ATTACHED IS A TEST REPORT FOR THE ACCEPTANCE TESTING OF PUMPING AND INSTRUMENTATION CONTROL SKID "M".

11A. Design Baseline Document? Yes No

NONE

12. Major Assm. Dwg. No.: N/A

13. Permit/Permit Application No.: N/A

14. Required Response Date: 12/15/99

15. DATA TRANSMITTED

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<th>Reason for Transmittal (G)</th>
<th>Disposition (H) &amp; (I)</th>
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18. Signature of EDT Originator

B.R. JOHNS 12/3/99

19. Authorized Representative for Receiving Organization

M.R. KOCH 12/3/99

20. Design Authority/Designated Manager

N.F. ZUROFF 12/3/99

21. DOE APPROVAL (if required)

Ctrl No. N/A

Approved

Approved w/comments

Disapproved w/comments
TEST REPORT FOR ACCEPTANCE TEST PROCEDURE FOR PUMPING INSTRUMENTATION AND CONTROL SKID "M"

M. R. KOCH
COGEMA ENGINEERING CORPORATION
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 624858  Charge Code: 103361
Org Code: 74000  Total Pages: 64
B&R Code: EW3120071

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

Abstract:
This is a Test Report for Acceptance Test Procedure (ATP) RPP-5073. This test report provides the results of the inspection and testing of the new Pumping Instrumentation and Control (PIC) skid designed as "M". The ATP was successfully completed. A copy of the completed ATP is in the Appendix of this document.

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Release Approval Date
Approved For Public Release

DATE: DEC 13 1999
STA: MANFORD RELEASE
ID: 2

Release Stamp

A-6400-073.1 (10/97)
1.0 INTRODUCTION

This test report provides the results from the performance of Acceptance Test Procedure (ATP) RPP-5073, for Pumping and Instrumentation Control (PIC) skid "M". The ATP verifies the proper construction of the PIC skid "M" by Site Fabrication Services along with proper programming of the Programmable Logic Controller (PLC) by engineering. New PIC skid "M" will be used for the pumping of tank U-102. A copy of the actual test results is in the Appendix of this document.

2.0 DESCRIPTION OF TEST

The test was performed at the Site Fabrication Services location. The ATP ensured the PIC skid was assembled and functioned as per the design drawings. Inputs to the skid were simulated to ensure proper equipment connections and wiring.

The ATP document provided detailed instructions for each test step and spaces for recording the data and signoffs. A copy of the test results including exceptions is in the Appendix.

3.0 TEST METHOD AND TEST EQUIPMENT

The ATP detailed the test methods and the test equipment to be used for testing. Test equipment identification and calibration dates are recorded on the ATP data sheets. Quality Control and Engineering witnessed the performance of the ATP.
4.0 TEST RESULTS

The ATP was successfully completed. Discrepancies in the test procedure were listed as exceptions. All the exceptions identified became part of the ATP and are in the Appendix along with the ATP results. All exceptions were reviewed, resolved and signed off as closed for this ATP.

A National Electrical Code (NEC) inspection was performed as part of the ATP. The NEC inspector accepted the electrical power portion of the skid and placed a blue acceptance sticker on the distribution panel. A Pressure Vessel inspector checked the water and air compressor tanks along with the associated relief valves. The installation of these tanks was acceptable. A copy of the NEC and Pressure Vessel inspection reports are in the Appendix of this document.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The PIC skid is found to be ready for field operation. All exceptions were resolved. An Operational Test Procedure (OTP) will be performed after the skid is set up for field configuration.

6.0 REFERENCES

RPP-5073, REVISION 0, ACCEPTANCE TEST PROCEDURE FOR PUMPING AND INSTRUMENTATION CONTROL SKIDS, Lockheed Martin Hanford Corporation, Richland, Washington.

2H9903387, Site Fabrication Services work package.
7.0 APPENDIX

Copy of ATP, RPP-5073, Revision 0.

NEC Inspection Report

Pressure Vessel Inspection Report
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.)

\[Signature\]
Cognizant Engineer Signature Date

\[Signature\]
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 # TPI-011-141-142

[Signature]
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 # 6158

[Signature]
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. 817-45-08-065 Exp. Date 2/17/2000 QA
Calibration No. ___________ Exp. Date _______ QA __

4.4.2 Transmation current (milliamp) simulator or equivalent

Calibration No. 817-45-08-065 Exp. Date 2/17/00 QA
Calibration No. 817-12-20-031 Exp. Date 3/31/00 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. 817-35-40-04y Exp. Date 11/24/99 QA
Calibration No. 817-35-40-024 Exp. Date 4/8/00 QA
817-35-40-054 9/6/00 QA

4.4.4 Megaohm meter, at least 500vac range.

Calibration No. 817-45-45-001 Exp. Date 9/16/00 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 2
- Breaker 3
- Breaker 4
- Breaker 5
- Breaker 6
- Breaker 7
- Breaker 8
- Breaker 9
- Breaker 10
- Breaker 11
- Breaker 12
- Breaker 13
- 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.

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.

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.

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.

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.

1. Phase-A to phase-C, continuity through transformer secondary

2. Phase-A to neutral, continuity through transformer secondary

3. 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:

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

Section 5.1 completed and all recorded readings within tolerance.

[Signature]

Quality Assurance Inspector Signature Date

11-28-99
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 11/23/99

Date
5.3 ELECTRICAL POWER CHECKS

The voltage checks are to verify proper voltages throughout the skid at specific termination points. Voltages checked are 480 vac, 3 phase; 120 vac, single phase; and 24 vac. 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, 480 vac 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 480 vac +10 vac/-20 vac on the line side of the main disconnect switch (SALW-DS-6002M). Record the voltage.

\[486\text{ vac A-B} \]
\[496\text{ vac A-C} \]
\[495\text{ vac B-C} \]

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

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

\[497\text{ vac A-C} \]

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

\[499\text{ vac A-B} \]
\[499\text{ vac A-C} \]
\[497\text{ vac B-C} \]
5.3.10  ✔ ENSURE 480 vac +10 vac/-20 vac on the line side of the pump motor
    starter (SALW-DS-6005M). Record the voltage.  v47 vac A-B
              v4 vac A-C
              v45 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 240 vac +10/-20 at the line side of the main breaker.
        Record voltage.  v47.2 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.

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<th>BKR OPEN VOLTAGE (NEAR 0Vac)</th>
<th>BKR CLOSED VOLTAGE (120+/−10Vac)</th>
<th>OPEN BKR</th>
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<td>124</td>
<td>124</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>FGM HT BOX</td>
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<td>124</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>TB10, INSTR PNL</td>
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<td>124</td>
<td>✓</td>
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<td>RCPT, AIR COMP</td>
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<td>124</td>
<td>✓</td>
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<tr>
<td>5</td>
<td>TB13, INSTR PNL</td>
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<td>✓</td>
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<tr>
<td>6</td>
<td>TB, INTRINSIC PNL</td>
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<td>124</td>
<td>✓</td>
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<tr>
<td>7</td>
<td>RCPT, WFIE</td>
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<td>124</td>
<td>✓</td>
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<tr>
<td>8</td>
<td>RCPT, WATER CAB</td>
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<td>124</td>
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<td>OUTSIDE RCPT.</td>
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<td>14</td>
<td>FGM J-BOX</td>
<td>124</td>
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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. Note: Close circuits in SALW-DP-6001M as required to complete these checks. ✓ FDP 1/3/97

FA 124.2; FB 124.3; FC 124.4; FD 124.4.

Heat trace fuse (wire CKT3H-B) 124.3.

Leak Detector fuse (wire CKT3H-A) 124.3.

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

First power supply 24.2; second power supply 24.05.

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  11/23/64

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.

<table>
<thead>
<tr>
<th>SWITCH OR BREAKER</th>
<th>Close</th>
<th>Open</th>
<th>Close</th>
<th>Open</th>
<th>Close</th>
<th>Open</th>
<th>Close</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALW-DS-6002M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SALW-DS-6003M</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CKT. #1</td>
<td></td>
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<tr>
<td>CKT. #2</td>
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<tr>
<td>CKT. #3</td>
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<tr>
<td>CKT. #4</td>
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<td>CKT. #5</td>
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<td>CKT. #6</td>
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<td>CKT. #7</td>
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<tr>
<td>CKT. #8</td>
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</tr>
<tr>
<td>CKT. #9</td>
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<td></td>
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<tr>
<td>CKT. #10</td>
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<tr>
<td>CKT. #11</td>
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<tr>
<td>CKT. #12</td>
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<tr>
<td>CKT. #13</td>
<td></td>
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</tr>
<tr>
<td>CKT. #14</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N/A

BRA

11/30/99
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.

<table>
<thead>
<tr>
<th>INSTRUMENT</th>
<th>LOCATION</th>
<th>PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALW-PS-6004M</td>
<td>INSTRU. AIR CAB.</td>
<td>6-PCD-508</td>
</tr>
<tr>
<td>SALW-WFT-6002M</td>
<td>WFIE CABINET</td>
<td>6-PCD-361</td>
</tr>
<tr>
<td>SALW-LT-6003M</td>
<td>WATER CABINET</td>
<td>6-PCD-361</td>
</tr>
<tr>
<td>SALW-SGT-6001M</td>
<td>WFIE CABINET</td>
<td>6-PCD-361</td>
</tr>
<tr>
<td>SALW-CONV-6001M</td>
<td>WFIE CABINET</td>
<td>6-CVT-520</td>
</tr>
<tr>
<td>SALW-FQIT-6001M</td>
<td>INSTRUMENT CAB.</td>
<td>Data sheet &amp; Vendor Man.</td>
</tr>
<tr>
<td>SALW-PI-6000M</td>
<td>AIR COMPRS. CABINET</td>
<td>6-TF-509</td>
</tr>
<tr>
<td>SALW-PI-6001M</td>
<td>WFIE CABINET</td>
<td>6-TF-509</td>
</tr>
<tr>
<td>SALW-PI-6005M</td>
<td>WFIE CABINET</td>
<td>6-TF-509</td>
</tr>
<tr>
<td>SALW-PI-6002M</td>
<td>WFIE CABINET</td>
<td>6-TF-509</td>
</tr>
<tr>
<td>SALW-PI-6003M</td>
<td>WFIE CABINET</td>
<td>6-TF-509</td>
</tr>
<tr>
<td>SALW-PI-6004M</td>
<td>WFIE CABINET</td>
<td>6-TF-509</td>
</tr>
<tr>
<td>SALW-PI-6007M</td>
<td>AIR COMPRS. CABINET</td>
<td>6-TF-509</td>
</tr>
<tr>
<td>SALW-PI-6008M</td>
<td>WATER CABINET</td>
<td>6-TF-509</td>
</tr>
</tbody>
</table>

Calibrations completed. Work package no. 2W-99-01384, 85, 86, 87, 88

\[ \text{Engineer Signature} \quad \text{Date} \]

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.

\[ \text{Engineer Signature} \quad \text{Date} \]
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:

<table>
<thead>
<tr>
<th>DISCONNECT SWITCH</th>
<th>ENERGIZED (√)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALW-DS-6002M</td>
<td>√</td>
</tr>
<tr>
<td>SALW-DS-6003M</td>
<td>√</td>
</tr>
<tr>
<td>SALW-DS-6004M</td>
<td>√</td>
</tr>
<tr>
<td>SALW-DS-6005M</td>
<td></td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
<th>DISCONNECT SWITCH</th>
<th>ENERGIZED (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;MAIN&quot;</td>
<td></td>
</tr>
<tr>
<td>1, FGM AND HEATER (SPARE)</td>
<td>✓</td>
</tr>
<tr>
<td>3, HEAT TRACE &amp; LEAK DETECTION IN INSTRUMENT ENCLOSURE</td>
<td>✓</td>
</tr>
<tr>
<td>5, INSTRUMENT CABINET</td>
<td>✓</td>
</tr>
<tr>
<td>7, WEIGHT FACTOR INSTRUMENT ENCLOSURE RECEPTACLES</td>
<td></td>
</tr>
<tr>
<td>9, RECEPTACLE NEAR PNLBD</td>
<td></td>
</tr>
<tr>
<td>11, FGM AND HEATER</td>
<td>✓</td>
</tr>
<tr>
<td>13, FGM SAMPLE/RETURN HEAT TRACE (SPARE)</td>
<td>✓</td>
</tr>
<tr>
<td>2, HEAT TRACE/FGM IA LINE (SPARE)</td>
<td>✓</td>
</tr>
<tr>
<td>4, AIR COMPRESSOR CABINET FAN, HEATER &amp; RECEPTACLE (GFCI)</td>
<td>✓</td>
</tr>
<tr>
<td>6, INTRINSICALLY SAFE PANEL</td>
<td></td>
</tr>
<tr>
<td>8, WATER TANK CABINET HEATER</td>
<td></td>
</tr>
<tr>
<td>10, HEAT TRACE FOR DIPTUBES &amp; FGM IA LINE</td>
<td></td>
</tr>
<tr>
<td>12, INSTR CAB A/C &amp; HTR RCPT</td>
<td></td>
</tr>
<tr>
<td>14, FGM SAMPLE/RETURN HEAT TRACE</td>
<td></td>
</tr>
</tbody>
</table>
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: 92.5 psig

<table>
<thead>
<tr>
<th>D. De F.</th>
<th>1/23/99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineer Signature</td>
<td>Date</td>
</tr>
</tbody>
</table>

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: 57 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.

<table>
<thead>
<tr>
<th>Flow</th>
<th>Engineer Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td></td>
<td>1/29/99</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Flow</th>
<th>Engineer Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td></td>
<td>1/29/99</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Flow</th>
<th>Engineer Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td></td>
<td>1/29/99</td>
</tr>
</tbody>
</table>

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.

[Signature]

Engineer Signature  1/24/99

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.

[Signature]

Engineer Signature  1/24/99

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.

[Signature]

Engineer Signature  1/24/99

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

[Signature]
Engineer Signature
1/29/99
Date

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

[Signature]
Quality Assurance Inspector Signature
1/29/99
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:

<table>
<thead>
<tr>
<th>VALVES</th>
<th>OPEN (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALW-V-6016M located in the middle of WFIE Cabinet</td>
<td>✓</td>
</tr>
<tr>
<td>SALW-V-6013M located in the middle of WFIE Cabinet</td>
<td>✓</td>
</tr>
<tr>
<td>SALW-V-6008M located in the middle of WFIE Cabinet</td>
<td>✓</td>
</tr>
</tbody>
</table>

**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:

<table>
<thead>
<tr>
<th>VALVE</th>
<th>CLOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALW-V-6015M</td>
<td>✔️</td>
</tr>
<tr>
<td>located in the middle of WFIE Cabinet</td>
<td></td>
</tr>
<tr>
<td>SALW-V-6014M</td>
<td>✔️</td>
</tr>
<tr>
<td>located in the middle of WFIE Cabinet</td>
<td></td>
</tr>
<tr>
<td>SALW-V-6008M</td>
<td>✔️</td>
</tr>
<tr>
<td>located in the middle of WFIE Cabinet</td>
<td></td>
</tr>
<tr>
<td>SALW-V-6013M</td>
<td>✔️</td>
</tr>
<tr>
<td>located in the middle of WFIE Cabinet</td>
<td></td>
</tr>
</tbody>
</table>

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.

[Signature]
Engineer Signature

Date
1/29/99

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

[Signature]
Quality Assurance Inspector Signature

Date
1/29/99
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:

<table>
<thead>
<tr>
<th>DATA TABLE ACCESS MODULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER TANK LEVEL</td>
</tr>
<tr>
<td>(RANGE: 28.5 TO 33.5 Inches)</td>
</tr>
<tr>
<td>31.1″</td>
</tr>
</tbody>
</table>

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.

QC INSPECTION RECORD

WORK ORDER 2H9903387F A-25 of 60
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)

<table>
<thead>
<tr>
<th>WATER TANK LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.2&quot;</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>WATER TANK LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.48</td>
</tr>
</tbody>
</table>

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.

**QC INSPECTION RECORD**

**WORK ORDER** 2H903387F
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. 125.04

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

<table>
<thead>
<tr>
<th>DATA TABLE ACCESS MODULE</th>
<th>WEIGHT FACTOR READING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(RANGE 120 to 130 inches)</td>
</tr>
<tr>
<td></td>
<td>125.4&quot;</td>
</tr>
</tbody>
</table>

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.

QC INSPECTION RECORD

A-27 of 60

WORK ORDER 2H9903387F

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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.

<table>
<thead>
<tr>
<th>DATA TABLE ACCESS MODULE</th>
<th>SPECIFIC GRAVITY READING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(RANGE 4.65 to 5.35 inches)</td>
</tr>
<tr>
<td></td>
<td>5.16</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>DATA TABLE ACCESS MODULE</th>
<th>SUPERNATANT FLOW XMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUPERNATANT FLOW</td>
<td>SUPERNATANT FLOW</td>
</tr>
<tr>
<td>(RANGE: 1.8 TO 2.2 GPM)</td>
<td>(RANGE: 1.8 TO 2.2 GPM)</td>
</tr>
<tr>
<td>2.00</td>
<td>2.00</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>SALW-PI-6012M JET PUMP SUCTION PRESSURE</th>
<th>DTAM DISCHARGE PRESSURE</th>
<th>SALW-PI-6011M JET PUMP DISCHARGE PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 At 4mA</td>
<td>0</td>
<td>0.1 At 4mA</td>
</tr>
<tr>
<td>99.8 At 20mA</td>
<td>300</td>
<td>299.3 At 20mA</td>
</tr>
</tbody>
</table>

**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%.)

<table>
<thead>
<tr>
<th>Input (mA)</th>
<th>Output (as displayed on Data Table Access Module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>10 %</td>
</tr>
<tr>
<td>10</td>
<td>11.2 %</td>
</tr>
<tr>
<td>20</td>
<td>30.0 %</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Input (mA)</th>
<th>Output (as displayed on Data Table Access Module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>80%</td>
</tr>
<tr>
<td>10</td>
<td>11.2%</td>
</tr>
<tr>
<td>20</td>
<td>30.0%</td>
</tr>
</tbody>
</table>

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 11/29/99

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 11/29/99

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.

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

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.

QC INSPECTION RECORD

A-33 of 60
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 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 laptop.

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.

No 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.

QC INSPECTION RECORD

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

* **B. Johns**  
  
* Engineer Signature  
  Date

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

* **D. M. Jones**  
  
* 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 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 \checkmark ENSURE software forces and bypasses are in place to start the pump. 
Record changes made.

\underline{Forces in place B\checkmark}

5.11.13 \checkmark ENSURE no dilution tank no flow alarm on the DTAM (alarm 35).

5.11.14 \checkmark START the pump from the DTAM.

5.11.15 \checkmark OPEN the switch at TB4.

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

5.11.17 \checkmark ACKNOWLEDGE the alarm.

5.11.18 \checkmark CLOSE the switch.

5.11.19 \checkmark ENSURE alarm clears.

5.11.20 \checkmark DISCONNECT the switch.

**FLAMMABLE GAS MONITOR INPUT**

5.11.21 \checkmark 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 \checkmark ENSURE software forces and bypasses are in place to start the pump. 
Record changes made.

\underline{Forces in places. Removed FGM \checkmark force on T8.3. B\checkmark}

5.11.23 \checkmark ENSURE no FGM interlock alarm on the DTAM (alarm 22).

5.11.24 \checkmark START the pump from the DTAM.

5.11.25 \checkmark OPEN the switch.

5.11.26 \checkmark ENSURE an FGM alarm on the DTAM and the pump shuts down 
immediately.

5.11.27 \checkmark 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 120 vac at TB-12, points HT-1 and CKT3-N. 123.6 vac

5.11.36  **OPEN** the FGM switch.

5.11.37  **ENSURE** 0 vac 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.

\[\begin{align*}
\text{Engineer Signature} & \quad 11/30/99 \\
\text{Date} & \\
\end{align*}\]

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

\[\begin{align*}
\text{Quality Assurance Inspector Signature} & \quad 11/30/99 \\
\text{Date} & \\
\end{align*}\]
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 WFE 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.)
RPP-5074
REVISION 0

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

[Signature] 11/29/99
Engineer Signature Date

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

[Signature] 11/29/99
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.

[Signature]

Engineer Signature  11/30/99  Date

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

[Signature]

Quality Assurance Inspector Signature  11/30/99  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.

\[ \sqrt{\text{SALW-DS-6002M}} \quad \sqrt{\text{SALW-DS-6003M}} \quad \sqrt{\text{SALW-DS-6004M}} \quad \sqrt{\text{SALW-DS-6005M}} \]

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

- Breaker “MAIN”
- Breaker 2
- Breaker 3
- Breaker 4
- Breaker 5
- Breaker 6
- Breaker 7
- Breaker 8
- Breaker 9
- Breaker 10
- Breaker 11
- Breaker 12
- Breaker 13
- 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.

\[ \sqrt{\text{SALW-V-6035M (EQUALIZING)}} \quad \sqrt{\text{SALW-V-6036M (EQUALIZING)}} \]

5.14.5 Ensure the following PIC skid valves are CLOSED.

Air Compressor cabinet: Water cabinet:

\[ \sqrt{\text{SALW-V-6025M}} \quad \sqrt{\text{SALW-V-6027M}} \]
\[ \sqrt{\text{SALW-V-6026M}} \quad \sqrt{\text{SALW-V-6028M}} \]
\[ \sqrt{\text{SALW-V-6034M}} \quad \sqrt{\text{SALW-V-6029M}} \]
\[ \sqrt{\text{SALW-V-6043M}} \quad \sqrt{\text{SALW-V-6030M}} \]
\[ \sqrt{\text{SALW-V-6044M}} \quad \sqrt{\text{SALW-V-6031M}} \]
\[ \sqrt{\text{SALW-V-6046M}} \quad \sqrt{\text{SALW-V-6032M}} \]
\[ \sqrt{\text{SALW-V-6047M}} \quad \sqrt{\text{SALW-V-6037M}} \]
\[ \sqrt{\text{SALW-V-6048M}} \]
\[ \sqrt{\text{SALW-V-6049M}} \]
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-6015M

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.

![Signature](signature-1)

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

![Signature](signature-2)
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.

Engineering Signature Date

11/16/99

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

Quality Assurance Inspector Signature Date

11/16/99
## ACCEPTANCE TEST PROCEDURE LOG

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1/23/99</td>
<td>Left off at end of day at step 5.8.22.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turned off all power. Air leak in EPC.</td>
</tr>
<tr>
<td>B Jones</td>
<td>11/29/99</td>
<td>Had to skip water level transmitter test due to transmitter not being calibrated.</td>
</tr>
<tr>
<td>B Jones</td>
<td>11/29/99</td>
<td>Add to process to have insty. techs to have correct fittings for connecting manometer to &quot;High press. DIP tube&quot;.</td>
</tr>
<tr>
<td>B Jones</td>
<td>11/29/99</td>
<td>Add to voltage checks to verify 32 volts at I-S. modules.</td>
</tr>
<tr>
<td>B Jones</td>
<td>11/29/99</td>
<td>Completed sections 5.9 and 5.12.</td>
</tr>
<tr>
<td>B Jones</td>
<td>11/29/99</td>
<td>Need to finish section 5.10. Need to do sections 5.11 and 5.13 of ATP testing.</td>
</tr>
<tr>
<td>B Jones</td>
<td>11/30/99</td>
<td>On future ATP's rewrite 5.13.23 to have installing jumpers as optional.</td>
</tr>
<tr>
<td>B Jones</td>
<td>12/2/99</td>
<td>Step 5.10.47 Editorial change. Changed 50% to 2.5%:bgq</td>
</tr>
</tbody>
</table>
# ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

This page may be reproduced as necessary

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11/22/99</td>
<td>Add note to section 5.1 to close o,c's as req'd for continuity checks. P.P.</td>
</tr>
<tr>
<td>2</td>
<td>11/23/99</td>
<td>Device configuration was required to get correct megger readings for o,c's 3,4,5,7.</td>
</tr>
<tr>
<td>3</td>
<td>11/2/99</td>
<td>Add note to section 5.3.21 to close circuits as req'd for voltage checks. P.P.</td>
</tr>
<tr>
<td>4</td>
<td>11/30/99</td>
<td>Flow converter not calibrated.</td>
</tr>
<tr>
<td>5</td>
<td>11/30/99</td>
<td>Labels on water level transmitter incorrect.</td>
</tr>
</tbody>
</table>

---

**QC INSPECTION RECORD**

WORK ORDER 2H9903387F

A-50 of 60
<table>
<thead>
<tr>
<th>Description of Exception:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Megger readings were below required 1000 megaohms.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resolution of Exception:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Megger readings were being taken &quot;through&quot; device windings (such as cabinet heaters), configure cuts per attached sheet and retest. All results should be within specified range (&gt; 1000 megaohms)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date of Resolution:</th>
<th>11/23/99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognizant Engineer signature:</td>
<td>BRE 11/30/99</td>
</tr>
<tr>
<td>Quality Assurance signature:</td>
<td>Mr. Koch 12/1/99</td>
</tr>
<tr>
<td>Design Authority:</td>
<td>12/1/99</td>
</tr>
<tr>
<td>RESOLUTION COMPLETED: (date)</td>
<td>12/1/99</td>
</tr>
<tr>
<td>Quality Assurance:</td>
<td></td>
</tr>
</tbody>
</table>
| Cognizant Engineer: | BRE
MEGGER TESTING
SKID "M"

FOR CKT 3:
DO NOT LOAD TO PREVENT READING DEVICE
IMPEDANCE AND CAUSING MEGGER TEST FAILURE,
BY PERFORMING THE FOLLOWING:

"OPEN" OR "REMOVE" 10A LEAK DETECTION FUSE
AND 10A HEAT TRACE FUSE IN INSTRUMENT ENCLOSURE.

\[ \text{CLOSE AT COMPLETION OF TEST} \]

REFERENCE H-14-103546 SHEET 13

FOR CKT 4:
TO PREVENT READING HEATER AND COOLING FAN
WINDING IMPEDANCE, PERFORM THE FOLLOWING:

- ENSURE HEATER IS TURNED DOWN LOWER THAN AMBIENT
  OR UNPLUG.
- ENSURE FAN THERMOSTAT IS TURNED HIGHER THAN
  AMBIENT.
- ENSURE NO OTHER DEVICES PLUGGED INTO CONVENIENCE
  RECEPTACLE IN AIR COMPRESSOR ENCLOURE.

REFERENCE H-14-103546 SHEET 5.

\[ \text{RESET TEMPERATURES AT COMPLETION OF MEGGER TEST} \]

FOR CKT 5
"OPEN" OR REMOVE FUSES 8

5 A CKT 5H-A
5 A CKT 5H-B
10 A CKT 5H-C
5 A CKT 5H-D

\[ \text{ENSURE ENCLOSURE LIGHT IS "OFF" OR DISCONNECT} \]
\[ \text{FIXTURE} \]

REFERENCE H-14-103546 SHEET 13

\[ \text{CLOSE FUSES AND RESTORE FIXTURE AT COMPLETION} \]
\[ \text{OF MEGGER TESTING.} \]

FOR CKT 7:
- UNPLUG HEATER AND LIGHT FIXTURE IN CKT 7.
- ENSURE NO OTHER DEVICES ARE PLUGGED IN

\[ \text{A-52 of 60} \]
# Acceptance Test Procedure Exception Record

This page may be reproduced as necessary.

<table>
<thead>
<tr>
<th>ATP step number: 5.10.45 to 5.10.49</th>
<th>ATP Exception Log Number: 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description of Exception:</strong></td>
<td></td>
</tr>
<tr>
<td>Unable to perform flow meter test due to flowmeter not calibrated.</td>
<td></td>
</tr>
<tr>
<td><strong>Resolution of Exception:</strong></td>
<td></td>
</tr>
<tr>
<td>The flow meter test will be performed after it is calibrated. This will be done at the salt well maintenance shop. The ATP procedure will be signed off as complete after the flow meter test is completed.</td>
<td></td>
</tr>
<tr>
<td><strong>Date of Resolution:</strong></td>
<td>11/30/99</td>
</tr>
<tr>
<td><strong>Cognizant Engineer signature:</strong></td>
<td>BR Johns</td>
</tr>
<tr>
<td><strong>Quality Assurance signature:</strong></td>
<td>Z. Voinov. 12/1/99</td>
</tr>
<tr>
<td><strong>Design Authority:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>RESOLUTION COMPLETED: (date)</strong></td>
<td>12/2/99</td>
</tr>
<tr>
<td><strong>Quality Assurance:</strong></td>
<td>Z. Voinov. 12/2/99</td>
</tr>
<tr>
<td><strong>Cognizant Engineer:</strong></td>
<td>BR Johns</td>
</tr>
</tbody>
</table>

A-53 of 60
## ACCEPTANCE TEST PROCEDURE EXCEPTION RECORD

This page may be reproduced as necessary.

<table>
<thead>
<tr>
<th>ATP step number:</th>
<th>Final Signoff</th>
<th>ATP Exception Log Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Exception:</td>
<td>Three water tank enclosure labels have errors, do not match final drawings.</td>
<td></td>
</tr>
<tr>
<td>Resolution of Exception:</td>
<td>The labels for valves SALW-V-6031M and SALW-V-6029M and for transmitter SALW-LT-6003M are to be replaced with correct labels. This will be completed at the saltwell maintenance shop after the skid is received from the fab shop.</td>
<td></td>
</tr>
<tr>
<td>Date of Resolution:</td>
<td>11/30/99</td>
<td></td>
</tr>
<tr>
<td>Cognizant Engineer signature:</td>
<td>BR Johns</td>
<td></td>
</tr>
<tr>
<td>Quality Assurance signature:</td>
<td>12/1/99</td>
<td></td>
</tr>
<tr>
<td>Design Authority:</td>
<td>12/1/99</td>
<td></td>
</tr>
<tr>
<td>RESOLUTION COMPLETED: (date)</td>
<td>12/1/99</td>
<td></td>
</tr>
<tr>
<td>Quality Assurance:</td>
<td>12/1/99</td>
<td></td>
</tr>
<tr>
<td>Cognizant Engineer:</td>
<td>BR Johns</td>
<td></td>
</tr>
</tbody>
</table>

A-54 of 60
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:

All exceptions completed: BRF

BR Johnson 12/2/99
Cognizant Engineer (Signature) (Print Name) Date

QC INSPECTION RECORD
A - 55 of 60

WORK ORDER 2H9903387F
PROCEDURE PERFORMER SIGNATURE SHEET

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

<table>
<thead>
<tr>
<th>PRINT NAME</th>
<th>SIGNATURE</th>
<th>INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dirk D. Wiggins</td>
<td>Dirk D. Wiggins</td>
<td>DOW</td>
</tr>
<tr>
<td>Doug Deford</td>
<td>D. Defdz</td>
<td>D</td>
</tr>
<tr>
<td>Ron Cowgill</td>
<td>Cowgill</td>
<td>C</td>
</tr>
<tr>
<td>Melissa Herring</td>
<td>Herring</td>
<td>HHH</td>
</tr>
<tr>
<td>Tim Yearout</td>
<td>Yearout</td>
<td>Y</td>
</tr>
<tr>
<td>Brad Daubenbaugh</td>
<td>Daubenbaugh</td>
<td>BBD</td>
</tr>
<tr>
<td>Bruce R Johns</td>
<td>BR Johns</td>
<td>BRJ</td>
</tr>
<tr>
<td>Roy C. Ferguson</td>
<td>Roy Ferguson</td>
<td>RF</td>
</tr>
<tr>
<td>James R Harris</td>
<td>Harris</td>
<td>JRN</td>
</tr>
</tbody>
</table>

QC INSPECTION RECORD  
A-56 of 60
<table>
<thead>
<tr>
<th>PRINT NAME</th>
<th>SIGNATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tim YEAROUT</td>
<td>Tim Yearot</td>
</tr>
<tr>
<td>Melissa Herron</td>
<td>U</td>
</tr>
<tr>
<td>Brad Daumtause</td>
<td>B.J. Daumtase</td>
</tr>
<tr>
<td>Bobby Joe Nicholson</td>
<td>J.O. Nicolson</td>
</tr>
<tr>
<td>Ron McMurtry</td>
<td>Ron McMurtry</td>
</tr>
<tr>
<td>Ron Dougill</td>
<td></td>
</tr>
<tr>
<td>Doug Deford</td>
<td>Doug Deford</td>
</tr>
<tr>
<td>Bruce Johns</td>
<td>BJ Johns</td>
</tr>
</tbody>
</table>
UNFIRED PRESSURE VESSEL - REPORT OF INSPECTION (Form NB-7)
THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY, HARTFORD, CT

TPI WO NO: 2W-99-_____ (1 Hrs)

<table>
<thead>
<tr>
<th></th>
<th>Date Inspected</th>
<th>Cert Exp</th>
<th>Cert. Posted</th>
<th>Owner No</th>
<th>Jurisdiction No</th>
<th>National Board / Other</th>
</tr>
</thead>
</table>

2 Owner: DEPARTMENT OF ENERGY (RL)
Owner Address: HANFORD, RICHLAND, WA 99352
Kind of Inspection: [ ] Int'l [X] Ext
Certificate Inspection: [X] Yes [ ] No

3 User Name: (LMHC)
LOCKHEED MARTIN HANFORD CORP.
User Location: 200-W TANK FARM
Specific Location: SALT WELL SKID M

4 Type: [X] AIR TANK [ ] WATER TANK [ ] Other
Year Built: 1998
Manufacture: BRUNNER ENG

5 Use: Storage [X] Process [ ] Exchange [ ] Other
Size: 14" X 20"
Inspection opening size: 2" PLUGS

6 Pressure Gauge Tested: [X] Yes [ ] No
Hydro Test: [X] Yes [ ] No
Pressure Allowed (MAWP): Safety-Relief Valve:
This Inspection: 200 FSIG Stamped PSI: 125
Valve: SALW-PRV-6004M How Tested: 1/2", 296 CFM NEW

7 Certificate may be issued? [X] Yes [ ] No (If No, explain fully under conditions)

7a. INSPECTION STATUS: [X] Passed [ ] Failed [ ] Passed with Discrepancy [ ] Reinspect

7b. VESSEL STATUS: [X] Active [ ] Inactive [X] New [ ] Exempt [ ] Removed

8 CONDITIONS: Small Horizontal Air Accumulator for salt well support skid M.

Inspected at 277-W Fabrication Shop during final assembly. Scheduled to be located at Tank Farms

8a: Internal Inspection not done or required this inspection.
Original Thickness: Shell = 0.106, Heads = 0.094

8b: External Inspection shows no dents, damage, leakage, corrosion or excess vibration.
Pressure guage: Installed & Proper Bottom drain: Installed & Suitable
Safety-Relief Valve Seal was intact with no evidence of damage or tampering

9 REQUIREMENTS/RECOMMENDATIONS: The following items are to be corrected:
1. None this inspection

10 Name of Facility Contact to whom requirements were explained: Bruce Johns  Tel: 373-3429  S7-24
Copies to: David Saueressig Tel: 373-0183 S7-20, Mike Koch Tel: 373-2699 S7-24

I hereby certify this is a true report of my inspection
Signature of Inspector

<table>
<thead>
<tr>
<th>John L. Densley</th>
<th>Commission No</th>
<th>Employed By: The Hartford Steam Boiler Inspection and Insurance Co.</th>
</tr>
</thead>
<tbody>
<tr>
<td>372-0003</td>
<td>NB-8032W</td>
<td></td>
</tr>
</tbody>
</table>

TPI-WT-141.doc

A-58 of 60
**UNFIR ED PRESSURE VESSEL - REPORT OF INSPECTION**

**THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY, HARTFORD, CT**

**REPORT OF INSPECTION (Form NB-7)**

**TPI WO NO: 2W-99-_____ (1 Hrs)**

### Date Inspected: 11/16/1999  
Cert Exp: 11/2001  
Cert. Posted: [X] Yes [ ] No  
Owner No: TK-6001M  
Owner Address: HANFORD, RICHLAND, WA 99352  
Jurisdiction No: TPI-WT-142  
National Board / Other: NB-100784

#### Owner: DEPARTMENT OF ENERGY (RL)

#### User Name: LOCKHEED MARTIN HANFORD CORP.

#### Type: [X] WATER TANK  
[ ] OTHER

#### Use: [X] Storage  
[ ] Receiver  
[ ] Process  
[ ] Exchange  
[ ] Other

#### Pressure Gauge Tested: [X] Yes [ ] No  
Hydro Test: [X] Yes [ ] No

#### Pressure Allowed (MAWP): 125 PSIG  
Safety-Relief Valve: Stamped PSI: 60  
Valve: SALW-PRV-6005M

#### This Inspection:  
Passed  
Failed  
Passed with Discrepancy  
Reinspect

#### Certificate may be issued: [X] Yes [ ] No  
If No, explain fully under conditions

#### Certificate: Internal Inspection not done or required this inspection. Vessel is galvanized and not subject to internal corrosion.

#### Conditions: Vertical Water Accumulator for salt well support skid M.

Inspected at 277-W Fabrication Shop during final assembly. Scheduled to be located at Tank Farms.

8a: Internal Inspection not done or required this inspection. Vessel is galvanized and not subject to internal corrosion.

8b: External Inspection shows no dents, damage, leakage, corrosion or excess vibration.

Pressure gauge: installed & proper  
Bottom drain: installed & suitable  
Safety-Relief Valve Seal was intact with no evidence of damage or tampering

### REQUIREMENTS/RECOMMENDATIONS:

The following items are to be corrected:

1. None this inspection

### Signature of Inspector

[Signature]

John L. Densley  
Commission No: 372-6003  
Employed By: The Hartford Steam Boiler Inspection and Insurance Co.

Copies to: David Saueressig  
Tel: 373-0183  
S7-20  
Mike Koch  
Tel: 373-2699  
S7-24

I hereby certify this is a true report of my inspection.
Nec Inspection Report

Project/W.O. No. N/A
Building No. 277W

Report No. 3156

Inspection Requested By Ron McMurphy
Phone 373-3793

Inspector Phone 376-5265
Bresina WL

Item Inspected: Pumping instrumentation control skid-M shop built

Condition Found: Acceptable

Unacceptable (See description below)
Inspector Signature: Bresina

Original Inspection Date: Nov. 9, 1999
Closure Date: Nov. 9, 1999

Description of NEC Violation

Cause Days to Violation Code Corrected Date

4

Note: "Days to Correct" is the time allowed for the equipment or facility identified in violations and not corrected within the allowed time. The "Days to Correct" column "Days to Correct" starts with the original inspection date. For comments regarding this call the Chief Electrical Engineer at 376-6347.

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11-16-99 TIE 07-54 STA 60, Section 1, Site 1