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Document #: SD-W030-ATR-004

Title/Desc: W-030 AY & AZ TANK FARM COOLING & MISC INSTRUMENTATION [VENTILATION UPGRADES]

Pages: 54
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W-030 Test Review Board

3. From: (Originating Organization)  
Project W-030, Tank Farm Projects

4. Related EDT No.:  
613210

5. Proj./Prog./Dept./Div.:  
Project W-030

6. Cog. Engr.:  
F.T.Clifton

7. Purchase Order No.:  
N/A

8. Originator Remarks:  

11. Receiver Remarks:

14. Required Response Date:  
April 15, 1996

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18.  
Signature of EDT Originator:  
APR 2.9 1996

19.  
Authorized Representative Date for Receiving Organization:  

20.  
Cognizant Manager Date:  

21. DOE APPROVAL (if required)  

- Approved  
- Approved w/comments  
- Disapproved w/comments
W030 AY/AZ TANK FARM COOLING AND MISCELLANEOUS INSTRUMENTATION

D. B. COLE
WHC, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 615251  UC: 2030
Org Code: 8K240  Charge Code: NK201
B&R Code: EW3130010  Total Pages: 5

Key Words: TEST, VENTILATION, INSTRUMENTATION, REPORT, W-030, STARTUP

Abstract: Acceptance test report for construction functional testing of Project W-030 cooling systems and related instrumentation. Project W-030 provides a ventilation upgrade for the four Aging Waste Facility tanks. The Tank Farm Cooling System consists of four forced draft cooling towers, a chilled water system, and associated controls.

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Approved for Public Release

A-6400-073 (10/95) GEF321
ACCEPTANCE TEST PROCEDURE - TANK FARM AND MISC. INSTRUMENTATION

FT Clifton
Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 613210    UC: 2030
Org Code: 8K240    Charge Code: NK201
B&R Code: EW3130010    Total Pages: 37

Key Words: Test, Ventilation, instrumentation, acceptance, W-030, startup

ACCEPTANCE TEST PROCEDURE  WHC-SD-W030-ATR-004

TEST TITLE  AY/AZ Tank Farm Cooling and Miscellaneous Instrumentation

LOCATION  AY/AZ Tank Farm

PROJECT NUMBER  W-030  WORK ORDER  P48738 and P48739

PROJECT TITLE  Tank Farm Ventilation Upgrade

Prepared By
ICF Kaiser Hanford Company
Richland, Washington

For Westinghouse Hanford Company
Subcontract WHC-380393

PROCEDURE APPROVAL

ICF KAISER HANFORD COMPANY (ICF KH)

Mark A. Friedlich  1-16-96  Robert B. Hoffmann  1-16-96
Author  Date  Technical Documents  Date

C. J. Janisse  1/16/96  C. D. Egger  1/17/96
Checker  Date  Safety  Date

N/A  

Environmental  Date  N/A  Quality Engineering  Date

J. Henderson  1/17/96
Project Management  Date

Westinghouse Hanford Company (WHC)

James W. Cole  1/18/96
Projects Department  Date  Quality Assurance  Date

E. A. Dole  1/19/96
Safety  Date  Operations  Date

W030004.SP.1232  - 1 -  WHC-SD-W030-ATR-004  Rev 0
01/16/95
# EXECUTION AND TEST APPROVAL

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## A-E APPROVAL

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Project Manager Date

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## TEST APPROVAL AND ACCEPTANCE

Westinghouse Hanford Company

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EXECUTION AND TEST APPROVAL

EXECUTED BY:

[Signature]

Test Director/Organization: ICF KH

Date: 2-13-96

[Signature]

Test Operator/Organization: ICF KH

Date: 2-13-96

[Signature]

Recorder/Organization: ICF KH

Date: 2-13-96

WITNESSES

[Signature]

Witness/Organization: M.D. Harding

Date: 4-15-96

Title III Inspector: Bruce Bels

Date: 2-13-96

[Signature]

Witness/Organization: John Doe

Date: 4-15-96

Witness/Organization: Jane Doe

Date: 4-15-96

A-E APPROVAL

ICF Kaiser Hanford Company (ICF KH)

Without exceptions ___ With exceptions resolved ___ With exceptions outstanding ___

[Signature]

Acceptance Inspection: Bruce Bels

Date: 3-28-96

Design Engineer: Mark A. Friedland

Date: 4-23-96

Project Manager: Jane Doe

Date: 4-23-96

TEST APPROVAL AND ACCEPTANCE

Westinghouse Hanford Company

Without exceptions ___ With exceptions resolved ___ With exceptions outstanding ___

[Signature]

Projects Department: Dennis B. Cole

Date: 4-19-96

Quality Assurance: Hawk M. Chaffin

Date: 4-17-96

Operations: M.D. Harding

Date: 4-15-96

WO30004.SP.1232 - 2 -

WHC-SD-W030-ATR-004
Rev 0
01/16/95
<table>
<thead>
<tr>
<th>Section</th>
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<th>Page</th>
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<tr>
<td>1</td>
<td>Purpose</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>References</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Responsibilities</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Change Control</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Execution</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Exceptions</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>Prerequisites, Equipment/Instruments, and Abbreviations</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>AY Recirculating Condensation Cooling Test</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>AZ Recirculating Condensation Cooling Test</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td>AZCW Ventilation Condensation Cooling System</td>
<td>35</td>
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<tr>
<td></td>
<td>Exception Form</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Test Exception Log</td>
<td>38</td>
</tr>
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</table>

**NOTE:** At completion of test, enter pages added during performance of test to this Table of Contents.
1 PURPOSE

This Acceptance Test Procedure (ATP) has been prepared in order to verify or demonstrate the following:

1.1 That the Contractor has performed the required calibration and wiring checks for all new instrumentation associated with:

1.1.1 Four packaged cooling towers and supply pumps.
1.1.2 One packaged process water chiller, condenser, and supply pumps.

1.2 Limited operational checks (including control devices) of:

1.2.1 Four packaged cooling towers and supply pumps.
1.2.2 One packaged process water chiller and supply pumps.

Local Control System testing will be accomplished by aligning the components as required for testing, actuating the local control switches, and verifying that the control signal is received at the component circuit breaker or motor starter. Manufacturer's representative will be consulted prior to energizing packaged equipment.

2 REFERENCES

2.1 DRAWINGS

H-2-131067, Sh 1, Rev 0  P&ID AY101EW Recirc Cond Cooling
H-2-131068, Sh 1, Rev 0  P&ID AY102EW Recirc Cond Cooling
H-2-131069, Sh 1, Rev 0  P&ID AZ101EW Recirc Cond Cooling
H-2-131070, Sh 1, Rev 0  P&ID AZ102EW Recirc Cond Cooling
H-2-131071, Sh 1, Rev 0  P&ID AZCW Vent Cond Cooling Sys
H-2-131357, Sh 1, Rev 0  Electrical Yard Plan & General Notes
H-2-131366, Sh 1, Rev 0  Electrical Elementary Diagram Recirc Bldg AY-101 & AY-102
H-2-131366, Sh 2, Rev 0  Electrical Elementary Diagram Recirc Bldg AZ-101 & AZ-102
H-2-131366, Sh 3, Rev 0  Electrical Elementary Diagram Evap Twr AY-101
H-2-131366, Sh 4, Rev 0  Electrical Elementary Diagram Evap Twr AY-102
H-2-131366, Sh 5, Rev 0  Electrical Elementary Diagram Evap Twr AZ-101
H-2-131366, Sh 6, Rev 0  Electrical Elementary Diagram Evap Twr AZ-102
H-2-131366, Sh 7, Rev 0  Electrical Elementary Diagram Chiller Pad
2.2 SPECIFICATIONS

W-030-C3, Rev. 0

Construction Specification for Tank Farm
Ventilation Upgrade

2.3 VENDOR INFORMATION (VI)

VI-22525

3 RESPONSIBILITIES

3.1 GENERAL

Each company or organization participating in this ATP will designate personnel
to assume the responsibilities and duties as defined herein for their
respective roles. The designees shall become familiar with this ATP and the
systems involved to the extent that they can perform their assigned duties.

3.2 WHC PROJECT ENGINEER

3.2.1 Designates a Test Director.

3.2.2 Coordinates testing with 200-East Tank Farms Operations.

3.2.3 Acts as liaison between the participants in acceptance testing.

3.2.4 Distributes the approved testing schedule before start of testing.

3.2.5 Schedules and conducts a pretest kickoff meeting with test
participants when necessary.

3.2.6 Notifies the persons supporting the test 2 days before the start of
testing.

3.2.7 Schedules a dry run when necessary.

3.2.8 Notifies concerned parties when a change is made in the testing
schedule.

3.2.9 Signs Execution and Test Approval page when test is approved and
accepted.

3.2.10 Takes necessary action to clear exceptions to the test.

3.2.11 Signs Exception Form when exception has been resolved.

3.2.12 Provides a distribution list for the approved and accepted ATP.

3.3 TEST DIRECTOR

3.3.1 Coordinates and directs acceptance testing.

3.3.2 Confirms that field testing and inspection of the system or portion
of the system to be tested has been completed.
3.3.3 Stops any test which, in his or her judgment, may cause damage to the system until the problem has been resolved.

3.3.4 After verifying there is no adverse impact, may alter the sequence in which systems or subsystems are tested.

3.3.5 Ensures that required environmental conditions are maintained.

3.3.6 If a test is to be suspended for a period of time, ensures that the system is left in a safe mode.

3.3.7 Before restarting suspended test, re-verifies the test prerequisites.

3.3.8 Initiates Engineering Change Notices (ECNs) to document required changes to the ATP.

3.3.9 Reviews recorded data, discrepancies, and exceptions.

3.3.10 Obtains information or changes necessary to clear or resolve objections during the performance of the test.

3.3.11 Signs Execution and Test Approval page when test has been performed.

3.3.12 Signs Exception Form when exception has been resolved.

3.3.13 Obtains required signatures on the ATP Master prior to reproduction and distribution.

3.4 WITNESSES (Provided by Participating Organizations. One witness shall be a Title III acceptance inspector.)

3.4.1 Witness the tests.

3.4.2 Review results of testing.

3.4.3 Assist the Test Director when requested.

3.4.4 Sign Execution and Test Approval page when test has been performed.

3.4.5 Sign Exception Form when exception has been resolved.

3.5 RECORDER (Provided by ICF KH)

3.5.1 Prepares a Field copy from the ATP Master.

3.5.2 Records names of all designated personnel on Field copy of ATP prior to start of testing.

3.5.3 Records test instrument identification numbers and calibration expiration dates, as required.

3.5.4 Initials and dates every test step on the Field copy as it is completed next to the step number or on a data sheet, when provided. Records test data. On data sheets where there is not room for both the initial and date, date may be entered at bottom of column.
3.5.5 Records objections and exceptions on an Exception form. Uses additional Exception forms as needed. Notifies the Test Director at time the objection is made.

3.5.6 Signs Execution and Test Approval page when test has been performed.

3.5.7 After test is finished, assigns alpha numeric page numbers to added data sheets and Exception forms. Records page numbers in the Table of Contents.

3.5.8 Transfers Field copy entries for each step to the Master in ink or type, signs, and dates. Transmits the completed Master to the Test Director for approval signature routing. Transmits the Field copy to Construction Document Control for inclusion in the official project file.

3.5.9 Signs Exception Form when exception has been resolved and transmits to Test Director.

3.6 TEST OPERATOR

3.6.1 Performs test under direction of the Test Director.

3.6.2 Provides labor, equipment, and test instruments required for performing tests which have not been designated as being provided by others.

3.6.3 Requests in writing from the Test Director those services, materials, or equipment that have been designated as being supplied by others.

3.6.4 Confirms that all equipment required for performing test will be available at the start of testing.

3.6.5 Signs the Execution and Test Approval page.

3.7 A-E ACCEPTANCE INSPECTION, DESIGN ENGINEER, AND PROJECT MANAGER

3.7.1 Evaluate results.

3.7.2 Sign for A-E Approval on Execution and Test Approval page.

4 CHANGE CONTROL

Test procedure editorial changes required during testing may be accommodated as exceptions in the released ATP and Test Report, if the changes do not affect operating facility safety, function, or performance and do not compromise or influence test data. Requirement changes, changes to acceptance criteria, or changes to Danger, Caution, Special Precautions, or other safety or environmental instructions must be processed on ECNs in accordance with company procedures, and if a need for such a change is discovered in the course of running the test, the test shall be stopped until the ECN is approved. However, this does not prevent the running of another portion of the test unaffected by the change.
EXECUTION

5.1 OCCUPATIONAL SAFETY AND HEALTH

 Individuals shall carry out their assigned work in a safe manner to protect themselves and others from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects.

5.2 PERFORMANCE

5.2.1 Conduct testing in accordance with ICF KH Procedure CON 3.5 (Performance and Recording of Acceptance Test Procedures).

5.2.2 Perform test following the steps and requirements of this procedure.

6 EXCEPTIONS

6.1 GENERAL

Exceptions to the required test results are sequentially numbered and recorded on individual Exception forms. This enables case-by-case resolution and approval of each exception.

Errors/exceptions in the ATP itself shall NOT be processed as test exceptions (see Section 4 CHANGE CONTROL).

6.2 RECORDING

6.2.1 Number each exception sequentially as it occurs and record it on an Exception Form (KEH-428), sample appended.

6.2.2 Enter name and organization of objecting party for each exception.

6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

Record the action taken to resolve each exception. Action taken may not be the same as planned action.

6.3.1 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Form.

6.3.2 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Form.
6.4 APPROVAL AND ACCEPTANCE

The customer provides final approval and acceptance of exceptions by checking one of the following on Exception Form:

6.4.1 Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.

6.4.2 Exception Accepted-As-Is: Requires detailed explanation.

6.4.3 Other: Requires detailed explanation.

The customer signs and dates the Exception Form and obtains other customer internal approvals, if required.

6.5 DISTRIBUTION

A copy of the approved Exception Form is distributed to each participant. The signed original is attached to the ATP Master.

7 PREREQUISITES, EQUIPMENT/INSTRUMENTS, AND ABBREVIATIONS

7.1 PREREQUISITES

The following conditions shall exist at start of testing for that portion of the system being tested.

7.1.1 The recirculating condensation cooling systems have been inspected for compliance with construction documents.

7.1.2 The AZCW ventilation condensation cooling system has been inspected for compliance with construction documents.

7.1.3 Reference documents (including this ATP) have been verified for correct revision number and outstanding ECNs.

7.1.4 A Job Safety Analysis (JSA) has been prepared, read and signed, and a Prejob Safety Meeting has been conducted.

7.1.5 A prejob walkthrough of systems being tested has been conducted.

7.1.6 Test instruments have a valid calibration stamp attached. Test instrument identification numbers and calibration expiration dates have been recorded in Para 7.2.

7.1.7 120 V ac power is available. See Drawing H-2-131366, Sh 1 and 2.

7.1.8 Ice and hot water are available.

7.1.9 Verification of required testing (meggering and continuity checks of all associated power cables and instrument and control cables) has been completed.

7.1.10 RWP has been approved by WHC Operations if required.
7.2 EQUIPMENT/INSTRUMENTS

Supplied by Test Operator unless otherwise noted.

7.2.1 Digital Multimeter (DMM): 4-1/2 digit or better 0.5% minimum accuracy (ac volts).

Manufacturer Fluke  Model No. 83  Serial No. 6120072
Calibration Date 12-21-95  Expiration Date 12-21-96

7.2.2 Process Instrument Calibrator (PIC): Output 4-20 mA, 0-5 V, input 4-20 mA, 0-5 V, accuracy ± 0.01 mA, 0.1 V.

Manufacturer  Model No.  Serial No.
Calibration Date  Expiration Date

7.2.3 Container: To hold water for leak or level detector tests 4-inch depth.

7.2.4 Thermometer.

7.2.5 Shorting Switches.
AY RECIRCULATING CONDENSATION COOLING TEST

This test will demonstrate the integrity of the instruments and equipment associated with the tank recirculating condensation cooling systems located at the AY evaporator pad. (Reference Drawings H-2-131067, Sh 1, H-2-131068, Sh 1, and H-2-131357, Sh 1)

8.1 FLUID COOLER SPRAY PUMP AY101-EW-SP-1 (Reference Drawing H-2-131366, Sh 3)

8.1.1 Verify that the disconnect switch to Fluid Cooler UIC-AY101EWT-1 is OPEN or OFF.

8.1.2 Verify that Spray Pump Handswitch HS-AY101EWSP-1A is in the STOP position.

8.1.3 Verify that Fluid Cooler Fan Handswitch HS-AY101EWT-1A1 is in the STOP position.

8.1.4 Verify that Pan Heater Handswitch HS-AY101EWT-1A2 is in the OFF position.

8.1.5 Verify that Damper Actuator Handswitch HS-AY101EWT-1A3 is in the AUTO position.

8.1.6 Verify that sump water make-up Isolation Valve HV-AY101RW-1 is CLOSED.

8.1.7 Verify that the spray pump sump is dry or water level is below the LSL-AY101EWT-1 level probes.

8.1.8 Set timer of fan on-Delay Relay 2MS, to 20 seconds at control panel UIC-AY101EWT-1.

8.1.9 Disconnect Motor Leads AY101EWT1-1T1, AY101EWT1-1T2, and AY101EWT1-1T3 from spray pump.

8.1.10 Disconnect Power Leads AY101EWT1-3T1, AY101EWT1-3T2, and AY101EWT1-3T3 from pan heater.

8.1.11 Install shorting switches at UIC-AY101EWT-1 between LLC level probe terminals as follows:

8.1.11.1 Terminals "G" and "H," Switch "H" in the ON or CLOSED position.

8.1.11.2 Terminals "G" and "L," Switch "L" in the ON or CLOSED position.

8.1.11.3 Terminals "G" and LLCO, Switch LLCO in the ON or CLOSED position.

NOTE: Shorting switches to remain in place until all tests associated with Fluid Cooler UIC-AY101EWT-1 have been completed.

8.1.12 Connect a DMM between UIC-AY101EWT-1 Terminals 2 and 4.

8.1.13 CLOSE disconnect switch (see Step 8.1.1).

8.1.14 Move Spray Pump Handswitch HS-AY101EWSP-1A to START position.
Verify that the disconnect switch to Fluid Cooler UIC-AYIOIEWT-1 is:

- OPEN or
- OFF.

Verify that Spray Pump Handswitch HS-AYIOIEWSP-1A to STOP position.

Verify that Fluid Cooler Fan Handswitch HS-AYIOIEWT-lA is in the

- STOP position.

Verify that Pan Heater Handswitch HS-AYIOIEWT-1A2 is in the OFF position.

Verify that Damper Actuator Handswitch HS-AYIOIEWT-1A3 is in the AUTO position.

Verify that sump water make-up Isolation Valve HV-AY10IRW-1 is CLOSED.

Set timer of fan-on-Delay-Relay-2MS, to 20-seconds at Control Panel UIC-AYIOIEWT-1.

Set inlet fan damper temperature controller range indicator at 60 °F using the set point adjusting knob on top of the controller.

Set inlet fan damper temperature controller throttling range to minimum position using the adjusting screw next to the set point adjustment knob.
8.2.10 Remove inlet damper temperature element from thermowell and place temperature element in container of 75 °F or greater, water.

8.2.12 Move Spray Pump Handswitch HS-AY101EWS-1A to the LOCAL position.

8.2.11 Connect a DMM between Terminals 2 and 11. ECN 198

8.2.12.11 CLOSE disconnect switch (see Step 8.2.1).

8.2.13 Move Cooling Fan Handswitch HS-AY101EW-1A1 to the START position.

8.2.14 Verify DMM reads line-voltage (120-V ac nominal) after approximately 20 seconds. ECN 198

8.2.15 Verify cooling fan motor is rotating.

8.2.16 Verify that inlet fan damper position indicator is in the OPEN position.

8.2.17 Place temperature element in a container of cold water (less than 60 °F) and adjust inlet damper temperature controller range indicator to 10 °F.

8.2.18 Verify that inlet fan damper position indicator moves to the CLOSED position.

8.2.19 Verify DMM reads 0-V ac, contactor 2MS opens.

8.2.20 Verify cooling fan motor stops rotating.

8.2.21 Place temperature element in a container of 75 °F or hotter water and adjust inlet damper temperature controller range indicator to 60 °F. ECN 198

8.2.22 Verify that inlet fan damper position indicator is in the OPEN position.

8.2.23 Verify DMM reads line-voltage, contactor 2MS closes.

8.2.24 Move Fan Control Handswitch HS-AY101EW-1A1 to the OFF position.

8.2.25 Verify DMM reads 0-V ac, contactor 2MS opens.

8.2.26 OPEN disconnect switch. ECN 198

8.2.27 Move spray pump handswitch to the OFF position. Disconnect DMM from UIC Terminals 2 and 11.

8.2.28 Remove inlet fan damper temperature element from container of water, dry element, and reinstall element in thermowell.

8.3 FLUID COOLER PAN HEATERS (Reference Drawing H-2-131366, Sh 3)

8.3.1 Verify disconnect switch of fluid cooler is OPEN or OFF.

8.3.2 Verify that Spray Pump Handswitch HS-AY101EWS-1A is in the STOP position.

8.3.3 Verify that Sump Water Make-up Isolation Valve HV-AY101RW-1 is CLOSED.
Verify that the spray pump sump is dry or water level is below the LSL-AYIOIEWT-1 level probes.

Remove cover of pan heater thermostat housing and adjust thermostat to maximum temperature setting (150-degrees).

Connect a DMM between Control Panel Terminals 2 and 20.

CLOSE disconnect switch.

Move the heater control handswitch to the ON position.

ECN 198

Verify DMM reads 0-V ac. Contactor IC opens.

Move "ILC" Switch "LLCO" to the OFF or OPEN position.

Verify DMM reads line voltage (120-V ac nominal).

Move "ILC" Switch "LLCO" to the ON or CLOSED position.

Adjust pan heater thermostat to minimum setting (0 °F).

Verify DMM reads 0-V ac. Contactor IC opens.

Adjust pan heater thermostat to maximum setting (150 °F).

Verify DMM reads line voltage. Contactor IC closes.

Move heater control handswitch to the OFF position.

Verify DMM reads 0-V ac. Contactor IC opens.

OPEN disconnect switch.

Connect DMM. Delete ECN 198.

Adjust pan heater thermostat to 40 °F setting and install thermostat housing cover.

8.4 FLUID COOLER MAKE-UP WATER SOLENOID VALVE EV-AYIOIEWT-1A1 (Reference Drawing H-2-131366, Sh 3)

Verify that the disconnect switch to Fluid Cooler UIC-AYIOIEWT-1 is OPEN or OFF.

Verify that Spray Pump Handswitch HS-AY101EWSP-IA is in the STOP position.

Verify that Sump Water Make-up Isolation Valve HV-AY101RW-1 is CLOSED.

Verify that the spray pump sump is dry or the water level is below the LSL-AY101EWT-1 level probes.
CLOSE disconnect switch (see Step 8.4.1).

Verify water make-up Solenoid Valve EV-AY101EWT-1A1 is DE-ENERGIZED.

Move ILC Shorting Switch "H" to the OFF or OPEN position.

Verify water make-up Solenoid Valve EV-AY101EWT-1A1 is still DE-ENERGIZED.

Move ILC Shorting Switch "L" to the OFF or OPEN position.

Verify water make-up solenoid valve is ENERGIZED (Shorting Switch "L" must remain OFF or OPEN for at least 6 seconds before ILC energizes the valve).

Move ILC Shorting Switch "L" to the ON or CLOSED position.

Verify water make-up solenoid valve is still ENERGIZED.

Move ILC Shorting Switch "H" to the ON or CLOSED position.

Verify water make-up solenoid valve is DE-ENERGIZED (Shorting Switch "H" must remain ON or CLOSED for at least 6 seconds before ILC DE-ENERGIZES the valve).

OPEN disconnect switch (see Step 8.4.1).

Remove shorting switches at UIC-AY101EWT-1 between ILC level probe.

Reconnect Motor Leads AY101EWT1-1T1, AY101EWT1-1T2, and AY101EWT1-1T3 to spray pump (see Step 8.1.9).

Reconnect Power Leads AY101EWT1-3T1, AY101EWT1-3T2, and AY101EWT1-3T3 to pan heater (see Step 8.1.10).

8.5 RECIRCULATION PUMP AY101-EW-P-1A (Reference Drawing H-2-131366, Sh 3)

Verify that the disconnect switch to Recirculation Pump AY101-EW-P-1A is OPEN or OFF.

Disconnect Motor Leads AY101EWPA1A-T1, AY101EWPA1A-T2, and AY101EWPA1A-T3 from Recirculation Pump AY101-EW-P-1A.

Close disconnect switch.

Place HS-AY101EWPA-1A in the STOP position.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Place HS-AY101EWPA-1A in the START position.

Verify Pump AY101-EW-P-1A motor-starter is ON.

Verify that the green light for the recirculation pump is OFF.
Verify that the red light for the recirculation pump is ON.

Place HS-AI01EW-1Al in the STOP position.

Verify Pump AYIO1-EW-P-1A motor-starter is OFF.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Open disconnect switch.

Reconnect Motor Leads AYIO1EWPA-T1, AYIO1EWPA-T2, and AYIO1EWPA-T3 to recirculation pump.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Open disconnect switch.

Reconnect Motor Leads AYIO1EWPA-T1, AYIO1EWPA-T2, and AYIO1EWPA-T3 to recirculation pump.

Verify that the disconnect switch to Recirculation Pump AYIO1-EW-P-1B is OPEN or OFF.

Disconnect Motor Leads AYIO1EWPA-B1, AYIO1EWPA-B2, and AYIO1EWPA-B3 from Recirculation Pump AYIO1-EW-P-1B.

Close disconnect switch.

Place HS-AI01EW-1B1 in the STOP position.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Place HS-AI01EW-1B1 in the START position.

Verify Pump AYIO1-EW-P-1B motor-starter is ON.

Verify that the green light for the recirculation pump is OFF.

Verify that the red light for the recirculation pump is ON.

Open disconnect switch.

Reconnect Motor Leads AYIO1EWPA-B1, AYIO1EWPA-B2, and AYIO1EWPA-B3 to recirculation pump.

Verify that the disconnect switch to Fluid Cooler UIC-AI02EWT-1 is OPEN or OFF.
Verify that Spray Pump Handswitch HS-AYIOLEWSP-1A is in the STOP position.

Verify that Fluid Cooler Fan Handswitch HS-AYIOLEWT-1A1 is in the STOP position.

Verify that Pan Heater Handswitch HS-AYIOLEWT-1A2 is in the OFF position.

Verify that Damper Actuator Handswitch HS-AYIOLEWT-1A3 is in the AUTO position.

Verify that sump water make-up Isolation Valve HV-AYIO2RW-1 is CLOSED.

Verify that the spray pump sump is dry or water level is below the LSL-AY10ZEWT-1 level probes.

Set Timer of fan on-Delay Relay 2MS, to 20 seconds at control panel UIC-AYIO2EWT-1.

Disconnect Power Leads AYIO2EWT1-3T1, AYIO2EWT1-3T2, and AYIO2EWT1-3T3 from pan heater.

Install shorting switches at UIC-AYIO2EWT-1 between 1LC level probe terminals as follows:

1. Terminals "G" and "H," Switch "H" in the ON or CLOSED position.
2. Terminals "G" and "L," Switch "L" in the ON or CLOSED position.
3. Terminals "G" and LLCO, Switch LLCO in the ON or CLOSED position.

NOTE: Shorting switches to remain in place until all tests associated with Fluid Cooler UIC-AYIO2EWT-1 have been completed.

Connect a DMM between UIC-AYIO2EWT-1 Terminals 2 and 4.

CLOSE disconnect switch (see Step 8.7.1).

Move Spray Pump Handswitch HS-AYIOLEWSP-1A to START position.

Verify DMM reads line voltage (120 V ac nominal).

Verify spray pump motor starter is ON.

Move Spray Pump Handswitch HS-AYIOLEWSP-1A to STOP position.

Verify DMM reads 0 V ac. Deicide.

Verify spray pump motor starter is OFF.

Move Spray Pump Handswitch HS-AYIOLEWSP-1A to START position.
Move ILG Shorting Switch ILG between Terminals "G" and ILG to the OFF or OPEN position.

Verify contactor Ims remains closed. EC0198

Verify DMM reads 0 V-ae, move ILG Shorting switch "L" to the off position

Verify contactor Ims opens "L". The ECM

Return ILG Shorting Switch ILG to ON or CLOSED position.

Verify DMM reads line voltage, contactor Ims remains open

Move ILG Shorting switch "L" to the on position.

Open disconnect switch. (See Step B.7.2) EC0198

Move Spray Pump handswitch HS-AyI0ZEWSp-1A to the off position.

Disconnect DMM from UIC Terminals 2 and 4. EC0198

Verify contactor Ims closes.

8.8 FLUID COOLER FAN HS-AyI0ZET 1A1 (Reference Drawing H-2-131366, Sh.3)

Verify that the disconnect switch to Fluid Cooler UIC-AyI0ZEWT-1 is OPEN or OFF.

Verify that Spray Pump Handswitch HS-AyI0ZEWSP-1A is in the STOP OFF position.

Verify that Fluid Cooler Fan Handswitch HS-AyI0ZET1A1 is in the OFF position.

Verify that Pan Heater Handswitch HS-AyI0ZEW1A2 is in the OFF position.

Verify that Damper Actuator Handswitch HS-AyI0ZET1A3 is in the AUTO position.

Verify that the sump water make-up Isolation Valve HV-AyI0ZRW-1 is CLOSED.

Set timer of fan on Delay Relay 2MS, to 20 seconds at Control Panel UIC-AyI0ZET 1.

Set inlet fan damper temperature controller range indicator at 60 °F using the set point adjusting knob on top of the controller.

Set inlet fan damper temperature controller throttling range to minimum position using the adjusting screw next to the set point adjustment knob.

Remove inlet damper temperature element from thermowell and place temperature element in container of 75 °F or greater, water.

Connect a DMM between Terminals 2 and 11. EC0198

CLOSE disconnect switch (see Step B.2.1).

Move Cooling Fan Handswitch HS-AyI0ZET1A1 to START position.

Note: contactor ZMS closes EC0198

Verify DMM reads line voltage (120 V-ae nominal) after approximately 20 seconds. Delete Ex. #2.

Verify cooling fan motor is rotating.
Verify that inlet fan damper position indicator is in the OPEN position.

Verify that inlet fan damper position indicator moves to the CLOSED position.

Verify that inlet fan damper position indicator is in the OPEN position.

Verify that inlet fan damper position indicator moves to the CLOSED position.

Verify that inlet fan damper position indicator is in the OPEN position.

Verify disconnect switch of fluid cooler is OPEN or OFF.

Verify that Spray Pump Handswitch HS-AY102EWSP-1A is in the STOP position.

Verify that Sump Water Make-up Isolation Valve HV-AY102RW-1 is CLOSED.

Verify that the spray pump sump is dry or water level is below the LSL-AY102EW-1 level probes.

Remove cover of pan heater thermostat housing and adjust thermostat to maximum temperature setting (150 degrees).

Connect a DMM between Control Panel Terminals 2 and 26.

CLOSE disconnect switch.

Move the heater control handswitch to the ON position.

Verify DMM reads 0-V ac. Contactor 2ms opens.

Verify that Spray Pump Handswitch HS-AY102EWSP-1A is in the STOP position.

Verify that inlet fan damper temperature controller range indicator to 60°F.

Verify cooling fan motor stops rotating.

Verify that Sump Water Make-up Isolation Valve HV-AY102RW-1 is CLOSED.

Verify that spray pump sump is dry or water level is below the LSL-AY102EW-1 level probes.

Remove cover of pan heater thermostat housing and adjust thermostat to maximum temperature setting (150 degrees).

Connect a DMM between Control Panel Terminals 2 and 26.

CLOSE disconnect switch.

Move the heater control handswitch to the ON position.

Verify DMM reads line voltage (120 V ac nominal).

Move "ILC" Switch "LLCO" to the OFF or OPEN position.
Verify DMM reads 0-V, contactor LC opens.

Move "ILC" Switch "LLCO" to the ON or CLOSED position.

Verify DMM reads line voltage, contactor LC closes.

Adjust pan heater thermostat to minimum setting (0 °F).

Verify DMM reads 0-V, contactor LC opens.

Adjust pan heater thermostat to maximum setting (150 °F).

Verify DMM reads line voltage, contactor LC closes.

Move heater control handswitch to the OFF position.

Verify DMM reads 0-V, contactor LC opens.

OPEN disconnect switch.

Adjust pan heater thermostat to 40 °F setting and install thermostat housing cover.

Verify that the disconnect switch to Fluid Cooler UIC-AY102EWT-1 is OPEN or OFF.

Verify that Spray Pump Handswitch HS-AY102EWS-1 is in the STOP position.

Verify that Sump Water Make-up Isolation Valve HV-AY102RW-1 is CLOSED.

Verify that the spray pump sump is dry or the water level is below the LSL-AY102EWT-1 level probes.

CLOSE disconnect switch (see Step 8.10.5).

Verify water make-up Solenoid Valve EV-AY102EWT-1A1 is DE-ENERGIZED.

Move 1LC Shorting Switch "H" to the OFF or OPEN position.

Verify water make-up Solenoid Valve EV-AY102EWT-1A1 is still DE-ENERGIZED.

Move 1LC Shorting Switch "L" to the OFF or OPEN position.

Verify water make-up solenoid valve is ENERGIZED (Shorting Switch "L" must remain OFF or OPEN for at least 6 seconds before 1LC energizes the valve).

Move 1LC Shorting Switch "L" to the ON or CLOSED position.
8.10.12 Verify water make-up solenoid valve is still ENERGIZED.

8.10.13 Move ILC Shorting Switch "H" to the ON or CLOSED position.

8.10.14 Verify water make-up solenoid valve is DE-ENERGIZED (Shorting Switch "H" must remain ON or CLOSED for at least 6 seconds before ILC DE-ENERGIZES the valve).

8.10.15 OPEN disconnect switch (see Step 8.10.1).

8.10.16 Remove shorting switches at UIC-A102EWT-1 between ILC level probe.

8.10.17 Reconnect Motor Leads A102EWT1-T1, A102EWT1-T2, and A102EWT1-T3 to spray pump (see Step 8.10.9).

8.10.18 Reconnect Power Leads A102EWT1-3T1, A102EWT1-3T2, and A102EWT1-3T3 to pan heater (see Step 8.10.10).

8.11 RECIRCULATION PUMP A102-EW-P-1A (Reference Drawing H-2-131366, Sh.3)

8.11.1 Verify that the disconnect switch to Recirculation Pump A102-EW-P-1A is OPEN or OFF.

8.11.2 Disconnect Motor Leads A102EWP1A-T1, A102EWP1A-T2, and A102EWP1A-T3 from Recirculation Pump A102-EW-P-1A.

8.11.4 Close disconnect switch.

8.11.3 Place HS-A102EWP-1A in the STOP position.

8.11.5 Verify that the green light for the recirculation pump is ON.

8.11.6 Verify that the red light for the recirculation pump is OFF.

8.11.7 Place HS-A102EWP-1A in the START position.

8.11.8 Verify Pump A102-EW-P-1A motor starter is ON.

8.11.9 Verify that the green light for the recirculation pump is OFF.

8.11.10 Verify that the red light for the recirculation pump is ON.

8.11.11 Place HS-A102EWP-1A in the STOP position.

8.11.12 Verify Pump A102-EW-P-1A motor starter is OFF.

8.11.13 Verify that the green light for the recirculation pump is ON.

8.11.14 Verify that the red light for the recirculation pump is OFF.

8.11.15 Open disconnect switch.

8.11.16 Reconnect Motor Leads A102EWP1A-T1, A102EWP1A-T2, and A102EWP1A-T3 to recirculation pump.
8.12 RECIRCULATION PUMP AY102-EW-P-1B (Reference Drawing H-2-131366, Sh. 4)

8.12.1 Verify that the disconnect switch to Recirculation Pump AY102-EW-P-1B is OPEN or OFF.

8.12.2 Disconnect Motor Leads AY102EWPIB-T1, AY102EWPIB-T2, and AY102EWPIB-T3 from Recirculation Pump AY102-EW-P-1B.

8.12.3 Close disconnect switch.

8.12.4 Place HS-AY102EWP-1B in the STOP position.

8.12.5 Verify that the green light for the recirculation pump is ON.

8.12.6 Verify that the red light for the recirculation pump is OFF.

8.12.7 Place HS-AY102EWP-1B in the START position.

8.12.8 Verify Pump AY102-EW-P-1B motor-starter is ON.

8.12.9 Verify that the green light for the recirculation pump is OFF.

8.12.10 Verify that the red light for the recirculation pump is ON.

8.12.11 Place HS-AY102EWP-1B in the STOP position.

8.12.12 Verify Pump AY102-EW-P-1B motor-starter is OFF.

8.12.13 Verify that the green light for the recirculation pump is ON.

8.12.14 Verify that the red light for the recirculation pump is OFF.

8.12.15 Open disconnect switch.

8.12.16 Reconnect Motor Leads AY102EWPIB-T1, AY102EWPIB-T2, and AY102EWPIB-T3 to recirculation pump.

END OF SECTION 8
AZ REcirculating Condensation Cooling Test

This test will demonstrate the integrity of the instruments and equipment associated with the tank recirculating condensation cooling systems located at the AZ evaporator pad. (Reference Drawings H-2-131069, Sh 1, H-2-131070, Sh 1, and H-2-131357, Sh 1)

9.1 FLUID COOLER SPRAY PUMP AZ101-EW-SP-1 (Reference Drawing H-2-131366, Sh 5)

9.1.1 Verify that the disconnect switch to Fluid Cooler UIC-AZ101EWT-1 is OPEN or OFF.

9.1.2 Verify that Spray Pump Handswitch HS-AZ101EWSP-1A is in the STOP or OFF position.

9.1.3 Verify that Fluid Cooler Fan Handswitch HS-AZ101EWT-1A1 is in the OFF position.

9.1.4 Verify that Pan Heater Handswitch HS-AZ101EWT-1A2 is in the OFF position.

9.1.5 Verify that Damper Actuator Handswitch HS-AZ101EWT-1A3 is in the AUTO position.

9.1.6 Verify that sump water make-up Isolation Valve HV-AZ101RW-1 is CLOSED.

9.1.7 Verify that the spray pump sump is dry or water level is below the LSL-AZ101EWT-1 level probes.

9.1.8 Set timer of fan on Delay Relay-2MS, to 20 seconds at control panel UIC-AZ101EWT-1.

9.1.9 Disconnect Motor Leads AZ101EWT1-1T1, AZ101EWT1-1T2, and AZ101EWT1-1T3 from spray pump.

9.1.10 Disconnect Power Leads AZ101EWT1-3T1, AZ101EWT1-3T2, and AZ101EWT1-3T3 from pan heater.

9.1.11 Install shorting switches at UIC-AZ101EWT-1 between LLC level probe terminals as follows:

9.1.11.1 Terminals "G" and "H," Switch "H" in the ON or CLOSED position.

9.1.11.2 Terminals "G" and "L," Switch "L" in the ON or CLOSED position.

9.1.11.3 Terminals "G" and LLCO, Switch LLCO in the ON or CLOSED position.

NOTE: Shorting switches to remain in place until all tests associated with Fluid Cooler UIC-AZ101EWT-1 have been completed.

9.1.12 Connect a DMM between UIC-AZ101EWT-1 Terminals 2 and 4.

9.1.13 CLOSE disconnect switch (see Step 9.1.1).

9.1.14 Move Spray Pump Handswitch HS-AZ101EWSP-1A to START position.
Verify that the disconnect switch to Fluid Cooler UIC-AZ101EWT-1 is OPEN or OFF.

Verify that Spray Pump Handswitch HS-AZ101EWS-1A is in the STOP OFF position.

Verify that Fluid Cooler Fan Handswitch HS-AZ101EWT-1A1 is in the STOP OFF position.

Verify that Pan Heater Handswitch HS-AZ101EWT-1A2 is in the OFF position.

Verify that Damper Actuator Handswitch HS-AZ101EWT-1A3 is in the AUTO position.

Verify that the sump water make-up Isolation Valve HV-AZ101RW-1 is CLOSED.

Set timer of fan on Delay Relay 2MS, to 20-seconds at Control Panel UIC-AZ101EWT-1. Delete Ex "1"

Set inlet fan damper temperature controller range indicator at 60 °F using the set point adjusting knob on top of the controller.

Set inlet fan damper temperature controller throttling range to minimum position using the adjusting screw next to the set point adjustment knob.
9.2.10 Remove inlet damper temperature element from thermowell and place temperature element in container of 75 °F or greater, water.

9.2.11 Connect a DMM between Terminals 2 and 11. ECN 198

9.2.12 CLOSE disconnect switch (see Step 9.2.1).

9.2.13 Move Cooling Fan Handswitch HS-AZ101EWSP-1A to the START position.

9.2.14 Verify DMM reads line voltage (120 V ac nominal) after approximately 20 seconds.

9.2.15 Verify cooling fan motor is rotating.

9.2.16 Verify that inlet fan damper position indicator is in the OPEN position.

9.2.17 Adjust inlet damper temperature controller range indicator to 10 °F.

9.2.18 Verify that inlet fan damper position indicator moves to the CLOSED position.

9.2.19 Verify DMM reads 0 V ac, contactor 2ms opens.

9.2.20 Verify cooling fan motor stops rotating.

9.2.21 Adjust inlet damper temperature controller range indicator to 60 °F.

9.2.22 Verify that inlet fan damper position indicator is in the OPEN position.

9.2.23 Verify DMM reads line voltage, contactor 2ms closes.

9.2.24 Move Fan Control Handswitch HS-AZ101EWSP-1A to the STOP position.

9.2.25 Verify DMM reads 0 V ac, contactor 2ms opens.

9.2.26 OPEN disconnect switch.

9.2.27 Disconnect DMM from UIC Terminals 2 and 11. ECN 198

9.2.28 Remove inlet fan damper temperature element from container of water, dry element, and reinstall element in thermowell.

9.3 FLUID COOLER PAN HEATER UIC-AZ101EWSP-1 (Reference Drawing H-2-131366, Sh 5)

9.3.1 Verify disconnect switch of fluid cooler is OPEN or OFF.

9.3.2 Verify that Spray Pump Handswitch HS-AZ101EWSP-1A is in the OFF position.

9.3.3 Verify that Sump Water Make-up Isolation Valve HV-AZ101RW-1 is CLOSED.
9.3.4 Verify that the spray pump sump is dry or water level is below the LSL-AZ101EWT-1 level probes.

9.3.5 Remove cover of pan heater thermostat housing and adjust thermostat to maximum temperature setting (150 degrees).

9.3.6 Connect a DMM between Control Panel Terminals 2 and 20.

9.3.6 CLOSE disconnect switch.

9.3.7 Move the heater control handswitch to the ON position.

9.3.8 Verify DMM reads line voltage (120 V ac nominal).

9.3.9 Move "ILC" Switch "LLCO" to the OFF or OPEN position.

9.3.10 Verify DMM reads 0 V ac, contactor LC opens

9.3.11 Move "ILC" Switch "LLCO" to the ON or CLOSED position.

9.3.12 Verify DMM reads line voltage.

9.3.13 Adjust pan heater thermostat to minimum setting (40 °F).

9.3.14 Verify DMM reads 0 V ac, contactor LC opens

9.3.15 Adjust pan heater thermostat to maximum setting (150 °F).

9.3.16 Verify DMM reads line voltage, contactor LC closes

9.3.17 Move heater control handswitch to the OFF position.

9.3.18 Verify DMM reads 0 V ac, contactor LC opens

9.3.19 OPEN disconnect switch.

9.3.20 Adjust pan heater thermostat to 40 °F setting and install thermostat housing cover.

9.4 FLUID COOLER MAKE-UP WATER SOLENOID VALVE EV-AZ101EWT-1A1 (Reference Drawing H-2-131366, Sh 5)

9.4.1 Verify that the disconnect switch to Fluid Cooler UIC-AZ101EWT-1 is OPEN or OFF.

9.4.2 Verify that Spray Pump Handswitch HS-AZ101EWSP-1A is in the STOP position.

9.4.3 Verify that Sump Water Make-up Isolation Valve HV-AZ101RW-1 is CLOSED.

9.4.4 Verify that the spray pump sump is dry or the water level is below the LSL-AZ101EWT-1 level probes.
CLOSE disconnect switch (see Step 9.4.1).

Verify water make-up Solenoid Valve EV-AZ101EW-1A1 is DE-ENERGIZED.

Move ILC Shorting Switch "H" to the OFF or OPEN position.

Verify water make-up Solenoid Valve EV-AZ101EW-1A1 is still DE-ENERGIZED.

Move ILC Shorting Switch "L" to the OFF or OPEN position.

Verify water make-up solenoid valve is ENERGIZED (Shorting Switch "L" must remain OFF or OPEN for at least 6 seconds before ILC energizes the valve).

Move ILC Shorting Switch "L" to the ON or CLOSED position.

Verify water make-up solenoid valve is still ENERGIZED.

Move ILC Shorting Switch "H" to the ON or CLOSED position.

Verify water make-up solenoid valve is DE-ENERGIZED (Shorting Switch "H" must remain ON or CLOSED for at least 6 seconds before ILC DE-ENERGIZES the valve).

OPEN disconnect switch (see Step 9.4.1).

Remove shorting switches at UIC-AZ101EW-1 between ILC level probe.

Reconnect Motor Leads AZ101EW-1T1, AZ101EW-1T2, and AZ101EW-1T3 to spray pump (see Step 9.1.9).

Reconnect Power Leads AZ101EW-3T1, AZ101EW-3T2, and AZ101EW-3T3 to pan heater (see Step 9.1.10).

Verify that the disconnect switch to Recirculation Pump AZ101-EW-P-1A is OPEN or OFF.

Disconnect Motor Leads AZ101EWP1A-T1, AZ101EWP1A-T2, and AZ101EWP1A-T3 from Recirculation Pump AZ101-EW-P-1A.

Close disconnect switch.

Place HS-AZ101EWP-1A1 in the STOP position.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Place HS-AZ101EWP-1A1 in the START position.

Verify Pump AZ101-EW-P-1A motor starter is ON.

Verify that the green light for the recirculation pump is OFF.
Verify that the red light for the recirculation pump is ON.

Place HS-AZ10IEWP-1A in the STOP position.

Verify Pump AZ101-EW-P-1A motor starter is OFF.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Open disconnect switch.

Reconnect Motor Leads AZ101EWPIA-T1, AZ101EWPIA-T2, and AZ101EWPIA-T3 to recirculation pump.

Verify that the disconnect switch to Recirculation Pump AZ101-EW-P-1B is OPEN or OFF.

Disconnect Motor Leads AZ101EWPIB-T1, AZ101EWPIB-T2, and AZ101EWPIB-T3 from Recirculation Pump AZ101-EW-P-1B.

Close disconnect switch.

Place HS-AZ101EW-1B in the STOP position.

Verify that the red light for the recirculation pump is OFF.

Place HS-AZ101EW-1B in the START position.

Verify Pump AZ101-EW-P-1B motor starter is ON.

Verify that the green light for the recirculation pump is OFF.

Verify that the red light for the recirculation pump is ON.

Place HS-AZ101EW-1B in the STOP position.

Verify Pump AZ101-EW-P-1B motor starter is OFF.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Open disconnect switch.

Reconnect Motor Leads AZ101EWPIB-T1, AZ101EWPIB-T2, and AZ101EWPIB-T3 to recirculation pump.

Verify that the disconnect switch to Fluid Cooler UIC-AZ102EW-1 is OPEN or OFF.
Verify that Spray Pump Handswitch HS-AZ102EWSP-1A is in the OFF position.

Verify that Fluid Cooler Fan Handswitch HS-AZ102EWT-1A1 is in the OFF position.

Verify that Pan Heater Handswitch HS-AZ102EWT-1A2 is in the OFF position.

Verify that Damper Actuator Handswitch HS-AZ102EWT-1A3 is in the AUTO position.

Verify that sump water make-up Isolation Valve HV-AZ102RW-1 is CLOSED.

Verify that the spray pump sump is dry or water level is below the LSL-AZ102EWT-1 level probes.

Set timer of fan on Delay Relay 2MS, to 20 seconds at control panel UIC-AZ102EWT-1.

Disconnect Motor Leads AZ102EWT1-1T1, AZ102EWT1-1T2, and AZ102EWT1-1T3 from spray pump.

Disconnect Power Leads AZ102EWT1-3T1, AZ102EWT1-3T2, and AZ102EWT1-3T3 from pan heater.

Install shorting switches at UIC-AZ102EWT-1 between 1LC level probe terminals as follows:

9.7.11.1 Terminals "G" and "H," Switch "H" in the ON or CLOSED position.

9.7.11.2 Terminals "G" and "L," Switch "L" in the ON or CLOSED position.

9.7.11.3 Terminals "G" and LLCO, Switch LLCO in the ON or CLOSED position.

NOTE: Shorting switches to remain in place until all tests associated with Fluid Cooler UIC-AZ102EWT-1 have been completed.

9.7.12 Connect a DMM between UIC-AZ102EWT-1 Terminals 2 and 4.

9.7.13 CLOSE disconnect switch (see Step 9.7.1).

9.7.14 Move Spray Pump Handswitch HS-AZ102EWSP-1A to START position.

9.7.15 Verify DMM reads line voltage (120 V ac nominal).

9.7.16 Verify spray pump motor starter is ON.

9.7.17 Move Spray Pump Handswitch HS-AZ102EWSP-1A to STOP position.

9.7.18 Verify DMM reads 0 V ac.

9.7.19 Verify spray pump motor starter is OFF.

9.7.20 Move Spray Pump Handswitch HS-AZ102EWSP-1A to START position.
Verify that the disconnect switch to Fluid Cooler UIC-AZ102EWT-1 is OPEN or OFF.

Verify that Spray Pump Handswitch HS-AZ102EWP-1A is in the STOP position.

Verify that Fluid Cooler Fan Handswitch HS-AZ102EWT-1A1 is in the STOP position.

Verify that Pan Heater Handswitch HS-AZ102EWT-1A2 is in the OFF position.

Verify that Damper Actuator Handswitch HS-AZ102EWT-1A3 is in the AUTO position.

Verify that the sump water make-up Isolation Valve HV-AZ102RW-1 is CLOSED.

Set timer of fan on Delay Relay-2MS to 20 seconds at Control Panel UIC-AZ102EWT-1.

Set inlet fan damper temperature controller range indicator at 60 °F using the set point adjusting knob on top of the controller.

Set inlet fan damper temperature controller throttling range to minimum position using the adjusting screw next to the set point adjustment knob.

Remove inlet damper temperature element from thermowell and place temperature element in container of 75 °F or greater, water.

Close disconnect switch (see Step 9.8.1).

Move Cooling Fan Handswitch HS-AZ102EWT-1A1 to START position.

Verify that Disconnect switch 2MS closes.

Verify DMM reads line voltage (120 V-ac nominal) after approximately 20 seconds.

Verify cooling fan motor is rotating.
9.8.16 Verify that inlet fan damper position indicator is in the OPEN position.

9.8.17 Place temperature element in a container of cold water (less than 60°F) and adjust inlet fan damper temperature controller range indicator to 10°F.

9.8.18 Verify that inlet fan damper position indicator moves to the CLOSED position.

9.8.19 Verify DMM reads 0 V ac, contactor 2 ms opens.

9.8.20 Verify cooling fan motor stops rotating.

9.8.21 Place temperature element in a container of 75°F or hotter water and adjust inlet fan damper temperature controller range indicator to 60°F.

9.8.22 Verify that inlet fan damper position indicator is in the OPEN position.

9.8.23 Verify DMM reads line voltage, contactor 2 ms closes.

9.8.24 Move Fan Control Handswitch HS-AZ10ZEWET-1A to the STOP position.

9.8.25 Verify DMM reads 0 V ac, contactor 2 ms opens.

9.8.26 OPEN disconnect switch.

9.8.27 Move spray pump handswitch to the OFF position.

9.8.28 Disconnect DMM from UIC Terminals 2 and 11.

9.8.29 Remove inlet fan damper temperature element from container of water, dry element, and reinstall element in thermowell.

9.9 FLUID COOLER PAN HEATERS UIC-AZ102-EWT-1 (Reference Drawing H-2-131366, Sh 6)

9.9.1 Verify disconnect switch of fluid cooler is OPEN or OFF.

9.9.2 Verify that Spray Pump Handswitch HS-AZ102EWSP-1A is in the STOP position.

9.9.3 Verify that Sump Water Make-up Isolation Valve EV-AZ102RW-1 is CLOSED.

9.9.4 Verify that the spray pump sump is dry or water level is below the LSL-AZ102EWET-1 level probes.

9.9.5 Remove cover of pan heater thermostat housing and adjust thermostat to maximum temperature setting (150 degrees).

9.9.6 Connect a DMM between Control Panel Terminals 2 and 20.

9.9.7 CLOSE disconnect switch.

9.9.8 Move the heater control handswitch to the ON position.

9.9.9 Verify DMM reads line voltage (120 V ac nominal).

9.9.10 Move "ILC" Switch "LLCO" to the OFF or OPEN position.
Verify DMM reads 0-V-ae. Contactor IC opens.

Move "ILC" Switch "LLCO" to the ON or CLOSED position.

Verify DMM reads line voltage. Contactor IC closes.

Adjust pan heater thermostat to minimum setting (40 °F).

Verify DMM reads 0-V-ae. Contactor IC opens.

Adjust pan heater thermostat to maximum setting (150 °F).

Verify DMM reads line voltage. Contactor IC closes.

Move heater control handswitch to the OFF position.

Verify DMM reads 0-V-ae. Contactor IC opens.

OPEN disconnect switch.

Adjust pan heater thermostat to 40 °F setting and install thermostat housing cover.

FLUID COOLER MAKE-UP WATER SOLENOID VALVE EV-AZ102EWT-1A1 (Reference Drawing H-2-131366, Sh 6)

Verify that the disconnect switch to Fluid Cooler UIC-AZ102EWT-1 is OPEN or OFF.

Verify that Spray Pump Handswitch HS-AZ102EWSP-1A is in the STOP OFF position.

Verify that Sump Water Make-up Isolation Valve HV-AZ102RW-1 is CLOSED.

Verify that the spray pump sump is dry or the water level is below the LSL-AZ102EWT-1 level probes.

CLOSE disconnect switch (see Step 9.10.1).

Verify water make-up Solenoid Valve EV-AZ102EWT-1A1 is DE-ENERGIZED.

Move ILC Shorting Switch "H" to the OFF or OPEN position.

Verify water make-up Solenoid Valve EV-AZ102EWT-1A1 is still DE-ENERGIZED.

Move ILC Shorting Switch "L" to the OFF or OPEN position.

Verify water make-up solenoid valve is ENERGIZED (Shorting Switch "L" must remain OFF or OPEN for at least 6 seconds before ILC energizes the valve).

Move ILC Shorting Switch "L" to the ON or CLOSED position.
Verify water make-up solenoid valve is still ENERGIZED.

Move ILC Shorting Switch "H" to the ON or CLOSED position.

Verify water make-up solenoid valve is DE-ENERGIZED (Shorting Switch "H" must remain ON or CLOSED for at least 6 seconds before ILC DE-ENERGIZES the valve).

OPEN disconnect switch (see Step 9.10.1).

Remove shorting switches at UIC-AZ10ZWT-1 between ILC level probe.

Reconnect Motor Leads AZ10ZWT1-T1, AZ10ZWT1-T2, and AZ10ZWT1-T3 to spray pump (see Step 9.7.9).

Reconnect Power Leads AZ10ZWT1-3T1, AZ10ZWT1-3T2, and AZ10ZWT1-3T3 to pan heater (see Step 9.7.10).

Verify that the disconnect switch to Recirculation Pump AZ10Z-EWP-1A is OPEN or OFF.

Disconnect Motor Leads AZ10ZWP1A-T1, AZ10ZWP1A-T2, and AZ10ZWP1A-T3 from Recirculation Pump AZ10Z-EWP-1A.

Close disconnect switch.

Place HS-AZ10ZWP-1A in the STOP position.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Place HS-AZ10ZWP-1A in the START position.

Verify Pump AZ10Z-EWP-1A motor-starter is ON.

Verify that the green light for the recirculation pump is OFF.

Verify that the red light for the recirculation pump is ON.

Place HS-AZ10ZWP-1A in the STOP position.

Verify Pump AZ10Z-EWP-1A motor-starter is OFF.

Verify that the green light for the recirculation pump is ON.

Verify that the red light for the recirculation pump is OFF.

Open disconnect switch.

Reconnect Motor Leads AZ10ZWP1A-T1, AZ10ZWP1A-T2, and AZ10ZWP1A-T3 to recirculation pump.
9.12 RECIRCULATION PUMP AZ102-EW-P-1B (Reference Drawing H-2-131366, Sh 6)

9.12.1 Verify that the disconnect switch to Recirculation Pump AZ102-EW-P-1B is OPEN or OFF.

9.12.2 Disconnect Motor Leads AZ102EW1B-T1, AZ102EW1B-T2, and AZ102EW1B-T3 from Recirculation Pump AZ102-EW-P-1B.

9.12.3 Close disconnect switch.

9.12.4 Place HS-AZ102EWP-1B in the STOP position.

9.12.5 Verify that the green light for the recirculation pump is ON.

9.12.6 Verify that the red light for the recirculation pump is OFF.

9.12.7 Place HS-AZ102EWP-1B in the START position.

9.12.8 Verify Pump AZ102-EW-P-1B motor starter is ON.

9.12.9 Verify that the green light for the recirculation pump is OFF.

9.12.10 Verify that the red light for the recirculation pump is ON.

9.12.11 Place HS-AZ102EWP-1B in the STOP position.

9.12.12 Verify Pump AZ102-EW-P-1B motor starter is OFF.

9.12.13 Verify that the green light for the recirculation pump is ON.

9.12.14 Verify that the red light for the recirculation pump is OFF.

9.12.15 Open disconnect switch.

9.12.16 Reconnect Motor Leads AZ102EW1B-T1, AZ102EW1B-T2, and AZ102EW1B-T3 to recirculation pump.

END OF SECTION 9
10 — AZCW VENTILATION CONDENSATION COOLING SYSTEM (Test Exception WHC-SD-W030-ATF-001)

This test will demonstrate the integrity of the instruments and equipment associated with the AZCW ventilation condensation cooling system. (Reference Drawing H-2-131071, Sh.1)

10.1 CHILLED WATER RECIRCULATION PUMP AZ-CW-P-1A (Reference Drawing H-2-131366, Sh.7)

NOTE: All steps are performed at the chiller pad unless otherwise noted. (Reference Drawing H-2-131357, Sh.1)

—— 10.1.1 Verify that the disconnect switch to Recirculation Pump AZ-CW-P-1A is OPEN or OFF.

—— 10.1.2 Disconnect Motor Leads AZCWPLA-T1, AZCWPLA-T2, and AZCWPLA-T3 from Recirculation Pump AZ-CW-P-1A.

—— 10.1.3 Close disconnect switch.

—— 10.1.4 Place HS-AZCWPL-1A in the STOP position.

—— 10.1.5 Verify that the green light for the recirculation pump is ON.

—— 10.1.6 Verify that the red light for the recirculation pump is OFF.

—— 10.1.7 Place HS-AZCWPL-1A in the START position.

—— 10.1.8 Verify Pump AZ-CW-P-1A motor-starter is ON.

—— 10.1.9 Verify that the green light for the recirculation-pump is OFF.

—— 10.1.10 Verify that the red light for the recirculation-pump is ON.

—— 10.1.11 Place HS-AZCWPL-1A in the STOP position.

—— 10.1.12 Verify Pump AZ-CW-P-1A motor-starter is OFF.

—— 10.1.13 Verify that the green light for the recirculation-pump is ON.

—— 10.1.14 Verify that the red light for the recirculation-pump is OFF.

—— 10.1.15 Open disconnect switch.

—— 10.1.16 Reconnect Motor Leads AZCWPLA-T1, AZCWPLA-T2, and AZCWPLA-T3 to recirculation pump.

10.2 CHILLED WATER RECIRCULATION PUMP AZ-CW-P-1B (Reference Drawing H-2-131366, Sh.7)

NOTE: All steps are performed at the chiller pad unless otherwise noted. (Reference Drawing H-2-131357, Sh.1)

—— 10.2.1 Verify that the disconnect switch to Recirculation Pump AZ-CW-P-1B is OPEN or OFF.
10.2.2 Disconnect Motor Leads AZCWP1B-T1, AZCWP1B-T2, and AZCWP1B-T3 from Recirculation Pump AZ-CW-P-1B.

10.2.3 Close disconnect switch.

10.2.4 Place HS-AZCWP-1B in the STOP position.

10.2.5 Verify that the green light for the recirculation pump is ON.

10.2.6 Verify that the red light for the recirculation pump is OFF.

10.2.7 Place HS-AZCWP-1B in the START position.

10.2.8 Verify Pump AZ-CW-P-1B motor starter is ON.

10.2.9 Verify that the green light for the recirculation pump is OFF.

10.2.10 Verify that the red light for the recirculation pump is ON.

10.2.11 Place HS-AZCWP-1B in the STOP position.

10.2.12 Verify Pump AZ-CW-P-1B motor starter is OFF.

10.2.13 Verify that the green light for the recirculation pump is ON.

10.2.14 Verify that the red light for the recirculation pump is OFF.

10.2.15 Open disconnect switch.

10.2.16 Reconnect Motor Leads AZCWP1B-T1, AZCWP1B-T2, and AZCWP1B-T3 to recirculation pump.

END OF SECTION 10
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**Rejection Execution and Acceptance**

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<td>Date</td>
<td>Test Director (Name/Organization)</td>
<td>Date</td>
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<td>Design Engineering (Author of ATP)</td>
<td>Date</td>
<td>A-E Project Engineer</td>
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**Approval and Acceptance – Operating Contractor**

- [ ] Reject Approved and Accepted
- [ ] Exception Accepted-as-is
- [ ] Other

* Explanation

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W030004.SP.1232 - 37 - WHC-SD-W030-ATR-004 Rev 0
01/16/95
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The ATP requires "set timer to 215 ms to 30 seconds." Relay 215 is not a time delay relay.

Planned Action


Action Taken

THE REFERENCES WERE DELETED AND TESTING CONTINUED

RETEST EXECUTION AND ACCEPTANCE

Re-test Installation Contractor | Date | Recorder | Date
---|---|---|---
[Name/Organization] | | [Name/Organization] | 4-25-96
Witness 1 | Date | Witness 2 | Date
M. D. Modi | 4-15-96 | M. J. Lee | 4-26-96
Field Engineering | Date | Test Director | Date
M. D. Modii | 4-23-96 | M. J. Lee | 4-27-96
Design Engineering (Author of ATP) | Date | A-E Project Engineer | Date
M. D. F. | 4-23-96 | [Name/Organization] | 4-23-96

APPROVAL AND ACCEPTANCE - OPERATING CONTRACTOR

☐ Re-test Approved and Accepted ☑ Exception Accepted as-is* ☐ Other*

* Explanation

THE ADJUSTABLE TRIP RELAYS WERE MISIDENTIFIED AS TIME DELAY RELAYS.
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<thead>
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<th>STEP NUMBER</th>
<th>PAGE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1.8</td>
<td>11</td>
</tr>
<tr>
<td>8.2.7</td>
<td>12</td>
</tr>
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<td>8.2.14</td>
<td>13</td>
</tr>
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</table>
The ATP says "Adjust Pan Heater Thermostat to Maximum Setting (150°F)."

It should say "Adjust Pan Heater Thermostat to Minimum Setting (0°F)."

Planned Action

CHANGE "MAXIMUM" TO "MINIMUM" AND '150°F' TO '0°F'.

Action Taken

The changes were made and testing continued.

Retest Execution and Acceptance

Retester Name: [Name]
Retester Date: 4/26/96

Witness 1: [Name]
Witness 2: [Name]
Witness Date: 4/25/96

Field Engineering: [Name]
Field Engineering Date: 4/15/96

Design Engineering (Author of ATP): [Name]
Design Engineering Date: 4/23/96

Approval and Acceptance - Operating Contractor

☐ Retest Approved and Accepted  ☑ Exception Accepted-as-is  ☐ Other

Explanation

The operation of the Pan Heater Controller was identified incorrectly.
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<thead>
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<th>STEP NUMBER</th>
<th>PAGE NUMBER</th>
</tr>
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<tbody>
<tr>
<td>8.3.5</td>
<td>14</td>
</tr>
<tr>
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<td>14</td>
</tr>
<tr>
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<td>19</td>
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**APPROVAL AND ACCEPTANCE - OPERATING CONTRACTOR**

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**REQUEST EXECUTION AND ACCEPTANCE**

The changes were made and testing continued.

Action Taken:

- Change Minimum To Maximum And Of To 15c

---

If you say "Adjust Minimum To Minimum Setting (15c),"

The Air Shocks Are To Be Set At Minimum Setting (0c)
<table>
<thead>
<tr>
<th>STEP NUMBER</th>
<th>PAGE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.13</td>
<td>14</td>
</tr>
<tr>
<td>8.9.13</td>
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<td>9.9.13</td>
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</table>
SECTION 9.2 PROVIDES DIRECTIONS TO TEST THE OPERATION OF FLUID COOLER FAN UIC-AZ1054-1M1. HOWEVER, DUE TO FAULTS OF THE DAMPER POSITIONER TO OPERATE AS DESIGNED WE WERE UNABLE TO COMPLETE THIS PORTION OF THE ATP.

Planned Action
DELETE SECTION 9.2 FROM THE ATP. AFTER THE PROBLEMS WITH THE DAMPER ARE CORRECTED THE FLUID COOLER FAN WILL BE TESTED AS PART OF THE PRE-OPERATIONAL PROCEDURE.

ACTION TAKEN
SECTION 9.2 WAS DELETED AND TESTING CONTINUED.

RETEST EXECUTION AND ACCEPTANCE

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<th>Recorder</th>
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<td>M.D. Harder, ETROPS</td>
<td>4-15-96</td>
<td>P. H. E.</td>
<td>4/23/96</td>
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Design Engineering (Author of ATP)
Mark A. Fiedler
Date: 4/23/96

APPROVAL AND ACCEPTANCE – OPERATING CONTRACTOR

☐ Re-test Approved and Accepted
☒ Exception Accepted as is*
☐ Other*

* Explanation
DELETION OF SECTION 9.2 DOES NOT COMPROMISE ANY OTHER SECTIONS OF THIS ATP.

Approver 1
M. D. Harder
Date: 4/16/96

Approver 2
P. H. E.
Date: 4/16/96

Approver 3
Date

Approver 4
Date
SECTION 9.8 PROVIDES DIRECTIONS TO TEST THE OPERATION OF FLUID COOLER FAN (WC-A710279T-1A). HOWEVER, DUE TO FAILURE OF THE DAMPER POSITIONER TO OPERATE AS DESIGNED WE WERE UNABLE TO COMPLETE THIS PORTION OF THE ATP.

Planned Action
DELETE SECTION 9.2 FROM THE ATP. AFTER THE PROBLEMS WITH THE DAMPER ARE CORRECTED THE FLUID COOLER FAN WILL BE TESTED AS PART OF THE PRE-OPERATIONAL PROCEDURE.

Action Taken
SECTION 9.2 WAS DELETED AND TESTING CONTINUED.

RETEST EXECUTION AND ACCEPTANCE

Retest Installation Contractor          Date          Recorder          Date
M.D. Hardy                            4-15-96       Mark A. Friedley   4-28-96

Witness 1 (Name/Organization) Date          Witness 2 (Name/Organization) Date
M.D. Hardy                            4-15-96       D. B. Cole          4-28-96

Field Engineering Date                Test Director (Name/Organization) Date
                                  4-15-96       A.E. Project Engineer 4-28-96

Design Engineering (Author of ATP) Date
Mark A. Friedley                     4-28-96

APPROVAL AND ACCEPTANCE – OPERATING CONTRACTOR

☐ Retest Approved and Accepted  ☑ Exception Accepted—asis*  ☐ Other*

* Explanation
DELETION OF SECTION 9.8 DOES NOT COMPROMISE ANY OTHER SECTIONS OF THIS ATP.

Approver 1 Date Approver 2 Date
M.D. Hardy 4-16-96 D. B. Cole 4-28-96

Approver 3 Date
4-16-96

Approver 4 Date
4-28-96
The ATP calls for a process instrument calibration.

This instrument is not required for this ATP.

Planned Action

DELETE 7.2.2

Action Taken

STEP 7.2.2 WAS DELETED AND TESTING CONTINUED

Retest Execution and Acceptance

Retest Installation Contractor

Date

M. D. Harding

4-15-96

Witness 1 (Name/Organization)

Date

M. D. Harding

4-15-96

Witness 2 (Name/Organization)

Date

M. D. Harding

4-15-96

Test Director (Name/Organization)

Date

M. D. Harding

4-25-96

Design Engineering (Author of ATP)

Date

Mark A. Friedland

4-25-96

Approver 1

M. D. Harding

4-15-96

Approver 2

D. B. Cle

4-16-96

Approver 3

M. D. Harding

4-15-96

Approver 4

D. B. Cle

4-16-96

Explanation

The process instrument calibration was not required as part of this ATP therefore it was deleted.
THIS SECTION REQUIRES THE OPERATION OF MOTOR STARTERS AZ-CW-7-1A/1B, WITH THE MOTOR LEADS DISCONNECTED; HOWEVER, THE CONTROL POWER TRANSFORMERS ARE NOT INSTALLED.

Planned Action
DELETE THE REQUIREMENT TO TEST THESE MOTOR STARTERS. THESE MOTOR STARTERS WILL BE TESTED AS PART OF THE PRE-OP TESTING.

Action Taken
THE REQUIREMENT WAS DELETED AND TESTING CONTINUED.

Retest Execution and Acceptance

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<th>Retest Installation Contractor</th>
<th>Date</th>
<th>Recorder</th>
<th>Date</th>
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<tbody>
<tr>
<td>M.D. Harder, ETOPS</td>
<td>4-16-96</td>
<td>OB Cle</td>
<td>4/25/96</td>
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Design Engineering (Author of ATP)  

<table>
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<tr>
<th>Date</th>
<th>Approver 1</th>
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<tr>
<td>4/16/96</td>
<td>M.O. Hendry</td>
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Average 4-16-96

The test of the motor starters AZ-CW-7-1A/1B will be conducted as part of the pre-op tests.

Approver 2

D.B. Cle

4/16/96

Approver 3

M.D. Hendry

4/16/96

Approver 4

4/16/96