

# SUBMEPP STANDARDIZED TEST PROCEDURE



**TEST NO:** 55151-3-201      **REV/CHG:** (5)      **CLASS:** SSN 21

**TITLE:** HIGH PRESSURE AIR COMPRESSORS AND  
DEHYDRATOR - OPERATION

<u>SUBMEPP APPROVAL:</u>			
<u>T. C. Chan</u> SYSTEM ENGINEER/TECHNICIAN	<u>11/4/14</u> DATE	<u>Daniel Gorman</u> PROGRAM MANAGER	<u>11/4/14</u> DATE

This Test Performs or Could Invalidate a Measured Parameter of URO MRC:	N/A	Identify URO MRC No. or enter "N/A" if None
This Test May Affect Ship Safety as Defined in NAVSEA S9002-AK-CCM-010/6010 or S9505-LP-485-6010, as applicable (For Accomplishing Activity Use Only)	YES	NO

TEST COMPLETION FOR SSN/SSB(G)N _____ <small>(Fill in Hull Number)</small>			
TEST PERFORMANCE SIGN-OFF:		TEST PERFORMANCE APPROVED:	
_____ TEST DIRECTOR	_____ DATE	_____ SUPSHIP/COMNAVSHIPYD	_____ DATE

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TEST PROCEDURE REVISION RECORD

REV/ CHG	DESCRIPTION	SUBMEPP APPROVAL & DATE
-	Initial issue. This test was developed from SSN 21 New Construction Test 55151-5-001 Rev B.	T. C. Chan D. Fogarty 9/9/05
(1)	TPR 22-SRA11-H046 dated 5 Jan 2006 Revised paragraphs 11.5.2.6 through 11.5.2.8 (and DATA SHEET 10) per New Construction Test 761-002.	T. C. Chan D. Fogarty 1/20/06
(2)	TPR SEA-0065 dated 13 Feb 2006 Made editorial corrections to paragraphs 11.1, 11.3, and 11.13.	T. C. Chan D. Fogarty 2/27/06
(3)	TPR SUB 07-0161 dated 7 Jun 2007 Updated mercury exclusion paragraph 8.3.2.  TPR 723-EOH01-H033A dated 17 Feb 2010 (Intent) Added reference 3.2.9 updated DATA SHEET 4 for reheaters. In addition, updated title of references 3.3.1 and 3.3.2.  TPR SUB 10-0216 dated 18 Jun 2010 Clarified Compressor Motor Sheets, DATA SHEETS 6 through 9.	T. C. Chan D. Fogarty 8/12/10
(4)	TPR 21-DMP01-H014 dated 6 Jun 2011 Rearranged the order of paragraphs 11.5, 11.6, and 11.7; DATA SHEETS 10 and 11 updated accordingly. Revised paragraphs 11.4.3 and 11.4.8 for clarity. Due to accessibility concerns, modified location of thermometers in paragraph 11.8.1 and requirement to record motor RPM in DATA SHEETS 6 through 9.  TPR 774-EDSRA01-H046 dated 6 Jul 2011 Revised paragraph 10.1 to line up system per reference 3.1.5. Deleted paragraphs 10.2 and 10.3.	T. C. Chan D. Fogarty 8/12/11

TEST PROCEDURE REVISION RECORD (Cont'd)

REV/ CHG	DESCRIPTION	SUBMEPP APPROVAL & DATE
(5)	<p>TPR SUB 11-0203 dated 27 Sep 2011            Revised temperature values in Note 1.b of            paragraph 11.2.</p> <p>TPR SUB 14-0034 dated 27 May 2014            Updated electrical safety note, paragraph            8.1.3.</p> <p>TPR 22-DMP01-H016 dated 4 Aug 2014            Revised HPAC coolant requirements in paragraph            10.5.</p> <p>Deleted summary of latest page revision,            removed previous change bars, and updated page            numbers accordingly. In addition, provided            administrative test procedure updates.</p>	<p>T. C. Chan            D. Gorman            11/4/14</p>

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## 1. PURPOSE

- 1.1 The purpose of this test is to demonstrate the satisfactory operation of the High Pressure Air Compressors (HPAC) and Automatic High Pressure Air Dehydrator (AHPD) to include insulation resistance, control, indication, and equipment performance checks.

## 2. SCOPE

### 2.1 Configuration

- 2.1.1 This test applies to SSN 21 Class submarines.

### 2.2 System/Equipment Involved

- 2.2.1 High Pressure Air Compressors No. 1 and No. 2, Automatic High Pressure Dehydrator, and associated components

## 3. REFERENCES

### 3.1 Technical Manuals and Other Requirement Documents

- 3.1.1 NAVSEA 0902-018-2010, General Overhaul Specifications for Deep Diving SSBN/SSN Submarines, Sections 9020-9 and 9490-1
- 3.1.2 NAVSEA Technical Manual S9086-KC-STM-010 Chapter 300, Electric Plant, General
- 3.1.3 NAVSEA Technical Manual S9550-CB-MMA-010, Maintenance Manual for Air Compressor, Model 5R5-75B 4500 PSIG, High Pressure, Description, Operation, and Maintenance
- 3.1.4 NAVSEA Technical Manual S9551-B3-MMO-010, Maintenance Manual for Desiccant Standard, Automatic, High Pressure Air Dehydrator; Description, Operation, and Maintenance
- 3.1.5 NAVSEA S9SSN-AW-SSM-GAO/(U)21CLV4P1C1, SEAWOLF Class Ship Systems Manual, Volume 4, Part 1, Chapter 1, High Pressure Air System

3.1.6 NAVSEA S9SSN-AW-SSM-XXO/(U)21CLV6P3B5, SEAWOLF Class Ship Systems Manual, Volume 6, Part 3, Book 5, High Pressure Air System Operation (OI 633-1)

3.2 Drawings

NOTE

Log the revision and any applicable liabilities (TVD, EN, DM, etc.) of the drawing used during the time the test was conducted. N/A those drawings not used.

3.2.1 NAVSEA Dwg No. 551-6404041 Rev \_\_\_\_, High Pressure Air System Diagram (U) (Confidential)

3.2.2 NAVSEA Dwg No. 551-6405036 Rev \_\_\_\_, High Pressure Air Compressor and Low Pressure Blow Equipment Cable Diagram

3.2.3 NAVSEA Dwg No. 551-6404040 Rev \_\_\_\_, Service Air System Diagram (U) (Confidential)

3.2.4 NAVSEA Dwg No. 216-6351946 Rev \_\_\_\_, Propulsion Plant Fresh Water Diagram (U) (Confidential)

3.2.5 NAVSEA Dwg No. 493-6404284 Rev \_\_\_\_, Monitoring System IC CKT MN Cabling Diagram (U) (Confidential)

3.2.6 NAVSEA Dwg No. 493-6404285 Rev \_\_\_\_, Monitoring System IC CKT MN Wiring Tables

3.2.7 NAVSEA Dwg No. 320-6351960 Rev \_\_\_\_, 60 Hz Power Distribution Diagram - AFT (U) (Confidential)

3.2.8 NAVSEA Dwg No. 320-6603212 Rev \_\_\_\_, Engine Room I&C Power Distribution Cabling Diagram

3.2.9 NAVSEA Dwg No. 551-6685218 Rev \_\_\_\_, Dehydrator, HP, Automatic (AHPD) Electrical Sys and Dets

3.3 Test Procedures and Other References

3.3.1 HM&E Test Procedure 55111-2-201, High Pressure Air (and SSN 23 Normal Blow) System - Strength and Tightness Test

3.3.2 HM&E Test Procedure 51420-2-201, R-114 Air Conditioning System - Strength and Tightness Test

- 3.3.3 HM&E Test Procedure 51420-5-202, R-114 Air Conditioning Cooling & Heating Control System - Operation
- 3.3.4 HM&E Test Procedure 07300-5-212, Structureborne Noise Survey
- 3.3.5 Maintenance Requirement Card 7CPL, Test AC Motor Controller Overload Relays

#### **4. PREREQUISITES**

- 4.1 Applicable portions of references 3.3.1 through 3.3.3 must be completed prior to the accomplishment of this test.
- 4.2 Those portions of the system affected during the availability must be installed in accordance with work authorizing documents.
- 4.3 Prior to energizing the system, insulation resistance measurements of all associated cables installed new or modified shall be performed in accordance with reference 3.1.2.

#### **5. TEST AND SUPPORT EQUIPMENT/MATERIAL**

- 5.1 Calibrated test instruments shall be used for testing. Permanently installed ship's instruments used to obtain test data shall have current calibration stickers. If test equipment requires periodic calibration, fill in Test Equipment Log Sheet.
- 5.2 Megohmmeter, QuadTech Model 1863 or equivalent - SCAT Code 4448
- 5.3 Multimeter, Fluke 77/BN or equivalent - SCAT Code 4245
- 5.4 Milliohmmeter, PPM Inc R1L-B or equivalent - SCAT Code 4445
- 5.5 Clamp-on Ammeter, Weston Model 633 or equivalent - SCAT Code 4236

- 5.6 Spare Level Sensing Probe Assembly, Rix Industries Mfg, Part No. A576-B5017
- 5.7 Tachometer, Sticht, Vibration Reed Type, Rix Industries Mfg, Part No. A576-B5017
- 5.8 Oil pressure test tool, Rix Industries Mfg, Part No. 455-C2403
- 5.9 Stopwatch, Breitling Model 605A/NSN 9Q6645-00-250-4680 or equivalent
- 5.10 Contact pyrometers
- 5.11 Thermometer (non-mercuric), Pandux, Model 310F or equivalent
- 5.12 Insulating putty
- 5.13 Rags for cleaning up any spilled oil
- 5.14 White cloth

**6. SHIP CONDITION AND SERVICES REQUIRED**

6.1 Ship Condition

- 6.1.1 Ship may be waterborne (dockside) or in drydock.

6.2 Services Required

- 6.2.1 Normal ship's communications between stations or sound powered telephone communications
- 6.2.2 440 VAC, 60 Hz, 3 phase electrical power (ship or shore)
- 6.2.3 Fresh water supply for cooling
- 6.2.4 Service air (125 psi)

**7. STATION ASSIGNMENTS**

- 7.1 At the HP air compressors and dryers, as required by test performance paragraphs 10 and 11

## 8. WARNINGS, CAUTIONS, & GENERAL PRECAUTIONS

### 8.1 Personnel Safety (WARNINGS)

#### NOTE

This section contains General Warnings applicable to a majority of the test. Additional Warnings specific to a procedural step are listed within the body of the test, as required.

8.1.1 Disconnect the source of power to all electrical equipment while making inspections, installation checks, and taking megger measurements.

8.1.2 Discharge all circuits to ground for 60 seconds (minimum) before and after taking insulation resistance measurements to minimize shock hazards.

8.1.3 US Naval requirements per Technical Manual S9086-KC-STM-010 NSTM Chapter 300 defines and requires circuits operating at 30 volts and above to be considered as potentially lethal voltage. Contact with voltages of 30 volts and greater may result in electrical shocks, permanent internal organ damage, or death by electrocution. Equipment involved in this Test Procedure uses voltages per Technical Manual S9086-KC-STM-010 NSTM Chapter 300 that are potentially dangerous to life. Intentional or accidental voltage contact may result in permanent injury or death. Strict compliance with the locally applicable Safety and Health Manual is mandatory. Failure to do so may put your life at risk.

### 8.2 Equipment Safety (CAUTIONS)

#### NOTE

This section contains General Cautions applicable to a majority of the test. Additional Cautions specific to a procedural step are listed within the body of the test, as required.

8.2.1 When verifying correct motor rotation, do not energize any motor longer than necessary to cause rotation. Secure immediately if rotation is incorrect to avoid equipment damage.

- 8.2.2 In the Battle Override mode, normal compressor safety controls are bypassed. An operator shall stay with the compressor and continually monitor its operation during the conduct of this test.
- 8.2.3 With the DRAIN MONITOR BYPASS selector switch in the BYPASS or SAFETY BYPASS position, the compressor operator must manually drain the moisture separators at least every 30 minutes to prevent damage to the compressor. These are degraded modes of operation which shall only be used long enough to obtain the messages required in paragraphs 11.5.5.3 and 11.5.5.4.
- 8.2.4 The AHPD discharge shall be directed to the atmosphere for this test. Ship's air banks shall not be charged until the dehydrator has performed satisfactorily by delivering effluent air with an equivalent dewpoint of -60°F or less (drier) at a discharge pressure of 4300 to 4600 psig or -107°F or less (drier) at atmospheric pressure.
- 8.3 General Precautions
- 8.3.1 Standard safety precautions shall be observed by test personnel at all times.
- 8.3.2 The use of mercury and mercury compounds, or equipment and instruments containing mercury, shall be in accordance with NAVSEAINST 5100.3.
- 8.3.3 If any abnormal condition such as low oil pressure, high stage temperature, high discharge pressure, or excessive vibration occurs during HPAC operation, press the STOP pushbutton to stop the compressor.
- 8.3.4 DO NOT charge the high pressure air banks with the ship's compressors until satisfactory operation of the automatic air dehydrator has been verified by paragraph 11.12.6.
- 8.3.5 The area surrounding each HPAC shall be free of dirt, oil, and loose debris that would cause serious damage if allowed to enter the compressor.

- 8.3.6 Open all AHPD valves slowly (200 psig per second) to minimize sudden loading of desiccant beds and system components. If high pressure air is applied suddenly, damage can occur to desiccant pellets or O-ring seals.
- 8.3.7 When a HPAC is running, the doors in bulkhead 53 and 54 must be open, the ventilation supply or return must be opened between the engine room and the forward spaces, or the Engine Room Logistics Escape Trunk hatch must be open to avoid pulling a vacuum on the engine room.

## 9. GENERAL NOTES AND INSTRUCTIONS

- 9.1 If testing is interrupted to troubleshoot, to correct a deficiency, or to improve operation, the Test Director shall determine if retesting and/or recertification of prerequisite or associated tests is necessary.
- 9.2 Where sign-off is required, signature verifies that the action has been satisfactorily performed in accordance with the applicable paragraphs.
- 9.3 Where supporting ship system auxiliaries are required to conduct this test, temporary auxiliaries which are equivalent to ship system auxiliaries may be used. Note the use of any temporary auxiliaries on the COMMENT SHEET.
- 9.4 SEAWOLF specification section 045 requires that a separate machinery history record shall be maintained of all hours of high pressure air compressor operation. This includes the time the equipment is being run during the performance of this test and all additional hours up to the time the equipment is turned over to ship's force. Record operating time and provide to ship's force.
- 9.5 It is recommended that structureborne noise testing of the Compressor/Motor be performed concurrent with paragraph 11.8 in accordance with reference 3.3.4.

9.6 The following abbreviations are used in this document:

<u>Abbreviation</u>	<u>Term</u>
AHPD	Automatic High Pressure Dehydrator
BP	Bypass
CMS	Compressor Management System
DSV	Depressurization Solenoid Valve
HPAC	High Pressure Air Compressor
HVE	High Voltage Enclosure
MBV	Manual Blowdown Valve
MCV	Manual Cutout Valve
MSV	Manual Shutoff Valve
OLH	Overload Heater
PPFW	Propulsion Plant Fresh Water
PTV	Purge Throttle Valve

9.7 Record significant information with respect to the accomplishment or results of this test on the attached COMMENT SHEET.

## 10. INITIAL CONDITIONS AND SETUP

- 10.1 Line up the High Pressure Air System for normal operation, in accordance with reference 3.1.5, with cooling water supplied to the compressors from the Propulsion Plant Fresh Water Cooling System (PPFW) and with starting air supplied to the compressors from the Service Air System.
- 10.2 Deleted
- 10.3 Deleted
- 10.4 Check oil level via the sight level gauge mounted on the HPAC main motor sump. The level should be at or near the top of the NORMAL range. Fill as necessary to obtain the proper level through the oil fill. Use oil in accordance with MIL-PRF-17331 Symbol 2190 TEP hydraulic grade.
- 10.5 Check the HPAC coolant level via the sight level indicator located alongside the expansion tank. When the compressor is cold, the level should be at or near the middle of the NORMAL range. Fill via the coolant fill cap as necessary to obtain the proper level. Small amounts of coolant (less than 1 gallon) can be made up by adding distilled water. If more than 1 gallon is needed, refill with a 50/50 mixture of distilled water and antifreeze per CID A-A-52624.
- 10.6 Check to ensure PPFW flow by observing the PPFW pressure gauge on the HPAC gauge panel with the PPFW selector switch set on IN and then OUT. A PPFW IN pressure (20 to 175 psig), higher than PPFW OUT pressure (10 to 165 psig), indicates PPFW flow.
- 10.7 Check to ensure electrical power is available to each HPAC and the AHPD. The circuit breaker for HPAC No. 1 is located in Control and Distribution Switchboard 5SB. The circuit breaker for HPAC No. 2 is located in Control and Distribution Switchboard 6SB. The circuit breaker for the AHPD is located in the Engine Room I&C Panel.
- 10.8 To ensure dry desiccant is in the main and bypass towers for startup of the AHPD, replace the desiccant cartridges in accordance with reference 3.1.4.

- 10.9 Ensure the Compressor Management System (CMS) for each HPAC has been calibrated in accordance with reference 3.1.3 prior to performing operational checks. The message PERFORM CALIBRATE PROCEDURE will be displayed upon energizing the CMS if calibration is necessary.
- 10.10 Remove and retain the cover plate and screws covering the moisture separator drain monitor bypass selector switch on the front of the CMS.
- 10.11 Ensure the CMS default operational parameters are satisfactory for shipboard operation of the HPAC. Reprogram any default values in accordance with reference 3.1.3.
- 10.12 All initial conditions and setup complete.

---

CODE/BADGE

---

SIGNATURE

---

DATE

**11. TESTING STEPS**

11.1 Circuit Protection Devices

11.1.1 Fuse Inspection

11.1.1.1 Certify on DATA SHEET 1 the ampere rating of the fuses in the compressor motor controller listed in DATA SHEET 1.

11.1.2 Motor Overload Heater Check

11.1.2.1 Certify on DATA SHEET 2 that the motor overload heaters are correctly sized and set (per reference 3.3.5).

11.2

Insulation Resistance Measurements

WARNINGS

1. US Naval requirements per Technical Manual S9086-KC-STM-010 NSTM Chapter 300 defines and requires circuits operating at 30 volts and above to be considered as potentially lethal voltage. Contact with voltages of 30 volts and greater may result in electrical shocks, permanent internal organ damage, or death by electrocution. Equipment involved in this Test Procedure uses voltages per Technical Manual S9086-KC-STM-010 NSTM Chapter 300 that are potentially dangerous to life. Intentional or accidental voltage contact may result in permanent injury or death. Strict compliance with the locally applicable Safety and Health Manual is mandatory. Failure to do so may put your life at risk.
2. Disconnect the source of power to all electrical equipment while making inspections, installation checks, and taking megger measurements.
3. Discharge all circuits to ground for 60 seconds (minimum) before and after taking insulation resistance measurements to minimize shock hazards.

NOTES

1. During the performance of this test procedure, paragraphs requiring insulation resistance readings to be corrected to 25°C (77°F) need not be corrected if either of the following conditions are satisfied.
  - a. The measured value of resistance is equal to or greater than the minimum value specified on the applicable Data Sheet and the temperature at the time of measurement is 25°C (77°F) or higher.
  - b. The measured resistance is equal to or greater than twice the minimum value specified on the applicable Data Sheet and the temperature at the time of the measurement is 15°C (59°F) or higher.
2. For each insulation resistance measurement that satisfies one of the conditions of Note 1, mark N/A in the "Corrected to 25°C" block on the applicable Data Sheet.
3. For the correction of insulation resistance measurements to 25°C, multiply the measured insulation resistance readings by the correction factor identified in TABLE 1.
4. In lieu of taking separate measurements, the resistance to ground of an interconnected motor and controller may be measured together as one unit provided devices which have a voltage rating less than the test voltage are disconnected or shorted out before the test voltage is applied. Temperature observations and corrections are not required for measurement of combined resistance to ground of interconnected units.

NOTES (Cont'd)

5. Combined IR readings may not be possible on some motors/controllers due to contactor configuration in the controllers.
- 11.2.1 Measure the insulation resistance of the interconnected motor (or compressor/controller). The combined resistance to ground of an interconnected motor (or compressor) and controller, from the controller load terminals to the motor, shall be not less than 4 megohms with an applied test voltage of 500 VDC. The test voltage shall be applied for 60 seconds. Record results on DATA SHEET 3.
- 11.2.1.1 If the insulation resistance measured in paragraph 11.2.1 is less than 4 megohms, separate measurements are required and must meet the requirements of DATA SHEET 3. The temperature of the component shall be recorded and insulation resistance measurements shall be corrected to 25°C/77°F (see paragraph 11.2 Notes 1 through 3). The test voltage of 500 VDC shall be applied for not less than 60 seconds. Record results on DATA SHEET 3.
- 11.2.2 Measure the insulation resistance of the Dehydrator Reheaters No. 1 and No. 2 with associated cabling in accordance with reference 3.1.2. Record results on DATA SHEET 4.

11.3 Pre-Operational Checks

11.3.1 Pressure Switch Setting and Repeatability

11.3.1.1 Verify the setting of the cutout switches (AHP-62-PS-011 and AHP-62-PS-012) by cycling each switch 3 times (after installation on the ship). Record results on DATA SHEET 5.

11.3.2 Pressure Regulating Valve Setting

11.3.2.1 Record actual setting of the AHPD Pressure Regulating Valve (PRV) on DATA SHEET 5.

11.3.3 Backpressure Valve Setting

11.3.3.1 Record actual setting of the following Backpressure Valves (BPV) on DATA SHEET 5.

HPAC No. 1 backpressure valve  
HPAC No. 2 backpressure valve  
AHPD backpressure valve

11.3.4 Deleted

11.3.5 Deleted

- 11.4 Compressor/Pump Motor Rotation Check
- 11.4.1 Record nameplate data on DATA SHEETS 6 through 9, as applicable.
- 11.4.2 Prior to initial operation, rotate the compressors by hand to ensure there is no internal binding.
- 11.4.3 Select manual operation by placing the MAN/AUTO selector switch in the MAN position.
- 11.4.4 Place the DRAIN MONITOR BYPASS selector switch, located behind the removed cover plate on the CMS, in the NORMAL position.
- 11.4.5 Place the compressor control power ON/OFF selector switch, located on the CMS control panel, in the ON position.
- 11.4.6 Ensure the HPAC pre-start display lamp test and pre-start self-test is completed, and the COMPRESSOR READY FOR START message is displayed on the Alphanumeric Message Display.
- 11.4.7 Place the HPAC discharge isolation valve (AHP-20 for HPAC No. 1, AHP-26 for HPAC No. 2) in the BLEED position. When the sound of air passing through the valve is no longer heard, place the discharge isolation valve in the OPEN position.

WARNING - Deleted

CAUTION

When verifying correct motor rotation, do not energize any motor longer than necessary to cause rotation. Secure immediately if rotation is incorrect to avoid equipment damage.

- 11.4.8 Momentarily jog each HPAC compressor motor to verify motor rotation. Proper compressor rotation is clockwise when viewed from above compressor; inspect through crankcase window. Record results on DATA SHEETS 6 and 8, as applicable.

NOTE

Lube oil/coolant pump motor rotation is verified by paragraph 11.6.1.6.

11.5                    Noise Monitoring System Contact Operation

11.5.1                Lift the leads of the noise monitoring system terminals at the terminal box listed in DATA SHEET 11 and connect a multimeter across the leads. Verify satisfactory contact operation by observing an open circuit with the HPACs secured and a completed circuit with the HPACs running. Reconnect the leads. Record results on DATA SHEET 11.

11.6 CMS Operational Checks

11.6.1 Maintenance Timer

NOTE

During these paragraphs, the maintenance mode may automatically exit if time limit is exceeded. To re-enter maintenance mode, depress the TEST then SCAN keys and perform required functions.

- 11.6.1.1 Turn the compressor control power ON/OFF selector switch, located on the CMS control panel, to the ON position. Verify the CMS performs a display lamp test and pre-start self-test, and the Alphanumeric Message Display first reads PRE-START SELF TEST and then COMPRESSOR READY FOR START. Refer to TABLE 2-2 of reference 3.1.3. Record results on DATA SHEET 11.
- 11.6.1.2 On the keypad, depress the TEST key. Verify the Alphanumeric Message Display alternately displays the following messages: ENTER READ FOR PRINT-OUT, ENTER SCAN FOR MAINTENANCE MODE, and ENTER TEST KEY TO ESCAPE. Refer to TABLE 2-7 of reference 3.1.3. Record results on DATA SHEET 11.
- 11.6.1.3 On the keypad, depress the SCAN key. Verify the Alphanumeric Message Display displays the following messages: DISPLAY MAINTENANCE TIMERS = READ, DISPLAY SYSTEM DEFAULTS = SCAN, AUX PUMP TEST/MAINTENANCE = OIL, DRAIN SYSTEM MAINTENANCE = STEP, and ENTER TEST KEY TO ESCAPE. Refer to TABLE 2-7 of reference 3.1.3. Record results on DATA SHEET 11.
- 11.6.1.4 Before the message sequence described in the prior step has repeated 5 times, depress the READ key. Verify the Alphanumeric Message Display displays the current hours logged by the various maintenance timers. Record results on DATA SHEET 11.
- 11.6.1.5 At the keypad, depress the TEST then SCAN key. Verify the programmed operational parameter default settings of the CMS are displayed. Record results on DATA SHEET 11.

- 11.6.1.6 At the keypad, depress the TEST, then SCAN, then OIL keys, and then the STEP key until oil pressure is indicated. Ensure the oil pressure and water level is satisfactory. Verify the auxiliary contractor in the High Voltage Enclosure (HVE) engages and causes the oil/coolant pump to start without starting the HPAC. Verify proper oil/coolant pump motor rotation by observing an indication of oil pressure on the CMS gauge panel. Release the OIL key and verify the oil/coolant pump stops. Record results on DATA SHEET 11.
- 11.6.1.7 At the keypad, depress the TEST, then SCAN, then STEP keys. In consecutive order, repeating the TEST-SCAN-STEP key actions for each stage (depress the TEST key to exit early), depress the STAGE 1, STAGE 2, STAGE 3, STAGE 4, and STAGE 5 keys and verify the Alphanumeric Message Display consecutively displays the status of the individual HPAC stages' moisture level sensors and associated drain solenoids. Record results on DATA SHEET 11.
- 11.6.1.8 At the keypad, depress the TEST key and verify the CMS returns to the ready for start mode. Record results on DATA SHEET 11.
- 11.6.2 Pressure Sensor Calibration
- 11.6.2.1 With the compressor control power ON/OFF selector switch in the ON position and the message COMPRESSOR READY FOR START displayed on the Alphanumeric Message Display, ensure the compressor is shut down, PPFW inlet and outlet is secured, and a zero pressure reading is observed at the PPFW pressure gauge on the HPAC gauge panel.
- 11.6.2.2 At the CMS control panel keypad, depress the PRESS and TEST keys in that order. The Alphanumeric Message Display will read DO CALIBRATE Y = STEP N = TEST.
- 11.6.2.3 At the keypad, depress the STEP key and verify the message SENSOR CALIBRATION IN PROGRESS appears on the Alphanumeric Message Display. Record results on DATA SHEET 11.

11.7 HPAC Operational Checks

11.7.1 Turn-On Procedure

11.7.1.1 Apply PPFW and ensure the compressor control power ON/OFF selector switch is in the ON position, the Alphanumeric Message Display reads COMPRESSOR READY FOR START, and the BATTLE OVERRIDE switch is in the NORMAL position (BATTLE OVERRIDE light is not illuminated).

11.7.1.2 At the CMS Control Panel, depress the START pushbutton. Verify the following and record results on DATA SHEET 10.

11.7.1.2.1 Oil/coolant pump motor starts.

11.7.1.2.2 Oil pressure rises to 20 psig.

11.7.1.2.3 Starting air is released to pressurize the fourth and fifth stage cylinders.

11.7.1.2.4 After 2 seconds, the HPAC main motor starts.

11.7.1.2.5 The following series of messages appears on the Alphanumeric Message Display:

COMPRESSOR START-UP ACTIVATED (displayed for 7-15 seconds)

NORMAL START-UP COMPLETE (displayed for 3 seconds)

11.7.1.2.6 Green MOTOR RUNNING light illuminates.

11.7.1.2.7 Mechanical hourmeter on CMS Control Panel starts to operate.

11.7.2 Manual/Automatic Operation

11.7.2.1 Select manual operation by placing the MAN/AUTO selector switch in the MAN position.

11.7.2.2 Observe that the high pressure air discharge pressure is increasing as read on the HPAC gauge panel stage pressure gages.

- 11.7.2.3 Verify the compressor stops and the moisture separator drains open sequentially when the high pressure air discharge pressure reaches  $4600 \pm 46$  psig. Record results on DATA SHEET 10.
- 11.7.2.4 Slowly vent the high pressure air and verify the compressor does not restart automatically when the high pressure air discharge pressure drops to  $4300 \pm 43$  psig. Record results on DATA SHEET 10.
- 11.7.2.5 When the high pressure air discharge pressure drops below 4257 psig, stop venting the high pressure air and switch to automatic operation by placing the MAN/AUTO selector switch in the AUTO position. Verify the compressor does not start and SWITCH TO MANUAL message is displayed on the CMS.
- 11.7.2.6 Place the MAN/AUTO selector switch in the MAN position. Start the compressor and observe that the high pressure air discharge pressure is increasing as read on the HPAC gauge panel stage discharge pressure gages.
- 11.7.2.7 Deleted
- 11.7.2.8 Deleted
- 11.7.2.9 Depress the STOP/RESET pushbutton on the CMS control panel. Verify the compressor main motor stops immediately and after 8 seconds, the oil/coolant pump motor stops. Record results on DATA SHEET 10.
- 11.7.2.10 Verify the following 4 messages appear on the Alphanumeric Message Display and record results on DATA SHEET 10:
- MAIN CONTRACTOR SHUT DOWN (displayed for 3 seconds)
  - AUX CONTRACTOR SHUT DOWN (displayed for 3 seconds)
  - PRESSURE UNLOAD IN PROGRESS (displayed for about 120 seconds)
  - COMPRESSOR READY FOR START (displayed continuously)

11.7.3 Battle Override (Emergency) Operation

CAUTION

In the Battle Override mode, normal compressor safety controls are bypassed. An operator shall stay with the compressor and continually monitor its operation during the conduct of this test.

- 11.7.3.1 Select manual operation by placing the MAN/AUTO selector switch in the MAN position.
- 11.7.3.2 Depress the BATTLE OVERRIDE pushbutton on the HVE. Verify the pushbutton illuminates and the compressor main motor and oil/coolant pump motor are running. Record results on DATA SHEET 10.
- 11.7.3.3 Verify the Alphanumeric Message Display alternately displays the message BATTLE OVERRIDE ACTIVE, operating pressure, and temperature display indications. Record results on DATA SHEET 10.
- 11.7.3.4 Depress the BATTLE OVERRIDE pushbutton on the HVE. Verify the compressor and oil/coolant pump shut down and the BATTLE OVERRIDE pushbutton is no longer illuminated. Record results on DATA SHEET 10.
- 11.7.4 Low Oil Pressure Shutdown Check (Refer to reference 3.1.3, paragraph 4-6.5.6.3)
  - 11.7.4.1 With the compressor shut down, disconnect the oil line from the oil pump to the drain manifold at the oil pump only. Contain and clean up any spilled oil.
  - 11.7.4.2 Attach the oil pressure testing tool in accordance with reference 3.1.3.
  - 11.7.4.3 Open the hand valve on the testing tool.
  - 11.7.4.4 Start the compressor and ensure the high pressure air discharge pressure is increasing as read on the HPAC gauge panel stage pressure gages. Close the hand valve on the testing tool.
  - 11.7.4.5 Slowly loosen the end cap on the snubber valve for the oil pressure gauge located on the gauge panel. Contain and clean up any spilled oil.

- 11.7.4.6 Observe the oil pressure gauge and verify the compressor will shut down at  $15 \pm 2$  psig. Record results on DATA SHEET 10.
- 11.7.4.7 Verify the message FATAL LOW LUBE OIL PRESSURE appears on the Alphanumeric Message Display. Record results on DATA SHEET 10.
- 11.7.4.8 Tighten the end cap on the oil pressure gauge snubber valve, remove the oil pressure testing tool and reconnect the oil line to the oil pump. Record results on DATA SHEET 10. Contain and clean up any spilled oil.
- 11.7.5 Moisture Separator Drain System Operation
  - 11.7.5.1 Start the compressor and observe that the high pressure air discharge pressure is increasing as read on the HPAC gauge panel stage pressure gages.
  - 11.7.5.2 Place the DRAIN MONITOR BYPASS selector switch, located behind the removed cover plate on the CMS, in the NORMAL position and verify the moisture separators for each stage drain automatically during compressor operation. Record results on DATA SHEET 10.

CAUTION

With the DRAIN MONITOR BYPASS selector switch in the BYPASS or SAFETY BYPASS position, the compressor operator must manually drain the moisture separators at least every 30 minutes to prevent damage to the compressor. These are degraded modes of operation which shall only be used long enough to obtain the messages required in paragraphs 11.7.5.3 and 11.7.5.4.

- 11.7.5.3 Place the DRAIN MONITOR BYPASS selector switch in the BYPASS position and verify the message AUTO DRAIN SYSTEM BYPASSED appears on the Alphanumeric Message Display. Record results on DATA SHEET 10.
- 11.7.5.4 Place the DRAIN MONITOR BYPASS selector switch in the SAFETY BYPASS position and verify the message HI LEVEL PROTECTION BYPASSED appears on the Alphanumeric Message Display. Record results on DATA SHEET 10.

- 11.7.5.5 Return the DRAIN MONITOR BYPASS selector switch to the NORMAL position and depress the STOP/RESET pushbutton on the CMS panel to shut down the compressor.
- 11.7.6 Moisture Separator High Level Shutdown Switch Operation
- 11.7.6.1 Turn the compressor control power ON/OFF selector switch, located on the CMS control panel, to the ON position. Ensure the COMPRESSOR READY FOR START message appears on the Alphanumeric Message Display.
- 11.7.6.2 One at a time, for each of the HPAC cylinders listed in DATA SHEET 10, perform the following paragraphs. Record results on DATA SHEET 10.
- 11.7.6.3 Remove the moisture separator Level Sensing Probe Assembly and replace with the spare Level Sensing Probe Assembly.
- 11.7.6.4 Depress the START pushbutton on the CMS control panel to start the compressor.
- 11.7.6.5 With the compressor running, manually slide the float assembly slowly along the length of the probe towards the float stop.
- 11.7.6.6 Ensure as the float assembly nears the mid-range of the probe, the message SEPARATOR DRAINING - STAGE X appears on the Alphanumeric Message Display. (The letter X will be replaced by the number 1-5 of the appropriate stage.)
- 11.7.6.7 Continue sliding the float assembly slowly along the length of the probe towards the float stop. Ensure as the float assembly nears the float stop at the end of the probe, the WARN/FAIL indicator light illuminates, the message HIGH SEPARATOR - STAGE X appears on the Alphanumeric Message Display, and the compressor shuts down. (The letter X will be replaced by the number 1-5 of the appropriate stage.)
- 11.7.6.8 Replace the spare Level Sensing Probe Assembly installed in the HPAC cylinder with the removed moisture separator Level Sensing Probe Assembly after verifying high level shutdown switch operation.

11.7.6.9           Depress the STOP/RESET pushbutton to clear all warning and fatal fault indications from the CMS and allow the compressor to be restarted.

11.8 Compressor/Pump Motor Operational Test

NOTES

1. This test is required for all pumps and/or motors that are new or overhauled, in addition to shop performed heat runs.
2. It is recommended that Structureborne noise testing of compressor/pump motors be performed concurrent with paragraph 11.8.4 in accordance with HM&E TP 07300-5-212, reference 3.3.4.
3. Ensure system is lined up in accordance with paragraph 10 and paragraph 11.3 has been accomplished.
4. Prior to operational test, any applicable compressor/pump motor safety control circuits should be tested for proper operation.
5. Paragraphs 11.8, 11.9, and 11.12 may be accomplished simultaneously.

11.8.1 Attach temporary thermometers to compressor/pump motors listed in DATA SHEETS 6 through 9 (a portable pyrometer may be substituted for the laboratory thermometers, 1 on the compressor lower bearing housing, 1 on the frame in the area between the upper and lower air openings with Ducseal or equal compound, and 2 on both ends of the lube oil/coolant pump motor. In addition, 1 thermometer must be installed in the vicinity of the compressor/pump being tested to measure ambient temperature at the same time of the test.

11.8.2 Depress the START pushbutton on the CMS control panel. Ensure the following messages are displayed on the Alphanumeric Message Display:

COMPRESSOR STARTUP ACTIVATED  
NORMAL STARTUP COMPLETE

11.8.3 Ensure the green MOTOR RUNNING indicator light on the CMS control panel illuminates.

11.8.4 Operate the compressor motors listed in DATA SHEETS 6 through 9 at rated conditions for 1 hour of operation. Record results on DATA SHEETS 6 through 9 every 15 minutes. The system should be lined up for normal operation.

11.8.4.1 If a shop heat run was not performed or if the compressor motors listed in DATA SHEETS 6 through 9 were disassembled for any reason subsequent to the shop heat run, conduct the test paragraph 11.8.2 for minimum of 1 hour and until temperatures (motor frame, bearings) have stabilized (3 consecutive 15 minute readings do not show a total increase in temperature of more than 2°F). Record results on DATA SHEETS 6 through 9, as applicable.

11.9 High Pressure Air Compressor Performance

- 11.9.1 With the HPAC operating in accordance with paragraph 11.8, vent high pressure discharge air as necessary to allow the HPAC to run continuously under a full load. When the equipment has been in operation for at least 1 hour and the HPAC main motor lube oil and coolant pump motor bearing temperatures have stabilized, complete 4 hours of operation. Record results at 15 minute intervals on DATA SHEETS 12 and 13.
- 11.9.2 Manually blow down the HPAC acoustic filter every 2 hours of HPAC operation by performing the following paragraphs. Record results on DATA SHEET 14.
- 11.9.2.1 Check acoustic filter drain valve (AHP-25 for HPAC No. 1, AHP-31 for HPAC No. 2) is in the SHUT position.
- 11.9.2.2 Position acoustic filter outlet chamber isolation valve (AHP-22 for HPAC No. 1, AHP-28 for HPAC No. 2) in the BLEED position for 10 to 20 seconds.
- 11.9.2.3 OPEN AHP-22 for HPAC No. 1 (AHP-28 for HPAC No. 2).
- 11.9.2.4 Crack open AHP-25 for HPAC No. 1 (AHP-31 for HPAC No. 2).
- 11.9.2.5 When moisture-free air discharges from the drain pipe, SHUT AHP-22 for HPAC No. 1 (AHP-28 for HPAC No. 2).
- 11.9.2.6 SHUT AHP-25 for HPAC No. 1 (AHP-31 for HPAC No. 2)
- 11.9.2.7 Position acoustic filter inlet mid chamber isolation valve (AHP-23 for HPAC No. 1, AHP-29 for HPAC No. 2) in the BLEED position for 10 to 20 seconds.
- 11.9.2.8 OPEN AHP-23 for HPAC No. 1 (AHP-29 for HPAC No. 2).
- 11.9.2.9 Crack open AHP-25 for HPAC No. 1 (AHP-31 for HPAC No. 2).
- 11.9.2.10 When moisture-free air discharges from the drain pipe, SHUT AHP-23 for HPAC No. 1 (AHP-29 for HPAC No. 2).

- 11.9.2.11 SHUT AHP-25 for HPAC No. 1 (AHP-31 for HPAC No. 2).
- 11.9.2.12 Position acoustic filter inlet chamber isolation valve (AHP-24 for HPAC No. 1, AHP-30 for HPAC No. 2) in the BLEED position for 10 to 20 seconds.
- 11.9.2.13 OPEN AHP-24 for HPAC No. 1 (AHP-30 for HPAC No. 2).
- 11.9.2.14 Crack open AHP-25 for HPAC No. 1 (AHP-31 for HPAC No. 2).
- 11.9.2.15 When moisture-free air discharges from the drain pipe, SHUT AHP-24 for HPAC No. 1 (AHP-30 for HPAC No. 2).
- 11.9.2.16 SHUT AHP-25 for HPAC No. 1 (AHP-31 for HPAC No. 2).
- 11.9.3 Verify proper operation of the particulate/coalescing filter automatic drain valve, AHP-18, by observing that the valve automatically opens once during each hour of HPAC operation and remains open for a duration of 3.5 seconds before closing. Record results on DATA SHEET 14.
- 11.9.4 Verify proper operation of the moisture separator automatic drain valve, AHP-119, by observing that the valve automatically opens once during each hour of HPAC operation and remains open for a duration of 3.5 seconds before closing. Record results on DATA SHEET 14.

11.10 Lube Oil Inspection

11.10.1 Upon satisfactory completion of the HPAC 4 hour performance run, drain the HPAC crankcase oil and inspect the lube oil filter for the presence of foreign materials and excessive wear particles. If any visible particles are present in the filter, the lubricating system shall be cleaned and the HPAC shall be run for an additional 4 hours. Re-inspect the lube oil filter. The presence of any visible particles shall be cause for rejection of the HPAC. Record results on DATA SHEET 14.

11.11 AHPD Pre-Operational Checks

11.11.1 Indicator Lamp Test

11.11.1.1 Place the POWER ON/POWER OFF switch in the POWER ON position.

11.11.1.2 Depress the LAMP TEST pushbutton located on the AHPD control panel.

11.11.1.3 Verify the indicator lamps listed in DATA SHEET 14 are illuminated. Record results on DATA SHEET 14.

11.11.2 Purge Air Flowmeter

11.11.2.1 Prior to AHPD operation, verify purge air flowmeter accuracy at each of the flow rates listed in DATA SHEET 14. Record results on DATA SHEET 14.

11.12 AHPD Operational Checks

11.12.1 Startup Procedure

CAUTION

The AHPD discharge shall be directed to the atmosphere for this test. Ship's air banks shall not be charged until the dehydrator has performed satisfactorily by delivering effluent air with an equivalent dewpoint of -60°F or less (drier) at a discharge pressure of 4300 to 4600 psig or -107°F or less (drier) at atmospheric pressure.

11.12.1.1 Place both HPACs in operation to supply high pressure air to the AHPD.

11.12.1.2 Line up the AHPD for operation as follows:

11.12.1.2.1 Shut Manual Blowdown Valve (MBV) located at the bottom right-hand side of the dehydrator below the prefilter. Ensure the vent port on valves BP-1, BV-1, BV-2, and MCV are closed and vent caps are installed on valves VV1, VV2, and VV3.

11.12.1.2.2 Shut Bypass (BP) valves BP1 and BP2 located on the top front and left-hand side of the dehydrator, respectively.

11.12.1.2.3 Open pressure gauge block valves BV1 and BV2 and pressure gauge vent valves VV1 and VV2.

11.12.1.2.4 Fully close Purge Throttle Valve (PTV) and then open the PTV 3 turns.

11.12.1.2.5 Open the Manual Cutout Valve (MCV) located at the bottom right-hand side of the dehydrator below the prefilter.

11.12.1.2.6 Open the Manual Shutoff Valve (MSV) located on the front bottom left-hand side of the dehydrator.

11.12.1.2.7 Place the COMPRESSOR SHIP/SHORE switch in the SHIP position.

NOTE

If the high pressure air being supplied to the AHPD is from a source other than a HPAC, such as shore air, the COMPRESSOR SHIP/SHORE switch shall be placed in the SHORE position and purge air flowmeter shall be adjusted in accordance with reference 3.1.4.

- 11.12.1.2.8 Place the POWER ON/POWER OFF switch in the POWER ON position. Verify the POWER ON indicator, located on the control panel, is illuminated. Record results on DATA SHEET 14.

NOTE

The system RESET pushbutton is to be used to reset the unit to start at a new cycle.

- 11.12.1.2.9 If applicable, verify the CMRSSR RUNNING indicator, located on the control panel, is illuminated. Record results on DATA SHEET 14.
- 11.12.1.2.10 Adjust the PTV until the purge air flowmeter indicates  $12.5 \pm 1.5$  scfm.
- 11.12.2 Low Purge Flow Alarm and Indication Check
- 11.12.2.1 With the AHPD operating, adjust the PTV to slowly decrease the purge air flow, as read on the purge air flowmeter, until the low purge flow pressure switch is activated. Verify the red LOW PURGE indicator lamp is flashing and an audible buzzer alarm sounds. Record results and record flowmeter reading on DATA SHEET 14.
- 11.12.2.2 Depress the ALARM SILENCE pushbutton located on the control panel and verify the audible buzzer alarm is silenced. Record results on DATA SHEET 14.
- 11.12.2.3 Adjust the PTV until the purge air flowmeter indicates  $12.5 \pm 1.5$  scfm.
- 11.12.2.4 Depress the ALARM RESET pushbutton located on the control panel and verify the LOW PURGE indicator lamp is de-energized. Record results on DATA SHEET 14.

- 11.12.3 High Purge Flow Alarm and Indication Check
  - 11.12.3.1 With the AHPD operating, adjust the PTV to slowly increase the purge air flow rate, as read on the purge air flowmeter, until the high purge flow pressure switch is activated. Verify the red HIGH PURGE indicator lamp is steadily illuminated and the audible buzzer alarm sounds. Record results and record flowmeter reading on DATA SHEET 14.
  - 11.12.3.2 Adjust the PTV until the purge air flowmeter indicates  $12.5 \pm 1.5$  scfm.
  - 11.12.3.3 Depress the ALARM RESET pushbutton and verify the HIGH PURGE indicator lamp is de-energized and the audible buzzer alarm is silenced. Record results on DATA SHEET 14.
- 11.12.4 AHPD Operation Time Cycle Check. Start up the AHPD and perform the following to verify proper cycling of the AHPD. Record results on DATA SHEET 14.
  - 11.12.4.1 With the AHPD operating, depress the SYSTEM RESET pushbutton located inside the control panel to position solenoid valves in proper position for the start of the dehydrator time cycle.
  - 11.12.4.2 At the start of the time cycle, observe the following indications on the control panel:
    - 11.12.4.2.1 TOWER NO. 1 DRYING indicator is illuminated.
    - 11.12.4.2.2 TOWER NO. 2 DRYING indicator is not illuminated.
    - 11.12.4.2.3 Blowdown Valve (BDV) green neon valve position indicator lamp is not illuminated.
    - 11.12.4.2.4 Pressurization Solenoid Valve (PSV) green neon valve position indicator lamp is not illuminated.
    - 11.12.4.2.5 Depressurization Solenoid Valve (DSV) green neon valve position indicator lamp is not illuminated.
    - 11.12.4.2.6 Desiccant Tower No. 1 Vent Solenoid Valve (SV3) green neon valve position indicator lamp is not illuminated.

- 11.12.4.2.7 Desiccant Tower No. 2 Vent Solenoid Valve (SV4) green neon valve position indicator lamp is illuminated.
- 11.12.4.2.8 Purge Air Directing Solenoid Valve (SV5) green neon valve position indicator lamp is not illuminated.
- 11.12.4.2.9 CMPRSSR RUNNING indicator is illuminated.
- 11.12.4.2.10 POWER ON indicator is illuminated.

NOTE

The following paragraphs indicate valve position indicator lamp changes from the initial conditions in paragraph 11.12.4.2, or changes in subsequent paragraphs.

- 11.12.4.3 At the 3 minute mark of the time cycle, observe that the DSV green neon valve position indicator lamp is now illuminated.
- 11.12.4.4 At the 8 minute mark of the time cycle, observe that the BDV green neon valve position indicator lamp illuminates for 5 seconds.
- 11.12.4.5 At the 29 minute mark of the time cycle, observe the following indication changes:
  - 11.12.4.5.1 PSV green neon valve position indicator lamp is illuminated.
  - 11.12.4.5.2 DSV green neon valve position indicator lamp is not illuminated.
  - 11.12.4.5.3 SV4 green neon valve position indicator lamp is not illuminated.
- 11.12.4.6 At the 30 minute mark of the time cycle, observe the following indication changes:
  - 11.12.4.6.1 TOWER NO. 1 DRYING indicator is not illuminated.
  - 11.12.4.6.2 TOWER NO. 2 DRYING indicator is illuminated.
  - 11.12.4.6.3 PSV green neon valve position indicator lamp is not illuminated.

- 11.12.4.6.4 SV3 green neon valve position indicator lamp is illuminated.
- 11.12.4.7 At the 33 minute mark of the time cycle, observe that the DSV valve position indicator lamp is illuminated.
- 11.12.4.8 At the 59 minute mark of the time cycle, observe the following indication changes:
  - 11.12.4.8.1 PSV green neon valve position indicator lamp is illuminated.
  - 11.12.4.8.2 DSV green neon valve position indicator lamp is not illuminated.
  - 11.12.4.8.3 SV3 green neon valve position indicator lamp is not illuminated.
- 11.12.4.9 At the 60 minute mark of the time cycle, observe the following indications:
  - 11.12.4.9.1 TOWER NO. 1 DRYING indicator is illuminated.
  - 11.12.4.9.2 TOWER NO. 2 DRYING indicator is not illuminated.
  - 11.12.4.9.3 BDV green neon valve position indicator lamp is not illuminated.
  - 11.12.4.9.4 PSV green neon valve position indicator lamp is not illuminated.
  - 11.12.4.9.5 DSV green neon valve position indicator lamp is not illuminated.
  - 11.12.4.9.6 SV3 green neon valve position indicator lamp is not illuminated.
  - 11.12.4.9.7 SV4 green neon valve position indicator lamp is illuminated.
  - 11.12.4.9.8 SV5 green neon valve position indicator lamp is not illuminated.

- 11.12.5 AHPD Performance Check (Both HPACs in operation)
  - 11.12.5.1 Place both HPACs in operation or supply shore high pressure air to the AHPD.
  - 11.12.5.2 Start up the AHPD and perform a 4 hour performance run. Record results at 20 minute intervals on DATA SHEET 15.
    - 11.12.5.2.1 During the AHPD performance run, take dewpoint temperature measurements of the AHPD discharge air at the portable dewpoint monitor isolation valve, AHP-11. Record results on DATA SHEET 15.
- 11.12.6 AHPD Performance (1 HPAC in operation)
  - 11.12.6.1 Place 1 HPAC in operation to the AHPD.
  - 11.12.6.2 Start the AHPD and perform a 2 hour performance run. Record results at 20 minute intervals on DATA SHEET 16.
    - 11.12.6.2.1 During the AHPD performance run, take dewpoint temperature measurements of the AHPD discharge air at portable dewpoint monitor isolation valve AHP-11. Record results on DATA SHEET 16.
    - 11.12.6.2.2 Ensure solenoid valve SV5 green indicator light remains illuminated throughout the cycle.
- 11.12.7 Shutdown Procedure
  - 11.12.7.1 With the AHPD operating, place the POWER ON/POWER OFF switch in the POWER OFF position.
  - 11.12.7.2 Shut down the HPACs (or shore source) supplying high pressure air to the AHPD.
  - 11.12.7.3 Line up the AHPD for shutdown as follows:
    - 11.12.7.3.1 Shut AHPD high pressure air inlet and outlet isolation valves, AHP-12 and AHP-9, respectively. Close pressure gauge vent valves VV1, VV2, and VV3, and pressure gauge block valves BV1, BV2, and BV3.
    - 11.12.7.3.2 Open vent (remove cap) on pressure gauge vent valves VV1, VV2, and VV3 and slowly open valves.

- 11.12.7.3.3 Slowly open pressure gauge block valves BV1, BV2, and BV3 and vent ports.
- 11.12.7.3.4 Open at the dewpoint sample connection (DSC).
- 11.12.7.3.5 Open vent on bypass tower inlet valve BP1.
- 11.12.7.3.6 Open vent on MCV.
- 11.12.7.3.7 Open MBV.
- 11.12.7.4 Record results on DATA SHEET 17.

- 11.13            AHPD Emergency Operational Check
- 11.13.1        Perform the following paragraphs to activate the  
                 bypass (emergency) tower:
- 11.13.1.1      Place both HPACs in operation or supply shore high  
                 pressure air to the AHPD.
- 11.13.1.2      Ensure the vent ports on BP1, MCV, VV3, and BV3 are  
                 fully closed.
- 11.13.1.3      Place the POWER ON/POWER OFF switch in the POWER OFF  
                 position.
- 11.13.1.4      Close MSV.
- 11.13.1.5      Close MBV.
- 11.13.1.6      Close MCV.
- 11.13.1.7      Slowly pressurize the bypass tower by slowly opening  
                 bypass tower inlet valve BP1 1/4 turn. Wait 2  
                 minutes for full pressurization.
- 11.13.1.8      Open BP1 fully.
- 11.13.1.9      Open bypass tower outlet valve, BP2.
- 11.13.2        With the bypass tower on-line, after 1 hour ensure  
                 satisfactory air drying by taking a dewpoint  
                 measurement of the AHPD discharge air at the dewpoint  
                 sample connection using the portable dewpoint  
                 monitor. Record results on DATA SHEET 17.

**12. SHUTDOWN/SECURING**

12.1 Upon completion of testing, secure the High Pressure Air System, remove all test equipment, and restore valve line up for normal operation.

\_\_\_\_\_  
CODE/BADGE

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

12.2 Certify all test equipment used during performance of this testing was properly calibrated by signing the Test Equipment Log Sheet.

TEST EQUIPMENT LOG SHEET

Paragraphs 5.1 and 12.2

Statement of Calibration: Only properly calibrated test equipment  
was used in performance of this test.

\_\_\_\_\_  
Test Director Signature, Badge, & Date

TEST EQUIPMENT USED	SERIAL NUMBER	CAL DUE DATE	SIGNATURE

Attach additional log sheets as necessary.

TABLE 1  
Insulation Resistance Temperature Correction Chart  
Paragraph 11.2

Temp °C	Temp °F	Correction Factor to 25°C	Temp °C	Temp °F	Correction Factor to 25°C	Temp °C	Temp °F	Correction Factor to 25°C
10	50	0.35	40	104	2.83	70	158	22.63
11	51.8	0.38	41	105.8	3.03	71	159.8	24.25
12	53.6	0.41	42	107.6	3.25	72	161.6	25.99
13	55.4	0.44	43	109.4	3.48	73	163.4	27.86
14	57.2	0.47	44	111.2	3.73	74	165.2	29.86
15	59	0.50	45	113	4.00	75	167	32.00
16	60.8	0.54	46	114.8	4.29	76	168.8	34.30
17	62.6	0.57	47	116.6	4.59	77	170.6	36.76
18	64.4	0.62	48	118.4	4.92	78	172.4	39.40
19	66.2	0.66	49	120.2	5.28	79	174.2	42.22
20	68	0.71	50	122	5.66	80	176	45.25
21	69.8	0.76	51	123.8	6.06	81	177.8	48.50
22	71.6	0.81	52	125.6	6.50	82	179.6	51.98
23	73.4	0.87	53	127.4	6.96	83	181.4	55.72
24	75.2	0.93	54	129.2	7.46	84	183.2	59.71
25	77	1.00	55	131	8.00	85	185	64.00
26	78.8	1.07	56	132.8	8.57	86	186.8	68.59
27	80.6	1.15	57	134.6	9.19	87	188.6	73.52
28	82.4	1.23	58	136.4	9.85	88	190.4	78.79
29	84.2	1.32	59	138.2	10.56	89	192.2	84.45
30	86	1.41	60	140	11.31	90	194	90.51
31	87.8	1.52	61	141.8	12.13	91	195.8	97.01
32	89.6	1.62	62	143.6	13.00	92	197.6	103.97
33	91.4	1.74	63	145.4	13.93	93	199.4	111.43
34	93.2	1.87	64	147.2	14.93	94	201.2	119.43
35	95	2.00	65	149	16.00	95	203	128.00
36	96.8	2.14	66	150.8	17.15	96	204.8	137.19
37	98.6	2.30	67	152.6	18.38	97	206.6	147.03
38	100.4	2.46	68	154.4	19.70	98	208.4	157.59
39	102.2	2.64	69	156.2	21.11	99	210.2	168.90

Beyond the table range, the corrected insulation resistance at 25°C may be determined by calculating the applicable correction factor as follows.  $T_c$  is the component temperature (in °C) at the time of the test.

$$\text{Correction Factor} = 2^{\left(\frac{T_c - 25}{10}\right)}$$

Fahrenheit/Centigrade conversion formulas are: °F = (9/5 °C) + 32 and °C = 5/9 (°F - 32)

DATA SHEET 1

Fuse Inspection  
Paragraph 11.1.1

EQUIPMENT (REF 3.2.2)	REQUIRED		ACTUAL		CODE/BADGE/ SIGNATURE/DATE
	RATING	QTY	RATING	QTY	
CONTLR FOR HPAC MOTOR & COOLANT PUMP NO. 1	1FU 3A	1			
	2FU 3A	1			
	3FU 3A	1			
	4FU 3A	1			
CONTLR FOR HPAC MOTOR & COOLANT PUMP NO. 2	1FU 3A	1			
	2FU 3A	1			
	3FU 3A	1			
	4FU 3A	1			
SOLENOID DRAIN VALVE RELAY ENCL	10A	2			
AUTOMATIC HIGH PRESSURE DEHYDRATOR	FU1 5A	1			
	FU2 5A	1			
	FU3 0.6A	1			
	FU4 0.6A	1			
	FU5 0.6A	1			
	FU6 0.6A	1			
	FU7 0.6A	1			
	FU8 0.6A	1			
	FU9 0.6A	1			
	FU10 0.6A	1			
	FU11 10A	1			
	FU12 10A	1			

DATA SHEET 2

Motor Overload Heater Check  
 Paragraph 11.1.2

MOTOR	REQUIRED		ACTUAL		CODE/BADGE/ SIGNATURE/DATE
	CATALOG GE #	SETTINGS	CATALOG #	SETTINGS	
HPAC No. 1	9104H3974 (QTY 2)	100%			
Coolant Pump No. 1	9104H3915 (QTY 2)	100%			
HPAC No. 2	9104H3974 (QTY 2)	100%			
Coolant Pump No. 2	9104H3915 (QTY 2)	100%			

DATA SHEET 3

Insulation Resistance Checks

Combined Readings, Paragraph 11.2.1

HPAC (REF 3.3.2)	DIST PANEL	TERM NO.	INSULATION RESISTANCE (MEGOHMS)		CODE/BADGE/ SIGNATURE/DATE
			MIN REQ'D	ACTUAL	
Compressor Pump No. 1	5SB	L1	4		
Coolant Pump No. 1	5SB	L1	4		
Compressor Pump No. 2	6SB	L1	4		
Coolant Pump No. 2	6SB	L1	4		

DATA SHEET 3 (Cont'd)

Insulation Resistance Measurements

Separate Readings, Paragraph 11.2.1.1

PUMP (REF 3.3.2)	COMPONENT	TERM NO.	FRAME TEMP °C/°F	READING (MEGOHMS)			CODE/BADGE/ SIGNATURE/DATE		
				MIN REQ'D	ACT	*CORR			
HPAC Compressor Pump No. 1	Motor	T1		25					
	Cable	T1		1					
		T2							
		T3							
	Controller	T1		10					
		T2							
		T3							
	HPAC Compressor Coolant Pump No. 1	Motor	T1		25				
		Cable	T1		1				
T2									
T3									
Controller		T1		10					
		T2							
		T3							

\* Corrected to 25°C/77°F

DATA SHEET 3 (Cont'd)

Insulation Resistance Measurements

Separate Readings, Paragraph 11.2.1.1 (Cont'd)

PUMP (REF 3.3.2)	COMPONENT	TERM NO.	FRAME TEMP °C/°F	READING (MEGOHMS)			CODE/BADGE/ SIGNATURE/DATE		
				MIN REQ'D	ACT	*CORR			
HPAC Compressor Pump No. 2	Motor	T1		25					
	Cable	T1		1					
		T2							
		T3							
	Controller	T1		10					
		T2							
		T3							
	HPAC Compressor Coolant Pump No. 2	Motor	T1		25				
		Cable	T1		1				
T2									
T3									
Controller		T1		10					
		T2							
		T3							

\* Corrected to 25°C/77°F

DATA SHEET 4

Insulation Resistance for Dehydrator Reheaters  
 Paragraph 11.2.2

CIRCUIT MEASURED	TERM NO.	MEASURED INSULATION RESISTANCE (MEGOHMS)		CODE/BADGE/ SIGNATURE/DATE
		*MINIMUM REQUIRED	ACTUAL	
Reheater No. 1 Ckt	J5A	1		
	J5B	1		
Reheater No. 2 Ckt	J11A	1		
	J11B	1		

\* Minimum required megohm value as a guideline. The purpose is to ensure no short-circuits.

DATA SHEET 5

Pre-Operational Checks  
Paragraph 11.3

Pressure Switch Setting, Paragraph 11.3.1.1

SWITCH NO.	SETTING (PSIG)		CODE/BADGE/ SIGNATURE/DATE
	REQUIRED	ACTUAL	
(HPAC No. 1) AHP-62-PS-011	Open 4600 ± 46 (increasing)		
	Close 4300 ± 43 (decreasing)		
(HPAC No. 2) AHP-62-PS-012	Open 4600 ± 46 (increasing)		
	Close 4300 ± 43 (decreasing)		

AHPD Pressure Regulating Valve (PRV) Setting, Paragraph 11.3.2.1

VALVE IDENTIFICATION	SETTING (PSIG)		CODE/BADGE/ SIGNATURE/DATE
	REQUIRED	ACTUAL	
PRV	75 ± 5		

Backpressure Valve (BPV) Settings, Paragraph 11.3.3.1

EQUIPMENT IDENTIFICATION	SETTING (PSIG)		CODE/BADGE/ SIGNATURE/DATE
	REQUIRED	ACTUAL	
HPAC No. 1	2200 ± 50		
HPAC No. 2	2200 ± 50		
AHPD	4025 ± 175		

Notes for DATA SHEETS 6 through 9

1. For motors that have had a documented heat run and no work has been done that could effect or invalidate the shop heat run, perform a shipboard heat run for a minimum of 1 hour.
2. For motors that have not had a documented shop heat run or work has been performed that could effect or invalidate the shop heat run such as motor or driven auxiliary disassembly, perform a shipboard heat run for a minimum of 1 hour plus a sufficient amount of time to allow temperatures to stabilize (i.e., 3 consecutive readings do not show a total temperature increase of more than 1.1°C (2°F)).
3. Motor bearing temperature must not exceed 90°C (194°F) or 40°C (72°F) rise above ambient, whichever is less (in accordance with MIL-B-17931E (bearings)).
4. Motor frame temperature must not exceed 110°C (230°F) or 60°C (108°F) rise above ambient, whichever is less (in accordance with MIL-M-17060E (AC)).
5. Although maximum temperature rise is specified, rise exceeding 25°C (45°F) above ambient should be considered abnormal and investigated.
6. Not to exceed nameplate current or current at actual full load, as recorded in the performance at rated voltage and frequency table on applicable drawing.

DATA SHEET 6

High Pressure Air Compressor Motor No. 1  
Paragraphs 11.4.1, 11.4.8, 11.8.4, and 11.8.4.1

MOTOR NAMEPLATE DATA (TAKEN DIRECTLY FROM NAMEPLATE)							COMP NAMEPLATE DATA (TAKEN DIRECTLY FROM NAMEPLATE)					
MFR		SER. NO.		VOLTS	AMPS	FULL LOAD (FL) RPM:	MFR		SER NO.		MODEL NO.	
WDG	INSULATION	DUTY	PHASE	TYPE	HP	DWG NO.	GPM	PSI	TYPE	DWG NO.		
ROTATION DIRECTION AGREES WITH ARROW ON MOTOR (CODE/BADGE/SIGNATURE/DATE)							COMP OR MOTOR DISASSEMBLED IN SHIP:			YES		
										NO		
MOTOR TYPE IS SINGLE SPEED							VALID SHOP HEAT RUN PERFORMED:			YES		
										NO		
							OVERHAULED MOTOR			YES		
							NEW MOTOR			YES		
REQUIRED DATA				NOTES*	COMP/MOTOR OPERATIONAL TEST DATA							
TIME - 15 MIN INTERVALS				1,2								
MOTOR AMPS				6								
MOTOR VOLTS (NAMEPLATE RATING ± 10%)												
COMP DISCH PRESS												
TEMPERATURE (CIRCLE APPLIC UNITS °F OR °C)												
FLUID (AIR)												
MOTOR BEARING (MOTOR END)				2,3,5								
MOTOR FRAME				2,4,5								
AMBIENT												
DATA TAKER (CODE/BADGE/SIGNATURE/DATE):				RECORDED DATA REVIEWED AND SATISFACTORY (CODE/BADGE/SIGNATURE/DATE):								

\*Notes located on page 54.

DATA SHEET 7

High Pressure Air Compressor Lube Oil/Coolant Pump Motor No. 1  
Paragraphs 11.4.1, 11.4.8, 11.8.4, and 11.8.4.1

MOTOR NAMEPLATE DATA (TAKEN DIRECTLY FROM NAMEPLATE)							PUMP NAMEPLATE DATA (TAKEN DIRECTLY FROM NAMEPLATE)					
MFR		SER. NO.		VOLTS	AMPS	FULL LOAD (FL) RPM:	MFR		SER NO.		MODEL NO.	
WDG	INSULATION	DUTY	PHASE	TYPE	HP	DWG NO.	GPM	PSI	TYPE	DWG NO.		
ROTATION DIRECTION AGREES WITH ARROW ON MOTOR (CODE/BADGE/SIGNATURE/DATE)							PUMP OR MOTOR DISASSEMBLED IN SHIP:			YES		
										NO		
MOTOR TYPE IS SINGLE SPEED							VALID SHOP HEAT RUN PERFORMED:			YES		
										NO		
							OVERHAULED MOTOR			YES		
							NEW MOTOR			YES		
REQUIRED DATA				NOTES*	PUMP/MOTOR OPERATIONAL TEST DATA							
TIME - 15 MIN INTERVALS				1,2								
MOTOR AMPS				6								
MOTOR VOLTS (NAMEPLATE RATING ± 10%)												
PUMP DISCH PRESS												
TEMPERATURE (CIRCLE APPLIC UNITS °F OR °C)												
FLUID (LUBE OIL)												
FLUID (COOLANT)												
MOTOR BEARING (DRIVE END)				2,3,5								
MOTOR BEARING (MOTOR END)				2,3,5								
MOTOR FRAME				2,4,5								
AMBIENT												
DATA TAKER (CODE/BADGE/SIGNATURE/DATE):				RECORDED DATA REVIEWED AND SATISFACTORY (CODE/BADGE/SIGNATURE/DATE):								

\*Notes located on page 54.

DATA SHEET 8

High Pressure Air Compressor Motor No. 2  
Paragraphs 11.4.1, 11.4.8, 11.8.4, and 11.8.4.1

MOTOR NAMEPLATE DATA (TAKEN DIRECTLY FROM NAMEPLATE)							COMP NAMEPLATE DATA (TAKEN DIRECTLY FROM NAMEPLATE)							
MFR		SER. NO.		VOLTS	AMPS	FULL LOAD (FL) RPM:	MFR		SER NO.		MODEL NO.			
WDG	INSULATION	DUTY	PHASE	TYPE	HP	DWG NO.	GPM	PSI	TYPE	DWG NO.				
ROTATION DIRECTION AGREES WITH ARROW ON MOTOR (CODE/BADGE/SIGNATURE/DATE)							COMP OR MOTOR DISASSEMBLED IN SHIP:			YES				
										NO				
MOTOR TYPE IS SINGLE SPEED							VALID SHOP HEAT RUN PERFORMED:			YES				
										NO				
							OVERHAULED MOTOR			YES				
							NEW MOTOR			YES				
REQUIRED DATA				NOTES*	COMP/MOTOR OPERATIONAL TEST DATA									
TIME - 15 MIN INTERVALS				1,2										
MOTOR AMPS				6										
MOTOR VOLTS (NAMEPLATE RATING ± 10%)														
COMP DISCH PRESS														
TEMPERATURE (CIRCLE APPLIC UNITS °F OR °C)														
FLUID (AIR)														
MOTOR BEARING (MOTOR END)				2,3,5										
MOTOR FRAME				2,4,5										
AMBIENT														
DATA TAKER (CODE/BADGE/SIGNATURE/DATE):				RECORDED DATA REVIEWED AND SATISFACTORY (CODE/BADGE/SIGNATURE/DATE):										

\*Notes located on page 54.

DATA SHEET 9

High Pressure Air Compressor Lube Oil/Coolant Pump Motor No. 2  
Paragraphs 11.4.1, 11.4.8, 11.8.4, and 11.8.4.1

MOTOR NAMEPLATE DATA (TAKEN DIRECTLY FROM NAMEPLATE)							PUMP NAMEPLATE DATA (TAKEN DIRECTLY FROM NAMEPLATE)					
MFR		SER. NO.		VOLTS	AMPS	FULL LOAD (FL) RPM:	MFR		SER NO.		MODEL NO.	
WDG	INSULATION	DUTY	PHASE	TYPE	HP	DWG NO.	GPM	PSI	TYPE	DWG NO.		
ROTATION DIRECTION AGREES WITH ARROW ON MOTOR (CODE/BADGE/SIGNATURE/DATE)							PUMP OR MOTOR DISASSEMBLED IN SHIP:			YES		
										NO		
MOTOR TYPE IS SINGLE SPEED							VALID SHOP HEAT RUN PERFORMED:			YES		
										NO		
							OVERHAULED MOTOR			YES		
							NEW MOTOR			YES		
REQUIRED DATA				NOTES*	PUMP/MOTOR OPERATIONAL TEST DATA							
TIME - 15 MIN INTERVALS				1,2								
MOTOR AMPS				6								
MOTOR VOLTS (NAMEPLATE RATING ± 10%)												
PUMP DISCH PRESS												
TEMPERATURE (CIRCLE APPLIC UNITS °F OR °C)												
FLUID (LUBE OIL)												
FLUID (COOLANT)												
MOTOR BEARING (DRIVE END)				2,3,5								
MOTOR BEARING (MOTOR END)				2,3,5								
MOTOR FRAME				2,4,5								
AMBIENT												
PUMP GLAND												
DATA TAKER (CODE/BADGE/SIGNATURE/DATE):				RECORDED DATA REVIEWED AND SATISFACTORY (CODE/BADGE/SIGNATURE/DATE):								

\*Notes located on page 54.

DATA SHEET 10

HPAC Operational Checks  
Paragraph 11.7

Turn-On Procedure, Paragraph 11.7.1.2

PARAGRAPH	DESCRIPTION	RESULTS (SAT)	
		HPAC NO. 1	HPAC NO. 2
11.7.1.2.1	Oil/Coolant pump motor starts		
11.7.1.2.2	Oil pressure rises to 20 psig		
11.7.1.2.3	Starting air releases		
11.7.1.2.4	HPAC main motor starts after 2 seconds		
11.7.1.2.5	Start-up indications correct		
11.7.1.2.6	MOTOR RUNNING light illuminates		
11.7.1.2.7	Mechanical hourmeter operates		

CODE/BADGE

SIGNATURE

DATE

Manual/Automatic Operation, Paragraph 11.7.2

PARAGRAPH	DESCRIPTION	RESULTS (SAT)	
		HPAC NO. 1	HPAC NO. 2
11.7.2.3	High pressure shutdown/ Manual mode		
11.7.2.4	HPAC will not restart/ Manual mode		
11.7.2.5	HPAC does not start SWITCH TO MANUAL message/ Automatic mode		
11.7.2.7	Deleted		
11.7.2.8	Deleted		
11.7.2.9	STOP/RESET pushbutton shutdown		
11.7.2.10	Shutdown messages		

CODE/BADGE

SIGNATURE

DATE

DATA SHEET 10 (Cont'd)

HPAC Operational Checks  
Paragraph 11.7

Battle Override (Emergency) Operation, Paragraph 11.7.3

PARAGRAPH	DESCRIPTION	RESULTS (SAT)	
		HPAC NO. 1	HPAC NO. 2
11.7.3.2	Pushbutton start-up		
11.7.3.3	BATTLE OVERRIDE ACTIVE message		
11.7.3.4	Pushbutton shutdown		

\_\_\_\_\_  
CODE/BADGE

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

Low Oil Pressure Shutdown, Paragraph 11.7.4.6

DESCRIPTION	PRESSURE (PSIG)		CODE/BADGE/ SIGNATURE/DATE
	REQUIRED	ACTUAL	
(HPAC No. 1) HPAC Low Oil Pressure Shutdown	15 ± 2	*	
(HPAC No. 2) HPAC Low Oil Pressure Shutdown	15 ± 2	*	

\* Read on HPAC Oil Pressure gauge located on HPAC gauge panel.

Low Oil Pressure Shutdown Message Display, Paragraph 11.7.4.7

HPAC	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
No. 1		
No. 2		

DATA SHEET 10 (Cont'd)

HPAC Operational Checks  
Paragraph 11.7

Restoration of Disturbed Oil Line, Paragraph 11.7.4.8

HPAC	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
No. 1		
No. 2		

Moisture Separator Drain System Operation, Paragraph 11.7.5.2

DESCRIPTION	RESULTS (SAT)		CODE/BADGE/ SIGNATURE/DATE
	HPAC NO. 1	HPAC NO. 2	
1st Stage Separator drain			
2nd Stage Separator drain			
3rd Stage Separator drain			
4th Stage Separator drain			
5th Stage Separator drain			

Moisture Separator Drain System Degraded Mode Operation,  
Paragraph 11.7.5

PARAGRAPH	SELECTOR SWITCH POSITION	EXPECTED MESSAGE	RESULTS (SAT)	
			HPAC NO. 1	HPAC NO. 2
11.7.5.3	BYPASS	AUTO DRAIN SYSTEM BYPASSED		
11.7.5.4	SAFETY BYPASS	HI LEVEL PROTECTION BYPASSED		

\_\_\_\_\_  
CODE/BADGE

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

DATA SHEET 10 (Cont'd)

HPAC Operational Checks  
 Paragraph 11.7

Moisture Separator High Level Shutdown Switch Operation -  
 HPAC No. 1, Paragraph 11.7.6.2

DESCRIPTION	RESULTS (SAT)		CODE/BADGE/ SIGNATURE/DATE
	HPAC NO. 1	HPAC NO. 2	
1st Stage Cylinder			
2nd Stage Cylinder			
3rd Stage Cylinder			
4th Stage Cylinder			
5th Stage Cylinder			
Level Sensing Probe Assemblies restored			

DATA SHEET 11

Operational Check  
Paragraphs 11.5 and 11.6

Noise Monitoring System Contact Operation, Paragraph 11.5.1

TERMINAL BOX NO.	TERMINAL NOS.	HPAC	RESULTS (SAT)	CODE/BADGE/ SIGNATURE/DATE
C-MN4	TB2-13 TB2-15	No. 1		
C-MN4	TB4-5 TB4-7	No. 2		

CMS Operational Checks, Paragraph 11.6.1

PARAGRAPH	DESCRIPTION	RESULTS (SAT)	
		HPAC NO. 1	HPAC NO. 2
11.6.1.1	Display Lamp Test/PRE-START SELF TEST and COMPRESSOR READY FOR START indications		
11.6.1.2	TEST key indications		
11.6.1.3	SCAN key indications		
11.6.1.4	READ key indication		
11.6.1.5	CMS Default setting indications		
11.6.1.6	Oil/Coolant Pump motor rotation check		
11.6.1.7	STEP key indications		
11.6.1.8	TEST key - return to start mode		

\_\_\_\_\_  
CODE/BADGE

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

Pressure Sensor Calibration, Paragraph 11.6.2.3

HPAC	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
No. 1		
No. 2		









DATA SHEET 14

HPAC Performance  
Paragraphs 11.9, 11.10, 11.11, and 11.12

HPAC Acoustic Filter Blowdown (Accomplish every 2 hours of HPAC operation), Paragraph 11.9.2

DESCRIPTION	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
HPAC No. 1		
HPAC No. 2		

Automatic Drain Valves Operation

PARAGRAPH	VALVE OPERATION	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
11.9.3	Particulate/Coalescing Filter Drain Valve AHP-18 automatically opens once each hour of HPAC operation for a duration of 3.5 seconds		
11.9.4	Moisture Separator Drain Valve AHP-119 automatically opens once each hour of HPAC operation for a duration of 3.5 seconds		

HPAC Lube Oil Inspection, Paragraph 11.10.1

DESCRIPTION	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
HPAC No. 1		
HPAC No. 2		

DATA SHEET 14 (Cont'd)

HPAC Performance  
Paragraphs 11.9, 11.10, 11.11, and 11.12

AHPD Indicator Lamp Test, Paragraph 11.11.1.3

INDICATOR	LAMP COLOR	RESULTS (SAT)
POWER ON	White	
COMPRESSOR RUNNING	Green	
TOWER NO. 1 DRYING	Green	
TOWER NO. 2 DRYING	Green	
HEATER OVER-TEMPERATURE	Red	
HIGH PURGE	Red	
LOW PURGE	Red	
FAULT	Red	
HIGH INLET AIR TEMP	Red	
VALVE POSITION FOR DSV, PSV, BDV, SV3, SV4, SV5	Green	

\_\_\_\_\_  
CODE/BADGE

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

Purge Air Flowmeter Accuracy Check, Paragraph 11.11.2.1

PURGE AIR FLOWRATE (SCFM)	REQUIRED ACCURACY (SCFM)	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
4.0	± 1.0		
5.3	± 1.0		
9.0	± 1.0		
14.0	± 1.0		

DATA SHEET 14 (Cont'd)

HPAC Performance  
Paragraphs 11.9, 11.10, 11.11, and 11.12

AHPD Operational Indicators, Paragraph 11.12.1.2

INDICATOR	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
POWER ON		
*CMPRSSR RUNNING		

\* Not applicable if source of high pressure air is other than HPAC.

AHPD Low Purge Flow Alarm and Indication, Paragraph 11.12.2

DESCRIPTION	RESULTS (SAT)	LOW FLOW SWITCH SETTING (SCFM)	
		REQUIRED	ACTUAL
LOW PURGE indication/Audible alarm		10 ± 0.5 (descending)	
ALARM SILENCE pushbutton/Audible alarm silenced			
ALARM RESET pushbutton/LOW PURGE indication deenergized			

\_\_\_\_\_  
CODE/BADGE

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

DATA SHEET 14 (Cont'd)

HPAC Performance  
Paragraphs 11.9, 11.10, 11.11, and 11.12

AHPD High Purge Flow Alarm and Indication, Paragraph 11.12.3

DESCRIPTION	RESULTS (SAT)	LOW FLOW SWITCH SETTING (SCFM)	
		REQUIRED	ACTUAL
HIGH PURGE indication		15 ± 0.5 (ascending)	
ALARM RESET pushbutton/HIGH PURGE indication de-energized/Audible alarm silenced			

CODE/BADGE

SIGNATURE

DATE

AHPD Operation Time Cycle, Paragraph 11.12.4

INDICATOR	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
Operation Time Cycle Indications		





DATA SHEET 17

AHPD Shutdown and Bypass Tower Operation  
 Paragraphs 11.12.8 and 11.13

AHPD Shutdown, Paragraph 11.12.7.4

DESCRIPTION	RESULTS (SAT)	CODE/BADGE/SIGNATURE/DATE
Shutdown Sequence		

AHPD Bypass (Emergency) Tower Operation, Paragraph 11.13.2

DESCRIPTION	RESULTS (SAT)	DEWPOINT (°F) (@ PSIG)	CODE/BADGE/SIGNATURE/DATE
		$\leq -107$ @ ATM $\leq -60$ @ 4500	
Bypass Tower			

