DEC 19 1996

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 161638

2. To: (Receiving Organization) WRAP 1		3. From: (Originating Organization) WRAP 1		4. Related EDT No.: N/A	
5. Proj./Prog./Dept./Div.: W026/Solid Waste Construction		6. Design Authority/ Design Agent/Cog. Engr.: TL Watson		7. Purchase Order No.: N/A	
8. Originator Remarks: For release				9. Equip./Component No.: N/A	
				10. System/Bldg./Facility: N/A	
11. Receiver Remarks: 11A. Design Baseline Document? ☐ Yes ☒ No				12. Major Assm. Dwg. No.: N/A	
				13. Permit/Permit Application No.: N/A	
				14. Required Response Date: N/A	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	HNF-SD-W026-ATP-016		0	HVAC Control System Test Plan	Q	2	1	
2	HNF-SD-W026-ATR-016		0	HVAC Control System Test Report	Q	2	1	

16. KEY					
Approval Designator (F)		Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		1. Approval	4. Review	1. Approved	4. Reviewed no/comment
		2. Release	5. Post-Review	2. Approved w/comment	5. Reviewed w/comment
		3. Information	6. Dist. (Receipt Acknow. Required)	3. Disapproved w/comment	6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Proj. Manager	<i>TL Watson</i>	12/16/96	14-52						
1	1	Design Authority: TL Watson									
1	1	Proj. Engr.: JB Payne	<i>JB Payne</i>	12/16/96	14-02						
1	1	Cog.Eng.: BF Pierce	<i>BF Pierce</i>	12/15/96	14-52						
1	1	Cog. Mgr.: RJ Bottenus	<i>RJ Bottenus</i>	12/16/96	14-02						
1	1	QA: JR McGee	<i>JR McGee</i>	12/16/96							
		Safety									
		Env.									
18.		19.		20.		21. DOE APPROVAL (if required) Ctrl. No.					
JB Payne		RJ Bottenus		RJ Bottenus		☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments					
Signature of EDT Originator		Date		Authorized Representative Date for Receiving Organization		Design Authority/ Cognizant Manager		Date			

W-026, Acceptance Test Report HVAC Control System (Submittal # 1572.1)

TL Watson

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

EDT/ECN: *EDT-161638*

UC:

Org Code: 04E00

Charge Code: PIJF18

B&R Code: 39EW3130020

Total Pages: *70*

Key Words: DCS, WRAP 1, ATR, Heating, Ventilation, Air Conditioning

Abstract: This report verified the HVAC-DSC performed to the criteria stated in this functional test.

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Kara J. Brown
Release Approval

12/19/96
Date

Approved for Public Release

WRAP ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

Tracking #:

ATP (Y/N) Y ATP#: HVAC Control ATP
 Test: Table 1A
 Step: Equipment Tag #: 11-PDISL-622/623
 Spec. Section:

Exception: 1
 Revision: 0
 Execution:

Test Operator: Matt Harper
 Test Witness/Author: Keith Ealden

Date: 26 September 1996
 Time: 1000hrs

Responsible Contractor: PCL
 Responsible Subcontractor: Building Control Services
 Responsible Individual: Matt Harper

EXCEPTION DESCRIPTION: (Expected Result versus Actual Result)

Actuation of 11-PDISL-623 and 11-PDISL-624 should have resulted in tripping Supply Fan SF-11-101 and Return Fan RF-11-101 respectively, and the annunciation of the associated fan fail indication. Neither fan tripped and it was approximately 30 minutes before the Return Fan fail indication was received.

EXCEPTION RESOLUTION:

11-PDISL-623 was Actuated during Alarm Response ATP. Supply Fan SF-11-101 Tripped with red fan fail indication, and Return Fan RF-11-101 stopped with red fan stopped indication. Date tested 9 Oct. '96
 11-PDISL-624 successfully retested during HVAC ATP PCS to DCS interface checks, 9 Oct '96

Exception Closed By:

Date: 10 Oct '96.

APPROVAL OF RESOLUTION

Contractor Representative:
 WHC Projects Representative:
 WHC NFS Representative:
 (NFS = New Facility Startup)

Date: 10/16/96
 Date: 10/16/96
 Date: 16 Oct '96
 Date: 10/16/96

ICF KEH Representative:

WRAP ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

Tracking #:

ATP (Y/N) Y ATP#: HVAC Control ATP
 Test: Table 1B
 Step: 1.2.1 Equipment Tag #: AH-11-101/OC & UC
 Spec. Section:

Exception: 2
 Revision: 0
 Execution:

Test Operator: Matt Harper
 Test Witness/Author: Keith Ealden

Date: 26 September 1996
 Time: 1410hrs

Responsible Contractor: PCL
 Responsible Subcontractor: Building Control Services
 Responsible Individual: Matt Harper

EXCEPTION DESCRIPTION: (Expected Result versus Actual Result)

"Manual over-ride to un-occupied cycle" command issued at the PCS RTAP screen. Command was received by the HVAC DCS system but no change in equipment status was noted. Similar results were obtained when the "Manual over-ride to occupied cycle" command was issued at the PCS RTAP screen.

EXCEPTION RESOLUTION:

Exception Closed By: _____ Date: _____

APPROVAL OF RESOLUTION

Contractor Representative: _____ Date: _____
 WHC Projects Representative: _____ Date: _____
 WHC NFS Representative: _____ Date: _____
 (NFS = New Facility Startup)
 ICF KEH Representative: _____ Date: _____

WRAP ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

Tracking #:

ATP (Y/N) Y ATP#: HVAC Control ATP
 Test: Table 1C
 Step: 1.2.1 Equipment Tag #: 11-XA-621
 Spec. Section: _____

Exception: 3
 Revision: 0
 Execution: _____

Test Operator: M att Harper
 Test Witness/Author: Keith Ealden

Date: 26 September 1996
 Time: 1030hrs

Responsible Contractor: PCL
 Responsible Subcontractor: Building Control Services
 Responsible Individual: Matt Harper

EXCEPTION DESCRIPTION: (Expected Result versus Actual Result)

Controller C-11-101 "Trouble" condition was simulated but alarm was not received at the PCS.

EXCEPTION RESOLUTION:

Succ.

Exception Closed By: _____ Date: _____

APPROVAL OF RESOLUTION

Contractor Representative: _____ Date: _____
 WHC Projects Representative: _____ Date: _____
 WHC NFS Representative: _____ Date: _____
 (NFS = New Facility Startup)
 ICF KEH Representative: _____ Date: _____

WRAP ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

Tracking #:

ATP (Y/N) Y ATP#: HVAC Control ATP
 Test: Table 2B
 Step: Equipment Tag #: AH-11-401/OC & UC
 Spec. Section:

Exception: 4
 Revision: 0
 Execution:

Test Operator: Matt Harper
 Test Witness/Author: Keith Ealden

Date: 26 September 1996
 Time: 1340hrs

Responsible Contractor: PCL
 Responsible Subcontractor: Building Control Services
 Responsible Individual: Matt Harper

EXCEPTION DESCRIPTION: (Expected Result versus Actual Result)

"Manual over-ride to un-occupied cycle" command issued at the PCS RTAP screen. Command was received by the HVAC DCS system but no change in equipment status was noted. Similar results were obtained when the "Manual over-ride to occupied cycle" command was issued at the PCS RTAP screen.

EXCEPTION RESOLUTION:

Exception Closed By: _____ Date: _____

APPROVAL OF RESOLUTION

Contractor Representative: _____ Date: _____
 WHC Projects Representative: _____ Date: _____
 WHC NFS Representative: _____ Date: _____
 (NFS = New Facility Startup)
 ICF KEH Representative: _____ Date: _____

WRAP ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

Tracking #:

ATP (Y/N) Y ATP#: HVAC Control ATP
 Test: Table 9B
 Step: Equipment Tag #: P-11-101A/B; 102A/B
 Spec. Section: _____

Exception: 5
 Revision: 0
 Execution: _____

Test Operator: M att Harper
 Test Witness/Author: Keith Ealden

Date: 26 September 1996
 Time: 1535hrs

Responsible Contractor: PCL
 Responsible Subcontractor: Building Control Services
 Responsible Individual: Matt Harper

EXCEPTION DESCRIPTION: (Expected Result versus Actual Result)

Stop and Start pulses for Chilled Glycol pumps P-11-101A/B and P-11-102A/B were issued at the PCS RTAP screen. The commands were received by the HVAC DCS system but the expected changes in equipment status were not observed.

EXCEPTION RESOLUTION:

BUILDING CONSTRUCTION SYSTEMS & SII MADE PROGRAM CHANGES TO CORRECT PROBLEM. RETESTED 14 OCT '96

Exception Closed By: *[Signature]*

Date: 15 Oct '96

APPROVAL OF RESOLUTION

Contractor Representative: *[Signature]*
 WHC Projects Representative: *[Signature]*
 WHC NFS Representative: *[Signature]*
 (NFS = New Facility Startup)
 ICF KEH Representative: *[Signature]*

Date: 10/16/96
 Date: 10/16/96
 Date: 16 Oct '96
 Date: 10/16/96

WRAP ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

Tracking #:

ATP (Y/N) Y ATP#: HVAC CONTROL ATP
 Test: TABLE 3B
 Step: 3.2.1 Equipment Tag #:
 Spec. Section:

Exception: 6
 Revision:
 Execution:

Test Operator: MATT HARPER
 Test Witness/Author: KEITH EALDEN

Date: 26 SEPT. 96
 Time:

Responsible Contractor:
 Responsible Subcontractor:
 Responsible Individual:

EXCEPTION DESCRIPTION: (Expected Result versus Actual Result)

OPERATOR OVERRIDE TO "UNOCCUPIED" AND "OCCUPIED"
CYCLES NOT TESTED

EXCEPTION RESOLUTION:

Exception Closed By: _____ Date: _____

APPROVAL OF RESOLUTION

Contractor Representative: _____ Date: _____
 WHC Projects Representative: _____ Date: _____
 WHC NFS Representative: _____ Date: _____
 (NFS = New Facility Startup)
 ICF KEH Representative: _____ Date: _____

HANFORD W.R.A.P.

PREREQUISITES AND EQUIPMENT REQUIRED

1. The Andover DDC system will have to be completely installed, wired and powered up.
2. All systems that are subject to testing will have to be completely installed, wired, powered up and checked out by the unit manufacturers representative.
3. All duct systems included in systems will have to be completely installed and sealed.
4. The following tools will be required:
 - Handheld digital multi-meter.
 - Laptop computer
 - Screwdrivers
 - Andover panel keys

APPENDIX A - GUIDE ATP

ACCEPTANCE TEST PROCEDURE * REV 0

DATE _____

TEST TITLE
_____LOCATION *
_____PROJECT NUMBER *
_____PROJECT TITLE *
_____Prepared By
(Company Name)

For _____

Contract _____

PROCEDURE APPROVAL

Originator _____ Date _____

Checker _____ Date _____

Project Manager _____ Date _____

***NOTE TO ATP ORIGINATOR: Enter project specific**

ATP _____
 Rev. 0 _____
 Page 1

EXECUTION AND TEST APPROVAL

EXECUTED BY

Test Director/Organization _____ Date _____ Test Operator/Organization _____ Date _____

Recorder/Organization _____ Date _____

WITNESSES*

Witness/Organization _____ Date _____ Witness/Organization _____ Date _____

Witness/Organization _____ Date _____ Witness/Organization _____ Date _____

A-E Approval

Kaiser Engineers Hanford Company

 Without
 exceptions _____

 With exceptions
 resolved _____

 With exceptions
 outstanding _____

Design Engineer _____ Date _____

Project Manager _____ Date _____

TEST APPROVAL AND ACCEPTANCE*

(Operating Contractor)

 Without
 exceptions _____

 With exceptions
 resolved _____

 With exceptions
 outstanding _____

(Title or Department) _____ Date _____ (Title or Department) _____ Date _____

* NOTE TO ATP ORIGINATOR: KEH will establish project specific signatory titles or organizations during approval review.

APPENDIX A - GUIDE ATP

ACCEPTANCE TEST PROCEDURE * REV 0 DATE _____

TEST TITLE
_____LOCATION *
_____PROJECT NUMBER *
_____PROJECT TITLE *
_____Prepared By
(Company Name)

For _____

Contract _____

PROCEDURE APPROVAL

Originator _____ Date _____

Checker _____ Date _____

Project Manager _____ Date _____

***NOTE TO ATP ORIGINATOR: Enter project specific**

HANFORD W.R.A.P.

Building Control Systems

Acceptance Test Procedure

Submittal

March 20, 1996

HANFORD W.R.A.P.

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HANFORD W.R.A.P.

PURPOSE

The purpose of the test and checkout is to witness and verify that the Andover HVAC system will perform the documented sequences as specified. This test will prove that all sensors, wire, hardware, controllers, and programming are working together properly.

HANFORD W.R.A.P.

PREREQUISITES AND EQUIPMENT REQUIRED

1. The Andover DDC system will have to be completely installed, wired and powered up.
2. All systems that are subject to testing will have to be completely installed, wired, powered up and checked out by the unit manufacturers representative.
3. All duct systems included in systems will have to be completely installed and sealed.
4. The following tools will be required:
 - Handheld digital multi-meter.
 - Laptop computer
 - Screwdrivers
 - Andover panel keys

HANFORD W.R.A.P.

SAFETY PRECAUTIONS

1. All standard safety guidelines will be followed at all times.
2. If there is any possibility that equipment will be damaged during testing, the testing will be stopped immediately.
3. If the differential pressure between the PROCESS AREA and the PROCESS HVAC AREA rises above 1"WC, the testing will be stopped immediately.

HANFORD W.R.A.P.

SECTION 1SHIPPING-RECEIVING AND NDE/ND A AREAS

1.0 AIR HANDLING SYSTEM 203-AH-11-101:

1.1 AH-11-101 will normally operate in accordance with the "OCCUPIED-UNOCCUPIED" schedule programmed into the Andover system.

1.2.0 Control points between HVAC DCS and the PCS for AH-11-101 will be verified on tables 1A, 1B and 1C. These points allow the Andover control system to enunciate alarm conditions and systems variables such as supply air temperature and fan failures to the PCS. These points also allow the PCS to send commands to the Andover control system such as system start/stop signals and temperature set points. The Hardwired control points to the PCS are to enunciate air handling unit controller failures such as loss of controller power or a controller hardware malfunction.

1.2.1 AH-11-101 HVAC DCS-PCS control points complete.

Verified by: *[Signature]*

Date: *4/26/96*

PERFORMED BY: *Matthew P. Hoy*

1.3.0 OCCUPIED CYCLE:

1.3.1 Upon receiving a start signal supply Fan 203-SF-11-101 will start.

Verified by: *[Signature]*

Date: *4/17/96*

PERFORMED BY: *Matthew P. Hoy*

1.3.2 Upon receiving a stop signal supply Fan 203-SF-11-101 will stop.

Verified by: *[Signature]*

Date: *4/17/96*

PERFORMED BY: *Matthew P. Hoy*

Safety shutdown access door to 203-SF-11-101 not installed properly functioning.
Warning lights inside 203-AH-11-101 not functioning.
The supply fan will be restarted.

1.3.3 Supply air flow will be proven by PDISL-623.

PDISL-623 not calibrated.

Verified by: *[Signature]*

Date: *4/19/96*

PERFORMED BY: *Matthew P. Hoy*

1.3.4 Supply Fan 203-SF-11-101 will be manually turned off and an alarm will be sent to the Andover control system. The Return Fan 203-RF-11-101 will not operate if Supply Fan 203-SF-11-101 is not running.

Verified by: *[Signature]*

Date: *4-22-96*

PERFORMED BY: *Matthew P. Hoy*

Clayton 4/22/96

HANFORD W.R.A.P.

Supply Fan 203-SF-11-101 and the Supply Fan 203-SF-11-101 alarm points will be restored to normal operation. The test will continue with Supply Fan 203-SF-11-101 running and air flow proven by PDISL-623.

1.3.5 Return Fan 203-RF-11-101 will start.

Verified by: PD 1326

Date: 4/19/96

PERFORMED BY Matthew Hays 4-19-96

1.3.6 Return air flow will be proven by PDISL-624.

PDISL-624 not calibrated. Manometer employed to confirm PDISL-624 (Buyer with 1227, SN 351C).

Verified by: PD 1326

Date: 4/19/96

PERFORMED BY Matthew Hays 4-19-96

1.3.7 Return Fan 203-RF-11-101 will be manually turned off and an alarm will be sent to the Andover control system.

Verified by: Matthew Hays

Date: 4-22-96

Return Fan 203-RF-11-101 and the Return Fan 203-RF-11-101 alarm points will be restored to normal operation. The test will continue with Return Fan 203-RF-11-101 running and air flow proven by PDISL-624.

1.3.8 Air solenoid valves TEV-628 and TEV-629 will energize enabling the economizer dampers.

Verified by: Matthew Hays

Date: 4-22-96

1.3.9 The outside air damper and the return air damper will be positioned to the minimum outside air setting by TX-628.

Verified by: Matthew Hays

Date: 4-22-96

1.3.10 The relief air damper, controlled by TX-629, will remain closed when the unit is operating on minimum outside air setting to provide a positive pressurization of the spaces served.

Verified by: Matthew Hays

Date: 4-22-96

1.3.11 The NDE/ND A space temperature will be sensed by room temperature sensor TE-627 and will be maintained at a minimum of 72°F in winter and 78°F in summer.

Verified by: Matthew Hays

Date: 4-22-96

1.3.12 If the space temperature TE-627 is above setpoint and the outside air temperature is below 70°F then the outside air damper and relief air damper will modulate open and the return air damper will modulate closed.

Verified by: Matthew Hays

Date: 4-22-96

1.3.13 The temperature sensor TE-621 located in the mixed air plenum will limit the mixed air temperature from dropping below 67°F until the minimum outside air setting results in a lower mixed air temperature.

Verified by: Matthew Hays

Date: 4-22-96

Deloye L. J. 4/22/96

HANFORD W.R.A.P.

1.3.14 If the space temperature TE-627 is above setpoint and the outside air temperature is above 70°F the outside air damper and the return air damper will return to the minimum outside air setting and the relief air damper will close. The chilled water coil valve TV-630 controlled by TY-630 will modulate open to maintain the space temperature setpoint.

Verified by: Matthew H. Hooper Date: 4-22-96

1.3.15 If the space temperature TE-627 falls below setpoint the outside air damper and the return air damper will return to the minimum outside air setting and the relief air damper will close. The electric heating coils will be energized in six stages.

Verified by: Matthew H. Hooper Date: 4-22-96

1.3.16 Temperature sensor TE-626 located in the supply air duct will limit the supply air temperature from exceeding 80°F.

Verified by: Matthew H. Hooper Date: 4-22-96

1.3.17 If differential pressure switch PDISH-621 indicates a pressure differential greater than 0.6"WC across the pre-filter an alarm will be sent to the Andover control system.

Verified by: Matthew H. Hooper Date: 4-22-96

1.3.18 If differential pressure switch PDISH-622 indicates a pressure differential greater than 1.0"WC across the final-filter an alarm will be sent to the Andover control system.

Verified by: Matthew H. Hooper Date: 4-22-96

1.4.0 UNOCCUPIED CYCLE:

1.4.1 During unoccupied cycle the system will be shut down.

Verified by: Matthew H. Hooper Date: 4-22-96

1.4.2 If the space temperature sensor TE-627 falls to 60°F the system will start. The outside air damper and the relief air damper will close and the return air damper will open. The heating coils will energize.

Verified by: Matthew H. Hooper Date: 4-22-96

1.4.4 When the space temperature sensor TE-627 reaches 68°F the system will shut down.

Verified by: Matthew H. Hooper Date: 4-22-96

Keyl Ingle 4/22/96

1.5.0 FIRE ALARM SHUT DOWN:

If the smoke detector (provided, Installed and wired by others) in the supply air duct is activated a signal will be sent to the central fire alarm panel (provided, Installed and wired by others) causing the supply and return air fans to shut down (interlock wiring by others).

HANFORD W.R.A.P.

1.6.0 ELECTRIC UNIT HEATERS:

Electric unit heaters are provided to offset heat losses at overhead doors in the shipping and receiving and truck loading areas. A separate thermostat for each heater will cycle the fan and energize the heating element on at 68°F.

1.6.1 101-EH-11-101A

Verified by: Matthew J. Hendon Date: 4-23-96

1.6.2 101-EH-11-101B

Verified by: Matthew J. Hendon Date: 4-23-96

1.6.3 100-EH-11-101C

Verified by: Matthew J. Hendon Date: 4-23-96

1.6.4 100-EH-11-101D

Verified by: Matthew J. Hendon Date: 4-23-96

1.7 EXHAUST FAN 100-EF-11-101:

A roof mounted exhaust fan above the truck loading area to clear truck exhaust fumes will be controlled by a wall mounted hand switch. Either of the two overhead doors in this area must be open before 100-EF-11-101 can run to prevent severe disruption of space pressure.

Verified by: Matthew J. Hendon Date: 4-23-96

Burton Hoover 4/23/96

1.8 AIR HANDLING SYSTEM 203-AH-11-101

COMPLETE SYSTEM CHECKOUT

Verified by: [Signature] Date: 10/06/96

HANFORD W.R.A.P.

SECTION 2ADMINISTRATION AREA:

2.0 AIR HANDLING SYSTEM 203-AH-11-401:

2.1 Air handler 203-AH-11-401 will normally operate in accordance with the "OCCUPIED-UNOCCUPIED" schedule programmed into the Andover system. 203-AH-11-401 is a variable air volume system with heating coils in the terminal units for each zone.

2.2.0 Control points between HVAC DCS and the PCS for AH-11-401 will be verified on tables 2A, 2B and 2C. These points allow the Andover control system to enunciate alarm conditions and systems variables such as supply air temperature and fan failures to the PCS. These points also allow the PCS to send commands to the Andover control system such as system start/stop signals and temperature set points. The Hardwired control points to the PCS are to enunciate air handling unit controller failures such as loss of controller power or a controller hardware malfunction.

2.2.1 AH-11-401 HVAC DCS-PCS control points complete.

EXCEPTION #4

Verified by: Matthew J. Harper Date: 26 Sept '96

2.3.0 OCCUPIED CYCLE:

2.3.1 Upon receiving a start signal the supply fan 203-SF-11-401 will start.

Verified by: Matthew J. Harper Date: 4-23-96

2.3.2 Upon receiving a stop signal the supply fan 203-SF-11-401 will stop.

Verified by: Matthew J. Harper Date: 4-23-96

The supply fan will be restarted.

2.3.3 The supply fan inlet vanes, controlled by TY-649, will open to the minimum CFM position of 5225 CFM as indicated by the flow monitoring station in the supply duct FE-643.

Verified by: Matthew J. Harper Date: 4-23-96

2.3.4 Supply air flow will be proven by PDISL-643.

Verified by: Matthew J. Harper Date: 4-23-96

HANFORD W.R.A.P.

2.3.5 Supply Fan 203-SF-11-401 will be manually turned off and an alarm will be sent to the Andover control system. The Return Fan 203-RF-11-401 will not operate if Supply Fan 203-SF-11-401 is not running.

Verified by: Matthew T. Harper Date: 4-23-96

Supply Fan 203-SF-11-401 and the Supply Fan 203-SF-11-401 alarm points will be restored to normal operation. The test will continue with Supply Fan 203-SF-11-401 running and air flow proven by PDISL-643.

2.3.6 The outside air damper and the return air damper will return to the minimum outside air setting and the relief air damper will remain closed.

Verified by: Matthew T. Harper Date: 4-23-96

2.3.7 When supply air flow is proven as indicated by the flow monitoring station FE-643, the return fan, 203-RF-11-401, will start.

Verified by: Matthew T. Harper Date: 4-23-96

2.3.8 The return fan inlet vanes, controlled by TY-640, will open to the minimum CFM position of 3305 CFM as indicated by the flow monitoring station FE-642.

Verified by: Matthew T. Harper Date: 4-23-96

2.3.9 Return air flow will be proven by PDISL-642: ^{MTM} 644

Verified by: Matthew T. Harper Date: 4-23-96

2.3.10 Return Fan 203-RF-11-401 will be manually turned off and an alarm will be sent to the Andover control system.

Verified by: Matthew T. Harper Date: 4-23-96

Return Fan 203-RF-11-401 and the Return Fan 203-RF-11-401 alarm points will be restored to normal operation. The test will continue with Return Fan 203-RF-11-401 running and air flow proven by PDISL-643

2.3.11 Supply air CFM measured by FE-643 and return air CFM measured by FE-642 will maintain a constant differential of 1920 CFM from a minimum supply air flow of 5225 CFM to a maximum supply air CFM of 11,735 CFM to offset exhaust and provide positive space pressurization.

Verified by: Matthew T. Harper Date: 4-23-96

2.3.12 If the outside air temperature as indicated by TE-641 is below 60°F then the temperature sensor TE-642 located in the mixed air plenum will maintain 55°F by modulating the mixed air dampers.

Verified by: Matthew T. Harper Date: 4-23-96

Ernie Hoover 4/23/96

HANFORD W.R.A.P.

2.3.13 If the outside air temperature is above 60°F the outside air damper and the return air damper will return to the minimum outside air setting and the relief damper will close. The supply air temperature sensor TE-645 will maintain 55°F supply air by modulating the cooling coil control valve TV-648, controlled by TY-648.

Verified by: Matthew Hoyer Date: 4-23-96

2.3.14 The supply air duct will be maintained at a constant Static pressure of 1.5"WC at the duct mounted differential pressure sensor PDT-645, the Andover system will reset the supply fan inlet vanes as the system CFM demand varies.

Verified by: Matthew Hoyer Date: 4-24-96

2.3.15 If differential pressure switch PDISH-641 indicates a pressure differential greater than 0.6"WC across the pre-filter an alarm will be sent to the Andover control system.

Verified by: Matthew Hoyer Date: 4-24-96

2.3.16 If differential pressure switch PDISH-642 indicates a pressure differential greater than 1.0"WC across the final-filter an alarm will be sent to the Andover control system.

Verified by: Matthew Hoyer Date: 4-24-96

Justin Hooser 9/29/96

HANFORD W.R.A.P.

2.4.0 VAV BOXES:

2.4.1 Individual zone temperatures will be monitored by zone sensors, and maintained at 78°F in summer and 72°F in winter.

2.4.1.0 151-VA-11-401: Sample Management and Corridor

2.4.1.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew Hoyer Date: 4-24-96

2.4.1.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew Hoyer Date: 4-24-96

2.4.1.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 1 stage.

Verified by: Matthew Hoyer Date: 4-24-96

2.4.1.4 151-VA-11-401 Complete.

Verified by: Matthew Hoyer Date: 4-24-96
Barbara Koonen 9/29/96

2.4.2.0 139-VA-11-402: Equipment Maintenance

2.4.2.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew Hoyer Date: 4-24-96

2.4.2.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew Hoyer Date: 4-24-96

2.4.2.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 2 stages.

Verified by: Matthew Hoyer Date: 4-24-96

2.4.2.4 139-VA-11-402 Complete.

Verified by: Matthew Hoyer Date: 4-24-96
Barbara Koonen 9/29/96

HANFORD W.R.A.P.

2.4.3.0 119-VA-11-403: Telecom Room

2.4.3.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.3.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew T. Harper Date: 4-23-96

2.4.3.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 1 stage. 24

Verified by: Matthew T. Harper Date: 4-23-96

2.4.3.4 119-VA-11-403 Complete. 24

Verified by: Matthew T. Harper Date: 4-23-96
Clinton Hoover 4/24/96

2.4.4.0 118-VA-11-404: Corridor

2.4.4.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.4.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.4.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 2 stages.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.4.4 118-VA-11-404 Complete.

Verified by: Matthew T. Harper Date: 4-24-96
Clinton Hoover 4/29/96

HANFORD W.R.A.P.

2.4.5.0 118-VA-11-405: Mechanical Equipment

2.4.5.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.5.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.5.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 1 stage.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.5.4 118-VA-11-405 Complete.

Verified by: Matthew T. Harper Date: 4-24-96
Bruce Hoover 4/24/96

2.4.6.0 115-VA-11-406: UPS Room

2.4.6.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.6.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.6.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 2 stages.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.6.4 115-VA-11-406 Complete.

Verified by: Matthew T. Harper Date: 4-24-96
Bruce Hoover 4/24/96

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2.4.7.0 116-VA-11-407: Electrical Room

2.4.7.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.7.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.7.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 2 stages.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.7.4 116-VA-11-407 Complete.

Verified by: Matthew J. Harper Date: 4-24-96
Barth Hoone 4/24/96

2.4.8.0 152-VA-11-408: Material Preparations Area

2.4.8.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.8.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.8.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 1 stage.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.8.4 152-VA-11-408 Complete.

Verified by: Matthew J. Harper Date: 4-24-96
Barth Hoone 4/24/96

HANFORD W.R.A.P.

2.4.9.0 102-VA-11-409: Shipping and Receiving Office

2.4.9.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.9.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.9.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 1 stage.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.9.4 102-VA-11-409 Complete.

Verified by: Matthew T. Harper Date: 4-24-96
Bruce Noor 9/24/96

2.4.10.0 130-VA-11-410: Corridor

2.4.10.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.10.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.10.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 3 stages.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.10.4 130-VA-11-410 Complete.

Verified by: Matthew T. Harper Date: 4-24-96
Bruce Noor 9/24/96

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2.4.11.0 129-VA-11-411: Lunch Room

2.4.11.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.11.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.11.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 3 stages.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.11.4 129-VA-11-411 Complete.

Verified by: Matthew J. Harper Date: 4-24-96
Butler Hoover 4/29/96

2.4.12.0 128-VA-11-412: Conference Room

2.4.12.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.12.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.12.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 3 stages.

Verified by: Matthew J. Harper Date: 4-24-96

2.4.12.4 128-VA-11-412 Complete.

Verified by: Matthew J. Harper Date: 4-24-96
Butler Hoover 4/24/96

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2.4.13.0 126-VA-11-413: Operations Manager RCD, MGT and Storage

2.4.13.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.13.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.13.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 3 stages.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.13.4 126-VA-11-413 Complete.

Verified by: Matthew T. Harper Date: 4-24-96
Garth Hooser 4/24/96

2.4.14.0 120-VA-11-414: RPT

2.4.14.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.14.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.14.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 1 stage.

Verified by: Matthew T. Harper Date: 4-24-96

2.4.14.4 120-VA-11-414 Complete.

Verified by: Matthew T. Harper Date: 4-24-96
Garth Hooser 4/24/96

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2.4.15.0 125-VA-11-415: Sec and Rec/Waiting Area

2.4.15.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew J. Henner Date: 4-24-96

2.4.15.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew J. Henner Date: 4-24-96

2.4.15.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 3 stages.

Verified by: Matthew J. Henner Date: 4-24-96

2.4.15.4 125-VA-11-415 Complete.

Verified by: Matthew J. Henner Date: 4-24-96

Ernie Kroon 4/29/96

2.4.16.0 203-VA-11-416: HVAC Equipment Room

2.4.16.1 If the room temperature rises above setpoint the volume of air supplied will increase.

Verified by: Matthew J. Henner Date: 4-24-96

2.4.16.2 If the room temperature drops below setpoint the volume of air supplied will decrease.

Verified by: Matthew J. Henner Date: 4-24-96

2.4.16.3 If the room temperature continues to drop after the VAV supply air has reached minimum CFM, electric heating coil will energize in 1 stage.

Verified by: Matthew J. Henner Date: 4-24-96

2.4.16.4 203-VA-11-416 Complete.

Verified by: Matthew J. Henner Date: 4-24-96

Ernie Kroon 4/29/96

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2.5.0 UNOCCUPIED CYCLE:

2.5.1 During the unoccupied cycle the system will shut down

Verified by: Matthew Harper Date: 4-24-96

2.5.2 If the temperature sensor in the Operations Manager's office (TE-646K) falls to 60°F, the supply fan 203-SF-11-401 will start, then the return fan 203-RF-11-401 will start.

Verified by: Matthew Harper Date: 4-24-96

2.5.3 The outside air damper and relief air damper will remain closed and the return air damper will remain open.

Verified by: Matthew Harper Date: 4-24-96

2.5.4 The exhaust fans will remain off.

Verified by: Matthew Harper Date: 4-24-96

2.5.5 The return air CFM will equal the supply air CFM.

Verified by: Matthew Harper Date: 4-24-96
Lucretia Hoone 4/24/96

2.6.0 EXHAUST FANS:

2.6.1 Toilet exhaust fan, 203-EF-11-401 will be interlocked to run when 203-RF-11-401 is operating during the occupied cycle.

Verified by: Matthew Harper Date: 4-24-96

2.6.2 Material prep room exhaust fan, 152-EF-11-402 will operate from a manual wall switch only if 203-RF-11-401 is running.

Verified by: _____ Date: _____

2.7 FIRE ALARM SHUT DOWN:

If the smoke detector (provided, Installed and wired by others) in the supply air duct is activated a signal will be sent to the central fire alarm panel (provided, Installed and wired by others) causing the supply, return and exhaust air fans to shut down (interlock wiring by others).

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2.8.0 ELECTRIC UNIT HEATERS:

Each electric unit heater will be cycled from a wall mounted thermostat.

2.8.1 152-EH-11-401

Verified by: Matthew Harper Date: 4-24-96

2.8.2 203-EH-11-402A

Verified by: Matthew Harper Date: 4-24-96

2.8.3 203-AH-11-402B

Verified by: Matthew Harper Date: 4-24-96

2.8.4 203-AH-11-402C

Verified by: Matthew Harper Date: 4-24-96

Burt Hoover 4/24/96

2.9 AIR HANDLING SYSTEM 203-AH-11-401

COMPLETE SYSTEM CHECKOUT

Verified by: [Signature] Date: 10 Oct '96

HANFORD W.R.A.P.

SECTION 3ADMINISTRATION AREA (LOCKER ROOMS)

3.0 AIR HANDLING SYSTEM 203-AH-11-301 / EXHAUST FAN 203-RF-11-301:

3.1 This system will normally operate in accordance with the "OCCUPIED-UNOCCUPIED" schedule programmed into the Andover Control System. The system used 100% outside air to ventilate the locker room area.

3.2.0 Control points between HVAC DCS and the PCS for AH-11-301 will be verified on tables 3A, 3B and 3C. These points allow the Andover control system to enunciate alarm conditions and systems variables such as supply air temperature and fan failures to the PCS. These points also allow the PCS to send commands to the Andover control system such as system start/stop signals and temperature set points. The Hardwired control points to the PCS are to enunciate air handling unit controller failures such as loss of controller power or a controller hardware malfunction.

3.2.1 AH-11-401 HVAC DCS-PCS control points complete.

Verified by: Matthew H. Hays Date: 4-23-96 EXCEPTION #6
Edgar 20 Sept '96

3.3.0 OCCUPIED CYCLE

3.3.1 Upon receiving a start signal, FEV-661 will enable the outside air damper and the exhaust air damper to open fully.

Verified by: Matthew H. Hays Date: 4-23-96

3.3.2 The supply fan 203-SF-11-301 will start and airflow will be proven by PDISL-663.

Verified by: Matthew H. Hays Date: 4-23-96

3.3.3 Upon receiving a stop signal, FEV-661 will disable and close fully the outside air damper and the exhaust air damper.

Verified by: Matthew H. Hays Date: 4-23-96

3.3.4 The supply fan 203-SF-11-301 will stop.

Verified by: Matthew H. Hays Date: 4-23-96

Emilio Hooser 4/23/96

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The supply fan will be restarted.

3.3.5 Supply Fan 203-SF-11-301 will be manually turned off and an alarm will be sent to the Andover control system. The Exhaust Fan 203-EF-11-301 will not operate if Supply Fan 203-SF-11-301 is not running.

Verified by: Matthew Harper Date: 4-23-96

Supply Fan 203-SF-11-301 and the Supply Fan 203-SF-11-301 alarm points will be restored to normal operation. The test will continue with Supply Fan 203-SF-11-301 running and air flow proven by PDISH-663.

3.3.6 The exhaust fan 203-EF-11-301 will start.

Verified by: Matthew Harper Date: 4-23-96

3.3.7 The locker room temperature sensor TE-668 will maintain a minimum of 72°F in winter and 78°F in summer.

Verified by: Matthew Harper Date: 4-23-96

3.3.8 If the room temperature sensor TE-668 is above setpoint the chilled glycol coil control valve TV-666, controlled by TY-666, will modulate open to maintain the room setpoint.

Verified by: Matthew Harper Date: 4-23-96

3.3.9 The supply air sensor TE-665 will limit the supply air temperature from dropping below 60°F.

Verified by: Matthew Harper Date: 4-23-96

* 3.3.10 If the room temperature sensor TE-668 is below setpoint and the cooling control valve TV-666 is fully closed, the electric heating coil will be energized in eight stages.

Verified by: _____ Date: _____

3.3.11 The supply air sensor TE-665 will limit the supply air temperature from rising above 80°F.

Verified by: Matthew Harper Date: 4-23-96

3.3.12 If differential pressure switch PDISH-661 indicates a pressure differential greater than 0.6"WC across the pre-filter an alarm will be sent to the Andover control system.

Verified by: Matthew Harper Date: 4-23-96

3.3.13 If differential pressure switch PDISH-662 indicates a pressure differential greater than 1.0"WC across the final-filter an alarm will be sent to the Andover control system.

Verified by: Matthew Harper Date: 4-23-96
Locker Room 4/23/96

* AUX DOCT HEATER (STAGES 7 & 8) WILL NOT FUNCTION.

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3.4.0 UNOCCUPIED CYCLE:

3.4.1 During the unoccupied cycle the system will be shut down.

Verified by: Matthew H. Brown Date: 4-23-96

3.4.2 If the room temperature sensor TE-668 falls to 60°F the fans will start and the heating coil will be energized.

Verified by: Matthew H. Brown Date: 4-23-96

3.4.3 When the space temperature reaches 68°F the system will shut down.

Verified by: Matthew H. Brown Date: 4-23-96
Smith-Rosen 4/23/96

3.5 FIRE ALARM SHUT DOWN:

If the smoke detector (provided, Installed and wired by others) in the supply air duct is activated a signal will be sent to the central fire alarm panel (provided, Installed and wired by others) causing the supply and exhaust air fans to shut down (interlock wiring by others).

3.6 AIR HANDLING SYSTEM 203-AH-11-301

COMPLETE SYSTEM CHECKOUT

Verified by: _____ Date: _____

HANFORD W.R.A.P.

SECTION 4

COMPUTER AND CONTROL ROOMS

4.0 AIR HANDLING SYSTEM 203-AH-11-501A AND B:

4.1.0 Control points between HVAC DCS and the PCS for AH-11-501A & B will be verified on tables 4A, 4B and 4C. These points allow the Andover control system to enunciate alarm conditions and systems variables such as supply air temperature and fan failures to the PCS. These points also allow the PCS to send commands to the Andover control system such as system start/stop signals and temperature set points. The Hardwired control points to the PCS are to enunciate air handling unit controller failures such as loss of controller power or a controller hardware malfunction.

4.1.1 AH-11-501A & B HVAC DCS-PCS control points complete.

Verified by: [Signature] Date: 14 Oct '96

4.2 Redundant air handlers arranged for active/standby operation serve the computer and control rooms. The active unit will operate 24 hours per day. The Andover system will alternate the active/standby status of the units every seven days.

Verified by: [Signature] Date: 4-24-96

4.3 AIR HANDLING SYSTEM 203-AH-11-501A: As the active unit, 203-AH-11-501B as the standby unit.

4.3.1 Upon receiving a start signal TEV-638A will enable and open fully the isolation dampers 203-DP-11-501A and 203-DP-11-502A.

Verified by: [Signature] Date: 4-24-96

4.3.2 Supply fan 203-SF-11-501A ~~will start~~ will be proven by PDISL-633A

Verified by: [Signature] Date: 4-24-96

4.3.3 Upon receiving a stop signal TEV-638A will disable and close fully the isolation dampers 203-DP-11-501A and 203-DP-11-502A.

Verified by: [Signature] Date: 4-24-96

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4.3.4 Supply fan 203-SF-11-501A will stop.

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 9/29/96

The supply fan will be restarted.

4.3.5 Supply Fan 203-SF-11-501A will be manually turned off and an alarm will be sent to the Andover control system.

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 9/29/96

Supply Fan 203-SF-11-501A and the Supply Fan 203-SF-11-501A alarm points will be restored to normal operation. The test will continue with Supply Fan 203-SF-11-501A running and air flow proven by PDISL-663A.

4.3.6 The outside air damper and the return air damper will travel to the minimum outside air setting and the relief damper will remain closed.

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 9/29/96

4.3.7 The room temperature sensor TE-632A will maintain 72°F.

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 9/29/96

4.3.8 ^{*}If the outside air temperature is below 60°F, a rise in room temperature sensor TE-632A, above setpoint will cause the outside air damper and the relief air damper to modulate open and the return air damper to modulate closed. The outside air damper and return air damper are modulated by TY-633A and the relief air damper by TY-632A. PER ECN

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 9/24/96

4.3.9 If the outside air temperature is above 60°F the outside air and return air dampers will return to a minimum outside air setting and the relief air damper will close, a rise in room temperature sensor TE-632A above setpoint will cause the chilled glycol cooling coil valve TV-638A, controlled by TY-638A, to modulate open to maintain room temperature setpoint.

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 9/24/96

4.3.10 The supply air sensor TE-637A will limit the supply air from dropping below 55°F.

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 4/29/96

4.3.11 If room temperature sensor TE-632A drops below room temperature setpoint, the outside air and return air dampers will return to a minimum outside air setting and the relief air damper will close. The electric heating coil will energize in three stages.

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 9/24/96

4.3.12 The supply air sensor TE-637A will limit the supply air from rising above 80°F.

Verified by: Matthew J. Harper Date: 4-24-96 butler Room 9/24/96

* IF THE OUTSIDE AIR TEMPERATURE IS BELOW 60°F, A RISE IN ROOM TEMPERATURE SENSOR TE-632A, ABOVE, IN ROOM TEMPERATURE SENSOR TE-632A, ABOVE SETPOINT WILL CAUSE THE OUTSIDE AIR DAMPER AND RETURN AIR DAMPER TO MODULATE TO OUTSIDE AIR. THE RELIEF DAMPER WILL OPEN FULLY. THE OUTSIDE AIR DAMPER AND RETURN AIR DAMPER ARE CONTROLLED BY TY-633A. THE RELIEF AIR DAMPER IS CONTROLLED BY TY-632A, WITH

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4.3.13 Room humidity sensor ME-632A will maintain a minimum of 30% RH by sequencing a two stage humidifier located in the supply air duct with a 4-20ma control signal.

Verified by: _____ Date: _____

4.3.14 If differential pressure switch PDISH-631A indicates a pressure differential greater than 0.6"WC across the pre-filter an alarm will be sent to the Andover control system.

Verified by: Matthew J. Harper Date: 4-24-96 Butler Hoover 4/29/96

4.3.15 If differential pressure switch PDISH-632A indicates a pressure differential greater than 1.0"WC across the final-filter an alarm will be sent to the Andover control system.

Verified by: Matthew J. Harper Date: 4-24-96 Butler Hoover 4/29/96

4.3.16 Upon a loss of airflow in 203-AH-11-501A or failure to maintain the room temperature setpoint the Andover system will shut down 203-AH-11-501A, set 203-AH-11-501B as the active unit and provide an alarm signal to the PCS.

Verified by: Matthew J. Harper Date: 4-24-96 Butler Hoover 4/29/96

4.3.17 FIRE ALARM SHUT DOWN:

If the smoke detector (provided, Installed and wired by others) in the supply air duct is activated a signal will be sent to the central fire alarm panel (provided, Installed and wired by others) causing the supply fan to shut down (interlock wiring by others).

4.3.18 AIR HANDLING SYSTEM 203-AH-11-501A

COMPLETE SYSTEM CHECKOUT

Verified by: _____ Date: _____

HANFORD W.R.A.P.

4.4.0 AIR HANDLING SYSTEM 203-AH-11-501B: As active unit, 203-AH-11-501A as standby unit.

4.4.1 Upon receiving a start signal TEV-638B will enable and open fully the isolation dampers 203-DP-11-501B and 203-DP-11-502B.

Verified by: Matthew J. Harper Date: 4-24-96 Butler Hoover 4/24/96

4.4.2 Supply fan 203-SF-11-501B will start and will be proven by PDISL-633B

Verified by: Matthew J. Harper Date: 4-24-96 Butler Hoover 4/24/96

4.4.3 Upon receiving a stop signal TEV-638B will disable and close fully the isolation dampers 203-DP-11-501B and 203-DP-11-502B.

Verified by: Matthew J. Harper Date: 4-24-96 Butler Hoover 4/24/96

4.4.4 Supply fan 203-SF-11-501B will stop.

Verified by: Matthew J. Harper Date: 4-24-96 Butler Hoover 4/24/96

The supply fan will be restarted.

4.4.5 Supply Fan 203-SF-11-501B will be manually turned off and an alarm will be sent to the Andover control system.

Verified by: Matthew J. Harper Date: 4-24-96 Butler Hoover 4/24/96

Supply Fan 203-SF-11-501B and the Supply Fan 203-SF-11-501B alarm points will be restored to normal operation. The test will continue with Supply Fan 203-SF-11-501B running and air flow proven by PDISL-663A.

4.4.6 The outside air damper and the return air damper will travel to the minimum outside air setting and the relief damper will remain closed.

Verified by: Matthew J. Harper Date: 4-25-96 Butler Hoover 4/25/96

4.4.7 The room temperature sensor TE-632B will maintain 72°F.

Verified by: Matthew J. Harper Date: 4-25-96 Butler Hoover 4/25/96

* 4.4.8 If the outside air temperature is below 60°F, a rise in room temperature sensor TE-632B PER ECM above setpoint will cause the outside air damper and the relief air damper to modulate open and the return air damper to modulate closed. The outside air damper and return air damper are modulated by TY-633B and the relief air damper by TY-632B. MTH

Verified by: Matthew J. Harper Date: 4-25-96 Butler Hoover 4/25/96

* IF THE OUTSIDE AIR TEMPERATURE IS BELOW 60°F, A RISE IN ROOM TEMPERATURE SENSOR, TE-632B, ABOVE SETPOINT WILL CAUSE THE OUTSIDE AIR DAMPER AND RETURN AIR DAMPER TO MODULATE TO THE OUTSIDE AIR POSITION. THE RELIEF DAMPER WILL OPEN FULLY. THE OUTSIDE AIR DAMPER AND RETURN AIR DAMPER ARE CONTROLLED BY TY-633^{A, T, B}. THE RELIEF AIR DAMPER IS CONTROLLED BY TY-632^{A, T, B} TEV-632B

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4.4.9 If the outside air temperature is above 60°F the outside air and return air dampers will return to a minimum outside air setting and the relief air damper will close, a rise in room temperature sensor TE-632B above setpoint will cause the chilled glycol cooling coil valve TV-638B, controlled by TY-638B, to modulate open to maintain room temperature setpoint.

Verified by: Matthew J. Harper Date: 4-25-96 Butch Hoorn 4/25/96

4.4.10 The supply air sensor TE-637B will limit the supply air from dropping below 55°F.

Verified by: Matthew J. Harper Date: 4-25-96 Butch Hoorn 4/25/96

4.4.11 If room temperature sensor TE-632B drops below room temperature setpoint, the outside air and return air dampers will return to a minimum outside air setting and the relief air damper will close. The electric heating coil will energize in three stages.

Verified by: Matthew J. Harper Date: 4-25-96 Butch Hoorn 4/25/96

4.4.12 The supply air sensor TE-637B will limit the supply air from rising above 80°F.

Verified by: Matthew J. Harper Date: 4-25-96 Butch Hoorn 4/25/96

4.4.13 Room humidity sensor ME-632B will maintain a minimum of 30% RH by sequencing a two stage humidifier located in the supply air duct with a 4-20ma control signal.

Verified by: _____ Date: _____

4.4.14 If differential pressure switch PDISH-631B indicates a pressure differential greater than 0.6"WC across the pre-filter an alarm will be sent to the Andover control system.

Verified by: Matthew J. Harper Date: 4-25-96 Butch Hoorn 4/25/96

4.4.15 If differential pressure switch PDISH-632B indicates a pressure differential greater than 1.0"WC across the final-filter an alarm will be sent to the Andover control system.

Verified by: Matthew J. Harper Date: 4-25-96 Butch Hoorn 4/25/96

4.4.16 Upon a loss of airflow in 203-AH-11-501B or failure to maintain the room temperature setpoint the Andover system will shut down 203-AH-11-501B, set 203-AH-11-501A as the active unit and provide an alarm signal to the PCS.

Verified by: Matthew J. Harper Date: 4-24-96 Butch Hoorn 4/25/96

4.4.17 FIRE ALARM SHUT DOWN:

If the smoke detector (provided, Installed and wired by others) in the supply air duct is activated a signal will be sent to the central fire alarm panel (provided, Installed and wired by others) causing the supply fan to shut down (interlock wiring by others).

4.4.18 AIR HANDLING SYSTEM 203-AH-11-501B

COMPLETE SYSTEM CHECKOUT

Verified by: [Signature] Date: 26 SEPT 96

HANFORD W.R.A.P.

SECTION 5

PROCESS AREA HVAC SYSTEMS:

5.0 Redundant exhaust fans and air handling units arranged for active/standby operation are provided for the process area. In no case will redundant units be connected to the same HVAC controller. Changeover from the active/standby status will require operator input to the Plant Control System (PCS) or direct to the Andover Control System except in the case of a failure of the active unit which will result in an automatic switchover by the Andover Control System to the standby unit, shutdown of the failed unit and an alarm set by the Andover Control System shall be reported to the PCS.

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SECTION 9CHILLED GLYCOL SYSTEM:

9.0 The chilled glycol system consists of two air-cooled reciprocating chillers 118-CH-11-101A and 118-CH-11-101B piped in parallel with a dedicated circulation pumps 118-P-11-102A and 118-P-11-102B, respectively per chiller. The chiller circulation pumps are piped in a secondary circuit to the primary chilled glycol distribution circuit which has redundant pumps 118-P-11-101A and 118-P-11-101B in a active/standby arrangement.

9.1.0 Control points between HVAC DCS and the PCS for CH-11-101A & B will be verified on tables 9A, 9B and 9C. These points allow the Andover control system to enunciate alarm conditions and systems variables such as supply air temperature and fan failures to the PCS. These points also allow the PCS to send commands to the Andover control system such as system start/stop signals and temperature set points. The Hardwired control points to the PCS are to enunciate air handling unit controller failures such as loss of controller power or a controller hardware malfunction. *EXCEPTION #5*

9.1.1 The Andover Control System will automatically alternate lead/lag status of the chillers and chiller circulation pumps every seven days.

Verified by: Matthew Harper Date: 4-26-96
Butler Hoover 4/26/96

9.2.0 CHILLER 118-CH-11-101A and PUMPS 118-P-11-101A and 118-P-11-102A as the active system.

9.2.1 When the outside air temperature reaches 58°F the Andover Control System will start 118-P-11-101A.

Verified by: Matthew Harper Date: 4-26-96 Butler Hoover 4/26/96

9.2.2 When the flow switch FS-654 in the primary distribution circuit proves circulation, circulation pump 118-P-11-102A will start.

Verified by: Matthew Harper Date: 4-26-96 Butler Hoover 4/26/96

9.2.3 The Andover Control System will enable chiller 118-CH-11-101A, when the chiller's factory furnished operating and safety controls are enabled, the chiller will start.

Verified by: Matthew Harper Date: 4-26-96 Butler Hoover 4/26/96

9.2.4 Chiller 118-CH-11-101A will maintain 44°F leaving chilled glycol by loading/unloading cylinders and sequencing compressors on and off. This is not a Function of the Andover control System and is internal to chiller 118-CH-11-101A.

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9.2.5 When the cooling load rises above the capacity of a single chiller and the flow switch FS-653 in the primary-secondary bridge leg detects a flow of approximately 30 GPM recirculation in the primary distribution circuit, the Andover Control System will activate the 118-CH-11-101B system.

Verified by: Matthew Harper Date: 4-26-95 ^{96 MTH} Burt Hoover 4/26/96

9.2.6 The chilled glycol system will operate with both chillers on-line until the load decreases to approximately 80% of the capacity of a single chiller. This condition occurs when the venturi/pressure transducer FE-652 senses approximately 180 GPM recirculation in the secondary circuit. At this time the chiller 118-CH-11-101B will shut down.

Verified by: Matthew Harper Date: 4-26-95 ^{96 MTH} Burt Hoover 4/26/96

9.2.7 The chiller 118-CH-11-101A system will continue to operate until the outside air temperature drops to 55°F.

Verified by: Matthew Harper Date: 4-26-95 ^{96 MTH} Burt Hoover 4/26/96

9.2.8 Chiller 118-CH-11-101A system complete.

Verified by: Matthew Harper Date: 4-26-95 ^{MTH} Burt Hoover 4/26/96

HANFORD W.R.A.P.

9.3.0 CHILLER 118-CH-11-101B and PUMPS 118-P-11-101B and 118-P-11-102B as the active system.

9.3.1 When the outside air temperature reaches 58°F the Andover Control System will start 118-P-11-101B.

Verified by: Matthew Harper Date: 4-26-96 Burt Hoover 4/26/96

9.3.2 When the flow switch FS-654 in the primary distribution circuit proves circulation, circulation pump 118-P-11-102B will start.

Verified by: Matthew Harper Date: 4-26-96 Burt Hoover 4/26/96

9.3.3 The Andover Control System will enable chiller 118-CH-11-101B, when the chiller's factory furnished operating and safety controls are enabled, the chiller will start.

Verified by: Matthew Harper Date: 4-26-96 Burt Hoover 4/26/96

9.3.4 Chiller 118-CH-11-101B will maintain 44°F leaving chilled glycol by loading/unloading cylinders and sequencing compressors on and off. This is not a Function of the Andover control System and is internal to chiller 118-CH-11-101B.

9.3.5 When the cooling load rises above the capacity of a single chiller and the flow switch FS-653 in the primary-secondary bridge leg detects a flow of approximately 30 GPM recirculation in the primary distribution circuit, the Andover Control System will activate the 118-CH-11-101A system.

Verified by: Matthew Harper Date: 4-26-96 Burt Hoover 4/26/96

9.3.6 The chilled glycol system will operate with both chillers on-line until the load decreases to approximately 80% of the capacity of a single chiller. This condition occurs when the venturi/pressure transducer FE-652 senses approximately 180 GPM recirculation in the secondary circuit. At this time the chiller 118-CH-11-101A will shut down.

Verified by: Matthew Harper Date: 4-26-96 Burt Hoover 4/26/96

9.3.7 The chiller 118-CH-11-101B system will continue to operate until the outside air temperature drops to 55°F.

Verified by: Matthew Harper Date: 4-26-96
Burt Hoover 4/26/96

9.3.8 Chiller 118-CH-11-101B system complete.

Verified by: Matthew Harper Date: 4-26-96
Burt Hoover 4/26/96
[Signature] 14 Oct '96

TABLES

<u>HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS</u>	<u>PAGE</u>
SHIPPING/RECEIVING AND NDE/NDA HVAC.....	1A, 1B, 1C
ADMINISTRATION AREA.....	2A, 2B, 2C
ADMINISTRATION (LOCKER ROOMS).....	3A, 3B, 3C
COMPUTER AND CONTROL ROOM HVAC.....	4A, 4B, 4C
PROCESS ZONE I (GLOVEBOX)	6A, 6B, 6C
PROCESS ZONE II (PROCESS AREA)	7A, 7B, 7C
PROCESS AREA SUPPLY AIR	8A, 8B, 8C
CHILLED GLYCOL	9A, 9B, 9C

TABLE SYMBOL AND TYPE KEY:

SYMBOL	TYPE
A	ANALOG 4-20 MA SIGNAL
B	BINARY BIT
DI	DISCRETE 3 AMP, 120 VAC DRY CONTACT INPUT TO PCS
V	INTEGER VALUE

NDE-NDA

1A

SHIPPING/RECEIVING AND NDE/NDA HVAC
HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 1A	HVAC DCS TO PCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-PDISL-624	RETURN FAN NOT RUNNING OR FAILED, RF-11-101	B	YES *
11-TI-621	MIXED AIR TEMPERATURE, AH-11-101	V	YES
11-PDISH-621	PRE-FILTER DIRTY, AH-11-101	B	YES
11-PDISH-622	FINAL FILTER DIRTY, AH-11-101	B	YES
11-PDISL-623	SUPPLY FAN NOT RUNNING OR FAILED, SF-11-101	B	YES *
11-TI-626	SUPPLY AIR TEMPERATURE, AH-11-101	V	YES
11-TI-627	NDE/NDA AREA TEMPERATURE, AH-11-101	V	YES
SF-11-101/S	SHIPPING/RECEIVING AND NDE/NDA SUPPLY FAN RUNNING, SF-11-101	B	YES
RF-11-101/S	SHIPPING/RECEIVING AND NDE/NDA RETURN FAN RUNNING, RF-11-101	B	YES
11-TI-627/SPS	NDE/NDA AREA CURRENT TEMPERATURE SET POINT, AH-11-101	V	YES

See EXCEPTION #1 STEP 1.2.1.

HVAC DCS TO PCS POINTS (TABLE 1A) COMPLETE

VERIFIED BY

DATE 26 Sep 96

NDE-NDA

1B

SHIPPING/RECEIVING AND NDE/NDA HVAC
HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 1B	PCS TO HVAC DCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
AH-11-101/ST	AHU START PULSE, AH-11-101	B	YES
AH-11-101/SP	AHU STOP PULSE, AH-11-101	B	YES
AH-11-101/OC	OPERATOR OVER-RIDE TO OCCUPIED CYCLE, AH-11-101	B	YES
AH-11-101/UC	OPERATOR OVER-RIDE TO UNOCCUPIED CYCLE, AH-11-101	B	YES
11-TI-627/SP	NDE/NDA TEMPERATURE SET POINT, AH-11-101	V	YES
11-TI-627/EN	ENABLE TEMPERATURE SET POINT PULSE, AH-11-101	B	YES

* SEE EXCEPTION[#] 2 REPORT FOR
STEP 1.2.1.

PCS TO HVAC DCS POINTS (TABLE 1B) COMPLETE

VERIFIED BY

DATE 26 Sept '96

NDE-NDA

1C

SHIPPING/RECEIVING AND NDE/NDA HVAC
HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 1C	POINTS HARDWIRED TO PCS		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-XA-821	SHIPPING/RECEIVING AND NDE/NDA AHU CONTROLLER, C-11-101 TROUBLE ALARM	DI	No *

See EXCEPTION #3 REPORT FOR STEP 1.2.1

POINTS HARDWIRED TO PCS (TABLE 1C) COMPLETE	
VERIFIED BY <i>[Signature]</i>	DATE <i>20 Sept '96</i>

ADMINISTRATION

2A

ADMINISTRATION AREA

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 2A	HVAC DCS TO PCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-PDISL-644	RETURN FAN NOT RUNNING OR FAILED, RF-11-401	B	YES
11-TI-641	OUTSIDE AIR TEMPERATURE, AH-11-401	V	YES
11-TI-642	MIXED AIR TEMPERATURE, AH-11-401	V	YES
11-PDISH-641	PRE-FILTER DIRTY, AH-11-401	B	YES
11-PDISH-642	FINAL FILTER DIRTY, AH-11-401	B	YES
11-PDISL-643	SUPPLY FAN NOT RUNNING OR FAILED, AH-11-401	B	YES
11-TI-645	SUPPLY AIR TEMPERATURE, AH-11-401	V	YES
11-FI-643	SUPPLY AIR FLOW, AH-11-401	V	YES
11-PDI-645	SUPPLY AIR PRESSURE, AH-11-401	V	YES
11-FI-642	RETURN AIR FLOW, RF-11-401	V	YES
SF-11-401/S	ADMINISTRATION AREA SUPPLY FAN, SF-11-401 RUNNING	B	YES
RF-11-401/S	ADMINISTRATION AREA RETURN FAN, RF-11-401 RUNNING	B	YES

HVAC DCS TO PCS POINTS (TABLE 2A) COMPLETE

VERIFIED BY

DATE 20 Sept '96

ADMINISTRATION

2B

ADMINISTRATION AREA

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 2B	PCS TO HVAC DCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
AH-11-401/ST	AHU START PULSE, AH-11-401	B	YES
AH-11-401/SP	AHU STOP PULSE, AH-11-401	B	YES
AH-11-401/OC	OPERATOR OVER-RIDE TO OCCUPIED CYCLE, AH-11-401	B	YES *
AH-11-401/UC	OPERATOR OVER-RIDE TO UNOCCUPIED CYCLE, AH-11-401	B	YES *

SEE EXCEPTION # 4 STEP 2.2.1

PCS TO HVAC DCS POINTS (TABLE 2B) COMPLETE

VERIFIED BY

DATE 20 Sept '96

ADMINISTRATION

2C

ADMINISTRATION AREA

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 2C	POINTS HARDWIRED TO PCS		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-XA-641	ADMINISTRATION AREA CONTROLLER, C-11-401 TROUBLE ALARM	DI	Yes

POINTS HARDWIRED TO PCS (TABLE 2C) COMPLETE

VERIFIED BY

DATE 26 Sept '96

LOCKER ROOMS

3A

ADMINISTRATION (LOCKER ROOMS)

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 3A	HVAC DCS TO PCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-TI-665	SUPPLY AIR TEMPERATURE, AH-11-301	V	YES
11-PDISH-661	PRE-FILTER DIRTY, AH-11-301	B	YES
11-PDISH-662	FINAL FILTER DIRTY, AH-11-301	B	YES
11-PDISL-663	SUPPLY FAN NOT RUNNING OR FAILED, SF-11-301	B	YES
11-TI-668	LOCKER ROOM AREA TEMPERATURE, AH-11-301	V	YES
11-TI-668/SPS	CURRENT LOCKER ROOM AREA TEMPERATURE SET POINT, AH-11-301	V	YES
EF-11-301/S	EXHAUST FAN RUNNING	B	YES
AH-11-301/S	ADMINISTRATION LOCKER ROOM AREA AHU RUNNING	B	YES

HVAC DCS TO PCS POINTS (TABLE 3A) COMPLETE

VERIFIED BY

DATE

26 Sept '96

LOCKER ROOMS

3B

ADMINISTRATION (LOCKER ROOMS)

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 3B	PCS TO HVAC DCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
AH-11-301/ST	AHU START PULSE, AH-11-301	B	YES
AH-11-301/SP	AHU STOP PULSE, AH-11-301	B	YES
AH-11-301/OC	OPERATOR OVER-RIDE TO OCCUPIED CYCLE, AH-11-301	B	
AH-11-301/UC	OPERATOR OVER-RIDE TO UNOCCUPIED CYCLE, AH-11-301	B	
11-TI-668/SP	LOCKER ROOM AREA TEMPERATURE SET POINT, AH-11-301	V	YES

See EXCEPTION #6, STEP 3.2.1.

PCS TO HVAC DCS POINTS (TABLE 3B) COMPLETE

VERIFIED BY

DATE *26 Sept 96*

LOCKER ROOMS

3C

ADMINISTRATION (LOCKER ROOMS)

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 3C	POINTS HARDWIRED TO PCS		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-XA-661	ADMINISTRATION AREA LOCKER ROOMS AHU CONTROLLER, C-11-301 TROUBLE ALARM	DI	YES

POINTS HARDWIRED TO PCS (TABLE 3C) COMPLETE

VERIFIED BY DATE 26 Sept '96

COMPUTER ROOM

4A

COMPUTER AND CONTROL ROOM HVAC

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 4A	HVAC DCS TO PCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-PDISL-633A	SUPPLY FAN NOT RUNNING OR FAILED, SF-11-501A	B	YES
11-TI-635A	MIXED AIR TEMPERATURE, AH-11-501A	V	YES
11-PDISH-631A	PRE-FILTER DIRTY, AH-11-501A	B	YES
11-PDISH-632A	FINAL FILTER DIRTY, AH-11-501A	B	YES
11-TI-637A	SUPPLY AIR TEMPERATURE, AH-11-501A	V	YES
11-MI-632A	CONTROL ROOM HUMIDITY, AH-11-501A	V	YES
11-MI-632A/SPS	CURRENT CONTROL ROOM HUMIDITY SET POINT, AH-11-501A	V	YES
11-TI-632A	CONTROL ROOM TEMPERATURE, AH-11-501A	V	YES
11-TI-632A/SPS	CURRENT CONTROL ROOM TEMPERATURE SET POINT, AH-11-501A	V	YES
SF-11-501A/S	SUPPLY FAN, SF-11-501A RUNNING	B	YES
11-PDISL-633B	SUPPLY FAN NOT RUNNING OR FAILED, SF-11-501B	B	YES
11-TI-635B	MIXED AIR TEMPERATURE, AH-11-501B	V	YES
11-PDISH-631B	PRE-FILTER DIRTY, AH-11-501B	B	YES
11-PDISH-632B	FINAL FILTER DIRTY, AH-11-501B	B	YES
11-TI-637B	SUPPLY AIR TEMPERATURE, AH-11-501B	V	YES
11-MI-632B	CONTROL ROOM HUMIDITY, AH-11-501B	V	YES
11-MI-632B/SPS	CURRENT CONTROL ROOM HUMIDITY SET POINT, AH-11-501B	V	YES
11-TI-632B	CONTROL ROOM TEMPERATURE, AH-11-501B	V	YES
11-TI-632B/SPS	CURRENT CONTROL ROOM TEMPERATURE SET POINT, AH-11-501B	V	YES
SF-11-501B/S	SUPPLY FAN, SF-11-501B RUNNING	B	YES

HVAC DCS TO PCS POINTS (TABLE 4A) COMPLETE

VERIFIED BY

DATE

9 Oct '96

COMPUTER ROOM

4B

COMPUTER AND CONTROL ROOM HVAC

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 4B	PCS TO HVAC DCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
AH-11-501A/ST	AHU START PULSE, AH-11-501A	B	YES
AH-11-501A/SP	AHU STOP PULSE, AH-11-501A	B	YES
11-TI-632A/SP	CONTROL ROOM TEMPERATURE SET POINT, AH-11-501A	V	YES
11-TI-632A/EN	ENABLE TEMPERATURE SET POINT PULSE, AH-11-501A	B	YES
11-MI-632A/SP	CONTROL ROOM HUMIDITY SET POINT, AH-11-501A	V	YES
11-MI-632A/EN	ENABLE HUMIDITY SET POINT PULSE, AH-11-501A	B	YES
AH-11-501B/ST	AHU START PULSE, AH-11-501B	B	YES
AH-11-501B/SP	AHU STOP PULSE, AH-11-501B	B	YES
11-TI-632B/SP	CONTROL ROOM TEMPERATURE SET POINT, AH-11-501B	V	YES
11-TI-632B/EN	ENABLE TEMPERATURE SET POINT PULSE, AH-11-501B	B	YES
11-MI-632B/SP	CONTROL ROOM HUMIDITY SET POINT, AH-11-501B	V	YES
11-MI-632B/EN	ENABLE HUMIDITY SET POINT PULSE, AH-11-501B	B	YES

PCS TO HVAC DCS POINTS (TABLE 4B) COMPLETE

VERIFIED BY

DATE 14 DEC '96

COMPUTER ROOM

4C

COMPUTER AND CONTROL ROOM HVAC
HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 4C	POINTS HARDWIRED TO PCS		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-XA-631A	COMPUTER AND CONTROL ROOM AHU A, CONTROLLER C-11-501A TROUBLE ALARM	DI	YES
11-XA-631B	COMPUTER AND CONTROL ROOM AHU B, CONTROLLER C-11-501B TROUBLE ALARM	DI	YES

POINTS HARDWIRED TO PCS (TABLE 4C) COMPLETE

VERIFIED BY

DATE

14 Oct '96

PROCESS ZONE I

6A

PROCESS ZONE I (GLOVEBOX)

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 6A	HVAC DCS TO PCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-PDI-392	LLW RESTRICTED WASTE GLOVEBOX DIFFERENTIAL PRESSURE.	V	
11-PDI-372	TRU RESTRICTED WASTE GLOVEBOX DIFFERENTIAL PRESSURE	V	
11-PDI-317	LLW GLOVEBOX DIFFERENTIAL PRESSURE	V	
11-PDI-315	TRU GLOVEBOX DIFFERENTIAL PRESSURE	V	
11-FI-391	LLW RESTRICTED WASTE GLOVEBOX AIRFLOW	V	
11-FI-371	TRU RESTRICTED WASTE GLOVEBOX AIRFLOW	V	
11-FI-316	LLW GLOVEBOX AIRFLOW	V	
11-FI-314	TRU GLOVEBOX AIRFLOW	V	
11-PDI-611A	EXHAUST FILTER - TRAIN A DIFFERENTIAL PRESSURE, FT-11-201A	V	
11-PDISH-611A	PRE-FILTER DIRTY - TRAIN A, FT-11-201A	B	
11-PDISH-613A	FIRST HEPA FILTER DIRTY - TRAIN A, FT-11-201A	B	
11-PDISH-615A	SECOND HEPA FILTER DIRTY - TRAIN A, FT-11-201A	B	
11-PDISL-617A	EXHAUST FAN NOT RUNNING OR FAILED - TRAIN A, EF-11-201A	B	
11-FI-617A	EXHAUST FLOW - TRAIN A, EF-11-201A	V	
11-FI-617A/SPS	CURRENT EXHAUST FLOW SET POINT - TRAIN A, EF-11-201A	V	
EF-11-201A/S	EXHAUST FAN, EF-11-201A RUNNING	B	
11-PDI-611B	EXHAUST FILTER - TRAIN B DIFFERENTIAL PRESSURE, FT-11-201B	V	
11-PDISH-611B	PRE-FILTER DIRTY - TRAIN B, FT-11-201B	B	
11-PDISH-613B	FIRST HEPA FILTER DIRTY - TRAIN B, FT-11-201B	B	
11-PDISH-615B	SECOND HEPA FILTER DIRTY - TRAIN B, FT-11-201B	B	
11-PDISL-617B	EXHAUST FAN NOT RUNNING OR FAILED - TRAIN B, EF-11-201B	B	
11-FI-617B	EXHAUST FLOW - TRAIN B, EF-11-201B	V	
11-FI-617B/SPS	CURRENT EXHAUST FLOW SET POINT - TRAIN B, EF-11-201B	V	
EF-11-201B/S	EXHAUST FAN, EF-11-201B RUNNING	B	

HVAC DCS TO PCS POINTS (TABLE 6A) COMPLETE

VERIFIED BY _____ DATE _____

PROCESS ZONE I**6B****PROCESS ZONE I (GLOVEBOX)****HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS**

TABLE 6B	PCS TO HVAC DCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
FT-11-201A/ST	EXHAUST FILTER TRAIN A START PULSE, EF-11-201A	B	
FT-11-201A/SP	EXHAUST FILTER TRAIN A STOP PULSE, EF-11-201A	B	
11-FI-617A/SP	EXHAUST FLOW SET POINT - TRAIN A, EF-11-201A	V	
11-FI-617A/EN	ENABLE EXHAUST FLOW SET POINT PULSE - TRAIN A, EF-11-201A	B	
FT-11-201B/ST	EXHAUST FILTER TRAIN B START PULSE, EF-11-201B	B	
FT-11-201B/SP	EXHAUST FILTER TRAIN B STOP PULSE, EF-11-201B	B	
11-FI-617B/SP	EXHAUST FLOW SET POINT - TRAIN B, EF-11-201B	V	
11-FI-617B/EN	ENABLE EXHAUST FLOW SET POINT PULSE - TRAIN B, EF-11-201B	B	

PCS TO HVAC DCS POINTS (TABLE 6B) COMPLETE

VERIFIED BY _____ DATE _____

PROCESS ZONE I

6C

PROCESS ZONE I (GLOVEBOX)

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 6C	POINTS HARDWIRED TO PCS		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-XA-611A	EXHAUST FILTER TRAIN CONTROLLER C-11-201A TROUBLE ALARM	DI	
11-XA-611B	EXHAUST FILTER TRAIN CONTROLLER C-11-201B TROUBLE ALARM	DI	

POINTS HARDWIRED TO PCS (TABLE 6C) COMPLETE

VERIFIED BY _____ DATE _____

PROCESS ZONE II

7A

PROCESS ZONE II (PROCESS AREA)

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 7A	HVAC DCS TO PCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-PDISH-612A	PRE-FILTER DIRTY, FILTER TRAIN A, FT-11-202A	B	
11-PDISH-614A	FIRST HEPA FILTER DIRTY, FILTER TRAIN A, FT-11-202A	B	
11-PDISH-616A	SECOND HEPA FILTER DIRTY, FILTER TRAIN A, FT-11-202A	B	
11-TI-618A	EXHAUST AIR TEMPERATURE, FILTER TRAIN A, FT-11-202A	V	
11-PDISL-618A	EXHAUST FAN NOT RUNNING OR FAILED, EF-11-202A	B	
11-FI-618A	EXHAUST AIR FLOW, EF-11-202A	V	
11-FI-618A/SPS	CURRENT EXHAUST AIR FLOW SET POINT, EF-11-202A	V	
FT-11-202A/S	EXHAUST FAN RUNNING, EF-11-202A	B	
11-PDISH-612B	PRE-FILTER DIRTY, FILTER TRAIN B, FT-11-202B	B	
11-PDISH-614B	FIRST HEPA FILTER DIRTY, FILTER TRAIN B, FT-11-202B	B	
11-PDISH-616B	SECOND HEPA FILTER DIRTY, FILTER TRAIN B, FT-11-202B	B	
11-TI-618B	EXHAUST AIR TEMPERATURE, FILTER TRAIN B, FT-11-202B	V	
11-PDISL-618B	EXHAUST FAN NOT RUNNING OR FAILED, EF-11-202B	B	
11-FI-618B	EXHAUST AIR FLOW, EF-11-202B	V	
11-FI-618B/SPS	CURRENT EXHAUST AIR FLOW SET POINT, EF-11-202B	V	
FT-11-202B/S	EXHAUST FAN RUNNING, EF-11-202B	B	
11-ZSO-608	ZONE II EXHAUST FIRE DAMPER OPEN	B	
11-ZSC-608	ZONE II EXHAUST FIRE DAMPER CLOSED	B	

HVAC DCS TO PCS POINTS (TABLE 7A) COMPLETE

VERIFIED BY _____ DATE _____

PROCESS ZONE II**7B****PROCESS ZONE II (PROCESS AREA)****HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS**

TABLE 7B	PCS TO HVAC DCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
FT-11-202A/ST	EXHAUST FILTER TRAIN A START PULSE, FT-11-202A	B	
FT-11-202A/SP	EXHAUST FILTER TRAIN A STOP PULSE, FT-11-202A	B	
11-FI-618A/SP	EXHAUST AIR FLOW SET POINT, EF-11-202A	B	
11-FI-618A/EN	ENABLE EXHAUST AIR FLOW SET POINT PULSE, EF-11-202A	B	
FT-11-202B/ST	EXHAUST FILTER TRAIN B START PULSE, FT-11-202B	B	
FT-11-202B/SP	EXHAUST FILTER TRAIN B STOP PULSE, FT-11-202B	B	
11-FI-618B/SP	EXHAUST AIR FLOW SET POINT, EF-11-202B	B	
11-FI-618B/EN	ENABLE EXHAUST AIR FLOW SET POINT PULSE, EF-11-202B	B	

PCS TO HVAC DCS POINTS (TABLE 7B) COMPLETE

VERIFIED BY _____ DATE _____

PROCESS ZONE II**7C****PROCESS ZONE II (PROCESS AREA)****HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS**

TABLE 7C	POINTS HARDWIRED TO PCS		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-PDIT-601	NON-CONFINEMENT / ZONE II PROCESS HVAC DIFFERENTIAL PRESSURE	A	
11-PDIT-602	NON-CONFINEMENT / ZONE II PROCESS DIFFERENTIAL PRESSURE	A	
11-PDIT-603	ZONE II PROCESS HVAC / ZONE II PROCESS DIFFERENTIAL PRESSURE		
11-PDIT-606	NON-CONFINEMENT / ATMOSPHERE DIFFERENTIAL PRESSURE	A	
11-PDIT-607	ATMOSPHERE / ZONE II PROCESS DIFFERENTIAL PRESSURE	A	
11-XA-612A	EXHAUST FILTER TRAIN CONTROLLER, C-11-202A TROUBLE ALARM	DI	
11-XA-612B	EXHAUST FILTER TRAIN CONTROLLER, C-11-202B TROUBLE ALARM	DI	

POINTS HARDWIRED TO PCS (TABLE 7C) COMPLETE**VERIFIED BY** _____ **DATE** _____

PROCESS SUPPLY AIR

8A

PROCESS AREA SUPPLY AIR

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 8A	HVAC DCS TO PCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-PDISH-601A	PRE-FILTER DIRTY, AH-11-201A	B	
11-PDISH-602A	FINAL FILTER DIRTY, AH-11-201A	B	
11-TI-601A	OUTSIDE AIR TEMPERATURE, AH-11-201A	V	
11-TI-605A	SUPPLY AIR TEMPERATURE, AH-11-201A	V	
11-PDISL-603A	SUPPLY FAN NOT RUNNING OR FAILED, SF-11-201A	B	
11-FI-603A	SUPPLY AIR FLOW, AH-11-201A	V	
11-FI-603A/SPS	CURRENT SUPPLY AIR FLOW SET POINT, AH-11-201A	V	
11-TI-609A	PROCESS AREA TEMPERATURE, AH-11-201A	V	
11-TI-609A/SPS	CURRENT PROCESS AREA TEMPERATURE SET POINT, AH-11-201A	V	
AH-11-201A/S	PROCESS AREA AHU, AH-11-201A, RUNNING	B	
11-PDISH-601B	PRE-FILTER DIRTY, AH-11-201B	B	
11-PDISH-602B	FINAL FILTER DIRTY, AH-11-201B	B	
11-TI-601B	OUTSIDE AIR TEMPERATURE, AH-11-201B	V	
11-TI-605B	SUPPLY AIR TEMPERATURE, AH-11-201B	V	
11-PDISL-603B	SUPPLY FAN NOT RUNNING OR FAILED, SF-11-201B	B	
11-FI-603B	SUPPLY AIR FLOW, AH-11-201B	V	
11-FI-603B/SPS	CURRENT SUPPLY AIR FLOW SET POINT, AH-11-201B	V	
11-TI-609B	PROCESS AREA TEMPERATURE, AH-11-201B	V	
11-TI-609B/SPS	CURRENT PROCESS AREA TEMPERATURE SET POINT, AH-11-201B	V	
AH-11-201B/S	PROCESS AREA AHU, AH-11-201B, RUNNING	B	

HVAC DCS TO PCS POINTS (TABLE 8A) COMPLETE

VERIFIED BY _____ DATE _____

PROCESS SUPPLY AIR**8B****PROCESS AREA SUPPLY AIR****HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS**

TABLE 8B	PCS TO HVAC DCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
AH-11-201A/ST	PROCESS AREA AHU START PULSE, AH-11-201A	B	
AH-11-201A/SP	PROCESS AREA AHU STOP PULSE, AH-11-201A	B	
11-FI-603A/SP	SUPPLY AIR FLOW SET POINT, AH-11-201A	V	
11-FI-603A/EN	ENABLE SUPPLY AIR FLOW SET POINT PULSE, AH-11-201A	B	
11-TI-609A/SP	PROCESS AREA TEMPERATURE SET POINT, AH-11-201A	V	
11-TI-609A/EN	ENABLE TEMPERATURE SET POINT PULSE, AH-11-201A	B	
AH-11-201B/ST	PROCESS AREA AHU START PULSE, AH-11-201B	B	
AH-11-201B/SP	PROCESS AREA AHU STOP PULSE, AH-11-201B	B	
11-FI-603B/SP	SUPPLY AIR FLOW SET POINT, AH-11-201B	V	
11-FI-603B/EN	ENABLE SUPPLY AIR FLOW SET POINT PULSE, AH-11-201B	B	
11-TI-609B/SP	PROCESS AREA TEMPERATURE SET POINT, AH-11-201B	V	
11-TI-609B/EN	ENABLE TEMPERATURE SET POINT PULSE, AH-11-201B	B	

PCS TO HVAC DCS POINTS (TABLE 8B) COMPLETE**VERIFIED BY** _____ **DATE** _____

PROCESS SUPPLY AIR**8C****PROCESS AREA SUPPLY AIR****HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS**

TABLE 8C	POINTS HARDWIRED TO PCS		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-XA-601A	PROCESS AREA AHU CONTROLLER, C-11-201A, TROUBLE ALARM	DI	
11-XA-601B	PROCESS AREA AHU CONTROLLER, C-11-201B, TROUBLE ALARM	DI	
11-ZSO-604	COMMON SUPPLY AIR DAMPER OPEN	DI	
11-ZSC-604	COMMON SUPPLY AIR DAMPER CLOSED	DI	

POINTS HARDWIRED TO PCS (TABLE 8C) COMPLETE

VERIFIED BY _____ DATE _____

CHILLERS

9A

CHILLED GLYCOL

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 9A	HVAC DCS TO PCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-FI-652	CHILLED GLYCOL PRIMARY-SECONDARY BRIDGE FLOW	V	YES
P-11-101A/S	CHILLED GLYCOL DISTRIBUTION PUMP P-11-101A RUNNING	B	YES
P-11-101B/S	CHILLED GLYCOL DISTRIBUTION PUMP P-11-101B RUNNING	B	YES
P-11-102A/S	CHILLER CIRCULATION PUMP P-11-102A RUNNING	B	YES
P-11-102B/S	CHILLER CIRCULATION PUMP P-11-102B RUNNING	B	YES

HVAC DCS TO PCS POINTS (TABLE 9A) COMPLETE

VERIFIED BY

DATE

14 Oct '96

CHILLERS

9B

CHILLED GLYCOL

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 9B	PCS TO HVAC DCS VIA COMMUNICATION LINK		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
P-11-101A/ST	CHILLED GLYCOL DISTRIBUTION PUMP P-11-101A START PULSE	B	YES
P-11-101A/SP	CHILLED GLYCOL DISTRIBUTION PUMP P-11-101A STOP PULSE	B	YES
P-11-101B/ST	CHILLED GLYCOL DISTRIBUTION PUMP P-11-101B START PULSE	B	YES
P-11-101B/SP	CHILLED GLYCOL DISTRIBUTION PUMP P-11-101B STOP PULSE	B	YES
P-11-102A/ST	CHILLER CIRCULATION PUMP P-11-102A START PULSE	B	YES
P-11-102A/SP	CHILLER CIRCULATION PUMP P-11-102A STOP PULSE	B	YES
P-11-102B/ST	CHILLER CIRCULATION PUMP P-11-102B START PULSE	B	YES
P-11-102B/SP	CHILLER CIRCULATION PUMP P-11-102B STOP PULSE	B	YES

SEE EXCEPTION #5, STEP 9.1.0.

PCS TO HVAC DCS POINTS (TABLE 9B) COMPLETE

VERIFIED BY

DATE 14 Dec '96

CHILLERS

9C

CHILLED GLYCOL

HVAC SYSTEM/PLANT CONTROL SYSTEM INTERFACE SIGNALS

TABLE 9C	POINTS HARDWIRED TO PCS		VERIFY
TAG	DESCRIPTION	TYPE	YES/NO
11-XA-651	CHILLED GLYCOL SYSTEM CONTROLLER, C-11-101 TROUBLE ALARM	DI	YES
11-TIT-652	CHILLED GLYCOL TEMPERATURE	A	YES

POINTS HARDWIRED TO PCS (TABLE 9C) COMPLETE

VERIFIED BY

DATE

14 Oct '96