18 STA. 2
JUN 2 2 1999

ENGINEERING DATA TRANSMITTAL

Page 1 of _____

1. EDT 625893

2. To: (Receiving Organization) FASTER/WESF Project	3. From: (Originating Organization) FASTER/WESF Project	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: B Plant	6. Design Authority/Design Agent/Cog. Engr.: K. S. McDaniel, Cog.Engr.	7. Purchase Order No.: N/A
8. Originator Remarks: Acceptance Test Procedure for Building 271U Remote Monitoring of the Project W-059 B Plant Canyon Exhaust System.		9. Equip./Component No.: 221BK-CP-1
		10. System/Bldg./Facility: W-059/221BK/B Plant
11. Receiver Remarks: The ATP is used to verify proper operation of system monitoring application software which was installed by PLCs Plus at an existing computer workstation in building 271-U. The test will support contract closeout.	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

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	HNF-4730		0	Acceptance Test Procedure	N/A			

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 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed 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
		Design Authority									
		Design Agent									
1,2	1	Cog. Eng. K.S. McDaniel	[signature]	6/21/99							
1,2	1	Cog. Mgr. R.Hernandez	Ray Hernandez	6/22/99							
		QA									
		Safety									
		Env.									

18.	19.	20.	21. DOE APPROVAL (if required)
[signature] K.S. McDaniel — Signature of EDT Originator — Date 6/21/99	[signature] K.S. McDaniel — Authorized Representative for Receiving Organization — Date 6/21/99	R. Hernandez R.Hernandez — Design Authority/ Cognizant Manager — Date 6/22/99	Ctrl No. _____ ◯ Approved ◯ Approved w/comments ◯ Disapproved w/comments

BD-7400-172-2 (10/97)

BD-7400-172-1

S

Acceptance Test Procedure Bldg. 271U Remote Monitoring of Project W-059 B Plant Canyon Exhaust System

K.S. McDaniel
B&W Hanford Company
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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Key Words: Acceptance Test Procedure, B Plant, Canyon Ventilation Control System, CVCS, B Plant Canyon Exhaust System

Abstract: The test procedure provides for verifying indications and alarms associated with the B Plant Canyon Ventilation System as they are being displayed on a remote monitoring workstation located in building 271-U. The system application software was installed by PLCs Plus under contract from B&W Hanford Company. The application software was installed on an existing operator workstation in building 271U which is owned and operated by Bechtel Hanford Inc.

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Release Approval — Date 6/22/99

DATE: JUN 22 1999
STA: 2 HANFORD RELEASE ID: 18

Release Stamp

Approved For Public Release

ACCEPTANCE TEST PROCEDURE
BLDG. 271U REMOTE MONITORING OF PROJECT W-059
B PLANT CANYON EXHAUST SYSTEM

June 17, 1999

HNF–4730, Rev. 0

PREPARED BY: K. S. McDANIEL, FASTER /WESF PROJECT ENGINEERING

APPROVAL:

B Plant HVAC Cognizant Engineer _____ Date 6/21/99
K.S. McDaniel

FASTER/WESF Chief Engineer _____ Date 6/22/99
S. J. Giamberadini

TEST EXECUTION

_____
Test Director/BWHC Date

_____
Test Director/PLCs Plus Date

TEST APPROVAL AND ACCEPTANCE

Without Exceptions _____ With Exceptions Resolved _____ With Exceptions Outstanding _____

_____
B Plant HVAC Cognizant Engineer/BWHC

_____
W-059 Project Engineer/BHI

1.0 SCOPE:

The following test plan provides for verifying indications and alarms associated with the B Plant Canyon Ventilation System as they are being displayed on the new remote monitoring workstation located in building 271-U.

The test will verify that all displayed indications at the Building 271-U Workstation properly respond to changing system conditions. The test will also verify that the displays are consistent with alarms and indications displayed locally at the B Plant Building 221BK Workstation. To input changing system conditions, the redundant Canyon Exhaust Fans and Record Sample Pumps will be started and stopped from the Canyon Ventilation Control System (CVCS) located at the building 221BK Workstation. System conditions will also be varied by manually cycling the fan inlet vanes, changing the valve lineup in the GEMS pump cabinet, and, by testing indications and alarms when instrument functional test buttons are available on local instrument panels.

The Programmable Logic Controller for the CVCS is a Siemans SIMATIC 555 and is located in building 221BK at Control Panel 221BK-CP-1. The configuration software for the PLC is TISOFT2 (TI505), Release 6.2.2 (operating at field revision 1.2). At the building 221BK workstation, the OIU is a XYCOM industrial computer using the Window NT operating system with CITECT, Version 5.01, application software (operating at field revision 1.1). At the building 271-U workstation, the OIU is a SAMSCONS computer using the Window NT operating system with Intellution FIX32, Version 6.15, application software.

2.0 REFERENCES

2.1 Unreviewed Safety Question (USQ) Evaluation, BP-99-079
2.2 Contract No. 2838, Release No. 0, 'PLCs PLUS- Fiber Optic Instrumentation Programming Support'
2.3 Dwg. No: W-059 to 221BK 'Project W-059 Fiber to 221BK Logical and Connectivity'
2.4 HNF-3330, 'B Plant Canyon Ventilation Control System Description'
2.5 HNF-3368, 'B Plant Post-Deactivation Punchlist', Section 5.7.
2.6 BWHC Engineering Procedure FSP-446, 'Testing Requirements'

3.0 ROLES AND RESPONSIBILITIES

PLCs Plus was contracted by B & W Hanford Company to replicate the monitoring features of the B Plant Canyon Ventilation Control System (CVCS) at an existing workstation located in Building 271-U. The building 271-U workstation is operated by the site Environmental Restoration Contractor, Bechtel Hanford Inc. (BHI). Successful completion of the acceptance test will verify proper operation of the new monitoring system and satisfy the contract requirement for PLCs Plus to perform a Factory Acceptance Test. Documentation of the completed test results will be used to support turnover of B Plant to the ERC and satisfy deactivation End Point 13.02.07 "Provide instrumentation/monitoring signal transfer to 271-U".

3.1 BWHC Test Director:

Direct test, and document and disposition 'Exceptions to Test'.

Administer changes to test in accordance with Section 4.0 'NOTES'.

At successful completion of test, sign for Test Execution on attached cover sheet.

Prepare final test documentation including all test data, redline changes, test exception/dispositions, retest, and conclusions.

Document Test Approval and Acceptance on attached coversheet.

Approve and release final test report.

3.2 PLCs Plus:

Participate and assist in test direction and execution.

Perform troubleshooting and repair, as required.

At successful completion of test, sign for Test Execution on attached coversheet.

3.3 BHI:

Participate in review and execution of test activities.

Review final test documentation and sign for Test Approval and Acceptance on attached coversheet.

4 ACCEPTANCE TEST

NOTES

Steps indicated below can be performed out of sequence to facilitate as-found operating configuration of system exhaust fans and record sample pumps.

Redline changes, including additional tests and retest requirements, may be made to this test procedure when authorized by the BWHC Test Director (system engineer) and within the scope the test specific USQ. Any test procedure changes that affect the safety, function, or performance capability of the Canyon Exhaust System, or test procedure changes that may compromise or influence test data must be made by an Engineering Change Notice (ECN).

For test steps which are not satisfactorily completed, the Test Director, will document exception or as-found condition on the attached 'Exceptions to Acceptance Test' form. All test exception is to be dispositioned prior to finalizing test approval and acceptance.

Unless otherwise indicated, steps verifying system indications and alarms are being performed at the 271-U Workstation.

4.1 With Exhaust Fan EF-101 operating,

4.1.1 Verify 221B-EF-101 STATUS indicates "RUNNING".
4.1.2 Verify 221B-EF-102 STATUS indicates "STOPPED".
4.1.3 Record 221B-EF-101 FAN VIBRATION VI-300.
(NOTE: For on-line fan VI-300~ .3 -.38 in/sec).

271U: _____ in/sec.
221BK: _____ in/sec.

4.1.4 Record 221B-EF-102 FAN VIBRATION, VI-301.

(NOTE: For off-line fan VI-301~ .05-.09 in/sec).

271U: _____ in/sec.
221BK: _____ in/sec.

4.1.5 Record 221B-EF-101 FAN BEARING TEMPERATURE TI-300.
(NOTE: For on-line fan TI-300~ 100- 130 deg. F).

271U: _____ deg.F
221BK: _____ deg.F

4.1.6 Record 221B-EF-102 FAN BEARING TEMPERATURE TI-302.
(NOTE: For off-line fan TI-301~ Ambient Temp).

271U: _____ deg.F
221BK: _____ deg.F

4.2 Modulate 221B-EF-101 Inlet Vane until STACK FLOW FI-302 indicates below 7500 scfm, and Low Alarm FAL-302 indicates at the 221BK Workstation.

4.2.1 Record STACK FLOW FI-302.

271U: _____ scfm
221BK: _____ scfm

4.2.2 Verify Low Alarm FAL-302 indicates at the 271-U Workstation.

4.2.3 Record CANYON TO ATMOSPHERE dP PDI-100, and AVERAGE CANYON TO ATMOSPHERE dP PDI-100AV.
(NOTE: For reduced flow condition, PDI-100 ~.05-.1 in H2O).

271U: PDI-100= _____ in.H2O, PDI-100AV= _____ inH2O.
221BK: PDI-100= _____ in H2O, PDI-100AV= _____ in H2O.

4.2.4 Verify Low Alarm PDAL-100 indicates at the 271-U Workstation.

4.3 Modulate 221B-EF-101 Inlet Vane until STACK FLOW FI-302 indicates approximately 17,000 scfm, at building 221BK workstation.

4.3.1 Record STACK FLOW FI-302.

271U: _____ scfm
221BK: _____ scfm

4.3.2 Verify Low Alarm FAL-302 clears at the 271-U Workstation.

4.3.3 Record CANYON TO ATMOSPHERE dP PDI-100, and AVERAGE CANYON TO ATMOSPHERE dP PDI-100AV.
(NOTE: For normal (full) flow condition, PDI-100 ~.35-.40 in H2O).

271U: PDI-100= _____ in.H2O, PDI-100AV= _____ inH2O.
221BK: PDI-100= _____ in H2O, PDI-100AV= _____ in H2O.

4.3.4 Verify Low Alarm PDAL-100 clears at the 271-U Workstation.

4.3.5 Record Filter Bank Differential Pressures, PDI-204 and PDI-200, for ACT-B-001 and ACT-B-002, respectively. (NOTE: For normal (full) flow condition, with present filter loading, PDI-204 &PDI-200 ~1.8 in-H20).

271U: PDI-204= _____ in.H2O, PDI-200= _____ inH2O.
221BK: PDI-204= _____ in H2O, PDI-200= _____ in H2O.

4.4 Shutdown Exhaust Fan 221B-EF-101.

4.4.1 Verify Exhaust Fan 221B-EF-101 STATUS indicates STOPPED.

4.4.2 Verify 221B-EF-101 VIBRATION VI-300, reduces to ~ zero.

4.4.3 Verify Filter Bank Differential Pressures, PDI-204 and PDI-200, for ACT-B-001 and ACT-B-002, respectively, reduce to ~ zero.

4.4.4 Verify CANYON TO ATMOSPHERE dP PDI-100, and AVERAGE CANYON TO ATMOSPHERE dP PDI-100AV, reduce to ~ zero, and that CANYON TO ATMOSPHERE Low Alarm PDAL-100 indicates.

4.4.5 Verify STACK FLOW FI-302, reduces to ~ zero, and that STACK FLOW Low Alarm FAL-302 indicates.

4.5 Start 221B-EF-102 at normal (full) flow.

4.5.1 Verify 221B-EF-102 STATUS indicates RUNNING.

4.5.2 Record 221B-EF-102 FAN VIBRATION VI-301.
(NOTE: For on-line fan VI-301~ .3 -.38 in/sec).

271U: _____ in/sec.
221BK: _____ in/sec.

4.5.3 Record 221B-EF-102 FAN TEMP, TI-301.
(NOTE: When fan is intially started, bearing temp. may increase to 185 deg. F high alarm but will stabilize shortly after startup.)

271U: _____ deg.F.
221BK: _____ deg.F.

4.6 Record CANYON TEMPERATURE, TI-100.

271U: _____ deg.F.
221BK: _____ deg.F.

4.7 Record 221-BK TEMPERATURE, TI-304.

271U: _____ deg.F.
221BK: _____ deg.F.

4.8 In building 221BK, hold the temperature sensing probe for TI-304 and elevate the probe temperature until 221BK TEMP. HIGH ALARM TAH-304 indicates at the 221BK workstation.

4.9 Verify the 221BK TEMP High Alarm TAH-304, indicates at the 271-U workstation.

4.10 Verify Cell 10 High Level Alarms indicate at the 271-U workstation when tested from the functional test buttons at the Cell 10 Liquid Level Ground Circuit Monitor Panel, located on the North Wall inside building 221BK:

4.10.1 Cell 10 High Level Alarm at 80" (LSH4-100) indicates from both the "PROBE TEST 1" button, and the "GROUND TEST 1" button.

4.10.2 Cell 10 High Level Alarm at 60" (LSH3-100) indicates from both the "PROBE TEST 2" button, and the "GROUND TEST 2" button.

4.10.3 Cell 10 High Level Alarm at 40" (LSH2-100) indicates from both the "PROBE TEST 3" button, and the "GROUND TEST 3" button.

4.10.4 Cell 10 High Level Alarm at 20" (LSH1-100) indicates from both the "PROBE TEST 4" button, and the "GROUND TEST 4" button.

4.11 Record ACT-B-001 Radiation Indication RI-201.

271U: _____ mR/hr.
221BK: _____ mR/hr.

4.12 Record ACT-B-002 Radiation Indication RI-200.

271U: _____ mR/hr.
221BK: _____ mR/hr.

NOTE:

In steps 4.13 and 4.14 below, local and remote alarms will not be activated due to internal instrument source check circuitry, which momentarily inhibit alarm indications.

4.13 Verify ACT-B-001 Radiation Indication RI-201 increases at the 271-U workstation when the instrument internal source check is activated in the field by depressing and holding the NORMAL (GREEN) test lamp located at the RIT-201 in Instrument Panel IP-200. Following upscale indication, verify Radiation Indication RI-201 returns to normal value recorded in step 3.11 above.

4.14 Verify ACT-B-002 Radiation Indication RI-200 increases at the 271-U workstation when the instrument internal source check is activated in the field by depressing and holding the NORMAL (GREEN) test lamp located at the RIT-200 in Instrument Panel IP-200. Following upscale indication, verify Radiation Indication RI-200 returns to normal value recorded in step 3.12 above.

4.15 Test GEMS pump indications:

4.15.1 At the 221BK workstation, verify the GEMS Sample System is configured with GEMS Pump #1 operating and GEMS Pump #2 as backup. If required, reconfigure pumps for the required configuration.

4.15.2 Verify GEMS Pump #1 indicates 'RUNNING' and GEMS Pump #2 indicates 'STANDBY'.

4.15.3 Verify Setpoint for GEMS Sample System, Sample Flow Value indicates 2.0 cfm, and that SAMPLE FLOW FI-301 indicates 2.0 scfm.

4.15.4 Record TOTALIZED SAMPLE FLOW FQI-301.

271U: _____ ft^3.
221BK: _____ ft^3.

4.15.5 In GEMS Pump Cabinet 221BK-CP-2B, slowly close Pump #1 Outlet Isolation Valve V1 so that Pump #1 shuts down and Pump #2 automatically starts.

4.15.6 Verify the following indications at the 271-U Workstation:
1) GEMS Pump #1 indicates 'FAILED'.
2) GEMS Pump #2 indicates 'RUNNING'.
3) SAMPLE FLOW FI-301 indicates 2.0 scfm.

4.15.7 In GEMS Pump Cabinet 221BK-CP-2B, reopen Pump #1 Outlet Isolation Valve V1, then slowly close Pump #2 Outlet Isolation Valve V2 so that Pump #2 shuts down.

4.15.8 Verify the following indications on the 271-U Workstation.
1) GEMS Pump #2 indicates 'FAILED'.
2) GEMS Pump #1 indicates 'FAILED'.
3) SAMPLE FLOW FI-301 goes to ~0 scfm.
4) Low Alarm FAL-301 indicates.

4.15.9 Re-Open Pump #2 Outlet Isolation Valve V2.

4.15.10 At the 221BK Workstation, Press 'RESET ALARM' in order to re-set the operation of the sample pumps and, then re-start sample system with GEMS Pump #2 operating and GEMS Pump #1 available as backup.

4.15.11 Verify the following indications on the 271-U Workstation.
1) GEMS Pump #2 indicates 'RUNNING'.
2) GEMS Pump #1 indicates 'STANDBY'.
3) SAMPLE FLOW FI-301 indicates 2.0 scfm.

4.15.12 At building 221BK, clear any system alarms, and reconfigure GEMS Sample System, as required, in order to fully restore sample system normal operation.

4.16 Verify Record Sample System & Operation of Sample System Heat Trace Indication:

NOTE:

The sample line heater indication displays block for off and green for on. The sample line is maintained at 10 degrees F above the stack temperature. If the stack temperature goes above 84 degrees, the heater turns off.

4.16.1 Record STACK TEMPERATURE TI-302:

271U: _____ deg.F
221BK: _____ deg.F.

4.16.2 Record SAMPLE TEMPERATURE TIC-303:

271U: _____ deg.F.
221BK: _____ deg.F.

4.16.3 Verify Sample Line Heater Indication at 271-U is consistent with operational note above.

4.17 In building 221BK, unplug one of the UPS Batteries from the dedicated wall outlet and, verify that the 'UPS ON BATTERY' alarm indicates at building 271-U.

4.18 In building 221BK, plug back in UPS battery and restore UPS Battery System to normal operation.

4.19 Verify 'UPS ON BATTERY' alarm clears.

5.0 RETEST

System Engineer will add test steps, as required, to retest system and resolve any test exceptions.

6.0 CONCLUSIONS & RECOMMENDATIONS

Conclusions /Recommendations will be evaluated at the completion of the test. A final report including test data, test exceptions, retest, and conclusions /recommendations will be issued at completion of the test.

Exceptions to Test

ITEM	STEP	PAGE	DESCRIPTION	DISPOSITION

DISTRIBUTION SHEET

To	From	
Distribution	K. S. McDaniel	Page 1 of 1
Project Title/Work Order		Date 06/21/99
Acceptance Test Procedure for 271U Remote Monitoring of Project W-059 B Plant Canyon Exhaust System		EDT No. 625893
		ECN No. N/A

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
K. S. McDaniel	S6-70	x			
H. A. Plaggee	S3-21	x			
G. M. MarFarlan	S3-21	x			

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