MAR 0 4 1996 (21) Sta. 21

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT No. 612354

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Remote System and Sensor Applications (8A800)	Remote System and Sensor Applications (8A800)	N/A
5. Proj./Prog./Dept./Div.:	**6. Cog. Engr.:**	**7. Purchase Order No.:**
LDUA Project	D. A. Clark	N/A
8. Originator Remarks: Initial release of LDUA Power Distribution System Test Report. Task Number ETN-96-0007.		**9. Equip./Component No.:** LDUA/5100
		10. System/Bldg./Facility: N/A
11. Receiver Remarks:		**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	WHC-SD-TD-TRP-002		0	Test Report Light Duty Utility Arm Power Distribution System	N/A	1,2	1	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 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 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	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1	/	Cog. Eng. D. A. Clark	D A Clark	2/23/96	N1-21						
1	/	Cog. Mgr. D. S. Dutt	Dale Dutt	2/23/96	N1-21						
1	/	K. L. Bennett	K L Bennett	2/23/96	N1-21						
3		LDUA File 12.1.6 (4)			N1-21						

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
D. A. Clark Signature of EDT Originator — Date: 2/23/96	G. R. Kiebel Authorized Representative for Receiving Organization — Date: 2/23/96	D. S. Dutt Cognizant Manager — Date: 2/23/96	[ ] Approved [ ] Approved w/comments [ ] Disapproved w/comments

BD-7400-172-2 (04/94) GEF097

Test Report Light Duty Utility Arm Power Distribution System (PDS)

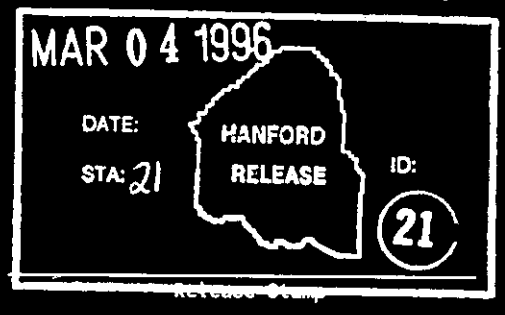
David A. Clark
Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 612354 UC: 2060
Org Code: 8A800 Charge Code: H1E02
B&R Code: EW4010000 Total Pages: 52

Key Words: Test Report, Light Duty Utility Arm (LDUA), Power Distribution System (PDS)

Abstract:

The Light Duty Utility Arm (LDUA) Power Distribution System has completed vendor and post-delivery acceptance testing. The Power Distribution System has been found to be acceptable and is now ready for integration with the overall LDUA system.



Karen H. Noland 3/4/96
Release Approval Date

Approved for Public Release

CONTENTS

TEST REPORT
LIGHT DUTY UTILITY ARM POWER DISTRIBUTION SYSTEM (PDS)

1.0 INTRODUCTION

This report documents the vendor and post-delivery acceptance testing performed on the Light Duty Utility Arm (LDUA) Power Distribution System, LDUA System Number 5100. The tests show that the power distribution system is fully operational and ready to provide power to the balance of the LDUA systems. Completion of this test report signifies that the power distribution system is ready for integration testing with the LDUA system qualification testing.

2.0 DESCRIPTION OF TEST

2.1 GENERAL DESCRIPTION

The Power Distribution System (System 5100) for the LDUA system consists of a power source, either portable generator (System 5120) or site electrical power (System 5110); the Power Distribution Skid (PDS, System 5130); and the associated cables necessary for connecting equipment to the PDS. System 5110 and/or System 5120 components are being supplied by the Tank Waste Remediation System (TWRS) organization and are outside the scope of this test report. Components tested for this report consist of the PDS (System 5130) and associated cabling.

This test report is being prepared in compliance with CM-6-1, Standard Engineering Practices, EP-4.2, WHC-IP-1026, Engineering Practice Guidelines, and WHC-SD-TD-TP-005, LDUA Subsystem Pre-Operational (Cold Test) Test Plan.

2.2 TEST METHOD

Vendor testing of the PDS and cables was performed at the vendor, H&N Electric of Pasco, Washington, under the direction of the PDS design contractor, Los Alamos Technical Associates (LATA), prior to shipment of the PDS to Hanford. A copy of the completed vendor test is included as Appendix A. Tests performed at H&N included continuity checks of the PDS and cabling, megger checks of the PDS and cabling (phase-to-phase and phase-to-ground), and verification that proper voltages were present throughout the system.

Post-delivery acceptance testing was performed at the LDUA Cold Test Facility (CTF) in the Fuels and Materials Examination Facility in Hanford's 400 Area. Post-delivery testing included visual inspection of the PDS for shipping damage, verification of proper output voltages, and verification of proper phase rotation for all three-phase portions of the system. A copy of the completed post-delivery acceptance test is included as Appendix B.

3.0 TEST RESULTS

All tests were completed satisfactorily at the vendor facility and the Hanford CTF. One test exception was generated during the post-delivery acceptance test due to improper phase rotation on the secondary side of the 45 KVA transformer (5130T2) on the PDS. The phase rotation was easily corrected, and wire color coding was revised to reflect the proper phase rotation.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The PDS and associated cables function according to the design criteria and are ready for integration with the remainder of the LDUA system.

5.0 DISPOSITION OF THE TEST ITEMS

The PDS and cables will be left in the CTF for integration with the LDUA system.

6.0 REFERENCES

WHC-SD-TD-FRD-003, *Functions and Requirements for the Light-Duty Utility Arm Integrated System*, 1994, Westinghouse Hanford Company, Richland, Washington.

APPENDIX A

VENDOR ACCEPTANCE TEST PROCEDURE

ACCEPTANCE TEST PROCEDURE FOR THE LIGHT DUTY UTILITY ARM POWER DISTRIBUTION SYSTEM

September 27, 1995

Prepared for
WESTINGHOUSE HANFORD COMPANY
Richland, Washington 99352

Prepared by
LOS ALAMOS TECHNICAL ASSOCIATES, INC.
Richland, Washington 99352

CONTENTS

1.0 PURPOSE

The purpose of this test is to verify that the electrical properties of the Light Duty Utility Arm (LDUA) Power Distribution System (PDS) are in accordance with the needs of the end user, and that they meet the requirements of applicable industry codes.

2.0 TEST REQUIREMENTS

This acceptance test will verify that: (1) the components of the power distribution system are connected and labeled correctly; (2) that cabling and circuit breakers have been checked for continuity; and (3) that output voltage is as designed.

3.0 REFERENCES

3.1 DOCUMENTS

NEC 1993
NEMA Code
Westinghouse Factory Specifications for Y48M28T45N and Y48028E15B transformers

3.2 DRAWINGS

a. As-built drawing of Power Distribution System
b. Drawing of power supply to Power Distribution System

4.0 TEST EQUIPMENT

a. Multimeter, 0 to 20 megohm scale for continuity, with record of calibration
b. Megohm meter (megger), 0.00 - 500 megohm scale, 1000 VDC DC volt scale, with record of calibration

5.0 PREREQUISITES

a. Verification of system construction completion, system is ready for testing.

Test Director/Engineer John Burkholder Date 9/28/95

Vendor Rep. [signature] Date 9/28/95

b. Three phase, 480 volt, 65 KVA power available to Power Distribution Skid
c. Appropriate lock-and-tag system in place to ensure electrical isolation of components being tested

6.0 INITIAL CONDITIONS

a. All circuit breakers verified open
b. All necessary personnel in place, with test equipment

7.0 PRECAUTIONS AND LIMITATIONS

a. Observe all applicable safety requirements when working with electrical equipment.

8.0 TEST PROCEDURE

8.1 CONTINUITY TEST

------WARNING------
(Ensure no power is applied to any circuit of the PDS.)

Close **5130CB3 (BST)** circuit breaker, connect power cable **5100W2D (LOT4)** to receptacle **5130A1J1 (RSTM)**. Using a multimeter set-up to measure ohms, check (maximum 1 ohm) from load side of circuit breaker **5130CB3 (BST)** phase A to pin 1 of **5100W2DP1 (ROT3M)**. Repeat this procedure for phases B, C, Ground, **5100W2DP1 (ROT3M)** pins 2, 3, G respectively. Check **5100W2DP1 (ROT3M)** pin G to connector body and to Power Skid frame for continuity. Open **5130CB3 (BST)** circuit breaker.

Test Director/Engineer _____ Date 9/28/95

Vendor Rep. _____ Date 9/28/95

Close **5130CB4 (BSE)** circuit breaker, connect power cable **5100W8A (LOE1)** to receptacle **5130A1J9 (RSEF)**. Using a multimeter set-up to measure ohms, check (maximum 1 ohm) from line side of circuit breaker **5130CB4 (BSE)** phase A to pin 1 of **5100W8AP2 (ROEF)**. Repeat this procedure for phases B, C, Neutral, Ground, **5100W8AP2 (ROEF)** pins 2, 3, N, G respectively. Check **5100W8AP2 (ROEF)** pin G to connector body and to Power Skid frame for continuity. Open **5130CB4 (BSE)** circuit breaker.

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Vendor Rep. _____ Date 9,28,95

Close **5130CB1 (BSX)** circuit breaker, connect power cable **5100W10D (LOX4)** to receptacle **5130A1J2 (RSXM)**. Using a multimeter set-up to measure ohms, check (maximum 1 ohm) from load side of circuit breaker **5130CB1 (BSX)** phase A to pin 1 of **5100W10DP1 (ROX3M)**. Repeat this procedure for phases B, C, Ground, **5100W10DP1 (ROX3M)** pins 2, 3, G respectively. Check **5100W10DP1 (ROX3M)** pin G to connector body and to Power Skid frame for continuity. Open **5130CB1 (BSX)** circuit breaker.

Test Director/Engineer _____ Date 9/28/95

Vendor Rep. _____ Date 9,28,95

Open **5130A2CB1 (BSN)** circuit breaker. Connect power cable **5100W4A (LOA1)** to receptacle **5130A1J8 (RSAF)**, shut **5130A2CB2 (BSA)** circuit breaker. Using a multimeter set-up to measure ohms, check (maximum 1 ohm) from line side of circuit breaker **5130A2CB2 (BSA)** phase A to pin 1 of **5100W4AP2 (ROAF)**. Repeat this procedure for phases B, Ground, **5100W4AP2 (ROAF)** pins 2, G respectively. Check **5100W4AP2 (ROAF)** pin G to connector body and to Power Skid frame for continuity. Open **5130A2CB2 (BSA)** circuit breaker.

Test Director/Engineer John Bartholomew Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

Connect power cable **5100W5A (LOD1)** to receptacle **5130A1J7 (RSDF)**. Close **5130A2CB3 (BSD)** circuit breaker. Using a multimeter set-up to measure ohms, check (maximum 1 ohm) from line side of circuit breaker **5130A2CB3 (BSD)** phase A to pin 1 of **5100W5AP2 (RODF)**. Repeat this procedure for phases B, C, Neutral, Ground, **5100W5AP2 (RODF)** pins 2, 3, N, G respectively. Check **5100W5AP2 (RODF)** pin G to connector body and to Power Skid frame for continuity. Open **5130A2CB3 (BSD)** circuit breaker.

Test Director/Engineer John Bartholomew Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

Connect power cable **5100W7A (LOC1)** to receptacle **5130A1J6 (RSCF)**. Close **5130A2CB4 (BSC)** circuit breaker. Using a multimeter set-up to measure ohms, check (maximum 1 ohm) from line side of circuit breaker **5130A2CB4 (BSC)** to pin 1 of **5100W7AP2 (ROCF)**. Repeat this procedure for Neutral, Ground **5100W7AP2 (ROCF)** pins N, G respectively. Check **5100W7AP2 (ROCF)** pin G to connector body and to Power Skid frame for continuity. Open **5130A2CB4 (BSC)** circuit breaker.

Test Director/Engineer John Bartholomew Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

Close **5130A2CB5 (BS)** circuit breaker. Using a multimeter set-up to measure ohms, check (maximum 1 ohm) from line side of circuit breaker **5130A2CB5 (BS)** to the ungrounded connector pin of **5130A1J5 (RSF)**. Repeat this procedure for Neutral, and Ground **5130A1J5 (RSF)** pins N, G respectively. Check **5130A1J5 (RSF)** ground pin to Power Skid frame for continuity. Open **5130A2CB5 (BS)** circuit breaker.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

Close **5130CB2 (BSV)** circuit breaker, connect power cable **5100W9D (LOV4)** to receptacle **5100WPDP2 (RSV1F)**, connect power cable **5100W3A (LOV5)** to receptacle **5130A1J4 (RSV2F)**. Using a multimeter set-up to measure ohms, check (maximum 1 ohm) from connector **5100W9DP1 (ROV3M)** pin 1 to **5100W3AP2 (ROV4F)** pin 1. Repeat this procedure for **5100W9DP1 (ROV3M)** pins 2, 3, G, and **5100W3AP2 (ROV4F)** pins 2, 3, G respectively. Check **5100W9DP1 (ROV3M)** pin G to connector body and to Power Skid frame for continuity. Check **5100W3AP2 (ROV4F)** pin G to connector body and to Power Skid frame for continuity. Open **5130CB2 (BSV)** circuit breaker.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

8.2 MEGGER TEST PDS

------WARNING------
(Ensure no power is applied to any circuit of the PDS.)

Open **5130CB3 (BST)** circuit breaker, connect power cable **5100W2D (LOT4)** to receptacle **5130A1J1 (RSTM)**. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on line side of circuit breaker **5130CB3 (BST)** between phases A-B, A-C, B-C, A-GND, B-GND, C-GND.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

Open **5130CB4 (BSE)** circuit breaker, connect power cable **5100W8A (LOE1)** to receptacle **5130A1J9 (RSEF)**. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on load side of circuit breaker **5130CB4 (BSE)** between phases A-B, A-C, B-C, A-GND, B-GND, C-GND.

Test Director/Engineer John Rathbun Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

Open **5130CB1 (BSX)** circuit breaker, connect power cable **5100W10D (LOX4)** to receptacle **5130A1J2 (RSXM)**. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on line side of circuit breaker **5130CB1 (BSX)** between phases A-B, A-C, B-C, A-GND, B-GND, C-GND.

Test Director/Engineer John Rathbun Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

Open **5130A2CB1 (BSN)**, **5130A2CB2 (BSA)**, **5130A2CB3 (BSD)**, **5130A2CB4 (BSC)**, ~~and **5130A2CB5 (BS) circuit breakers**~~. Connect cables **5100W4A (LOA1)**, **5100W5A (LOD1)**, and **5100W7A (LOC1)** to receptacles **5130A1J8 (RSAF)**, **5130A1J7 (RSDF)**, and **5130A1J6 (RSCF)**, respectively. Close **5130A2CB2 (BSA)**, **5130A2CB3 (BSD)**, **5130A2CB4 (BSC)**, ~~and **5130A2CB5 (BS)**~~ circuit breakers. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on load side of circuit breaker **5130A2CB1 (BSN)** between phases A-B, A-GND, B-GND. Open **5130A2CB2 (BSA)**, **5130A2CB3 (BSD)**, **5130A2CB4 (BSC)**, ~~and **5130A2CB5 (BS) circuit breakers**~~.

GFCI RECEPTACLE MUST BE ISOLATED FOR MEGGER CHECKS

Test Director/Engineer John Rathbun Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

* PHASE TO PHASE RESISTANCE WAS ALSO CHECKED, A-B, A-C, AND B-C. ALL > 500 MΩ

Close **5130CB2 (BSV)** circuit breaker, connect power cable **5100W9D (LOV4)** to receptacle **5100WPDP2 (RSV1F)**, connect power cable **5100W3A (LOV5)** to receptacle **5130A1J4 (RSV2F)**. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on line side of circuit breaker **5130CB2 (BSV)** between phases A-B, A-C, B-C, A-GND, B-GND, C-GND. Open **5130CB2 (BSV)** circuit breaker.

Test Director/Engineer _____ Date 9/28/95

Vendor Rep. _____ Date 9,28,95

8.3 TRANSFORMER CHECKS

------WARNING------
(Ensure no power is applied to any circuit of the PDS.)

Open **5130CB3 (BST)** circuit breaker. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on load side of circuit breaker **5130CB3 (BST)** between any single phase and ground (A-GND, B-GND, or C-GND).

Test Director/Engineer _____ Date 9/28/95

Vendor Rep. _____ Date 9,28,95

Open **5130CB4 (BSE)** circuit breaker. Disconnect transformer **5130T1 (TSE)** neutral at the **5130CB4 (BSE)** enclosure. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on line side of circuit breaker **5130CB4 (BSE)** between any single phase and ground (A-GND, B-GND, or C-GND). Reconnect transformer **5130T1 (TSE)** neutral at the **5130CB4 (BSE)** enclosure.

Test Director/Engineer _____ Date 9/28/95

Vendor Rep. _____ Date 9,28,95

Verify that transformer **5130T1 (TSE)** is wired correctly, by visually inspecting primary phase connections to **5130CB3 (BST)** circuit breaker and secondary phase and neutral connections to **5130CB4 (BSE)** circuit breaker.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. T. Ant Date 9,28,95

Open **5130CB1 (BSX)** circuit breaker. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on load side of circuit breaker **5130CB1 (BSX)** between any single phase and ground (A-GND, B-GND, or C-GND).

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. T. Ant Date 9,28,95

Open **5130A2CB1 (BSN)** circuit breaker. Disconnect transformer **5130T2 (XSN)** neutral at the **Power Panel 5130A2 (PANEL "A")** enclosure. Using a megger set-up to apply 1000 VDC, check (minimum 500 M ohms) on line side of circuit breaker **5130A2CB1 (BSN)** between any single phase and ground (A-GND, B-GND, or C-GND). Reconnect transformer **5130T2 (XSN)** neutral at the **Power Panel 5130A2 (PANEL "A")** enclosure.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. T. Ant Date 9,28,95

Verify that transformer **5130T2 (XSN)** is wired correctly, by visually inspecting primary phase connections to **5130CB1 (BSX)** circuit breaker and secondary phase and neutral connections to the **Power Panel 5130A2 (PANEL "A")** enclosure.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. T. Ant Date 9,28,95

8.4 FUNCTION TEST PDS

Connect the three phase, 480 volt, 65 KVA power supply to the PDS.

------WARNING------
(Beware of energized circuits.)

Open **5130CB3 (BST)**, **5130CB4 (BSE)** circuit breakers, connect power cable **5100W2D (LOT4)** to receptacle **5130A1J1 (RSTM)**, connect **5100W2DP1 (ROT3M)** to power source. Using a multimeter set-up to measure 480 VAC nominal, check **5130CB3 (BST)** circuit breaker line in for 480 VAC nominal across A-B, B-C, A-C phases. Record the actual phase voltage below.

A-B 476.4
B-C 471.3
A-C phase voltage 484.0 VAC *

Close **5130CB3 (BST)** circuit breaker. Using a multimeter set-up to measure 208 VAC nominal, check line side **5130CB4 (BSE)** circuit breaker for 208 VAC ± 5% across A-B, B-C, A-C phases and 120 VAC ±5% between A-N, B-N, C-N. Open **5130CB3 (BST)** circuit breaker.

Test Director/Engineer [signature] Date 9/28/95

Vendor Rep. [signature] Date 9,28,95

Open **5130CB1 (BSX)**, **5130A2CB1 (BSN)**, **5130A2CB2 (BSA)**, **5130A2CB3 (BSD)**, **5130A2CB4 (BSC)**, **5130A2CB5 (BS)** circuit breakers, remove cables **5100W4A (LOA1)**, **5100W5A (LOD1)**, and **5100W7A (LOC1)** from receptacles **5130A1J8 (RSAF)**, **5130A1J7 (RSDF)**, and **5130A1J6 (RSCF)**, respectively. Connect power cable **5100W10D (LOX4)** to receptacle **5130A1J2 (RSXM)**, connect **5100W10DP1 (ROX3M)** to power source. Using a multimeter set-up to measure 480 VAC nominal, check **5130CB1 (BSX)** circuit breaker line in for 480 VAC nominal across A-B, B-C, A-C phases. Record the actual phase voltage below.

A-B 482.0
B-C 475.4
A-C phase voltage 471.3 VAC *

* TEST FACILITY SUPPLY WAS UNBALANCED, SO ALL THREE PHASES WERE CHECKED JRB

Remove the cover on Panel A to gain access to circuit breaker terminals. Close **5130CB1 (BSX)** circuit breaker. Using a multimeter set-up to measure 208 VAC nominal, check line side **5130A2CB1 (BSN)** circuit breaker for 208 VAC ±5% across A-B, B-C, A-C phases and 120 VAC ±5% between A-N, B-N, C-N.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. T. Ant Date 9,28,95

Close **5130A2CB1 (BSN)** and **5130A2CB2 (BSA)** circuit breakers. Using a multimeter set-up to measure 208 VAC nominal, check load side **5130A2CB2 (BSA)** circuit breaker for 208 VAC ±5% across A-B phases. Open **5130A2CB2 (BSA)** circuit breaker, leave **5130A2CB1 (BSN)** circuit breaker closed.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. T. Ant Date 9,28,95

Close **5130A2CB3 (BSD)** circuit breaker. Using a multimeter set-up to measure 208 VAC nominal, check load side **5130A2CB3 (BSD)** circuit breaker for 208 VAC ±5% across A-B, B-C, A-C phases. Open **5130A2CB3 (BSD)** circuit breaker, leave **5130A2CB1 (BSN)** circuit breaker closed.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. T. Ant Date 9,28,95

Close **5130A2CB4 (BSC)** circuit breaker. Using a multimeter set-up to measure 120 VAC nominal, check load side **5130A2CB4 (BSC)** circuit breaker 120 VAC ±5% to neutral, N. Open **5130A2CB4 (BSC)** circuit breaker, leave **5130A2CB1 (BSN)** circuit breaker closed.

Test Director/Engineer John Bartholow Date 9/28/95

Vendor Rep. T. Ant Date 9,28,95

Close **5130A2CB5 (BS)** circuit breaker. Using a multimeter set-up to measure 120 VAC nominal, check load side **5130A2CB5 (BS)** circuit breaker 120 VAC ±5% to neutral, N. Open **5130A2CB5 (BS)** and **5130A2CB1 (BSN)** circuit breakers. Open **5130CB1 (BSX)** circuit breaker. Replace the cover on Panel A.

Test Director/Engineer _____ Date 9/28/95

Vendor Rep. _____ Date 9,28,95

Open **5130CB2 (BSV)** circuit breaker, connect power cable **5100W9D (LOV4)** to receptacle **5130A1J3 (RSV1M)**, connect **5100W9DP1 (ROV3M)** to power source. Using a multimeter set-up to measure 480 VAC nominal, check line side **5130CB2 (BSV)** breaker for 480 VAC nominal across A-B, B-C, A-C phases.

Test Director/Engineer _____ Date 9/28/95

Vendor Rep. _____ Date 9,28,95

Certificate

Issued To:
H AND N ELECTRIC INC.
BLDG. T-121
BIG PASCO INDUST. PARK
PASCO, WA 99301

Issued By:
GE ELECTRONIC SERVICES
SEATTLE SERVICE CENTER
22717 72ND AVENUE SOUTH
KENT, WA 98032

Work Order #:	217510-0005
Purchase Order #:	8036
CAP #:	9V2088
Customer Asset #:	
Description:	MEGGER
Manufacturer:	J.G. BIDDLE
Model:	218640
Serial #:	G1887
Cal Procedure:	MANUAL
Environmental Conditions:	62 Deg F/52%RH
Calibrated By:	WILLIAM L. THOMAS
In Cal As Received:	Yes
Calibration Date:	04/13/95
Recalibration Due:	12 Months

Remarks:
NEXT DUE DATE: 04/13/96

This calibration was performed in compliance with the GE Quality Manual, dated July 1994, and the technical requirements of the customer's order. The measurement standards used are traceable to the National Institute of Standards and Technology (NIST), fundamental or natural physical constants with values assigned of accepted by NIST, National Standards of other countries which are correlated with U.S. National Standards, ratio type or self calibrating techniques, or comparison to consensus standards. The Test Accuracy Ratio (TAR) for each calibrated parameter is at least 1:1. This certificate may not be reproduced, except in full, without the approval of GE.

Standards Used For This Calibration:

CAP#	Manufacturer/Model	Serial No.	Due Date
002870	FLU-8012A	2134172	08/14/95
097398	VHA-4500	24-1151	07/31/95
180354	CPI-836860	23746	04/28/95

Approved By: B Church — Date APR 13 1995
BRYAN R. CHURCH
QA Representative
GE Q/SA S-ES

GE Electronic Services & Rental

NQA ISO 9002 REGISTERED COMPANY

Certificate

Issued To:
H AND N ELECTRIC INC.
BLDG. T-121
BIG PASCO INDUST. PARK
PASCO, WA 99301

Issued By:
GE ELECTRONIC SERVICES
SEATTLE SERVICE CENTER
22717 72ND AVENUE SOUTH
KENT, WA 98032

Work Order #:	217510-0006
Purchase Order #:	8036
CAP #:	9V2087
Customer Asset #:	
Description:	DIGITAL MULTIMETER
Manufacturer:	FLUKE
Model:	8060A
Serial #:	4285138
Cal Procedure:	FLU-8060A-03/82 REV3 1/88
Environmental Conditions:	62 Deg F/52%RH
Calibrated By:	WILLIAM L. THOMAS
In Cal As Received:	Yes
Calibration Date:	04/13/95
Recalibration Due:	12 Months

Remarks:
NEXT DUE DATE: 04/13/96

This calibration was performed in compliance with the GE Quality Manual, dated July 1994, and the technical requirements of the customer's order. The measurement standards used are traceable to the National Institute of Standards and Technology (NIST), fundamental or natural physical constants with values assigned of accepted by NIST, National Standards of other countries which are correlated with U.S. National Standards, ratio type or self calibrating techniques, or comparison to consensus standards. The Test Accuracy Ratio (TAR) for each calibrated parameter is at least 1:1. This certificate may not be reproduced, except in full, without the approval of GE.

Standards Used For This Calibration:

CAP#	Manufacturer/Model	Serial No.	Due Date
180354	CPI-836860	23746	04/28/95
9V1119	FLU-5700A	5255003	05/25/95

Approved By: BRYAN R. CHURCH
QA Representative

Date APR 13 1995

GE Electronic Services & Rental

ISO 9002

APPENDIX B

POST-DELIVERY ACCEPTANCE TEST PROCEDURE

ACCEPTANCE TEST PROCEDURE

FOR THE

LIGHT DUTY UTILITY ARM POWER DISTRIBUTION SKID (PDS)

Revision 0

February 7, 1996

BY

D. A. CLARK

REMOTE SYSTEM AND SENSOR APPLICATIONS

WESTINGHOUSE HANFORD COMPANY
RICHLAND, WASHINGTON

APPROVALS:

LDUA PDS Design Agent: Dadel 2/7/96

LDUA Design Authority: [signature] 2/7/96

LDUA Cold Test Coordinator: [signature] 2/7/96

FFFS (Industrial Safety): [signature] 2/9/96

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Acceptance Test Procedure
for the
Light Duty Utility Arm Power Distribution Skid (PDS)

ACCEPTANCE TEST PROCEDURE

LIGHT DUTY UTILITY ARM POWER DISTRIBUTION SKID (PDS)

1.0 TEST ITEM IDENTIFICATION

The equipment to be tested is the Light Duty Utility Arm (LDUA) system 5130, Power Distribution Skid (PDS). The PDS is presently located on the upper mezzanine of the Fuels and Materials Examination Facility (FMEF) in the Hanford 400 area.

The PDS is designed to convert 480 VAC, 3-phase power to 208Y/120 VAC power for use by LDUA equipment to be located near the waste tank where the LDUA system is being deployed. The PDS consists of a steel frame holding transformers, circuit breakers, and electrical connectors needed to ensure delivery of power in accordance with system requirements.

2.0 GENERAL TEST DESCRIPTION

2.1 Test Objectives

This test is being performed to verify the functionality of the LDUA Power Distribution Skid following receipt from the vendor and prior to integration with the remainder of the LDUA system. The procedure is being prepared in compliance with CM-6-1, Standard Engineering Practices, EP-4.2, WHC-IP-1026, Engineering Practice Guidelines, and WHC-SD-TD-TP-005, LDUA Subsystem Pre-Operational (Cold Test) Test Plan. Because of the simplicity of the PDS design, the Calibration, Grooming, and Alignment (CG&A) and Post Delivery Factory Acceptance Tests required by the Cold Test Plan are being combined into this single procedure.

2.2 Test Method

Detailed testing of the PDS was performed at the vendor, H&N Electric of Pasco, Washington, prior to shipment of the PDS to Hanford. The vendor testing will be documented in the PDS Acceptance Test Report following completion of this ATP. This ATP will repeat some of the tests performed at the vendor shop, and add a phase-rotation test that could not be readily performed at the vendor's facility.

3.0 TEST CONDITION LIMITS

Test conditions which could cause the test to be aborted would be a loss of power in the facility, or complete failure of the PDS to perform its intended function. If either of these occur, the test will be suspended until the problems are resolved. After problem resolution, the test will be resumed. If necessary, test sections may be repeated at the discretion of the test engineer.

4.0 INSTRUMENTS AND CALIBRATION

Unless otherwise specified, all test instruments shall have a current calibration sticker from the Hanford Standards Laboratory.

4.1 Voltmeter (2 reqd.) capable of reading 120, 208, and 480VAC, 60Hz, minimum accuracy 1%, minimum resolution 1V. Record calibration data in Appendix C.

4.2 Phase-rotation indicator suitable for use with 480VAC and 208 VAC 3-phase circuits. (Calibration sticker not required)

4.3 Electronic calculator. (Calibration sticker not required)

5.0 FACILITIES, EQUIPMENT, AND MATERIALS

The PDS will be tested in the Fuels and Materials Examination Facility (FMEF) on the upper mezzanine level.

No special equipment, other than standard electrician hand tools and the instruments specified in section 4 above, is required for this test.

6.0 SAFETY

The PDS contains power sources of 480VAC, 208VAC, and 120VAC. Power sources are not exposed during normal operation; however, this test will require exposure of electrical conductors to permit connection of test instruments. Barriers and signs will be provided to restrict access to the work area during test performance. The procedure steps are sequenced so that instrument connections are only made with the circuits de-energized, therefore no Energized Work Permit is required.

The PDS is plug-and-cord connected equipment, with power disconnection locations visible to and easily controlled by the test performer. Per CM-1-10 Safety Manual, WKS 15, section 4.2.1, PDS equipment does not have to be locked and tagged out for de-energization.

At all times when the PDS is energized with equipment covers removed, at least two people with current CPR training must be present.

A pre-job briefing will be performed by the PIC prior to test initiation. The test engineer, test performer, and all other personnel associated with the test performance are required to attend the pre-job briefing.

7.0 MAINTENANCE AND FAILURES

7.1 FAILURES

Exceptions noted during the execution of the procedure shall be recorded in the test log and Appendix E. If an exception is noted, testing must be suspended until approval to continue is obtained from the cognizant engineer and test engineer. Approval to continue shall be documented by signature in the test log and test exception sheet in Appendix E.

7.2 MAINTENANCE

There are no components within the PDS which should require maintenance during the test period. If a component fails during testing, the failure shall be documented as a test exception and testing suspended until the test exception is resolved.

8.0 TEST DATA

Data from the test will be recorded in the Appendix B data sheets.

9.0 PERSONNEL REQUIREMENTS

Unless otherwise specified, the following personnel are required to be present during performance of this test:

9.1 Test performer - the test performer shall be an engineer, technician, or craft qualified to work on electrical equipment up to at least 480VAC. The test performer performs the actual test steps.

9.2 Test engineer - the test engineer shall be a representative of Remote Systems and Sensor Applications (RSSA) engineering staff. The test engineer is responsible for observing and documenting the test performance, and coordinating approval of test exception resolutions. The following RSSA personnel may serve as test engineer: K.L. Bennett, D.A. Clark, and C.L. Trang. The test engineer, cognizant engineer, and PIC may be the same person.

9.3 Person In Charge (PIC) - conducts pre-job briefing and coordinates test release and performance with FMEF facility personnel. Ensures that test is performed safely and in accordance with applicable Hanford procedures. The PIC must hold current FMEF PIC qualification. The PIC is not required to be present at all times, but must be closely enough involved to ensure safe and timely test performance.

9.4 Cognizant engineer - the RSSA design engineer responsible for the PDS system. The cognizant engineer is not required to be present at all times during test performance. The cognizant engineer for the PDS is D.A. Clark.

All personnel involved in the performance of this test shall print and sign their name, initials, position, and date of signature prior to beginning the testing in the personnel record section of Appendix D.

10.0 WITNESSES

There are no witnesses required for performance of this ATP.

11.0 PROCEDURE

The detailed test procedure steps are attached as Appendix A.

12.0 DISPOSITION OF TEST ITEM

After completion of testing, the PDS will remain in the FMEF Cold Test Facility for integration with the remainder of the LDUA system.

13.0 DATA SHEETS

All data sheets are contained in Appendix B.

14.0 REFERENCE DRAWINGS

14.1 H-6-14110, Rev. 0, LDUA Power Distribution Rack Front View
14.2 H-6-14111, Rev. 0, LDUA Power Distribution Rack One-Line Diagram & Details, modified per ECN 624882

APPENDIX A
PDS DETAILED TEST INSTRUCTIONS

A1.0 PREPARATION

NOTE: Abbreviations on signature lines are as follows:

PIC = Person In Charge

Test Engr. = Test Engineer

Test Perf. = Test Performer

A1.1 PIC provide pre-job briefing to test engineer, test performer, and all other personnel who may be involved in the test. All personnel attending the briefing must sign the pre-job briefing sheet. Attach the completed pre-job briefing sheet to this procedure.

SK Zm 12-13-96
PIC /Date

A1.2 Using rope or tape barriers and signs, post the entrance to the upper mezzanine area in the FMEF Cold Test Facility to restrict access to the PDS while it is under test. Signs shall read "DANGER - ELECTRICAL HAZARDS - AUTHORIZED PERSONNEL ONLY".

SK Zm 12-13-96
PIC /Date

NOTE: The Test Engineer is required to maintain a test log during performance of the PDS testing. Items to be recorded in the test log will consist of, as a minimum, dates/times for procedure start and stop, documentation of test exceptions, and commentary on any issues observed during testing. Each test log entry shall be signed and dated by the person making the entry.

A1.3 Verify the test log has been prepared and is at the test location.

CF Frame 12/13/96
Test Engr /Date

A2.0 De-Energized Equipment Tests

A2.1 Verify PDS supply disconnect switches for Special Receptacles 1, 2, and 3 on the southwest wall of the CTF upper mezzanine are open, and connectors 5100W2DP1, 5100W10DP1, 5100W9DP1 are all disconnected. This removes all power from the PDS.

RJ Blain 12-13-96
Test Perf. /Date

A2.2 Verify all input and output cables are disconnected from the power distribution skid.

RJ Blain 12-13-96
Test Perf. /Date

A2.3 Remove/open the covers for all equipment on the Power Distribution skid and perform a visual inspection for possible shipping damage and loose connections. Loose connections may be tightened as needed. Any other problems shall be documented via test exception and test log entry. Do not re-install covers at this time.

Inspection completed

RJ Blain 12-13-96
Test Perf. /Date

A3.0 ENERGIZED EQUIPMENT TESTS

> **CAUTION**
>
> Portions of the PDS will be energized with voltages up to 480VAC during parts of this test section. Only qualified test personnel are permitted inside the barriers at the entrance to the CTF upper mezzanine area until further notice.

A3.1 ATIE Instrument Load Circuit

A3.1.1 Ensure the PDS is still de-energized by verifying PDS supply disconnect switches for Special Receptacles 1, 2, and 3 on the southwest wall of the CTF upper mezzanine are open, and connectors 5100W2DP1, 5100W10DP1, 5100W9DP1 are all disconnected. This removes all power from the PDS.

RJ Brain 12-13-96
Test Perf. /Date

NOTE: Unless otherwise specified, all components referred to in the following steps are mounted on the PDS.

A3.1.2 Verify all breakers on the power distribution skid are open.

A3.1.3 Connect a voltmeter capable of reading 480 VAC between any two phases on the line side of breaker 5130CB3.

A3.1.4 Connect a phase-rotation meter to the line side of breaker 5130CB3.

A3.1.5 Connect a voltmeter capable of reading 208 VAC between the same two phases on the load side of breaker 5130CB4 as the meter connected to breaker 5130CB3.

All test equipment connected, ready to energize PDS.

RJ Brain 12-13-96
Test Perf. /Date

A3.1.6 Close breakers 5130CB3 and 5130CB4 on the power distribution skid.

A3.1.7 Connect 5100W2DP2 to 5130A1J1 on the power distribution skid.

A3.1.8 Connect 5100W2DP1 to Special Receptacle 3 on the upper mezzanine wall, then close the test facility disconnect switch for Special Receptacle 3. This applies 480VAC power to the PDS.

A3.1.9 On the data sheet (Appendix B), record the readings from both voltmeters and the phase rotation meter connected to the PDS.

A3.1.10 Open the test facility disconnect switch for Special Receptacle 3, then disconnect 5100W2DP1 from the receptacle. This removes power from the PDS.

R J Blair 12-13-96
Test Perf. /Date

A3.1.11 Move the phase rotation meter from the line side of breaker 5130CB3 to the load side of breaker 5130CB4. The voltmeters can be removed or left connected at the test performer's option.

All test equipment connected, ready to energize PDS.

R J Blair 12-13-96
Test Perf. /Date

A3.1.12 Verify breakers 5130CB3 and 5130CB4 are still closed.

A3.1.13 Connect 5100W2DP1 to Special Receptacle 3 on the upper mezzanine wall, then close the test facility disconnect switch for Special Receptacle 3. This applies 480VAC power to the PDS.

A3.1.14 On the data sheet (Appendix B), record the reading from the phase rotation meter.

A3.1.15 Open the test facility disconnect switch for Special Receptacle 3, then disconnect 5100W2DP1 from the receptacle. This removes power from the PDS.

R J Blair 12-13-96
Test Perf. /Date

A3.1.16 Disconnect 5100W2DP2 from 5130A1J1 on the distribution skid.

R. J. Blair 12-13-96
Test Perf. /Date

A3.1.17 Disconnect all test equipment and verify the covers for 5130CB3 and 5130CB4 are in place.

R. J. Blair 12-13-96
Test Perf. /Date

A3.2 Deployment Vehicle Circuit

A3.2.1 Ensure the PDS is still de-energized by verifying PDS supply disconnect switches for Special Receptacles 1, 2, and 3 on the southwest wall of the CTF upper mezzanine are open, and connectors 5100W2DP1, 5100W10DP1, 5100W9DP1 are all disconnected. This removes all power from the PDS.

R J Brun 12-13 96
Test Perf. /Date

A3.2.2 Verify all breakers on the power distribution skid are open.

A3.2.3 Connect a voltmeter capable of reading 480 VAC between any two phases on the load side of breaker 5130CB2.

All test equipment connected, ready to energize PDS.

R J Brun 12-13-96
Test Perf. /Date

A3.2.4 Close breaker 5130CB2 on the power distribution skid.

A3.2.5 Connect 5100W9DP2 to 5130A1J3 on the power distribution skid.

A3.2.6 Connect 5100W9DP1 to Special Receptacle 1 on the upper mezzanine wall, then close the test facility disconnect switch for Special Receptacle 1. This applies 480VAC power to the PDS.

A3.2.7 On the data sheet (Appendix B), record the reading from the voltmeter connected to the PDS.

A3.2.8 Open the test facility disconnect switch for Special Receptacle 1, then disconnect 5100W9DP1 from the receptacle. This removes power from the PDS.

R J Brun 12-13-96
Test Perf. /Date

A3.2.9 Disconnect 5100W9DP2 from 5130A1J3 on the distribution skid.

R. J. Brun 12-13-96
Test Perf. /Date

A3.2.10 Disconnect all test equipment and verify the cover for 5130CB2 is in place.

R J Blain 12-13-96
Test Perf. /Date

A3.3 ATIE Air Conditioner, Decon System, Purge Air Compressor, and Utility Outlet

A3.3.1 Ensure the PDS is still de-energized by verifying PDS supply disconnect switches for Special Receptacles 1, 2, and 3 on the southwest wall of the CTF upper mezzanine are open, and connectors 5100W2DP1, 5100W10DP1, 5100W9DP1 are all disconnected. This removes all power from the PDS.

R J Blain 12-13-96
Test Perf. /Date

A3.3.2 Verify all breakers on the power distribution skid are open.

A3.3.3 Connect a voltmeter capable of reading 480 VAC between any two phases on the line side of breaker 5130CB1.

A3.3.4 Connect a phase-rotation meter to the line side of breaker 5130CB1.

A3.3.5 Connect a voltmeter capable of reading 208 VAC across the load side of breaker 5130A2CB2 (circuit is 208VAC, single-phase).

All test equipment connected, ready to energize PDS.

R. J. Blain 12-13-96
Test Perf. /Date

A3.3.6 Close breakers 5130CB1, 5130A2CB1, and 5130A2CB2 on the power distribution skid.

A3.3.7 Connect 5100W10DP2 to 5130A1J2 on the power distribution skid.

A3.3.8 Connect 5100W10DP1 to Special Receptacle 2 on the upper mezzanine wall, then close the test facility disconnect switch for Special Receptacle 2. This applies 480VAC power to the PDS.

A3.3.9 On the data sheet (Appendix B), record the readings from both voltmeters and the phase rotation meter connected to the PDS.

A3.3.10 Open the test facility disconnect switch for Special Receptacle 2, then disconnect 5100W10DP1 from the receptacle. This removes power from the PDS.

R.J. Blain 12-13-96
Test Perf. /Date

A3.3.10 Open breaker 5130A2CB2.

A3.3.11 Move the phase rotation meter from the line side of breaker 5130CB1 to the load side of breaker 5130A2CB3.

A3.3.12 Connect one of the voltmeters between any two phases on the line side of breaker 5130A2CB3 (circuit is 208VAC, three-phase).

A3.3.13 Connect the other voltmeter between the load side of breaker 5130A2CB4 and circuit neutral (circuit is 120VAC, single-phase).

All test equipment connected, ready to energize PDS.

R.J. Blain 12-13-96
Test Perf. /Date

A3.3.14 Verify breakers 5130CB1 and 5130A2CB1 are still closed.

A3.3.15 Close breakers 5130A2CB3 and 5130A2CB4.

A3.3.16 Connect 5100W10DP1 to Special Receptacle 2 on the upper mezzanine wall, then close the test facility disconnect switch for Special Receptacle 2. This applies 480VAC power to the PDS.

A3.3.17 On the data sheet (Appendix B), record the readings from the two voltmeters and the phase rotation meter.

A3.3.18 Open the test facility disconnect switch for Special Receptacle 2, then disconnect 5100W10DP1 from the receptacle. This removes power from the PDS.

R J Blair 12-13-96 R J Blair 2-13-96 11:35AM
Test Perf. /Date

A3.3.19 Open breakers 5130A2CB3 and 5130A2CB4.

A3.3.20 Connect one of the voltmeters between the load side of breaker 5130A2CB5 and circuit neutral (circuit is 120VAC, single-phase).

All test equipment connected, ready to energize PDS.

R J Blair 12-13 96
Test Perf. /Date

A3.3.21 Verify breakers 5130CB1 and 5130A2CB1 are still closed.

A3.3.22 Close breaker 5130CB5.

A3.3.23 Connect 5100W10DP1 to Special Receptacle 2 on the upper mezzanine wall, then close the test facility disconnect switch for Special Receptacle 2. This applies 480VAC power to the PDS.

A3.3.24 On the data sheet (Appendix B), record the reading from the voltmeter.

A3.3.25 Open the test facility disconnect switch for Special Receptacle 2, then disconnect 5100W10DP1 from the receptacle. This removes power from the PDS.

R. J. Blair 12-13-96
Test Perf. /Date

A3.3.26 Open breaker 5130A2CB5.

A3.3.27 Disconnect 5100W10AP2 from 5130A1J2 on the distribution skid.

R. J. Blair 12-13-96
Test Perf. /Date

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A3.3.28 Disconnect all test equipment and verify the covers for all pieces of equipment on the power distribution skid are in place.

RDBlain 12-13-96
Test Perf. /Date

A4.0 PROCEDURE COMPLETION

A4.1 Verify PDS supply disconnect switches for Special Receptacles 1, 2, and 3 on the southwest wall of the CTF upper mezzanine are open, and connectors 5100W2DP1, 5100W10DP1, 5100W9DP1 are all disconnected. This removes all power from the PDS.

SK Jay 12-13-96
PIC /Date

A4.2 Remove the barriers from the entrance to the CTF upper mezzanine area. The test area is now open for normal access.

SK Jay 12-13-96
PIC /Date

This test procedure is now complete.

APPENDIX B
DATA SHEETS

Step 3.1.9:

5130CB3 line side voltage 488.3 VAC

5130CB4 load side voltage 214.6 VAC

5130CB3 line side phase rotation ABC

Acceptance Criteria:

5130CB4 voltage = 5130CB3 voltage x (208/480) +/- 10VAC 211.60VAC

(Acceptable)/Not Acceptable (circle one)

C J Tang / 2/13/96
Test Engr. /Date

Step 3.1.14:

5130CB4 line side phase rotation ABC

Acceptance Criteria:

Same phase rotation at 5130CB3 and 5130CB4

(Acceptable)/Not Acceptable (circle one)

C J Tang / 2/13/96
Test Engr. /Date

Step 3.2.7:

5130CB2 load side voltage 494 VAC

Acceptance Criteria:

5130CB2 voltage = 480 +/- 24 VAC

(Acceptable)/Not Acceptable (circle one)

C J Trang / 2/13/96
Test Engr. /Date

Step 3.3.9:

5130CB1 line side voltage 488.9 VAC

5130A2CB2 load side voltage 213.2 VAC

5130CB1 line side phase rotation ABC

Acceptance Criteria:

5130A2CB2 voltage = 5130CB1 voltage x (208/480) +/- 10VAC 211.86 VAC

(Acceptable)/Not Acceptable (circle one)

C J Trang / 2/13/96
Test Engr. /Date

Step 3.3.17:

5130A2CB3 line side voltage 212.6 VAC

5130A2CB4 load side voltage 122.5 VAC reposition the aligator clip.

5130A2CB3 line side phase rotation CBA
ABC —

Acceptance Criteria:

5130A2CB3 voltage = 5130CB1 voltage x (208/480) +/- 10VAC 211.86

5130A2CB4 voltage = 5130CB1 voltage x (208/480) x 0.577 +/- 6 VAC 122.24

Same phase rotation at 5130CB1 and 5130A2CB3

Acceptable / Not Acceptable (circle one) CLT. phase rotation is corrected @ 11:25 AM on test log.

CJ Hang 12/13/96
Test Engr. /Date

Step 3.3.24:

5130A2CB5 line side voltage 121.0 VAC

Acceptance Criteria:

5130A2CB5 voltage = 5130CB1 voltage x (208/480) x 0.577 +/- 6 VAC 122.24V

Acceptable / Not Acceptable (circle one)

CJ Hang 12/13/96
Test Engr. /Date

OFFICIAL COPY

APPENDIX C
TEST INSTRUMENTATION

MAN. & MODEL	CAL STICKER NUMBER	DUE DATE
Fluke 8060A meter	646-45-08-134	9/1/96
" " "	646-45-68-153	10/10/96
Model 146 Phase sequence Indicator	NONE	NONE

APPENDIX D
PERSONNEL RECORD

NAME (Print)	SIGNATURE	INITIALS	POSITION	DATE
DA Clark	DAClark	DAC	Cog Engr	2/13/96
CL Trang	CLTrang	CLT	Test Engr.	2/13/96
SK Fong	SKFong	SKF	PIC	2/13/96
R.J. Braim	RJBraim	RB	Electrician	2/13/96

APPENDIX E
TEST EXCEPTIONS

NUMBER	DESCRIPTION	RESOLUTION	RESOLUTION APPROVALS
3.3.17	The phase rotation is incorrect	Ron will switch the two wires @ the ~~tree~~ breaker main @ 5130A2CB1	CE Due TE CHang
		leave the color code & remark the transformer to reflect —	CE ____ TE ____
			CE ____ TE ____
			CE ____ TE ____
	See test	log	CE ____ TE ____
			CE ____ TE ____
			CE ____ TE ____
			CE ____ TE ____
			CE ____ TE ____

Note: CE = Cognizant Engineer
TE = Test Engineer

PAGE 1

TEST LOG
PDS ACCEPTANCE TESTING

DATE/ TIME	COMMENTS	INITIALS
2/13/96 8:15AM	Pre-Job Briefing completed by Steve Fong	CAF
9AM	Starting De-energized Equipment test	CFT
	by Ron Braim - Check all equipment on	
	PDS to ensure that there are no	
	damage (from shipping) a loose connections.	
9:20	ready to Energize - and read meters	
	recod in Appendix B	
9:35	perfomed step A3.2.2 - A3.2.5	
	before [redacted] PDS.	
10:40	Stop for a short break	
10:50	Start on A3.3	
10:03	Energize - [redacted] there is a small	
	buzz sound - Ron said thats to	
	be expected	
10:15	Reading on load side of 5130A2CB4	
	is 1.2 ≈ 0V - Buzz sound	
	Ron disconnected everything and	
	started Again - Voltage seems reasonable !	
10:21	Phase rotation changed to CBA	
	caused from tranformer wound @ factory	

or the leads. just need to be swap.

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TEST LOG
PDS ACCEPTANCE TESTING

DATE/ TIME	COMMENTS	INITIALS
	Ron sugested that switch the two wires on the breaker side.	
	The transformer label is Y B R	
	B X2	
	X1	
10:40	See test Exception - redo	
	Step A3.3.10 -	
11:00	Troubleshoot - check for continuity from	
	CB3 - to Decon system.	
11:15	Swap blue and yellow	
	wires (4 wires total) on CB3,	
	& main Breaker CB1.	
	The color coding on phase is not	
	consistent - making it correct by remark	
	for CB2 & CB4 the yellow to blue & Vice Versa	
11:25	The phase rotation corrected	
	color coding needs to be corrected	
	CB2 & CB4 ⇒ Yellow & blue (exchange)	
	both ends.	

PAGE _____

TEST LOG
PDS ACCEPTANCE TESTING

DATE/ TIME	COMMENTS	INITIALS
11:35	Break for lunch / Resume @ 1PM	
1 AM	Start on step A3.3.19	
	label wires correctly on transformer side.	
	Completed @ 1:45 PM	
	Cal # for meters 646 45 08 153	
	646 45 08134	
	Phase sequence Indicator Model 146	
	Pad lock for PDS breaker handles	
	NEC or Westinghouse	
	Need to buy some or see if	
	electrical shop in FMEF has some	
	cable Connectors @ PDS are connected!	

PAGE _____

TEST LOG
PDS ACCEPTANCE TESTING

DATE/ TIME	COMMENTS	INITIALS

PRE-JOB SAFETY MEETING FORM

Job Description/Title

Acceptance Test for the Light Duty Utility Arm Power Distribution Skid (PDS).

Date: 2/13/96

Work Package No.: PDS ATP

Person in Charge (PIC): Steve Fong

First Aid Qualified Person: Catherine Trang

Check Items Discussed

[X]	Procedures/Plans to be Used	No. PDS Aceptance Test
[ ]	Applicable OSR's	No.
[ ]	Radiation Work Permit	No.
[X]	Job Hazard Analysis	No.
[ ]	Construction Permit (as needed)	No.
[ ]	Additional Permits (i.e., confined space, excavation, etc.)	No.

[X] Review All Applicable Safety Precautions and Prestart Conditions per Procedures/Plans to be used

[ ] Components Locked and Tagged

[ ] ALARA Considerations (applicable MSDS's)

[ ] Respiratory Protection (fresh air, PAPR's, chemical filters, etc.)

[ ] Radioactive Contamination Containment Device

[ ] Emergency Response and Actions

[X] Summary of Job Sequence (or steps)

[ ] Work Area Conditions (high/low temperatures, lighting, etc.)

[ ] All Equipment Functionally Checked and at Work Site

Special Circumstances or COMMENTS:

Chairman Signature:

Operations SK Fong 2-13-96

Maintenance _____

Other _____

PREJOB SAFETY PLANNING/JOB HAZARD ANALYSIS SIGNOFF

Job Description Acceptance Test For LDV4 PDS 4M-96-037/W

Job Location Building 427 Rm 500

Date	Name (Print)	Signature	Supervisor	Org. Code
2-13-96	SK Fong	SK Fong	AD Danko.	19200
2-13-96	D A Clark	D A Clark	D S Dutt	SA800
2-13-96	C.L Trang	CL Trang	D S Dutt	SA800
2-13-96	R J. BRAIM	RJ Braim	G. Robinson	18640

PRE-JOB BRIEFING ANALYSIS SHEET

A pre-job briefing is required prior to all tasks that are non-routine in nature. This includes those tasks with complicated or critical work steps as well as those involving safety concerns. Examples of tasks requiring a pre-job brief are: complicated or critical work, working on energized equipment (over 50 V), and tasks requiring the use of, or availability of, personal protective or safety equipment (e.g. wash stations, respirators). When required, the PIC, or other qualified individual, shall conduct a pre-job briefing with all employees involved in the job or task before the job or task begins. As a minimum, the pre-job briefing shall address the following, as applicable:

- Job hazard analysis
- Specific work procedures
- Hazardous waste operations permit(s)
- Health and safety plans
- Personnel protective and safety plans
- Step-by-step description or walk-thru of complicated or critical tasks.

Pre-job briefings shall be documented on a Pre-Job Planning/Job Hazard Analysis Sign-off (form 54-3000-702). Each employee who attends the briefing shall sign the form. Those people that arrive to the job late shall also be briefed and sign the sign-off sheet. The sign-off sheet shall be included in the work package.

The need for a pre-job briefing shall be determined by the work package preparer prior to routing of the package for approval. Work package approvers must concur with the determination before they approve the work package.

PRE-JOB BRIEFING REQUIRED YES ✓ NO ___

Work Package Preparer SK Dy (Signature) 2-13-96 (Date)

Reason for briefing, if required:

Discuss safety requirements for the AWP.

J-2 | **WORK REQUEST--COMBINED FORM**

1. Document Number: 4M-96-1137/1

2. Work Item Title: PDS ACCEPTANCE TEST PROCEDURE FOR LIDUA

3. System	4. Component	5. Location	6. Assoc. Components
		FMEF (Facility) / 427 (Bldg) / 500 (Room) / ____ (Other) / ____ (Other)	

7. Originator: SCHELL, AD (Name) / 02/13/96 (Date) / FMEF MAINT (Organization) / 376-1185 (Telephone Number) / N1-40 (MSIN)

8. Charge Code:

9. Work Item Description:
PERFORM ACCEPTANCE TEST PROCEDURE FOR THE LIGHT DUTY UTILITY ARM POWER DISTRIBUTION SKID (PDS).

10. Operations Review	11. Priority	13. Corrective Maintenance Assessment	APPROVAL DESIGNATOR
R W Smith (Signature) 12-13-96 (Date)	2	☐ Yes ☒ No	NA
	12. Phase Designator: F061	14. Personnel Safety Related: ☐ Yes ☒ No	15. Mode: NONE

16. Resolution/Retest:
PERFORM THE PRE-APPROVED PDS TEST PROCEDURE.

17. PIC	19. Resolution By	20 Plant Forces Work Review Required
FONG, SK	A D Schell (Signature) 12-15-96 (Date)	☐ Yes ☒ No Number ____
18. PIC Organization: FMEF ENGINEERING		21. Resources Required

Resource Code	Number	Estimate	Actual
22	1	4	6

22. Cognizant Engineer	23. Cognizant Manager
S K Fong (Signature) 12-13-96 (Date)	D L Duncan (Signature) 12-13-96 (Date)

24. Reference Documents:
ACCEPTANCE TEST PROCEDURE FOR THE LIGHT DUTY UTILITY ARM POWER DISTRIBUTION SKID (PDS) REV 0

25. Field Work Complete
S K Fong (Signature) 12-13-96 (Date)