WATTS BAR NUCLEAR PLANT

SURVEILLANCE INSTRUCTION

SI-8.21

VITAL BATTERY - BATTERY INSPECTION AND CHARGER TEST

SEE ESPECIALLY STEP 6.1, pages 9 & 3.

CURRENT REVISION LEVEL: 5

Prepared By: John T. Maddux

Revised By: John T. Maddux

Submitted By: [signature] Supervisor

PQA Review: N/A

PORC Review Date: 1/14/85

Approved By: [signature] Plant Manager

Date Approved: 1/14/85

1C	Doc Control Unit, 1520 CST2-C
	NRC
1C	NSRS, 249 A HBB-K
1C	Plant Master File
	Plant Manager
	Supt (O&E)
	Supt (Maint)
	Plant Adm Svs Supv
	ASE Duty Station
	Building Services Supv
	Chem Lab
	Chem Unit Supv
	Chief, Nuclear Safety Staff
1C	Chief, Nuclear Training Branch
	Chief, Operations QA Branch, 401 UBB-C
	Compliance Unit
	Component Engg & Svs Group
	DPSO-WBN
	Dwg & Vendor Manual Supv
1C	Elect Maint Supv
	Engg Group Supv
1C	Engg Section Supv
	Health Physicist
	Health Physics Lab
	Instr Maint Supv
	Instr Shop
	Materials Unit Supv
	Mech Maint Supv
	Mech Unit Supv
1C	Modifications Manager
	Operating Instruction Coordinator
1C	Operations Supv
	Operator Training Classroom
1U & 1C	P&S Supv
1C	Plant QA Supv
	Plant Training Officer
1U	Plant Training Shift Engr
	Power Stores Unit Supv
	Preop Test Supv
	Public Safety
	Reactor Unit Supv
	Safety Engr
1C	Shift Engr's Office
	Support Svs Supv
	Tech Support Center
1C	Unit 1 Control Rm
1C	Unit 2 Control Rm
1C	John Raulston, NEB, W10A63 C-K
	Site Director
	Site Svs Manager
	Design Svs Manager
	Power Operations Training Center
	Plant Manager, BNP

Last page of this instruction: 42

8503270436 850323
PDR ADOCK 05000390
E PDR

HISTORY OF REVISION/REVIEW

REV. NO.	DATE	REVISED PAGES	REASON FOR CURRENT REVISION (INCLUDE ALL TEMPORARY CHANGE NUMBERS)
4	8/10/82	All	General Revision.
5	1-14-85	All	To add guidelines for Battery Inspection, 2-year review, to incorporate new battery discharge equipment. General Revision.

1.0 PURPOSE

This instruction provides for an inspection of the 125V DC Vital Batteries and their racks, and provides for a load and current limit test on the Vital Battery chargers. The battery inspection includes a visual inspection of the battery cells, terminals, plates, and the battery racks. This instruction shall be done at least every 18 months, and shall be performed concurrently with SI-8.22 or SI-8.30.

This instruction is for the following listed CSSC batteries and chargers:

125-Volt Vital Battery No. I and Charger I
125-Volt Vital Battery No. II and Charger II
125-Volt Vital Battery No. III and Charger III
125-Volt Vital Battery No. IV and Charger IV
Spare Vital Battery Chargers 1-S and 2-S

This instruction meets the conditions imposed by the following Surveillance Instructions:

Surveillance Requirement	Applicable Modes
4.8.2.1.C	1, 2, 3, 4
4.8.2.2 partial	5,6

NOTE: Those steps preceeded by the symbol "#" will require documentation in the data package.

2.0 REFERENCES

2.1 For general information on batteries and battery maintenance use ESL 5.1, Scheduled Battery Maintenance.

2.2 TVA drawing Nos. 45N703-1 R7, 45N703-2 R7, 45N703-3 R7, and 45N703-4 R7.

2.3 Technical Specification 4.8.2.1.C.

2.4 IEEE-450-1980

2.5 ESL 5.17

3.0 PREREQUISITES

#3.1 Obtain approval of the shift engineer or his designated representative to perform this instruction.

3.2 Obtain the necessary clearances for the performance of the instruction.

3.3 This instruction may be run in all modes of operation.

3.4 Review ESL 5.1 before proceeding with this instruction.

3.5 Notify QC for torquing verification.

3.6 Obtain copy of ESL 5.17 for operation of battery discharge unit.

4.0 PRECAUTIONS

4.1 Personnel performing this instruction should be aware of working in the vicinity of energized equipment such as the battery charger and the batteries, and they should be aware of the proper safety equipment as explained in ESL 5.1.

4.2 Personnel performing this instruction should operate and be aware of the location of the eyewash station in each battery room. If found inoperable, notify foreman before proceeding with this instruction.

4.3 Smoking, open flames, or welding is prohibited in the battery rooms as a precaution against ignition of any hydrogen present.

4.4 Keep battery terminals and straps clear of all tools and other foreign objects. Tools used on the battery terminals shall have insulated handles.

4.5 Discharge all static electricity from the body before touching a cell or cell post by touching a grounded surface.

4.6 Ensure proper polarity is observed while making all test connections.

#4.7 Foreman shall ensure common mode requirements are met.

5.0 PREPARATION FOR WORK

#5.1 Obtain two microhmers with a ±0.6 percent accuracy.

#5.2 Obtain two torque wrenches. 0-250 in-lbs ±10 percent.

#5.3 Ensure load unit shunts of discharge unit are in calibration

#5.4 Obtain no-oxide "A" grease--record 575# in data sheets.

6.0 PERFORMANCE OF WORK

NOTE: Two craftsmen shall independently perform this instruction and initial each step when a space is provided to verify that it was properly completed. Both craftsmen shall sign and date each data sheet as it is completed, to verify that it was properly done. (125-volt vital battery chargers I and III are associated with train A, 125-volt vital battery chargers II and IV are associated with train B.)

The voltage of the battery charger must be maintained at a minimum of 125 volts for 8 hours. The output current of the charger must be maintained at a minimum of 150 amps for the 8-hour period of the test. The charger may need adjusting throughout the test to maintain acceptable current and voltage levels.

NOTE: Use a different microhmer and torque wrench on Trains A and B.

6.0 PERFORMANCE OF WORK (Continued)

DATA ON PAGE 9

#6.1 Visually inspect battery racks for loose bolts, distorted members or any abnormal deterioration. Notify general foreman if any problems are found.

#6.2 Visually inspect the cells, cell plates, and battery racks for an indication of physical damage or abnormal deterioration, using the following guidelines.

A. The general overall color of the top layer of sediment in the bottom of the cell indicates the battery charge condition within the last 6 to 12 months. A whitish-gray background indicates an undercharge condition. A brownish-chocolate background indicates an overcharge condition.

B. Charge condition of the battery in accordance with plate color:

Fully Charged	Discharged
Positive plate - Chocolate brown color	Medium gray color
Negative - Light to medium gray color	Medium gray color

When the positive plates are a medium gray in color, this indicates the battery is partially discharged.

C. Grid fractures, discoloration of the plates or electrolyte, plate buckling, plate growth@, and cell cracks or leaks should be noted.

D. Scale (small slivers or pieces of plate material which have peeled from the plate surface) shorts sometimes occur between adjacent plates at the top of the plate structure. These shorts turn white when electrically connected and can usually be broken or dislodged by extending a rubber hose or the hydrometer tube near the area and forcing air through the hose to agitate the electrolyte in the vicinity of the short. DO NOT USE COMPRESSED AIR FOR THIS PURPOSE.

@NOTE: The positive plates of lead-calcium batteries normally swell or "grow" with age and use. Most manufacturers claim that 10 percent growth is the expected maximum limit during the life of the battery. Most manufacturers make the plate separators 10 percent larger than the plates so that when the plates "grow" to the dimensions of the separators, normally the battery is nearing the end of its useful life. Therefore, if any plate appears to have dropped lower than the other plates, or if buckling or warping of the plates is evident, or if an excessive amount of sediment appears in the bottom of the cell (more than the average), notify the general foreman.

6.0 PERFORMANCE OF WORK (Continued)

#6.3 Visually inspect the cell to cell and terminal connections for cleanliness, or corrosion, and note any abnormalities in the data sheets.

#6.4 Read the intercell and terminal connection resistance of each cell with a microhm and record each value on the appropriate data sheet.

#6.4.1 ACCEPTANCE CRITERIA: The resistance of each cell to cell and terminal connection is less than or equal to 150×10^{-6} ohms.

QC HOLD POINT:

6.5 Torque the high reading connnection(s) to 100 in/lbs (for stainless steel terminal connectors).

#6.6 Reread and record the questionable connection resistance to see if torquing the connection has improved the microhm reading. QC inspector to verify torque if resistance is acceptable.

6.7 If torquing has not improved the reading, check the post and the connector for corrosion. If it is necessary to break a terminal connection, have operations remove the battery from service.

6.7.1 If the terminal connector and the battery terminal are corroded, the connector should be removed and the terminal and the connector should be cleaned with a brass suede brush or fine sand paper.

6.7.2 Apply no-oxide grease to the clean battery terminal and connector and reinstall it.

QC HOLD POINT:

6.7.3 Torque the bolted connection to 100 in/lbs.

#6.7.4 Reread the newly installed connector resistance and record the reading. QC Inspector to verify torque if resistance is acceptable. If connection is still above 150×10^{-6} ohms, notify the general foreman.

#6.8 Inspect the cell posts and cell connectors for a coating of a corrosion-inhibiting grease (no-oxide "A" grease) and add corrosion-inhibiting grease (no-oxide "A" grease) to any terminals that are not coated.

6.9 Charger Test

#6.9.1 Have operations remove charger being tested from service and replace with spare charger.

6.0 PERFORMANCE OF WORK (Continued)

CAUTION: Prior to connecting discharge unit to charger - check battery power leads connected to resistor banks for grounds - resistance should be greater than 100 k ohms.

#6.9.2 Connect discharge unit test leads to charger on output terminal strip as per figure 1.

#6.9.3 Program unit using ESL 5.17 guidelines to the following values: 8-hour discharge, 150 amps, 30-minute print interval.

#6.9.4 Initiate Test

#6.9.5 Acceptance Criteria:

@Charger maintained 150 amps at 125 volts for 8 hours.

#6.9.6 Attach printouts to completed SI package.

#6.9.7 After capacity check is complete increase current to 225 amps and verify current limit is operable. Adjust if necessary. Contact general foreman if charger cannot be corrected. NOTE: This check is not a requirement for the surveillance.

6.10 Repeat step 6.9 until all chargers are tested.

#6.11 Notify SRO on completion of instruction.

#6.12 Foreman to ensure work area is clean.

#6.13 When instruction is complete, remove shunts from load banks and send to central lab for calibration, verify in data sheet calibration is acceptable.

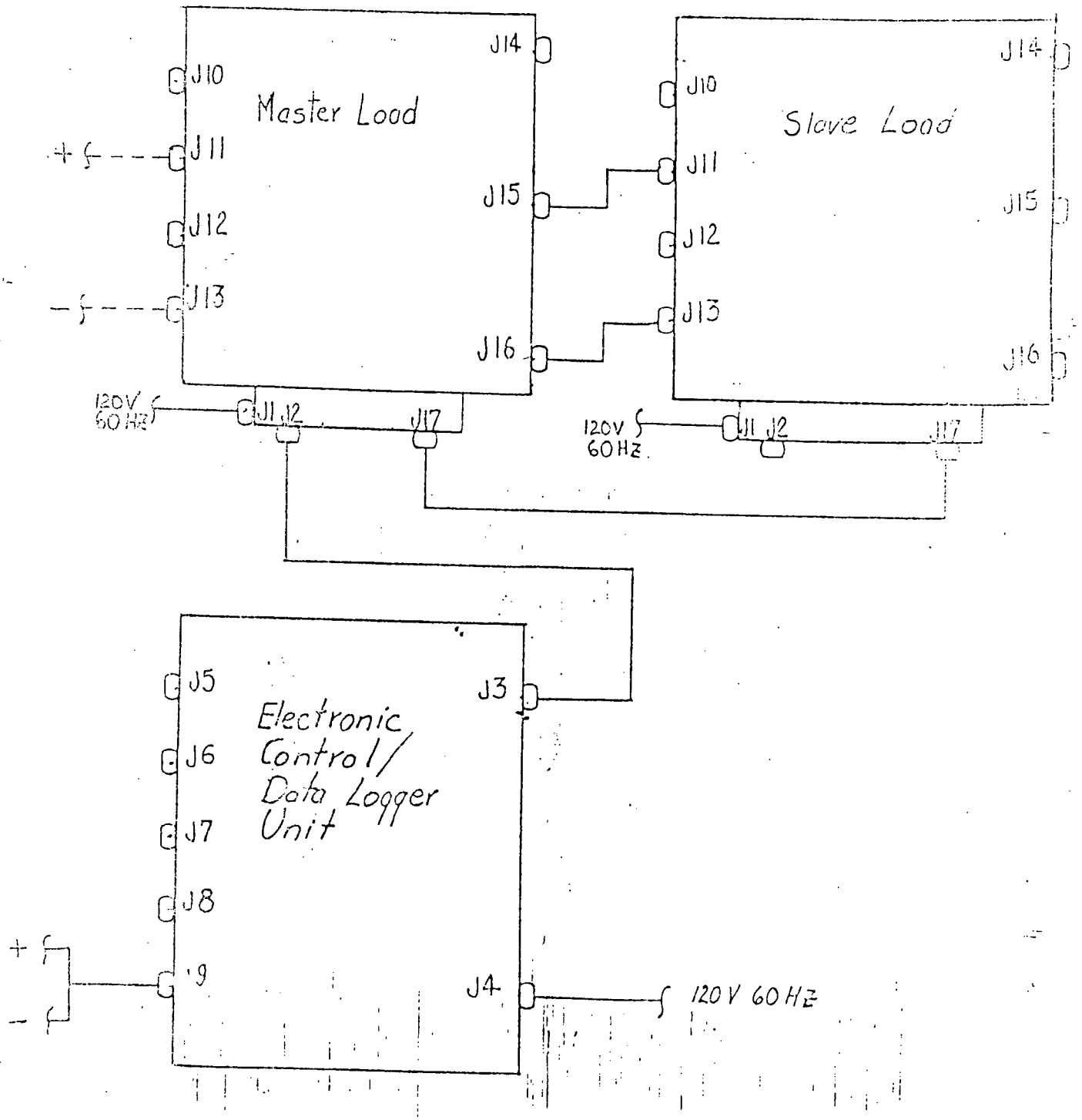
Master Load
J10
J11
J12
J13
J14
J15
J16
J1 J2
J17
120V 60Hz
Slave Load
J10
J11
J12
J13
J14
J15
J16
J1 J2
J17
120V 60Hz
Electronic Control/ Data Logger Unit
J5
J6
J7
J8
J9
J3
J4
120V 60Hz

FIGURE 1

DATA PACKAGE COVER SHEET

TITLE: SAFETY RELATED STORAGE BATTERY INSPECTION UNIT _____

Performed By _____ Date _____
Craftsman

_____ Date _____
Craftsman

This data package contains 36 pages. If any pages were removed from or added to the data package as supplied by the Planning and Scheduling Section, indicate by checkmark. ☐ If checked, explain: _____

_____

Were Technical Specifications criteria satisfied? _____ Yes _____ No

If criteria were not satisfied, notify the SRO who completes the following:

Was a limiting condition for operation violated?

_____ Yes (explain in remarks) _____ No (explain in remarks)

Verified by SRO _____ Date _____

Reason for test:

_____ Required by schedule

_____ Maintenance complete on MR#, WP#, MI#, etc. _____

_____ Another system (_____) inoperable

_____ Plant condition (explain) _____

_____ Other (explain) _____

Reviewed:

SRO _____ Date _____

Additional Review Required: ☐ Yes ☐ No

General Foreman _____

Responsible Engineer _____ Date _____

Rescheduled:

P&S Section _____ Date _____

Remarks _____

_____

_____

PQA Review _____ Date _____

3.1 SRO approval to perform instruction _____ / _____
Operations Section Date

4.7 Common mode requirements met _____ / _____
Foreman Date

5.1

	TVA Tag No.	Calibration Due Date
Microhmer #1		
Microhmer #2		

5.2

	TVA Tag No.	Calibration Due Date
Torque wrench #1		
Torque wrench #2		

5.3 Discharge unit shunts _____

5.4 "575" _____

6.11 SRO notified on completion of instruction.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.12 Work area clean.

_____ / _____ _____ / _____ _____ / _____
Craftsman Date Craftsman Date Foreman Date

6.13 Calibration check acceptable.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

125 Volt Vital Battery No. I
125 Volt Battery Charger I

	TVA Tag #	Cal. Due Date
Microhmer #1		
Torque wrench #1		

INITIALS

Craftsman I Craftsman II

Approval to perform this instruction _____ / _____
SRO Date

6.1 Battery rack physical appearance
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.2 Plate color and growth, cell condition
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.3 Cell and cell terminal connections
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.8 Cell post and connectors are coated with corrosion-inhibiting grease

NOTES: _____

_____ / _____

Data Taken By _____ / _____
Craftsman I Date

Verified By _____ / _____
Craftsman II Date

125-VOLT D.C. VITAL BATTERY BANK NO. I
Sheet 1 of 6

READINGS TAKEN BY _____ / _____
Craftsman I Date

VERIFIED BY _____ / _____
Craftsman II Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 1 (+)					
1 (-)					
2 (+)					
2 (-)					
3 (+)					
3 (-)					
4 (+)					
4 (-)					
5 (+)					
5 (-)					
6 (+)					
6 (-)					
7 (+)					
7 (-)					
8 (+)					
8 (-)					
9 (+)					
9 (-)					
10 (+)					
Cable & 10 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. I
Sheet 2 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 11 (+)					
11 (-)					
12 (+)					
12 (-)					
13 (+)					
13 (-)					
14 (+)					
14 (-)					
15 (+)					
15 (-)					
16 (+)					
16 (-)					
17 (+)					
17 (-)					
18 (+)					
18 (-)					
19 (+)					
19 (-)					
20 (+)					
Cable & 20 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. I
Sheet 3 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Coil Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 21 (+)					
21 (-)					
22 (+)					
22 (-)					
23 (+)					
23 (-)					
24 (+)					
24 (-)					
25 (+)					
25 (-)					
26 (+)					
26 (-)					
27 (+)					
27 (-)					
28 (+)					
28 (-)					
29 (+)					
29 (-)					
30 (+)					
Cable & 30 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. I
Sheet 3 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 21 (+)					
21 (-)					
22 (+)					
22 (-)					
23 (+)					
23 (-)					
24 (+)					
24 (-)					
25 (+)					
25 (-)					
26 (+)					
26 (-)					
27 (+)					
27 (-)					
28 (+)					
28 (-)					
29 (+)					
29 (-)					
30 (+)					
Cable & 30 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. I
Sheet 4 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 31 (+)					
31 (-)					
32 (+)					
32 (-)					
33 (+)					
33 (-)					
34 (+)					
34 (-)					
35 (+)					
35 (-)					
36 (+)					
36 (-)					
37 (+)					
37 (-)					
38 (+)					
38 (-)					
39 (+)					
39 (-)					
40 (+)					
Cable & 40 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. I
Sheet 5 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 41 (+)					
41 (-)					
42 (+)					
42 (-)					
43 (+)					
43 (-)					
44 (+)					
44 (-)					
45 (+)					
45 (-)					
46 (+)					
46 (-)					
47 (+)					
47 (-)					
48 (+)					
48 (-)					
49 (+)					
49 (-)					
50 (+)					
Cable & 50 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. I
Sheet 6 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 51 (+)					
51 (-)					
52 (+)					
52 (-)					
53 (+)					
53 (-)					
54 (+)					
54 (-)					
55 (+)					
55 (-)					
56 (+)					
56 (-)					
57 (+)					
57 (-)					
58 (+)					
58 (-)					
59 (+)					
59 (-)					
60 (+)					
Cable & 60 (-)					

6.4.1 All connections are less than (150×10^{-6}) ohms /____/ Acceptable
/____/ Unacceptable

_____ _____
Craftsman #1 Craftsman #2

CHARGER NO. I

6.9.1 Charger being tested removed from service and replaced with spare.

_____ / _____ Craftsman Date _____ / _____ Craftsman Date

6.9.2 Discharge unit test leads connected.

_____ / _____ Craftsman Date _____ / _____ Craftsman Date

6.9.3 Discharge unit programed to 8-hour discharge, 150 amps, 30-minute print interval.

_____ / _____ Craftsman Date _____ / _____ Craftsman Date

6.9.4 Test Initiated.

_____ / _____ Craftsman Date _____ / _____ Craftsman Date

6.9.5 Acceptance Cirteria: Charger maintained 150 amps at 125 volts for 8 hours.

/___/ Acceptable
/___/ Unacceptable

_____ / _____ Craftsman 1 Date _____ / _____ Craftsman 2 Date

6.9.6 Printout attached.

_____ / _____ Craftsman Date _____ / _____ Craftsman Date

6.9.7 Current limit is 225 ±25 amps → current = _____

_____ / _____ Craftsman Date _____ / _____ Craftsman Date

125 Volt Vital Battery No. II
125 Volt Battery Charger II

	TVA Tag #	Cal. Due Date
Microohmer #1	_____	_____
Torque wrench #1	_____	_____

INITIALS

Craftsman I _____ Craftsman II _____

Approval to perform this instruction _____ / _____
SRO Date

6.1 Battery rack physical appearance
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.2 Plate color and growth, cell condition
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.3 Cell and cell terminal connections
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.8 Cell post and connectors are coated with corrosion-inhibiting grease

NOTES: _____

_____ / _____

Data Taken By _____ / _____
Craftsman Date

Verified By _____ / _____
Craftsman Date

125-VOLT D.C. VITAL BATTERY BANK NO. II
Sheet 1 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 1 (+)					
1 (-)					
2 (+)					
2 (-)					
3 (+)					
3 (-)					
4 (+)					
4 (-)					
5 (+)					
5 (-)					
6 (+)					
6 (-)					
7 (+)					
7 (-)					
8 (+)					
8 (-)					
9 (+)					
9 (-)					
10 (+)					
Cable & 10 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. II
Sheet 2 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 11 (+)					
11 (-)					
12 (+)					
12 (-)					
13 (+)					
13 (-)					
14 (+)					
14 (-)					
15 (+)					
15 (-)					
16 (+)					
16 (-)					
17 (+)					
17 (-)					
18 (+)					
18 (-)					
19 (+)					
19 (-)					
20 (+)					
Cable & 20 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. II
Sheet 3 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 21 (+)					
21 (-)					
22 (+)					
22 (-)					
23 (+)					
23 (-)					
24 (+)					
24 (-)					
25 (+)					
25 (-)					
26 (+)					
26 (-)					
27 (+)					
27 (-)					
28 (+)					
28 (-)					
29 (+)					
29 (-)					
30 (+)					
Cable & 30 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. II
Sheet 4 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 31 (+)					
31 (-)					
32 (+)					
32 (-)					
33 (+)					
33 (-)					
34 (+)					
34 (-)					
35 (+)					
35 (-)					
36 (+)					
36 (-)					
37 (+)					
37 (-)					
38 (+)					
38 (-)					
39 (+)					
39 (-)					
40 (+)					
Cable & 40 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. II
Sheet 5 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 41 (+)					
41 (-)					
42 (+)					
42 (-)					
43 (+)					
43 (-)					
44 (+)					
44 (-)					
45 (+)					
45 (-)					
46 (+)					
46 (-)					
47 (+)					
47 (-)					
48 (+)					
48 (-)					
49 (+)					
49 (-)					
50 (+)					
Cable & 50 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. II
Sheet 6 of 6

READINGS TAKEN BY _____ / _____
Craftsman I Date

VERIFIED BY _____ / _____
Craftsman II Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 51 (+)					
51 (-)					
52 (+)					
52 (-)					
53 (+)					
53 (-)					
54 (+)					
54 (-)					
55 (+)					
55 (-)					
56 (+)					
56 (-)					
57 (+)					
57 (-)					
58 (+)					
58 (-)					
59 (+)					
59 (-)					
60 (+)					
Cable & 60 (-)					

6.4.1 All connections are less than (150×10^{-6}) ohms /____/ Acceptable
/____/ Unacceptable

_____ Craftsman #1

_____ Craftsman #2

CHARGER NO. II

6.9.1 Charger being tested removed from service and replaced with spare.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.2 Discharge unit test leads connected.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.3 Discharge unit programed to 8-hour discharge, 150 amps, 30-minute print interval.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.4 Test Initiated.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.5 Acceptance Cirteria: Charger maintained 150 amps at 125 volts for 8 hours.

/___/ Acceptable
/___/ Unacceptable

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.6 Printout attached.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.7 Current limit is 225 ±25 amps → current = _____

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

125 Volt Vital Battery No. III
125 Volt Battery Charger III

	TVA Tag #	Cal. Due Date
Microhmer #1		
Torque wrench #1		

INITIALS

Craftsman I _____ Craftsman II _____

Approval to perform this instruction _____ / _____
SRO Date

6.1 Battery rack physical appearance
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.2 Plate color and growth, cell condition
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.3 Cell and cell terminal connections
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ / _____

6.8 Cell post and connectors are coated with corrosion-inhibiting grease

NOTES: _____

_____ / _____

Data Taken By _____ / _____
Craftsman Date

Verified By _____ / _____
Craftsman Date

125-VOLT D.C. VITAL BATTERY BANK NO. III
Sheet 1 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 1 (+)					
1 (-)					
2 (+)					
2 (-)					
3 (+)					
3 (-)					
4 (+)					
4 (-)					
5 (+)					
5 (-)					
6 (+)					
6 (-)					
7 (+)					
7 (-)					
8 (+)					
8 (-)					
9 (+)					
9 (-)					
10 (+)					
Cable & 10 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. III
Sheet 2 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 11 (+)					
11 (-)					
12 (+)					
12 (-)					
13 (+)					
13 (-)					
14 (+)					
14 (-)					
15 (+)					
15 (-)					
16 (+)					
16 (-)					
17 (+)					
17 (-)					
18 (+)					
18 (-)					
19 (+)					
19 (-)					
20 (+)					
Cable & 20 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. III
Sheet 3 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 21 (+)					
21 (-)					
22 (+)					
22 (-)					
23 (+)					
23 (-)					
24 (+)					
24 (-)					
25 (+)					
25 (-)					
26 (+)					
26 (-)					
27 (+)					
27 (-)					
28 (+)					
28 (-)					
29 (+)					
29 (-)					
30 (+)					
Cable & 30 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. III
Sheet 4 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 31 (+)					
31 (-)					
32 (+)					
32 (-)					
33 (+)					
33 (-)					
34 (+)					
34 (-)					
35 (+)					
35 (-)					
36 (+)					
36 (-)					
37 (+)					
37 (-)					
38 (+)					
38 (-)					
39 (+)					
39 (-)					
40 (+)					
Cable & 40 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. II
Sheet 5 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 41 (+)					
41 (-)					
42 (+)					
42 (-)					
43 (+)					
43 (-)					
44 (+)					
44 (-)					
45 (+)					
45 (-)					
46 (+)					
46 (-)					
47 (+)					
47 (-)					
48 (+)					
48 (-)					
49 (+)					
49 (-)					
50 (+)					
Cable & 50 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. III
Sheet 6 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 51 (+)					
51 (-)					
52 (+)					
52 (-)					
53 (+)					
53 (-)					
54 (+)					
54 (-)					
55 (+)					
55 (-)					
56 (+)					
56 (-)					
57 (+)					
57 (-)					
58 (+)					
58 (-)					
59 (+)					
59 (-)					
60 (+)					
Cable & 60 (-)					

6.4.1 All connections are less than (150×10^{-6}) ohms /____/ Acceptable
/____/ Unacceptable

_____ _____
Craftsman #1 Craftsman #2

CHARGER NO. III

6.9.1 Charger being tested removed from service and replaced with spare.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.2 Discharge unit test leads connected.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.3 Discharge unit programed to 8-hour discharge, 150 amps, 30-minute print interval.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.4 Test Initiated.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.5 Acceptance Cirteria: Charger maintained 150 amps at 125 volts for 8 hours.

/___/ Acceptable
/___/ Unacceptable

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.6 Printout attached.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.7 Current limit is 225 ±25 amps → current = _____

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

125 Volt Vital Battery No. IV
125 Volt Battery Charger IV

	TVA Tag #	Cal. Due Date	INITIALS
Micrometer #1	_____	_____	_____
Torque wrench #1	_____	_____	_____

Craftsman I Craftsman II

Approval to perform this instruction _____ / _____
SRO Date

6.1 Battery rack physical appearance
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ _____ / _____

6.2 Plate color and growth, cell condition
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ _____ / _____

6.3 Cell and cell terminal connections
/____/ Acceptable /____/ Unacceptable

NOTES: _____

_____ _____ / _____

6.8 Cell post and connectors are coated with corrosion-inhibiting grease

NOTES: _____

_____ _____ / _____

Data Taken By _____ / _____
Craftsman Date

Verified By _____ / _____
Craftsman Date

125-VOLT D.C. VITAL BATTERY BANK NO. IV
Sheet 1 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 1 (+)					
1 (-)					
2 (+)					
2 (-)					
3 (+)					
3 (-)					
4 (+)					
4 (-)					
5 (+)					
5 (-)					
6 (+)					
6 (-)					
7 (+)					
7 (-)					
8 (+)					
8 (-)					
9 (+)					
9 (-)					
10 (+)					
Cable & 10 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. IV
Sheet 2 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 11 (+)					
11 (-)					
12 (+)					
12 (-)					
13 (+)					
13 (-)					
14 (+)					
14 (-)					
15 (+)					
15 (-)					
16 (+)					
16 (-)					
17 (+)					
17 (-)					
18 (+)					
18 (-)					
19 (+)					
19 (-)					
20 (+)					
Cable & 20 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. IV
Sheet 3 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 21 (+)					
21 (-)					
22 (+)					
22 (-)					
23 (+)					
23 (-)					
24 (+)					
24 (-)					
25 (+)					
25 (-)					
26 (+)					
26 (-)					
27 (+)					
27 (-)					
28 (+)					
28 (-)					
29 (+)					
29 (-)					
30 (+)					
Cable & 30 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. IV
Sheet 4 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 31 (+)					
31 (-)					
32 (+)					
32 (-)					
33 (+)					
33 (-)					
34 (+)					
34 (-)					
35 (+)					
35 (-)					
36 (+)					
36 (-)					
37 (+)					
37 (-)					
38 (+)					
38 (-)					
39 (+)					
39 (-)					
40 (+)					
Cable & 40 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. IV
Sheet 5 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 41 (+)					
41 (-)					
42 (+)					
42 (-)					
43 (+)					
43 (-)					
44 (+)					
44 (-)					
45 (+)					
45 (-)					
46 (+)					
46 (-)					
47 (+)					
47 (-)					
48 (+)					
48 (-)					
49 (+)					
49 (-)					
50 (+)					
Cable & 50 (-)					

125-VOLT D.C. VITAL BATTERY BANK NO. IV
Sheet 6 of 6

READINGS TAKEN BY _____ / _____
Craftsman Date

VERIFIED BY _____ / _____
Craftsman Date

Connection Cell Nos.	6.4 Resistance μΩ	6.6 (If applicable) Resistance μΩ After Torque Only	QC/Date	6.7.4 (If applicable) Resistance μΩ After Removed and Cleaned	QC/Date
Cable & 51 (+)					
51 (-)					
52 (+)					
52 (-)					
53 (+)					
53 (-)					
54 (+)					
54 (-)					
55 (+)					
55 (-)					
56 (+)					
56 (-)					
57 (+)					
57 (-)					
58 (+)					
58 (-)					
59 (+)					
59 (-)					
60 (+)					
Cable & 60 (-)					

6.4.1 All connections are less than (150×10^{-6}) ohms /____/ Acceptable
/____/ Unacceptable

_____ _____
Craftsman #1 Craftsman #2

CHARGER NO. IV

6.9.1 Charger being tested removed from service and replaced with spare.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.2 Discharge unit test leads connected.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.3 Discharge unit programed to 8-hour discharge, 150 amps, 30-minute print interval.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.4 Test Initiated.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.5 Acceptance Cirteria: Charger maintained 150 amps at 125 volts for 8 hours.

/___/ Acceptable
/___/ Unacceptable

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.6 Printout attached.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.7 Current limit is 225 ±25 amps → current = _____

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

CHARGER NO. 1-S

6.9.1 Charger being tested removed from service and replaced with spare.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.2 Discharge unit test leads connected.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.3 Discharge unit programed to 8-hour discharge, 150 amps, 30-minute print interval.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.4 Test Initiated.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.5 Acceptance Cirteria: Charger maintained 150 amps at 125 volts for 8 hours.

/___/ Acceptable
/___/ Unacceptable

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.6 Printout attached.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.7 Current limit is 225 ±25 amps → current = _____

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

CHARGER NO. 2-S

6.9.1 Charger being tested removed from service and replaced with spare.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.2 Discharge unit test leads connected.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.3 Discharge unit programed to 8-hour discharge, 150 amps, 30-minute print interval.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.4 Test Initiated.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.5 Acceptance Cirteria: Charger maintained 150 amps at 125 volts for 8 hours.

/___/ Acceptable
/___/ Unacceptable

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.6 Printout attached.

_____ / _____ _____ / _____
Craftsman Date Craftsman Date

6.9.7 Current limit is 225 ±25 amps → current = _____

_____ / _____ _____ / _____
Craftsman Date Craftsman Date