| 2403 001 | | E/WORK PLAN TITLE: | | | PAGE | 6 of 40 |
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| | | UNIT II 2D11 P | ERFORMANCE TE | ST | CHANGE: | 008-03-0 |
| 0 INSTRUCT | IONS | | | | | |
| 8.1 | PERFORMAN | CE DISCHARGE TE | IST SET UP. | | | |
| | 8.1.1 | Removal of 2D: | 11 from servic | e: | | |
| . • • • • | -: | A. Verify C up and s | harger 2D31 or upplying power | alternate i for Bus 2D0 | s powered (1. | AU 4.22 |
| · · · · · · · · · · · · · · · · · · · | | B. Obtain a with the | ssistance from removal of 2D | Operations 11 from serv | to aid 🕻 rice. | <u>Ile/14</u> -22 |
| | | C. Open the | battery disco | nnect switch | ι, 2D51 ζ | <u> 11/14</u> .22 |
| The 2D01 removing | side of th the fuses. | e fuse connecti | WARNING ions are energ | ized. Avoid | contact wh | len |
| L | 8.1.2 | Remove the 180 | 00 amp fuses. | | | <u></u> |
| The Batt removing | ery side of the fuses. | the fuse conne | WARNING ections are end | ergized. Avo | oid contact | when |
| | 8.1.3 | Remove the pir | n indicating f | uses from 2D | 41. (| Clu 14-22 |
| | 8.1.4 | Verify that Ha "NORMAL" posit | andswitch AS1 tion. | on 2D41 is i | n the . | Ctv 14-22 |
| | | | | | | |
| | | | WARNING | | |] |
| The 2D01 bolting | side of th cables from | e fuse connecti test load devi | WARNING ions are energ: ice. | ized. Avoid | contact wh | len |
| The 2D01 bolting | side of th cables from 8.1.5 | e fuse connecti test load devi Bolt the cable battery side c | WARNING tons are energy tce. es from the ter of the 1800 am | ized. Avoid st load devi- o fuse conne | contact wh ce to the ctor. | en 20/14-22 |
| The 2D01 bolting ECOND PERSON | side of th cables from 8.1.5 VERIFIER | e fuse connecti test load devi Bolt the cable battery side c | WARNING tons are energy toc. es from the ter of the 1800 amp erify here ste | ized. Avoid st load devi- o fuse conner | contact wh ce to the c ctor. | en 20/14-22 |
| ECOND PERSON A Second | side of th cables from 8.1.5 VERIFIER d Person Ve | e fuse connecti test load devi Bolt the cable battery side c erifier shall ve | WARNING tons are energy toc. es from the ter of the 1800 amy erify here ste | ized. Avoid st load devi- p fuse conner p 8.15 was | contact wh ce to the c ctor. | correctly $/4-22$ |
| The 2D01 bolting ECOND PERSON A Secon | side of th cables from 8.1.5 <u>VERIFIER</u> d Person Ve 8.1.6 | e fuse connecti test load devi Bolt the cable battery side c erifier shall ve Install noncor at the dischar | WARNING lons are energy loce. es from the ter of the 1800 amy erify here ste nductive cover rge unit load 1 | ized. Avoid st load devid p fuse conner p 8.1 5 was Second Pe over the te pank. | contact wh ce to the c ctor. performed of erson verif rminals | correctly /4-22 fier Date //4-22 |
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| The 2D01 bolting ECOND PERSON A Secon | side of th cables from 8.1.5 VERIFIER d Person Ve 8.1.6 | e fuse connecti test load devi Bolt the cable battery side o erifier shall ve Install noncor at the dischar | WARNING lons are energy ice. es from the ter of the 1800 amy erify here ste nductive cover rge unit load 1 | ized. Avoid st load devic p fuse conner p 8.15 was Second Pe over the te pank. | contact where the contact whe | correctly /4-22 fier Date //4-22 |
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| The 2D01 bolting ECOND PERSON A Secon | side of th cables from 8.1.5 <u>I VERIFIER</u> d Person Ve 8.1.6 | e fuse connecti test load devi Bolt the cable battery side o erifier shall vo Install noncor at the dischar | WARNING lons are energy ice. es from the ter of the 1800 amp erify here ste nductive cover rge unit load b | ized. Avoid st load devis o fuse conner p 8.1 5 was Second Pe over the te pank. | contact where the contact where to the contact the contact where the contact of t | correctly $\frac{4}{14} - 22$ fier Date $\frac{14}{14} - 22$ |
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UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE

CHANGE: 008-03-0

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8.2 MEASURING CELL TEMPERATURE

PROCEDURE/WORK PLAN TITLE:

NOTE When using the Fluke model 51 DT to take temperature measurements, the DT and probe to be used must have a pre cal performed by the Met Lab before use and a post cal after use in the temperature range it is going to be used in. A DSG (Digital Specific Gravity Meter) may be used.

8.2.1 Measure the cell temperature of each individual cell as listed on Attachment 1.

NOTE

 \underline{IF} the front sample tube is bent or broken, THEN the thermometer may be placed in the rear sample tube.

NOTE A second person shall observe, sign and verify after completion, that steps A through C have been completed for all cells listed on Attachment 1 and this value recorded.

NOTE

Repeat steps 8.2.1.A through 8.2.1.C until all of the cells listed on Attachment 1 been measured.

- A. Place the thermometer in the sample tube of the individual cell being measured. Thermometer should rest on the upper sample tube housing.
- B. Leaving the thermometer in the cell being measured for 15 seconds will allow the reading to stabilize.
- C. Record the temperature to the nearest 1/10 °F for each cell on Attachment 1.

SECOND PERSON VERIFIER

An Second Person Verifier shall verify here and on Attachment 1 that temperature values were properly recorded in step 8.2.1.C for all rells.

VerAfier Second Person

D. IF any of the monitored cells have bent or broken sample tubes, or broken thermometer parts in the cell, <u>THEN</u> record the cell number in the space provided below, and notify the Electrical Maintenance Supervisor; <u>IF NOT</u>, <u>THEN</u> mark this step N/A.

Supervisor Remarks:

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| PROC /WORK PLAN NO. | PROCEDURE/WOR | K PLAN TITLE: | | PAGE: | 8 of 40 |
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| |] | | <u> </u> | | |
| | F | TF any cell temper | ature deviate | s more than | |
| | | 3°C (5°F) from the | other cells | during | |
| I. | | Inspection, THEN notify the Eli | ectrical Main | tenance | |
| x | | Supervisor; | cerrear nam | | |
| | | IF NOT, THEN mark this ste | n N/A | | |
| • | | IIIIN MAIN CHID DEC. | p N/N. | | |
| 1 | | Supervisor Remarks | : | | |
| | | | | | n/h. |
| I | | | | | <u></u> |
| · · · · · · · | F. | Calculate and reco | rd on Attachm | ent 1 the (| <u>u 4</u> |
| | | average cell tempe | rature of the | monitored | |
| | | CCTTS TIBEEd ON AL | cachinette 1. | | |
| | | | | | |
| 8.3 E | BATTERY PERFORM | MANCE DISCHARGE TEST | - | | |
| 8.3 E | BATTERY PERFORM | MANCE DISCHARGE TEST | | | |
| 8.3 H OE-10978 h | BATTERY PERFORM | MANCE DISCHARGE TEST CAUTION that some Albers test | st equipment) | have a delay | when |
| 8.3 F OE-10978 h changing f | BATTERY PERFORM as identified rom 0000 hours | MANCE DISCHARGE TEST <u>CAUTION</u> that some Albers test to 0001 hours on th | st equipment) he internal c | have a delay lock. This ca | when n cause |
| 8.3 F OE-10978 h changing f a shutdown bours prio | BATTERY PERFORM as identified rom 0000 hours of the test; | MANCE DISCHARGE TEST CAUTION that some Albers test to 0001 hours on th therefore the interr | st equipment) he internal c nal clock shal | have a delay lock. This ca ll be set at | when n cause 0100 |
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| 8.3 H OE-10978 h changing f a shutdown hours prio | as identified rom 0000 hours of the test; r to starting 3.3.1 Conn cont | MANCE DISCHARGE TEST CAUTION that some Albers test to 0001 hours on the therefore the interrefore the interrefore the interrefore the interrefore the test. Hect any remaining back rol wiring needed for rol. | st equipment h he internal c nal clock shal attery load t or load monit | have a delay o lock. This ca ll be set at est set (oring or | when n cause 0100 |
| 8.3 H OE-10978 h changing f a shutdown hours prio | as identified rom 0000 hours of the test; r to starting 3.3.1 Conn cont 3.3.2 Dete | CAUTION that some Albers test to 0001 hours on th therefore the interr the test. ect any remaining ba rol wiring needed for rol. | st equipment h he internal c nal clock shal attery load t or load monito low the disch | have a delay lock. This can ll be set at est set (oring or arge current | when n cause 0100 Cur 4 |
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| 8.3 H OE-10978 h changing f a shutdown hours prio | as identified rom 0000 hours of the test; r to starting 3.3.1 Conn cont 3.3.2 Dete corr aver and | MANCE DISCHARGE TEST CAUTION that some Albers test to 0001 hours on the therefore the interrefore the interrefore the interrefore the interrefore the test. Hect any remaining bar rol wiring needed for rol. The and record best rection factor (K Factorefore) rection factor (K Factorefore) the Table on Attached | st equipment h he internal c nal clock shat attery load t or load monit low the disch ctor) based u e obtained in ment 1. | have a delay lock. This can ll be set at est set (oring or arge current pon the Step 8.2.1 | when n cause 0100 Cur 4 |
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| | | | |
| | 8.3.3 | Calculate the actual discharge currend dividing 258 by the K Factor from Ste | nt by . ep 8.3.2. |
| , , , | | 258 amps $\div \frac{.960}{K \text{ Factor}} = \frac{2}{Act}$ Rated discharge K Factor Act | ual discharge current |
| 1 1 1 | • | $\frac{258 \text{ Amps}}{(K)} = \frac{2.69}{2.69} \text{ Amps}$ | Cle/4-22- |
| SECOND PERSO | N VERIFIER | | |
| A Seco dividi | nd Persón ng 258 by | Verifier is to calculate the actual dis the K Factor from Step 8.3.2 and record | charge current by below. |
| 1 | · | 258 amps + $\frac{1.960}{K}$ = $\frac{2}{Act}$ Rated discharge K Factor Act current | ual discharge |
| • | , | $\frac{258 \text{ Amps}}{(K)} = \frac{269}{269} \text{ Amps}$ | rson Verifier Date |
| | 8.3.4 | Set up the load tester to 269 and 12 hours calculated in Steps 8.3.3 and 12 hours discharge with a shutdown setting of cell voltage or 105 VDC bank voltage | amps <u><i>Clu</i></u> 4-22-6 rs of .75 VDC |
| | | | |
| SECOND PERSO | N VERIFIER | | |
| SECOND PERSO A Seco for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 | Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. | ter is set up correctly in Step 8.3.3 and a 4-22-0 |
| SECOND PERSO A Seco for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 | Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. | ter is set up correctly in Step 8.3.3 and a Additional July 14-22-0 Person Verifier Date |
| SECOND PERSO A Seco for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 8.3.5 | Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. Second Cognizant Supervisor shall verify ca are correct and has granted permission the test. | ter is set up correctly in Step 8.3.3 and a Attended 4-22-0 Person Verifier Date Iculations on to start |
| SECOND PERSO A Seco for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 8.3.5 | Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. Cognizant Supervisor shall verify ca are correct and has granted permission the test. | ter is set up correctly in Step 8.3.3 and a Att 4-22-0 Person Verifier Date lculations on to start Om E Now /4/22/02 ognizant Supervisor Date |
| SECOND PERSO A Seco for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 8.3.5 8.3.5 | Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. Cognizant Supervisor shall verify ca are correct and has granted permission the test. Close 2D51 disconnect switch. | ter is set up correctly in Step 8.3.3 and a 4-22-0 Person Verifier Date lculations on to start |
| SECOND PERSO A Seco for a shutdor | N VERIFIER nd Person 12 hour di wn of .75 8.3.5 8.3.6 8.3.7 | Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. Cognizant Supervisor shall verify ca are correct and has granted permission the test. Close 2D51 disconnect switch. Start the discharge test. | ter is set up correctly in Step 8.3.3 and a 4-22-0 Person Verifier Date lculations on to start 2mE Now $4/22/02ognizant Supervisor Date4/22/021/4-22-0$ |
| SECOND PERSO A Seco for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 8.3.5 8.3.6 8.3.7 8.3.8 | Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. Cognizant Supervisor shall verify ca are correct and has granted permission the test. Close 2D51 disconnect switch. Start the discharge test. Record the Start time on Data Sheet 1 Attachment 3. | ter is set up correctly in Step 8.3.3 and a 4-22-0 Person Verifier Date lculations on to start $2m^2$ how $4/22/02$ ognizant Supervisor Date 4/2-22-0 1 and |
| SECOND PERSO for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 8.3.5 8.3.6 8.3.7 8.3.8 8.3.8 8.3.9 | <pre>Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. Cognizant Supervisor shall verify ca are correct and has granted permission the test. Close 2D51 disconnect switch. Start the discharge test. Record the Start time on Data Sheet 1 Attachment 3. Adjust and maintain current throughon to the calculated value + 1% of setp Amp. (i.e., Displayed Value may vary setpoint by + 1%, then an additional</pre> | ter is set up correctly in Step 8.3.3 and a 4-22-0 Person Verifier Date lculations on to start $2m^2$ Mon /4/22/02 ognizant Supervisor Date 4/22/02 ognizant Supervisor Date 4/22/02 4/2/22/02 |
| SECOND PERSO A Seco for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 8.3.5 8.3.6 8.3.7 8.3.8 8.3.8 8.3.9 | <pre>Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. Cognizant Supervisor shall verify ca are correct and has granted permission the test. Close 2D51 disconnect switch. Start the discharge test. Record the Start time on Data Sheet A Attachment 3. Adjust and maintain current throughor to the calculated value + 1% of setp Amp. (i.e., Displayed Value may vary setpoint by + 1%, then an additional</pre> | ter is set up correctly in Step 8.3.3 and a 4-22-0 Person Verifier Date lculations on to start 2m 2 m 0, 4/22/02 ognizant Supervisor Date 4/22/02 ognizant Supervisor Date 4/22/02 4/2-22-0 4/2- |
| SECOND PERSO A Seco for a shutdo | N VERIFIER nd Person 12 hour di wn of .75 8.3.5 8.3.6 8.3.7 8.3.8 8.3.9 | <pre>Verifier shall verify that the load tes scharge at the current value calculated VDC or 105 VDC bank voltage. Cognizant Supervisor shall verify ca are correct and has granted permission the test. Close 2D51 disconnect switch. Start the discharge test. Record the Start time on Data Sheet A Attachment 3. Adjust and maintain current throughor to the calculated value + 1% of setp Amp. (i.e., Displayed Value may vary setpoint by + 1%, then an additional</pre> | ter is set up correctly in Step 8.3.3 and a 4-22-0 Person Verifier Date lculations on to start 2m $4/22/02ognizant Supervisor Date4/22/02ognizant Supervisor Date4/22/021$ and ut the test $4-22-0$ 1 and ut the test $4/4-22-0$ 1 and 1 Amp.) |

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UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE

008-03-0 CHANGE:

Extra data may be taken and attached for the following test. The discharge rate and the battery voltage should be monitored from start to stop.

NOTE

The print out from the Albers unit may be attached to this procedure to accompany the following step.

| | 8.3.10 | Monitor and record the discharge rate and the battery voltage at intervals established in Data Sheet 1. | _ |
|-----|--------|--|--------------------|
| 4 | 8.3.11 | IF the discharge is stopped for any reason other than a low voltage cell, THEN record the stop and restart times below; | <u>Cles 14</u> -23 |
| 1 | | THEN mark this step N/A. | |
| | ı | | |
| | | Stop time $1/50$ Restart time 07.50 | · · |
| | | Reason for discharge stop Unit dropped load | <u>1</u> |
| - 1 | | * SEE ER-AND-2002-0534-000 | |
|) | 8.3.12 | <u>IF</u> an individual cell or cells are approaching 1.0 volts, <u>THEN</u> record the cell(s) number below and notify the Cognizant Supervisor immediately, continue the test <u>closely</u> monitoring the cell voltage to verify that no cell goes to 0.75 VDC; <u>IF NOT</u> , <u>THEN</u> mark this step N/A: | |
| I | | Cell number: Volts: | |
| | | Cell number: Volts: | ~ 1.0 |
| | | Cell number: Volts: | NPA_ |
| : | 8.3.13 | IF at any time during the test a cell(s) voltage drops to 0.75 VDC, THEN stop the discharge immediately, contact the Cognizant Supervisor and record the stop time below and on Attachment 3, and go to Attachment 2; | Ĩ |
| 1 | | If NOT, | |
| 1 | | THEN mark this step N/A: | 1 |
| | | Discharge Stop Time: | NA |

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UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE

CHANGE: 008-03-0

| ne final oltage a | l readings approaches | NOTE need to be rapidly taken as the decaying overall and goes below the 105 VDC voltage level. | battery |
|--|--|--|--|
| 1 | 8.3.14 | Read the individual cell voltages and battery terminal voltage (rapidly) when the battery approaches 105 VDC, and record below and in the last column of Data Sheet 1. | |
| | | Final Battery readings recorded: 105.0 | Clu14.23- |
| | 8.3.15 | Decrease the test load to "0" when the overall battery voltage is 105 VDC. | <u>Cter 14-23-</u> |
| ri | 8.3.16 | Turn off test load. | <u>CW/4-23-</u> |
| 1 | 8.3.17 | Record the Stop Time above the last column on Data Sheet 1, and on Attachment 3. | <u>Cle 14</u> .23. |
| | 8.3.18 | Open 2D51 disconnect switch. | CW 14-23- |
| I | 8.3.19 | De-energize load tester. | CW1 4-23 |
| D01 sid isconne | e of fuse cting cabl 8.3.20 | WARNING connections are energized. Contact should be avoi es. Unbolt and remove the load test cables from the | .ded when |
| D01 sid isconne | e of fuse cting cabl 8.3.20 8.3.21 | WARNING connections are energized. Contact should be avoi es. Unbolt and remove the load test cables from the fuse cabinet. Disconnect any remaining battery load test set | .ded when |
| D01 sid isconne | e of fuse cting cabl 8.3.20 8.3.21 | WARNING connections are energized. Contact should be avoided es. Unbolt and remove the load test cables from the fuse cabinet. Disconnect any remaining battery load test set control or monitoring cables connected to the battery. | .ded when <u>Cur</u> 4-23-0 <u>Cur</u> 4-23-0 |
| D01 sid isconne | e of fuse cting cabl 8.3.20 8.3.21 EQUALIZE | WARNING connections are energized. Contact should be avoided es. Unbolt and remove the load test cables from the fuse cabinet. Disconnect any remaining battery load test set control or monitoring cables connected to the battery. CHARGE AND BATTERY RESTORATION | ded when <u>Cur</u> 4-23-0 <u>Cur</u> 4-23-0 |
| D01 sid isconne | e of fuse cting cabl 8.3.20 8.3.21 EQUALIZE 8.4.1 | WARNING connections are energized. Contact should be avoided. es. Unbolt and remove the load test cables from the fuse cabinet. Disconnect any remaining battery load test set control or monitoring cables connected to the battery. CHARGE AND BATTERY RESTORATION Place the battery on equalize charge by one of the following methods as directed by Cognizant Supervision. Supervision to record below the method to be used. | .ded when <u>Cur4-23-0</u> <u>Cur4-23-0</u> |
| D01 sid isconne | e of fuse cting cabl 8.3.20 8.3.21 EQUALIZE 8.4.1 | WARNING connections are energized. Contact should be avoided .es. Unbolt and remove the load test cables from the fuse cabinet. Disconnect any remaining battery load test set control or monitoring cables connected to the battery. CHARGE AND BATTERY RESTORATION Place the battery on equalize charge by one of the following methods as directed by Cognizant Supervision. Supervision to record below the method to be used. Method 1 Method 2 | ded when <u>Carl4.23-0</u> <u>Carl4.23-0</u> <u>Carl4.23-0</u> <u>Supervisor</u> |
| D01 sid isconne 8.4 | e of fuse cting cabl 8.3.20 8.3.21 EQUALIZE 8.4.1 | WARNING connections are energized. Contact should be avoided .es. Unbolt and remove the load test cables from the fuse cabinet. Disconnect any remaining battery load test set control or monitoring cables connected to the battery. CHARGE AND BATTERY RESTORATION Place the battery on equalize charge by one of the following methods as directed by Cognizant Supervision. Supervision to record below the method to be used. Method 1 Method 2 A. Install the pin indicating fuses in 2D41. | .ded when <u>Cur4-23-0</u> <u>Cur4-23-0</u> <u>Supervisor</u> <u>Cur4-23-0</u> <u>Supervisor</u> |
| D01 sid isconne 8.4 " <u>Methoc</u> | e of fuse cting cabl 8.3.20 8.3.21 EQUALIZE 8.4.1 | WARNING connections are energized. Contact should be avoided. es. Unbolt and remove the load test cables from the fuse cabinet. Disconnect any remaining battery load test set control or monitoring cables connected to the battery. CHARGE AND BATTERY RESTORATION Place the battery on equalize charge by one of the following methods as directed by Cognizant Supervision. Supervision to record below the method to be used. Method 1 ✓ Method 2 A. Install the pin indicating fuses in 2D41. B. Install the 1800 Amp fuses. | .ded when <u>Cur4-23-0</u> <u>Cur4-23-0</u> <u>Supervisor</u> <u>Cur4-23-0</u> <u>Cur4-23-0</u> |
| D01 sid isconne 8.4 | e of fuse cting cabl 8.3.20 8.3.21 EQUALIZE 8.4.1 | WARNING connections are energized. Contact should be avoided. es. Unbolt and remove the load test cables from the fuse cabinet. Disconnect any remaining battery load test set control or monitoring cables connected to the battery. CHARGE AND BATTERY RESTORATION Place the battery on equalize charge by one of the following methods as directed by Cognizant Supervision. Supervision to record below the method to be used. Method 1 | .ded when $\frac{C(1/4.23-c)}{C(1/4.23-c)}$ $\frac{TEB}{Supervisor} \frac{4}{23/c}$ $\frac{C(1/4-23-c)}{C(1/4-23-c)}$ $\frac{C(1/4-23-c)}{C(1/4-23-c)}$ |

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| 2403.001 | UN | IT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE | CHANGE: 008-03-0 |
| | Ε. | Verify that the electrical lineup is restored and the charger is working properly. | s <u>CU14-23-6</u> |
| 1 | F. | Record below the charger being used | |
| | | Charger used: 20-31 A | M14-23-0 |
| · · · · · · · · · · · · · · · · · · · | G. | Place the battery on an equalize cha (Charger set point is 135.2 to 137.5 Record below the equalizing start to voltage. $\frac{08:00}{\text{Start time}} \frac{137.3}{\text{Voltage}}$ | arge. 5 volts) ime and . <u>(W14</u> -23-6 |
| Step 8.5 ma accomplishe | y be performed d. | NOTE at any time after Step 8.4.1.G has b | been |
| · · · | н. | Record below the equalize voltage at battery after 15 hours from the stay equalization. | t the rt of |
| I. | | Battery Terminal Voltage: 137.2 | <u>6 vdc</u> |
| ; | | MT&E used: DMM -081 Cal. Due: 7- | 14.02 - 14-23 |
| | I. | WHEN the equalize charge current real less than 2 amps (end of charge current THEN place the battery on float char Record below the equalizing stop time date, and voltage. | aches rent), rge. ne, |
| "Method 2 | | <u>14.40 /4-25-02/ 128.5</u> Stop time Date Voltage | <u>Clu 14-25-</u> |
| | | | |
| | | NOTE | |
| A Te | np. Mod. may b | e required to power the spare battery | / charger. |
| | | | |
| · . | A. | Install the pin indication fuses in | 2D41: MAI |
| | А. . В. | Install the pin indication fuses in Bolt 2-2/C 2/0 AWG cables or greated the spare 200 Amp battery charger. (S Model RCS200 or equal) to the batter of the 1800 Amp fuse connector. | 2D41: $MA/$ r from $MA/$ SCI ry side |
| | А. В. | Install the pin indication fuses in Bolt 2-2/C 2/0 AWG cables or greater the spare 200 Amp battery charger.(S Model RCS200 or equal) to the batter of the 1800 Amp fuse connector. Close the 2D51 Disconnect Switch. | 2D41: $MA/$ r from $MA/$ SCI ry side MA/ |
| | A. B. | Install the pin indication fuses in Bolt 2-2/C 2/O AWG cables or greater the spare 200 Amp battery charger (S Model RCS200 or equal) to the batter of the 1800 Amp fuse connector. Close the 2D51 Disconnect Switch. | 2D41: MAI r from MAI SCI ry side MAI |
| | А. В. С. | Install the pin indication fuses in Bolt 2-2/C 2/O AWG cables or greater the spare 200 Amp battery charger. (S Model RCS200 or equal) to the batter of the 1800 Amp fuse connector. Close the 2D51 Disconnect Switch. | 2D41: MAI r from MAI SCI ry side NAI |
| | А. В. С. | Install the pin indication fuses in Bolt 2-2/C 2/O AWG cables or greater the spare 200 Amp battery charger. (S Model RCS200 or equal) to the batter of the 1800 Amp fuse connector. Close the 2D51 Disconnect Switch. | 2D41: MAI r from MAI SCI ry side NAI |
| | А. В. С. | Install the pin indication fuses in Bolt 2-2/C 2/O AWG cables or greater the spare 200 Amp battery charger. (S Model RCS200 or equal) to the batter of the 1800 Amp fuse connector. Close the 2D51 Disconnect Switch. | 2D41: MAI r from MAI SCI ry side NAI |

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PROC./WORK PLAN NO. 2403.001

PROCEDURE/WORK PLAN TITLE: UNIT II 2D11 PERFORMANCE TEST

ELECTRICAL MAINTENANCE

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NOTE Charging at the higher equalize voltage of 144 min. - 145 max. will create more gas and heat than at the normal equalize charge of 135.2 to 137.5 volts Place the battery bank on a high level D equalize charge of 144 min. - 145 max. volts and perform the following. NOTE Banana jacks and wiring will be installed across the shunt and mounted on the charger to facilitate the voltage measurements. 1. Record below the equalizing start time and voltage. Start time Date Voltage NOTE Step 8.5 may be performed at any time after the battery has been placed on equalize charge (or at the same time the battery is being placed on equalize charge). 1 2. Monitor the current supplied by the spare battery charger. 3. Maintain charger voltage at 144 min -145 max. 4. Monitor electrolyte temperature to ensure it does not exceed 120° F. during the high level equalize charge. NOTE When using the Fluke model 51 DT to take temperature measurements, the DT and probe to be used must have a pre cal performed by the Met Lab before use and a post cal after use in the temperature range it is going to be used in. A DSG (Digital Specific Gravity Meter) may be used. . 5. When the equalize charge current reaches the range of 20 amps or below, "open" Disconnect switch 2D51 and measure the current by using a Fluke Digital Multimeter 8842A or equivalent across J1 and J2 of 2D41. (100mv = 20)amps)

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| 2403.001 | | UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE | CHANGE: | 008-03-0 |
| | | 6. Stop the equalize charge (deenergizing the spare bat charger) when the current than 2 amps as measured in Record below the equalizin date and final measurement | by tery reaches less 2D41. g stop time, reading. | |
| | | / | | MAI |
| : | | Stop time Date Mv | Amps | |
| | E | 5. Verify 2D51 Disconnect switch is | s open. | NH / |
| | . I | Verify that the spare battery cl disconnected and determinate the from the charger and 2D41. | harger is e cables | <u>N/A / _</u> |
| | C | . Install the 1800 amp fuses. | • | NAI |
|) | ł | Check tightness of all connection 2D-51, tighten snug tight as new | ons inside cessary. | N/A [|
| 4 |] | Close the 2D51 Disconnect switch | h. | NA I |
| ۲. | . L | J. Place the battery on float charg | ge. | NA / |
| | | NOTE | <u> </u> | |
| measured at | t the batte | ry terminal. | | WIIEI |
| measured at | t the batte 8.4.2 F | Record the float voltage measured at below: | the battery | C~ 5-2-4 |
| measured at | t the batte 8.4.2 F | Record the float voltage measured at below: $e_{1} = 5 - 2 - 6 = 6$ Toltage $\frac{1 - 3 - 3 - 6}{1 - 3 - 3 - 6}$ | the battery | c. 5-2-2 |
| Measured at | t the batte 8.4.2 F 1 1 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | Record the float voltage measured at below: Toltage <u>130.3</u> F the float voltage <u>"is not"</u> within 30.5 volts, THEN notify the Electrical Supervisor 7/S for an evaluation of the problem. F the float voltage is below 124.7 voltage THEN <u>"immediately"</u> notify the Electric Supervisor and S/S that a possible Ter- riolation exists. | the battery 127.6 to and/or DC, cal sch Spec | en 5-2-2 |
| ACCEPTANCE CRITERION 8.5 E | 8.4.2 F 8.4.2 F 1 1 1 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | Record the float voltage measured at below: Voltage <u>130.3</u> F the float voltage <u>"is not"</u> within 30.5 volts, THEN notify the Electrical Supervisor VS for an evaluation of the problem. F the float voltage is below 124.7 within HEN <u>"immediately</u> " notify the Electric Supervisor and S/S that a possible Terviolation exists. ACITY CALCULATION | the battery 127.6 to and/or VDC, cal ech Spec | er 5-2-2 |
| ACCEPTANCE CRITERION 8.5 E | t the batte 8.4.2 F 8.4.2 F 3.5.1 I 7 8.5.1 I 7 7 7 7 7 7 7 7 7 7 7 7 7 | ry terminal. Record the float voltage measured at below: Poltage <u>130.3</u> F the float voltage <u>"is not"</u> within 30.5 volts, THEN notify the Electrical Supervisor 7/S for an evaluation of the problem. F the float voltage is below 124.7 W THEN <u>"immediately"</u> notify the Electrical Supervisor and S/S that a possible Terviolation exists. ACITY CALCULATION F Attachment 2 was used, THEN use the new calculated T _A from s Attachment 2; F NOT, THEN obtain T _A from Data Sheet 2, Start Time - Stop Time) | the battery 127.6 to and/or VDC, cal ech Spec tep 15 of | WIEN CC 5-2-A CC / |
| ACCEPTANCE CRITERION 8.5 E | BATTERY CAP 3.5.1 3.5.2 1 7 7 7 7 7 7 7 7 7 7 7 7 7 | ry terminal. Record the float voltage measured at below: e = 5 - 2 - 6 - 6 - 5 - 2 - 6 - 6 - 6 - 6 - 2 - 6 - 6 - 6 - 2 - 6 - 6 | the battery 127.6 to and/or DC, cal ech Spec tep 15 of 8.2.11, stopped ted from the test | WITCH Car 5-2-2 Car / - Car / - 29 |
| ACCEPTANCE CRITERION 8.5 E | BATTERY CAP 3.5.1 5.5.2 7 7 7 7 7 7 7 7 7 7 7 7 7 | ry terminal. Record the float voltage measured at below: $e = 5 - 2 - 6 - 6 - 5 - 2 - 6 - 6 - 5 - 2 - 6 - 6 - 5 - 2 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6$ | the battery 127.6 to and/or VDC, cal ech Spec tep 15 of 8.2.11, stopped ted from the test | WITCH Car 5-2-4 Car 1 |

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PROC./WORK PLAN NO. **PROCEDURE/WORK PLAN TITLE:** PAGE: 15 of 40 2403.001 **UNIT II 2D11 PERFORMANCE TEST** 008-03-0 CHANGE: ELECTRICAL MAINTENANCE NOTE The following calculations is required to comply with Tech Spec step 500 attached 534-000 ER-ANO-2002-0534-000 4.8.2.3 E. Determine the capacity of the battery by completing the following equation: % capacity at 77°F = $(T_{a} / T_{c}) \times 100$ T_{a} = Actual time of the test in minutes. T_c = Rated time to specified terminal voltage in minutes (8hrs. or 480 minutes) _____ x 100 = <u>98.3</u>% capacity T_n (minutes) _ BEG 14-29-02 480 minutes SECOND PERSON VERIFIER A Second Person Verifier shall repeat the calculations for determining the capacity of the battery. T_A (minutes) _____ _ x 100 = % capacity 480 minutes Second Person Verifier NOTE Per Tech Spec 4.8.2.3.e and f, battery capacity must be ≥80%. However, if capacity is <90%, then the 60 month Performance Discharge Test must be performed every 18 months. Kg 14.2902 8.5.4 Notify System Engineering to evaluate the calculated capacity to determine compliance with Tech Spec. 4.8.2.3.E and 4.8.2.3.F. BATTERY MAINTENANCE 8.6 NOTE When tightening the terminal connectors, two insulated wrenches should be used, applying one as counter-torque to prevent damage to the terminal post. If just checking the torque of a 5/16 inch stainless bolt connection that was not disassembled then 125 in/lb is the proper value. If the connection was loosened or disassembled then torque to 165 in/lbs. Step 8.6.1 through 8.6.7 may be accomplished at any time after Step 8.4.6 has been accomplished. Steps 8.6.8 through 8.6.10 may be accomplished after equalize charge current diminishes to a low enough level such that charge current does not affect resistance readings. Verify that all battery connections are tight by $\frac{1}{122}$ $\frac{1}{29.02}$ 8.6.1 125 in/lbs

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| 2403.001 | | UNIT II 2D11 ELECTRIC | PERFORMANC | E TEST | CHANGE: | 008-03-0 |
| · · | 8.6.2 | Record below due date and | the torque the torque | wrench used, c values: | calibration | |
| ! | | Torque wrenc | h number: | TW792 | | |
| : | · | Calibration | due date: | 5-25-07 | - | _ |
| • | | Torque value | :_125 in 1 | bs | | <u> 182-14</u> -29. |
| The micro- cable conn | ohm limit ections n | is for the in eed to be meas | NOTE atercell str sured from t | aps and cable he battery pos | connections. t to termina | The l lug. |
| | 8.6.3 | Perform an " the reading Sheet 2. | As Left" mid in the "As I | ero-ohm check a Left" section c | nd record of Data | |
| | 8.6.4 | Verify if an greater than appropriate | y intercell 150 micro-c space below: | micro-ohm read ohms and check : | ling is the | |
| | | Yes | | | | |
| | | <u>IF</u> the answe <u>THEN</u> proceed <u>IF</u> the answe <u>THEN</u> mark st proceed to s | , r is "yes", to step 8.6 r is "no", eps 8.6.5 th tep 8.6.8. | 5.5. arough 8.6.7 "N | J/A" and | |
| | 8.6.5 | <u>IF</u> the answe <u>THEN</u> perform <u>IF NOT</u> , <u>THEN</u> mark th | r to 8.6.4 v the followi e following | was "Yes", ing; steps N/A. | | |
| 1 | | A. Open di | sconnect sw | itch 2D51. | · . | UAL |
| Р 1 | | B. Disasse | mble the af: | fected connecti | ion(s). | N/A-1 |
| | | C. Clean a connect then co (TM C 1 | nd neutrali: ions using) at the conne 73.0010) and | ze the affected baking soda and ections per C&I d reassemble. | i water, D Manual | <u>h)</u> A/ |
| 1 1 | | D. Torque in/lbs. | the affected | d connections t | 0 165 | NA1 |
| | | E. Micro-c | hm the affeo | cted connection | 18. | NAI_ |
| 1 | | | | | | |
| 1 | | | | | | |
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| 2403.001 | UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE | CHANGE: | 008-03-0 |
| - | F. Record the micro-ohm readings of the affected connections on Data Sheet fl them as the second "As Left" reading. <u>IF</u> the second "As Left" reading <u>IS</u> acceptable, <u>THEN</u> proceed to step 8.6.7. <u>IF</u> the second "As Left" reading is <u>NO</u> acceptable, <u>THEN</u> proceed to step 8.6.6. | a gg ing T | <u>M</u> A/ |
| ۰ ۲ ۲ | .6.6 IF the reading is still unacceptable, THEN perform the following. IF the reading is acceptable, THEN mark steps A through F "N/A" and proce step 8.6.7. | eed to | |
| | A. Verify Disconnect Switch 2D51 is open | • | h/j/2/ |
| : | B. Replace the affected parts. | | MAL |
| | C. Clean and neutralize replacement part coat connections per C&D Manual (TM C 173.0010) and reassemble. | s and | MB1_ |
| | D. Torque connections to 165 in/lbs. | | NA1 |
| ! | E. Obtain an "As Left" resistance readin | g. | MA/ |
| · · · | F. Record action taken and readings on t Left" comments section of Data Sheet | he "As 2. | -N/M |
| . e | .6.7 Close Disconnect Switch 2D51. | | MA / |
| ee step Xe | .6.8 Place the battery bank on Float charge and record the time, date and float voltage be | - low: | 1 |
| ,1,2 | Time and Date <u>1440 / 4-25-02</u> Float Voltage <u>128.5</u> VDC | | 15- 14- |
| 8 | .6.9 Perform 3 random specific gravity readings the 2D11 battery bank, using procedure 2400 as a guide, to determine if stratification these cells exist. | on 3.024 of | · |
| | A. <u>IF</u> stratification of the tested cells electrolyte exists, <u>THEN</u> mix the electrolyte in each cell the battery bank for 30 minutes on eacell, using a variable speed micro put with suction taken from the top of the cells through the flame arrestor hole discharge through the sample tube to bottom of the cells; <u>IF NOT</u>, <u>THEN</u> mark this step N/A. | of ch mp, e , and the | <u>МА-/_</u> |

| PROC./WORK PLAN NO. | PROCEDURE/WORK | (PLAN TITLE: | | PAGE: | 18 of 40 |
|----------------------|--|--|---|---|----------------|
| 2403.001 | UN | IT II 2D11 PERFORM | ANCE TEST ENANCE | CHANGE: | 008-03-1 |
| : | В. | Verify cell para 0503-001 Table : declaring 2D11 d 7 days (ref. T.S | ameters meet ER-ANG 2 acceptance criter operable for a max: 3. 4.8.2.3). | D-2002- ria for imum of | Aey 1 |
| 9.0 <u>RESTORATI</u> | ON AND CHECKOU | I Xuork was d | GNE 4-15-02 Proc | cedure cha | nge was |
| 9.1 | IF any Condition of this procedu | 4-29-02 on Reports were i are, where the Condi | ssued during the p | erformance | νια / |
| I | procedure; IF NOT, THEN mark this | step N/A. | | | |
| 9.2 | Verify that the been met. | e requirements of | Housekeeping Leve | l II have 🤆 | A 94 1 1 |
| 9.3 | Verify that the deficiency. | e measuring and t | est equipment have | no known 🧧 | 1 cy 1 |
| 9.4 | Verify with ope normal operatic | erations that 2D1 on/lineup. | l has been returne | d to its 🦂 | 898 1. |
| measured at | t the battery t | erminal. | pat voltage is bet | | 1 <u>4</u> 1 |
| 9.5 | Verify that the and 130.5 VDC w | e battery bank flo when on normal flo | oat voltage is bet oat charge. | ween 127.6 | 1az 1: |
| 9.6 | Verify that all less than or eq | . cell-to-cell and ual to 150 mocro | d terminal connect -ohms. | ions are | <u> 15-7-</u> |
| 9.7 | Verify that the include the fol | e battery log boo lowing: | k has been updated | to | |
| 2 | 9.7.1 Date | this procedure w | as performed. | 1 | try 1 |
| 2 | 9.7.2 Time | this procedure w | as started. | 4 | AEy 11 |
| 2 | 9.7.3 Time | this procedure w | as completed. | Ċ | 184 1S |
| : | 9.7.4 Any j take | problems encounte n. | red and corrective | action 🧹 | 854 1. |
| <u>9</u> | 9.7.5 Perfe | ormer of this pro | cedure. | | 2 Fr 1: |
| 9.8 P I C | Notify the Unit Performance Dis charger is not bus. | 2 Operations Sh charge Test is co on equalize or ba | ift Manager that t omplete and the ba attery disconnected | he 2D11 <u>-</u> ttery d from the | <u> 49- 18</u> |
| 4 1 | | | | | |
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| | PROCEDURE/WORK PLAN IIILE: | FAGE: | 190140 |
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| 2403.001 | UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE | CHANGE: | 008-03-0 |
| 9.9 | Perform post test check of torque wrenches on Torqu and record the following: | e Tester, | 145-13-1-C |
| | Equip. No. $Tu - 782$ Cal. Due Date $5/6$ | 15 102 | |
| | Equip. No. <u>7 W-655</u> Cal. Due Date <u>6</u> / | 1 102 | <u>A 44.15.1.0</u> |
| 9.10 | All setpoints and tolerances in this procedure have checked and are verified to be within the limits he specified and any exceptions are noted. | been rein | |
| | Comments/Actions taken: | | |
| | | 6 | |
| | Maintena Maintena | ance Super | 15,020 Tvisor Data |
| Per Tech S months ins has reache indicated from its a manufactur The capac | Spec 4.8.2.3.f, this discharge test must be accompli- stead of 60 months IF the battery shows signs of deg ed 85% of the service life (year 2003 for 2D11). Deg when the battery capacity drops more than 10% of ra average on previous performance tests, or is below 9 rer's rating. 2D-11 has had one test performed prior ity at that time was recorded to be 116.25% (JO-8731 | shed ever pradation, pradation ted capac 0% of the to 10/12 .02, micro | y 18 or is ity /99. film |
| Per Tech S months ins has reached indicated from its a manufactur The capac: #64101381 IDEAS). Th to the ave capacity f surveillar 9.11 | Spec 4.8.2.3.f, this discharge test must be accomplisted of 60 months IF the battery shows signs of deged 85% of the service life (year 2003 for 2D11). Dege when the battery capacity drops more than 10% of radiaverage on previous performance tests, or is below 9 rer's rating. 2D-11 has had one test performed prior ity at that time was recorded to be 116.25% (JO-8731) and 106.5566% recalculated under CR-2-97-0444 (JO-9 he measured capacity of the test being performed must be rests previously accomplished. Should the fall MORE THAN 10% below the 111.4033%, then the 240 nce must be rescheduled to be accomplished every reference must be rescheduled to be accomplished every reference with the measured capacity observed during the set have compared with the measured capacity observed during the set with the measured | shed ever radation, (radation ted capac 0% of the to 10/12 .02, micro 56320 on t be comp the measur 3.001 tueling ou been | y 18 or is ity /99. film ared ed tage |
| Per Tech S months ins has reached indicated from its a manufactur The capace #64101381 IDEAS). The to the avec capacity of surveillar 9.11 | Spec 4.8.2.3.f, this discharge test must be accompli- stead of 60 months IF the battery shows signs of deg ed 85% of the service life (year 2003 for 2D11). Deg when the battery capacity drops more than 10% of ra average on previous performance tests, or is below 9 rer's rating. 2D-11 has had one test performed prior ity at that time was recorded to be 116.25% (JO-8731)) and 106.5566% recalculated under CR-2-97-0444 (JO-9 he measured capacity of the test being performed must erage of the tests previously accomplished. Should t fall MORE THAN 10% below the 111.4033%, then the 240 nce must be rescheduled to be accomplished every ref Battery capacity as measured during this test have compared with the measured capacity observed during previous tests | shed ever radation, radation ted capac 0% of the to 10/12 .02, micro 56320 on t be comp the measur 3.001 tueling ou been | y 18 or is ity /99. film ared ed tage |
| Per Tech S months ins has reached indicated from its a manufactur The capac: #64101381 IDEAS). Th to the ave capacity f surveillar 9.11 | Spec 4.8.2.3.f, this discharge test must be accompli- stead of 60 months IF the battery shows signs of deg ed 85% of the service life (year 2003 for 2D11). Deg when the battery capacity drops more than 10% of ra average on previous performance tests, or is below 9 rer's rating. 2D-11 has had one test performed prior ity at that time was recorded to be 116.25% (JO-8731) and 106.5566% recalculated under CR-2-97-0444 (JO-9 he measured capacity of the test being performed must erage of the tests previously accomplished. Should t fall MORE THAN 10% below the 111.4033%, then the 240 nce must be rescheduled to be accomplished every ref Battery capacity as measured during this test have compared with the measured capacity observed during previous tests The capacity average or battery condition do warrant the performance of this test even refueling outage in the future. | shed ever radation, radation ted capac 0% of the to 10/12 02, micro 56320 on the measur 3.001 tueling ou been ves ry | y 18 or is ity /99. film ared ed tage |
| Per Tech 9 months ins has reached indicated from its a manufactur The capac: #64101381 IDEAS). Th to the ave capacity f surveillar 9.11 | Spec 4.8.2.3.f, this discharge test must be accompli stead of 60 months IF the battery shows signs of deg ed 85% of the service life (year 2003 for 2D11). Deg when the battery capacity drops more than 10% of ra average on previous performance tests, or is below 9 rer's rating. 2D-11 has had one test performed prior ity at that time was recorded to be 116.25% (JO-8731) and 106.5566% recalculated under CR-2-97-0444 (JO-9 he measured capacity of the test being performed muse erage of the tests previously accomplished. Should t fall MORE THAN 10% below the 111.4033%, then the 240 nce must be rescheduled to be accomplished every ref Battery capacity as measured during this test have compared with the measured capacity observed during previous tests The capacity average or <u>battery condition</u> do warrant the performance of this test ever refueling outage in the future. | shed ever radation, radation ted capace 10% of the to 10/12 02, micro 56320 on the measur 3.001 tueling out been ves ry ves not ry | y 18 or is ity /99. film ared ed tage |
| Per Tech 9 months ins has reached indicated from its a manufactur The capac: #64101381 IDEAS). Th to the ave capacity f surveillar 9.11 | Spec 4.8.2.3.f, this discharge test must be accompli stead of 60 months IF the battery shows signs of deg ed 85% of the service life (year 2003 for 2D11). Deg when the battery capacity drops more than 10% of ra average on previous performance tests, or is below 9 rer's rating. 2D-11 has had one test performed prior ity at that time was recorded to be 116.25% (JO-8731) and 106.5566% recalculated under CR-2-97-0444 (JO-9 he measured capacity of the test being performed must erage of the tests previously accomplished. Should t fall MORE THAN 10% below the 111.4033%, then the 240 nce must be rescheduled to be accomplished every ref Battery capacity as measured during this test have compared with the measured capacity observed during previous tests The capacity average or battery condition do warrant the performance of this test even refueling outage in the future. The capacity average or battery condition do warrant the performance of this test even refueling outage in the future. Respo | shed ever radation, radation ted capace 10% of the to 10/12 .02, micro 156320 on the measur 3.001 tueling ou been ves not ry nsible En | y 18 or is ity /99. film ared ed tage |
| Per Tech S months ins has reached indicated from its a manufactur The capace #64101381 IDEAS). Th to the ave capacity f surveillar 9.11 9.11 | Spec 4.8.2.3.f, this discharge test must be accompli- stead of 60 months IF the battery shows signs of deg ed 85% of the service life (year 2003 for 2D11). Deg when the battery capacity drops more than 10% of ra- average on previous performance tests, or is below 9 rer's rating. 2D-11 has had one test performed prior ity at that time was recorded to be 116.25% (JO-8731)) and 106.5566% recalculated under CR-2-97-0444 (JO-9 he measured capacity of the test being performed mus- erage of the tests previously accomplished. Should t fall MORE THAN 10% below the 111.4033%, then the 240 nce must be rescheduled to be accomplished every ref Battery capacity as measured during this test have compared with the measured capacity observed during previous tests The capacity average or <u>battery condition</u> do warrant the performance of this test even refueling outage in the future. The capacity average or battery condition do warrant the performance of this test even refueling outage in the future. A PIF has been submitted to include this latest test in this procedure for use next performance. | shed ever radation, radation ted capac 10% of the to 10/12 .02, micro 56320 on the measur 3.001 tueling ou been been ry pes not ry nsible En st data | y 18 or is ity /99. film ared ed tage $\frac{5/5/D2}{gineer}$ |

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- 10.0 ATTACHMENTS AND FORMS
- 10.1 ATTACHMENTS
 - 10.1.1 Attachment 1 Discharge Current Correction K Factor For Temperature
 - 10.1.2 Attachment 2 Jumpering Low Voltage Cells
 - 10.1.3 Attachment 3 Calculation for Total Down Time
 - 10.1.4 Data Sheet 1 Performance Discharge Test Battery Bank Voltage
 - 10.1.5 Data Sheet 2 "As Left" Resistance
- 10.2 FORMS

10.2.1 None

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ATTACHMENT 1

DISCHARGE CURRENT CORRECTION FACTOR K FOR TEMPERATURE

NOTE When using the Fluke model 51 DT to take temperature measurements, the DT and probe to be used must have a pre cal performed by the Met Lab before use and a post cal after use in the temperature range it is going to be used in. A DSG (Digital Specific Gravity Meter) may be used.

| | Average | |
|---------------------------------------|-------------------|----------|
| Cell No. Temp. (F) | Temp. (F) | Factor K |
| (nearest 1/10 °F) | (nearest 1/10 °F) | |
| · · · · | | |
| 1 <i>84.8</i> | 62 | 1.098 |
| 6 85,2 | 63 | 1.092 |
| 12 85.8 | 64 | 1.086 |
| 18 <u>85,9</u> | 65 | 1.080 |
| _24 %4.% | 66 ` | 1.072 |
| 30 84.7 | 67 | 1.064 |
| 36 84.3 | . 68 | 1.056 |
| 43 84.4 | 69 | 1.048 |
| 48 84.6 | 70 | 1.040 |
| 54 · 84.8 | 71 | 1.034 |
| I | 72. | 1.029 |
| Temp. | 73 | 1.023 |
| Total for | 74 | 1.017 |
| 10 cells = 543.3 | 75 | 1.011 |
| · · · · · · · · · · · · · · · · · · · | 76 | 1.006 |
| | 77 . | 1.000 |
| | 78 | 0.994 |
| Temp. Total for 10 cells | 70 | 0 007 |
| = Avg. Iemp. | 79 | 0.967 |
| - 0C | 80 | 0.980 |
| Average Temp - 849 .F | 0.0 DT | 0.970 |
| Average remp. $=$ F | 82 | 0.972 |
| Bag Bactor K - 960 | 83 | 0.966 |
| keq. Factor $k = -700$ | 84 | 0.964 |
| 1 | 83 | 0.960 |
| 1 I | 88 | 0.950 |
| | 87 | 0.952 |
| | 80 | 0.940 |
| | 89 | 0.944 |
| | 91 | 0.940 |
| | 22 , 21 , | 0.550 |
| : | | 0.230 |
| Test Equip. # <u>D56-002</u> | Cal. Due: 5-5-0 | 2 |
| Prostal to | 4 12+ 12- | 2 |
| Performed By | | |
| | Date | |
| I WANT K I KAN | 4,77,07 | 7 |
| Second Person Verifier | | _ |
| Second reison verittet | • Date | |
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ATTACHMENT 2

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PAGE:

Performance Test Cell Jumpering Procedure

NOTE

This Attachment provides a method to BY-PASS a low voltage cell.

NOTE

Responsible Engineer shall review Attachment 2 if attachment is required for procedure completion.

A Second Person Verifier shall verify the content of steps 10, 11, and 15.

NOTE

NOTE Two - 250 mcm cables with 3/8 - 1/2 lug, cables approximate length is 10 feet will be needed for the cell jumpering. These are available in the Maintenance Facility Battery Storage Room.

 Record the number of the cell(s) at or below 0.75 VDC, the Stop Time, the Cell voltage and the Bank Voltage below and on Attachment 3.

 Cell Number:
 Cell Voltage:
 Stop Time:
 Bank Voltage:

 Cell Number:
 Cell Voltage:
 Stop Time:
 Bank Voltage:

NOTE

At this time the Cognizant Supervisor shall make the judgement to determine if the cell(s) should be jumpered or to continue the test with the cell(s) installed. This judgement should be based on Total Test Time, overall Bank Voltage, and the number of cells at or below 0.75 volts.

<u>IF</u> the Cognizant Supervisor's judgment is to continue the test with the cell(s) installed,

THEN restart the discharge at the calculated current and record the restart time below and on Attachment 3. Continue recording data on Data Sheet 1 and discharge the bank until the bank voltage approaches 105 VDC, N/A Steps 3 through 11 of this Attachment and continue with Step 12.

 $\underline{\rm IF}$ the Cognizant Supervisor's judgement is to jumper the cell(s), $\underline{\rm THEN}$ mark "Restart Time" below N/A and continue with Step 3.

Restart Time:_____

Cognizant Supervisor Date

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| 2403.001 | UNIT II 2D11 PERFORMANCE TEST | | |
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ATTACHMENT 2



3. Open 2D51 Disconnect Switch.

4.



WARNING Jumpering, shorting or connecting the positive and negative lugs of a single cell may cause equipment damage or personnel injury.

Jumpering of end cell may be accomplished by using the inter-tier or interbank cables.

Using Figure 1 as a guide only and presuming "B" is the affected cell then remove bolts and intercell connection straps from the low voltage cell and its adjacent cell terminals.

NOTE Based on which is the low cell you may be jumpering the negative of A to the positive of C. As shown below in figure 2.





| | , *- 1 | | | |
|----------|------------------------------------|---|---------------------|-----------|
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| | • | ATTACHMENT 2 | Page 3 of | 5 |
| 5. | Bolt a (2 to the le bolts as | 50 mcm) jumper from the left negative Battery A te ft positive Battery C terminal, using the same sta used in the intercell connection straps. | erminal inless - | |
| б. | Bolt anot terminal stainless | her (250 mcm) jumper from the right negative Batte to the right positive Battery C terminal, using th bolts as used in the intercell connection straps. | ery A le same | |
| 7. | Torque te value and | rminal bolts to 165 in/lbs and record below the to the recal date: | orque - | / |
| | Torque wr Torque va | ench number: | • | |
| | Recal, Dat | e: | | |
| 8. | Discharge | the battery to a new voltage of | - | |
| | | 105 - (1.81 x # of Cells Jumpered) - new voltage | | |
| | T | Example: | | |
| | 1 | 105 - (1.81 x 1 cell) = 103.19 VDC | 2 | |
| | I | 105 - (1.81 x 2 cells) = 101.38 VDC | 2 | |
| | | 105 - (1.81 x) - Ne | w Discharo | e Voltage |
| SECON | JD PERSON V | ERIFIER | - | - |
| | A Second in step 8 | Person Verifier shall verify the "New Discharge Vo is correct. | oltage" | / |
| | | Second P | erson Veri | fier Date |
| 9. | Close 2D5 | 1 Disconnect Switch. | - | |
| Г | * | CAUTION | | |
| | While c | discharging, continue to watch for cells falling be | elow .75 VI | pc. |
| . 10. | Restart d | ischarge at the calculated current. | | |
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| 2403.001 UNIT II 2011 PERFORMANCE TEST ELECTRICAL MAINTENANCE CHANGE: 008-03-4 ATTACHMENT 2 Page 4 of 5 11. Record the restart time (below and on Attachment 3), and battery terminal voltage after the load is applied: Discharge started at Amps Time restarted: | PROC./W | ORK PLAN NO. | PROCEDURE/WORK PLAN TITLE: | | PAGE | 25 of 40 |
|---|------------|------------------------------------|---|---|---------------------------|-----------------|
| ATTACHMENT 2 Page 4 of 5 11. Record the restart time (below and on Attachment 3), and battery terminal voltage after the load is applied: Discharge started at Amps Time restarted: Overall battery terminal voltage VDC SECOND PERSON VERIFIER A Second Person Verifier shall verify step 11 was correctly completed. 21. Read and record in the last column of Data Sheet 1, the discharge before the minimum calculated voltage is reached. 13. Stop the test and de-energize the test equipment. Record the Stop Time on Attachment 3, on Data Sheet 1 and below: Stop Time: | 2403.001 | | UNIT II 2D11 PERFOR ELECTRICAL MAI | CHANGE: | 008-03-0 | |
| 11. Record the restart time (below and on Attachment 3), and battery terminal voltage after the load is applied: Discharge started at Amps Time restarted: Overall battery terminal voltage VDC/ <u>SECOND PERSON VERIFIER</u> A Second Person Verifier shall verify step 11 was correctly completed. 12. Read and record in the last column of Data Sheet 1, the discharge battery overall bank voltage and cell voltages in the final moments before the minimum calculated voltage is reached. 13. Stop the test and de-energize the test equipment. Record the Stop Time on Attachment 3, on Data Sheet 1 and below: Stop Time: // Implement is the final moment of the stop time is the New TA. 14. Open 2D51 disconnect switch. 15. Find the Down Time and old TA from Attachment 3 and use below to figure the New TA. Old TA Down Time Mew TA" in step 15 is correct. Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Verifier ball verify the "New TA" in step 15 is correct. (/ Second Person Ve | | | ATTACHM | ENT 2 | Page 4 of | E 5 . |
| Discharge started at Amps Time restarted: Overall battery terminal voltage VDC/ SECOND PERSON VERIFIER A Second Person Verifier shall verify step 11 was correctly completed/ Second Person Verifier De battery overall bank voltage and cell voltages in the final moments before the minimum calculated voltage is reached. 13. Stop the test and de-energize the test equipment. Record the Stop Time on Attachment 3, on Data Sheet 1 and below: Stop Time: / 14. Open 2D51 disconnect switch/ Old T _A Down Time mew T _A / SECOND PERSON VERIFIER A Second Person Verifier shall verify the "New TA" in step 15 is correct/ | 11. | Record th terminal | e restart time (below and on voltage after the load is ap | Attachment 3), an plied: | d battery | |
| Time restarted: | | Discharge | started at Amps | | | |
| Overall battery terminal voltage VDC / SECOND PERSON VERIFIER A Second Person Verifier shall verify step 11 was correctly completed. / 12. Read and record in the last column of Data Sheet 1, the discharge battery overall bank voltage and cell voltages in the final moments before the minimum calculated voltage is reached. 13. 13. Stop the test and de-energize the test equipment. Record the Stop Time on Attachment 3, on Data Sheet 1 and below: / 14. Open 2D51 disconnect switch. | | Time rest | arted: | | | |
| SECOND PERSON VERIFIER A Second Person Verifier shall verify step 11 was correctly completed. / | | Overall b | attery terminal voltage | VDC | | |
| A Second Person Verifier shall verify step 11 was correctly completed. / Second Person Verifier De 12. Read and record in the last column of Data Sheet 1, the discharge battery overall bank voltage and cell voltages in the final moments before the minimum calculated voltage is reached. 13. Stop the test and de-energize the test equipment. Record the Stop Time on Attachment 3, on Data Sheet 1 and below: Stop Time: | SECO | ND PERSON V | ERIFIER | | | |
| Second Person Verifier Descent desc | | A Second completed | Person Verifier shall verify | step 11 was corre | ctly | |
| 12. Read and record in the last column of Data Sheet 1, the discharge battery overall bank voltage and cell voltages in the final moments before the minimum calculated voltage is reached. 13. Stop the test and de-energize the test equipment. Record the Stop Time on Attachment 3, on Data Sheet 1 and below: Stop Time: | | | | Secor | nd Person Veri | / .fier Date |
| 13. Stop the test and de-energize the test equipment. Record the Stop Time on Attachment 3, on Data Sheet 1 and below: Stop Time: | 12. | Read and battery o before th | record in the last column of overall bank voltage and cell a minimum calculated voltage | Data Sheet 1, the voltages in the f is reached. | discharge inal moments | |
| Stop Time: | 13. | Stop the Time on A | test and de-energize the test ttachment 3, on Data Sheet 1 | t equipment. Reco and below: | ord the Stop | |
| <pre>14. Open 2D51 disconnect switch</pre> | | Stop Time | : | | | / |
| 15. Find the Down Time and old T _A from Attachment 3 and use below to figure the New T _A : Old T _A | 14. | Open 2D51 | disconnect switch. | | · . | / |
| Old T _A Down Time = | 15. | Find the figure th | Down Time and old T_A from Att | achment 3 and use | below to | |
| SECOND PERSON VERIFIER A Second Person Verifier shall verify the "New TA" in step 15 is correct. Second Person Verifier Da | г . | old T _A | - Down Time | = | | / |
| A Second Person Verifier shall verify the "New TA" in step 15 is correct. Second Person Verifier Da | SECO | ND PERSON V | ERIFIER | | | |
| Second Person Verifier Da | | A Second correct. | Person Verifier shall verify | the "New TA" in s | tep 15 is | _ |
| | | | | Secor | nd Person Veri | / fier Date |
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| 24 | 03.001 | UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE | CHANGE: | 008-03-0 |
| | ; | ATTACHMENT 2 | Page 5 of | 5 |
| 16. | <u>IF</u> cells <u>THEN</u> Engi an evalua battery c | were jumpered due to low voltage, neering and the Cognizant Supervisor must be notifi tion made of cell condition prior to re-assembly of onnections. | ed and – | / |
| 17. | <u>IF</u> cells <u>THEN</u> rest | were jumpered, ore battery connections as follows: | | |
| | A. C | lean and neutralize the affected connections using oda and water. | baking | |
| | B. C | Coat the connections per C&D Manual (TM C 173.0010) eassemble. | and - | / |
| 18. | <u>IF</u> cells <u>THEN</u> torq torque va | were jumpered, ue the connections to 165 in/lbs and record below t lue used and the recal date of the torque wrench us | he - ed. | / |
| | Torque wr | ench number: | • | |
| | Torque va | lue: | | |
| · | Calibrati | on due date: | . • - | / |
| 19. | <u>IF</u> cells <u>THEN</u> micr connectio reading. | were jumpered, o-ohm the affected connections and record the affec ns on Data Sheet, flagging them as the second "As L | ted - eft" | / |
| 20. | Mark Step | s 8.3.14 through 8.3.19 N/A and proceed with Step 8 | .3.20 - | / |
| | | NOTE | | |
| | Respon | sible Engineer's signature is not needed to continu | e the wor | ĸ. |

21. Responsible Engineer has reviewed data of Attachment 2.

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Responsible Engineer

Date

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| FR00./m | /ORK PLAN NO. | PROCEDURE/WORK P | LAN TITLE: | | | PAGE: | 27 of 40 |
|--|---|---|--|--|---|---|--|
| 24 | 403.001 | UNIT EI | II 2D11 PERFO | ORMANCE TEST AINTENANCE | r | CHANGE: | 008-03-1 |
| | | | | | | | _ |
| | t . | | ATTACI | HMENT 3 | | | |
| | | CALC | CULATION FOR | TOTAL DOWN | TIME | | |
| 1. | Start Tim | e. Stop Time | | | | • | |
| | (A) ⁱ Start | Time # | (B) | Stop Time: | * | | <i>ر</i> بلا |
| | (C) Start | Time: | (D) | Stop Time. | N | | |
| | (C) Start | | (D) | scop iime: | • • | | _ |
| | (E) Start | | (F) | Stop Time: | | | <u>+</u> / |
| | (G) Start | : Time: | (H) | Stop Time: | La . | | <u>* / /</u> |
| SECO | ND PERSON V | ERIFIER | | | | | |
| | A Second step 1 is | Person Verifier correct. | shall verif | y the "Start | , stop" tim | e in . | · . |
| | - i | | | | Second Pe | erson Veri | fier Date |
| • | | | | - | | | |
| 2 . <u>SECO</u> | Total Dow Total Dow Total Dow (in minut ND PERSON V A Second step 1 is | n Time n Time (in minut n Time es) = (ERIFIER Person Verifier correct. | ces) = (C -) + (shall verif | B) + (E - D)) + (Ty the "Start | + (G - F)) = , Stop" time | • in | * / |
| 2 . <u>SECO</u> 3 . | Total Dow Total Dow (in minut <u>ND PERSON V</u> A Second step,1 is Old T _A Cal | n Time n Time (in minut n Time es) = (ERIFIER Person Verifier correct. | ces) = (C -) + (shall verif | B) + (E - D)) + (Y the "Start | + (G - F)) = , Stop" time Second Pe | e in Arson Veri | fier Date |
| 2 . <u>SECO</u> 3 . | Total Dow Total Dow (in minut ND PERSON V A Second step, 1 is Old T_A Cal Old $T_A = 0$ | n Time n Time (in minut n Time es) = (ERIFIER Person Verifier correct. culation (A) - (Final Sto | ces) = {C -) + (shall verif | B) + (E - D)) + (Y the "Start | + (G - F)) = , Stop" time | e in Frson Veri | // |
| 2 . <u>SECO</u> 3 . | Total Dow Total Dow Total Dow (in minut <u>ND PERSON V</u> A Second step,1 is Old T_A Cal Old T_A = | n Time n Time (in minut n Time es) = (<u>ERIFIER</u> Person Verifier correct. culation (A) - (Final Sto | res) = (C -) + (shall verif | B) + (E - D)) + (Y the "Start | + (G - F)) = , Stop" time Second Pe | e in Arson Veri | fier Date |
| 2 . <u>SECO</u> 3 . <u>SECO</u> | Total Dow Total Dow Total Dow (in minut ND PERSON V A Second step, 1 is Old T_A Cal Old T_A = 0 Old \tilde{T}_A = 0 | n Time n Time (in minut n Time es) = (ERIFIER Person Verifier correct. .culation (A) - (Final Sto | <pre>ces) = (C) + (shall verif p Time)</pre> | B) + (E - D)) + (Y the "Start | + (G - F)) = , Stop" time Second Pe | e in Prson Veri | fier Date |
| 2. <u>SECO</u> 3. <u>SECO</u> | Total Dow Total Dow Total Dow (in minut ND PERSON V A Second step 1 is Old T_A Cal Old T_A = Old T_A = ND PERSON V A Second step 3. | n Time n Time (in minut n Time es) = (<u>ERIFIER</u> Person Verifier correct. .culation (A) - (Final Sto <u>ERIFIER</u> Person Verifier Bee attace | <pre>ces) = (C) + (shall verif p Time) shall verif </pre> | B) + (E - D)) + (Ty the "Start Ty calculation Ty calculation Ty of E1 | + (G - F)) = , Stop" time Second Pe Second Pe Second Pe | e in Frison Veri ect in Frison Veri -2002 | / fier Date / fier Date -0534- C |

| PROC./WORK PLAN NO. | PROCEDURE/WORK PLAN TITLE: | PAGE: | 28 of 40 |
|---------------------|--|---------|----------|
| 2403.001 | UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE | CHANGE: | 008-03-0 |

ATTACHMENT 4

MINIMUM SAFETY APPAREL FOR BATTERY MAINTENANCE***

| | <u>, , , , , , , , , , , , , , , , , , , </u> | · | r | | | |
|---|---|-------|--------|----------------------------|--------------|---------------------|
| Activity | Safety Glasses w/side shield | Apron | Gloves | Face Shield or Goggles* | Plastic Suit | Eye Wash Station |
| Cell or Battery Change Out | <u>x</u> | | x | x | X | x |
| Daily Surveillance | X | | X | | | x |
| Weekly Surveillance | X | | x | | | x |
| Quarterly Surveillance and Discharge Tests | х | | x | | | х |
| Electrolyte Add or Removal | X | x | x | X | | x |
| Electrolyte Mixing | <u>x</u> | x | x | X | | x |
| Connection Cleaning and or Disconnecting | X | | x | | | x |
| Adding Water | X | | X | | | x |
| Cell Cleaning | x | | x | | | х |
| | | | | | | |
| Emergency 12 Volt Light Battery Maintenance Minimum Requirements | x | | x | | | |
| | | | | | | |
| Diesel Fire Pump or Diesel Generator Battery Surveillance | x | | X | | | |
| Change Out | x | | x | Х | | |

*Face shields may be worn without hard hats, and must be non-metallic **Hard Hats are not required inside Station Battery Room while performing routine battery maintenance. ***Applies to person subjected to hazard only.

PROC./WORK PLAN NO.

2403.001

PROCEDURE/WORK PLAN TITLE:

UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE

CHANGE: 008-03-0

MAI 57320

DATA SHEET 1

Page 1 of 6

Performance Discharge Test Battery Bank and Cell Voltages Battery Bank <u>2D11</u>

Start Time 18:22

| Cell | · · · · | | 1 Hour | | 2 Hours | ······ | 3 Hours | 4 Hours |
|-------|---------|--------------|---------|---------|----------|---------------------------------------|---------------|----------|
| No. | 30 Min. | 1 Hour | 30 Min. | 2 Hours | 30 Min. | 3 Hours | 30 Min 4 Hour | el30 Min |
| 1 | 1.986 | 1.99 | 1,982 | 1.977 | 1.9.70 | 1914 | 1.95771950 | 11.9 112 |
| 2 | 1.993 | 1.99 | 1.978 | 1.974 | 1966 | 1929 | 1957 1.9 41 | 1927 |
| 3 | 1.994 | 1. 99 | 1.979 | 1.944 | 1967 | 1960 | 1954 1941 | 16 29 |
| 4 | 1.490 | 1.99 | 1.976 | 1.912 | 1.964 | 1957 | 1956 1947 | 1936 |
| 5 | 1. 993 | 1.99 | 1.978 | 1.973 | 1.966 | 1964 | 1951 1.940 | 1.936 |
| 6 | 1.990 | 1.99 | 1,975 | 1970 | 1963 | 1966 | 1949 1.941 | 1934 |
| 7 | 1.992 | 1.49 | 1.776 | 1.9 72 | 1964 | 1.927 | 1950 1947 | 1.9 28 |
| 8 | 1.994 | 1.99 | 1.978 | 1.9.73 | 1966 | 1.959 | 1.9 57 1.9 45 | 1937 |
| 9 | 1.990 | 1.98 | 1.974 | 1.969 | 1963 | 1955 | 1.9 48 1.9 40 | 1.9 32 |
| 10 | 1. 994 | 1.99 | 1.978 | 1.974 | 1A66 | 1.959 | 19 52 19 45 | 1.9 37 |
| 11 | 1.994 | 1.99 | 1.978 | 1.9.74 | 1.967 | 1939 | 1,9 52 1.9 45 | 1.9 37 |
| 12 | 1.988 | 1.98 | 1.974 | 1.959 | 1963 | 1.956 | 1.9 49 1.941 | 1.9 34 |
| 13 | 1. 487 | 1.99 | 1.990 | 1,975 | 1968 | 1961 | 19 55 19 47 | 1.9 39 |
| 14 | 1.996 | 1.98 | 1.977 | 1.973 | 1.965 | 1957 | 1949 1940 | 1.9 32 |
| 15 | 1.996 | 1.99 | 1.982 | 1.976 | 1.969 | 1962 | 19 56 19 40 | 1.9 40 |
| 16 | 1 989 | 1.99 | 1.982 | 1.976 | 1979 | 1.962 | 1.9 56 1.949 | 1.9 41 |
| 17 | 1.992 | 1.48 | 1.974 | 1.9.69 | 1.963 | 1956 | 1.9 49 1.9 42 | 1.9 35 |
| 18 | 1. 992 | 1.49 | 1-977 | 1.473 | 1966 | 1959 | 1.9 52 1.9 46 | 1.9 38 |
| 19 | 2.002 | 2.00 | 1936 | 19 82 | 1.975 | 1.968 | 1.9 62 1.9 54 | 1.9 46 |
| 20 | 1.983 | 1.98 | 1.468 | 1.963 | 19 56 | 1.949 | 1.9 42 1.9 35 | 1.9 27 |
| 21 | 1.986 | 1.98 | 1.970 | 1.965 | 19 58 | 1.951 | 1.9 45 1.9 37 | 1.9 29 |
| 22 | 1.992 | 1.99 | 1.975 | 1,970 | 1.964 | 1.9 57 | 1.949 1.942 | 1.9 34 |
| 23 | 1.996 | 1.94 | 1.979 | 1,975 | 1.968 | 1961 | 1.9 54 1.9 47 | 1.9 39 |
| 24 | 1.997 | 1.99 | 1.983 | 1.978 | 1.970 | 1.964 | 1.9 57 1.9 49 | 1.9 42 |
| 25 | 2.007 | 2.00 | 1.993 | 11987 | 1,9 80 | 1972 | 1.966 1.9 58 | 1.9 50 |
| 26 | 1.994 | 1.99 | 1.9.19 | 1.9.74 | 1.967 | 1.960 | 1.9 54 1.9 46 | 1.9 38 |
| - 27 | 1:991 | 1.99 | 1.976 | 1.9.70 | 1964 | 1957 | 1.950 1.9 42 | 1.9 36 |
| 28 | 1.993 | 1.99 | 1.911 | 1973 | 1965 | 1.9 58 | 1.951 1.944 | 1.9 37 |
| - 29 | 1.943 | 1.79 | 1911 | 1172 | 1965 | 1.9 58 | 1.1 51 1.9 44 | 1.9 36 |
| 30 | 1.794 | 1.77 | IP XU | 1.7.71 | 1.7.6% | 1.260 | 1.9 54 1.9 46 | 1.7 38 |
| 31 | 1 988 | 170 | 1.415 | 1763 | 1.762 | 1.1 59 | 1.1 48 1.1 40 | 1.9 32 |
| Bank | 1.796 | <u>1: 19</u> | 4981 | 1,976 | 1969 | 1.76/ | 1.9 55 1.9 48 | 1.9 40 |
| Volts | 113.8 | 27269 | 7.978 | 114.5 | 114,1 | 113.7 | 113.5 112.9 | 112.5 |
| | | · | 1110 | l | <u> </u> | · · · · · · · · · · · · · · · · · · · | <u> </u> | |
| | | | 11710 | | | | | |

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Performed by

<u>17 Gauge 14.22-02</u> Signature Date

PROC./WORK PLAN NO.

PROCEDURE/WORK PLAN TITLE: **UNIT II 2D11 PERFORMANCE TEST** ELECTRICAL MAINTENANCE

· .

008-03-0 CHANGE:

;

DATA SHEET 1

Page 2 of 6

Performance Discharge Test Battery Bank and Cell Voltages Battery Bank 2D11

| Cell | | | 1 Hour | <u> </u> | 2 Hours | | 3 Hours | 4 Hours |
|-----------|---------|--------|---------|----------|--------------|---------|-------------------|---------------|
| _No. | 30 Min. | 1 Hour | 30 Min. | 2 Hours | 30_Min. | 3 Hours | 30 Min. 4 Hours | 30 Min. |
| 33 | 1.992 | 1.99 | 1.978 | 1,977 | 1.967 | 1.960 | 1.9 52 1.9 44 | 1.9 37 |
| 34 | 1,491 | 1.99 | 1,975 | 1.971 | 1.964 | 1.958 | 1.9 50 1.9 42 | 1.9 34 |
| 35 | 1,988 | 1.98 | 1.972 | 1.968 | 1.961 | 1.954 | 1.9 47 1.9 34 | 1931 |
| 36 | 1.988 | 1.48 | 1972 | 1.9.68 | 1961 | 1.954 | 1.947 1.940 | 1.9 32 |
| 37 | 1.984 | 1.98 | 1.972 | 1.968 | 1,961 | 1.9.54 | 1.947 1.940 | 1.9 32 |
| 38 - | 11992 | 1.99 | 1976 | 1972 | 1965 | 1.959 | 1.951 1.944 | 1.937 |
| 39 | 1.994 | 1.99 | 1.97.8 | 1.97.4 | 1.967 | 1.961 | 1.954 1.947 | 1.9 39 |
| 40 | 1.984 | 1.98 | 1.969 | 1.9.64 | 1.958 | 1.9.51 | 1.9.43 1.937 | 1,2 29 |
| 41 | 1.986 | 1.98 | 1.971 | 1,967 | 1.960 | 1.953 | 1.9 47 1.9 39 | 1.9 31 |
| 42 | 1.786 | 1.98 | 1972 | 1.968 | 1.961 | 1.954 | 1.9 48 1.9 40 | 1.9 32 |
| 43 | 1.793 | 1.99 | 1.982 | 1.9.79 | 19.72 | 1.965 | 1.9 59 1.9 5/ | 1.9 43 |
| 44 | 1. 289 | 1.98 | 1.972 | 1969 | 1.961 | 1.955 | 1.948 1.940 | 1933 |
| 45 | 1.986 | 1.98 | 1.969 | 1.964 | 1,958 | 1.9 51 | 1.944 1.937 | 1929 |
| 46 | 1.989 | 1.98 | 1.972 | 1,9 69 | 1.962 | 1.955 | 1.949 1.941 | 1.9 32 |
| 47 | 1.990 | 1.99 | 1.973 | 1.969 | 1.962 | 1.955 | 1.9 49 1.9 41 | <u>1,9 33</u> |
| | 1.988 | 1.98 | 1.972 | 1.967 | 1.960 | 1.9 54 | 1.9 47 1.9 40 | 1.9 32 |
| 49 | 1.989 | 1.98 | 1473 | 1.969 | 1 <u>462</u> | 1.955 | 1.9 49 1.1 42 | 1.9 33 |
| 50 | 1.985 |) 98 | 1.971 | 1,765 | 1,9,59 | 1.1.53 | 1.9 45 1.9 34 | 1931 |
| | 1.991 | 1.99 | 1.994 | 1.969 | 1662 | 1.7 55 | 1.9 44 1.9 41 | 1.7 33 |
| 52 | 1.992 | 1.44 | 1.975 | 1.970 | 1.765 | 1.957 | 1.9 50 1.9 43 | 1939 |
| 53 | 1.984 | 1.98 | 1.972 | 1.968 | 1.961 | 1.953 | 1.9 48 1.7 40 | <u>1.2 3(</u> |
| | 1.991 | 1.99 | 11919 | 1970 | 1962 | 1.9 55 | 1150 1.142 | 47 34 |
| 55 | 1991 | 1.99 | 1.974 | 1970 | 1963 | 1.955 | 1.9 50 1.1 42 | <u>1.734</u> |
| 56 | 1990 | 1.94 | 1-9.74 | 1970 | 1962 | 1155 | 1.9 50 1.9 42 | 11 34 |
| 57 | 1.991 | 1.99 | 1.915 | 1971 | 1963 | 1.9 58 | 1.9 56 1.9 43 | 1137 |
| <u>58</u> | 1.989 | 1.98 | 10972 | 1168 | 1.761 | 1.952 | 1.745 1.737 | 4132 |
| Disch | | | | | | | | |
| Kate | 269 | 222 | 100 | 970 | 270 | 271 | 270 27/ | 270 |
| (Amps) | | 010 | a IU | SIU : | -1- | | $ \gamma \rho $ | × 10 |

Performed by <u>150 course</u> 14-22-02 Signature Date

Test Equip: <u>BCT-003</u> <u>5/4-17</u>

۰.

Cal. Due: 11-14-02

2403.001

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PROCEDURE/WORK PLAN TITLE:

UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE

008-03-0 CHANGE:

4-23-02 Restart at 0200 DATA SHEET 1 Page 3 of 6 Performance Discharge Test Battery Bank and Cell Voltages Battery Bank 2D11 8 Hours Cell 5 Hours 6 Hours 7 Hours 9 Hours 30 Min. 30 Min. 30 Min. NO 5 Hours 30 Min. 6 Hours 7 Hours 8 Hours 34 19 9 25 1.1) 1.86 1.82 1.90 1.88 1.83 1 928 17.4 1.90 1.80 2 1.88 1.84 1.86 1.81 L Ĩų 21 1.89 3 1.9 1.90 1.87 1.45 1.82 1.82 1.61 191 1 87 4 1.70) 84 221 5 1.90 1.86 1.64 1.80 1.925 1.926 1.928 1.928 1.924 25 1.90 1.90 15 1.88 1.80 1.79 6) 86 1.84 L, 1.88 1.86 1.29 7 1.80 1.84 1.9 1.9 1.9 1.9 1.87 1.60 8 1.90 1.81 1.87 24 88 1.86 1.79 1.81 14 9 1.90 1.64 1.50 10 89 1.90 1.81 1. 1.85 <u>1.</u>9 1979 1.89 1.90 11 1.87 1.81 1.84 25 1.85 1.9 19 1.90 <u>1. 87</u> 1.81 12 1.8) 19 1.91 1.82 1.82 13 31 Ŷ. 21 1.87 1.85 1 22 14 1.89 1.87 1.85 12 1.83 1.78 1.932).86).86].85 1.9 22 1.83 15 1.90 1 43 1.91 1.88 1.9 25 1.84 16 1.92 1.90 1.68 1.84 1.89 1.87 17 1. 82 1.82 ાંઉ 1.91 29 37 20 1.85 1.85 1.9 18 1.91 1.82 1.82 1.9 1.91 1.88 19 1.90 1.82 1.9 1.82 ti-1 I <u>1</u>9 20 OI 1.89 1,88 1.86 1.84 1.81 1.81 1.9 1.88 1.86 1.920 1.90 1.83 1.79 21 10 1.88 1.80 1.9 25 1.84 22 15 1.90 1.84 1.80 1920 30 23 1.9 1.9 1.88 1.84 1.90 1.86 1.81 1.81 1.925 1.86 34 24 1.91 1.90 1.88 1.83 1.83 1.9 42).91 1.89 1.89 1.89 1.87 1.85 1.82 25 1.87 1.92 J.90 1.85 30 1.85 26 1.82 7.9 1.97 27 1.82 1.90 1.87 1.85 1.9 1.9 1.1 1/ 1.82 1.90 1.81 28 1.83 28 1.9 1.87 1.84 1.81 18 20 SEE ER-1.84 1.81 29 1.90 1.81 1.920 1.88 30 1.87 1.81 1.9 1.90 1.84 AN0-2002-Bank 1.9 111,4 110.4 109.4 108.3 107.0 105.2 105.0 0534-000 Volts * END OF TEST 8 m. Imin. 4-23-02

Performed by

Signature

Date

NOTE

Terminal voltage of 105 volts may be reached before a hour or ½ hour reading can be taken. Indicate the number of minutes past the hour or half hour above the column where the last reading was taken at test completion.

PROC./WORK PLAN NO. 2403.001

NO. PROCEDURE/WORK PLAN TITLE:

UNIT II 2D11 PERFORMANCE TEST ELECTRICAL MAINTENANCE

CHANGE: 008-03-0

DATA SHEET 1

Page 4 of 6

Performance Discharge Test Battery Bank and Cell Voltages

Battery Bank 2D11

ł

Bank Voltage: 128.5 Start Time: 18.22 4-22-02 Stop Time: 07:15 4-23.02

| | Cell | 1 | 5 Hours | | 6 Hours | | 7 Hours | [| 8. Hours | 1 | Ι. |
|-----|--------------------|---------|---------|---------|---------|--------------|---------|---|--------------------|--------------|------------|
| Ì | No. | 5 Hours | 30 Min. | 6 Hours | 30 Min. | 7 Hours | 30 Min. | 8 Hours | 30 Min. | 9 Hours | |
| | 31 | 1.924 | 1915 | 1.90 | 1.89 | 1.87 | 1.84 | 1 81 | 1.81 | | 1 |
| | 32 | 1.931 | 1.924 | 1.91 | 1.89 | 1.88 | 1.86 | 1.83 | 1.82 | NH | |
| 1 | 33 | 1.929 | 1.918 | 1.91 | 1.89 | 1.87 | 1.85 | 1.91 | 1.41 | | 1 |
| | 34 | 1.9.27 | 1.916 | 1.41 | 1.89 | 1.87 | 1.84 | 1.81 | 1.80 | | |
| | 35 | 1.923 | 1912 | 1.91 | 1.88 | 1.86 | 1.84 | 1.80 | 1.79 | | · · |
| | 36 | 1.923 | 1.914 | 1.91 | 1.68 | 1.86 | 1.84 | 1.81 | 1.80 | | i . |
| | _37 | 1.723 | 1.9/3 | 1.91 | 1. 88 | 1.86 | 1.84 | 1.81 | 1.90 | | ĺ |
| _ | 38 | 1.728 | 1.9/9 | 1.91 | 1.89 | 1.87 | 1.84 |). 82 | 1.81 | | |
| | 39 | 1.1 30 | 1.921 | 1.91 | 1.89 | 1.87 | 1.84 | 1.81 | 1.81 | | |
| ! | 40 | 1.1 19 | 1910 | 1.90 | 1.88 | 1.86 | 1.64 | 1.80 | 1.74 | | |
| ! | 41 | 1.9 22 | 1.9 13 | 1.90 | 1.88 | 1.86 | 1.84 | 1.8) | 1.80 | · · | |
| | 42 | 1.1 23 | 1.9 13 | 1.91 | 1.58 | 1.86 | 1.85 | 1.82 | 1.81 | | 1 |
| | 43 | 1.7 30 | 1.9 23 | 1.90 | 1.89 | 1.87 | 1.86 | 1.84 | 1.83 | | |
| | 44 | 1.9 23 | 1.9 19 | 1.91 | 1.88 | 1.86 | 1.84 | 1.8/ | 1.81 | | |
| | 45 | 1.1 19 | 1.70 | 1.90 | 1.88 | 1.86 | 1.84 | 1. 29 | 1.79 | | |
| | 46 | 1.1.24 | 1.7.16 | 1.9) | 1.87 |).86 | 1.84 | 1.82 | 1.8) | | |
| — | 47 | 1.7 2.4 | 1774 | 1.91 | 1.88 | 1.86 | 1.84 | 1.81 | 1.80 | | |
| | 48 | 1122 | 11/4 | 1.9/ | 1.88 | 1.86 | 1.84 | 1.82 |).81 | | |
| | 49 | 1.1 25 | 1.1/2 | 1.91 | 1.87 | <u> ·87</u> | 1.85 | 1.82 | 1.82 | | L. |
| | 50 | 11 22 | 1.1/3 | 1.90 | 1.88 | 1.86 | 1.84 | 1.82 | 1.81 | | |
| | 51 | | 1.7.14 | 1.91 | 1.88 | 1.86 | 1.84 | 1.81 | 1.80 | | |
| | <u> </u> | 1022 | 1.9/ | 1.9/ | 1.87 | 1.86 | 1.84 | 1.62 | 1.6) | | |
| | 55 | 1000 | 1.475 | 1.9 | 1.80 | 1.86 | 1.84 | 1.81 | 1.79 | | |
| - | | 1122 | 1.11/1- | 1.91 | 1.87 | 1.87 |).84 | 1.81 | 1.80 | | |
| | 55 | 1976 | 1.1/ | 1.90 | 1.89 | 1.87 | 1.84 | 1.8) | 1.80 | | |
| - | 57 | 1920 | 1614 | 1.9/ | 1.87 | 1.87 | 1.84 | 1.82 | 1.8/ | | 56-2- ER- |
| | 58 | 1973 | | 1.9/ | 1.07 | <u>1. D/</u> | 1.85 | 1.82 | 1.82 | | |
| | <u>Jo</u> Nisch | 4.122 | 1.174 | <u></u> | 1.01 | 1.06 | 1.04 | <u> 1. 80 </u> | 1.80 | | 1110-2002- |
| i F | Rate | 171 | 270 | 2 | 000 | . | o MA | . . - | ~1A | \mathbf{V} | 0534-000 |
| 11 | (mps) | 0:11 | 010 | x.10 | 210 | 270 | 210 | 270 | 267 | • | |
| 1 | | L ł | I | | | | | | L | | İ |
| | | 1 | | | | | | | + = | D nE | Trat |

Performed by

8 m. 4-23-02 Time

NOTE

ignature

Terminal voltage of 105 volts may be reached before a hour or ½ hour reading can be taken. Indicate the number of minutes past the hour or half hour above the column where the last reading was taken at test completion.

| 2403.001 | | | UNIT II 2D11 ELECTR | PERFORM | ANCE TEST | | CHANGE: | 008-03-0 |
|-------------------|----------------|---------------------------------------|------------------------|---------------|----------------|--|--|--------------------|
| | | <u></u> | | DATA SHEE | T 1 | | Page 5of | `6 |
| | 1 | | Perform | mance Disc | harge Tes | t | | |
| | 4 | | Battery E | ank and C | eli voita | ges . | | |
| ittery I | 3ank <u>2D</u> | <u>11</u> | | | | Bank <u>Volt</u> Start <u>Tin</u> Stop <u>Time</u> | age: /2 ne: / 8:2 ≥: 07:/ | 2 4-22-0 5 4-23 |
| Cell | 9 Hour | s | 10 Hours | | 11 Hours | | ž | |
| <u>No.</u> | <u>30 Min</u> | . 10 Hours | 30 Min | 11 Hours | <u>30 Min.</u> | 12 Hours | | |
| <u>⊥</u> | | | | | <u> </u> | | | |
| 3 | | <u> </u> | - | | | _ <u>_</u> | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | . <u></u> | <u> </u> | | | | | | |
| | | | _ <mark></mark> | 1 | | | | |
| <u> </u> | | | - A | | <u> </u> | · | | |
| 10 | | $\rightarrow \rightarrow \rightarrow$ | +/} | | | | | |
| 11 | ; | | | | | - | | |
| 12 | | | | | | | | |
| 13 | L | | | IT- | | | | |
| 14 | | | <u> </u> | <u> / </u> | · · · · · · | | | |
| | | | | <u> </u> | | - <u>+</u> | | |
| 17 | | | | | <u> </u> | | | |
| 18 | | | | | <u>} _</u> | | | |
| 19 | | | | | | | | |
| 20 | | | 9 | | | | | |
| 21 | | | | | | ··· | | |
| | | | | | L | | | |
| 24 | 1 | | | + | \sim | -{ | | |
| 25 | | - | ··· | 5 | | | | |
| 26 | | | | <u> </u> | t_{2} | | | |
| 27 | | | | 1 | 0, / | | | |
| | <u> </u> | | | <u> </u> | <u> </u> | ↓ | | |
| <u>. 29</u> 30 | <u> </u> | | | <u> </u> | | | | |
| Disch | <u> </u> | | | <u> </u> | <u> </u> | | | |
| Rate | , | İ | | | | 1/4 | | |
| (Amps) | | | | | l | F. | | |
| | ; | | | Performed | bγ ∙ | 000 |) | |
| | с. 1 | , | | | S | Signature | | Time |
| [| <u>+</u> | <u> </u> | | NOT | E | | | |
| Term | inal vo | ltage of 10 |)5 volts ma | v be reac | hed befor | e a hour or | 8 hour r | eading |

| PROC./WORK PLAN NO. | PROCEDURE/WORK PLAN TITLE: | PAGE: | 34 of 40 |
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Performance Discharge Test Battery Bank and Cell Voltages

Battery Bank 2D11

1.1

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l,

18:22 04/23

Bank <u>Voltage:</u> Start <u>Time:</u> Stop <u>Time:</u> 128.5 23-4 -23-02 4 **^**

1

| Cell | 9 Hours | | 10 Hours | 1 | 11 Hours | <u> </u> |
|--------|---------------------------------------|---------------------------------------|----------|------------------------------------|-------------------|----------|
| NO. | 30 Min. | 10 Hours | 30 Min. | 11 Hours | 30 Min. | 12 Hours |
| 31 | N | | 1 | 1 | | |
| 32 | | | · · | 1 | | |
| 33 | | | 1 | - | | |
| 34 | | | | | | |
| 35 | ````` | K | | | | 1 |
| 36 | · | | | | + | · · · |
| 37 | 5 | | | | <u> </u> | |
| 38 | < | | | 1 | 1 | 1 |
| 39 | | 41/ | | 1-1-1 | 1 | |
| 40 | | | | 1 | | |
| 41 | | | | 1. | | |
| 42 | | · · · · · | <u>A</u> | | | |
| 43 | | · · · · · · · · · · · · · · · · · · · | | | 1 | |
| 44 | : | | | | | |
| 45 | | <u> </u> | | × | 1 | |
| 46 | | | <u> </u> | | | |
| 47 | , | | C | × <u> </u> | | |
| 48 | | | 1 | \backslash | | |
| 49 | | | | | | |
| 50 | | | | ,0, | \ | |
| 51 | | | | <u> </u> | | · · · |
| 52 | <u> </u> | | ļ | ⊥~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | 1. \ | |
| 53 | <u> </u> | | | | | |
| 54 | <u>.</u> | | | ļ | $ - \frac{1}{2}$ | |
| 55 | ļ | | | 1 | <u>ا</u> ک_` | X |
| 56 | 1 | ļ | <u> </u> | <u> </u> | <u>└──~</u> द | |
| 57 | | | ļ | | ļ | |
| 58 | · · · · · · · · · · · · · · · · · · · | l | ļ | | | 1° |
| Disch | | | | | | |
| Rate | | | | | | |
| (Amps) | I | | | | J | \ |

| Performed by | YSignature | / |
|--|---|-----------------------------------|
| NOTE Terminal voltage of 105 volts may be reache can be taken. Indicate the number of minut above the column where the last reading was | d before a hour or ½ h es past the hour or ha taken at test complet | nour reading llf hour tion. |

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BATTERY BANK _ 2D11_

| BATTERY RACK | RECORD RE | ESISTANCE | | |
|---------------------------------------|-------------------|------------|--|--|
| CELL TO CELL | IN MICRO-OHMS FOR | | | |
| CONNECTIONS | LISTED CO | DNNECTIONS | | |
| · · | 1N1-2P1 | 1N2-2P2 | | |
| 1 - 2 | 19 | 19 | | |
| | 2N1-3P1 | 2N2-3P2 | | |
| 2 ~ 3 | 22 | 23 | | |
| · · · · · · | 3N1-4P1 | 3N2-4P2 | | |
| 3 - 4 | 26 | 25 | | |
| | 4N1-5P1 | 4N2-5P2 | | |
| 4 - 5 | 34 | 24 | | |
| | 5N1-6P1 | 5N2-6P2 | | |
| 5 - 6 | 25 | 21 | | |
| | 6N1-7P1 | 6N2-7P2 | | |
| 6 - 7 | .21 | 19 | | |
| | 7N1-8P1 | 7N2-8P2 | | |
| 7 - 8 | 25 | 26 | | |
| · · · · · · · · · · · · · · · · · · · | 8N1-9P1 | 8N2-9P2 | | |
| 8 - 9 1 | 23 | 20 | | |
| · · | 9N1-10P1 | 9N2-10P2 | | |
| 9 - 10 | 23 | 23 | | |
| | 10N1-11P1 | 10N2-1102 | | |
| 10 - 11 | 22 | 23 | | |
| · | 11N1-12P1 | 11N2-12P2 | | |
| 11 - 12 | 26 | 26 | | |
| · · · · · · · · · · · · · · · · · · · | 12N1-13D1 | 12N2-1302 | | |
| 12 - 13 | | 10110 1050 | | |
| ,- | 12 | 25 | | |
| · · · · · · · · · · · · · · · · · · · | 13N1-14P1 | 13N2-14P2 | | |
| 13 - 14 | 23 | 22 | | |
| | 14N1-15P1 | 14N2-15P2 | | |
| 14 - 15 | 0.0 | | | |
| | 23 | 23 | | |

| BATTERY | RACK | RECORD RE | ESISTANCE |
|---------|---------|------------|------------|
| CELL TO | CELL | IN MICRO- | OHMS FOR |
| CONNECT | TIONS | LISTED CO | DNNECTIONS |
| | | 15N1-16P1 | 15N2-16P2 |
| 15 - | 16 | 25 | 19 |
| | | _16N1-17P1 | 16N2-17P2 |
| 16 - | 17 , | 24 | 25 |
| | | 17N1-18P1 | 17N2-18P2 |
| 17 - | 18 | 23 | 21 |
| | | 18N1-19P1 | 18N2-19P2 |
| 18 - | 19 | 33 | 25 |
| | · · · · | 20N1-21P1 | 20N2-21P2 |
| 20 - | 21 | . 19 | 20 |
| | | 21N1-22P1 | 21N2-22P2 |
| 21 - | 22 | 21 | 25 |
| | | 22N1-23P1 | 22N2-23P2 |
| 22 - | 23 | 22 | 24 |
| | | _23N1-24P1 | 23N2-24P2 |
| 23 - | 24 | . 22 | 23 |
| | | 24N1-25P1 | 24N2-25P2 |
| 24 - | 25 | 20 | 21 |
| _ | | 25N1-26P1 | 25N2-26P2 |
| 25 - | 26 | 21 | 23 |
| | | _26N1-27P1 | 26N2-27P2 |
| 26 - | 27 | 26 | 29 |
| | | 27N1-28P1 | 27N2-28P2 |
| 27 - | 28 | 25 | 29 |
| | | 28N1-29P1 | 28N2-29P2 |
| 28 - | 29 | 23 | 12 |

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| BATTERY RACK | RECORD RE | ESISTANCE | | |
|----------------------|-------------------|-----------|--|--|
| CELL TO CELL | IN MICRO-OHMS FOR | | | |
| CONNECTIONS | LISTED CO | NNECTIONS | | |
| | 29N1-30P1 | 29N2-30P2 | | |
| 29 - 30 | 25 | 25 | | |
| | 30N1-31P1 | 30N2-31P2 | | |
| 30 - 31 ' | 33 | 30 | | |
| ; i | 31N1-32P1 | 31N2-32P2 | | |
| 31 - 32 | 93 | 24 | | |
| : | 32N1-33P1 | 32N2-33P2 | | |
| 32 - 33 | 20 | 22 | | |
| i | 33N1-34P1 | 33N2-34P2 | | |
| 33 - 34 | 23 | 20 | | |
| 1 | 34N1-35P1 | 34N2-35P2 | | |
| 34 - 35 | 23 | 24 | | |
| 1 | 35N1-36P1 | 35N2-36P2 | | |
| 35 - 36 ₁ | 24 | 26 | | |
| | 36N1-37P1 | 36N2-37P2 | | |
| 36 - 37 | 25 | 24 | | |
| | _37N1-38P1 | 37N2-38P2 | | |
| 37 - 38 | 23 | 24 | | |
| | 38N1-39P1 | 38N2-39P2 | | |
| <u> 38 - 39</u> | 22 | 25 | | |
| · · · | 40N1-41P1 | 40N2-41P2 | | |
| 40 - 41 | 25 | .21 | | |
| | 41N1-42P1 | 41N2-42P2 | | |
| 41 - 42 | 28 | 25 | | |
| | 42N1-43P1 | 42N2-43P2 | | |
| 42 - 43 _j | 24 | 24 | | |
| •••• | 43N1-44D1 | 43N2-44P2 | | |
| 43 - 44 | | 45W2-44F2 | | |
| | 22 | 20 | | |

| BATTERY RACK | RECORD RE | ESISTANCE | | |
|--------------|-------------------|------------|--|--|
| CELL TO CELL | IN MICRO-OHMS FOR | | | |
| _CONNECTIONS | LISTED CC | DNNECTIONS | | |
| | _44N1-45P1 | 44N2-45P2 | | |
| 44 - 45 | 26 | 24 | | |
| | _45N1-46P1 | 45N2-46P2 | | |
| 45 - 46 | 22 | 30 | | |
| | 46N1-47P1 | 46N2-47P2 | | |
| 46 - 47 | 22 | 23 | | |
| | _47N1-48P1 | 47N2-48P2 | | |
| 47 - 48 | 24 | 23 | | |
| | 48N1-49P1 | 48N2-49P2 | | |
| 48 - 49 | 25 | 72 | | |
| | 49N1-50P1 | 49N2-50P2 | | |
| 49 - 50 | 23 | 24 | | |
| | _50N1-51P1 | 50N2-51P2 | | |
| 50 - 51 | 21 | 23 | | |
| | _51N1-52P1 | 51N2-52P2 | | |
| 51 - 52 | 21 | 21 | | |
| | 52N1-53P1 | 52N2-53P2 | | |
| ,52 - 53 | 21 | 17 | | |
| | _53N1-54P1 | 53N2-54P2 | | |
| ·53 - 54 | 23 | .27 | | |
| | 54N1-55P1 | 54N2-55P2 | | |
| 54 - 55 | 20 | 24 | | |
| | 55N1-56P1 | 55N2-56P2 | | |
| 55 - 56 | 14 | 2.2 | | |
| | -56N1-57P1 | 56N2-57P2 | | |
| . 56 - 57 | 24 | 25 | | |
| I | 57N1-58P1 | 57N2-58P2 | | |
| 57 - 58 | 24 | 18 | | |

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| BATTERY RACK CELL TO TERMINAL | RECORD RESISTANCE IN |
|--|-----------------------|
| PLATE AND TERMINAL PLATE TO | MICRO OHMS FOR LISTED |
| CABLE CONNECTIONS | CONNECTIONS |
| | 1P1-TERM. PLT. |
| ' | |
| TERMINAL PLATE TO | |
| CELL # 1 | <u>1P2-TERM. PLT.</u> |
| | 7 |
| | TERM. PLTLUG#1 |
| 4 | 27- |
| TERMINAL PLATE TO | TEPM PLT -LUG#2 |
| INCOMING 250 MCM | |
| CABLE LUGS CELL # 1 | 29 |
| ······ ···· ···· ···· ···· ··· ··· ··· | TERM. PLTLUG#3 |
| | 20 |
| | |
| | |
| TERMINAL PLATE TO | 4 |
| CELL # 19 | 19N2-TERM PLT |
| | |
| | 1 9 |
| | TERM. PLTLUG#1 |
| | 13 |
| * | |
| | TERM. PLTLUG#2 |
| | 10 |
| 1 | TERM. PLT, -LUG#3 |
| |)// |
| TERMINAL PLATE ON CELL # 19 | /9 |
| TO INTERTIER 470 CABLE LUGS | TERM. PLTLUG#4 |
| 1 | 11 |
| ' | TERM. PLTLUG#5 |
| | <u> </u> |
| | TERM. PLT,-LUG#6 |
| | 171 |
| | 19 |

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BATTERY BANK __2D11___

| BATTERY RACK CELL TO TERMINAL | RECORD RESISTANCE IN |
|---------------------------------------|---------------------------------------|
| PLATE AND TERMINAL PLATE TO | MICRO OHMS FOR LISTED |
| CABLE CONNECTIONS | CONNECTIONS |
| | _20P1-TERM. PLT. |
| 1 | 1 13 |
| TERMINAL PLATE TO | 1 |
| CELL # 20 | 20P2-TERM. PLT. |
| | 9 |
| | TERM. PLTLUG#1 |
| : | 11 |
| k a | TERM. PLTLUG#2 |
| | 14 |
| | TERM. PLTLUG#3 |
| TERMINAL DIATE ON CELL # 20 | 10 |
| TO INTERTIER 4/0 CABLE LUGS | TERM. PLTLUG#4 |
| | 17_ |
| | |
| | |
| | 8 |
| | TERM. PLTLUG#6 |
| | |
| | 10 |
| | _39N1-TERM. PLT. |
| | 8 |
| TERMINAL PLATE TO | |
| רחינצא 🗄 דרינא 🕂 דרי | 39NZ-TERM. PLT. |
| | 10 |
| · · · · · · · · · · · · · · · · · · · | |
| | |
| · · · | · 10 |
| TERMINAL PLATE ON CELL # 39 | TERM, PLT, -LUG#2 |
| TO INTERTIER 4/0 CABLE LUGS | |
| | · · · · · · · · · · · · · · · · · · · |
| | TERM. PLTLUG#3 |
| | |
| l | 17 |

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| BATTERY RACK CELL TO TERMINAL | RECORD RESISTANCE IN |
|---|-----------------------|
| PLATE AND TERMINAL PLATE TO | MICRO OHMS FOR LISTED |
| CABLE CONNECTIONS | CONNECTIONS |
| r | TERM. PLTLUG#4 |
| | 2 |
| | |
| TERMINAL PLATE ON CELL # 39 | TERM. PLTLUG#5 |
| TO INTERTIER 4/0 CABLE LUGS | |
| | 10 |
| () () () () () () () () () () | TERM. PLTLUG#6 |
| 1 | |
| | i <i>JI</i> i |
| | 40P1-TERM. PLT. |
| | 10 |
| TERMINAL PLATE TO | |
| CELL # 40 | 40P2-TERM. PLT. |
| | . 6 |
| 11 | ð |
| | TERM. PLTLUG#1 |
| | ∂ |
| · · · | <u> </u> |
| | TERM. PLTLUG#2 |
| | Q |
| 1 | <u>7</u> |
| : | TERM. PLTLUG#3 |
| | 10 |
| TERMINAL PLATE ON CELL # 40 | /0 |
| TO INTERTIER 4/0 CABLE LUGS | TERM. PLTLUG#4 |
| | 12 |
| · · · | |
| * . | TERM. PLTLUG#5 |
| | |
| | |
| | TERM, PLTLUG#6 |
| | 10 |
| | 58N1_TEPM DIT |
| | |
| TERMINAL DLATE TO | 7 |
| CELT. # 58' | |
| | <u></u> |
| | // |
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| BATTERY BANK | 2D11 | | | | |
| | | | | | |
| BATTERY RACK PLATE AND TEN CABLE CONNECT | CELL TO TERMINAL MINAL PLATE TO MIONS | RECORD RESISTANCE IN MICRO OHMS FOR LISTED CONNECTIONS TERM. PLTLUG#1 | | | |
| TERMINAL PLAT | re to MCM | TERM. PLTLUG#2 | | , | • • |
| CABLE LUGS CH | SLL # 58 | TERM PLT -LUG#3 | | | |
| | | 72 | | | |
| I | | | | • | • • |
| COMMENTS: | <u>•</u> | | | | |
| COMMENTS: | · | | | | |
| COMMENTS: | 1 Cal. Due. Date: | DLRO 004, 9.11-02 | | / | |
| COMMENTS: | d Cal. Due. Date: | <u>DLRO 004 19.11.07</u> | · · · · · · · · · · · · · · · · · · · | / | |
| COMMENTS: | 1 Cal. Due. Date: 4 | <u>DLRO 004 9.11-07</u> | · · · · · · · · · · · · · · · · · · · | / | |
| COMMENTS: | d Cal. Due. Date: | <u>DLRO 004,9.11-07</u> | -02 | / | |
| COMMENTS: Test Equip. and , Performed by: Second Person V | d Cal. Due. Date: /, /, /, /, /, /, /, /, /, /, /, , /, | 0LRO 004 / 9.11-07 //, //, | -02 | / | |
| COMMENTS: Test Equip. and , Performed by:. Second Person V | d Cal. Due. Date: /, /, /, /, /, /, /, /, /, /, , , , , | DLRO 004 / 9.11.02 / | -02- 1.0-7 | / | |
| COMMENTS: Test Equip. and , Performed by: Second Person V | d Cal. Due. Date: | 0LRO 004/9.11-07 / | 202 | / | |
| COMMENTS: Test Equip. and Performed by: Second Person V | 1 Cal. Due. Date: /, , | <u>DLRO 004 / 9.11-07</u> // // // / | -02 | / | |
| COMMENTS: Test Equip. and Performed by: Second Person V | I Cal. Due. Date: | DLRO 004 19.11-07 | -02 | / | |
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