g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-Battery Removal & Installation**

Work Instruction for removing & installing batteries on an IS215UCVE cards.

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PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
R. Johnson			Charlie Wade
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1. SCOPE

1.1 This is a procedure for removing & installing batteries from IS215UCVE card and testing for typical current draw of each circuit.

2. STANDARDS OF QUALITY

2.1 Refer to the current revision of the IPC-A-610 standard for workmanship standards.

3. APPLICABLE DOCUMENTS

3.1 The following document(s) shall form part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.

3.1.1 336A4940BT.pdf Board Handout on battery connections
3.1.2 TIL1650 Technical Information Letter
3.1.3 RTVxx.pdf Data Sheet
3.1.4 BR2335 Rayovac Material Safety Data Sheets
3.1.5 CR1225 Renata Material Safety Data Sheets

4. ENGINEERING REQUIREMENTS

4.1 Equipment Cleaning

4.1.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to site specific SRA's for cleaning guidelines.

4.2 Equipment Inspection

4.2.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:

4.2.1.1 Wires - broken, cracked, or loosely connected
4.2.1.2 Terminal strips / connectors - broken or cracked
4.2.1.3 Components - visually damaged
4.2.1.4 Capacitors - bloated or leaking
4.2.1.5 Solder joints - damaged or cold
4.2.1.6 Circuit board - burned or de-laminated
4.2.1.7 Printed wire runs / Traces - burned or damaged

5. EQUIPMENT REQUIRED

5.1 The following equipment is required to perform the process requirements. Equipment may be substituted provided that all accuracy's and test ratios are equivalent or better.

Qty	Description
1	Fluke 87 DMM (or Equivalent)
1	Solder/Desolder Station
1	RTV-102 (White Adhesive) High Performance MIL-A-46106B Compliance UL/FDA/NSF
1	X-Acto knife with cut resistant gloves
1	Small Plastic soldering stick (used for prying and scrapping)
1	Large Battery (BR2335SM-B)
1	Small Battery (CR1225SM)

6. TESTING PROCESS

6.1 Setup

6.1.1 Read procedure completely before beginning any work.

6.1.2 Insure proper ESD precautions have been followed when handling, soldering, and desoldering parts on and off the card.

6.1.3 Once card has been removed from the rack, be sure battery circuit has been disabled before beginning any soldering/desoldering.

6.1.3.1 This shall be done by removing jumpers E10 (1-2) and E8 (7-8).

6.1.4 Use X-Acto knife to cut the RTV around each battery, taking care not to go to deep. Cut RTV away from both contacts and then desolder one at a time.

6.1.4.1 We use a small plastic tool (PCC Mars 12) to gently lift the battery's edge while heating the contact, until the battery contact lifts away. Be sure solder has been removed from the contact before lifting the battery's contact away from card.

6.1.4.2 Repeat step for other side

6.1.4.3 Once battery contacts are free from card gently pry battery away from board.

6.1.4.4 See attached picture of before and during battery removal process. The board on the right is before any work has been performed. The board on the left has had both batteries removed and the first battery has been installed.

6.1.5 Once battery has been removed from card, remove any access RTV from board. Do not use a metal scrapper it will damage the card. We use the edge of our plastic pry stick to scrap away remaining RTV. Care must be taken when performing this task.

6.1.6 Clean landings/pads. Prepare card for soldering.

6.1.7 New batteries may be built slightly different then original. Check battery orientation and polarity before soldering to card.

6.1.8 Solder batteries to card following proper soldering techniques.

6.2 Testing Procedure

6.2.1 Typical current draw: Check current draw after new batteries have been replaced.

6.2.1.1 (B2) Connect a current meter to J10 Pin-1 to Pin-2. It is not uncommon for the circuit's current to spike for a short period of time, but current should level out (usually <10 minutes) and read between **3uA to 5uA draw, typical**. If unit is 6uA or higher, the RTC circuit is overdrawing and battery will not last for the advertised rated period. This RTC circuit goes to a BGA (U35).

6.2.1.2 (B2) Next connect the current meter to E8 Pin-7 to Pin-8. Again, it is not uncommon for the circuit's current to spike for a short period of time, but current should level out (usually <10 minutes) and current should read **.1uA draw, typical**. If unit is .2uA or higher, U62 may require replacement to lower current draw.

6.2.1.3 Once unit has passed current test, install RTV around each battery to securely fasten to board. Usually the RTV is tack free in about twenty minutes.

6.2.2 Unit is now ready to be installed and programmed for customer's system. Only someone who is properly trained with Toolbox Software and familiar with the Turbine Control should do this.

6.3 ***TEST COMPLETE ***

7. NOTES

7.1 None at this time.

8. ATTACHMENTS

8.1 Picture of two IS215UCVE cards prepare for servicing.