



GE Energy

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-MKV-Revitalization

Statement of Work for Mark V Revitalization Program

DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column

| REV. | DESCRIPTION | SIGNATURE | REV. DATE |
|------|----------------------|------------------------|------------|
| A | Initial release | J. Barton & C. Wade | 4/9/2013 |
| B | Updated instructions | J. Barton & C. Wade | 11/13/2013 |
| C | | | |

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| | | | |
|---------------------------------|--------------------|--------------------|-------------------------|
| PREPARED BY J. Barton | REVIEWED BY | REVIEWED BY | QUALITY APPROVAL |
| DATE 4/9/2013 | DATE | DATE | DATE |

| | | |
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1. Scope

1.1 This is a statement of work for the Mark V Revitalization program. This program is focused on providing replacement cards and assemblies that can be swapped out at the customer site by GE Engineer. This document is to guide “Louisville Service Center” to rework, handle, and process all cards and firmware for the Mark V program.

2. Standards of quality

2.1 Refer to the current revision of the IPC-A-610 standard for workmanship standards for all circuit card(s) and assemblies.

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 Individual printed circuit boards work instruction

3.1.2 Board folder for ECN and drawing information

4. Engineering requirements

4.1 Equipment Cleaning for board’s and assemblies

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.

5. Site Survey Done by MCS

5.1 Receive from MCS.

5.2 Verify the Site survey and MCS’s requested boards/EPROM's match.

5.3 Make new Site Inventory list from template: <J:\MkV Revitalization Program\Revital Check List Template.xlsx> (Boards and EPROMS)

5.4 Save in new folder under <J:\MkV Revitalization Program\Sites>

6. Inventory and pre-packaging

6.1 Compile needed inventory from the MK V revival returns or legacy with requested revs (G1Axx)

6.1.1 Verify revs are functionally equivalent to latest rev or functional equivalent

6.1.2 Note possible problems (if any) from EC review going from customer original rev. on site survey to replacement rev (Latest or functionally equivalent). **TBD**

i. Review site survey for PSB 25282 for TCQC and QTBA compatibility.

<http://web01.salem.ge.com/fieldeng/PDF%20Service%20Bulletins/PSB25282.pdf>

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6.2 Confirm tool kit (ESD/IC extraction) available for shipment date. US Made. Qty 1 each.

6.2.1 100021022 SAP #, Vendor # 606WI1162, IC Insertion/Extraction Kit 5 piece

6.2.2 100021023 SAP #, Vendor 758ST1725, Techni-Stat Field Service Kit, 24"x 24", Wrist Strap, Blue

6.3 Confirm cases & pallets available for shipment date. Qty 3 cases required for TMR and qty 2 for Simplex units.

6.4 Confirm tie downs available for shipment date. Qty 2 for each case. TMR, need qty 6. Simplex, need qty 4.

7. Incoming

7.1 Receive PO and complete Incoming Worksheet

7.1.1 "Tag" all boards with Site Name

7.1.2 Include "Tool Kit" as job or line item

7.1.3 Include "EPROM Kit" as job or line item

8. Modifications/Upgrades

8.1 All boards shall be upgraded to latest revision or functionally equivalent when filling orders. Check board's ECN information for required changes.

8.1.1 If latest revision or functionally equivalent cards are not available, request authorization from ISM/MCS/J. Schaffter to use not functionally equivalent revision.

8.2 Site Survey will be done by MCS

8.2.1 Verify the Site survey and MCS's requested boards/EPROM's match.

8.2.2 Make new Site Inventory list from template:

<J:\Mkv Revitalization Program\Revital Check List Template.xlsx> (Boards and EPROMS)

8.2.3 Save in new folder under <J:\Mkv Revitalization Program\Sites>

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All comments in yellow need to be finalized.

9. Part Replacement

9.1 Replace components per the Mark 5e revitalization spreadsheet. **This should be spelled out in this document maybe this section. Predetermined by MCS.**

9.1.1 Follow LVL Test procedure per board

9.1.2 Replace ALL electrolytic capacitors with new cap less than 5 yrs. old per cap date code

9.1.3 Replace ALL socketed relays with new

9.1.4 Replace ALL reset switches with new. Remove if possible; that may NOT damage board in process. **This should be specified by customer, not technician.**

9.1.5 Replace ALL components that typically fail with new or others components detailed in excel file. (For example, replace the IC's on TCQA) Where is Excel File? Probably should be attached to this document.

9.1.6 Replace ALL components that typically fail with new detailed by the boards work instruction. **This should be specified in this procedure and inspected before burn-in.**

9.1.7 Replace ALL other relays with new. Remove if possible; that may NOT damage board in process. **This should be specified by customer, not technician.**

10. Board Testing & Burn-in

10.1 All cards shall be tested before burn-in.

10.2 Cards shall be burn-in for a minimum of 12 hours.

10.3 All cards shall be tested after burn-in. If unit fails, it shall be repaired and again go through the burn-in process.

10.4 If any soldering is done to a card after testing, it shall be re-tested.

10.5 If a card is washed (cleaned in the wash booth) after testing, it shall be re-tested. Cleaning/touching up small areas of the card on the bench are presently exempt, unless damaged or the integrity of the card has been violated.

10.6 All revitalized boards shall be tested after the burn-in process; while (hot). Cards shall be tested immediately after taken off of power soaking. The idea is to test while still hot/warm.

10.7 Board(s) shall be tested and repaired to meet factory specifications as outlined in Louisville’s Work Instruction(s).

10.8 Boards are to ship without firmware (Specifically EPROM’s). Remove EPROMs prior to shipment. The customer’s firmware will be installed into these revitalized boards when they arrive on site.

10.9 Apply SAP repair tag label with date.

11. Tool Kit for Field Service Engineer

11.1 Include ESD kit p/n (USA made). Kit includes anti-static mat and wrist strap.

11.2 Include IC extraction tool p/n (USA made).

11.3 Include sample board, use DS200SDCCG1A (unsellable revision). Install 4 sample proms. Label board and proms in YELLOW (i.e. sample board, sample U12 prom).



PRACTICE BOARD - Labeling



Sample picture

- Tool kit – Includes prom puller & wrist strap
- Practice board
- Emergency Prom kit

Questions???????

12. EPROMs/Firmware

- 12.1 Assemble EPROM List from PO and site survey.
- 12.2 Acquire quantity 2 each from Legacy Stock or Burn new. Must be verified with master.
- 12.3 Green dot pin 1 for orientation.
- 12.4 Package all in Static ESD Container, see picture below.



- 12.5 Place static bin in small shipping board box marked EMERGENCY USE ONLY
- 12.6 Attach EPROM Inventory list onto box made from site survey Completed in Site Survey step #3 made from Template : <J:\Mkv Revitalization Program\Revital Check List Template.xlsx>

| GE Energy | |
|---|---------------------------|
| Mkv Revitalization Program | |
| Brennillis #3 | |
| Emergency EPROM Kit | |
| Use EPROM's from this kit ONLY if the customer EPROM is damaged. Mark "bad" proms with 'X' and return to GE Energy | |
| Kit List: | Quantity |
| P1320N40936 / M1J02LAA | From SDCC -C- U3L1BUL2 |
| D1200G450P1BBD | From SDCC U3L1BUL2 -R1T1C |
| P1320N40936 / M1N1K1LAA | From SDCC U3L1BUL2 -R1T1C |
| D1200G450P1BBD | From SDCC -C- |
| P1320N40936 / M1D003LAA | From SDCC -R1T1C |
| D1200TCC471BOP | From TCEA |
| D1200TCC471BOP | From TCEA |
| P1320N40936 / M1G003LAA | From TCEA |
| D1200TCC471BOP | From TCEA |
| Shipped: _____ | |
| Return: _____ | |
| Packed By: _____ | Date: _____ |
| Inspected By: _____ | Date: _____ |
| Shipped By: _____ | Date: _____ |

Sample EPROM Inventory Label

13. Quantity Assurance

- 13.1 Inspect Boards per LVL Standard QA Procedure
- 13.2 Place "NEW" removable label on components' side of board. (Fold over one end to itself for easy FE removal)
- 13.3 Attach Yellow Tag
- 13.4 Seal board in Static Bag
- 13.5 Do NOT include service failure reports, SFR's, with the repaired board box.
- 13.6 Place SFR in appropriate MKV REVIT folder located in QA
- 13.7 Place on Designated Revitalization shipping rack according to site listed in SAP text box.

14. Packaging

- 14.1 Print out excel sheet packing list of boards to ship (11" x 17") prepared by LVL or Jill. Excel template storage location of Revital Kit Checklist with site name, Completed in Site Survey step #3 made from Template at: J:\Mkv Revitalization Program\Revital Check List Template.xlsx

| Roquette 1 | | | | | | | | | |
|------------|------------------|-------------|---------------|---------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--|
| | <u>Kit List:</u> | <u>QTY.</u> | <u>Packed</u> | <u># of PROMs to swap</u> | <u>EPROM's Swapped?</u> | <u>Jumpers to Verify</u> | <u>Jumpers Verified?</u> | <u>Did board packed?</u> | |
| 3 | DS200SDCCG4A | 1 | ✓ | 4 | | Y | | | |
| 4 | DS200SDCCG4A | 1 | ✓ | 4 | | Y | | | |
| 5 | DS200SDCCG4A | 1 | ✓ | 4 | | Y | | | |
| 6 | DS200SDCCG4A | 1 | ✓ | 4 | | Y | | | |
| 7 | DS200SLCCG3A | 1 | ✓ | 2 | | Y | | | |
| 8 | DS200SLCCG3A | 1 | ✓ | 2 | | Y | | | |
| 9 | DS200SLCCG3A | 1 | ✓ | 2 | | Y | | | |
| 10 | DS200SLCCG3A | 1 | ✓ | 2 | | Y | | | |

Kit checklist to go on inside of lid, case 1

- 14.2 Station Shipping rack to accommodate all boards prior to boxing
- 14.3 Label cases as "1 of x", 2 of x, etc. in the left hand bottom corner of lid; outside of case.
- 14.4 Label cases with site name in the right hand bottom corner of lid; outside of case.

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15. Shipping

15.1 Acquire board(s) from Shipping rack and proceed to box

15.1.1 Verify “NEW” sticker can be easily seen



15.2 Process thru SAP.

15.3 Place boxed board into shipping case.

15.4 Mark off board on excel packing list and note which case (1 of 3) it was placed.

15.5 Verify all boards are included.

15.6 Print “Returning Boards Instruction Sheets” (Who does this?)

J:\sdata\Mkv Revitalization Program\General Info\INSTRUCTIONS FOR RETURNING revival kit .docx

15.6.1 Place instructions in case 1 on the inside lid, right side.

15.7 Print 4 sheets of the “Job specific return customs forms” provided by MCS . Print only the 4 sheets on 4 tabs:
(EXCEL file): Proforma, manufacturer affidavit, importers endorsement, & foreign shippers. Examples below.

GE Energy Customs Compliance cannot obtain the following statement from the shipper; therefore requests GE Business contact with working knowledge of this shipment to complete, sign and return to GEE Customs Compliance.

I, name, declare that to the best of my knowledge and belief, that the articles herein specified were exported from the United States, from the Port of _____ (if known) on or about _____ (month/year) and that they are returned without having been advanced in value or improved in condition by any process of manufacture or other means.

| Part Number | Description | Quantity | Value, US Dollar |
|----------------|---------------|----------|------------------|
| DS200TCQAG1ADC | Circuit Board | 1 | \$100 |

Date:
Name and Title:
Signature:

Sheet 1

GE Energy Customs Compliance

Importer's Endorsement

I, _____, declare that the attached declaration that the article(s) were not advanced in value or improved in condition by any process of manufacturer or other means. It is true and correct to the best of my knowledge and belief, that the articles were manufactured by GE Energy located in the United States, and that the articles were not manufactured or produced in the United States under subheading 9813.00.05, HTSUS, and that the articles were exported from the U. S. without benefit of drawback.

Date
Printed Name
Title
Signature|

Sheet 2

MANUFACTURER'S AFFIDAVIT

GE Energy
Salem, VA

We hereby, affirm and declare that the products listed below: (circle one):

- ☒ A. Are Wholly, including all components, the growth, produce or manufacture of the listed country, or:
B. Are substantially transformed by us through a process of manufacture (other than simple combining, re packaging, etc.) into its current **FORM, FIT and FUNCTION** as indicated in the part C listing below:

| Product Name | Part # | Countries of Manufacture |
|---------------|----------------|--------------------------|
| Circuit Board | DS200TCQAG1ADC | USA |
| Circuit Board | DS200TCPSG1ACB | USA |

E. Certification: I certify that I am personally familiar with the facts stated above and will assist GE Energy if further information is required. To the best of my knowledge, parts listed above were not previously manufactured or produced in the United States under subheading 9813.00.05, Temporary Import Bond.

I declare that: (circle one)

- ☒ 1. No U.S. Customs Drawback was claimed by us.
2. U.S. Customs Drawback was claimed and we have listed the amounts stated below:

Name - Title
Date
Signature

Sheet 3

PROFORMA INVOICE



Date:
11/30/2010

Exporter Name and Address:
Attn: Barb Tobin / Tony Brouwer
MAITLAND PLANT MFGG 0968 F3
INVISTA (Canada) Company
1400 Highway 2 East
MAITLAND-ONTARIO ON K0E 1P0,
CANADA

Phone: 613-348-4042
Email: Tony.A.Brouwer@invista.com

Intermediate Consignee/Consigned to:

Measurement & Control Solutions
1800 Nelson Road
Longmont, CO 80501

Conditions of Sale and Terms of Payment:

Incoterms: EXW

Ultimate Consignee Name and Address:
GE ENERGY SERVICES
240 PRODUCTION COURT
LOUISVILLE, KY 40299
USA
ATTN: Robert Duvall
502-493-8000 ex 102
Robert.duvall@ge.com

Notify Party Name and Address:
GE ENERGY SERVICES
240 PRODUCTION COURT
LOUISVILLE, KY 40299
USA
ATTN: Robert Duvall
502-493-8000 ex 102
Robert.duvall@ge.com

Transportation method:

Via:

From MAITLAND-ONTARIO

To: KY

Sold To Name and Address (Importer of Record):
Measurement & Control Solutions
1800 Nelson Road
Longmont, CO 80501

Date of Shipment:
AWB/BL Number:
Currency: \$
PO Number: 1C1-170000429

Total Number of Packages: 2
Total Net Weight (kgs): 22
Total Gross Weight (kgs): 22

Item Number, Product Description, Country of Origin

Quantity

Unit Price

Total Price

DS200TCQAG1ADC Circuit Board USA
DS200TCQCG1ADA Circuit Board USA

1
1

\$100
\$100

\$100
\$100

Total Price
Currency

\$200
dollars

Please Note: These commodities, technology, or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law prohibited

Authorized Signature:

Company: GE Energy

Name:

Title:

This invoice is for export/import purposes only and not intended for payment purpose

Sheet 4

15.8 Place the 4 return custom forms with the board return instruction sheets.

15.9 Place qty 1 "kit return pre-printed air bills" in the Case 1. Use Fed EX for domestic and DHL for international.

15.10 Include the “kit return customs forms in Case 1. Forms provided by Jill/MCS.



Lid Attachments

- 1. Revital Kit checklist contents.**
- 2. Copy of outgoing “Ship-To-Customer” air bill.**
- 3. Kit return instruction & return airbills.**

15.11 If international, include the Commercial Invoice from MCS/Jill, on the outside of the box in the clear air bill.

15.12 Secure cases to shipping pallets. Use tie downs in a criss-cross pattern.



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15.13 Evaluate shipping instructions and contact appropriate carrier, **Domestic** – FEDEX or DHL (Air or Ground)

15.13.1 Use standard LVL shipping procedure.

15.13.2 Remove documentation showing value of shipment.

15.13.3 Air bill **TBD**

15.13.4 Bill of Lading is NOT included in contents **TBD**

15.13.5 E-mail tracking # to MCS (present contact is Jill Schaffter & PM)

15.14 Evaluate shipping instructions and contact appropriate carrier, **International** – DHL Express (Air)

15.14.1 Commercial Invoice should include boards, Eproms, tool kit, sample board, and cases.

15.14.2 Include Air bill

15.14.3 Remove Bill of Lading and other SAP generated shipping documents. These are NOT to be included in contents of the shipment.

15.14.4 E-mail tracking # to MCS (present contact is Jill Schaffter & PM)

16. Notes

16.1 None at this time.

17. Attachments

17.1 None at this time.

17.2 We probably can post a list of those cards that we have already process here along with the minimum parts required for replacement on those same units.