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GE Energy Services

Functional Testing Specification*Parts & Repair Services
Louisville, KY.***LOU-GED-TMR-RST****Test Procedure for the Mark VI TMR-RST system****DOCUMENT REVISION STATUS:** Determined by the last entry in the "REV" and "DATE" column

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<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 2 of 18</p>
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Functional test procedure for a TMR rack with miscellaneous cards

1. SCOPE

1.1 This is a functional testing procedure for the TMR controller.

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 For more information go to board's electronic folder.

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 or cracked

4.2.1.2 Terminal strips / connectors broken or cracked

4.2.1.3 Loose wires

4.2.1.4 Components visually damaged

4.2.1.5 Capacitors leaking

4.2.1.6 Solder joints damaged or cold

4.2.1.7 Circuit board burned or de-laminated

4.2.1.8 Printed wire runs 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	Reference #	Description
1	H188886	SIM035 MK6TMR

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 3 of 18</p>
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6. TESTING PROCESS

6.1 Setup

List of cards tested in the TMR rack.

IS200UCVE

IS200VAIC and IS200TBAI

IS200VAOC and IS200TBAO

IS200VCRC and IS200TBCI with IS200TRLY

IS200VCCC and IS200TICI with IS200TRLY

IS200VTCC and IS200TBTC

IS200VTURH1 and IS200TTUR with IS200TRPG

IS200VTURH2 and IS200TTUR with IS200TRPG

IS200VRTD and IS200TRTD

IS200VGENH1B and IS200TGEN with IS200TRLYH1B

IS200VCMI and IS2020RKPS

IS200VPROH1 and IS200TPRO with IS200TREG

IS200VPROH2 and IS200TPRO with IS200TREG

DS200DACA

DS2020PDMA

6.2 Testing Procedure

DOWNLOAD FIRMWARE

***NOTE* the unit must be in programming mode to download firmware from hyper-terminal.**

- 6.2.1** To down load firmware and system configuration to all V-cards.
- 6.2.2** Power down the rack for R Rack-SW1 with VPRO X Rack-SW6, and or S Rack-SW2 with VPRO Y Rack-SW7 and or T Rack-SW3 with VPRO Z Rack-SW8.
- 6.2.3** Install the V-card into the desired rack R-S-T or the VPRO into X-Y-Z.
- 6.2.4** Connect the serial cable to the IS200VCMI in the same rack the new card was installed.
- 6.2.5** Open the serial TMR hyper Terminal on the (HMI) computer with toolbox.
- 6.2.6** Apply power to the rack and wait for the UCVE to beep then apply power to the VPRO.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 4 of 18</p>
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- 6.2.7** On the TMR hyper terminal the window should display the following. VCM
Loader V4.3 [17-Mar-2000]
B-boot Normal Code
T-Enter Test Code
P-Flash Programming Code
R-Semi-Infinite RAM Test
- 6.2.8** Type P to enter Flash programming code then hit enter.
- 6.2.9** When the unit is completed its booting process the display should be at the prompt **TSM>_**.
- 6.2.10** Verify that the rack in which the new card was installed is in program mode. On the VCM the RUN led and STATUS led should be alternating back and forth.
- 6.2.11** On the (HMI) open the FM_UDP-R to download firmware to R-Rack or FM_UDP-S to download firmware to S-Rack or FM_UDP-T to download firmware to T-Rack.
- 6.2.12** The DOS prompt should read. **C:\Program Files\GE control system solutions\markVIV05.13.04C\firmware>_**.
- 6.2.13** At the DOS prompt type the four letters of the new card that needs the firmware download Example- to download to a VAIC type VAIC hit enter.
- 6.2.14** After the download is complete turn off the Rack and the VPRO rack that goes with it. (R and X), (S and Y), (T and Z).
- 6.2.15** Wait 5 seconds then apply power to the R-S-T rack wait until the rack beeps then apply power to the VPRO X-Y-Z.
- 6.2.16** Now on the (HMI) open toolbox and ensure the TMR SIM035_MK6TMR is open. Click the go on-line button.
- 6.2.17** When on-line click the YELLOW boot, this will open a popup that will show the status of the controllers.
- 6.2.18** When the controller status reads OXCA (if unit has the system configuration already downloaded) or fail (if unit needs the system configuration) close this menu and download system configuration to the new card.
- 6.2.19** On the left side of the software window highlight the card type that was just installed. Then right click and arrow down to download, choose download configuration. Click ok the unit will now start to download system configuration.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 5 of 18</p>
--	---	----------------------------

- 6.2.20** If the rack came up in a fail status. Power down the Rack and VPRO then re-apply power. Allow rack to boot in normal code or enter B on hyper-terminal.
- 6.2.21** Click go-online and click the YELLOW boot to see status.
- 6.2.22** When the unit completes booting all racks will go GREEN and read Control equal.
- 6.2.23** Now open the Reset panel-2 and clear all the errors.

TO TEST THE IS200VAIC WITH THE IS200TBAI

- 6.2.24** After the firmware and system configuration have been downloaded.
- 6.2.25** Open the Reset panel-2 and clear all the errors.
- 6.2.26** Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel R/S/T [TMR]/VAIC/card points.
- 6.2.27** Must verify I/O points on R/S/T the output is a voted output and can still read ok. You must check the non-voted I/O points.
- 6.2.28** Use the up and down arrow keys to scroll through all the cards I/O points. SysLimit 1_1 through SysLimit 1_20 and SysLimit 2_1 through SysLimit 2_20
- 6.2.29** Verify that all points toggle from 0 to 1.
- 6.2.30** Verify that R/S/T points match as they toggle on all I/O points.
- 6.2.31** OUTSUICIDE 1-4 should all read 0. Will turn on if Analogout 1-4 on R/S/T has a difference count of 4 on the 2/3 vote.
- 6.2.32** Deltafault- should toggle. This point is connected to AnalogIn2 which makes it lag behind all other I/O points.
- 6.2.33** Compstall=0.
- 6.2.34** OUT1mA varies from 8mA to 16mA.
- 6.2.35** OUT2mA varies from 8mA to 16mA.
- 6.2.36** OUT3mA varies from 8mA to 16mA.
- 6.2.37** OUT4mA varies from 8mA to 16mA.
- 6.2.38** compressSel varies from 38 to 76.
- 6.2.39** PressRateSel varies -16 to 16.
- 6.2.40** Compstalprem=0

TO TEST THE IS200VAOC WITH THE IS200TBAO

- 6.2.41** After the firmware and system configuration have been downloaded.
- 6.2.42** Open the Reset panel-2 and clear all the errors.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 6 of 18</p>
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6.2.43 Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel R/S/T [TMR]/VAOC/card points.

6.2.44 Must verify I/O points on R/S/T the output is a voted output and can still read ok. You must check the non-voted I/O points.

6.2.45 Use the up and down arrow keys to scroll through all the cards I/O points.

6.2.46 Outsucide 1-16 should read 0. Will turn on if Analogout 1-16 on R/S/T has a difference count of 4 on the 2/3 vote.

6.2.47 Out1mA thru Out16mA varies 5mA to 14mA.

6.2.48 Analogout 1-16 varies 25 to 74.

TO TEST THE IS200VCRC WITH IS200TBCI AND IS200TRLY

6.2.49 After the firmware and system configuration have been downloaded.

6.2.50 Open the Reset panel-2 and clear all the errors.

6.2.51 Open and start the VCRC graphic and start the program.

6.2.52 While the graphic runs the program verify all I/O points change and that no errors are generated on the system.

6.2.53 Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel R/S/T [TMR]/VCRC/card points.

6.2.54 Must verify I/O points on R/S/T the output is a voted output and can still read ok. You must check the non-voted I/O points.

TO TEST THE IS200VCCC WITH IS200TICI AND IS200TRLY

6.2.55 After the firmware and system configuration have been downloaded.

6.2.56 Open the Reset panel-2 and clear all the errors.

6.2.57 Open and start the VCCC graphic and start the program.

6.2.58 Locate the VCCC graphic TICI output display panel.

6.2.59 While the graphic runs the program verify all I/O points change and that no errors are generated on the system.

6.2.60 Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel R/S/T [TMR]/VCCC/card points.

6.2.61 Must verify I/O points on R/S/T the output is a voted output and can still read ok. You must check the non-voted I/O points.

TO TEST THE IS200VTCC WITH THE IS200TBTC

- 6.2.62** After the firmware and system configuration have been downloaded.
- 6.2.63** Open the Reset panel-2 and clear all the errors.
- 6.2.64** Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel R/S/T [TMR]/VTCC/card points.
- 6.2.65** Must verify I/O points on R/S/T the output is a voted output and can still read ok. You must check the non-voted I/O points.
- 6.2.66** Verify all CJ points. CJ backup, Coldjunc1, Coldjunc2, CJ Remote1, CJ Remote2 all measure room temperature.
- 6.2.67** Verify all ThermCpl1-24 all read about 37 if not adjust pot on IS200TBTC control panel. ThermCpl1-24 Range is 0 to 55.
- 6.2.68** Verify all SysLim1-24 and SysLim2-24 all read 0.
- 6.2.69** On the IS200TBTC control panel turn the POT counter clockwise this will decrease the ThermCpl1-24.
- 6.2.70** All the SysLim2TC1 thru SysLim2TC24 will enable and go to 1 when the ThermCpl1-24 drops below 5.
- 6.2.71** Now turn to POT on the IS200TBTC control panel clockwise until the ThermCpl1-24 reads 37.
- 6.2.72** Verify all SysLim1-24 and SysLim2-24 all read 0.
- 6.2.73** Continue to turn the POT until theThermCpl1-24 all read 52.
- 6.2.74** Verify all SysLim1TC1 thru SysLim1TC24 are enabled and read 1. They enable and go to 1 when the ThermCpl1-24 reads 50 or above.
- 6.2.75** If the POT is turned above 55 all ThermCpl1-24 should read 0U.
- 6.2.76** Adjust POT until ThermCpl1-24 are again back to 37 and verify all SysLim's are 0.

TO TEST THE IS200VTURH1 WITH THE IS200TTUR

- 6.2.77** After the firmware and system configuration have been downloaded.
- 6.2.78** Open the Reset panel-2 and clear all the errors.
- 6.2.79** Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel R/S/T [TMR]/VTUR/card points.
- 6.2.80** Must verify I/O points on R/S/T the output is a voted output and can still read ok. You must check the non-voted I/O points.
- 6.2.81** Open reset panel-2, find the push button labeled KQ1 this button controls a relay on the IS200TRPG, and the VTRU reads, Kq1_statNVR/S/T, Kq1_status

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 8 of 18</p>
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and Kq1 on the VTUR when this button is turned off all of the I/O point should follow. Verify this on the VTUR. For normal operation KQ1 point is high.

- 6.2.82** Now find the push button labeled KQ2 this button controls a relay on the IS200TRPG, and the VTRU reads, Kq2_statNVR/S/T, Kq2_status and Kq2 on the VTUR when this button is turned off all of the I/O point should follow. Verify this on the VTUR. For normal operation KQ2 point is high.
- 6.2.83** Next find the push button labeled KQ3 this button controls a relay on the IS200TRPG, and the VTRU reads, Kq3_statNVR/S/T, Kq3_status and Kq3 on the VTUR when this button is turned off all of the I/O point should follow. Verify this on the VTUR. For normal operation KQ3 point is high.
- 6.2.84** On VTUR1 KQ4 is not used.
- 6.2.85** ShshntTst_OK and the ShBrshTst_OK are controlled by the TTUR control panel.
- 6.2.86** On the TTUR control panel flip down the shunt voltage Mon 0HZ from 60HZ to 0HZ.
- 6.2.87** Next flip up the shunt voltage mon 120HZ.
- 6.2.88** Then on the reset panel-2 turn on the Shunt_DC you should hear the relays on the IS200TTRU's enable.
- 6.2.89** Verify on the IS200VTUR1 that ShshntTst_OK and the ShBrshTst_OK changed from 0U to a 0.
- 6.2.90** Turn off the Shunt_DC.
- 6.2.91** Now flip down the Shunt voltage Mon 120HZ.
- 6.2.92** On the reset panel locate the Shunt_AC button turn it on and verify that ShvoltMon=2000 and ShcurrMon starts to increase to 107 then slowly drops to 83 then starts to increase again.
- 6.2.93** Turn off Shunt_AC.
- 6.2.94** Flip Shunt voltage Mon 0HZ back up to 60HZ.
- 6.2.95** Verify and clear all alarms.
- 6.2.96** Gensync_Lo and Sync Bypass1 test, on the reset panel-2 turn off BYK2 then on the TTUR control panel press the 1E4 button. This should cause a Gen Sync Lo error to turn on.
- 6.2.97** To reset turn BYK2 back on and toggle the Gen low Rst and the GenSync Lo error should turn off.
- 6.2.98** Verify and clear all alarms.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 9 of 18</p>
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- 6.2.99** CB_VOLTS_OK should also be 1 this point reads the 125VDC power bus.
- 6.2.100** On the reset panel-2 SYK1 button controls CB_K25P_PU, CB_K25_PU and CB_K25A_PU. When SYK1 is high they should also be high. For normal operation SYK1 should be high.
- 6.2.101** BYK2 controls CB_K25_PU, CB_K25A_PU, L25_Command, Sync_Bypass1, CKT-BKR, CB1Closetime=15 and CB2Closetime. For normal operation BYK2 should be high
- 6.2.102** To control CB2closetime turn on CD2 select on reset panel and toggle BYK2. Verify CB2closetime=15.
- 6.2.103** On the IS200TRPG control panel locate the POT labeled (POT Flame IND 1-8) this controls FD1_Flame 1-8, FD1_Level 1-8 and FlameInd 1-8 and the VTUR reads the values. The range for FlameInd 1-8 are 120 to 1100.
- 6.2.104** Verify FlameInd 1-8 reads 1000 and verify FD1_Flame and FD1_Level = 1.
- 6.2.105** Now turn the POT counter clockwise when FlameInd is decreased below 130. FD1_Flame and FD1_Level should drop to 0.
- 6.2.106** Verify and clear all alarms.
- 6.2.107** Locate the small function generator mounted next to the TRPG board. Then on the reset panel-2 locate the TTUR RPM display verify the display is approx. 60Hz. Turn the function generator until the display reads 14KHz.
- 6.2.108** Also if the function generator is turned up at a 1500 RPM per second rate. ACCAtrip and ACCBtrip will enable.
- 6.2.109** ACCEL1-4 is where the 1500 RPM per second rate is measured. As the function generator is increased this will show the rate of increase.
- 6.2.110** Verify that PR1TRperm 1-4 enable when TTUR RPM went above 10KHZ.
- 6.2.111** Verify that the FastOS1 trip thru FastOS4 trip enabled and went to 1.
- 6.2.112** Now verify that SysLim1PR1-4 enabled and when to 1. Turn generator back to 60HZ and verify SysLimPR1-4 reset back to 0.
- 6.2.113** Verify that the FastOS1 trip thru FastOS4 trip disabled and went to 0.
- 6.2.114** Continue to turn the generator below 0HZ and verify that SysLim2PR1-4 went high.
- 6.2.115** Verify that PR1_EAstat1-4 disabled and went to 0. Will disable when below 20Hz.
- 6.2.116** Set the generator back to 60HZ and verify SysLim2PR1-4 reset back to 0.
- 6.2.117** Verify that PR1_EAstat1-4 enabled and went to 1.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 10 of 18</p>
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6.2.118 Verify and clear all alarms.

6.2.119 On the TTRU control panel locate the Shunt Voltage Mon 120Hz switch flip this switch to the up position. Verify that SysLim1SHV enabled and went to 1.

6.2.120 Flip the Shunt Voltage Mon 120Hz to the down position and verify that SysLim1SHV reset back to 0. For normal operation this switch is down.

6.2.121 Next locate the Shunt voltage Mon 0HZ switch flip this switch to the down position and verify that SysLim2SHV enable and went to 1.

6.2.122 Flip the switch back up and verify that SysLim2SHV reset back to 0. For normal operation this switch is up.

6.2.123 On the TRPG control panel locate the PT-BUS volts switch and PT-GEN bus volts switch. Verify they are both in the up position.

6.2.124 Verify the following.

Genfreq=60	Busfreq=60	GenvoltsDiff=.1
GenfreqDiff=0 and float	GenphaseDiff=0	

6.2.125 Now flip the PTBus switch down and Verify the following.

Genfreq=60	Busfreq=0	GenvoltsDiff=121
GenfreqDiff=180	GenphaseDiff=0	

6.2.126 Now flip the PTBus switch up and flip down PTGen switch and Verify the following.

Genfreq=0	Busfreq=60	GenvoltsDiff= -121
GenfreqDiff=0	GenphaseDiff=180	

6.2.127 Flip them to the down position. For normal operation they are in the up position.

6.2.128 Verify that GenFreq, BusFreq, GenvoltsDiff, GenfreqDiff and GenphaseDiff went to 0Hz.

6.2.129 Verify that SysLim2GEN and SysLim2BUS enable and went to 1.

6.2.130 Verify the relays in location 1G5 Relay K2, K3 and G52 turned off.

6.2.131 Flip them back up and verify SysLim2GEN, SysLim2BUS reset and the relays in 1G5 turned back on. Verify that GenFreq and BusFreq went to 60Hz.

6.2.132 SysLim1GEN and SysLim1BUS measure power bus and are not adjusted at this time.

6.2.133 Verify and clear all alarms.

6.2.134 FlmDetpwr1 should read approx. 340 volts from R/S/T.

6.2.135 Sol1vfdbk thru Sol3vfdbk not used with this configuration.

6.2.136 Sync_Perm_AS=0, Sync_Perm=1, Sync_monitor=0. Controlled by program.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 11 of 18</p>
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6.2.137 ETR1_fdbk thru ETR3_fdbk are not used.

6.2.138 Decelperm=1, fastos1perm=1 fastos2perm=1, diffperm=1, AccelAperm=1
AccelBperm=1 controlled by program.

TO TEST THE IS200VTURH2 WITH THE IS200TTUR

6.2.139 After the firmware and system configuration have been downloaded.

6.2.140 Open the Reset panel-2 and clear all the errors.

6.2.141 Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel R/S/T
[TMR]/VTUR/card points.

6.2.142 Must verify I/O points on R/S/T the output is a voted output and can still read
ok. You must check the non-voted I/O points.

6.2.143 Open reset panel-2, find the push button labeled KQ1-1 this button controls a
relay on the IS200TRPG, and the VTRU reads, Kq1_statNVR/S/T, Kq1_status
and Kq1 on the VTURH2 when this button is turned off all of the I/O point
should follow. Verify this on the VTURH2. For normal operation KQ1-1 point is
high.

6.2.144 Now find the push button labeled KQ2-1 this button controls a relay on the
IS200TRPG, and the VTRU reads, Kq2_statNVR/S/T, Kq2_status and Kq2 on
the VTURH2 when this button is turned off all of the I/O point should follow.
Verify this on the VTURH2. For normal operation KQ2-1 point is high.

6.2.145 Next find the push button labeled KQ3-1 this button controls a relay on the
IS200TRPG, and the VTRU reads, Kq3_statNVR/S/T, Kq3_status and Kq3 on
the VTURH2 when this button is turned off all of the I/O point should follow.
Verify this on the VTURH2. For normal operation KQ3-1 point is high.

6.2.146 Next find the push button labeled KQ4-1 this button controls a relay on the
IS200TRPG, and the VTRU reads, Kq4_statNVR/S/T, Kq4_status and Kq4 on
the VTURH2 when this button is turned off all of the I/O point should follow.
Verify this on the VTURH2. For normal operation KQ4-1 point is high.

6.2.147 ShshntTst_OK and the ShBrshTst_OK are controlled by the TTUR control
panel.

6.2.148 On the TTUR control panel flip down the shunt voltage Mon 0HZ from 60HZ to
0HZ.

6.2.149 Next flip up the shunt voltage mon 120HZ.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 12 of 18</p>
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- 6.2.150** Then on the reset panel-2 turn on the Shunt_DC you should hear the relays on the IS200TTRU's enable.
- 6.2.151** Verify on the IS200VTUR1 that ShshntTst_OK and the ShBrshTst_OK changed from 0U to a 0.
- 6.2.152** Turn off the Shunt_DC.
- 6.2.153** Now flip down the Shunt voltage Mon 120HZ.
- 6.2.154** On the reset panel locate the Shunt_AC button turn it on and verify that ShvoltMon=2000 and ShcurrMon starts to increase to 107 then slowly drops to 83 then starts to increase again.
- 6.2.155** Turn off Shunt_AC.
- 6.2.156** Flip Shunt voltage Mon 0HZ back up to 60HZ.
- 6.2.157** Verify VTURH2 and clear all alarms.
- 6.2.158** Gensync_Lo and Sync Bypass1 test, on the reset panel-2 turn off BYK2 then on the TTUR control panel press the 1E4 button. This should cause a Gen Sync Lo error to turn on and the Sync Bypass1 to turn off.
- 6.2.159** To reset turn SYK2-1 back on and toggle the Gen low Rst and the GenSync Lo error should turn off.
- 6.2.160** Verify VTURH2 and clear all alarms.
- 6.2.161** CB_VOLTS_OK should also be 1 this point reads the 125VDC power bus.
- 6.2.162** On the reset panel-2 SYK1-1 button controls CB_K25P_PU, CB_K25_PU and CB_K25A_PU. When SYK1-1 is high they should also be high. For normal operation SYK1-1 should be high.
- 6.2.163** SYK2-1 controls CB_K25_PU, CB_K25A_PU, L25_Command, Sync_Bypass1, CKT-BKR, CB1Closetime=15 and CB2Closetime. For normal operation SYK2-1 should be high
- 6.2.164** To control CB2closetime turn on CD2 select on reset panel and toggle SYK1-1. Verify CB2closetime=15.
- 6.2.165** On the IS200TRPG control panel locate the POT labeled (POT Flame IND 1-8) this controls FD1_Flame 1-8, FD1_Level 1-8 and FlameInd 1-8 and the VTUR reads the values. The range for FlameInd 1-8 are 120 to 1100.
- 6.2.166** Verify FlameInd 1-8 reads 1000 and verify FD1_Flame and FD1_Level = 1.
- 6.2.167** Now turn the POT counter clockwise when FlameInd is decreased below 130. FD1_Flame and FD1_Level should drop to 0.
- 6.2.168** Verify and clear all alarms.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 13 of 18</p>
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6.2.169 Locate the small function generator mounted next to the TRPG board. Then on the reset panel-2 locate the TTUR RPM display verify the display is approx. 60Hz. Turn the function generator until the display reads 14KHz.

6.2.170 Verify that the FastOS1 trip thru FastOS4 trip enabled and went to 1.

6.2.171 Also if the function generator is turned up at a 1500 RPM per second rate. ACCAtrip and ACCBtrip will enable.

6.2.172 ACCEL1-4 is where the 1500 RPM per second rate is measured. As the function generator is increased this will show the rate of increase.

6.2.173 Verify that PR1TRperm 1-4 enable when TTUR RPM went above 10KHZ.

6.2.174 Now verify that SysLim1PR1-4 enabled and when to 1. Turn generator back to 60HZ and verify SysLimPR1-4 reset back to 0.

6.2.175 Verify that the FastOS1 trip thru FastOS4 trip disabled and went to 0.

6.2.176 Continue to turn the generator below 0HZ and verify that SysLim2PR1-4 went high.

6.2.177 Verify that PR1_EAstat1-4 disabled and went to 0. Will disable when below 20Hz.

6.2.178 Set the generator back to 60HZ and verify SysLim2PR1-4 reset back to 0.

6.2.179 Verify that PR1_EAstat1-4 enabled and went to 1.

6.2.180 Verify and clear all alarms.

6.2.181 On the TTRU control panel locate the Shunt Voltage Mon 120Hz switch flip this switch to the up position. Verify that SysLim1SHV enabled and went to 1.

6.2.182 Flip the Shunt Voltage Mon 120Hz to the down position and verify that SysLim1SHV reset back to 0. For normal operation this switch is down.

6.2.183 Next locate the Shunt voltage Mon 0HZ switch flip this switch to the down position and verify that SysLim2SHV enable and went to 1.

6.2.184 Flip the switch back up and verify that SysLim2SHV reset back to 0. For normal operation this switch is up.

6.2.185 On the TRPG control panel locate the PT-BUS volts switch and PT-GEN bus volts switch. Verify they are both in the up position.

6.2.186 Verify the following.

Genfreq=60	Busfreq=60	GenvoltsDiff=.1
GenfreqDiff=0 and float	GenphaseDiff=0	

6.2.187 Now flip the PTBus switch down and Verify the following.

Genfreq=60	Busfreq=0	GenvoltsDiff=121
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<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 14 of 18</p>
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GenfreqDiff=180

GenphaseDiff=0

6.2.188 Now flip the PTBus switch up and flip down PTGen switch and Verify the following.

Genfreq=0

Busfreq=60

GenvoltsDiff= -121

GenfreqDiff=0

GenphaseDiff=180

6.2.189 Flip them to the down position. For normal operation they are in the up position.

6.2.190 Verify that GenFreq, BusFreq, GenvoltsDiff, GenfreqDiff and GenphaseDiff went to 0Hz.

6.2.191 Verify that SysLim2GEN and SysLim2BUS enable and went to 1.

6.2.192 Verify the relays in location 1G5 Relay K2, K3 and G52 turned off.

6.2.193 Flip them back up and verify SysLim2GEN, SysLim2BUS reset and the relays in 1G5 turned back on. Verify that GenFreq and BusFreq went to 60Hz.

6.2.194 SysLim1GEN and SysLim1BUS measure power bus and are not adjusted at this time.

6.2.195 Verify and clear all alarms.

6.2.196 FlmDetpwr1 should read approx. 340 volts from R/S/T.

6.2.197 Sol1vfdbk thru Sol3vfdbk not used with this configuration.

6.2.198 Sync_Perm_AS=0, Sync_Perm=1, Sync_monitor=0. Controlled by program.

6.2.199 ETR1_fdbk thru ETR3_fdbk are not used.

6.2.200 Decelperm=1, fastos1perm=1 fastos2perm=1, diffperm=1, AccelAperm=1
AccelBperm=1 controlled by program.

TO TEST THE IS200VRTD WITH THE IS200TRTD

6.2.201 After the firmware and system configuration have been downloaded.

6.2.202 Open the Reset panel-2 and clear all the errors.

6.2.203 Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel R/S/T [TMR]/VRTD/card points.

6.2.204 Must verify I/O points on R/S/T the output is a voted output and can still read ok. You must check the non-voted I/O points.

6.2.205 Verify all 16 RTD's read about 200 and all Syslim's are 0.

6.2.206 Now locate the VRTD control panel.

6.2.207 Turn the POT counter clockwise and verify the RTD points on the card are decreasing. When they go below 5 all SysLim2 1-16 should go high.

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 15 of 18</p>
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6.2.208 Now turn the POT clockwise when above 5 all SysLim2 1-16 should go back low. Continue to turn the POT when 450 is reached all SysLim1 1-16 should go high.

6.2.209 Set RTD's back to 200.

6.2.210 Verify and clear all alarms.

TO TEST THE VGEN WITH TGEN AND TRLY-B

6.2.211 After the firmware and system configuration have been downloaded.

6.2.212 Open the Reset panel-2 and clear all the errors.

6.2.213 Click on SIM035/Hardware and I/O definitions/mark VI I/O/Rack0 channel R/S/T [TMR]/VGEN/card points.

6.2.214 Must verify I/O points on R/S/T the output is a voted output and can still read ok. You must check the non-voted I/O points.

6.2.215 Next open the VGEN graphics screen.

6.2.216 Click the IV_TRIGR button this will turn on relay Feedback outputs 5 thru 10 only. Also should generate a relay mismatch error on the VGEN card.

6.2.217 Verify all the outputs enabled on the VGEN and TRLY-B card. If all points read ok turn IV_TRIGR back off.

6.2.218 Clear all alarms.

6.2.219 Click on the EVA_EXTCMD button this will turn on relay Feedback outputs 1 thru 10 and turn on the L10EVA_EVT which will turn on all three L10EVA_NVR,S,T points on the VGEN card. This will also generate relay mismatch errors on the VGEN.

6.2.220 After 10 seconds this will time out and reset.

6.2.221 Verify all I/O points and relay point's control.

6.2.222 Turn EVA_EXTCMD off.

6.2.223 Now click on Automatic to run the VGEN relay program. All relays and Feedback points should follow each other as the program runs.

*** NOTE THE IV_TRIGR AND EVA_EXTCMD WILL OVER RIDE THE AUTO RELAY PROGRAM***

6.2.224 Verify all I/O points control on the VGEN and TRLY-B card. This should not generate any errors.

6.2.225 Now locate the TGEN control panel. Located on the TGEN panel then locate the adjustable knob labeled GenPT and BusPT.

6.2.226 This controls the voltage on the PT transformers on the TGEN board.

6.2.227 Verify all the PT outputs are ok.

6.2.228 For both Gen and Bus

Gen-PT	Vab-120 to 0	VOLTS
Gen-PT	Vbc-120 to 0	VOLTS
Gen-PT	Vca-240 to 0	VOLTS
Bus-PT	Vab-120 to 0	VOLTS
Bus-PT	Vbc-120 to 0	VOLTS
Bus-PT	Vca-240 to 0	VOLTS

6.2.229 Verify the voltages will decrease to zero as the knob is turned counter clockwise.

6.2.230 Verify all I/O point on the VGEN read ok and verify alarms then set back to max.

6.2.231 Now locate the TGEN control panel. There are four knobs labeled Analog 1 ,2 ,3 and 4.

6.2.232 Those are 4-20ma I/O points.

6.2.233 Their range will adjust from 3.6mA to 21mA. Verify they are all setting at 4.2mA.

6.2.234 Adjust the analogs one at a time.

NOTE IF MORE THEN ONE ANALOG IS ADJUSTED AT A TIME, THIS WILL CAUSE RANDEME PLU ERRORS. THESE ERRORS ARE OK THAT IS WHAT IT IS DESIGNED TO DO.

6.2.235 Adjust analog 1 down to its lowest point verify 3.6mA then turn to max 21mA. Set back to 4.2mA.

6.2.236 Repeat this for all four analogs.

6.2.237 Next verify all the current switches for A, B and C are all off. Currents A,B and C should be 0Amps. The switches should be in the up position. Now start turning on the switches and follow the table below.

CURRENT A	CURRENT B	CURRENT C
SW1= 3.1A	SW1= 3.1A	SW1= 3.1A
SW1,2= 6.3A	SW1,2= 6.3A	SW1,2= 6.3A
SW1,2,3= 9.4A	SW1,2,3= 9.4A	SW1,2,3= 9.4A
SW1,2,3,4= 12.5A	SW1,2,3,4= 12.5A	SW1,2,3,4= 12.5A

6.2.238 Next when all currents A,B and C are maxed adjust analog 1 and analog 2 to 21mA.

6.2.239 Now on current C turn off SW3 and SW4 at the same time. This will enable the L10PLU_EVT and L10EVA_EVT with all six PLU and EVA I/O points.

6.2.240 After all six L10 I/O points enable all the other current switches can be turned off. Current's A,B and C should read 0AMPS.

6.2.241 The L10EVA_NVR,S,T with relays 1 thru 10 with stay enabled for 10 seconds.

6.2.242 After 10 seconds they will reset and the PLU will keep relays 1 thru 4 enabled.

6.2.243 Now turn down analog's 1 and 2 to 4.2mA as they are turned down the L10PLU_EVT should disable and the L10PLU_NVR,S,T should reset.

6.2.244 Verify all I/O points and alarms then clear all alarms.

TO TEST THE VCM I AND RKPS

6.2.245 After the firmware and system configuration have been downloaded.

6.2.246 Open the Reset panel-2 and clear all the errors.

6.2.247 Click on SIM035/Hardware and I/O definitions/markVI I/O/Rack0 channel S (simplex) [TMR]/VCM I.

6.2.248 Locate Rack S power supply box.

6.2.249 Verify all Syslimits's are 0.

6.2.250 Verify

P125Bus = 120

P125_Grd= 60

N125_Grd= -60

Spare01= 120

Spare02= 120

6.2.251 Switch the toggle switch to the high side.

6.2.252 Verify SysLimit1_1 thru Syslimt1_125 went to 1.

6.2.253 Verify

P125Bus = 149

P125_Grd= 74.4

N125_Grd= -74.4

Spare01= 149

Spare02= 149

<p>LOU-GED-TMR-RST REV. A</p>	<p>g</p> <p>GE Energy Services Parts & Repair Services Louisville, KY</p>	<p>Page 18 of 18</p>
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6.2.254 Switch back to normal and verify all the readings' are normal.

6.2.255 Now switch to LOW

6.2.256 Verify Syslimit2_1 thru SysLimit2_4 went to 1.

6.2.257 Verify NOTE SYSLMT2_125 HAS A SOFTWARE AND WILL NOT CHANGE.

P125Bus = 88

P125_Grd= 44

N125_Grd= -44

Spare01= 88

Spare02= 88

6.2.258 Switch back to normal and verify all the readings' are normal.

6.2.259 PS_Lmt_P5 thru PS_Lmt_N28 should all be 0.

6.2.260 Locate the Rack S logic control board.

6.2.261 Verify all Logic_IN 1-12 are 0.

6.2.262 Flip up the switch located on this board.

6.2.263 Verify all logic's went to 1.

6.2.264 Flip it back down and they should return to 0.

6.2.265 Locate the IONET Test box.

6.2.266 Press and hold the Kill S button and verify that all readings on the VCMI-s went 0U.

6.2.267 Also verify in toolbox the green control at the bottom of the software now displays a YELLOW UNKN.

6.2.268 Release the button and all readings should return.

6.2.269 Verify and clears errors.

6.3 *TEST COMPLETE*****