g GE Energy	**Functional Testing Specification**
Inspection & Repair Services ***Louisville, KY***	**LOU-GEF-DIF2** **1050HL Board**

Test Procedure for DIF2 Printed Circuit Board for a 1050HL Control

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Functional test procedure for 1050HL DIF2 Printed Circuit Board

1. SCOPE

1.1 The instructions apply to all DIF2 boards in test.

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 GEK-71770

4. ENGINEERING REQUIREMENTS

4.1 Description

4.1.1 The 1050 Control is a solid-state, integrated circuit controller/processor system using LSI circuits for data processing and control. The static logic circuits are arranged on modular, plug in, printed circuit boards, clearly identified by type. The circuit boards are mounted with functional grouping. In addition, a board identification number marks each rack slot.

4.2 Equipment Cleaning

4.2.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to the local documented procedures for cleaning guidelines.

4.3 Equipment Inspection

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

4.3.1.1 Wires broken or cracked
4.3.1.2 Terminal strips / connectors broken or cracked
4.3.1.3 Loose wires
4.3.1.4 Components visually damaged
4.3.1.5 Capacitors leaking
4.3.1.6 Solder joints damaged or cold
4.3.1.7 Circuit board burned or de-laminated
4.3.1.8 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	GE 1050HL	Control with axis cart

6. Purpose:

6.1 To describe the procedure for testing the circuitry of the DIF2 board using the 1050HL simulator.

7. General:

7.1 The DIF2 board does not have its own specific software diagnostics, therefore the board is tested by operating the diagnostics for the other boards in the system.

8. TESTING PROCESS

8.1 Procedure

8.1.1 Remove the test DIF2 board from slot 5 and insert the board to be tested.
8.1.2 Special Mode Switch should be on (UP).
8.1.3 Press "ON".
8.1.4 "00" or "20" should appear in the message display and "?" in the alphanumeric display.
8.1.5 Press "P4", "1", and "ENTER". This instructs the control to read from the resident diagnostics boards.
8.1.6 A "T" will appear in the alpha display. Press "R" and "ENTER". This instructs the control to run all of the software diagnostics. See Exhibit A.
8.1.7 Observe message display for error codes.

8.2 ***TEST COMPLETE ***

8.3 Exhibit A

Q.S.I. No. 3,7,5,713
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FOM Board Diagnostics for the 1050H Control
Operating Procedure

GEK-71790

EXHIBIT A

VERIFY

Sufficient directions are now entered. The following procedure explains how to step through a display of the list of tests. 'V' is on the display.

Also displayed are the ID number and commands (if any) of the first test which has been selected. Press the Next pushbutton and the next test in the list is displayed. The iteration index is also displayed all the while.

If the tests and commands are correct, push Forward to begin testing.

SHORTCUT TO RUN ALL UNAIDED TESTS

Some tests require the assistance of the troubleshooter while they execute. For instance, the control station display exerciser (C50C) relies on the user to spot failures in the control station display hardware. Tests which run without assistance are called unaided. Table 2 lists the unaided tests.

Table 2
UNAIDED TESTS

Test	ID	Command
Data Controller Processor	0100	None
Data Controller Memory	0200	None
Axis Controller Processor	1000	None
Axis Controller Memory	2000	None
CGTU	3000	None
Axis Boards	4000	Subtest No. (00-12)
Spindle Board	5000	Subtest No. (00-09)

All unaided tests can be run by pressing R and Enter. Testing begins automatically. Continuous iteration and stopping for errors is assumed (default conditions). This command will include test 5000 if Machine Setup Data (MSD) indicates that a spindle board should be in the Control or if MSD were lost.

ID Number 9999

Another way to select all unaided tests is to input 9999 as an ID number. In this case, however, testing does not begin automatically. The user can select additional tests, and he must answer the questions about iterating and stopping for errors.

Example 7. Select all unaided tests and the RS-232 test (9400), Mixed mode (command '2'). Specify iteration of all selected tests and whether or not to stop for errors.

PRESS KEYS	OBSERVE DISPLAYS BLOCK NUMBER	MAIN READOUT	MESSAGE
9	9 0 0 9	T	0 0
9	0 0 9 9	T	0 0
9	0 9 9 9	T	0 0
9	9 9 9 9	T	0 0
Enter	0 0 0 0	T	0 7
4	0 0 0 4	T	0 7
0	0 0 4 0	T	0 7
0	0 4 0 0	T	0 7
Enter	0 4 0 0	C	0 7
2	0 4 0 0	C 2	0 7
Enter	0 0 0 0	T	0 8
Forward	0 4 0 0	I	0 7
6	0 4 0 6	I 0	0 7
0	0 4 0 0	I 0 0	0 7
Enter	0 4 0 0	S 0 0	0 7
Enter	0 1 0 0	V 0 8	0 0

Note that the index number jumps from 00 to 07. This happens because the 7 unaided tests were selected because the operator entered ID number 9999.