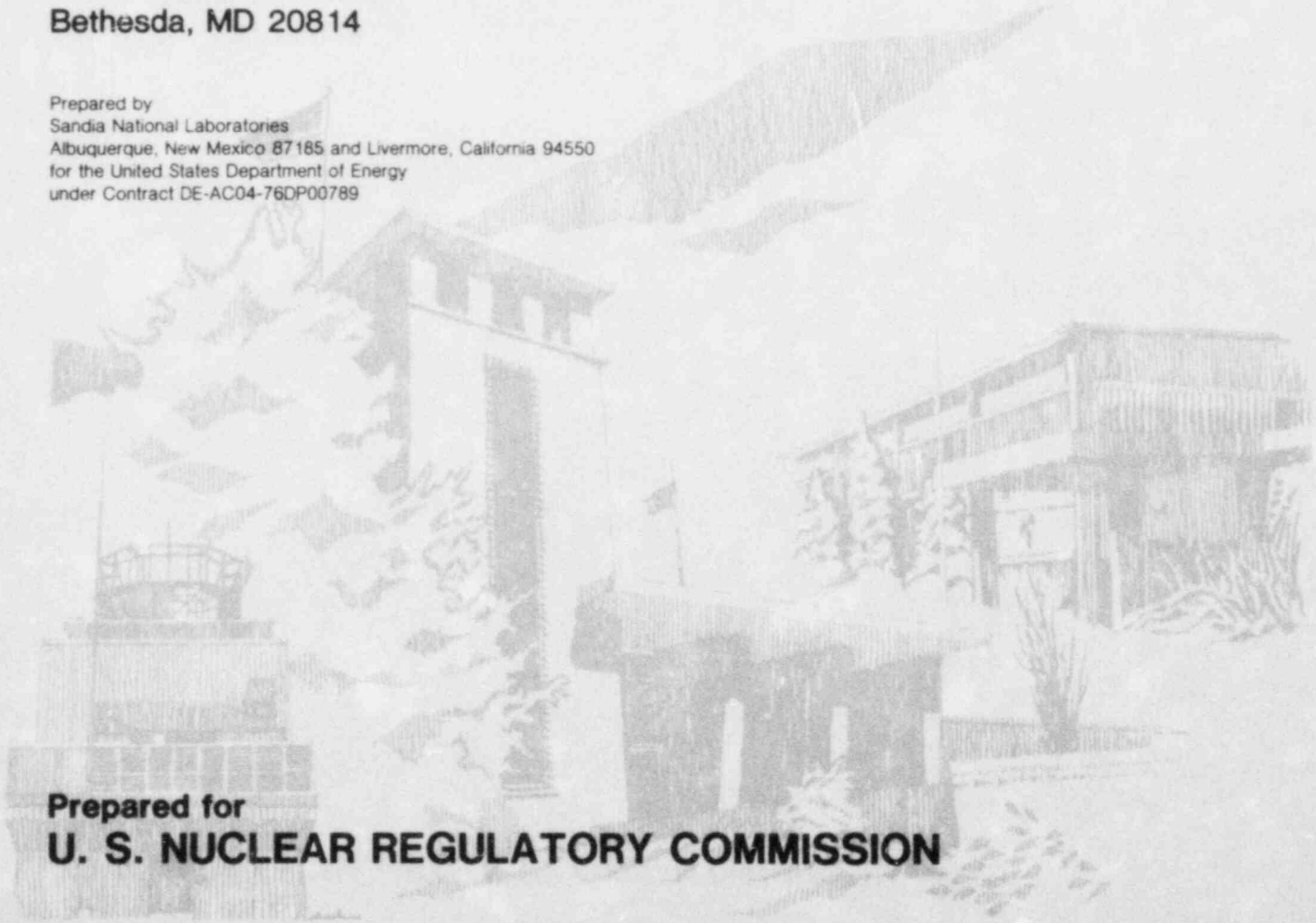
NUREG/CR--3085/3 of 4
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AN, RG, XA
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CONTRACTOR REPORT

# Interim Reliability Evaluation Program: Analysis of the Millstone Point Unit 1 Nuclear Power Plant

## Volume III—Appendix B.5 Through B.8

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under Contract DE-AC04-76DP00789



**Prepared for**
**U. S. NUCLEAR REGULATORY COMMISSION**

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# INTERIM RELIABILITY EVALUATION PROGRAM:

# ANALYSIS OF THE MILLSTONE POINT UNIT 1 NUCLEAR POWER PLANT

Volume III

Appendix B.5 through B.8
May 1983

Prepared by

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# APPENDIX B.5

# LOW PRESSURE COOLANT INJECTION SYSTEM

## B.5.1 Low Pressure Coolant Injection (LPCI) Description

### B.5.1.1 Purpose

The purpose of the LPCI system is to provide sufficient coolant makeup to the vessel to prevent fuel clad melting as a result of a LOCA, which may range in break size from those which can be adequately handled by FWCI to the largest possible pipe break. The LPCI/containment cooling system provides containment cooling following core recovery.

### B.5.1.2 Description and Configuration

The LPCI system is separated into two subsystems (A and B) connected through a cross tie line with one normally key locked open motor operated valve. Each of the LPCI subsystems consists of two pumps, one heat exchanger (with heat removal through the emergency service water system), a drywell spray header, torus test line, a shared torus spray header, and the associated check, manual and motor operated valves. The system configuration is shown in Figure B.5-1. Table B.5-1 is a valve list.

Coolant is drawn from the suppression chamber through three suction strainers and into a common header. From this ring header, flow passes to each subsystem where it is again divided and drawn through each of the LPCI pumps. (LPCI pumps A and C for the A subsystem, B and D for the B subsystem). In each subsystem the coolant flow from the two pumps goes into a common header before passing through the heat exchanger or the heat exchanger bypass line. (During the injection mode of operation, flow passes through both the heat exchanger and the bypass line; during the containment cooling mode, flow passes through the heat exchanger only.) Flow from these two paths is combined before passing through the LPCI injection valves and into recirculation loop A or B.

In the event of a recirculation line break, instrumentation is provided to select the undamaged flow path for injection of the required LPCI system flow into the reactor vessel. This instrumentation also causes appropriate valves to close which could otherwise result in spillage of the LPCI flow from the shroud region. With no break, LPCI injection loop B is the preferred injection path.

Three possible flow diversion paths exist in each LPCI subsystem. Flow can be diverted through the torus test lines, the torus spray lines or the containment spray lines. The two spray lines in each subsystem draw flow from the injection line before it passes through the injection valves (LP-9A or LP-9B). The torus test lines draw flow from between the inboard and outboard injection valves, between LP-9A and 10A or LP-9B and 10B.

The LPCI pumps are self cooled drawing flow from the injection line just past the heat exchanger and returning the flow to the pump suction lines.

The condensate storage tank forms a backup water supply to the LPCI pumps through a series of normally closed manual valves. These valves are located in high radiation areas.

B.5.1.3 System Interfaces

The system interfaces for LPCI and LPCI/containment cooling (LPCI/CC) are shown in Table B.5-2.

B.5.1.4 Instrumentation and Control

The LPCI system is actuated by either high drywell pressure or low reactor level in conjunction with low reactor pressure signals. Valve operation is initiated upon receipt of any of the following combinations of sensor outputs:

high drywell pressure (1 out of 2 twice) and low Rx pressure (1 out of 2 twice)

or

low reactor water level (1 out of 2 twice) and low Rx pressure (1 out of 2 twice)

or

high drywell pressure (1 out of 2 twice) and low Rxpressure (1 out of 2) and low Rx pressure (1 out of 2twice)[1]

or

low Rx water level (1 out of 2 twice) and low Rx pressure (1 out of 2) and low Rx pressure (1 out of 2 twice)[1]

The LPCI pumps auto start upon receipt of either of the following two sensor output combinations:

high drywell pressure (1 out of 2 twice)

or

low reactor water level (1 out of 2 twice) and low reactor pressure (1 out of 2).

Loop selection is achieved through the use of differential pressure indication switches located on the jet pumps. With no differential pressure indicated, injection is through loop B. When a 1 out of 2 twice differential pressure sensor output exists injection is through the A loop. As part of the loop selection, the two recirculation pumps are tripped, if running, before

---

1 One set of low Rx pressure sensors (1 out of 2 twice) are specifically used to generate a valve open permissive signal. The second set of low Rx pressure sensors (1 out of 2) is part of the system actuation logic.

the output signal from the differential pressure switches at the jet pumps is used to select the injection loop. Recirculation pump operation is monitored by 8 differential pressure switches with outputs arranged in a 1 out of 2 four times logic to indicate pump operation.

The LPCI pumps also have undervoltage protection circuits and an LNP trip circuit for the two pumps on the diesel generator, LPCI pumps A and C. LPCI system actuation is fully automatic. Operator action is required only to place the LPCI system into the LPCI/CC mode of operation. The operator also has the option of opening the torus and containment spray lines that are supplied from the LPCI pumps.

The instrumentation used by the LPCI system is shown in Table B.5.3. The control logic is shown in the set of control wire diagrams in Figure B.5-2.

B.5.1.5 Testing

Tests performed on the LPCI system are of three major types: 1) Sensor Functional and Calibration Tests, 2) System Logic tests, and 3) Mechanical Component Functional and Position Tests.

Sensor Functional and Calibration Tests

In each of the tests in this category the relay coil associated with each sensor is tested by virtue of being energized and de-energized as part of the test.

SP 412A Reactor Low-Pressure Valve Permissive Functional and Calibration Test

The operation of PS 2205/263-52A, 2206/263-52B, 2205/263-52C, 2206/263-52D is checked monthly. Any calibration required as a result of the check is performed as part of this surveillance procedure.

SP 412B Reactor Low-Pressure Pump Start Functional and Calibration Test

The operation of PS 2251/263-54A and 2252/263-54A is checked monthly. Any calibration required is performed as part of this procedure.

SP 412C Reactor Low-Low Water Level Functional and Calibration Test

Level switches 2205/263-72A, 2206/263-72B, 2205/ 263-72C, 2206/263-72D are functionally tested monthly and calibrated quarterly in this procedure.

SP 412D High Drywell Pressure Functional and Calibration Test

Drywell pressure sensors, 2205/1501-90A, 2206/1501-90B, 2205/1501-90C, 2206/1501-90D are tested and calibrated as needed, monthly.

SP 412E Containment Spray Interlock Functional and Calibration test

Drywell pressure sensors 2205/1501-83A, 206/ 1501-83B, 2205/1501-83C, and 2206/1501-83D are tested and calibrated as required monthly.

SP 412G Break Detection Valve Permissive Functional and Calibration Test

Pressure switches 2251-263-111A, 2252-263-111B, 2251-263-111C, 2252-263-111D; recirculation riser differential pressure switches 2251-261-12A, 2252-261-12B, 2251-261-12C, 2252-261-12D; and recirculation pump differential pressure switches 2271-263-36A, 2271-263-36B, 2271-263-37A, 2271-263-37B, 2272-263-38A, 2272-263-38B, 2272-263-39A, 2272-263-39B are tested and calibrated as required during refueling.

System Logic Tests

SP 412F Power Available Relays Functional Tests

Undervoltage and LNP circuits to the LPCI pumps are tested monthly. Relays LNP2, 27-5A, 27-5B, 27-6A, and 27-6B are tested.

SP 412K LPCI/Containment Cooling Logic Test

Performed during a refueling outage, this procedure is used to test individual relay coils and contact pairs in the LPCI auto-initiation logic.

SP 628.1 Integrated Simulated Automatic Actuation of FWCI, Core Spray, LPCI, Diesel and Gas Turbine Generators

During refueling, a dummy LNP and high drywell signal are induced and full system actuation is checked. All four LPCI pumps start and injection valve LP-10B opens (valve LP-12B is manually closed).

Mechanical Component Functional and Position Check

SP 622.7 LPCI System Operability Test

The LPCI pumps, MOVs, and check valves P-3A(B)(C)(D) are all tested monthly for operability. (Table B.5-1 LPCI valve list designates which valves are MOVs and check valves.) This procedure is performed daily on the operable system(s) when one train of the LPCI or core spray system is inoperable or when one LPCI pump is inoperable.

SP 622.2 LPCI Pump Flow Rate Test

All four LPCI pumps are tested quarterly, and after maintenance to verify the pump flow rates.

SP 622.3 LPCI Pump Operability Test

All four LPCI pumps are started and run monthly.

SP 622.4 LPCI Motor Operated Valve Functional Test

LPCI MOVs are opened and closed during this monthly surveillance procedure. (See Table B.5-1 for LPCI MOVs).

SP 623.18 Emergency Valve Position Check

Weekly, the following LPCI valves are checked for proper positioning: LP-1A(B), LP-2A(B), LP-2C(D), LP-4A(B), LP-4C(D), LP-5A(B), LP-6A(B), LP-7A(B), LP-8A, LP-13A(B), LP-14A(B), LP-15A(B), LP-16A(B), LP-48A(B), LP-44A(B), LP-9A(B), and LP-10A(B)

OP 335 LPCI/Containment Cooling System

All LPCI valves (see Table B.5-1) are aligned in their proper standby position during each refueling and following system use.

B.5.1.6 Maintenance

Maintenance on the LPCI system is performed on an as needed basis.

B.5.1.7 Technical Specifications

A. Limiting condition for operation

1) The LPCI system must be operable whenever irradiated fuel is in the core except under the conditions outlined below.

2) When one of the LPCI pumps is inoperable reactor operation is allowed for 30 days provided that the remaining LPCI equipment, both core spray systems and both emergency power sources are operable.

3) One drywell spray loop may be inoperable for 30 days with the reactor water temperature being greater than 212$^{o}$F.

4) Reactor operation is permitted for seven days when one component in each containment cooling subsystem or one component in the LPCI and ESW systems is inoperable provided both core spray subsystems, the remaining LPCI components and the emergency AC power sources are operable.

5) Reactor operation is permitted for only four days if one LPCI and one ESW pump in each containment cooling subsystem is inoperable or if one containment cooling subsystem itself is inoperable, provided the remaining containment cooling components, both core spray subsystems and both emergency AC power sources are operable.

6) If the above conditions cannot be met, the reactor must be shut down.

B. Surveillance requirements

1) LPCI Subsystem Testing:

a. Each refueling, a simulated automatic activation test is performed.

b. After pump maintenance and at least every three months, pump flow rate tests are performed.

c. Pump operability is tested monthly.

d. Motor operated valves are tested monthly.

2) With one LPCI pump inoperable, the remaining LPCI components, both core spray subsystems and both emergency AC power sources are tested immediately upon discovery of the inoperable pump. The operable LPCI pumps are tested daily as long as one LPCI pump is inoperable.

3) An air test is performed once every five years on the drywell spray headers and nozzles.

4) When one component in each containment cooling system or one component in both the LPCI and ESW systems is inoperable the remaining containment cooling components, both core spray subsystems, and both emergency AC power sources are tested immediately and daily until the inoperable components are repaired.

5) When one LPCI and ESW pump is inoperable the surveillance requirements outlined in Section B.4 above are followed.

6) When one containment cooling subsystem is inoperable the surveillance requirements outlined in Section B.4 above are followed.

B.5.1.8 Operation

The LPCI pumps start on high drywell pressure or low reactor water level and pressure. High drywell pressure or low water level in conjunction with low reactor pressure will open one set of injection valves. (The LPCI system will inject coolant into the B recirculation loop only, unless a break exists in the B loop.) If there is a break in the B recirculation loop, all the LPCI flow is injected into recirculation loop A.

Initiation of the LPCI system is fully automatic. The operator's only action is to verify that the system has initiated. The conversion to the LPCI/Containment Cooling mode of operation requires that the operator close the heat exchanger bypass valve LP-7A(B), shut down the appropriate number of LPCI pumps (leaving 2 running) and start the appropriate emergency service water (ESW) pumps. Stopping the pumps places them in a manual operating mode with an automatic start override if the pumps were stopped after the initiating pressure and level signals had cleared.

Once the initiating signals have cleared, the operator has the option to use the LPCI system to cool the drywell and torus using the drywell spray lines and the torus spray lines, respectively. The LPCI test lines may also be used to help cool the torus.

B.5.2 Analysis

B.5.2.1 Success/Failure Criteria

There are three modes of LPCI system operation each with a different set of success criteria. The criteria for which models were constructed for the LPCI system are:

1) Two of four LPCI pumps must operate injecting flow from the torus through one of the recirculation loops,

2) One of four LPCI pumps must operate injecting flow from the torus through either recirculation loop, and

3) Containment cooling -- one of four LPCI pumps must operate with the associated heat exchanger bypass valve closed forcing flow through the heat exchanger with heat transfer to the ESW system ultimately injecting flow back to the torus.

B.5.2.2 Assumptions

1) LPCI injection through the recirculation loop other than the one that should have been selected (i.e. the B loop if a break exists in the A recirculation loop or no break exists; the A loop if a break exists in the B recirculation loop) is treated as a system failure.

2) Similarly, propagation of the correct control (actuation) signal through an improper signal path is considered a control signal failure.

3) The minimum flow bypass lines, used to prevent pump cavitation during pump start up, were not included as leading to pump failure during the course of the accident.

4) Flow diversion through the relatively small (6" as opposed to 18" for the main LPCI pipes) torus spray lines was considered only in the more restrictive case of two of four LPCI pumps required for system success.

5) The condensate storage tank is not considered as a possible source of water for the LPCI System.

Table B.5-1.

LPCI Valve List

| Valve No. | Type | Function | Position |
|---|---|---|---|
| LP-1A | manual, butterfly | System Suction Shutoff | NO |
| LP-1B | manual, butterfly | System Suction Shutoff | NO |
| LP-2A | motor operated | Pump A Suction Valve | NO |
| LP-2B | motor operated | Pump B Suction Valve | NO |
| LP-2C | motor operated | Pump C Suction Valve | NO |
| LP-2D | motor operated | Pump D Suction Valve | NO |
| LP-3A | check valve | Pump A Discharge Check | |
| LP-3B | check valve | Pump B Discharge Check | |
| LP-3C | check valve | Pump C Discharge Check | |
| LP-3D | check valve | Pump D Discharge Check | |
| LP-4A | manual valve | Pump A Discharge Valve | NO |
| LP-4B | manual valve | Pump B Discharge Valve | NO |
| LP-4C | manual valve | Pump C Discharge Valve | NO |
| LP-4D | manual valve | Pump D Discharge Valve | NO |
| LP-5A | manual valve | Heat Exchanger A Inlet | NO |
| LP-5B | manual valve | Heat Exchanger B Inlet | NO |
| LP-6A | manual valve | Heat Exchanger A Outlet | NO |
| LP-6B | manual valve | Heat Exchanger B Outlet | NO |
| LP-7A | motor operated | Heat Exchanger A Bypass | NO |
| LP-7B | motor operated | Heat Exchanger B Bypass | NO |
| LP-8A | motor operated | System Cross Tie | (key locked open) |
| LP-9A | motor operated | Outboard Stop LPCI Injection | NO |
| LP-9B | motor operated | Outboard Stop LPCI injection | NO |
| LP-10A | motor operated | Inboard LPCI Injection Valve | NC |
| LP-10B | motor operated | Inboard LPCI Injection Valve | NC |
| LP-11A | check | Testable check | |
| LP-11B | check | Testable check | |
| LP-12A | manual | System Discharge Shutoff | NO |
| LP-12B | manual | System Discharge Shutoff | NO |
| LP-13A | motor operated | Outboard Stop to Torus Spray | NC |
| LP-13B | motor operated | Outboard Stop to Torus Spray | NC |
| LP-14A | motor operated | Inboard Stop to Torus Spray | NC |
| LP-14B | motor operated | Inboard Stop to Torus Spray | NC |
| LP-15A | motor operated | Outboard Stop to Containment Spray | NC |
| LP-15B | motor operated | Outboard Stop to Containment Spray | NC |

Table B.5-1. (Cont'd)

LPCI Valve List

| Valve No. | Type | Function | Position |
|---|---|---|---|
| LP-16A | motor operated | Inboard Stop to Containment Spray | NC |
| LP-16B | motor operated | Inboard Stop to Containment Spray | NC |
| LP-17A | manual | LPCI pumps A and C Cooling Water Return Stop | NO |
| LP-17B | manual | LPCI pumps B and D Cooling Water Return Stop | NO |
| LP-18A | manual | LPCI pumps A and C Cooling Water Backup Stop | NO |
| LP-43A | motor operated | Outboard Stop Test Line to Torus | NC |
| LP-43B | motor operated | Outboard Stop Test Line to Torus | NC |
| LP-44A | motor operated | Inboard Stop Test Line to Torus | NC |
| LP-44B | motor operated | Inboard Stop Test Line to Torus | NC |
| LP-51A | manual | Cooling Water Supply Stop, Pumps A and C | NO |
| LP-51B | manual | Cooling Water Supply Stop, Pumps B and D | NO |
| LP-52A | solonoid operated | Cooling Water Solonoid Stop, Pumps A and C | NC |
| LP-52B | solonoid operated | Cooling Water Solonoid Stop, Pumps B and D | NC |
| LP-53A | manual | Inlet to "A" Cooling Water Reducer | NO |
| LP-53B | manual | Inlet to "B" Cooling Water Reducer | NO |
| LP-54A | manual | Inlet to "C" Cooling Water Reducer | NO |
| LP-54B | manual | Inlet to "D" Cooling Water Reducer | NO |
| LP-55A | manual | Outlet from "A" Cooling Water Reducer | NO |
| LP-55B | manual | Outlet from "B" Cooling Water Reducer | NO |
| LP-56A | manual | Outlet from "C" Cooling Water Reducer | NO |
| LP-56B | manual | Outlet from "D" Cooling Water Reducer | NO |
| LP-62A | manual | Cooling Water Return from "A" LPCI Pump | NO |
| LP-62B | manual | Cooling Water Return from "B" LPCI Pump | NO |
| LP-63A | manual | Cooling Water Return from "C" LPCI Pump | NO |
| LP-63B | manual | Cooling Water Return from "D" LPCI Pump | NO |
| LP-73A | pressure control | LPCI Pump "A" Cooling Water Pressure Reducer | NO |
| LP-73B | pressure control | LPCI Pump "B" Cooling Water Pressure Reducer | NO |
| LP-74A | pressure control | LPCI Pump "C" Cooling Water Pressure Reducer | NO |
| LP-74B | pressure control | LPCI Pump "D" Cooling Water Pressure Reducer | NO |

* NO -- normally open
NC -- normally closed

Table B.5-2

LPCI System Interfaces Failure Modes and Effects

| Front Line System | | | Support System | | | Failure Mode | Failure Effect |
|---|---|---|---|---|---|---|---|
| System | Div. | Comp. | System | Div. | Comp. | | |
| LPCI | | Drywell Spray Valve LP-15A | AC Pwr | Diesel | Bus F-3 | | |
| | A | LP-16A | DC Pwr | | Bus 101-AB-1 | Low or zero voltage | Valve fails as is (N.C.) |
| | B | LP-15B | AC Pwr | G/T | Bus E-3 | | |
| | | LP-16B | DC Pwr | | Bus 101-AB-2 | | |
| LPCI | | Torus Spray Valve LP-13A | AC Pwr | Diesel | Bus F-3 | | |
| | A | LP-14A | DC Pwr | | Bus 101-AB-1 | Low or zero voltage | Valve fails as is (N.C.) |
| | B | LP-13B | AC Pwr | G/T | Bus E-3 | | |
| | | LP-14B | DC Pwr | | Bus 101-AB-2 | | |
| LPCI | | Torus Cooling and Test Valve LP-43A | AC Pwr | Diesel | Bus F-3 | | |
| | A | LP-44A | DC Pwr | | Bus 101-AB-1 | Low or zero voltage | Valve fails as is (N.C.) |
| | B | LP-43B | AC Pwr | G/T | Bus E-3 | | |
| | | LP-44B | DC Pwr | | Bus 101-AB-2 | | |

Table B.5-2 (Cont'd)

LPCI System Interfaces Failure Modes and Effects

| Front Line System | | | Support System | | | Failure Mode | Failure Effect |
|---|---|---|---|---|---|---|---|
| System | Div. | Comp. | System | Div. | Comp. | | |
| LPCI | A | LPCI Throttle Valve LP-9A | AC Pwr | Diesel | Bus FE-3 | Low or zero voltage | Valve fails as is (partially open) no means of flow control or NPSH protection |
| | B | LP-9B | AC Pwr | G/T | Bus EF-3 | | |
| LPCI | A | LPCI Heat Ex. | E.S.W. | A | LPCI Ht. Exchanger Secondary side | No ESW flow | No heat exchange in LPCI/CC loop; Torus water not cooled could also affect LPCI pump motor lubrication oil cooler |
| | B | LPCI Heat Ex. | E.S.W. | B | | | |
| LPCI | A | Control Logic | DC Pwr | | Bus 11A-1 | Loss of DC power through distribution panel | Loss of one of two trains of control logic, failure to open correct injection valve if pipe break exists in recirc. loop B. |
| | B | Control Logic | DC Pwr | | Bus 11A-2 | | |
| LPCI | A<br>C | Suction Valve MOV LP-2A<br>MOV LP-2C | AC Pwr | Diesel | Bus F-3 | Low or zero voltage | Valves N.O.; if not, cannot be opened; no LPCI flow |
| | B<br>D | MOV LP-2B<br>MOV LP-2D | AC Pwr | G/T | Bus E-3 | | |
| LPCI | A | LPCI Injection Valve LP-10A | AC Pwr | Diesel | Bus FE-3 | Low or zero voltage | Valve fails as is (N.C.) |
| | B | LP-10B | AC Pwr | G/T | Bus EF-3 | | |

Table B.5-2 (Cont'd)

LPCI System Interfaces Failure Modes and Effects

| Front Line System | | | Support System | | | Failure Mode | Failure Effect |
|---|---|---|---|---|---|---|---|
| System | Div. | Comp. | System | Div. | Comp. | | |
| LPCI | A<br>C | LPCI Pump A<br>LPCI Pump C | AC Pwr | Diesel | Bus 14F | Low or zero voltage | LPCI pump failure to start or run, possible motor burnout on low voltage |
| | B<br>D | LPCI Pump B<br>LPCI Pump D | AC Pwr | G/T | Bus 14E | | |
| LPCI | A<br>C | LPCI Pump A<br>LPCI Pump C | DC Pwr | A | Bus 101A | Low or zero voltage | LPCI pump does not start on demand; no effect if already running |
| | B<br>D | LPCI Pump B<br>LPCI Pump D | DC Pwr | B | Bus 101B | | |
| LPCI | A | Heat Exchange Bypass Valve MOV LP-7A | AC Pwr | A | Bus F-3 | Low or zero voltage | N.O. valve, if fails as is no cooling. If valve fails closed, flow goes through heat exchanger and is cooled. |
| | B | Heat Exchange Bypass Valve MOV LP-7B | AC Pwr | B | Bus E-3 | | |
| LPCI | | Suction Valve | | | | | |
| | A<br>C | LP-2A<br>LP-2C | DC Pwr | A | Bus 101-AB-1 | Low or zero voltage | N.O. valves fail as are if not open (during surveillance valve is closed) no LPCI flow (DC control power) |
| | B<br>D | LP-2B<br>LP-2D | DC Pwr | B | Bus 101-AB-2 | | |

Table B.5-2 (Cont'd)

LPCI System Interfaces Failure Modes and Effects

| Front Line System | | | Support System | | | Failure Mode | Failure Effect |
|---|---|---|---|---|---|---|---|
| System | Div. | Comp. | System | Div. | Comp. | | |
| LPCI | | Heat Exchange Bypass Valve | DC Pwr | | Bus 101-AB-1 | Low or zero voltage | N.O. valve fails as is |
| | A | LP-7A | | | | | |
| | B | LP-7B | DC Pwr | | Bus 101-AB-2 | | |
| LPCI | | Drywell Spray Valve | DC Pwr | | Bus 101-AB-1 | Low or zero voltage | N.C. valve fails as is |
| | A | LP-15A | | | | | |
| | B | LP-15B | DC Pwr | | Bus 101-AB-2 | | |
| LPCI | | Torus Spray Valve | DC Pwr | | Bus 101-AB-1 | Low or zero voltage | N.C. valve fails as is |
| | A | LP-13A | | | | | |
| | B | LP-13B | DC Pwr | | Bus 101-AB-2 | | |
| LPCI | | Test Line | DC Pwr | | Bus 101-AB-1 | Low or zero voltage | N.C. valve fails as is |
| | A | LP-43A | | | | | |
| | B | LP-43B | DC Pwr | | Bus 101-AB-2 | | |
| LPCI | | Throttle Valve | DC Pwr | | Bus 101-AB-1 | Low or zero voltage | N.C. valve fails as is |
| | A | LP-9A | | | | | |
| | B | LP-9B | DC Pwr | | Bus 101-AB-2 | | |

Table B.5-3

LPCI System Instrumentation

| Sensor | Function | Setpoint |
|---|---|---|
| DPIS 2251/261-12A<br>DPIS 2252/261-12B<br>DPIS 2251/261-12C<br>DPIS 2252/261-12D | Loop selection logic; differential pressure switches on jet pumps a $\Delta p$ indicates loop B break | $\geq$ .05 psid between loop A and B (loop A > loop B) |
| DPIS 2271/261-36A<br>DPIS 2272/261-36B<br>DPIS 2271/261-37A<br>DPIS 2272/261-37B<br>DPIS 2271/261-38A<br>DPIS 2272/261-38B<br>DPIS 2271/261-39A<br>DPIS 2272/261-39B | Differential pressure switch set to determine if recirculation pumps are running; if so, pumps tripped | $\geq$ 2 psid across pump |
| PS 2251/263-111A<br>PS 2252/263-111B<br>PS 2251/263-111C<br>PS 2252/263-111D | Pressure permissive to allow the effects of the recirculation pump trip to subside before loop selection is made | Rx Press $\leq$ 926 psig |
| PS 2205/263-52A<br>PS 2206/263-52B<br>PS 2251/263-52C<br>PS 2252/263-52D | Pressure sensor set to indicate low reactor pressure; injection valve 1-LP-9A(B) and 1-LP-10A(B) open permissive | Rx $\leq$ 338 psig<br>$\leq$ 338 psig<br>$\leq$ 351 psig<br>$\leq$ 351 psig |
| PS 2251/263-54A<br>PS 2252/263-54B | Pressure sensors set for low reactor pressure; part of pump start logic and LPCI valve open logic | Rx Press $\leq$ 351 psig |
| LIS 2205/263-72A<br>LIS 2205/263-72C<br>LIS 2206/263-72B<br>LIS 2206/263-72D | Low-low water level indication; part of pump start and LPCI injection valve open logic | Rx Level $\leq$ 93.78" $H_2O$ (77.59" above top of active fuel) |
| PS 2205/1501-83A<br>PS 2206/1501-83B<br>PS 2205/1501-83C<br>PS 2206/1501-83D | Restricts conditions under which flow can be diverted to containment and torus spray (in conjunction with the following drywell sensors) | Drywell press > 5 psig |

Table B.5-3

LPCI System Instrumentation (Cont'd)

| Sensors | | Function | Setpoint |
|---|---|---|---|
| PS | 2205/1501-90A | Hi Drywell Pressure initiation signal; starts LPCI pumps, initiates LPCI injection valves open logic, restricts conditions under which containment and torus spray lines may be used (in conjunction with the above listed drywell sensors) | Drywell Press $\geq$ 1.8 psig |
| PS | 2206/1501-90B | | |
| PS | 2205/1501-90C | | |
| PS | 2206/1501-90D | | |

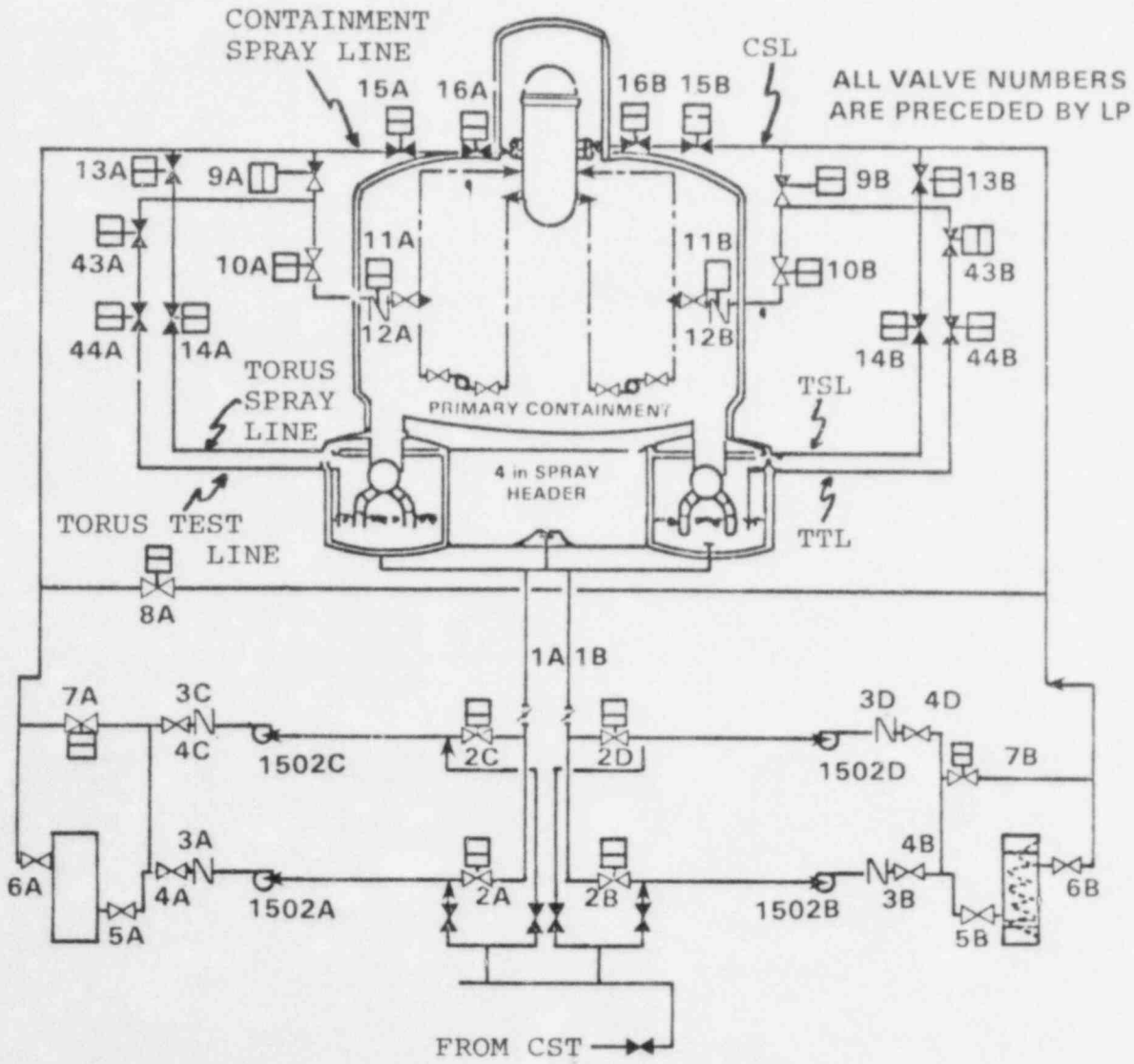



FIGURE B.5-1. LPCI SYSTEM DIAGRAM (SHEET 1 OF 2)

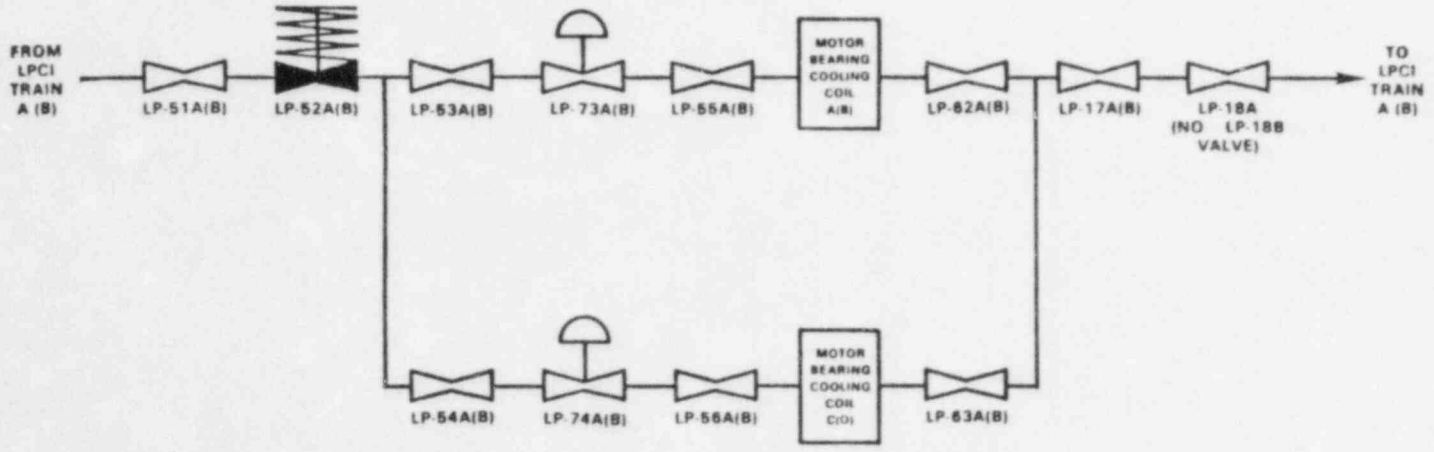



**FIGURE B.5-1. LPCI SYSTEM DIAGRAM**
**LPCI PUMP COOLING (SHEET 2 OF 2)**

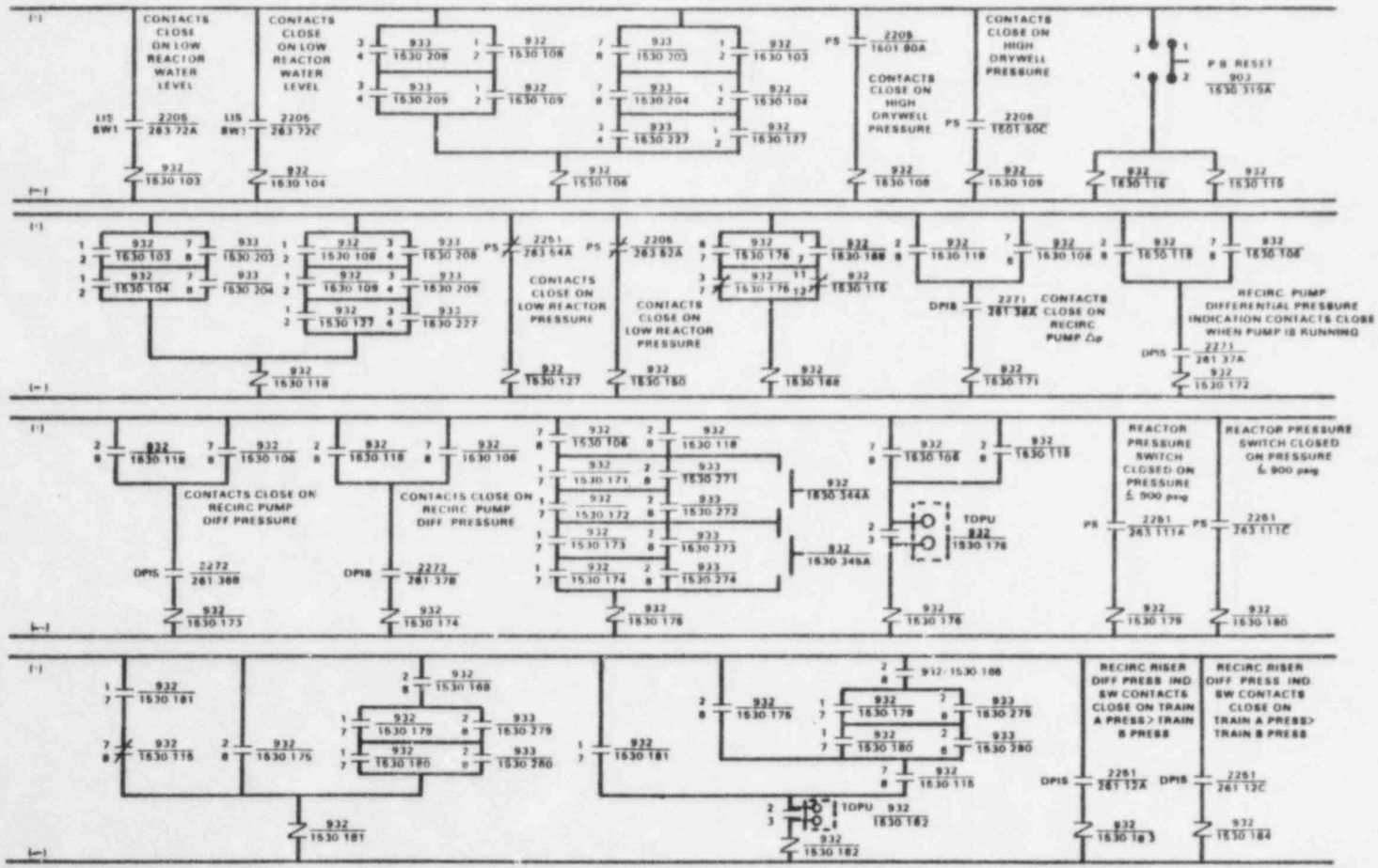



**FIGURE B.5-2. LPCI SYSTEM CONTROL WIRE SCHEMATICS (SHEET 1 OF 6)**

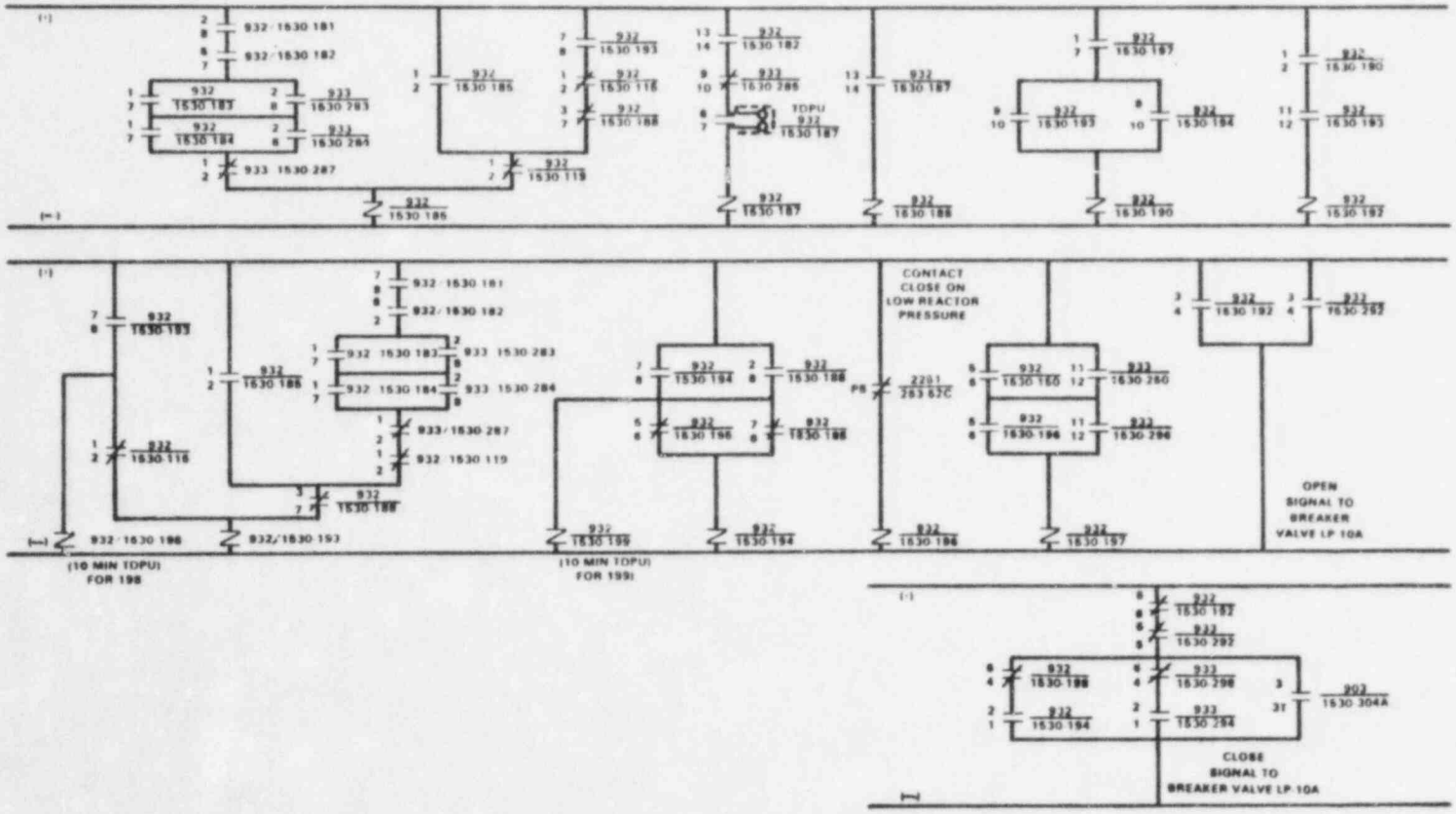



**FIGURE B.5-2. LPCI SYSTEM CONTROL WIRE SCHEMATICS (SHEET 2 OF 6)**

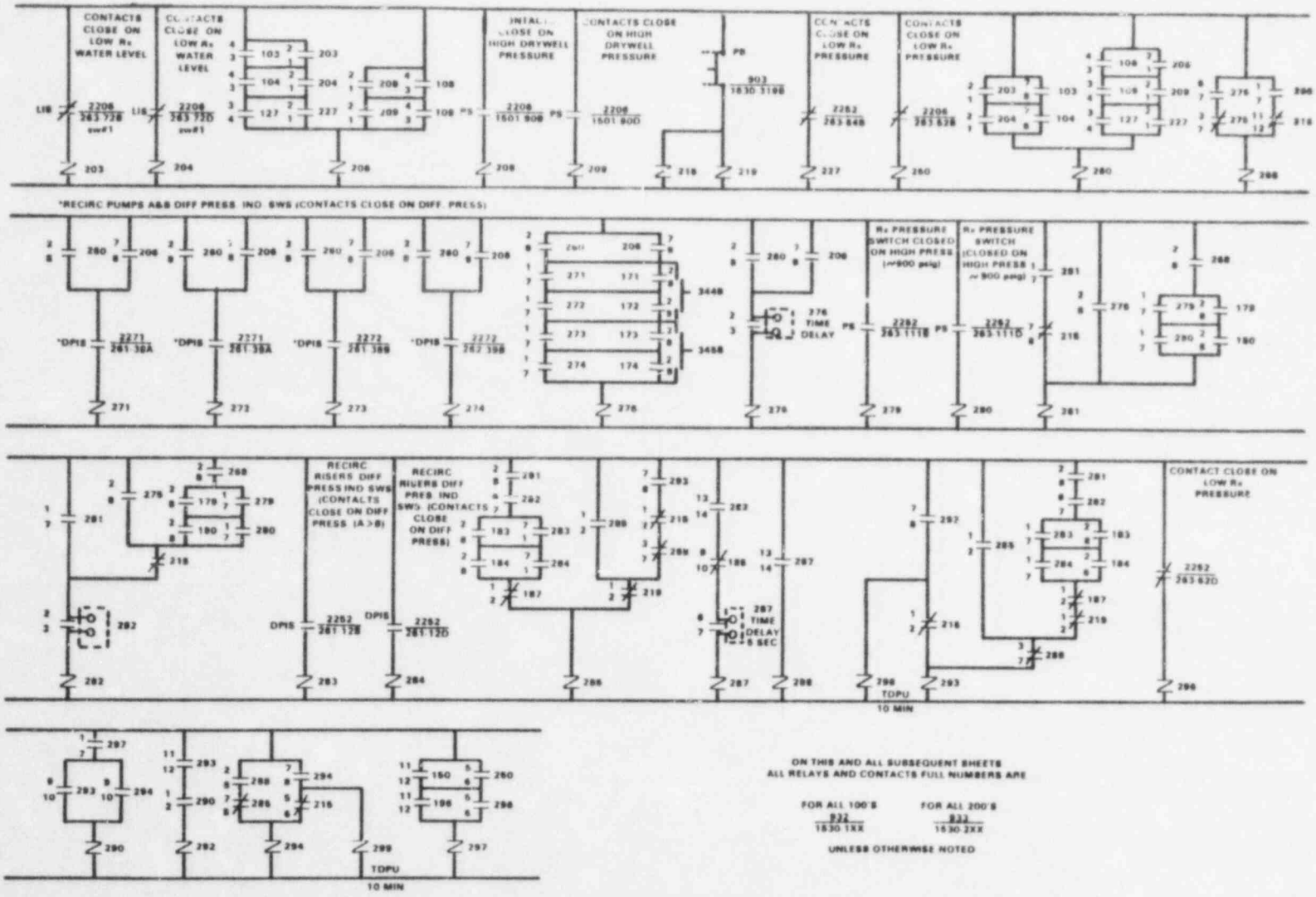



**FIGURE B.5-2. LPCI SYSTEM CONTROL WIRE SCHEMATICS (SHEET 3 OF 8)**

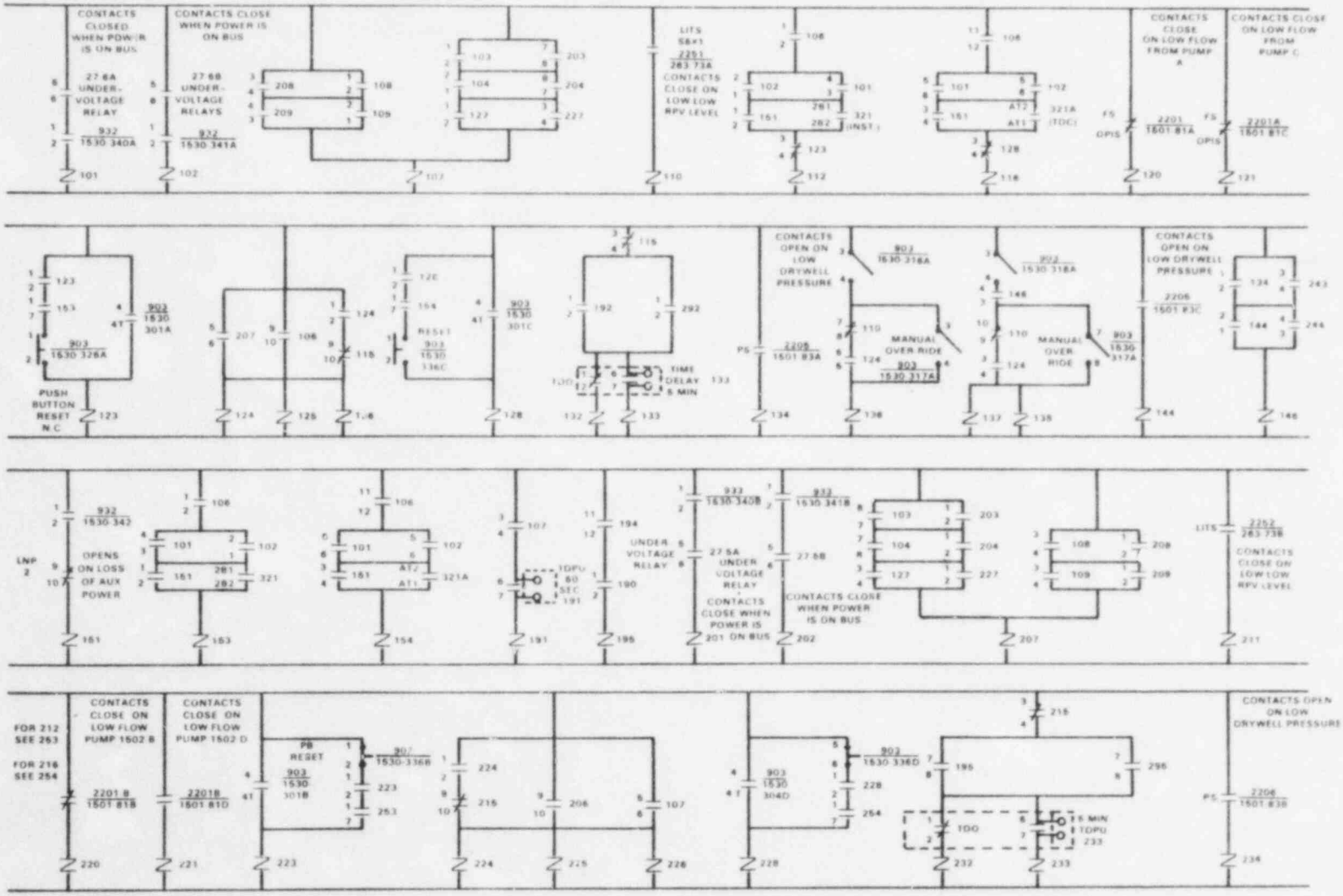



**FIGURE B.5-2. LPCI SYSTEM CONTROL WIRE SCHEMATICS (SHEET 4 OF 6)**

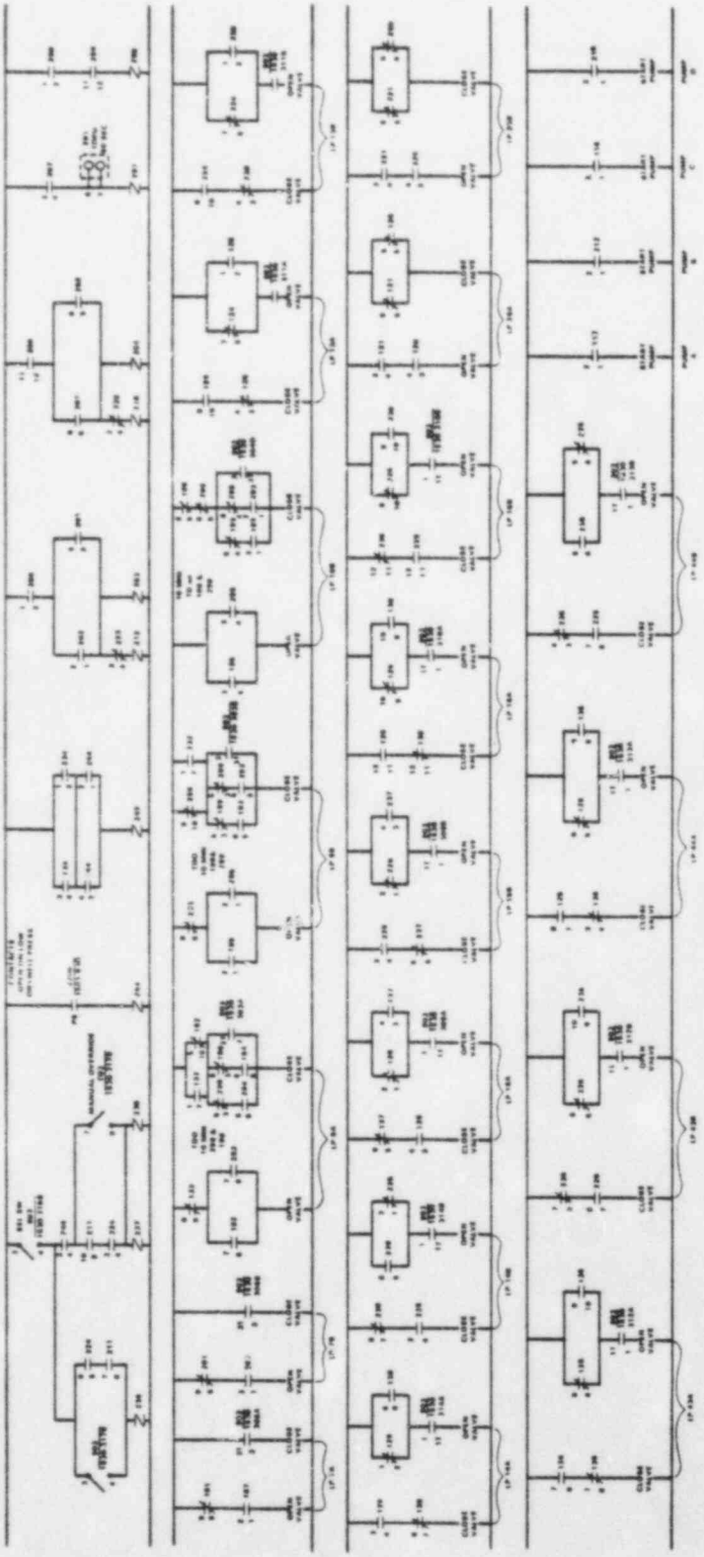


FIGURE B.5-2. LPCI SYSTEM CONTROL WIRE SCHEMATICS (SHEET 6 OF 6)

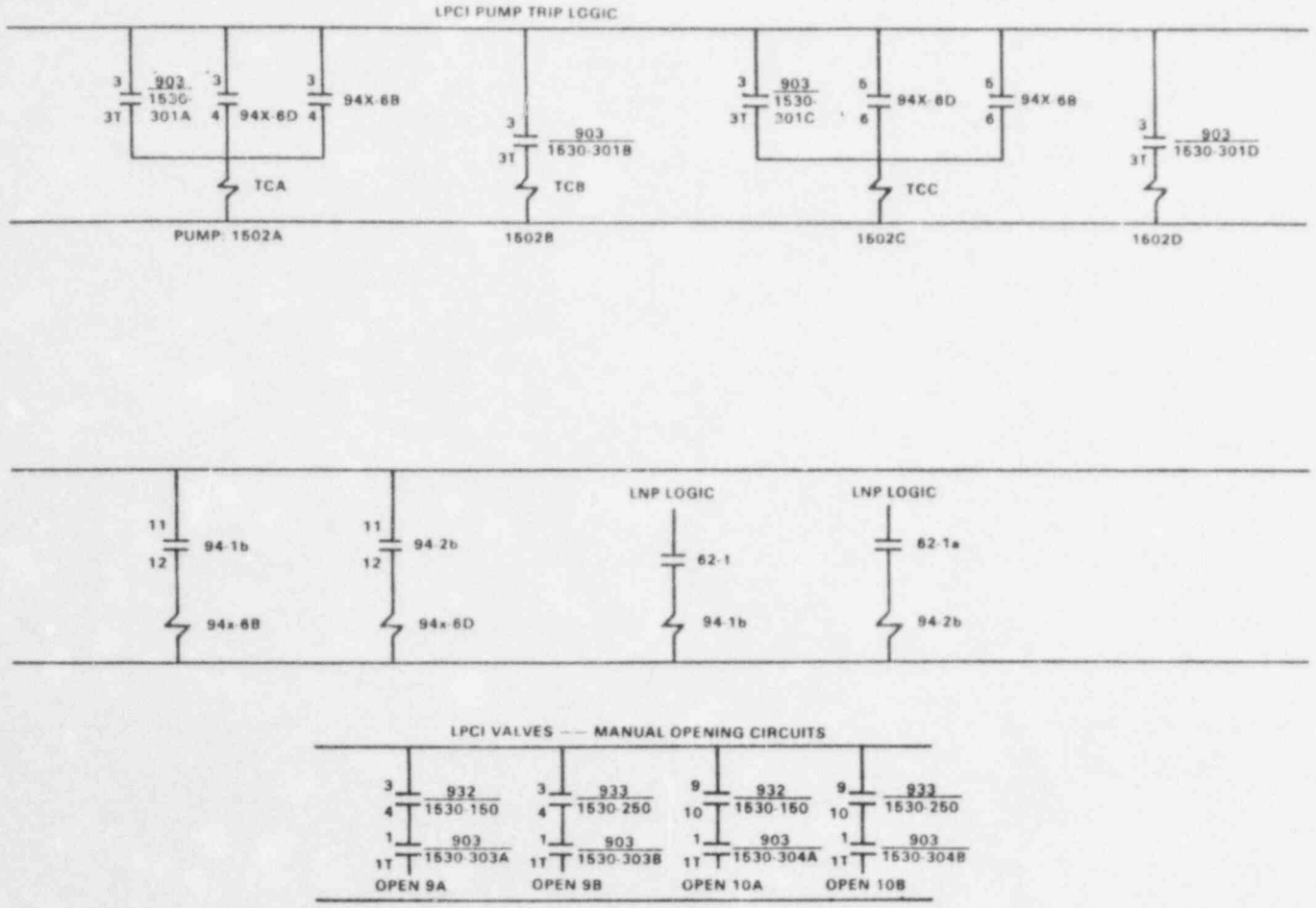



**FIGURE B.5-2. LPCI SYSTEM CONTROL WIRE SCHEMATIC (SHEET 6 OF 6)**

LOW PRESSURE COOLANT INJECTION SYSTEM

FAULT TREE AND FAULT SUMMARY SHEETS

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-10A-MOV-OPO<br>LP-10B-MOV-OPO | In response to the initiating event the operator opens a motor-operated-valve that should remain closed | | Operator manually opens the inboard injection valve on a recirculation loop with a pipe break | 3E-3 |
| LP-13A-MOV-OPO<br>LP-13B-MOV-OPO<br>LP-14A-MOV-OPO<br>LP-14B-MOV-OPO | In response to the initiating event the operator opens an MOV that should remain closed | | Operator opens valves to cool torus using torus spray | 3E-3 |
| LP-15A-MOV-OPO<br>LP-15B-MOV-OPO<br>LP-16A-MOV-OPO<br>LP-16B-MOV-OPO | In response to the initiating event the operator opens an MOV that should remain closed | | Operator opens valves to provide flow to containment spray | 3E-3 |
| LP-43A-MOV-OPO<br>LP-44A-MOV-OPO<br>LP-43B-MOV-OPO<br>LP-44B-MOV-OPO | In response to the initiating event the operator opens an MOV that should remain closed | | Operator inadvertently opens LPCI test line | 3E-3 |
| LP-2A-MOV-OPC<br>LP-2B-MOV-OPC<br>LP-2C-MOV-OPC<br>LP-2D-MOV-OPC<br>LP-8A-MOV-OPC | In response to the initiating event the operator closes an MOV that should remain open | | These valves should be closed only for maintenance | 3E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #1

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-7A-MOV-OPC<br>LP-7B-MOV-OPC | In response to the initiating event the operator closes an MOV that should remain open | | Operator places the LPCI system into the containment cooling mode | 3E-3 |
| LP-9A-MOV-OPC<br>LP-9B-MOV-OPC | In response to the initiating event the operator closes an MOV that should remain open | | Operator should not consider closing these valves | 3E-3 |
| LP-9A-MOV-OFO<br>LP-9B-MOV-OFO<br>LP-10A-MOV-OFO<br>LP-10B-MOV-OFO | Operator fails to open the MOV | | This action is required only when LPCI has failed and the operator wishes to use the containment cooling capabilities | 1E-2 |
| LP-9A-MOV-ILC<br>LP-9B-MOV-ILC | Motor operated valve inadvertantly left closed | One week | Valve position checked as per SP 623.18, weekly; SP 628.1, during refueling; Valve cycled as per SP 622.7, monthly; SP 622.4 & SP 622.3, monthly; SP 622.2, quarterly | 2.3E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #2

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-7A-MOV-ILC<br>LP-7B-MOV-ILC | Motor operated valve inadvertently left closed | One week | Valve position checked as per SP 623.18, weekly; SP 628.1 during refueling; valve cycled as per SP 622.4 & SP 622.7, monthly; SP 622.2, quarterly | 2.3E-3 |
| LP-7A-MOV-OFC<br>LP-7B-MOV-OFC | Operator fails to close motor operated valve | | Operator closes valves to switch from LPCI to LPCI/ containment cooling mode | 1E-3 |
| LP-13A-MOV-ILO<br>LP-13B-MOV-ILO<br>LP-14A-MOV-ILO<br>LP-14B-MOV-ILO<br>LP-15A-MOV-ILO<br>LP-15B-MOV-ILO<br>LP-16A-MOV-ILO<br>LP-16B-MOV-ILO<br>LP-10A-MOV-ILO<br>LP-10B-MOV-ILO | Motor operated valve inadvertently left open following test | One week | Valve position checked as per SP 623.18, weekly; Valve cycled as per SP 622.4 & & SP 622.7, monthly; position checked as per SP 628.1; during refueling, position checked using OP 335 | 2.3E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #3

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-43A-MOV-ILO<br>LP-43B-MOV-ILO<br>LP-44A-MOV-ILO<br>LP-44B-MOV-ILO | Motor operated valve inadvertently left open following test | One week | Valve position checked as per SP 623.18, weekly; valve cycled as per SP 622.4 & 622.7 (monthly) and SP 622.2 (every 3 months); position checked during re-fueling as per SP 628.1, position checked by OP 335 | 2.3E-3 |
| LP-43A-MOV-FRC<br>LP-43B-MOV-FRC<br>LP-44A-MOV-FRC<br>LP-44B-MOV-FRC | A motor operated valve fails to remain closed | Flow passed thru valve quarterly | Valve cycled as per SP 622.7, monthly; SP 622.2, quarterly (actual flow thru valve); SP 622.4 monthly | 1.1E-5 |
| LP-13A-MOV-FRC<br>LP-13B-MOV-FRC<br>LP-14A-MOV-FRC<br>LP-14B-MOV-FRC<br>LP-15A-MOV-FRC<br>LP-15B-MOV-FRC<br>LP-16A-MOV-FRC<br>LP-16B-MOV-FRC | Motor operated valve fails to remain closed | Detection occurs when system is utilized and a pair (such as 13A or 14A) of valves are both in the wrong position | Valve cycled as per SP 622.7, monthly; SP 622.4, monthly | 1E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #4

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-13A-MOV-FTC<br>LP-13B-MOV-FTC<br>LP-14A-MOV-FTC<br>LP-14B-MOV-FTC<br>LP-15A-MOV-FTC<br>LP-15B-MOV-FTC<br>LP-16A-MOV-FTC<br>LP-16B-MOV-FTC | Motor operated valve fails to close | One month | Valve cycled as per SP 622.7, monthly SP 622.4, monthly | 1E-3 |
| LP-43A-MOV-FTC<br>LP-43B-MOV-FTC<br>LP-44A-MOV-FTC<br>LP-44B-MOV-FTC | Motor operated valves fail to close | One month | Valve cycled as per SP 622.7, monthly; SP 622.2, quarterly; SP 622.4, monthly | 1E-3 |
| LP-10A-MOV-FTC<br>LP-7A-MOV-FTC<br>LP-7B-MOV-FTC | Motor operated valve fails to close | One month | Valve cycled as per SP 622.4, monthly; SP 622.7, monthly | 1E-3 |
| LP-9A-MOV-FTC<br>LP-9B-MOV-FTC | Motor operated valve fails to close | One month | Valve cycled as per SP 622.4, monthly; SP 622.7, monthly; SP 622.3, monthly | 1E-3 |
| LP-10B-MOV-FTC | Motor operated valve fails to close | One month | Valve cycled as per SP 622.4, monthly; SP 622.7, monthly; SP 628.1, during refueling | 1E-3 |
| LP-9A-MOV-FTO<br>LP-9B-MOV-FTO | Motor operated valve fails to open | One month | Valve cycled as per SP 622.4, SP 622.3, SP 622.7; monthly | 1E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #5

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-7A-MOV-FTO<br>LP-7B-MOV-FTO<br>LP-10A-MOV-FTO | Motor operated valve fails to open | One month | Valve cycled as per SP 622.4 and SP 622.7, monthly | 1E-3 |
| LP-10B-MOV-FTO | Motor operated valve fails to open | One month | Valve cycled as per SP 622.4 and SP 622.7, monthly and SP 628.1, during refueling | 1E-3 |
| LP-9A-MOV-FRO<br>LP-9B-MOV-FRO | Motor operated valve, normally open, fails to remain open | Flow through valve checked quarterly | Flow is pumped through valve during performance of SP 622.2, quarterly | 1E-4 |
| LP-2A-MOV-FRO<br>LP-2B-MOV-FRO<br>LP-2C-MOV-FRO<br>LP-2D-MOV-FRO | Normally open MOV fails to remain open | One month | Flow through valve checked as per SP 622.3 and SP 622.7, monthly; SP 622.2, quarterly | 1E-4 |
| LP-7A-MOV-FRO<br>LP-7B-MOV-FRO | Normally open MOV fails to remain open | | Flow thru the valve is not explicitdy checked. However when the LPCI pumps are run a flow path thru these valves or the HT exchanger exists. | 3E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #6

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-10A-MOV-FRC<br>LP-10B-MOV-FRC | Normally closed MOV fails to remain closed | | Flow does not pass thru these inboard injection valves except during response to the initiating event | 1E-3 |
| LP-8A-MOV-FRO | Normally open MOV fails to remain open | | Cross flow is never checked | 3E-4 |
| LP-9B-MOV-TMC<br>LP-9A-MOV-TMC | MOV closed for test/maintenance or left in test/ maint. mode (closed). Valve out of service | One week | Valve position as per SP 623.18, weekly. Valve also ceecked during performance of SP 622.7, SP 628.1 SP 622.3, SP 622.4, & OP 335 | 2.2E-5 |
| LP-2A-MOV-TMC<br>LP-2B-MOV-TMC<br>LP-2C-MOV-TMC<br>LP-2D-MOV-TMC<br>LP-10A-MOV-TMC<br>LP-10B-MOV-TMC<br>LP-8A-MOV-TMC<br>LP-7A-MOV-TMC<br>LP-7B-MOV-TMC | MOV closed for test/maintenance or left closed following test/ maintenance. Valve out of service | One week | Valve position checked weekly as per SP 623.18 Valve also checked during performance of SP 622.7, SP 622.4 and OP 335 | 3.3E-5 |

MILLSTONE 1
SYSTEM LPCI
SHEET #7

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-52A-SOV-FTO<br>LP-52B-SOV-FTO | Solonoid op. valve fails to open on demand | Detection is upon trip loss of associated LPCI pump during test or operation | Valve operation is is checked when pumps run during integrated test at refueling | 1.7E-2 |
| LP-52A-SOV-TMC<br>LP-52B-SOV-TMC | SOV closed for maintenance or left closed and out of service due to maintenance | Valve position checked after major outage | Valve position checked as per OP 335; as required (after refueling, system use, etc.) | 3.3E-4 |
| LP-12A-XV-FRO<br>LP-12B-XV-FRO | Manual valve, normally open, fails to remain open | Detection upon failure of LPCI to inject through valve | This failure mode not tested for. Valve used for injection when CST water used to reflood core (refuel) | 3E-4 |
| LP-12A-XV-TMC<br>LP-12B-XV-TMC | Manual valve closed or left closed due to test or maintenance | One week | Valve position checked as per SP 623.18, weekly; valve closed during SP 628.1, during refueling | 1.4E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #8

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-4A-XV-FRO<br>LP-4B-XV-FRO<br>LP-4C-XV-FRO<br>LP-4D-XV-FRO<br>LP-1A-XV-FRO<br>LP-1B-XV-FRO | Normally open manual valve fails to remain open | One month | Pump tests run monthly (SP 622.3 & SP 622.7), quarterly (SP 622.2) and during refueling (SP 628.1) | 1.E-4 |
| LP-6A-XV-FRO<br>LP-6B-XV-FRO<br>LP-5A-XV-FRO<br>LP-5B-XV-FRO | Normally open manual valve fails to remain open | | Flow thru valves never specifically tested | 3E-4 |
| LP-53A-XV-FRO<br>LP-53B-XV-FRO<br>LP-54A-XV-FRO<br>LP-54B-XV-FRO<br>LP-55A-XV-FRO<br>LP-55B-XV-FRO<br>LP-56A-XV-FRO<br>LP-62A-XV-FRO<br>LP-62B-XV-FRO<br>LP-63A-XV-FRO<br>LP-63B-XV-FRO<br>LP-17A-XV-FRO<br>LP-17B-XV-FRO<br>LP-18A-XV-FRO<br>LP-51A-XV-FRO<br>LP-51B-XV-FRO<br>LP-56B-XV-FRO | Normally open manual valve fails to remain open | 12000 hrs (detected during refueling outages) | SP 628.1 indirectly checks flow through valves | 3E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #9

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-1A-XV-TMC<br>LP-1B-XV-TMC<br>LP-4A-XV-TMC<br>LP-4B-XV-TMC<br>LP-4C-XV-TMC<br>LP-4D-XV-TMC<br>LP-5A-XV-TMC<br>LP-5B-XV-TMC<br>LP-6A-XV-TMC<br>LP-6B-XV-TMC | Manual valve left closed following maintenance or closed for maintenance | One week | Valve position checked as per SP 623.18, weekly; position also checked during OP 335 | 3.3E-6 |
| LP-17A-XV-TMC<br>LP-17B-XV-TMC<br>LP-18A-XV-TMC<br>LP-51A-XV-TMC<br>LP-51B-XV-TMC<br>LP-53A-XV-TMC<br>LP-53B-XV-TMC<br>LP-54A-XV-TMC<br>LP-54B-XV-TMC<br>LP-55A-XV-TMC<br>LP-55B-XV-TMC<br>LP-56A-XV-TMC<br>LP-56B-XV-TMC<br>LP-62A-XV-TMC<br>LP-62B-XV-TMC<br>LP-63A-XV-TMC<br>LP-63B-XV-TMC | Manual valve closed for maintenance or left closed following maintenance | Valve position checked after major outages | Valve position checked as per OP 335, following major outages | 3.6E-5 |

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-3A-CKV-FTO<br>LP-3B-CKV-FTO<br>LP-3C-CKV-FTO<br>LP-3D-CKV-FTO | Check valve fails to open on demand | One month | Valve failure would be discovered on a monthly basis during LPCI pump test, specifically checked during SP 622.7, & indirectly checked during SP 622.3 (monthly) SP 622.2 (quarterly) SP 628.1 (during refueling) | 1E-4 |
| LP-3A-CKV-TMC<br>LP-3B-CKV-TMC<br>LP-3C-CKV-TMC<br>LP-3D-CKV-TMC | Check valve closed & out of service due to maintenance | One week | Valve position checked as per SP 623.18, weekly and during OP 335 | 5E-6 |
| LP-11A-CKV-FTO<br>LP-11B-CKV-FTO | Check valve fails to open on demand | 12000 hrs (detected during refueling outages) | Flow thru valve checked during refilling of reactor cavity at refuel | 1.6E-3 |
| LP-11A-CKV-TMC<br>LP-11B-CKV-TMC | Check valve closed & out of service due to maintenance | Valve position checked after major outages | Valve check performed during OP 335 | 3.9E-5 |
| LP-73A-PHV-FRO<br>LP-73B-PHV-FRO<br>LP-74A-PHF-FRO<br>LP-74B-PHV-FRO | Hydraulic valve, normally open, fails to remain open | 12000 hrs (detected during refueling outage) | Failure may be detected during pump test (as per SP 628.1) at refueling | 3E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #11

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-73A-PHV-TMC<br>LP-73B-PHV-TMC<br>LP-74A-PHV-TMC<br>LP-74B-PHV-TMC | Hydraulic vaive closed & out of service due to maintenance | Valve checked after major outages | Valve check performed during OP 335 | 1E-4 |
| LP-1-STR-LOF<br>LP-2-STR-LOF<br>LP-3-STR-LOF | Suction strainers in torus become clogged | One month | Pumps tested as per SP 622.7 & SP 622.3, quarterly as per SP 622.2, durig refueling as per SP 628.1 (detected during pump test) | 7.48E-5 |
| LP-1503A-HTX-LOF<br>LP-1503B-HTX-LOF | LPCI heat exchanger fails to cool LPCI flow | ------ | This fault is not tested for. NPRDS data. | 2.05E-4 |
| LP-1502A-HTX-LOF<br>LP-1502B-HTX-LOF<br>LP-1502C-HTX-LOF<br>LP-1502D-HTX-LOF | Motor bearing cooling coil fails to cool pump | 12000 hrs (detection during refueling outages) | Detection would be during testing during refueling (SP 628.1) NPRDS data. | 2.05E-4 |
| LP-1503A-HTX-TOM<br>LP-1503B-HTX-TOM | Heat exchanger removed from service for maintenance | | Procedures require additional testing if one LPCI loop out of service. Out of service ht. ex. would be noted promptly. | 1.7E-6 |

MILLSTONE 1
SYSTEM LPCI
SHEET #12

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-1502A-HTX-TOM<br>LP-1502B-HTX-TOM<br>LP-1502C-HTX-TOM<br>LP-1502D-HTX-TOM | Motor bearing cooling removed for maintenance | | Detected during monthly pump test (see LP-1503A-HTX-TOM comments) | 1.7E-6 |
| LP-A-MDP-FSR<br>LP-B-MDP-FSR<br>LP-C-MDP-FSR<br>LP-D-MDP-FSR | LPCI pump fails to start on demand | One month | Pump started as per SP 622.7 & SP 622.3, monthly; SP 622.2, quarterly; SP 628.1, during refueling | 1.7E-3 |
| LP-A-MDP-OFS<br>LP-B-MDP-OFS<br>LP-C-MDP-OFS<br>LP-D-MDP-OFS | Operator fails to start LPCI pump for containment cooling mode | | Operator must start pump only if auto actuation fails and he wants to use the LPCI/CC mode of operation | 5E-2 |
| LP-A-MDP-TOM<br>LP-B-MDP-TOM<br>LP-C-MDP-TOM<br>LP-D-MDP-TOM | LPCI pump out of service for maintenance | One month | Pump started as per SP 622.7 and SP 622.3, monthly; SP 622.3, quarterly; and SP 628.1 during refueling | 1E-3 |
| 9031530-301A-FTE<br>9031530-301B-FTE<br>9031530-301C-FTE<br>9031530-301D-FTE | Manual switch for pump start fails to function | One month | Tested on manual LPCI pump starts: SP 622.7 and SP 622.3, monthly; SP 622.2, quarterly | 1E-5 |

MILLSTONE 1
SYSTEM LPCI
SHEET #13

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9031530-301A-1FC<br>9031530-301B-1FC<br>9031530-301C-1FC<br>9031530-301D-1FC | Contact pair, normally open, fails to close when the manual switch is closed | One month | Tested on manual LPCI pump starts: SP 622.7 & SP 622.3; monthly SP 622.2; quarterly | 3.6E-5 |
| 9031530-301A-3RO<br>9031530-301B-3RO<br>9031530-301C-3RO<br>9031530-301D-3RO | Normally open contact pair fails to remain open | One month | Pump will fail to start if contacts closed. LPCI pump tested: monthly (SP 622.7 & SP 622.3), quarterly (SP 622.2) & during refueling (SP 628.1) | 1.1E-5 |
| LCL94X-6B-FTD<br>LCL-94X-6D-FTD | Relay coil that energizes on LNP trip signal fails to deenergize on removal of that signal | 12000 hrs (detected during refueling outages) | Tested as per SP 628.1, during refueling. Test requires an LNP trip and then LPCI pumps must start, if they do the relay is deenergized. | 1.7E-3 |
| LCL94X-6B-3RO<br>LCL94X-6B-5RO<br>LCL94X-6D-3RO<br>LCL94X-6D-5RO | Normaliy open contact pair fails to remain open | One month | LPCI pump tests will test for spurious trip signals. Pumps tested as per: SP 622.3 & SP 622.7, monthly; SP 622.2, quarterly; SP 628.1, during refueling | 3.6E-5 |

MILLSTONE 1
SYSTEM LPCI
SHEET #14

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 92694-1B-FTD<br>92694-2B-FTD | Relay coil that energizes on LNP fails to deenergize on removal of LNP trip signal | 12000 hrs (detected during refueling outages) | Tested as per SP 628.1, during refueling. Test generates LNP trip and then LPCI pumps must start. If pumps start, relay deenergized. | 1.7E-3 |
| 92694-1B-BFO<br>92694-2B-BFO | Contact pair fails to open after removal of LNP trip signal | 12000 hrs (detected during refueling outages) | Tested as per SP 628.1, during refueling. Test generates LNP trip signal and then requries LPCI pumps to start. If pump starts the contact pair opened. | 1.8E-3 |
| 92662-1-XFO<br>92662-1A-XFO | Spurious LNP trip signal remains after the signal should have been removed. | 12000 hrs (detected during refueling outages) | Tested as per SP 628.1, during refueling. In test operator generates LNP trip signal. LPCI pumps should auto start. If pumps start no spurious LNP trip signal is present | 2.0E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #15

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9031530-303A-FTE<br>9031530-303B-FTE<br>9031530-303C-FTE<br>9031530-303D-FTE | Manual switch fails to function | One month | Switch tested when valve cycled as per SP 622.7, SP 622.4, and SP 622.3 monthly | 1E-5 |
| 9031530-303A-1FC<br>9031530-303B-1FC<br>9031530-303C-1FC<br>9031530-303D-1FC | Normally open contact pair fails to close | One month | Contact pair tested when valve cycled as per SP 622.3, SP 622.4, SP 622.7, monthly | 3.6E-5 |
| 9321530-150-3FC<br>9321520-150-9FC<br>9331530-250-3FC<br>9331530-250-9FC | Normally open contact pair fails to close | No prior detection | Contact pair need not be closed during test of valve | 2.9E-2 |
| 9031530-306A-FTE<br>9031530-306B-FTE | Manual switch fails to make up on demand | One month | Switch tested when when valve cycled as per: SP 622.7 and SP 622.4 monthly | 1E-5 |
| 9031530-306A-3FC<br>9031530-306B-3FC | Contact pair fails to close | One month | Contact pair tested when valve cycled as per: SP 622.4, monthly; SP 622.7, monthly | 3.6E-5 |

MILLSTONE 1
SYSTEM LPCI
SHEET #16

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 2251261-12A-XFC<br>2252261-12B-XFC<br>2251261-12C-XFC<br>2252261-12D-XFC<br>2251261-36A-XFC<br>2252261-36B-XFC<br>2251261-37A-XFC<br>2252261-37B-XFC<br>2251261-38A-XFC<br>2252261-38B-XFC<br>2251261-39A-XFC<br>2252261-39B-XFC | Normally open contacts on differential pressure switch fail to close i.e. dpis fails to properly indicate situation | 12000 hrs (during each refueling outage) | Sensor tested as per SP 412G during refueling | 2.4E-3 |
| 2251261-12A-OMC<br>2252261-12B-OMC<br>2251261-12C-OMC<br>2252261-12D-OMC<br>2251261-36A-OMC<br>2252261-36B-OMC<br>2251261-37A-OMC<br>2252261-37B-OMC<br>2251261-38A-OMC<br>2252261-38B-OMC<br>2251261-39A-OMC<br>2252261-39B-OMC | Operator miscalibrates differential pressure indication switch | 12000 hrs (during each refueling outage) | Sensor tested as per SP 412G during refueling | .001 |
| 2251261-12A-XRO<br>2252261-12B-XRO<br>2251261-12C-XRO<br>2252261-12D-XRO | Normally open contacts on diff. press switch fail to remain open | 12000 hrs (during each refueling outage) | Sensor tested as per SP 412G, dur- refueling | 1.8E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #17

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 2251261-12A-TOM<br>2252261-12B-TOM<br>2251261-12C-TOM<br>2252261-12D-TOM<br>2251261-36A-TOM<br>2252261-36B-TOM<br>2251261-37A-TOM<br>2252261-37B-TOM<br>2251261-38A-TOM<br>2252261-38B-TOM<br>2251261-39A-TOM<br>2252261-39B-TOM | Differential pressure indication switch out of service due to test/maintenance | 12000 hrs (tested during refueling outages) | Sensor tested as per SP 412G during refueling. Sensor isolated and jumped during SP 412 K (indicaging a p) | 1E-2 |
| 2251263-111A-XFC<br>2252263-111B-XFC<br>2251263-111C-XFC<br>2252263-111D-XFC | Pressure switch contacts fail to close | 12000 hrs (tested during refueling outages) | PS tested as per SP 412G during refueling | 2.4E-3 |
| 2251263-111A-OMC<br>2252263-111B-OMC<br>2251263-111C-OMC<br>2252263-111D-OMC | Operator miscalibrates pressure switch | 12000 hrs (detected during refueling outages) | PS tested as per SP 412G during refueling; isolated during SP 412G | 1E-3 |
| 2251263-111A-TOM<br>2252263-111B-TOM<br>2251263-111C-TOM<br>2252263-111D-TOM | Pressure switch out of service due to test or maintenance | 12000 hrs (detected during refueling outages) | PS tested as per SP 412G during refueling; isolated and jumped during refueling as per SP 412K | 1E-2 |

MILLSTONE 1
SYSTEM LPCI
SHEET #18

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 2205263-52A-XFC<br>2206263-52B-XFC<br>2251263-52C-XFC<br>2252263-52D-XFC | Pressure switch normally open contacts fail to close | One month | PS tested as per SP 412A, monthly | 1.4E-4 |
| 2205263-52A-OMC<br>2206263-52B-OMC<br>2251263-52C-OMC<br>2252263-52D-OMC | Operator miscalibrates pressure switch | One month | PS tested as per SP 412A, monthly | 1E-3 |
| 2205263-52A-TOM<br>2206263-52B-TOM<br>2251263-52C-TOM<br>2252263-52D-TOM | Pressure switch out of service due to test or maintenance | One month | PS tested as per SP 412A, monthly isolated and jumped during refueling as per SP 412K | 1E-2 |
| 2251263-54A-XFC<br>2252263-54B-XFC | Pressure switch, contacts (normally open) fail to close | One month | PS tested as per SP 412B, monthly | 1.4E-4 |
| 2251263-54A-OMC<br>2252263-54B-OMC | Operator miscalibrates pressure switch | One month | PS tested as per SP 412B, monthly | 1E-3 |
| 2251263-54A-TOM<br>2252263-54B-TOM | Pressure switch out of service due to test or maintenance | One month | PS tested as per SP 412B, monthly; isolated & jumped during refueling as per SP 412K | 1E-2 |

MILLSTONE 1
SYSTEM LPCI
SHEET #19

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 2205263-72A1-XFC<br>2205263-72C1-XFC<br>2206263-72B1-XFC<br>2206263-72D1-XFC | Normally open contacts of level indication switch fail to close | One month | LIS tested as per SP 412C, monthly | 1.4E-4 |
| 2205263-72A1-OMC<br>2205263-72C1-OMC<br>2206263-72B1-OMC<br>2206263-72D1-OMC | Operator miscalibrates LIS | One month | LIS tested as per SP 412C, monthly; calibrated, quarterly | 1E-3 |
| 2205263-72A1-TOM<br>2205263-72C1-TOM<br>2206263-72B1-TOM<br>2206263-72D1-TOM | LIS out of service due to test or maintenance | One month | LIS tested as per SP 412C, monthly; LIS isolated and jumped during refueling, as per SP 412K | 1.E-2 |
| 22051501-83A-XRO<br>22061501-83B-XRO<br>22052501-83C-XRO<br>22061501-83D-XRO | Pressure switch, normally open contacts fail to remain open | One month | PS tested as per SP 412E, monthly | 1E-5 |
| 22051501-83A-OMC<br>22061501-83B-OMC<br>22052501-83C-OMC<br>22061501-83D-OMC | Operator miscalibrates PS | One month | PS tested as per SP 412E, monthly | 1E-3 |
| 22051501-83A-TOM<br>22061501-83B-TOM<br>22052501-83C-TOM<br>22061501-83D-TOM | PS out of service due to test or maintenance | One month | PS tested as per SP 412E, monthly PS isolated and jumped during refueling as per SP 412K | 1E-2 |

MILLSTONE 1
SYSTEM LPCI
SHEET #20

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 22051501-90A-XFC<br>22061501-90B-XFC<br>22051501-90C-XFC<br>22061501-90D-XFC | Normally open contacts on pressure switch fail to close | One month | PS tested as per SP 412D, monthly | 1.4E-4 |
| 22051501-90A-OMC<br>22061501-90B-OMC<br>22051501-90C-OMC<br>22061501-90D-OMC | Operator miscalibrates pressure switch | One month | PS tested as per SP 412D, monthly | 1E-3 |
| 22051501-90A-TOM<br>22061501-90B-TOM<br>22051501-90C-TOM<br>22061501-90D-TOM | PS out of service due to test or maintenance | One month | PS tested as per SP 412D, monthly; PS isolated and jumped during refueling as per SP 412K | 1E-2 |
| 9321530-103-FTE<br>9321530-104-FTE<br>9331530-203-FTE<br>9331530-204-FTE | Normally deenergized relay coil fails to energize | One month | Relay coil tested monthly as per SP 412C; checked during each refueling outage as per SP 412K | 1E-4 |
| 9321530-108-FTE<br>9321530-109-FTE<br>9331530-208-FTE<br>9331530-209-FTE | Normally deenergized coil fails to energize | One month | Relay coil tested as per SP 412D, monthly; also tested during each refueling as per SP 412K | 1E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #21

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-118-FTE<br>9321530-171-FTE<br>9321530-172-FTE<br>9321530-173-FTE<br>9321530-174-FTE<br>9321530-183-FTE<br>9321530-184-FTE<br>9331530-260-FTE<br>9331530-271-FTE<br>9331530-272-FTE<br>9331530-273-FTE<br>9331530-274-FTE<br>9331530-283-FTE<br>9331530-284-FTE | Normally deenergized relay coil fails to energize | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412G and SP 412K during refueling | 1.8E-3 |
| 9321530-127-FTE<br>9331530-227-FTE | Normally deenergized relay coil fails to energize | One month | Relay coil tested as per SP 412B, monthly; SP 412K, during refueling SP 628.1 checks final signal propogation not these relays specifically (during refueling) | 1E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #22

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-150-FTE<br>9321530-196-FTE<br>9331530-250-FTE<br>9331530-296-FTE | Normally deenergized coil fails to energize | One month | Relay coil tested as per SP 412A, monthly; SP 412K, during refueling; SP 628.1 checks final signal propogation not these relays specifically (during refueling) | 1E-4 |
| 9321530-179-FTE<br>9321530-180-FTE<br>9331530-279-FTE<br>9331530-280-FTE | Normally deenergized relay coil fails to energize | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412G, SP 412K, and SP 628.1 (checking final signal propogation & not each relay specifically) during refueling | 1.8E-3 |
| 9321530-183-FRD<br>9321530-184-FRD<br>9331530-283-FRD<br>9331530-284-FRD | Normally denergized relay coil fails to remain deenergized | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412G and SP 412K during refueling outage | 6E-5 |

MILLSTONE 1
SYSTEM LPCI
SHEET #23

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-106-FTE<br>9321530-112-FTE<br>9321530-116-FTE<br>9321530-197-FTE<br>9331530-206-FTE<br>9331530-212-FTE<br>9331530-216-FTE<br>9331530-297-FTE | Normally deenergized relay fails to energize | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412K and SP 628.1, during refueling | 1.8E-3 |
| 9331530-168-FTE<br>9331530-181-FTE<br>9331530-188-FTE<br>9331530-194-FTE<br>9331530-268-FTE<br>9321530-107-FTE<br>9331530-281-FTE<br>9331530-288-FTE<br>9331530-294-FTE<br>9331530-207-FTE | Normally deenergized relay fails to energize | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412K, during refueling; in the system operability check (SP 628.1) individual relays are not tested but signal propogation is tested | 1.8E-3 |
| 9331530-276-FTE<br>9331530-282-FTE<br>9331530-287-FTE<br>9321530-176-FTE<br>9321530-182-FTE<br>9321530-187-FTE | Normally deenergized time delay relay coil fails to energize | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412K, during refueling | 1.8E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #24

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-124-FTE<br>9321530-125-FTE<br>9321530-126-FTE<br>9321530-193-FTE<br>9331530-224-FTE<br>9331530-225-FTE<br>9331530-226-FTE<br>9331530-293-FTE<br>9321530-175-FTE<br>9321530-185-FTE<br>9331530-275-FTE<br>9331530-285-FTE | Normally deenergized coil fails to energize | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412K, during refueling | 1.8E-3 |
| 9321530-190-FTE<br>9331530-290-FTE<br>9321530-195-FTE<br>9331530-295-FTE | Normally deenergized coil fails to energize | | Relay coil tested only as part of a system check, SP 628.1, at least one of the two works (i.e. energizes) during test. Tested during refueling | 3E-2 |
| 9321530-192-FTE<br>9331530-292-FTE | Normally deenergized coil fails to energize | | Relay coils are not normally in use and are not tested | 3E-2 |
| 9321530-123-FRD<br>9321530-128-FRD<br>9331530-223-FRD<br>9331530-228-FRD | Normally deenergized relay coil fails to remain deenergized | 12000 hrs (detected during refueling outages) | Relay coil tested during refueling as per SP 412K and SP 628.1 | 6E-5 |

MILLSTONE 1
SYSTEM LPCI
SHEET #25

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-136-FRD<br>9321530-137-FRD<br>9321530-138-FRD<br>9321530-185-FRD<br>9321530-146-FRD<br>9321530-188-FRD<br>9331530-285-FRD<br>9331530-236-FRD<br>9331530-237-FRD<br>9331530-238-FRD<br>9331530-246-FRD<br>9331530-288-FRD<br>9321530-134-FRD<br>9321530-144-FRD<br>9331530-244-FRD<br>9331530-234-FRD | Normally deener-gized relay coil fails to remain deenergized | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412K, during refueling | 6E-5 |
| 9321530-134-FRD<br>9321530-144-FRD<br>9331530-244-FRD<br>9331530-234-FRD | Normally deener-gized relay coil fails to remain deenergized | One month | Relay coil tested as per SP 412E, monthly | 3.6E-6 |
| 9321530-187-FRD<br>9321530-191-FRD<br>9321530-198-FRD<br>9321530-199-FRD<br>9331530-287-FRD<br>9331530-291-FRD<br>9331530-298-FRD<br>9331530-299-FRD | Normally deener-gized time delay relay fails to remain denergized | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412K, during refueling | 6E-5 |

MILLSTONE 1
SYSTEM LPCI
SHEET #26

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-192-FRD<br>9331530-292-FRD | Normally deener-gized relay fails to remain de-energized | 12000 hrs (detected during refueling outages) | Relay coil position checked during SP 412K restoration, during refueling | 6E-5 |
| 9321530-133-FRD<br>9331530-233-FRD | Normally deener-gized time delay relay coil fails to remain de-energized | 12000 hrs (detected during refueling outages) | Relay coil position checked as per SP 412K restoration, during refueling | 6E-5 |
| 9321530-175-FRD<br>9331530-275-FRD | Normally deenergized relay coil fails to remain deenergized | 12000 hrs (detected during refueling outages) | Relay coil tested as per SP 412K, during refueling; at least one of two relays function during performance of SP 628.1 | 6E-5 |
| 9321530-195-FRD<br>9331530-295-FRD | Normally deenergized relay coil fails to remain deenergized | 12000 hrs (detected during refueling outages) | Relay coil tested as part of SP 628.1 (if either coil had failed an improper signal would have propagated) | 6E-5 |

MILLSTONE 1
SYSTEM LPCI
SHEET #27

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-101-FRE<br>9321530-102-FRE<br>9331530-201-FRE<br>9331530-202-FRE | Normally energized relay coil fails to remain energized | Immediate | Deenergized relay is annunciated in control room. Tested as per SP 412F, monthly; SP 412K during refueling. SP 628.1 tests each pair of relays, during refueling. | 2.4E-6 |
| 9321530-151-FRE | Normally energized relay coil fails to remain energized | One month | Relay coil tested as per: SP 412F, monthly, SP 628.1 tests this relay and 9321530-321, 9321530-321A as a pair, during refueling | 3.6E-5 |
| 9321530-103-1FC<br>9321530-104-1FC<br>9321530-106-9FC<br>9321530-107-5FC<br>9321530-168-1FC<br>9321530-171-1FC<br>9321530-172-1FC<br>9321530-173-1FC<br>9321530-174-1FC<br>9321530-175-2FC<br>9321530-181-1FC<br>9321530-182-6FC<br>9321530-183-1FC<br>9321530-184-1FC | Normally open contact pair fails to close on a change of state in the relay coil | 12000 hrs (detected during refueling outages) | Contact pair operation is tested as per SP 412K, during refueling | 1.8E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #28

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-185-1FC<br>9321530-194-7FC<br>9331530-203-1FC<br>9331530-204-1FC<br>9331530-206-9FC<br>9331530-207-5FC<br>9331530-208-1FC<br>9331530-209-1FC<br>9331530-227-1FC<br>9331530-268-1FC<br>9331530-271-1FC<br>9331530-272-1FC<br>9331530-273-1FC<br>9331530-274-1FC<br>9331530-275-2FC<br>9331530-281-1FC<br>9331530-281-2FC<br>9331530-282-6FC<br>9331530-283-1FC<br>9331530-284-1FC<br>9331530-294-7FC<br>9331530-285-1FC | Normally open contact pair fails to close on a change of state in the relay coil | 12000 hrs (detected during refueling outages) | Contact pair operation is tested as per SP 412K, during refueling | 1.8E-3 |
| 9321530-103-7FC<br>9321530-104-7FC<br>9321530-107-1FC<br>9321530-124-9FC<br>9321530-125-3FC<br>9321530-125-7FC<br>9321530-125-BFC<br>9321530-126-7FC | Normally open contact pair fails to close on a change of state in the associated relay coil | No detection | Contact pair never tested | 2.9E-2 |

MILLSTONE 1
SYSTEM LPCI
SHEET #29

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-171-2FC<br>9321530-172-2FC<br>9321530-126-3FC<br>9321530-173-2FC<br>9321530-174-2FC<br>9321530-183-2FC<br>9321530-184-2FC<br>9321530-190-1FC<br>9321530-192-3FC<br>9321530-192-7FC<br>9321530-193-BFC<br>9321530-193-9FC<br>9321530-193-1FC<br>9321530-193-5FC<br>9321530-194-1FC<br>9321530-194-5FC<br>9321530-195-1FC<br>9321530-195-3FC<br>9331530-203-7FC<br>9331530-204-7FC<br>9331530-207-1FC<br>9331530-208-3FC<br>9331530-209-3FC<br>9331530-224-9FC<br>9331530-225-3FC<br>9331530-225-7FC<br>9331530-225-BFC<br>9331530-226-3FC<br>9331530-226-7FC<br>9331530-227-3FC<br>9331530-271-2FC<br>9331530-272-2FC<br>9331530-273-2FC | Normally open contact pair fails to close on a change of state in the associated relay coil | No detection | Contact pair never tested | 2.9E-2 |

MILLSTONE 1
SYSTEM LPCI
SHEET #30

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9331530-274-2FC<br>9331530-283-2FC<br>9331530-284-2FC<br>9331530-290-1FC<br>9331530-292-3FC<br>9331530-293-1FC<br>9331530-293-5FC<br>9331530-293-9FC<br>9331530-293-BFC<br>9331530-294-1FC<br>9331530-294-5FC<br>9331530-295-1FC<br>9331530-292-7FC | Normally open contact pair fails to close on a change of state in the associated relay coil | No detection | Contact pair never tested | 2.9E-2 |
| 9321530-108-3FC<br>9321530-109-3FC<br>9321530-127-3FC<br>9321530-150-BFC<br>9321530-179-2FC<br>9321530-180-2FC<br>9321530-193-7FC<br>9321530-194-9FC<br>9321530-194-BFC<br>9321530-196-BFC<br>9321530-197-1FC<br>9331530-250-BFC<br>9331530-279-2FC<br>9331530-280-2FC<br>9331530-294-9FC<br>9331530-294-BFC<br>9331530-295-3FC<br>9331530-296-BFC<br>9331530-297-1FC<br>9321530-127-1FC | Normally open contact pair fails to close on a change in state of the associated relay coil | None | Final signal propagation tested, but not necessarily contact pair operation as per SP 628.1, during refueling | 2.9E-2 |

MILLSTONE 1
SYSTEM LPCI
SHEET #31

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-106-7FC<br>9321530-108-1FC<br>9321530-109-1FC<br>9321530-118-1FC<br>9321530-127-5FC<br>9321530-150-2FC<br>9321530-168-2FC<br>9321530-176-6FC<br>9321530-176-2FC<br>9321530-179-1FC<br>9321530-180-1FC<br>9321530-182-DFC<br>9321530-182-2FC<br>9321530-187-6FC<br>9321530-187-DFC<br>9321530-188-2FC<br>9321530-196-5FC<br>9331530-206-7FC<br>9331530-250-5FC<br>9331530-260-2FC<br>9331530-268-2FC<br>9331530-276-2FC<br>9331530-276-6FC<br>9331530-279-1FC<br>9331530-280-1FC<br>9331530-282-2FC<br>9331530-282-DFC<br>9331530-293-7FC<br>9331530-296-5FC<br>9321530-150-5FC | Normally open contact pair fails to close on a change of state in the associated relay coil | 12000 hrs (detected during refueling outages) | Contact pair operated tested as per SP 412K during refueling. Final signal propagation tested, but not necessarily contact pair operation as per SP 628.1, during refueling. | 1.8E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #32

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9331530-287-6FC<br>9331530-287-DFC<br>9331530-288-2FC | Normally open contact pair fails to close on a change of state in the associated relay coil | 12000 hrs (detected during refueling outages) | Contact pair operation tested as per SP 412K, during refueling. Final signal propagation tested, but not specific contact pairs, in SP 628.1; during refueling. | 1.8E-3 |
| 9321530-106-1FC<br>9321530-106-BFC<br>9331530-206-1FC<br>9331530-206-BFC | Normally open contact pair fails to close on a change of state in the associated relay coil | 12000 hrs (detected during refueling outages) | Contact pair operation is tested as per SP 628.1, during refueling | 1.8E-3 |
| 9321530-112-1FC<br>9321530-116-1FC<br>9331530-212-1FC<br>9331530-216-1FC | Normally open contact pair fails to close on a change of state in the associated relay coil | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 628.1, during refueling | 1.8E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #33

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-185-9F0<br>9331530-285-9F0 | Normally closed contact pair fails to open on a change of state in the associated relay coil | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 412K, during refueling; system operation checked as per SP 628.1 and at least 1 of 2 contact pairs must open (during refueling) | 1.8E-3 |
| 9321530-188-3F0<br>9331530-288-3F0 | Normally closed contact pair fails to open on a change in state of the associated relay | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 412K, during refueling | 1.8E-3 |
| 9331530-287-1RC<br>9331530-288-3RC<br>9321530-175-3RC<br>9321530-185-7RC<br>9321530-185-9RC<br>9331530-275-3RC<br>9331530-285-7RC<br>9331530-285-9RC<br>9321530-187-1RC<br>9321530-188-3RC | Normally closed contact pair fails to remain closed | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 412K, during refueling; SP 628.1 provides a check of system function but not necessarily each set of contacts | 6E-4 |
| 9321530-123-3RC<br>9321530-128-3RC<br>9331530-223-3RC<br>9331530-228-3RC | Normally closed contact pair fails to remain closed | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 628.1, during refueling; SP 412K provides a partial functional test | 6E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #34

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-101-1RC<br>9321530-101-5RC<br>9321530-102-3RC<br>9321530-102-5RC<br>9331530-201-5RC<br>9331530-201-3RC<br>9331530-202-1RC<br>9331530-202-5RC | Normally closed contact pair fails to remain closed | | Contact pair is tested only as part of a system/subsystem test as per SP 412K and SP 628.1 during refueling | 1E-2 |
| 9321530-151-1RC<br>9321530-151-3RC | Normally closed contact pair fails to remain closed | | Contact pair tested only as part of system check in which individual contact pairs may or may not have functioned as per SP 628.1, during refueling | 1E-2 |
| 9321530-133-8RC<br>9321530-137-5RC<br>9321530-138-3RC<br>9321530-138-7RC<br>9321530-138-8RC<br>9321530-191-8RC<br>9321530-192-9RC<br>9321530-192-5RC<br>9321530-195-5RC<br>9321530-198-3RC<br>9321530-198-4RC<br>9321530-199-3RC<br>9321530-199-4RC<br>9321530-136-3RC<br>9321530-136-7RC | Normally closed contact pair fails to remain closed | No detection | Contact pair not tested | 1E-2 |

MILLSTONE 1
SYSTEM LPCI
SHEET #35

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9331530-233-8RC<br>9331530-236-3RC<br>9331530-236-7RC<br>9331530-237-5RC<br>9331530-238-3RC<br>9331530-238-7RC<br>9331530-238-6RC<br>9331530-291-8RC<br>9331530-292-5RC<br>9331530-295-5RC<br>9331530-295-9RC<br>9331530-298-3RC<br>9331530-299-4RC<br>9331530-298-4RC<br>9331530-299-3RC | Normally closed contact pair fails to remain closed | No detection | Contact pair not tested | 1E-2 |
| 9321530-183-1RO<br>9321530-184-1RO<br>9321530-185-1RO<br>9321530-187-DRO<br>9331530-283-2RO<br>9331530-284-2RO<br>9331530-285-1RO<br>9331530-287-DRO | Normally open contact pair fails to remain open | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 412K, during refueling; as part of system check for SP 628.1 contact pair may be tested, during refueling | 6E-4 |
| 9321530-124-5RO<br>9331530-224-5RO<br>9321530-107-3RO<br>9331530-207-3RO<br>9321530-187-6RO<br>9321530-188-2RO<br>9331530-287-6RO<br>9331530-288-2RO | Normally open contact pair fails to remain open | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 412K, during refueling | 6E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #36

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-134-1RO<br>9321530-134-3RO<br>9321530-144-1RO<br>9321530-144-3RO<br>9321530-146-3RO<br>9331530-234-1RO<br>9331530-234-3RO<br>9331530-244-1RO<br>9331530-244-3RO<br>9331530-246-3RO | Normally open contact pair fails to remain open | | Contact pair tested only as part of system operation (i.e. system works, contact pair may/may not have worked) as per SP 412K, during refueling | 1E-2 |
| 9321530-123-1RO<br>9321530-128-1RO<br>9321530-183-2RO<br>9321530-184-2RO<br>9321530-193-7RO<br>9321530-193-BRO<br>9321530-194-BRO<br>9331530-223-1RO<br>9331530-228-1RO<br>9331530-283-1RO<br>9331530-284-1RO<br>9331530-293-7RO<br>9331530-294-BRO | Normally open contact pair fails to remain open | | Contact pair may be tested as part of SP 628.1, performed during refueling | 1E-2 |
| 9321530-192-1RO<br>9321530-195-7RO<br>9331530-292-1RO<br>9331530-293-BRO<br>9331530-295-7RO | Normally open contact pair fails to remain open | | Contact pair not tested | 1E-2 |

MILLSTONE 1
SYSTEM LPCI
SHEET #37

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-115-FRD<br>9321530-119-FRD<br>9331530-215-FRD<br>9331530-219-FRD | Normally deenergized relay coil (of manual switch) fails to remain deenergized | 12000 hrs (detected during refueling outages) | Relay coil is tested as per SP 412K, during refueling | 6E-5 |
| 9321530-115-5RC<br>9321530-115-7RC<br>9321530-115-BRC<br>9321530-119-1RC<br>9331530-215-5RC<br>9331530-215-7RC<br>9331530-215-BRC<br>9331530-219-1RC | Normally closed contact pair fails to remain closed | 12000 hrs (detected during refueling outages) | Contact pairs tested as per SP 412K, during refueling | 1.8E-4 |
| 9321530-115-1RC<br>9331530-215-1RC | Normally closed contact pair fails to remain closed | | Contact pairs not tested | 3E-3 |
| 9031530-301A-FRD<br>9031530-301B-FRD<br>9031530-301C-FRD<br>9031530-301D-FRD | Manual switch, pump control, fails to remain in the auto position. Pump control switch fails in stop position | One month | Pump switch must be operable for pump to start during SP 622.3 (monthly test); SP 622.2 (quarterly); and SP 628.1 and SP 412K, during refueling | 3.6E-6 |
| 9031530-301A-4RO<br>9031530-301B-4RO<br>9031530-301C-4RO<br>9031530-301D-4RO | Normally open pair fails to remain open | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 412K and SP 628.1 during refueling | 1.8E-4 |

MILLSTONE 1
SYSTEM LPCI
SHEET #38

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| LP-A-MDP-OSP<br>LP-B-MDP-OSP<br>LP-C-MDP-OSP<br>LP-D-MDP-OSP | Operator stops LPCI pump during the course of the transient/LOCA | | Operator stops the pump while "LOCA" conditions exist in the core or drywell | 3E-3 |
| 9031530-336A-FTE<br>9031530-336B-FTE<br>9031530-336C-FTE<br>9031530-336D-FTE | Reset switch fails to change position when operator presses switch | | This reset switch is not tested | 3E-3 |
| 9031530-336A-1FO<br>9031530-336B-1FO<br>9031530-336C-1FO<br>9031530-336D-1FO | Contact pair fails to close when reset switch is operated | | The contact pairs are not tested | 1E-2 |
| 9031530-336A-OFR<br>9031530-336B-OFR<br>9031530-336C-OFR<br>9031530-336D-OFR | Operator fails to reset button for LPCI pumps | | LPCI pumps will not restart automatically if stopped and reset is not pushed | 1E-2 |
| 9321530-340A-TOM<br>9331530-340B-TOM<br>9321530-341A-TOM<br>9331530-341B-TOM | Switch is engaged, or left engaged, due to test on undervoltage relay circuits | Prompt | Test switch used in SP 412F, monthly. Circuit is annunciated if no current passes thru the circuit. | 1.3E-7 |
| 9321530-340A-1RC<br>9321530-341A-1RC<br>9331530-340B-1RC<br>9331530-341B-1RC | Contact pair on test switch fail to remain closed | Prompt | Contact pair tested as per SP 412F, monthly. Circuit is annunciated if no current passes thru this circuit. | 6E-8 |

MILLSTONE 1
SYSTEM LPCI
SHEET #39

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321530-342-TOM | Test switch on LNP circuit out of service due to test | One month | Circuit tested monthly as per SP 412F, monthly | 1E-2 |
| 9321530-342-1RC | Contact pair on LNP test switch fails to remain closed (normally closed) | One month | Circuit tested monthly as per SP 412F | 1.1E-5 |
| 9321530-321-FTE<br>9321530-321A-FTE | Time delay unit fails to energize properly | 12000 hrs (detected during refueling outages) | Unit tested as per SP 412K during refueling | 1.8E-3 |
| 9321530-321-2FC<br>9321530-321A-1FC | Contact pair on time delay unit fails to close (normally open) | 12000 hrs (detected during refueling outages) | Contact pair tested as per SP 412K, during refueling | 1.8E-3 |
| LCL27-5A-FRE<br>LCL27-5B-FRE<br>LCL27-6A-FRE<br>LCL27-6B-FRE | Undervoltage relay, normally energized, fails to remain energized | Prompt | Undervoltage circuit annunciated. Coil tested as per SP 412F monthly | 2.4E-6 |
| LCL27-5A-5RC<br>LCL27-5B-5RC<br>LCL27-6A-5RC<br>LCL27-6B-5RC | Normally closed contact pair on undervoltage relay fails to remain closed | Prompt | Undervoltage circuit annunciated. Contact pair tested as per SP 412F, monthly | 2.4E-6 |
| 926LNP-2-FRD | Normally deenergized LNP relay coil fails to remain deenergized | One month | LNP relay tested as per SP 412F, monthly | 3.6E-6 |

MILLSTONE 1
SYSTEM LPCI
SHEET #40

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 926LNP-2-9RC | Normally closed contact pair fails to remain closed | One month | Contact pair must function properly during SP 622.3, held monthly; SP 622.2, quarterly; and SP 628.1, during refueling | 3.6E-5 |
| AC-14F-3-FTC<br>AC-14E-3-FTC<br>AC-14F-4-FTC<br>AC-14E-4-FTC | Normally open breaker (LPCI pump) fails to close on demand | One month | Breaker engages when pump starts. Pump started as per SP 622.7, monthly; SP 622.3, monthly; SP 622.2, quarterly; SP 628.1 during refueling | 1E-3 |
| AC-F3-4C-FTC<br>AC-E3-2C-FTC<br>AC-FE3-2B-FTC<br>AC-EF3-1C-FTC<br>AC-F3-5A-FTC<br>AC-E3-3A-FTC<br>DC-101AB1-2E-FTC<br>DC-101AB2-3B-FTC<br>AC-F3-4A-FTC<br>AC-E3-2A-FTC<br>DC-101AB1-2D-FTC<br>DC-101AB2-3A-FTC | Normally open breaker fails to close on demand | One month | Valve cycled (breaker tested) as per SP 622.4, monthly; SP 622.7. monthly | 1E-3 |

MILLSTONE 1
SYSTEM LPCI
SHEET #41

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| AC-FE3-2C-FTC<br>AC-EF3-2A-FTC | Normally open breaker fails to close on demand | One month | Breaker engages when valve cycled. Valve cycled as per SP 622.7 and SP 622.3, monthly | 1E-3 |
| AC-F3-4B-FTC<br>AC-E3-2B-FTC<br>DC-101AB1-5C-FTC<br>DC-101AB2-4E-FTC | Normally open breaker fails to close on demand | One month | Breaker tested when associated valve cycled. Valve tested as per: SP 622.7, monthly; SP 622.3, monthly | 1E-3 |
| AC-14E-UVD-LOF<br>AC-14F-UVD-LOF | Undervoltage detection erroneously shows loss of power on bus | Immediate | Indication of undervoltage condition is alarmed in the control room | 2.4E-5 |

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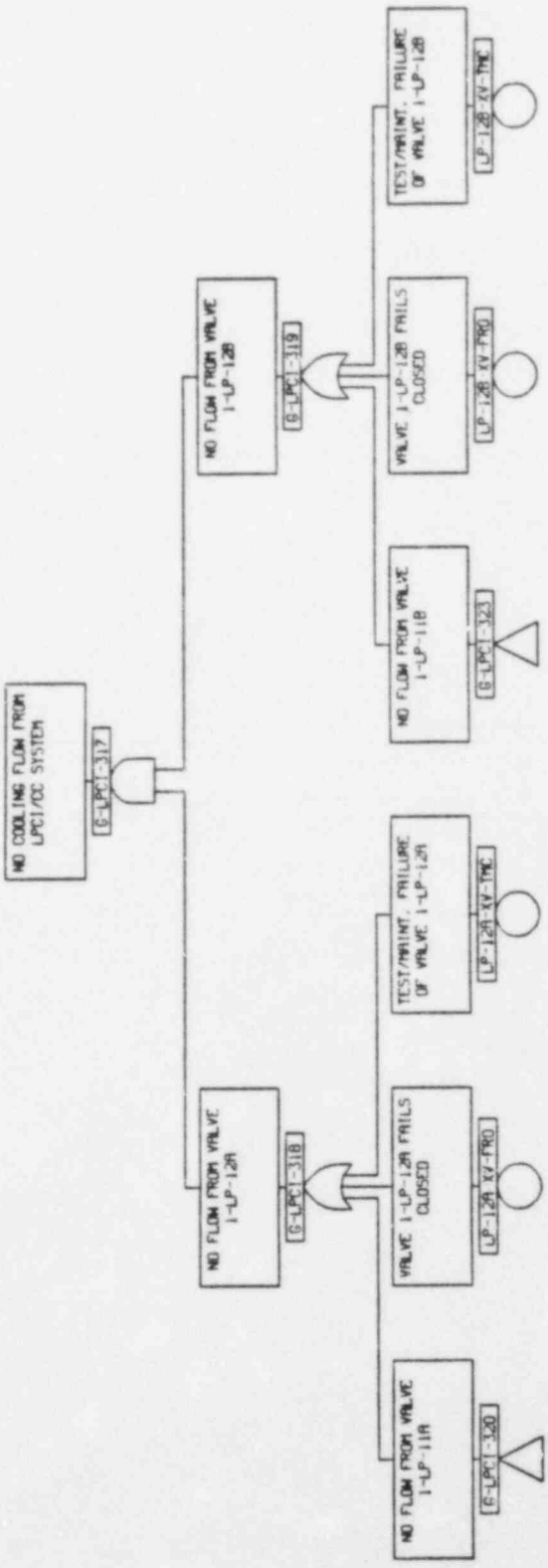
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|---|---|---|
| G-LPCI-580 | LPCI.CW-32 | LPCI.CW-31,LPCI.CW-34 |
| G-LPCI-581 | LPCI.CW-33 | LPCI.CW-31,LPCI.CW-34 |
| G-LPCI-587 | LPCI.CW-35 | LPCI.CW-32 |
| G-LPCI-588 | LPCI.CW-35 | LPCI.CW-32 |
| G-LPCI-591 | LPCI.CW-36 | LPCI.CW-32 |
| G-LPCI-594 | LPCI.CW-37 | LPCI.CW-33 |
| G-LPCI-595 | LPCI.CW-36 | LPCI.CW-32 |
| G-LPCI-596 | LPCI.CW-12 | LPCI.CW-11,LPCI.CW-18 |
| G-LPCI-598 | LPCI.CW-38 | LPCI.CW-12,LPCI.CW-13,LPCI.CW-103 |
| G-LPCI-601 | LPCI.CW-39 | LPCI.CW-12,LPCI.CW-103 |
| G-LPCI-603 | LPCI.CW-13 | LPCI.CW-11,LPCI.CW-18 |
| G-LPCI-605 | LPCI.CW-41 | LPCI.CW-13 |
| G-LPCI-606 | LPCI.CW-41 | LPCI.CW-13 |
| G-LPCI-608 | LPCI.CW-40 | LPCI.CW-39,LPCI.CW-41 |
| G-LPCI-609 | LPCI.CW-40 | LPCI.CW-39,LPCI.CW-41 |
| G-LPCI-610 | LPCI.CW-42 | LPCI.CW-39,LPCI.CW-41 |
| G-LPCI-618 | LPCI.CW-44 | LPCI.CW-40 |
| G-LPCI-619 | LPCI.CW-44 | LPCI.CW-40 |
| G-LPCI-620 | LPCI.CW-45 | LPCI.CW-40 |
| G-LPCI-621 | LPCI.CW-45 | LPCI.CW-40 |
| G-LPCI-627 | LPCI.CW-46 | LPCI.CW-30 |
| G-LPCI-628 | LPCI.CW-46 | LPCI.CW-30 |
| G-LPCI-629 | LPCI.CW-46 | LPCI.CW-30 |
| G-LPCI-630 | LPCI.CW-47 | LPCI.CW-46 |
| G-LPCI-631 | LPCI.CW-48 | LPCI.CW-46 |
| G-LPCI-632 | LPCI.CW-50 | LPCI.CW-46 |
| G-LPCI-633 | LPCI.CW-51 | LPCI.CW-46 |
| G-LPCI-646 | LPCI.CW-46 | LPCI.CW-30 |
| G-LPCI-647 | LPCI.CW-53 | LPCI.CW-46 |
| G-LPCI-648 | LPCI.CW-54 | LPCI.CW-46 |
| G-LPCI-655 | LPCI.CW-46 | LPCI.CW-30 |
| G-LPCI-656 | LPCI.CW-55 | LPCI.CW-46 |
| G-LPCI-657 | LPCI.CW-56 | LPCI.CW-46 |
| G-LPCI-665 | LPCI.CW-57 | LPCI.CW-38 |
| G-LPCI-666 | LPCI.CW-57 | LPCI.CW-38 |
| G-LPCI-667 | LPCI.CW-57 | LPCI.CW-38 |
| G-LPCI-668 | LPCI.CW-58 | LPCI.CW-57 |
| G-LPCI-669 | LPCI.CW-59 | LPCI.CW-57 |
| G-LPCI-670 | LPCI.CW-60 | LPCI.CW-57 |
| G-LPCI-671 | LPCI.CW-61 | LPCI.CW-57 |
| G-LPCI-684 | LPCI.CW-57 | LPCI.CW-38 |
| G-LPCI-685 | LPCI.CW-62 | LPCI.CW-57 |
| G-LPCI-686 | LPCI.CW-63 | LPCI.CW-57 |
| G-LPCI-693 | LPCI.CW-57 | LPCI.CW-38 |
| G-LPCI-694 | LPCI.CW-64 | LPCI.CW-57 |
| G-LPCI-695 | LPCI.CW-65 | LPCI.CW-57 |
| G-LPCI-705 | LPCI.CW-66 | LPCI.CW-49,LPCI.CW-112,LPCI.CW-119, LPCI.CW-123,LPCI.CW-127,LPCI.CW-131, LPCI.CW-135,LPCI.CW-148,LPCI.CW-155 |

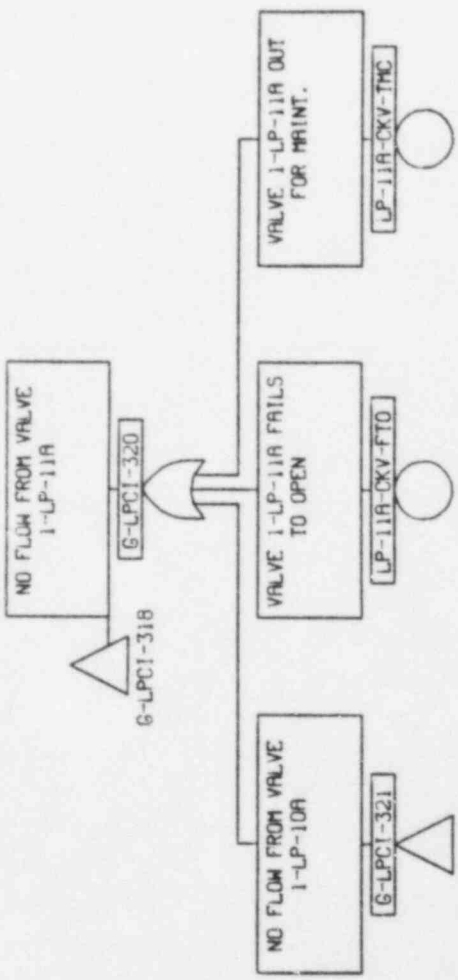
| GATE NAME | DEFINED ON PAGE | TRANSFERS TO PAGE(S) |
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| G-LPCI-707 | LPCI.CW-49 | LPCI.CW-37,LPCI.CW-46,LPCI.CW-47, LPCI.CW-50,LPCI.CW-53,LPCI.CW-55, LPCI.CW-58,LPCI.CW-60,LPCI.CW-62, LPCI.CW-64 |
| G-LPCI-710 | LPCI.CW-66 | LPCI.CW-66 |
| G-LPCI-711 | LPCI.CW-67 | LPCI.CW-66 |
| G-LPCI-718 | LPCI.CW-67 | LPCI.CW-49 |
| G-LPCI-719 | LPCI.CW-71 | LPCI.CW-49 |
| G-LPCI-725 | LPCI.CW-68 | LPCI.CW-67,LPCI.CW-67,LPCI.CW-107 |
| G-LPCI-726 | LPCI.CW-68 | LPCI.CW-85,LPCI.CW-111,LPCI.CW-171 |
| G-LPCI-727 | LPCI.CW-72 | LPCI.CW-68,LPCI.CW-68 |
| G-LPCI-729 | LPCI.CW-68 | LPCI.CW-67,LPCI.CW-67,LPCI.CW-107 |
| G-LPCI-730 | LPCI.CW-68 | LPCI.CW-85,LPCI.CW-111,LPCI.CW-171 |
| G-LPCI-731 | LPCI.CW-73 | LPCI.CW-68,LPCI.CW-68 |
| G-LPCI-733 | LPCI.CW-69 | LPCI.CW-66,LPCI.CW-67,LPCI.CW-106 |
| G-LPCI-734 | LPCI.CW-69 | LPCI.CW-85,LPCI.CW-108,LPCI.CW-171 |
| G-LPCI-735 | LPCI.CW-74 | LPCI.CW-69,LPCI.CW-69 |
| G-LPCI-737 | LPCI.CW-69 | LPCI.CW-66,LPCI.CW-67,LPCI.CW-106 |
| G-LPCI-738 | LPCI.CW-69 | LPCI.CW-85,LPCI.CW-108,LPCI.CW-171 |
| G-LPCI-739 | LPCI.CW-75 | LPCI.CW-69,LPCI.CW-69 |
| G-LPCI-741 | LPCI.CW-70 | LPCI.CW-66,LPCI.CW-67,LPCI.CW-106 |
| G-LPCI-742 | LPCI.CW-76 | LPCI.CW-85,LPCI.CW-108,LPCI.CW-171 |
| G-LPCI-743 | LPCI.CW-78 | LPCI.CW-70,LPCI.CW-76 |
| G-LPCI-745 | LPCI.CW-70 | LPCI.CW-66,LPCI.CW-67,LPCI.CW-106 |
| G-LPCI-746 | LPCI.CW-76 | LPCI.CW-85,LPCI.CW-108,LPCI.CW-171 |
| G-LPCI-747 | LPCI.CW-79 | LPCI.CW-70,LPCI.CW-76 |
| G-LPCI-749 | LPCI.CW-70 | LPCI.CW-67,LPCI.CW-71,LPCI.CW-107 |
| G-LPCI-750 | LPCI.CW-76 | LPCI.CW-86,LPCI.CW-111,LPCI.CW-171 |
| G-LPCI-751 | LPCI.CW-80 | LPCI.CW-70,LPCI.CW-76 |
| G-LPCI-753 | LPCI.CW-70 | LPCI.CW-67,LPCI.CW-71,LPCI.CW-107 |
| G-LPCI-754 | LPCI.CW-76 | LPCI.CW-86,LPCI.CW-111,LPCI.CW-171 |
| G-LPCI-755 | LPCI.CW-81 | LPCI.CW-70,LPCI.CW-76 |
| G-LPCI-757 | LPCI.CW-77 | LPCI.CW-67,LPCI.CW-71,LPCI.CW-107 |
| G-LPCI-758 | LPCI.CW-77 | LPCI.CW-86,LPCI.CW-111,LPCI.CW-171 |
| G-LPCI-759 | LPCI.CW-82 | LPCI.CW-77,LPCI.CW-77 |
| G-LPCI-761 | LPCI.CW-77 | LPCI.CW-67,LPCI.CW-71,LPCI.CW-107 |
| G-LPCI-762 | LPCI.CW-77 | LPCI.CW-86,LPCI.CW-111,LPCI.CW-171 |
| G-LPCI-763 | LPCI.CW-83 | LPCI.CW-77,LPCI.CW-77 |
| G-LPCI-765 | LPCI.CW-84 | --- |
| G-LPCI-770 | LPCI.CW-85 | LPCI.CW-84,LPCI.CW-104 |
| G-LPCI-771 | LPCI.CW-88 | LPCI.CW-84,LPCI.CW-104 |
| G-LPCI-776 | LPCI.CW-87 | LPCI.CW-85 |
| G-LPCI-777 | LPCI.CW-87 | LPCI.CW-88 |
| G-LPCI-780 | LPCI.CW-88 | LPCI.CW-85,LPCI.CW-87,LPCI.CW-164, LPCI.CW-167 |

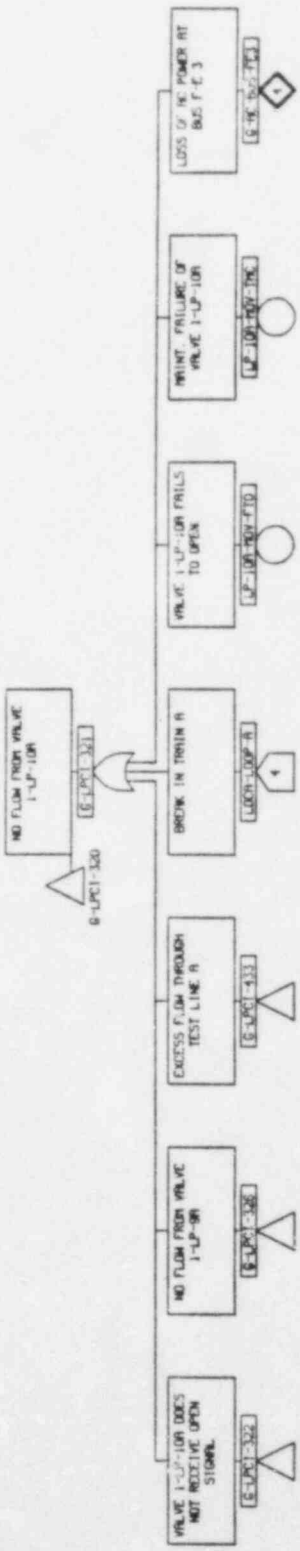
| GATE NAME | DEFINED ON PAGE | TRANSFERS TO PAGE(S) |
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| G-LPCI-783 | LPCI.CW-90 | LPCI.CW-88 |
| G-LPCI-785 | LPCI.CW-91 | LPCI.CW-88,LPCI.CW-102 |
| G-LPCI-788 | LPCI.CW-92 | LPCI.CW-90 |
| G-LPCI-791 | LPCI.CW-93 | LPCI.CW-91 |
| G-LPCI-792 | LPCI.CW-94 | LPCI.CW-91 |
| G-LPCI-793 | LPCI.CW-96 | LPCI.CW-91 |
| G-LPCI-794 | LPCI.CW-96 | LPCI.CW-91 |
| G-LPCI-796 | LPCI.CW-95 | LPCI.CW-92 |
| G-LPCI-802 | LPCI.CW-89 | LPCI.CW-87,LPCI.CW-88,LPCI.CW-164, LPCI.CW-167 |
| G-LPCI-805 | LPCI.CW-98 | LPCI.CW-89 |
| G-LPCI-807 | LPCI.CW-97 | LPCI.CW-89,LPCI.CW-92 |
| G-LPCI-811 | LPCI.CW-99 | LPCI.CW-97 |
| G-LPCI-812 | LPCI.CW-99 | LPCI.CW-97 |
| G-LPCI-813 | LPCI.CW-99 | LPCI.CW-97 |
| G-LPCI-814 | LPCI.CW-99 | LPCI.CW-97 |
| G-LPCI-820 | LPCI.CW-102 | LPCI.CW-98 |
| G-LPCI-822 | LPCI.CW-103 | LPCI.CW-102 |
| G-LPCI-824 | LPCI.CW-100 | --- |
| G-LPCI-826 | LPCI.CW-89 | LPCI.CW-100 |
| G-LPCI-827 | LPCI.CW-102 | LPCI.CW-100 |
| G-LPCI-831 | LPCI.CW-100 | --- |
| G-LPCI-833 | LPCI.CW-104 | LPCI.CW-100 |
| G-LPCI-834 | LPCI.CW-105 | LPCI.CW-100 |
| G-LPCI-838 | LPCI.CW-101 | --- |
| G-LPCI-840 | LPCI.CW-104 | LPCI.CW-101 |
| G-LPCI-843 | LPCI.CW-105 | LPCI.CW-104,LPCI.CW-120,LPCI.CW-121, LPCI.CW-125,LPCI.CW-129,LPCI.CW-133, LPCI.CW-137 |
| G-LPCI-845 | LPCI.CW-106 | LPCI.CW-105 |
| G-LPCI-846 | LPCI.CW-107 | LPCI.CW-105 |
| G-LPCI-852 | LPCI.CW-101 | --- |
| G-LPCI-854 | LPCI.CW-107 | LPCI.CW-101 |
| G-LPCI-857 | LPCI.CW-106 | LPCI.CW-107,LPCI.CW-112,LPCI.CW-119, LPCI.CW-123,LPCI.CW-127,LPCI.CW-131, LPCI.CW-135 |
| G-LPCI-859 | LPCI.CW-108 | LPCI.CW-106 |
| G-LPCI-860 | LPCI.CW-111 | LPCI.CW-106 |
| G-LPCI-866 | LPCI.CW-109 | --- |
| G-LPCI-870 | LPCI.CW-110 | LPCI.CW-109 |
| G-LPCI-871 | LPCI.CW-110 | LPCI.CW-109,LPCI.CW-117,LPCI.CW-122, LPCI.CW-126 |
| G-LPCI-873 | LPCI.CW-111 | LPCI.CW-110 |
| G-LPCI-876 | LPCI.CW-112 | LPCI.CW-110 |
| G-LPCI-880 | LPCI.CW-112 | LPCI.CW-110 |
| G-LPCI-883 | LPCI.CW-113 | LPCI.CW-111,LPCI.CW-116 |
| G-LPCI-884 | LPCI.CW-113 | LPCI.CW-111,LPCI.CW-116 |
| G-LPCI-885 | LPCI.CW-113 | LPCI.CW-112,LPCI.CW-116 |
| G-LPCI-886 | LPCI.CW-113 | LPCI.CW-112,LPCI.CW-116 |

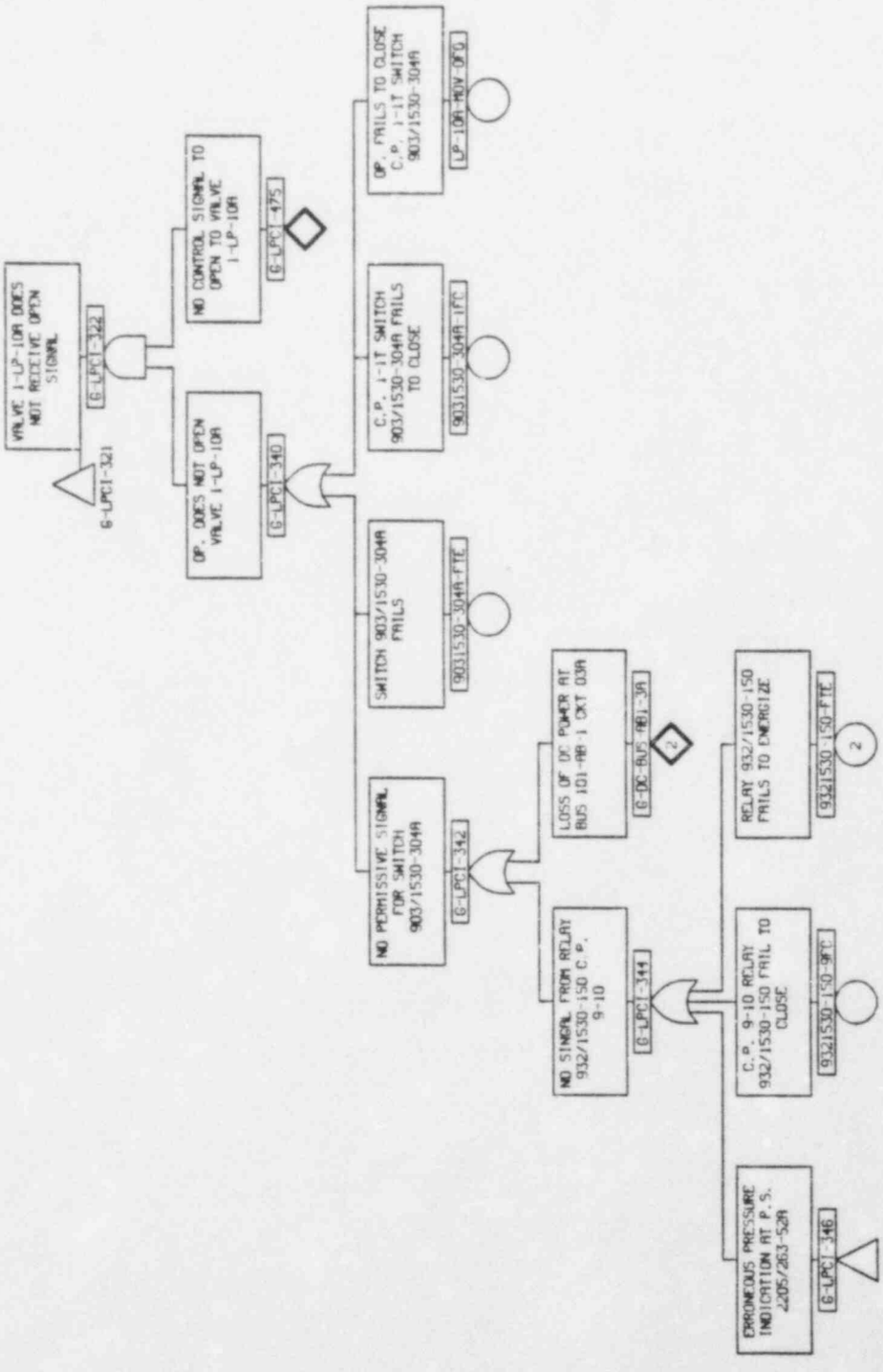
| GATE NAME | DEFINED ON PAGE | TRANSFERS TO PAGE(S) |
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| G-LPCI-887 | LPCI.CW-114 | --- |
| G-LPCI-890 | LPCI.CW-115 | LPCI.CW-114 |
| G-LPCI-891 | LPCI.CW-115 | LPCI.CW-114,LPCI.CW-118,LPCI.CW-124, LPCI.CW-128 |
| G-LPCI-893 | LPCI.CW-116 | LPCI.CW-115 |
| G-LPCI-894 | LPCI.CW-116 | LPCI.CW-115 |
| G-LPCI-900 | LPCI.CW-120 | LPCI.CW-115 |
| G-LPCI-903 | LPCI.CW-117 | --- |
| G-LPCI-906 | LPCI.CW-119 | LPCI.CW-117 |
| G-LPCI-911 | LPCI.CW-118 | --- |
| G-LPCI-914 | LPCI.CW-121 | LPCI.CW-118 |
| G-LPCI-919 | LPCI.CW-122 | --- |
| G-LPCI-922 | LPCI.CW-123 | LPCI.CW-122 |
| G-LPCI-927 | LPCI.CW-124 | --- |
| G-LPCI-929 | LPCI.CW-125 | LPCI.CW-124 |
| G-LPCI-935 | LPCI.CW-126 | --- |
| G-LPCI-938 | LPCI.CW-127 | LPCI.CW-126 |
| G-LPCI-943 | LPCI.CW-128 | --- |
| G-LPCI-946 | LPCI.CW-129 | LPCI.CW-128 |
| G-LPCI-951 | LPCI.CW-130 | --- |
| G-LPCI-954 | LPCI.CW-131 | LPCI.CW-130 |
| G-LPCI-960 | LPCI.CW-132 | --- |
| G-LPCI-963 | LPCI.CW-133 | LPCI.CW-132 |
| G-LPCI-969 | LPCI.CW-134 | --- |
| G-LPCI-972 | LPCI.CW-135 | LPCI.CW-134 |
| G-LPCI-978 | LPCI.CW-136 | --- |
| G-LPCI-981 | LPCI.CW-137 | LPCI.CW-136 |
| G-LPCI-987 | LPCI.CW-138 | --- |
| G-LPCI-990 | LPCI.CW-139 | LPCI.CW-138 |
| G-LPCI-991 | LPCI.CW-140 | LPCI.CW-139 |
| G-LPCI-997 | LPCI.CW-141 | LPCI.CW-139 |
| G-LPCI-1000 | LPCI.CW-142 | LPCI.CW-139 |
| G-LPCI-1003 | LPCI.CW-143 | --- |
| G-LPCI-1006 | LPCI.CW-139 | LPCI.CW-143 |
| G-LPCI-1007 | LPCI.CW-144 | LPCI.CW-139 |
| G-LPCI-1013 | LPCI.CW-145 | LPCI.CW-139 |
| G-LPCI-1014 | LPCI.CW-146 | LPCI.CW-139 |
| G-LPCI-1019 | LPCI.CW-147 | --- |
| G-LPCI-1023 | LPCI.CW-148 | LPCI.CW-147 |
| G-LPCI-1025 | LPCI.CW-148 | LPCI.CW-148 |
| G-LPCI-1028 | LPCI.CW-151 | LPCI.CW-148 |
| G-LPCI-1031 | LPCI.CW-149 | LPCI.CW-148 |
| G-LPCI-1033 | LPCI.CW-152 | LPCI.CW-149 |
| G-LPCI-1034 | LPCI.CW-153 | LPCI.CW-149 |
| G-LPCI-1038 | LPCI.CW-150 | LPCI.CW-148 |
| G-LPCI-1040 | LPCI.CW-153 | LPCI.CW-150 |
| G-LPCI-1042 | LPCI.CW-154 | --- |
| G-LPCI-1045 | LPCI.CW-155 | LPCI.CW-154 |
| G-LPCI-1046 | LPCI.CW-120 | LPCI.CW-155 |

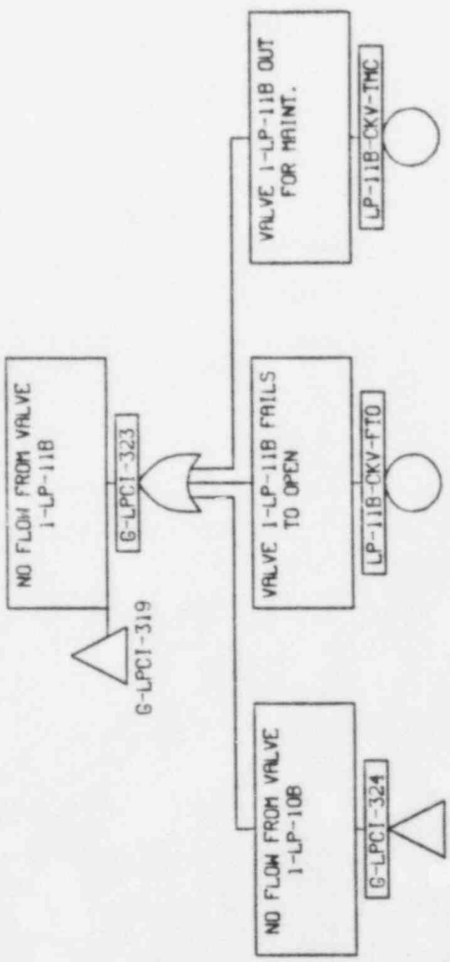
| GATE NAME | DEFINED ON PAGE | TRANSFERS TO PAGE(S) |
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| G-LPCI-1047 | LPCI.CW-156 | LPCI.CW-155 |
| G-LPCI-1048 | LPCI.CW-157 | LPCI.CW-155 |
| G-LPCI-1051 | LPCI.CW-158 | LPCI.CW-120 |
| G-LPCI-1054 | LPCI.CW-159 | LPCI.CW-120 |
| G-LPCI-1057 | LPCI.CW-166 | LPCI.CW-156 |
| G-LPCI-1061 | LPCI.CW-160 | LPCI.CW-157 |
| G-LPCI-1064 | LPCI.CW-161 | --- |
| G-LPCI-1069 | LPCI.CW-162 | LPCI.CW-161 |
| G-LPCI-1070 | LPCI.CW-162 | LPCI.CW-161 |
| G-LPCI-1075 | LPCI.CW-163 | --- |
| G-LPCI-1080 | LPCI.CW-164 | LPCI.CW-163 |
| G-LPCI-1081 | LPCI.CW-164 | LPCI.CW-163 |
| G-LPCI-1086 | LPCI.CW-165 | --- |
| G-LPCI-1089 | LPCI.CW-166 | LPCI.CW-165 |
| G-LPCI-1091 | LPCI.CW-166 | LPCI.CW-165 |
| G-LPCI-1092 | LPCI.CW-167 | LPCI.CW-165 |
| G-LPCI-1093 | LPCI.CW-167 | LPCI.CW-165 |
| G-LPCI-1098 | LPCI.CW-168 | --- |
| G-LPCI-1101 | LPCI.CW-169 | LPCI.CW-168 |
| G-LPCI-1102 | LPCI.CW-169 | LPCI.CW-168 |
| G-LPCI-1103 | LPCI.CW-170 | LPCI.CW-168 |
| G-LPCI-1104 | LPCI.CW-170 | LPCI.CW-168 |
| G-LPCI-1146 | LPCI.CW-43 | LPCI.CW-42 |
| G-LPCI-1149 | LPCI.CW-117 | LPCI.CW-52,LPCI.CW-120,LPCI.CW-121, LPCI.CW-125,LPCI.CW-129,LPCI.CW-133, LPCI.CW-137,LPCI.CW-139,LPCI.CW-139 |
| G-LPCI-1150 | LPCI.CW-52 | LPCI.CW-43,LPCI.CW-48,LPCI.CW-51, LPCI.CW-54,LPCI.CW-56,LPCI.CW-57, LPCI.CW-59,LPCI.CW-61,LPCI.CW-63, LPCI.CW-65 |
| G-LPCI-1151 | LPCI.CW-52 | LPCI.CW-43,LPCI.CW-48,LPCI.CW-51, LPCI.CW-54,LPCI.CW-56,LPCI.CW-57, LPCI.CW-59,LPCI.CW-61,LPCI.CW-63, LPCI.CW-65 |
| G-LPCI-1155 | LPCI.CW-171 | LPCI.CW-117 |
| G-LPCI-1156 | LPCI.CW-171 | LPCI.CW-117 |
| G-LPCI-1157 | LPCI.CW-85 | LPCI.CW-52 |
| G-LPCI-1158 | LPCI.CW-86 | LPCI.CW-52 |

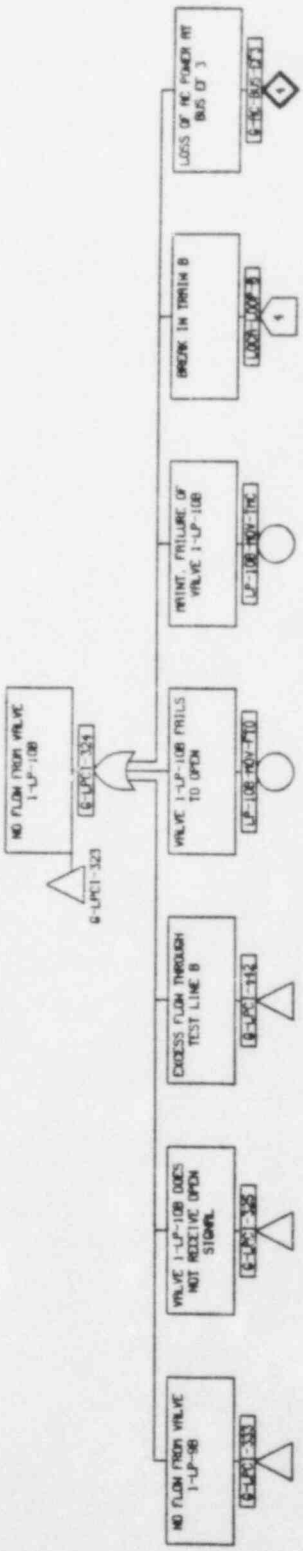

NO COOLING FLOW FROM LPCI/CC SYSTEM
G-LPCI-317
NO FLOW FROM VALVE 1-LP-128
G-LPCI-319
NO FLOW FROM VALVE 1-LP-128
G-LPCI-318
NO FLOW FROM VALVE 1-LP-118
G-LPCI-321
NO FLOW FROM VALVE 1-LP-11A
G-LPCI-320
VALVE 1-LP-128 FAILS CLOSED
LP-128-XV-PRO
VALVE 1-LP-128 FAILS CLOSED
LP-128-XV-PRO
TEST/MAINT. FAILURE OF VALVE 1-LP-128
LP-128-XV-TMC
TEST/MAINT. FAILURE OF VALVE 1-LP-128
LP-128-XV-TMC

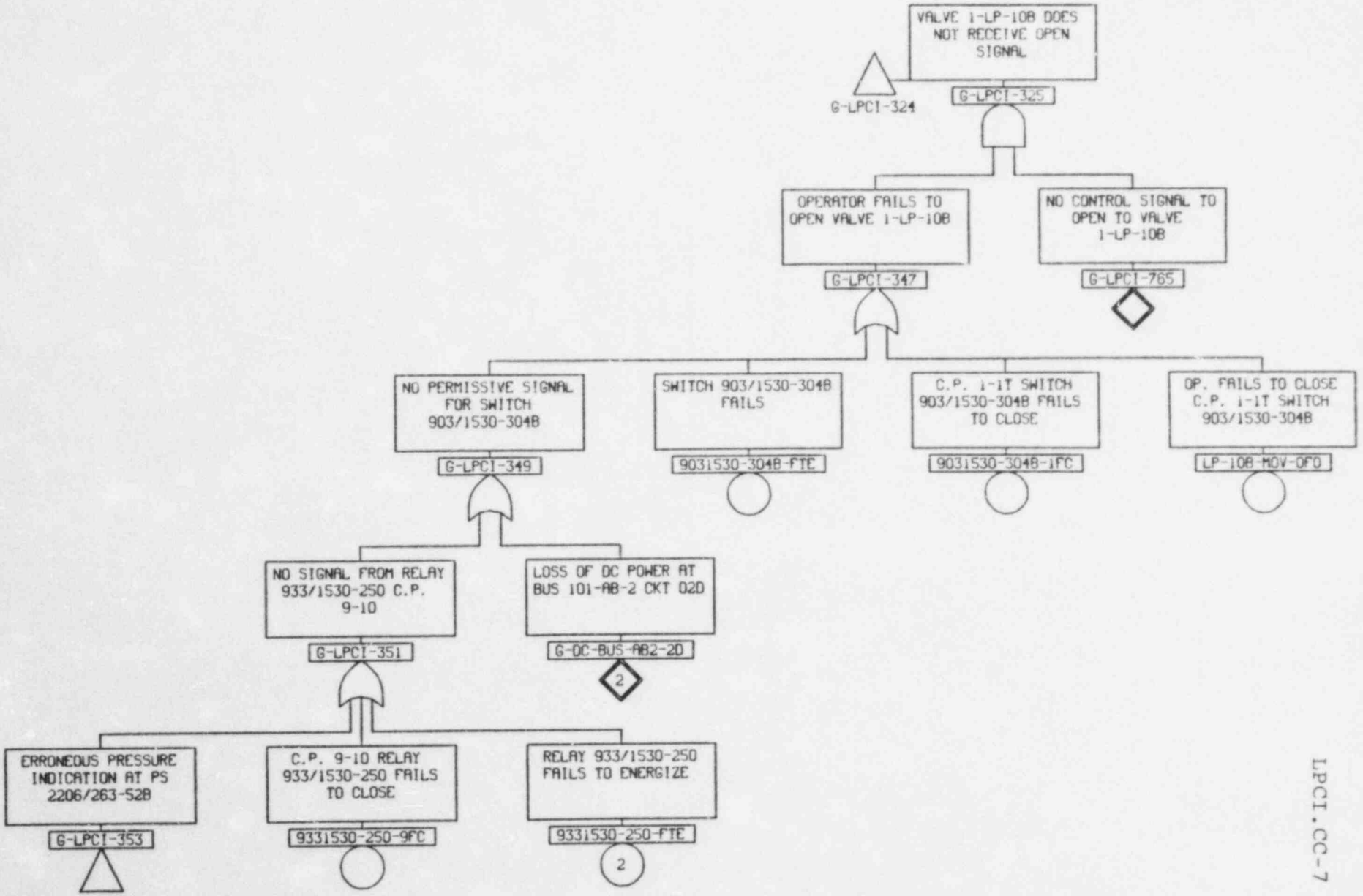

NO FLOW FROM VALVE
1-LP-11A
G-LPCI-320
G-LPCI-318
VALVE 1-LP-11A FAILS
TO OPEN
LP-11A-CKV-FTO
VALVE 1-LP-11A OUT
FOR MAINT.
LP-11A-CKV-TMC
NO FLOW FROM VALVE
1-LP-10A
G-LPCI-321

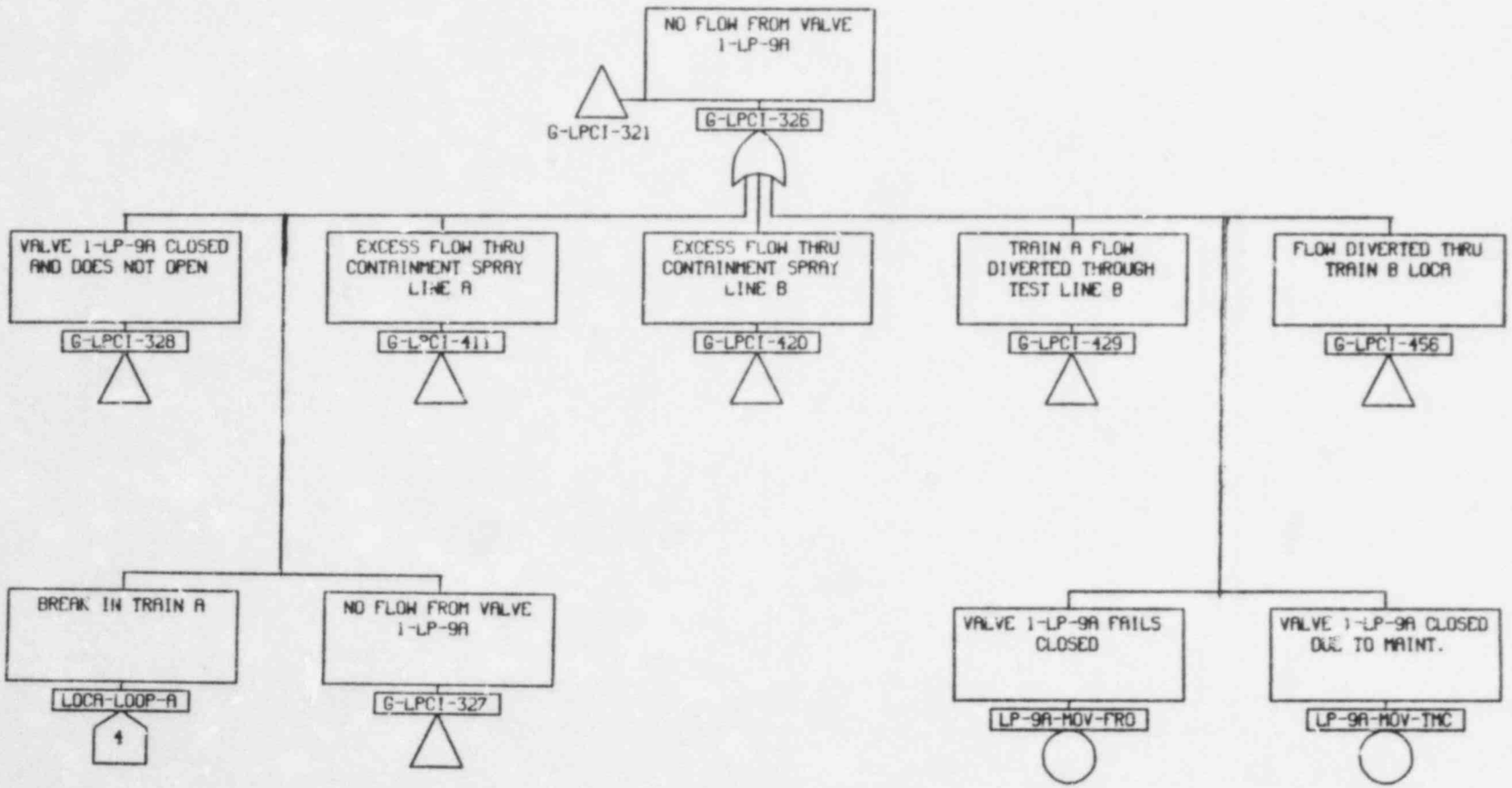

LOSS OF AC POWER AT BUS F-E 3
MAINT. FAILURE OF VALVE 1-LP-10A
VALVE 1-LP-10A FAILS TO OPEN
BREAK IN TRAIN A
EXCESS FLOW THROUGH TEST LINE A
NO FLOW FROM VALVE 1-LP-9A
VALVE 1-LP-10A DOES NOT RECEIVE OPEN SIGNAL
NO FLOW FROM VALVE 1-LP-10A
G-LPCI-320

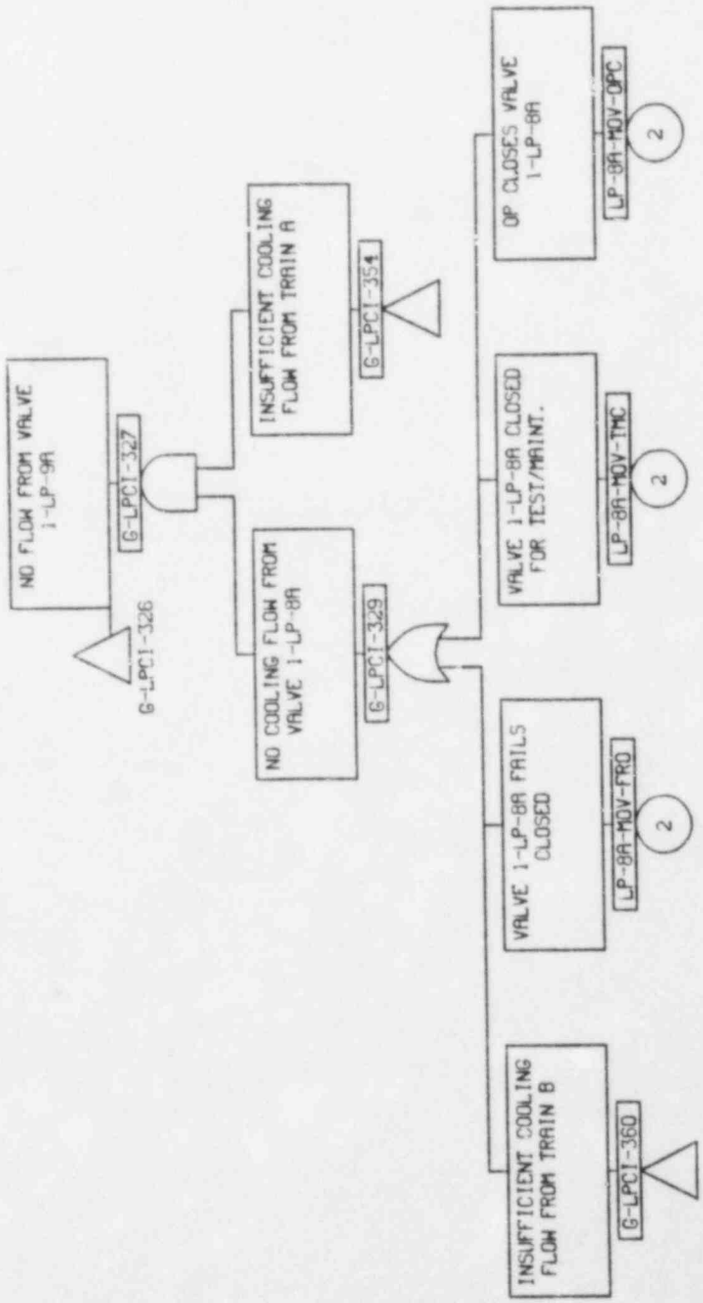

VALVE 1-LP-10A DOES NOT RECEIVE OPEN SIGNAL
6-LPCI-322
6-LPCI-321
OP. DOES NOT OPEN VALVE 1-LP-10A
NO CONTROL SIGNAL TO OPEN TO VALVE 1-LP-10A
6-LPCI-340
6-LPCI-475
C.P. 1-1T SWITCH 903/1530-304A FAILS TO CLOSE
OP. FAILS TO CLOSE C.P. 1-1T SWITCH 903/1530-304A
903/1530-304A-FTC
LP-10A-MOV-OPO
SWITCH 903/1530-304A FAILS
903/1530-304A-FTE
NO PERMISSIVE SIGNAL FOR SWITCH 903/1530-304A
LOSS OF DC POWER AT BUS 101-AB 1 CKT 03A
6-LPCI-342
6-DC-BUS-AB1-3A
2
NO SIGNAL FROM RELAY 932/1530-150 C.P. 9-10
C.P. 9-10 RELAY 932/1530-150 FAIL TO CLOSE
RELAY 932/1530-150 FAILS TO ENERGIZE
6-LPCI-344
932/1530-150-OPC
932/1530-150-FTE
2
ERRONEOUS PRESSURE INDICATION AT P.S. 2205/263-52A
6-LPCI-346

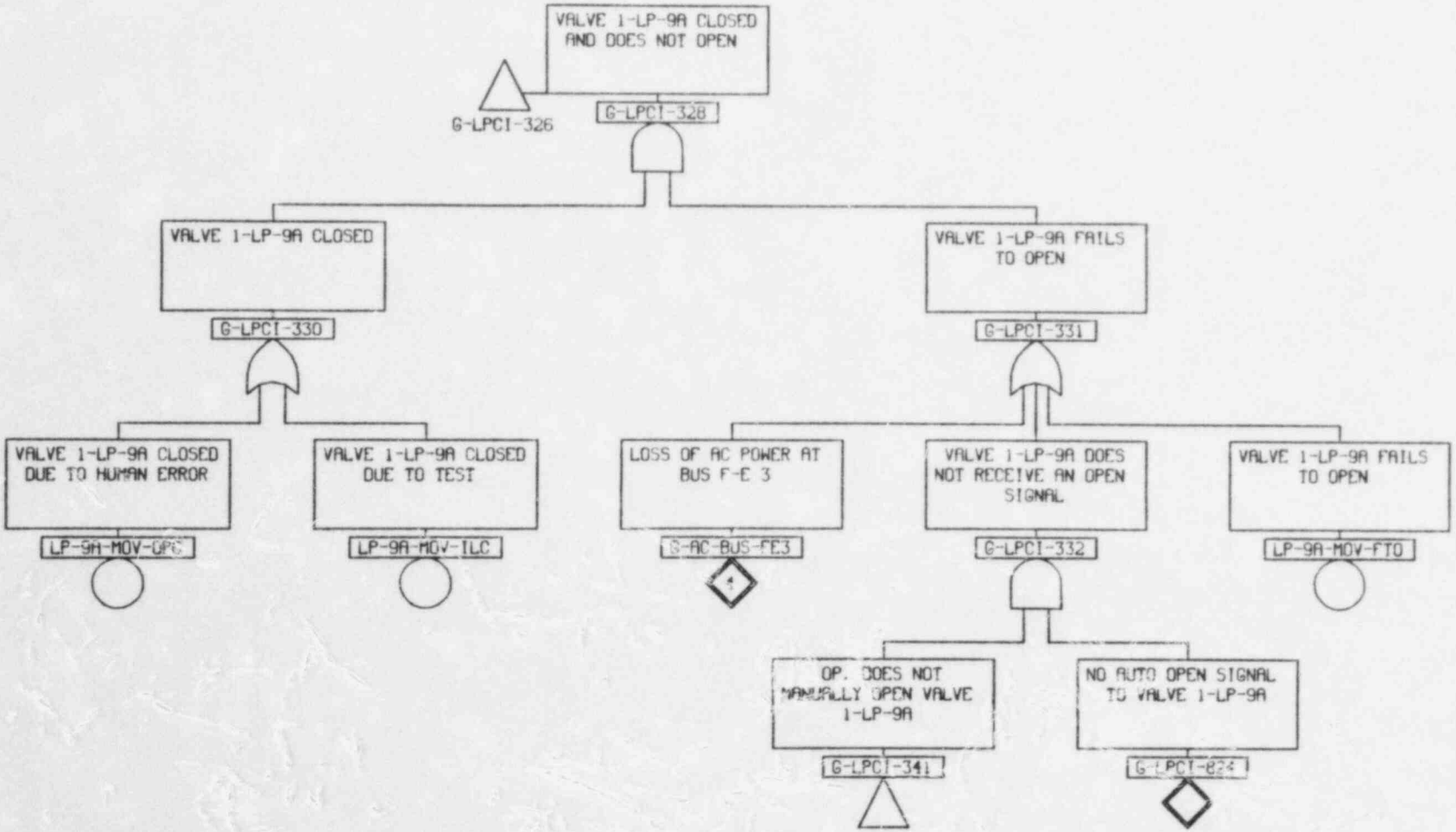

NO FLOW FROM VALVE 1-LP-118
G-LPCI-323
G-LPCI-319
VALVE 1-LP-118 FAILS TO OPEN
LP-118-CKV-FTO
VALVE 1-LP-118 OUT FOR MAINT.
LP-118-CKV-TMC
NO FLOW FROM VALVE 1-LP-108
G-LPCI-324

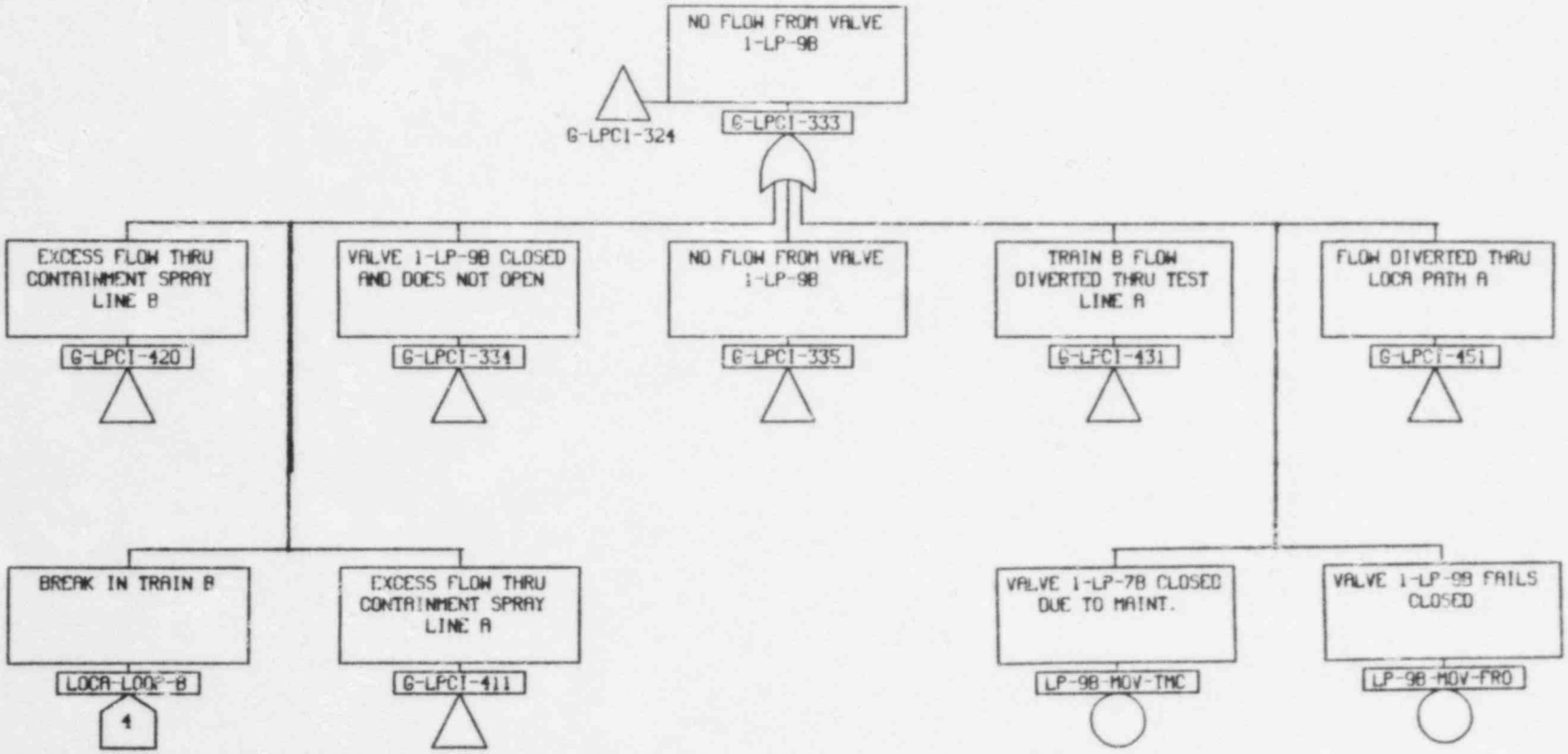

NO FLOW FROM VALVE 1-LP-108
6-LPCI-323
6-LPCI-323
VALVE 1-LP-108 FAILS TO OPEN
MAINT. FAILURE OF VALVE 1-LP-108
BREAK IN TRAIN B
LOSS OF AC POWER AT BUS D 1
VALVE 1-LP-108 DOES NOT RECEIVE OPEN SIGNAL
CROSS FLOW THROUGH TEST LINE B
NO FLOW FROM VALVE 1-LP-98

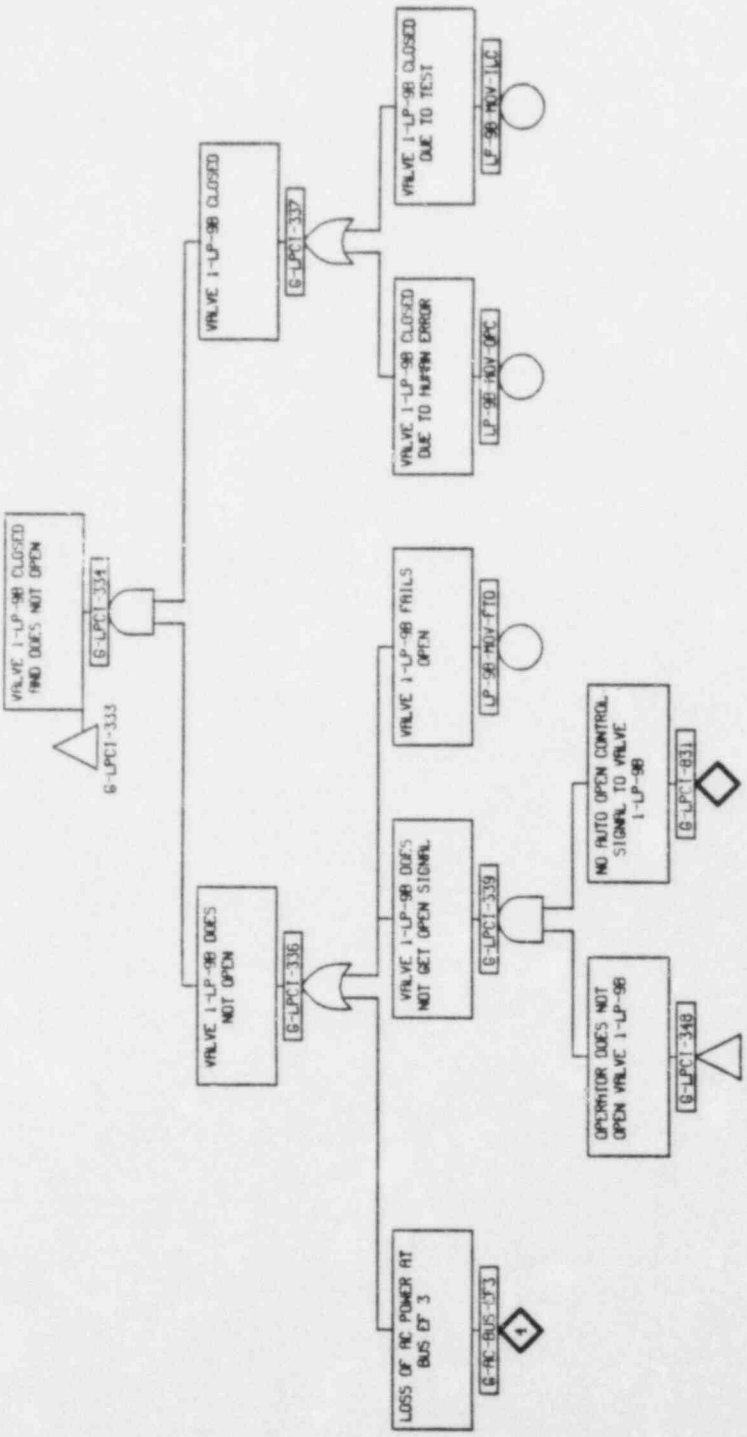

VALVE 1-LP-108 DOES NOT RECEIVE OPEN SIGNAL
G-LPCI-325
G-LPCI-324
OPERATOR FAILS TO OPEN VALVE 1-LP-108
G-LPCI-347
NO CONTROL SIGNAL TO OPEN TO VALVE 1-LP-108
G-LPCI-765
NO PERMISSIVE SIGNAL FOR SWITCH 903/1530-304B
G-LPCI-349
SWITCH 903/1530-304B FAILS
9031530-304B-FTE
C.P. 1-1T SWITCH 903/1530-304B FAILS TO CLOSE
9031530-304B-1FC
OP. FAILS TO CLOSE C.P. 1-1T SWITCH 903/1530-304B
LP-108-MOV-OFO
NO SIGNAL FROM RELAY 933/1530-250 C.P. 9-10
G-LPCI-351
LOSS OF DC POWER AT BUS 101-AB-2 CKT 02D
G-DC-BUS-AB2-2D
2
ERRONEOUS PRESSURE INDICATION AT PS 2206/263-52B
G-LPCI-353
C.P. 9-10 RELAY 933/1530-250 FAILS TO CLOSE
9331530-250-9FC
RELAY 933/1530-250 FAILS TO ENERGIZE
9331530-250-FTE
2

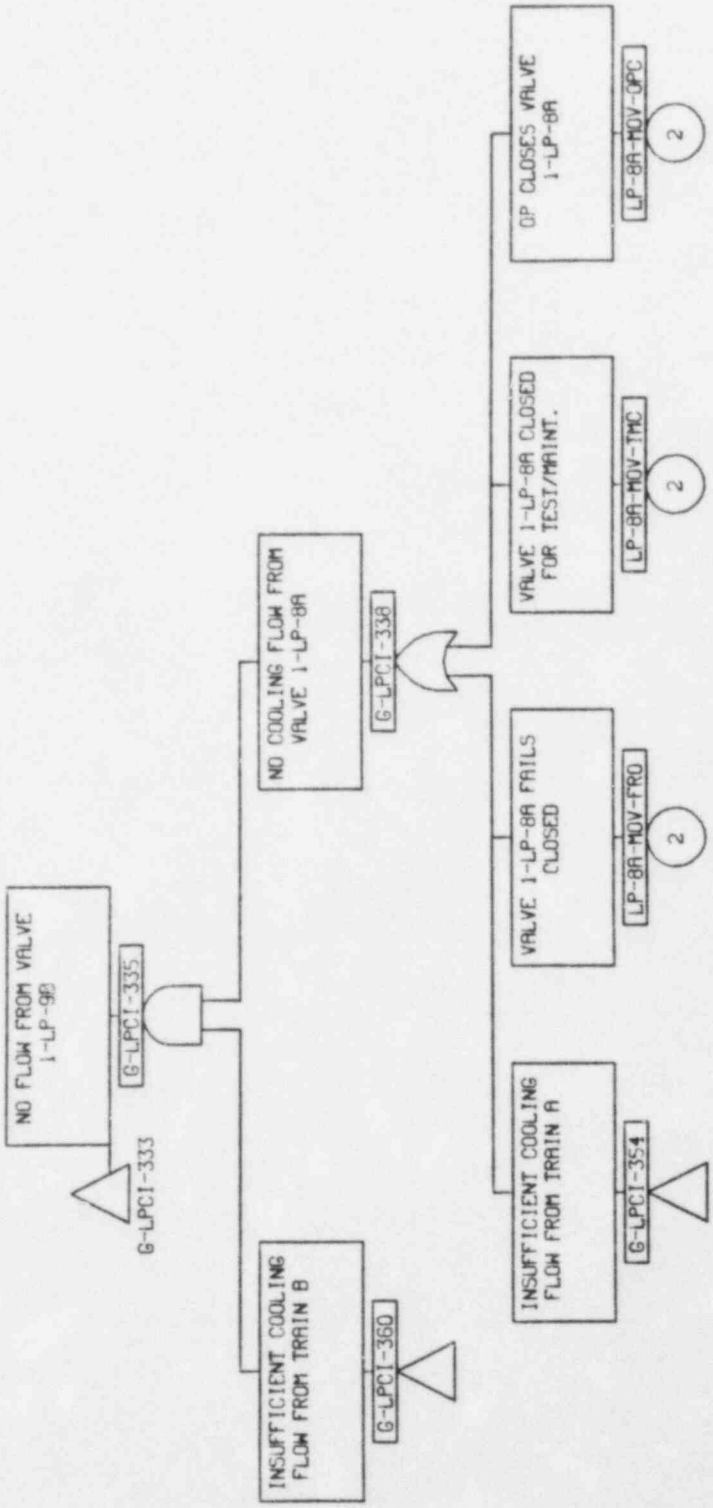

NO FLOW FROM VALVE 1-LP-9A
G-LPCI-321
G-LPCI-326
VALVE 1-LP-9A CLOSED AND DOES NOT OPEN
G-LPCI-328
EXCESS FLOW THRU CONTAINMENT SPRAY LINE A
G-LPCI-411
EXCESS FLOW THRU CONTAINMENT SPRAY LINE B
G-LPCI-420
TRAIN A FLOW DIVERTED THROUGH TEST LINE B
G-LPCI-429
FLOW DIVERTED THRU TRAIN B LOCA
G-LPCI-456
BREAK IN TRAIN A
LOCA-LOOP-A
1
NO FLOW FROM VALVE 1-LP-9A
G-LPCI-327
VALVE 1-LP-9A FAILS CLOSED
LP-9A-MOV-FRO
VALVE 1-LP-9A CLOSED DUE TO MAINT.
LP-9A-MOV-TMC

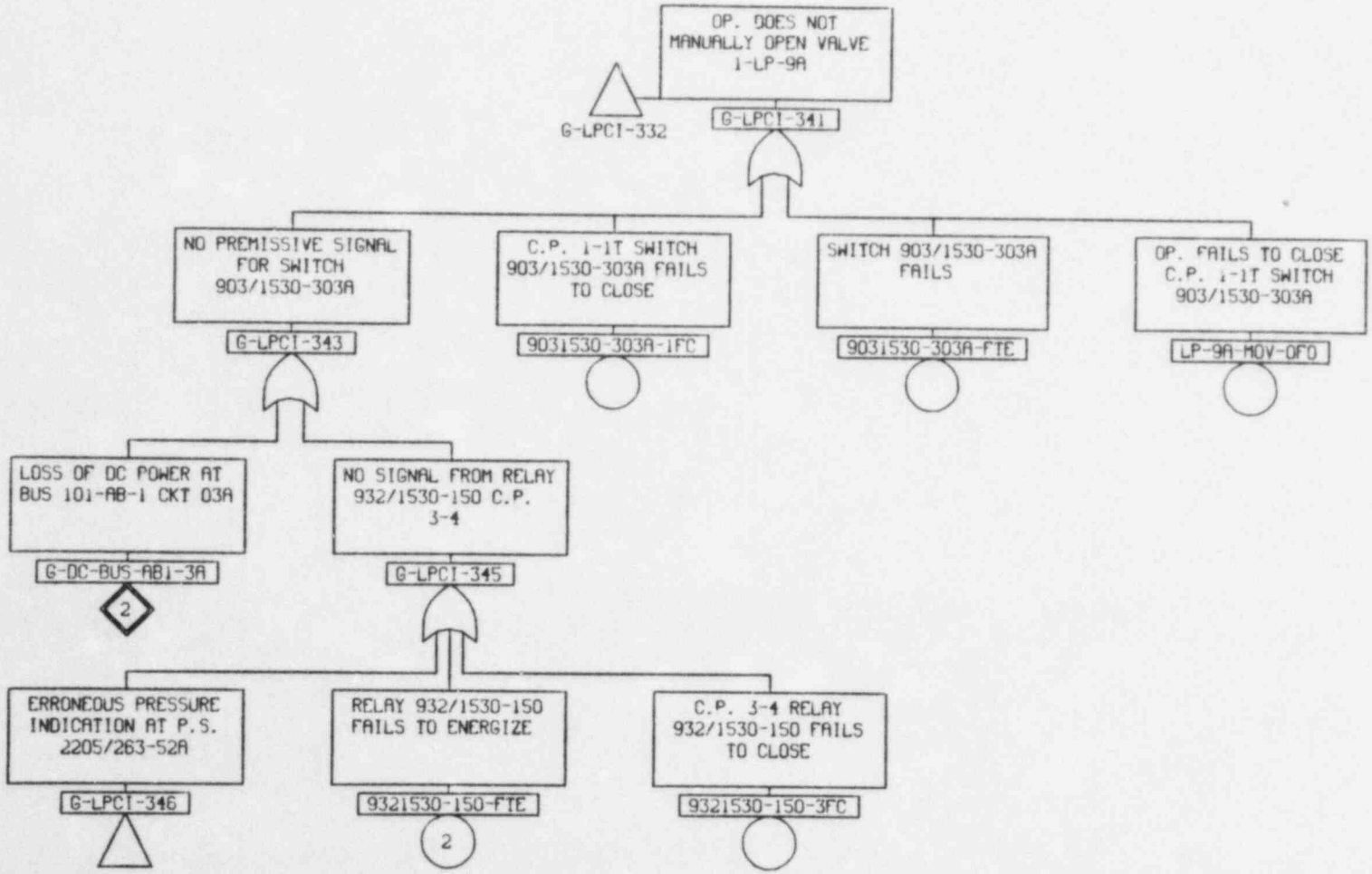

NO FLOW FROM VALVE 1-LP-9A
G-LPCI-326
G-LPCI-327
INSUFFICIENT COOLING FLOW FROM TRAIN A
G-LPCI-354
NO COOLING FLOW FROM VALVE 1-LP-8A
G-LPCI-329
OP CLOSES VALVE 1-LP-8A
LP-8A-MOV-OPC
2
VALVE 1-LP-8A CLOSED FOR TEST/MAINT.
LP-8A-MOV-TMC
2
VALVE 1-LP-8A FAILS CLOSED
LP-8A-MOV-FRO
2
INSUFFICIENT COOLING FLOW FROM TRAIN B
G-LPCI-360

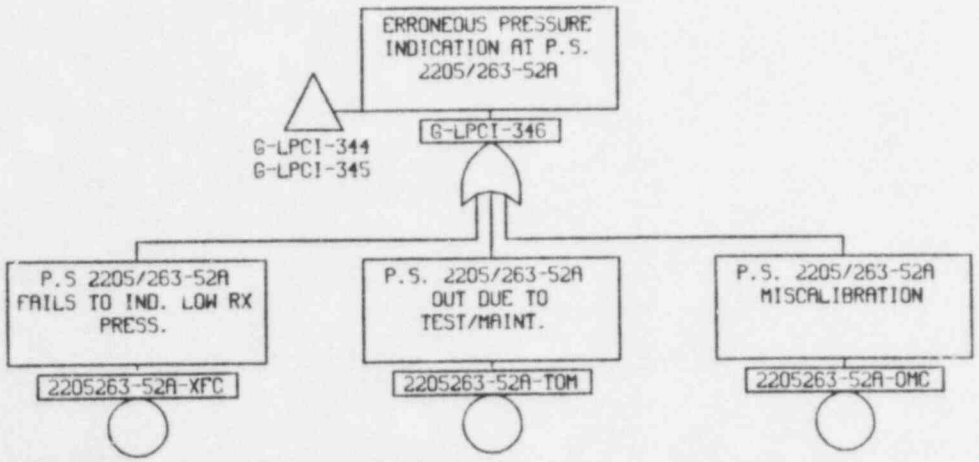

VALVE 1-LP-9A CLOSED AND DOES NOT OPEN
G-LPCI-326
G-LPCI-328
VALVE 1-LP-9A CLOSED
G-LPCI-330
VALVE 1-LP-9A FAILS TO OPEN
G-LPCI-331
VALVE 1-LP-9A CLOSED DUE TO HUMAN ERROR
LP-9A-MOV-OPC
VALVE 1-LP-9A CLOSED DUE TO TEST
LP-9A-MOV-ILC
LOSS OF AC POWER AT BUS F-E 3
G-AC-BUS-FE3
VALVE 1-LP-9A DOES NOT RECEIVE AN OPEN SIGNAL
G-LPCI-332
VALVE 1-LP-9A FAILS TO OPEN
LP-9A-MOV-FTO
OP. DOES NOT MANUALLY OPEN VALVE 1-LP-9A
G-LPCI-341
NO AUTO OPEN SIGNAL TO VALVE 1-LP-9A
G-LPCI-824

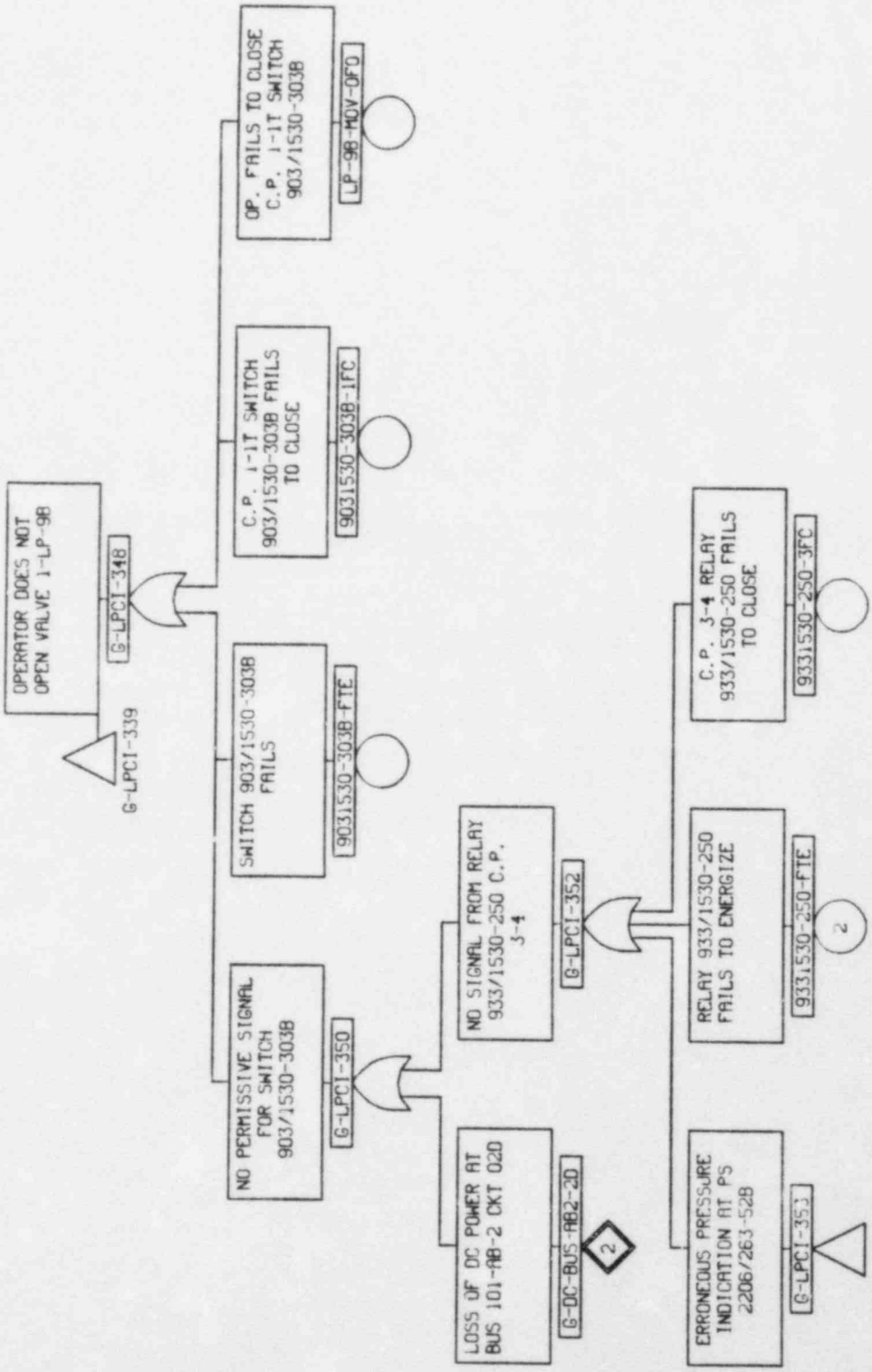

NO FLOW FROM VALVE 1-LP-98
G-LPCI-324
G-LPCI-333
EXCESS FLOW THRU CONTAINMENT SPRAY LINE B
G-LPCI-420
VALVE 1-LP-98 CLOSED AND DOES NOT OPEN
G-LPCI-334
NO FLOW FROM VALVE 1-LP-98
G-LPCI-335
TRAIN B FLOW DIVERTED THRU TEST LINE A
G-LPCI-431
FLOW DIVERTED THRU LOCA PATH A
G-LPCI-451
BREAK IN TRAIN B
LOCA-LOOP-B
1
EXCESS FLOW THRU CONTAINMENT SPRAY LINE A
G-LPCI-411
VALVE 1-LP-78 CLOSED DUE TO MAINT.
LP-98-MOV-TMC
VALVE 1-LP-98 FAILS CLOSED
LP-98-MOV-FRO

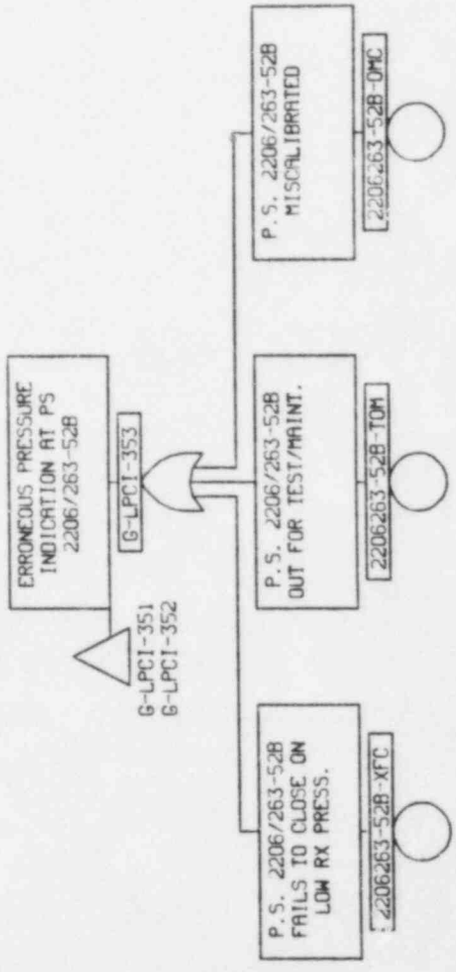

VALVE 1-LP-98 CLOSED
AND DOES NOT OPEN
G-LPCI-334
G-LPCI-333
VALVE 1-LP-98 CLOSED
G-LPCI-337
VALVE 1-LP-98 CLOSED
DUE TO TEST
LP-98-MOV-TST
VALVE 1-LP-98 CLOSED
DUE TO HUMAN ERROR
LP-98-MOV-OPC
VALVE 1-LP-98 DOES
NOT OPEN
G-LPCI-336
VALVE 1-LP-98 FAILS
OPEN
LP-98-MOV-FTO
VALVE 1-LP-98 DOES
NOT GET OPEN SIGNAL
G-LPCI-339
NO AUTO OPEN CONTROL
SIGNAL TO VALVE
1-LP-98
G-LPCI-831
OPERATOR DOES NOT
OPEN VALVE 1-LP-98
G-LPCI-348
LOSS OF AC POWER AT
BUS EF 3
G-AC-BUS-EF3
1

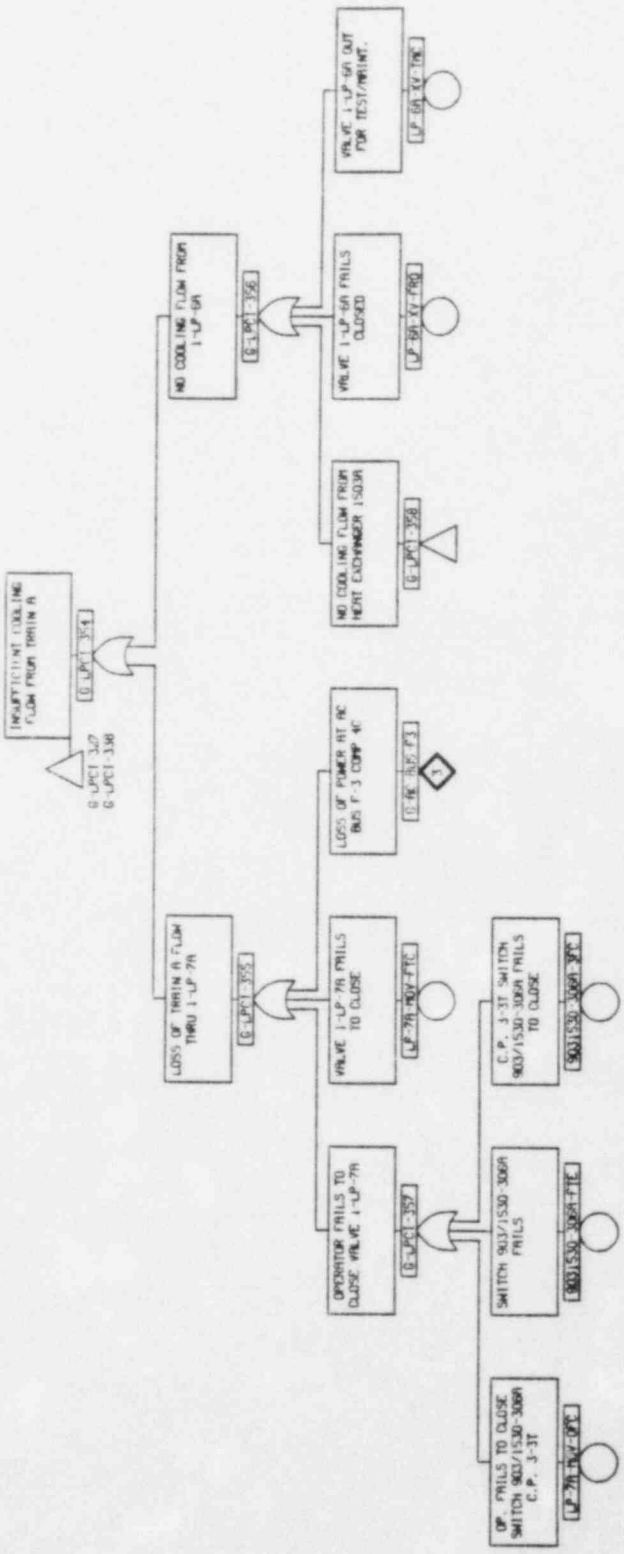

INSUFFICIENT COOLING FLOW FROM TRAIN B
G-LPCI-360
NO FLOW FROM VALVE 1-LP-9B
G-LPCI-335
G-LPCI-333
NO COOLING FLOW FROM VALVE 1-LP-8A
G-LPCI-338
INSUFFICIENT COOLING FLOW FROM TRAIN A
G-LPCI-354
VALVE 1-LP-8A FAILS CLOSED
LP-8A-MOV-FRO
2
VALVE 1-LP-8A CLOSED FOR TEST/MAINT.
LP-8A-MOV-TMC
2
OP CLOSES VALVE 1-LP-8A
LP-8A-MOV-OPC
2

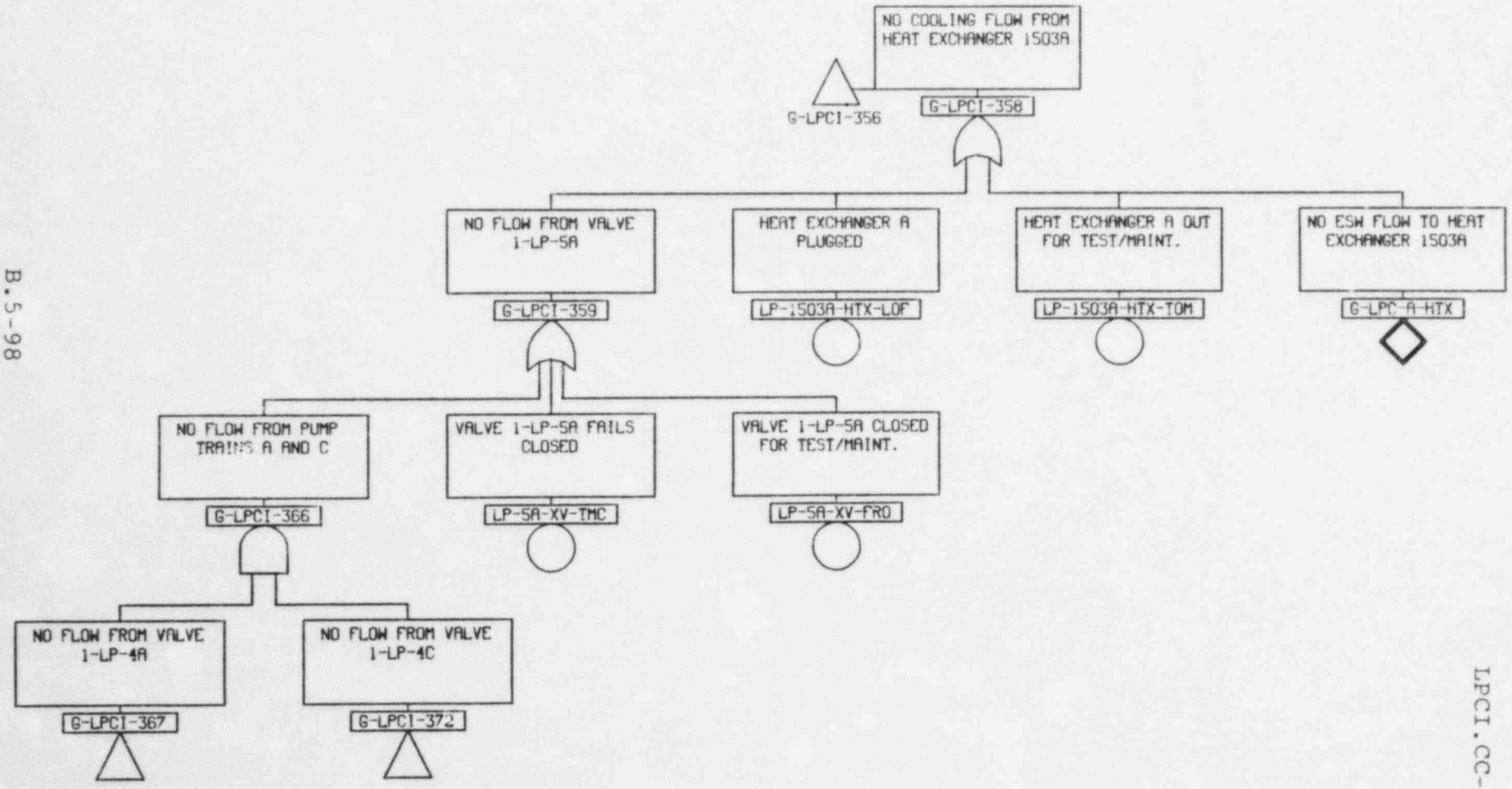

OP. DOES NOT MANUALLY OPEN VALVE 1-LP-9A
G-LPCI-341
G-LPCI-332
NO PREMISSIVE SIGNAL FOR SWITCH 903/1530-303A
G-LPCI-343
C.P. 1-1T SWITCH 903/1530-303A FAILS TO CLOSE
9031530-303A-1FC
SWITCH 903/1530-303A FAILS
9031530-303A-FTE
OP. FAILS TO CLOSE C.P. 1-1T SWITCH 903/1530-303A
LP-9A-MOV-OFO
LOSS OF DC POWER AT BUS 101-AB-1 CKT 03A
G-DC-BUS-AB1-3A
2
NO SIGNAL FROM RELAY 932/1530-150 C.P. 3-4
G-LPCI-345
ERRONEOUS PRESSURE INDICATION AT P.S. 2205/263-52A
G-LPCI-346
RELAY 932/1530-150 FAILS TO ENERGIZE
9321530-150-FTE
2
C.P. 3-4 RELAY 932/1530-150 FAILS TO CLOSE
9321530-150-3FC

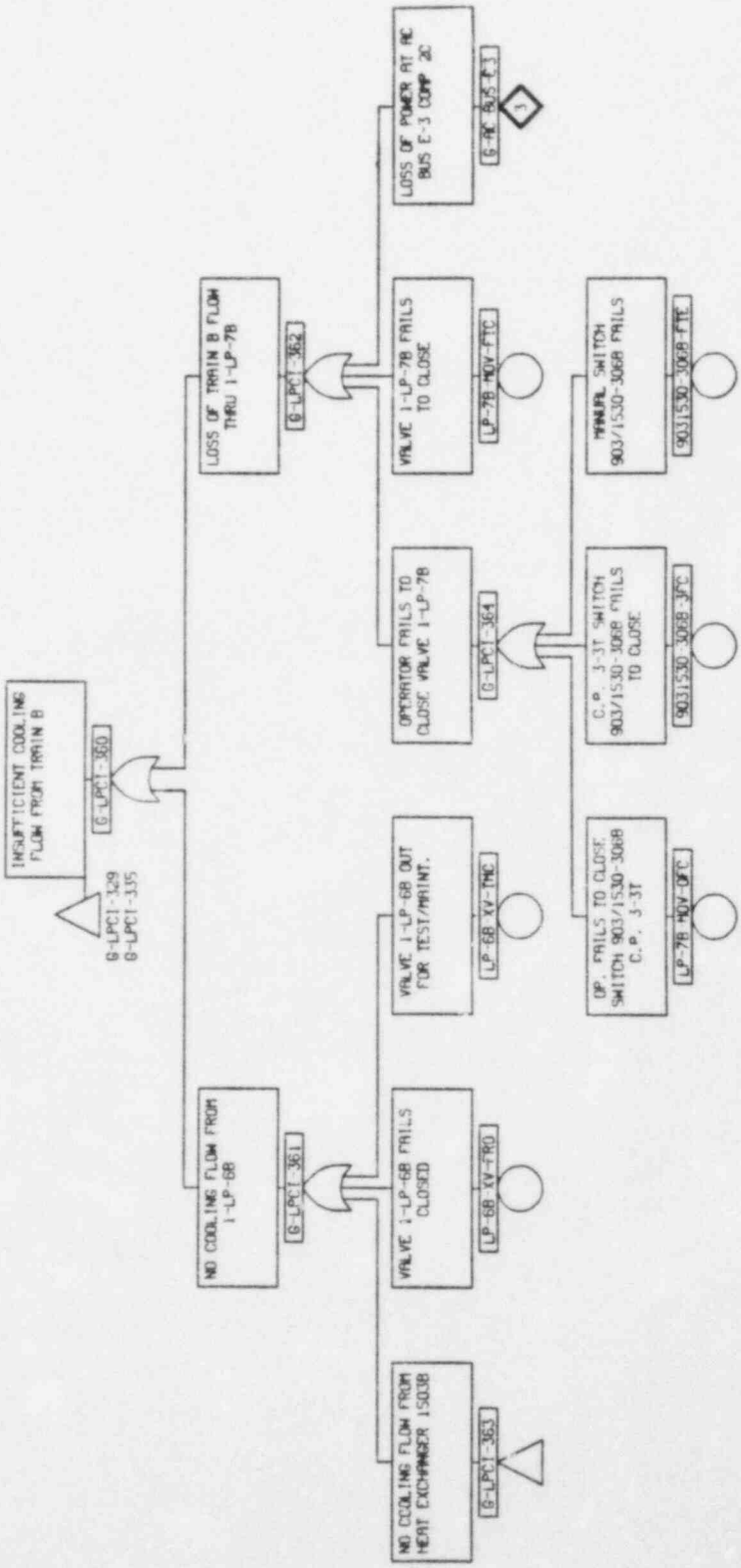

ERRONEOUS PRESSURE INDICATION AT P.S. 2205/263-52A
G-LPCI-346
G-LPCI-344
G-LPCI-345
P.S 2205/263-52A FAILS TO IND. LOW RX PRESS.
2205263-52A-XFC
P.S. 2205/263-52A OUT DUE TO TEST/MAINT.
2205263-52A-TOM
P.S. 2205/263-52A MISCALIBRATION
2205263-52A-OMC

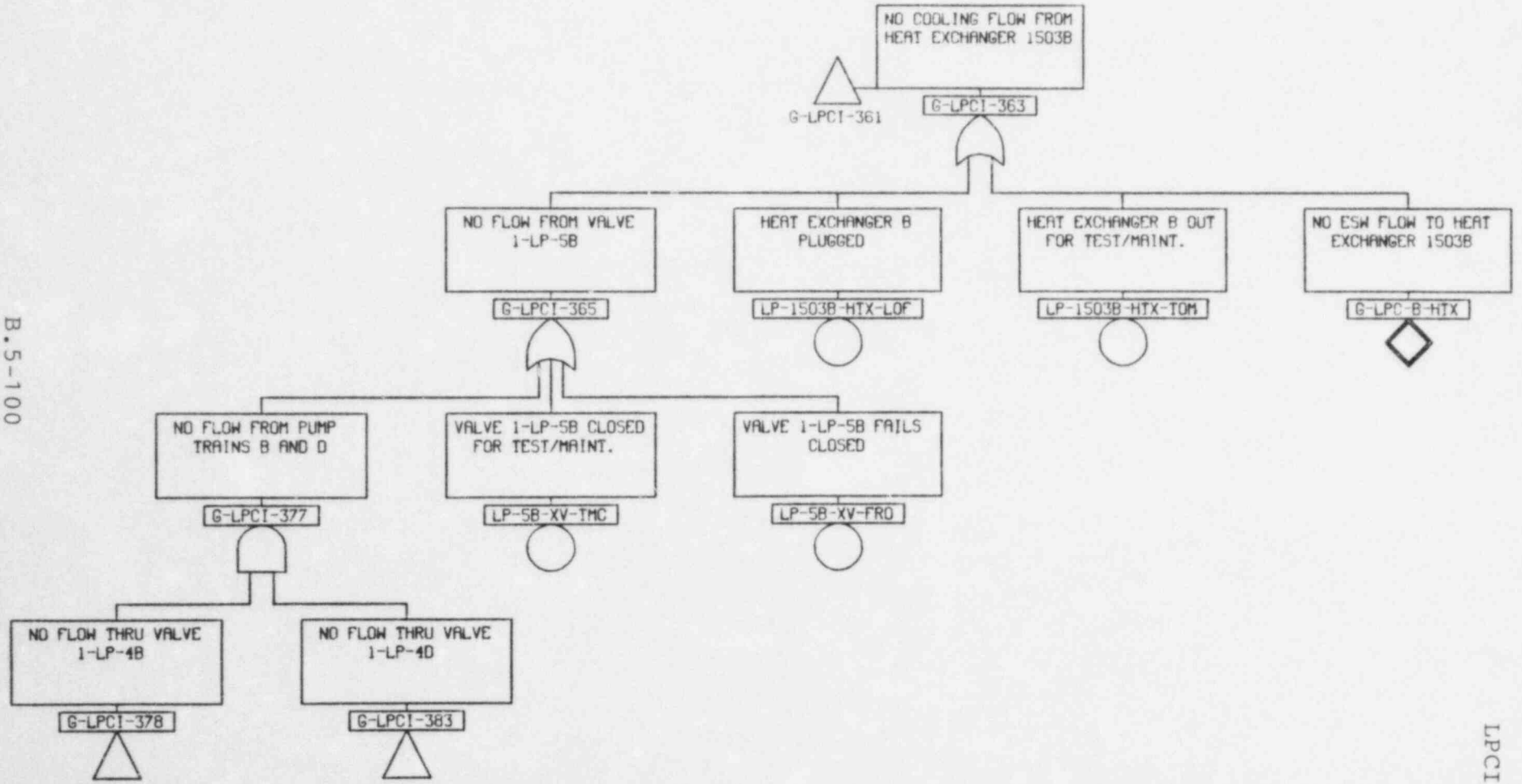

OPERATOR DOES NOT OPEN VALVE 1-LP-98
G-LPCI-339
G-LPCI-348
OP. FAILS TO CLOSE C.P. 1-1T SWITCH 903/1530-303B
LP-98 MOV-OPO
C.P. 1-1T SWITCH 903/1530-303B FAILS TO CLOSE
9031530-303B-1FC
SWITCH 903/1530-303B FAILS
9031530-303B-FTE
NO PERMISSIVE SIGNAL FOR SWITCH 903/1530-303B
G-LPCI-350
NO SIGNAL FROM RELAY 933/1530-250 C.P. 3-4
G-LPCI-352
C.P. 3-4 RELAY 933/1530-250 FAILS TO CLOSE
9331530-250-3FC
RELAY 933/1530-250 FAILS TO ENERGIZE
9331530-250-FTE
2
LOSS OF DC POWER AT BUS 101-AB-2 CKT 02D
G-DC-BUS-AB2-2D
2
ERRONEOUS PRESSURE INDICATION AT PS 2206/263-52B
G-LPCI-353

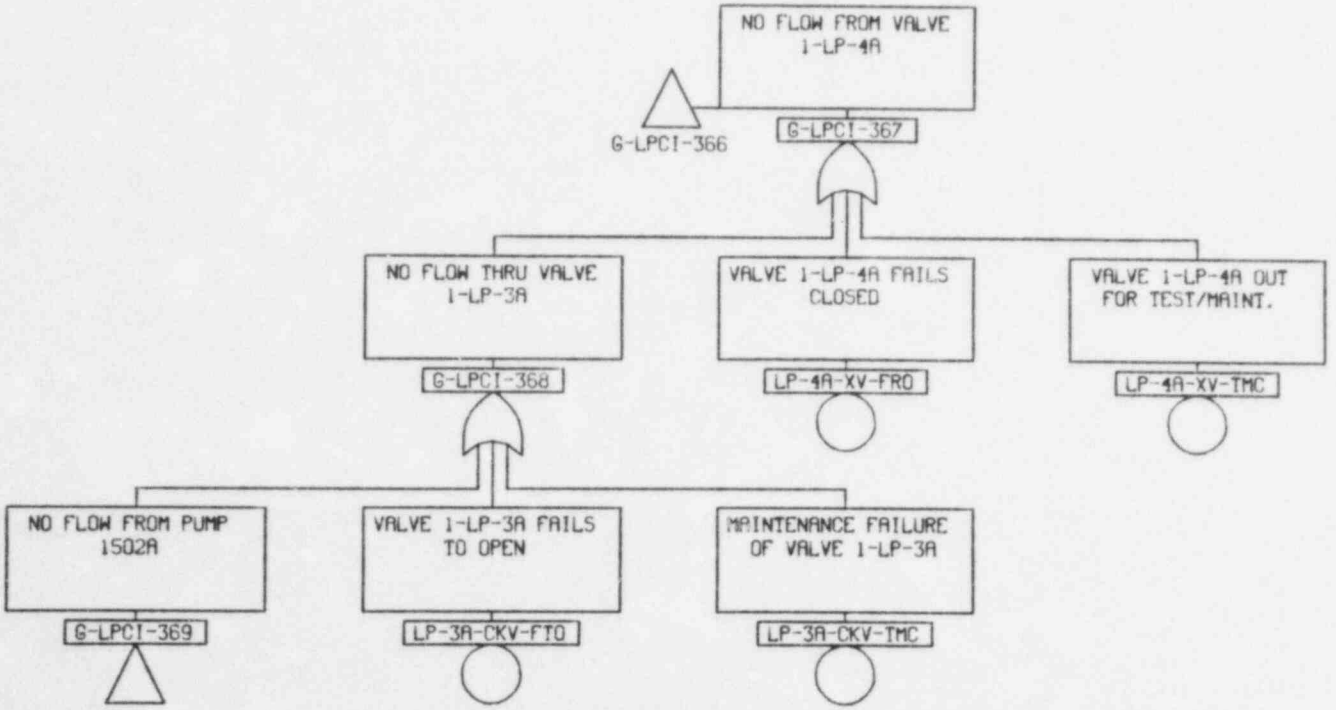

ERRONEOUS PRESSURE INDICATION AT PS 2206/263-52B
G-LPCI-353
G-LPCI-351
G-LPCI-352
P.S. 2206/263-52B FAILS TO CLOSE ON LOW RX PRESS.
2206263-52B-XFC
P.S. 2206/263-52B OUT FOR TEST/MAINT.
2206263-52B-TOM
P.S. 2206/263-52B MISCALIBRATED
2206263-52B-OMC

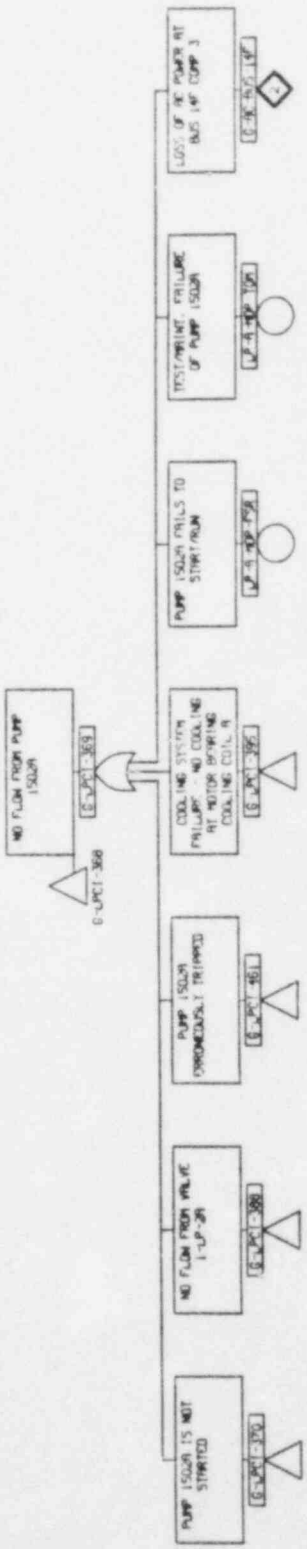

INSUFFICIENT COOLING FLOW FROM TRAIN A
G-LPCI-354
G-LPCI-347
G-LPCI-348
NO COOLING FLOW FROM 1-LP-9A
G-LPCI-356
VALVE 1-LP-9A FAILS CLOSED
LP-9A-XV-FRO
VALVE 1-LP-9A OUT FOR TEST/MAINT.
LP-9A-XV-TMC
NO COOLING FLOW FROM HEAT EXCHANGER 1SG9A
G-LPCI-358
LOSS OF TRAIN A FLOW THRU 1-LP-9A
G-LPCI-355
LOSS OF POWER AT AC BUS F-3 COMP 4C
G-AC-BUS-F3
1
VALVE 1-LP-9A FAILS TO CLOSE
LP-9A-MOV-FTC
C.P. 3-3T SWITCH 903/1530-3009A FAILS TO CLOSE
903/1530-3009A-FTC
OPERATOR FAILS TO CLOSE VALVE 1-LP-9A
G-LPCI-357
SWITCH 903/1530 3009 FAILS
903/1530-3009-FTC
OP FAILS TO CLOSE SWITCH 903/1530-3009 C.P. 3-3T
LP-9A-OPC

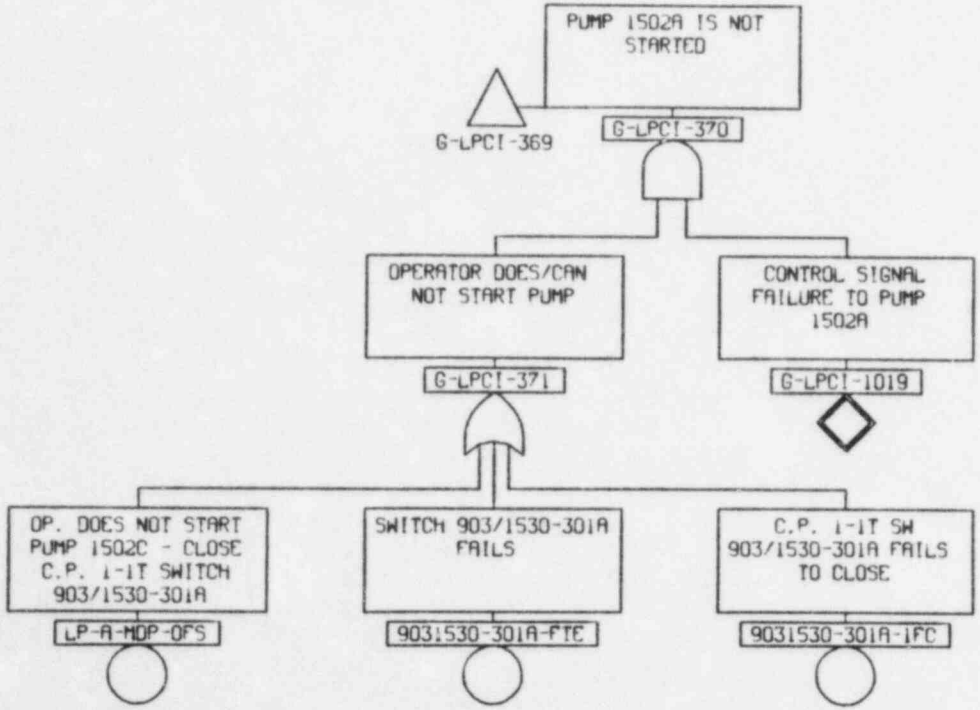

NO COOLING FLOW FROM HEAT EXCHANGER 1503A
G-LPCI-356
G-LPCI-358
NO FLOW FROM VALVE 1-LP-5A
HEAT EXCHANGER A PLUGGED
HEAT EXCHANGER A OUT FOR TEST/MAINT.
NO ESW FLOW TO HEAT EXCHANGER 1503A
G-LPCI-359
LP-1503A-HTX-LOF
LP-1503A-HTX-TOM
G-LPC-A-HTX
NO FLOW FROM PUMP TRAINS A AND C
VALVE 1-LP-5A FAILS CLOSED
VALVE 1-LP-5A CLOSED FOR TEST/MAINT.
G-LPCI-366
LP-5A-XV-TMC
LP-5A-XV-FRO
NO FLOW FROM VALVE 1-LP-4A
NO FLOW FROM VALVE 1-LP-4C
G-LPCI-367
G-LPCI-372

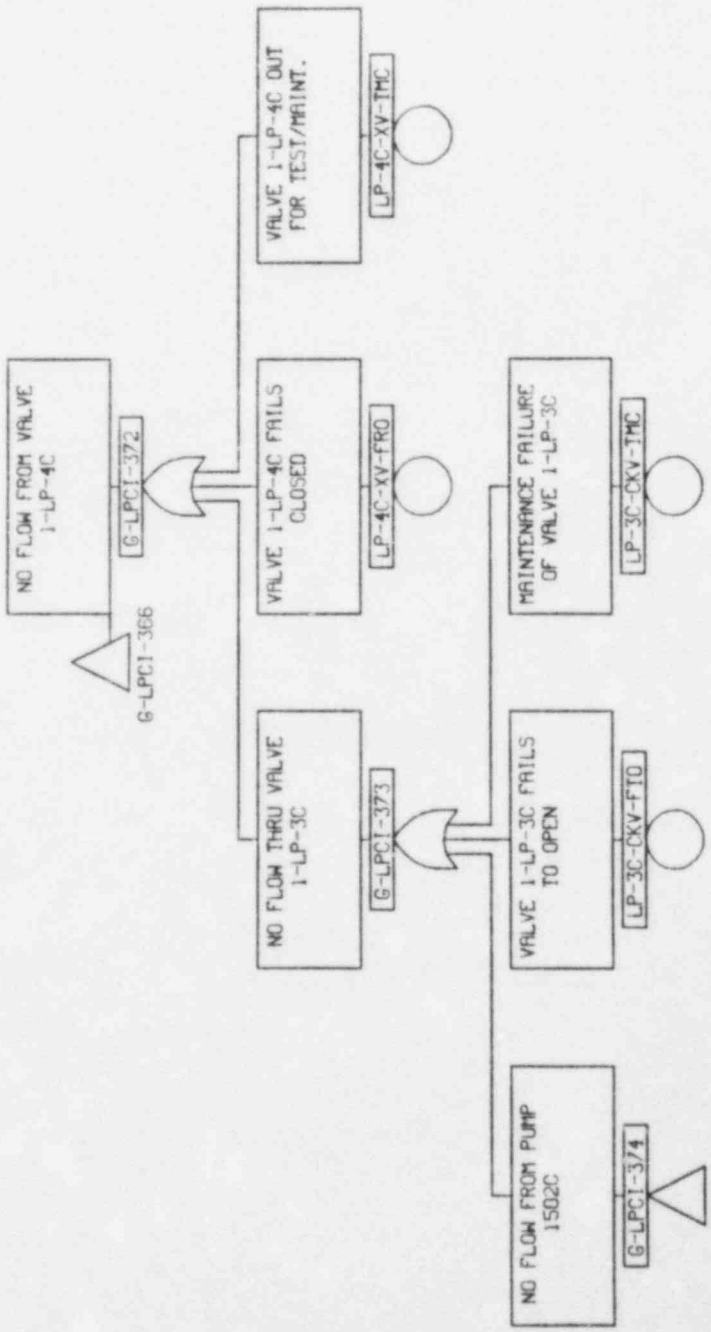

INSUFFICIENT COOLING FLOW FROM TRAIN B
G-LPCI-360
G-LPCI-329
G-LPCI-335
LOSS OF TRAIN B FLOW THRU 1-LP-7B
G-LPCI-362
NO COOLING FLOW FROM 1-LP-6B
G-LPCI-361
NO COOLING FLOW FROM HEAT EXCHANGER 1SG3B
G-LPCI-363
VALVE 1-LP-7B FAILS TO CLOSE
LP-7B MOV-FTC
OPERATOR FAILS TO CLOSE VALVE 1-LP-7B
G-LPCI-364
VALVE 1-LP-6B FAILS CLOSED
LP-6B MOV-FTO
VALVE 1-LP-6B OUT FOR TEST/MAINT.
LP-6B XV-TME
LOSS OF POWER AT AC BUS E-3 COMP 2C
G-AC BUS E-3
MANUAL SWITCH 903/1530-3068 FAILS
903/1530-3068-FME
C.o. 3-3T SWITCH 903/1530-3068 FAILS TO CLOSE
903/1530-3068-3FC
OP. FAILS TO CLOSE SWITCH 903/1530-3068 C.o. 3-3T
LP-7B MOV-OFC

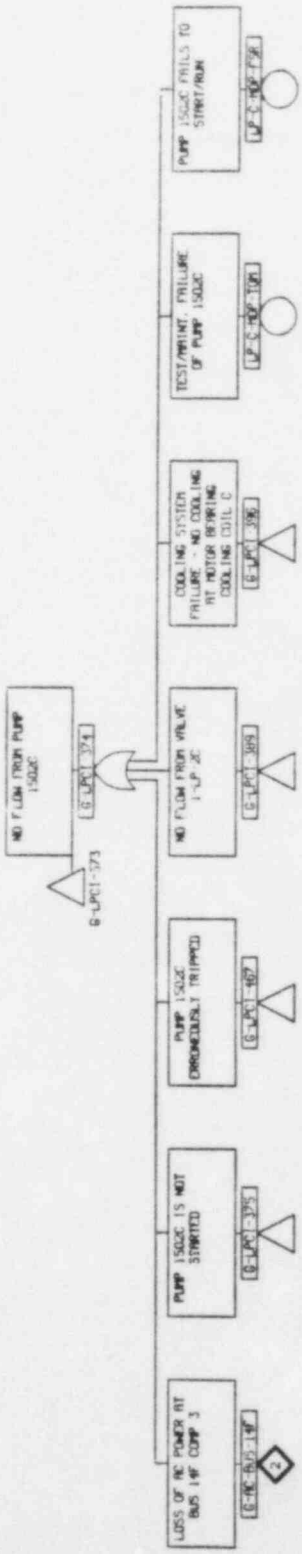

NO COOLING FLOW FROM HEAT EXCHANGER 1503B
G-LPCI-361
G-LPCI-363
NO FLOW FROM VALVE 1-LP-5B
HEAT EXCHANGER B PLUGGED
HEAT EXCHANGER B OUT FOR TEST/MAINT.
NO ESW FLOW TO HEAT EXCHANGER 1503B
G-LPCI-365
LP-1503B-HTX-LOF
LP-1503B-HTX-TOM
G-LPC-B-HTX
NO FLOW FROM PUMP TRAINS B AND D
VALVE 1-LP-5B CLOSED FOR TEST/MAINT.
VALVE 1-LP-5B FAILS CLOSED
G-LPCI-377
LP-5B-XV-TMC
LP-5B-XV-FRO
NO FLOW THRU VALVE 1-LP-4B
NO FLOW THRU VALVE 1-LP-4D
G-LPCI-378
G-LPCI-383

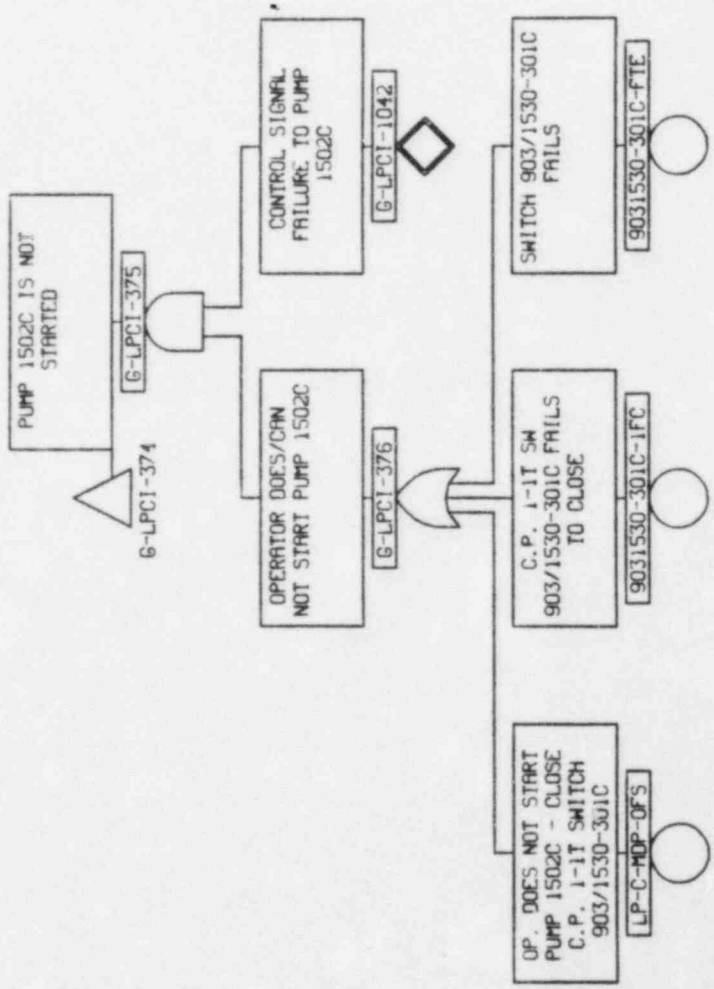

NO FLOW FROM VALVE 1-LP-4A
G-LPCI-366
G-LPCI-367
NO FLOW THRU VALVE 1-LP-3A
VALVE 1-LP-4A FAILS CLOSED
VALVE 1-LP-4A OUT FOR TEST/MAINT.
G-LPCI-368
LP-4A-XV-FRO
LP-4A-XV-TMC
NO FLOW FROM PUMP 1502A
VALVE 1-LP-3A FAILS TO OPEN
MAINTENANCE FAILURE OF VALVE 1-LP-3A
G-LPCI-369
LP-3A-CKV-FTO
LP-3A-CKV-TMC

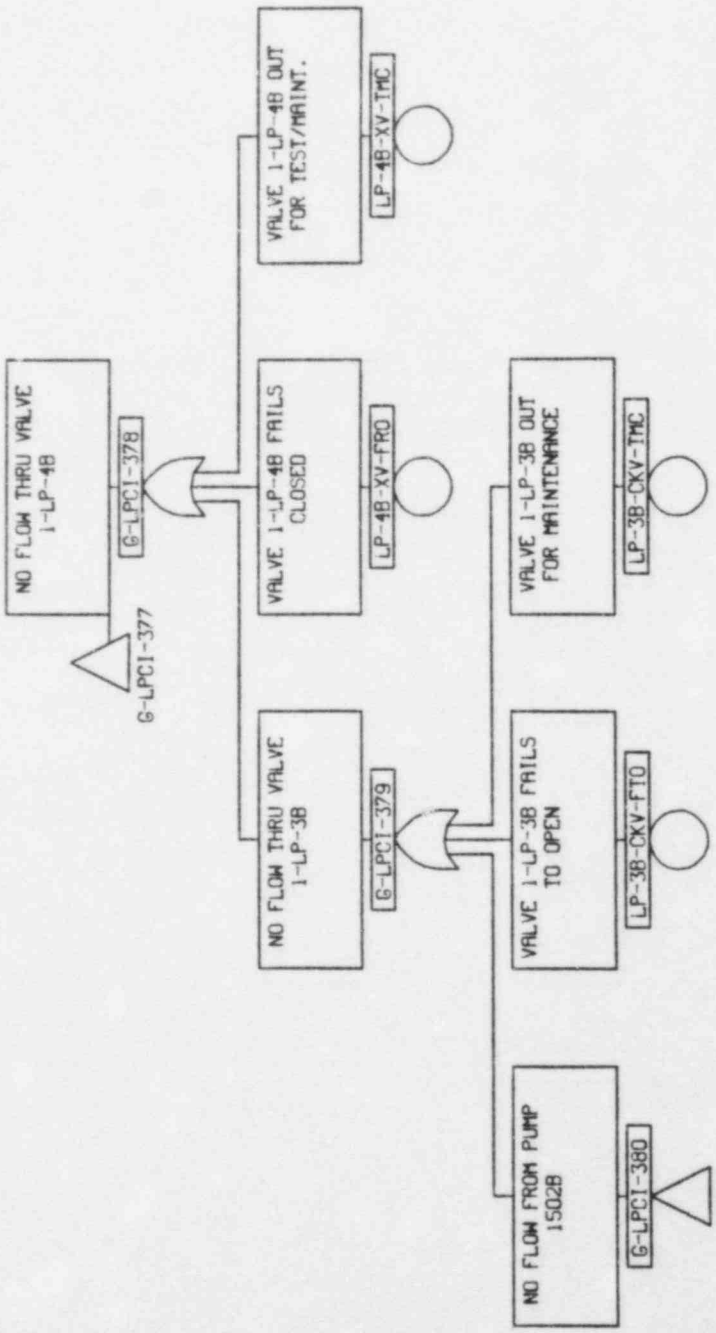

NO FLOW FROM PUMP 1SI04
G-LPCI-369
G-LPCI-368
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR (EXCEEDING COOLING COIL A
PUMP 1SI04 FAILS TO START/RUN
TEST/MAINT FAILURE OF PUMP 1SI04
LOSS OF AC POWER BUS 14F COMP 3
PUMP 1SI04 IS NOT STARTED
NO FLOW FROM VALVE 1-LP-39
PUMP 1SI04 CHRONOLOGICALLY TRIPPED

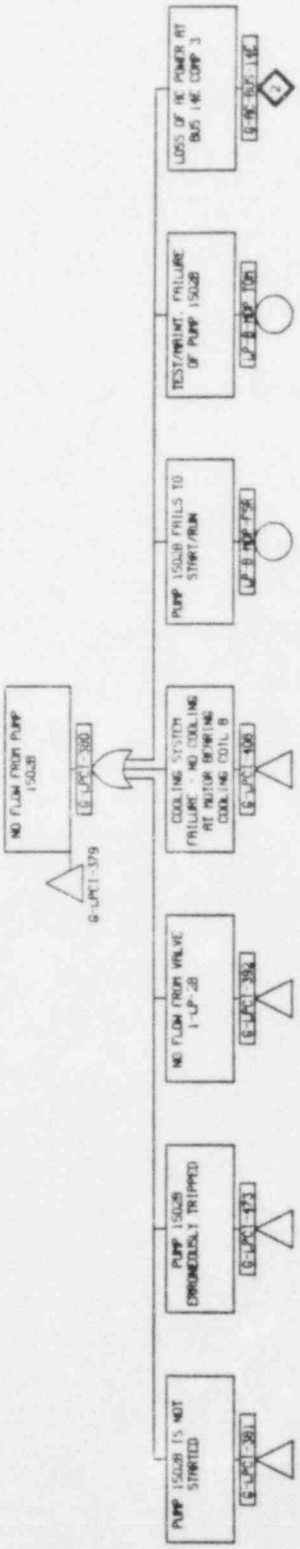

PUMP 1502A IS NOT STARTED
G-LPCI-369
G-LPCI-370
OPERATOR DOES/CAN NOT START PUMP
CONTROL SIGNAL FAILURE TO PUMP 1502A
G-LPCI-371
G-LPCI-1019
OP. DOES NOT START PUMP 1502C - CLOSE C.P. 1-1T SWITCH 903/1530-301A
SWITCH 903/1530-301A FAILS
C.P. 1-1T SW 903/1530-301A FAILS TO CLOSE
LP-A-MDP-OFS
9031530-301A-FTE
9031530-301A-FTC

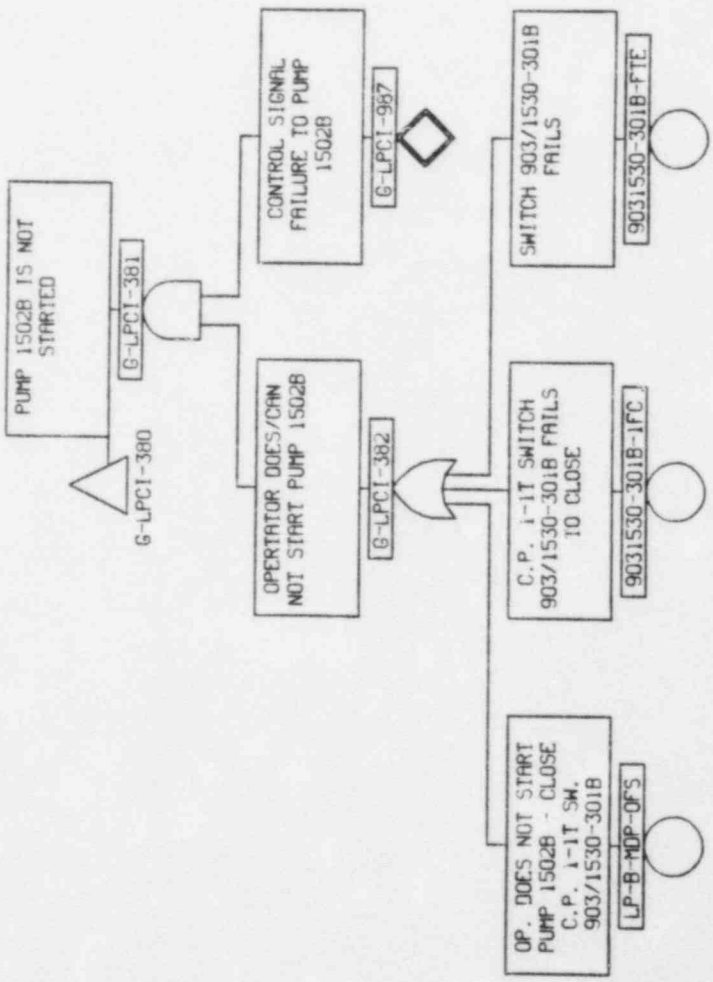

NO FLOW FROM VALVE 1-LP-4C
G-LPCI-372
G-LPCI-366
VALVE 1-LP-4C FAILS CLOSED
LP-4C-XV-FRO
VALVE 1-LP-4C OUT FOR TEST/MAINT.
LP-4C-XV-TMC
NO FLOW THRU VALVE 1-LP-3C
G-LPCI-373
MAINTENANCE FAILURE OF VALVE 1-LP-3C
LP-3C-CKV-TMC
VALVE 1-LP-3C FAILS TO OPEN
LP-3C-CKV-FTO
NO FLOW FROM PUMP 1502C
G-LPCI-374

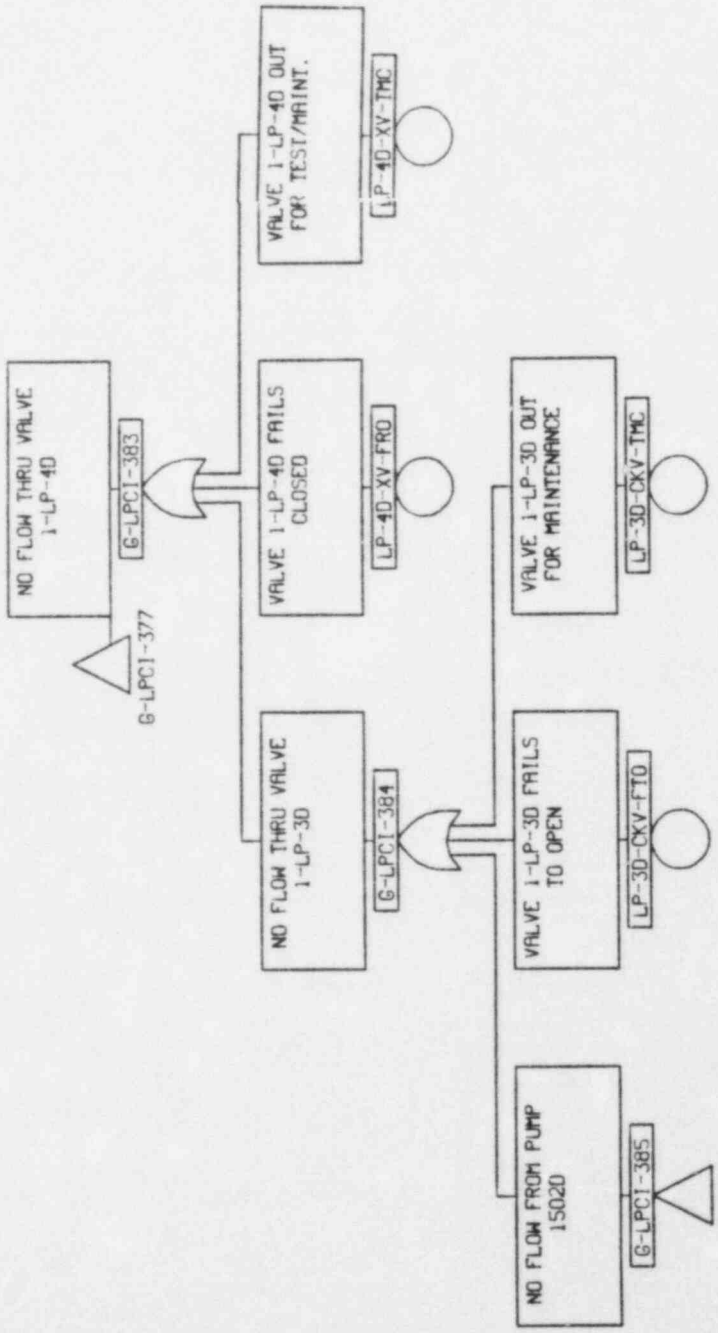

NO FLOW FROM PUMP 1SI2C
G-LPCI-374
G-LPCI-373
NO FLOW FROM VALVE 1-SI-2C
G-LPCI-369
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL C
G-LPCI-396
TEST/MAINT. FAILURE OF PUMP 1SI2C
PUMP 1SI2C FAILS TO START/RUN
PUMP 1SI2C ERRONEOUSLY TRIPPED
G-LPCI-367
PUMP 1SI2C IS NOT STARTED
G-LPCI-375
LOSS OF AC POWER AT BUS 14F COMP 3
2

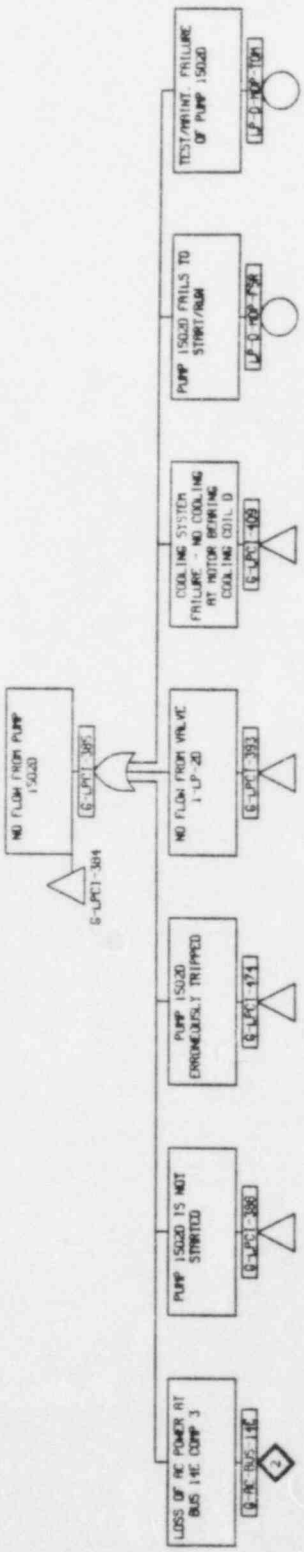

PUMP 1502C IS NOT STARTED
G-LPCI-375
G-LPCI-374
CONTROL SIGNAL FAILURE TO PUMP 1502C
G-LPCI-1042
OPERATOR DOES/CAN NOT START PUMP 1502C
G-LPCI-376
SWITCH 903/1530-301C FAILS
90315301C-FTE
C.P. 1-1T SW 903/1530-301C FAILS TO CLOSE
90315301C-1FC
OP. DOES NOT START PUMP 1502C - CLOSE C.P. 1-1T SWITCH 903/1530-301C
LP-C-MOP-OFS

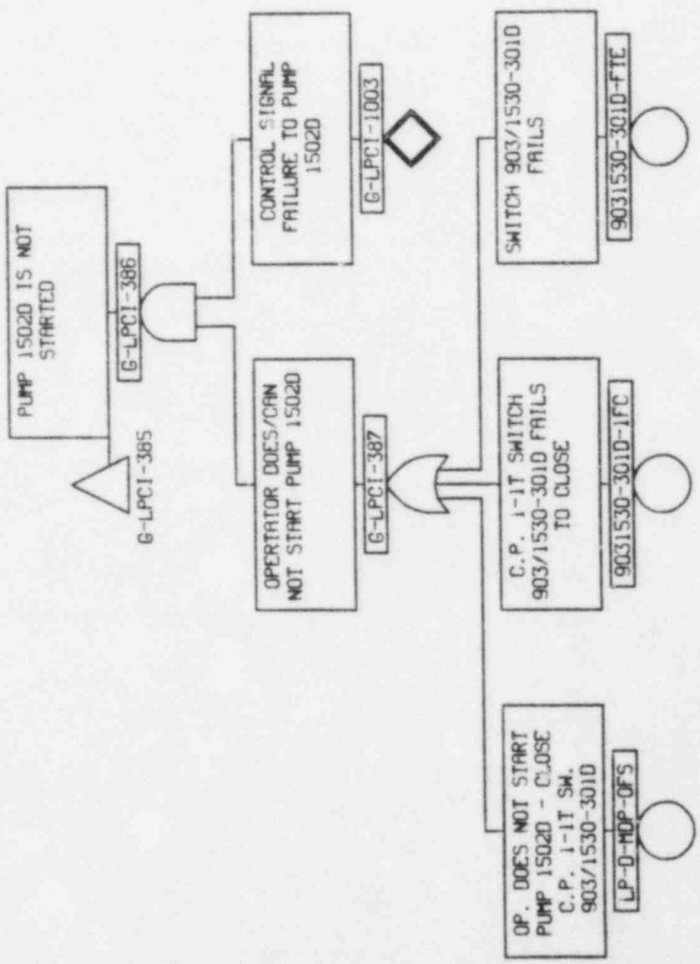

NO FLOW THRU VALVE
1-LP-4B
G-LPCI-378
G-LPCI-377
VALVE 1-LP-4B OUT
FOR TEST/MAINT.
LP-4B-XV-TMC
VALVE 1-LP-4B FAILS
CLOSED
LP-4B-XV-FRO
NO FLOW THRU VALVE
1-LP-3B
G-LPCI-379
VALVE 1-LP-3B OUT
FOR MAINTENANCE
LP-3B-CKV-TMC
VALVE 1-LP-3B FAILS
TO OPEN
LP-3B-CKV-FTO
NO FLOW FROM PUMP
1502B
G-LPCI-380

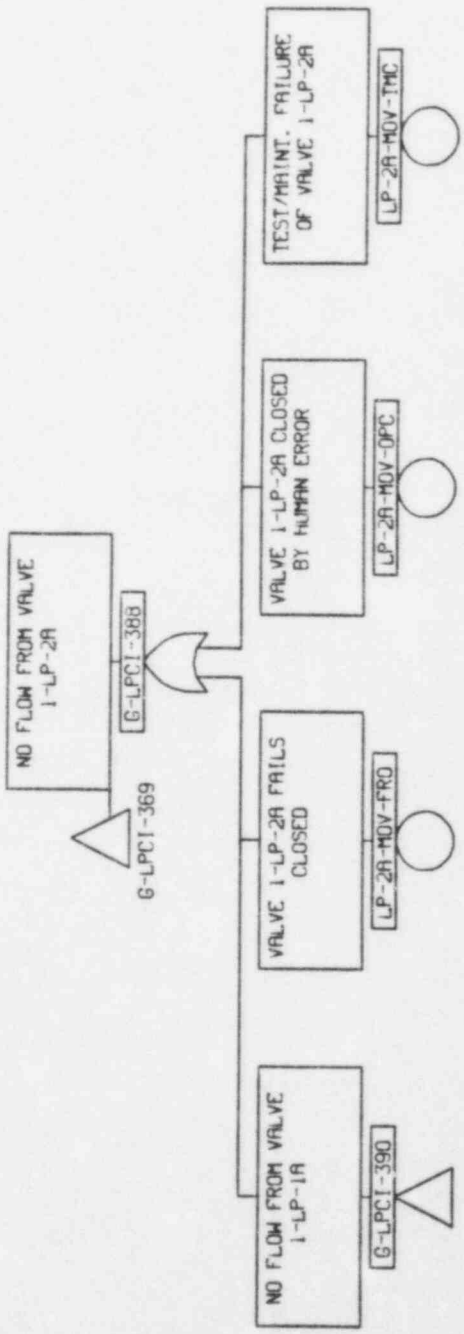

NO FLOW FROM PUMP 1502B
G-LPCI-379
G-LPCI-380
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL B
G-LPCI-406
PUMP 1502B FAILS TO START/RUN
LOSS OF AC POWER AT BUS 1AE COMP 3
TEST/MAINT. FAILURE OF PUMP 1502B
NO FLOW FROM VALVE 1-LP-2B
G-LPCI-384
PUMP 1502B ERRONEOUSLY TRIPPED
G-LPCI-383
PUMP 1502B IS NOT STARTED
G-LPCI-381

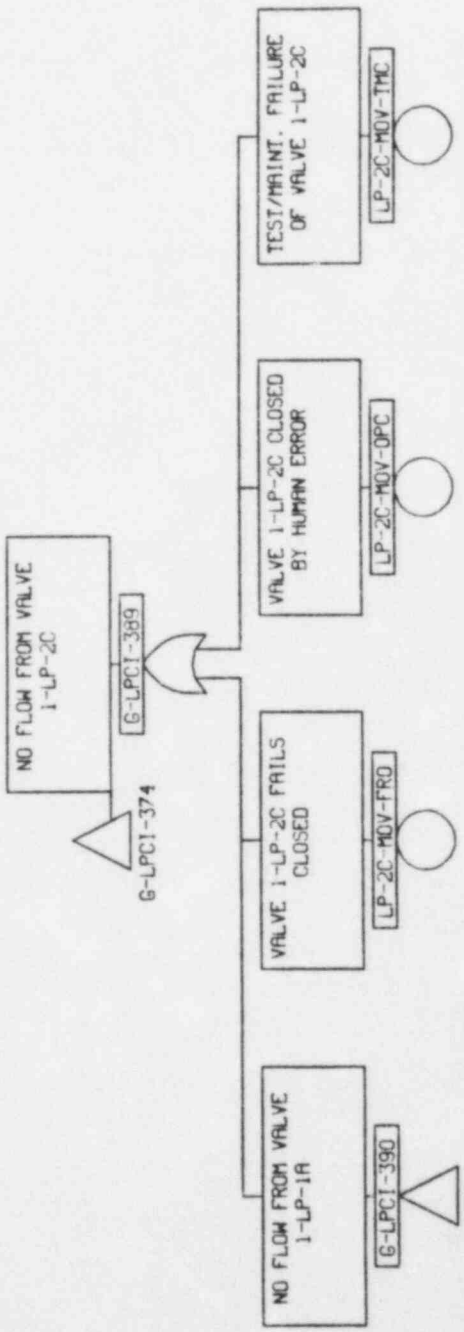

PUMP 1502B IS NOT STARTED
G-LPCI-380
G-LPCI-381
CONTROL SIGNAL FAILURE TO PUMP 1502B
G-LPCI-967
OPERATOR DOES/CAN NOT START PUMP 1502B
G-LPCI-382
SWITCH 903/1530-301B FAILS
9031530-301B-FTE
C.P. 1-1T SWITCH 903/1530-301B FAILS TO CLOSE
9031530-301B-1FC
OP. DOES NOT START PUMP 1502B - CLOSE C.P. 1-1T SW. 903/1530-301B
LP-B-MOP-OFS

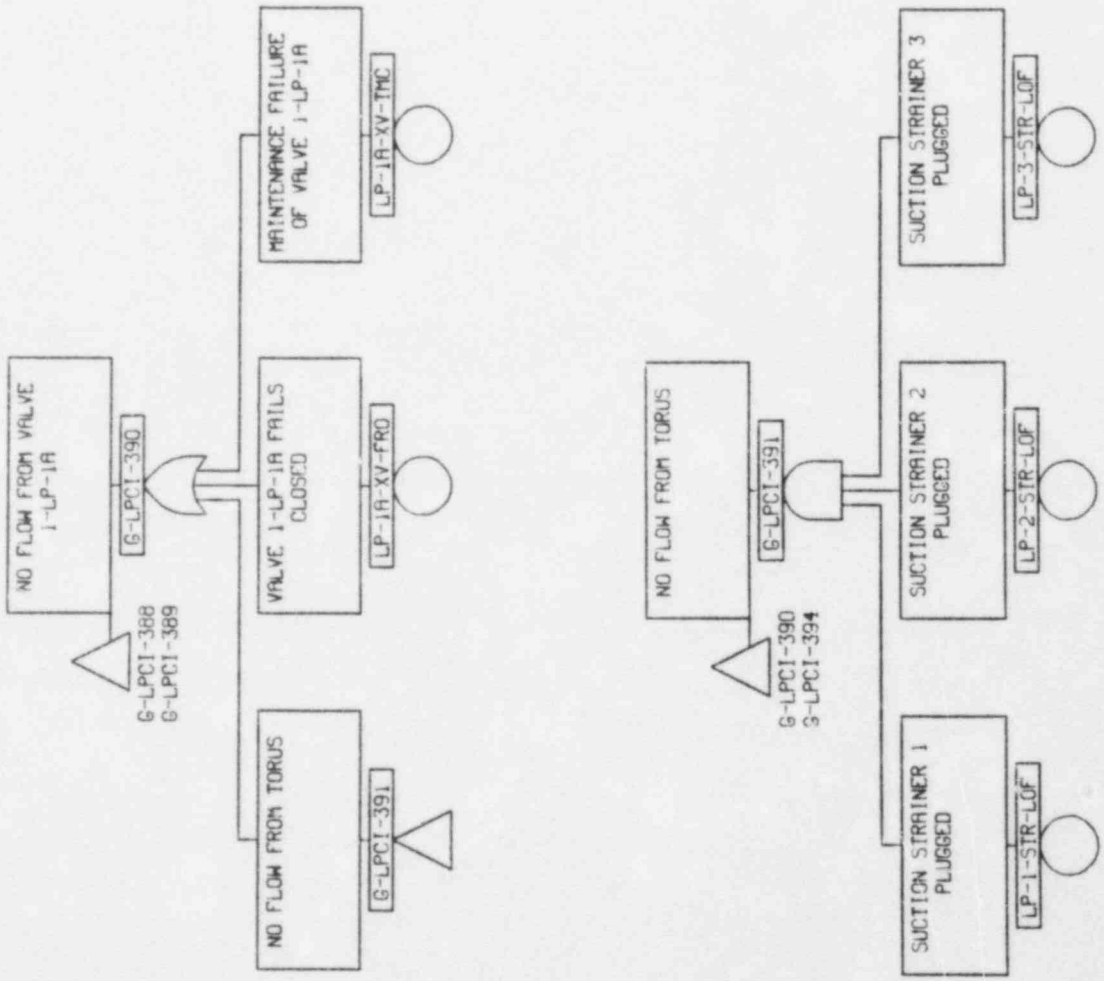

NO FLOW THRU VALVE
1-LP-4D
G-LPCI-383
G-LPCI-377
VALVE 1-LP-4D FAILS
CLOSED
LP-4D-XV-FRO
VALVE 1-LP-4D OUT
FOR TEST/MAINT.
LP-4D-XV-TMC
NO FLOW THRU VALVE
1-LP-3D
G-LPCI-384
VALVE 1-LP-3D FAILS
TO OPEN
LP-3D-CKV-FTO
VALVE 1-LP-3D OUT
FOR MAINTENANCE
LP-3D-CKV-TMC
NO FLOW FROM PUMP
15020
G-LPCI-385

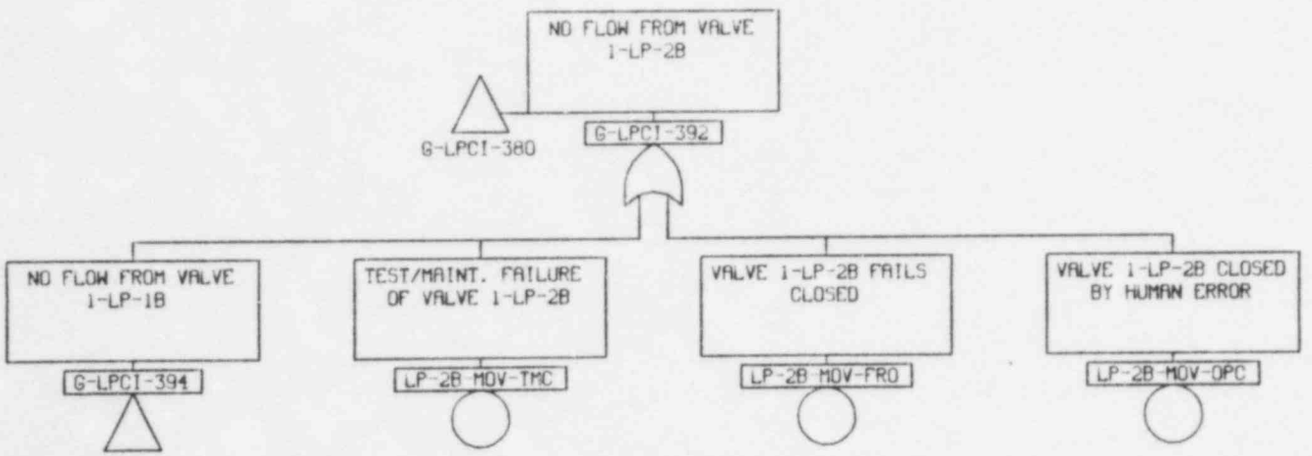

NO FLOW FROM PUMP 1-5020
G-LPCI-385
G-LPCI-384
NO FLOW FROM VALVE 1-LP-20
G-LPCI-383
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL 9
G-LPCI-409
PUMP 1-5020 FAILS TO START/RUN
LP-S-TOP-PMP
TEST/MAINT FAILURE OF PUMP 1-5020
LP-S-TOP-TEST
PUMP 1-5020 TRIPPED ERRONEOUSLY
G-LPCI-471
PUMP 1-5020 IS NOT STARTED
G-LPCI-386
LOSS OF AC POWER AT BUS 1-4E COMP 3
G-AC-BUS-1E
2

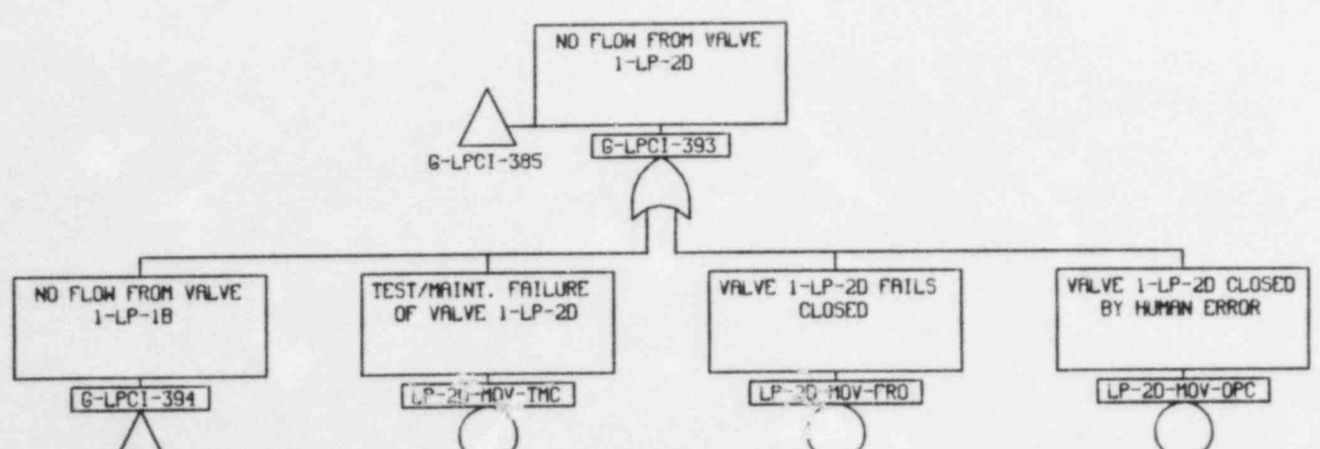

PUMP 15020 IS NOT STARTED
G-LPCI-385
G-LPCI-386
CONTROL SIGNAL FAILURE TO PUMP 15020
G-LPCI-1003
OPERATOR DOES/CAN NOT START PUMP 15020
G-LPCI-387
SWITCH 903/1530-3010 FAILS
9031530-3010-FTE
C.P. 1-1T SWITCH 903/1530-3010 FAILS TO CLOSE
9031530-3010-1FC
OP. DOES NOT START PUMP 15020 - CLOSE C.P. 1-1T SW. 903/1530-3010
LP-O-MOP-OPS

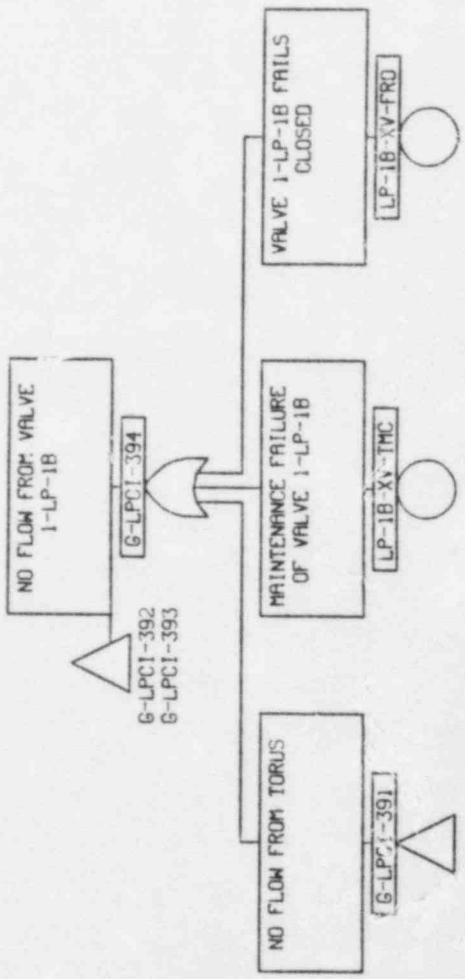

NO FLOW FROM VALVE
1-LP-2A
G-LPCI-369
G-LPCI-388
VALVE 1-LP-2A CLOSED
BY HUMAN ERROR
LP-2A-MOV-OPC
TEST/MAINT. FAILURE
OF VALVE 1-LP-2A
LP-2A-MOV-TMC
VALVE 1-LP-2A FAILS
CLOSED
LP-2A-MOV-FRO
NO FLOW FROM VALVE
1-LP-1A
G-LPCI-390

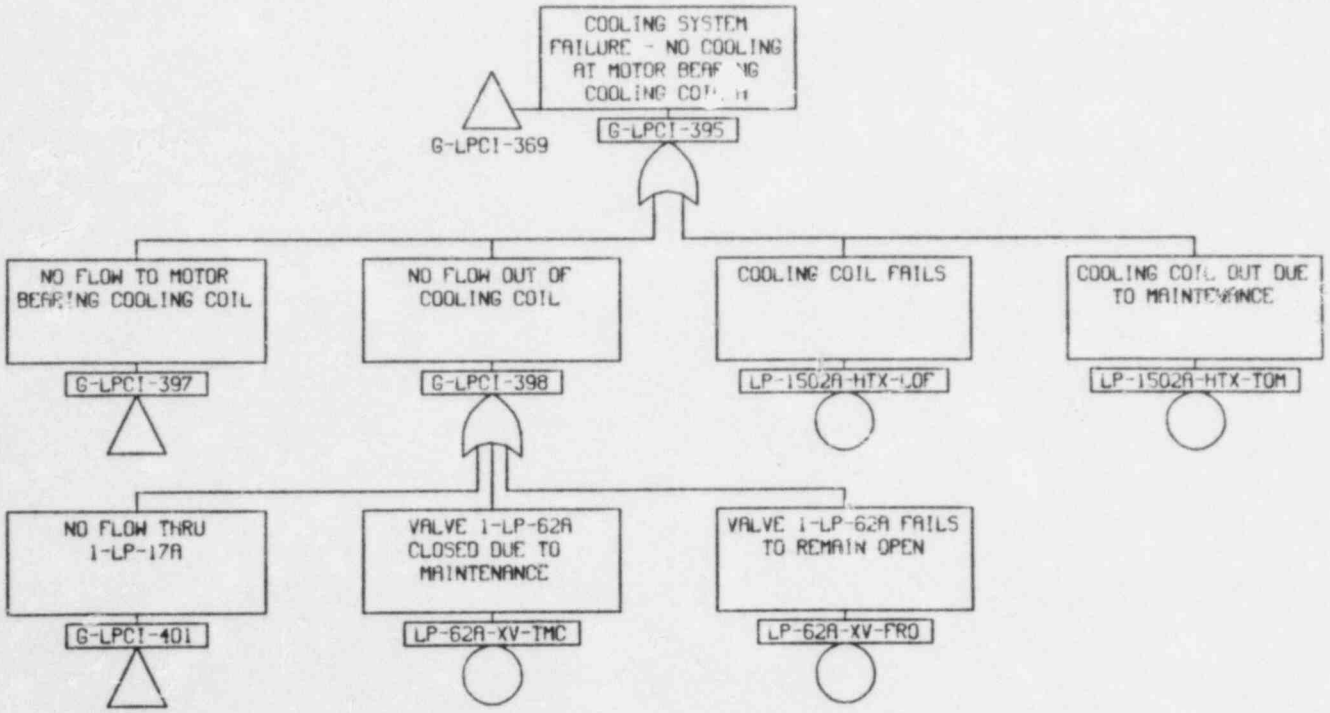

NO FLOW FROM VALVE
1-LP-2C
G-LPCI-374
G-LPCI-389
VALVE 1-LP-2C CLOSED
BY HUMAN ERROR
LP-2C-MOV-OPC
TEST/MAINT. FAILURE
OF VALVE 1-LP-2C
LP-2C-MOV-TMC
VALVE 1-LP-2C FAILS
CLOSED
LP-2C-MOV-FRO
NO FLOW FROM VALVE
1-LP-1A
G-LPCI-390

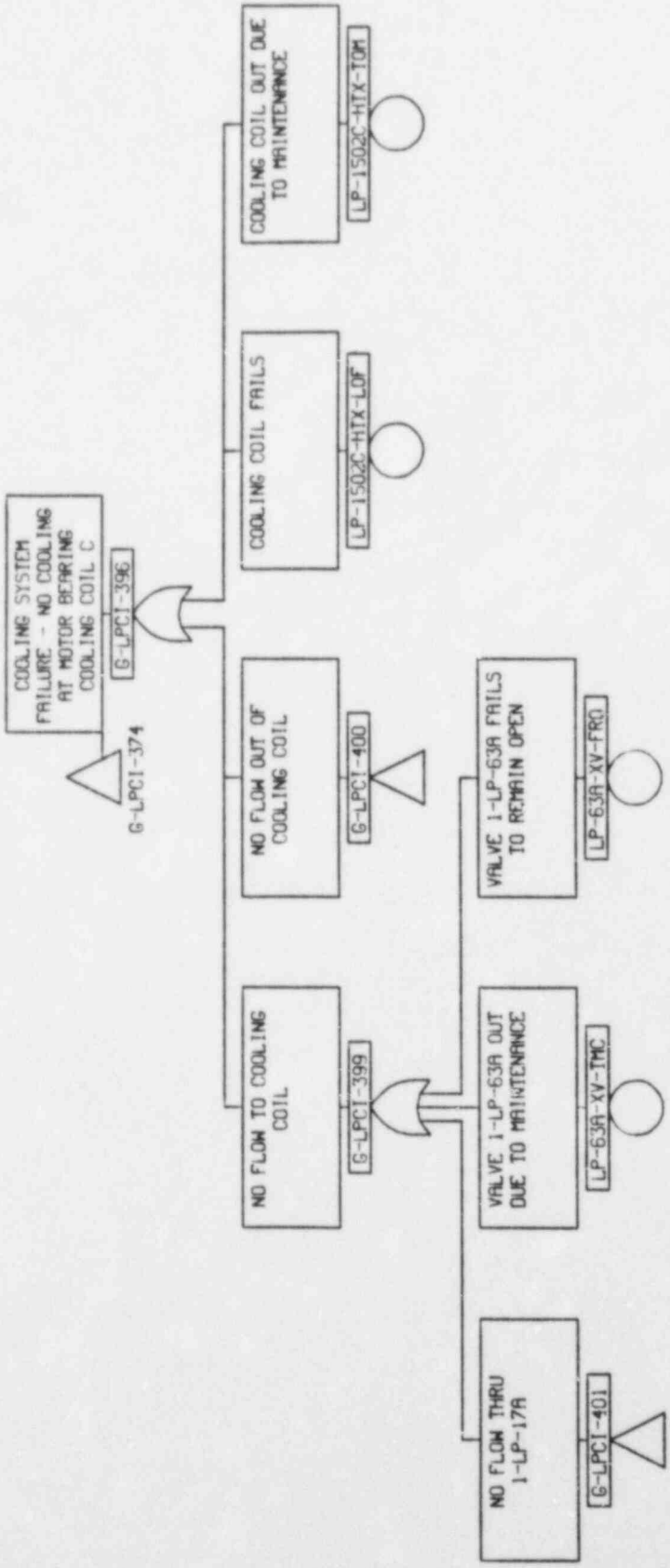

NO FLOW FROM VALVE 1-LP-1A
G-LPCI-390
G-LPCI-388
G-LPCI-389
VALVE 1-LP-1A FAILS CLOSED
LP-1A-XV-FRO
MAINTENANCE FAILURE OF VALVE 1-LP-1A
LP-1A-XV-TMC
NO FLOW FROM TORUS
G-LPCI-391
NO FLOW FROM TORUS
G-LPCI-391
G-LPCI-390
G-LPCI-394
SUCTION STRAINER 2 PLUGGED
LP-2-STR-LOF
SUCTION STRAINER 3 PLUGGED
LP-3-STR-LOF
SUCTION STRAINER 1 PLUGGED
LP-1-STR-LOF

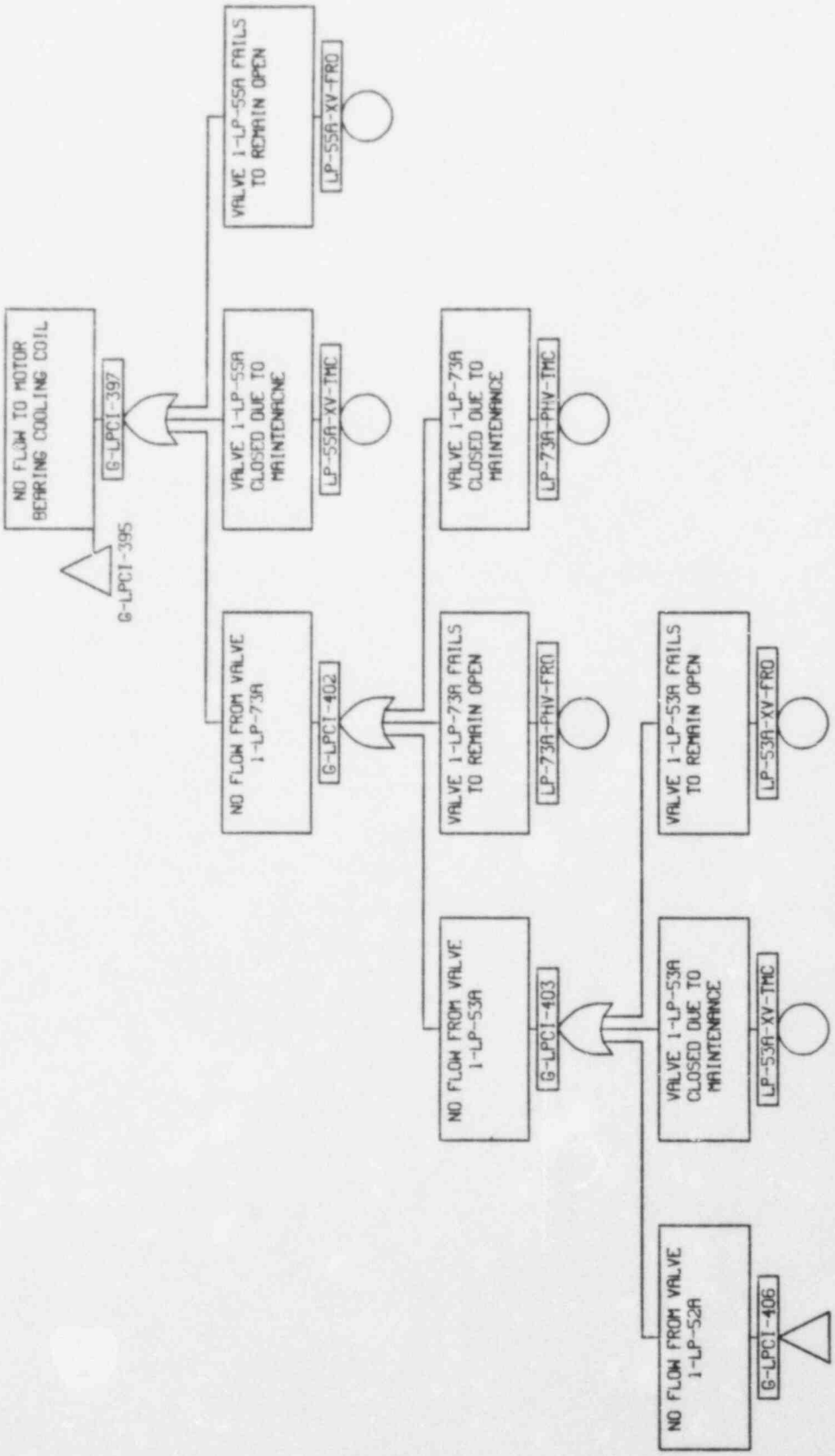

NO FLOW FROM VALVE
1-LP-2B
G-LPCI-380
G-LPCI-392
NO FLOW FROM VALVE
1-LP-1B
TEST/MAINT. FAILURE
OF VALVE 1-LP-2B
VALVE 1-LP-2B FAILS
CLOSED
VALVE 1-LP-2B CLOSED
BY HUMAN ERROR
G-LPCI-394
LP-2B-MOV-TMC
LP-2B-MOV-FRO
LP-2B-MOV-OPC

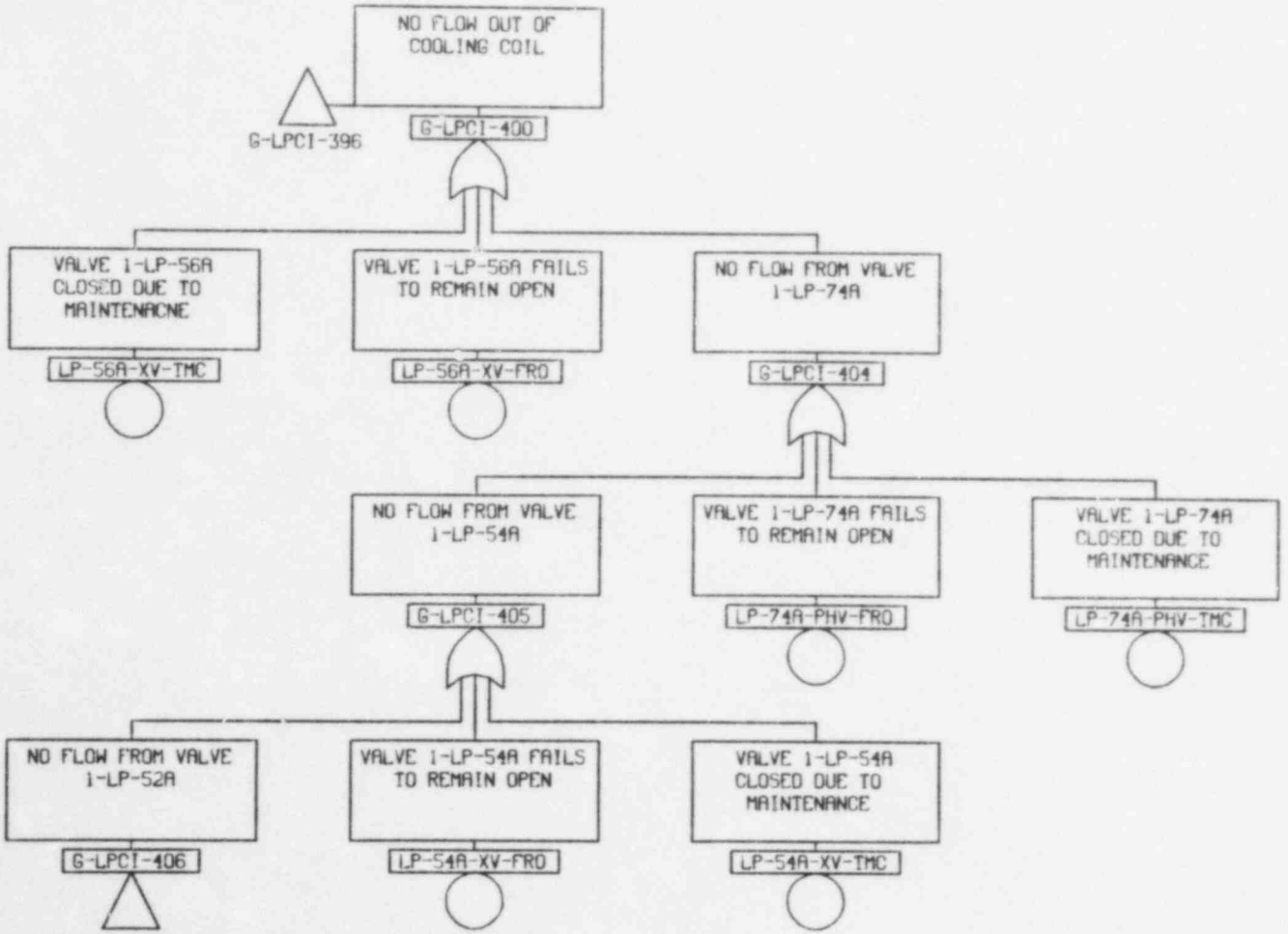

NO FLOW FROM VALVE
1-LP-2D
G-LPCI-385
G-LPCI-393
NO FLOW FROM VALVE
1-LP-1B
TEST/MAINT. FAILURE
OF VALVE 1-LP-2D
VALVE 1-LP-2D FAILS
CLOSED
VALVE 1-LP-2D CLOSED
BY HUMAN ERROR
G-LPCI-394
LP-2D-MOV-TMC
LP-2D-MOV-FRO
LP-2D-MOV-OPC

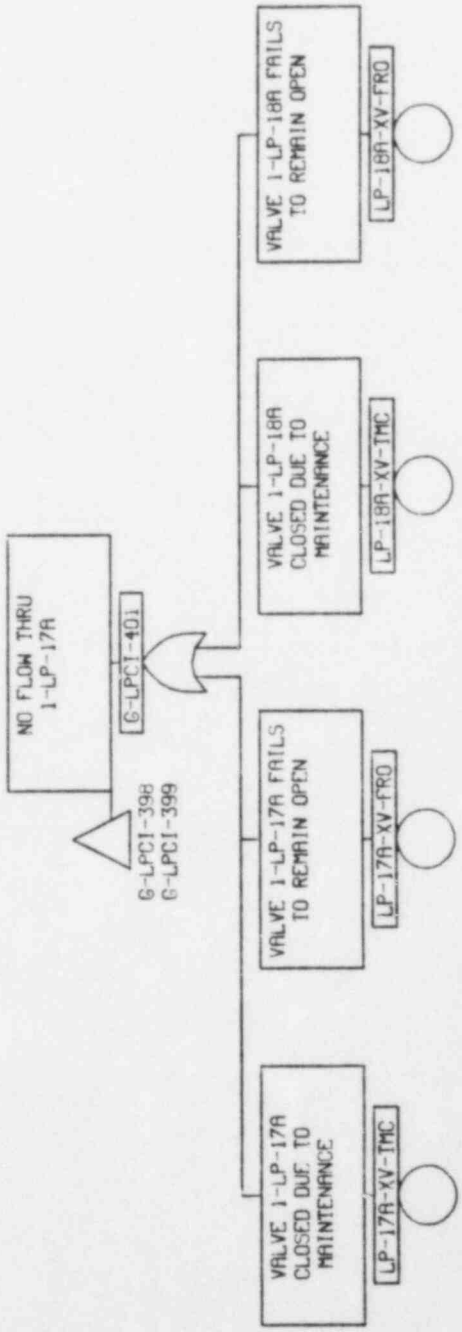

NO FLOW FROM VALVE 1-LP-1B
G-LPCI-394
G-LPCI-392
G-LPCI-393
VALVE 1-LP-1B FAILS CLOSED
LP-1B-XV-FRO
MAINTENANCE FAILURE OF VALVE 1-LP-1B
LP-1B-XV-TMC
NO FLOW FROM TORUS
G-LPCI-391

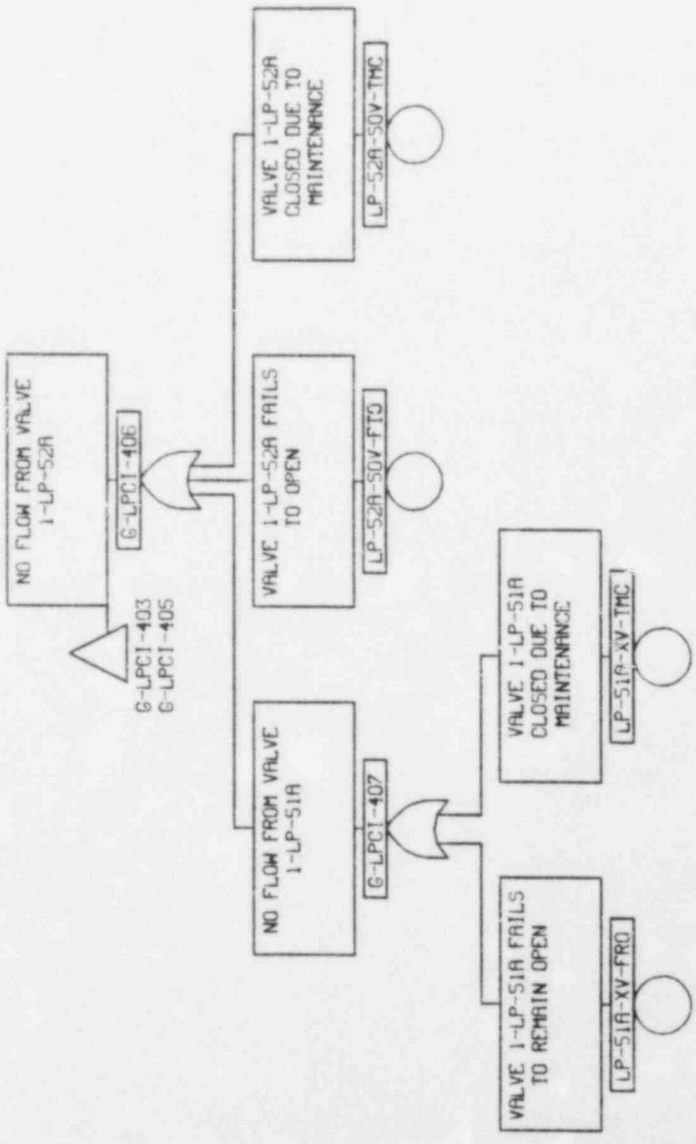

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL
G-LPCI-395
G-LPCI-369
NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-397
NO FLOW OUT OF COOLING COIL
G-LPCI-398
COOLING COIL FAILS
LP-1502A-HTX-LOF
COOLING COIL OUT DUE TO MAINTENANCE
LP-1502A-HTX-TOM
NO FLOW THRU 1-LP-17A
G-LPCI-401
VALVE 1-LP-62A CLOSED DUE TO MAINTENANCE
LP-62A-XV-TMC
VALVE 1-LP-62A FAILS TO REMAIN OPEN
LP-62A-XV-FRO

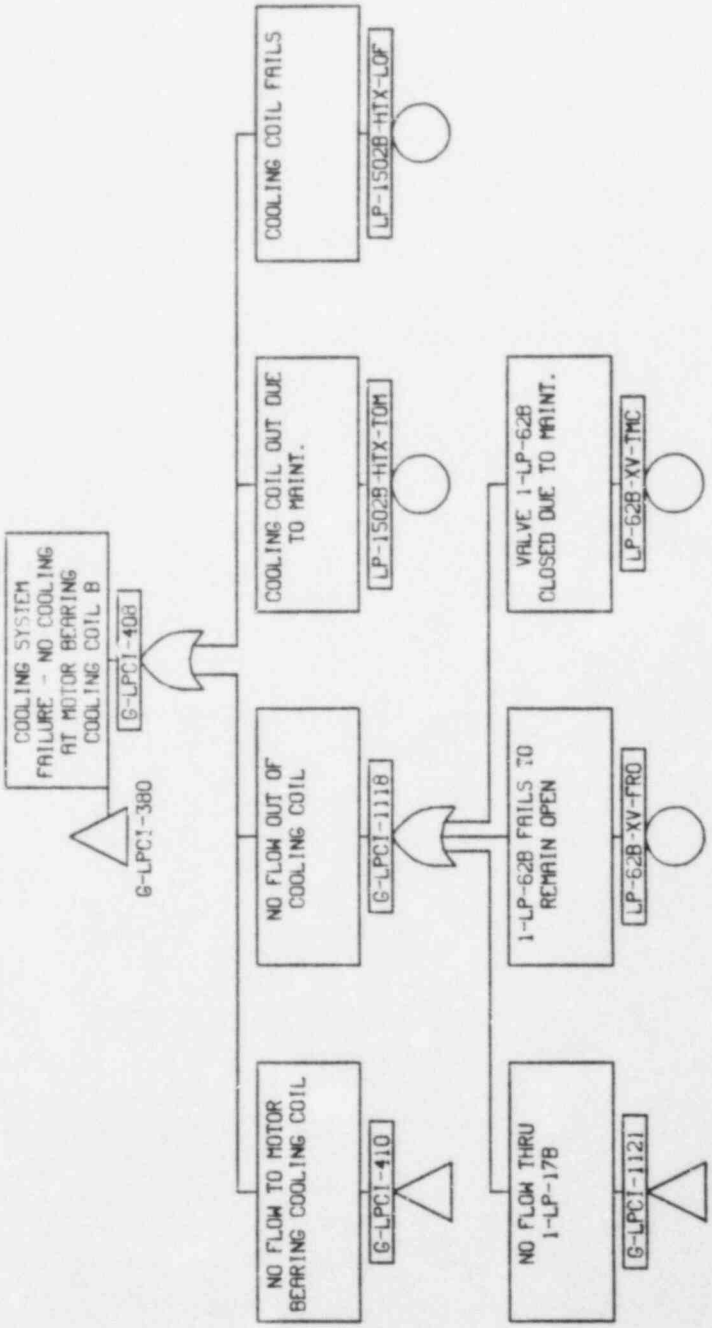

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL C
G-LPCI-396
G-LPCI-374
COOLING COIL OUT DUE TO MAINTENANCE
LP-1502C-HTX-TOM
COOLING COIL FAILS
LP-1502C-HTX-LOF
NO FLOW OUT OF COOLING COIL
G-LPCI-400
VALVE 1-LP-63A FAILS TO REMAIN OPEN
LP-63A-XV-FRO
NO FLOW TO COOLING COIL
G-LPCI-399
VALVE 1-LP-63A OUT DUE TO MAINTENANCE
LP-63A-XV-TMC
NO FLOW THRU 1-LP-17A
G-LPCI-401

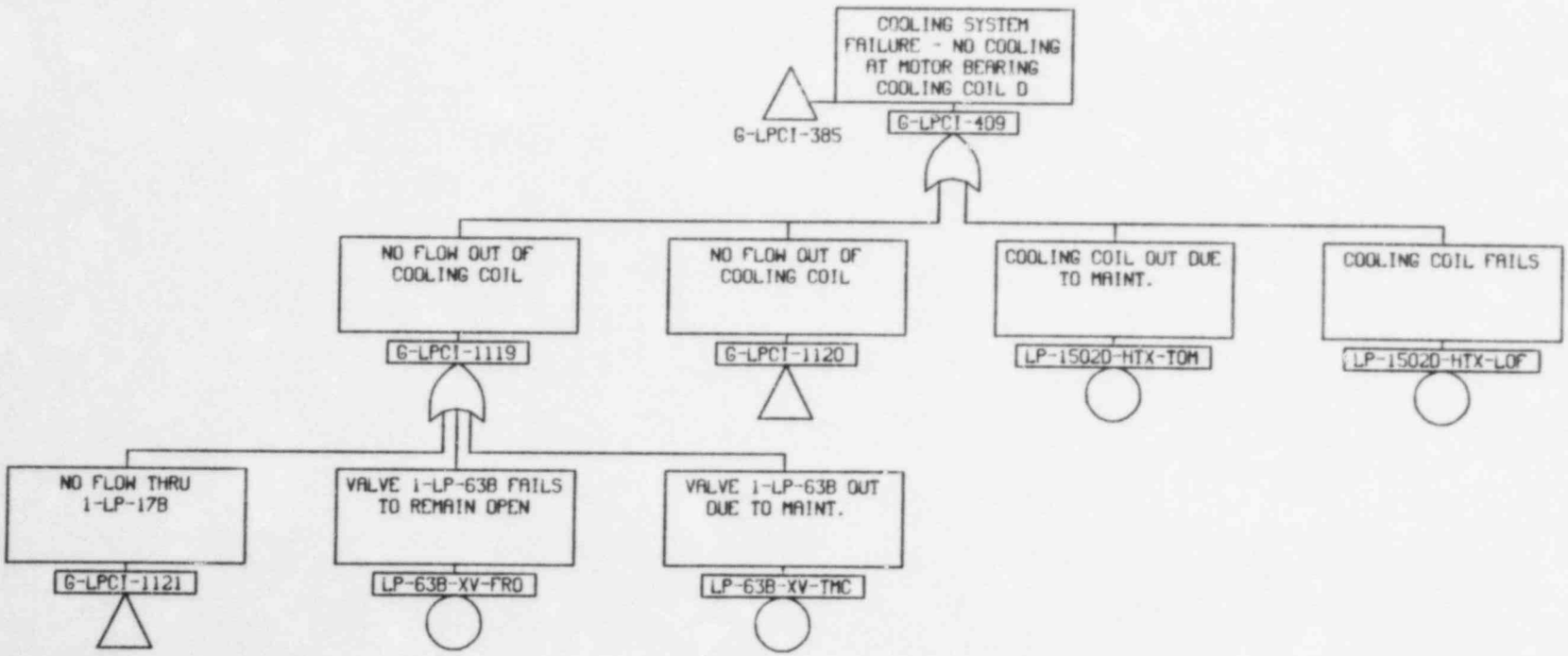

NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-397
G-LPCI-395
VALVE 1-LP-55A FAILS TO REMAIN OPEN
LP-55A-XV-FRO
VALVE 1-LP-55A CLOSED DUE TO MAINTENANCE
LP-55A-XV-TMC
VALVE 1-LP-73A CLOSED DUE TO MAINTENANCE
LP-73A-PHV-TMC
NO FLOW FROM VALVE 1-LP-73A
G-LPCI-402
VALVE 1-LP-73A FAILS TO REMAIN OPEN
LP-73A-PHV-FRO
VALVE 1-LP-53A FAILS TO REMAIN OPEN
LP-53A-XV-FRO
NO FLOW FROM VALVE 1-LP-53A
G-LPCI-403
VALVE 1-LP-53A CLOSED DUE TO MAINTENANCE
LP-53A-XV-TMC
NO FLOW FROM VALVE 1-LP-52A
G-LPCI-406

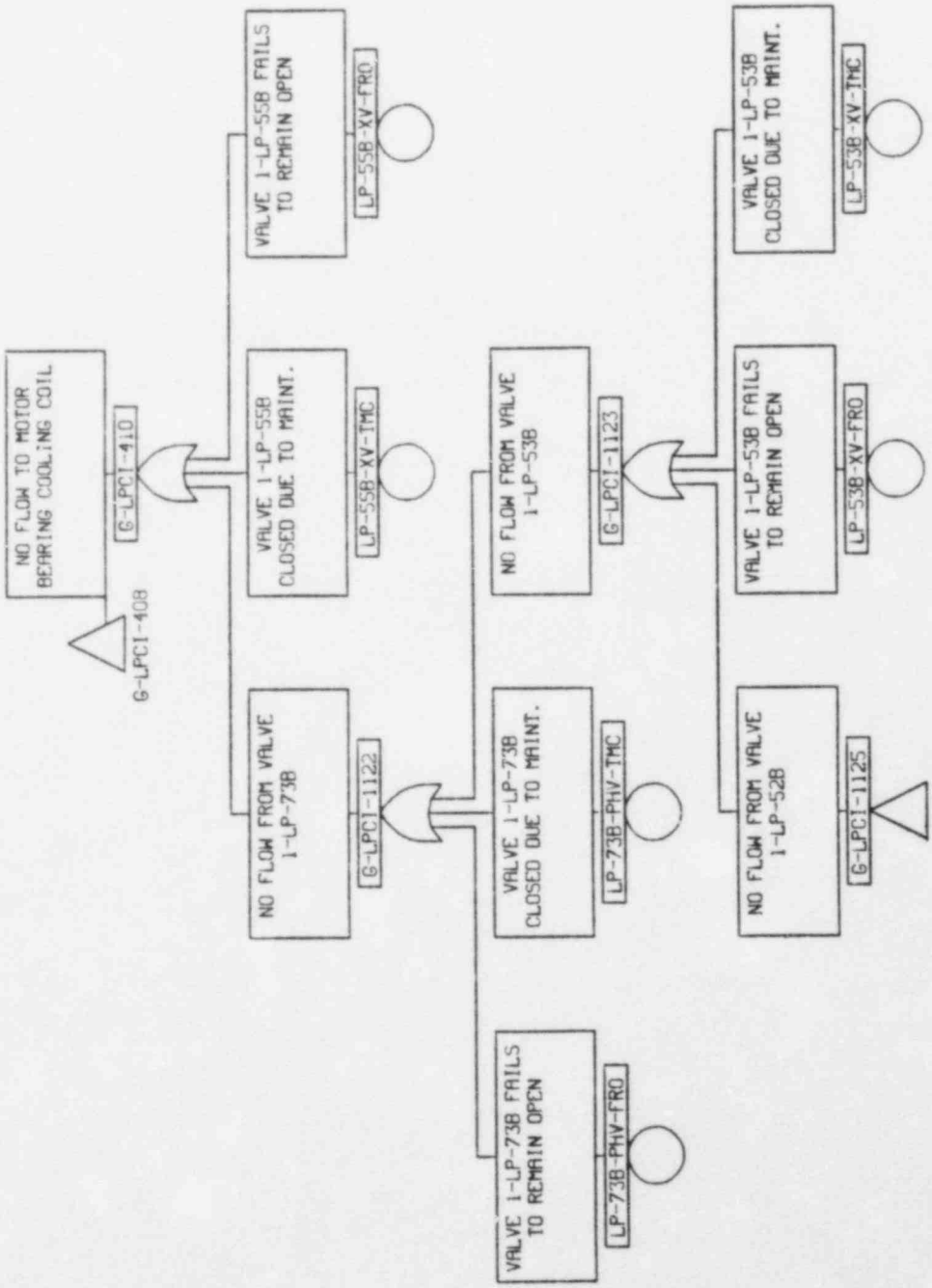

NO FLOW OUT OF COOLING COIL
G-LPCI-396
G-LPCI-400
VALVE 1-LP-56A CLOSED DUE TO MAINTENACNE
LP-56A-XV-TMC
VALVE 1-LP-56A FAILS TO REMAIN OPEN
LP-56A-XV-FRO
NO FLOW FROM VALVE 1-LP-74A
G-LPCI-404
NO FLOW FROM VALVE 1-LP-54A
G-LPCI-405
VALVE 1-LP-74A FAILS TO REMAIN OPEN
LP-74A-PHV-FRO
VALVE 1-LP-74A CLOSED DUE TO MAINTENANCE
LP-74A-PHV-TMC
NO FLOW FROM VALVE 1-LP-52A
G-LPCI-406
VALVE 1-LP-54A FAILS TO REMAIN OPEN
LP-54A-XV-FRO
VALVE 1-LP-54A CLOSED DUE TO MAINTENANCE
LP-54A-XV-TMC

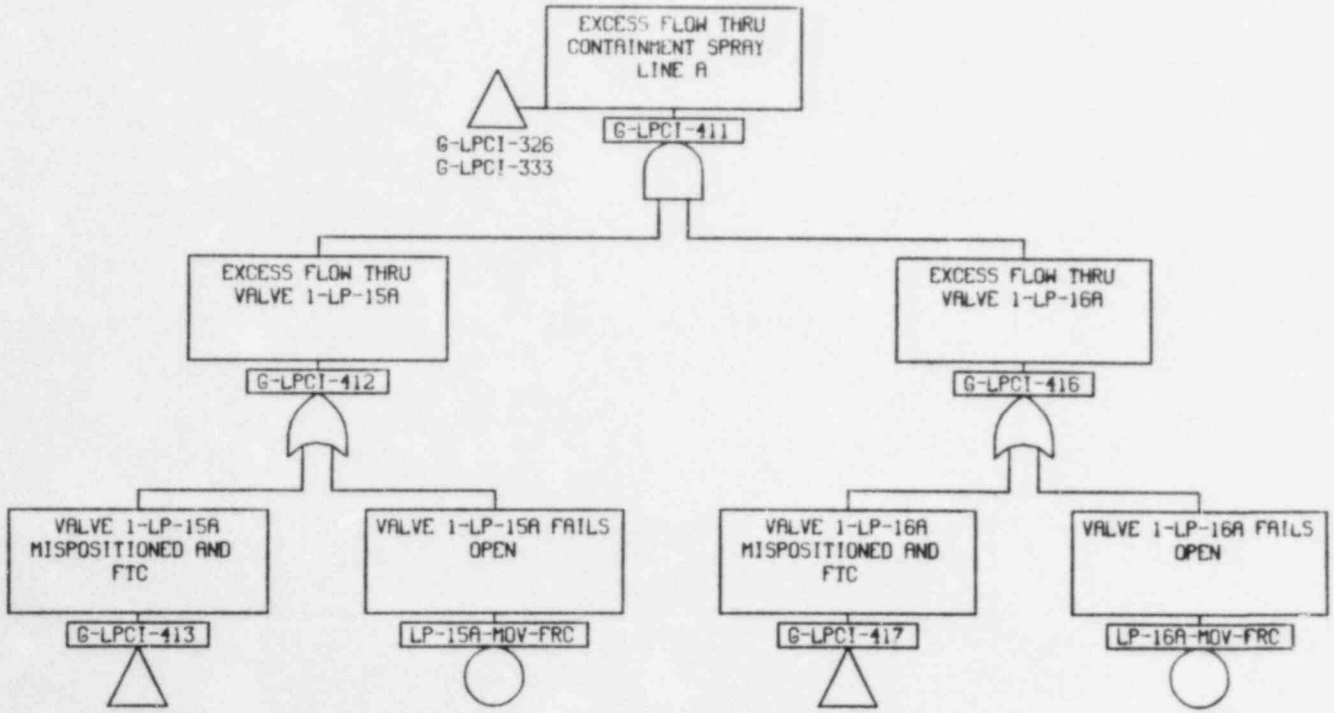

NO FLOW THRU
1-LP-17A
G-LPCI-401
G-LPCI-398
G-LPCI-399
VALVE 1-LP-17A
CLOSED DUE TO
MAINTENANCE
LP-17A-XV-TMC
VALVE 1-LP-17A FAILS
TO REMAIN OPEN
LP-17A-XV-FRO
VALVE 1-LP-18A
CLOSED DUE TO
MAINTENANCE
LP-18A-XV-TMC
VALVE 1-LP-18A FAILS
TO REMAIN OPEN
LP-18A-XV-FRO

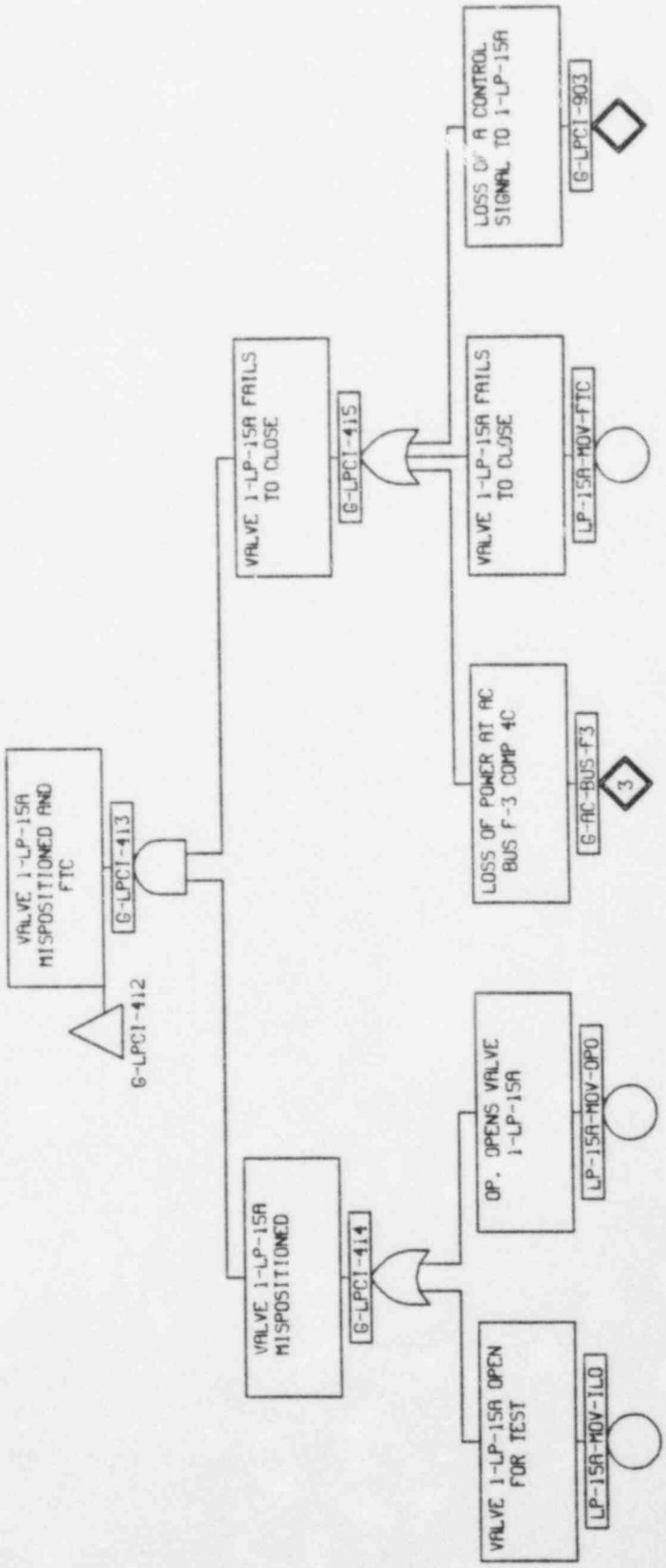

NO FLOW FROM VALVE 1-LP-52A
G-LPCI-406
G-LPCI-403
G-LPCI-405
VALVE 1-LP-52A FAILS TO OPEN
LP-52A-SOV-FTO
VALVE 1-LP-52A CLOSED DUE TO MAINTENANCE
LP-52A-SOV-TMC
NO FLOW FROM VALVE 1-LP-51A
G-LPCI-407
VALVE 1-LP-51A FAILS TO REMAIN OPEN
LP-51A-XV-FRO
VALVE 1-LP-51A CLOSED DUE TO MAINTENANCE
LP-51A-XV-TMC

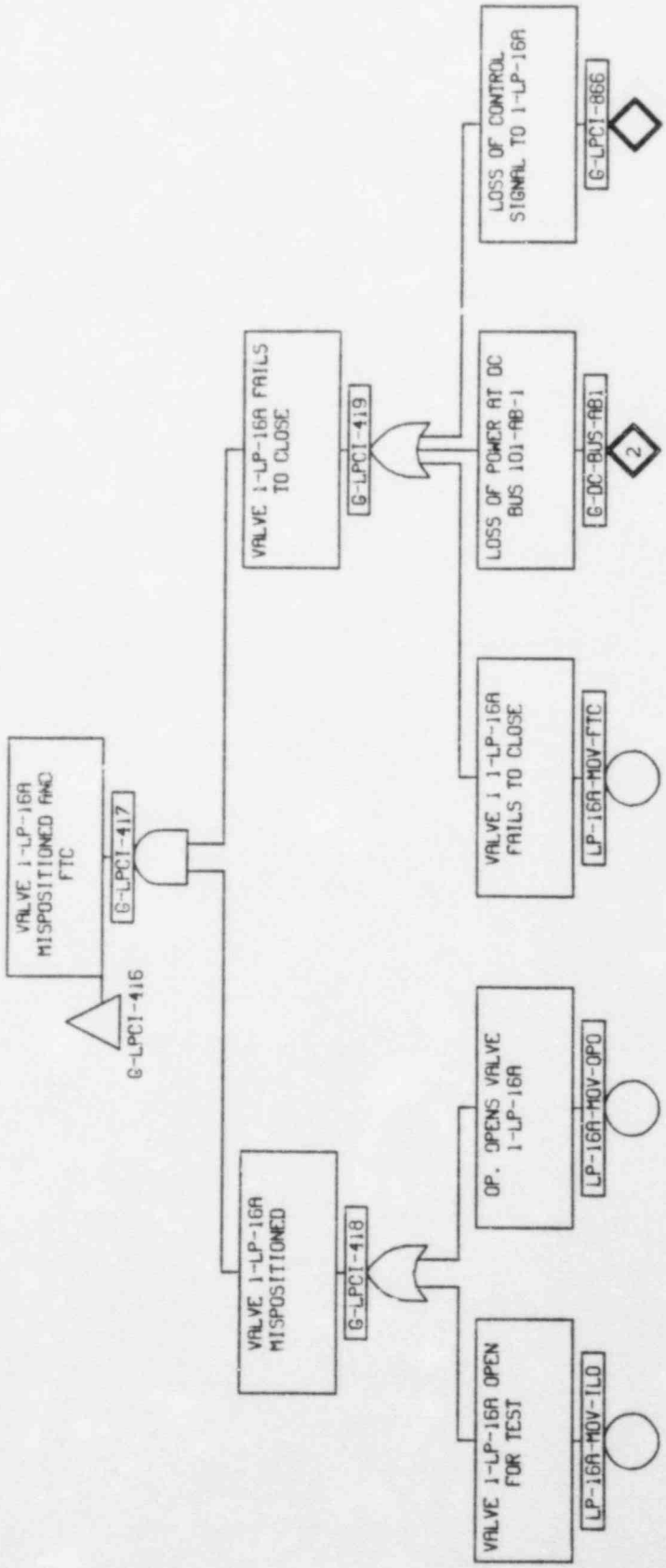

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL B
G-LPCI-408
G-LPCI-380
COOLING COIL FAILS
LP-1502B-HTX-LOF
COOLING COIL OUT DUE TO MAINT.
LP-1502B-HTX-TOM
VALVE 1-LP-62B CLOSED DUE TO MAINT.
LP-62B-XV-TMC
NO FLOW OUT OF COOLING COIL
G-LPCI-1118
1-LP-62B FAILS TO REMAIN OPEN
LP-62B-XV-FRO
NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-410
NO FLOW THRU 1-LP-17B
G-LPCI-1121

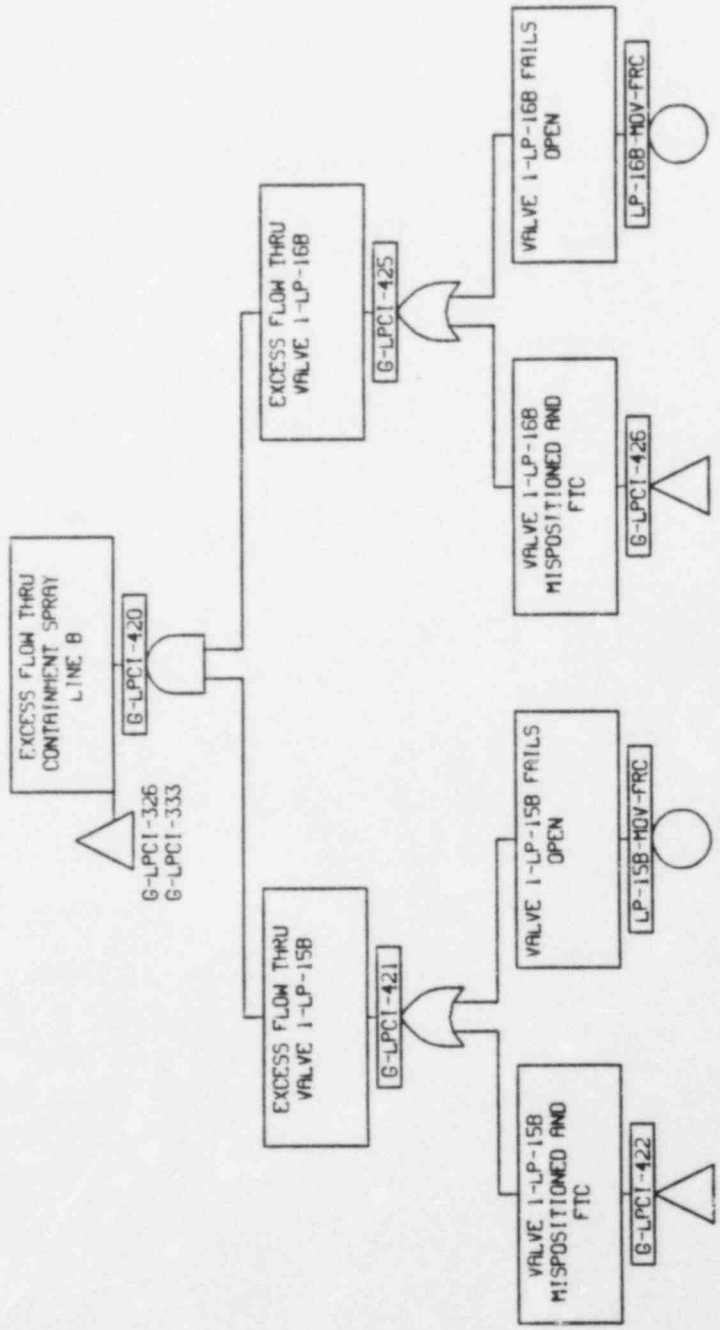

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL D
G-LPCI-409
G-LPCI-385
NO FLOW OUT OF COOLING COIL
G-LPCI-1119
NO FLOW OUT OF COOLING COIL
G-LPCI-1120
COOLING COIL OUT DUE TO MAINT.
LP-1502D-HTX-TOM
COOLING COIL FAILS
LP-1502D-HTX-LOF
NO FLOW THRU 1-LP-17B
G-LPCI-1121
VALVE 1-LP-63B FAILS TO REMAIN OPEN
LP-63B-XV-FRO
VALVE 1-LP-63B OUT DUE TO MAINT.
LP-63B-XV-TMC

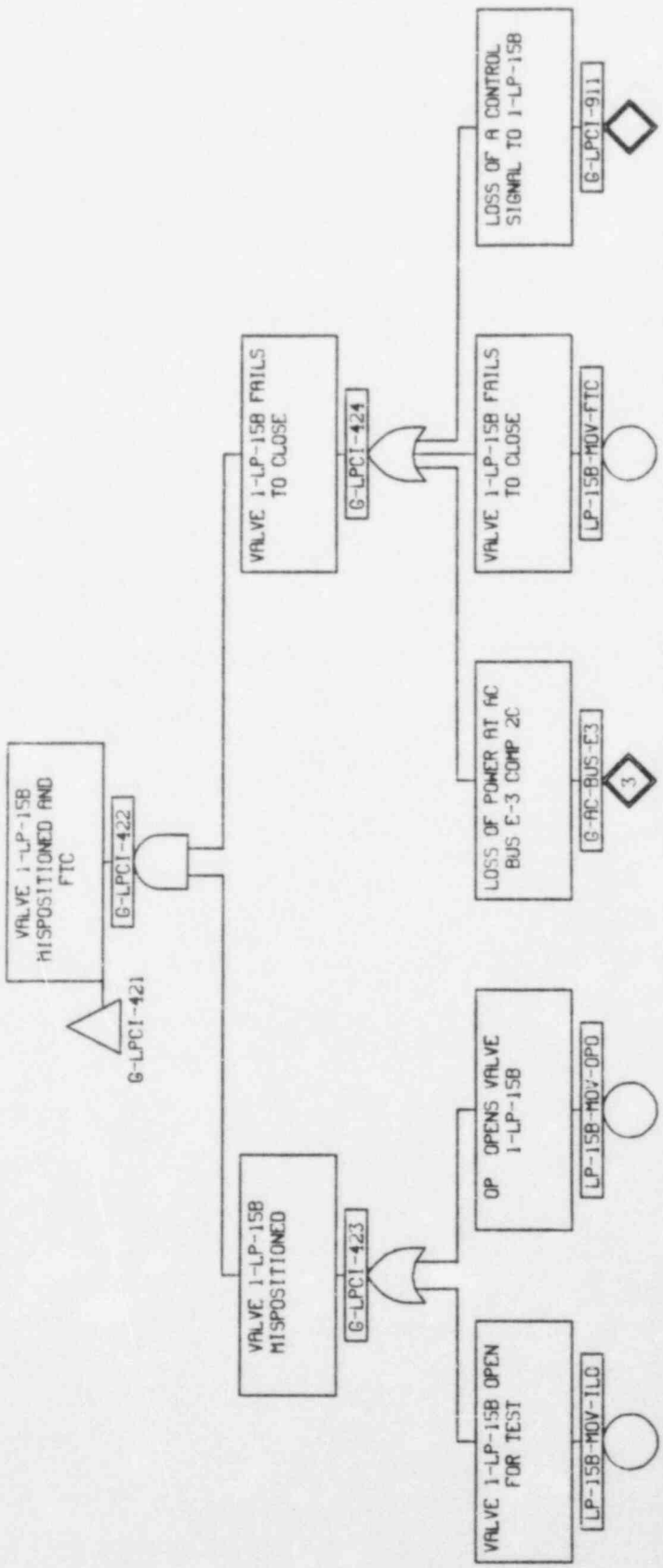

NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-408
G-LPCI-410
VALVE 1-LP-55B FAILS TO REMAIN OPEN
LP-55B-XV-FRO
VALVE 1-LP-55B CLOSED DUE TO MAINT.
LP-55B-XV-TMC
NO FLOW FROM VALVE 1-LP-73B
G-LPCI-1122
VALVE 1-LP-73B CLOSED DUE TO MAINT.
LP-73B-PHV-TMC
VALVE 1-LP-73B FAILS TO REMAIN OPEN
LP-73B-PHV-FRO
NO FLOW FROM VALVE 1-LP-53B
G-LPCI-1123
VALVE 1-LP-53B FAILS TO REMAIN OPEN
LP-53B-XV-FRO
NO FLOW FROM VALVE 1-LP-52B
G-LPCI-1125
VALVE 1-LP-53B CLOSED DUE TO MAINT.
LP-53B-XV-TMC

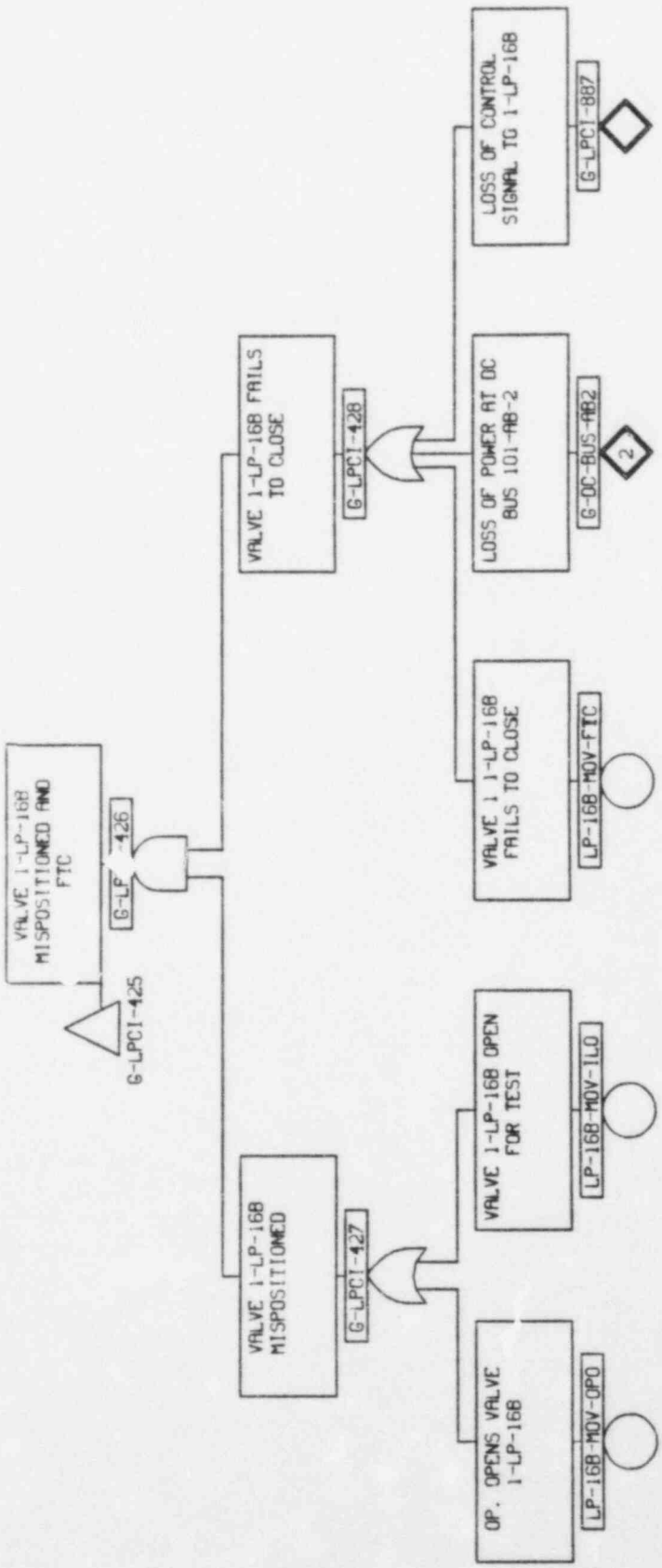

EXCESS FLOW THRU
CONTAINMENT SPRAY
LINE A
G-LPCI-411
G-LPCI-326
G-LPCI-333
EXCESS FLOW THRU
VALVE 1-LP-15A
G-LPCI-412
EXCESS FLOW THRU
VALVE 1-LP-16A
G-LPCI-416
VALVE 1-LP-15A
MISPOSITIONED AND
FTC
G-LPCI-413
VALVE 1-LP-15A FAILS
OPEN
LP-15A-MOV-FRC
VALVE 1-LP-16A
MISPOSITIONED AND
FTC
G-LPCI-417
VALVE 1-LP-16A FAILS
OPEN
LP-16A-MOV-FRC

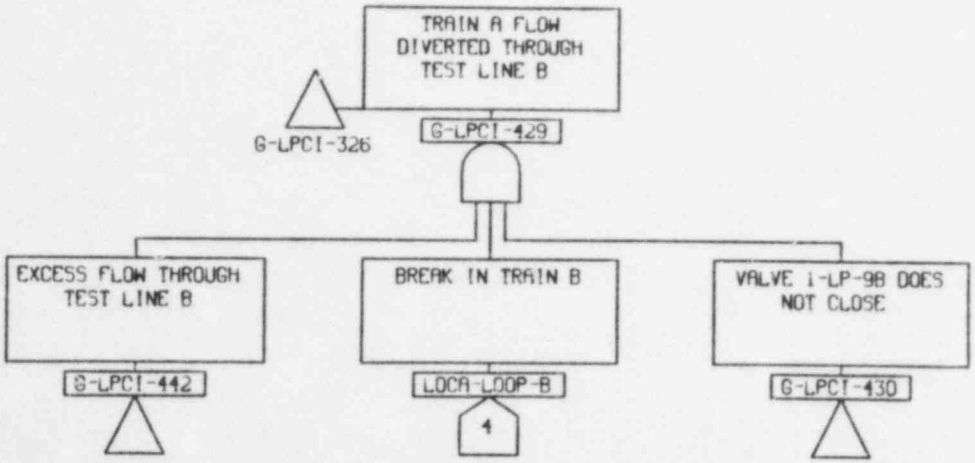

VALVE 1-LP-15A MISPOSITIONED AND FTC
G-LPCI-412
G-LPCI-413
VALVE 1-LP-15A MISPOSITIONED
G-LPCI-414
VALVE 1-LP-15A FAILS TO CLOSE
G-LPCI-415
OP. OPENS VALVE 1-LP-15A
LP-15A-MOV-OPO
VALVE 1-LP-15A OPEN FOR TEST
LP-15A-MOV-ILO
LOSS OF POWER AT AC BUS F-3 COMP 4C
G-AC-BUS-F3
3
VALVE 1-LP-15A FAILS TO CLOSE
LP-15A-MOV-FTC
LOSS OF A CONTROL SIGNAL TO 1-LP-15A
G-LPCI-903

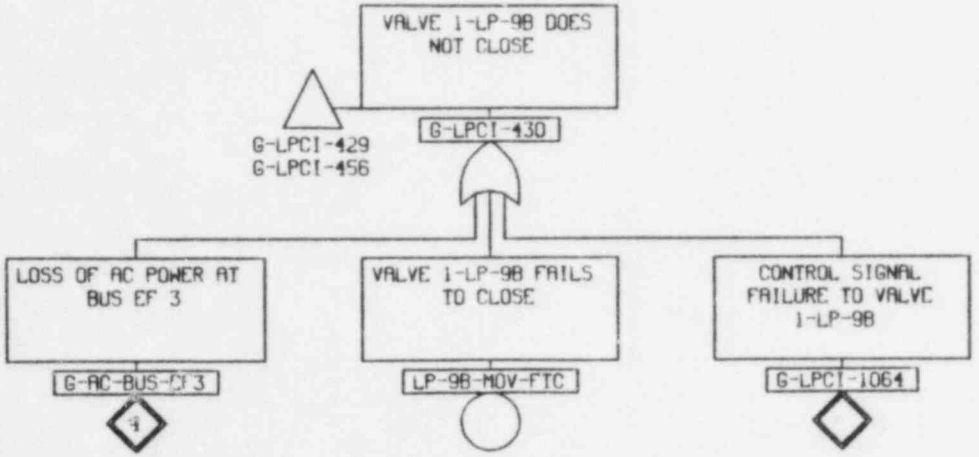

VALVE 1-LP-16A MISPOSITIONED FAIL FTC
G-LPCI-416
G-LPCI-417
VALVE 1-LP-16A MISPOSITIONED
G-LPCI-418
VALVE 1-LP-16A FAILS TO CLOSE
G-LPCI-419
OP. OPENS VALVE 1-LP-16A
LP-16A-MOV-OPO
VALVE 1-LP-16A OPEN FOR TEST
LP-16A-MOV-ILO
VALVE 1 1-LP-16A FAILS TO CLOSE
LP-16A-MOV-FTC
LOSS OF POWER AT DC BUS 101-AB-1
G-DC-BUS-AB1
2
LOSS OF CONTROL SIGNAL TO 1-LP-16A
G-LPCI-866

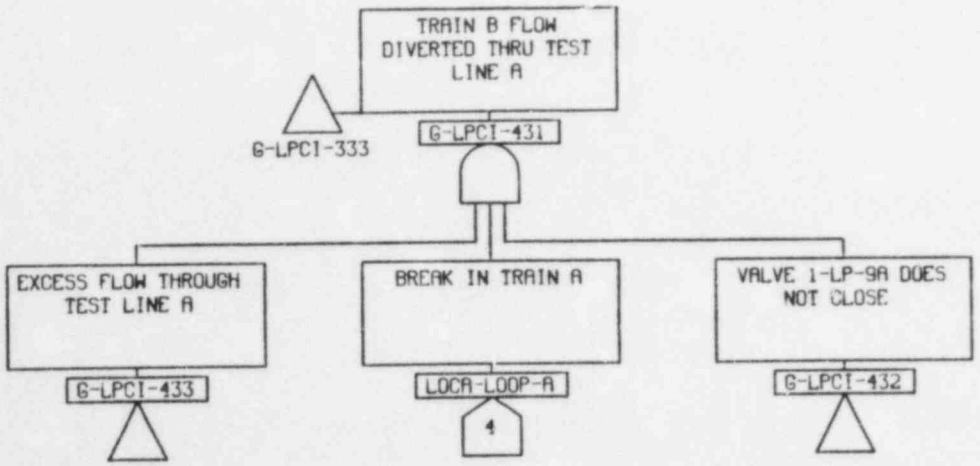

EXCESS FLOW THRU CONTAINMENT SPRAY LINE B
G-LPCI-420
G-LPCI-326
G-LPCI-333
EXCESS FLOW THRU VALVE 1-LP-168
G-LPCI-425
VALVE 1-LP-168 FAILS OPEN
LP-168-MOV-FRC
VALVE 1-LP-168 MISPOSITIONED AND FTC
G-LPCI-426
EXCESS FLOW THRU VALVE 1-LP-158
G-LPCI-421
VALVE 1-LP-158 FAILS OPEN
LP-158-MOV-FRC
VALVE 1-LP-158 MISPOSITIONED AND FTC
G-LPCI-422

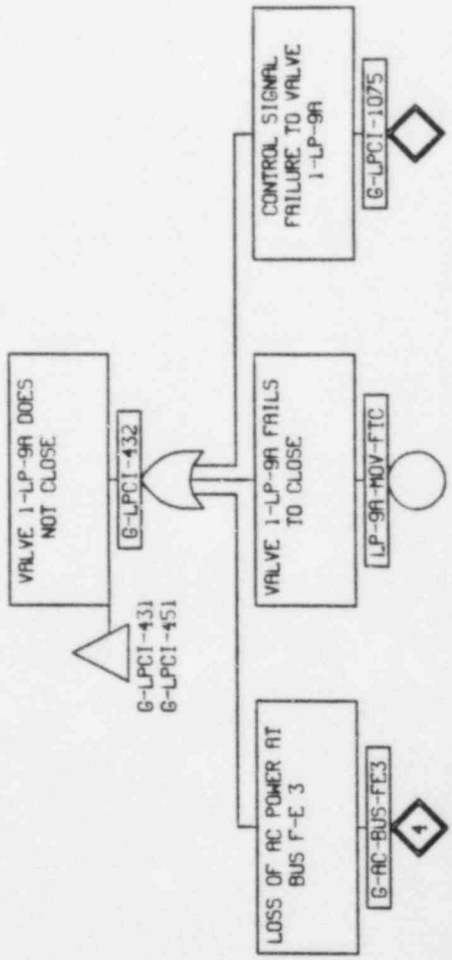

VALVE 1-LP-15B MISPOSITIONED AND FTC
G-LPCI-421
G-LPCI-422
VALVE 1-LP-15B MISPOSITIONED
G-LPCI-423
VALVE 1-LP-15B FAILS TO CLOSE
G-LPCI-424
VALVE 1-LP-15B FAILS TO CLOSE
LP-15B-MOV-FTC
LOSS OF POWER AT AC BUS E-3 COMP 2C
G-AC-BUS-E3
3
LOSS OF A CONTROL SIGNAL TO 1-LP-15B
G-LPCI-911
OP OPENS VALVE 1-LP-15B
LP-15B-MOV-OPO
VALVE 1-LP-15B OPEN FOR TEST
LP-15B-MOV-ILC

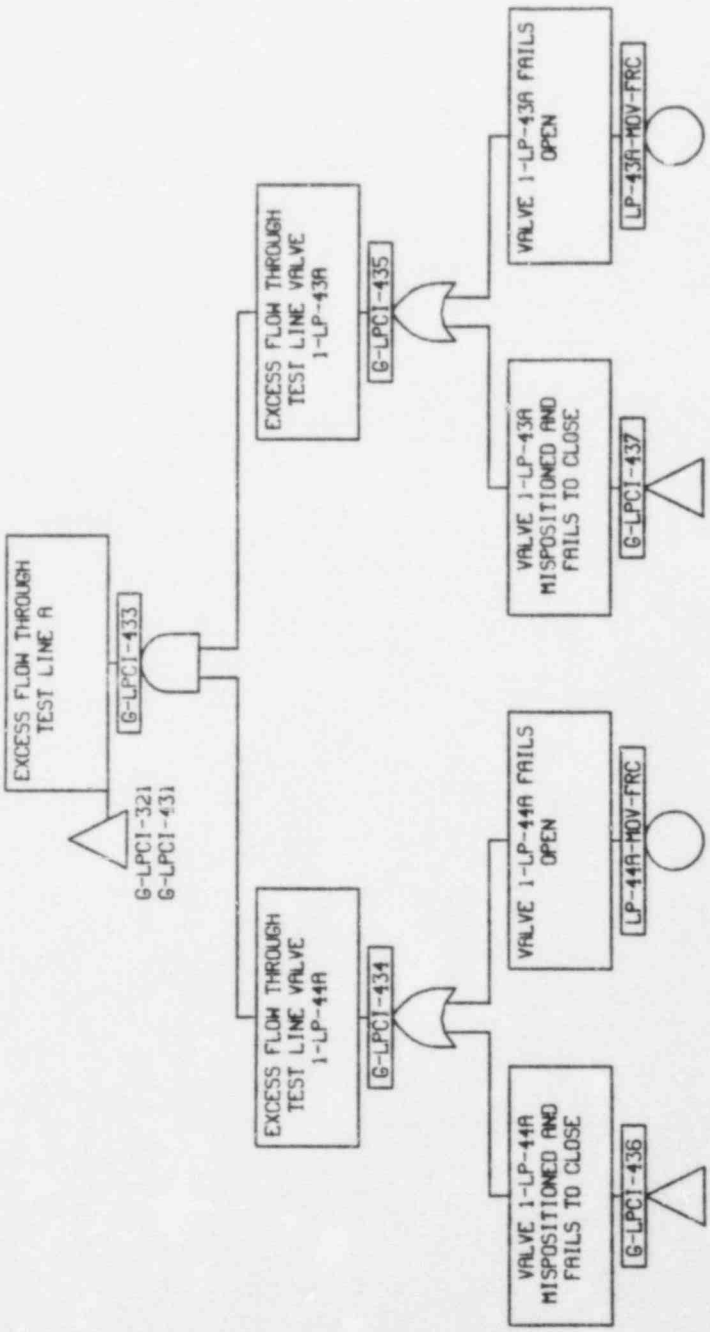

VALVE 1-LP-168 MISPOSITIONED AND FTC
G-LPCI-425
G-LF -426
VALVE 1-LP-168 MISPOSITIONED
G-LPCI-427
OP. OPENS VALVE 1-LP-168
LP-168-MOV-OPO
VALVE 1-LP-168 OPEN FOR TEST
LP-168-MOV-1LO
VALVE 1-LP-168 FAILS TO CLOSE
G-LPCI-428
VALVE 1 1-LP-168 FAILS TO CLOSE
LP-168-MOV-FTC
LOSS OF POWER AT DC BUS 101-AB-2
G-DC-BUS-AB2
2
LOSS OF CONTROL SIGNAL TO 1-LP-168
G-LPCI-887

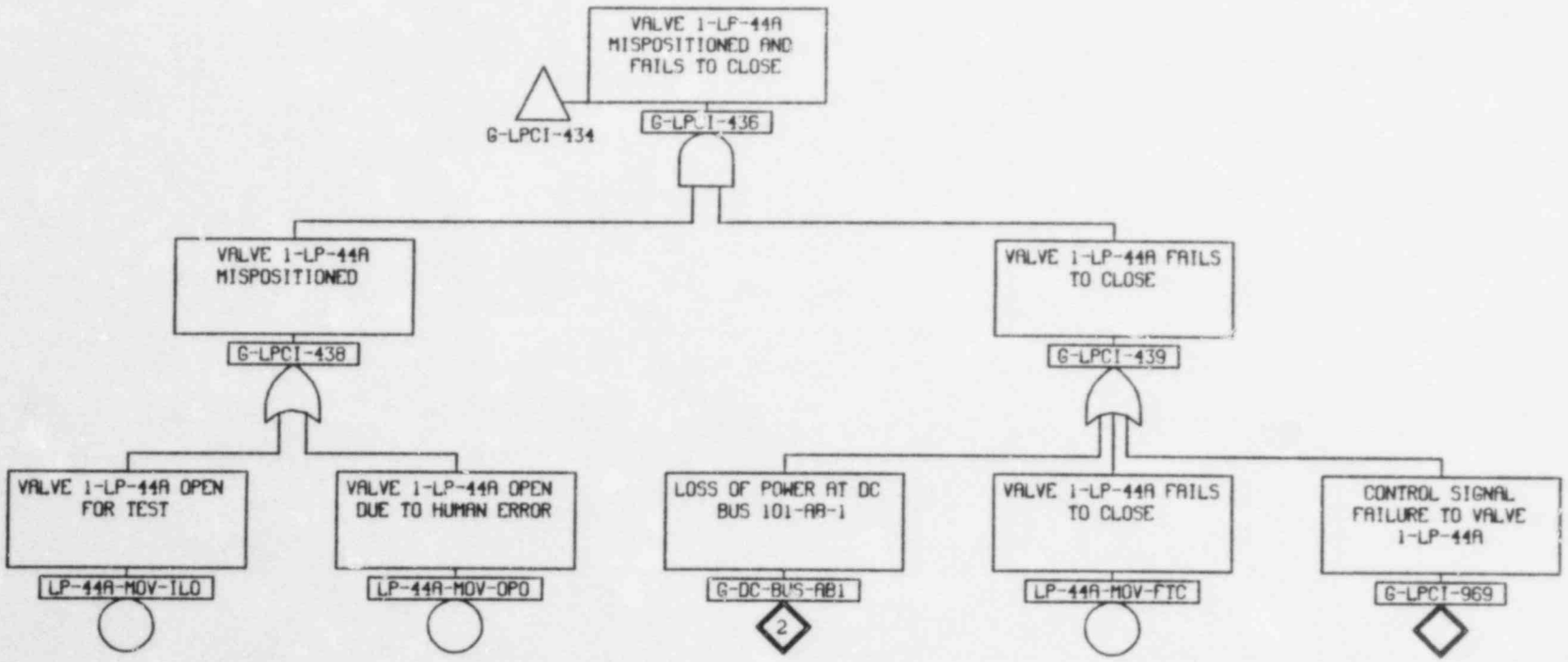

TRAIN A FLOW
DIVERTED THROUGH
TEST LINE B
G-LPCI-326
G-LPCI-429
EXCESS FLOW THROUGH
TEST LINE B
BREAK IN TRAIN B
VALVE 1-LP-98 DOES
NOT CLOSE
G-LPCI-442
LOCA-LOOP-B
1
G-LPCI-430

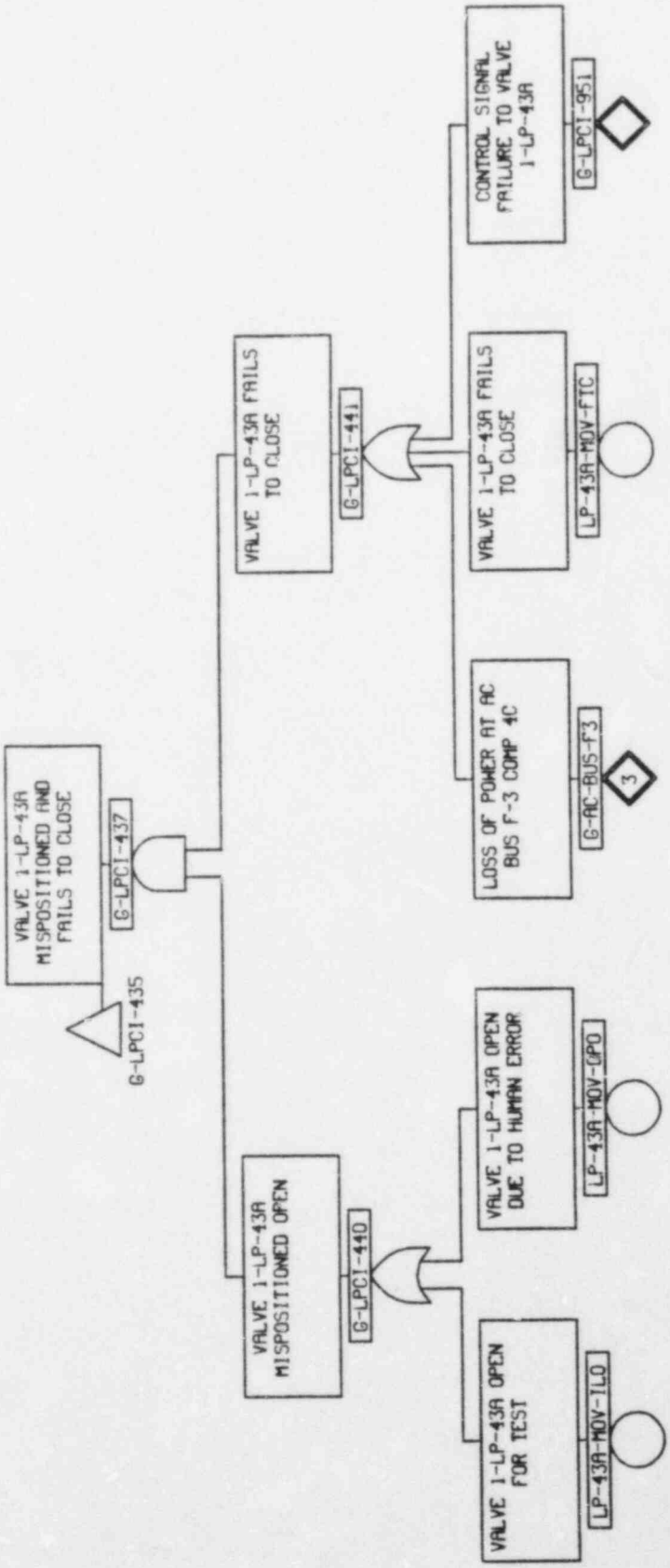

VALVE 1-LP-9B DOES NOT CLOSE
G-LPCI-429
G-LPCI-456
G-LPCI-430
LOSS OF AC POWER AT BUS EF 3
VALVE 1-LP-9B FAILS TO CLOSE
CONTROL SIGNAL FAILURE TO VALVE 1-LP-9B
G-AC-BUS-EF3
LP-9B-MOV-FTC
G-LPCI-1064
1

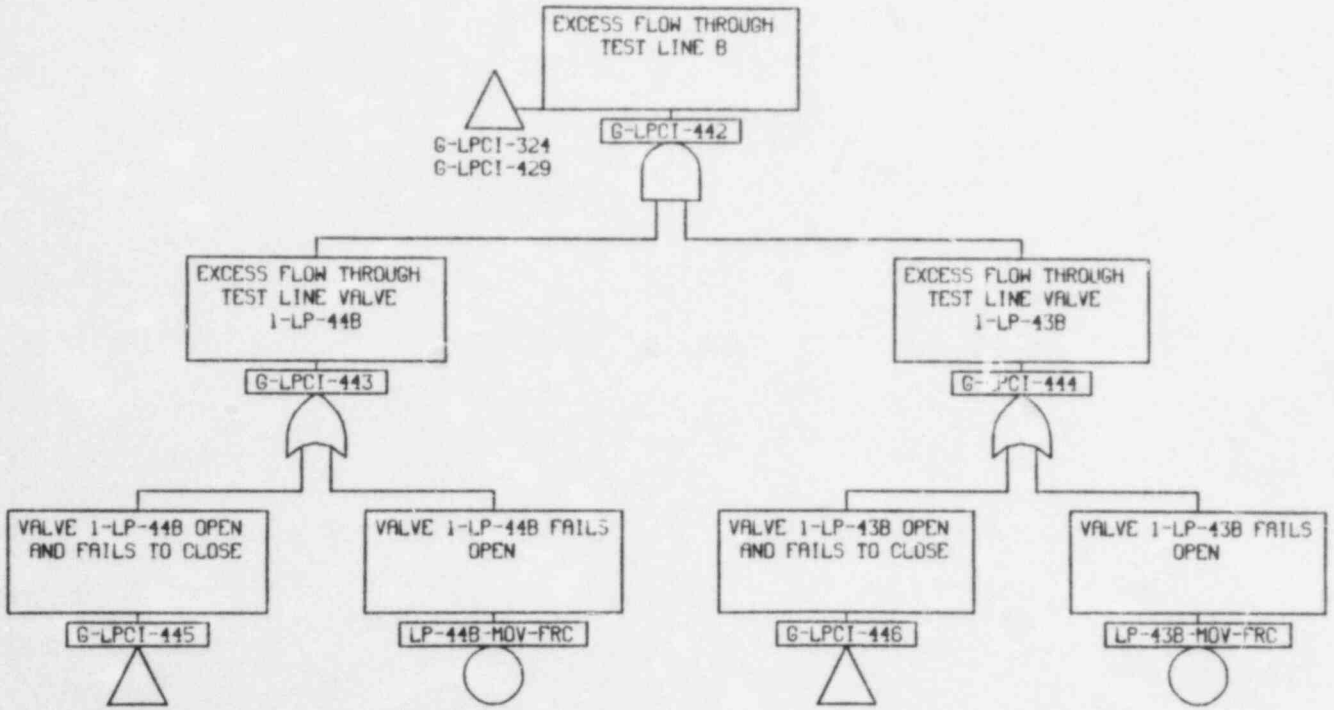

TRAIN B FLOW DIVERTED THRU TEST LINE A
G-LPCI-333
G-LPCI-431
EXCESS FLOW THROUGH TEST LINE A
BREAK IN TRAIN A
VALVE 1-LP-9A DOES NOT CLOSE
G-LPCI-433
LOCA-LOOP-A
G-LPCI-432
1

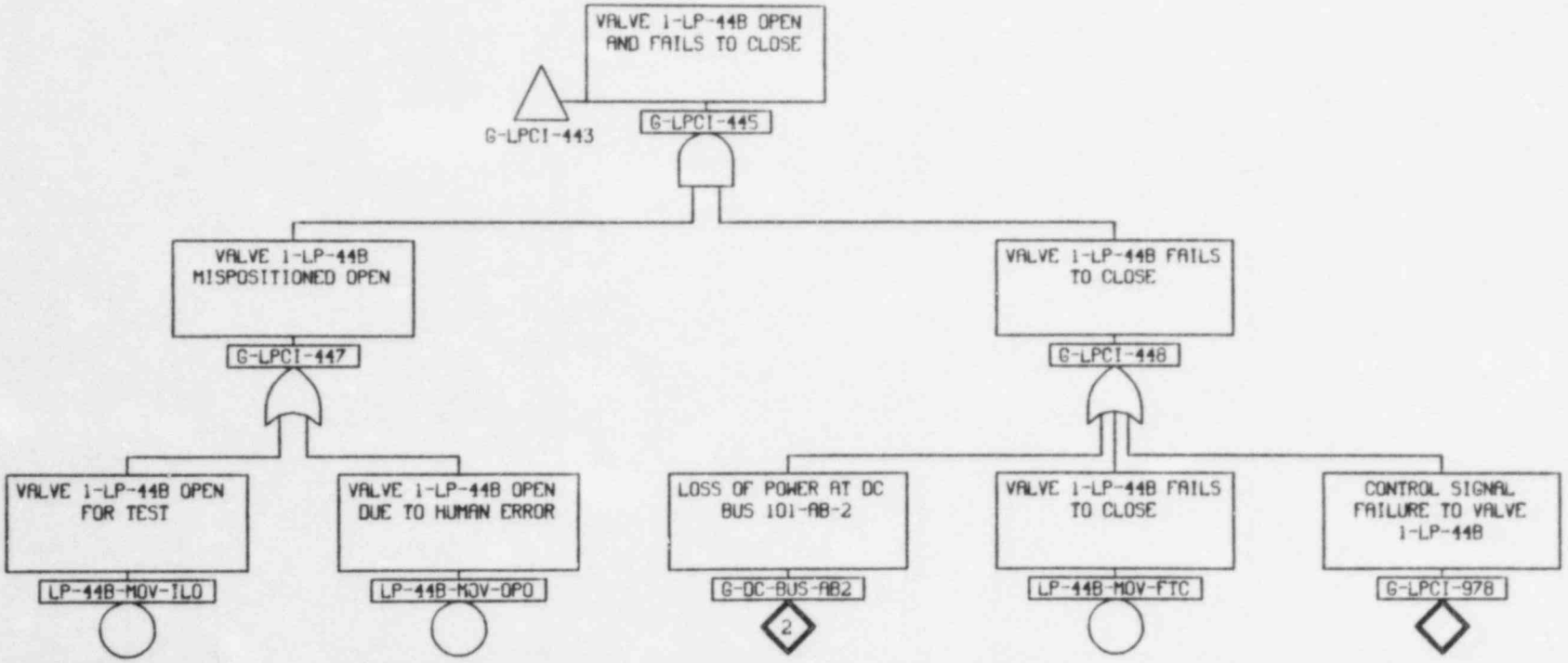

VALVE 1-LP-9A DOES NOT CLOSE
G-LPCI-432
G-LPCI-431
G-LPCI-451
VALVE 1-LP-9A FAILS TO CLOSE
LP-9A-MOV-FTC
CONTROL SIGNAL FAILURE TO VALVE 1-LP-9A
G-LPCI-1075
LOSS OF AC POWER AT BUS F-E 3
G-AC-BUS-FE3
1

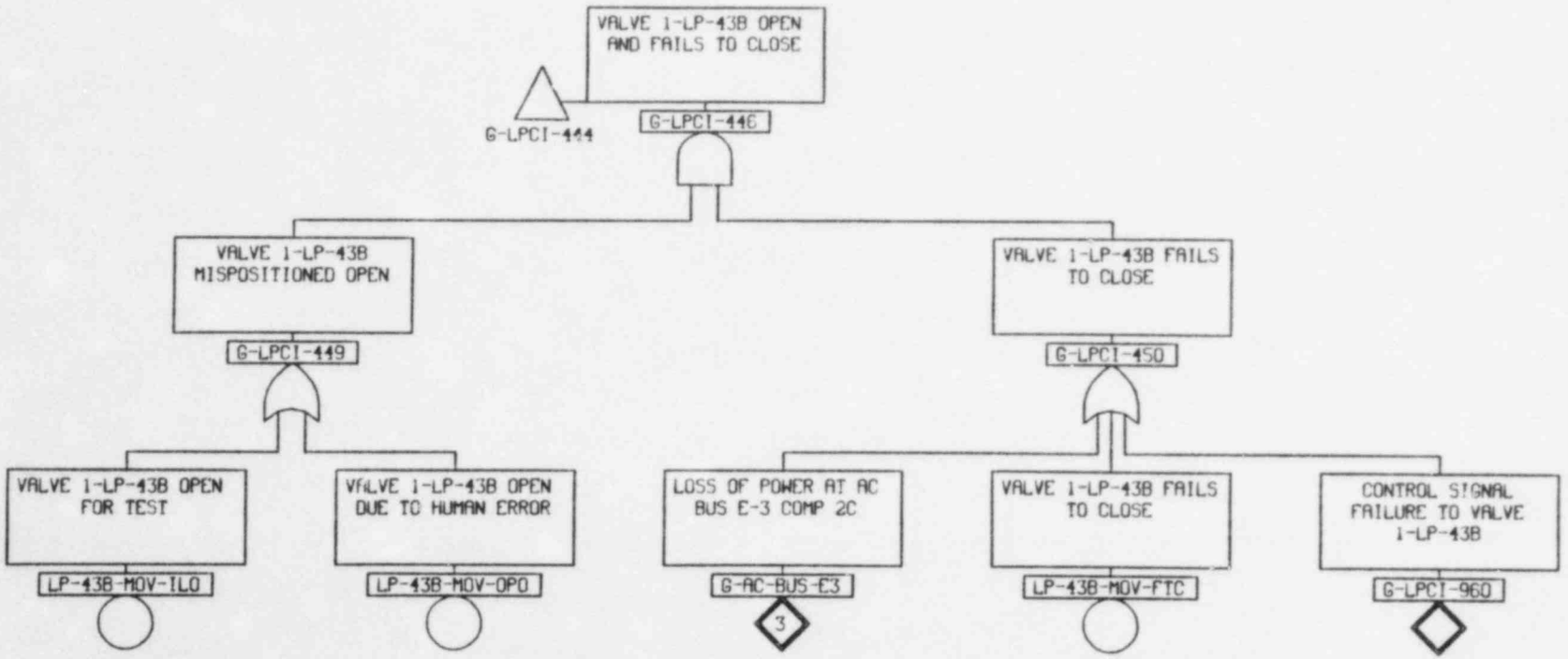

EXCESS FLOW THROUGH TEST LINE A
G-LPCI-321
G-LPCI-431
G-LPCI-433
EXCESS FLOW THROUGH TEST LINE VALVE 1-LP-44A
G-LPCI-434
VALVE 1-LP-44A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-436
VALVE 1-LP-44A FAILS OPEN
LP-44A-MOV-FRC
EXCESS FLOW THROUGH TEST LINE VALVE 1-LP-43A
G-LPCI-435
VALVE 1-LP-43A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-437
VALVE 1-LP-43A FAILS OPEN
LP-43A-MOV-FRC

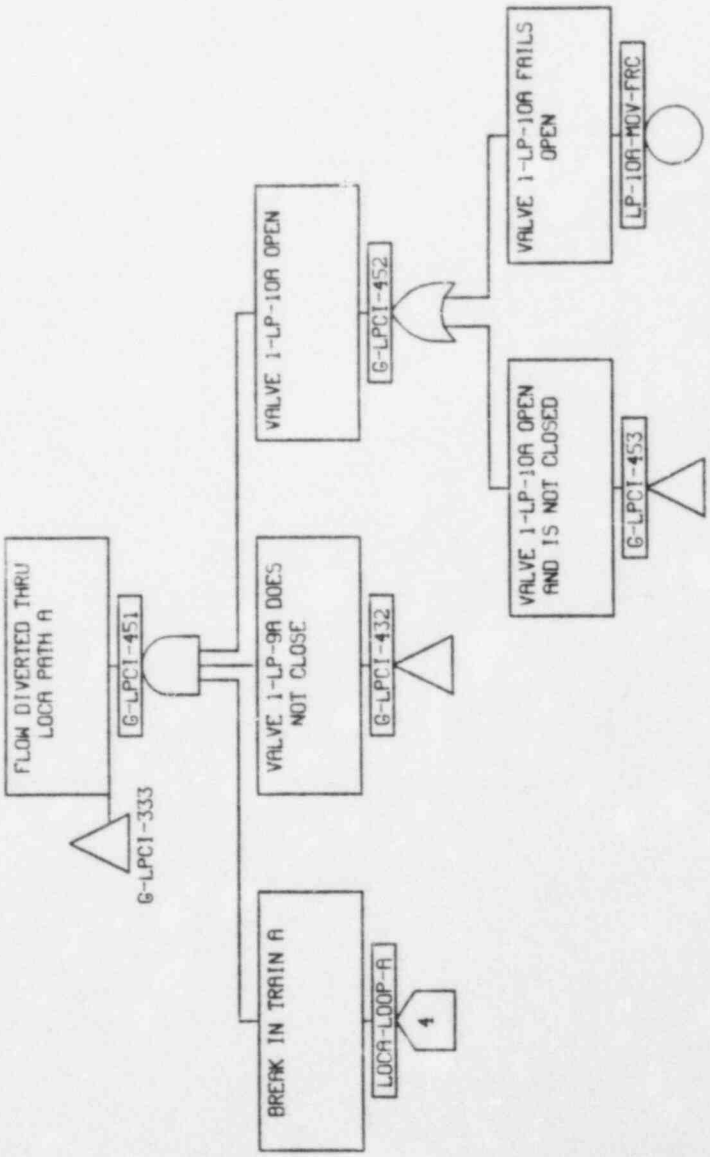

VALVE 1-LP-44A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-434
G-LPCI-436
VALVE 1-LP-44A MISPOSITIONED
G-LPCI-438
VALVE 1-LP-44A FAILS TO CLOSE
G-LPCI-439
VALVE 1-LP-44A OPEN FOR TEST
LP-44A-MOV-ILO
VALVE 1-LP-44A OPEN DUE TO HUMAN ERROR
LP-44A-MOV-OPO
LOSS OF POWER AT DC BUS 101-AA-1
G-DC-BUS-AB1
2
VALVE 1-LP-44A FAILS TO CLOSE
LP-44A-MOV-FTC
CONTROL SIGNAL FAILURE TO VALVE 1-LP-44A
G-LPCI-969

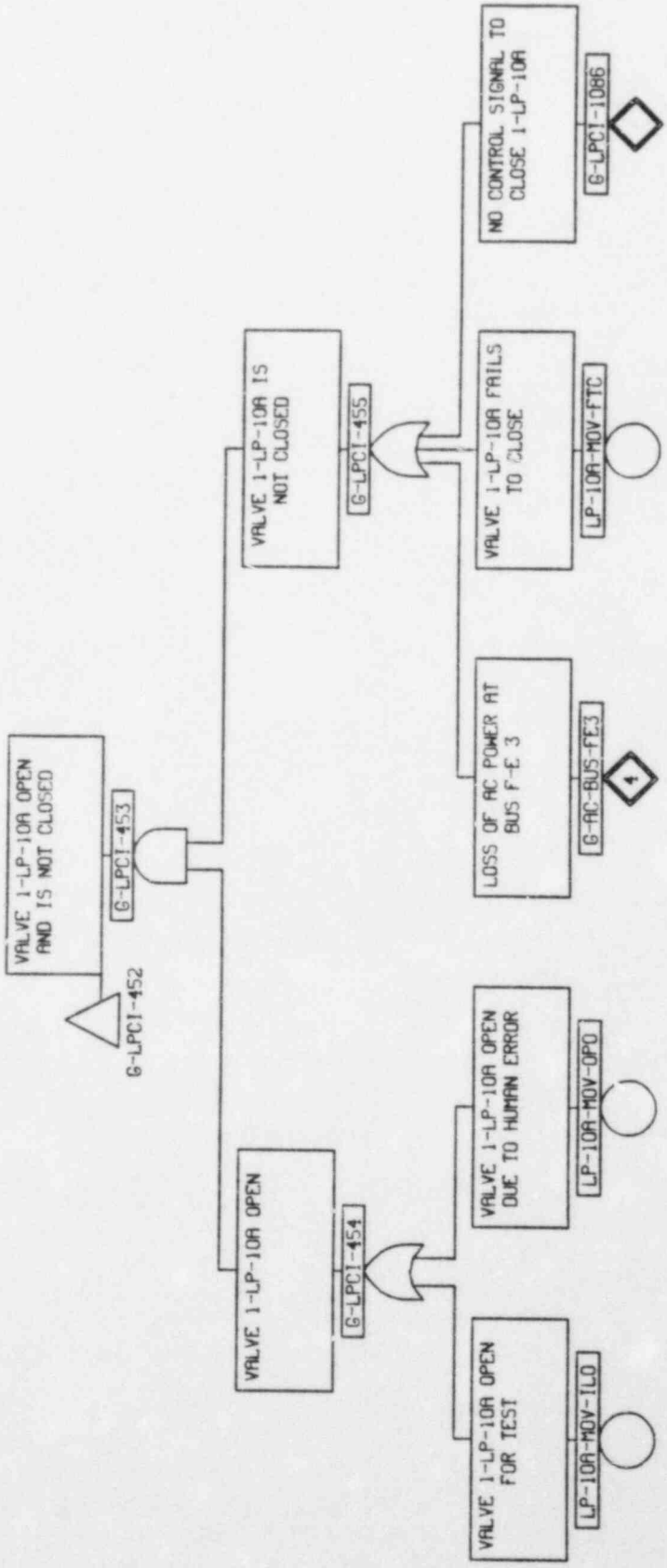

VALVE 1-LP-43A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-435
G-LPCI-437
VALVE 1-LP-43A MISPOSITIONED OPEN
G-LPCI-440
VALVE 1-LP-43A FAILS TO CLOSE
G-LPCI-441
VALVE 1-LP-43A OPEN FOR TEST
LP-43A-MOV-1LO
VALVE 1-LP-43A OPEN DUE TO HUMAN ERROR
LP-43A-MOV-OPO
LOSS OF POWER AT AC BUS F-3 COMP 4C
G-AC-BUS-F3
3
VALVE 1-LP-43A FAILS TO CLOSE
LP-43A-MOV-FTC
CONTROL SIGNAL FAILURE TO VALVE 1-LP-43A
G-LPCI-951

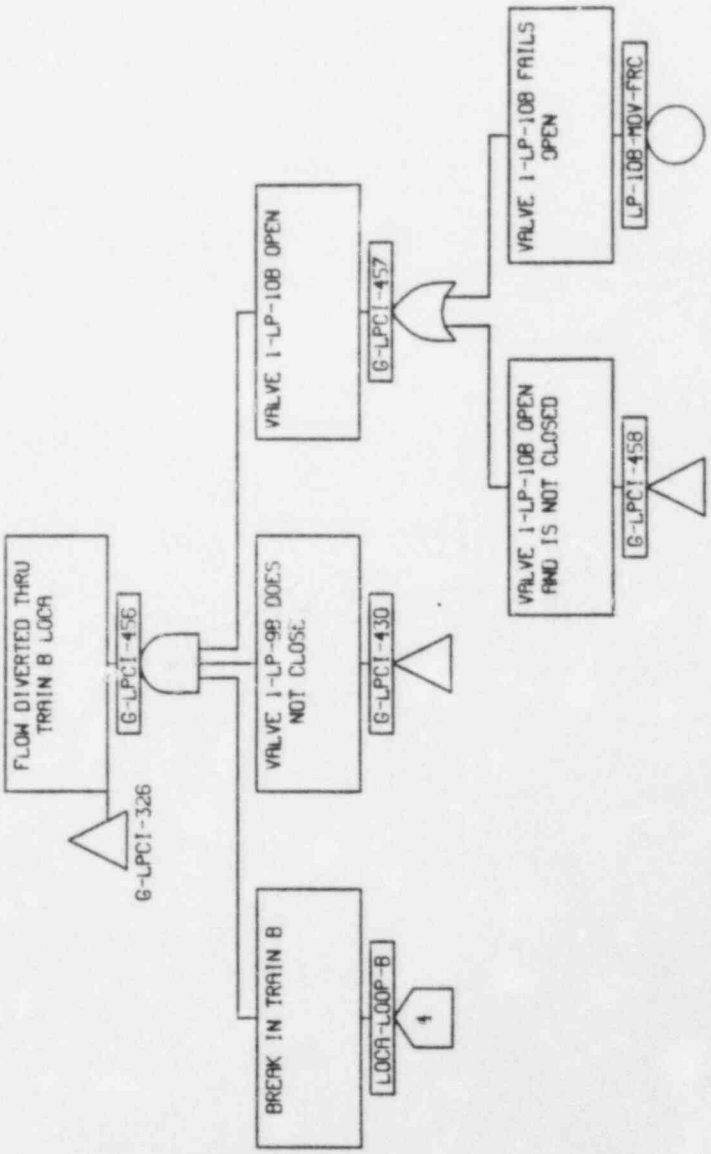

EXCESS FLOW THROUGH TEST LINE B
G-LPCI-442
G-LPCI-324
G-LPCI-429
EXCESS FLOW THROUGH TEST LINE VALVE 1-LP-44B
G-LPCI-443
EXCESS FLOW THROUGH TEST LINE VALVE 1-LP-43B
G-LPCI-444
VALVE 1-LP-44B OPEN AND FAILS TO CLOSE
G-LPCI-445
VALVE 1-LP-44B FAILS OPEN
LP-44B-MOV-FRC
VALVE 1-LP-43B OPEN AND FAILS TO CLOSE
G-LPCI-446
VALVE 1-LP-43B FAILS OPEN
LP-43B-MOV-FRC

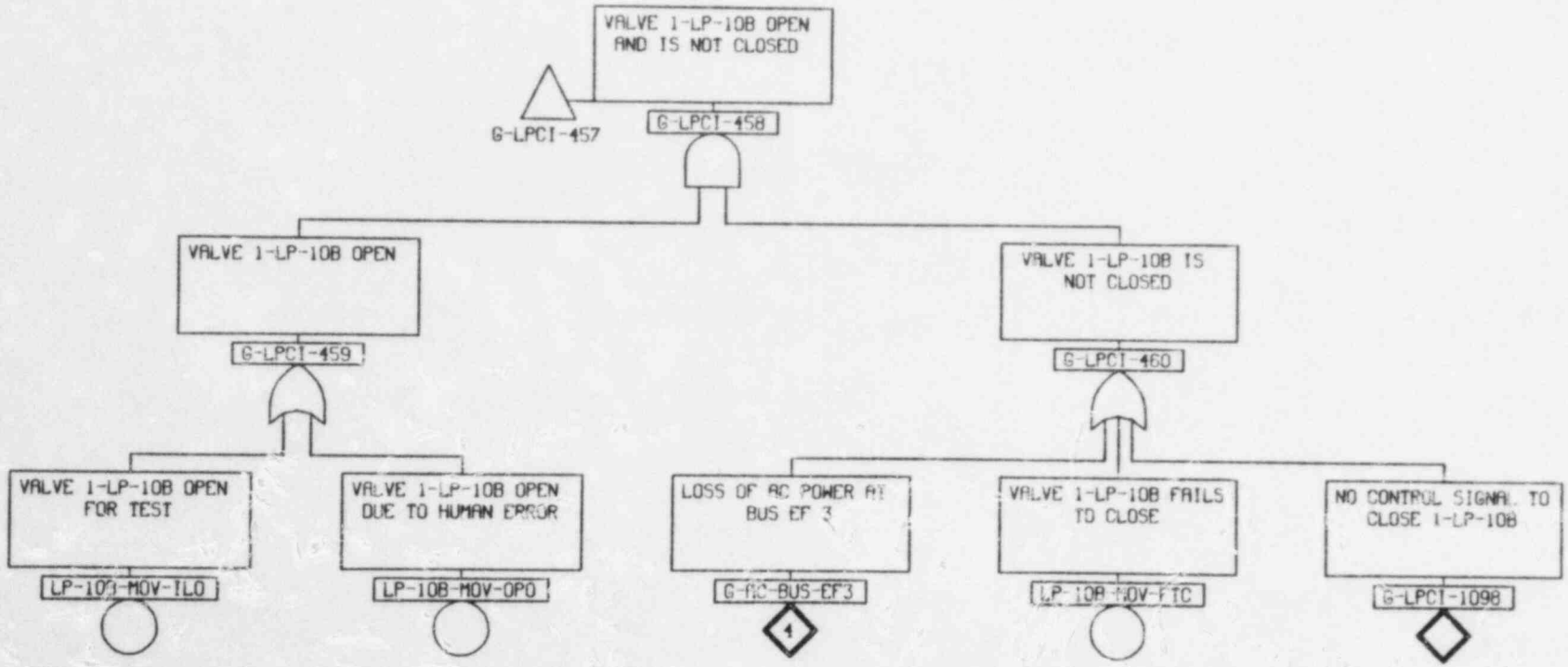

VALVE 1-LP-44B OPEN AND FAILS TO CLOSE
G-LPCI-443
G-LPCI-445
VALVE 1-LP-44B MISPOSITIONED OPEN
G-LPCI-447
VALVE 1-LP-44B FAILS TO CLOSE
G-LPCI-448
VALVE 1-LP-44B OPEN FOR TEST
LP-44B-MOV-1LO
VALVE 1-LP-44B OPEN DUE TO HUMAN ERROR
LP-44B-MOV-OPO
LOSS OF POWER AT DC BUS 101-AB-2
G-DC-BUS-AB2
2
VALVE 1-LP-44B FAILS TO CLOSE
LP-44B-MOV-FTC
CONTROL SIGNAL FAILURE TO VALVE 1-LP-44B
G-LPCI-978

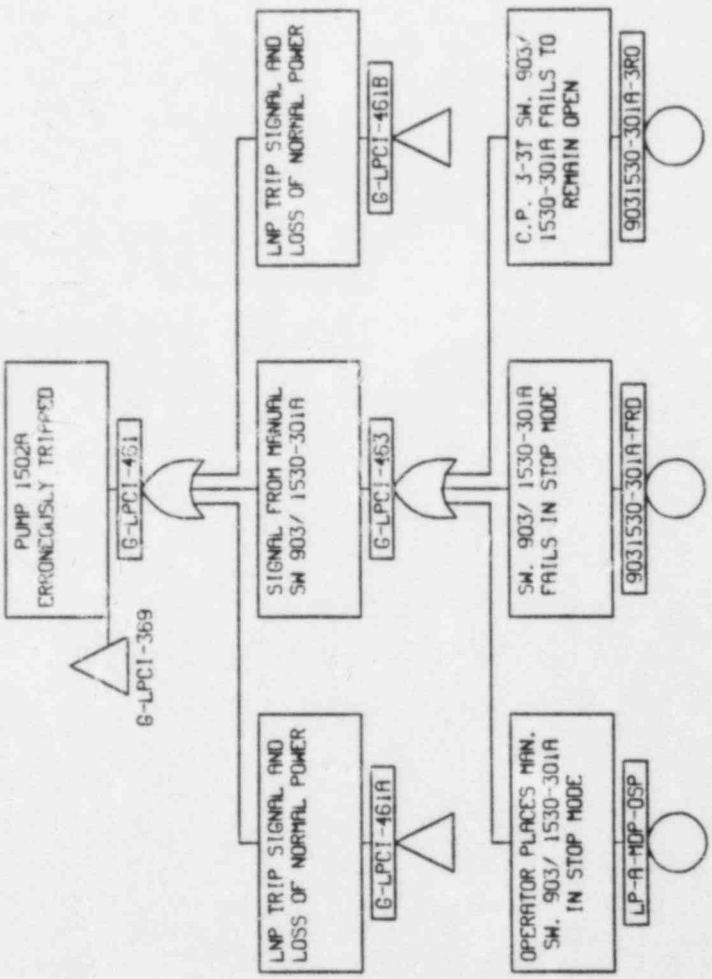

VALVE 1-LP-43B OPEN AND FAILS TO CLOSE
G-LPCI-444
G-LPCI-446
VALVE 1-LP-43B MISPOSITIONED OPEN
G-LPCI-449
VALVE 1-LP-43B FAILS TO CLOSE
G-LPCI-450
VALVE 1-LP-43B OPEN FOR TEST
LP-43B-MOV-ILO
VALVE 1-LP-43B OPEN DUE TO HUMAN ERROR
LP-43B-MOV-OPO
LOSS OF POWER AT AC BUS E-3 COMP 2C
G-AC-BUS-E3
3
VALVE 1-LP-43B FAILS TO CLOSE
LP-43B-MOV-FTC
CONTROL SIGNAL FAILURE TO VALVE 1-LP-43B
G-LPCI-960

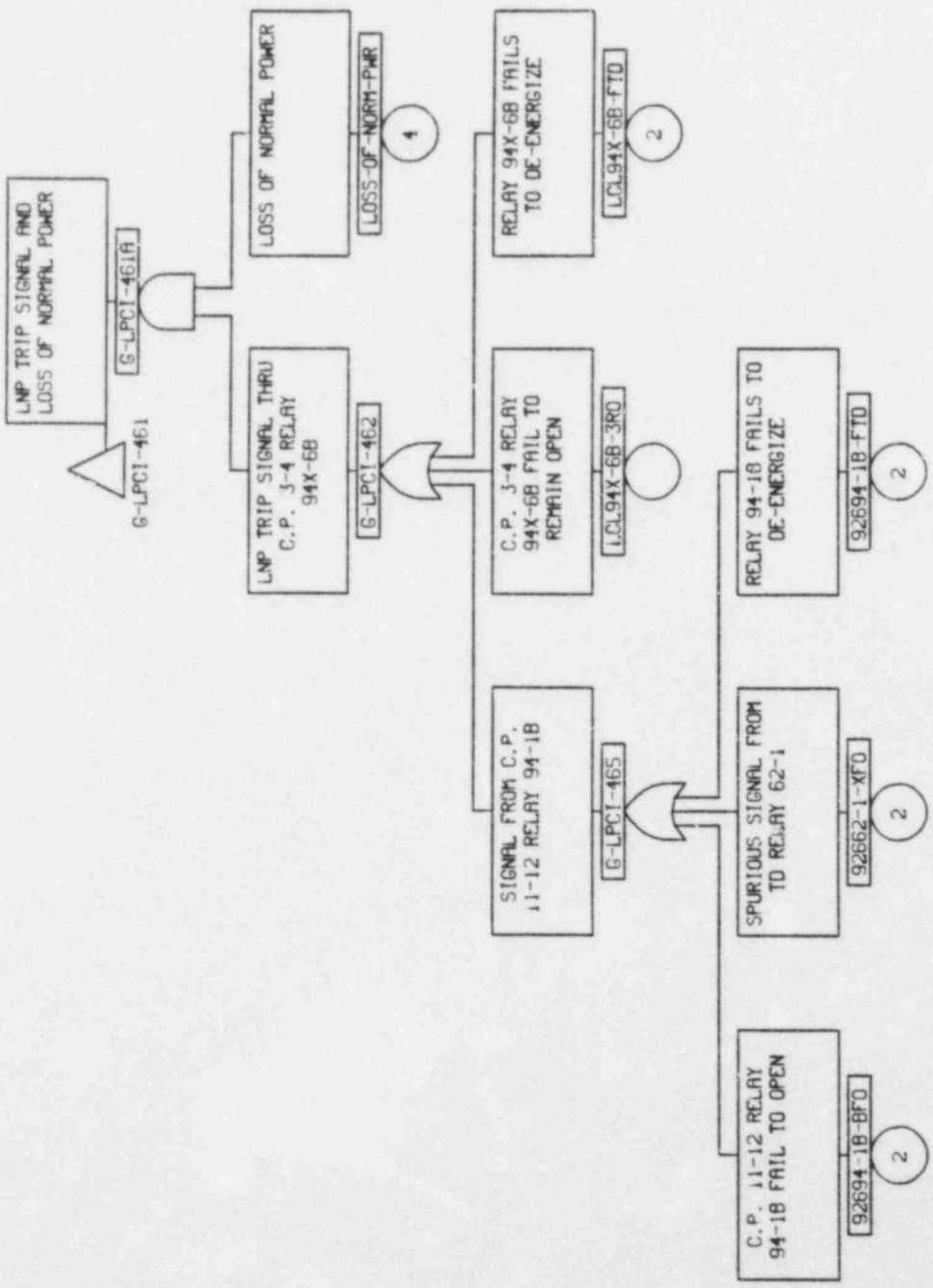

FLOW DIVERTED THRU LOCA PATH A
G-LPCI-333
G-LPCI-451
BREAK IN TRAIN A
LOCA-LOOP-A
4
VALVE 1-LP-9A DOES NOT CLOSE
G-LPCI-432
VALVE 1-LP-10A OPEN
G-LPCI-452
VALVE 1-LP-10A OPEN AND IS NOT CLOSED
G-LPCI-453
VALVE 1-LP-10A FAILS OPEN
LP-10A-MOV-FRC

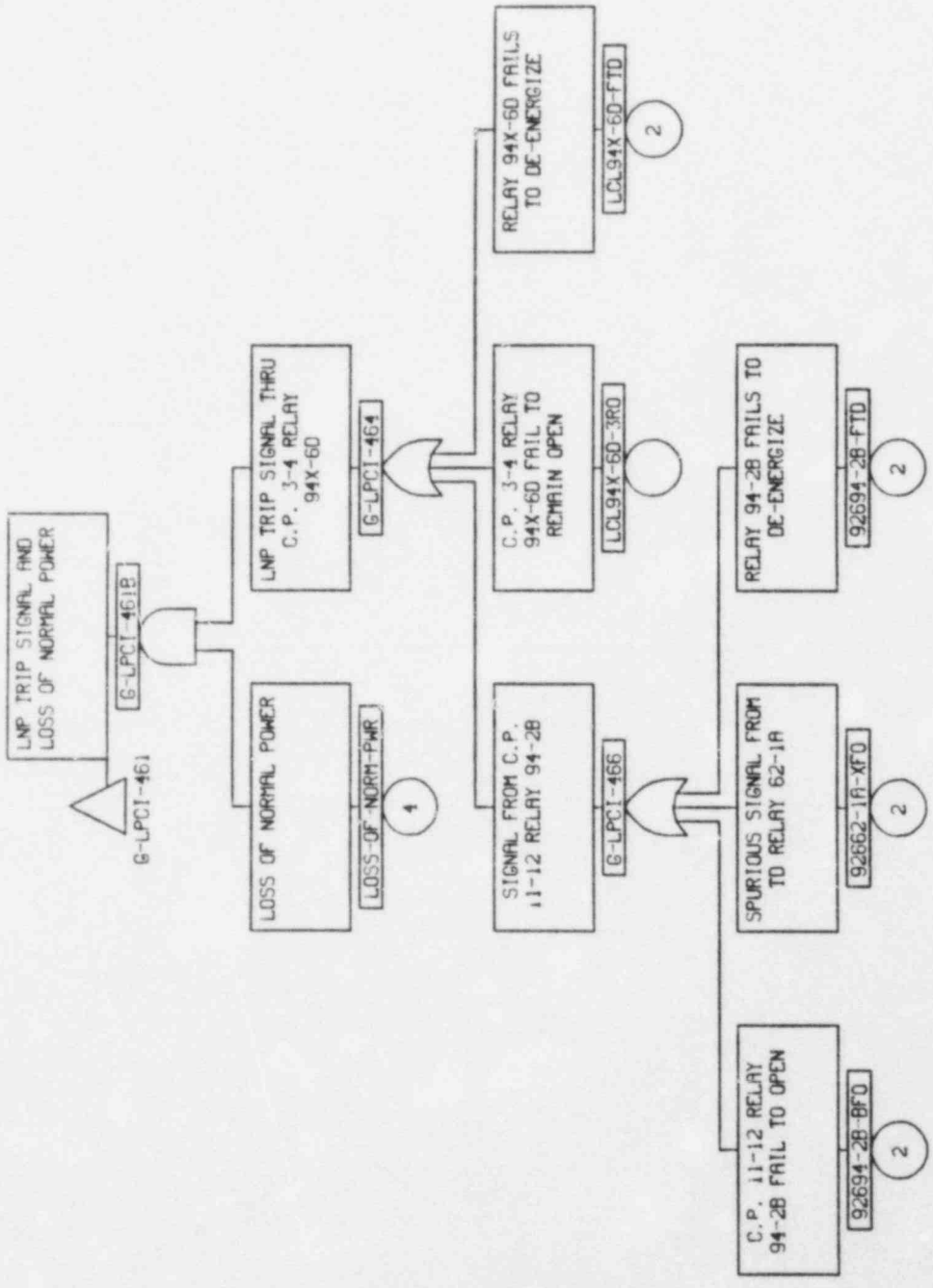

VALVE 1-LP-10A OPEN AND IS NOT CLOSED
G-LPCI-452
G-LPCI-453
VALVE 1-LP-10A IS NOT CLOSED
G-LPCI-455
NO CONTROL SIGNAL TO CLOSE 1-LP-10A
G-LPCI-1086
VALVE 1-LP-10A FAILS TO CLOSE
LP-10A-MOV-FTC
LOSS OF AC POWER AT BUS F-E 3
G-AC-BUS-FE3
1
VALVE 1-LP-10A OPEN
G-LPCI-454
VALVE 1-LP-10A OPEN DUE TO HUMAN ERROR
LP-10A-MOV-OPO
VALVE 1-LP-10A OPEN FOR TEST
LP-10A-MOV-ILO

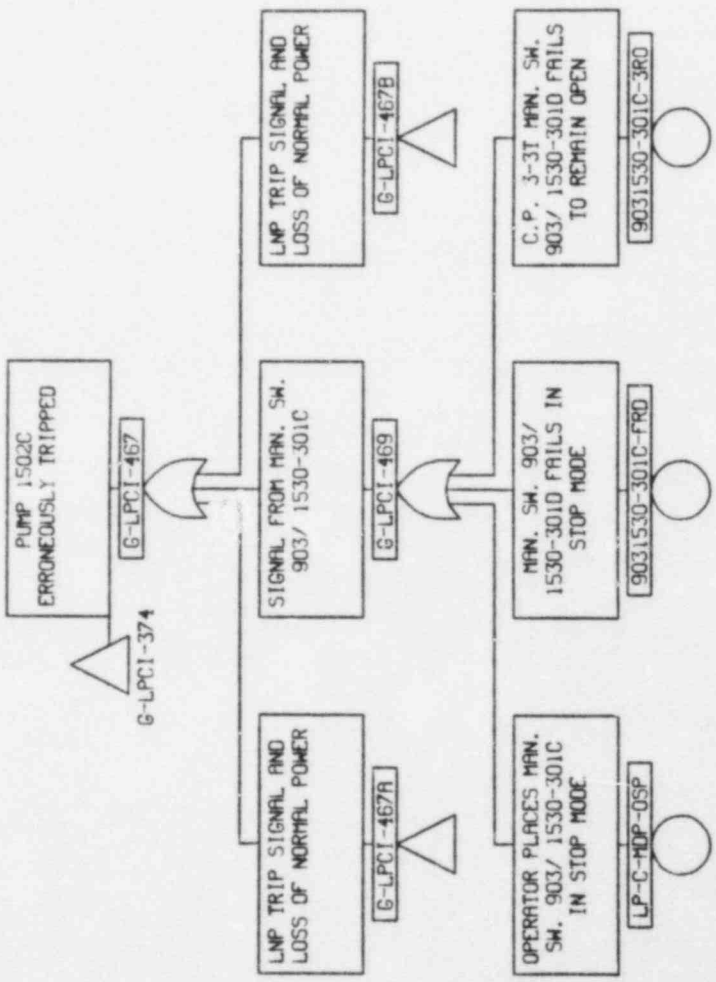

FLOW DIVERTED THRU TRAIN B LOCA
G-LPCI-456
G-LPCI-326
VALVE 1-LP-98 DOES NOT CLOSE
G-LPCI-430
VALVE 1-LP-108 OPEN
G-LPCI-457
VALVE 1-LP-108 OPEN AND IS NOT CLOSED
G-LPCI-458
VALVE 1-LP-108 FAILS OPEN
LP-108-MOV-FRC
BREAK IN TRAIN B
LOCA-LOOP-B
1

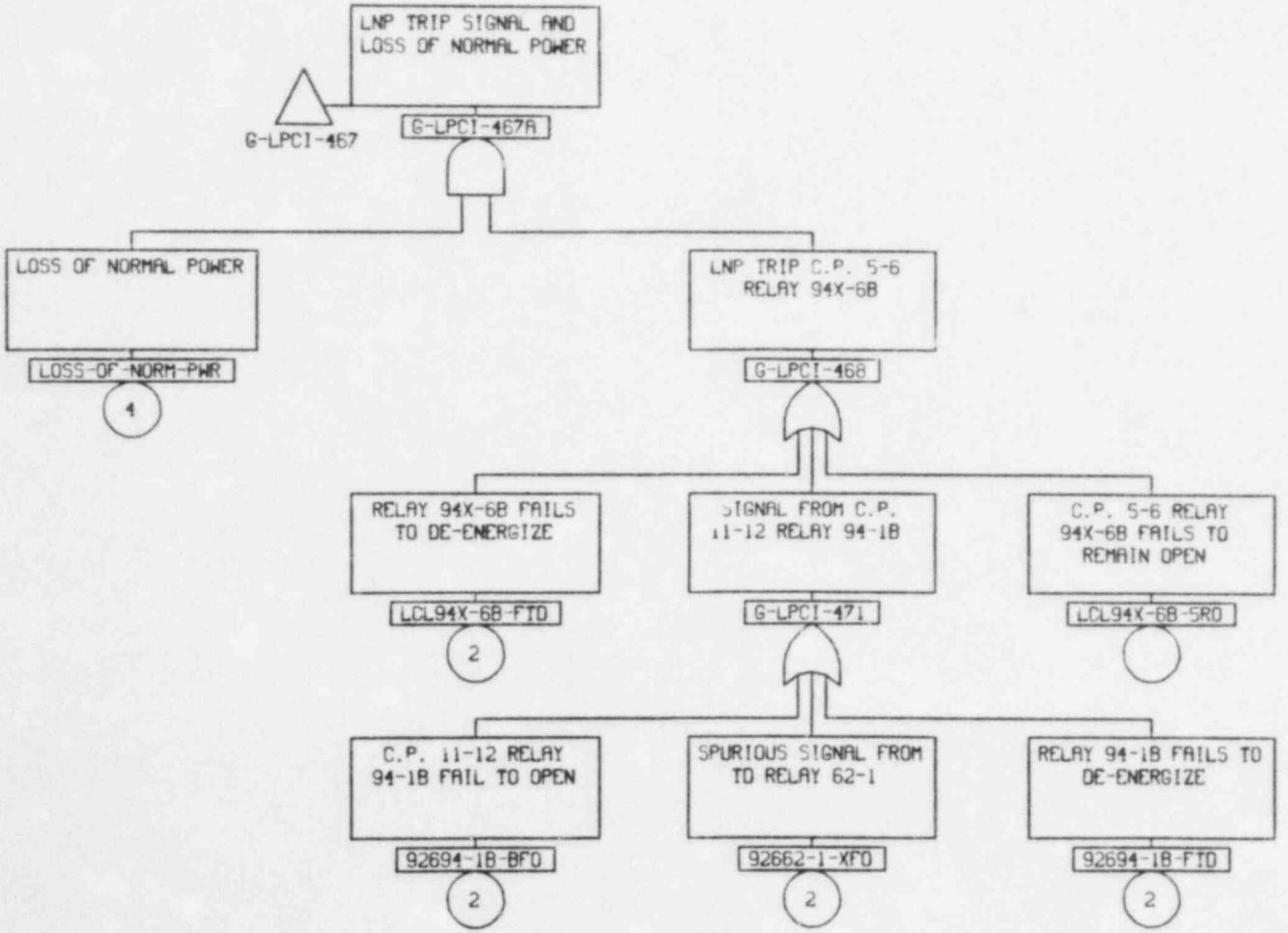

VALVE 1-LP-108 OPEN AND IS NOT CLOSED
G-LPCI-457
G-LPCI-458
VALVE 1-LP-108 OPEN
G-LPCI-459
VALVE 1-LP-108 IS NOT CLOSED
G-LPCI-460
VALVE 1-LP-108 OPEN FOR TEST
VALVE 1-LP-108 OPEN DUE TO HUMAN ERROR
LOSS OF AC POWER AT BUS EF 3
VALVE 1-LP-108 FAILS TO CLOSE
NO CONTROL SIGNAL TO CLOSE 1-LP-108
LP-108-MOV-ILO
LP-108-MOV-OPO
G-AC-BUS-EF3
1
LP-108-MOV-FTC
G-LPCI-1098

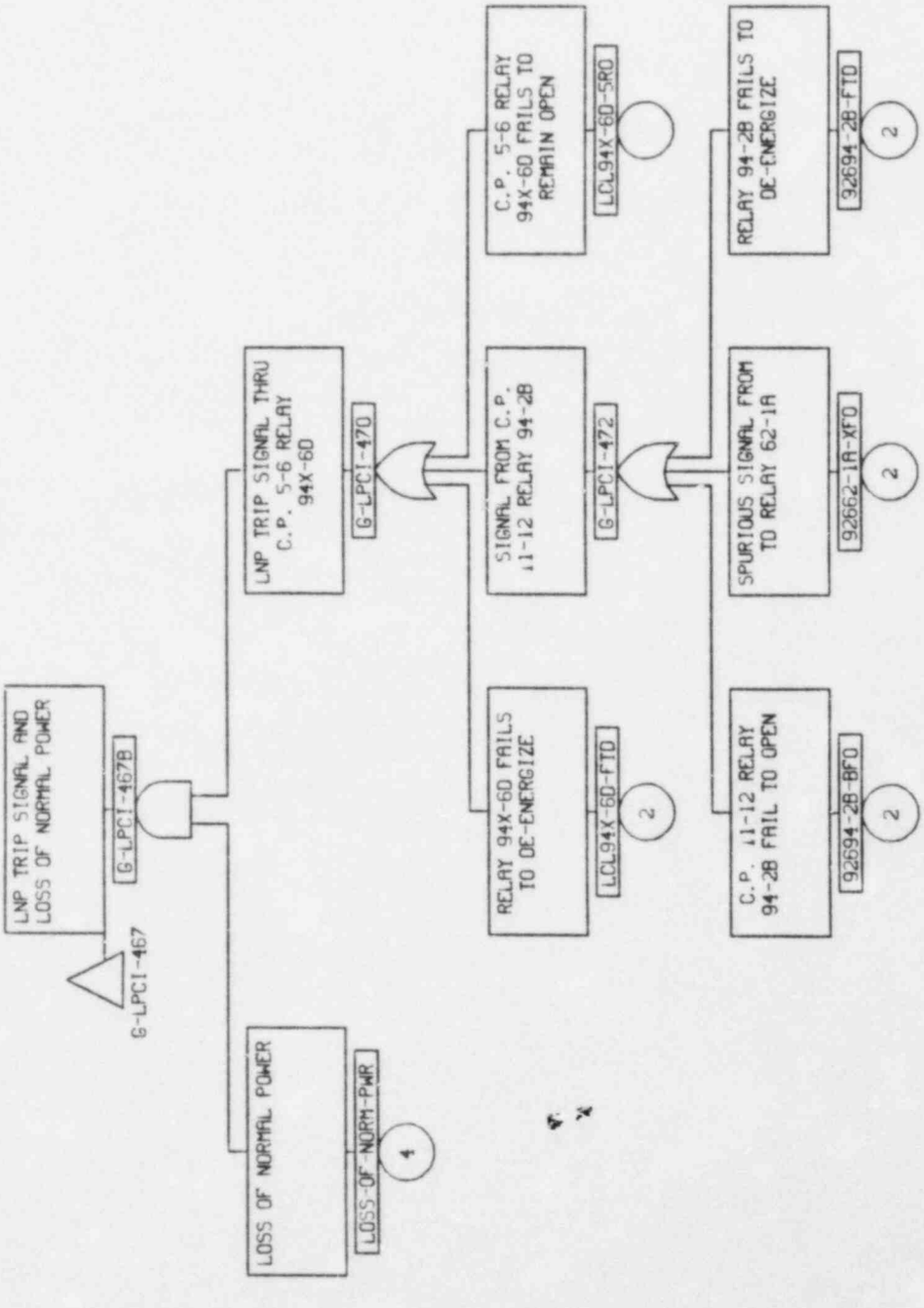

PUMP 1502A
ERRONEOUSLY TRIPPED
G-LPCI-369
G-LPCI-461
LNP TRIP SIGNAL AND
LOSS OF NORMAL POWER
G-LPCI-461A
SIGNAL FROM MANUAL
SW 903/ 1530-301A
G-LPCI-463
LNP TRIP SIGNAL AND
LOSS OF NORMAL POWER
G-LPCI-461B
SW. 903/ 1530-301A
FAILS IN STOP MODE
9031530-301A-FRD
OPERATOR PLACES MAN.
SW. 903/ 1530-301A
IN STOP MODE
LP-A-MOP-OSP
C.P. 3-3T SW. 903/
1530-301A FAILS TO
REMAIN OPEN
9031530-301A-3RO

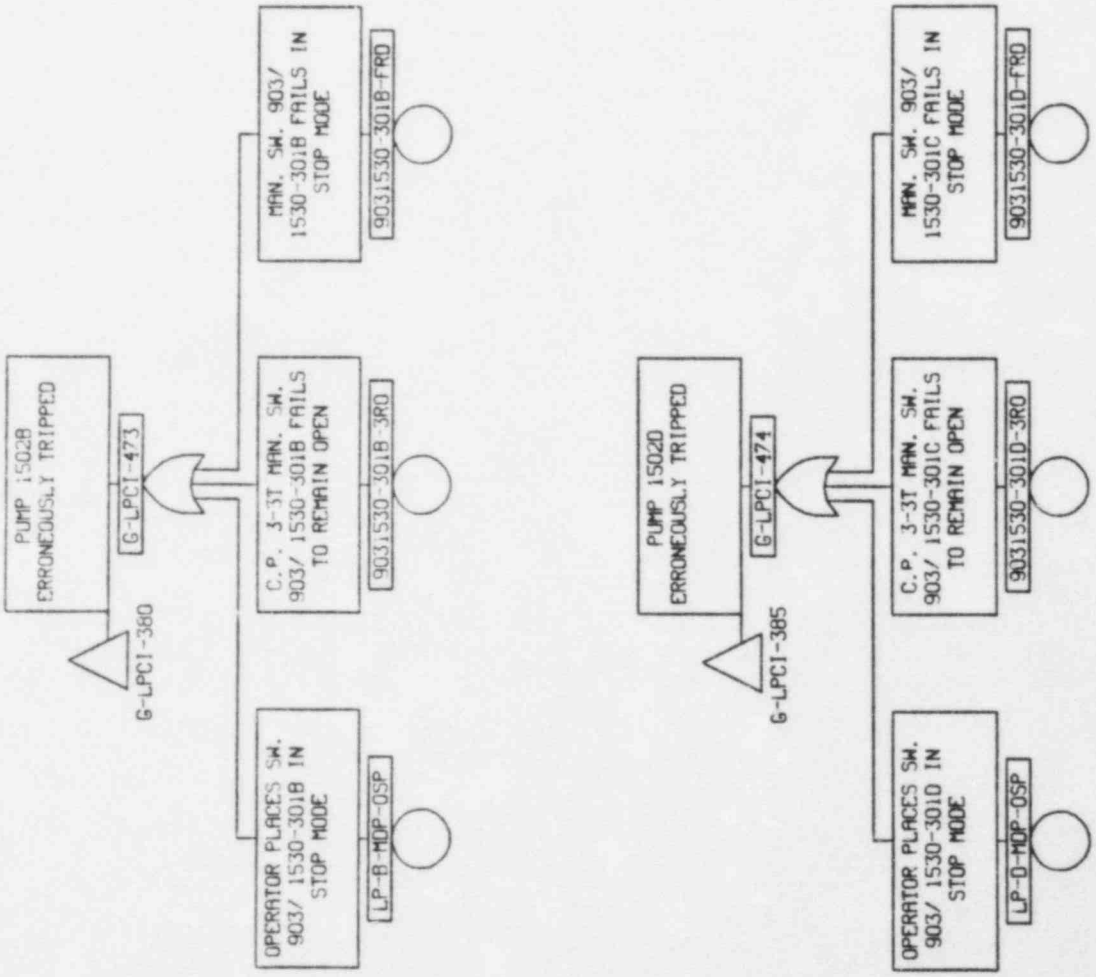

LNP TRIP SIGNAL AND
LOSS OF NORMAL POWER
G-LPCI-461
G-LPCI-461A
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
4
LNP TRIP SIGNAL THRU
C.P. J-4 RELAY
94X-6B
G-LPCI-462
RELAY 94X-6B FAILS
TO DE-ENERGIZE
LGL94X-6B-FTO
2
C.P. J-4 RELAY
94X-6B FAIL TO
REMAIN OPEN
LGL94X-6B-3RO
SIGNAL FROM C.P.
11-12 RELAY 94-1B
G-LPCI-465
RELAY 94-1B FAILS TO
DE-ENERGIZE
92694-1B-FTO
2
SPURIOUS SIGNAL FROM
TO RELAY 62-1
92662-1-XFO
2
C.P. 11-12 RELAY
94-1B FAIL TO OPEN
92694-1B-BFO
2

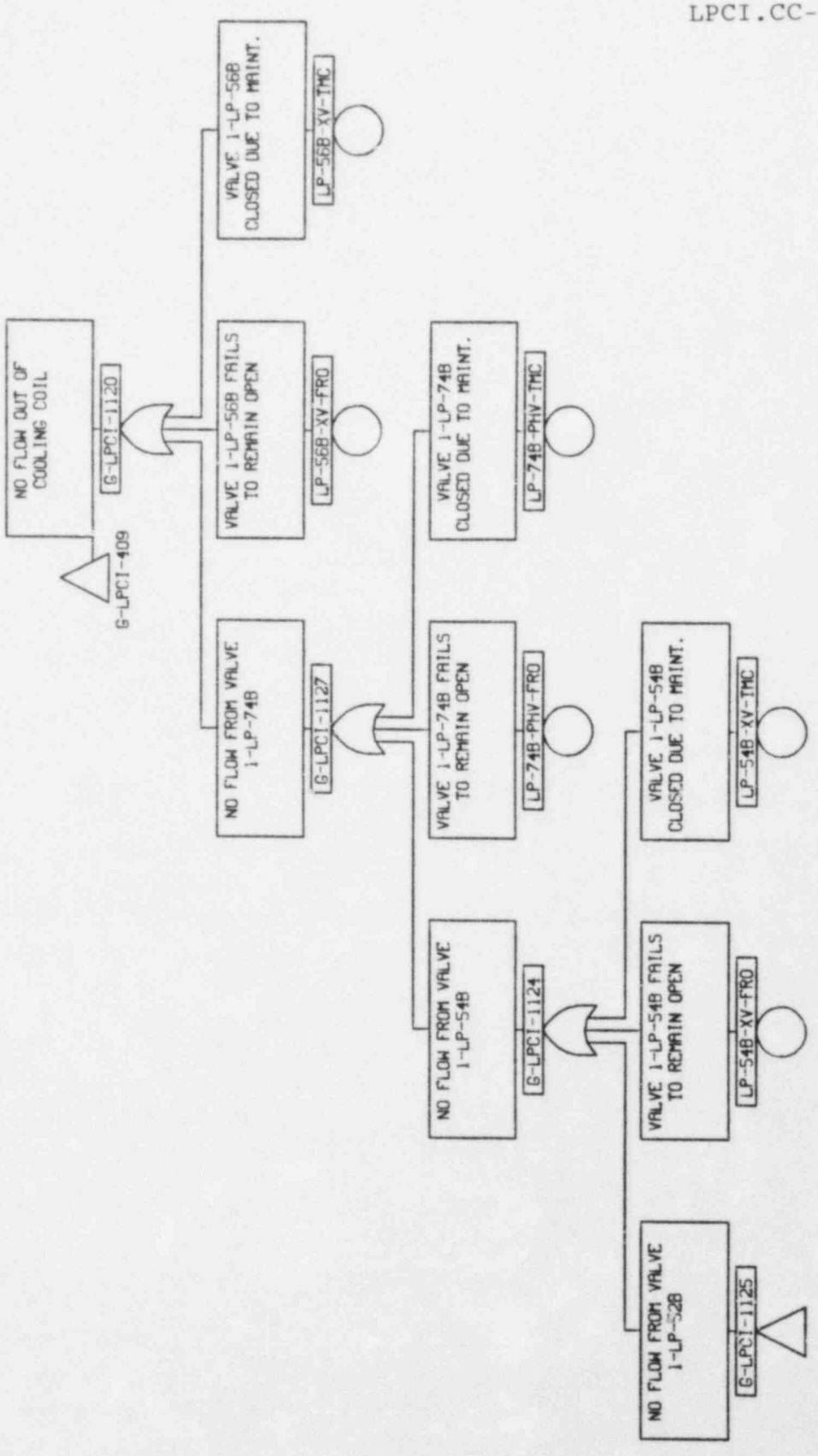

LNP TRIP SIGNAL AND LOSS OF NORMAL POWER
G-LPCI-461
G-LPCI-461B
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
4
LNP TRIP SIGNAL THRU C.P. 3-4 RELAY 94X-60
G-LPCI-464
SIGNAL FROM C.P. 11-12 RELAY 94-2B
G-LPCI-466
C.P. 3-4 RELAY 94X-60 FAIL TO REMAIN OPEN
LCL94X-60-3RO
RELAY 94X-60 FAILS TO DE-ENERGIZE
LCL94X-60-FTD
2
SPURIOUS SIGNAL FROM TO RELAY 62-1A
92662-1A-XFD
2
RELAY 94-2B FAILS TO DE-ENERGIZE
92694-2B-FTD
2
C.P. 11-12 RELAY 94-2B FAIL TO OPEN
92694-2B-BFO
2

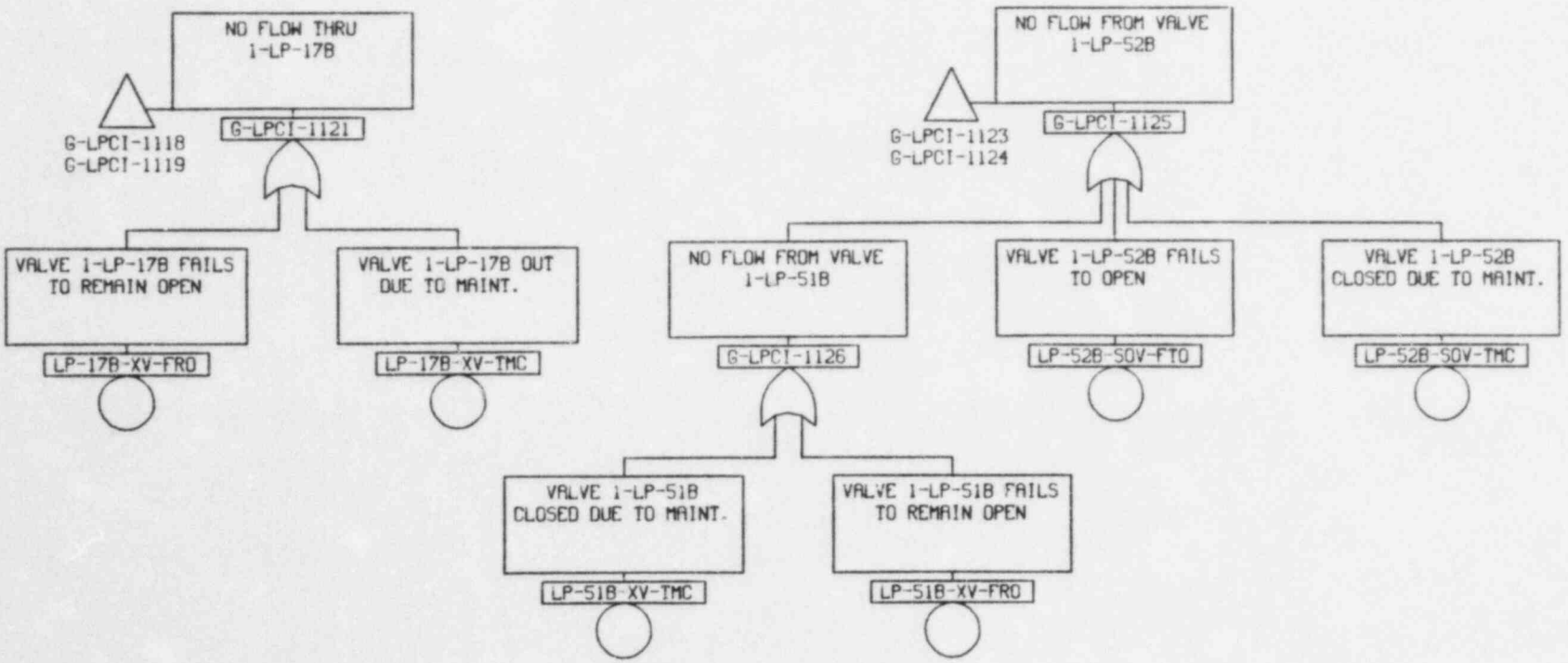

PUMP 1502C
ERRONEOUSLY TRIPPED
G-LPCI-374
G-LPCI-467
LNP TRIP SIGNAL AND
LOSS OF NORMAL POWER
G-LPCI-467B
SIGNAL FROM MAN. SW.
903/ 1530-301C
G-LPCI-469
C.P. 3-3T MAN. SW.
903/ 1530-3010 FAILS
TO REMAIN OPEN
9031530-301C-3R0
MAN. SW. 903/
1530-3010 FAILS IN
STOP MODE
9031530-301C-FR0
LNP TRIP SIGNAL AND
LOSS OF NORMAL POWER
G-LPCI-467A
OPERATOR PLACES MAN.
SW. 903/ 1530-301C
IN STOP MODE
LP-C-MOP-0SP

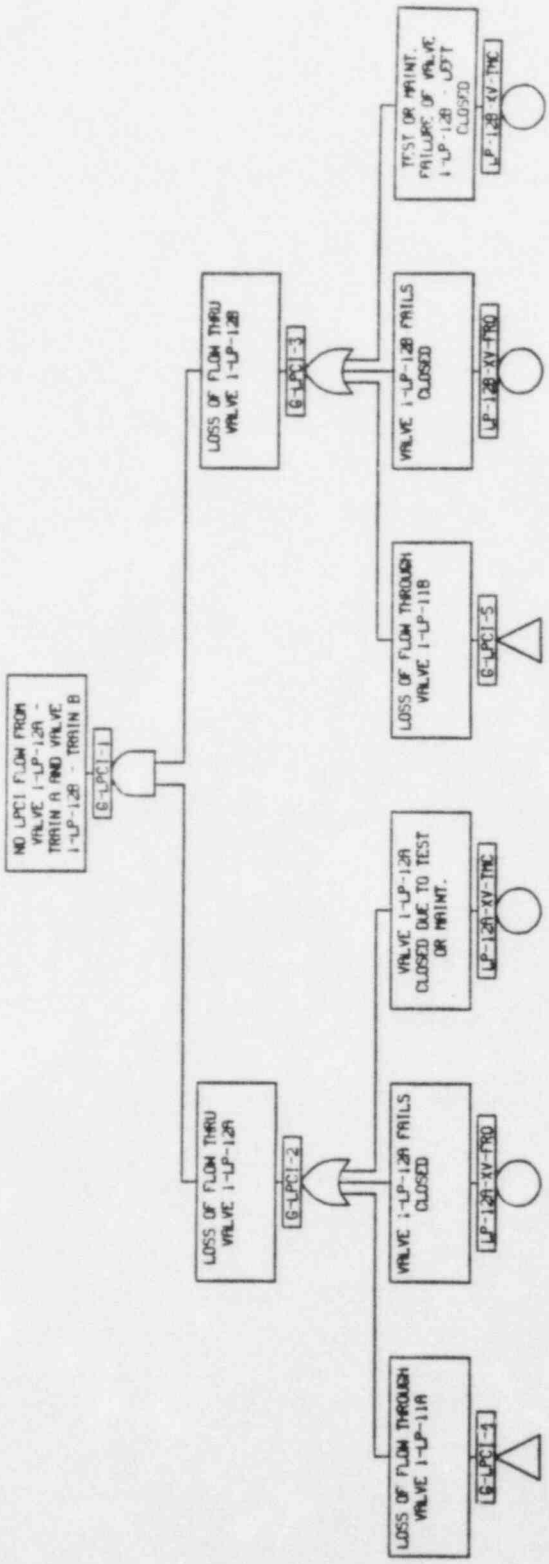

LNP TRIP SIGNAL AND LOSS OF NORMAL POWER
G-LPCI-467A
G-LPCI-467
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
1
LNP TRIP C.P. 5-6 RELAY 94X-6B
G-LPCI-468
RELAY 94X-6B FAILS TO DE-ENERGIZE
LCL94X-6B-FTO
2
SIGNAL FROM C.P. 11-12 RELAY 94-1B
G-LPCI-471
C.P. 5-6 RELAY 94X-6B FAILS TO REMAIN OPEN
LCL94X-6B-5RO
C.P. 11-12 RELAY 94-1B FAIL TO OPEN
92694-1B-BFO
2
SPURIOUS SIGNAL FROM TO RELAY 62-1
92662-1-XFO
2
RELAY 94-1B FAILS TO DE-ENERGIZE
92694-1B-FTO
2

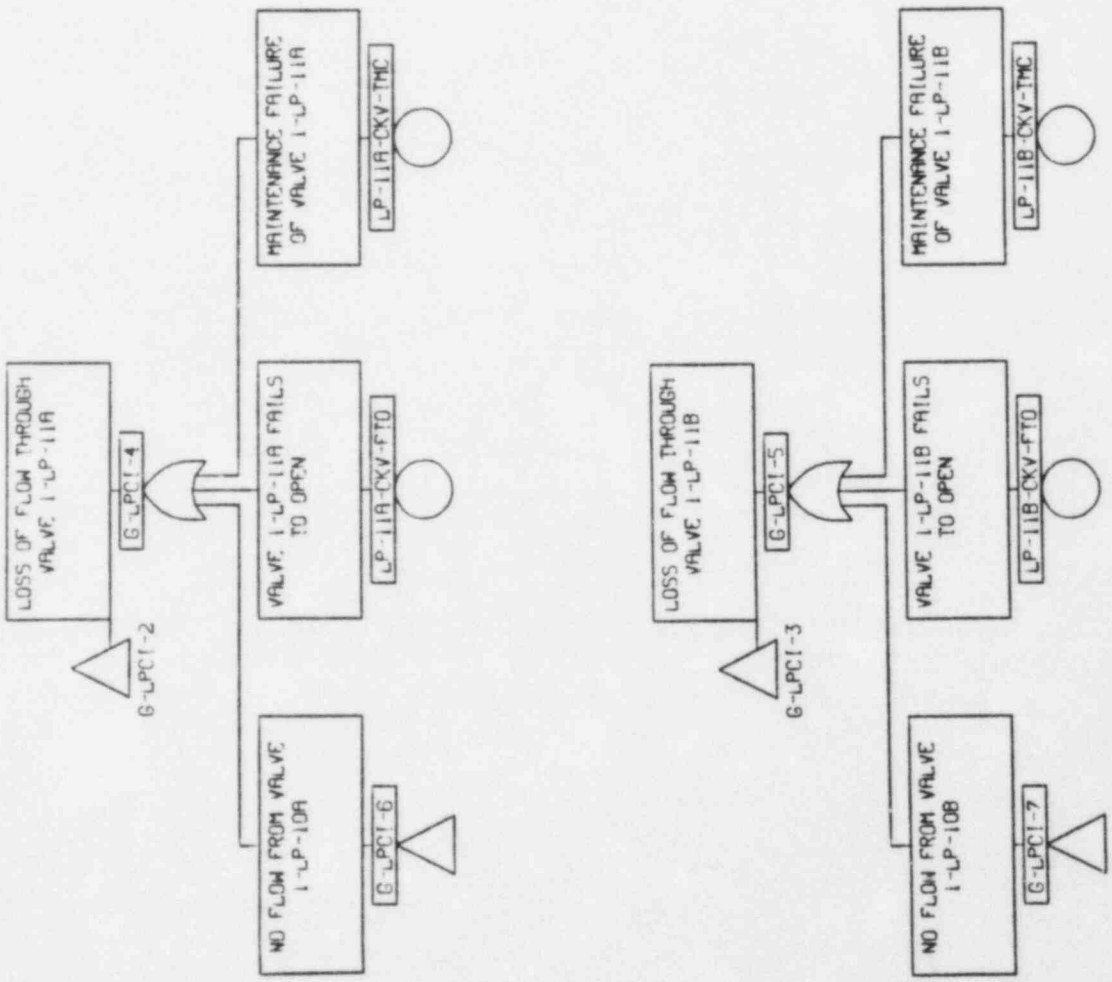

LNP TRIP SIGNAL AND LOSS OF NORMAL POWER
G-LPCI-467B
G-LPCI-467
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
4
LNP TRIP SIGNAL THRU C.P. 5-6 RELAY 94X-60
G-LPCI-470
RELAY 94X-60 FAILS TO DE-ENERGIZE
LCL94X-60-FTD
2
SIGNAL FROM C.P. 11-12 RELAY 94-2B
G-LPCI-472
C.P. 11-12 RELAY 94-2B FAIL TO OPEN
92694-2B-BFO
2
C.P. 5-6 RELAY 94X-60 FAILS TO REMAIN OPEN
LCL94X-60-5RO
SPURIOUS SIGNAL FROM TO RELAY 62-1A
92662-1A-XFO
2
RELAY 94-2B FAILS TO DE-ENERGIZE
92694-2B-FTO
2

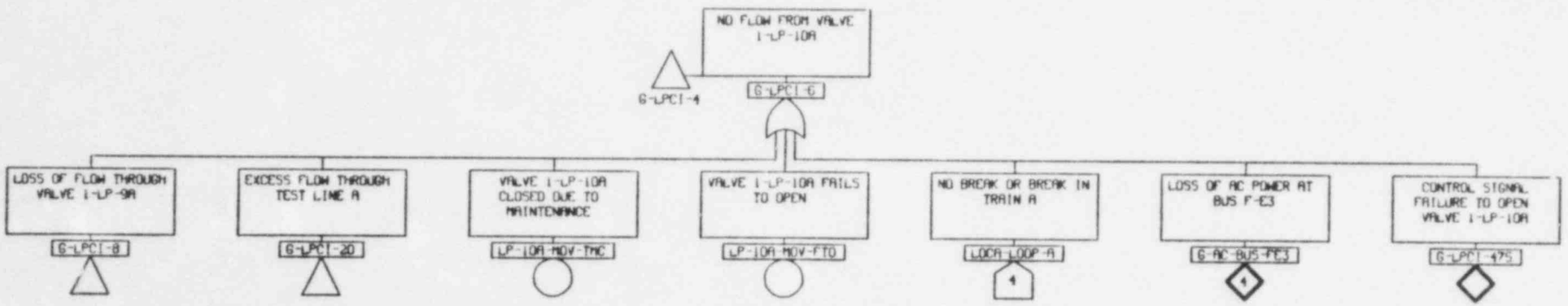

PUMP 1502B ERRONEOUSLY TRIPPED
G-LPCI-380
G-LPCI-473
OPERATOR PLACES SW. 903/ 1530-301B IN STOP MODE
LP-B-MOP-OSP
C.P. 3-3T MAN. SW. 903/ 1530-301B FAILS TO REMAIN OPEN
9031530-3018-3RO
MAN. SW. 903/ 1530-301B FAILS IN STOP MODE
9031530-3018-FRO
PUMP 1502D ERRONEOUSLY TRIPPED
G-LPCI-385
G-LPCI-474
OPERATOR PLACES SW. 903/ 1530-3010 IN STOP MODE
LP-D-MOP-OSP
C.P. 3-3T MAN. SW. 903/ 1530-301C FAILS TO REMAIN OPEN
90331530-3010-3RO
MAN. SW. 903/ 1530-301C FAILS IN STOP MODE
9031530-3010-FRO

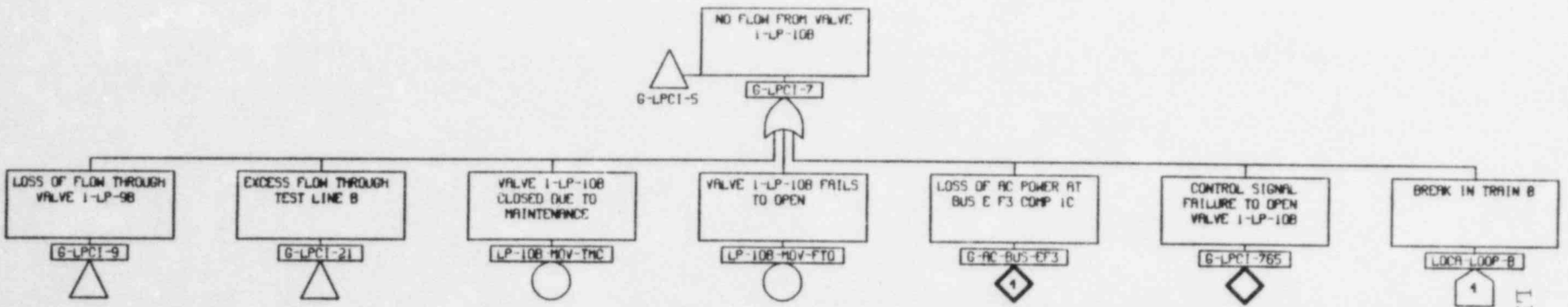

NO FLOW OUT OF COOLING COIL
G-LPCI-1120
G-LPCI-409
VALVE 1-LP-56B CLOSED DUE TO MAINT.
LP-56B-XV-TMC
VALVE 1-LP-56B FAILS TO REMAIN OPEN
LP-56B-XV-FRO
NO FLOW FROM VALVE 1-LP-74B
G-LPCI-1127
VALVE 1-LP-74B CLOSED DUE TO MAINT.
LP-74B-PHV-TMC
VALVE 1-LP-74B FAILS TO REMAIN OPEN
LP-74B-PHV-FRO
NO FLOW FROM VALVE 1-LP-54B
G-LPCI-1124
VALVE 1-LP-54B CLOSED DUE TO MAINT.
LP-54B-XV-TMC
VALVE 1-LP-54B FAILS TO REMAIN OPEN
LP-54B-XV-FRO
NO FLOW FROM VALVE 1-LP-52B
G-LPCI-1125

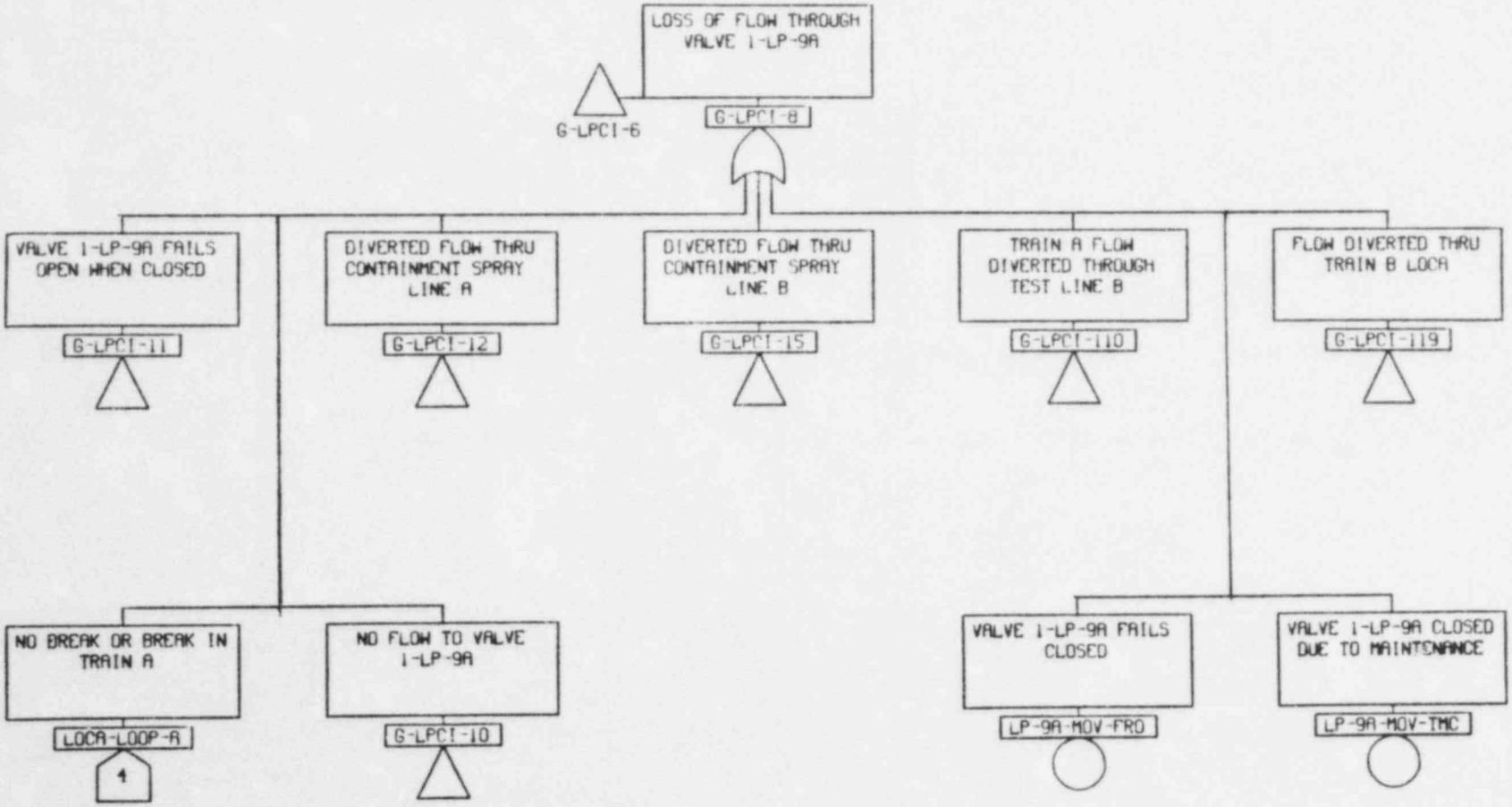

NO FLOW THRU
1-LP-17B
G-LPCI-1118
G-LPCI-1119
G-LPCI-1121
VALVE 1-LP-17B FAILS
TO REMAIN OPEN
VALVE 1-LP-17B OUT
DUE TO MAINT.
LP-17B-XV-FRO
LP-17B-XV-TMC
NO FLOW FROM VALVE
1-LP-52B
G-LPCI-1123
G-LPCI-1124
G-LPCI-1125
NO FLOW FROM VALVE
1-LP-51B
VALVE 1-LP-52B FAILS
TO OPEN
VALVE 1-LP-52B
CLOSED DUE TO MAINT.
G-LPCI-1126
LP-52B-SOV-FTO
LP-52B-SOV-TMC
VALVE 1-LP-51B
CLOSED DUE TO MAINT.
VALVE 1-LP-51B FAILS
TO REMAIN OPEN
LP-51B-XV-TMC
LP-51B-XV-FRO

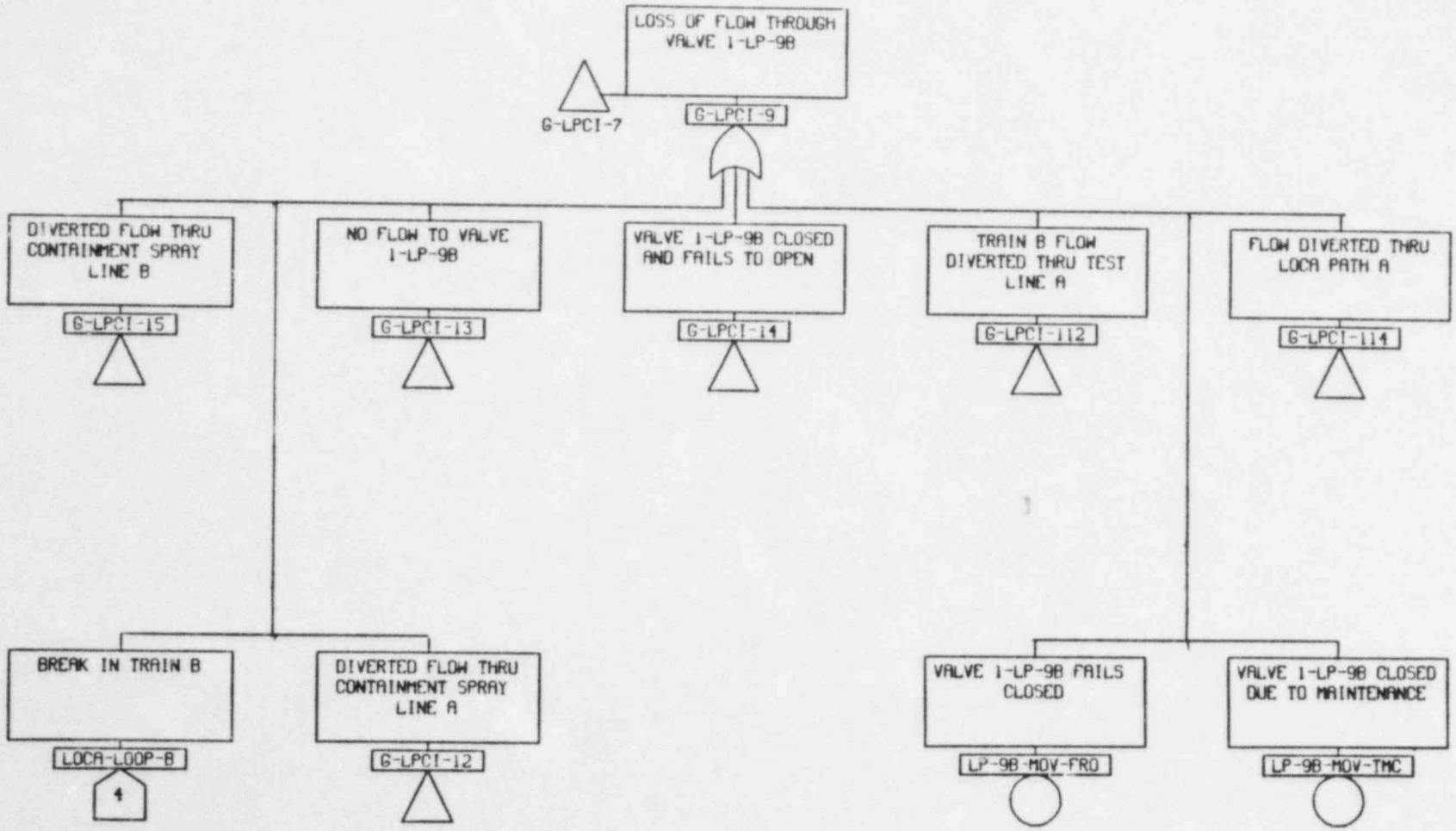

NO LPCI FLOW FROM VALVE 1-LP-1.2A - TRAIN A AND VALVE 1-LP-1.2B - TRAIN B
G-LPCI-1
LOSS OF FLOW THRU VALVE 1-LP-1.2A
G-LPCI-2
LOSS OF FLOW THRU VALVE 1-LP-1.2B
G-LPCI-3
LOSS OF FLOW THROUGH VALVE 1-LP-11A
G-LPCI-4
VALVE 1-LP-1.2A FAILS CLOSED
LP-1.2A-XV-FRO
VALVE 1-LP-1.2A CLOSED DUE TO TEST OR MAINT.
LP-1.2A-XV-TMC
LOSS OF FLOW THROUGH VALVE 1-LP-11B
G-LPCI-5
VALVE 1-LP-1.2B FAILS CLOSED
LP-1.2B-XV-FRO
TEST OR MAINT. FAILURE OF VALVE 1-LP-1.2B - LEFT CLOSED
LP-1.2B-XV-TMC

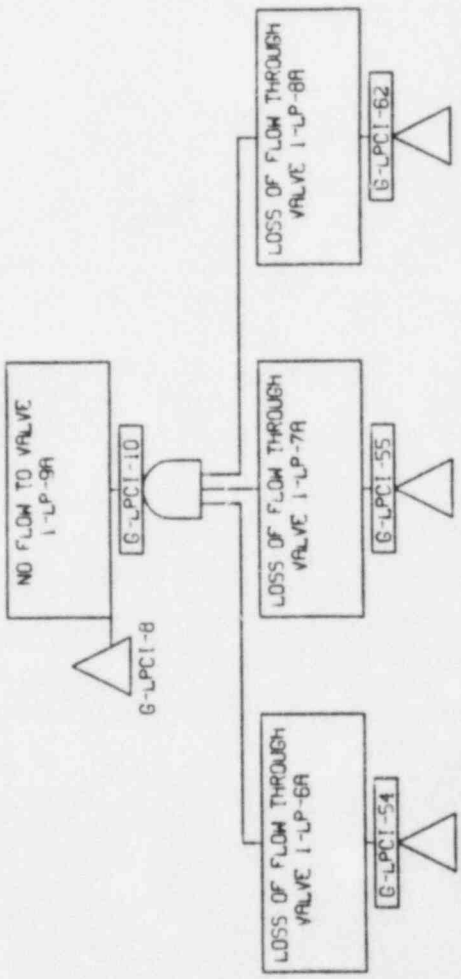

LOSS OF FLOW THROUGH VALVE 1-LP-118
G-LPCI-3
G-LPCI-5
VALVE 1-LP-118 FAILS TO OPEN
LP-118-CKV-FTO
MAINTENANCE FAILURE OF VALVE 1-LP-118
LP-118-CKV-TMC
NO FLOW FROM VALVE 1-LP-108
G-LPCI-7
LOSS OF FLOW THROUGH VALVE 1-LP-118
G-LPCI-2
G-LPCI-4
VALVE 1-LP-118 FAILS TO OPEN
LP-118-CKV-FTO
MAINTENANCE FAILURE OF VALVE 1-LP-118
LP-118-CKV-TMC
NO FLOW FROM VALVE 1-LP-108
G-LPCI-6

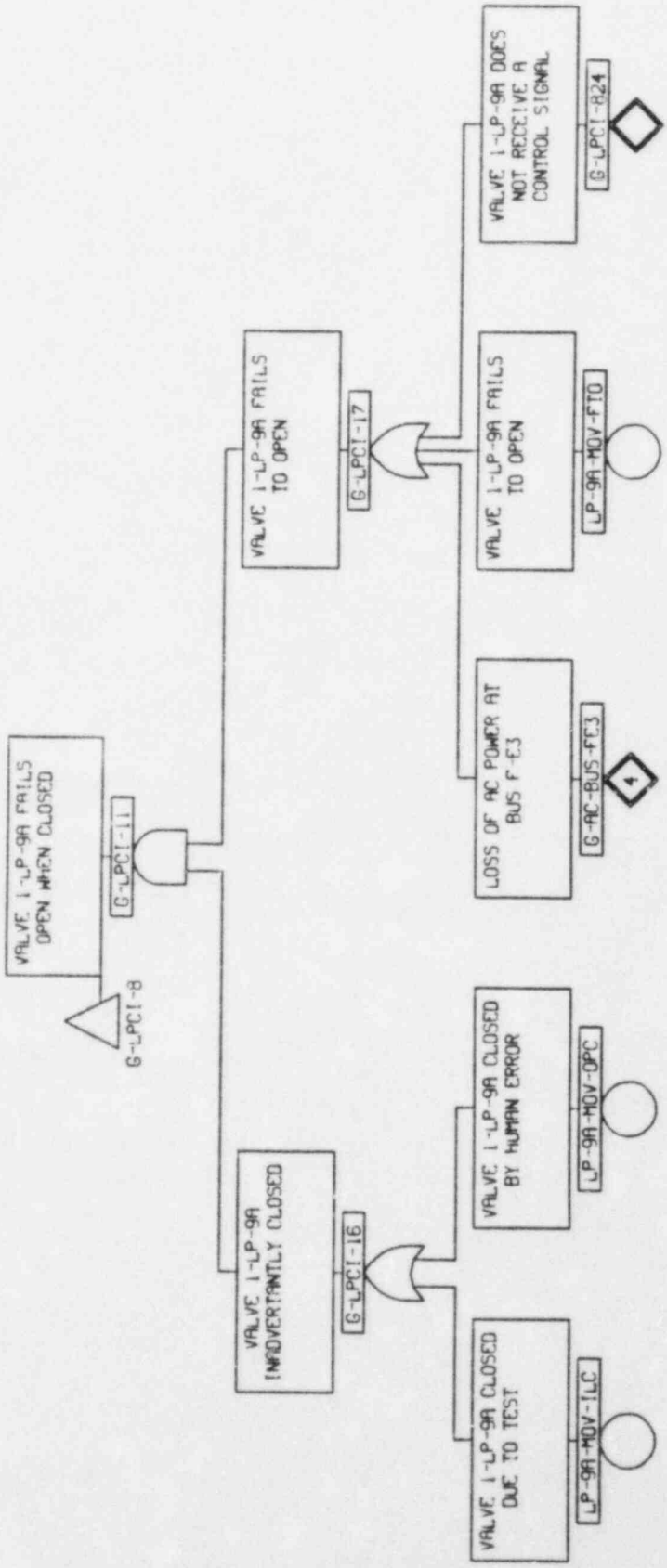

NO FLOW FROM VALVE
1-LP-10A
G-LPCI-4
G-LPCI-6
LOSS OF FLOW THROUGH
VALVE 1-LP-9A
G-LPCI-8
EXCESS FLOW THROUGH
TEST LINE A
G-LPCI-20
VALVE 1-LP-10A
CLOSED DUE TO
MAINTENANCE
LP-10A-MOV-TMC
VALVE 1-LP-10A FAILS
TO OPEN
LP-10A-MOV-FTO
NO BREAK OR BREAK IN
TRAIN A
LOCA-LOOP-A
1
LOSS OF AC POWER AT
BUS F-E3
G-AC-BUS-FE3
1
CONTROL SIGNAL
FAILURE TO OPEN
VALVE 1-LP-10A
G-LPCI-475

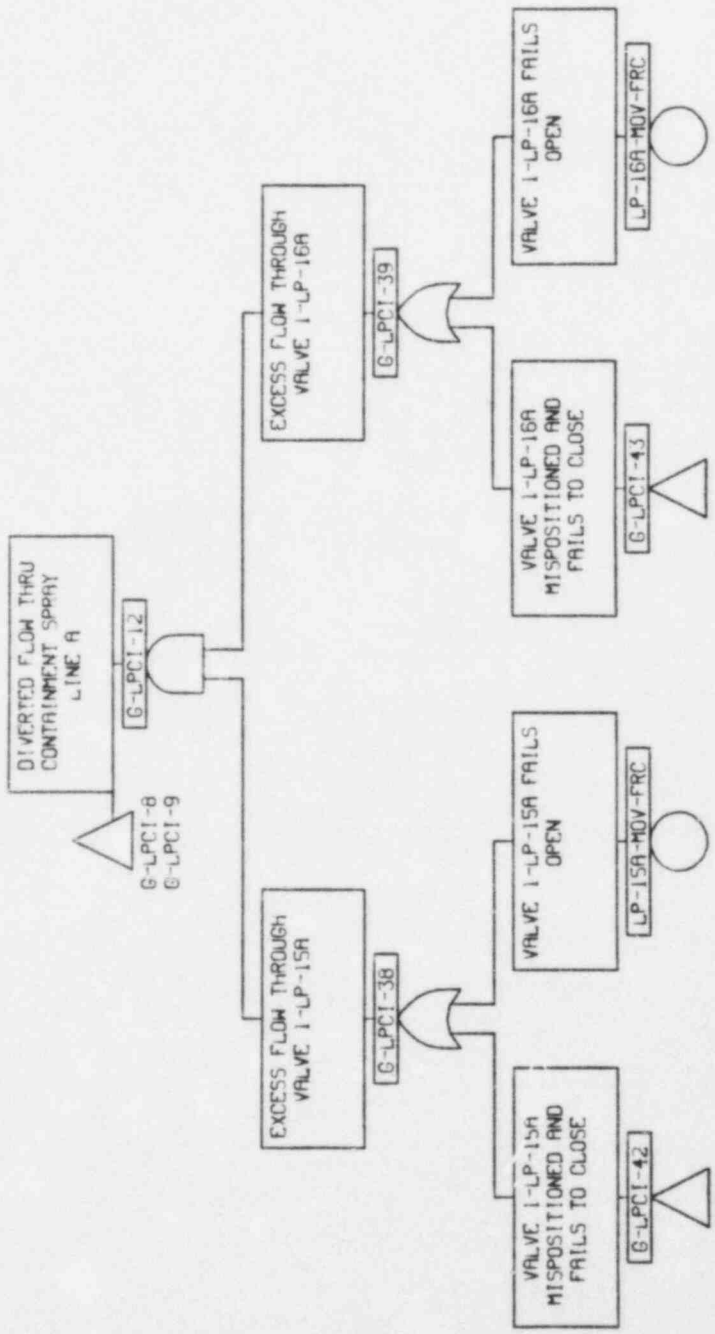

NO FLOW FROM VALVE
1-LP-10B
G-LPCI-5
G-LPCI-7
LOSS OF FLOW THROUGH
VALVE 1-LP-9B
G-LPCI-9
EXCESS FLOW THROUGH
TEST LINE B
G-LPCI-21
VALVE 1-LP-10B
CLOSED DUE TO
MAINTENANCE
LP-10B-MOV-TMC
VALVE 1-LP-10B FAILS
TO OPEN
LP-10B-MOV-FTO
LOSS OF AC POWER AT
BUS E F3 COMP 1C
G-AC-BUS-EF3
1
CONTROL SIGNAL
FAILURE TO OPEN
VALVE 1-LP-10B
G-LPCI-765
BREAK IN TRAIN B
LOCA-LOOP-B
1

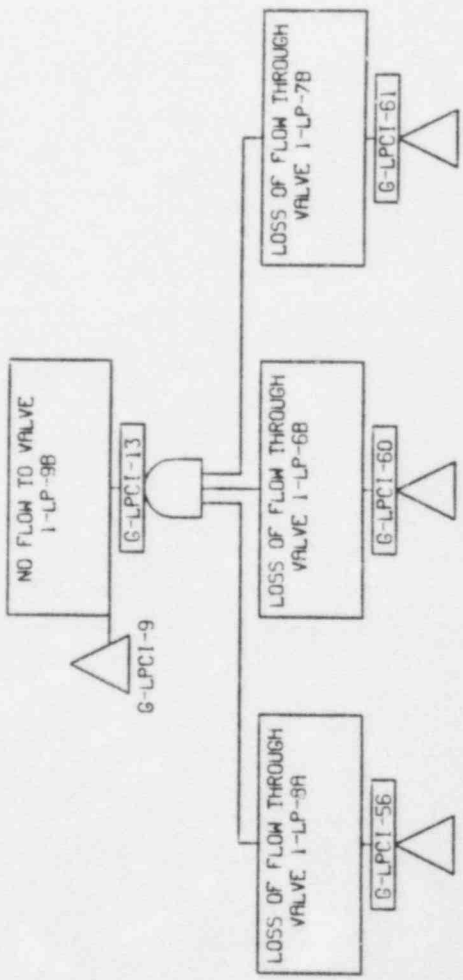

LOSS OF FLOW THROUGH VALVE 1-LP-9A
G-LPCI-6
G-LPCI-8
VALVE 1-LP-9A FAILS OPEN WHEN CLOSED
G-LPCI-11
DIVERTED FLOW THRU CONTAINMENT SPRAY LINE A
G-LPCI-12
DIVERTED FLOW THRU CONTAINMENT SPRAY LINE B
G-LPCI-15
TRAIN A FLOW DIVERTED THROUGH TEST LINE B
G-LPCI-110
FLOW DIVERTED THRU TRAIN B LOCA
G-LPCI-119
NO BREAK OR BREAK IN TRAIN A
LOCA-LOOP-A
4
NO FLOW TO VALVE 1-LP-9A
G-LPCI-10
VALVE 1-LP-9A FAILS CLOSED
LP-9A-MOV-FRO
VALVE 1-LP-9A CLOSED DUE TO MAINTENANCE
LP-9A-MOV-TMC

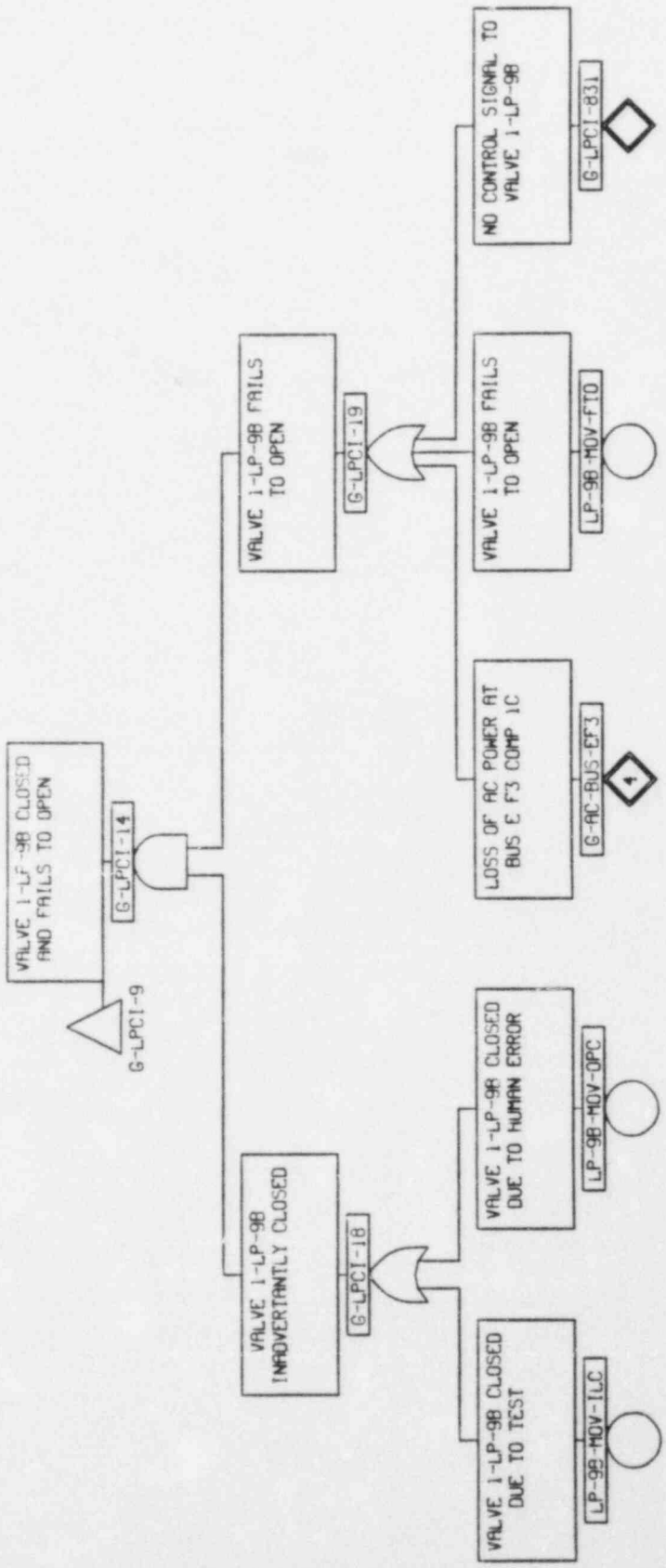

LOSS OF FLOW THROUGH VALVE 1-LP-98
G-LPCI-7
G-LPCI-9
DIVERTED FLOW THRU CONTAINMENT SPRAY LINE B
G-LPCI-15
NO FLOW TO VALVE 1-LP-98
G-LPCI-13
VALVE 1-LP-98 CLOSED AND FAILS TO OPEN
G-LPCI-14
TRAIN B FLOW DIVERTED THRU TEST LINE A
G-LPCI-112
FLOW DIVERTED THRU LOCA PATH A
G-LPCI-114
BREAK IN TRAIN B
LOCA-LOOP-B
4
DIVERTED FLOW THRU CONTAINMENT SPRAY LINE A
G-LPCI-12
VALVE 1-LP-98 FAILS CLOSED
LP-98-MOV-FRO
VALVE 1-LP-98 CLOSED DUE TO MAINTENANCE
LP-98-MOV-TMC

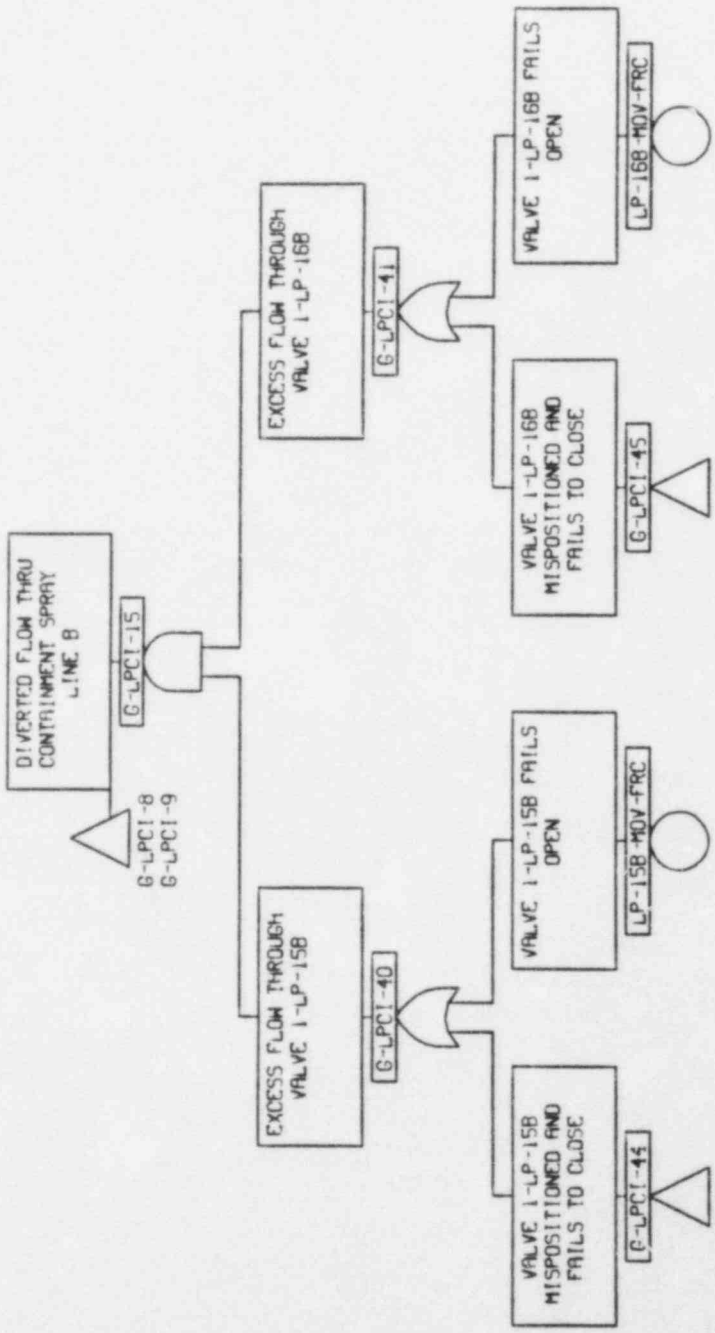

NO FLOW TO VALVE
1-LP-9A
G-LPCI-10
G-LPCI-8
LOSS OF FLOW THROUGH
VALVE 1-LP-8A
G-LPCI-62
LOSS OF FLOW THROUGH
VALVE 1-LP-7A
G-LPCI-55
LOSS OF FLOW THROUGH
VALVE 1-LP-6A
G-LPCI-54

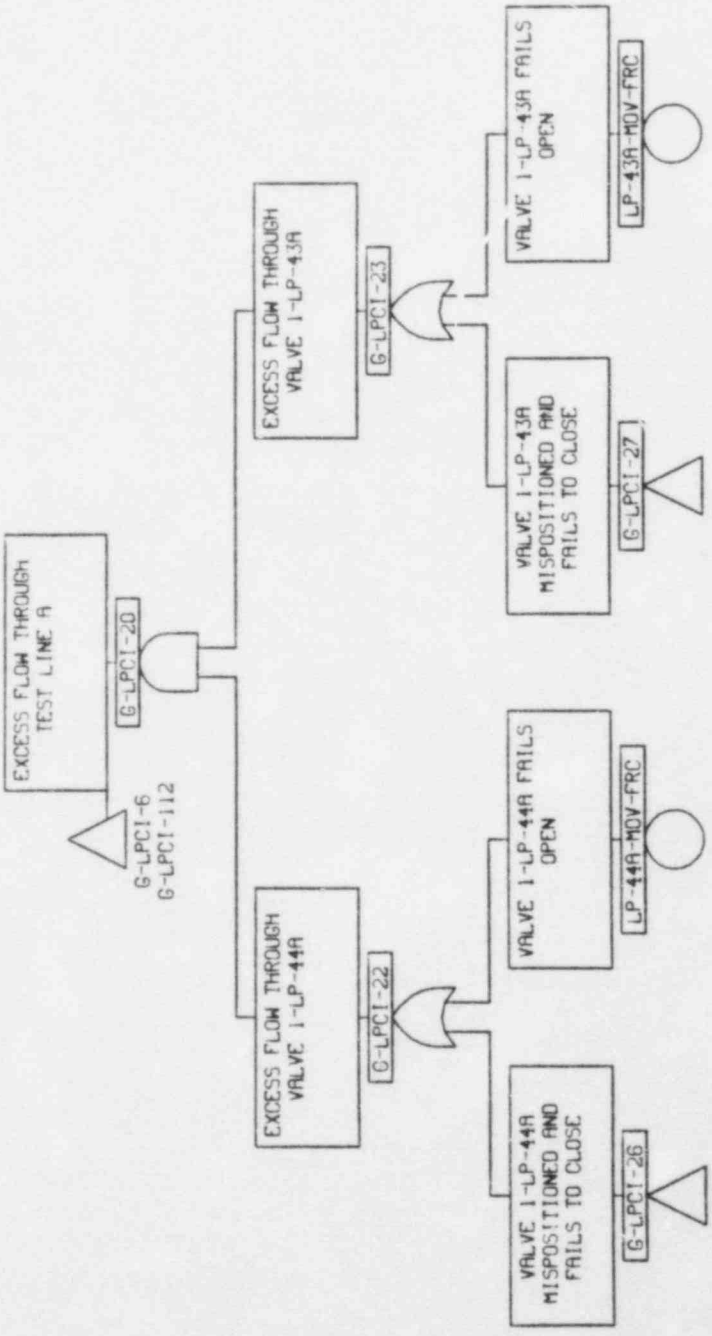

VALVE 1-LP-9A FAILS OPEN WHEN CLOSED
G-LPCI-11
G-LPCI-8
VALVE 1-LP-9A INADVERTANTLY CLOSED
G-LPCI-16
VALVE 1-LP-9A CLOSED DUE TO TEST
LP-9A-MOV-1LC
VALVE 1-LP-9A CLOSED BY HUMAN ERROR
LP-9A-MOV-OPC
VALVE 1-LP-9A FAILS TO OPEN
G-LPCI-17
LOSS OF AC POWER AT BUS F-E3
G-AC-BUS-FE3
4
VALVE 1-LP-9A FAILS TO OPEN
LP-9A-MOV-FTO
VALVE 1-LP-9A DOES NOT RECEIVE A CONTROL SIGNAL
G-LPCI-R24

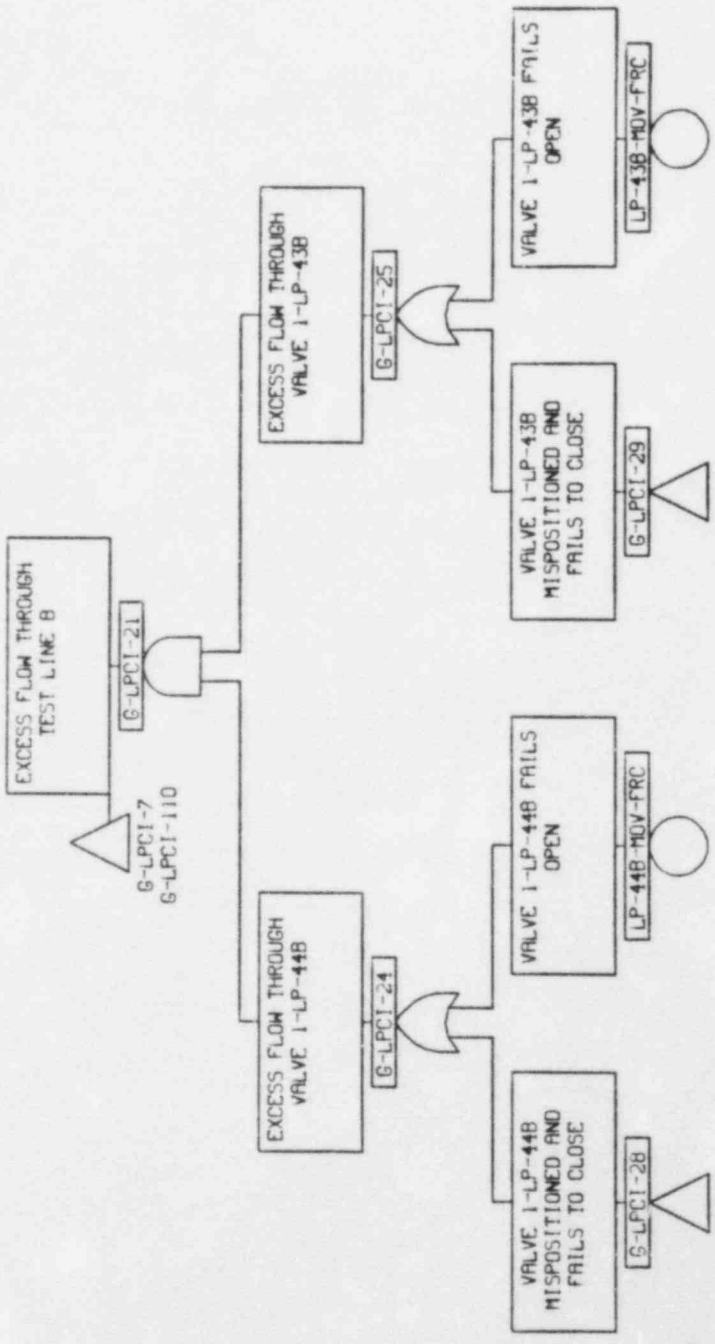

DIVERTED FLOW THRU CONTAINMENT SPRAY LINE A
G-LPCI-12
G-LPCI-8
G-LPCI-9
EXCESS FLOW THROUGH VALVE 1-LP-16A
G-LPCI-39
VALVE 1-LP-16A FAILS OPEN
LP-16A-MOV-FRC
VALVE 1-LP-16A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-43
EXCESS FLOW THROUGH VALVE 1-LP-15A
G-LPCI-38
VALVE 1-LP-15A FAILS OPEN
LP-15A-MOV-FRC
VALVE 1-LP-15A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-42

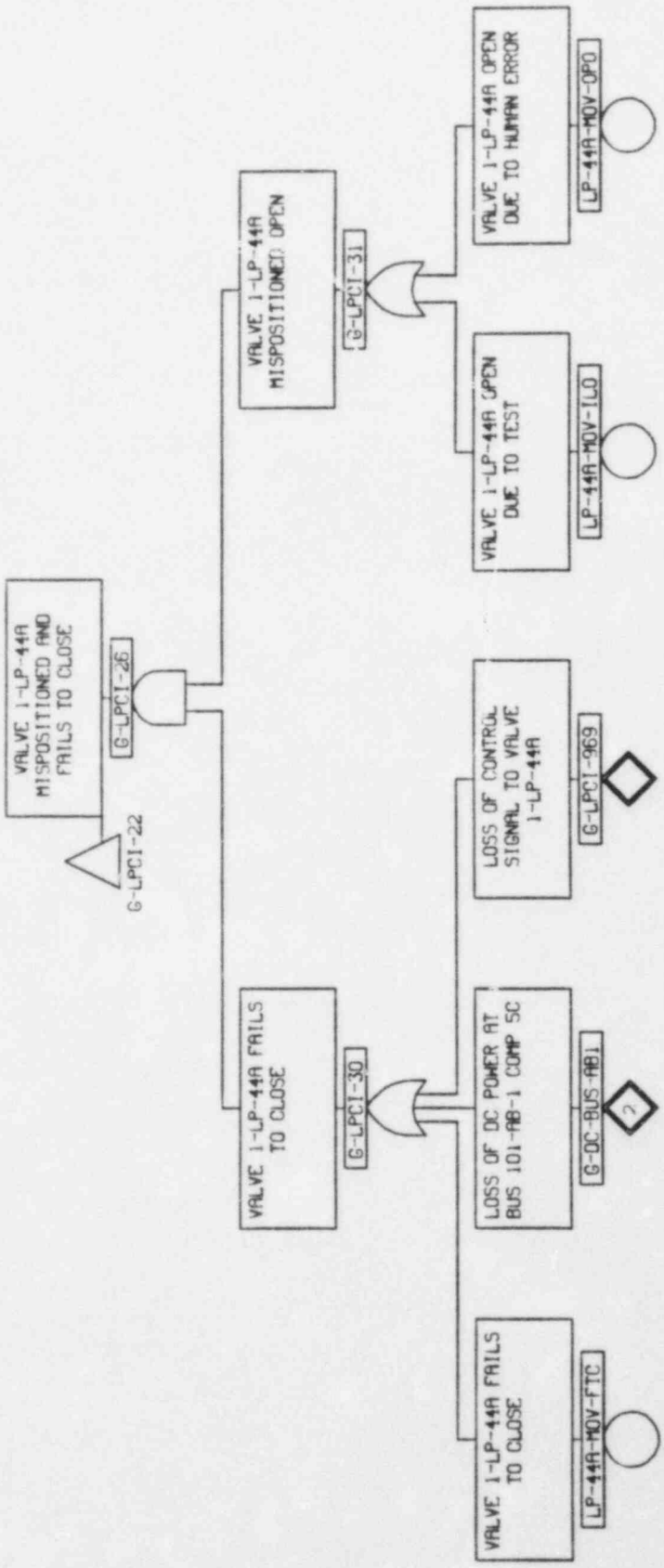

NO FLOW TO VALVE
1-LP-9B
G-LPCI-13
G-LPCI-9
LOSS OF FLOW THROUGH
VALVE 1-LP-7B
G-LPCI-61
LOSS OF FLOW THROUGH
VALVE 1-LP-6B
G-LPCI-60
LOSS OF FLOW THROUGH
VALVE 1-LP-9A
G-LPCI-56

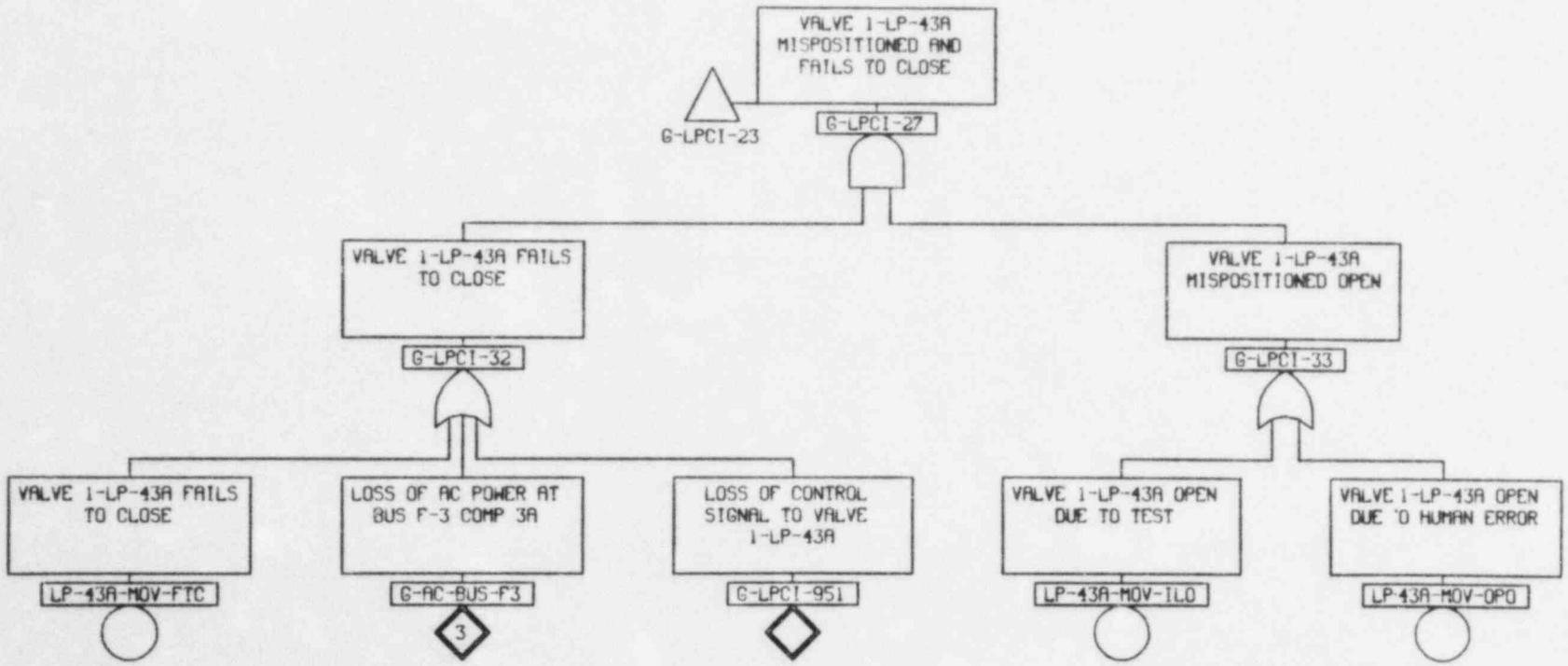

VALVE 1-LP-98 CLOSED AND FAILS TO OPEN
G-LPCI-14
G-LPCI-9
VALVE 1-LP-98 FAILS TO OPEN
G-LPCI-19
VALVE 1-LP-98 INADVERTANTLY CLOSED
G-LPCI-18
NO CONTROL SIGNAL TO VALVE 1-LP-98
G-LPCI-831
VALVE 1-LP-98 FAILS TO OPEN
LP-98-MOV-FTO
LOSS OF AC POWER AT BUS E F3 COMP 1C
G-AC-BUS-EF3
1
VALVE 1-LP-98 CLOSED DUE TO HUMAN ERROR
LP-98-MOV-OPC
VALVE 1-LP-98 CLOSED DUE TO TEST
LP-98-MOV-ILC

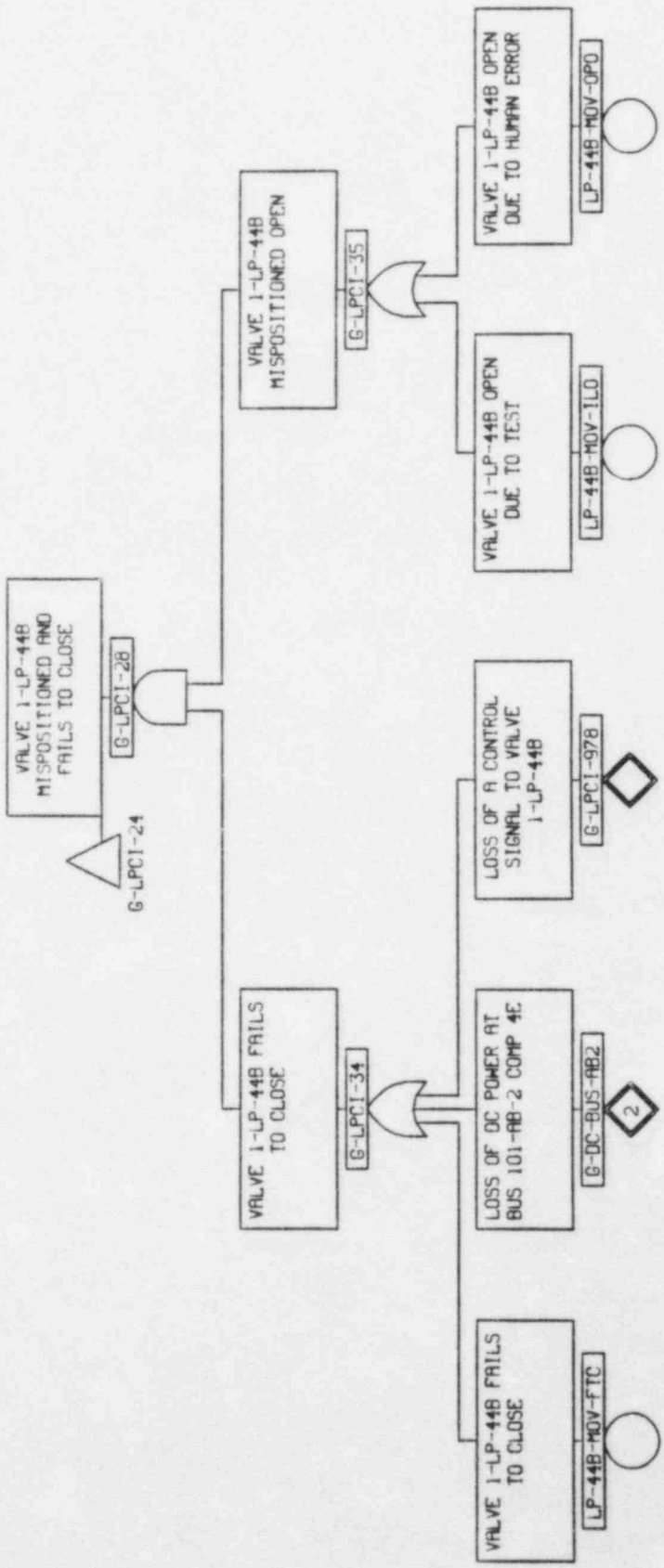

DIVERTED FLOW THRU CONTAINMENT SPRAY LINE B
G-LPCI-15
G-LPCI-8
G-LPCI-9
EXCESS FLOW THROUGH VALVE 1-LP-168
G-LPCI-41
VALVE 1-LP-168 FAILS OPEN
LP-168-MOV-FRC
VALVE 1-LP-168 MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-45
EXCESS FLOW THROUGH VALVE 1-LP-158
G-LPCI-40
VALVE 1-LP-158 FAILS OPEN
LP-158-MOV-FRC
VALVE 1-LP-158 MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-45

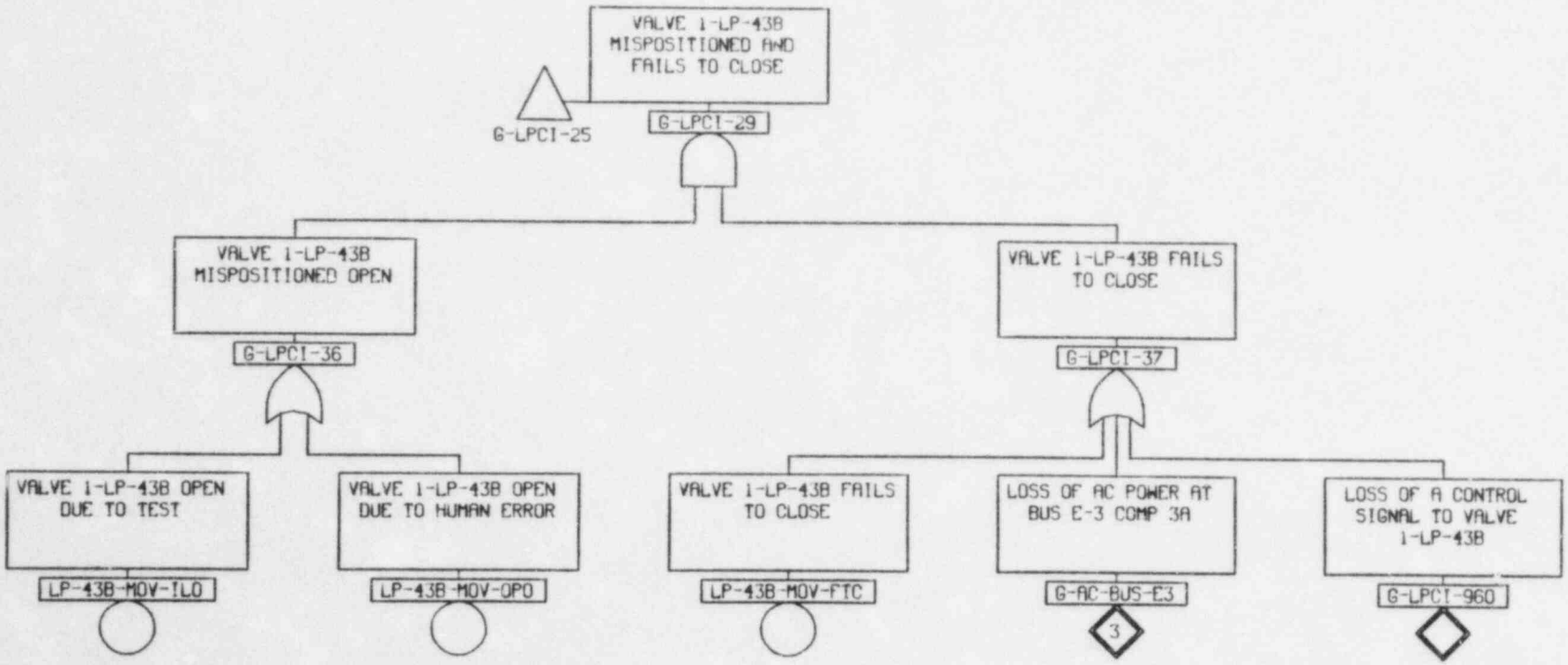

EXCESS FLOW THROUGH TEST LINE A
G-LPCI-6
G-LPCI-112
G-LPCI-20
EXCESS FLOW THROUGH VALVE 1-LP-44A
G-LPCI-22
VALVE 1-LP-44A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-26
VALVE 1-LP-44A FAILS OPEN
LP-44A-MOV-FRC
EXCESS FLOW THROUGH VALVE 1-LP-43A
G-LPCI-23
VALVE 1-LP-43A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-27
VALVE 1-LP-43A FAILS OPEN
LP-43A-MOV-FRC

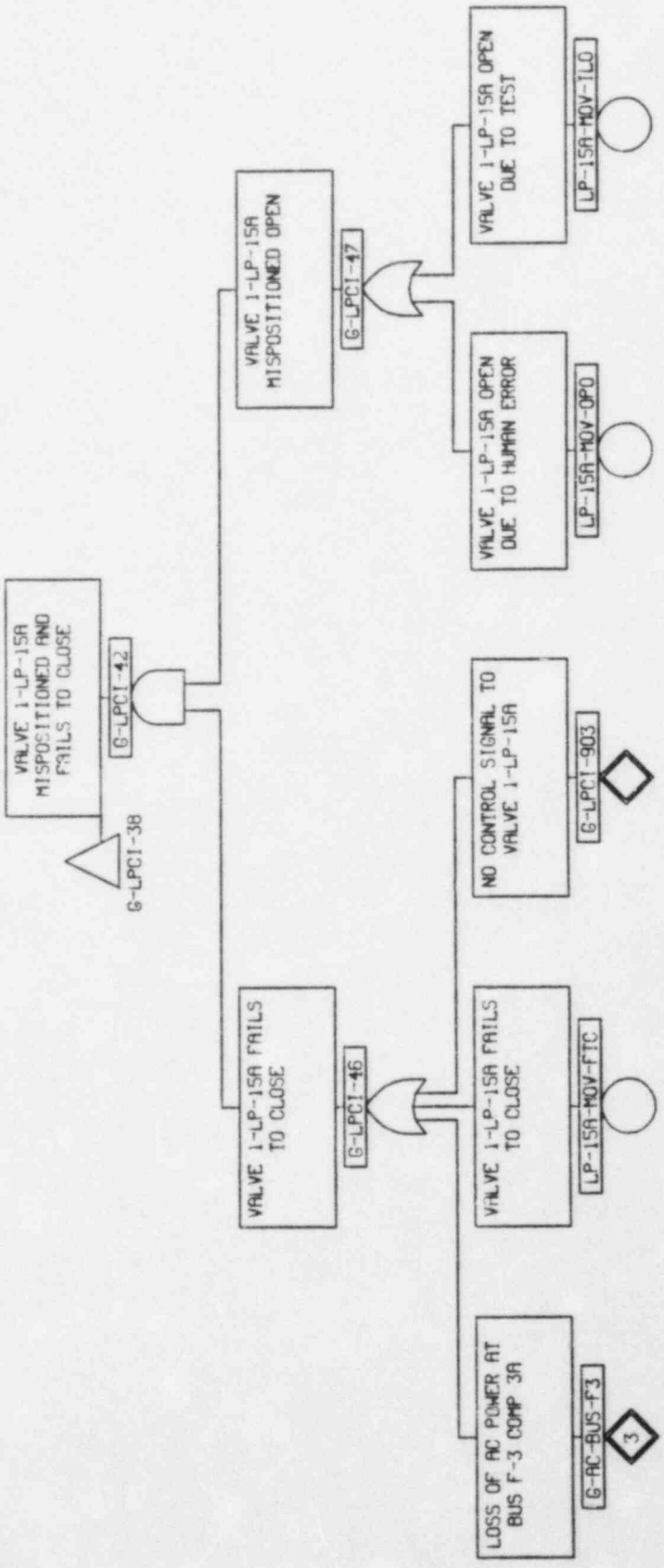

EXCESS FLOW THROUGH TEST LINE B
G-LPCI-7
G-LPCI-110
G-LPCI-21
EXCESS FLOW THROUGH VALVE 1-LP-44B
G-LPCI-24
VALVE 1-LP-44B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-28
VALVE 1-LP-44B FAILS OPEN
LP-44B-MOV-FRC
EXCESS FLOW THROUGH VALVE 1-LP-43B
G-LPCI-25
VALVE 1-LP-43B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-29
VALVE 1-LP-43B FAILS OPEN
LP-43B-MOV-FRC

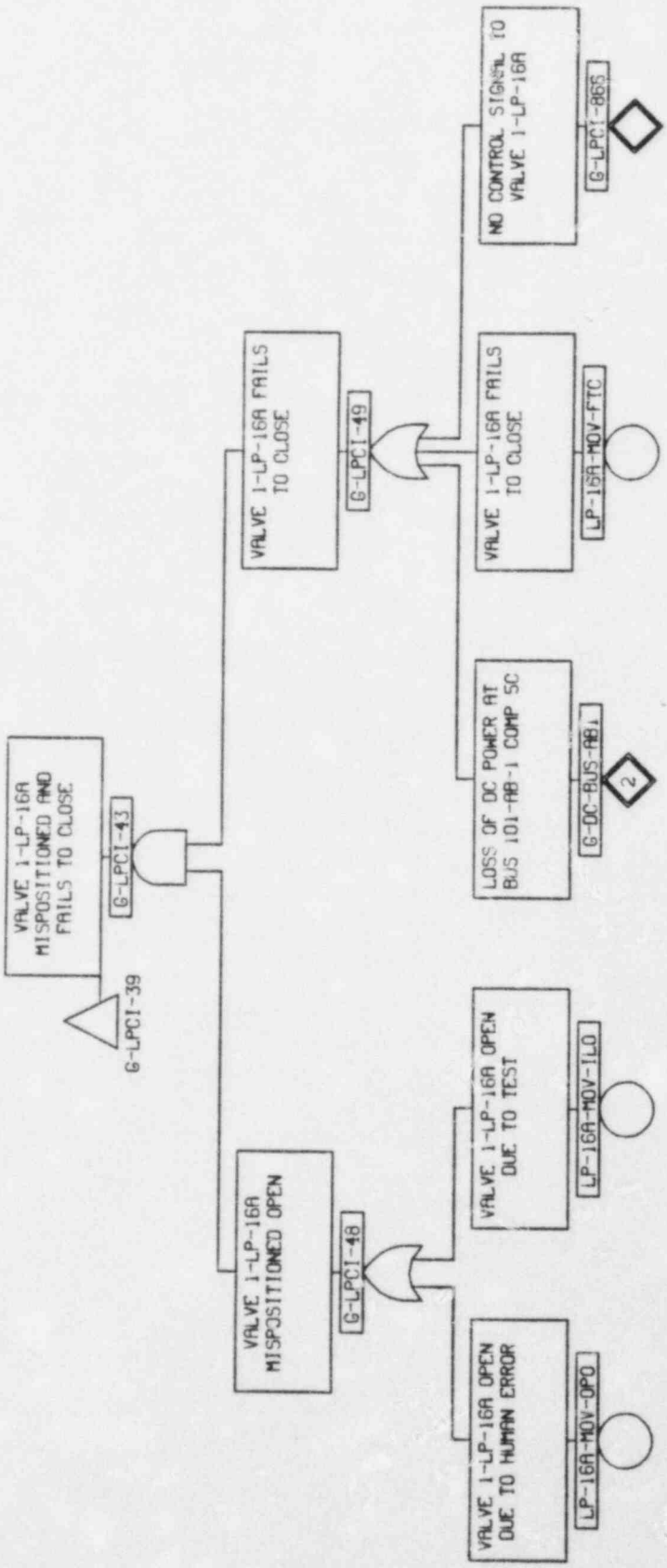

VALVE 1-LP-44A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-26
G-LPCI-22
VALVE 1-LP-44A MISPOSITIONED OPEN
G-LPCI-31
VALVE 1-LP-44A OPEN DUE TO HUMAN ERROR
LP-44A-MOV-OPO
VALVE 1-LP-44A OPEN DUE TO TEST
LP-44A-MOV-ILO
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-44A
G-LPCI-969
VALVE 1-LP-44A FAILS TO CLOSE
G-LPCI-30
LOSS OF DC POWER AT BUS 101-AB-1 COMP SC
G-DC-BUS-AB1
2
VALVE 1-LP-44A FAILS TO CLOSE
LP-44A-MOV-FTC

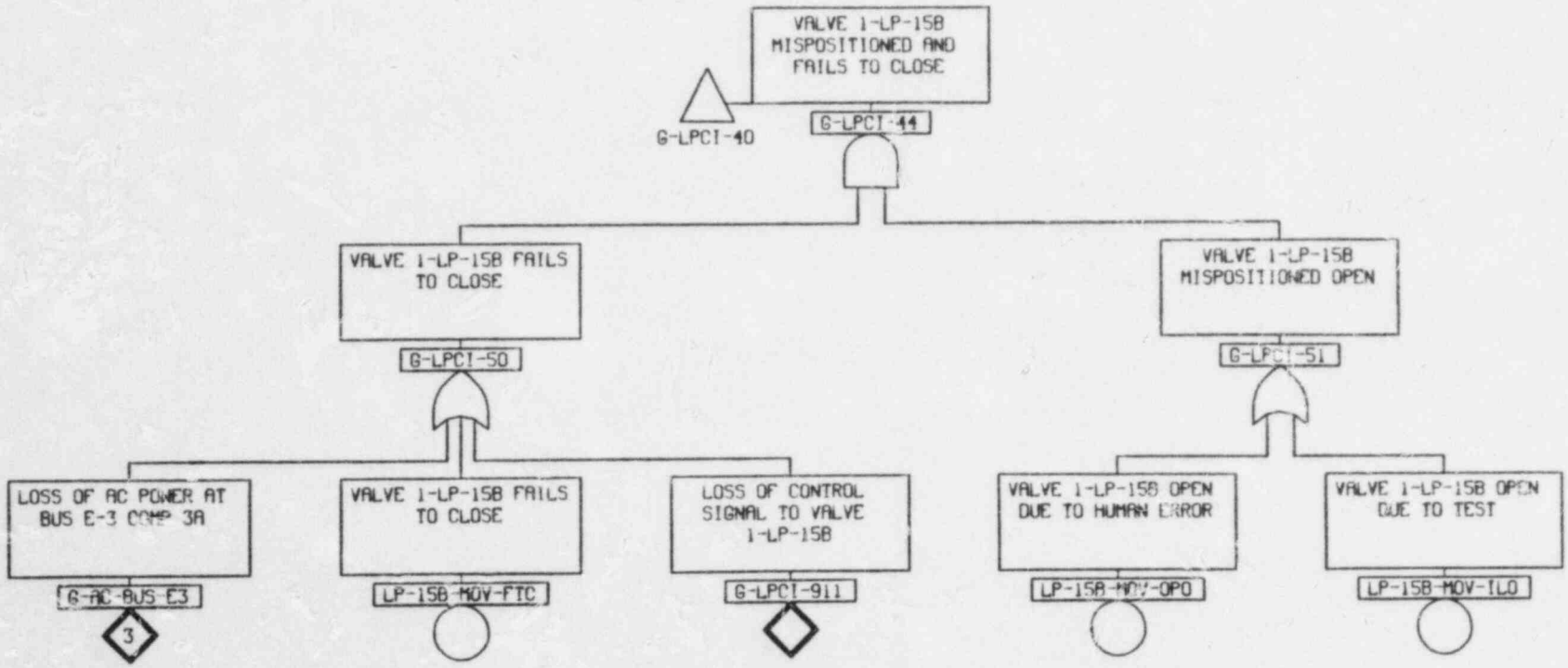

VALVE 1-LP-43A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-23
G-LPCI-27
VALVE 1-LP-43A FAILS TO CLOSE
G-LPCI-32
VALVE 1-LP-43A MISPOSITIONED OPEN
G-LPCI-33
VALVE 1-LP-43A FAILS TO CLOSE
LP-43A-MOV-FTC
LOSS OF AC POWER AT BUS F-3 COMP 3A
G-AC-BUS-F3
3
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-43A
G-LPCI-951
VALVE 1-LP-43A OPEN DUE TO TEST
LP-43A-MOV-ILO
VALVE 1-LP-43A OPEN DUE TO HUMAN ERROR
LP-43A-MOV-OPO

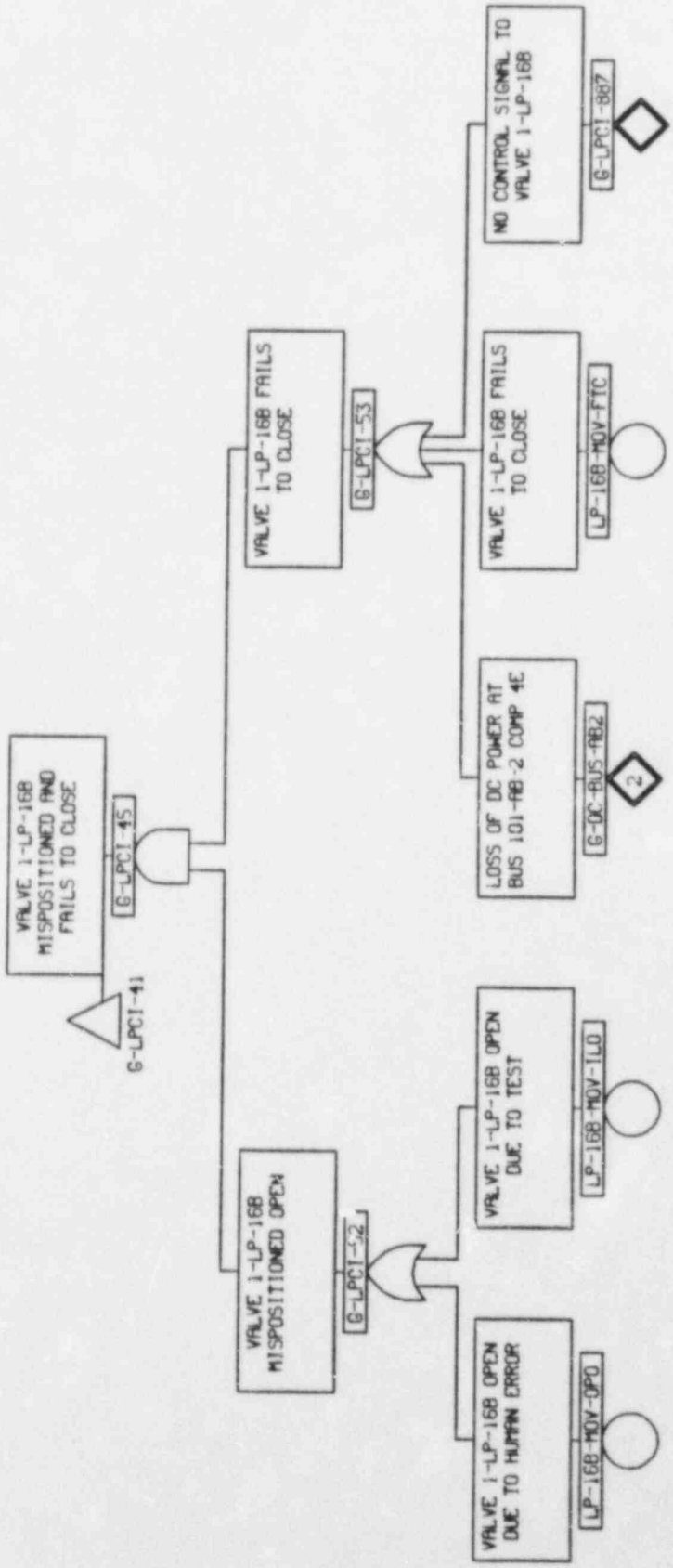

VALVE 1-LP-44B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-28
G-LPCI-24
VALVE 1-LP-44B FAILS TO CLOSE
G-LPCI-34
VALVE 1-LP-44B FAILS TO CLOSE
LP-44B-MOV-FTC
LOSS OF DC POWER AT BUS 101-AB-2 COMP 4E
G-DC-BUS-AB2
2
LOSS OF A CONTROL SIGNAL TO VALVE 1-LP-44B
G-LPCI-978
VALVE 1-LP-44B MISPOSITIONED OPEN
G-LPCI-35
VALVE 1-LP-44B OPEN DUE TO TEST
LP-44B-MOV-1LO
VALVE 1-LP-44B OPEN DUE TO HUMAN ERROR
LP-44B-MOV-OPO

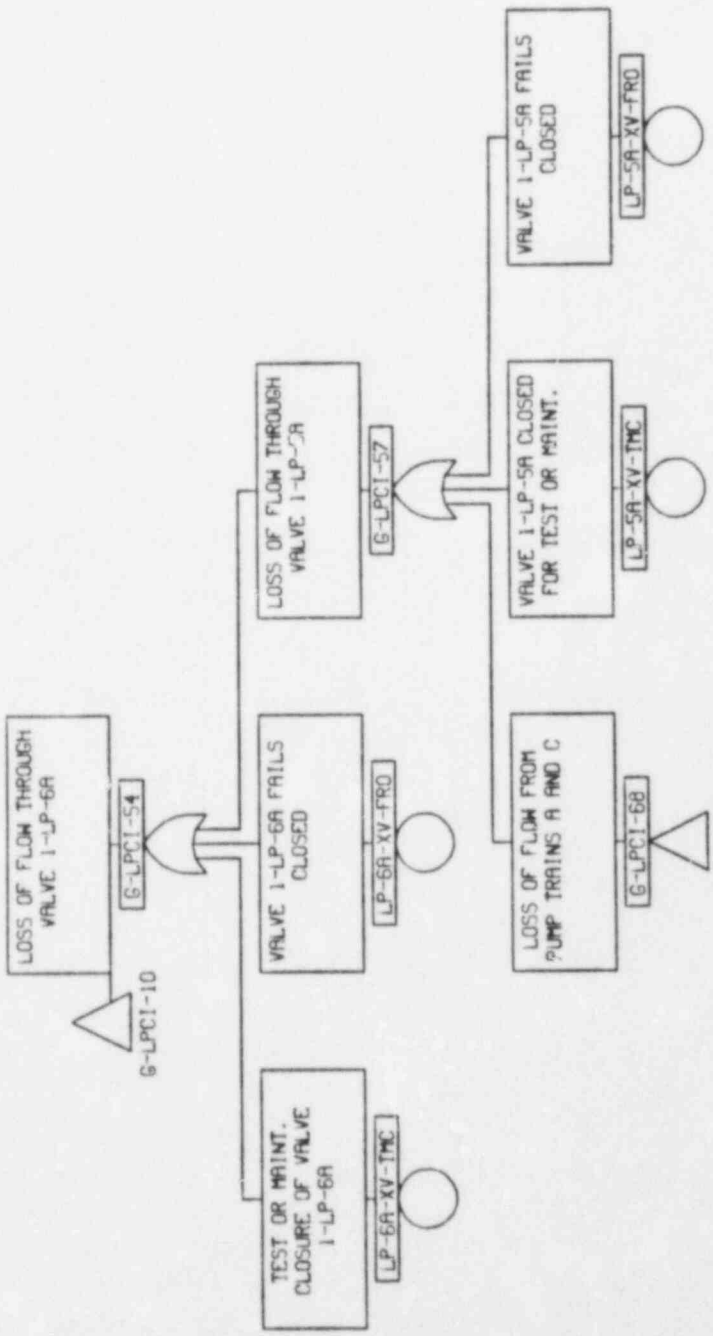

VALVE 1-LP-43B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-29
G-LPCI-25
VALVE 1-LP-43B MISPOSITIONED OPEN
G-LPCI-36
VALVE 1-LP-43B FAILS TO CLOSE
G-LPCI-37
VALVE 1-LP-43B OPEN DUE TO TEST
LP-43B-MOV-ILO
VALVE 1-LP-43B OPEN DUE TO HUMAN ERROR
LP-43B-MOV-OPO
VALVE 1-LP-43B FAILS TO CLOSE
LP-43B-MOV-FTC
LOSS OF AC POWER AT BUS E-3 COMP 3A
G-AC-BUS-E3
3
LOSS OF A CONTROL SIGNAL TO VALVE 1-LP-43B
G-LPCI-960

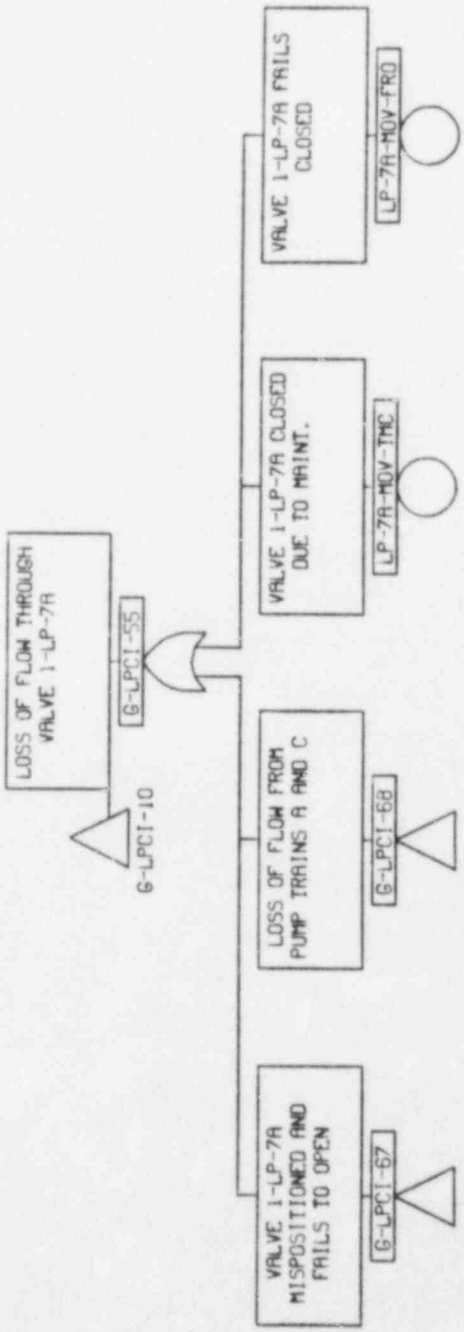

VALVE 1-LP-15A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-38
G-LPCI-42
VALVE 1-LP-15A MISPOSITIONED OPEN
G-LPCI-47
VALVE 1-LP-15A OPEN DUE TO TEST
LP-15A-MOV-TLO
VALVE 1-LP-15A OPEN DUE TO HUMAN ERROR
LP-15A-MOV-OPO
VALVE 1-LP-15A FAILS TO CLOSE
G-LPCI-46
NO CONTROL SIGNAL TO VALVE 1-LP-15A
G-LPCI-903
VALVE 1-LP-15A FAILS TO CLOSE
LP-15A-MOV-FTC
LOSS OF AC POWER AT BUS F-3 COMP 3A
G-AC-BUS-F3
3

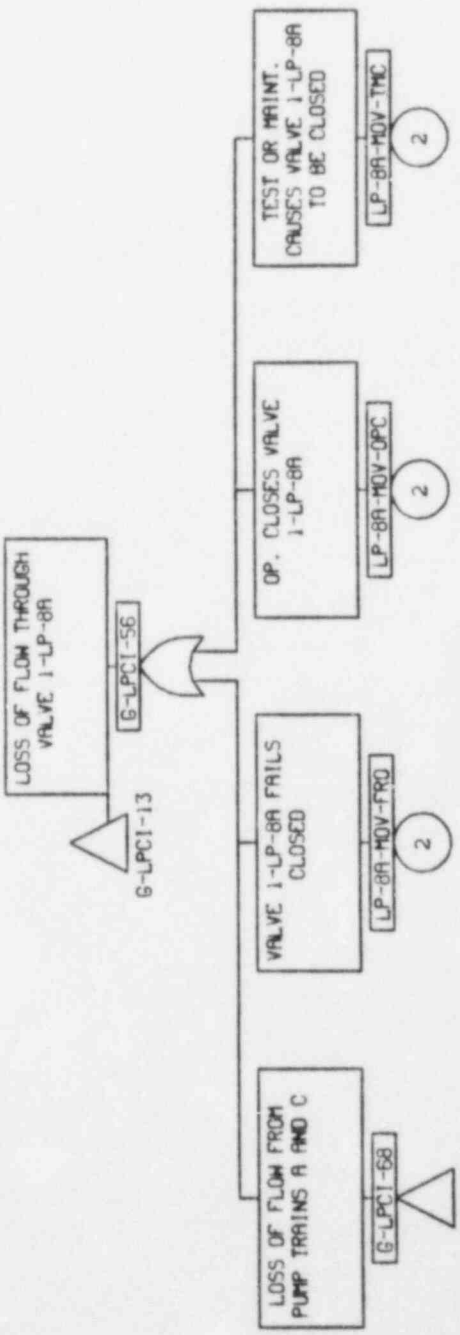

VALVE 1-LP-16A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-43
G-LPCI-39
VALVE 1-LP-16A FAILS TO CLOSE
G-LPCI-49
NO CONTROL SIGNAL TO VALVE 1-LP-16A
G-LPCI-86S
VALVE 1-LP-16A FAILS TO CLOSE
LP-16A-MOV-FTC
LOSS OF DC POWER AT BUS 101-AB-1 COMP 5C
G-DC-BUS-AB1
2
VALVE 1-LP-16A MISPOSITIONED OPEN
G-LPCI-48
VALVE 1-LP-16A OPEN DUE TO TEST
LP-16A-MOV-ILO
VALVE 1-LP-16A OPEN DUE TO HUMAN ERROR
LP-16A-MOV-OPO

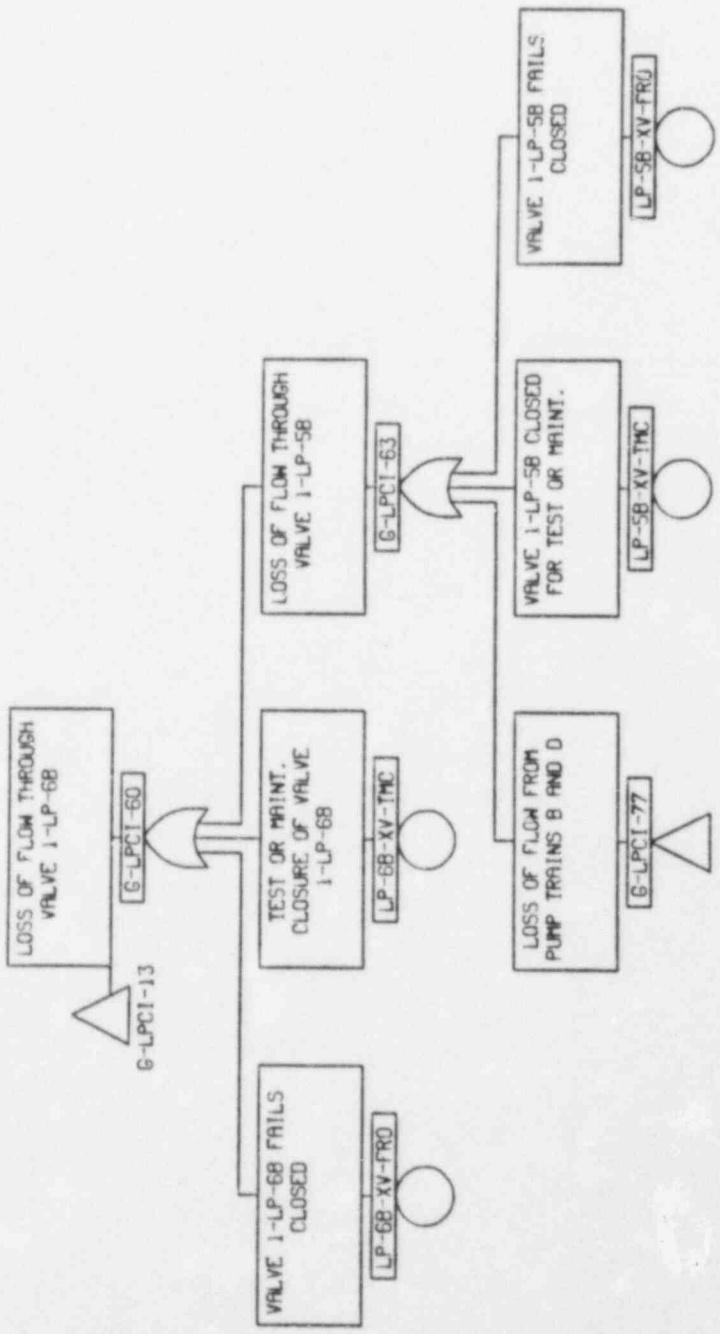

VALVE 1-LP-15B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-44
G-LPCI-40
VALVE 1-LP-15B FAILS TO CLOSE
G-LPCI-50
VALVE 1-LP-15B MISPOSITIONED OPEN
G-LPCI-51
LOSS OF AC POWER AT BUS E-3 COMP 3A
G-AC-BUS-E3
3
VALVE 1-LP-15B FAILS TO CLOSE
LP-15B-MOV-FTC
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-15B
G-LPCI-911
VALVE 1-LP-15B OPEN DUE TO HUMAN ERROR
LP-15B-MOV-OPO
VALVE 1-LP-15B OPEN DUE TO TEST
LP-15B-MOV-TLO

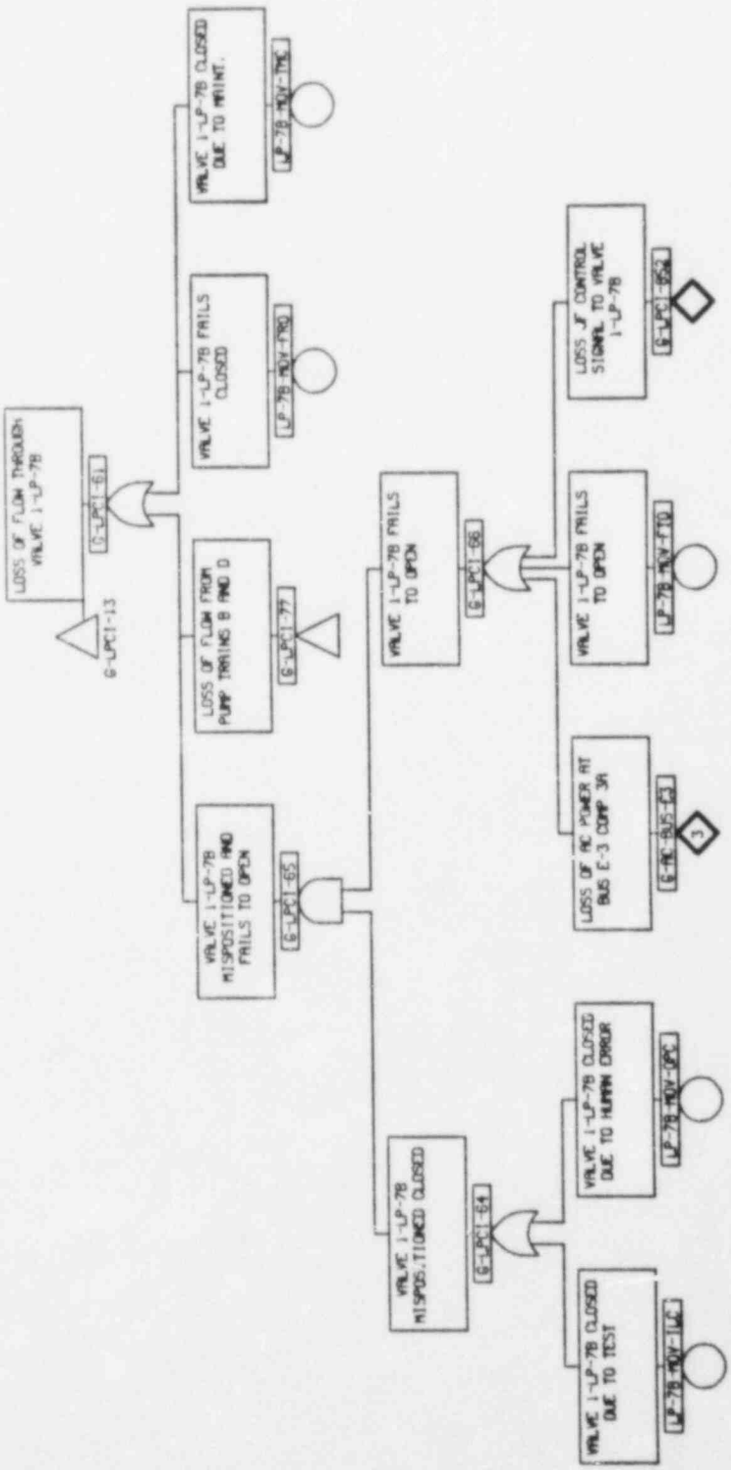

VALVE 1-LP-168 MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-45
G-LPCI-41
VALVE 1-LP-168 MISPOSITIONED OPEN
G-LPCI-42
VALVE 1-LP-168 FAILS TO CLOSE
G-LPCI-53
VALVE 1-LP-168 OPEN DUE TO TEST
LP-168-MOV-TLO
VALVE 1-LP-168 OPEN DUE TO HUMAN ERROR
LP-168-MOV-OPO
LOSS OF DC POWER AT BUS 101-AB-2 COMP 4E
G-DC-BUS-AB2
2
VALVE 1-LP-168 FAILS TO CLOSE
LP-168-MOV-FTC
NO CONTROL SIGNAL TO VALVE 1-LP-168
G-LPCI-867

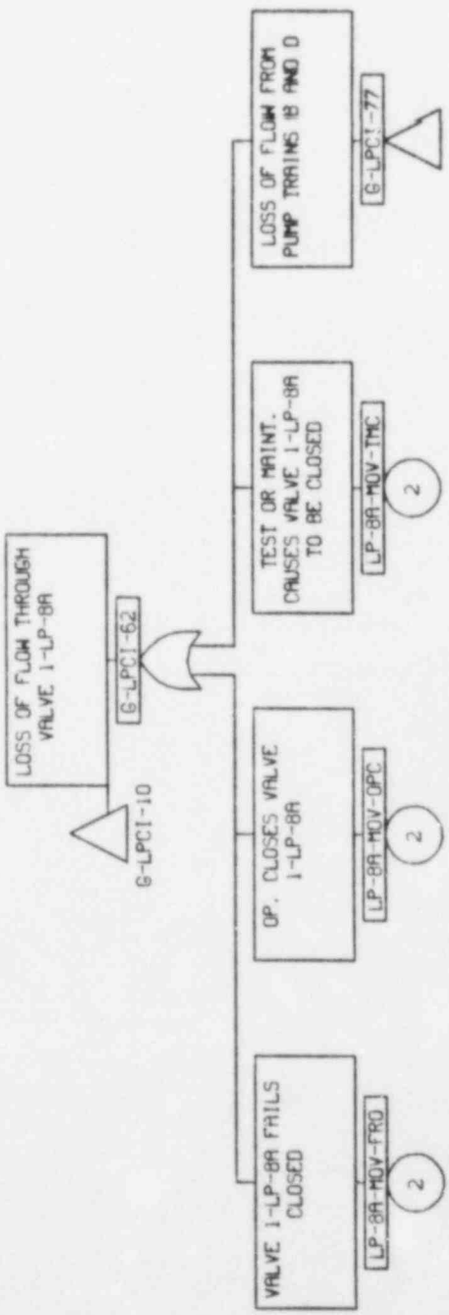

LOSS OF FLOW THROUGH VALVE 1-LP-6A
G-LPCI-54
G-LPCI-10
LOSS OF FLOW THROUGH VALVE 1-LP-5A
G-LPCI-57
VALVE 1-LP-6A FAILS CLOSED
LP-6A-XV-FRO
VALVE 1-LP-5A CLOSED FOR TEST OR MAINT.
LP-5A-XV-TMC
VALVE 1-LP-5A FAILS CLOSED
LP-5A-XV-FRO
TEST OR MAINT. CLOSURE OF VALVE 1-LP-6A
LP-6A-XV-TMC
LOSS OF FLOW FROM PUMP TRAINS A AND C
G-LPCI-68

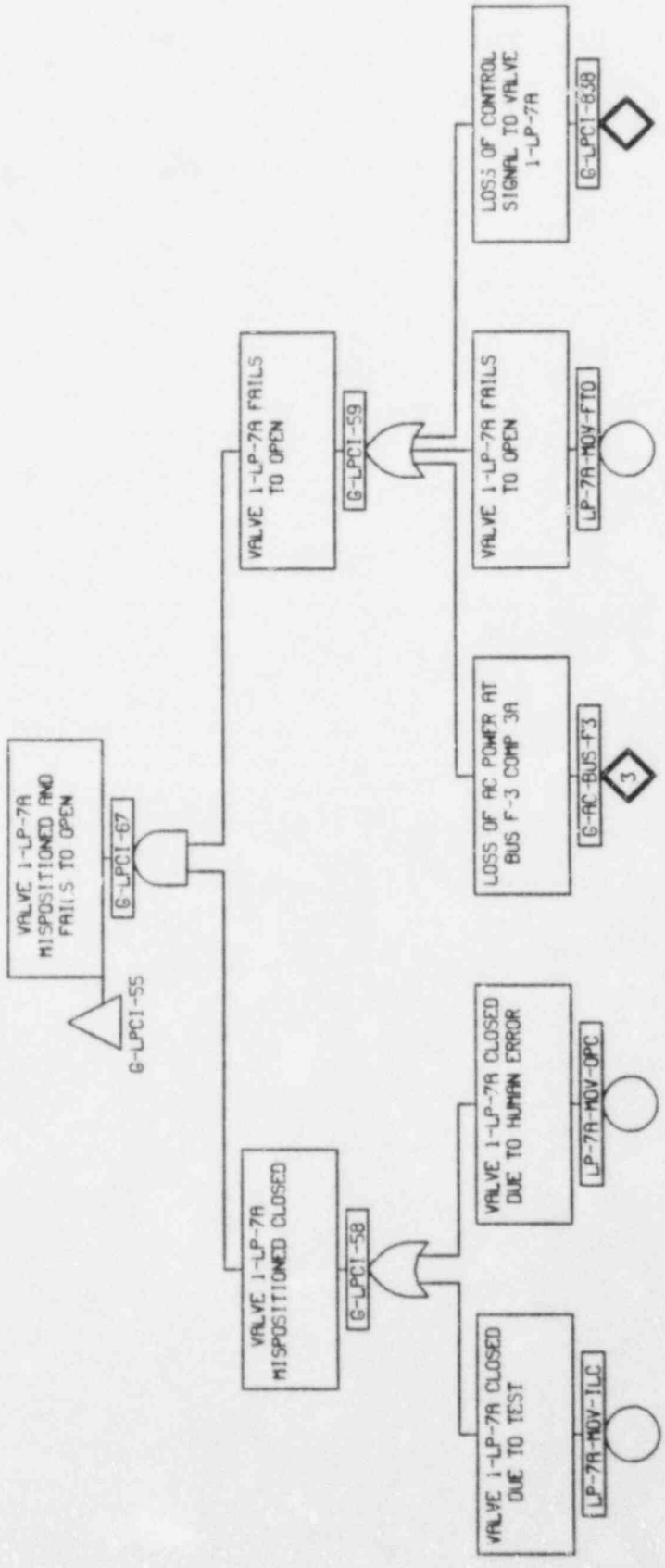

LOSS OF FLOW THROUGH VALVE 1-LP-7A
G-LPCI-10
G-LPCI-55
VALVE 1-LP-7A CLOSED DUE TO MAINT.
LP-7A-MOV-TMC
VALVE 1-LP-7A FAILS CLOSED
LP-7A-MOV-FRO
LOSS OF FLOW FROM PUMP TRAINS A AND C
G-LPCI-68
VALVE 1-LP-7A MISPOSITIONED AND FAILS TO OPEN
G-LPCI-67

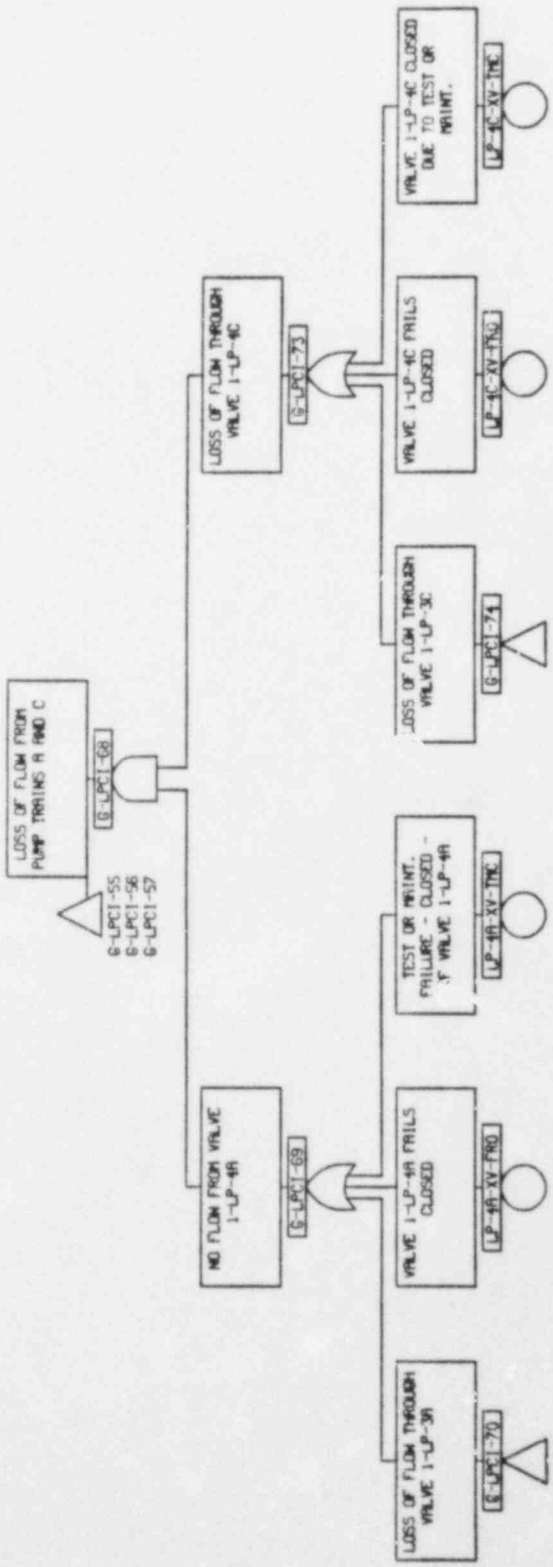

LOSS OF FLOW THROUGH VALVE 1-LP-8A
G-LPCI-S6
G-LPCI-13
OP. CLOSES VALVE 1-LP-8A
LP-8A-MOV-OPC
2
TEST OR MAINT. CAUSES VALVE 1-LP-8A TO BE CLOSED
LP-8A-MOV-TMC
2
VALVE 1-LP-8A FAILS CLOSED
LP-8A-MOV-FRO
2
LOSS OF FLOW FROM PUMP TRAINS A AND C
G-LPCI-68

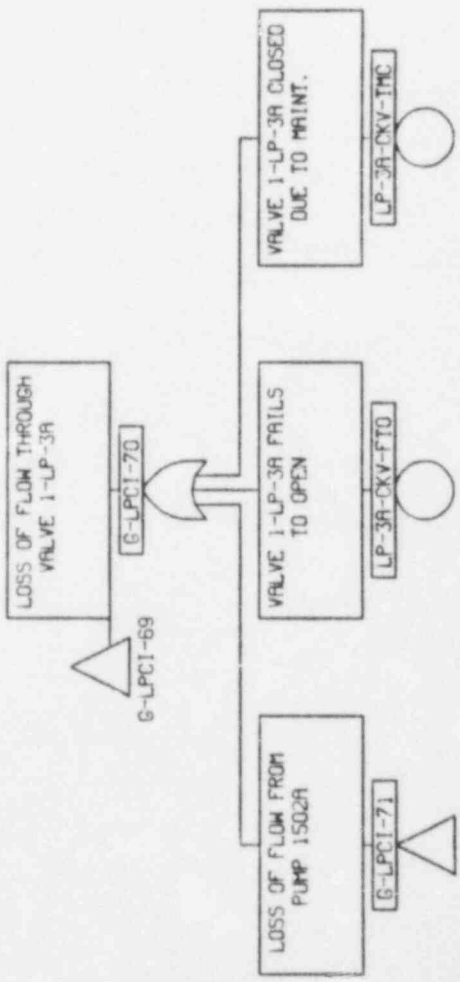

LOSS OF FLOW THROUGH VALVE 1-LP-68
G-LPCI-60
G-LPCI-13
TEST OR MAINT. CLOSURE OF VALVE 1-LP-68
LP-68-XV-TMC
VALVE 1-LP-68 FAILS CLOSED
LP-68-XV-FRO
LOSS OF FLOW THROUGH VALVE 1-LP-58
G-LPCI-63
VALVE 1-LP-58 CLOSED FOR TEST OR MAINT.
LP-58-XV-TMC
LOSS OF FLOW FROM PUMP TRAINS B AND D
G-LPCI-77
VALVE 1-LP-58 FAILS CLOSED
LP-58-XV-FRO

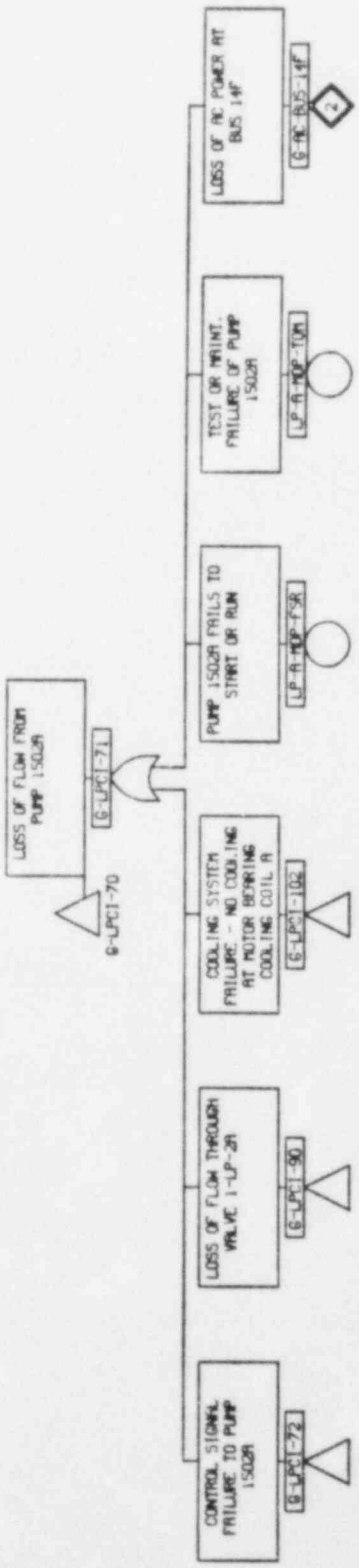

LOSS OF FLOW THROUGH VALVE 1-LP-78
G-LPCI-61
G-LPCI-13
VALVE 1-LP-78 CLOSED DUE TO MAINT.
LP-78-MAN-TMC
VALVE 1-LP-78 FAILS CLOSED
LP-78-MOV-FAC
LOSS OF FLOW FROM PUMP TRAINS B AND D
G-LPCI-39
VALVE 1-LP-78 MISPOSITIONED AND FAILS TO OPEN
G-LPCI-65
VALVE 1-LP-78 FAILS TO OPEN
G-LPCI-66
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-78
G-LPCI-65A
VALVE 1-LP-78 FAILS TO OPEN
LP-78-MOV-FTO
LOSS OF AC POWER MT BUS E-3 COMP 3A
G-AC-BUS-E3
3
VALVE 1-LP-78 MISPOS.TIONED CLOSED
G-LPCI-64
VALVE 1-LP-78 CLOSED DUE TO HUMAN ERROR
LP-78-MOV-CAC
VALVE 1-LP-78 CLOSED DUE TO TEST
LP-78-MOV-TST

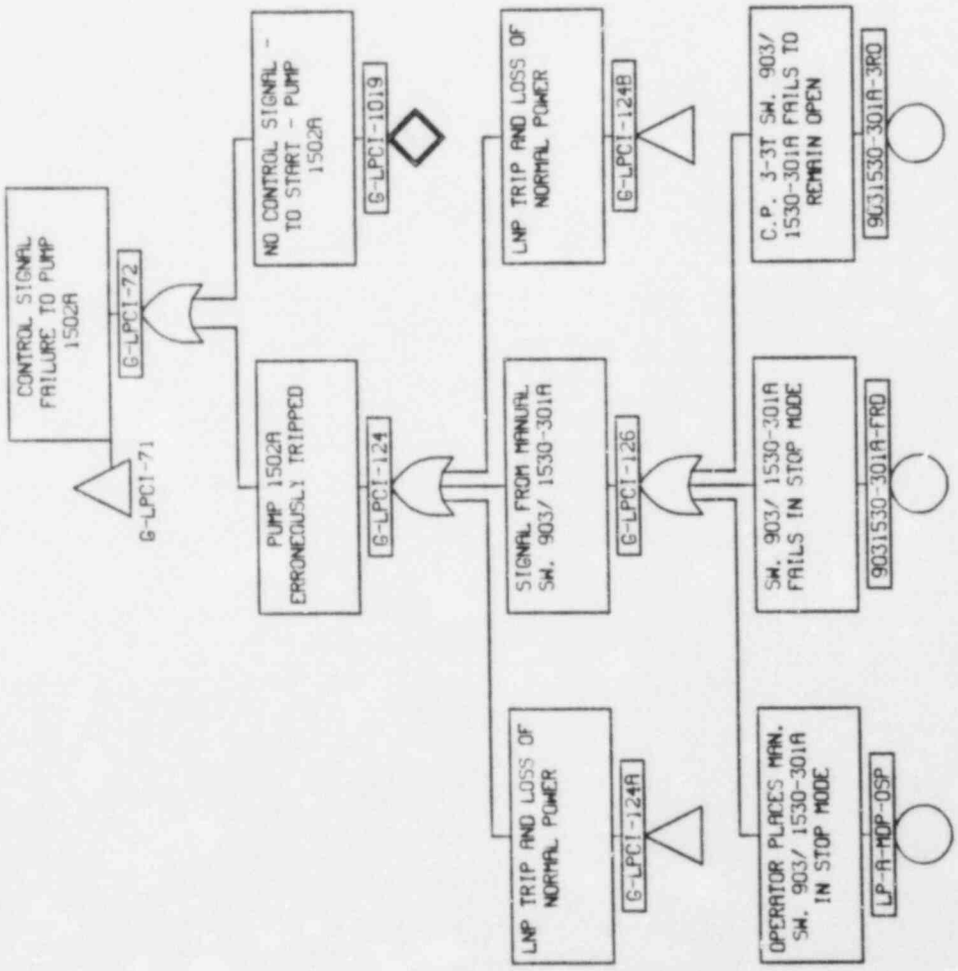

LOSS OF FLOW THROUGH VALVE 1-LP-8A
G-LPCI-62
G-LPCI-10
LOSS OF FLOW FROM PUMP TRAINS 1B AND D
G-LPCI-77
TEST OR MAINT. CAUSES VALVE 1-LP-8A TO BE CLOSED
LP-8A-MOV-TMC
2
OP. CLOSES VALVE 1-LP-8A
LP-8A-MOV-OPC
2
VALVE 1-LP-8A FAILS CLOSED
LP-8A-MOV-FRO
2

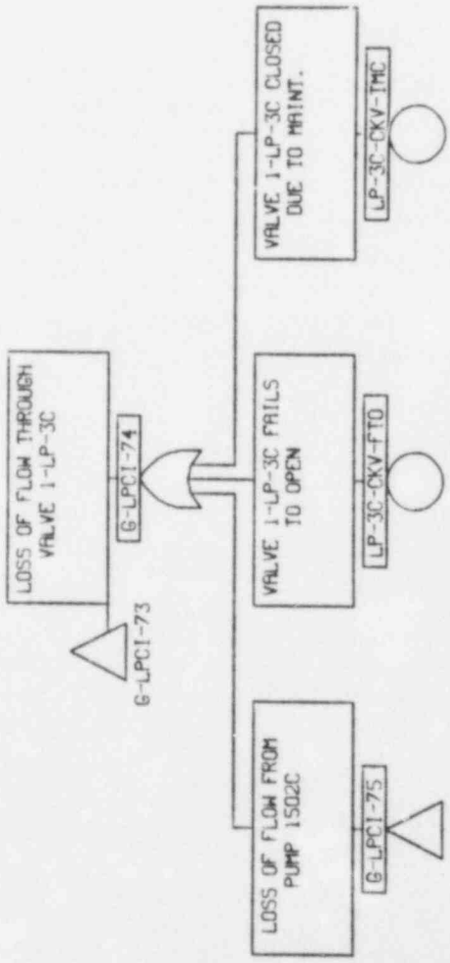

VALVE 1-LP-7A MISPOSITIONED AND FAILS TO OPEN
G-LPCI-67
G-LPCI-55
VALVE 1-LP-7A FAILS TO OPEN
G-LPCI-59
VALVE 1-LP-7A MISPOSITIONED CLOSED
G-LPCI-58
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-7A
G-LPCI-638
VALVE 1-LP-7A FAILS TO OPEN
LP-7A-MOV-FTO
LOSS OF AC POWER AT BUS F-3 COMP 3A
G-AC-BUS-F3
3
VALVE 1-LP-7A CLOSED DUE TO HUMAN ERROR
LP-7A-MOV-OPC
VALVE 1-LP-7A CLOSED DUE TO TEST
LP-7A-MOV-ILC

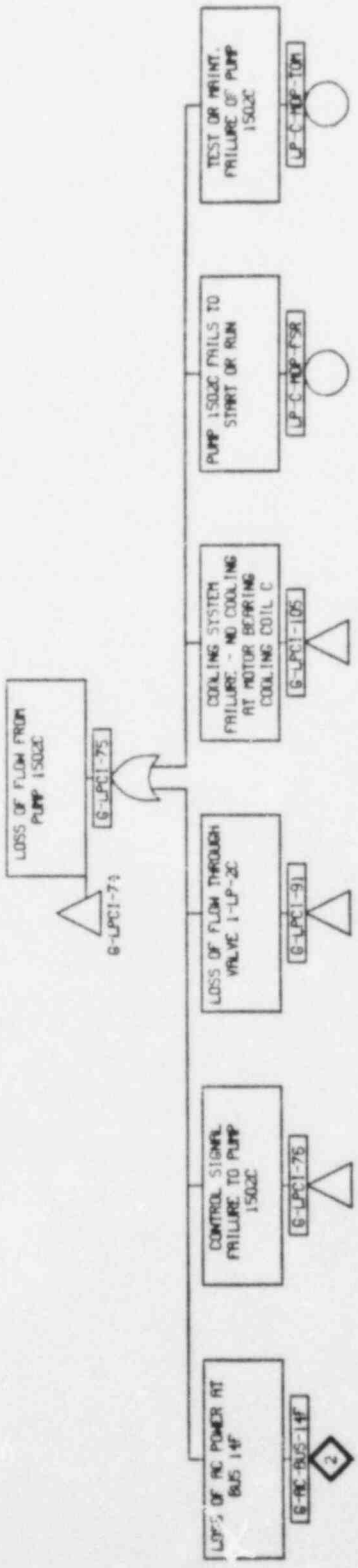

LOSS OF FLOW FROM PUMP TRAINS A AND C
G-LPCI-68
G-LPCI-55
G-LPCI-56
G-LPCI-57
NO FLOW FROM VALVE 1-LP-4A
G-LPCI-69
LOSS OF FLOW THROUGH VALVE 1-LP-4C
G-LPCI-73
VALVE 1-LP-4A FAILS CLOSED
LP-4A-XV-FAIL
TEST OR MAINT. FAILURE - CLOSED - OF VALVE 1-LP-4A
LP-4A-XV-TMC
LOSS OF FLOW THROUGH VALVE 1-LP-3A
G-LPCI-70
VALVE 1-LP-4C FAILS CLOSED
LP-4C-XV-FAIL
LOSS OF FLOW THROUGH VALVE 1-LP-3C
G-LPCI-71
VALVE 1-LP-4C CLOSED DUE TO TEST OR MAINT.
LP-4C-XV-TMC

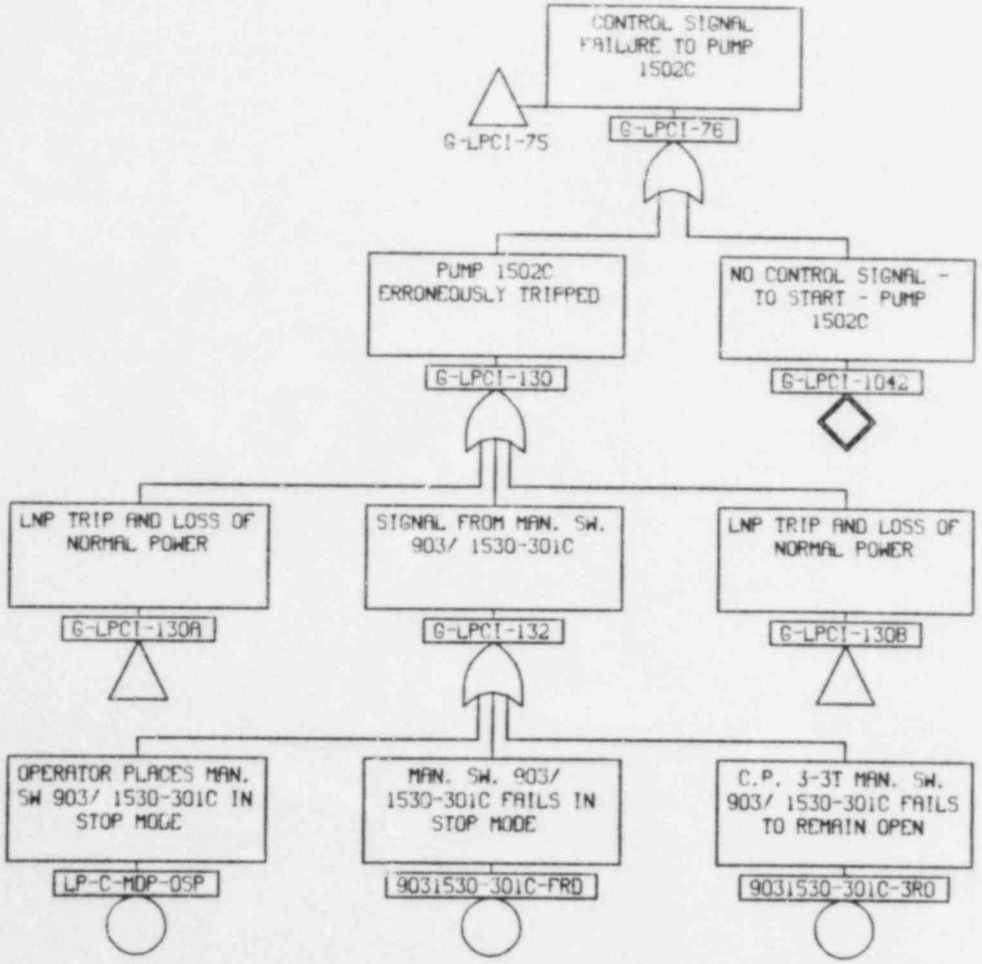

LOSS OF FLOW THROUGH VALVE 1-LP-3A
G-LPCI-70
G-LPCI-69
VALVE 1-LP-3A FAILS TO OPEN
LP-3A-CKV-FTO
VALVE 1-LP-3A CLOSED DUE TO MAINT.
LP-3A-CKV-TMC
LOSS OF FLOW FROM PUMP 1502A
G-LPCI-71

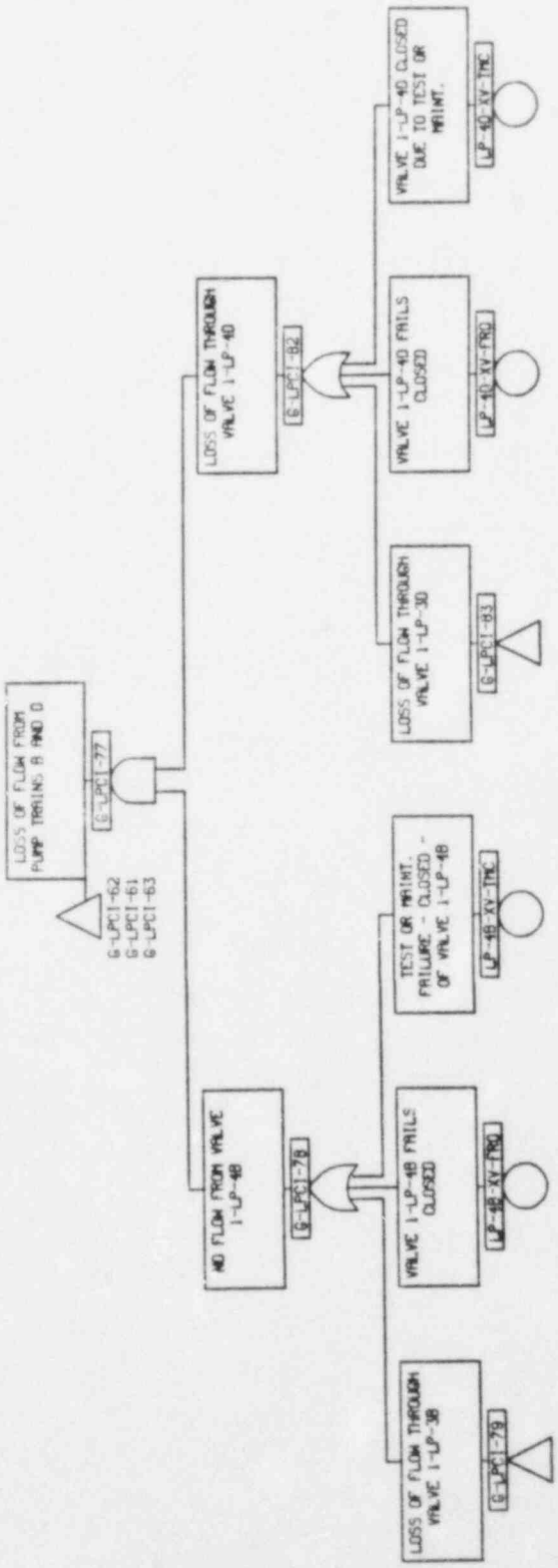

LOSS OF FLOW FROM PUMP 1SI02A
6-LPCI-70
6-LPCI-71
PUMP 1SI02A FAILS TO START OR RUN
LP-A-MOP-PSA
TEST OR MAINT. FAILURE OF PUMP 1SI02A
LP-A-MOP-TOM
LOSS OF AC POWER AT BUS 14F
6-AC-BUS-14F
2
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL A
6-LPCI-102
LOSS OF FLOW THROUGH VALVE 1-LP-29
6-LPCI-90
CONTROL SIGNAL FAILURE TO PUMP 1SI02A
6-LPCI-72

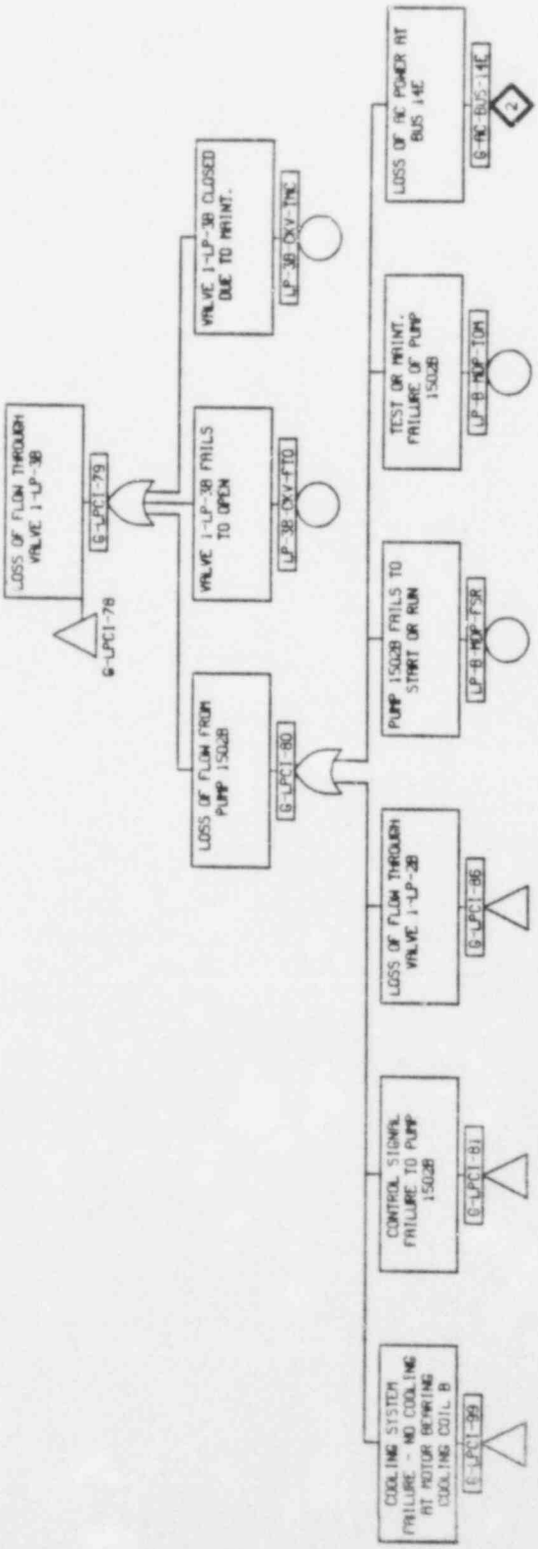

CONTROL SIGNAL FAILURE TO PUMP 1502A
G-LPCI-71
G-LPCI-72
NO CONTROL SIGNAL - TO START - PUMP 1502A
G-LPCI-1019
PUMP 1502A ERRONEOUSLY TRIPPED
G-LPCI-124
LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-124B
SIGNAL FROM MANUAL SW. 903/ 1530-301A
G-LPCI-126
C.P. 3-3T SW. 903/ 1530-301A FAILS TO REMAIN OPEN
9031530-301A-3RO
SW. 903/ 1530-301A FAILS IN STOP MODE
9031530-301A-FRO
LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-124A
OPERATOR PLACES MAN. SW. 903/ 1530-301A IN STOP MODE
LP-A-MOP-OSP

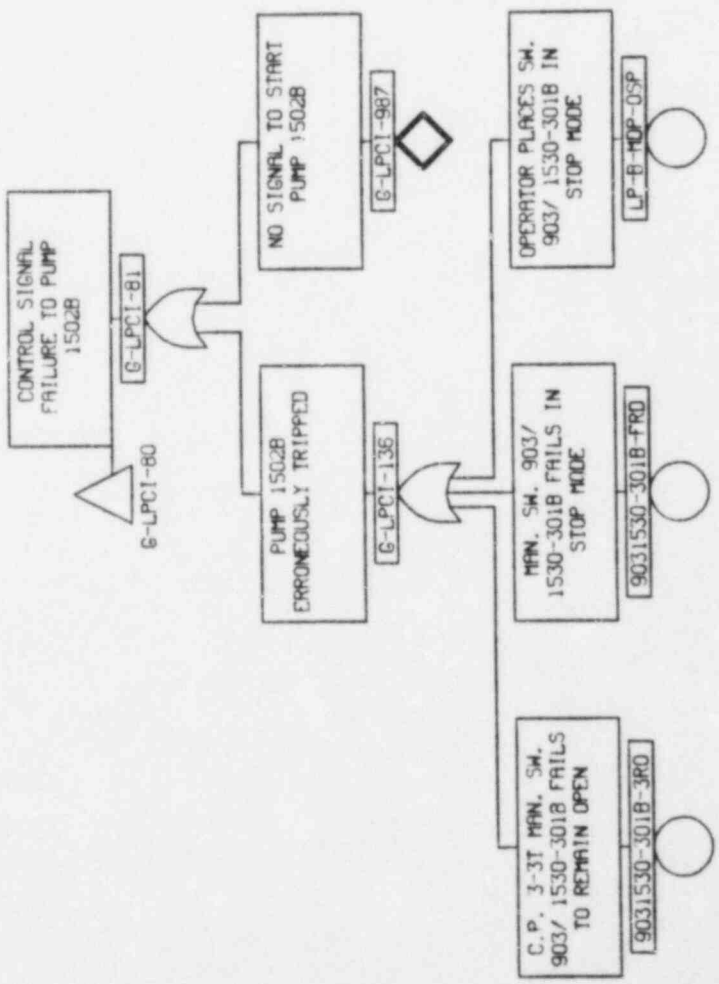

LOSS OF FLOW THROUGH VALVE 1-LP-3C
G-LPCI-74
VALVE 1-LP-3C CLOSED DUE TO MAINT.
LP-3C-CKV-IMC
VALVE 1-LP-3C FAILS TO OPEN
LP-3C-CKV-FTO
G-LPCI-73
LOSS OF FLOW FROM PUMP 1502C
G-LPCI-75

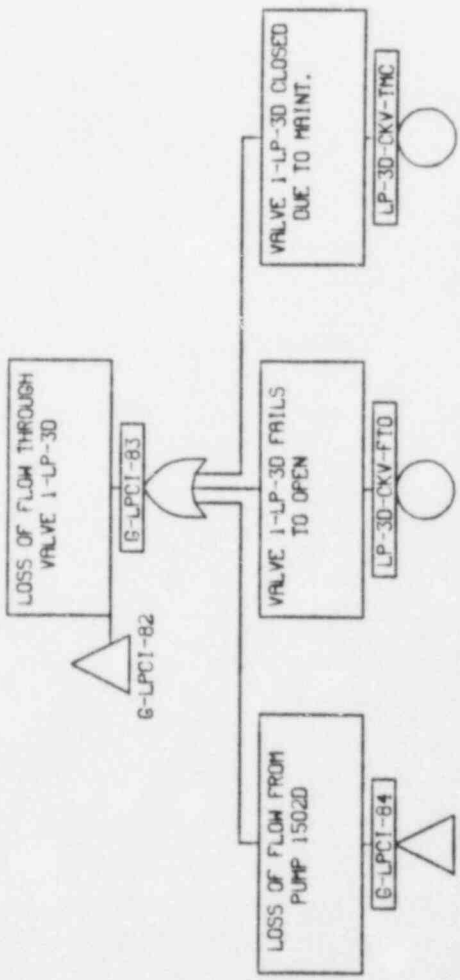

LOSS OF FLOW FROM PUMP 1SI2C
G-LPCI-75
G-LPCI-73
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL C
G-LPCI-105
PUMP 1SI2C FAILS TO START OR RUN
LP-C-MOP-FSR
TEST OR MAINT. FAILURE OF PUMP 1SI2C
LP-C-MOP-TOM
LOSS OF FLOW THROUGH VALVE 1-LP-2C
G-LPCI-91
CONTROL SIGNAL FAILURE TO PUMP 1SI2C
G-LPCI-75
LOSS OF AC POWER AT BUS 14F
G-AC-BUS-14F
2

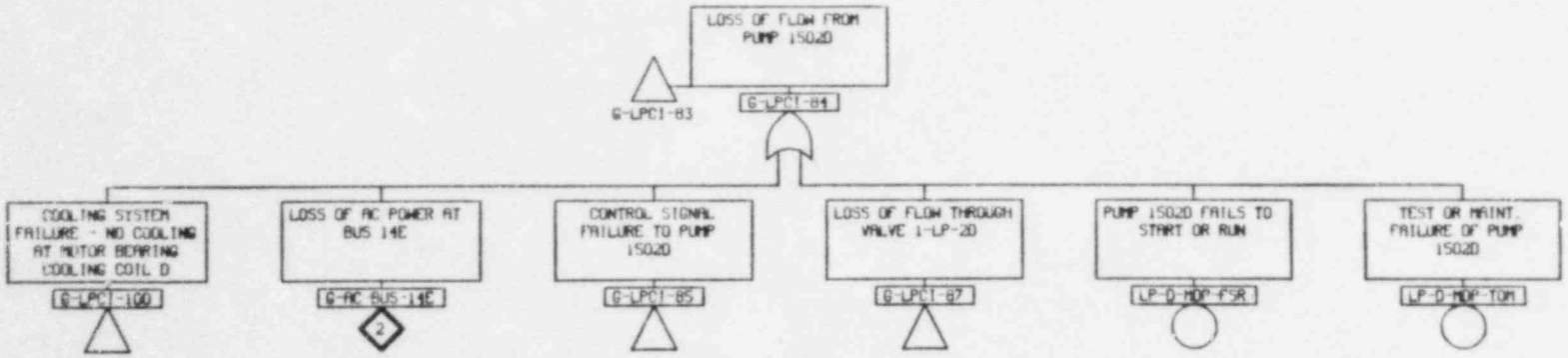

CONTROL SIGNAL FAILURE TO PUMP 1502C
G-LPCI-75
G-LPCI-76
PUMP 1502C ERRONEOUSLY TRIPPED
NO CONTROL SIGNAL - TO START - PUMP 1502C
G-LPCI-130
G-LPCI-1042
LNP TRIP AND LOSS OF NORMAL POWER
SIGNAL FROM MAN. SW. 903/ 1530-301C
LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-130A
G-LPCI-132
G-LPCI-130B
OPERATOR PLACES MAN. SW 903/ 1530-301C IN STOP MODE
MAN. SW. 903/ 1530-301C FAILS IN STOP MODE
C.P. 3-3T MAN. SW. 903/ 1530-301C FAILS TO REMAIN OPEN
LP-C-MDP-OSP
9031530-301C-FRO
9031530-301C-3RO

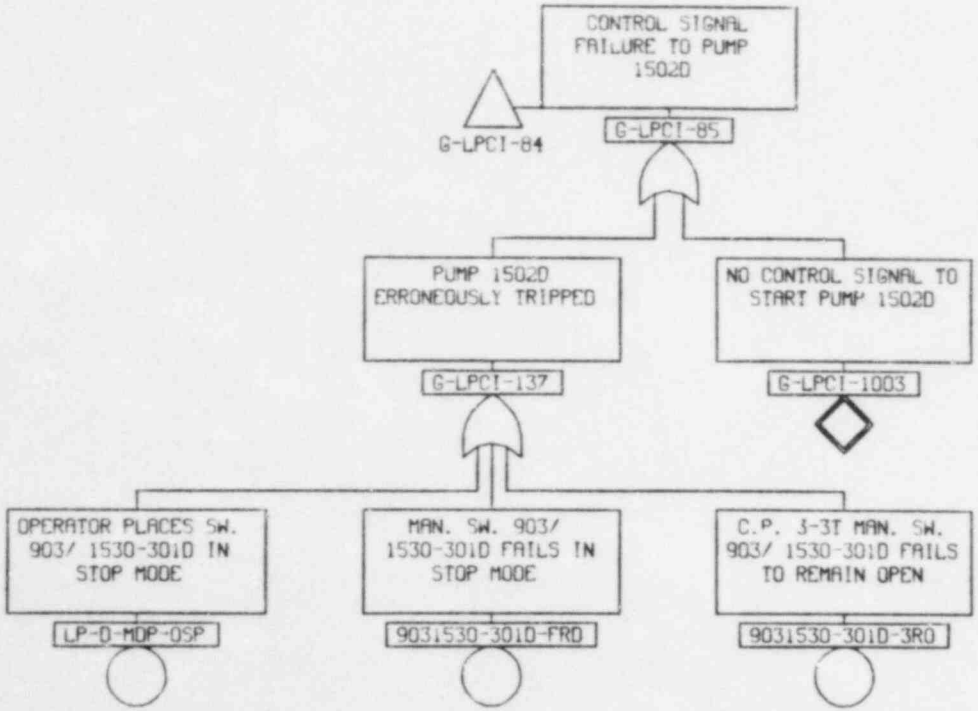

LOSS OF FLOW FROM PUMP TRAINS A AND D
G-LPCI-62
G-LPCI-61
G-LPCI-63
G-LPCI-77
NO FLOW FROM VALVE 1-LP-48
G-LPCI-78
LOSS OF FLOW THROUGH VALVE 1-LP-38
G-LPCI-79
VALVE 1-LP-48 FAILS CLOSED
LP-48-XV-FRO
TEST OR MAINT. FAILURE - CLOSED - OF VALVE 1-LP-48
LP-48-XV-TMC
LOSS OF FLOW THROUGH VALVE 1-LP-30
G-LPCI-83
LOSS OF FLOW THROUGH VALVE 1-LP-40
G-LPCI-82
VALVE 1-LP-40 FAILS CLOSED
LP-40-XV-FRO
VALVE 1-LP-40 CLOSED DUE TO TEST OR MAINT.
LP-40-XV-TMC

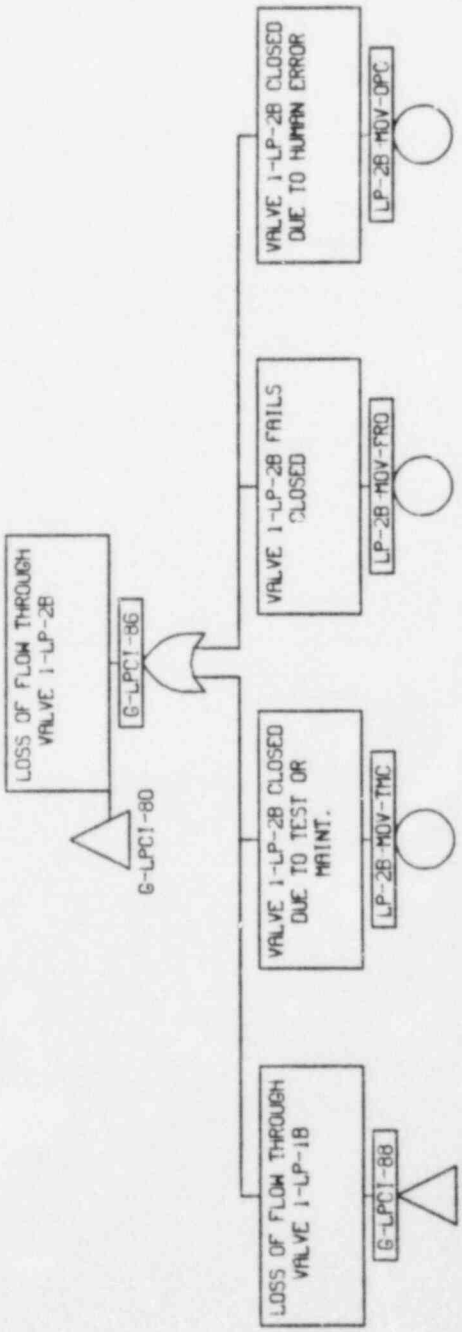

LOSS OF FLOW THROUGH VALVE 1-LP-1B
G-LPCI-79
G-LPCI-78
VALVE 1-LP-1B FAILS TO OPEN
LP-1B-CKV-FTO
VALVE 1-LP-1B CLOSED DUE TO MAINT.
LP-1B-CKV-TMC
LOSS OF FLOW FROM PUMP 1SO2B
G-LPCI-80
PUMP 1SO2B FAILS TO START OR RUN
LP-B-MDP-FSR
TEST OR MAINT. FAILURE OF PUMP 1SO2B
LP-B-MDP-TDM
LOSS OF FLOW THROUGH VALVE 1-LP-2B
G-LPCI-86
LOSS OF AC POWER AT BUS 14E
G-AC-BUS-14E
2
CONTROL SIGNAL FAILURE TO PUMP 1SO2B
G-LPCI-81
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL B
G-LPCI-99

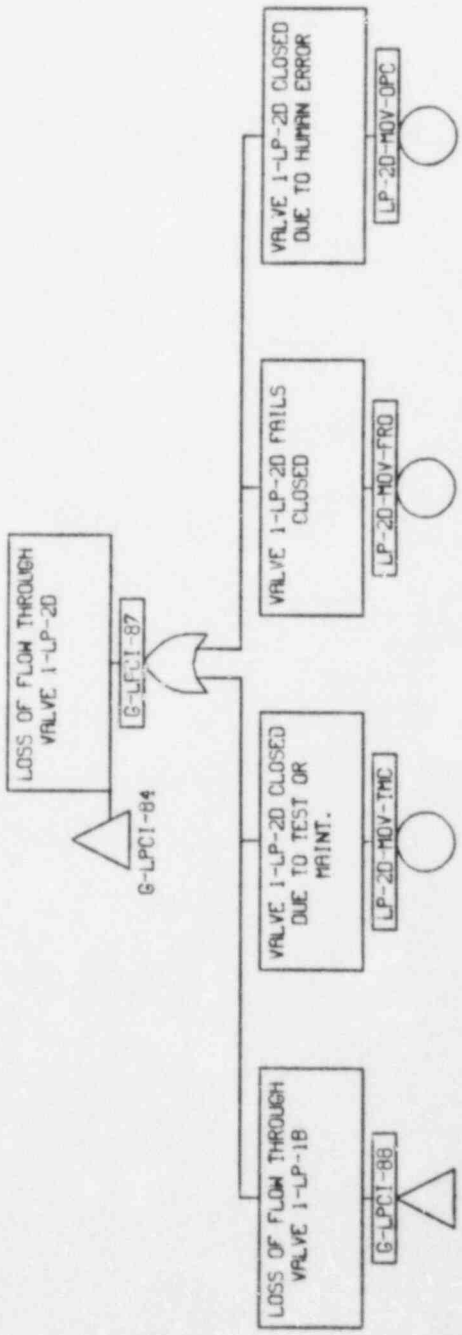

CONTROL SIGNAL FAILURE TO PUMP 1502B
G-LPCI-80
G-LPCI-81
NO SIGNAL TO START PUMP 1502B
G-LPCI-987
PUMP 1502B ERRONEOUSLY TRIPPED
G-LPCI-136
OPERATOR PLACES SW. 903/ 1530-3018 IN STOP MODE
LP-B-MOP-OSP
MAN. SW. 903/ 1530-3018 FAILS IN STOP MODE
90315301-3018-FRO
C.P. 3-3T MAN. SW. 903/ 1530-3018 FAILS TO REMAIN OPEN
90315301-3018-3RO

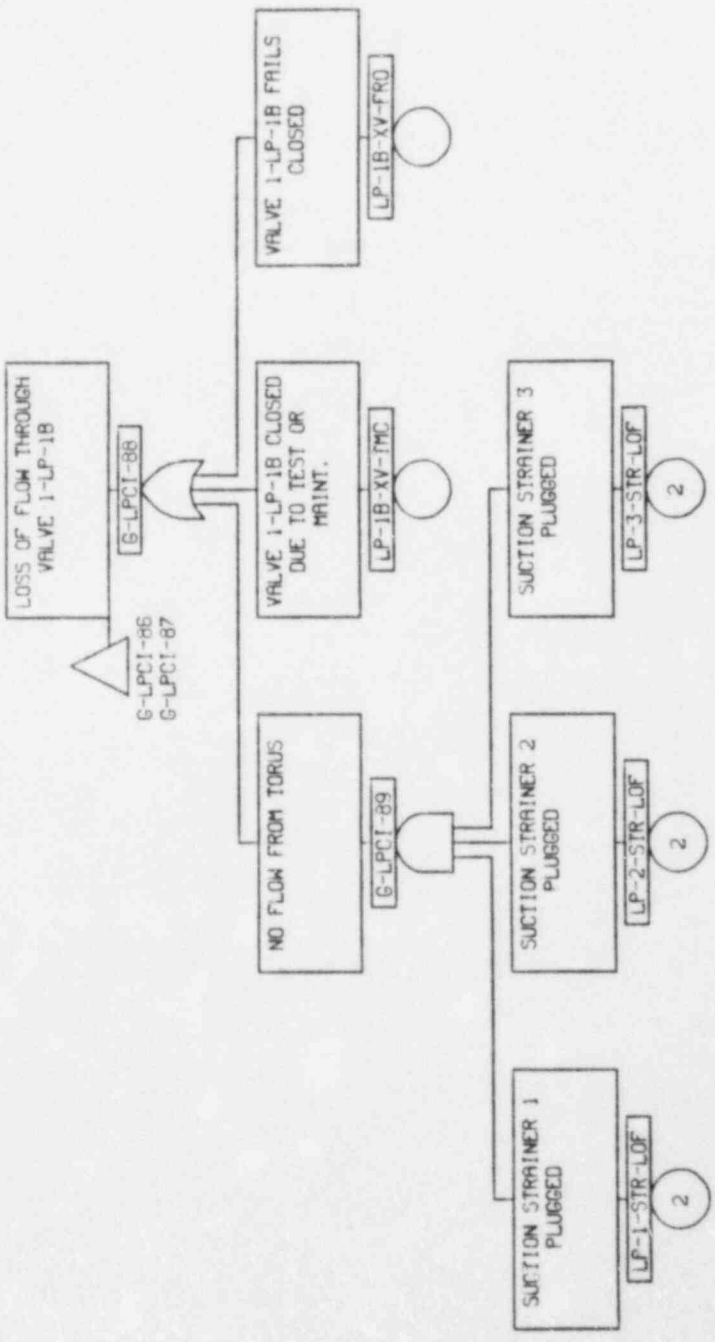

LOSS OF FLOW THROUGH VALVE 1-LP-30
G-LPCI-83
G-LPCI-82
VALVE 1-LP-30 FAILS TO OPEN
LP-30-CKV-FTO
VALVE 1-LP-30 CLOSED DUE TO MAINT.
LP-30-CKV-TMC
LOSS OF FLOW FROM PUMP 1502D
G-LPCI-84

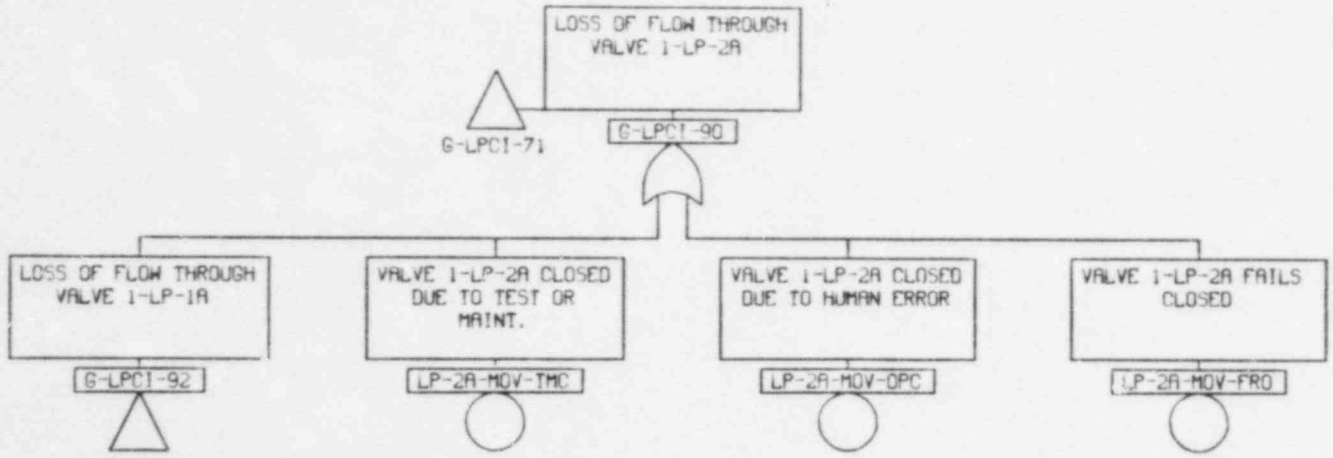

LOSS OF FLOW FROM PUMP 1502D
G-LPCI-84
G-LPCI-83
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL D
G-LPCI-100
LOSS OF AC POWER AT BUS 14E
G-AC BUS-14E
2
CONTROL SIGNAL FAILURE TO PUMP 1502D
G-LPCI-85
LOSS OF FLOW THROUGH VALVE 1-LP-2D
G-LPCI-87
PUMP 1502D FAILS TO START OR RUN
LP-D-MDP-FSR
TEST OR MAINT. FAILURE OF PUMP 1502D
LP-D-MDP-TOM

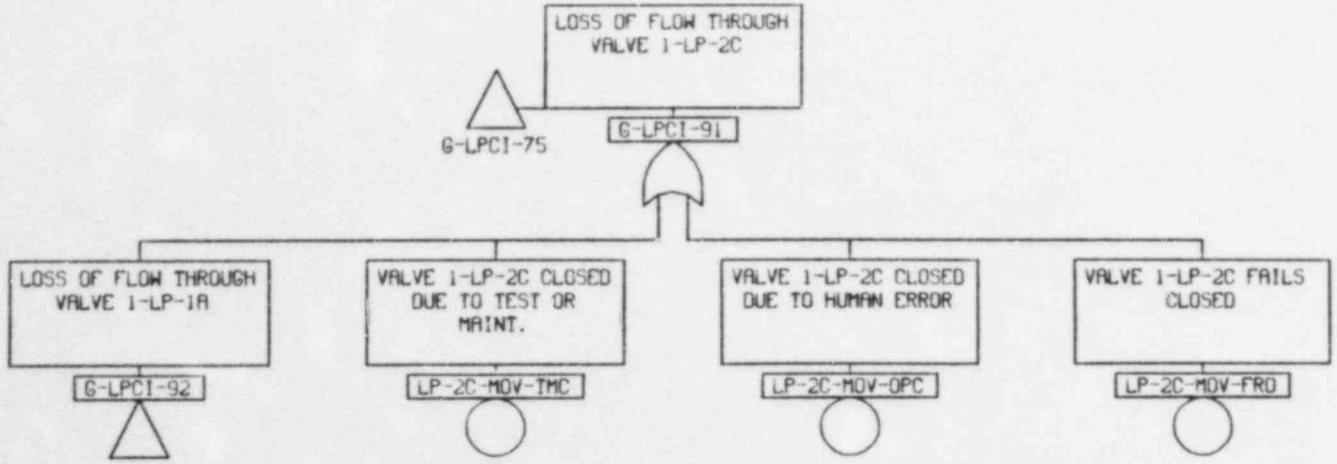

CONTROL SIGNAL FAILURE TO PUMP 1502D
G-LPCI-84
G-LPCI-85
PUMP 1502D ERRONEOUSLY TRIPPED
NO CONTROL SIGNAL TO START PUMP 1502D
G-LPCI-137
G-LPCI-1003
OPERATOR PLACES SW. 903/ 1530-301D IN STOP MODE
MAN. SW. 903/ 1530-301D FAILS IN STOP MODE
C.P. 3-3T MAN. SW. 903/ 1530-301D FAILS TO REMAIN OPEN
LP-D-MDP-OSP
903:530-301D-FRD
903:530-301D-3RO

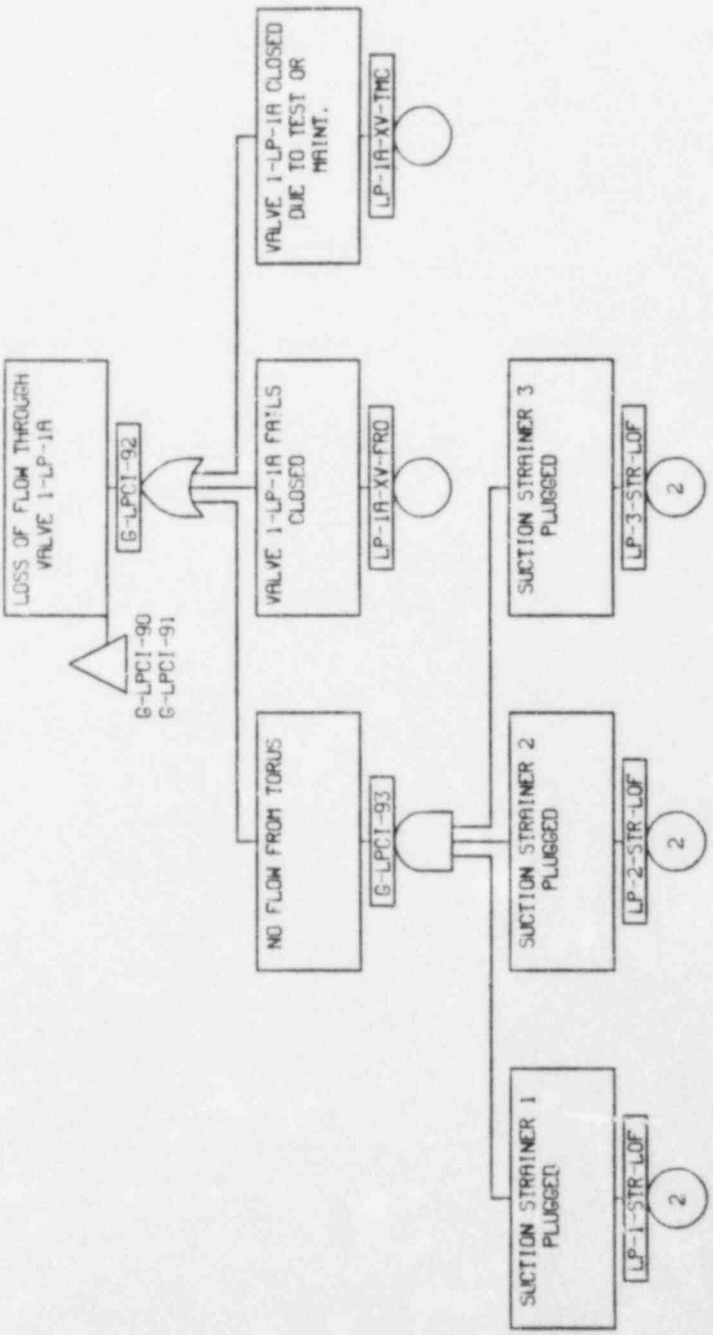

LOSS OF FLOW THROUGH VALVE 1-LP-2B
G-LPCI-80
G-LPCI-86
VALVE 1-LP-2B FAILS CLOSED
LP-2B-MOV-FRO
VALVE 1-LP-2B CLOSED DUE TO HUMAN ERROR
LP-2B-MOV-OPC
VALVE 1-LP-2B CLOSED DUE TO TEST OR MAINT.
LP-2B-MOV-TMC
LOSS OF FLOW THROUGH VALVE 1-LP-1B
G-LPCI-88

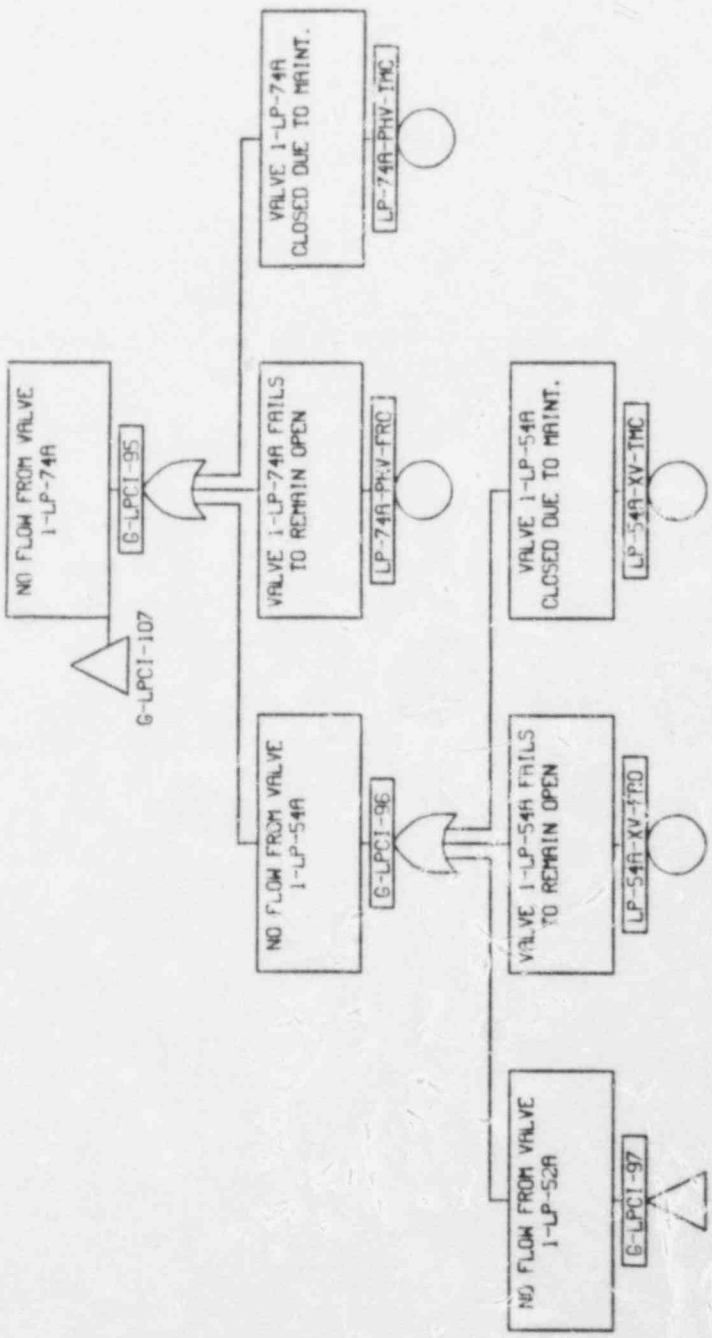

LOSS OF FLOW THROUGH VALVE 1-LP-2D
G-LPCI-87
G-LPCI-84
VALVE 1-LP-2D FAILS CLOSED
LP-2D-MOV-FRO
VALVE 1-LP-2D CLOSED DUE TO HUMAN ERROR
LP-2D-MOV-OPC
VALVE 1-LP-2D CLOSED DUE TO TEST OR MAINT.
LP-2D-MOV-TMC
LOSS OF FLOW THROUGH VALVE 1-LP-1B
G-LPCI-88

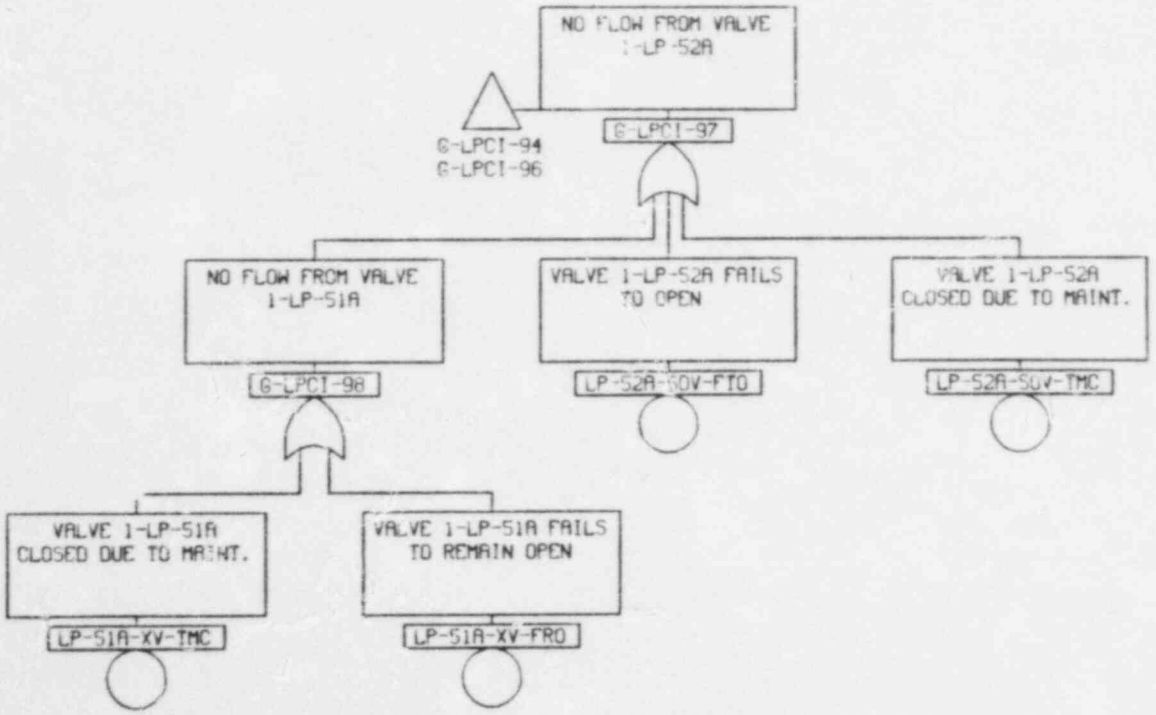

LOSS OF FLOW THROUGH VALVE 1-LP-1B
G-LPCI-88
G-LPCI-86
G-LPCI-87
VALVE 1-LP-1B FAILS CLOSED
LP-1B-XV-FRO
VALVE 1-LP-1B CLOSED DUE TO TEST OR MAINT.
LP-1B-XV-TMC
NO FLOW FROM TORUS
G-LPCI-89
SUCTION STRAINER 3 PLUGGED
LP-3-STR-LOF
2
SUCTION STRAINER 2 PLUGGED
LP-2-STR-LOF
2
SUCTION STRAINER 1 PLUGGED
LP-1-STR-LOF
2

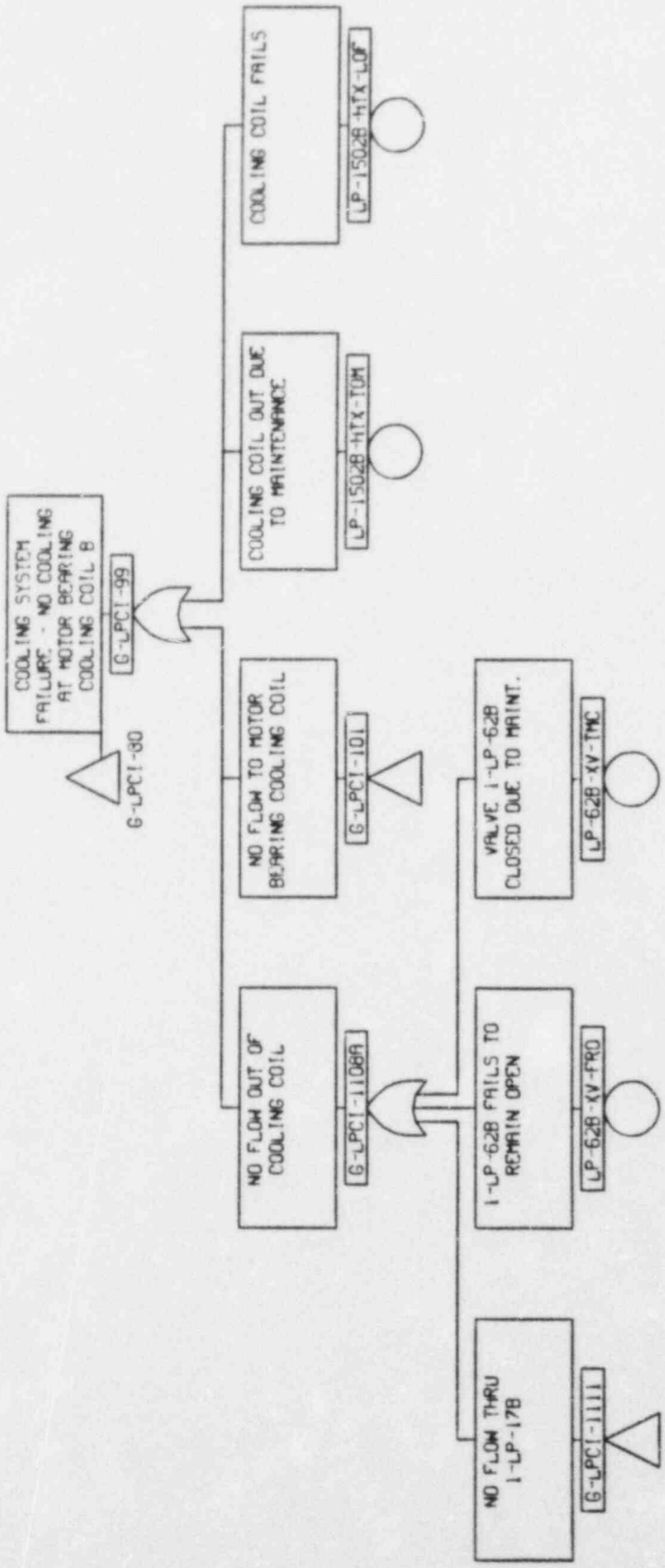

LOSS OF FLOW THROUGH VALVE 1-LP-2A
G-LPCI-71
G-LPCI-90
LOSS OF FLOW THROUGH VALVE 1-LP-1A
G-LPCI-92
VALVE 1-LP-2A CLOSED DUE TO TEST OR MAINT.
LP-2A-MOV-TMC
VALVE 1-LP-2A CLOSED DUE TO HUMAN ERROR
LP-2A-MOV-OPC
VALVE 1-LP-2A FAILS CLOSED
LP-2A-MOV-FRO

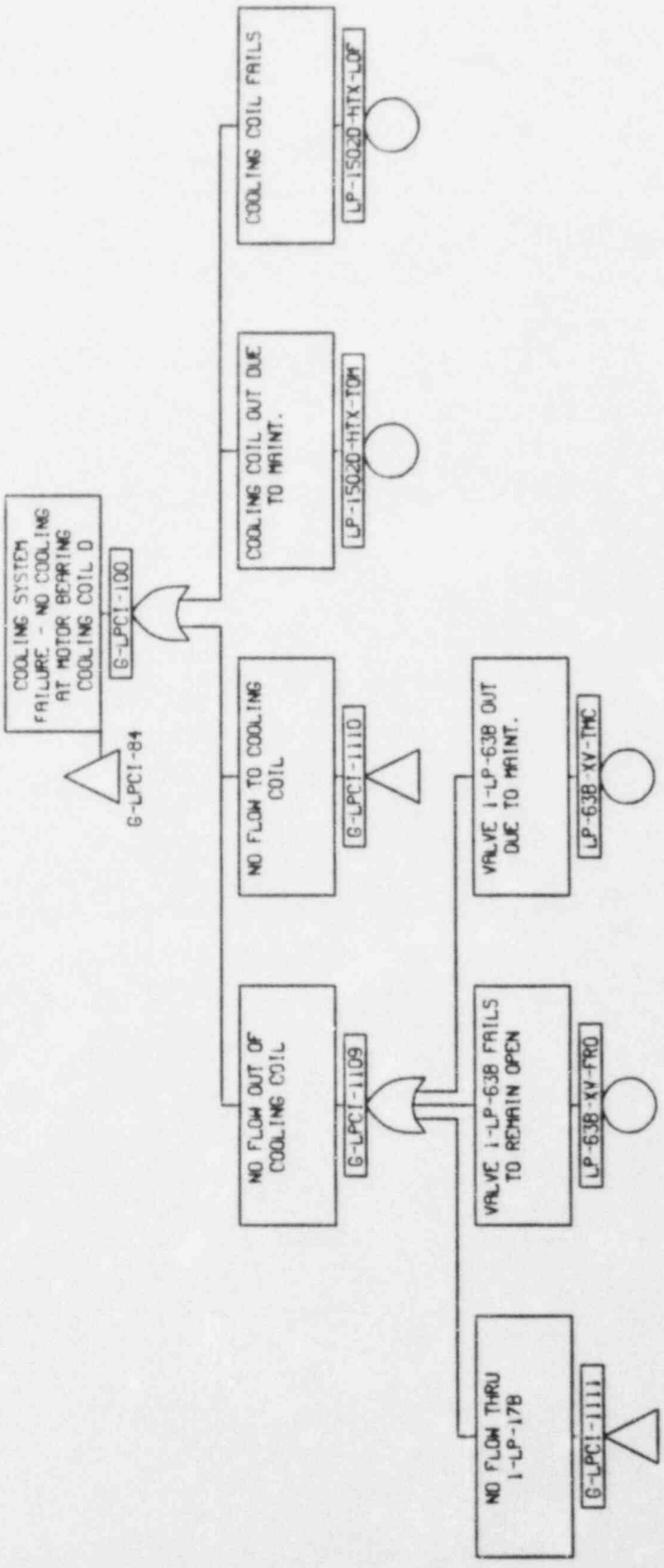

LOSS OF FLOW THROUGH VALVE 1-LP-2C
G-LPCI-75
G-LPCI-91
LOSS OF FLOW THROUGH VALVE 1-LP-1A
G-LPCI-92
VALVE 1-LP-2C CLOSED DUE TO TEST OR MAINT.
LP-2C-MOV-TMC
VALVE 1-LP-2C CLOSED DUE TO HUMAN ERROR
LP-2C-MOV-OPC
VALVE 1-LP-2C FAILS CLOSED
LP-2C-MOV-FRO

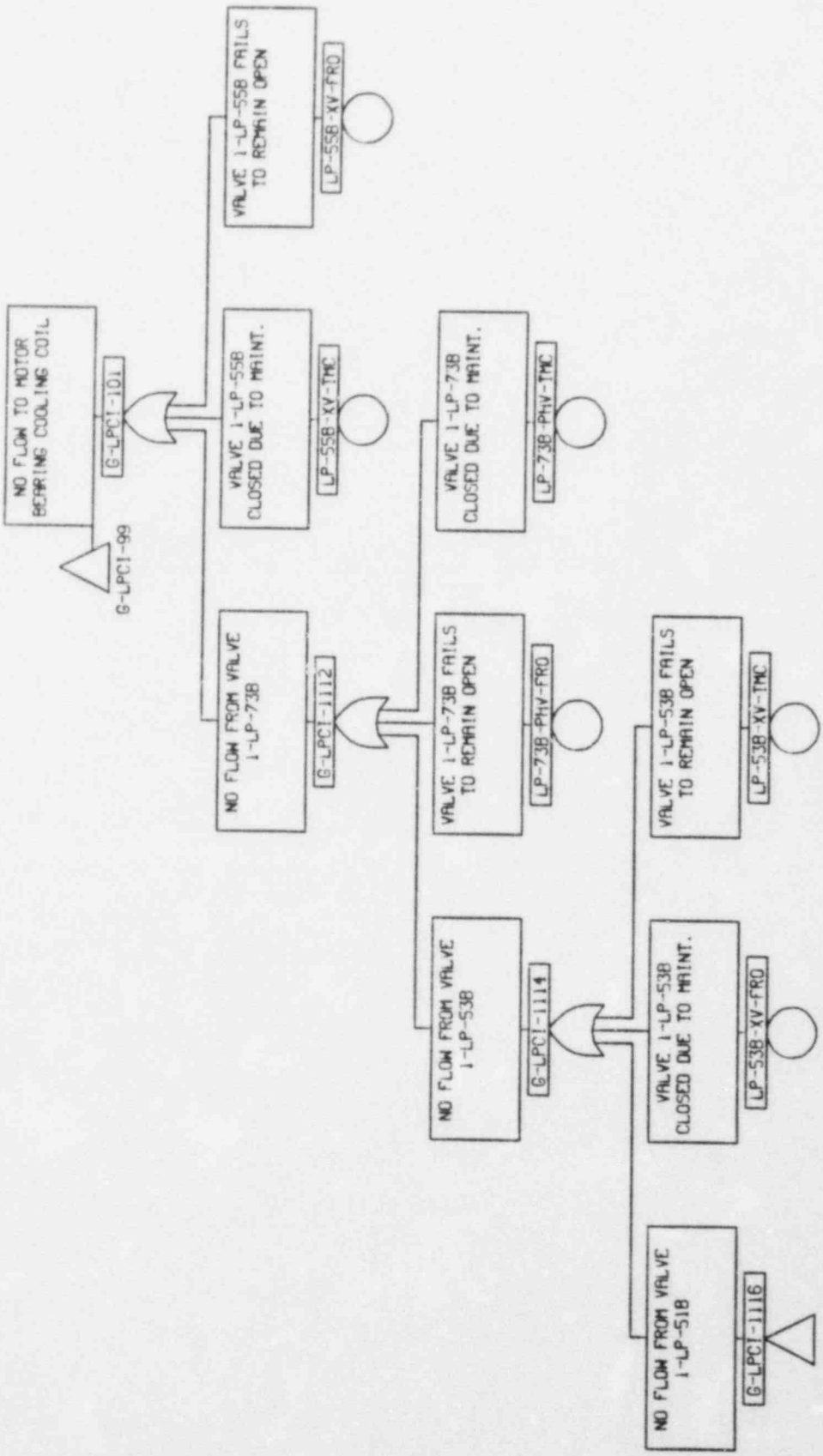

LOSS OF FLOW THROUGH VALVE 1-LP-1A
G-LPCI-92
G-LPCI-90
G-LPCI-91
NO FLOW FROM TORUS
G-LPCI-93
VALVE 1-LP-1A FAILS CLOSED
LP-1A-XV-FRO
VALVE 1-LP-1A CLOSED DUE TO TEST OR MAINT.
LP-1A-XV-TMC
SUCTION STRAINER 1 PLUGGED
LP-1-STR-LOF
2
SUCTION STRAINER 2 PLUGGED
LP-2-STR-LOF
2
SUCTION STRAINER 3 PLUGGED
LP-3-STR-LOF
2

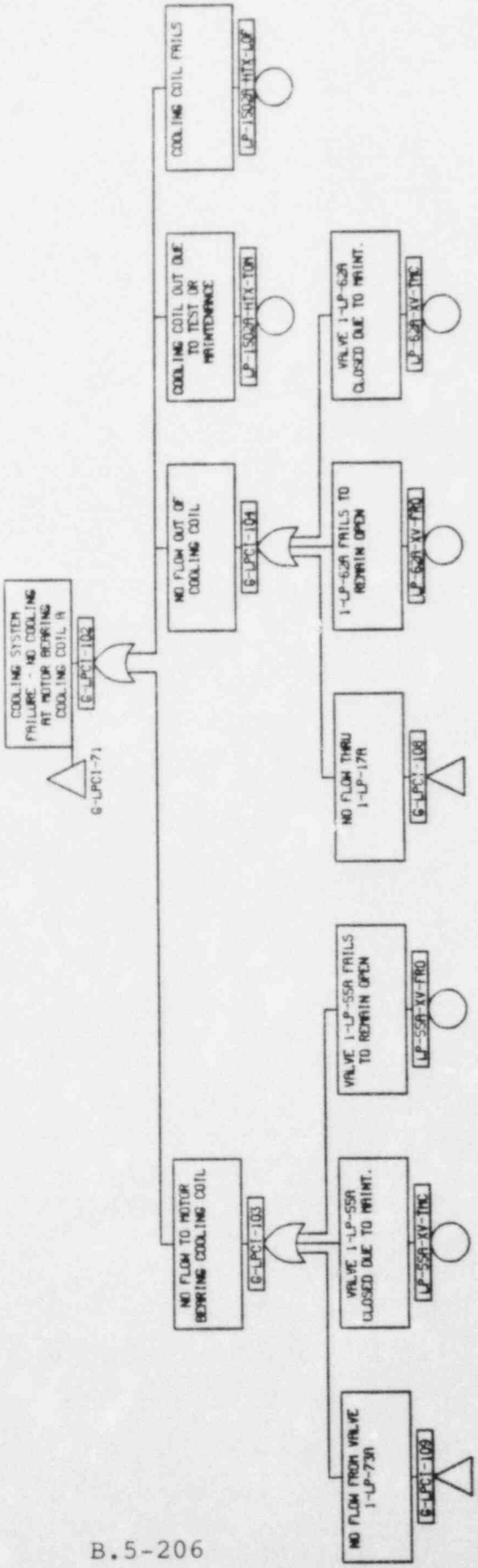

NO FLOW FROM VALVE 1-LP-74A
G-LPCI-95
G-LPCI-107
VALVE 1-LP-74A FAILS TO REMAIN OPEN
LP-74A-PKV-FRC
VALVE 1-LP-74A CLOSED DUE TO MAINT.
LP-74A-PHV-TMC
NO FLOW FROM VALVE 1-LP-54A
G-LPCI-96
VALVE 1-LP-54A FAILS TO REMAIN OPEN
LP-54A-XV-FRC
VALVE 1-LP-54A CLOSED DUE TO MAINT.
LP-54A-XV-TMC
NO FLOW FROM VALVE 1-LP-52A
G-LPCI-97

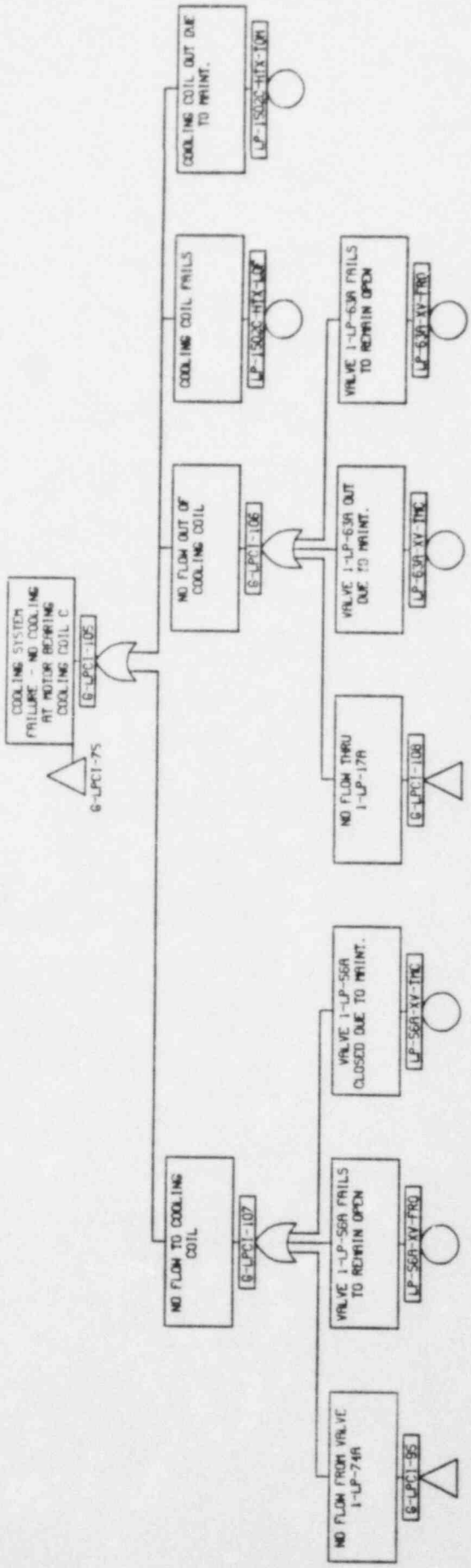

NO FLOW FROM VALVE
1-LP-52A
G-LPCI-94
G-LPCI-96
G-LPCI-97
NO FLOW FROM VALVE
1-LP-51A
VALVE 1-LP-52A FAILS
TO OPEN
VALVE 1-LP-52A
CLOSED DUE TO MAINT.
G-LPCI-98
LP-52A-SOV-FTO
LP-52A-SOV-TMC
VALVE 1-LP-51A
CLOSED DUE TO MAINT.
VALVE 1-LP-51A FAILS
TO REMAIN OPEN
LP-51A-XV-TMC
LP-51A-XV-FRO

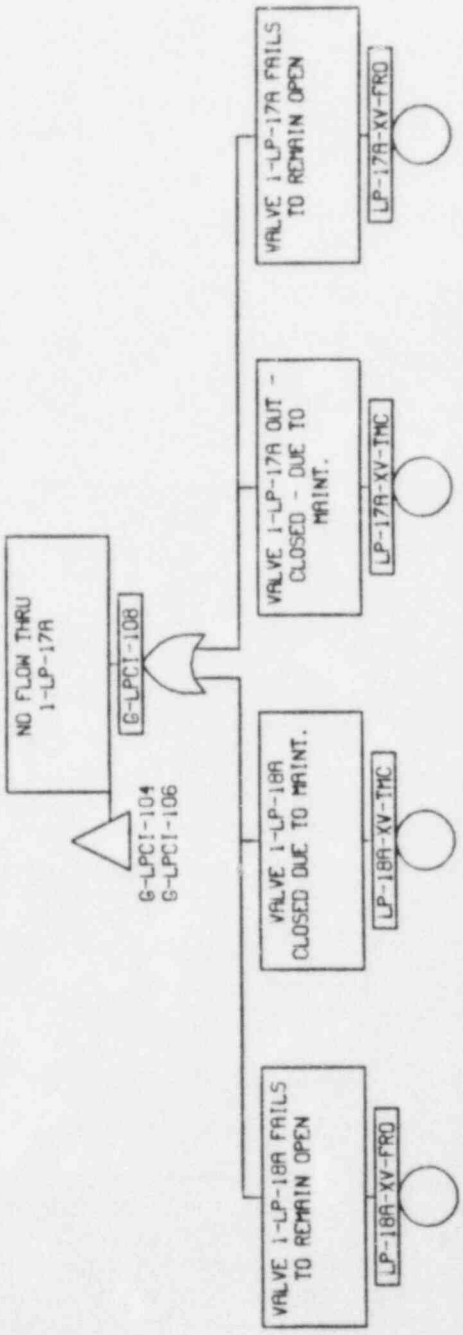

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL B
G-LPCI-99
G-LPCI-30
COOLING COIL FAILS
LP-1502B-HTX-LOF
COOLING COIL OUT DUE TO MAINTENANCE
LP-1502B-HTX-TOM
NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-101
VALVE 1-LP-628 CLOSED DUE TO MAINT.
LP-628-XV-TMC
NO FLOW OUT OF COOLING COIL
G-LPCI-1100A
1-LP-628 FAILS TO REMAIN OPEN
LP-628-XV-FRO
NO FLOW THRU 1-LP-178
G-LPCI-1111

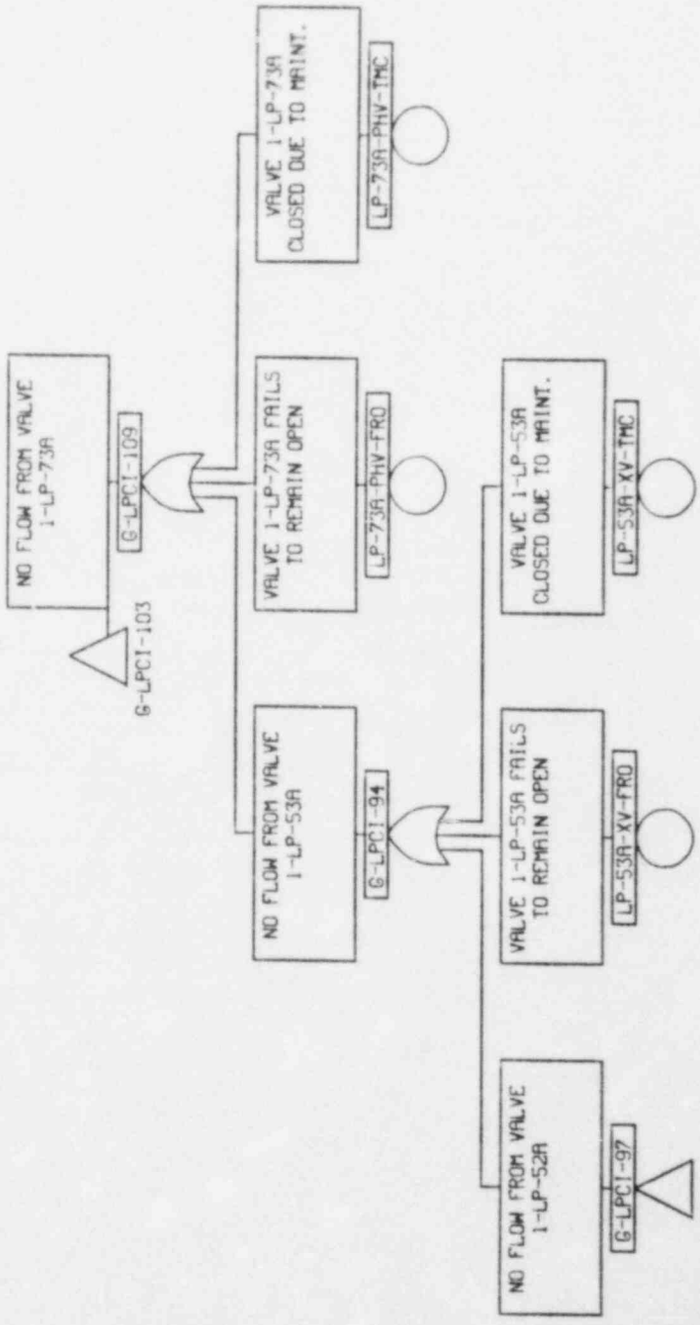

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL D
G-LPCI-100
G-LPCI-84
COOLING COIL FAILS
LP-15020-HTX-LOF
COOLING COIL OUT DUE TO MAINT.
LP-15020-HTX-TOM
NO FLOW TO COOLING COIL
G-LPCI-1110
NO FLOW OUT OF COOLING COIL
G-LPCI-1109
VALVE 1-LP-638 OUT DUE TO MAINT.
LP-638-XV-TMC
VALVE 1-LP-638 FAILS TO REMAIN OPEN
LP-638-XV-FRO
NO FLOW THRU 1-LP-178
G-LPCI-1111

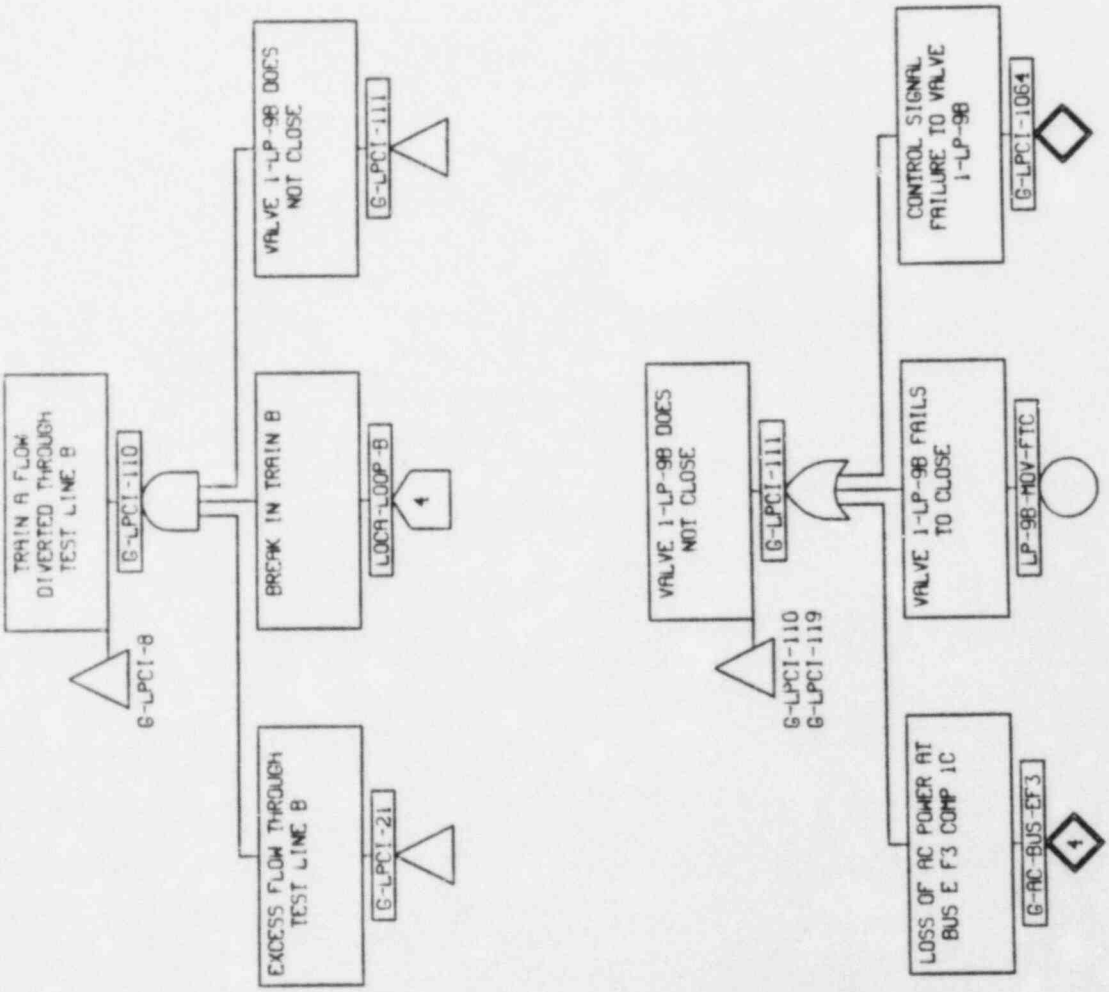

NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-101
G-LPCI-99
VALVE 1-LP-558 FAILS TO REMAIN OPEN
LP-558-XV-FRO
VALVE 1-LP-558 CLOSED DUE TO MAINT.
LP-558-XV-TMC
VALVE 1-LP-738 CLOSED DUE TO MAINT.
LP-738-PHV-TMC
NO FLOW FROM VALVE 1-LP-738
G-LPCI-1112
VALVE 1-LP-738 FAILS TO REMAIN OPEN
LP-738-PHV-FRO
VALVE 1-LP-538 FAILS TO REMAIN OPEN
LP-538-XV-TMC
NO FLOW FROM VALVE 1-LP-538
G-LPCI-1114
VALVE 1-LP-538 CLOSED DUE TO MAINT.
LP-538-XV-FRO
NO FLOW FROM VALVE 1-LP-518
G-LPCI-1116

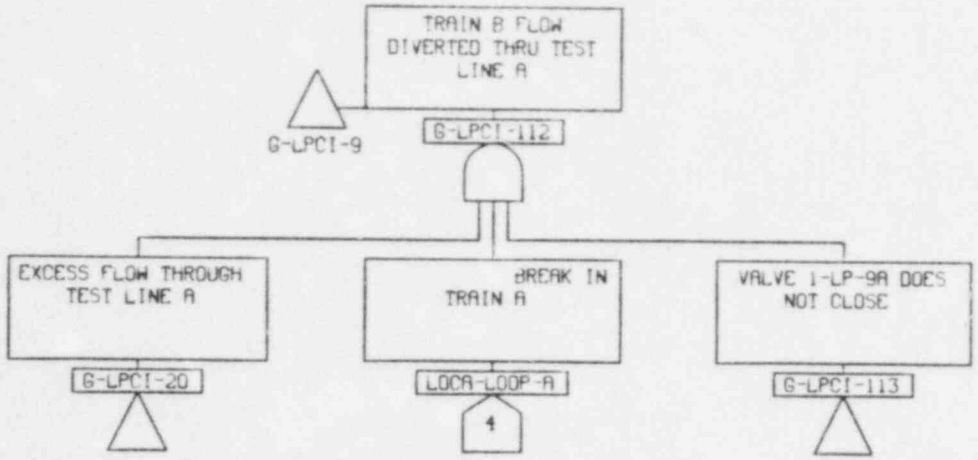

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL A
G-LPCI-103
G-LPCI-71
NO FLOW OUT OF COOLING COIL
G-LPCI-104
COOLING COIL FAILS
LP-1500A-HTX-COIL
COOLING COIL OUT DUE TO TEST OR MAINTENANCE
LP-1500A-HTX-TOM
1-LP-62A FAILS TO REMAIN OPEN
LP-62A-XV-FRO
VALVE 1-LP-62A CLOSED DUE TO MAINT.
LP-62A-XV-TMC
NO FLOW THRU 1-LP-17A
G-LPCI-100
NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-103
VALVE 1-LP-55A FAILS TO REMAIN OPEN
LP-55A-XV-FRO
VALVE 1-LP-55A CLOSED DUE TO MAINT.
LP-55A-XV-TMC
NO FLOW FROM VALVE 1-LP-73A
G-LPCI-109

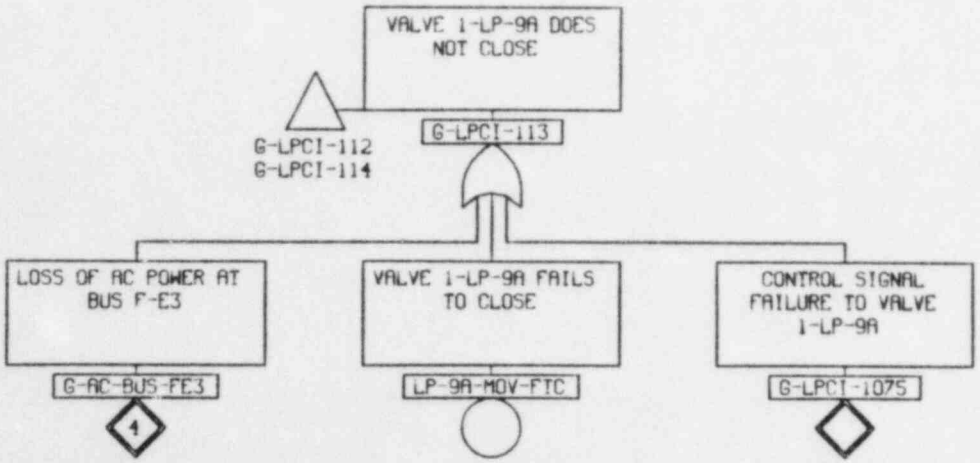

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR REPAIRING COOLING COIL C
G-LPCI-105
G-LPCI-75
NO FLOW OUT OF COOLING COIL
G-LPCI-106
COOLING COIL FAILS
LP-1502C-HTX-LOF
COOLING COIL OUT DUE TO MAINT.
LP-1502C-HTX-LOM
VALVE 1-LP-63A FAILS TO REMAIN OPEN
LP-63A-XV-FRO
VALVE 1-LP-63A OUT DUE TO MAINT.
LP-63A-XV-TMC
NO FLOW THRU 1-LP-17A
G-LPCI-108
NO FLOW TO COOLING COIL
G-LPCI-107
VALVE 1-LP-56A FAILS TO REMAIN OPEN
LP-56A-XV-FRO
VALVE 1-LP-56A CLOSED DUE TO MAINT.
LP-56A-XV-TMC
NO FLOW FROM VALVE 1-LP-74A
G-LPCI-95

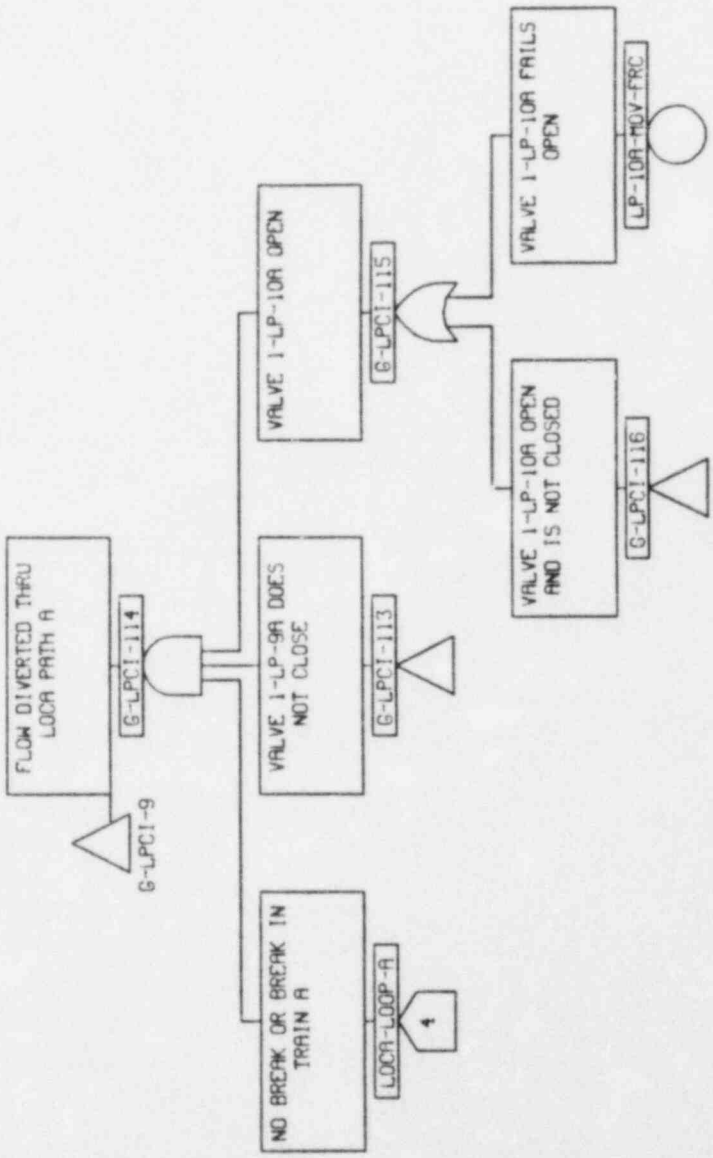

NO FLOW THRU
1-LP-17A
G-LPCI-108
G-LPCI-104
G-LPCI-106
VALVE 1-LP-17A FAILS
TO REMAIN OPEN
LP-17A-XV-FRO
VALVE 1-LP-17A OUT -
CLOSED - DUE TO
MAINT.
LP-17A-XV-TMC
VALVE 1-LP-18A
CLOSED DUE TO MAINT.
LP-18A-XV-TMC
VALVE 1-LP-18A FAILS
TO REMAIN OPEN
LP-18A-XV-FRO

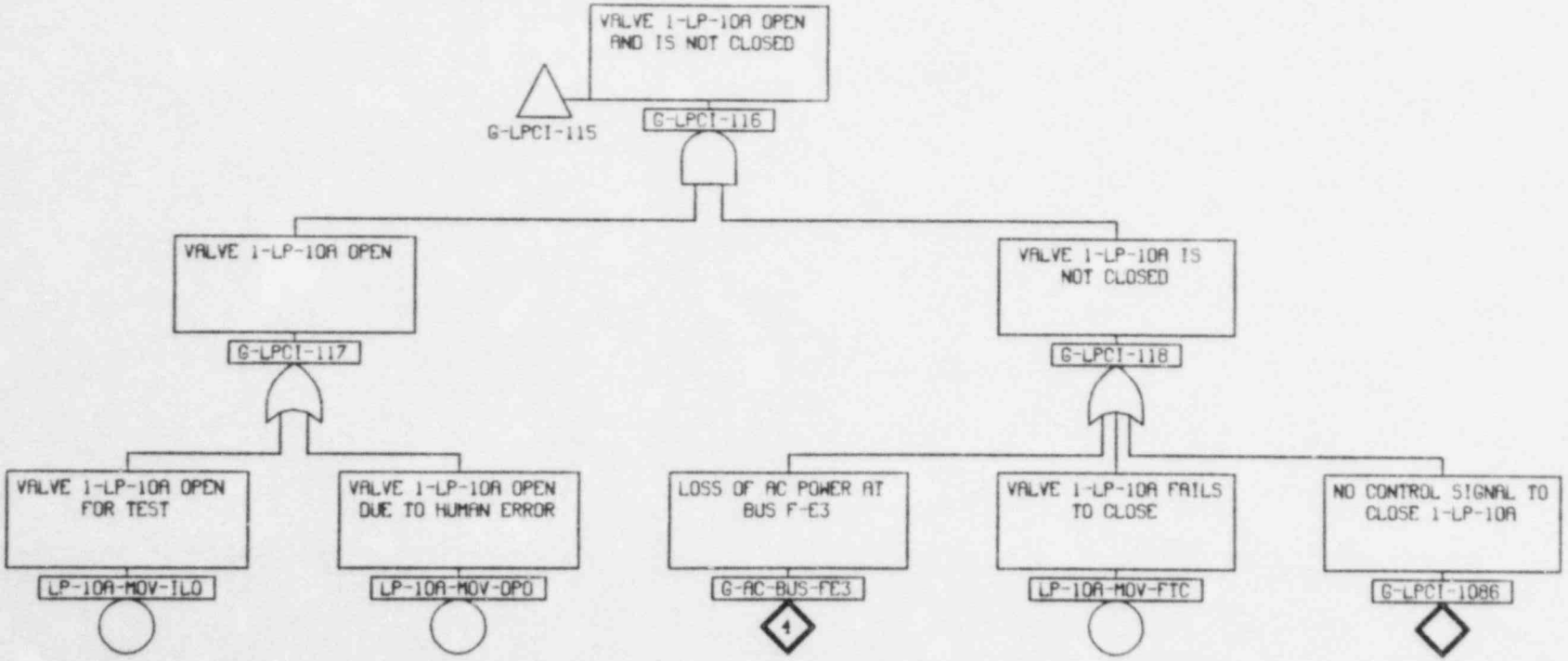

NO FLOW FROM VALVE
1-LP-73A
G-LPCI-109
G-LPCI-103
VALVE 1-LP-73A
CLOSED DUE TO MAINT.
LP-73A-PHV-TMC
VALVE 1-LP-73A FAILS
TO REMAIN OPEN
LP-73A-PHV-FRO
NO FLOW FROM VALVE
1-LP-53A
G-LPCI-94
VALVE 1-LP-53A
CLOSED DUE TO MAINT.
LP-53A-XV-TMC
VALVE 1-LP-53A FAILS
TO REMAIN OPEN
LP-53A-XV-FRO
NO FLOW FROM VALVE
1-LP-52A
G-LPCI-97

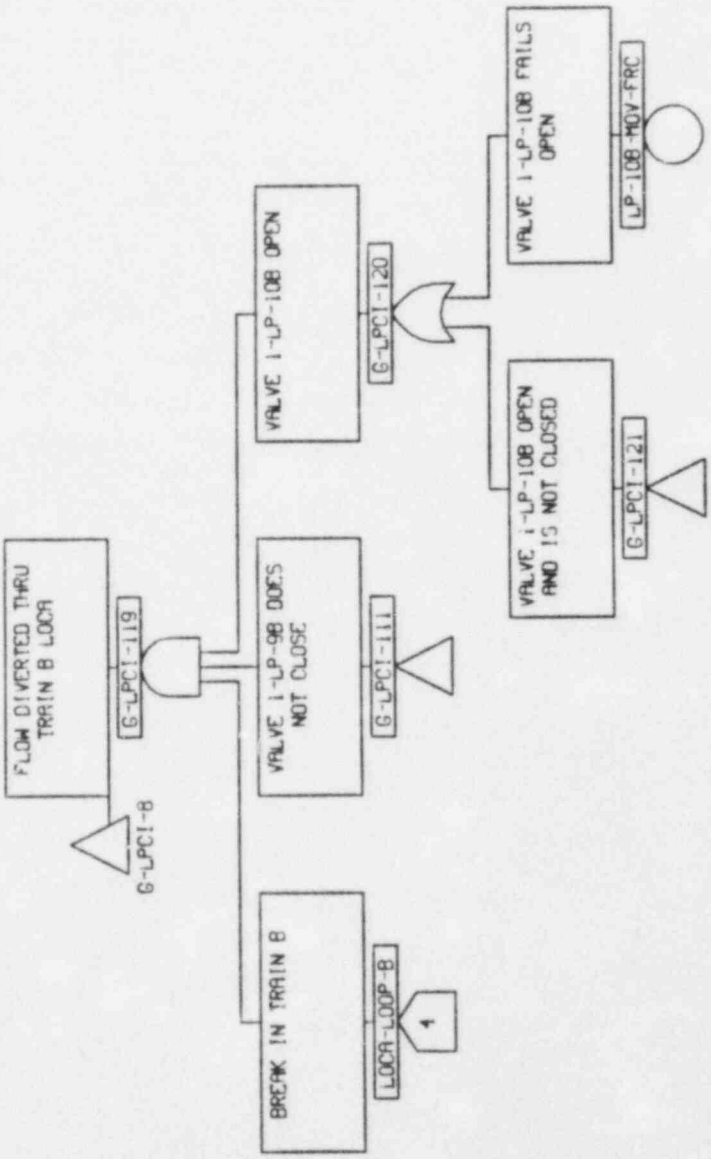

TRAIN A FLOW DIVERTED THROUGH TEST LINE B
G-LPCI-110
G-LPCI-8
BREAK IN TRAIN B
LOCA-LOOP-B
4
VALVE 1-LP-98 DOES NOT CLOSE
G-LPCI-111
EXCESS FLOW THROUGH TEST LINE B
G-LPCI-21
VALVE 1-LP-98 DOES NOT CLOSE
G-LPCI-111
G-LPCI-110
G-LPCI-119
VALVE 1-LP-98 FAILS TO CLOSE
LP-98-MOV-FTC
CONTROL SIGNAL FAILURE TO VALVE 1-LP-98
G-LPCI-1064
LOSS OF AC POWER AT BUS E F3 COMP IC
G-AC-BUS-EF3
4

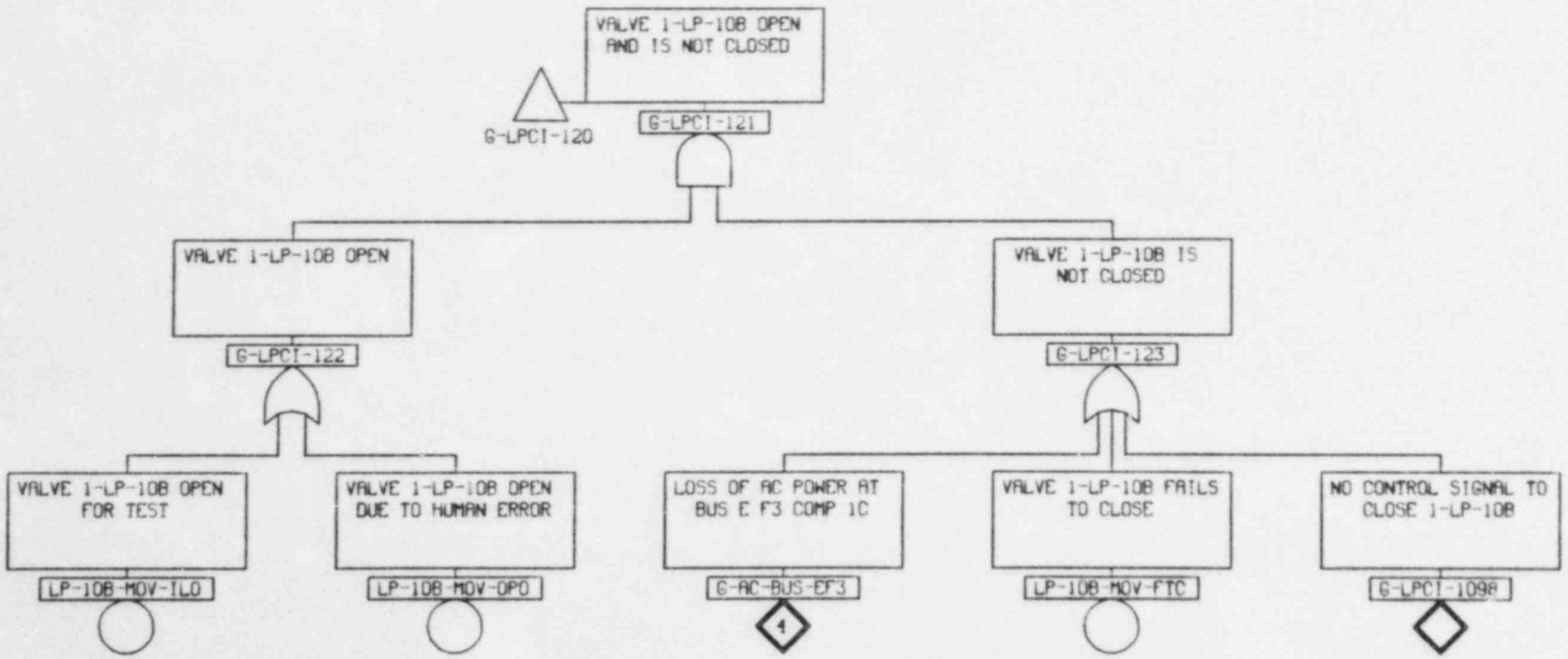

TRAIN B FLOW
DIVERTED THRU TEST
LINE A
G-LPCI-9
G-LPCI-112
EXCESS FLOW THROUGH
TEST LINE A
BREAK IN
TRAIN A
VALVE 1-LP-9A DOES
NOT CLOSE
G-LPCI-20
LOCA-LOOP-A
1
G-LPCI-113

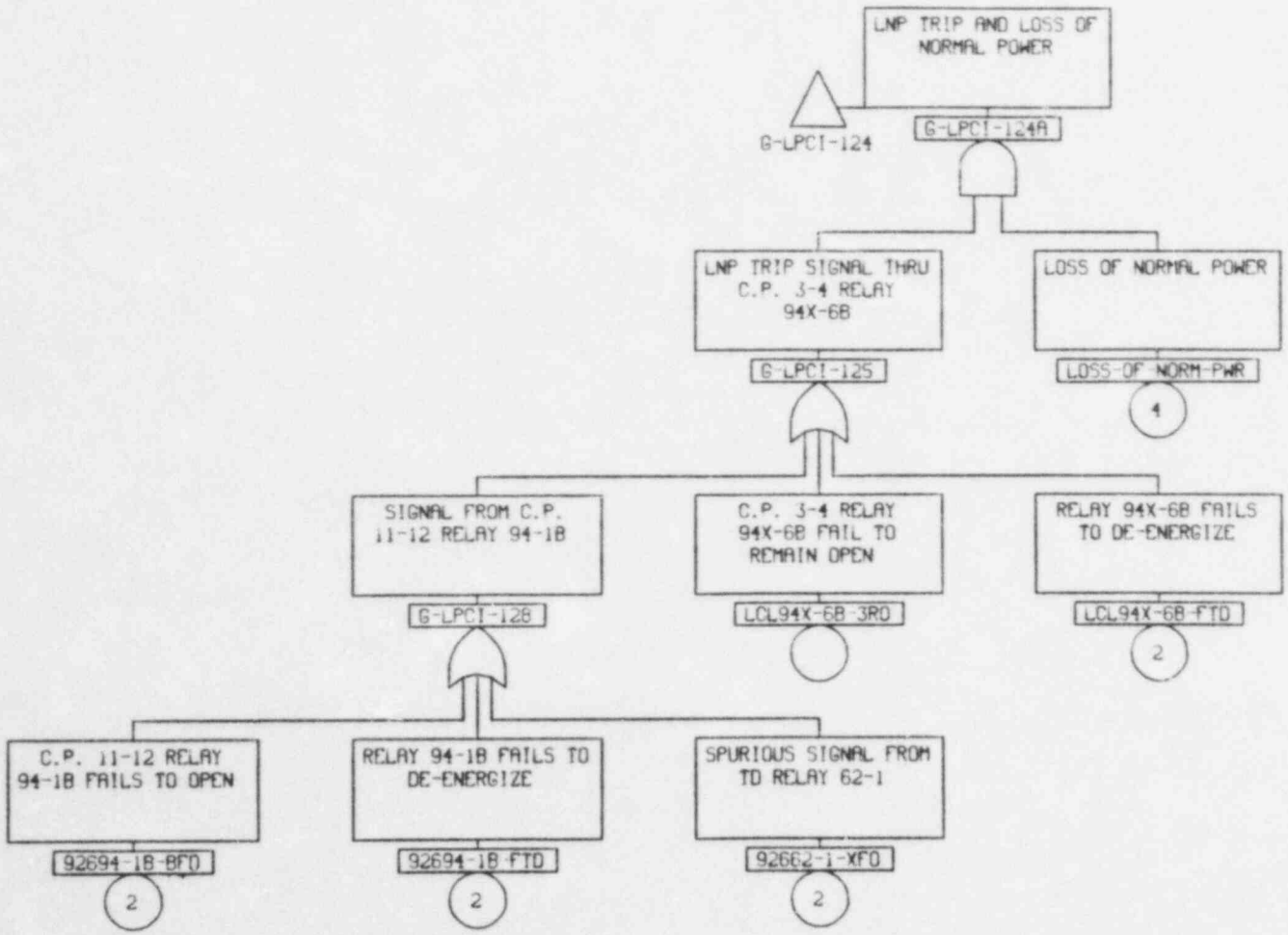

VALVE 1-LP-9A DOES
NOT CLOSE
G-LPCI-112
G-LPCI-114
G-LPCI-113
LOSS OF AC POWER AT
BUS F-E3
VALVE 1-LP-9A FAILS
TO CLOSE
CONTROL SIGNAL
FAILURE TO VALVE
1-LP-9A
G-AC-BUS-FE3
LP-9A-MOV-FTC
G-LPCI-1075
1

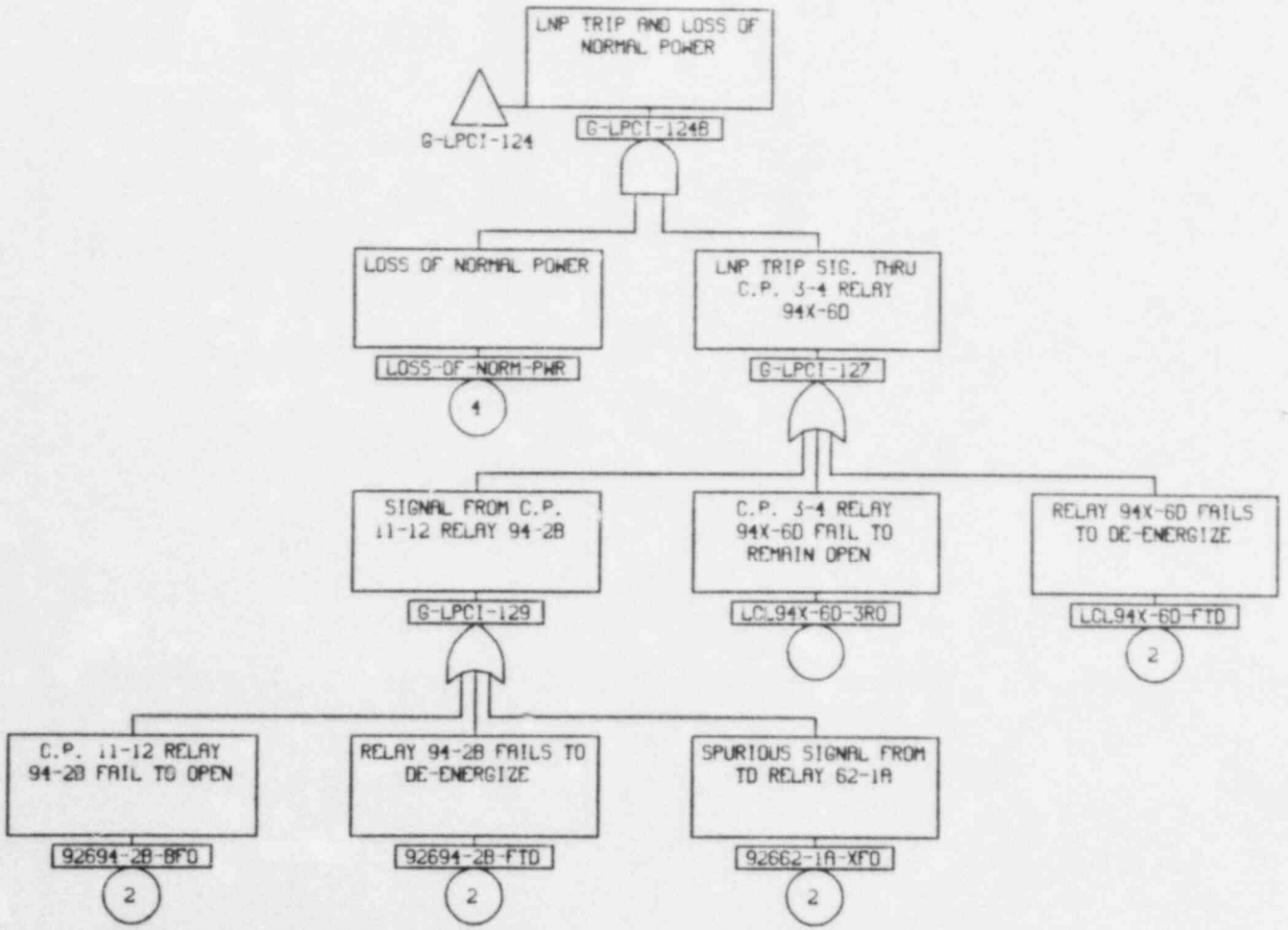

FLOW DIVERTED THRU LOCA PATH A
G-LPCI-114
G-LPCI-9
VALVE 1-LP-9A DOES NOT CLOSE
G-LPCI-113
VALVE 1-LP-10A OPEN
G-LPCI-115
VALVE 1-LP-10A OPEN AND IS NOT CLOSED
G-LPCI-116
VALVE 1-LP-10A FAILS OPEN
LP-10A-MOV-FRC
NO BREAK OR BREAK IN TRAIN A
LOCA-LOOP-A
4

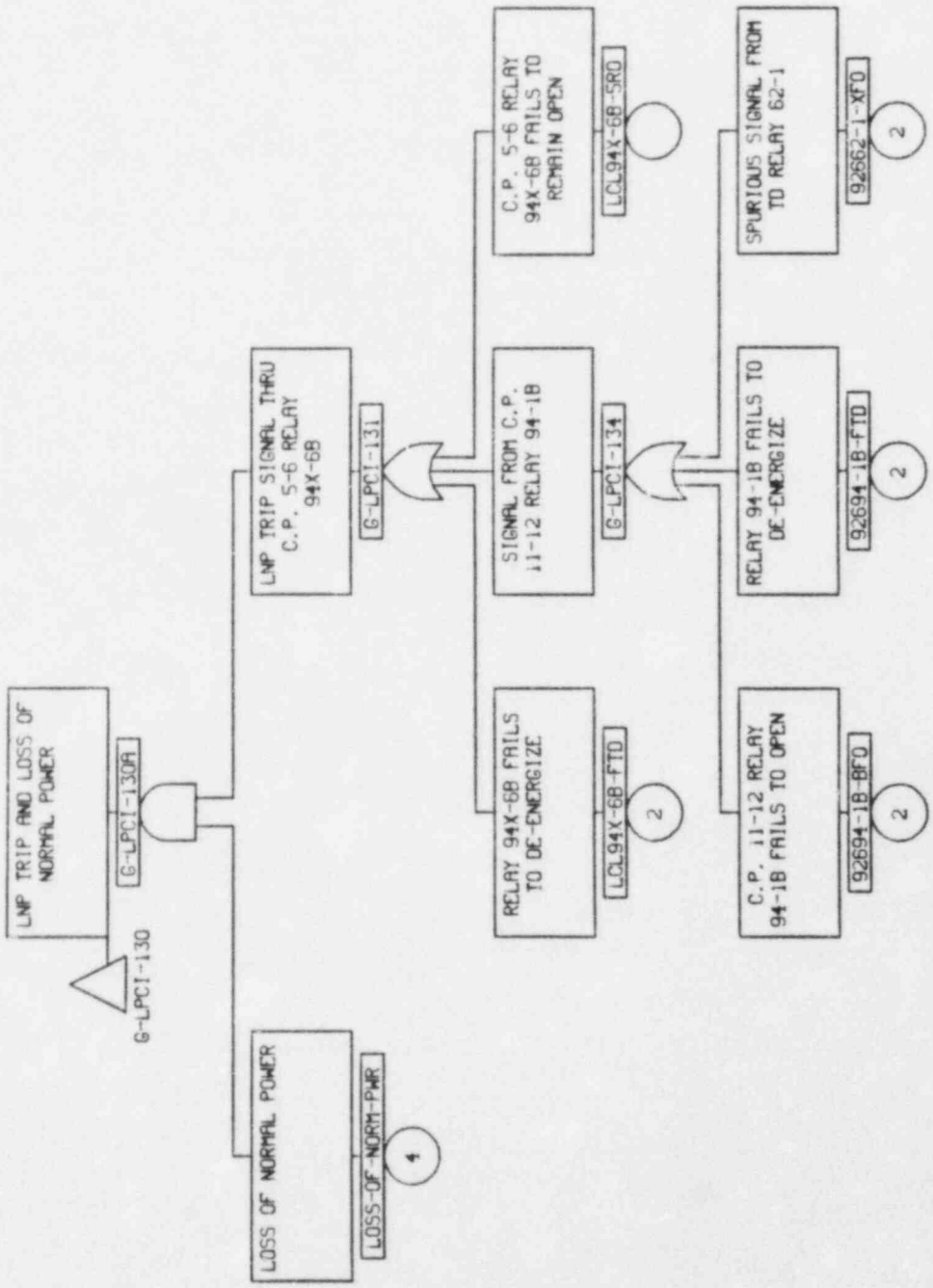

VALVE 1-LP-10A OPEN AND IS NOT CLOSED
G-LPCI-115
G-LPCI-116
VALVE 1-LP-10A OPEN
G-LPCI-117
VALVE 1-LP-10A IS NOT CLOSED
G-LPCI-118
VALVE 1-LP-10A OPEN FOR TEST
LP-10A-MOV-ILO
VALVE 1-LP-10A OPEN DUE TO HUMAN ERROR
LP-10A-MOV-OPO
LOSS OF AC POWER AT BUS F-E3
G-AC-BUS-FE3
1
VALVE 1-LP-10A FAILS TO CLOSE
LP-10A-MOV-FTC
NO CONTROL SIGNAL TO CLOSE 1-LP-10A
G-LPCI-1086

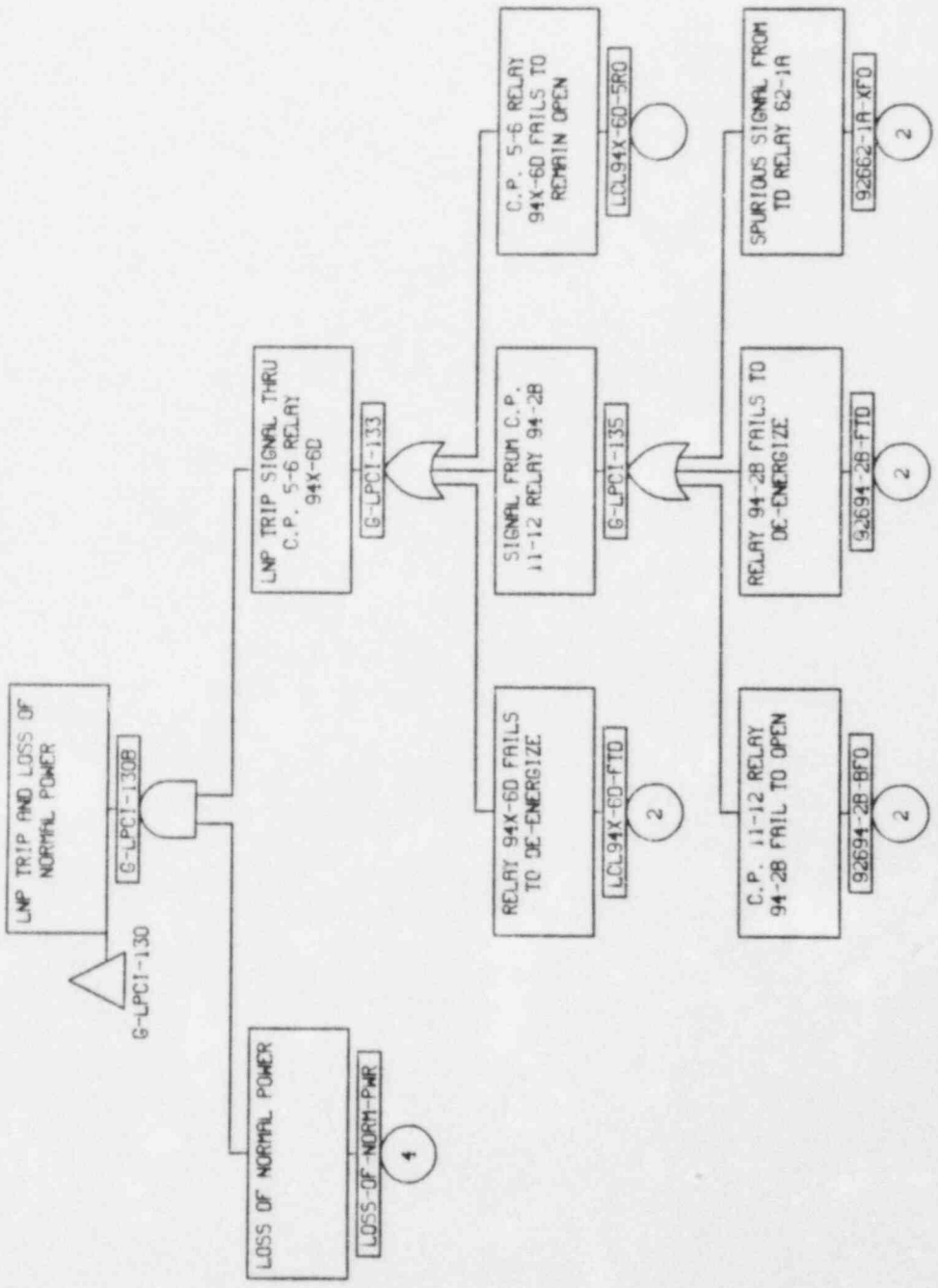

FLOW DIVERTED THRU TRAIN B LOCA
G-LPCI-119
G-LPCI-8
VALVE 1-LP-108 OPEN
G-LPCI-120
VALVE 1-LP-108 FAILS OPEN
LP-108-MOV-FRC
VALVE 1-LP-108 OPEN AND IS NOT CLOSED
G-LPCI-121
VALVE 1-LP-88 DOES NOT CLOSE
G-LPCI-111
BREAK IN TRAIN B
LOCA-LOOP-B
1

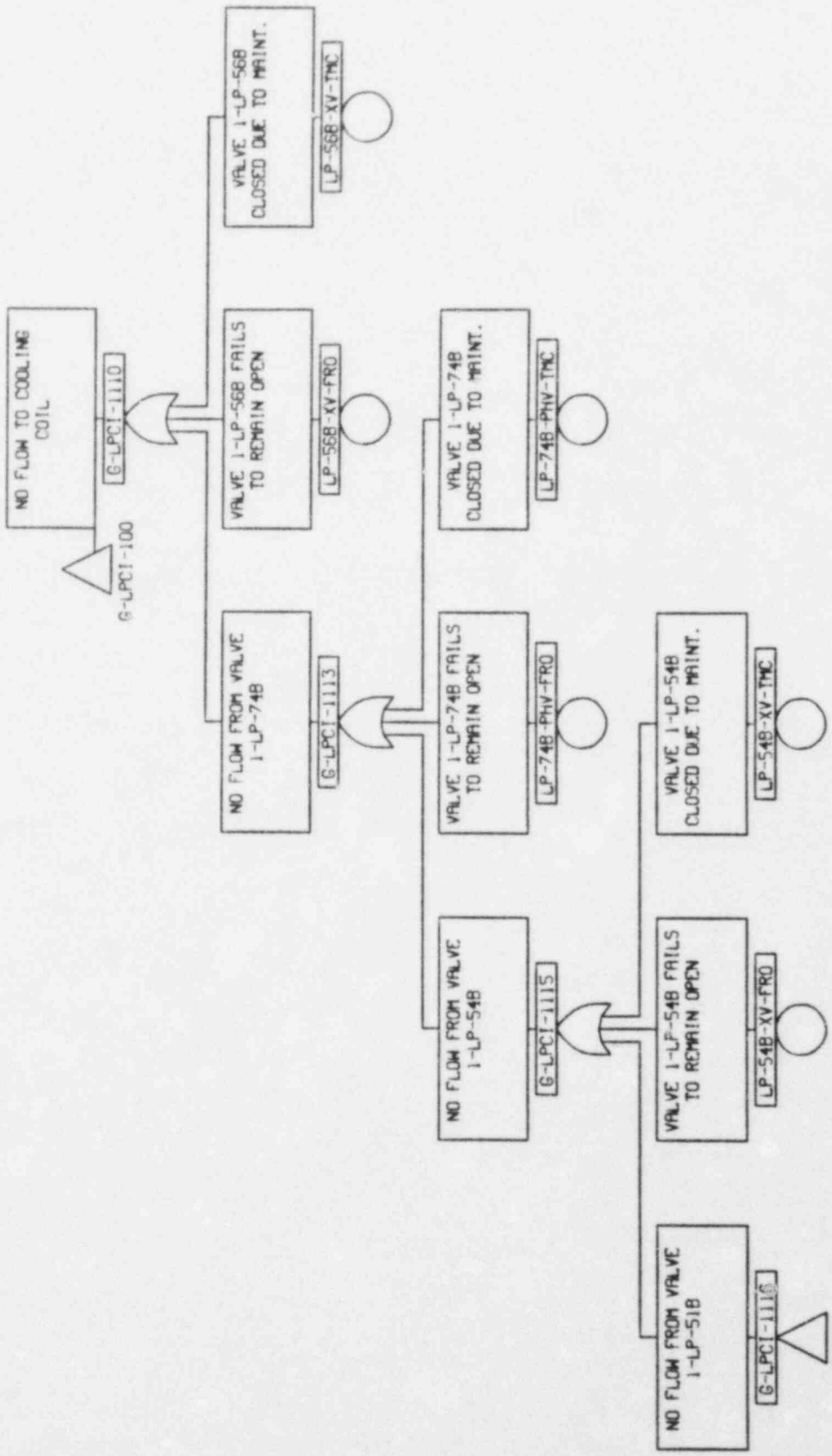

VALVE 1-LP-108 OPEN AND IS NOT CLOSED
G-LPCI-120
G-LPCI-121
VALVE 1-LP-108 OPEN
G-LPCI-122
VALVE 1-LP-108 IS NOT CLOSED
G-LPCI-123
VALVE 1-LP-108 OPEN FOR TEST
LP-108-MOV-1LO
VALVE 1-LP-108 OPEN DUE TO HUMAN ERROR
LP-108-MOV-OPO
LOSS OF AC POWER AT BUS E F3 COMP 1C
G-AC-BUS-EF3
4
VALVE 1-LP-108 FAILS TO CLOSE
LP-108-MOV-FTC
NO CONTROL SIGNAL TO CLOSE 1-LP-108
G-LPCI-109B

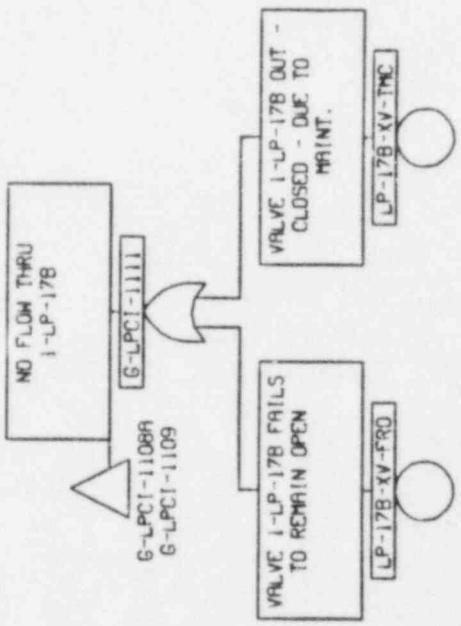

LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-124
G-LPCI-124A
LNP TRIP SIGNAL THRU C.P. 3-4 RELAY 94X-6B
LOSS OF NORMAL POWER
G-LPCI-125
LOSS-OF-NORM-PWR
4
SIGNAL FROM C.P. 11-12 RELAY 94-1B
C.P. 3-4 RELAY 94X-6B FAIL TO REMAIN OPEN
RELAY 94X-6B FAILS TO DE-ENERGIZE
G-LPCI-126
LCL94X-6B-3RO
LCL94X-6B-FTD
2
C.P. 11-12 RELAY 94-1B FAILS TO OPEN
RELAY 94-1B FAILS TO DE-ENERGIZE
SPURIOUS SIGNAL FROM TD RELAY 62-1
92694-1B-BFO
92694-1B-FTD
92662-1-XFO
2

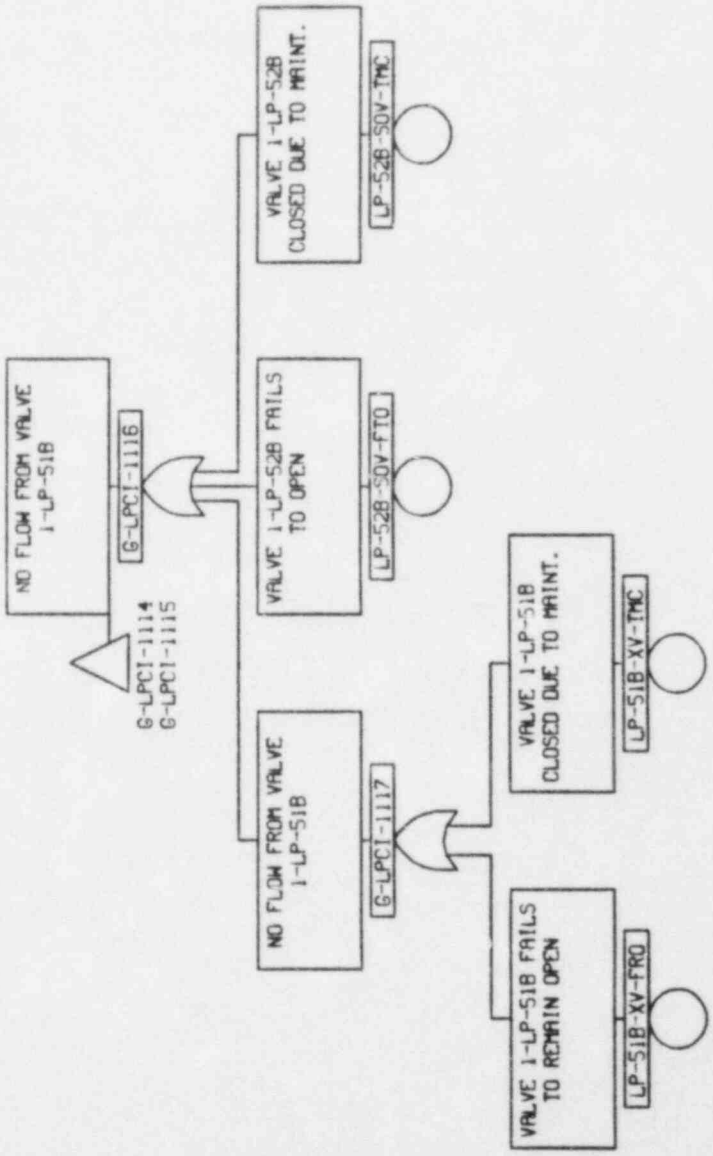

LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-124
G-LPCI-124B
LOSS OF NORMAL POWER
LNP TRIP SIG. THRU C.P. 3-4 RELAY 94X-6D
LOSS-OF-NORM-PWR
G-LPCI-127
1
SIGNAL FROM C.P. 11-12 RELAY 94-2B
C.P. 3-4 RELAY 94X-6D FAIL TO REMAIN OPEN
RELAY 94X-6D FAILS TO DE-ENERGIZE
G-LPCI-129
LCL94X-6D-3RO
LCL94X-6D-FTD
2
C.P. 11-12 RELAY 94-2B FAIL TO OPEN
RELAY 94-2B FAILS TO DE-ENERGIZE
SPURIOUS SIGNAL FROM TD RELAY 62-1A
92694-2B-BFO
92694-2B-FTD
92662-1A-XFO
2
2
2

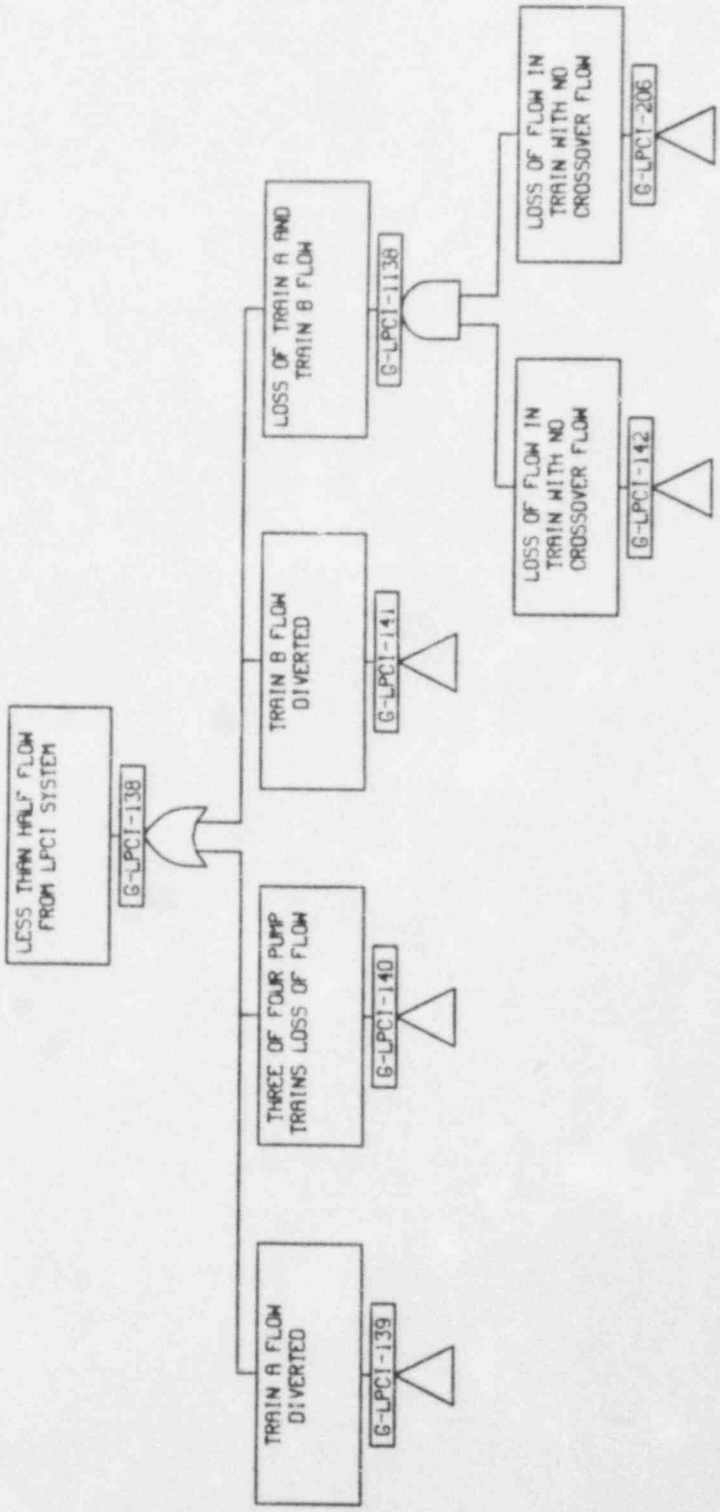

LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-130A
G-LPCI-130
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
1
LNP TRIP SIGNAL THRU C.P. 5-6 RELAY 94X-6B
G-LPCI-131
RELAY 94X-6B FAILS TO DE-ENERGIZE
LCL94X-6B-FTO
2
SIGNAL FROM C.P. 11-12 RELAY 94-1B
G-LPCI-134
C.P. 11-12 RELAY 94-1B FAILS TO OPEN
92694-1B-BFO
2
C.P. 5-6 RELAY 94X-6B FAILS TO REMAIN OPEN
LCL94X-6B-SRO
RELAY 94-1B FAILS TO DE-ENERGIZE
92694-1B-FTO
2
SPURIOUS SIGNAL FROM TD RELAY 62-1
92662-1-XFO
2

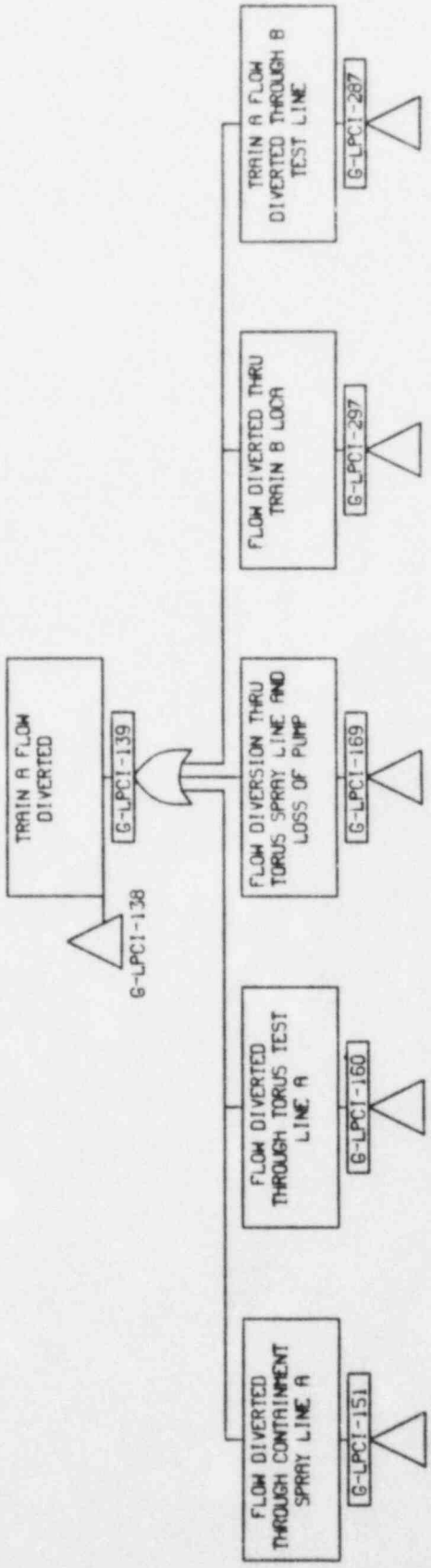

LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-130
G-LPCI-130B
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
1
LNP TRIP SIGNAL THRU C.P. 5-6 RELAY 94X-6D
G-LPCI-133
RELAY 94X-6D FAILS TO DE-ENERGIZE
LCL94X-6D-FTD
2
SIGNAL FROM C.P. 11-12 RELAY 94-2B
G-LPCI-135
C.P. 11-12 RELAY 94-2B FAIL TO OPEN
92694-2B-BFO
2
C.P. 5-6 RELAY 94X-6D FAILS TO REMAIN OPEN
LCL94X-6D-5RO
2
RELAY 94-2B FAILS TO DE-ENERGIZE
92694-2B-FTD
2
SPURIOUS SIGNAL FROM TD RELAY 62-1A
92662-1A-XFO
2

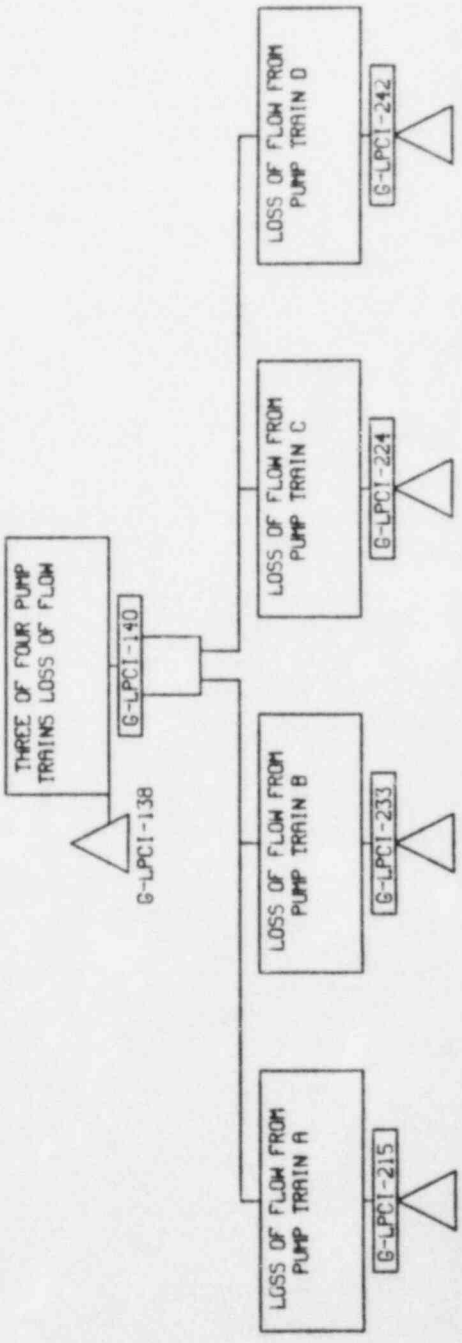

NO FLOW TO COOLING COIL
G-LPCI-100
G-LPCI-1110
VALVE 1-LP-568 FAILS TO REMAIN OPEN
LP-568-XV-FRO
VALVE 1-LP-568 CLOSED DUE TO MAINT.
LP-568-XV-TMC
NO FLOW FROM VALVE 1-LP-74B
G-LPCI-1113
VALVE 1-LP-74B FAILS TO REMAIN OPEN
LP-74B-PHV-FRO
VALVE 1-LP-74B CLOSED DUE TO MAINT.
LP-74B-PHV-TMC
NO FLOW FROM VALVE 1-LP-54B
G-LPCI-1115
VALVE 1-LP-54B FAILS TO REMAIN OPEN
LP-54B-XV-FRO
VALVE 1-LP-54B CLOSED DUE TO MAINT.
LP-54B-XV-TMC
NO FLOW FROM VALVE 1-LP-51B
G-LPCI-1116

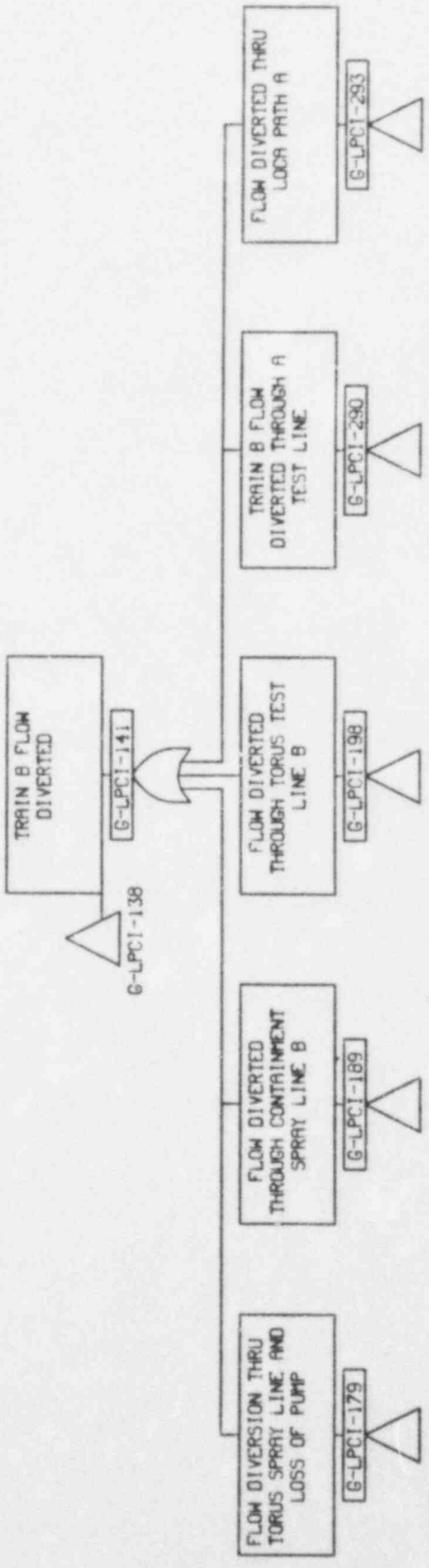

NO FLOW THRU
1-LP-178
G-LPCI-1111
G-LPCI-1108A
G-LPCI-1109
VALVE 1-LP-178 FAILS
TO REMAIN OPEN
LP-178-XV-F80
VALVE 1-LP-178 OUT -
CLOSED - DUE TO
MAINT.
LP-178-XV-TMC

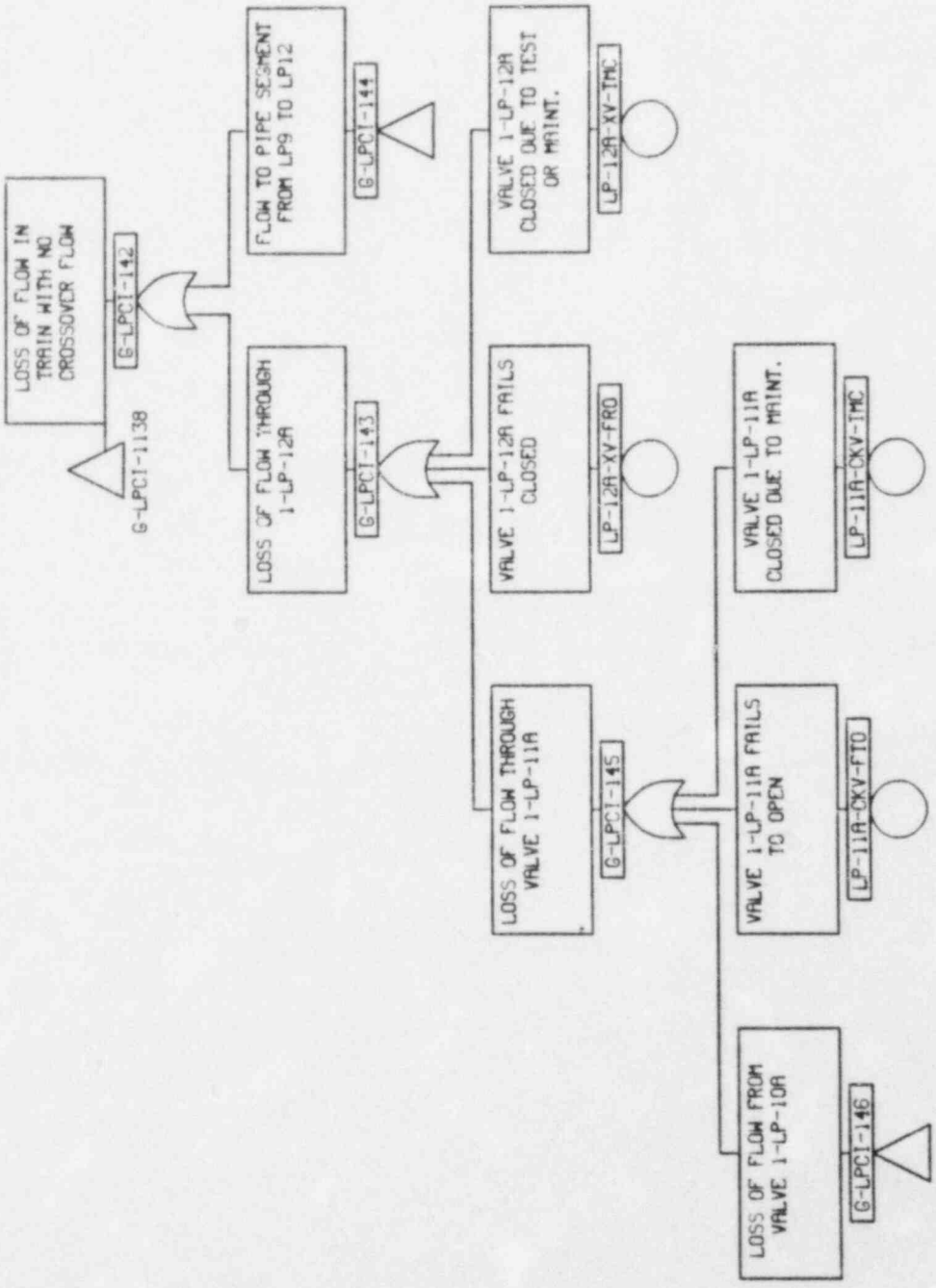

NO FLOW FROM VALVE
1-LP-51B
G-LPCI-1116
G-LPCI-1114
G-LPCI-1115
VALVE 1-LP-52B
CLOSED DUE TO MAINT.
LP-52B-SOV-TMC
VALVE 1-LP-52B FAILS
TO OPEN
LP-52B-SOV-FTO
NO FLOW FROM VALVE
1-LP-51B
G-LPCI-1117
VALVE 1-LP-51B
CLOSED DUE TO MAINT.
LP-51B-XV-TMC
VALVE 1-LP-51B FAILS
TO REMAIN OPEN
LP-51B-XV-FRO

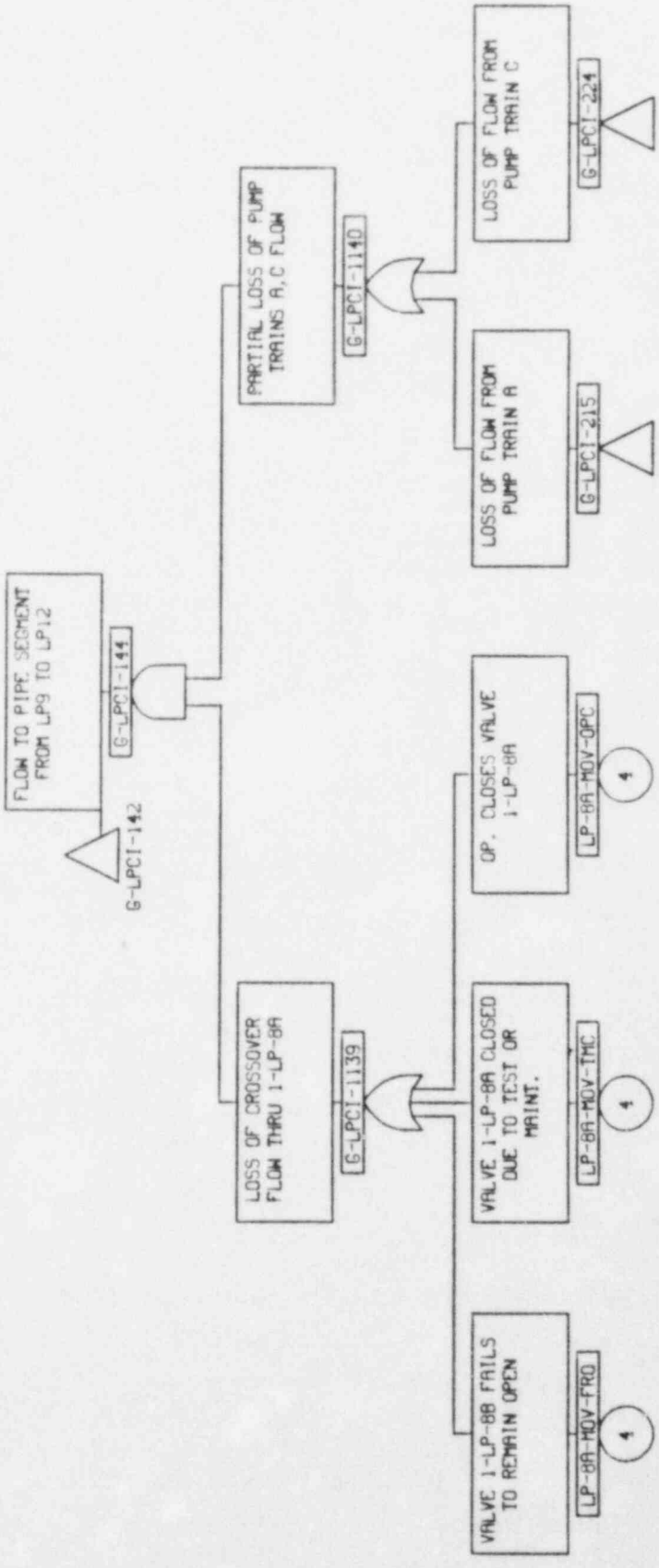

LESS THAN HALF FLOW FROM LPCI SYSTEM
G-LPCI-138
TRAIN A FLOW DIVERTED
G-LPCI-139
THREE OF FOUR PUMP TRAINS LOSS OF FLOW
G-LPCI-140
TRAIN B FLOW DIVERTED
G-LPCI-141
LOSS OF TRAIN A AND TRAIN B FLOW
G-LPCI-1138
LOSS OF FLOW IN TRAIN WITH NO CROSSOVER FLOW
G-LPCI-142
LOSS OF FLOW IN TRAIN WITH NO CROSSOVER FLOW
G-LPCI-206

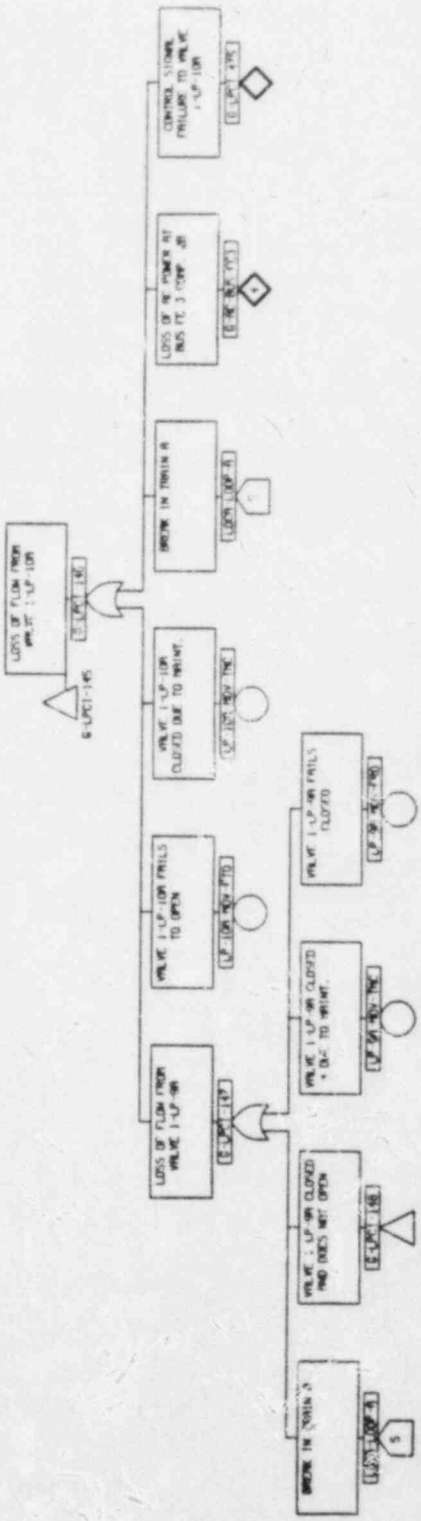

TRAIN A FLOW DIVERTED
G-LPCI-139
G-LPCI-138
FLOW DIVERSION THRU TORUS SPRAY LINE AND LOSS OF PUMP
G-LPCI-169
FLOW DIVERTED THRU TRAIN B LOCA
G-LPCI-297
TRAIN A FLOW DIVERTED THROUGH B TEST LINE
G-LPCI-287
FLOW DIVERTED THROUGH TORUS TEST LINE A
G-LPCI-160
FLOW DIVERTED THROUGH CONTAINMENT SPRAY LINE A
G-LPCI-151

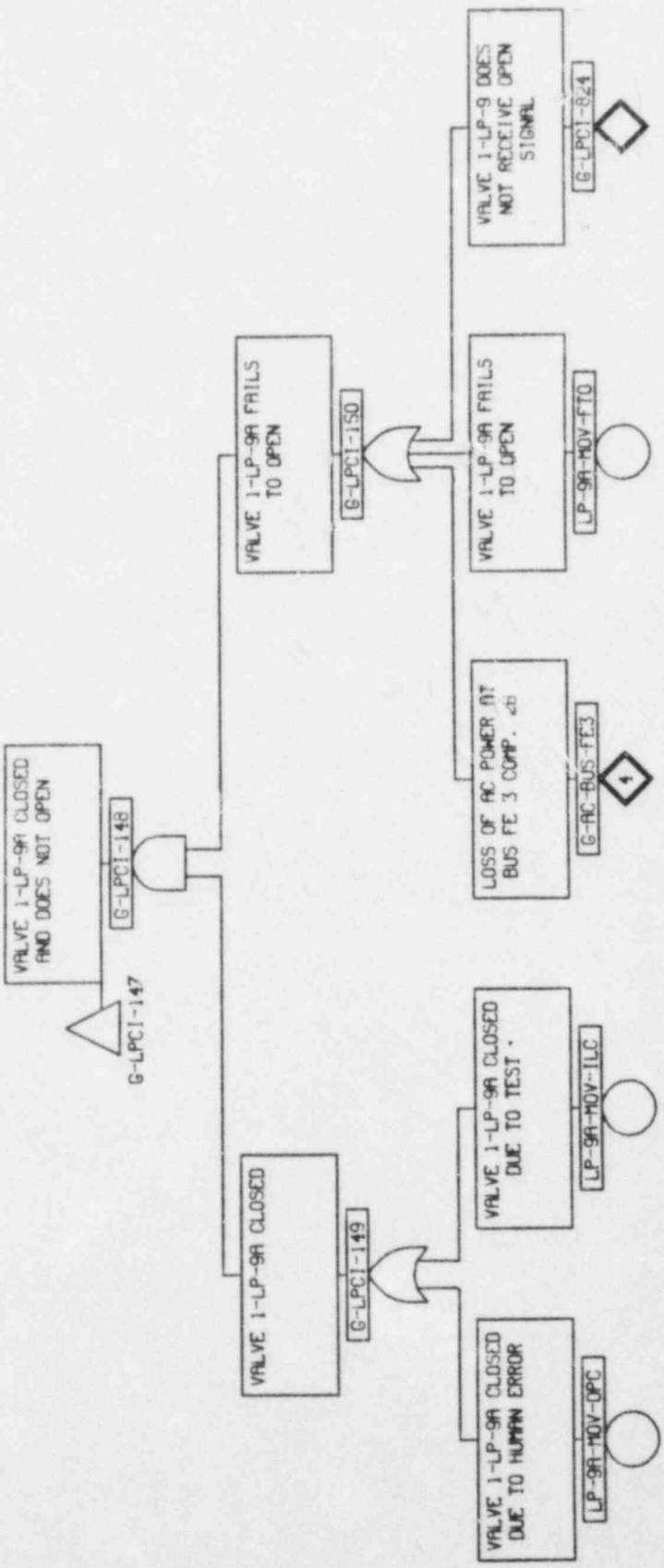

THREE OF FOUR PUMP TRAINS LOSS OF FLOW
G-LPCI-138
G-LPCI-140
LOSS OF FLOW FROM PUMP TRAIN A
G-LPCI-215
LOSS OF FLOW FROM PUMP TRAIN B
G-LPCI-233
LOSS OF FLOW FROM PUMP TRAIN C
G-LPCI-224
LOSS OF FLOW FROM PUMP TRAIN D
G-LPCI-242

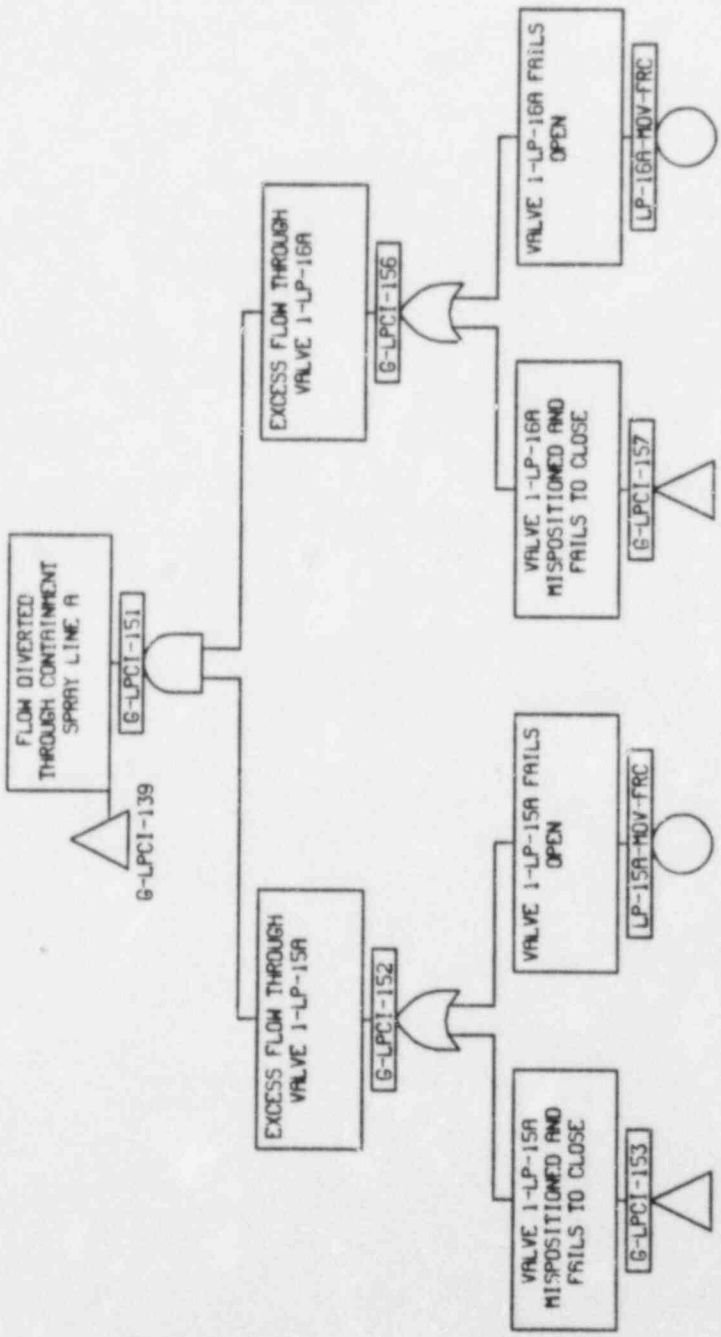

TRAIN B FLOW DIVERTED
G-LPCI-138
G-LPCI-141
FLOW DIVERSION THRU TORUS SPRAY LINE AND LOSS OF PUMP
G-LPCI-179
FLOW DIVERTED THROUGH CONTAINMENT SPRAY LINE B
G-LPCI-189
FLOW DIVERTED THROUGH TORUS TEST LINE B
G-LPCI-198
TRAIN B FLOW DIVERTED THROUGH A TEST LINE
G-LPCI-290
FLOW DIVERTED THRU LOOP PATH A
G-LPCI-293

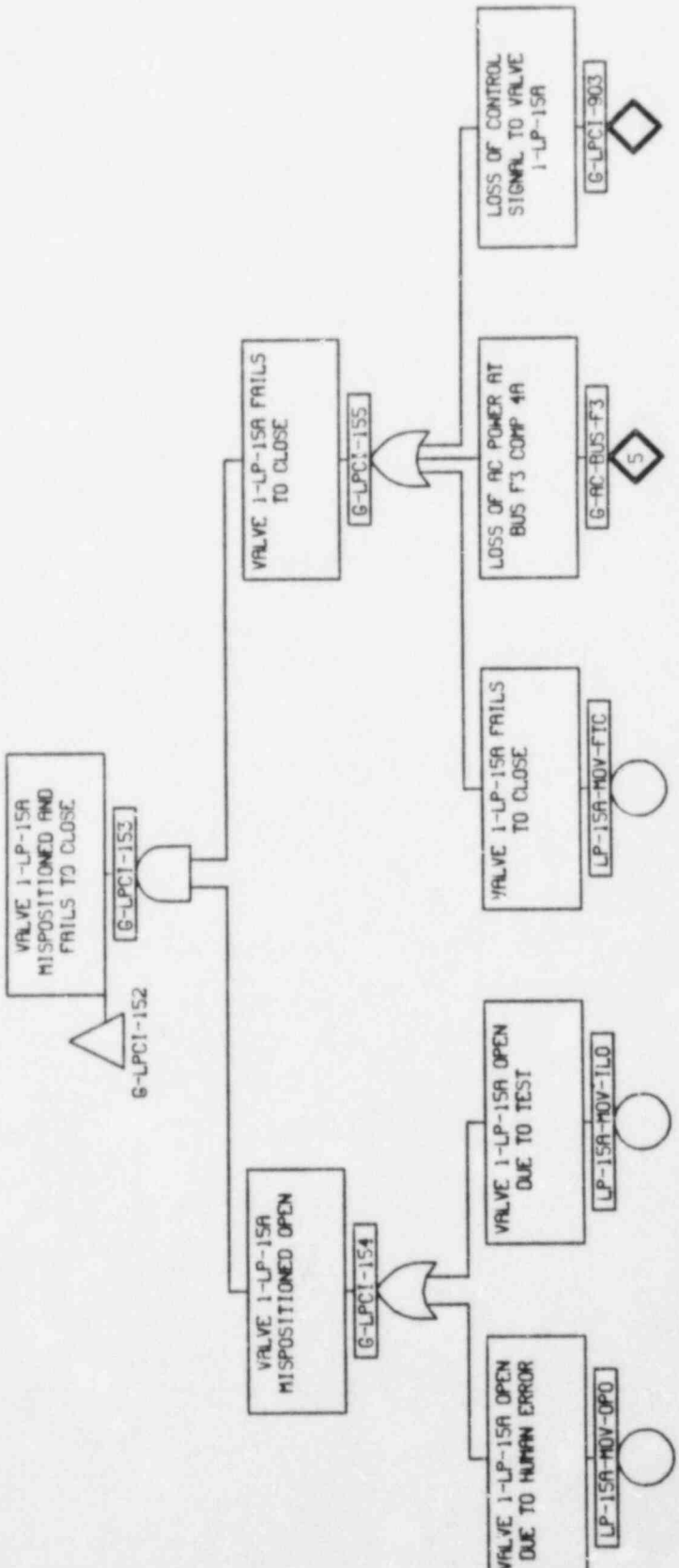

LOSS OF FLOW IN TRAIN WITH NO CROSSOVER FLOW
G-LPCI-1138
G-LPCI-142
FLOW TO PIPE SEGMENT FROM LP9 TO LP12
G-LPCI-144
LOSS OF FLOW THROUGH 1-LP-12A
G-LPCI-143
VALVE 1-LP-12A CLOSED DUE TO TEST OR MAINT.
LP-12A-XV-TMC
VALVE 1-LP-12A FAILS CLOSED
LP-12A-XV-FRO
LOSS OF FLOW THROUGH VALVE 1-LP-11A
G-LPCI-145
VALVE 1-LP-11A CLOSED DUE TO MAINT.
LP-11A-CKV-TMC
VALVE 1-LP-11A FAILS TO OPEN
LP-11A-CKV-FTO
LOSS OF FLOW FROM VALVE 1-LP-10A
G-LPCI-146

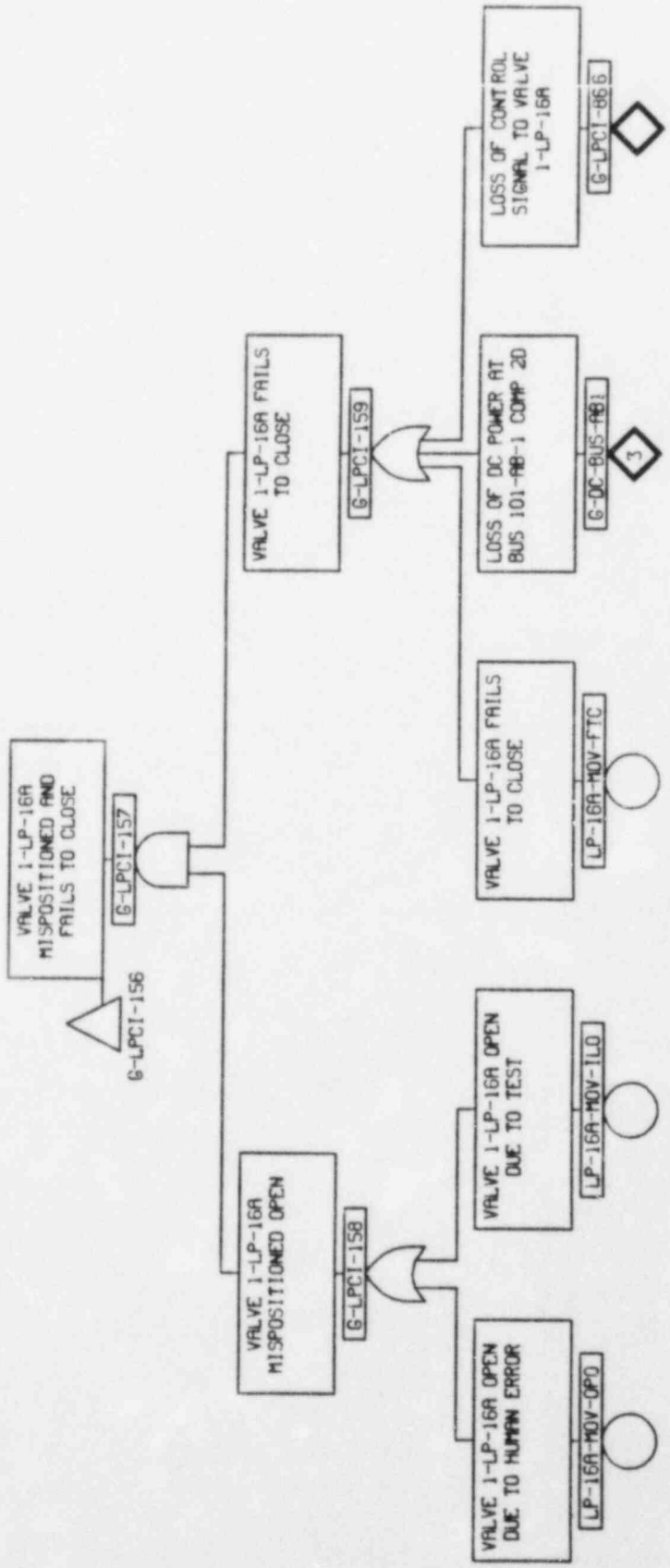

FLOW TO PIPE SEGMENT FROM LP9 TO LP12
G-LPCI-144
G-LPCI-142
PARTIAL LOSS OF PUMP TRAINS A,C FLOW
G-LPCI-1140
LOSS OF FLOW FROM PUMP TRAIN C
G-LPCI-224
LOSS OF FLOW FROM PUMP TRAIN A
G-LPCI-215
OP. CLOSES VALVE 1-LP-8A
LP-8A-MOV-OPC
LOSS OF CROSSOVER FLOW THRU 1-LP-8A
G-LPCI-1139
VALVE 1-LP-8A CLOSED DUE TO TEST OR MAINT.
LP-8A-MOV-TMC
VALVE 1-LP-8B FAILS TO REMAIN OPEN
LP-8A-MOV-FRO

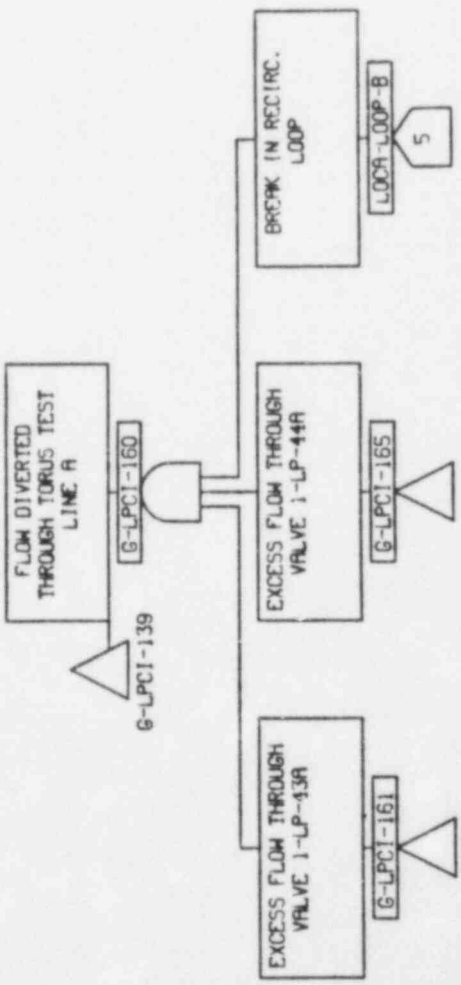


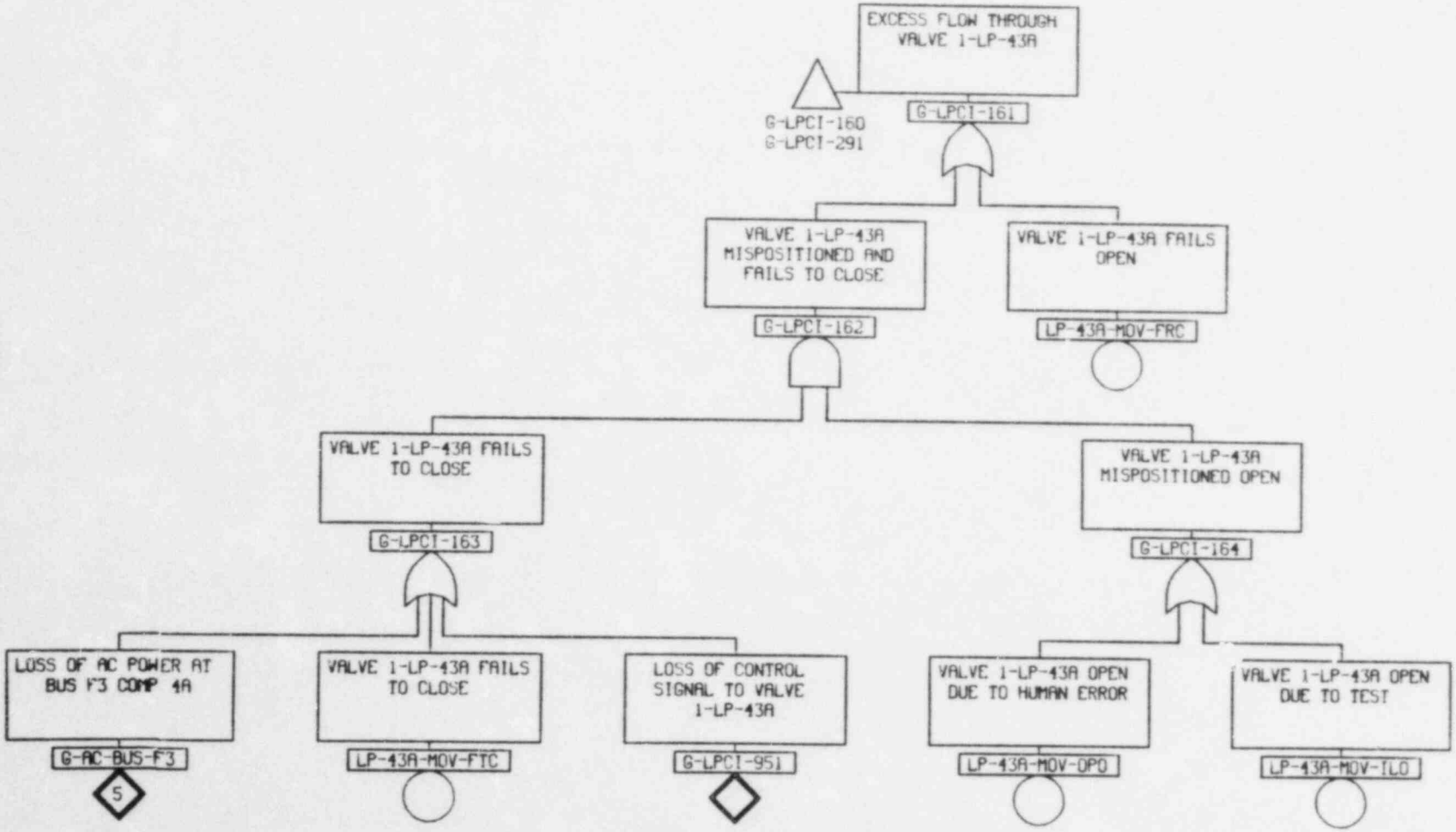

VALVE 1-LP-9A CLOSED AND DOES NOT OPEN
G-LPCI-148
G-LPCI-147
VALVE 1-LP-9A FAILS TO OPEN
G-LPCI-150
VALVE 1-LP-9A FAILS TO OPEN
LP-9A-MOV-FTO
VALVE 1-LP-9 DOES NOT RECEIVE OPEN SIGNAL
G-LPCI-824
LOSS OF AC POWER AT BUS FE 3 COMP.
G-AC-BUS-FE3
VALVE 1-LP-9A CLOSED
G-LPCI-149
VALVE 1-LP-9A CLOSED DUE TO TEST
LP-9A-MOV-ILC
VALVE 1-LP-9A CLOSED DUE TO HUMAN ERROR
LP-9A-MOV-OPC

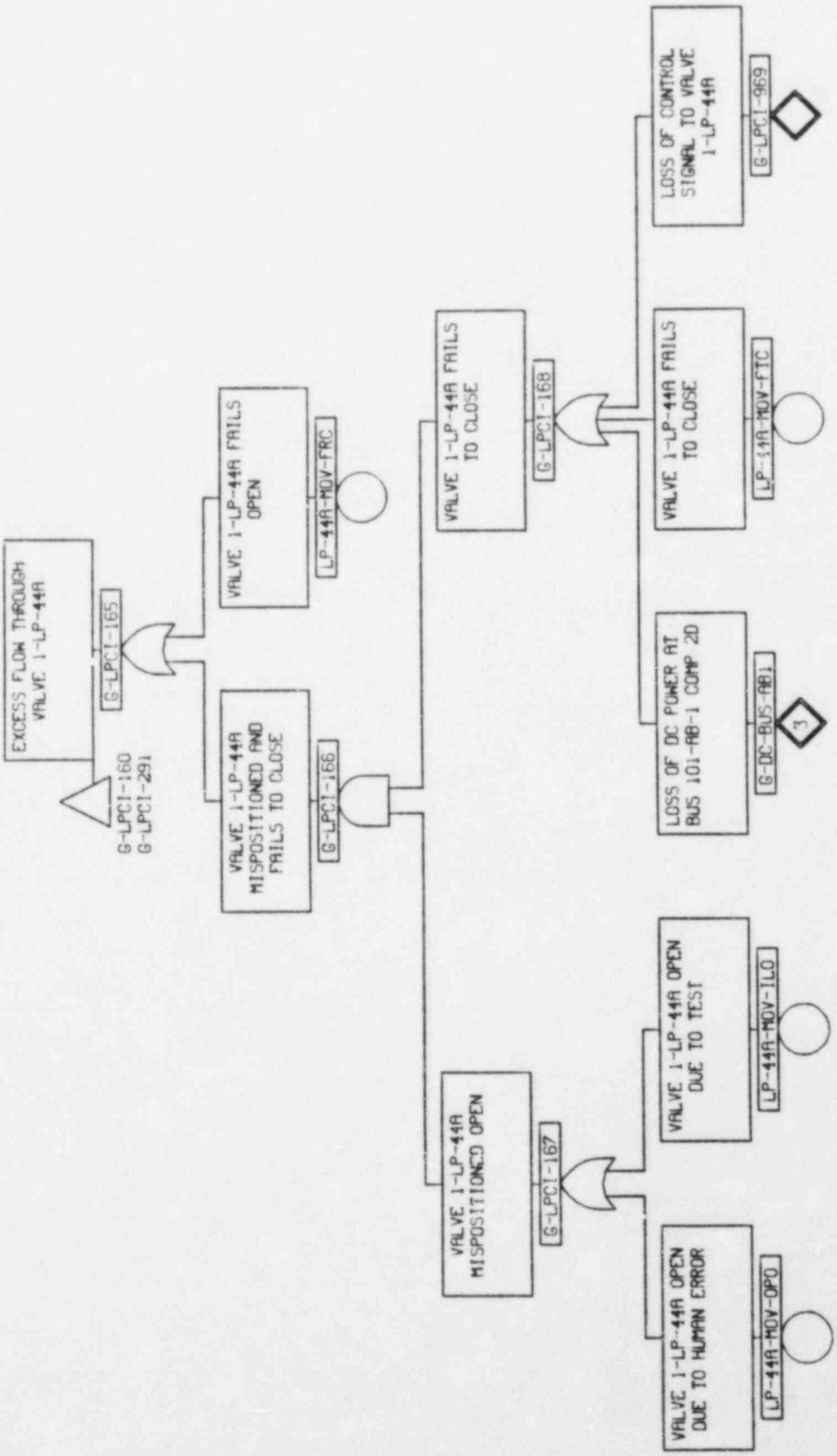

FLOW DIVERTED THROUGH CONTAINMENT SPRAY LINE A
G-LPCI-139
G-LPCI-151
EXCESS FLOW THROUGH VALVE 1-LP-15A
G-LPCI-152
VALVE 1-LP-15A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-153
VALVE 1-LP-15A FAILS OPEN
LP-15A-MOV-FRC
EXCESS FLOW THROUGH VALVE 1-LP-16A
G-LPCI-156
VALVE 1-LP-16A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-157
VALVE 1-LP-16A FAILS OPEN
LP-16A-MOV-FRC

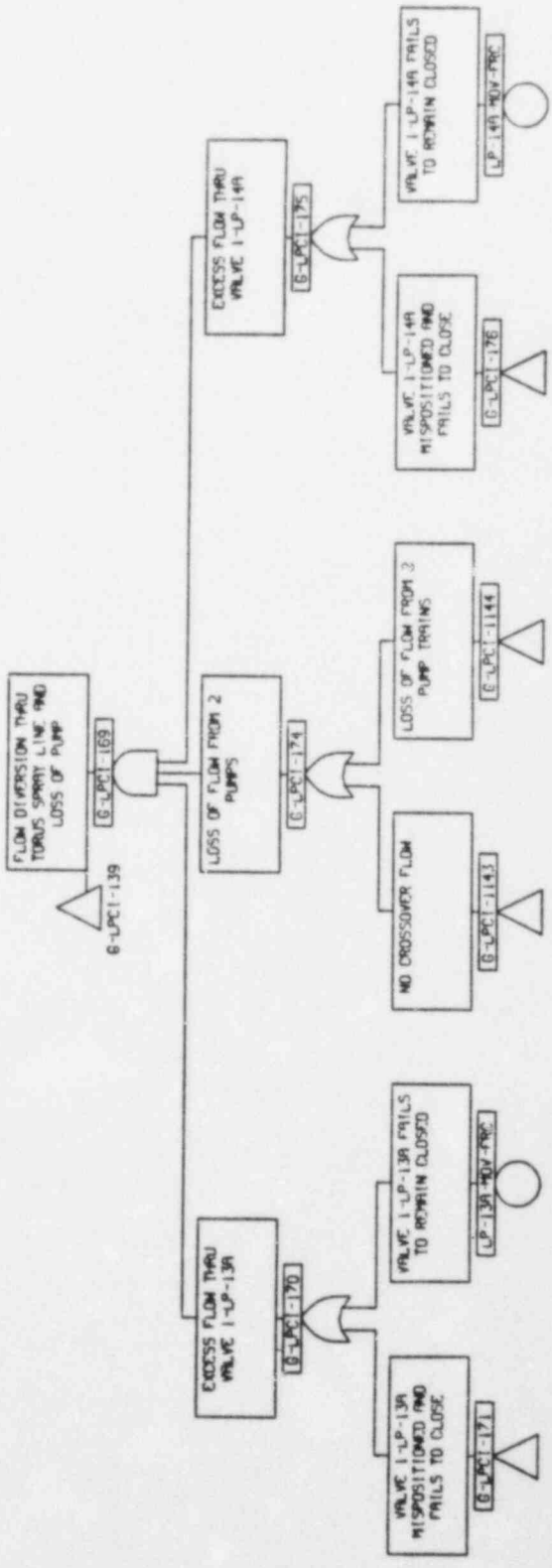

VALVE 1-LP-15A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-152
G-LPCI-153
VALVE 1-LP-15A MISPOSITIONED OPEN
G-LPCI-154
VALVE 1-LP-15A OPEN DUE TO HUMAN ERROR
LP-15A-MOV-OPO
VALVE 1-LP-15A OPEN DUE TO TEST
LP-15A-MOV-1LO
VALVE 1-LP-15A FAILS TO CLOSE
LP-15A-MOV-FTC
VALVE 1-LP-15A FAILS TO CLOSE
G-LPCI-155
LOSS OF AC POWER AT BUS F3 COMP 4A
G-AC-BUS-F3
S
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-15A
G-LPCI-903

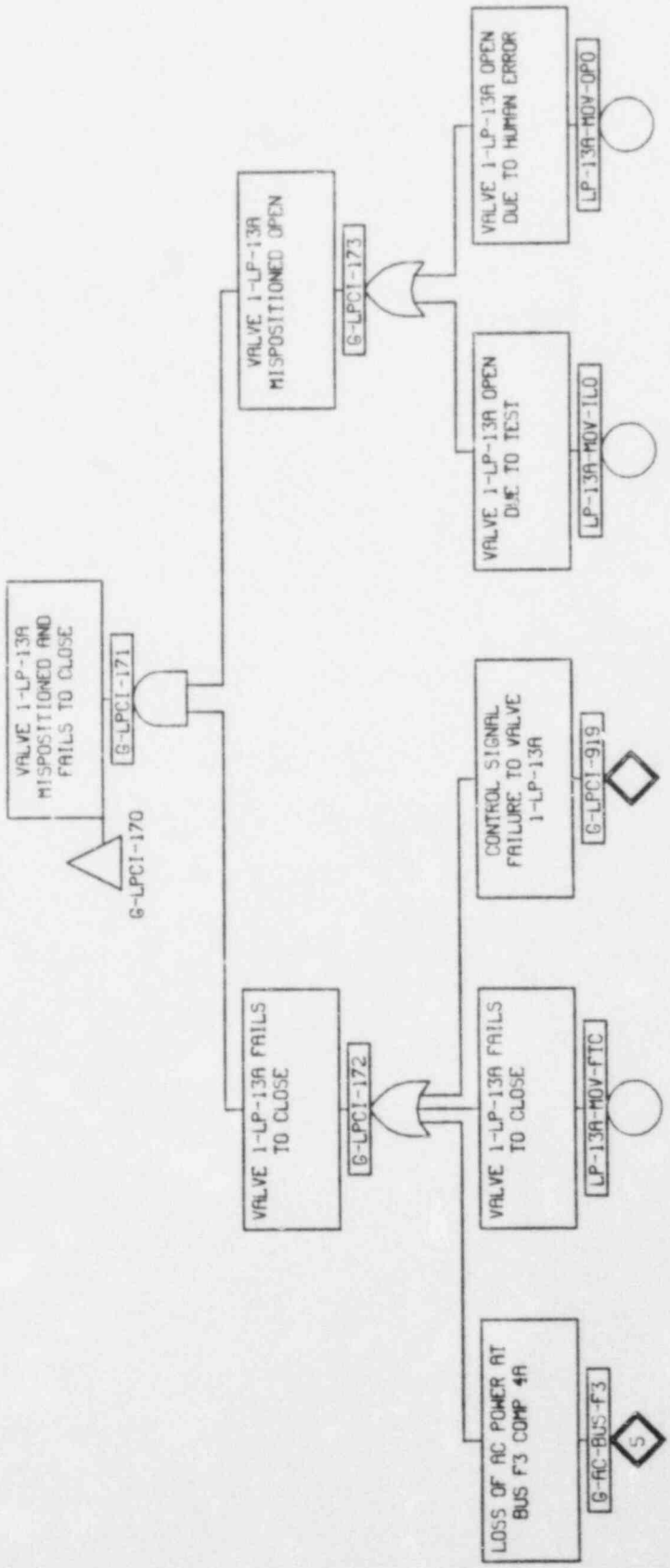

VALVE 1-LP-16A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-156
G-LPCI-157
VALVE 1-LP-16A MISPOSITIONED OPEN
G-LPCI-158
VALVE 1-LP-16A FAILS TO CLOSE
G-LPCI-159
VALVE 1-LP-16A OPEN DUE TO HUMAN ERROR
LP-16A-MOV-OPO
VALVE 1-LP-16A OPEN DUE TO TEST
LP-16A-MOV-ILO
VALVE 1-LP-16A FAILS TO CLOSE
LP-16A-MOV-FTC
LOSS OF DC POWER AT BUS 101-AB-1 COMP 2D
G-DC-BUS-AB1
3
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-16A
G-LPCI-066

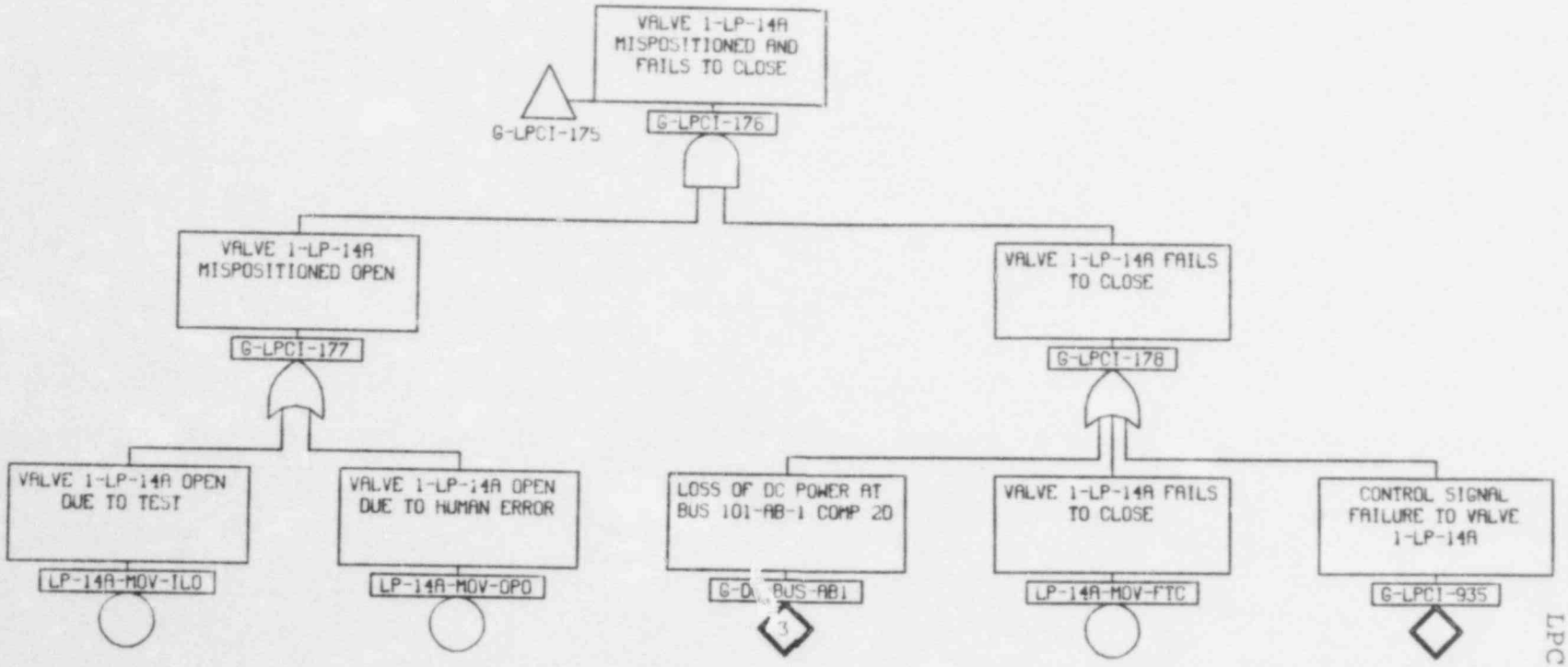

FLOW DIVERTED THROUGH TORUS TEST LINE A
G-LPCI-160
G-LPCI-139
BREAK IN RECIRC. LOOP
LOCA-LOOP-B
5
EXCESS FLOW THROUGH VALVE 1-LP-44A
G-LPCI-165
EXCESS FLOW THROUGH VALVE 1-LP-43A
G-LPCI-161

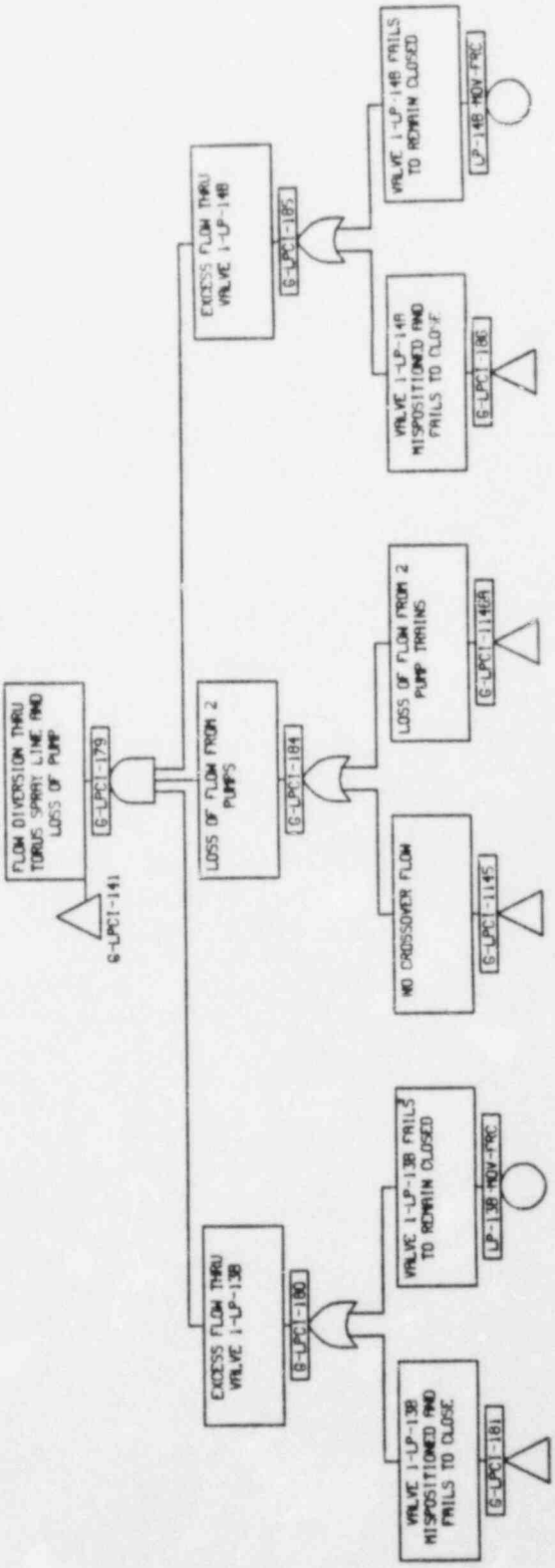

EXCESS FLOW THROUGH VALVE 1-LP-43A
G-LPCI-161
G-LPCI-160
G-LPCI-291
VALVE 1-LP-43A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-162
VALVE 1-LP-43A FAILS OPEN
LP-43A-MOV-FRC
VALVE 1-LP-43A FAILS TO CLOSE
G-LPCI-163
VALVE 1-LP-43A MISPOSITIONED OPEN
G-LPCI-164
LOSS OF AC POWER AT BUS F3 COMP 1A
G-AC-BUS-F3
5
VALVE 1-LP-43A FAILS TO CLOSE
LP-43A-MOV-FTC
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-43A
G-LPCI-951
VALVE 1-LP-43A OPEN DUE TO HUMAN ERROR
LP-43A-MOV-OPO
VALVE 1-LP-43A OPEN DUE TO TEST
LP-43A-MOV-TLO

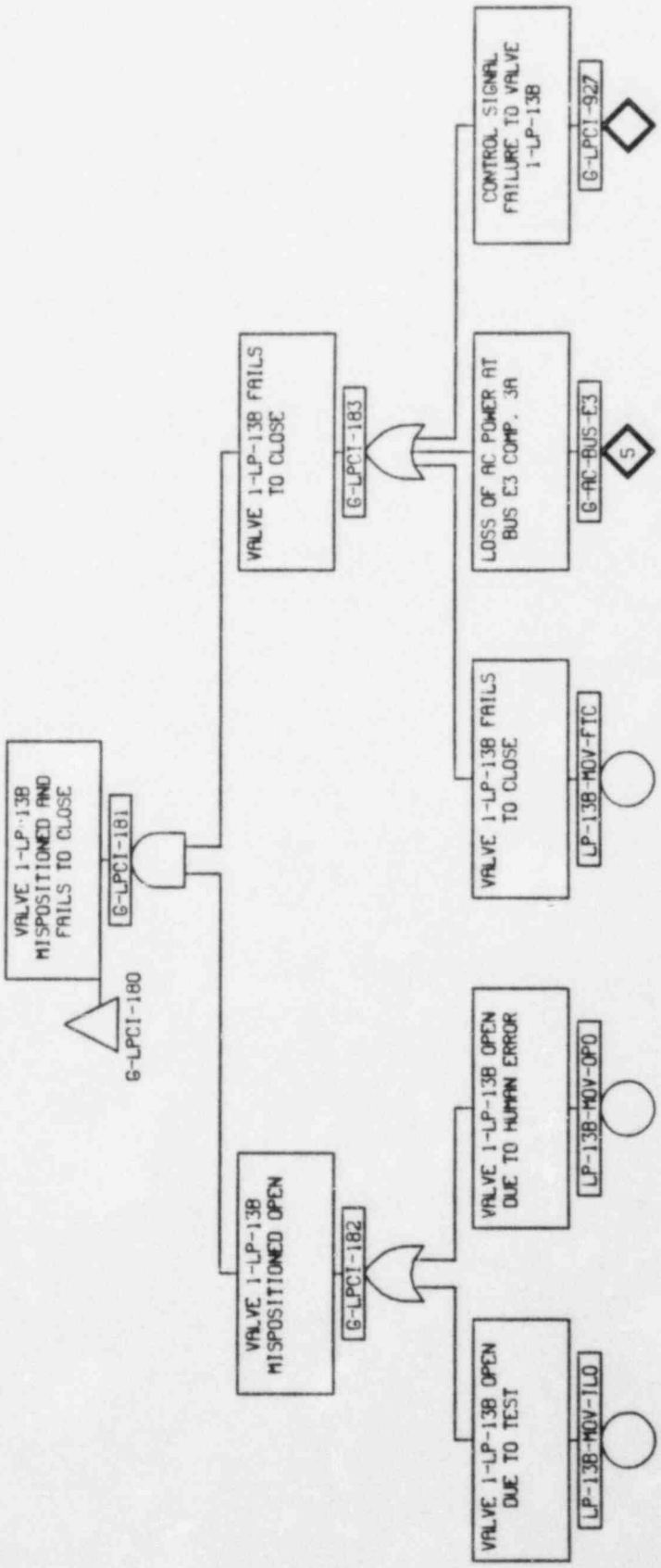

EXCESS FLOW THROUGH VALVE 1-LP-44A
G-LPCI-165
G-LPCI-160
G-LPCI-291
VALVE 1-LP-44A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-166
VALVE 1-LP-44A FAILS OPEN
LP-44A-MOV-FRC
VALVE 1-LP-44A MISPOSITIONED OPEN
G-LPCI-167
VALVE 1-LP-44A FAILS TO CLOSE
G-LPCI-168
VALVE 1-LP-44A OPEN DUE TO HUMAN ERROR
LP-44A-MOV-OPO
VALVE 1-LP-44A OPEN DUE TO TEST
LP-44A-MOV-ILO
LOSS OF DC POWER AT BUS 101-AB-1 COMP 2D
G-DC-BUS-AB1
3
VALVE 1-LP-44A FAILS TO CLOSE
LP-44A-MOV-FTC
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-44A
G-LPCI-969

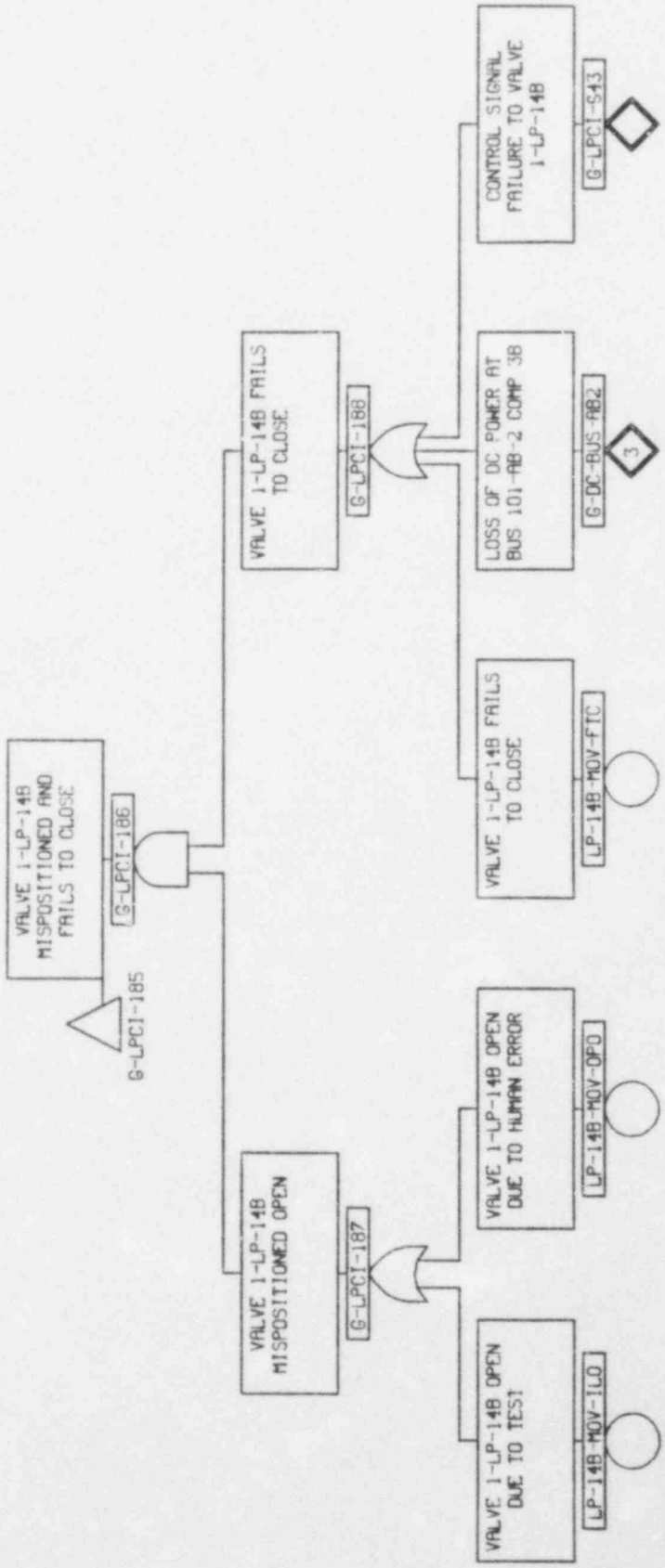

FLOW DIVERSION THRU TORUS SPRAY LINE AND LOSS OF PUMP
G-LPCI-169
G-LPCI-139
LOSS OF FLOW FROM 2 PUMPS
G-LPCI-174
EXCESS FLOW THRU VALVE 1-LP-14A
G-LPCI-175
VALVE 1-LP-14A FAILS TO REMAIN CLOSED
LP-14A-MOV-FRC
VALVE 1-LP-14A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-176
LOSS OF FLOW FROM 2 PUMP TRAINS
G-LPCI-1144
NO CROSSOVER FLOW
G-LPCI-1143
EXCESS FLOW THRU VALVE 1-LP-13A
G-LPCI-170
VALVE 1-LP-13A FAILS TO REMAIN CLOSED
LP-13A-MOV-FRC
VALVE 1-LP-13A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-171

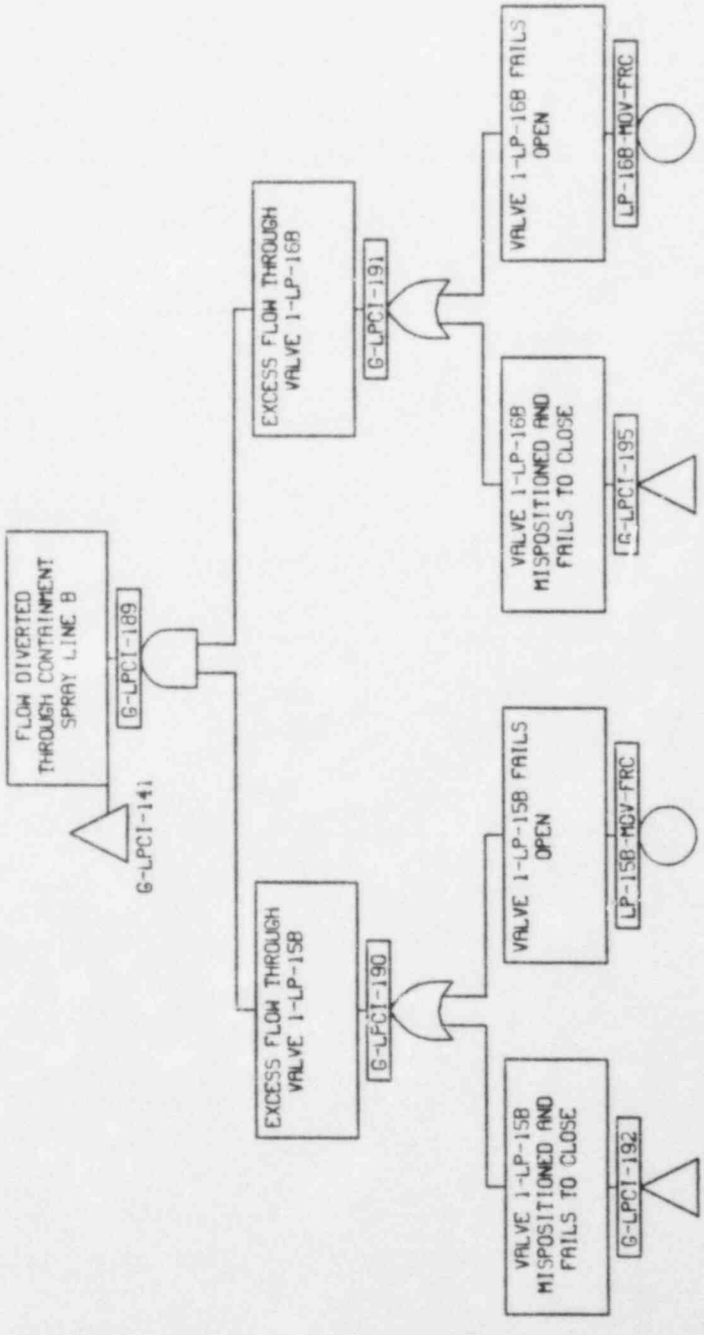

VALVE 1-LP-13A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-171
G-LPCI-170
VALVE 1-LP-13A MISPOSITIONED OPEN
G-LPCI-173
VALVE 1-LP-13A OPEN DUE TO HUMAN ERROR
LP-13A-MOV-OPO
VALVE 1-LP-13A OPEN DUE TO TEST
LP-13A-MOV-TLO
CONTROL SIGNAL FAILURE TO VALVE 1-LP-13A
G-LPCI-919
VALVE 1-LP-13A FAILS TO CLOSE
G-LPCI-172
VALVE 1-LP-13A FAILS TO CLOSE
LP-13A-MOV-FTC
LOSS OF AC POWER AT BUS F3 COMP 4A
G-AC-BUS-F3
S

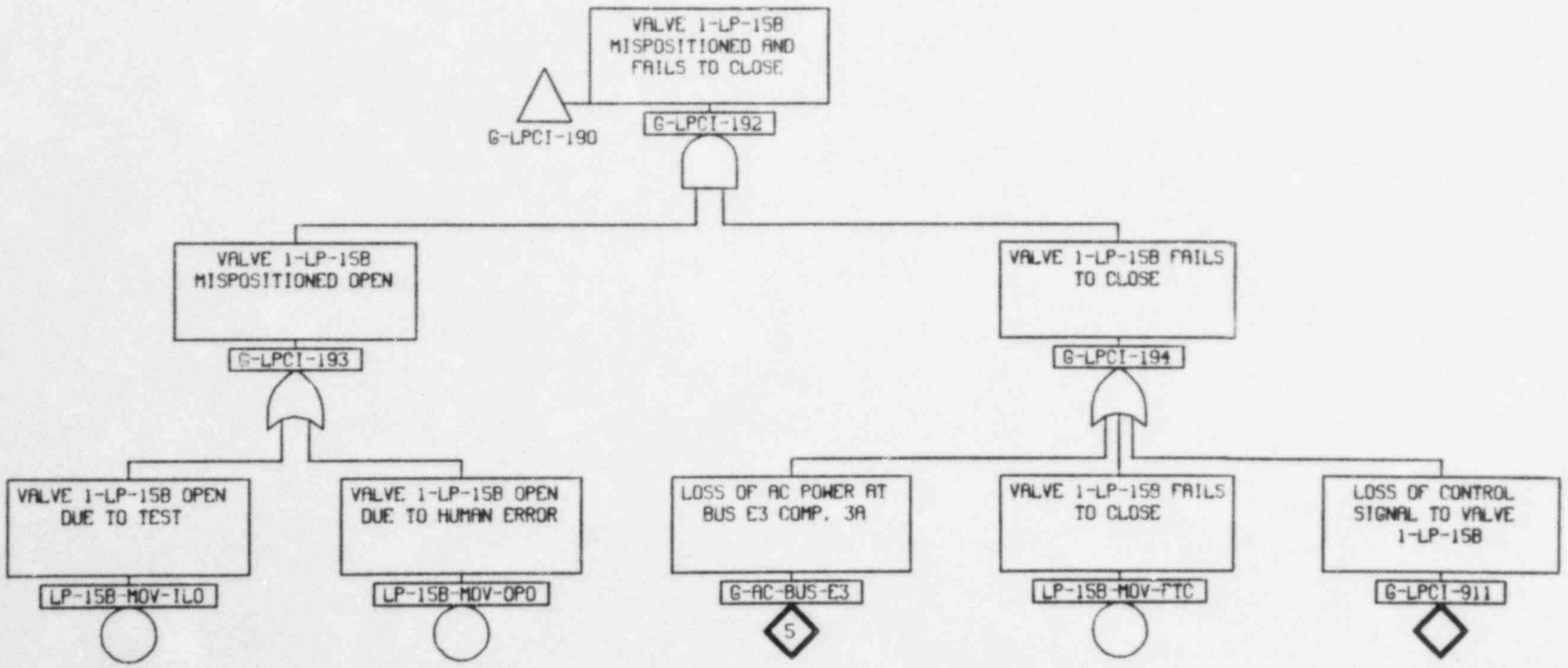

VALVE 1-LP-14A MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-175
G-LPCI-176
VALVE 1-LP-14A MISPOSITIONED OPEN
G-LPCI-177
VALVE 1-LP-14A FAILS TO CLOSE
G-LPCI-178
VALVE 1-LP-14A OPEN DUE TO TEST
LP-14A-MOV-ILO
VALVE 1-LP-14A OPEN DUE TO HUMAN ERROR
LP-14A-MOV-OPO
LOSS OF DC POWER AT BUS 101-AB-1 COMP 2D
VALVE 1-LP-14A FAILS TO CLOSE
LP-14A-MOV-FTC
CONTROL SIGNAL FAILURE TO VALVE 1-LP-14A
G-LPCI-935
3

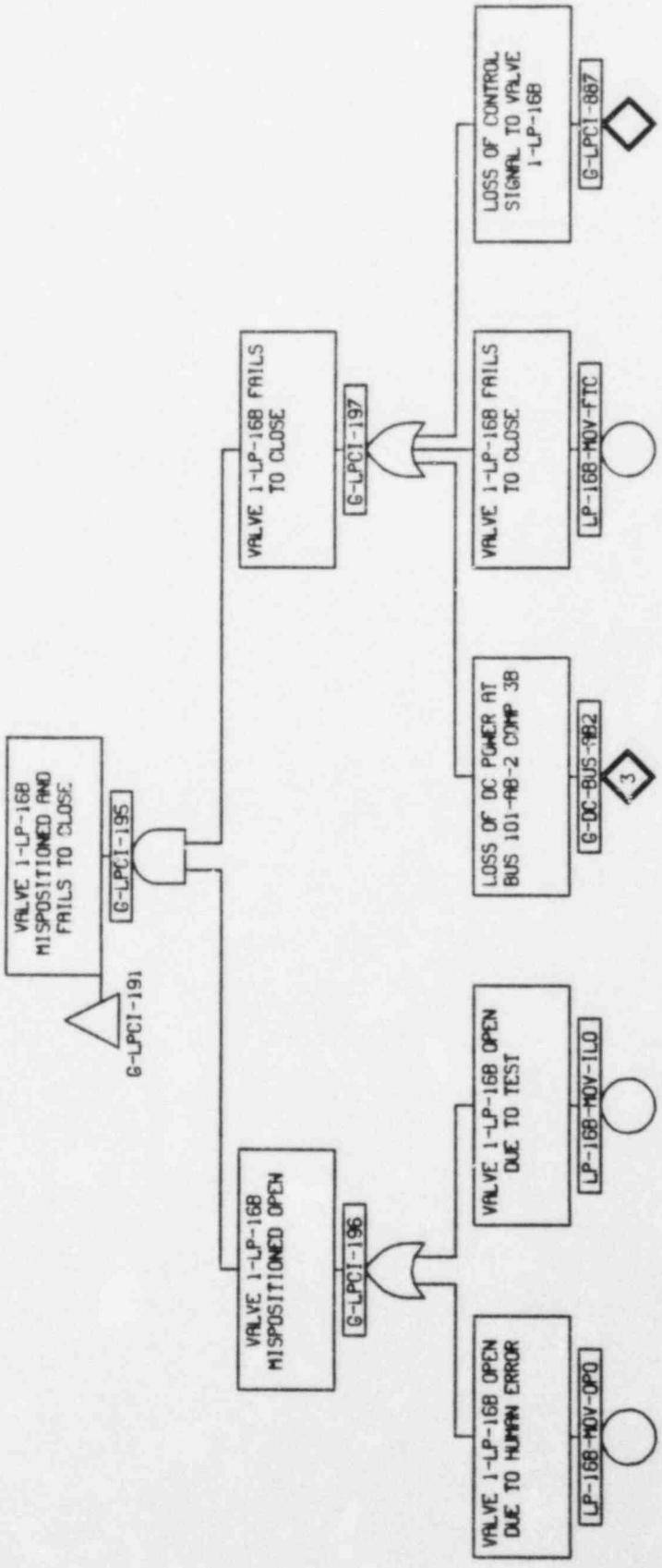

FLOW DIVERSION THRU TORUS SPRAY LINE AND LOSS OF PUMP
G-LPCI-179
G-LPCI-141
LOSS OF FLOW FROM 2 PUMPS
G-LPCI-184
EXCESS FLOW THRU VALVE 1-LP-148
G-LPCI-185
VALVE 1-LP-148 FAILS TO REMAIN CLOSED
LP-148-MOV-FRC
VALVE 1-LP-149 MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-186
LOSS OF FLOW FROM 2 PUMP TRAINS
G-LPCI-114A
NO CROSSOVER FLOW
G-LPCI-114S
EXCESS FLOW THRU VALVE 1-LP-138
G-LPCI-180
VALVE 1-LP-138 FAILS TO REMAIN CLOSED
LP-138-MOV-FRC
VALVE 1-LP-138 MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-181

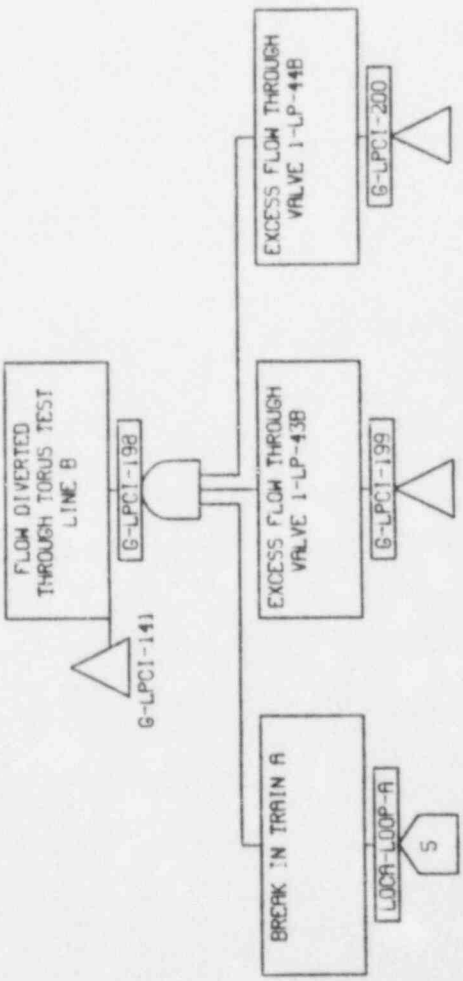

VALVE 1-LP-13B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-180
G-LPCI-181
VALVE 1-LP-13B MISPOSITIONED OPEN
G-LPCI-182
VALVE 1-LP-13B FAILS TO CLOSE
G-LPCI-183
VALVE 1-LP-13B OPEN DUE TO TEST
LP-13B-MOV-1LO
VALVE 1-LP-13B OPEN DUE TO HUMAN ERROR
LP-13B-MOV-OPO
VALVE 1-LP-13B FAILS TO CLOSE
LP-13B-MOV-FTC
LOSS OF AC POWER AT BUS E3 COMP. 3A
G-AC-BUS-E3
5
CONTROL SIGNAL FAILURE TO VALVE 1-LP-13B
G-LPCI-927

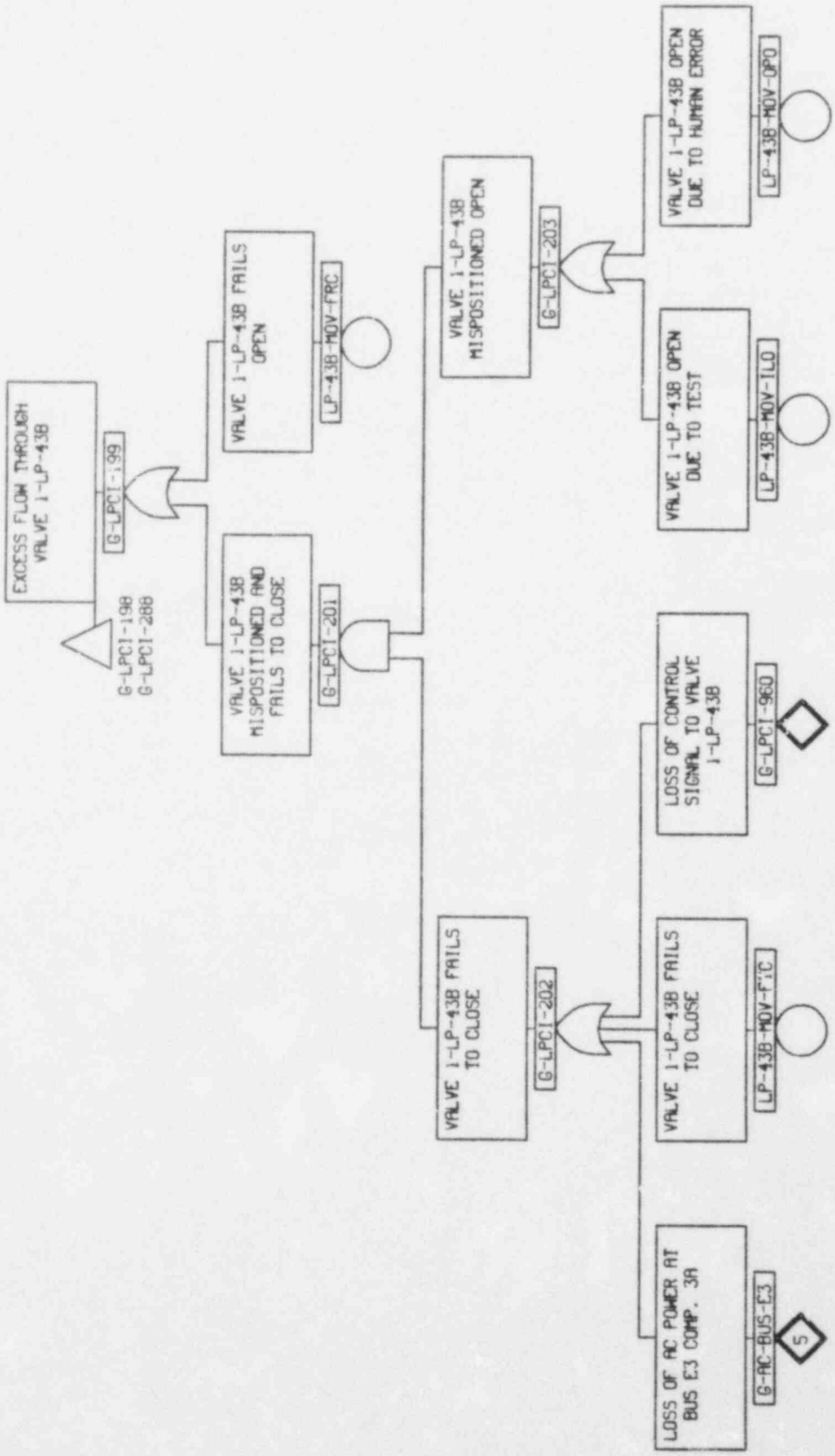

VALVE 1-LP-14B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-185
G-LPCI-186
VALVE 1-LP-14B MISPOSITIONED OPEN
G-LPCI-187
VALVE 1-LP-14B FAILS TO CLOSE
G-LPCI-188
VALVE 1-LP-14B OPEN DUE TO TEST
LP-14B-MOV-ILO
VALVE 1-LP-14B OPEN DUE TO HUMAN ERROR
LP-14B-MOV-OPO
VALVE 1-LP-14B FAILS TO CLOSE
LP-14B-MOV-FTC
LOSS OF DC POWER AT BUS 101-AB-2 COMP 3B
G-DC-BUS-AB2
3
CONTROL SIGNAL FAILURE TO VALVE 1-LP-14B
G-LPCI-S43

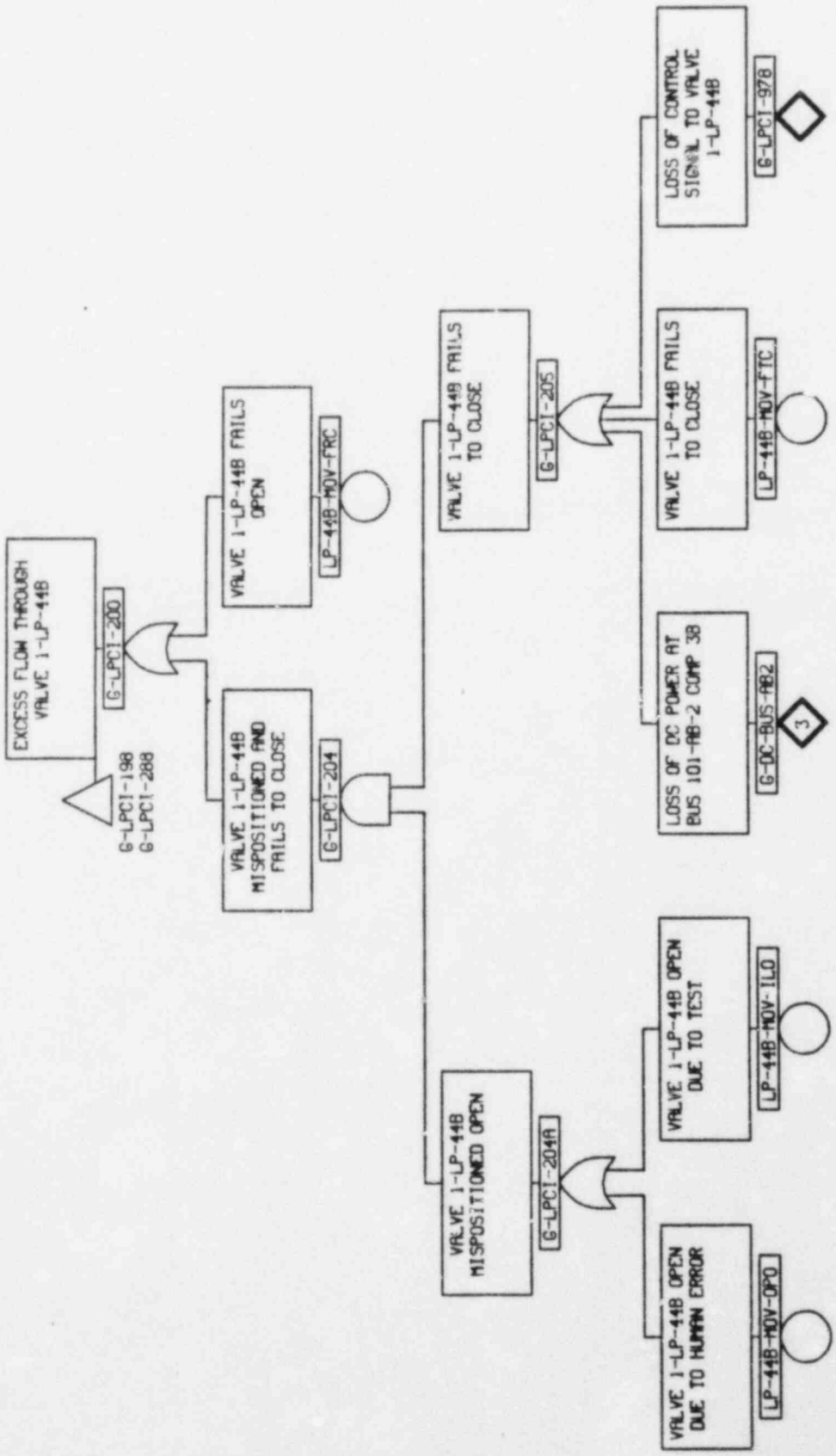

FLOW DIVERTED THROUGH CONTAINMENT SPRAY LINE B
G-LPCI-141
G-LPCI-189
EXCESS FLOW THROUGH VALVE 1-LP-158
G-LPCI-190
VALVE 1-LP-158 FAILS OPEN
LP-158-MOV-FRC
VALVE 1-LP-158 MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-192
EXCESS FLOW THROUGH VALVE 1-LP-168
G-LPCI-191
VALVE 1-LP-168 FAILS OPEN
LP-168-MOV-FRC
VALVE 1-LP-168 MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-195

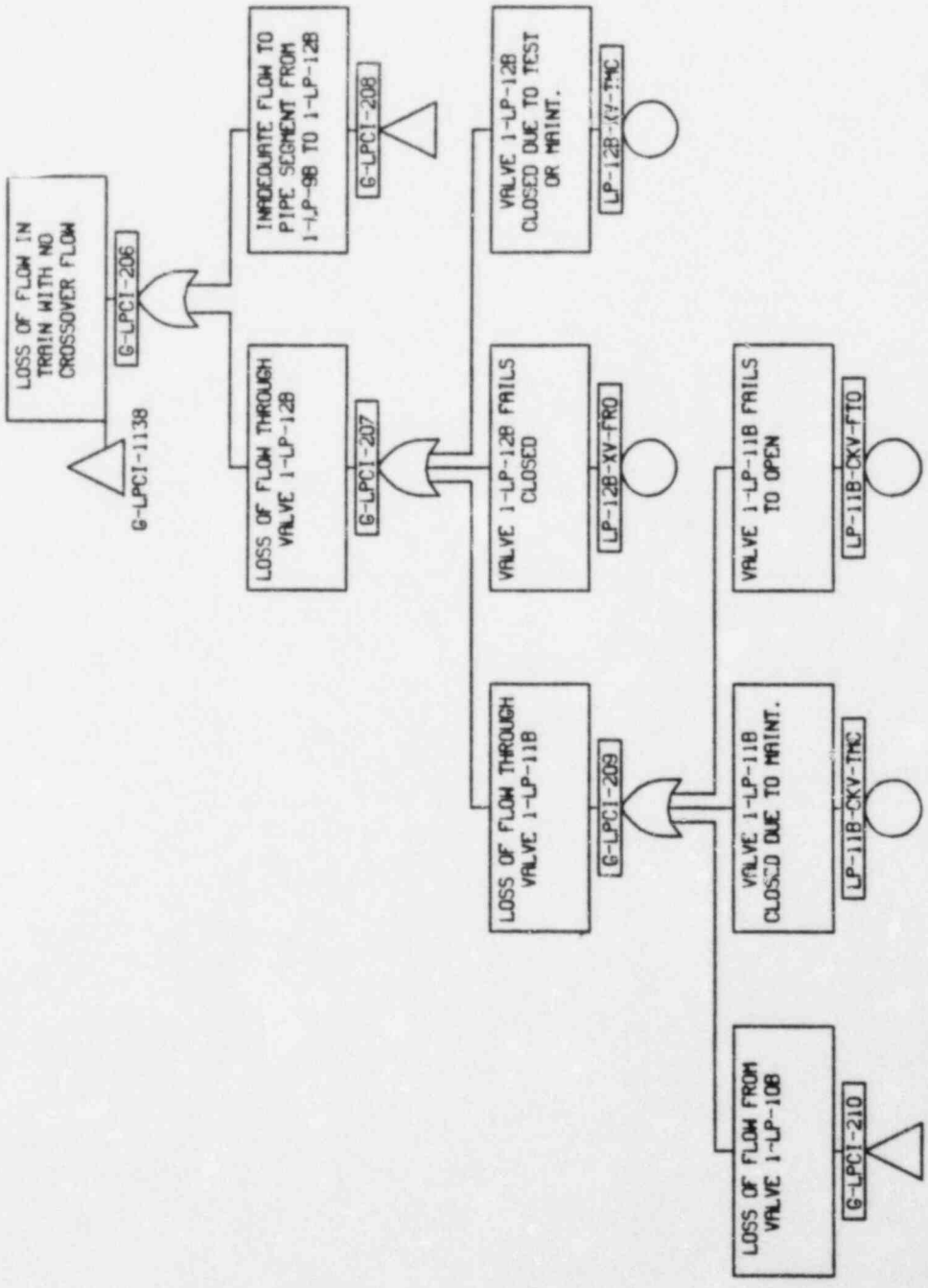

VALVE 1-LP-15B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-190
G-LPCI-192
VALVE 1-LP-15B MISPOSITIONED OPEN
G-LPCI-193
VALVE 1-LP-15B FAILS TO CLOSE
G-LPCI-194
VALVE 1-LP-15B OPEN DUE TO TEST
LP-15B-MOV-1LO
VALVE 1-LP-15B OPEN DUE TO HUMAN ERROR
LP-15B-MOV-OPO
LOSS OF AC POWER AT BUS E3 COMP. 3A
G-AC-BUS-E3
5
VALVE 1-LP-15B FAILS TO CLOSE
LP-15B-MOV-FTC
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-15B
G-LPCI-911

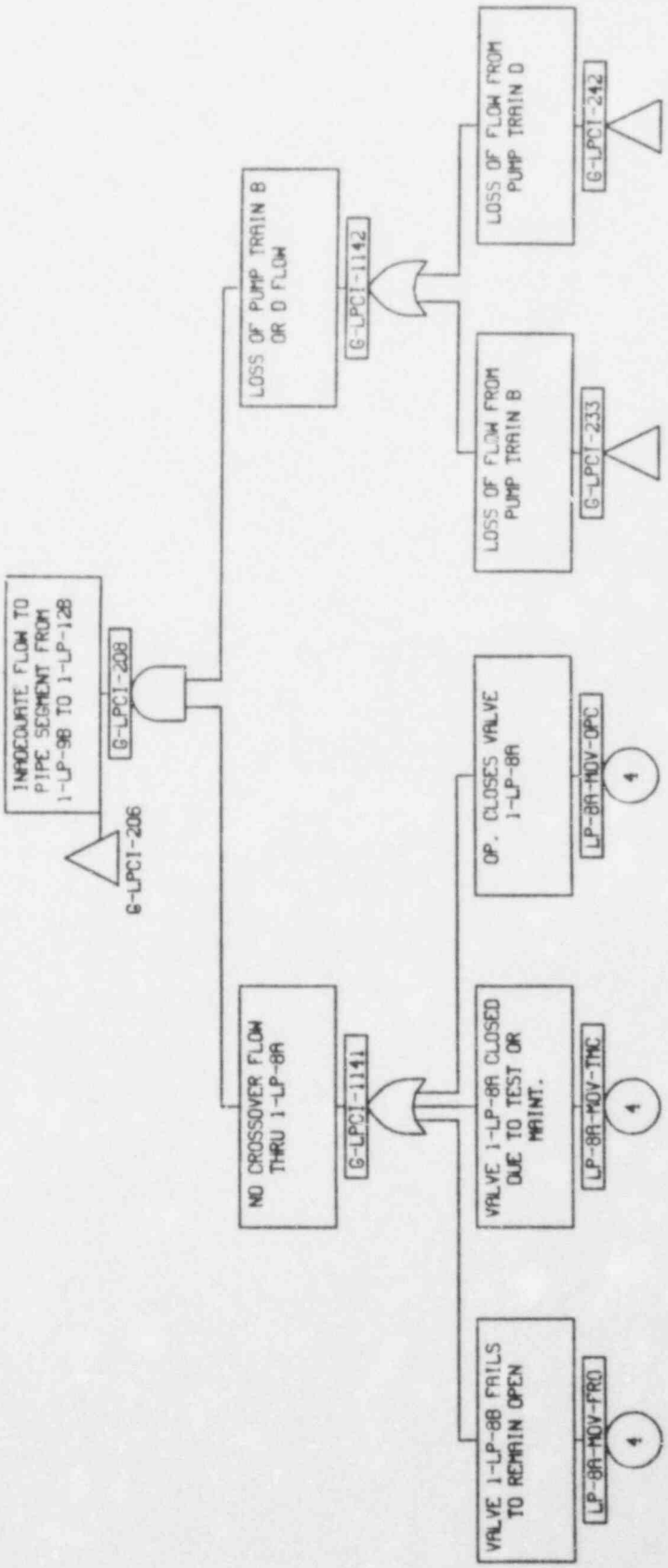

VALVE 1-LP-168 MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-191
G-LPCI-195
VALVE 1-LP-168 MISPOSITIONED OPEN
G-LPCI-196
VALVE 1-LP-168 FAILS TO CLOSE
G-LPCI-197
VALVE 1-LP-168 OPEN DUE TO HUMAN ERROR
LP-168-MOV-OPO
VALVE 1-LP-168 OPEN DUE TO TEST
LP-168-MOV-ILO
LOSS OF DC POWER AT BUS 101-AB-2 COMP 3B
G-DC-BUS-3B2
3
VALVE 1-LP-168 FAILS TO CLOSE
LP-168-MOV-FTC
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-168
G-LPCI-867

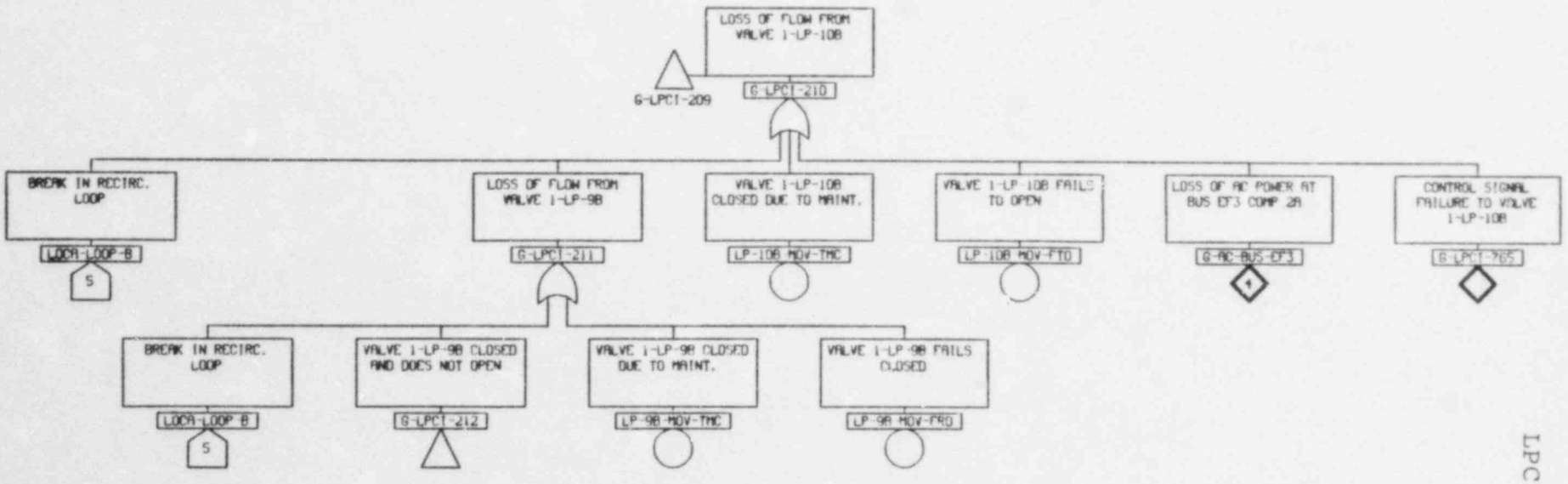

FLOW DIVERTED THROUGH TORUS TEST LINE B
G-LPCI-141
G-LPCI-198
EXCESS FLOW THROUGH VALVE 1-LP-44B
G-LPCI-200
EXCESS FLOW THROUGH VALVE 1-LP-43B
G-LPCI-199
BREAK IN TRAIN A
LOCA-LOOP-A
S

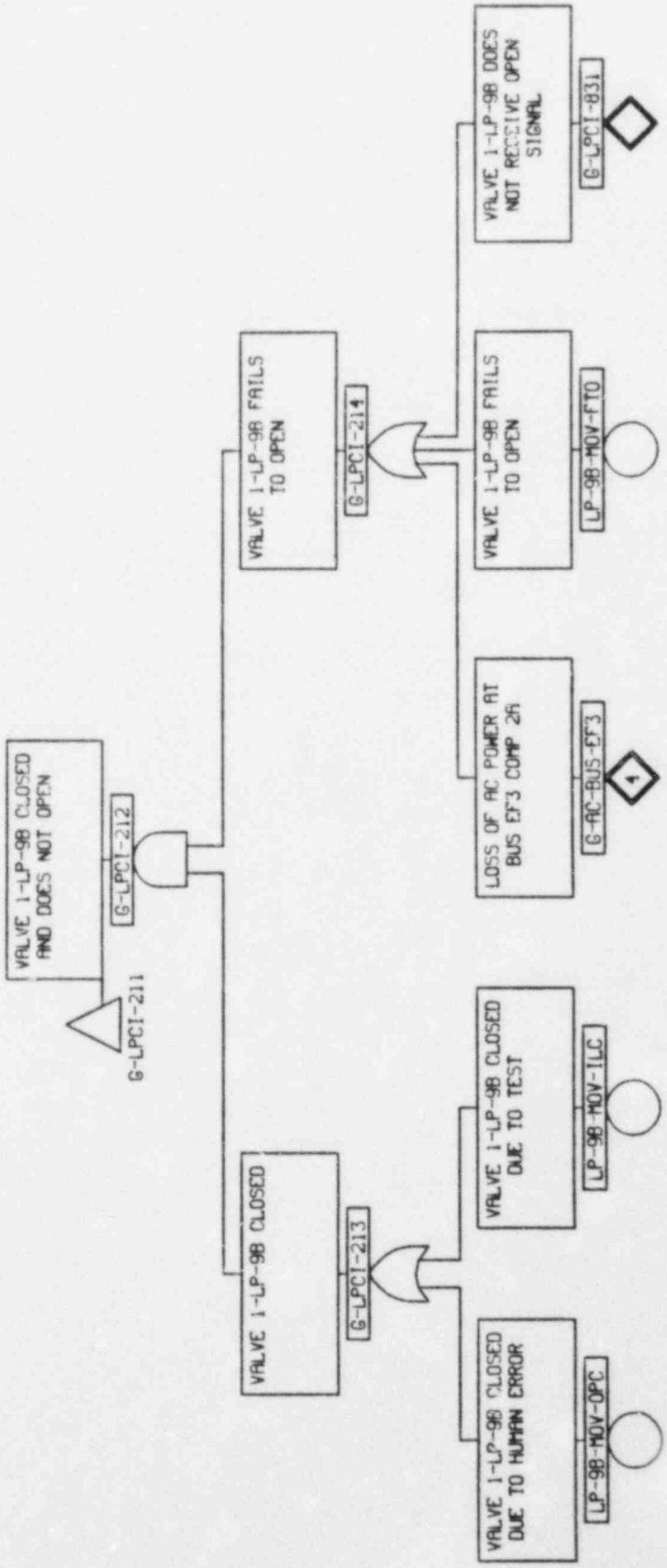

EXCESS FLOW THROUGH VALVE 1-LP-43B
G-LPCI-199
G-LPCI-198
G-LPCI-288
VALVE 1-LP-43B FAILS OPEN
LP-43B-MOV-FRC
VALVE 1-LP-43B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-201
VALVE 1-LP-43B MISPOSITIONED OPEN
G-LPCI-203
VALVE 1-LP-43B OPEN DUE TO HUMAN ERROR
LP-43B-MOV-OPO
VALVE 1-LP-43B OPEN DUE TO TEST
LP-43B-MOV-TLO
VALVE 1-LP-43B FAILS TO CLOSE
G-LPCI-202
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-43B
G-LPCI-960
VALVE 1-LP-43B FAILS TO CLOSE
LP-43B-MOV-FTC
LOSS OF AC POWER AT BUS E3 COMP. 3A
G-AC-BUS-E3
5

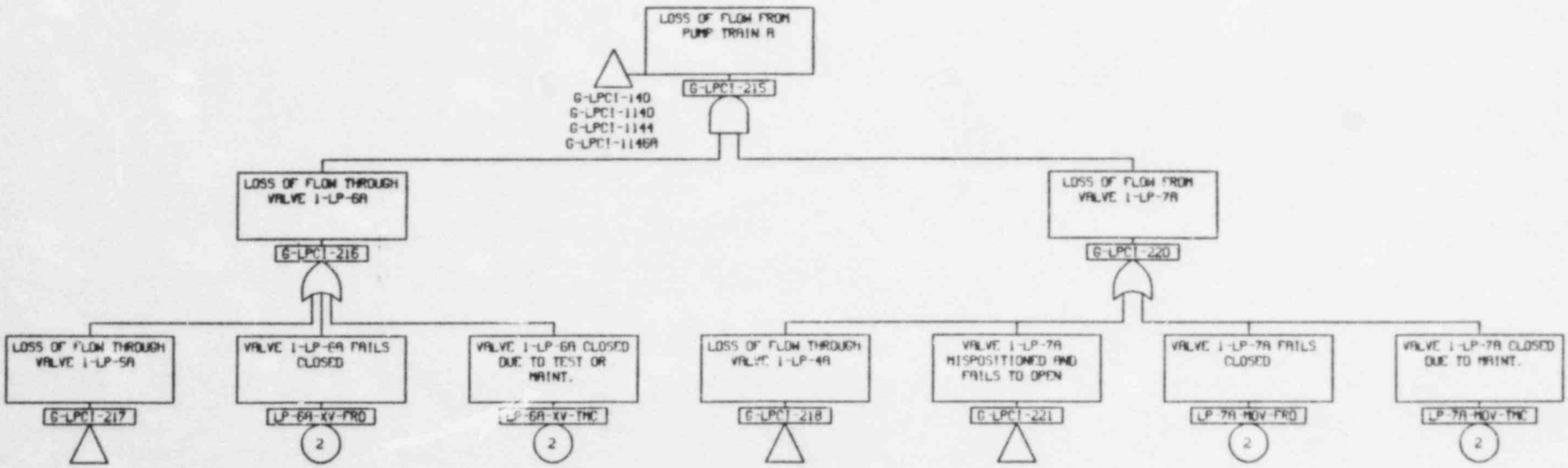

EXCESS FLOW THROUGH VALVE 1-LP-44B
G-LPCI-198
G-LPCI-288
G-LPCI-200
VALVE 1-LP-44B FAILS OPEN
LP-44B-MOV-FRC
VALVE 1-LP-44B MISPOSITIONED AND FAILS TO CLOSE
G-LPCI-204
VALVE 1-LP-44B FAILS TO CLOSE
G-LPCI-205
LOSS OF CONTROL SIGNAL TO VALVE 1-LP-44B
G-LPCI-978
VALVE 1-LP-44B FAILS TO CLOSE
LP-44B-MOV-FTC
LOSS OF DC POWER AT BUS 101-AB-2 COMP 3B
G-DC-BUS-AB2
3
VALVE 1-LP-44B MISPOSITIONED OPEN
G-LPCI-204A
VALVE 1-LP-44B OPEN DUE TO TEST
LP-44B-MOV-ILO
VALVE 1-LP-44B OPEN DUE TO HUMAN ERROR
LP-44B-MOV-OPO

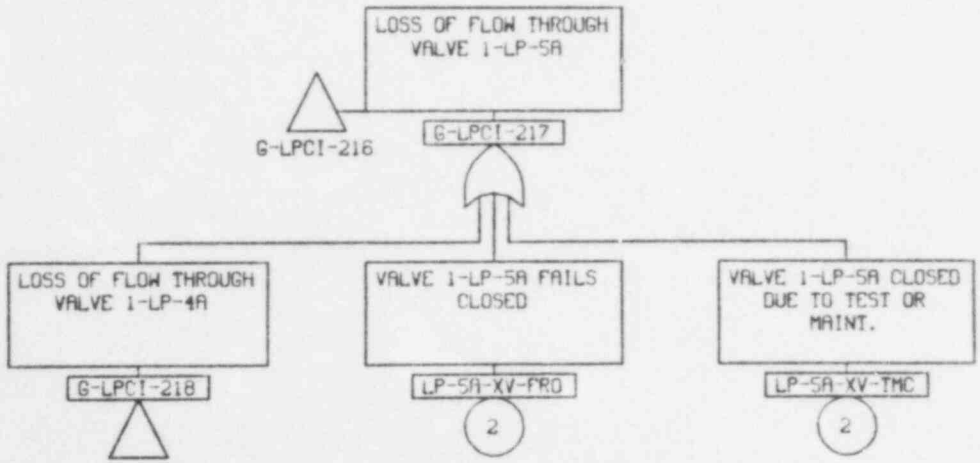

LOSS OF FLOW IN TRAIN WITH NO CROSSOVER FLOW
G-LPCI-206
G-LPCI-1138
INADEQUATE FLOW TO PIPE SEGMENT FROM 1-LP-9B TO 1-LP-12B
G-LPCI-208
LOSS OF FLOW THROUGH VALVE 1-LP-12B
G-LPCI-207
VALVE 1-LP-12B CLOSED DUE TO TEST OR MAINT.
LP-12B-[illegible]-TMC
VALVE 1-LP-12B FAILS CLOSED
LP-12B-XV-FRO
LOSS OF FLOW THROUGH VALVE 1-LP-11B
G-LPCI-209
VALVE 1-LP-11B FAILS TO OPEN
LP-11B-CKV-FTO
VALVE 1-LP-11B CLOSED DUE TO MAINT.
LP-11B-CKV-TMC
LOSS OF FLOW FROM VALVE 1-LP-10B
G-LPCI-210

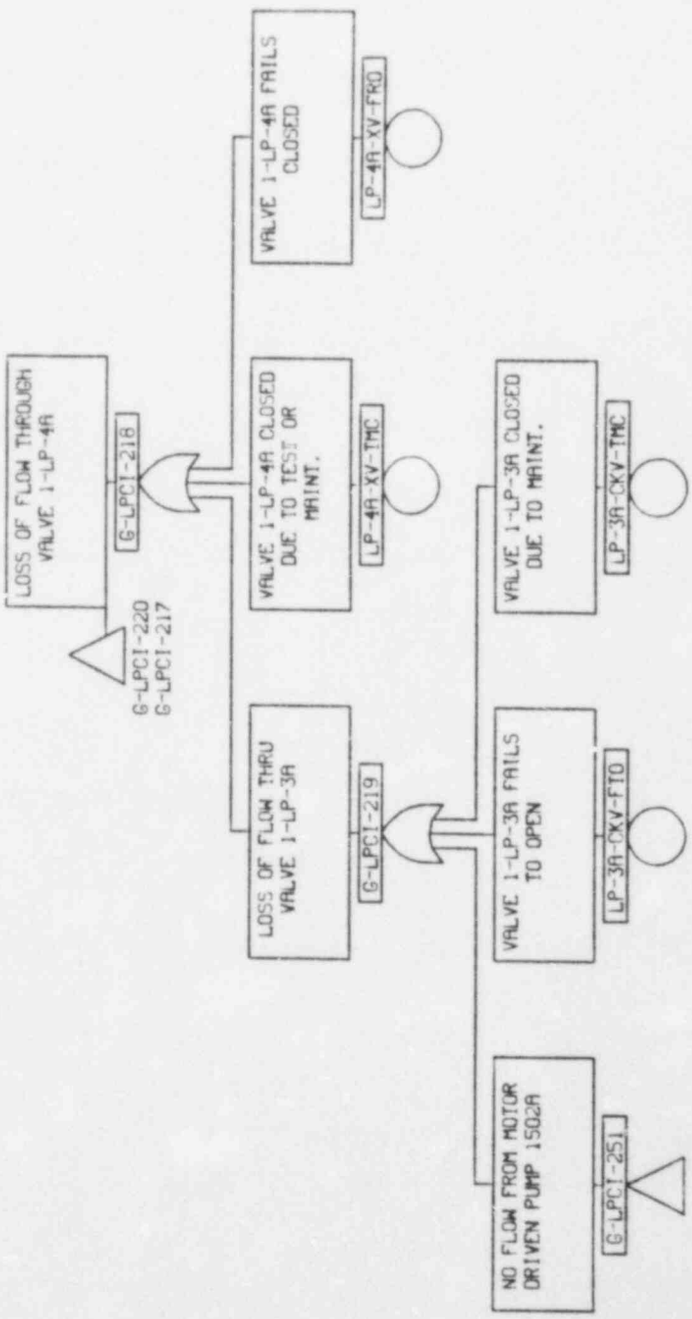

INADEQUATE FLOW TO PIPE SEGMENT FROM 1-LP-9B TO 1-LP-12B
G-LPCI-208
G-LPCI-206
LOSS OF PUMP TRAIN B OR D FLOW
G-LPCI-1142
LOSS OF FLOW FROM PUMP TRAIN D
G-LPCI-242
LOSS OF FLOW FROM PUMP TRAIN B
G-LPCI-233
NO CROSSOVER FLOW THRU 1-LP-8A
G-LPCI-1141
OP. CLOSES VALVE 1-LP-8A
LP-8A-MOV-OPC
1
VALVE 1-LP-8A CLOSED DUE TO TEST OR MAINT.
LP-8A-MOV-TMC
1
VALVE 1-LP-8A FAILS TO REMAIN OPEN
LP-8A-MOV-FRO
1

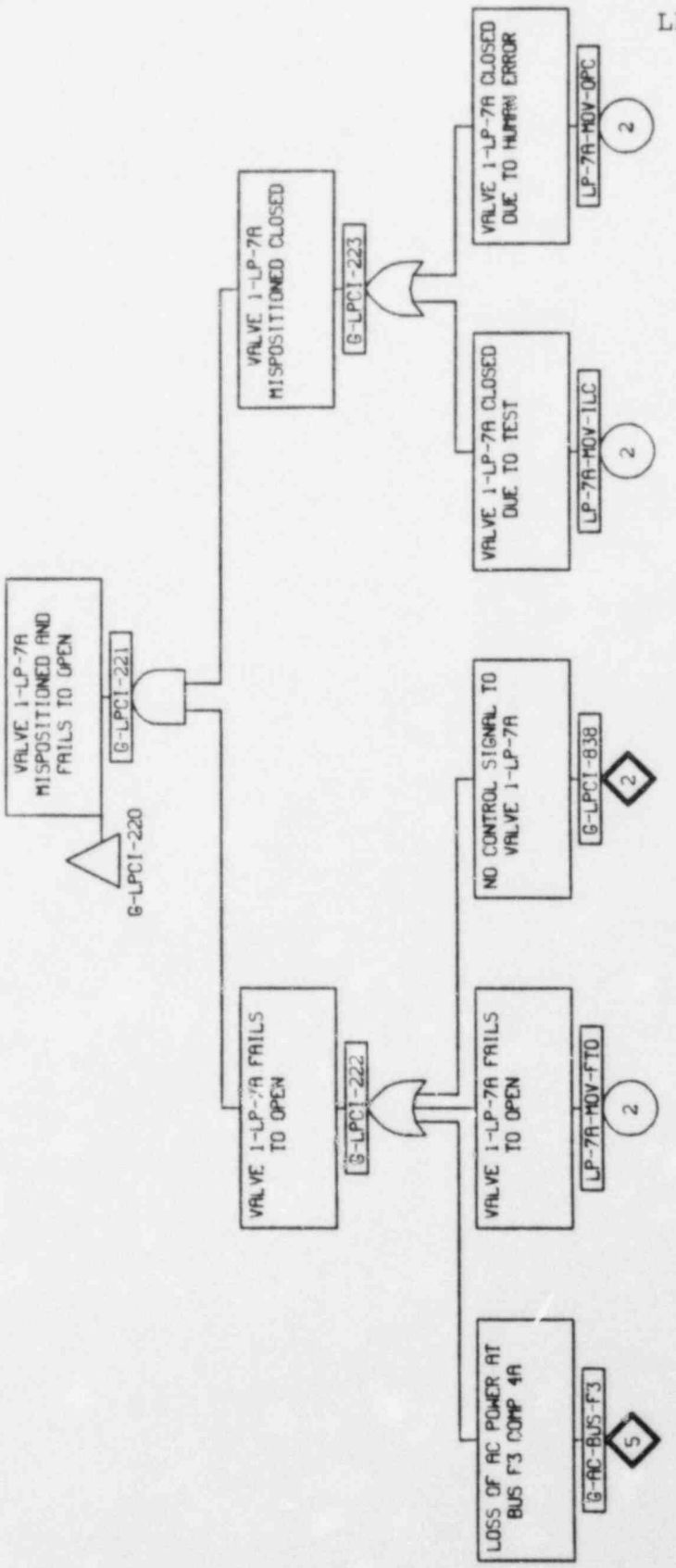

LOSS OF FLOW FROM VALVE 1-LP-10B
G-LPCI-209
G-LPCI-210
BREAK IN RECIRC. LOOP
LOCA-LOOP-B
S
LOSS OF FLOW FROM VALVE 1-LP-9B
G-LPCI-211
VALVE 1-LP-10B CLOSED DUE TO MAINT.
LP-10B-MOV-TMC
VALVE 1-LP-10B FAILS TO OPEN
LP-10B-MOV-FTO
LOSS OF AC POWER AT BUS E13 COMP 2A
G-AC-BUS-E13
1
CONTROL SIGNAL FAILURE TO VALVE 1-LP-10B
G-LPCI-765
BREAK IN RECIRC. LOOP
LOCA-LOOP-B
S
VALVE 1-LP-9B CLOSED AND DOES NOT OPEN
G-LPCI-212
VALVE 1-LP-9B CLOSED DUE TO MAINT.
LP-9B-MOV-TMC
VALVE 1-LP-9B FAILS CLOSED
LP-9B-MOV-FTO

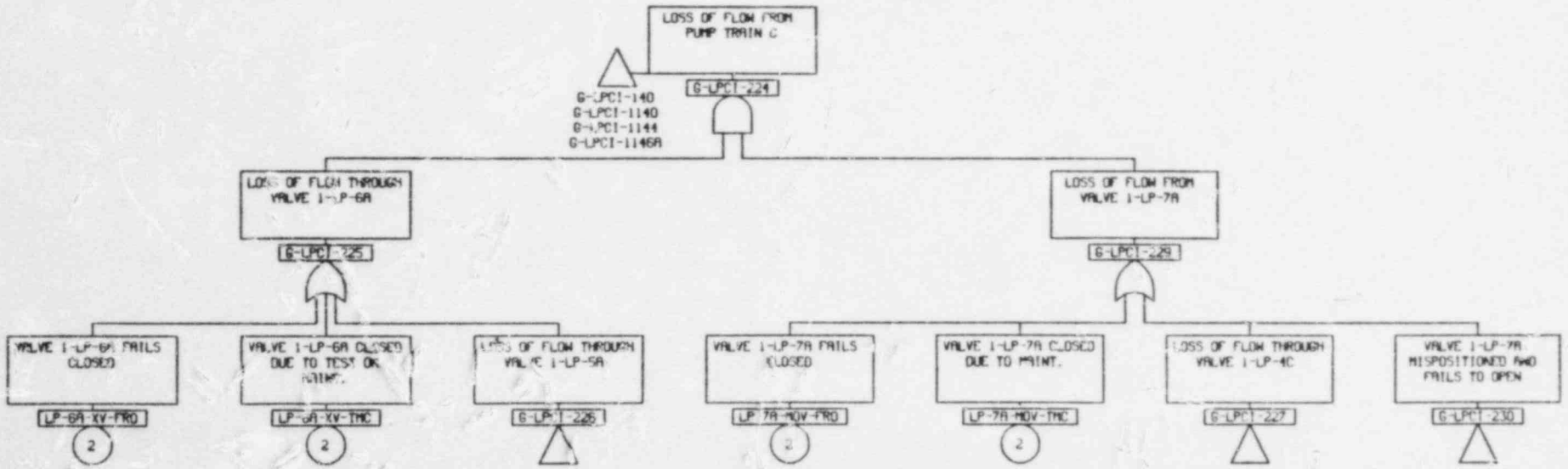

VALVE 1-LP-98 CLOSED AND DOES NOT OPEN
G-LPCI-211
G-LPCI-212
VALVE 1-LP-98 CLOSED
G-LPCI-213
VALVE 1-LP-98 CLOSED DUE TO HUMAN ERROR
LP-98-MOV-OPC
VALVE 1-LP-98 CLOSED DUE TO TEST
LP-98-MOV-1LC
VALVE 1-LP-98 FAILS TO OPEN
G-LPCI-214
LOSS OF AC POWER AT BUS EF3 COMP 2A
G-AC-BUS-EF3
1
VALVE 1-LP-98 FAILS TO OPEN
LP-98-MOV-FTO
VALVE 1-LP-98 DOES NOT RECEIVE OPEN SIGNAL
G-LPCI-831

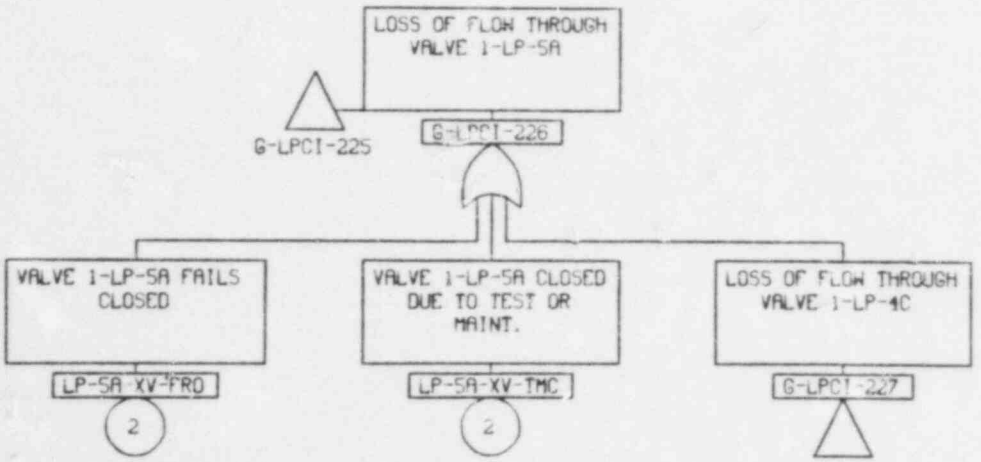

LOSS OF FLOW FROM PUMP TRAIN A
G-LPCI-215
G-LPCI-140
G-LPCI-1140
G-LPCI-1144
G-LPCI-1146A
LOSS OF FLOW THROUGH VALVE 1-LP-6A
G-LPCI-216
LOSS OF FLOW FROM VALVE 1-LP-7A
G-LPCI-220
LOSS OF FLOW THROUGH VALVE 1-LP-5A
G-LPCI-217
VALVE 1-LP-6A FAILS CLOSED
LP-6A-XV-FRO
VALVE 1-LP-6A CLOSED DUE TO TEST OR MAINT.
LP-6A-XV-TMC
LOSS OF FLOW THROUGH VALVE 1-LP-4A
G-LPCI-218
VALVE 1-LP-7A MISPOSITIONED AND FAILS TO OPEN
G-LPCI-221
VALVE 1-LP-7A FAILS CLOSED
LP-7A-MOV-FRO
VALVE 1-LP-7A CLOSED DUE TO MAINT.
LP-7A-MOV-TMC
2
2
2
2

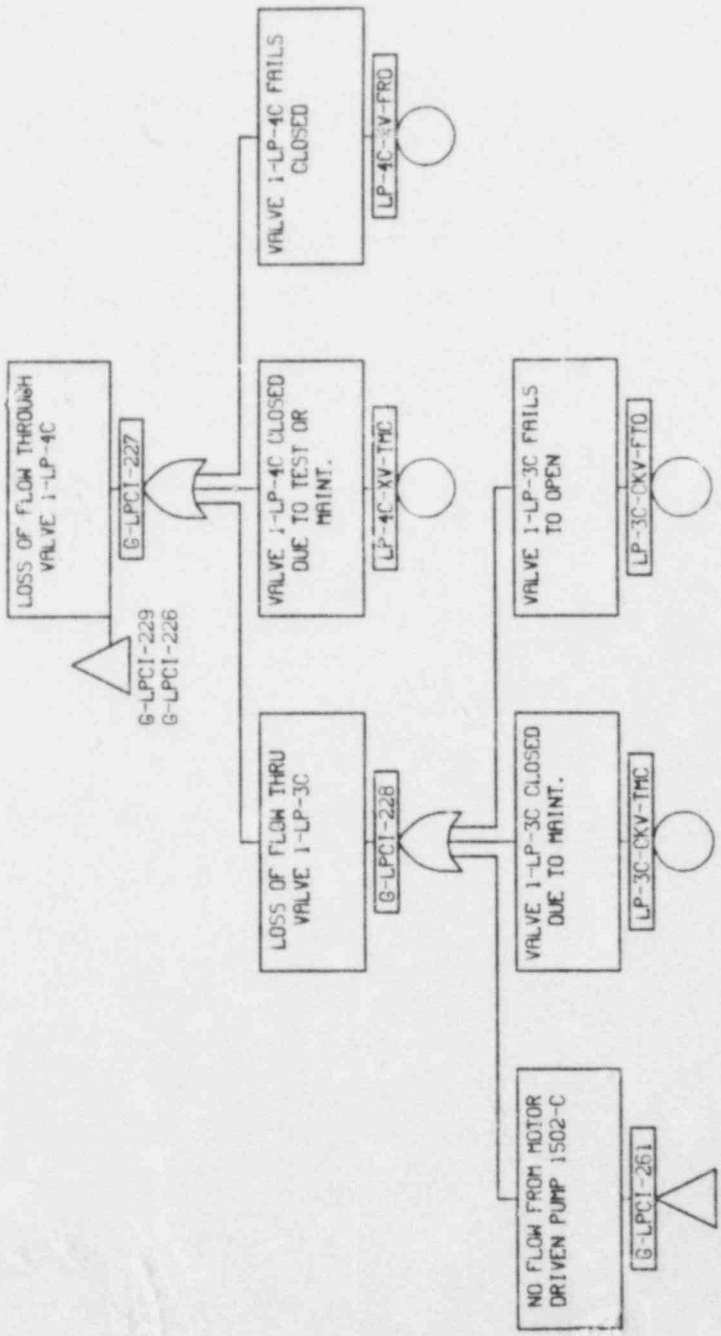

LOSS OF FLOW THROUGH VALVE 1-LP-5A
G-LPCI-216
G-LPCI-217
LOSS OF FLOW THROUGH VALVE 1-LP-4A
VALVE 1-LP-5A FAILS CLOSED
VALVE 1-LP-5A CLOSED DUE TO TEST OR MAINT.
G-LPCI-218
LP-5A-XV-FRO
LP-5A-XV-TMC
2
2

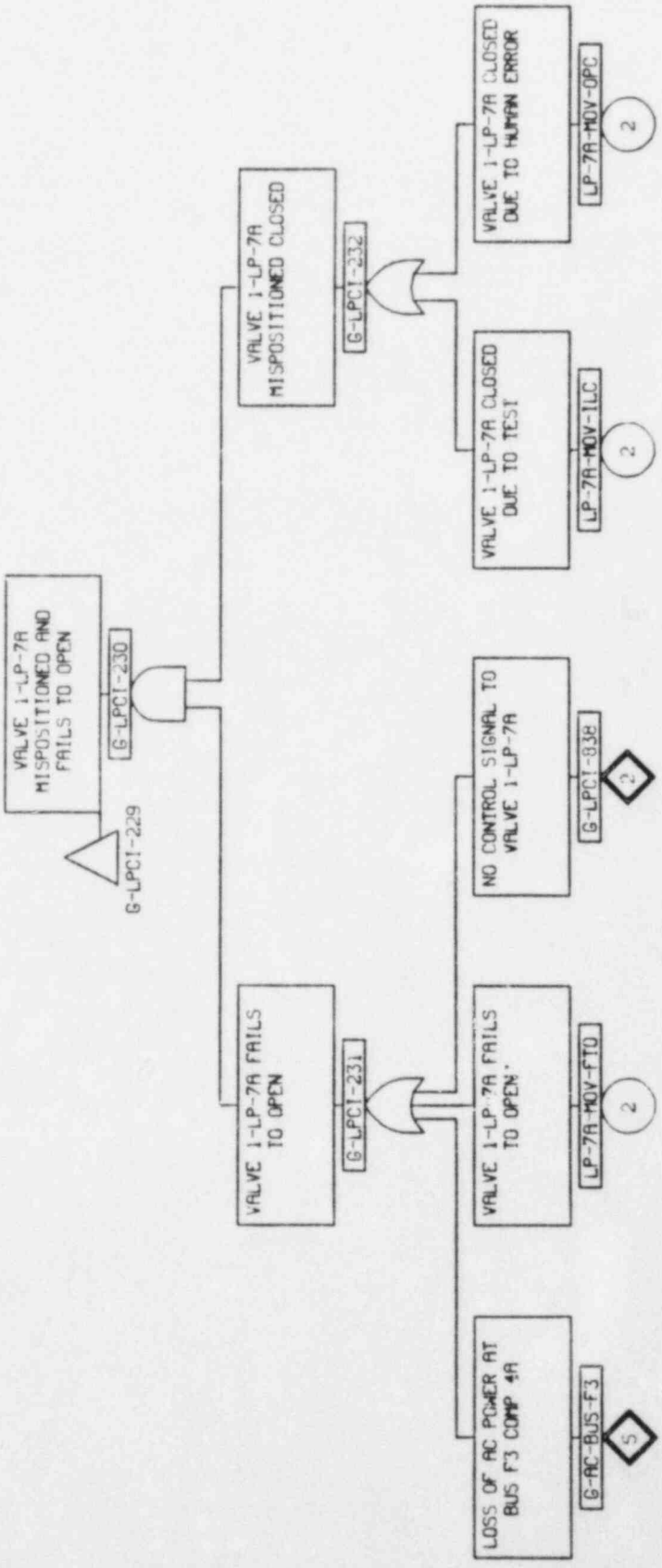

LOSS OF FLOW THROUGH VALVE 1-LP-4A
G-LPCI-218
G-LPCI-220
G-LPCI-217
VALVE 1-LP-4A FAILS CLOSED
LP-4A-XV-FRO
VALVE 1-LP-4A CLOSED DUE TO TEST OR MAINT.
LP-4A-XV-TMC
LOSS OF FLOW THRU VALVE 1-LP-3A
G-LPCI-219
VALVE 1-LP-3A CLOSED DUE TO MAINT.
LP-3A-CKV-TMC
VALVE 1-LP-3A FAILS TO OPEN
LP-3A-CKV-FTO
NO FLOW FROM MOTOR DRIVEN PUMP 150A
G-LPCI-251

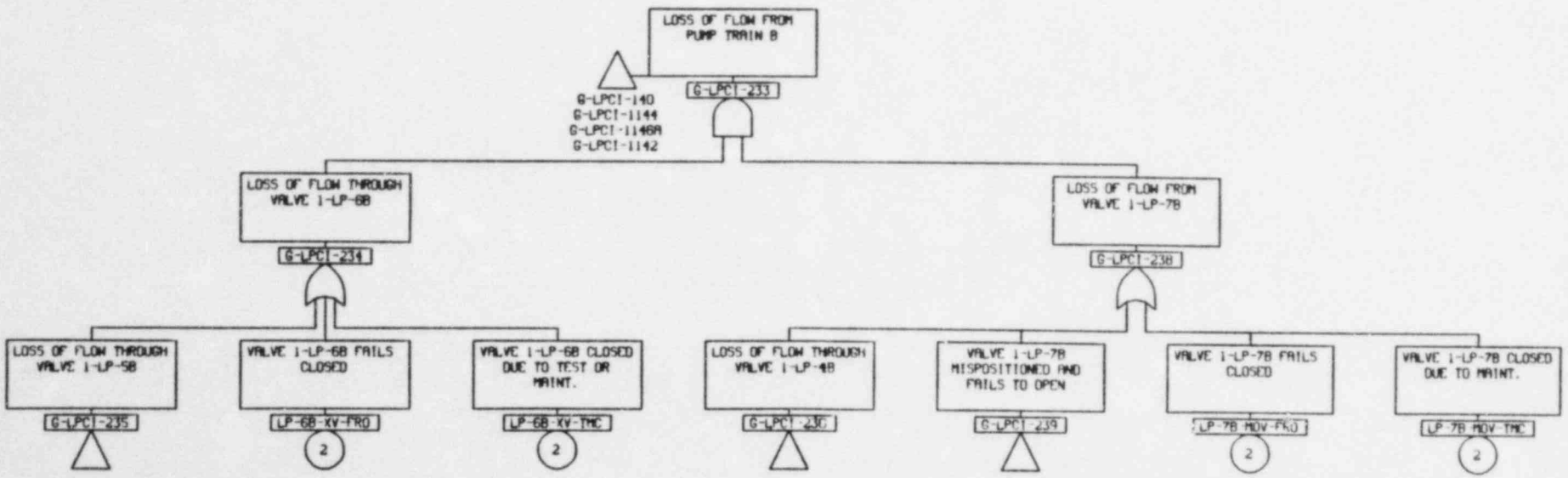

VALVE 1-LP-7A MISPOSITIONED AND FAILS TO OPEN
G-LPCI-221
G-LPCI-220
VALVE 1-LP-7A MISPOSITIONED CLOSED
G-LPCI-223
VALVE 1-LP-7A CLOSED DUE TO HUMAN ERROR
LP-7A-MOV-OPC
2
VALVE 1-LP-7A CLOSED DUE TO TEST
LP-7A-MOV-ILC
2
NO CONTROL SIGNAL TO VALVE 1-LP-7A
G-LPCI-838
2
VALVE 1-LP-7A FAILS TO OPEN
G-LPCI-222
VALVE 1-LP-7A FAILS TO OPEN
LP-7A-MOV-FTO
2
LOSS OF AC POWER AT BUS F3 COMP 4A
G-AC-BUS-F3
5

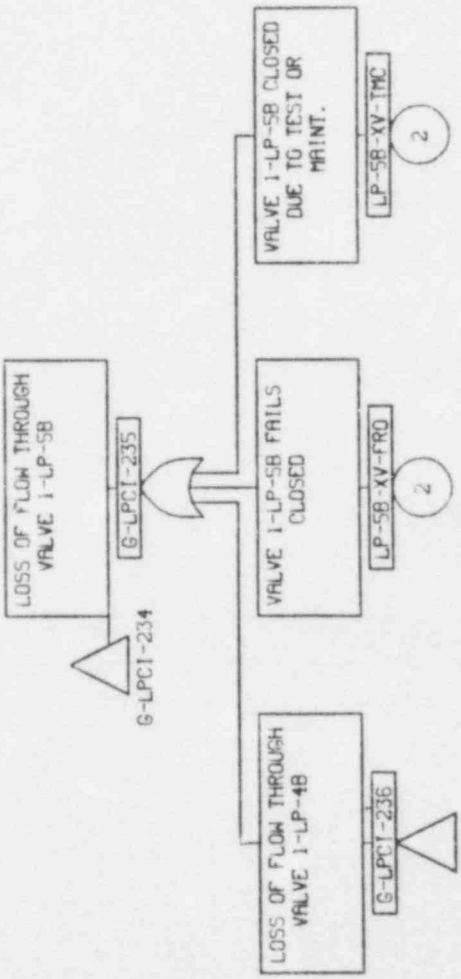

LOSS OF FLOW FROM PUMP TRAIN C
G-LPCI-224
G-LPCI-140
G-LPCI-1140
G-LPCI-1144
G-LPCI-1146A
LOSS OF FLOW THROUGH VALVE 1-LP-6A
G-LPCI-225
LOSS OF FLOW FROM VALVE 1-LP-7A
G-LPCI-229
VALVE 1-LP-6A FAILS CLOSED
LP-6A-XV-FRO
2
VALVE 1-LP-6A CLOSED DUE TO TEST OR MAINT.
LP-6A-XV-TMC
2
LOSS OF FLOW THROUGH VALVE 1-LP-5A
G-LPCI-226
VALVE 1-LP-7A FAILS CLOSED
LP-7A-MOV-FRO
2
VALVE 1-LP-7A CLOSED DUE TO MAINT.
LP-7A-MOV-TMC
2
LOSS OF FLOW THROUGH VALVE 1-LP-4C
G-LPCI-227
VALVE 1-LP-7A MISPOSITIONED AND FAILS TO OPEN
G-LPCI-230

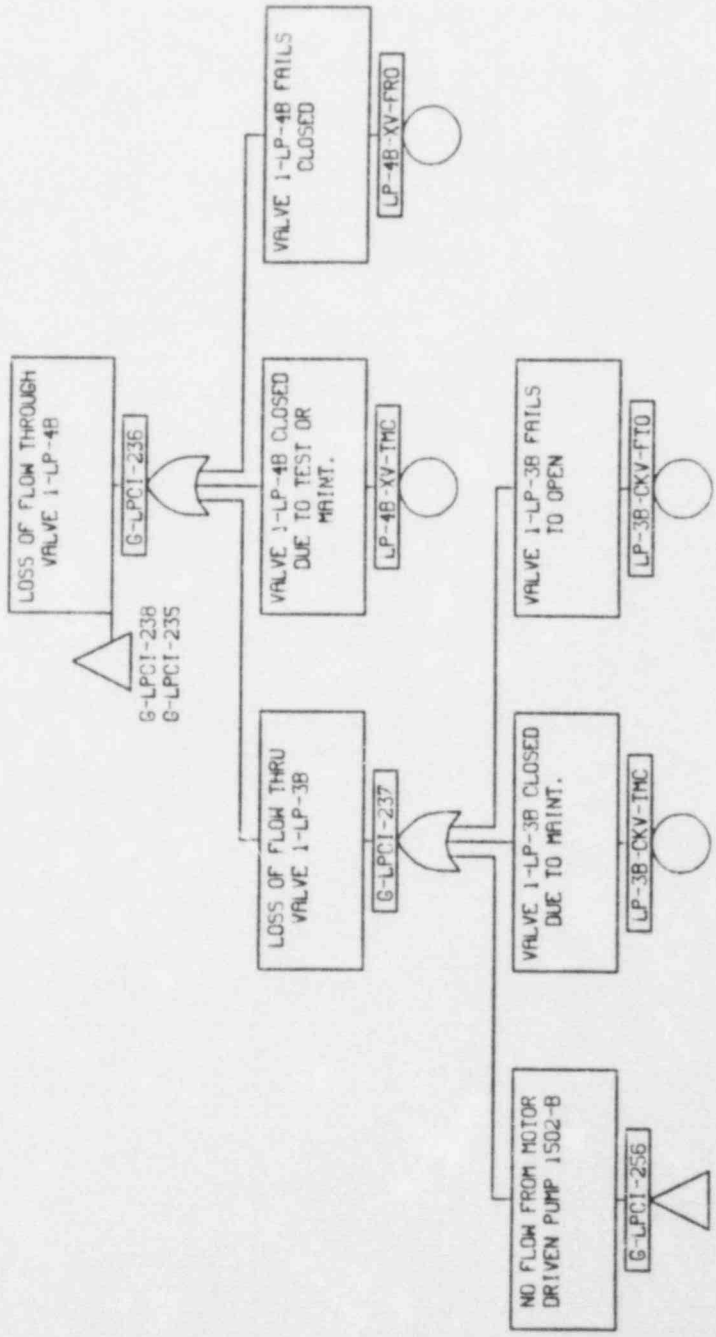

LOSS OF FLOW THROUGH VALVE 1-LP-5A
G-LPCI-225
G-LPCI-226
VALVE 1-LP-5A FAILS CLOSED
VALVE 1-LP-5A CLOSED DUE TO TEST OR MAINT.
LOSS OF FLOW THROUGH VALVE 1-LP-1C
LP-5A-XV-FRO
LP-5A-XV-TMC
G-LPCI-227
2
2

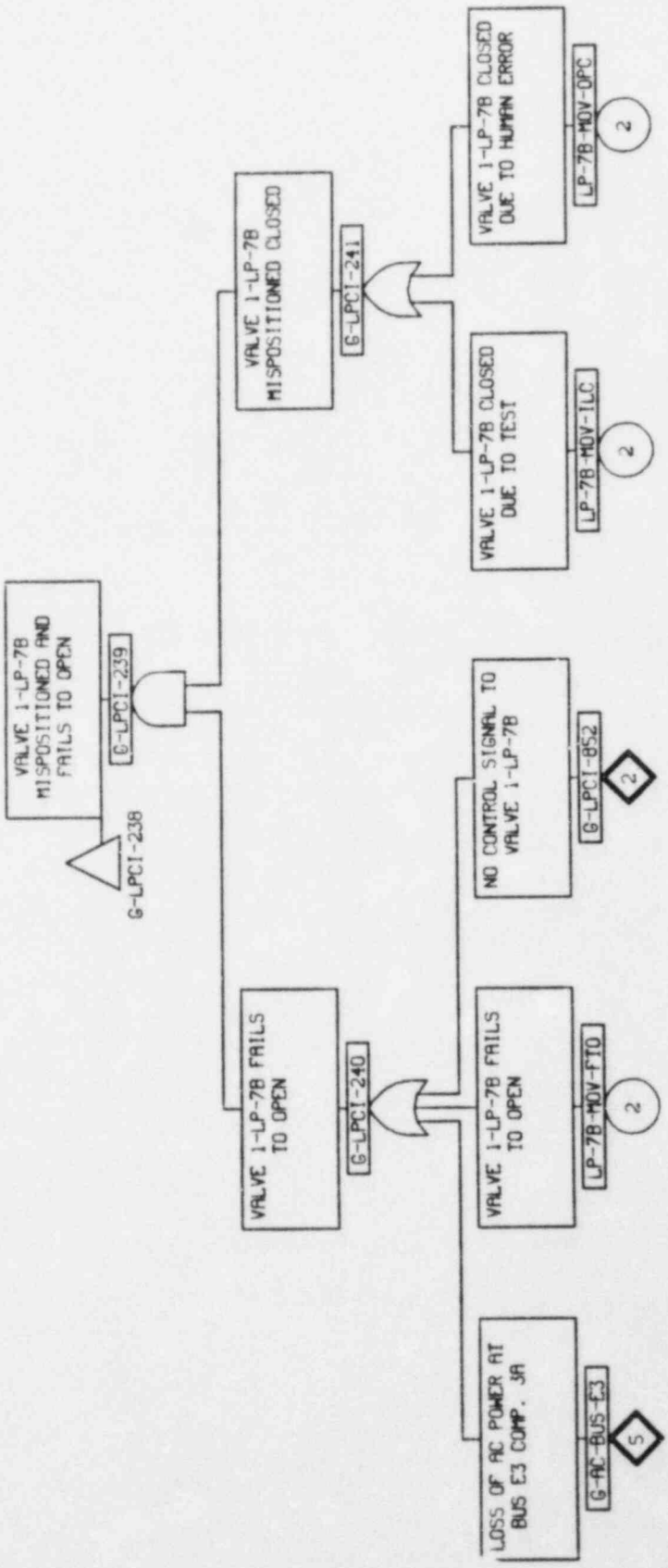

LOSS OF FLOW THROUGH VALVE 1-LP-4C
G-LPCI-227
G-LPCI-229
G-LPCI-226
VALVE 1-LP-4C CLOSED DUE TO TEST OR MAINT.
LP-4C-XV-TMC
VALVE 1-LP-4C FAILS CLOSED
LP-4C-XV-FRO
LOSS OF FLOW THRU VALVE 1-LP-3C
G-LPCI-228
VALVE 1-LP-3C CLOSED DUE TO MAINT.
LP-3C-CKV-TMC
VALVE 1-LP-3C FAILS TO OPEN
LP-3C-CKV-FTO
NO FLOW FROM MOTOR DRIVEN PUMP 1502-C
G-LPCI-261

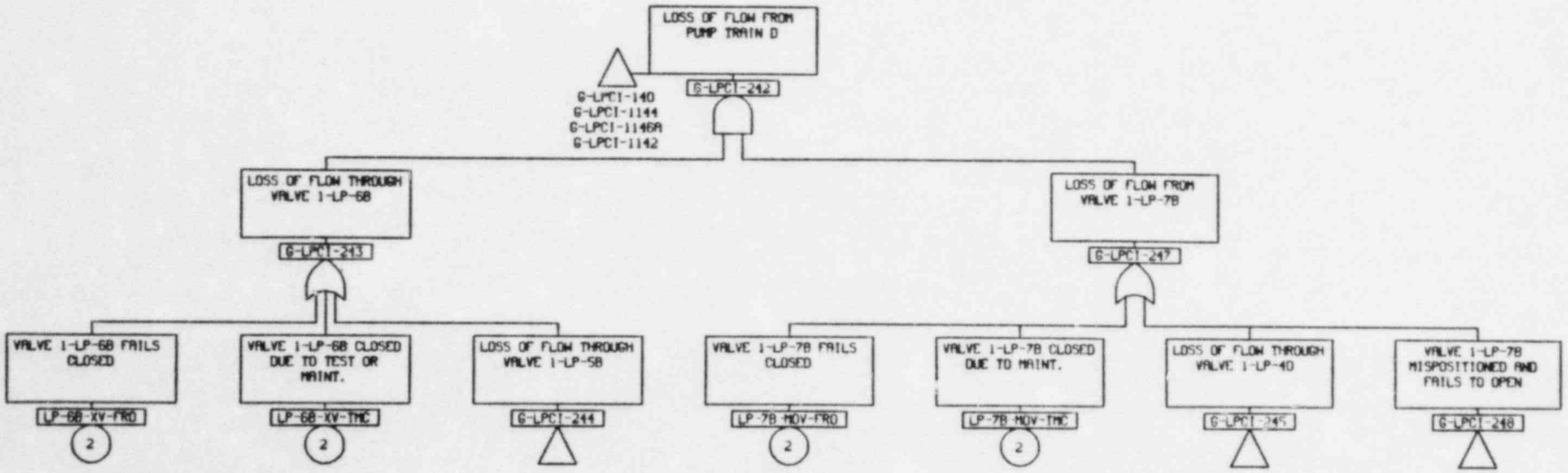

VALVE 1-LP-7A MISPOSITIONED AND FAILS TO OPEN
G-LPCI-229
G-LPCI-230
VALVE 1-LP-7A FAILS TO OPEN
G-LPCI-231
VALVE 1-LP-7A MISPOSITIONED CLOSED
G-LPCI-232
LOSS OF AC POWER AT BUS F3 COMP 4A
G-AC-BUS-F3
5
VALVE 1-LP-7A FAILS TO OPEN
LP-7A-MOV-FTO
2
NO CONTROL SIGNAL TO VALVE 1-LP-7A
G-LPCI-83E
2
VALVE 1-LP-7A CLOSED DUE TO TEST
LP-7A-MOV-1LC
2
VALVE 1-LP-7A CLOSED DUE TO HUMAN ERROR
LP-7A-MOV-OPC
2

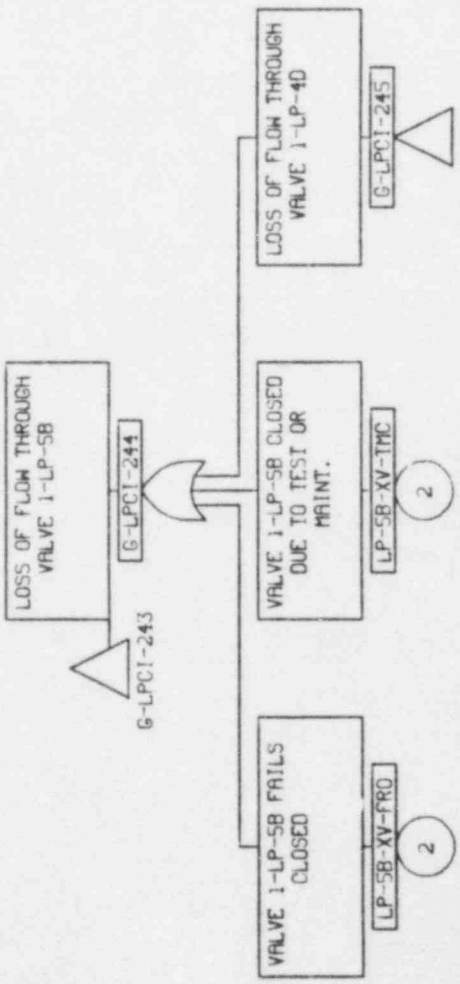

LOSS OF FLOW FROM PUMP TRAIN B
G-LPCI-233
G-LPCI-140
G-LPCI-1144
G-LPCI-1146A
G-LPCI-1142
LOSS OF FLOW THROUGH VALVE 1-LP-6B
G-LPCI-234
LOSS OF FLOW FROM VALVE 1-LP-7B
G-LPCI-238
LOSS OF FLOW THROUGH VALVE 1-LP-5B
G-LPCI-235
VALVE 1-LP-6B FAILS CLOSED
LP-6B-XV-FRO
VALVE 1-LP-6B CLOSED DUE TO TEST OR MAINT.
LP-6B-XV-TMC
LOSS OF FLOW THROUGH VALVE 1-LP-4B
G-LPCI-236
VALVE 1-LP-7B MISPOSITIONED AND FAILS TO OPEN
G-LPCI-239
VALVE 1-LP-7B FAILS CLOSED
LP-7B MOV-FRO
VALVE 1-LP-7B CLOSED DUE TO MAINT.
LP-7B MOV-TMC
2
2
2
2

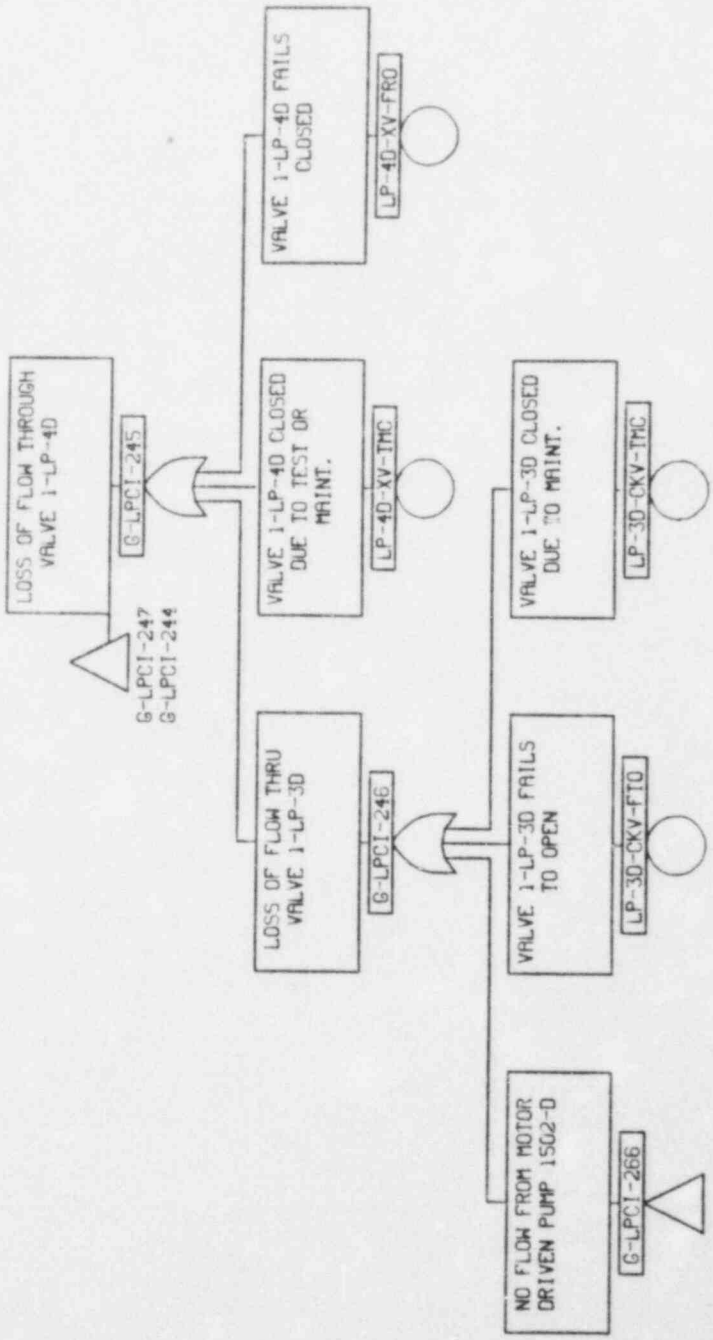

LOSS OF FLOW THROUGH VALVE 1-LP-5B
G-LPCI-235
G-LPCI-234
VALVE 1-LP-5B FAILS CLOSED
LP-5B-XV-FRO
2
VALVE 1-LP-5B CLOSED DUE TO TEST OR MAINT.
LP-5B-XV-TMC
2
LOSS OF FLOW THROUGH VALVE 1-LP-4B
G-LPCI-236

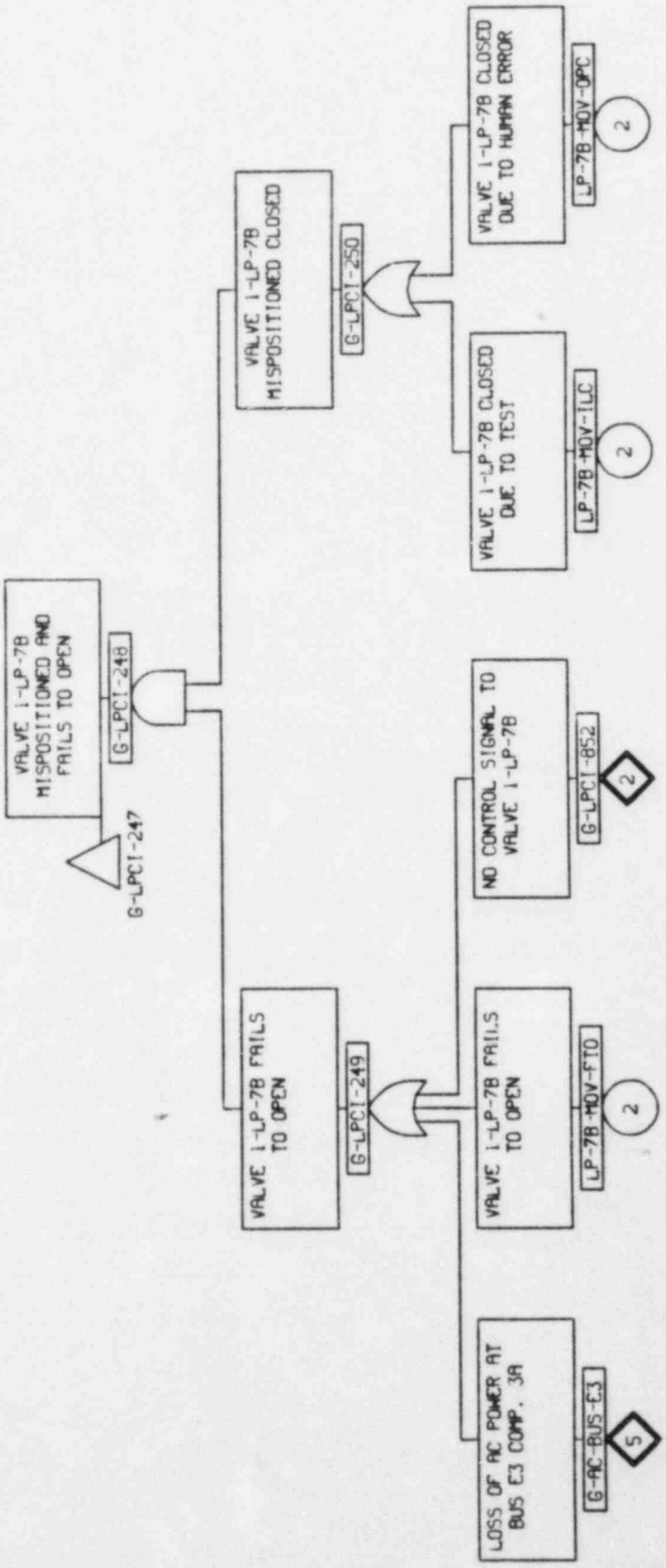

LOSS OF FLOW THROUGH VALVE 1-LP-4B
G-LPCI-236
G-LPCI-238
G-LPCI-235
VALVE 1-LP-4B FAILS CLOSED
LP-4B-XV-FRO
VALVE 1-LP-4B CLOSED DUE TO TEST OR MAINT.
LP-4B-XV-TMC
LOSS OF FLOW THRU VALVE 1-LP-3B
G-LPCI-237
VALVE 1-LP-3B FAILS TO OPEN
LP-3B-CKV-FTO
VALVE 1-LP-3B CLOSED DUE TO MAINT.
LP-3B-CKV-TMC
NO FLOW FROM MOTOR DRIVEN PUMP 1502-B
G-LPCI-256

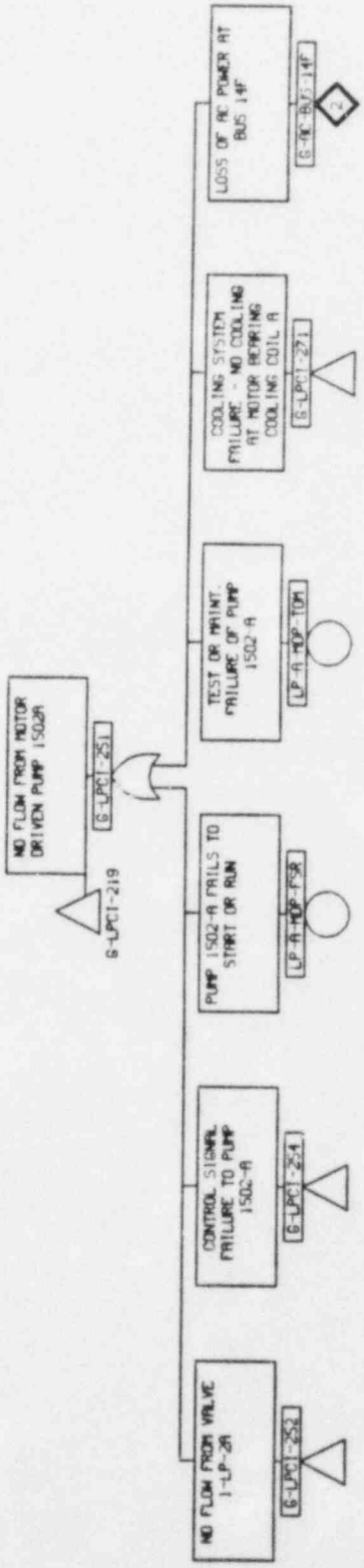

VALVE 1-LP-7B MISPOSITIONED AND FAILS TO OPEN
G-LPCI-238
G-LPCI-239
VALVE 1-LP-7B MISPOSITIONED CLOSED
G-LPCI-241
VALVE 1-LP-7B CLOSED DUE TO HUMAN ERROR
LP-7B-MOV-OPC
2
VALVE 1-LP-7B CLOSED DUE TO TEST
LP-7B-MOV-1LC
2
VALVE 1-LP-7B FAILS TO OPEN
G-LPCI-240
NO CONTROL SIGNAL TO VALVE 1-LP-7B
G-LPCI-852
2
VALVE 1-LP-7B FAILS TO OPEN
LP-7B-MOV-FTO
2
LOSS OF AC POWER AT BUS E3 COMP. 3A
G-AC-BUS-E3
5

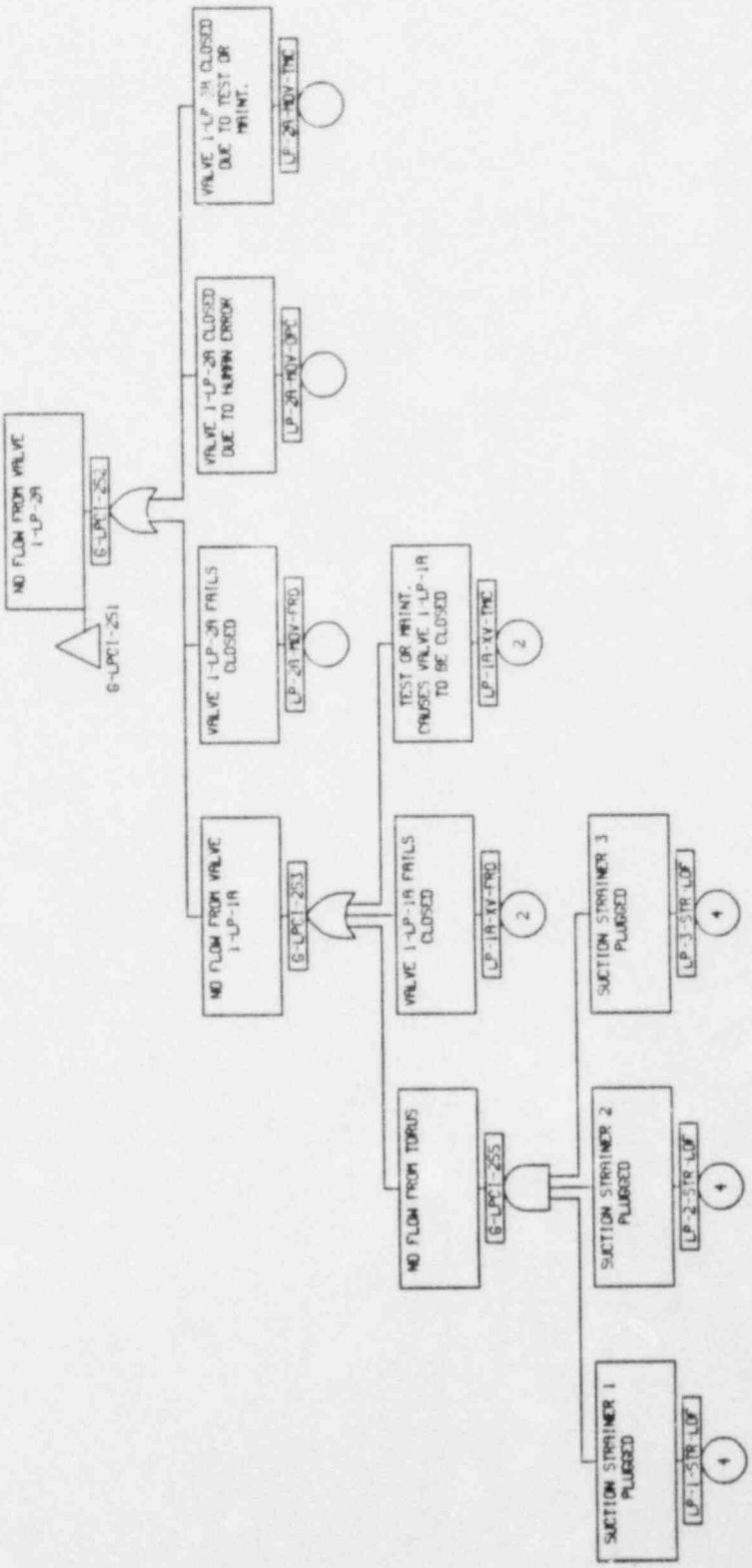

LOSS OF FLOW FROM PUMP TRAIN D
G-LPCI-242
G-LPCI-140
G-LPCI-1144
G-LPCI-1146A
G-LPCI-1142
LOSS OF FLOW THROUGH VALVE 1-LP-6B
G-LPCI-243
LOSS OF FLOW FROM VALVE 1-LP-7B
G-LPCI-247
VALVE 1-LP-6B FAILS CLOSED
LP-6B-XV-FRO
2
VALVE 1-LP-6B CLOSED DUE TO TEST OR MAINT.
LP-6B-XV-TMC
2
LOSS OF FLOW THROUGH VALVE 1-LP-5B
G-LPCI-244
VALVE 1-LP-7B FAILS CLOSED
LP-7B MOV-FRO
2
VALVE 1-LP-7B CLOSED DUE TO MAINT.
LP-7B MOV-TMC
2
LOSS OF FLOW THROUGH VALVE 1-LP-4D
G-LPCI-245
VALVE 1-LP-7B MISPOSITIONED AND FAILS TO OPEN
G-LPCI-248

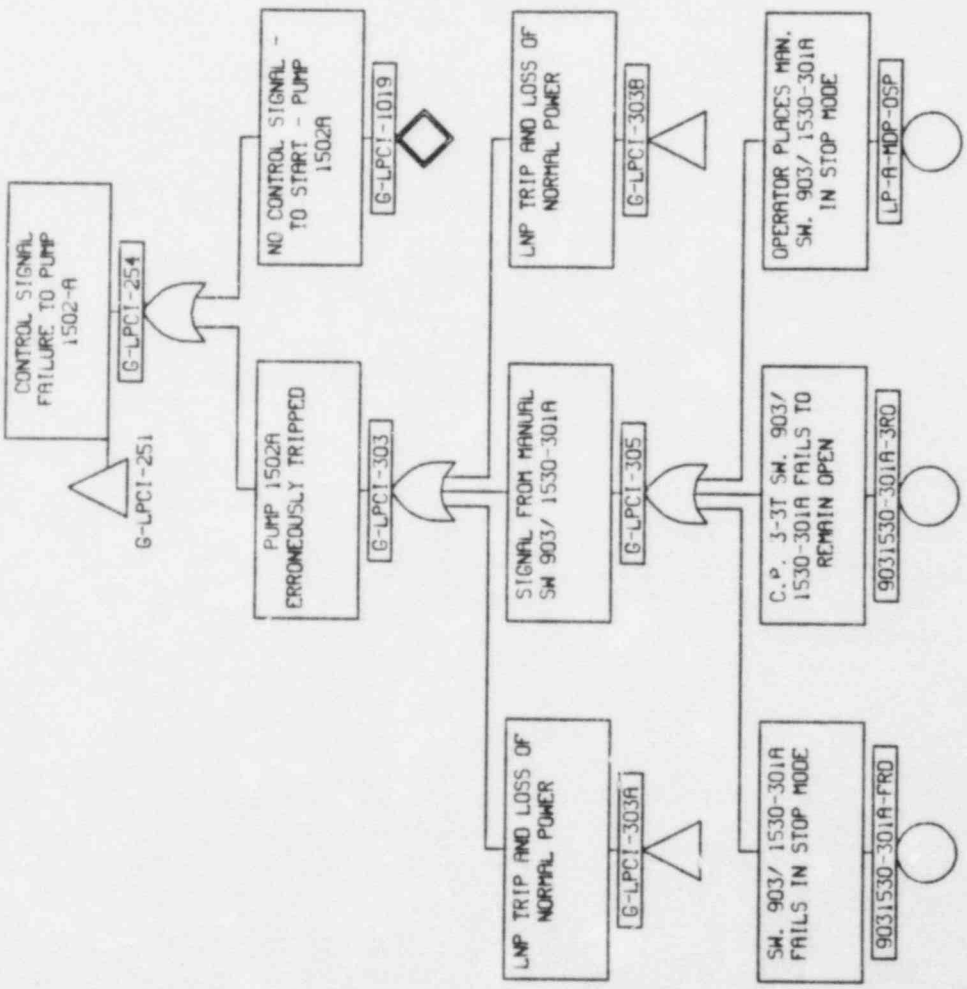

LOSS OF FLOW THROUGH VALVE 1-LP-5B
G-LPCI-243
G-LPCI-244
VALVE 1-LP-5B FAILS CLOSED
LP-5B-XV-FRO
2
VALVE 1-LP-5B CLOSED DUE TO TEST OR MAINT.
LP-5B-XV-TMC
2
LOSS OF FLOW THROUGH VALVE 1-LP-4D
G-LPCI-245

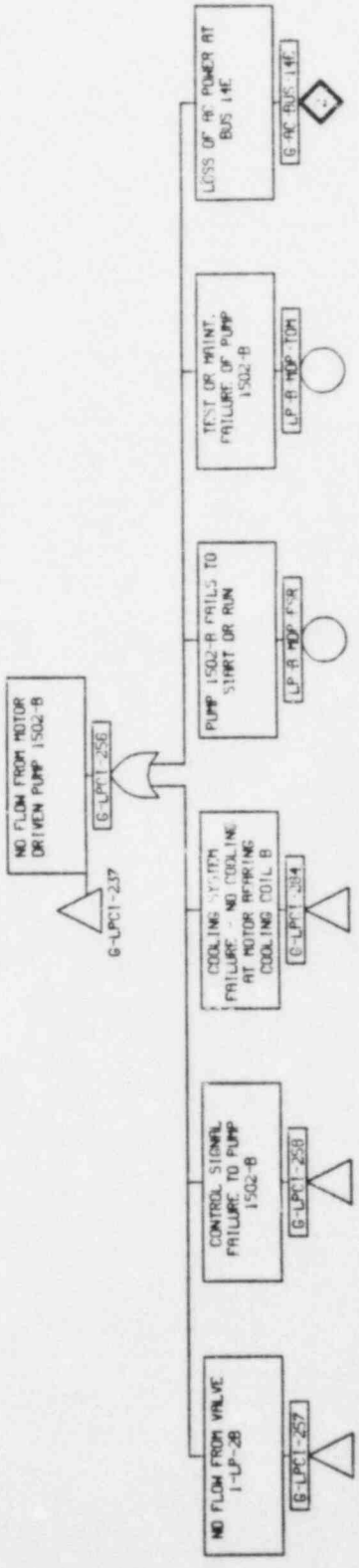

LOSS OF FLOW THROUGH VALVE 1-LP-4D
G-LPCI-245
G-LPCI-247
G-LPCI-244
VALVE 1-LP-4D FAILS CLOSED
LP-4D-XV-FRO
VALVE 1-LP-4D CLOSED DUE TO TEST OR MAINT.
LP-4D-XV-TMC
LOSS OF FLOW THRU VALVE 1-LP-3D
G-LPCI-246
VALVE 1-LP-3D CLOSED DUE TO MAINT.
LP-3D-CKV-TMC
VALVE 1-LP-3D FAILS TO OPEN
LP-3D-CKV-FTO
NO FLOW FROM MOTOR DRIVEN PUMP 1502-D
G-LPCI-266

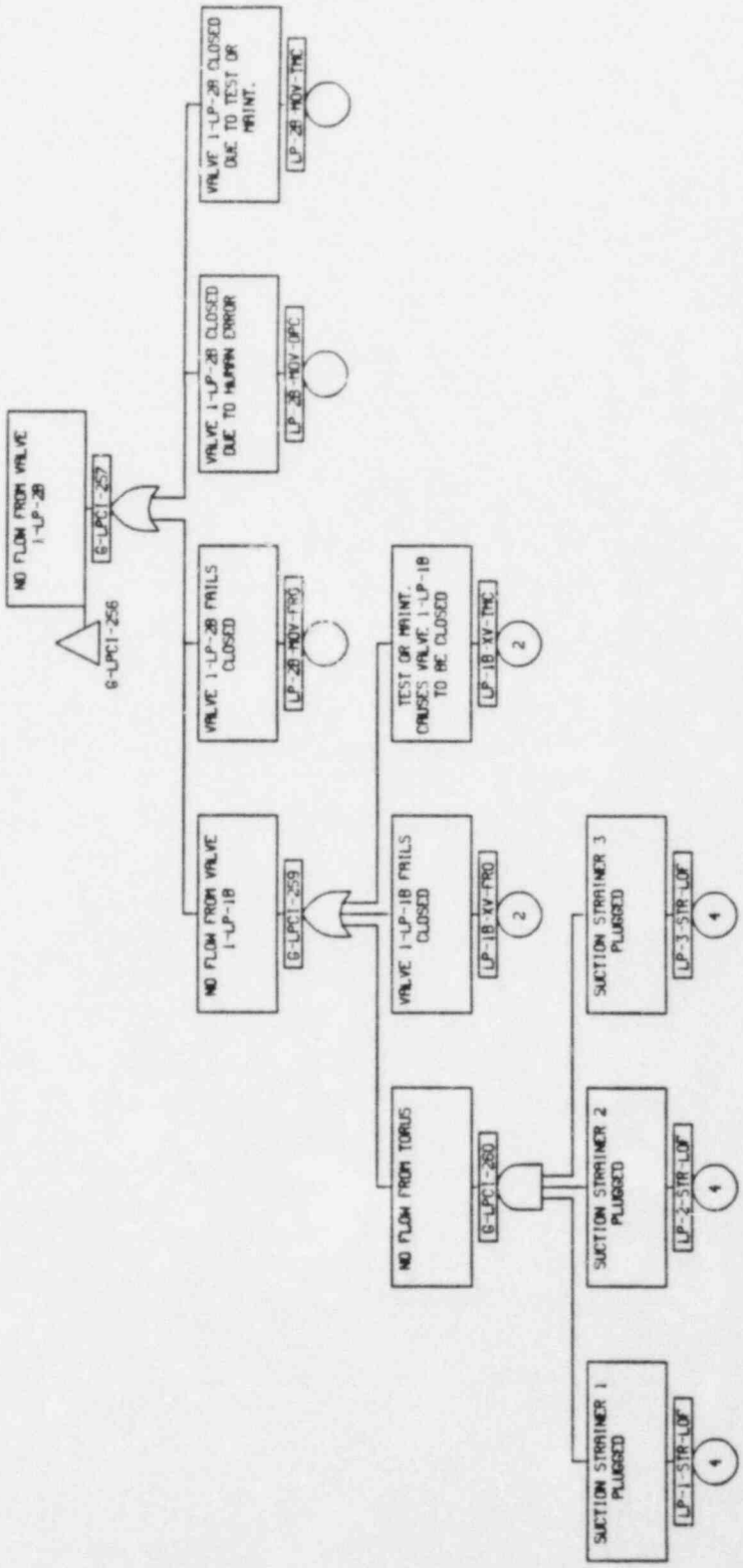

VALVE 1-LP-7B MISPOSITIONED AND FAILS TO OPEN
G-LPCI-247
G-LPCI-248
VALVE 1-LP-7B MISPOSITIONED CLOSED
G-LPCI-250
VALVE 1-LP-7B CLOSED DUE TO HUMAN ERROR
LP-7B-MOV-OPC
2
VALVE 1-LP-7B CLOSED DUE TO TEST
LP-7B-MOV-1LC
2
VALVE 1-LP-7B FAILS TO OPEN
G-LPCI-249
NO CONTROL SIGNAL TO VALVE 1-LP-7B
G-LPCI-852
2
VALVE 1-LP-7B FAILS TO OPEN
LP-7B-MOV-F1O
2
LOSS OF AC POWER AT BUS E3 COMP. 3A
G-AC-BUS-E3
5

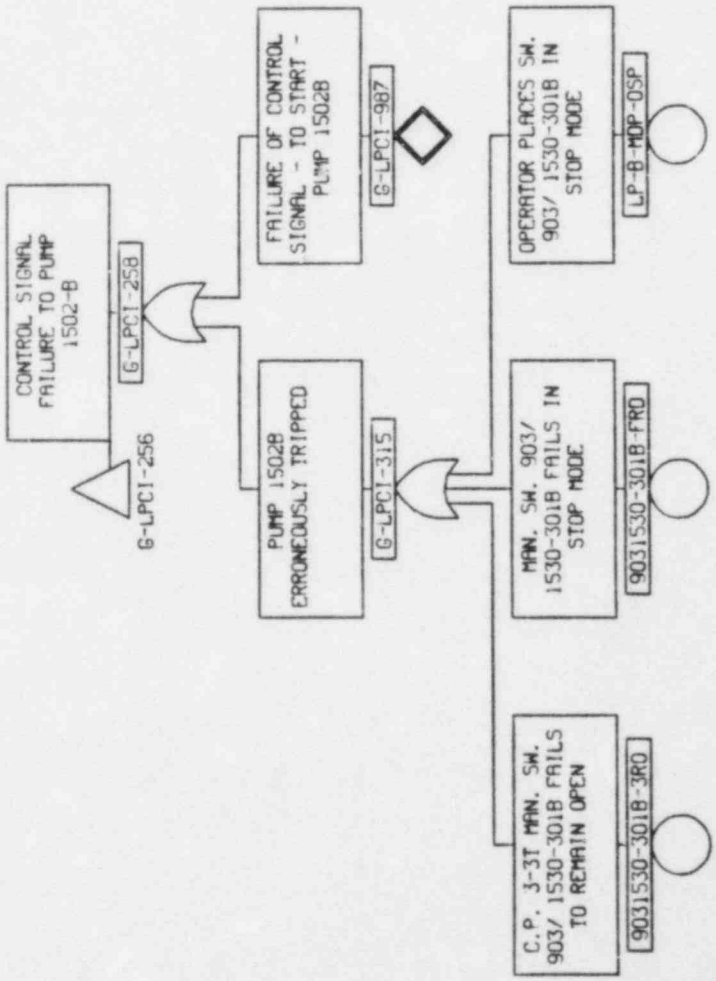

NO FLOW FROM MOTOR DRIVEN PUMP 1502A
6-LPCI-251
6-LPCI-219
TEST OR MAINT. FAILURE OF PUMP 1502-A
LP-A-MOP-TOM
PUMP 1502-A FAILS TO START OR RUN
LP-A-MOP-FSR
CONTROL SIGNAL FAILURE TO PUMP 1502-A
6-LPCI-254
NO FLOW FROM VALVE 1-LP-29
6-LPCI-252
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL A
6-LPCI-271
LOSS OF AC POWER AT BUS 14F
6-AC-BUS-14F
2

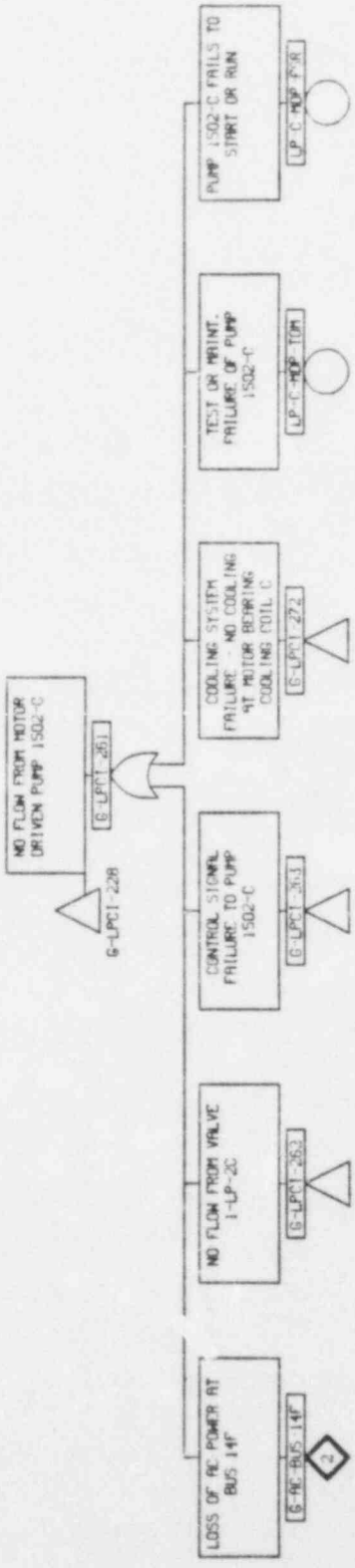

NO FLOW FROM VALVE 1-LP-2A
G-LPCI-251
G-LPCI-251
VALVE 1-LP-2A CLOSED DUE TO TEST OR MAINT.
LP-2A-MOV-TMC
VALVE 1-LP-2A CLOSED DUE TO HUMAN ERROR
LP-2A-MOV-OPC
VALVE 1-LP-2A FAILS CLOSED
LP-2A-MOV-FRO
NO FLOW FROM VALVE 1-LP-1A
G-LPCI-253
TEST OR MAINT. CAUSES VALVE 1-LP-1A TO BE CLOSED
LP-1A-XV-TMC
2
VALVE 1-LP-1A FAILS CLOSED
LP-1A-XV-FRO
2
SUCTION STRAINER 3 PLUGGED
LP-3-STR-LOF
1
NO FLOW FROM TORUS
G-LPCI-255
SUCTION STRAINER 2 PLUGGED
LP-2-STR-LOF
1
SUCTION STRAINER 1 PLUGGED
LP-1-STR-LOF
1

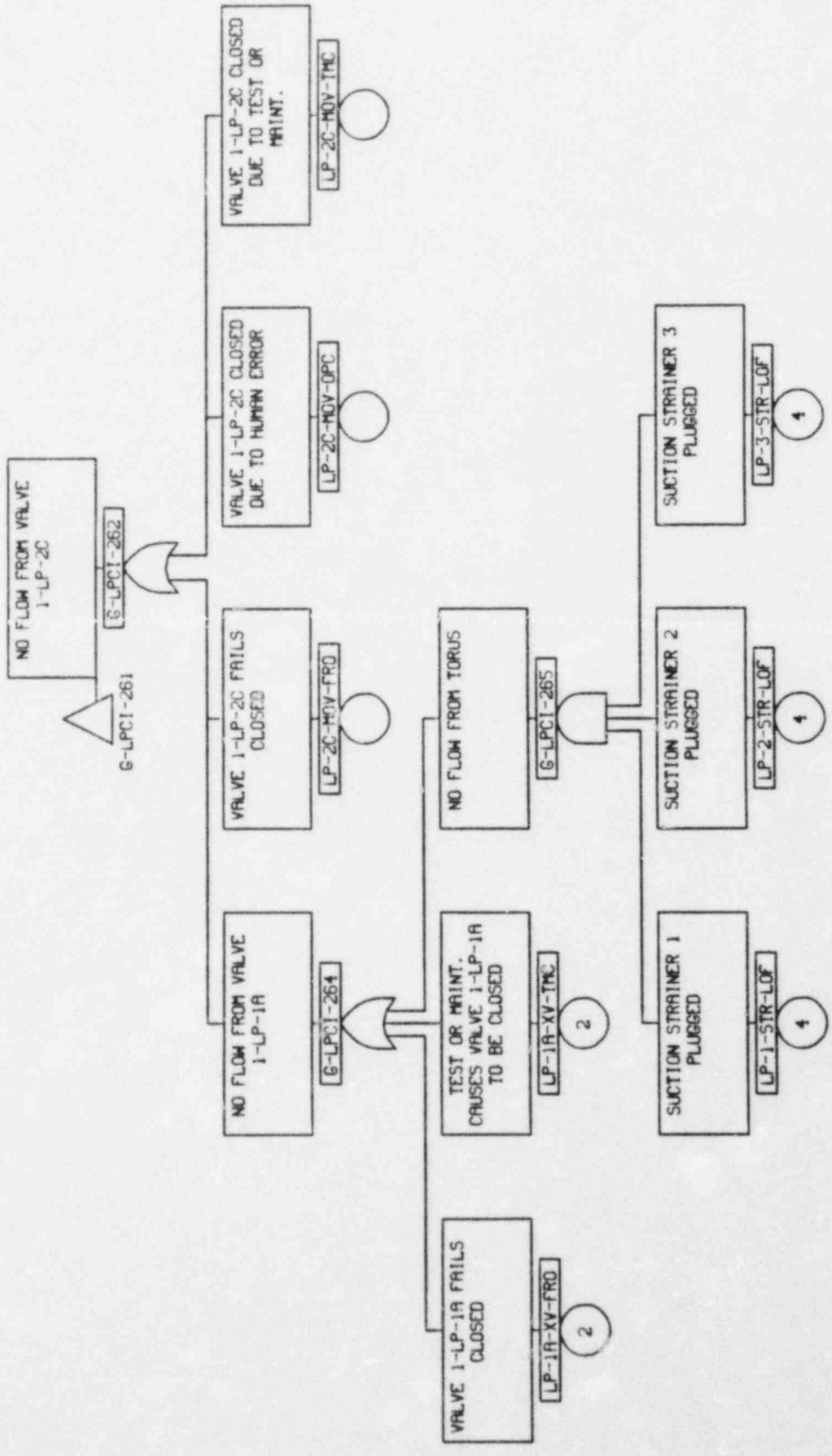

CONTROL SIGNAL FAILURE TO PUMP 1502-A
G-LPCI-254
G-LPCI-251
NO CONTROL SIGNAL - TO START - PUMP 1502A
G-LPCI-1019
PUMP 1502A ERRONEOUSLY TRIPPED
G-LPCI-303
LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-303B
OPERATOR PLACES MAN. SW. 903/ 1530-301A IN STOP MODE
LP-A-MOP-OSP
SIGNAL FROM MANUAL SW 903/ 1530-301A
G-LPCI-305
C.P. J-3T SW. 903/ 1530-301A FAILS TO REMAIN OPEN
9031530-301A-3RO
LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-303A
SW. 903/ 1530-301A FAILS IN STOP MODE
9031530-301A-FRO

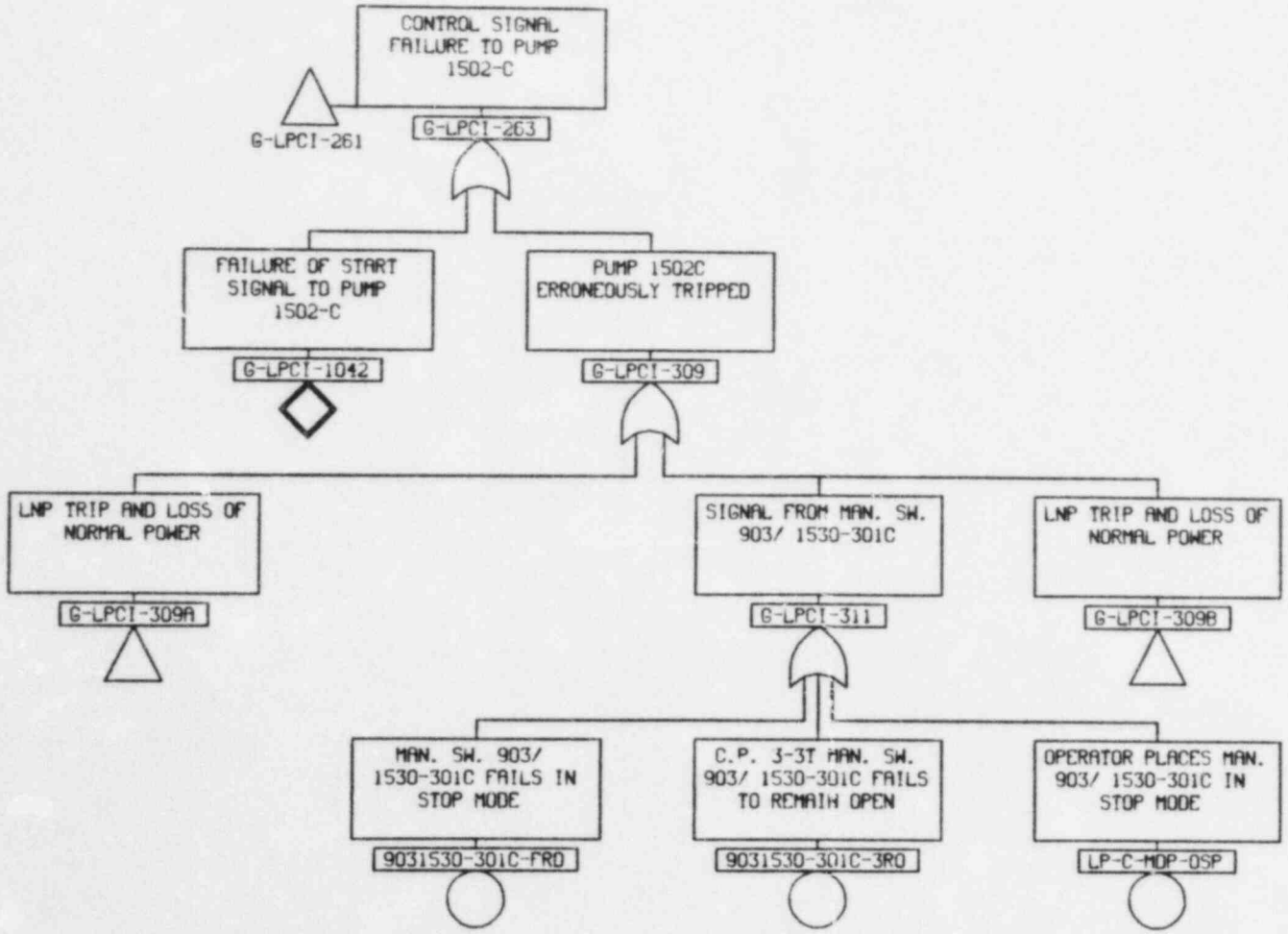

NO FLOW FROM MOTOR DRIVEN PUMP 1SI2-B
G-LPCI-256
G-LPCI-257
PUMP 1SI2-B FAILS TO START OR RUN
LP-B MDP-FSR
TEST OR MAINT. FAILURE OF PUMP 1SI2-B
LP-B MDP-TOM
LOSS OF AC POWER AT BUS 14E
G-AC-BUS-14E
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR WINDING COOLING COIL B
G-LPCI-254
CONTROL SIGNAL FAILURE TO PUMP 1SI2-B
G-LPCI-258
NO FLOW FROM VALVE 1-LP-2B
G-LPCI-255

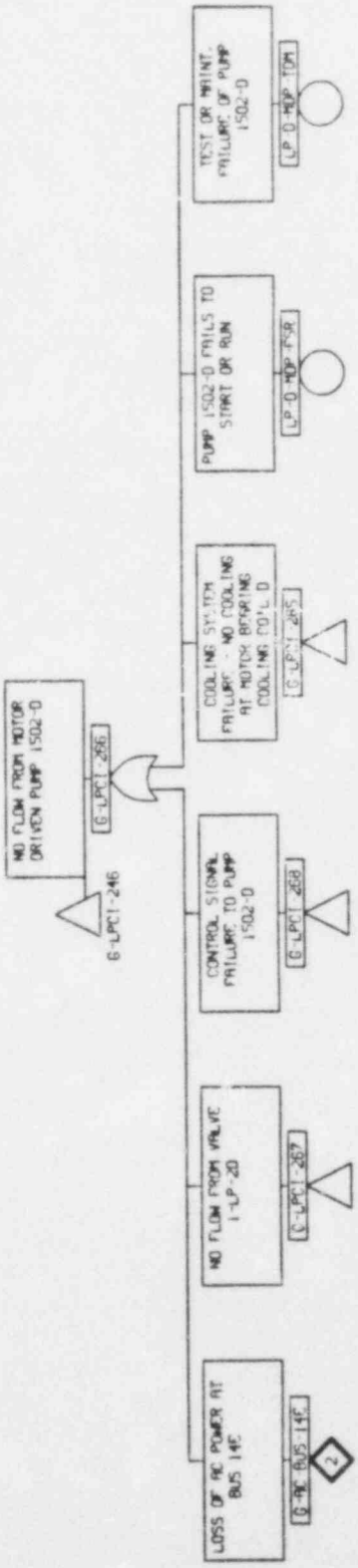

NO FLOW FROM VALVE 1-LP-28
G-LPCI-256
G-LPCI-257
VALVE 1-LP-28 FAILS CLOSED
LP-28-MOV-FAIL
VALVE 1-LP-28 CLOSED DUE TO HUMAN ERROR
LP-28-MOV-OPC
VALVE 1-LP-28 CLOSED DUE TO TEST OR MAINT.
LP-28-MOV-TMC
NO FLOW FROM VALVE 1-LP-18
G-LPCI-259
VALVE 1-LP-18 FAILS CLOSED
LP-18-XV-FAIL
2
TEST OR MAINT. CAUSES VALVE 1-LP-18 TO BE CLOSED
LP-18-XV-TMC
2
NO FLOW FROM TORUS
G-LPCI-260
SUCTION STRAINER 2 PLUGGED
LP-2-STR-LOF
1
SUCTION STRAINER 3 PLUGGED
LP-3-STR-LOF
1
SUCTION STRAINER 1 PLUGGED
LP-1-STR-LOF
1

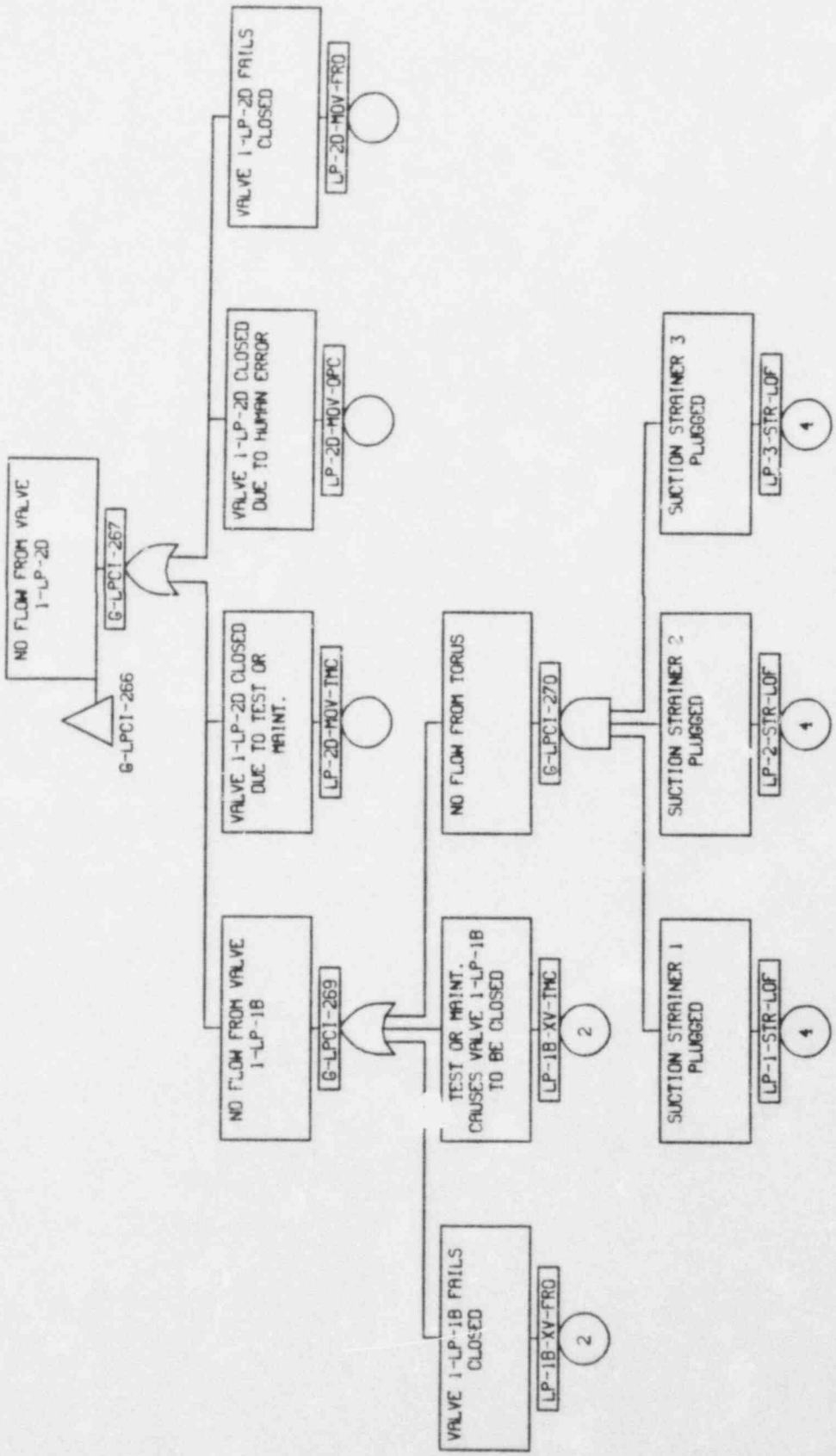

CONTROL SIGNAL FAILURE TO PUMP 1502-B
G-LPCI-256
G-LPCI-258
FAILURE OF CONTROL SIGNAL - TO START - PUMP 1502B
G-LPCI-987
PUMP 1502B ERRONEOUSLY TRIPPED
G-LPCI-315
OPERATOR PLACES SW. 903/ 1530-301B IN STOP MODE
LP-B-MOP-OSP
MAN. SW. 903/ 1530-301B FAILS IN STOP MODE
9031530-301B-FRO
C.P. 3-3T MAN. SW. 903/ 1530-301B FAILS TO REMAIN OPEN
9031530-301B-3RO

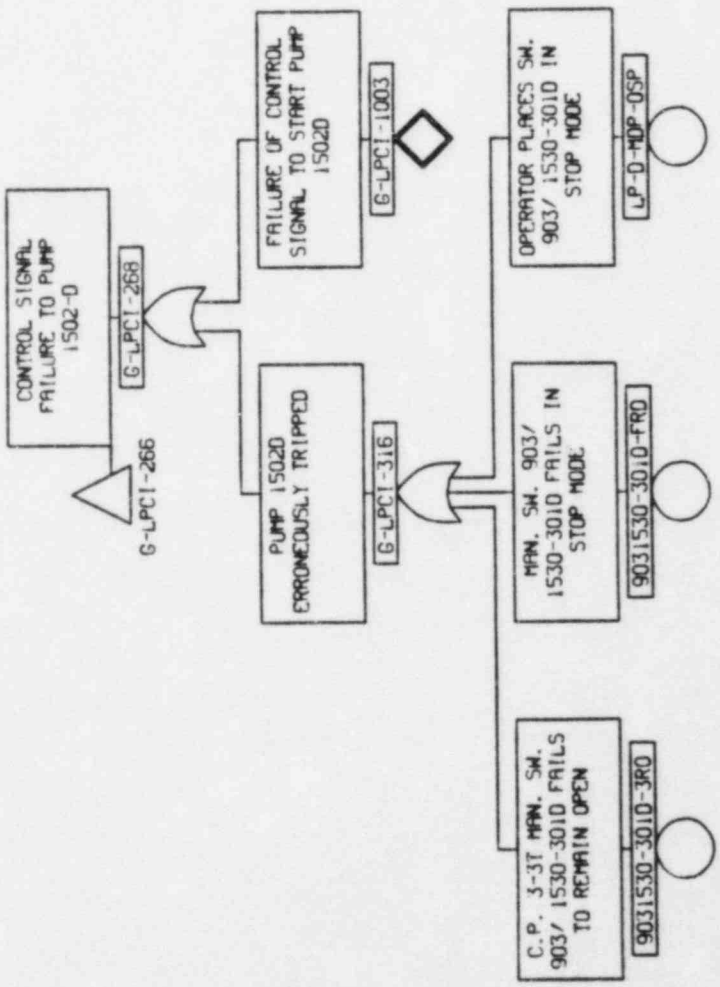

NO FLOW FROM MOTOR DRIVEN PUMP 1SQ2-C
G-LPCI-261
G-LPCI-228
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL C
G-LPCI-272
TEST OR MAINT. FAILURE OF PUMP 1SQ2-C
LP-C-MOP-TOM
PUMP 1SQ2-C FAILS TO START OR RUN
LP-C-MOP-FSR
CONTROL SIGNAL FAILURE TO PUMP 1SQ2-C
G-LPCI-363
NO FLOW FROM VALVE 1-LP-2C
G-LPCI-362
LOSS OF AC POWER AT BUS 14F
G-AC-BUS-14F
2

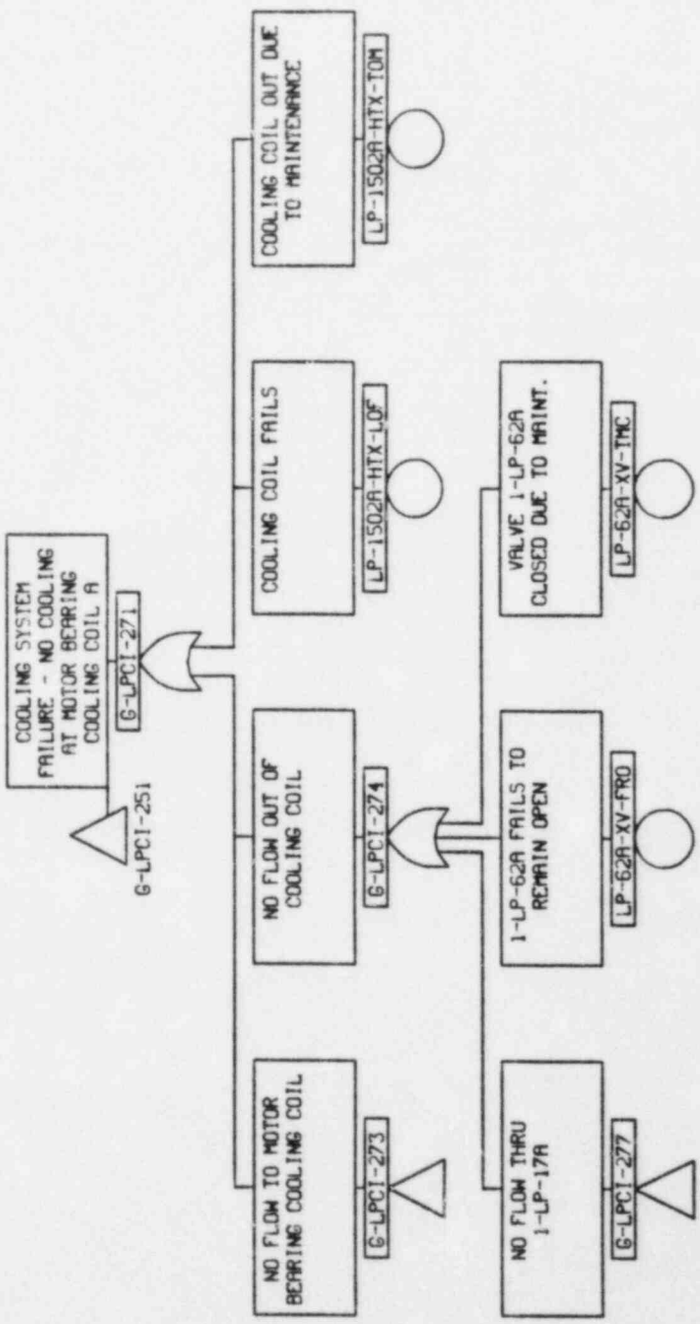

NO FLOW FROM VALVE 1-LP-2C
G-LPCI-262
G-LPCI-261
VALVE 1-LP-2C CLOSED DUE TO TEST OR MAINT.
LP-2C-MOV-TMC
VALVE 1-LP-2C CLOSED DUE TO HUMAN ERROR
LP-2C-MOV-OPC
VALVE 1-LP-2C FAILS CLOSED
LP-2C-MOV-FRO
NO FLOW FROM VALVE 1-LP-1A
G-LPCI-264
NO FLOW FROM TORUS
G-LPCI-265
TEST OR MAINT. CAUSES VALVE 1-LP-1A TO BE CLOSED
LP-1A-XV-TMC
2
SUCTION STRAINER 3 PLUGGED
LP-3-STR-LOF
4
SUCTION STRAINER 2 PLUGGED
LP-2-STR-LOF
4
SUCTION STRAINER 1 PLUGGED
LP-1-STR-LOF
4
VALVE 1-LP-1A FAILS CLOSED
LP-1A-XV-FRO
2

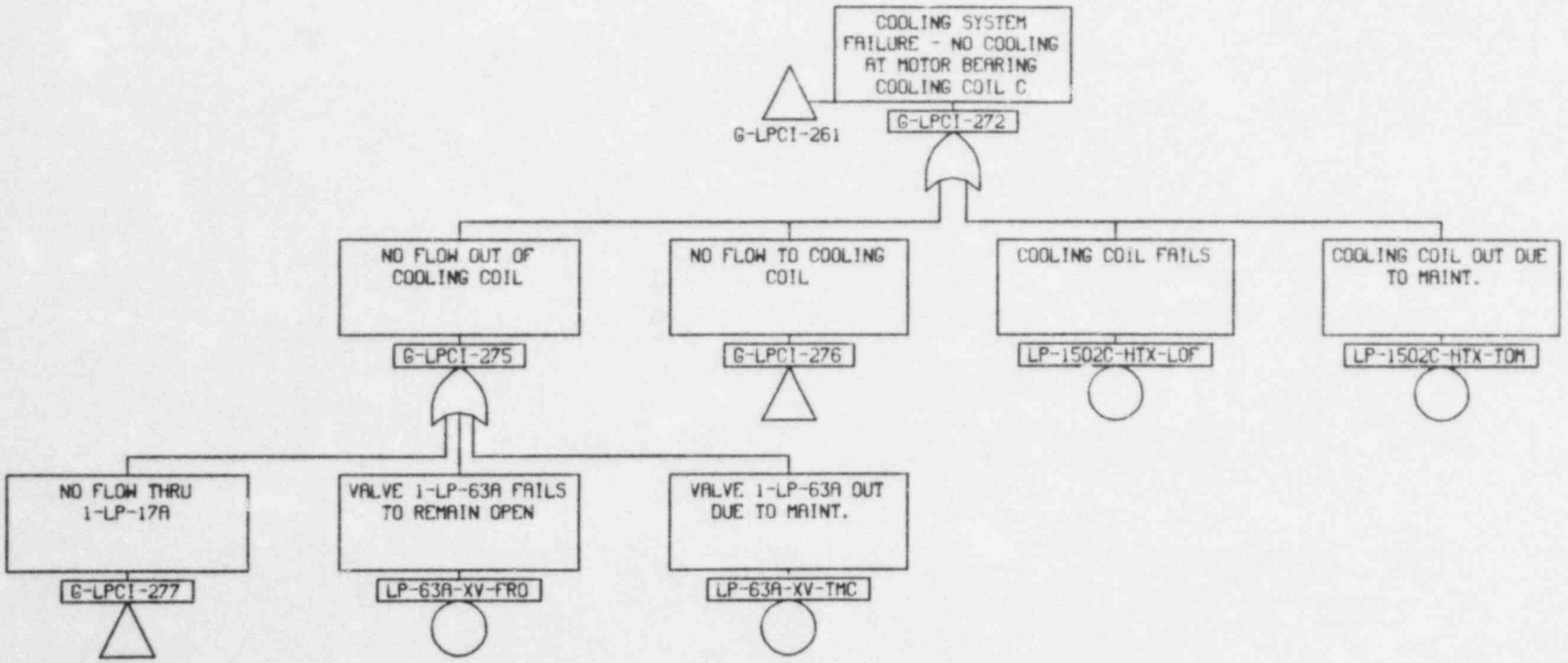

CONTROL SIGNAL FAILURE TO PUMP 1502-C
G-LPCI-261
G-LPCI-263
FAILURE OF START SIGNAL TO PUMP 1502-C
G-LPCI-1042
PUMP 1502C ERRONEOUSLY TRIPPED
G-LPCI-309
LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-309A
SIGNAL FROM MAN. SW. 903/ 1530-301C
G-LPCI-311
LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-309B
MAN. SW. 903/ 1530-301C FAILS IN STOP MODE
9031530-301C-FRO
C.P. 3-3T MAN. SW. 903/ 1530-301C FAILS TO REMAIN OPEN
9031530-301C-3RO
OPERATOR PLACES MAN. 903/ 1530-301C IN STOP MODE
LP-C-MOP-OSP

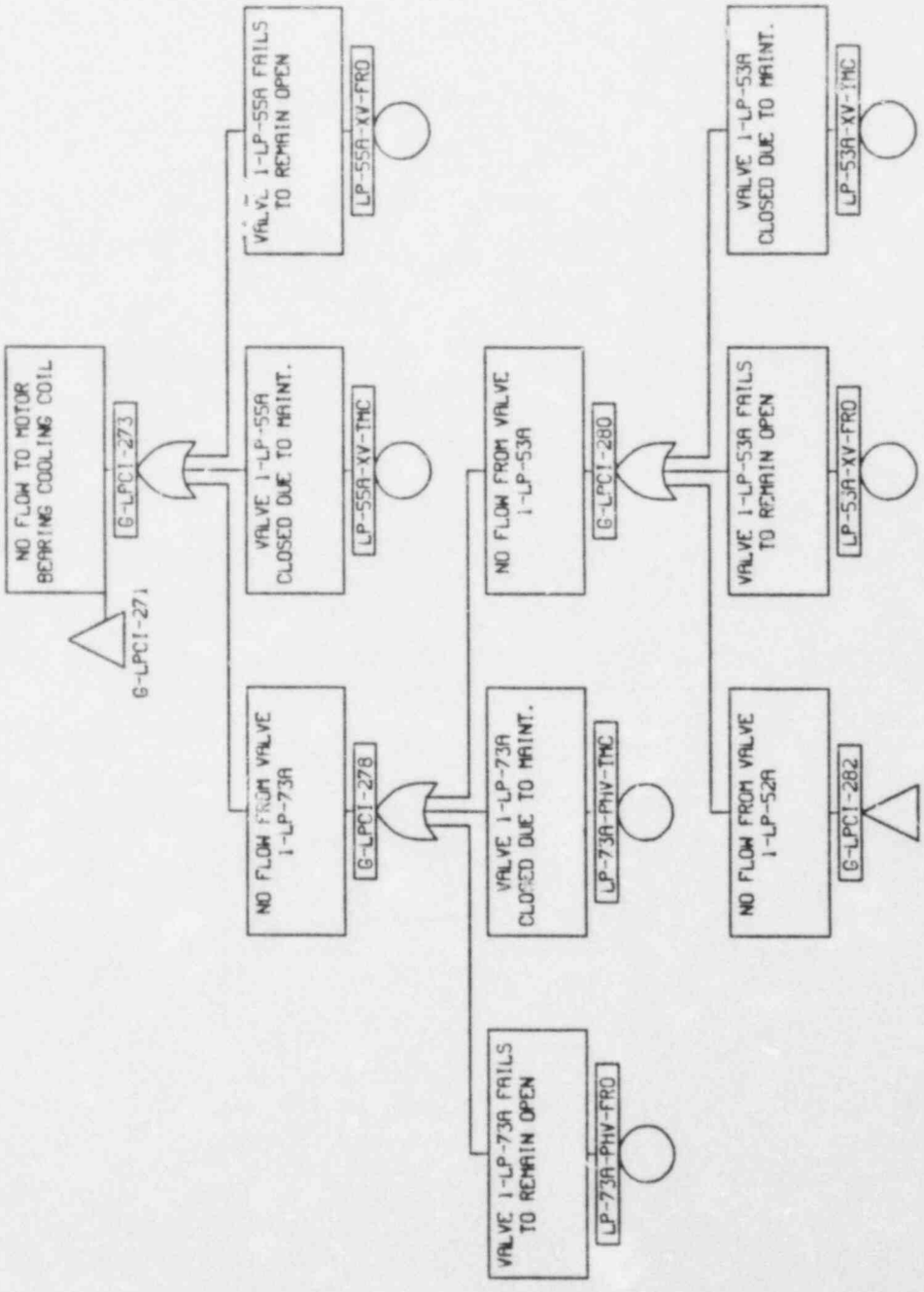

NO FLOW FROM MOTOR DRIVEN PUMP 1502-0
G-LPCI-256
6-LPCI-246
LOSS OF AC POWER AT BUS 14E
G-AC-BUS-14E
2
NO FLOW FROM VALVE 1-LP-20
G-LPCI-267
CONTROL SIGNAL FAILURE TO PUMP 1502-0
G-LPCI-268
COOLING SYSTEM FAILURE - NO COOLING AT MOTOR STARTING COOLING TO PUMP 1502-0
G-LPCI-269
PUMP 1502-0 FAILS TO START OR RUN
LP-0-MDP-FSR
TEST OR MAINT. FAILURE OF PUMP 1502-0
LP-0-MDP-TOM

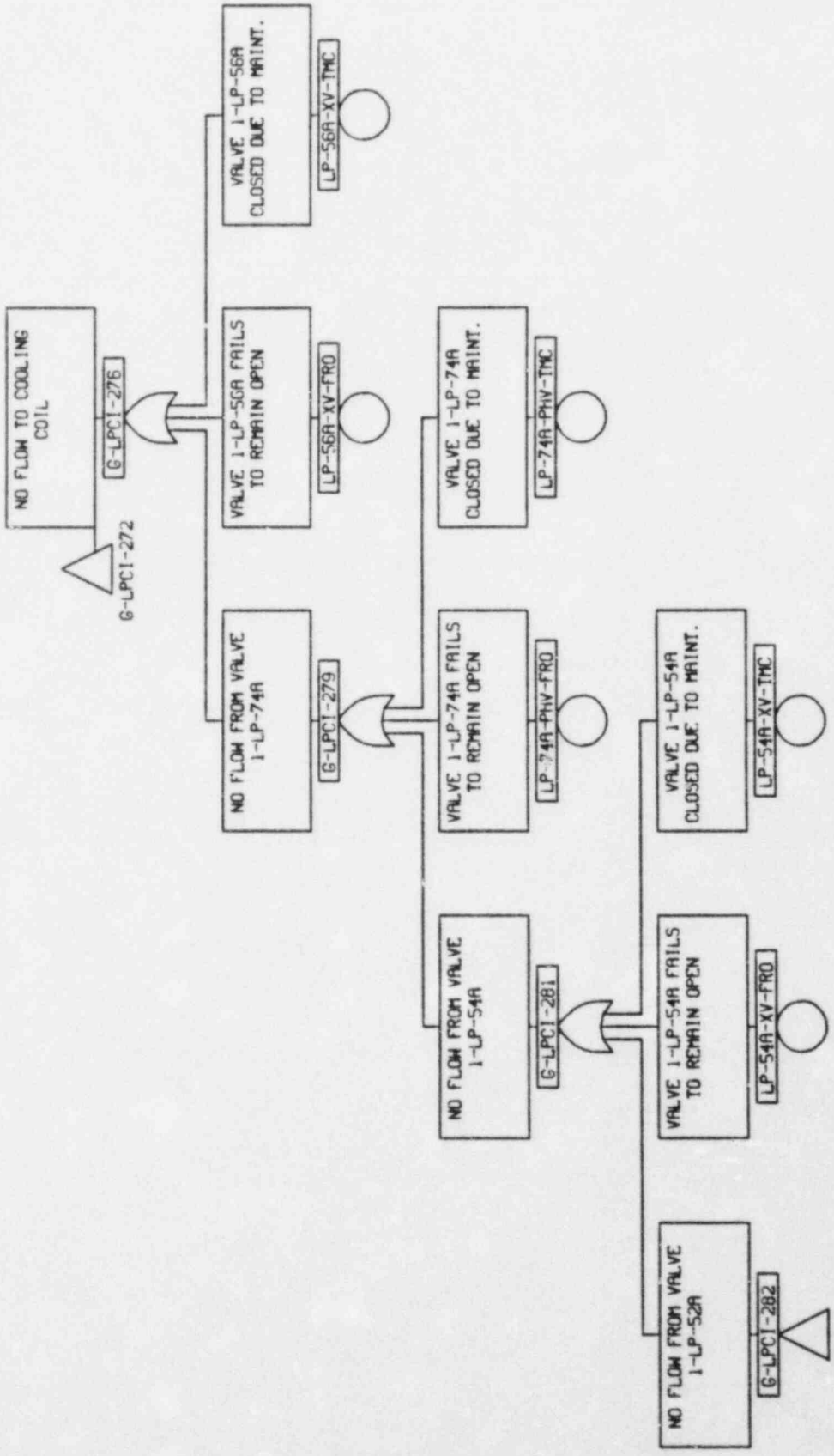

NO FLOW FROM VALVE 1-LP-2D
G-LPCI-266
G-LPCI-267
VALVE 1-LP-2D FAILS CLOSED
LP-2D-MOV-FRO
VALVE 1-LP-2D CLOSED DUE TO HUMAN ERROR
LP-2D-MOV-OPC
VALVE 1-LP-2D CLOSED DUE TO TEST OR MAINT.
LP-2D-MOV-TMC
NO FLOW FROM VALVE 1-LP-1B
G-LPCI-269
TEST OR MAINT. CAUSES VALVE 1-LP-1B TO BE CLOSED
LP-1B-XV-TMC
2
NO FLOW FROM TORUS
G-LPCI-270
VALVE 1-LP-1B FAILS CLOSED
LP-1B-XV-FRO
2
SUCTION STRAINER 3 PLUGGED
LP-3-STR-LOF
4
SUCTION STRAINER 2 PLUGGED
LP-2-STR-LOF
4
SUCTION STRAINER 1 PLUGGED
LP-1-STR-LOF
4


CONTROL SIGNAL FAILURE TO PUMP 1502-0
G-LPCI-266
G-LPCI-268
FAILURE OF CONTROL SIGNAL TO START PUMP 15020
G-LPCI-1003
PUMP 15020 ERRONEOUSLY TRIPPED
G-LPCI-316
OPERATOR PLACES SW. 903/ 1530-3010 IN STOP MODE
LP-O-MOP-OSP
MAN. SW. 903/ 1530-3010 FAILS IN STOP MODE
9031530-3010-FRO
C.P. 3-3T MAN. SW. 903/ 1530-3010 FAILS TO REMAIN OPEN
9031530-3010-3RO

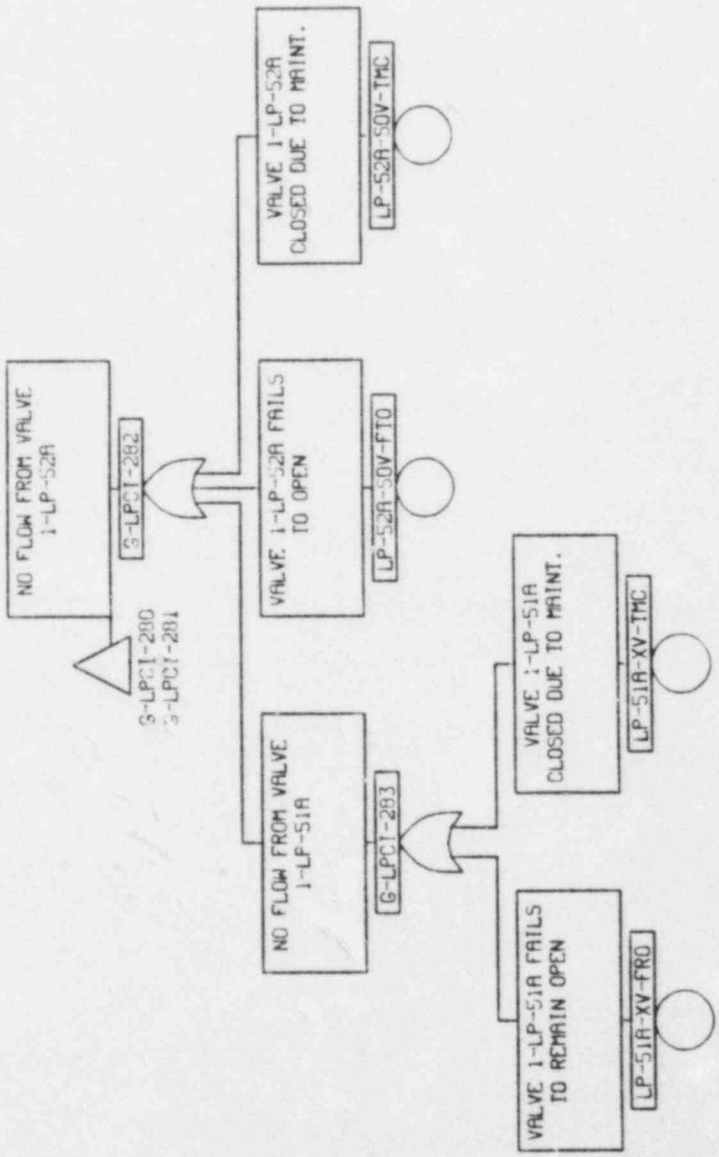

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL A
G-LPCI-251
G-LPCI-271
NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-273
NO FLOW OUT OF COOLING COIL
G-LPCI-274
COOLING COIL FAILS
LP-1502A-HTX-LOF
COOLING COIL OUT DUE TO MAINTENANCE
LP-1502A-HTX-TOM
NO FLOW THRU 1-LP-17A
G-LPCI-277
1-LP-62A FAILS TO REMAIN OPEN
LP-62A-XV-FRO
VALVE 1-LP-62A CLOSED DUE TO MAINT.
LP-62A-XV-TMC

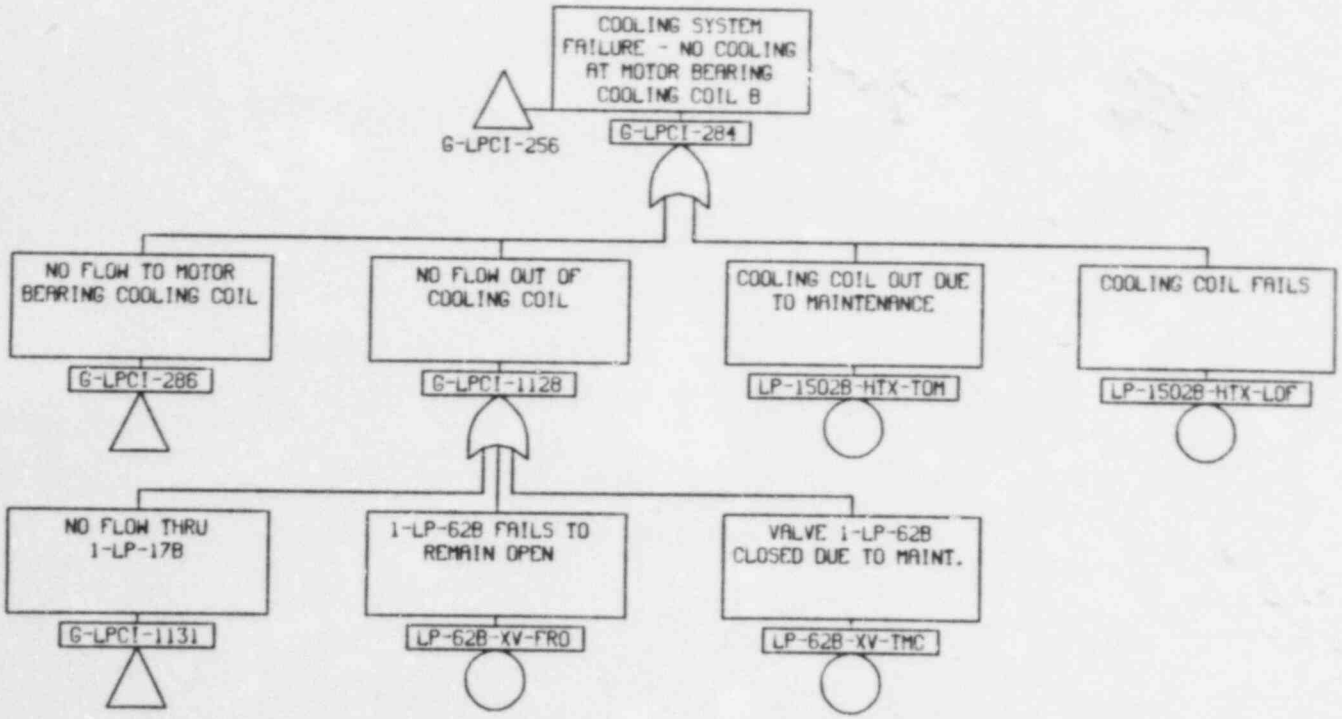

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL C
G-LPCI-272
G-LPCI-261
NO FLOW OUT OF COOLING COIL
G-LPCI-275
NO FLOW TO COOLING COIL
G-LPCI-276
COOLING COIL FAILS
LP-1502C-HTX-LOF
COOLING COIL OUT DUE TO MAINT.
LP-1502C-HTX-TOM
NO FLOW THRU 1-LP-17A
G-LPCI-277
VALVE 1-LP-63A FAILS TO REMAIN OPEN
LP-63A-XV-FRO
VALVE 1-LP-63A OUT DUE TO MAINT.
LP-63A-XV-TMC

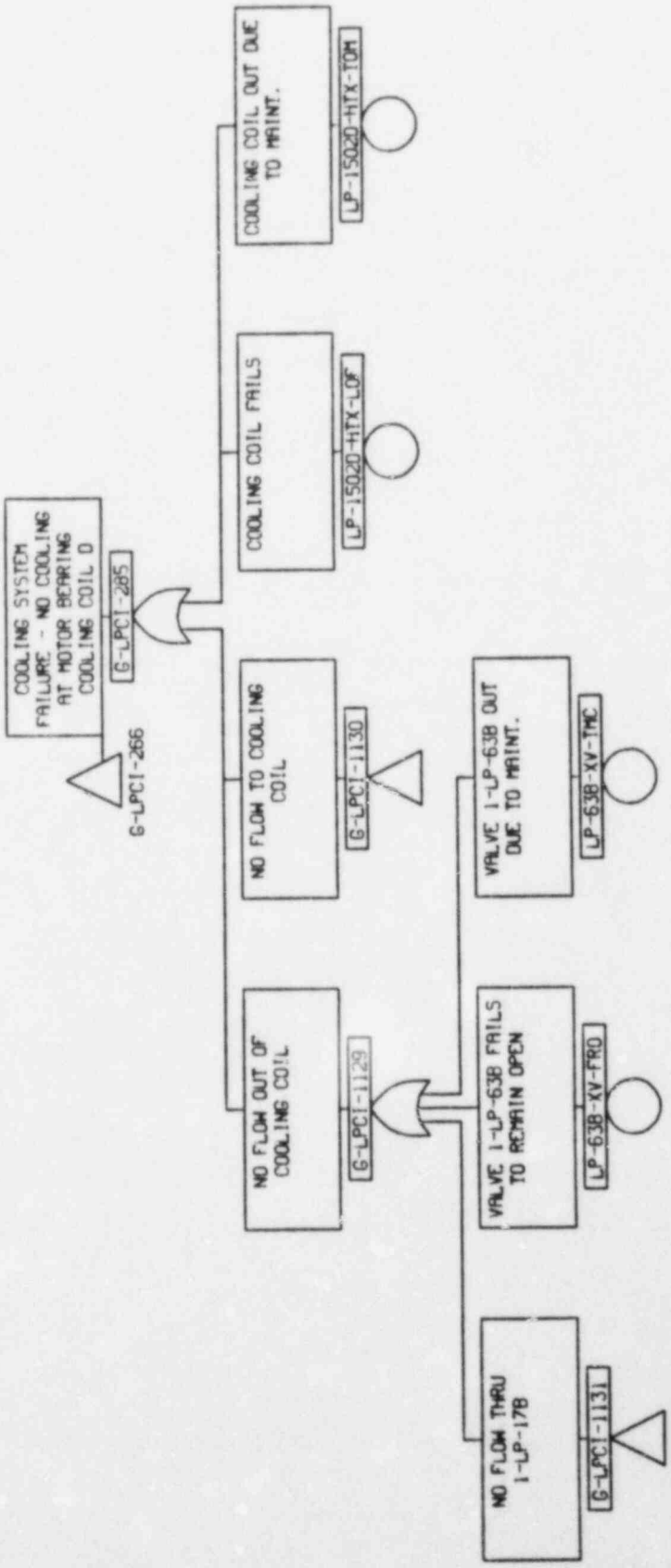

NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-271
G-LPCI-273
VALVE I-LP-55A FAILS TO REMAIN OPEN
LP-55A-XV-FRO
VALVE I-LP-55A CLOSED DUE TO MAINT.
LP-55A-XV-TMC
NO FLOW FROM VALVE I-LP-73A
G-LPCI-278
VALVE I-LP-73A FAILS TO REMAIN OPEN
LP-73A-PHV-FRO
VALVE I-LP-73A CLOSED DUE TO MAINT.
LP-73A-PHV-TMC
NO FLOW FROM VALVE I-LP-53A
G-LPCI-280
VALVE I-LP-53A FAILS TO REMAIN OPEN
LP-53A-XV-FRO
VALVE I-LP-53A CLOSED DUE TO MAINT.
LP-53A-XV-TMC
NO FLOW FROM VALVE I-LP-52A
G-LPCI-282

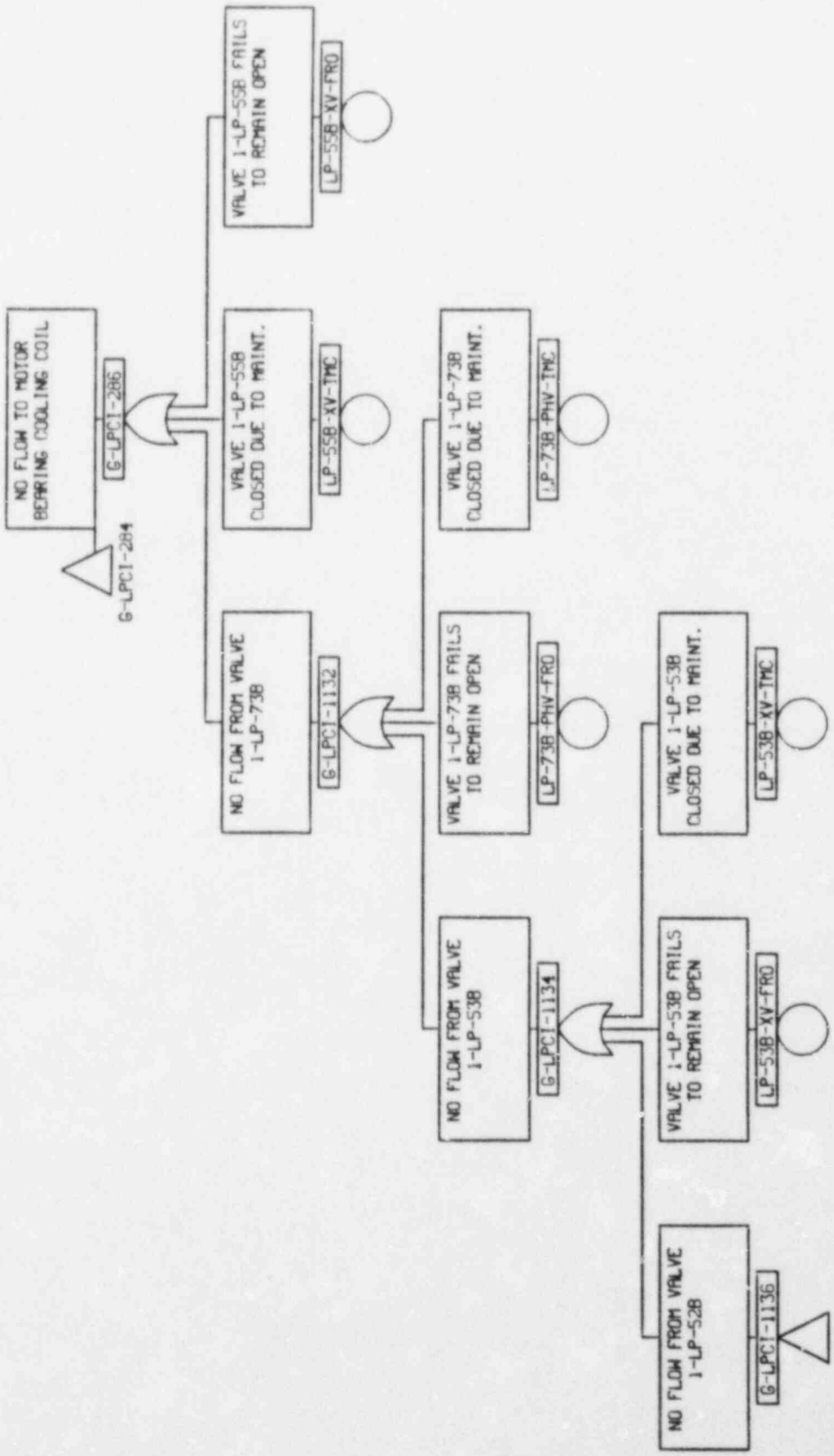

NO FLOW TO COOLING COIL
G-LPCI-276
G-LPCI-272
VALVE 1-LP-56A CLOSED DUE TO MAINT.
LP-56A-XV-TMC
VALVE 1-LP-56A FAILS TO REMAIN OPEN
LP-56A-XV-FRO
NO FLOW FROM VALVE 1-LP-74A
G-LPCI-279
VALVE 1-LP-74A CLOSED DUE TO MAINT.
LP-74A-PHV-TMC
VALVE 1-LP-74A FAILS TO REMAIN OPEN
LP-74A-PHV-FRO
NO FLOW FROM VALVE 1-LP-54A
G-LPCI-281
VALVE 1-LP-54A CLOSED DUE TO MAINT.
LP-54A-XV-TMC
VALVE 1-LP-54A FAILS TO REMAIN OPEN
LP-54A-XV-FRO
NO FLOW FROM VALVE 1-LP-52A
G-LPCI-282

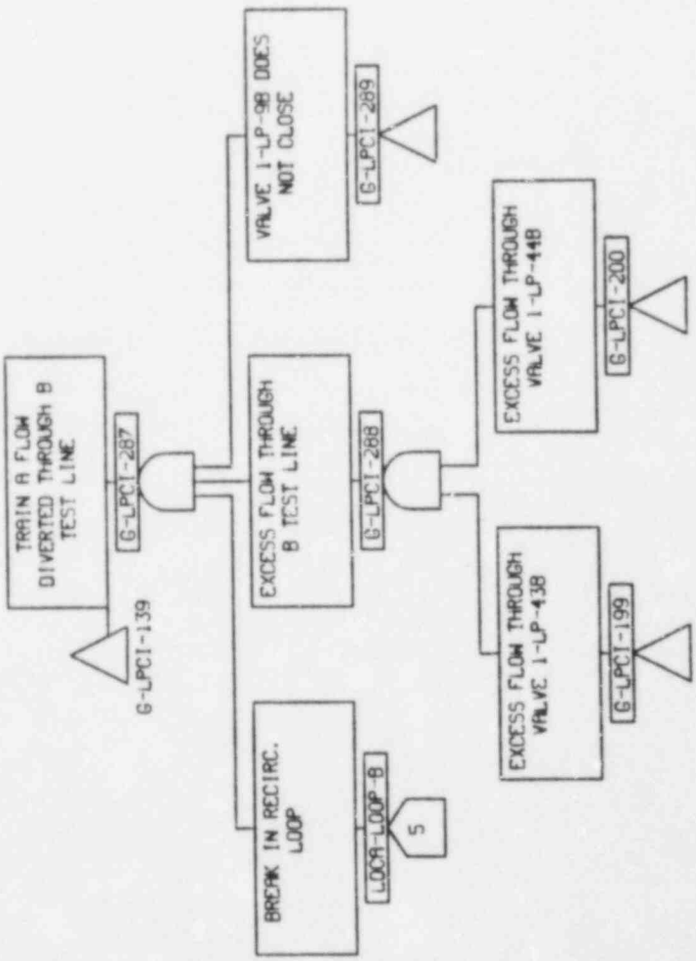
NO FLOW THRU
1-LP-17A
G-LPCI-277
G-LPCI-274
G-LPCI-275
VALVE 1-LP-17A OUT - CLOSED - DUE TO MAINT.
LP-17A-XV-TMC
VALVE 1-LP-17A FAILS TO REMAIN OPEN
LP-17A-XV-FRO
VALVE 1-LP-18A CLOSED DUE TO MAINT.
LP-18A-XV-TMC
VALVE 1-LP-18A FAILS TO REMAIN OPEN
LP-18A-XV-FRO

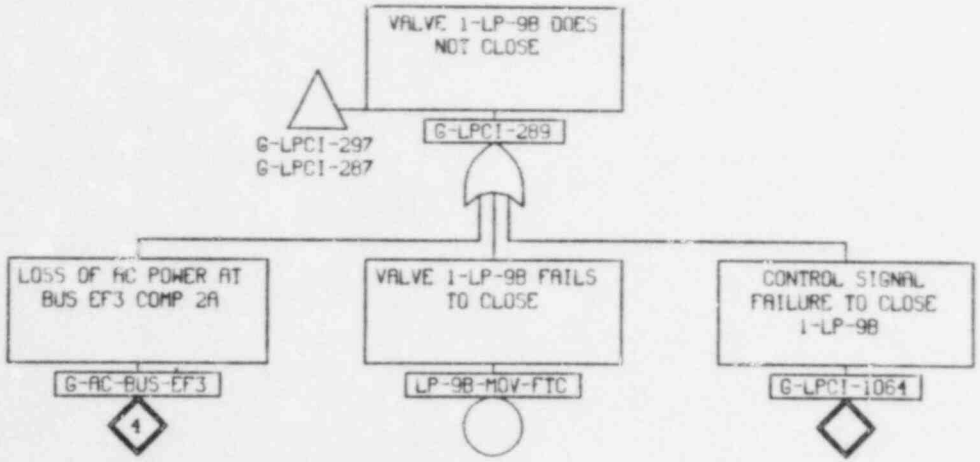

NO FLOW FROM VALVE
1-LP-52A
G-LPCI-282
G-LPCI-280
G-LPCI-281
VALVE 1-LP-52A
CLOSED DUE TO MAINT.
LP-52A-SOV-TMC
VALVE 1-LP-52A FAILS
TO OPEN
LP-52A-SOV-FTO
NO FLOW FROM VALVE
1-LP-51A
G-LPCI-283
VALVE 1-LP-51A
CLOSED DUE TO MAINT.
LP-51A-XV-TMC
VALVE 1-LP-51A FAILS
TO REMAIN OPEN
LP-51A-XV-FRO

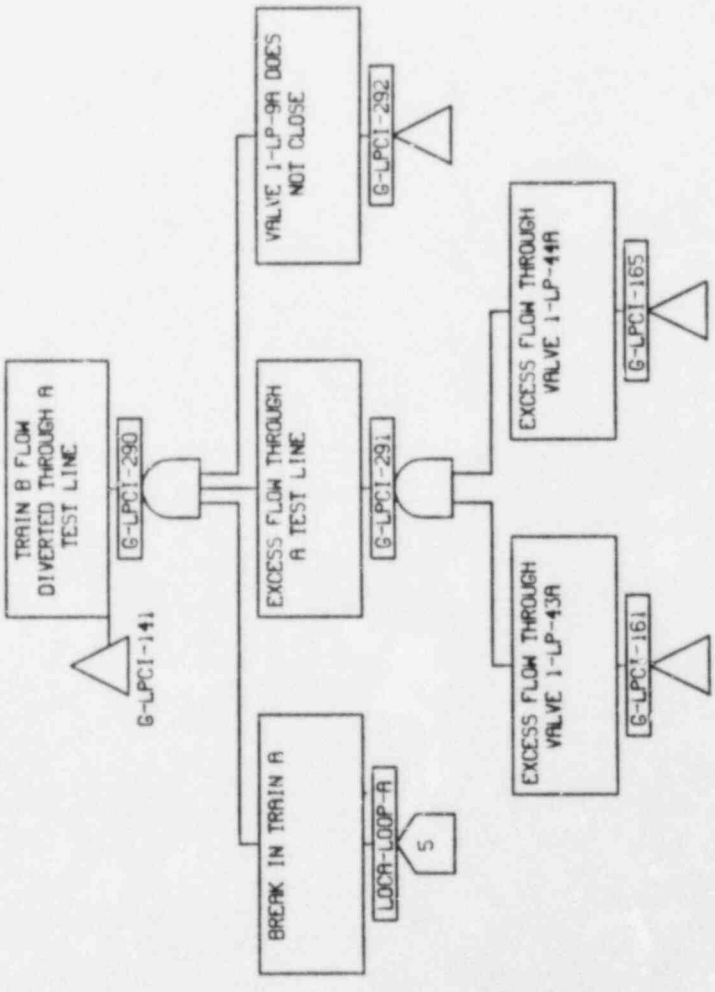

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL B
G-LPCI-284
G-LPCI-256
NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-286
NO FLOW OUT OF COOLING COIL
G-LPCI-1128
COOLING COIL OUT DUE TO MAINTENANCE
LP-1502B-HTX-TOM
COOLING COIL FAILS
LP-1502B-HTX-LOF
NO FLOW THRU 1-LP-17B
G-LPCI-1131
1-LP-62B FAILS TO REMAIN OPEN
LP-62B-XV-FRO
VALVE 1-LP-62B CLOSED DUE TO MAINT.
LP-62B-XV-TMC

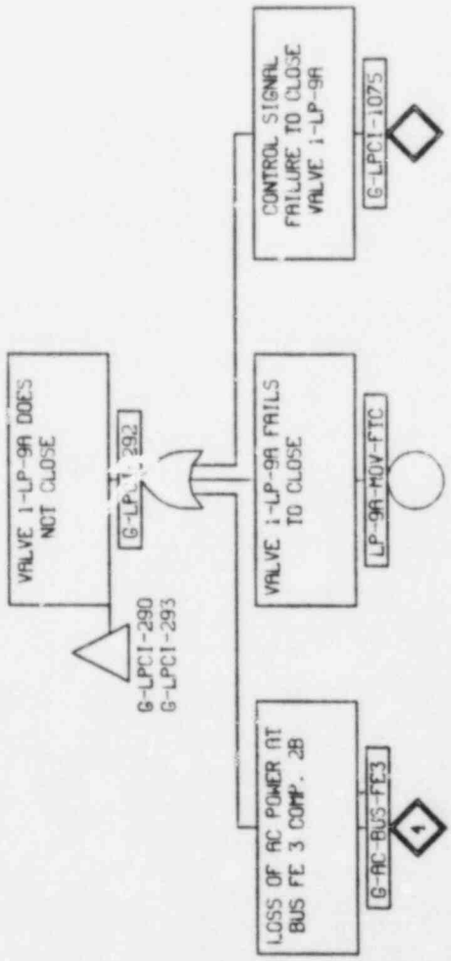

COOLING SYSTEM FAILURE - NO COOLING AT MOTOR BEARING COOLING COIL 0
G-LPCI-266
G-LPCI-285
COOLING COIL FAILS
LP-15020-HTX-LOF
COOLING COIL OUT DUE TO MAINT.
LP-15020-HTX-TOM
NO FLOW TO COOLING COIL
G-LPCI-1130
NO FLOW OUT OF COOLING COIL
G-LPCI-1129
VALVE 1-LP-638 FAILS TO REMAIN OPEN
LP-638-XV-FRO
VALVE 1-LP-638 OUT DUE TO MAINT.
LP-638-XV-TMC
NO FLOW THRU 1-LP-178
G-LPCI-1131

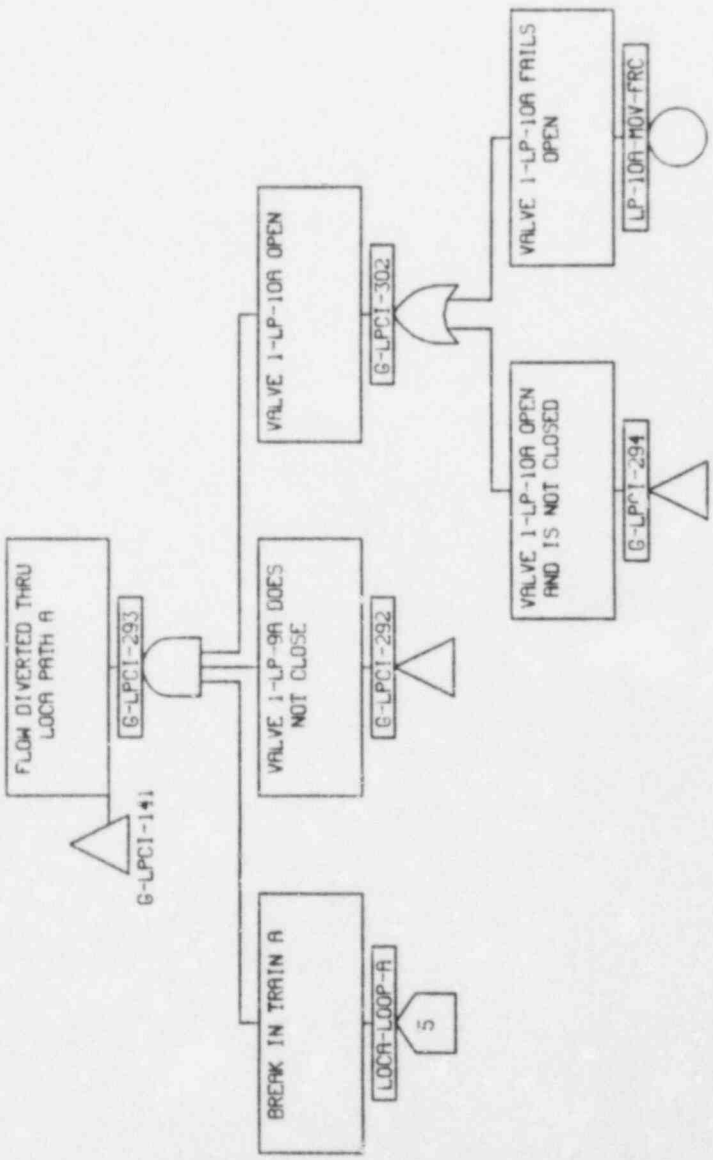

NO FLOW TO MOTOR BEARING COOLING COIL
G-LPCI-284
G-LPCI-286
VALVE 1-LP-558 FAILS TO REMAIN OPEN
LP-558-XV-FRO
VALVE 1-LP-558 CLOSED DUE TO MAINT.
LP-558-XV-TMC
NO FLOW FROM VALVE 1-LP-738
G-LPCI-1132
VALVE 1-LP-738 FAILS TO REMAIN OPEN
LP-738-PHV-FRO
VALVE 1-LP-738 CLOSED DUE TO MAINT.
LP-738-PHV-TMC
NO FLOW FROM VALVE 1-LP-538
G-LPCI-1134
VALVE 1-LP-538 FAILS TO REMAIN OPEN
LP-538-XV-FRO
VALVE 1-LP-538 CLOSED DUE TO MAINT.
LP-538-XV-TMC
NO FLOW FROM VALVE 1-LP-528
G-LPCI-1136

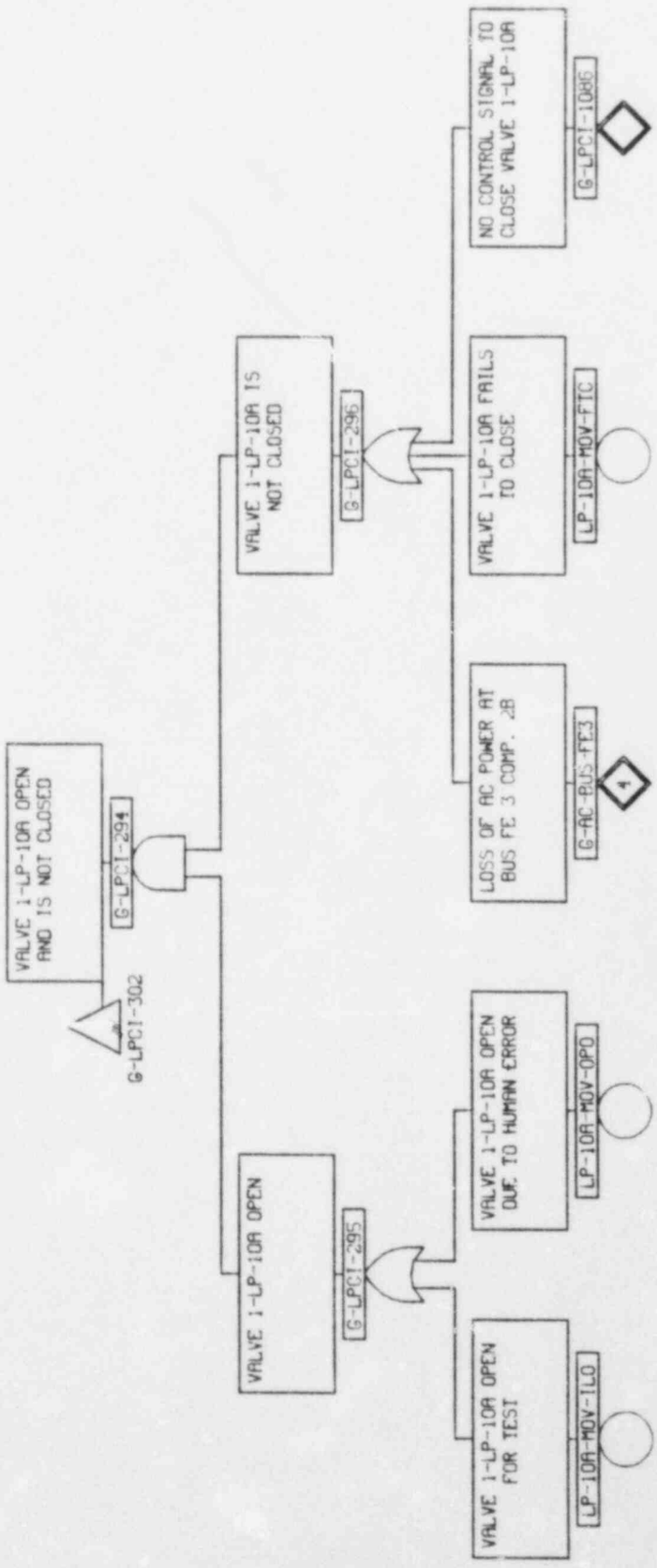

TRAIN A FLOW DIVERTED THROUGH B TEST LINE
G-LPCI-287
G-LPCI-139
EXCESS FLOW THROUGH B TEST LINE
G-LPCI-288
VALVE 1-LP-98 DOES NOT CLOSE
G-LPCI-289
EXCESS FLOW THROUGH VALVE 1-LP-448
G-LPCI-200
EXCESS FLOW THROUGH VALVE 1-LP-438
G-LPCI-199
BREAK IN RECIRC. LOOP
LOCA-LOOP-B
S

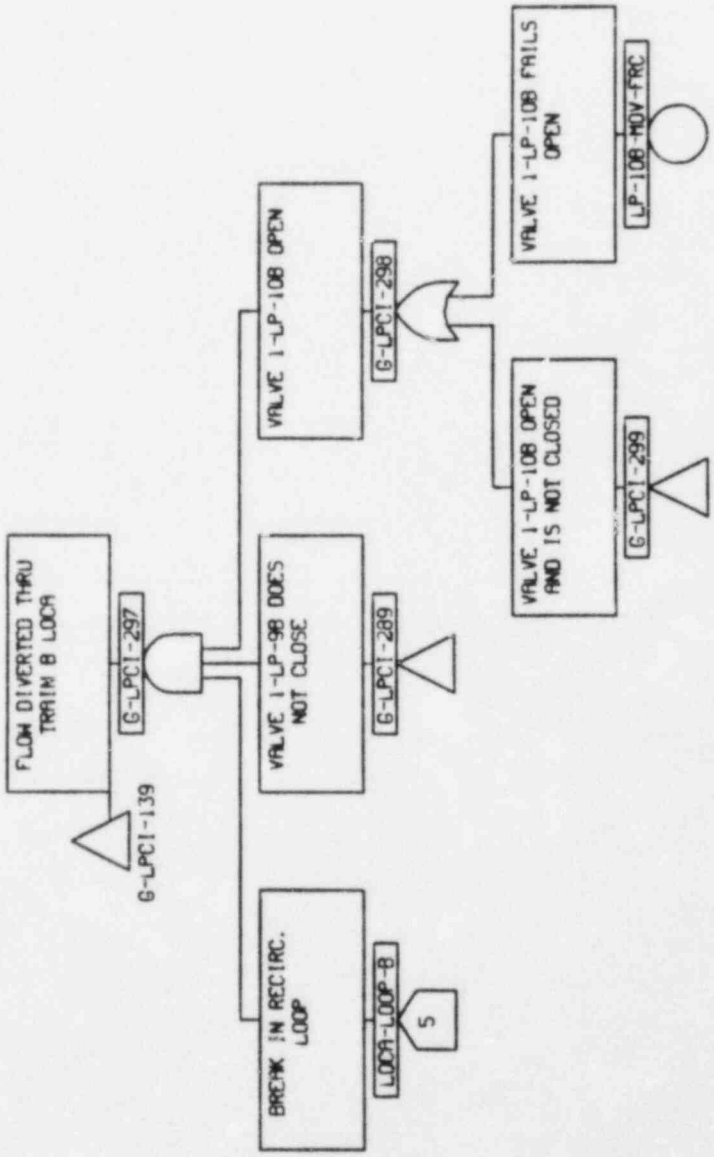

VALVE 1-LP-9B DOES NOT CLOSE
G-LPCI-289
G-LPCI-297
G-LPCI-287
LOSS OF AC POWER AT BUS EF3 COMP 2A
G-AC-BUS-EF3
1
VALVE 1-LP-9B FAILS TO CLOSE
LP-9B-MOV-FTC
CONTROL SIGNAL FAILURE TO CLOSE 1-LP-9B
G-LPCI-1064

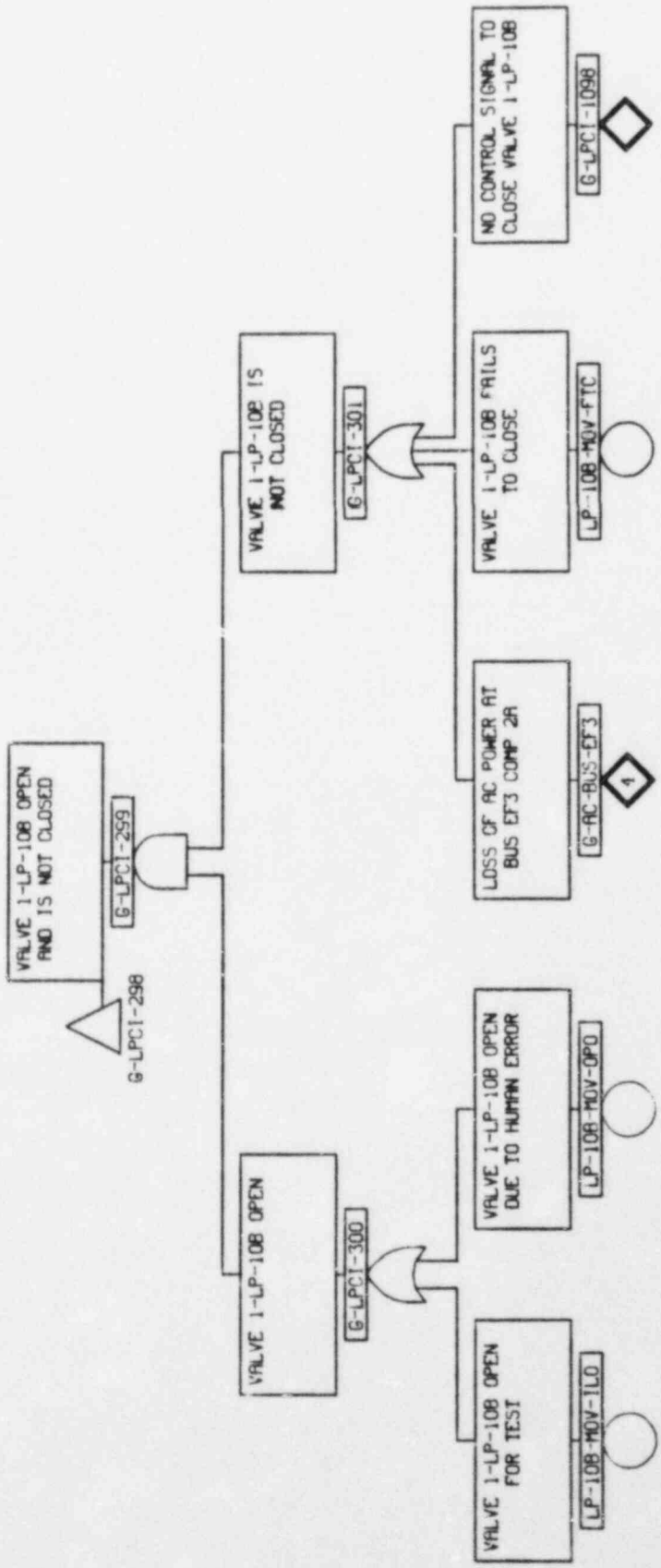

TRAIN B FLOW DIVERTED THROUGH A TEST LINE
G-LPCI-290
G-LPCI-141
VALVE 1-LP-9A DOES NOT CLOSE
G-LPCI-292
EXCESS FLOW THROUGH A TEST LINE
G-LPCI-291
EXCESS FLOW THROUGH VALVE 1-LP-44A
G-LPCI-165
BREAK IN TRAIN A
LOCA-LOOP-A
S
EXCESS FLOW THROUGH VALVE 1-LP-43A
G-LPCI-161

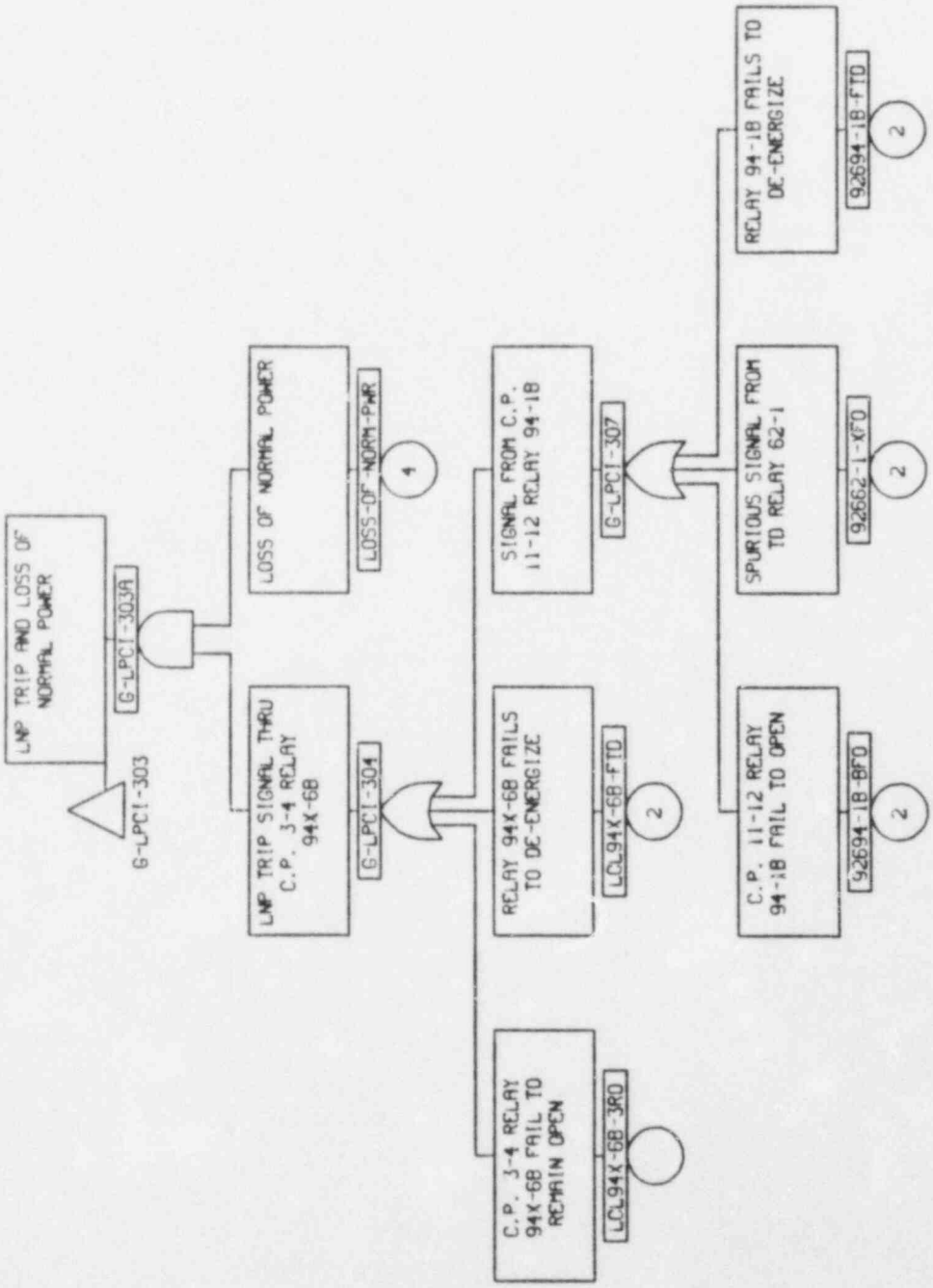

VALVE 1-LP-9A DOES NOT CLOSE
G-LPCI-290
G-LPCI-293
G-LPCI-292
VALVE 1-LP-9A FAILS TO CLOSE
LP-9A-MOV-FTC
CONTROL SIGNAL FAILURE TO CLOSE VALVE 1-LP-9A
G-LPCI-1075
LOSS OF AC POWER AT BUS FE 3 COMP. 2B
G-AC-BUS-FE3
1

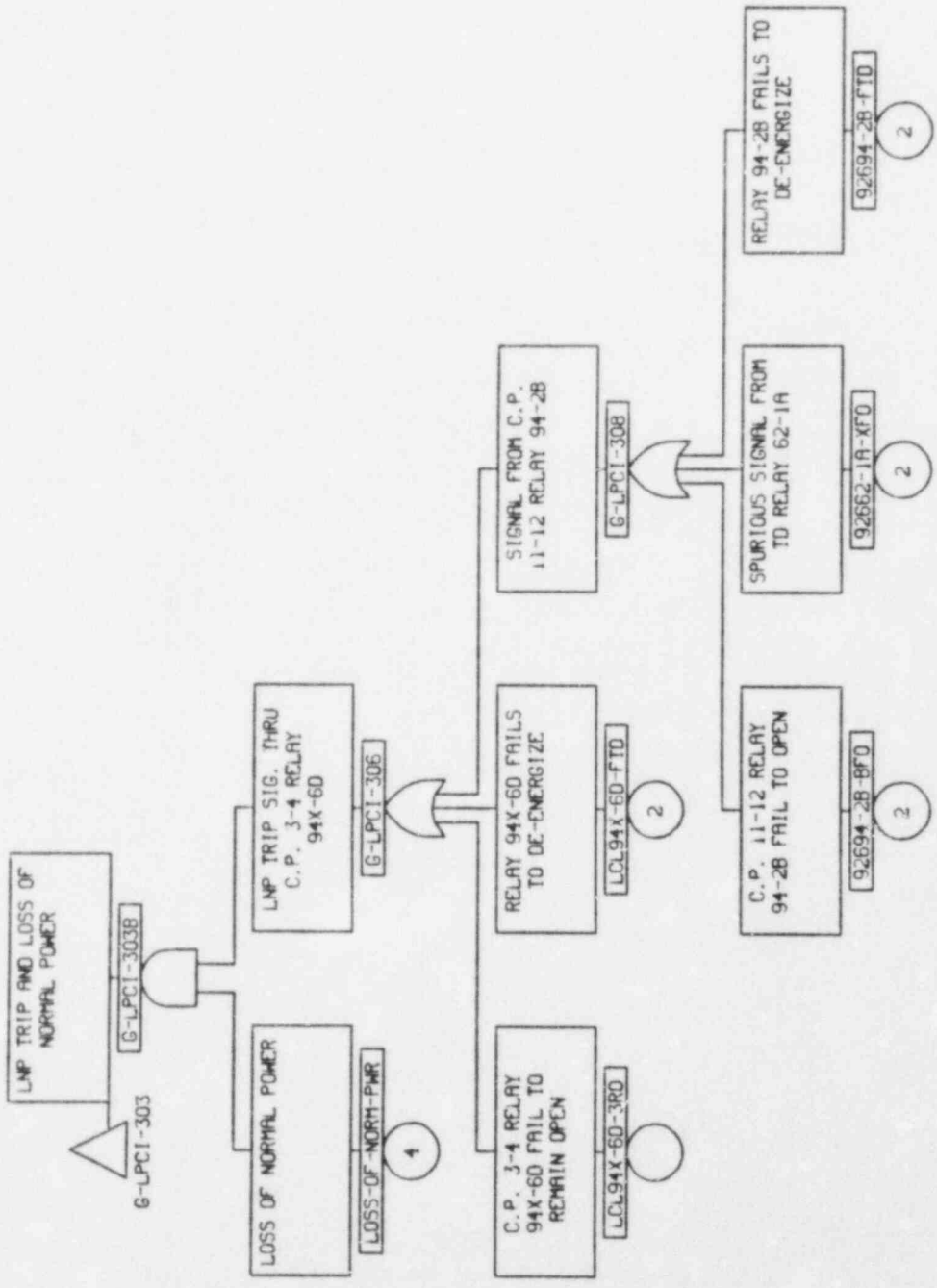

FLOW DIVERTED THRU LOCA PATH A
G-LPCI-293
G-LPCI-1+1
BREAK IN TRAIN A
LOCA-LOOP-A
5
VALVE 1-LP-9A DOES NOT CLOSE
G-LPCI-292
VALVE 1-LP-10A OPEN
G-LPCI-302
VALVE 1-LP-10A OPEN AND IS NOT CLOSED
G-LPCI-294
VALVE 1-LP-10A FAILS OPEN
LP-10A-MOV-FRC

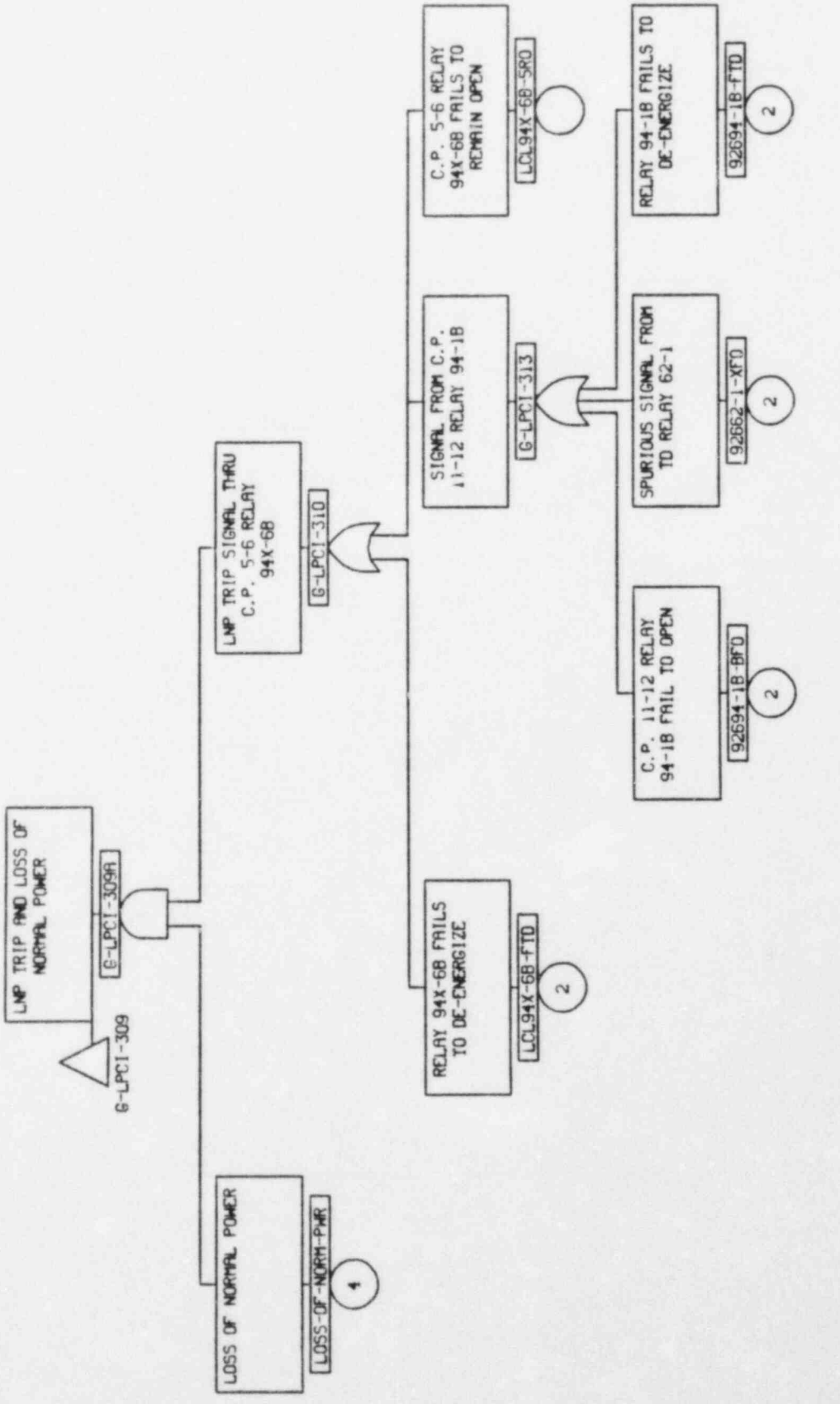

VALVE 1-LP-10A OPEN AND IS NOT CLOSED
G-LPCI-294
G-LPCI-302
VALVE 1-LP-10A IS NOT CLOSED
G-LPCI-296
VALVE 1-LP-10A FAILS TO CLOSE
LP-10A-MOV-FTC
NO CONTROL SIGNAL TO CLOSE VALVE 1-LP-10A
G-LPCI-1086
LOSS OF AC POWER AT BUS FE 3 COMP. 2B
G-AC-BUS-FE3
1
VALVE 1-LP-10A OPEN
G-LPCI-295
VALVE 1-LP-10A OPEN DUE TO HUMAN ERROR
LP-10A-MOV-OPO
VALVE 1-LP-10A OPEN FOR TEST
LP-10A-MOV-1LO

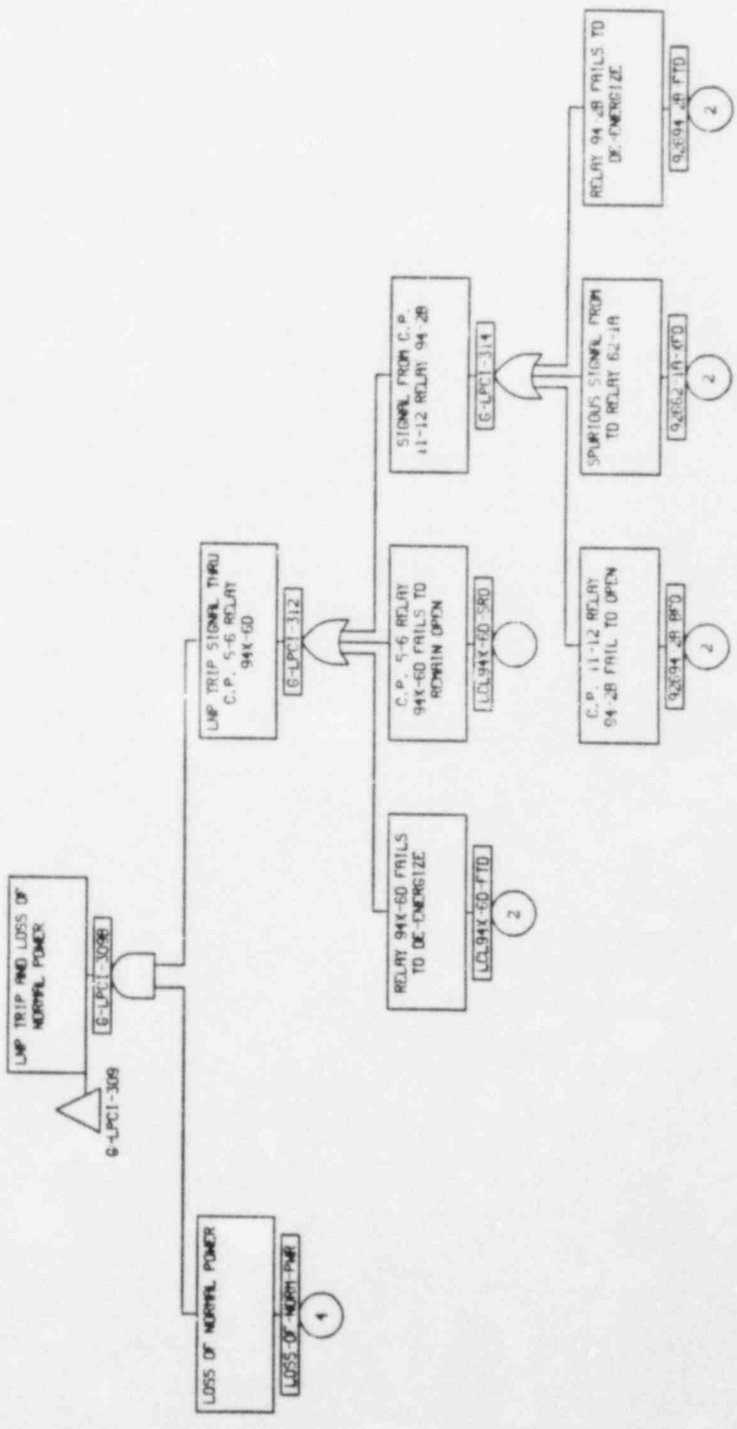

FLOW DIVERTED THRU TRAIN B LOCA
G-LPCI-297
G-LPCI-139
VALVE 1-LP-98 DOES NOT CLOSE
G-LPCI-289
BREAK IN RECIRC. LOOP
LOCA-LOOP-B
S
VALVE 1-LP-108 OPEN
G-LPCI-298
VALVE 1-LP-108 OPEN AND IS NOT CLOSED
G-LPCI-299
VALVE 1-LP-108 FAILS OPEN
LP-108-MOV-FRC

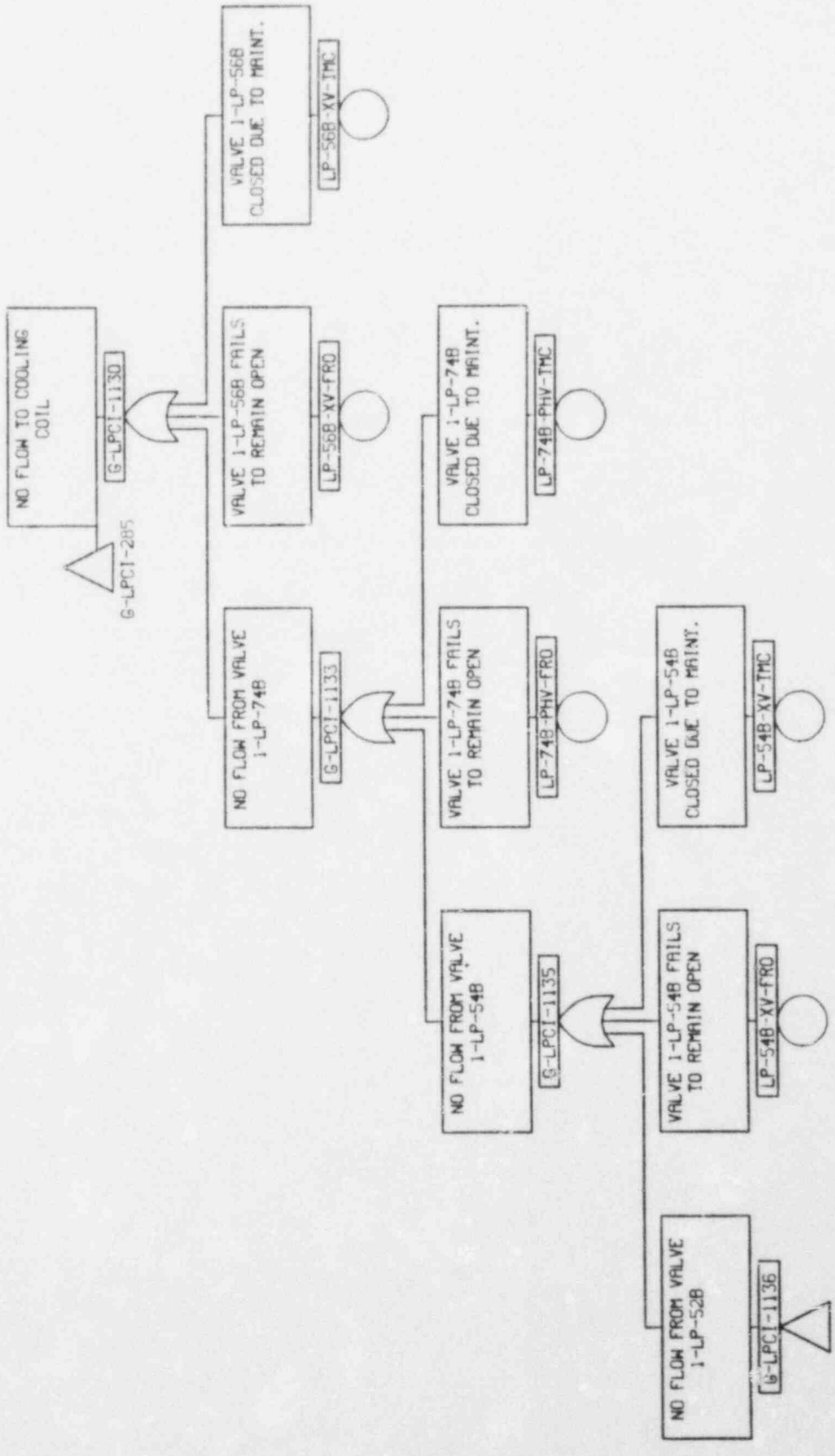

VALVE 1-LP-108 OPEN AND IS NOT CLOSED
G-LPCI-299
G-LPCI-298
VALVE 1-LP-108 IS NOT CLOSED
G-LPCI-301
VALVE 1-LP-108 FAILS TO CLOSE
LP-108-MOV-FTC
NO CONTROL SIGNAL TO CLOSE VALVE 1-LP-108
G-LPCI-1098
LOSS OF AC POWER AT BUS EF3 COMP 2A
G-AC-BUS-EF3
4
VALVE 1-LP-108 OPEN
G-LPCI-300
VALVE 1-LP-108 OPEN DUE TO HUMAN ERROR
LP-108-MOV-OPO
VALVE 1-LP-108 OPEN FOR TEST
LP-108-MOV-1LO

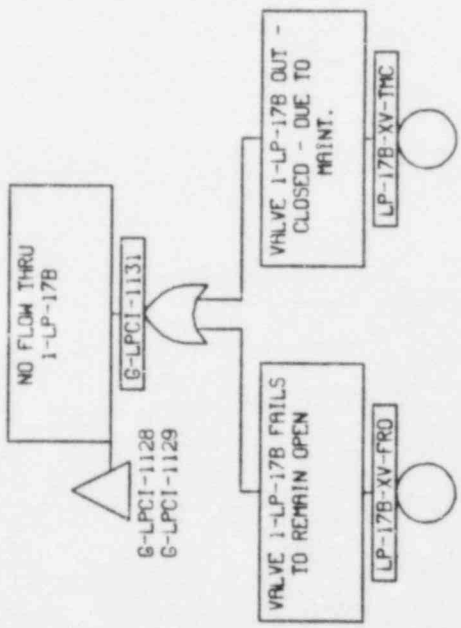

LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-303
G-LPCI-303A
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
1
LNP TRIP SIGNAL THRU C.P. 3-4 RELAY 94X-68
G-LPCI-304
SIGNAL FROM C.P. 11-12 RELAY 94-1B
G-LPCI-307
RELAY 94X-68 FAILS TO DE-ENERGIZE
LCL94X-68-FTD
2
SPURIOUS SIGNAL FROM TD RELAY 62-1
92662-1-XFD
2
RELAY 94-1B FAILS TO DE-ENERGIZE
92694-1B-FTD
2
C.P. 3-4 RELAY 94X-68 FAIL TO REMAIN OPEN
LCL94X-68-3RO
C.P. 11-12 RELAY 94-1B FAIL TO OPEN
92694-1B-BFO
2

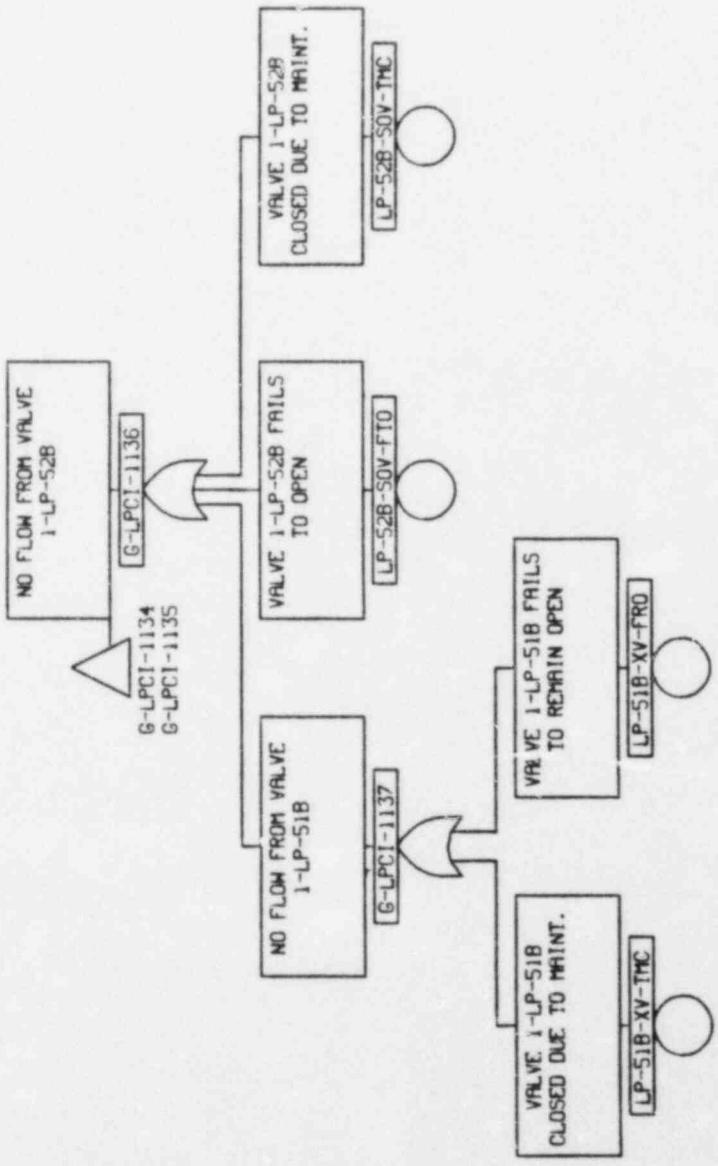

LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-303
G-LPCI-3038
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
4
LNP TRIP SIG. THRU C.P. 3-4 RELAY 94X-60
G-LPCI-306
C.P. 3-4 RELAY 94X-60 FAIL TO REMAIN OPEN
LCL94X-60-3RO
RELAY 94X-60 FAILS TO DE-ENERGIZE
LCL94X-60-FTO
2
SIGNAL FROM C.P. 11-12 RELAY 94-2B
G-LPCI-308
C.P. 11-12 RELAY 94-2B FAIL TO OPEN
92694-2B-BFO
2
SPURIOUS SIGNAL FROM TD RELAY 62-1A
92662-1A-XFO
2
RELAY 94-2B FAILS TO DE-ENERGIZE
92694-2B-FTD
2

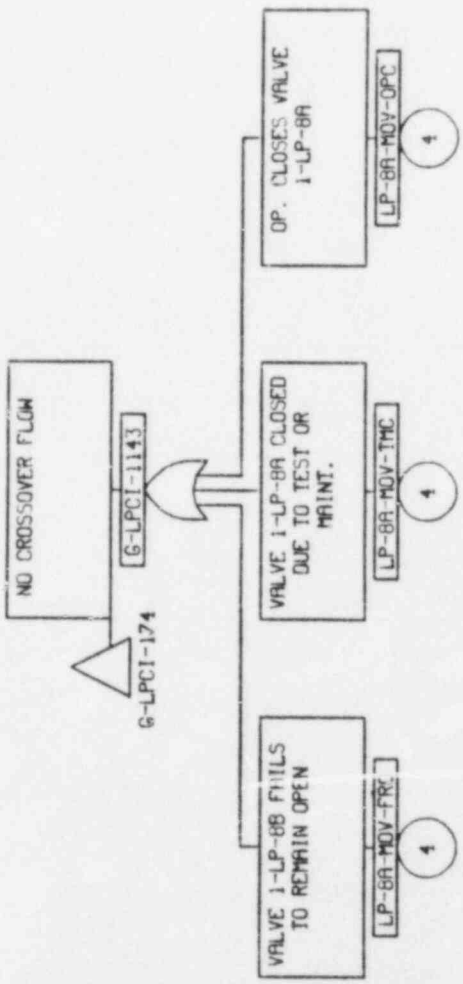

LNP TRIP AND LOSS OF NORMAL POWER
G-LPCI-309
G-LPCI-309A
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
1
LNP TRIP SIGNAL THRU C.P. 5-6 RELAY 94X-68
G-LPCI-310
RELAY 94X-68 FAILS TO DE-ENERGIZE
LCL94X-68-FTD
2
SIGNAL FROM C.P. 11-12 RELAY 94-1B
G-LPCI-313
C.P. 5-6 RELAY 94X-68 FAILS TO REMAIN OPEN
LCL94X-68-SRO
C.P. 11-12 RELAY 94-1B FAIL TO OPEN
92694-1B-BFO
2
SPURIOUS SIGNAL FROM TO RELAY 62-1
92662-1-XFO
2
RELAY 94-1B FAILS TO DE-ENERGIZE
92694-1B-FTD
2

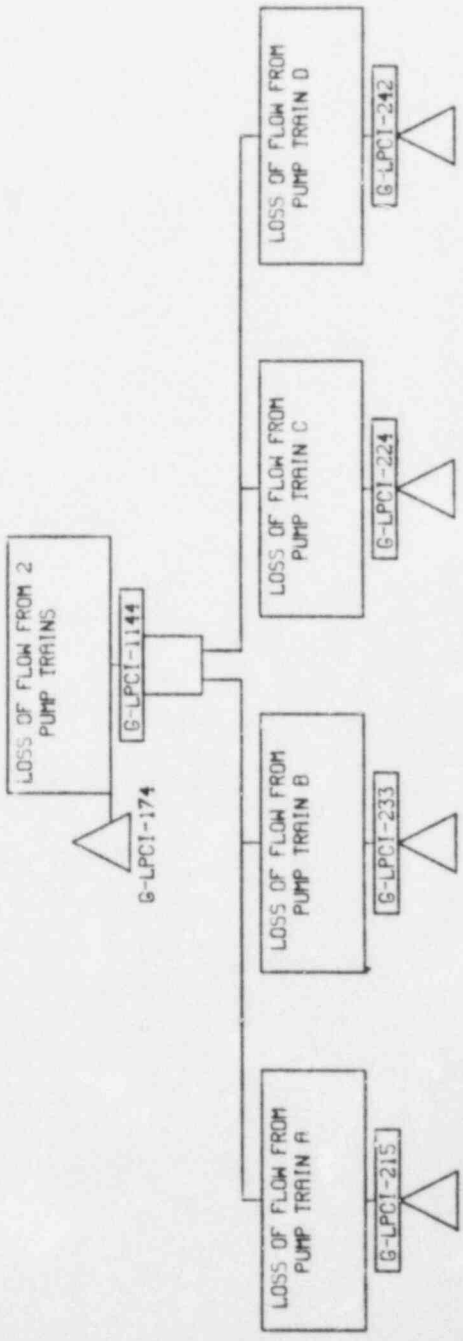

LHP TRIP AND LOSS OF NORMAL POWER
G-LPCI-308
G-LPCI-309
LOSS OF NORMAL POWER
LOSS OF NORM PWR
1
LHP TRIP SIGNAL THRU C.P. 5-6 RELAY 94X-60
G-LPCI-312
C.P. 5-6 RELAY 94X-60 FAILS TO REMAIN OPEN
LO-94X-60-580
RELAY 94X-60 FAILS TO DE-ENERGIZE
LO-94X-60-FTO
2
SIGNAL FROM C.P. 11-12 RELAY 94-2B
G-LPCI-314
C.P. 11-12 RELAY 94-2B FAIL TO OPEN
92-94-2B-FTO
SPURIOUS SIGNAL FROM TO RELAY 62-1A
92-62-1A-SPO
RELAY 94-2B FAILS TO DE-ENERGIZE
92-94-2B-FTO

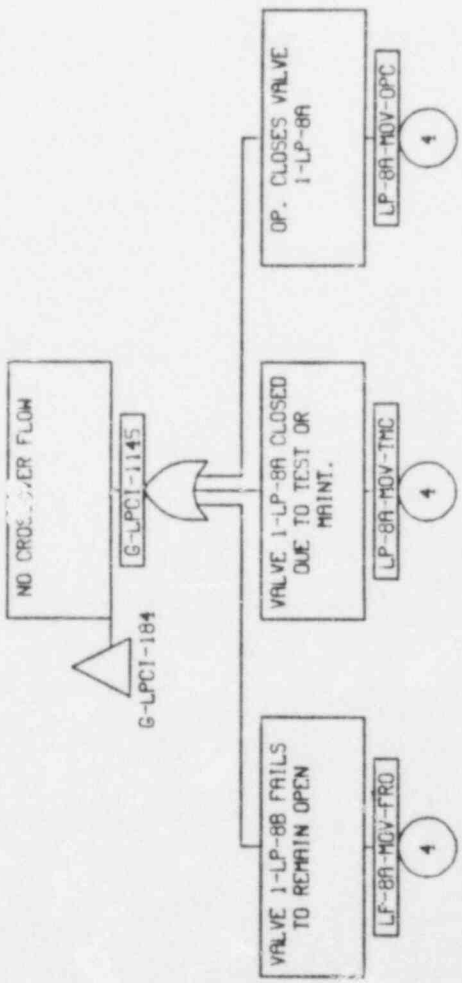

NO FLOW TO COOLING COIL
G-LPCI-1130
G-LPCI-285
VALVE 1-LP-56B FAILS TO REMAIN OPEN
LP-56B-XV-FRO
VALVE 1-LP-56B CLOSED DUE TO MAINT.
LP-56B-XV-TMC
NO FLOW FROM VALVE 1-LP-74B
G-LPCI-1133
VALVE 1-LP-74B FAILS TO REMAIN OPEN
LP-74B-PHV-FRO
VALVE 1-LP-74B CLOSED DUE TO MAINT.
LP-74B-PHV-TMC
NO FLOW FROM VALVE 1-LP-54B
G-LPCI-1135
VALVE 1-LP-54B FAILS TO REMAIN OPEN
LP-54B-XV-FRO
VALVE 1-LP-54B CLOSED DUE TO MAINT.
LP-54B-XV-TMC
NO FLOW FROM VALVE 1-LP-52B
G-LPCI-1136

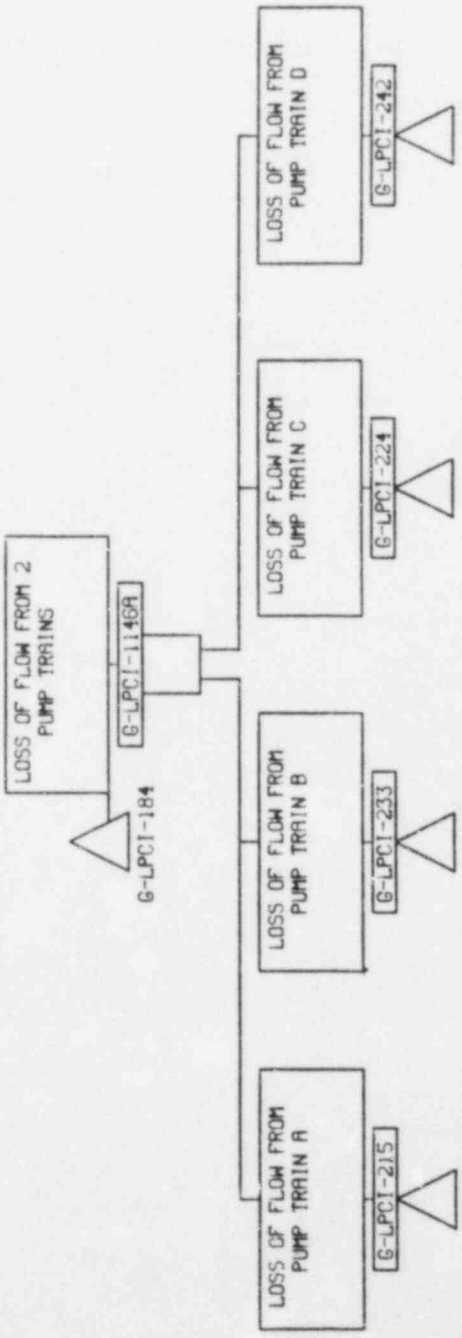

NO FLOW THRU
1-LP-17B
G-LPCI-1128
G-LPCI-1129
G-LPCI-113J
VALVE 1-LP-17B FAILS
TO REMAIN OPEN
LP-17B-XV-FRO
VALVE 1-LP-17B OUT -
CLOSED - DUE TO
MAINT.
LP-17B-XV-TMC

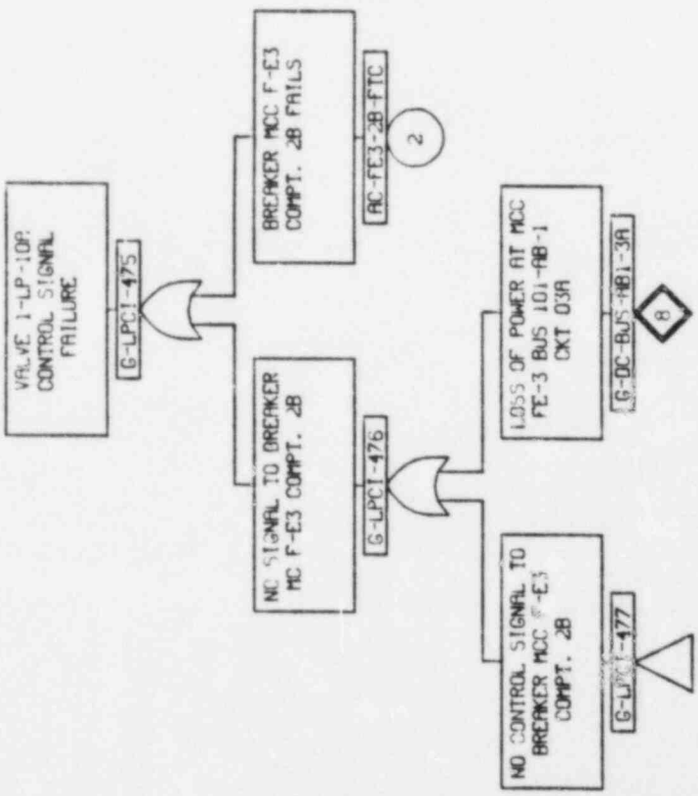

NO FLOW FROM VALVE
1-LP-52B
G-LPCI-1134
G-LPCI-1135
G-LPCI-1136
VALVE 1-LP-52B
CLOSED DUE TO MAINT.
LP-52B-SOV-TMC
VALVE 1-LP-52B FAILS
TO OPEN
LP-52B-SOV-FTO
NO FLOW FROM VALVE
1-LP-51B
G-LPCI-1137
VALVE 1-LP-51B FAILS
TO REMAIN OPEN
LP-51B-XV-FRO
VALVE 1-LP-51B
CLOSED DUE TO MAINT.
LP-51B-XV-TMC

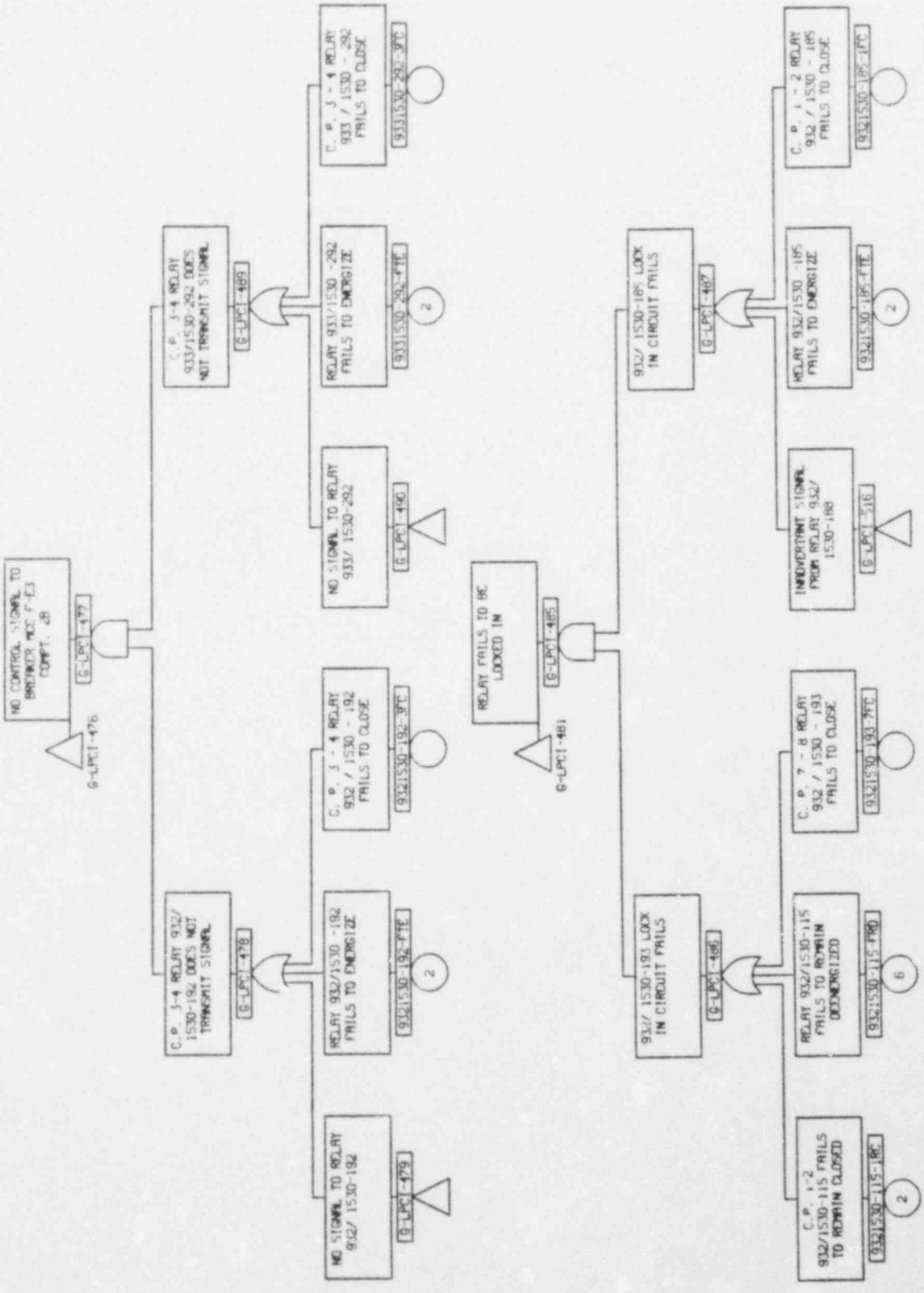

NO CROSSOVER FLOW
G-LPCI-174
G-LPCI-1143
VALVE 1-LP-8B FAILS TO REMAIN OPEN
LP-8A-MOV-FRC
1
VALVE 1-LP-8A CLOSED DUE TO TEST OR MAINT.
LP-8A-MOV-TMC
1
OP. CLOSES VALVE 1-LP-8A
LP-8A-MOV-OPC
1

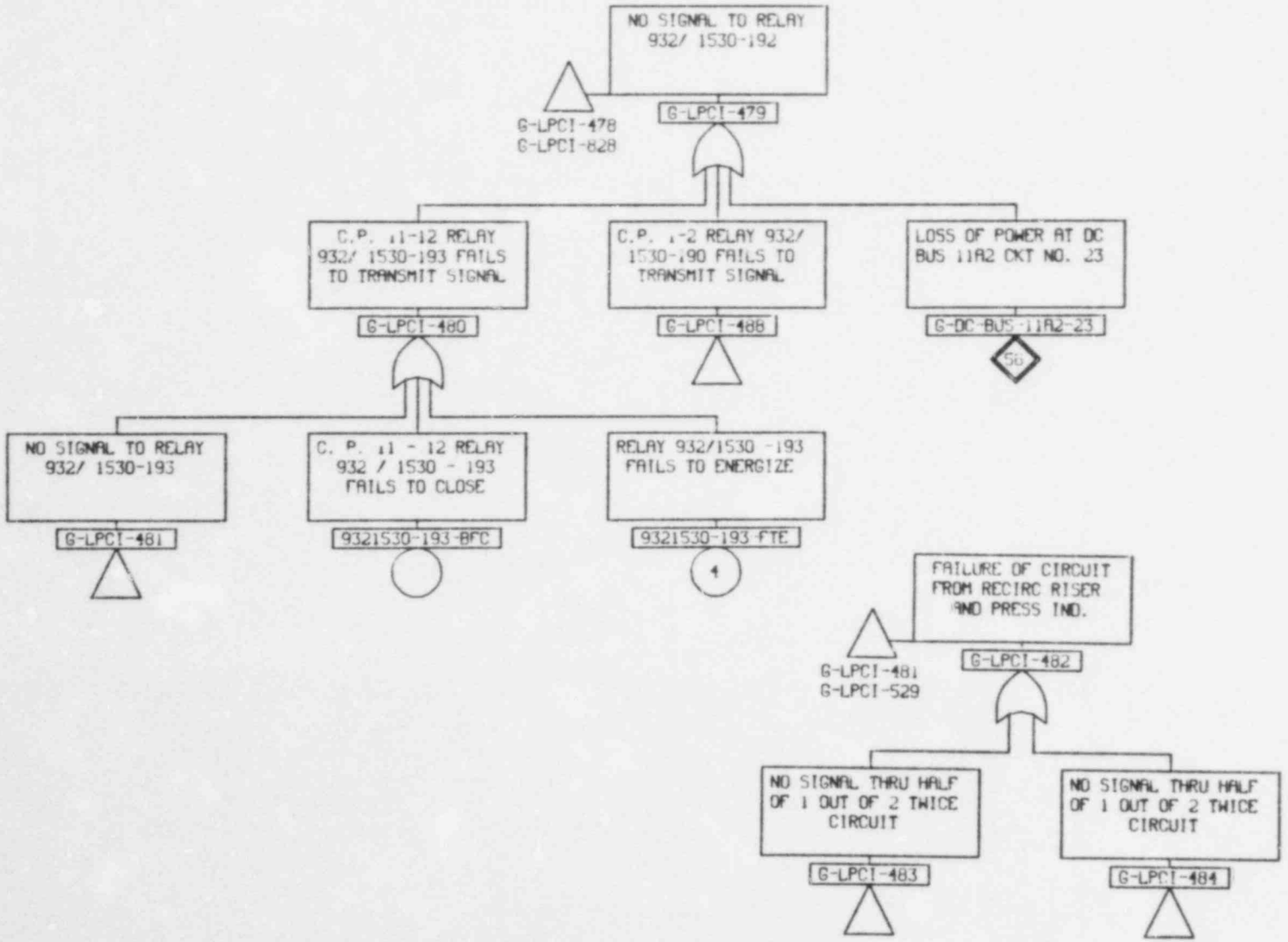

LOSS OF FLOW FROM 2 PUMP TRAINS
G-LPCI-1144
G-LPCI-174
LOSS OF FLOW FROM PUMP TRAIN A
G-LPCI-215
LOSS OF FLOW FROM PUMP TRAIN B
G-LPCI-233
LOSS OF FLOW FROM PUMP TRAIN C
G-LPCI-224
LOSS OF FLOW FROM PUMP TRAIN D
G-LPCI-242

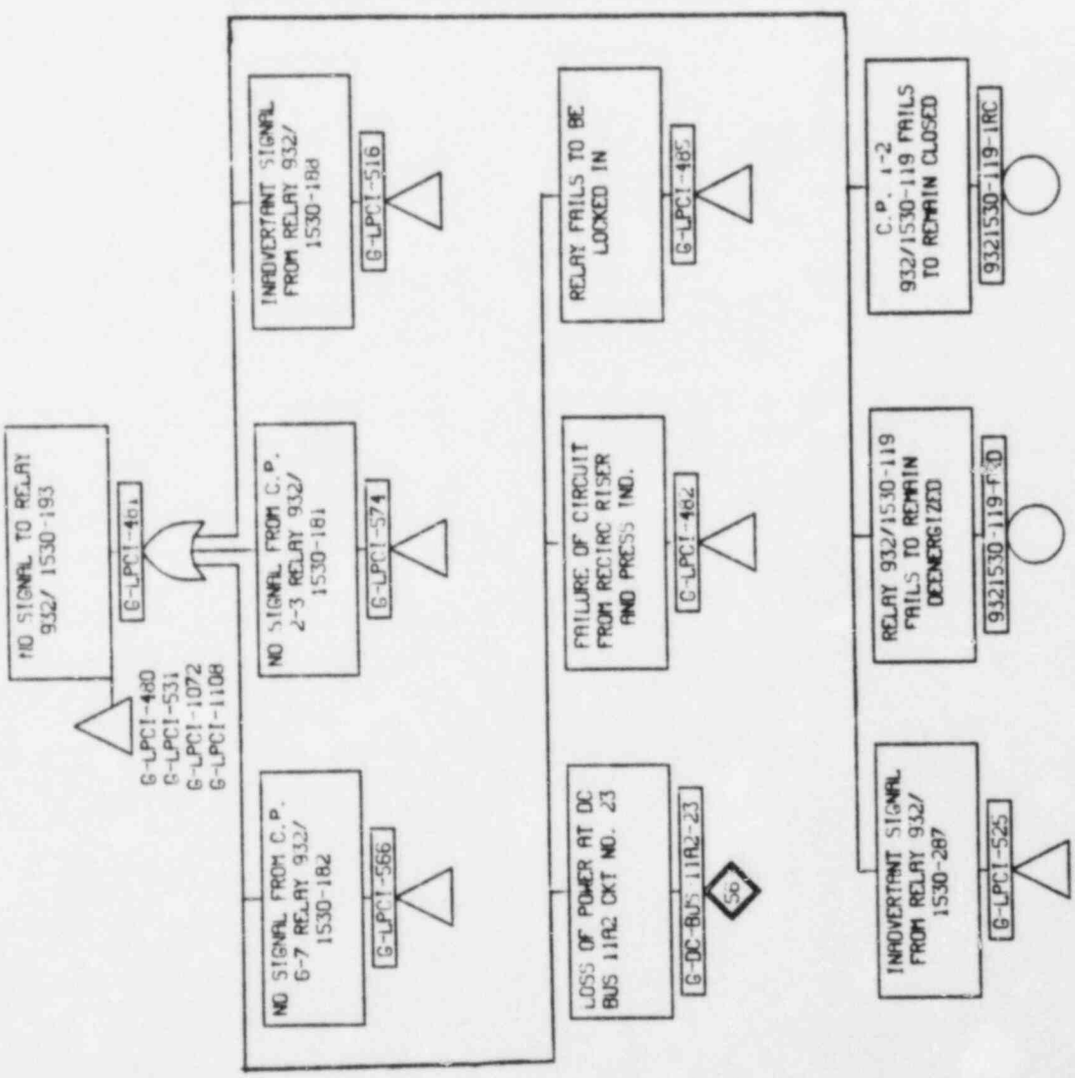

NO CROSS FLOW
G-LPCI-184
G-LPCI-1145
VALVE 1-LP-8B FAILS TO REMAIN OPEN
LP-8A-MOV-FRO
4
VALVE 1-LP-8A CLOSED DUE TO TEST OR MAINT.
LP-8A-MOV-TMC
4
OP. CLOSES VALVE 1-LP-8A
LP-8A-MOV-OPC
4

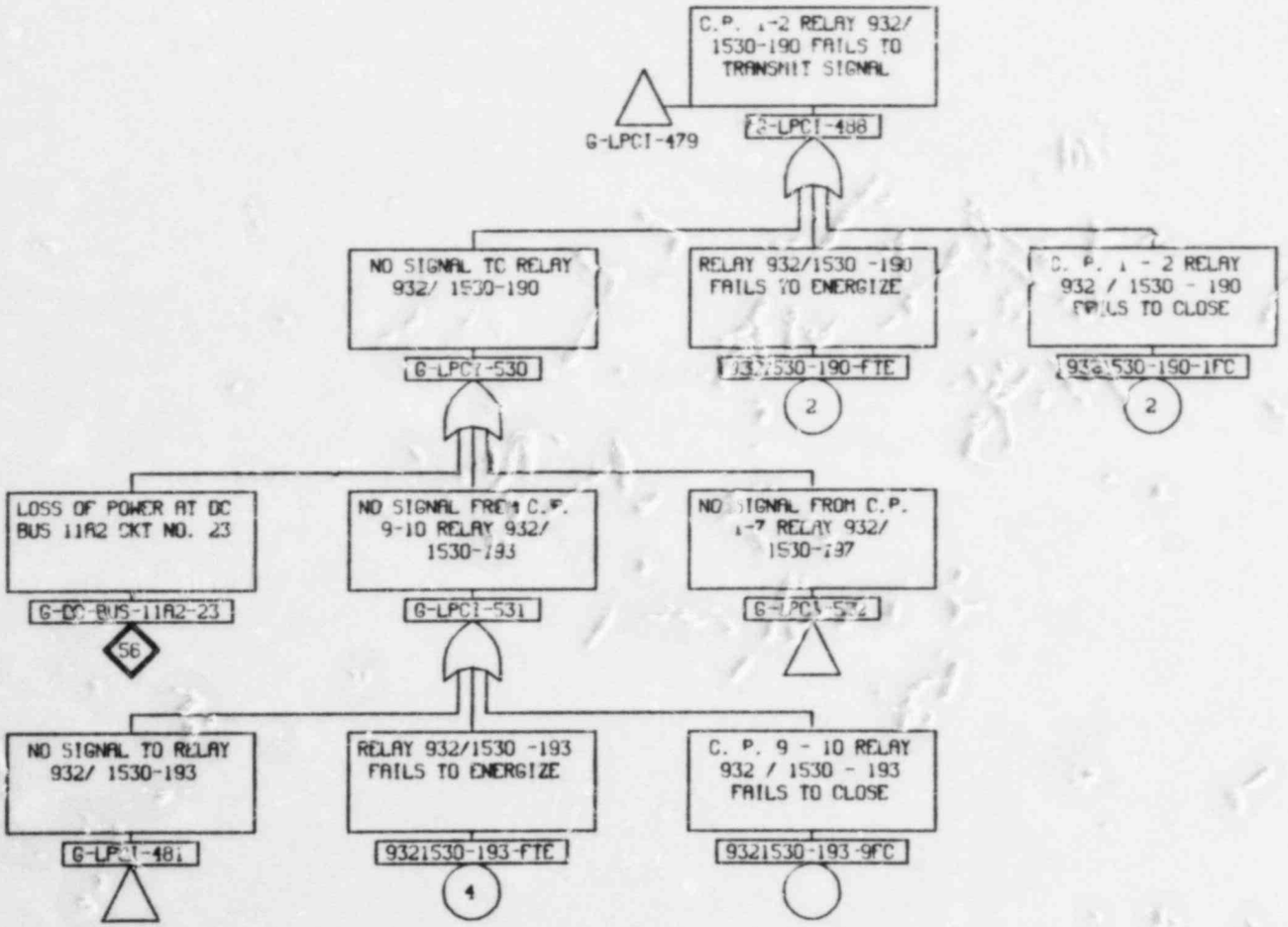

LOSS OF FLOW FROM 2 PUMP TRAINS
G-LPCI-184
G-LPCI-114A
LOSS OF FLOW FROM PUMP TRAIN A
G-LPCI-215
LOSS OF FLOW FROM PUMP TRAIN B
G-LPCI-233
LOSS OF FLOW FROM PUMP TRAIN C
G-LPCI-224
LOSS OF FLOW FROM PUMP TRAIN D
G-LPCI-242

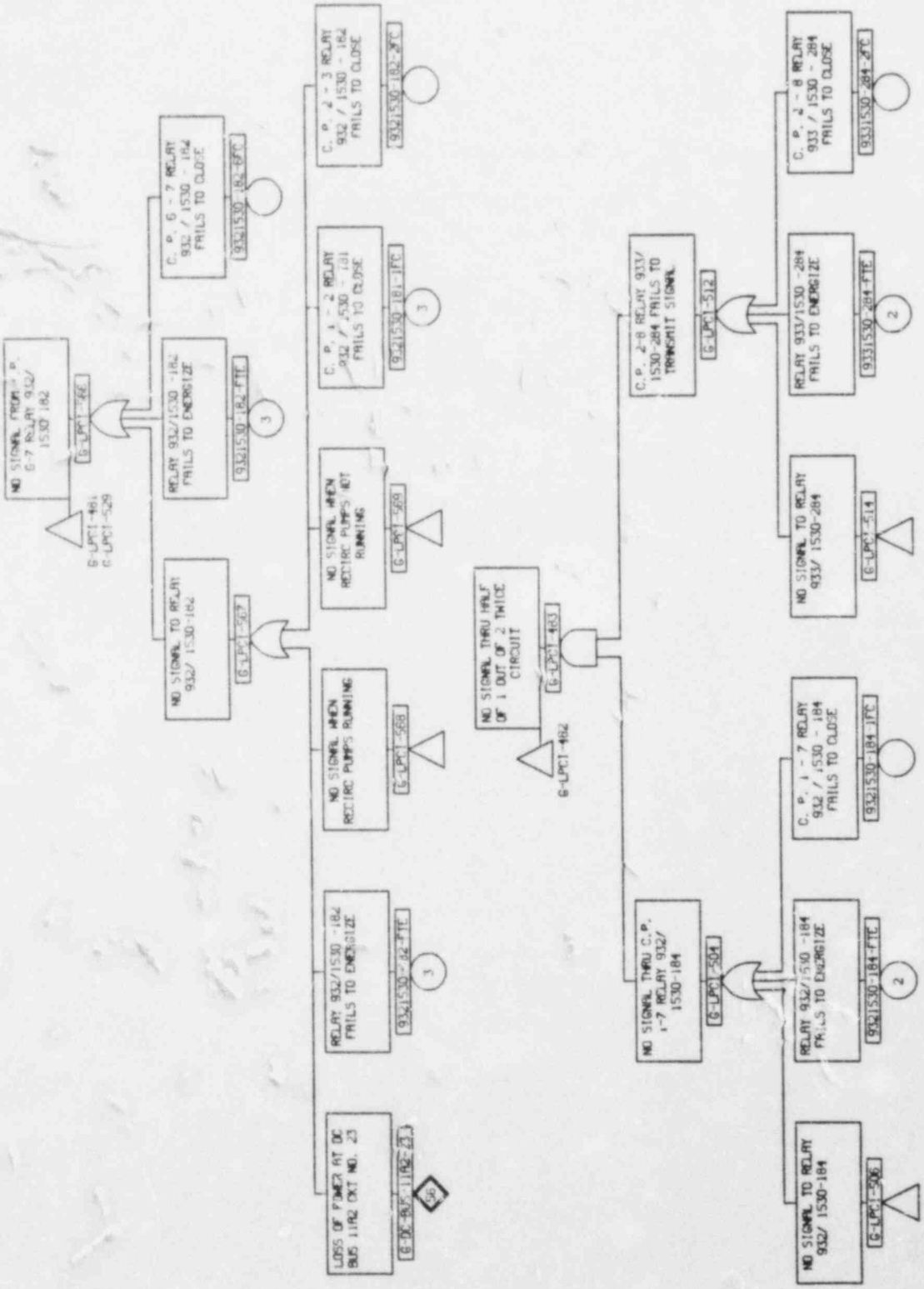

VALVE 1-LP-10P
CONTROL SIGNAL
FAILURE
G-LPCI-475
BREAKER MCC F-E3
COMPT. 2B FAILS
AC-FE3-2B-FTC
2
NO SIGNAL TO BREAKER
MC F-E3 COMPT. 2B
G-LPCI-476
LOSS OF POWER AT MCC
FE-3 BUS 101-AB-1
CKT 03A
G-DC-BUS-AB1-3A
8
NO CONTROL SIGNAL TO
BREAKER MCC F-E3
COMPT. 2B
G-LPCI-477

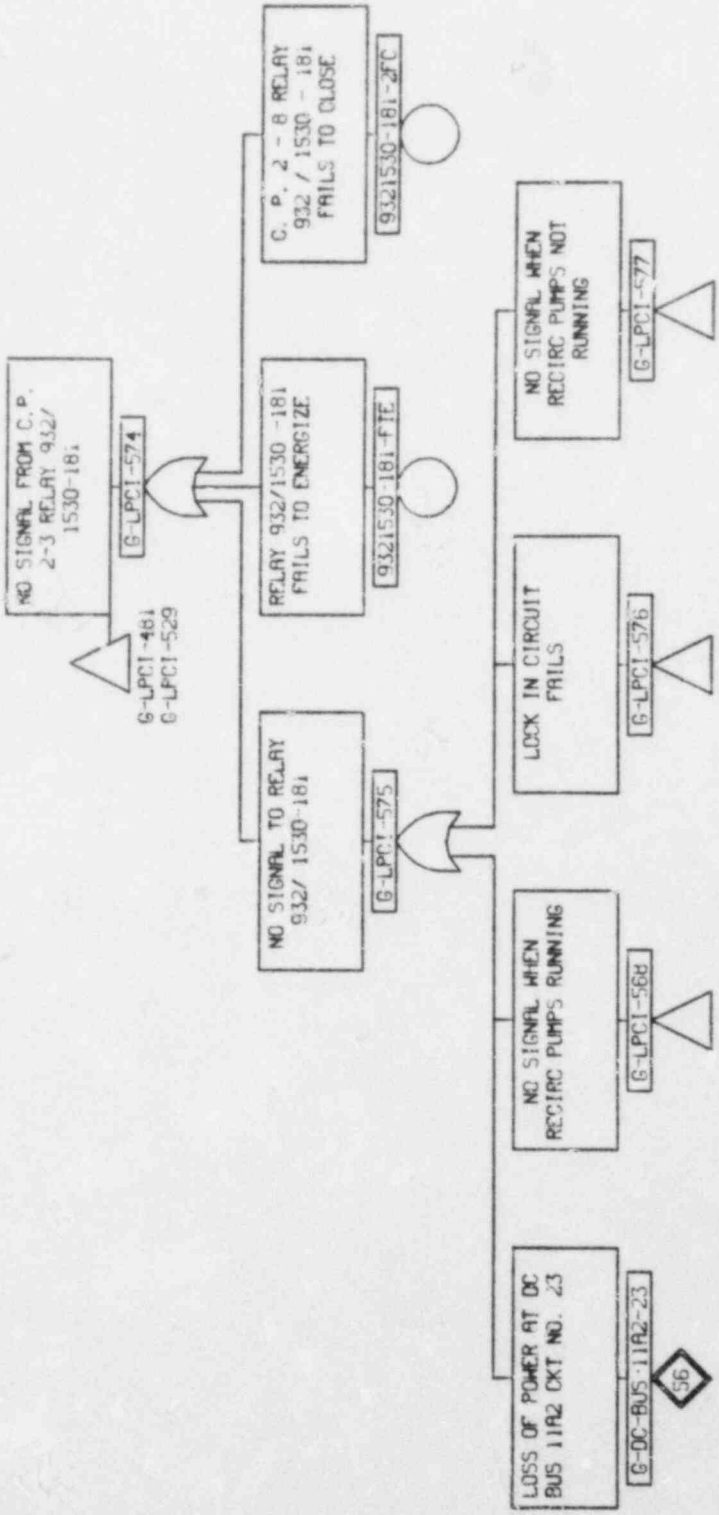

NO CONTROL SIGNAL TO BREAKER MOT F-E3 COMPT. 28
G-LPCI-476
G-LPCI-477
C.P. 3-4 RELAY 933/1530-292 DOES NOT TRANSMIT SIGNAL
G-LPCI-489
C.P. 3-4 RELAY 933/1530-292 FAILS TO CLOSE
9331530-292-SPC
RELAY 933/1530-292 FAILS TO ENERGIZE
9331530-292-FPE
2
NO SIGNAL TO RELAY 933/ 1530-292
G-LPCI-490
C.P. 3-4 RELAY 932/1530-194 DOES NOT TRANSMIT SIGNAL
G-LPCI-478
C.P. 3-4 RELAY 932 / 1530 - 192 FAILS TO CLOSE
9321530-192-SPC
RELAY 932/1530-192 FAILS TO ENERGIZE
9321530-192-FPE
2
NO SIGNAL TO RELAY 932/ 1530-192
G-LPCI-479
RELAY FAILS TO BE LOCKED IN
G-LPCI-485
G-LPCI-481
933/ 1530-185 LOCK IN CIRCUIT FAILS
G-LPCI-487
C.P. 1-2 RELAY 932 / 1530 - 185 FAILS TO CLOSE
9321530-185-SPC
RELAY 932/1530-185 FAILS TO ENERGIZE
9321530-185-FPE
2
INDEPENDENT SIGNAL FROM RELAY 932/ 1530-188
G-LPCI-516
C.P. 7-8 RELAY 932 / 1530 - 193 FAILS TO CLOSE
9321530-193-SPC
933/ 1530-193 LOCK IN CIRCUIT FAILS
G-LPCI-486
RELAY 932/1530-115 FAILS TO REMAIN DEENERGIZED
9321530-115-FRD
6
C.P. 1-2 932/1530-115 FAILS TO REMAIN CLOSED
9321530-115-SRC
2

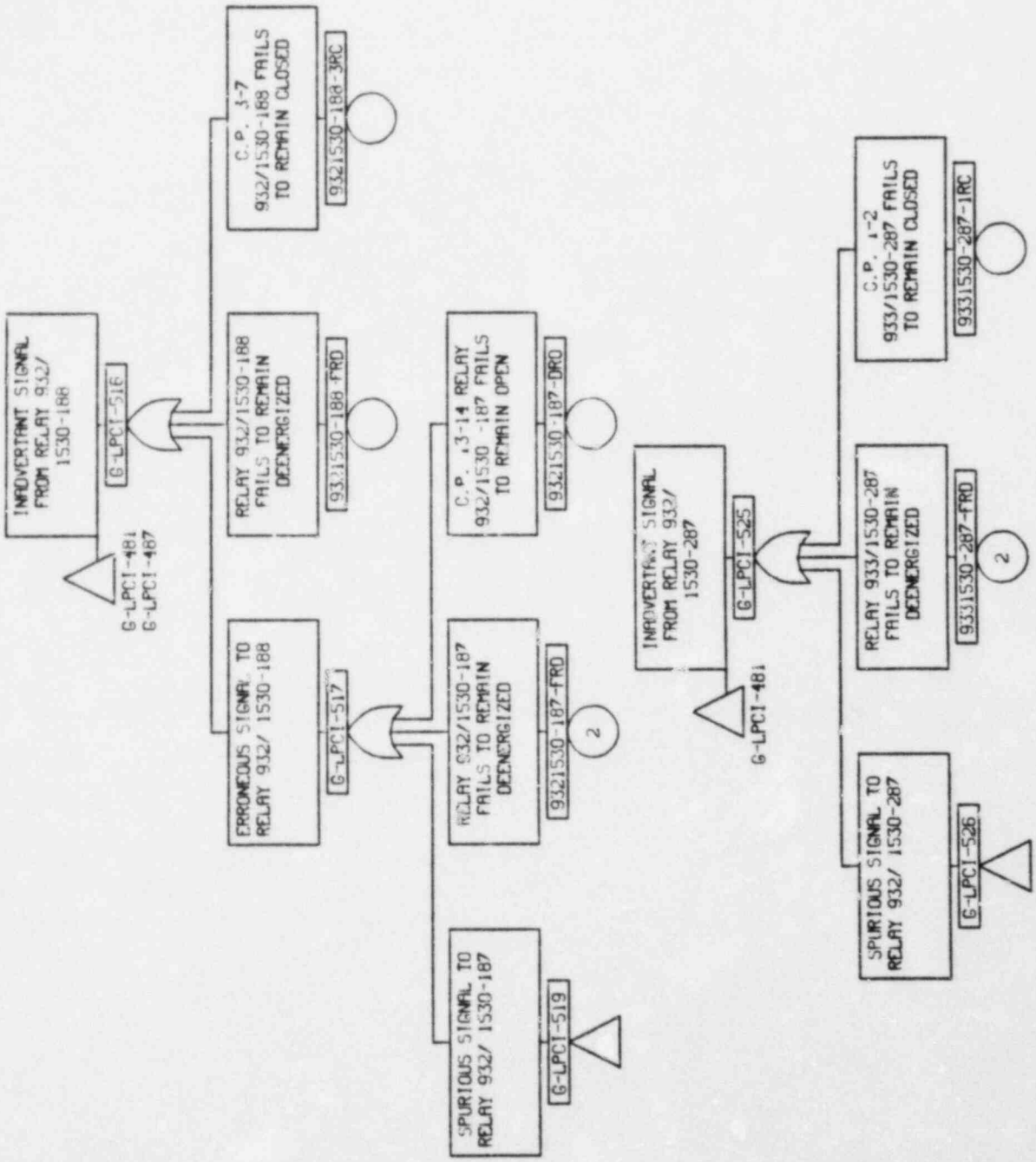

NO SIGNAL TO RELAY 932/ 1530-192
G-LPCI-478
G-LPCI-828
G-LPCI-479
C.P. 1-12 RELAY 932/ 1530-193 FAILS TO TRANSMIT SIGNAL
G-LPCI-480
C.P. 1-2 RELAY 932/ 1530-190 FAILS TO TRANSMIT SIGNAL
G-LPCI-486
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
5B
NO SIGNAL TO RELAY 932/ 1530-193
G-LPCI-481
C. P. 1 - 12 RELAY 932 / 1530 - 193 FAILS TO CLOSE
9321530-193-BFC
RELAY 932/1530 -193 FAILS TO ENERGIZE
9321530-193-FTE
4
FAILURE OF CIRCUIT FROM RECIRC RISER AND PRESS IND.
G-LPCI-481
G-LPCI-529
G-LPCI-482
NO SIGNAL THRU HALF OF 1 OUT OF 2 TWICE CIRCUIT
G-LPCI-483
NO SIGNAL THRU HALF OF 1 OUT OF 2 TWICE CIRCUIT
G-LPCI-484

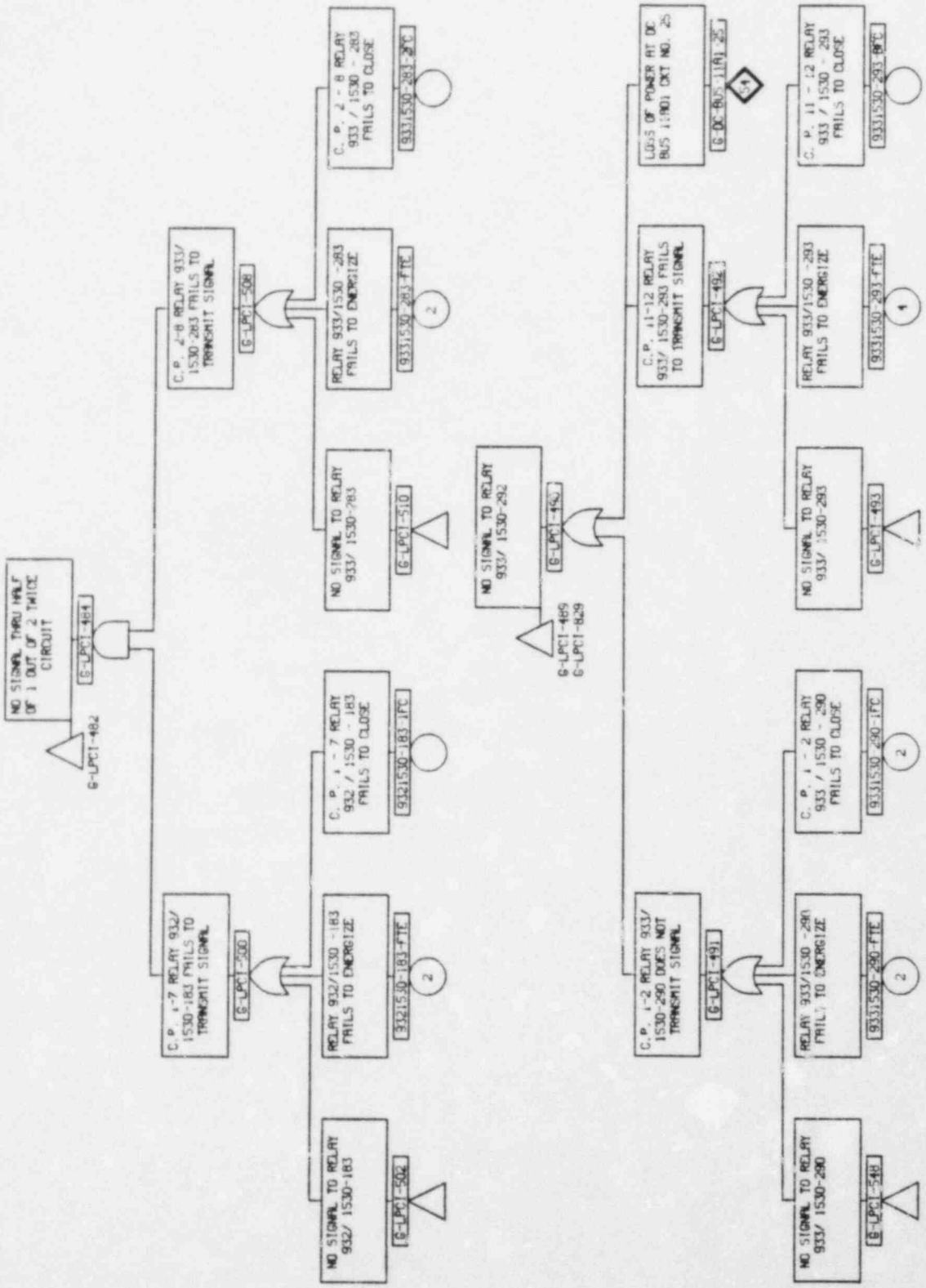

NO SIGNAL TO RELAY 932/ 1530-193
G-LPCI-460
G-LPCI-531
G-LPCI-1072
G-LPCI-1108
G-LPCI-461
NO SIGNAL FROM C.P. 6-7 RELAY 932/ 1530-182
G-LPCI-566
NO SIGNAL FROM C.P. 2-3 RELAY 932/ 1530-181
G-LPCI-574
INADVERTANT SIGNAL FROM RELAY 932/ 1530-188
G-LPCI-516
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
50
FAILURE OF CIRCUIT FROM RECIRC RISER AND PRESS IND.
G-LPCI-496
RELAY FAILS TO BE LOCKED IN
G-LPCI-495
INADVERTANT SIGNAL FROM RELAY 932/ 1530-287
G-LPCI-525
RELAY 932/1530-119 FAILS TO REMAIN DEENERGIZED
9321530-119-F30
C.P. 1-2 932/1530-119 FAILS TO REMAIN CLOSED
9321530-119-IRC

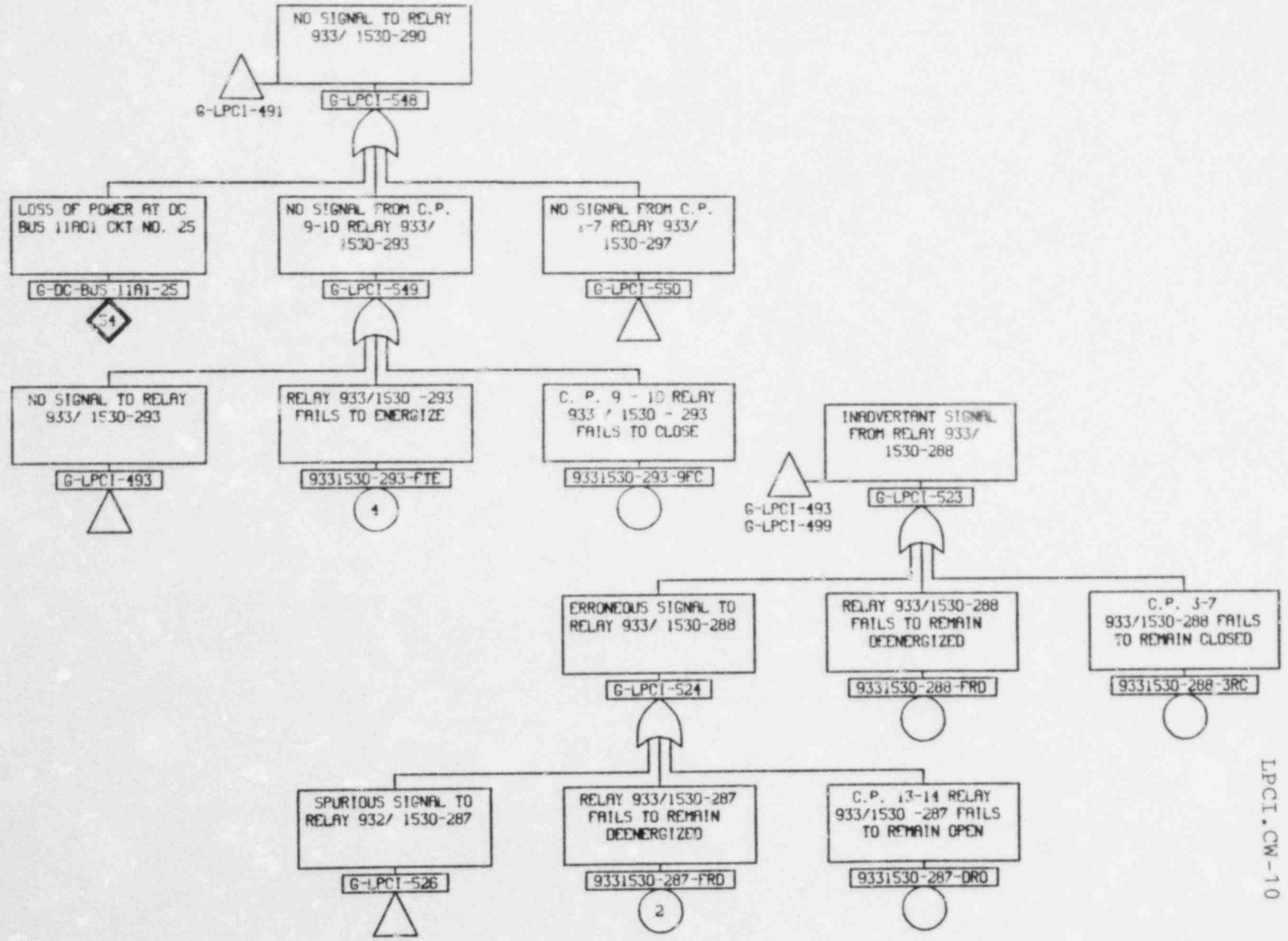

C.P. 1-2 RELAY 932/ 1530-190 FAILS TO TRANSMIT SIGNAL
G-LPCI-488
G-LPCI-479
NO SIGNAL TO RELAY 932/ 1530-190
G-LPCI-530
RELAY 932/1530 -190 FAILS TO ENERGIZE
932/1530-190-FTE
2
C. P. 1 - 2 RELAY 932 / 1530 - 190 FAILS TO CLOSE
932/1530-190-FTC
2
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM C.P. 9-10 RELAY 932/ 1530-193
G-LPCI-531
NO SIGNAL FROM C.P. 1-7 RELAY 932/ 1530-197
NO SIGNAL TO RELAY 932/ 1530-193
G-LPCI-481
RELAY 932/1530 -193 FAILS TO ENERGIZE
9321530-193-FTE
4
C. P. 9 - 10 RELAY 932 / 1530 - 193 FAILS TO CLOSE
9321530-193-FTC

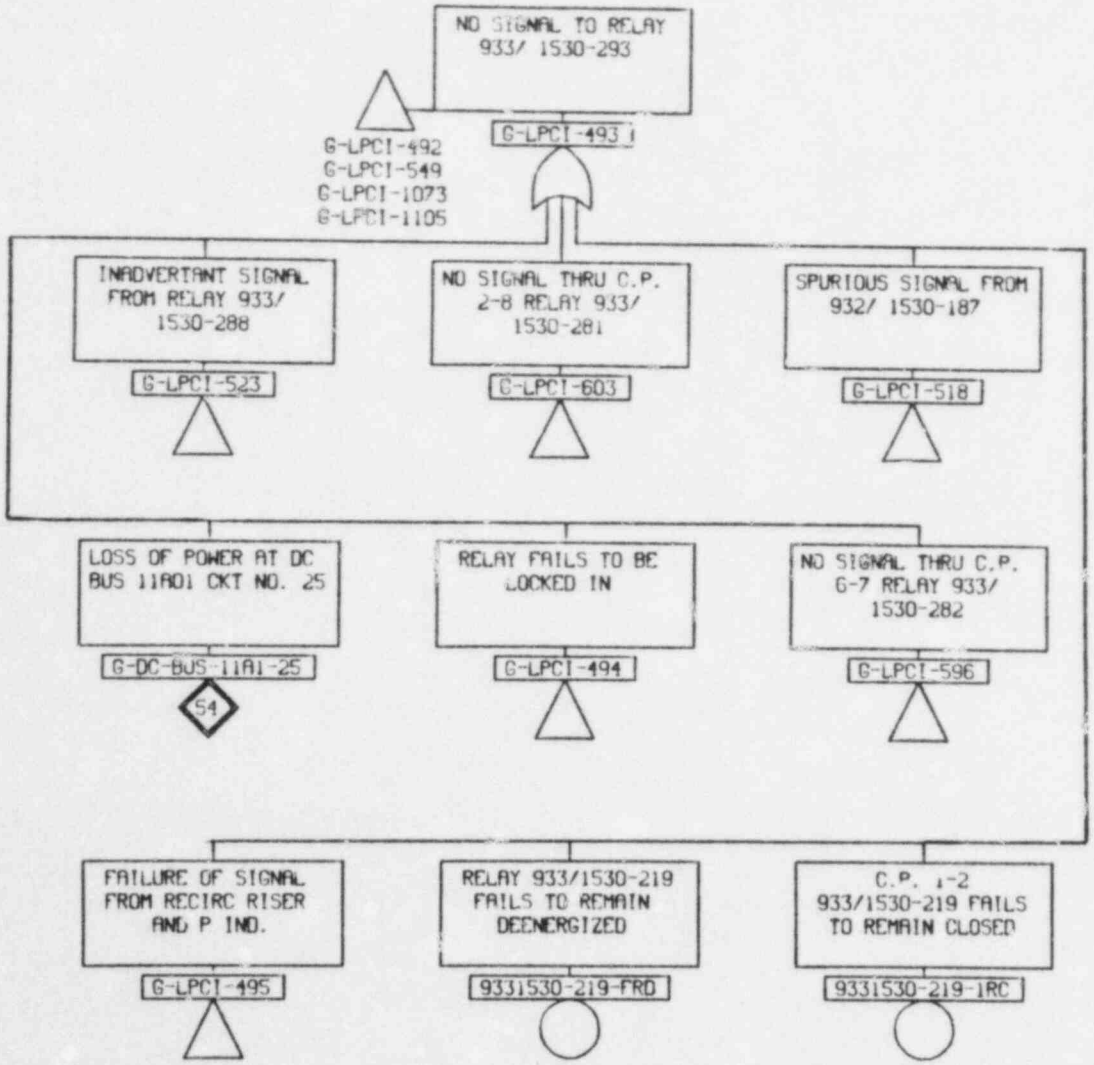

NO SIGNAL FROM C.P. 6-7 RELAY 932/ 1530 184
G-LPCI-486
G-LPCI-489
RELAY 932/1530 -184 FAILS TO ENERGIZE
932/1530-184-FFE
3
C. P. 6 - 7 RELAY 932 / 1530 - 184 FAILS TO CLOSE
932/1530-184-FFC
C. P. 1 - 2 RELAY 932 / 1530 - 181 FAILS TO CLOSE
932/1530-181-FFC
3
C. P. 2 - 3 RELAY 932 / 1530 - 184 FAILS TO CLOSE
932/1530-182-FFC
NO SIGNAL TO RELAY 932/ 1530-184
G-LPCI-509
NO SIGNAL WHEN ROTATING PUMPS NOT RUNNING
G-LPCI-508
NO SIGNAL WHEN ROTATING PUMPS RUNNING
G-LPCI-508
RELAY 932/1530 -184 FAILS TO ENERGIZE
932/1530-182-FFE
3
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
36
NO SIGNAL THRU HALF OF 1 OUT OF 2 TWICE CIRCUIT
G-LPCI-483
G-LPCI-482
C. P. 2-8 RELAY 933/ 1530-284 FAILS TO TRANSMIT SIGNAL
G-LPCI-512
C. P. 2 - 8 RELAY 933 / 1530 - 284 FAILS TO CLOSE
933/1530-284-FFC
RELAY 933/1530 -284 FAILS TO ENERGIZE
933/1530-284-FFE
2
NO SIGNAL TO RELAY 933/ 1530-284
G-LPCI-514
NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-184
G-LPCI-504
C. P. 1 - 7 RELAY 932 / 1530 - 184 FAILS TO CLOSE
932/1530-184-FFC
RELAY 932/1530 -184 FAILS TO ENERGIZE
932/1530-184-FFE
2
NO SIGNAL TO RELAY 932/ 1530-184
G-LPCI-506

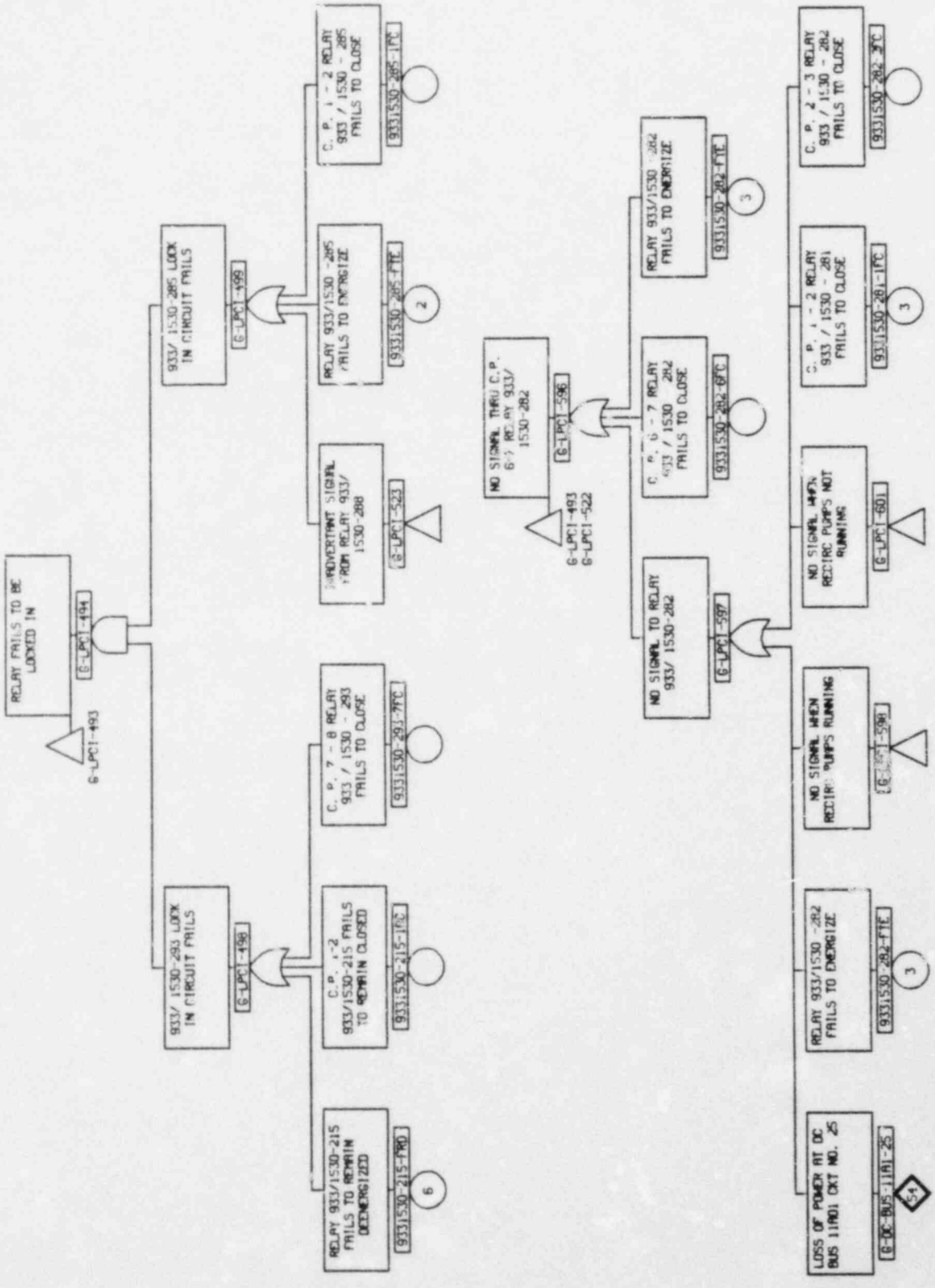

NO SIGNAL FROM C.P. 2-3 RELAY 932/ 1530-181
G-LPCI-574
G-LPCI-481
G-LPCI-529
C. P. 2 - 8 RELAY 932 / 1530 - 181 FAILS TO CLOSE
9321530-181-2FC
RELAY 932/1530 -181 FAILS TO ENERGIZE
9321530-181-FTE
NO SIGNAL TO RELAY 932/ 1530-181
G-LPCI-575
LOCK IN CIRCUIT FAILS
G-LPCI-576
NO SIGNAL WHEN RECIRC PUMPS NOT RUNNING
G-LPCI-577
NO SIGNAL WHEN RECIRC PUMPS RUNNING
G-LPCI-568
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56

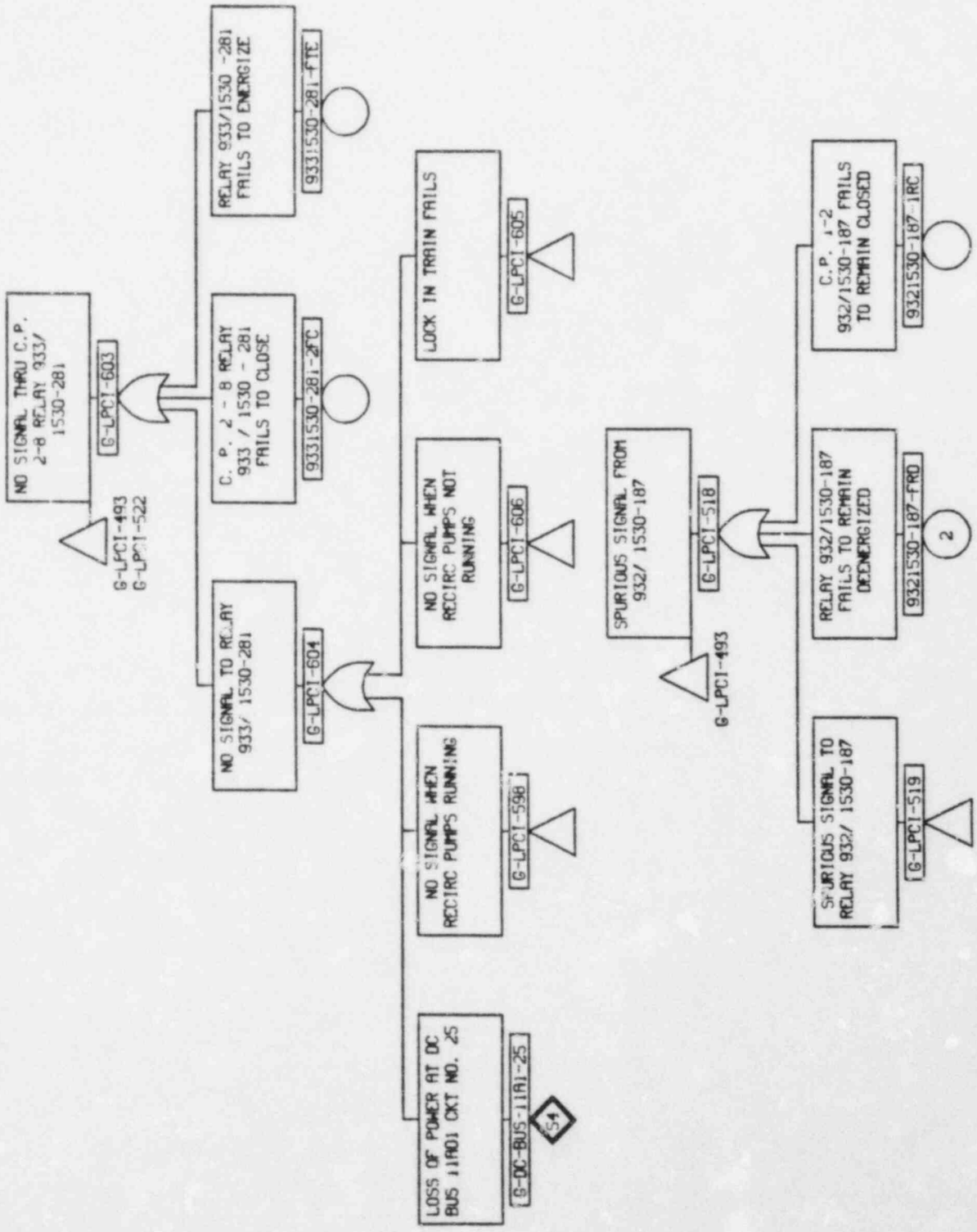

INADVERTANT SIGNAL FROM RELAY 932/ 1530-188
G-LPCI-516
G-LPCI-481
G-LPCI-487
ERRONEOUS SIGNAL TO RELAY 932/ 1530-188
G-LPCI-517
RELAY 932/1530-188 FAILS TO REMAIN DEENERGIZED
9321530-188-FRD
C.P. 3-7 932/1530-188 FAILS TO REMAIN CLOSED
9321530-188-3RC
SPURIOUS SIGNAL TO RELAY 932/ 1530-187
G-LPCI-519
RELAY 932/1530-187 FAILS TO REMAIN DEENERGIZED
9321530-187-FRD
2
C.P. 13-14 RELAY 932/1530 -187 FAILS TO REMAIN OPEN
9321530-187-DRO
INADVERTANT SIGNAL FROM RELAY 933/ 1530-287
G-LPCI-525
G-LPCI-481
RELAY 933/1530-287 FAILS TO REMAIN DEENERGIZED
9331530-287-FRD
2
C.P. 1-2 933/1530-287 FAILS TO REMAIN CLOSED
9331530-287-1RC
SPURIOUS SIGNAL TO RELAY 932/ 1530-287
G-LPCI-526

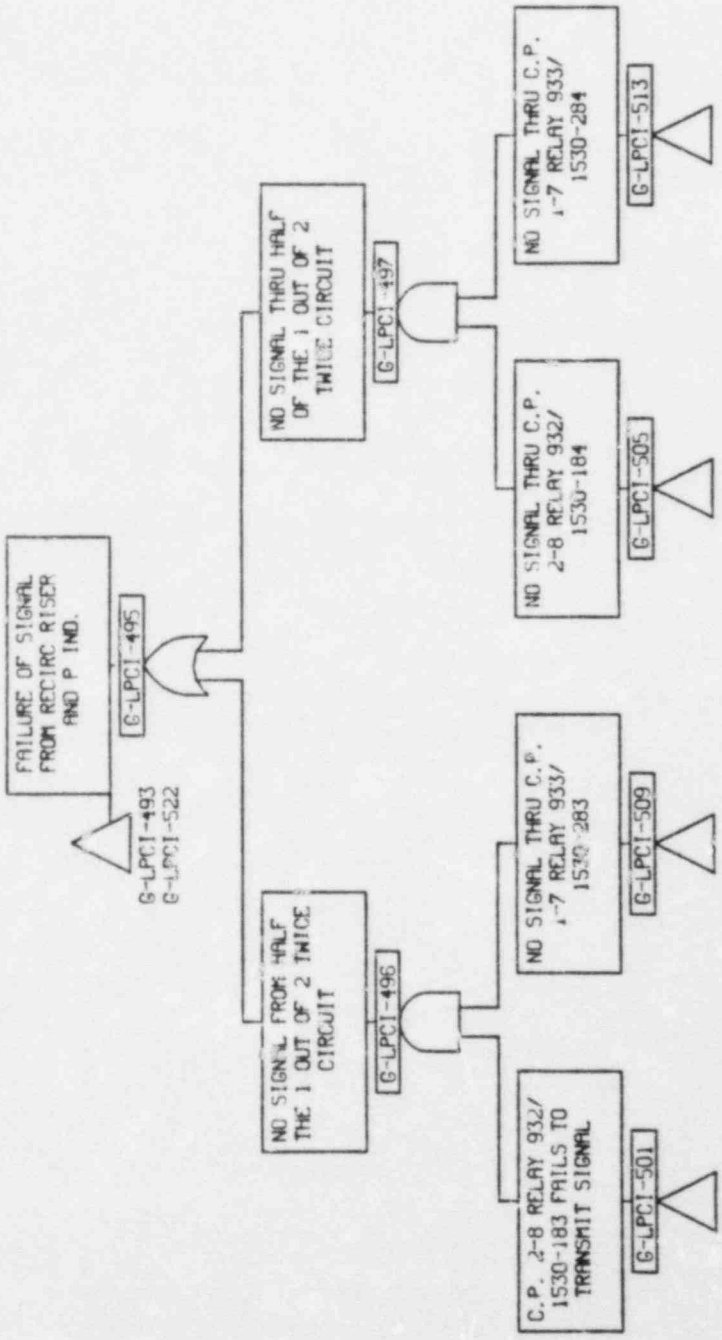

NO SIGNAL THRU HALF OF 1 OUT OF 2 TWICE CIRCUIT
G-LPCI-484
G-LPCI-484
C.P. 1-7 RELAY 932/ 1530-183 FAILS TO TRANSMIT SIGNAL
G-LPCI-500
C.P. 1-8 RELAY 933/ 1530-283 FAILS TO TRANSMIT SIGNAL
G-LPCI-508
C.P. 1 - 7 RELAY 932 / 1530 - 183 FAILS TO CLOSE
RELAY 932/1530 - 183 FAILS TO ENERGIZE
C.P. 2 - 8 RELAY 933 / 1530 - 283 FAILS TO CLOSE
RELAY 933/1530 -283 FAILS TO ENERGIZE
9321530-183-FFE
9321530-183-FFC
9331530-283-FFE
9331530-283-FFC
2
2
2
2
NO SIGNAL TO RELAY 932/ 1530-183
G-LPCI-502
NO SIGNAL TO RELAY 933/ 1530-283
G-LPCI-510
NO SIGNAL TO RELAY 933/ 1530-292
G-LPCI-496
G-LPCI-489
G-LPCI-829
C.P. 1-2 RELAY 933/ 1530-290 DOES NOT TRANSMIT SIGNAL
G-LPCI-491
C.P. 11-12 RELAY 933/ 1530-293 FAILS TO TRANSMIT SIGNAL
G-LPCI-492
LOSS OF POWER AT DC BUS 1A1001 CKT NO. 25
G-DC-BUS-1A1-25
C.P. 1 - 2 RELAY 933 / 1530 - 290 FAILS TO CLOSE
RELAY 933/1530 -290 FAILS TO ENERGIZE
C.P. 11 - 12 RELAY 933 / 1530 - 293 FAILS TO CLOSE
RELAY 933/1530 -293 FAILS TO ENERGIZE
9331530-290-FFC
9331530-290-FFE
9331530-293-FFC
9331530-293-FFE
2
2
1
1
NO SIGNAL TO RELAY 933/ 1530-290
G-LPCI-548
NO SIGNAL TO RELAY 933/ 1530-293
G-LPCI-493

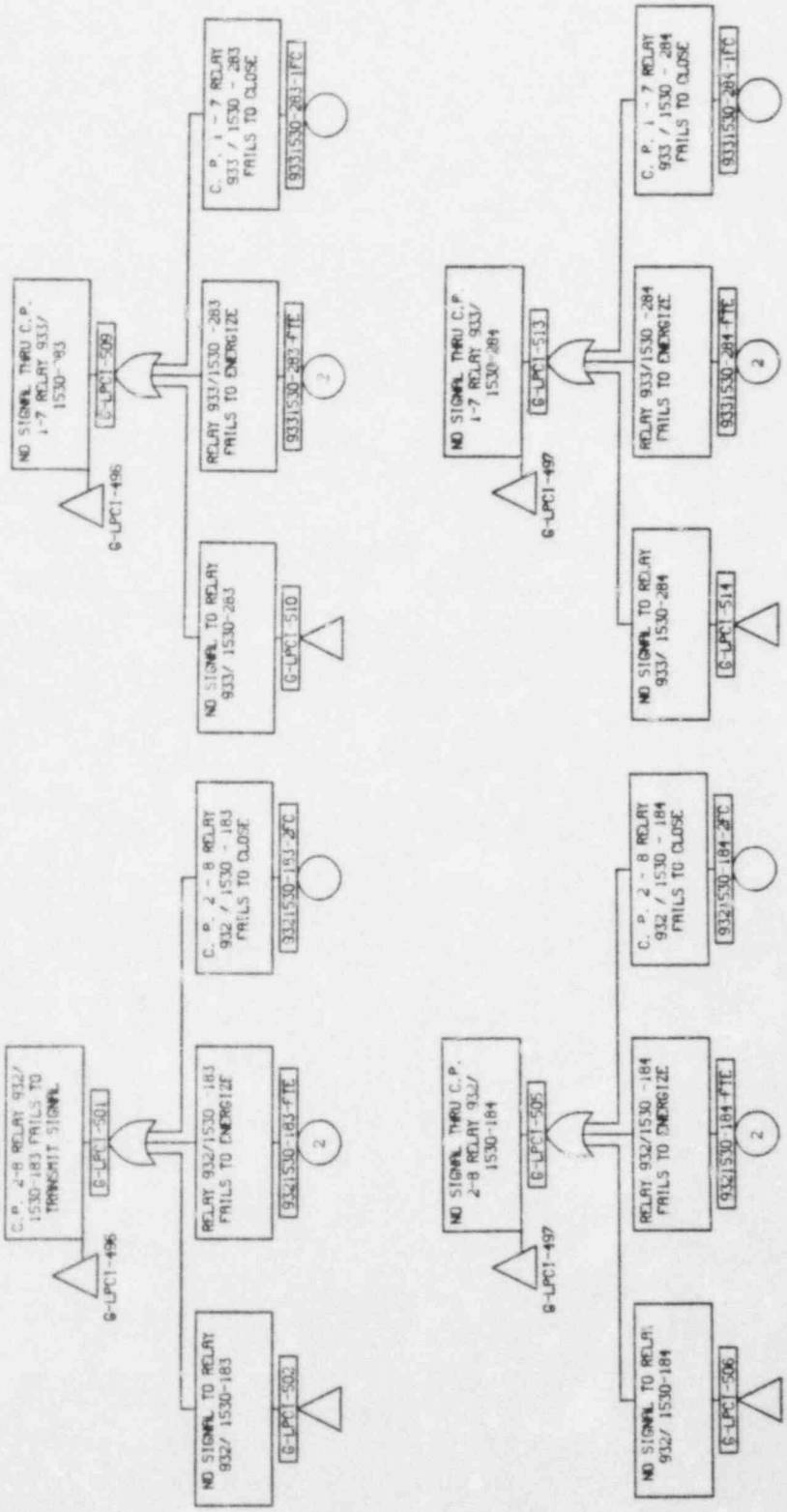

NO SIGNAL TO RELAY 933/ 1530-290
G-LPCI-548
G-LPCI-491
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL FROM C.P. 9-10 RELAY 933/ 1530-293
G-LPCI-549
NO SIGNAL FROM C.P. 3-7 RELAY 933/ 1530-297
G-LPCI-550
NO SIGNAL TO RELAY 933/ 1530-293
G-LPCI-493
RELAY 933/1530 -293 FAILS TO ENERGIZE
9331530-293-FTE
1
C. P. 9 - 10 RELAY 933 / 1530 - 293 FAILS TO CLOSE
9331530-293-9FC
INADVERTANT SIGNAL FROM RELAY 933/ 1530-288
G-LPCI-523
G-LPCI-493
G-LPCI-499
ERRONEOUS SIGNAL TO RELAY 933/ 1530-288
G-LPCI-524
RELAY 933/1530-288 FAILS TO REMAIN DEENERGIZED
9331530-288-FRD
C.P. 3-7 933/1530-288 FAILS TO REMAIN CLOSED
9331530-288-3RC
SPURIOUS SIGNAL TO RELAY 932/ 1530-287
G-LPCI-526
RELAY 933/1530-287 FAILS TO REMAIN DEENERGIZED
9331530-287-FRD
2
C.P. 13-14 RELAY 933/1530 -287 FAILS TO REMAIN OPEN
9331530-287-DRO

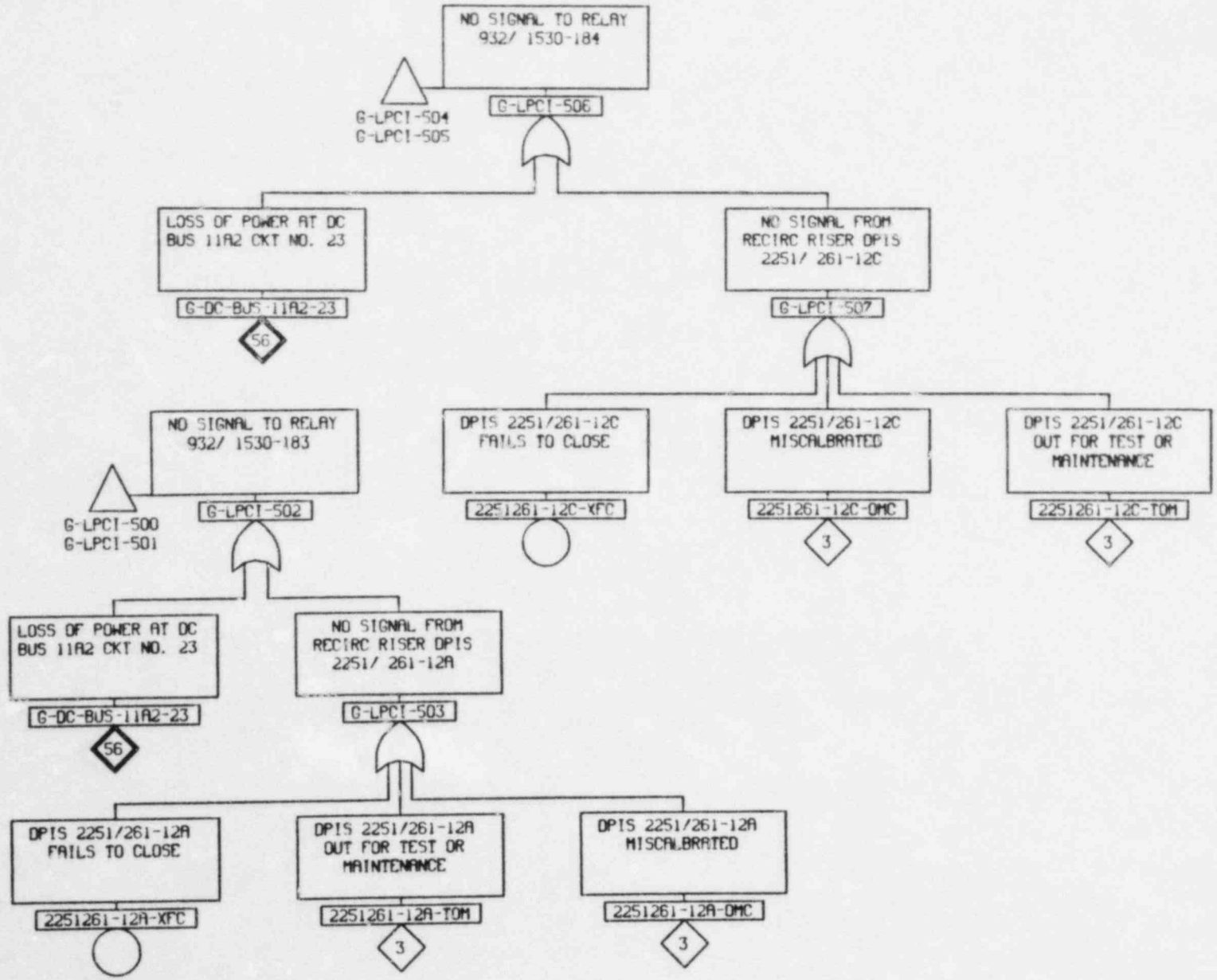

NO SIGNAL TO RELAY 933/ 1530-293
G-LPCI-493
G-LPCI-492
G-LPCI-549
G-LPCI-1073
G-LPCI-1105
INADVERTANT SIGNAL FROM RELAY 933/ 1530-288
G-LPCI-523
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-281
G-LPCI-603
SPURIOUS SIGNAL FROM 932/ 1530-187
G-LPCI-518
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
RELAY FAILS TO BE LOCKED IN
G-LPCI-494
NO SIGNAL THRU C.P. G-7 RELAY 933/ 1530-282
G-LPCI-596
FAILURE OF SIGNAL FROM RECIRC RISER AND P IND.
G-LPCI-495
RELAY 933/1530-219 FAILS TO REMAIN DEENERGIZED
9331530-219-FRD
C.P. 1-2 933/1530-219 FAILS TO REMAIN CLOSED
9331530-219-1RC

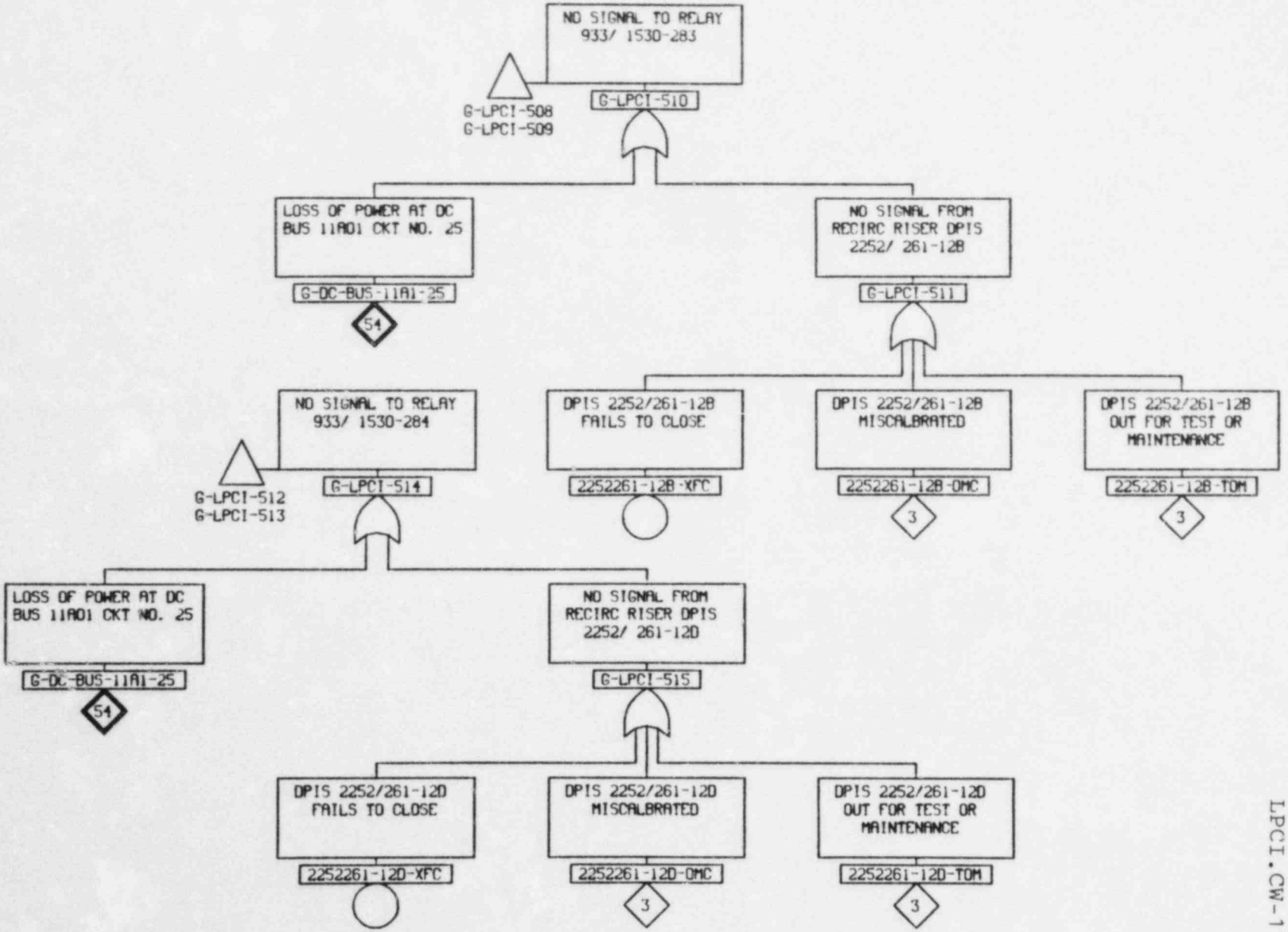

RELAY FAILS TO BE LOCKED IN
G-LPCI-493
G-LPCI-494
933/ 1530-285 LOCK IN CIRCUIT FAILS
G-LPCI-499
C. P. 1 - 2 RELAY 933 / 1530 - 285 FAILS TO CLOSE
933/1530-285-1PC
RELAY 933/1530 -285 FAILS TO ENERGIZE
933/1530-285-FTE
2
INADVERTANT SIGNAL FROM RELAY 933/ 1530-288
G-LPCI-523
C. P. 7 - 8 RELAY 933 / 1530 - 293 FAILS TO CLOSE
933/1530-293-7PC
933/ 1530-293 LOCK IN CIRCUIT FAILS
G-LPCI-498
C.P. 1-2 933/1530-215 FAILS TO REMAIN CLOSED
933/1530-215-1PC
RELAY 933/1530-215 FAILS TO REMAIN DEENERGIZED
933/1530-215-FRD
6
NO SIGNAL THRU C.P. 6-7 RELAY 933/ 1530-282
G-LPCI-586
G-LPCI-493
G-LPCI-522
C. P. 6 - 7 RELAY 933 / 1530 -282 FAILS TO CLOSE
933/1530-282-6PC
RELAY 933/1530 -282 FAILS TO ENERGIZE
933/1530-282-FTE
3
NO SIGNAL WHEN REDIRC PUMPS NOT RUNNING
G-LPCI-601
C. P. 1 - 2 RELAY 933 / 1530 - 281 FAILS TO CLOSE
933/1530-281-1PC
3
NO SIGNAL 933/ 1530-282
G-LPCI-597
NO SIGNAL WHEN REDIRC PUMPS RUNNING
G-LPCI-598
C. P. 2 - 3 RELAY 933 / 1530 - 282 FAILS TO CLOSE
933/1530-282-2PC
RELAY 933/1530 -282 FAILS TO ENERGIZE
933/1530-282-FTE
3
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54

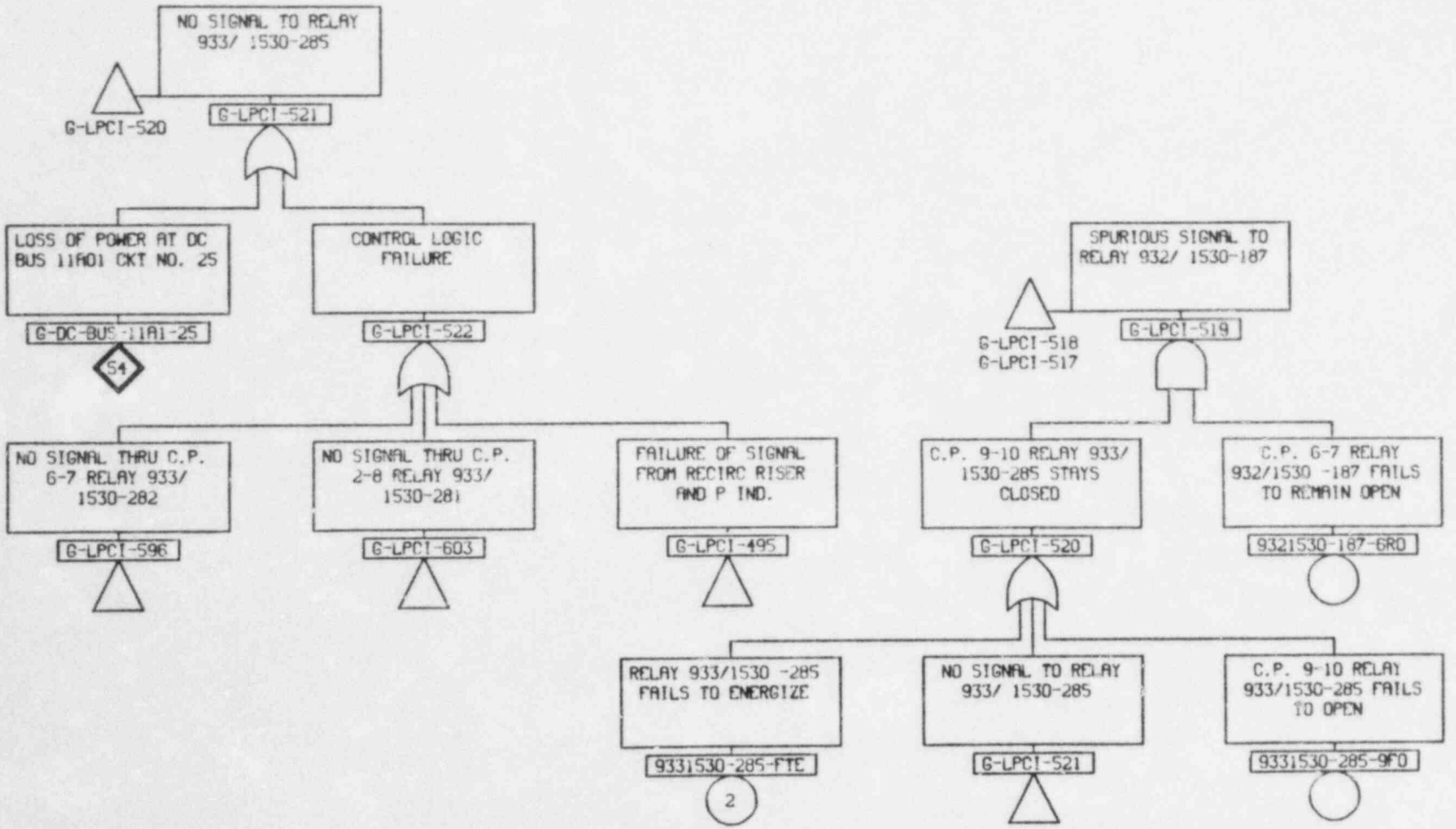

NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-281
G-LPCI-603
G-LPCI-493
G-LPCI-522
C. P. 2 - 8 RELAY 933 / 1530 - 281 FAILS TO CLOSE
9331530-281-2FC
RELAY 933/1530 -281 FAILS TO ENERGIZE
9331530-281-FTE
NO SIGNAL TO RELAY 933/ 1530-281
G-LPCI-604
NO SIGNAL WHEN RECIRC PUMPS NOT RUNNING
G-LPCI-606
LOCK IN TRAIN FAILS
G-LPCI-605
NO SIGNAL WHEN RECIRC PUMPS RUNNING
G-LPCI-598
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
S4
SPURIOUS SIGNAL FROM 932/ 1530-187
G-LPCI-493
G-LPCI-518
RELAY 932/1530-187 FAILS TO REMAIN DEENERGIZED
9321530-187-FRD
2
C.P. 1-2 932/1530-187 FAILS TO REMAIN CLOSED
9321530-187-1RC
SPURIOUS SIGNAL TO RELAY 932/ 1530-187
G-LPCI-519

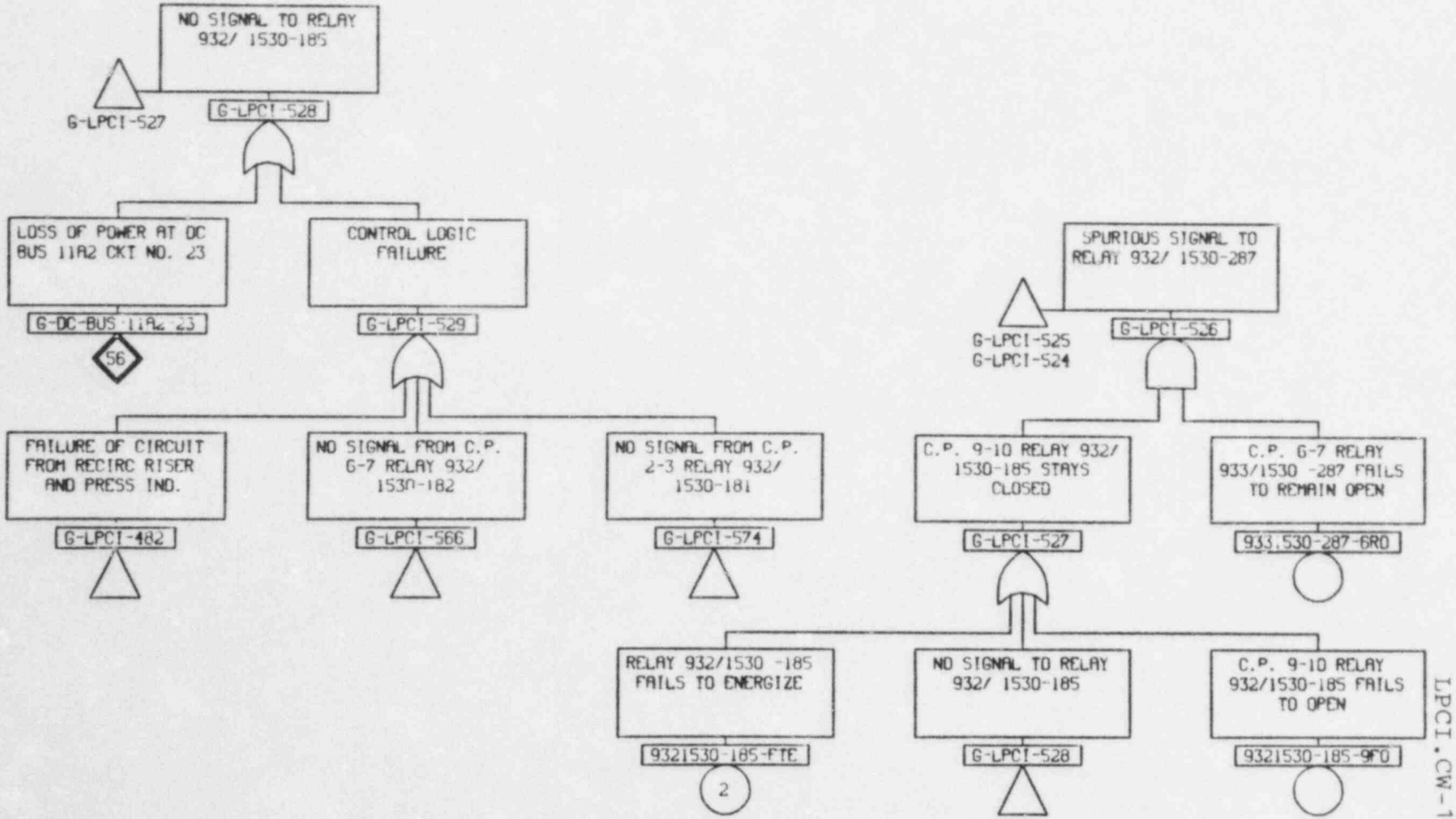

FAILURE OF SIGNAL FROM RECIRC RISER AND P IND.
G-LPCI-493
G-LPCI-522
G-LPCI-495
NO SIGNAL FROM HALF THE 1 OUT OF 2 TWICE CIRCUIT
G-LPCI-496
NO SIGNAL THRU HALF OF THE 1 OUT OF 2 TWICE CIRCUIT
G-LPCI-497
C.P. 2-8 RELAY 932/ 1530-183 FAILS TO TRANSMIT SIGNAL
G-LPCI-501
NO SIGNAL THRU C.P. 1-7 RELAY 933/ 1530-283
G-LPCI-509
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-184
G-LPCI-505
NO SIGNAL THRU C.P. 1-7 RELAY 933/ 1530-284
G-LPCI-513

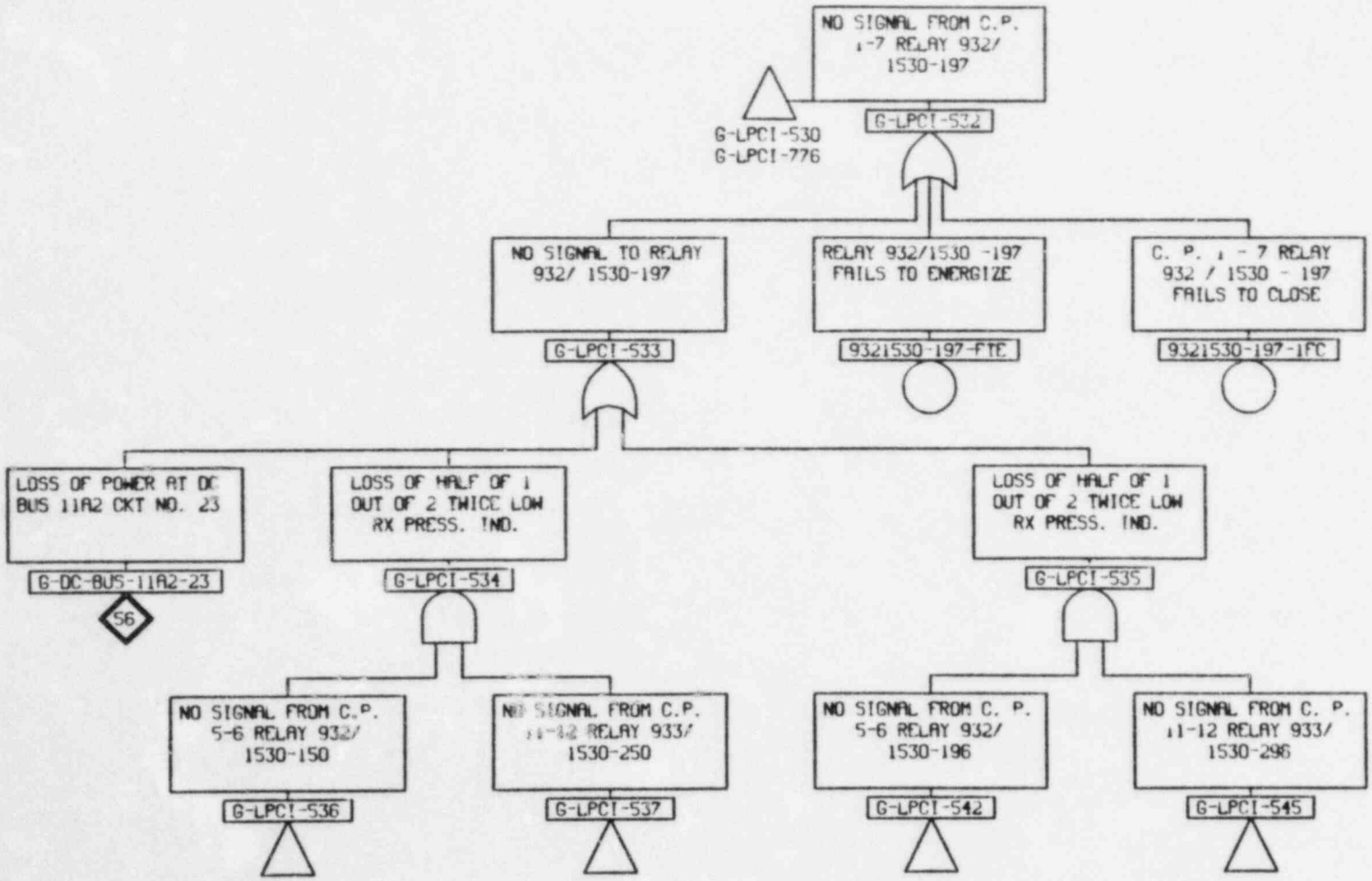

C. P. 4-8 RELAY 932/ 1530-183 FAILS TO TRANSMIT SIGNAL
G-LPCI-501
G-LPCI-496
RELAY 932/1530-183 FAILS TO ENERGIZE
932/1530-183-FTE
2
C. P. 2 - 8 RELAY 932 / 1530 - 183 FAILS TO CLOSE
932/1530-183-FTC
NO SIGNAL TO RELAY 932/ 1530-183
G-LPCI-502
NO SIGNAL THRU C.P. 1-7 RELAY 933/ 1530-183
G-LPCI-509
G-LPCI-496
RELAY 933/1530-283 FAILS TO ENERGIZE
933/1530-283-FTE
2
C. P. 1 - 7 RELAY 933 / 1530 - 283 FAILS TO CLOSE
933/1530-283-FTC
NO SIGNAL TO RELAY 933/ 1530-283
G-LPCI-510
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-184
G-LPCI-505
G-LPCI-497
RELAY 932/1530-184 FAILS TO ENERGIZE
932/1530-184-FTE
2
C. P. 2 - 8 RELAY 932 / 1530 - 184 FAILS TO CLOSE
932/1530-184-FTC
NO SIGNAL TO RELAY 932/ 1530-184
G-LPCI-506
NO SIGNAL THRU C.P. 1-7 RELAY 933/ 1530-284
G-LPCI-513
G-LPCI-497
RELAY 933/1530-284 FAILS TO ENERGIZE
933/1530-284-FTE
2
C. P. 1 - 7 RELAY 933 / 1530 - 284 FAILS TO CLOSE
933/1530-284-FTC
NO SIGNAL TO RELAY 933/ 1530-284
G-LPCI-514

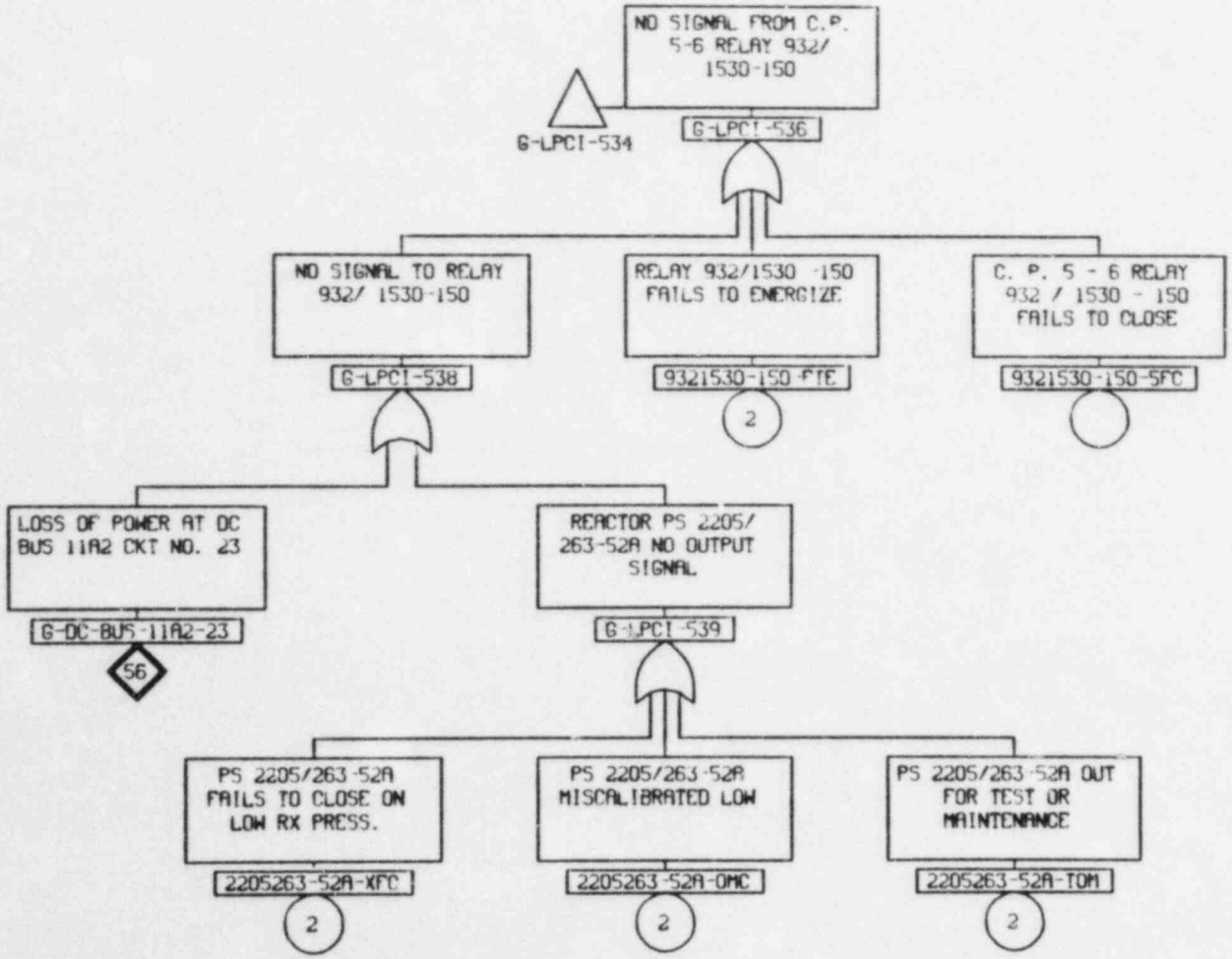

NO SIGNAL TO RELAY
932/ 1530-184
G-LPCI-504
G-LPCI-505
G-LPCI-506
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM
RECIRC RISER DPIS
2251/ 261-12C
G-LPCI-507
NO SIGNAL TO RELAY
932/ 1530-183
G-LPCI-500
G-LPCI-501
G-LPCI-502
DPIS 2251/261-12C
FAILS TO CLOSE
2251261-12C-XFC
DPIS 2251/261-12C
MISCALBRATED
2251261-12C-OMC
3
DPIS 2251/261-12C
OUT FOR TEST OR
MAINTENANCE
2251261-12C-TOM
3
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM
RECIRC RISER DPIS
2251/ 261-12A
G-LPCI-503
DPIS 2251/261-12A
FAILS TO CLOSE
2251261-12A-XFC
DPIS 2251/261-12A
OUT FOR TEST OR
MAINTENANCE
2251261-12A-TOM
3
DPIS 2251/261-12A
MISCALBRATED
2251261-12A-OMC
3

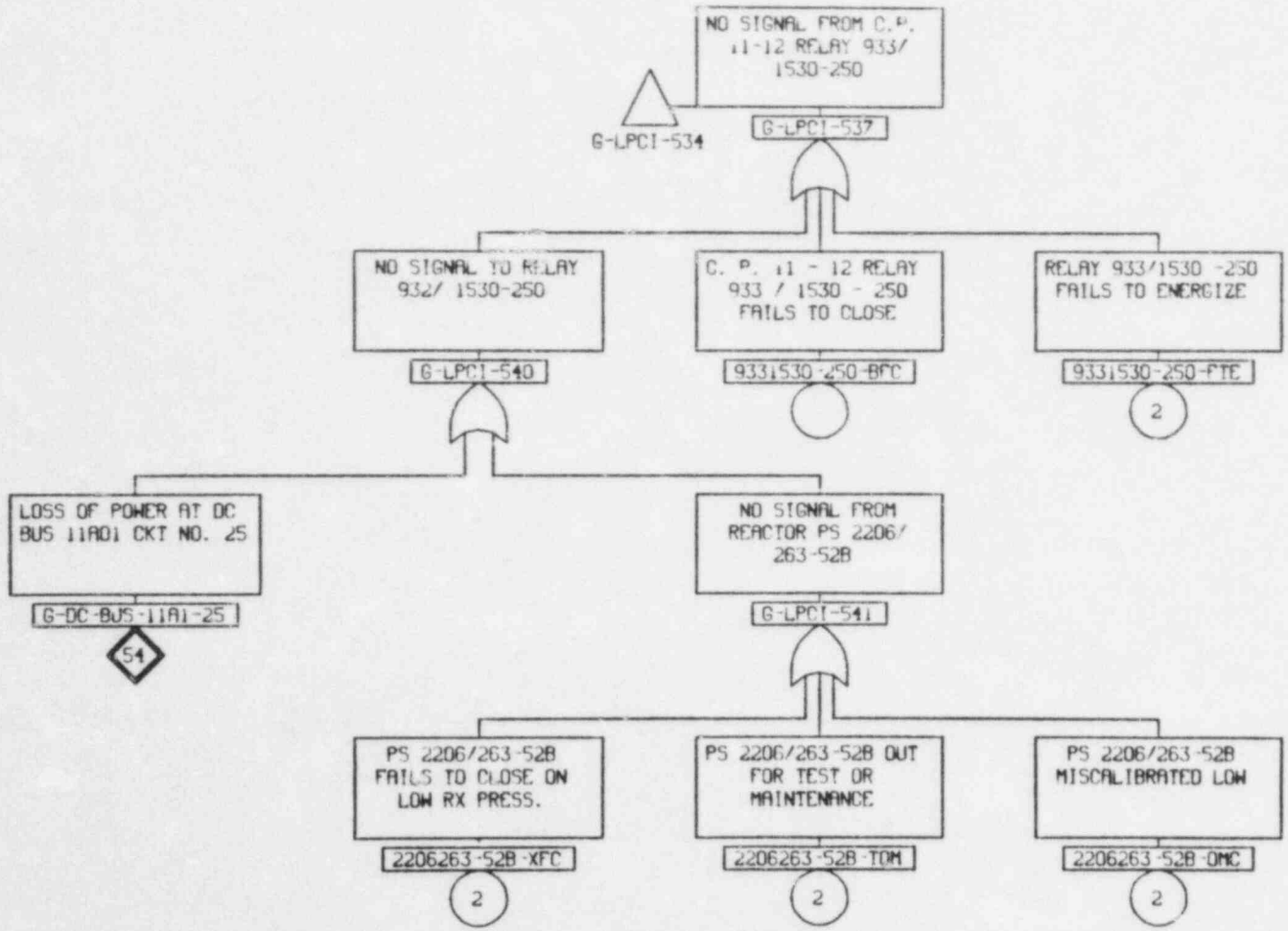

NO SIGNAL TO RELAY
933/ 1530-283
G-LPCI-508
G-LPCI-509
G-LPCI-510
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL FROM
RECIRC RISER DPIS
2252/ 261-12B
G-LPCI-511
NO SIGNAL TO RELAY
933/ 1530-284
G-LPCI-512
G-LPCI-513
G-LPCI-514
DPIS 2252/261-12B
FAILS TO CLOSE
2252261-12B-XFC
DPIS 2252/261-12B
MISCALBRATED
2252261-12B-OMC
3
DPIS 2252/261-12B
OUT FOR TEST OR
MAINTENANCE
2252261-12B-TOM
3
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL FROM
RECIRC RISER DPIS
2252/ 261-12D
G-LPCI-515
DPIS 2252/261-12D
FAILS TO CLOSE
2252261-12D-XFC
DPIS 2252/261-12D
MISCALBRATED
2252261-12D-OMC
3
DPIS 2252/261-12D
OUT FOR TEST OR
MAINTENANCE
2252261-12D-TOM
3

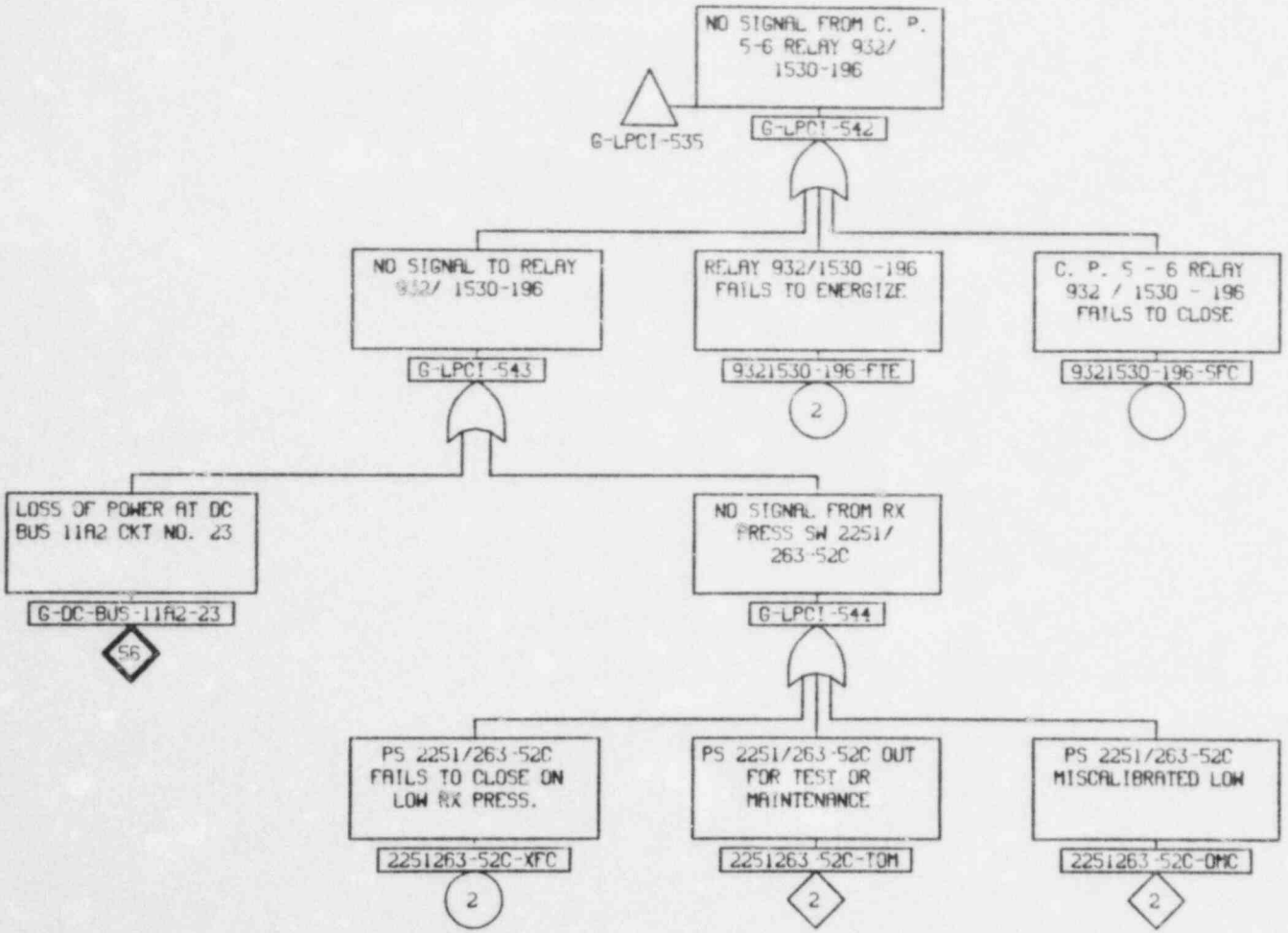

NO SIGNAL TO RELAY 933/ 1530-285
G-LPCI-520
G-LPCI-521
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
CONTROL LOGIC FAILURE
G-DC-BUS-11A1-25
G-LPCI-522
S4
NO SIGNAL THRU C.P. G-7 RELAY 933/ 1530-282
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-281
FAILURE OF SIGNAL FROM RECIRC RISER AND P IND.
G-LPCI-596
G-LPCI-603
G-LPCI-495
SPURIOUS SIGNAL TO RELAY 932/ 1530-187
G-LPCI-518
G-LPCI-517
G-LPCI-519
C.P. 9-10 RELAY 933/ 1530-285 STAYS CLOSED
C.P. G-7 RELAY 932/1530 -187 FAILS TO REMAIN OPEN
G-LPCI-520
9321530-187-6RO
RELAY 933/1530 -285 FAILS TO ENERGIZE
NO SIGNAL TO RELAY 933/ 1530-285
C.P. 9-10 RELAY 933/1530-285 FAILS TO OPEN
9331530-285-FTE
G-LPCI-521
9331530-285-9F0
2

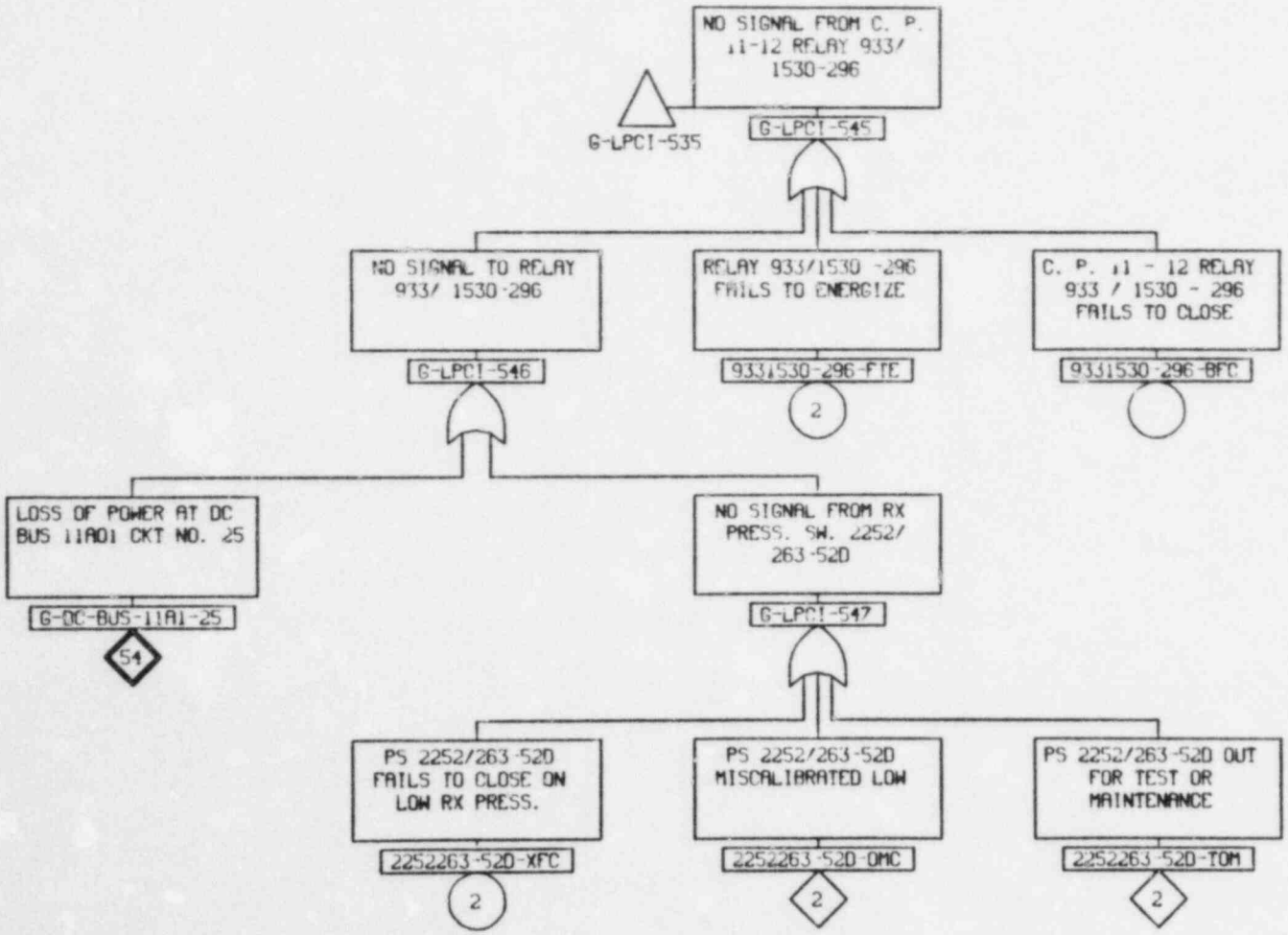

NO SIGNAL TO RELAY 932/ 1530-185
G-LPCI-527
G-LPCI-528
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
CONTROL LOGIC FAILURE
G-LPCI-529
FAILURE OF CIRCUIT FROM RECIRC RISER AND PRESS IND.
G-LPCI-482
NO SIGNAL FROM C.P. G-7 RELAY 932/ 1530-182
G-LPCI-566
NO SIGNAL FROM C.P. 2-3 RELAY 932/ 1530-181
G-LPCI-574
SPURIOUS SIGNAL TO RELAY 932/ 1530-287
G-LPCI-525
G-LPCI-524
G-LPCI-526
C.P. 9-10 RELAY 932/ 1530-185 STAYS CLOSED
G-LPCI-527
C.P. G-7 RELAY 933/1530 -287 FAILS TO REMAIN OPEN
933.530-287-6R0
RELAY 932/1530 -185 FAILS TO ENERGIZE
9321530-185-FTE
2
NO SIGNAL TO RELAY 932/ 1530-185
G-LPCI-528
C.P. 9-10 RELAY 932/1530-185 FAILS TO OPEN
9321530-185-9F0

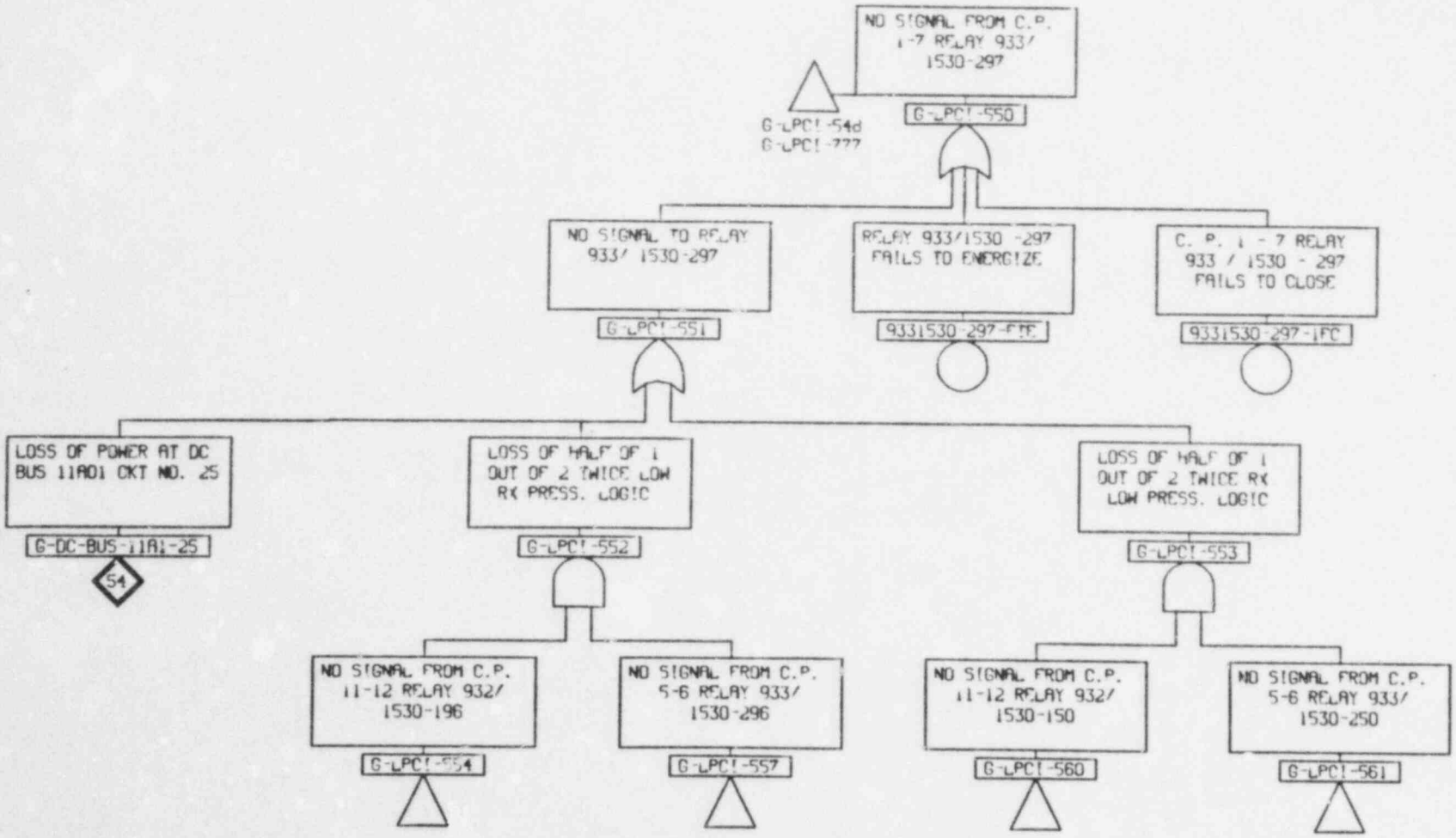

NO SIGNAL FROM C.P.
1-7 RELAY 932/
1530-197
G-LPCI-532
G-LPCI-530
G-LPCI-776
NO SIGNAL TO RELAY
932/ 1530-197
G-LPCI-533
RELAY 932/1530 -197
FAILS TO ENERGIZE
9321530-197-FTE
C. P. 1 - 7 RELAY
932 / 1530 - 197
FAILS TO CLOSE
9321530-197-FTC
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
S6
LOSS OF HALF OF 1
OUT OF 2 TWICE LOW
RX PRESS. IND.
G-LPCI-534
LOSS OF HALF OF 1
OUT OF 2 TWICE LOW
RX PRESS. IND.
G-LPCI-535
NO SIGNAL FROM C.P.
5-6 RELAY 932/
1530-150
G-LPCI-536
NO SIGNAL FROM C.P.
11-12 RELAY 933/
1530-250
G-LPCI-537
NO SIGNAL FROM C. P.
5-6 RELAY 932/
1530-196
G-LPCI-542
NO SIGNAL FROM C. P.
11-12 RELAY 933/
1530-296
G-LPCI-545

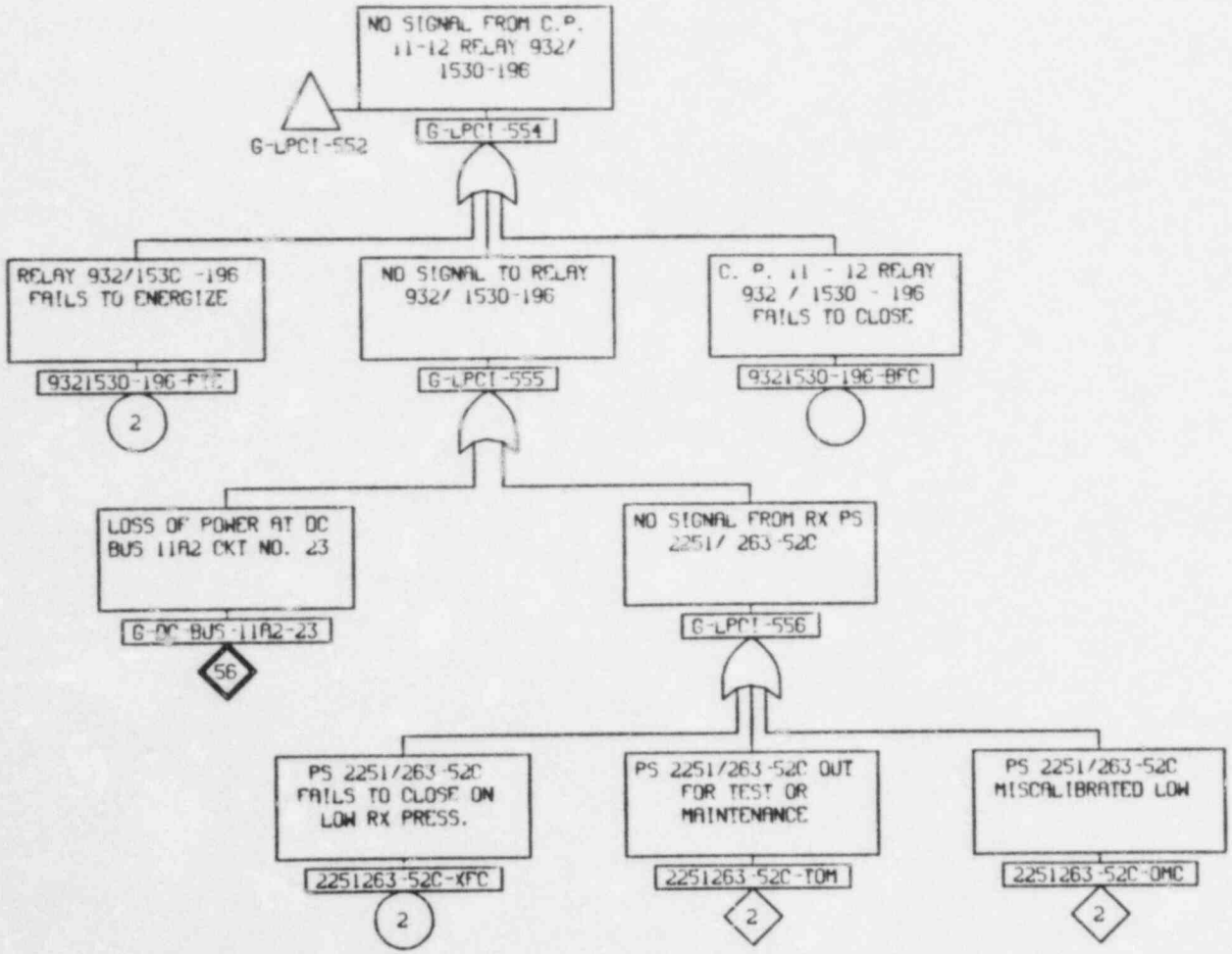

NO SIGNAL FROM C.P. 5-6 RELAY 932/ 1530-150
G-LPCI-534
G-LPCI-536
NO SIGNAL TO RELAY 932/ 1530-150
RELAY 932/1530 -150 FAILS TO ENERGIZE
C. P. 5 - 6 RELAY 932 / 1530 - 150 FAILS TO CLOSE
G-LPCI-538
9321530-150-FTE
9321530-150-SFC
2
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
REACTOR PS 2205/ 263-52A NO OUTPUT SIGNAL
G-DC-BUS-11A2-23
G-LPCI-539
56
PS 2205/263-52A FAILS TO CLOSE ON LOW RX PRESS.
PS 2205/263-52A MISCALIBRATED LOW
PS 2205/263-52A OUT FOR TEST OR MAINTENANCE
2205263-52A-XFC
2205263-52A-OMC
2205263-52A-TOM
2
2
2

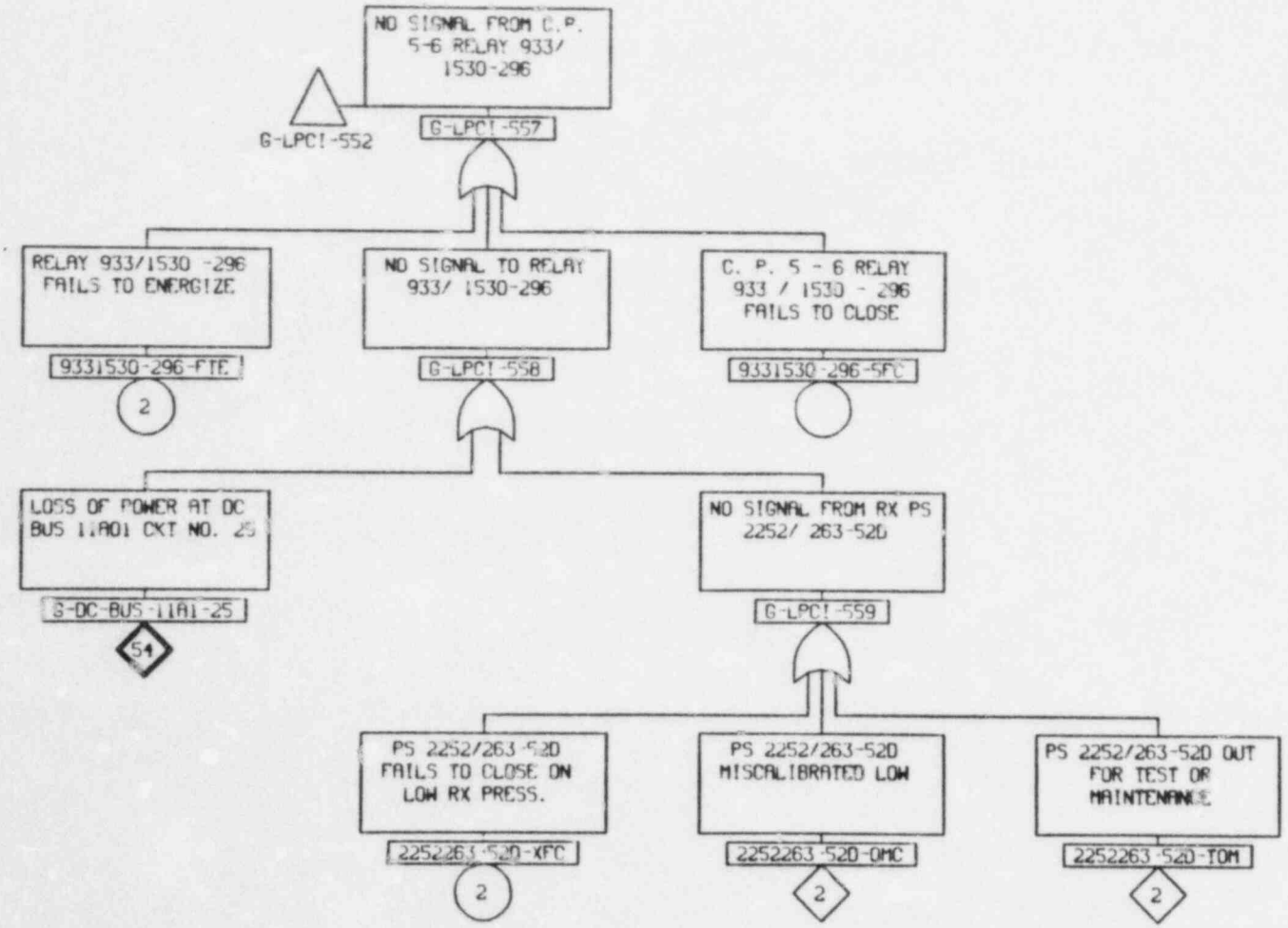

NO SIGNAL FROM C.P. 11-12 RELAY 933/ 1530-250
G-LPCI-534
G-LPCI-537
NO SIGNAL TO RELAY 932/ 1530-250
G-LPCI-540
C. P. 11 - 12 RELAY 933 / 1530 - 250 FAILS TO CLOSE
9331530-250-BFC
RELAY 933/1530 -250 FAILS TO ENERGIZE
9331530-250-FTE
2
LOSS OF POWER AT DC BUS 11AD1 CKT NO. 25
G-DC-BUS-11A1-25
51
NO SIGNAL FROM REACTOR PS 2206/ 263-52B
G-LPCI-541
PS 2206/263-52B FAILS TO CLOSE ON LOW RX PRESS.
2206263-52B-XFC
2
PS 2206/263-52B OUT FOR TEST OR MAINTENANCE
2206263-52B-TOM
2
PS 2206/263-52B MISCALIBRATED LOW
2206263-52B-OMC
2

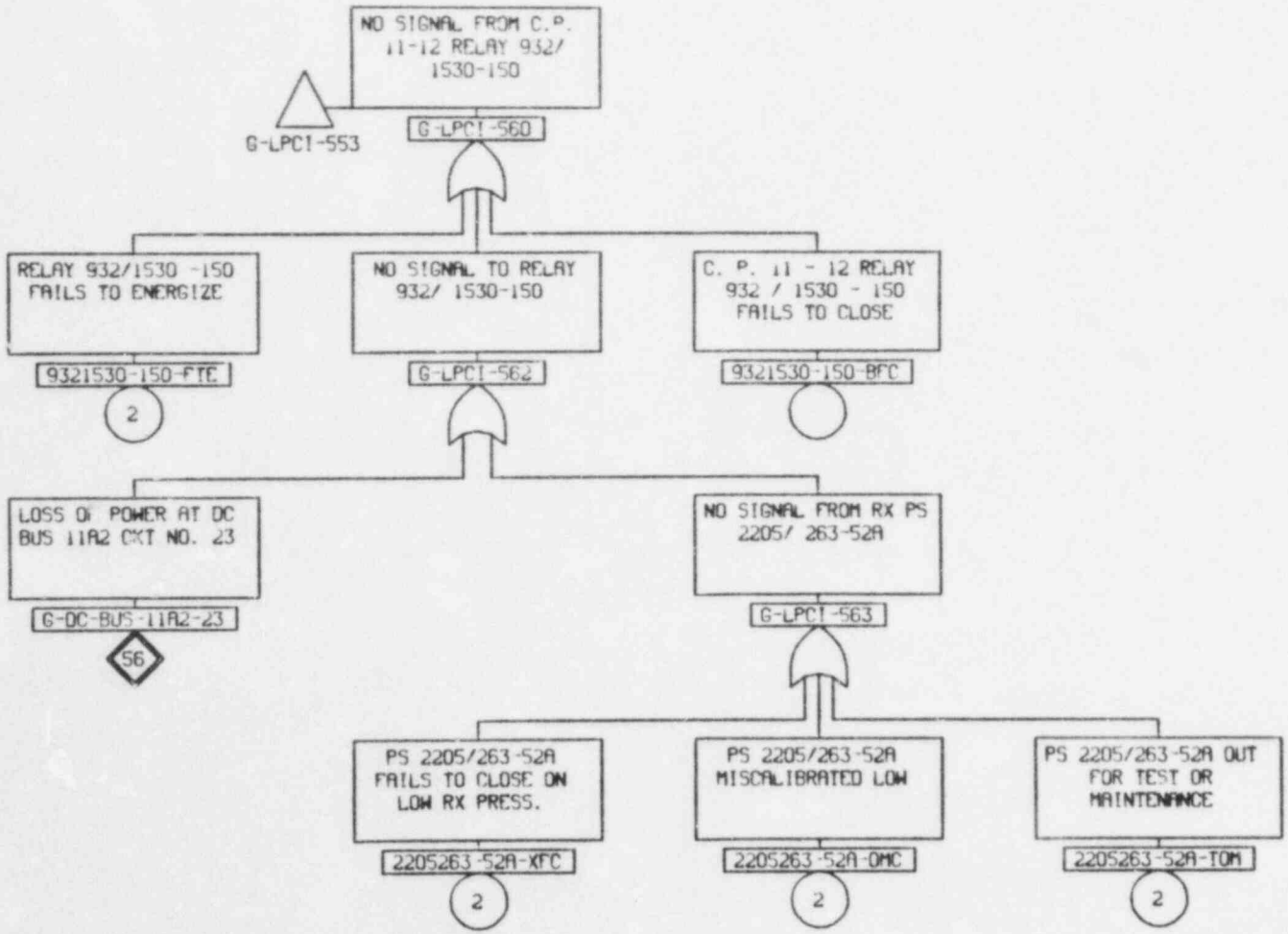

NO SIGNAL FROM C. P. 5-6 RELAY 932/ 1530-196
G-LPCI-542
G-LPCI-535
NO SIGNAL TO RELAY 932/ 1530-196
G-LPCI-543
RELAY 932/1530 -196 FAILS TO ENERGIZE
9321530-196-FTE
2
C. P. 5 - 6 RELAY 932 / 1530 - 196 FAILS TO CLOSE
9321530-196-SFC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM RX PRESS SW 2251/ 263-52C
G-LPCI-544
PS 2251/263-52C FAILS TO CLOSE ON LOW RX PRESS.
2251263-52C-XFC
2
PS 2251/263-52C OUT FOR TEST OR MAINTENANCE
2251263-52C-TOM
2
PS 2251/263-52C MISCALIBRATED LOW
2251263-52C-OMC
2

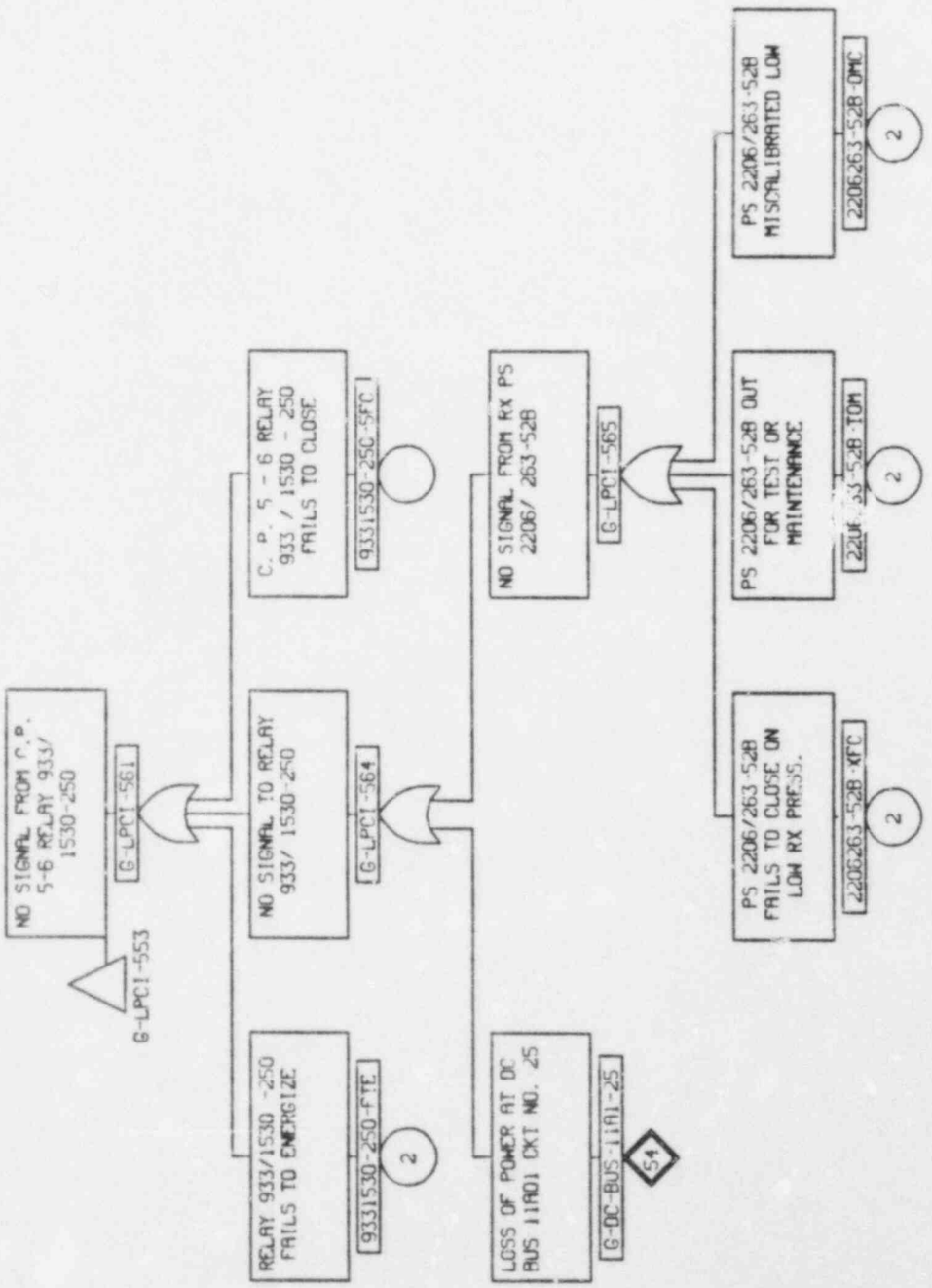

NO SIGNAL FROM C. P. 11-12 RELAY 933/ 1530-296
G-LPCI-545
G-LPCI-535
NO SIGNAL TO RELAY 933/ 1530-296
G-LPCI-546
RELAY 933/1530 -296 FAILS TO ENERGIZE
933/1530-296-FTE
2
C. P. 11 - 12 RELAY 933 / 1530 - 296 FAILS TO CLOSE
933/1530-296-BFC
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL FROM RX PRESS. SW. 2252/ 263-52D
G-LPCI-547
PS 2252/263-52D FAILS TO CLOSE ON LOW RX PRESS.
2252263-52D-XFC
2
PS 2252/263-52D MISCALIBRATED LOW
2252263-52D-OMC
2
PS 2252/263-52D OUT FOR TEST OR MAINTENANCE
2252263-52D-TOM
2

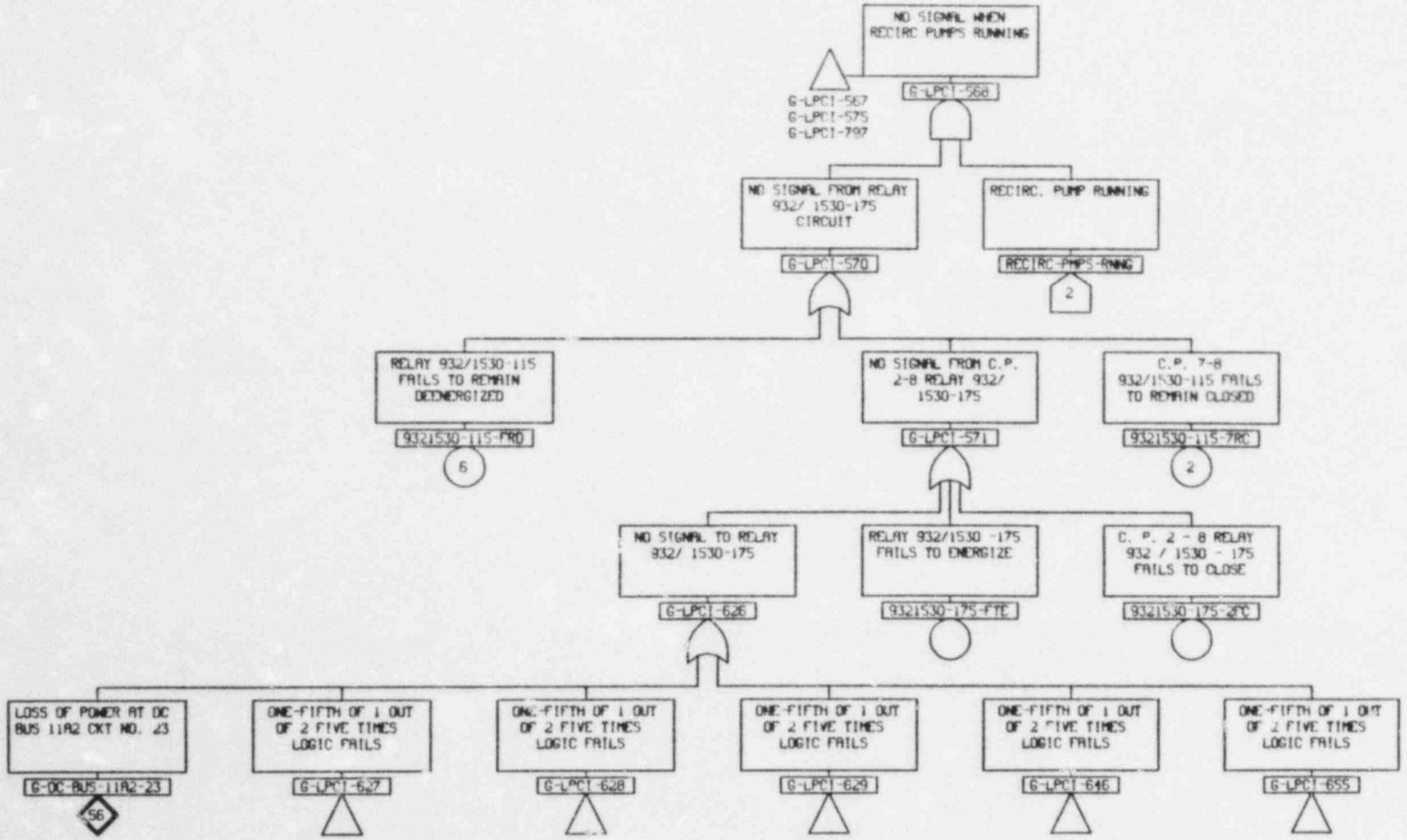

NO SIGNAL FROM C.P.
1-7 RELAY 933/
1530-297
G-LPCI-550
G-LPCI-54d
G-LPCI-777
NO SIGNAL TO RELAY
933/ 1530-297
G-LPCI-551
RELAY 933/1530 -297
FAILS TO ENERGIZE
9331530-297-FTE
C. P. 1 - 7 RELAY
933 / 1530 - 297
FAILS TO CLOSE
9331530-297-1FC
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
LOSS OF HALF OF 1
OUT OF 2 TWICE LOW
RX PRESS. LOGIC
G-LPCI-552
LOSS OF HALF OF 1
OUT OF 2 TWICE RX
LOW PRESS. LOGIC
G-LPCI-553
NO SIGNAL FROM C.P.
11-12 RELAY 932/
1530-196
G-LPCI-554
NO SIGNAL FROM C.P.
5-6 RELAY 933/
1530-296
G-LPCI-557
NO SIGNAL FROM C.P.
11-12 RELAY 932/
1530-150
G-LPCI-560
NO SIGNAL FROM C.P.
5-6 RELAY 933/
1530-250
G-LPCI-561

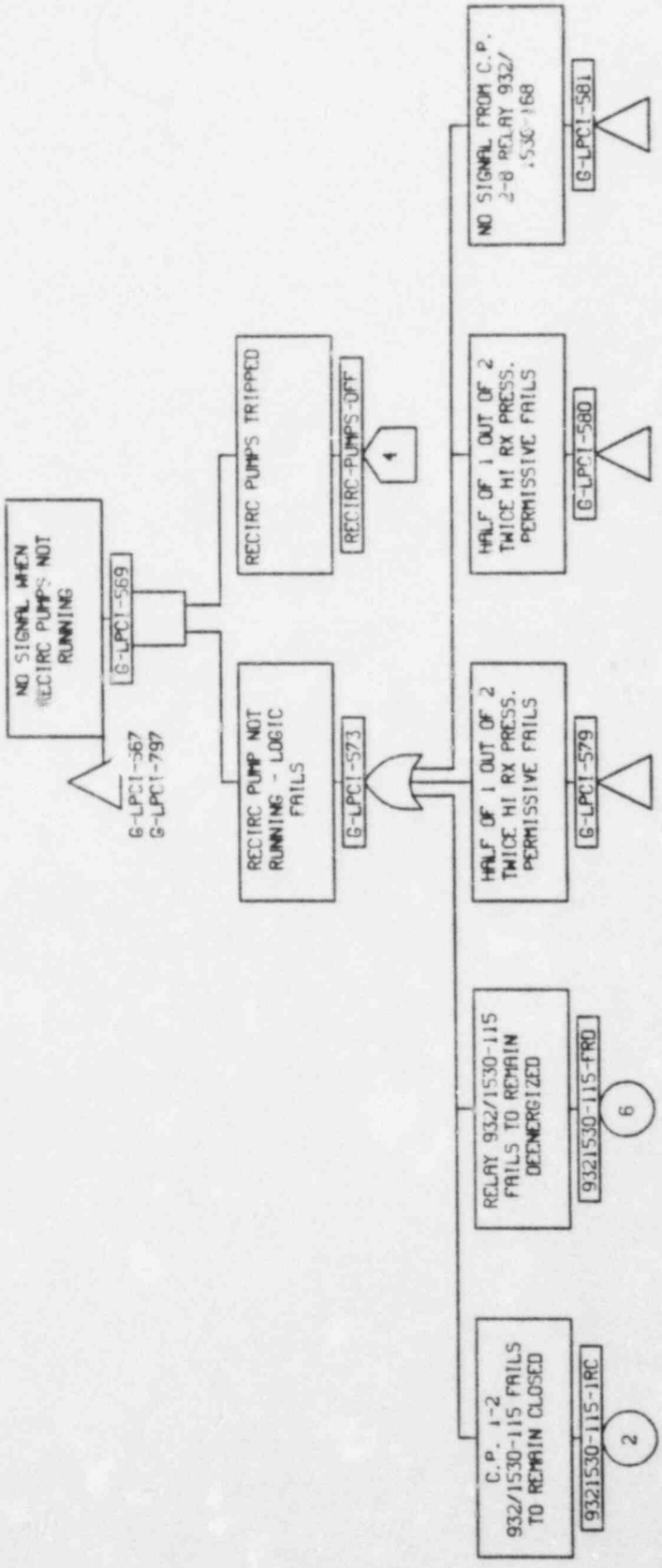

NO SIGNAL FROM C.P. 11-12 RELAY 932/ 1530-196
G-LPCI-552
G-LPCI-554
RELAY 932/153C -196 FAILS TO ENERGIZE
9321530-196-FTE
2
NO SIGNAL TO RELAY 932/ 1530-196
G-LPCI-555
C. P. 11 - 12 RELAY 932 / 1530 - 196 FAILS TO CLOSE
9321530-196-BFC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM RX PS 2251/ 263-52C
G-LPCI-556
PS 2251/263-52C FAILS TO CLOSE ON LOW RX PRESS.
2251263-52C-XFC
2
PS 2251/263-52C OUT FOR TEST OR MAINTENANCE
2251263-52C-TOM
2
PS 2251/263-52C MISCALIBRATED LOW
2251263-52C-OMC
2

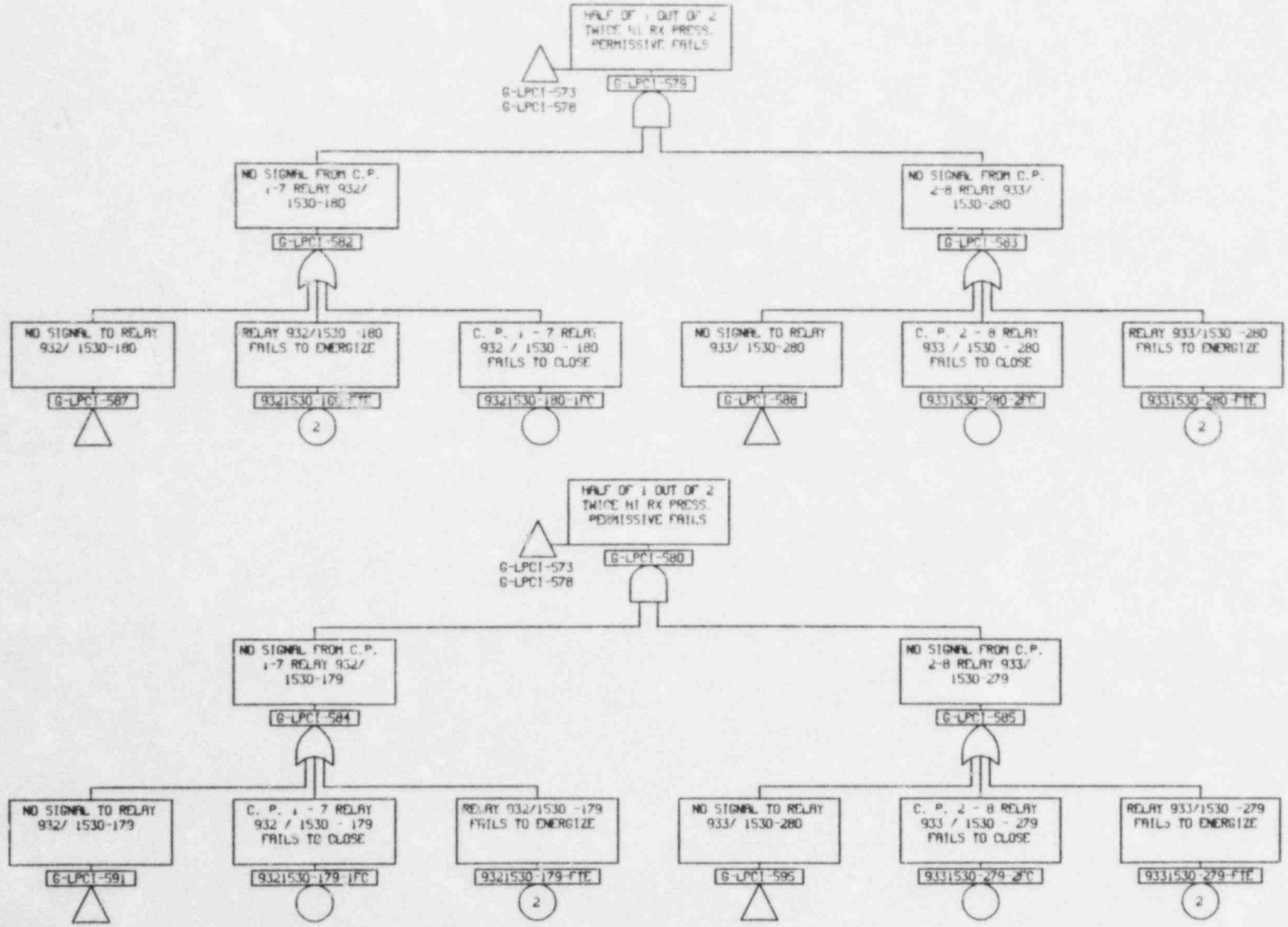

NO SIGNAL FROM C.P.
5-6 RELAY 933/
1530-296
G-LPCI-552
G-LPCI-557
RELAY 933/1530 -296
FAILS TO ENERGIZE
9331530-296-FTE
2
NO SIGNAL TO RELAY
933/ 1530-296
G-LPCI-558
C. P. 5 - 6 RELAY
933 / 1530 - 296
FAILS TO CLOSE
9331530-296-SFC
LOSS OF POWER AT DC
BUS 1A01 CKT NO. 25
G-DC-BUS-1A1-25
54
NO SIGNAL FROM RX PS
2252/ 263-52D
G-LPCI-559
PS 2252/263-52D
FAILS TO CLOSE ON
LOW RX PRESS.
2252263-52D-XFC
2
PS 2252/263-52D
MISCALIBRATED LOW
2252263-52D-OMC
2
PS 2252/263-52D OUT
FOR TEST OR
MAINTENANCE
2252263-52D-TOM
2

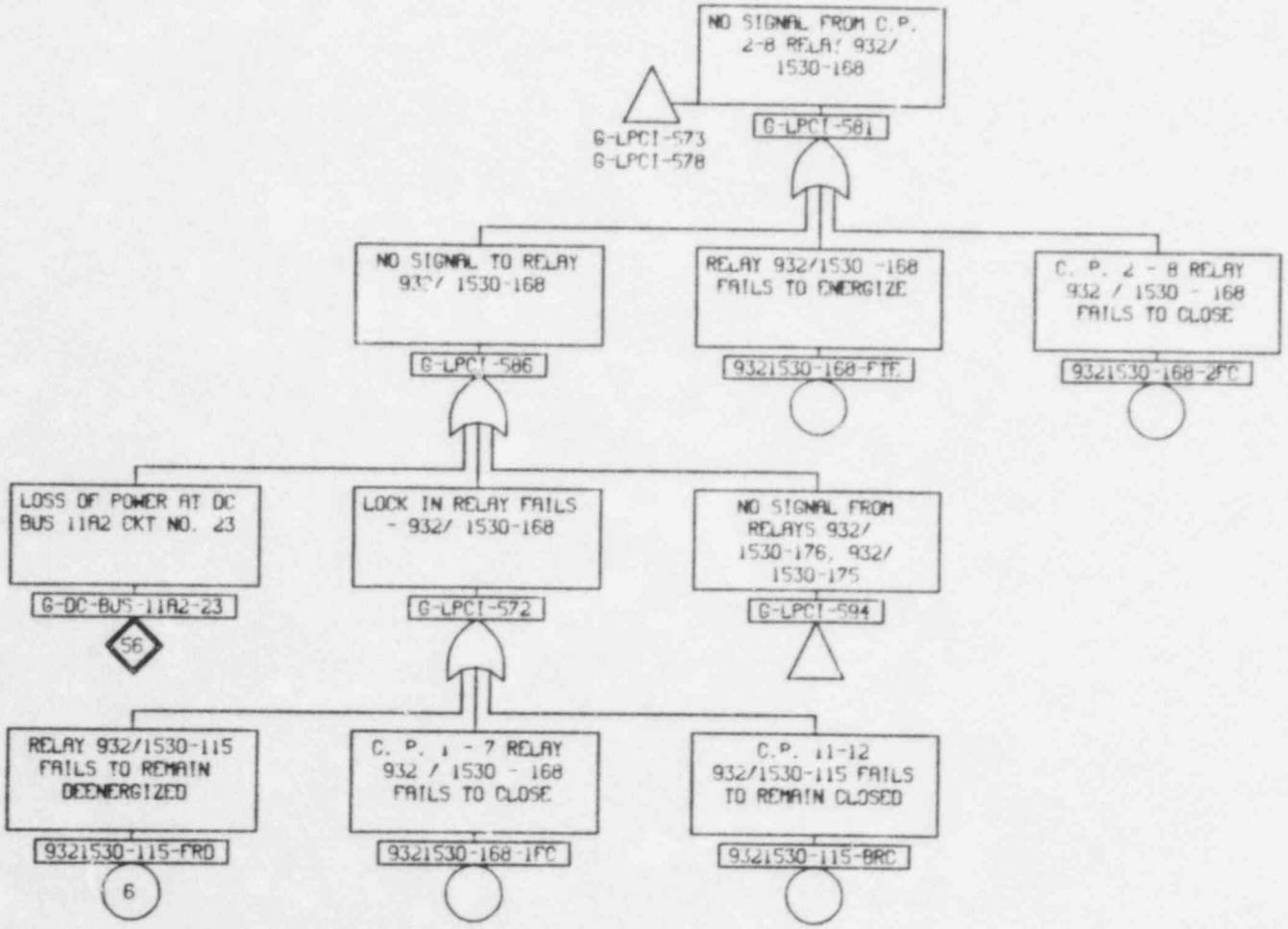

NO SIGNAL FROM C.P. 11-12 RELAY 932/ 1530-150
G-LPCI-553
G-LPCI-560
RELAY 932/1530 -150 FAILS TO ENERGIZE
9321530-150-FTE
2
NO SIGNAL TO RELAY 932/ 1530-150
G-LPCI-562
C. P. 11 - 12 RELAY 932 / 1530 - 150 FAILS TO CLOSE
9321530-150-BFC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM RX PS 2205/ 263-52A
G-LPCI-563
PS 2205/263-52A FAILS TO CLOSE ON LOW RX PRESS.
2205263-52A-XFC
2
PS 2205/263-52A MISCALIBRATED LOW
2205263-52A-OMC
2
PS 2205/263-52A OUT FOR TEST OR MAINTENANCE
2205263-52A-TOM
2

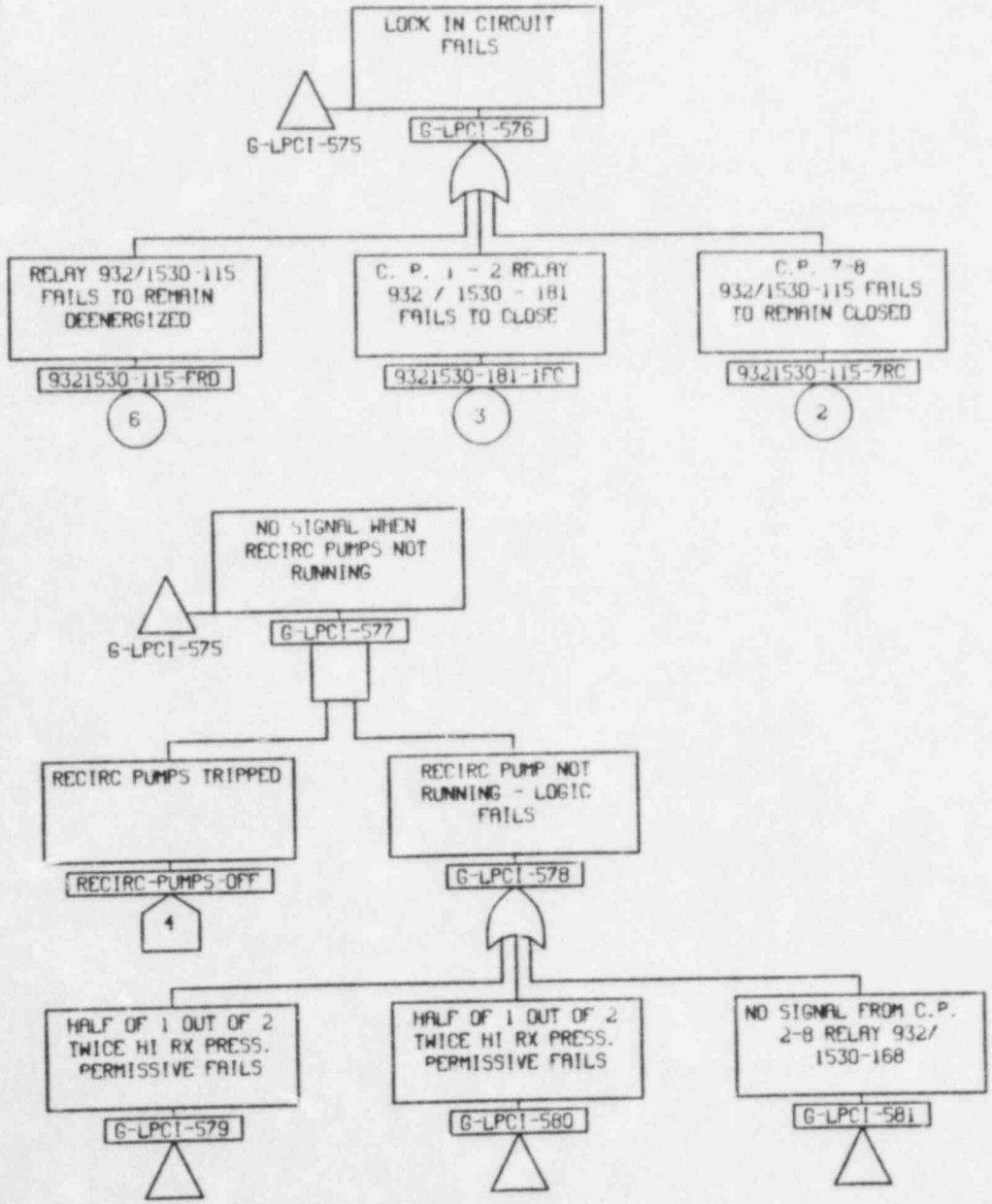

NO SIGNAL FROM C.P. 5-6 RELAY 933/ 1530-250
G-LPCI-561
G-LPCI-553
NO SIGNAL TO RELAY 933/ 1530-250
G-LPCI-564
C. P. 5 - 6 RELAY 933 / 1530 - 250 FAILS TO CLOSE
9331530-250-5FC
RELAY 933/1530 -250 FAILS TO ENERGIZE
9331530-250-FTE
2
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
51
NO SIGNAL FROM RX PS 2206/ 263-528
G-LPCI-565
PS 2206/263-528 FAILS TO CLOSE ON LOW RX PRESS.
2206263-528-XFC
2
PS 2206/263-528 OUT FOR TEST OR MAINTENANCE
220[illegible]-528-TOM
2
PS 2206/263-528 MISCALIBRATED LOW
2206263-528-OMC
2

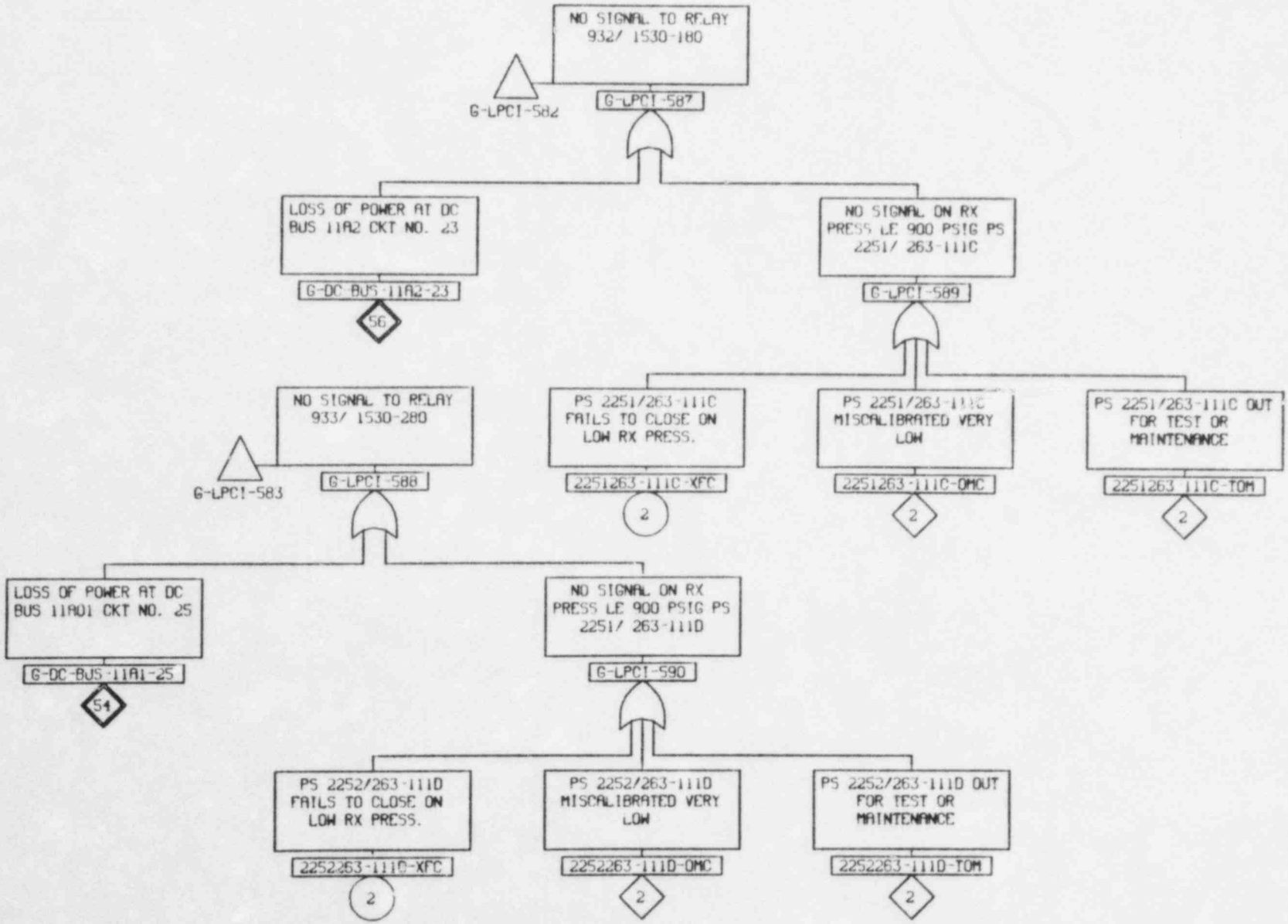

NO SIGNAL WHEN RECIRC PUMPS RUNNING
G-LPCI-568
G-LPCI-567
G-LPCI-575
G-LPCI-797
NO SIGNAL FROM RELAY 932/ 1530-175 CIRCUIT
G-LPCI-570
RECIRC. PUMP RUNNING
RECIRC-PMPS-RNNG
2
RELAY 932/1530-115 FAILS TO REMAIN DEENERGIZED
9321530-115-PRD
6
NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-175
G-LPCI-571
C.P. 7-8 932/1530-115 FAILS TO REMAIN CLOSED
9321530-115-7RC
2
NO SIGNAL TO RELAY 932/ 1530-175
G-LPCI-626
RELAY 932/1530 -175 FAILS TO ENERGIZE
9321530-175-FTE
C. P. 2 - 8 RELAY 932 / 1530 - 175 FAILS TO CLOSE
9321530-175-2CC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-627
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-628
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-629
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-646
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-655

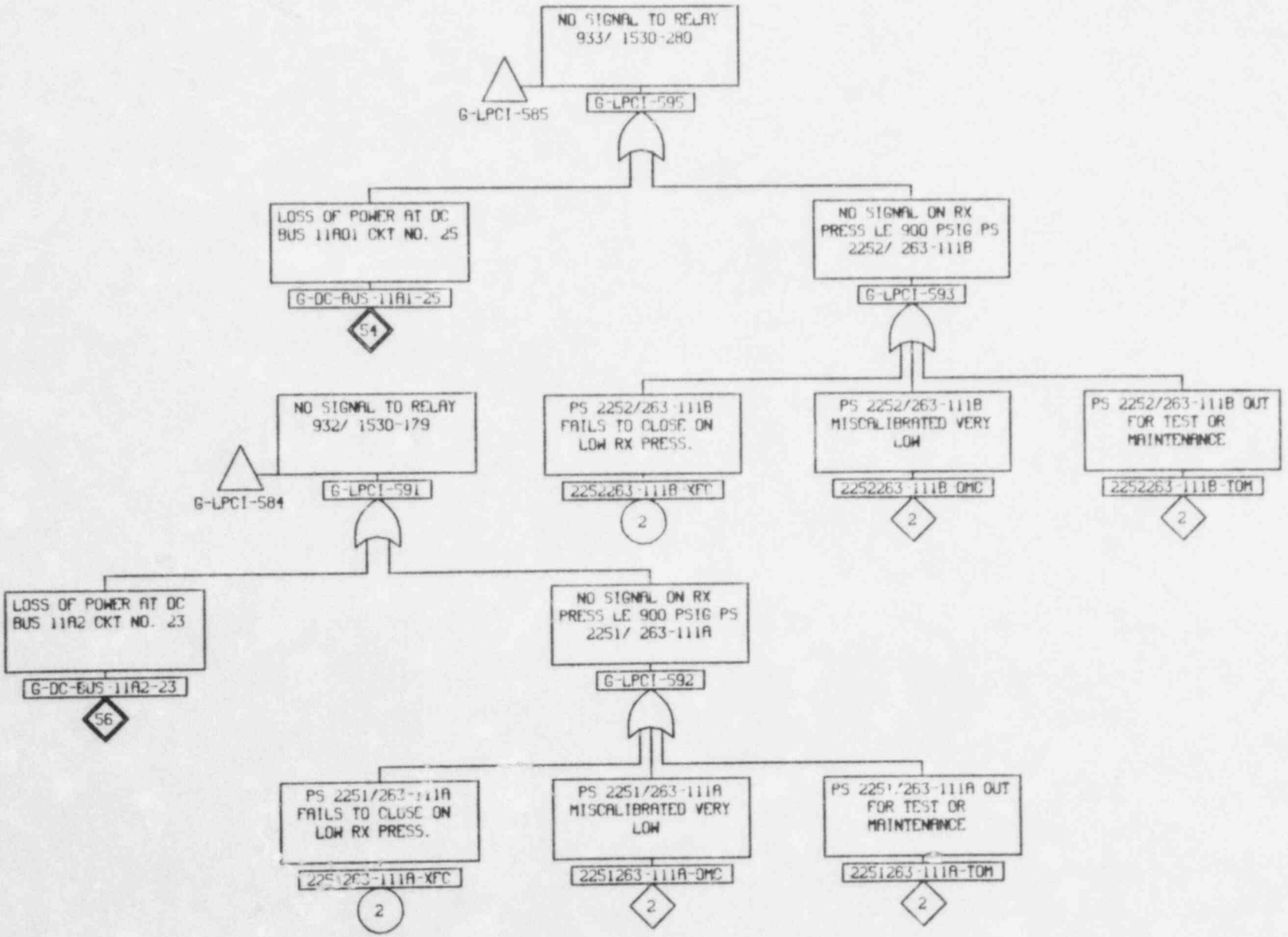

NO SIGNAL WHEN RECIRC PUMPS NOT RUNNING
G-LPCI-569
G-LPCI-367
G-LPCI-797
RECIRC PUMPS TRIPPED
RECIRC-PUMPS-OFF
4
RECIRC PUMP NOT RUNNING - LOGIC FAILS
G-LPCI-573
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE FAILS
G-LPCI-580
NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-168
G-LPCI-581
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE FAILS
G-LPCI-579
RELAY 932/1530-115 FAILS TO REMAIN DEENERGIZED
9321530-115-FRD
6
C.P. 1-2 932/1530-115 FAILS TO REMAIN CLOSED
9321530-115-IRC
2

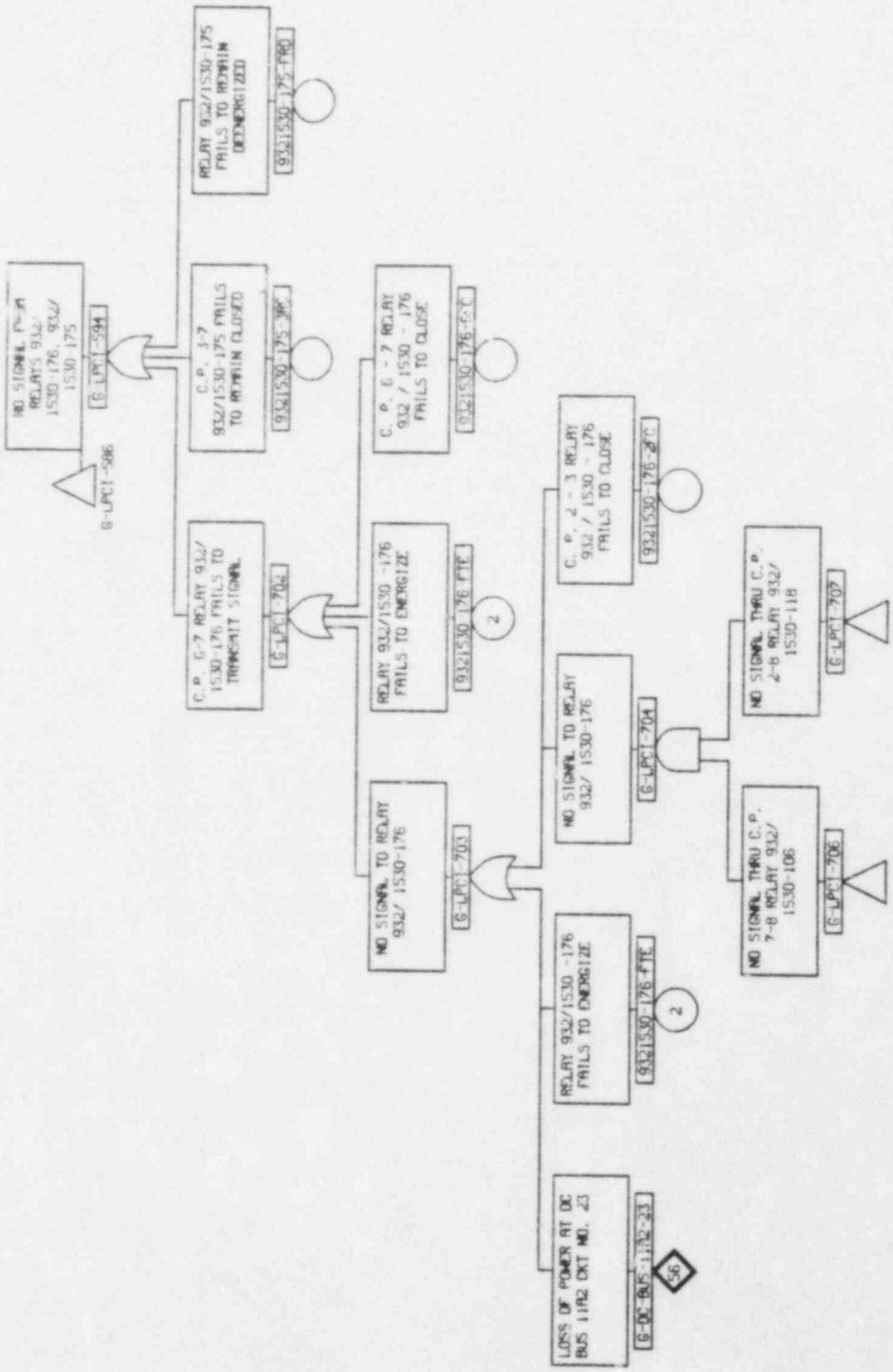

HALF OF 1 OUT OF 2 TWICE HI Rx PRESS. PERMISSIVE FAILS
G-LPCI-573
G-LPCI-578
G-LPCI-579
NO SIGNAL FROM C.P. 1-7 RELAY 932/ 1530-180
G-LPCI-582
NO SIGNAL FROM C.P. 2-8 RELAY 933/ 1530-280
G-LPCI-583
NO SIGNAL TO RELAY 932/ 1530-180
G-LPCI-587
RELAY 932/1530 -180 FAILS TO ENERGIZE
C. P. 1 - 7 RELAY 932 / 1530 - 180 FAILS TO CLOSE
NO SIGNAL TO RELAY 933/ 1530-280
G-LPCI-588
C. P. 2 - 8 RELAY 933 / 1530 - 280 FAILS TO CLOSE
RELAY 933/1530 -280 FAILS TO ENERGIZE
2
HALF OF 1 OUT OF 2 TWICE HI Rx PRESS. PERMISSIVE FAILS
G-LPCI-573
G-LPCI-578
G-LPCI-580
NO SIGNAL FROM C.P. 1-7 RELAY 932/ 1530-179
G-LPCI-584
NO SIGNAL FROM C.P. 2-8 RELAY 933/ 1530-279
G-LPCI-585
NO SIGNAL TO RELAY 932/ 1530-179
G-LPCI-591
C. P. 1 - 7 RELAY 932 / 1530 - 179 FAILS TO CLOSE
RELAY 932/1530 -179 FAILS TO ENERGIZE
NO SIGNAL TO RELAY 933/ 1530-280
G-LPCI-595
C. P. 2 - 8 RELAY 933 / 1530 - 279 FAILS TO CLOSE
RELAY 933/1530 -279 FAILS TO ENERGIZE
2

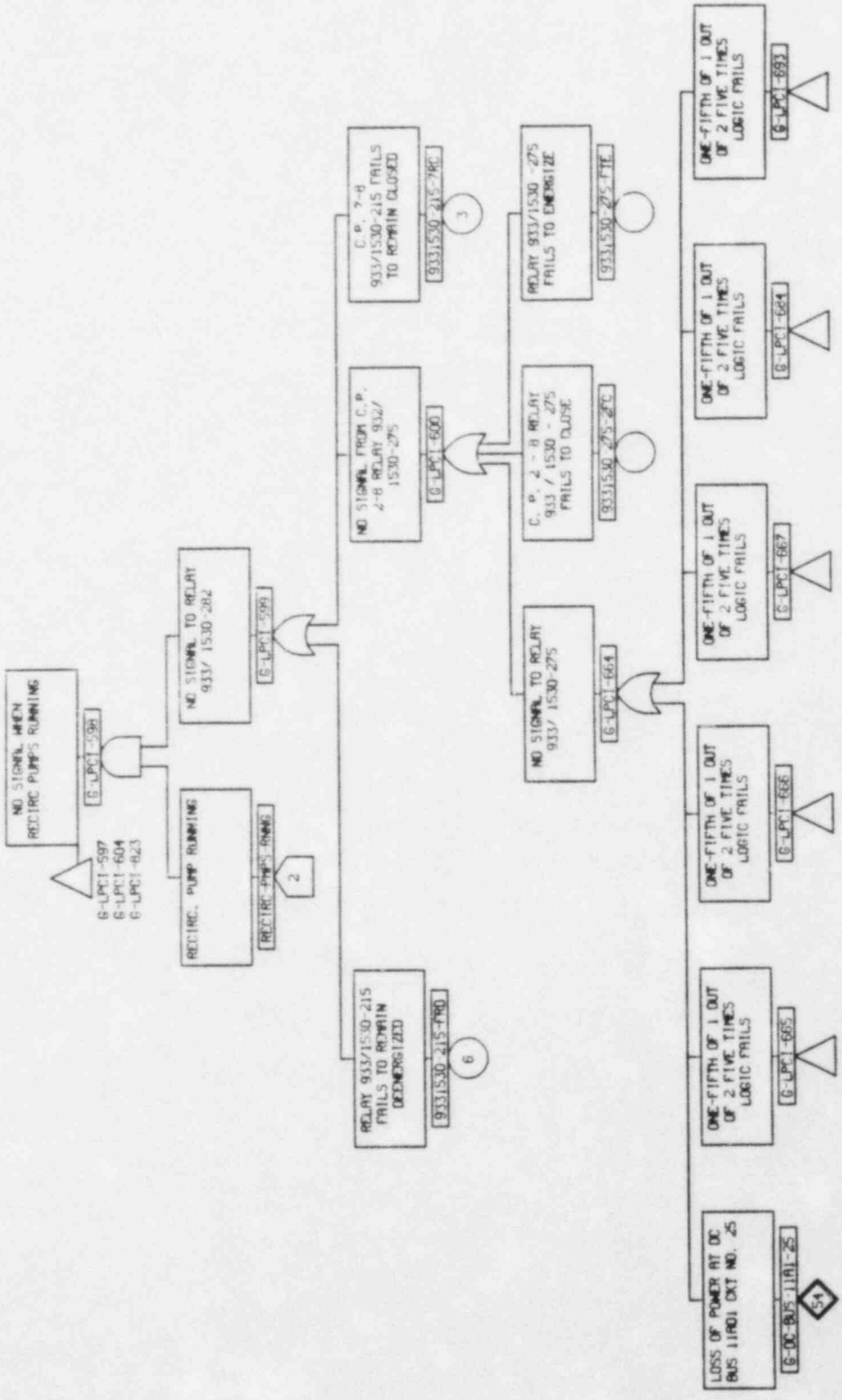

NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-168
G-LPCI-581
G-LPCI-573
G-LPCI-578
NO SIGNAL TO RELAY 932/ 1530-168
G-LPCI-586
RELAY 932/1530 -168 FAILS TO ENERGIZE
9321530-168-FTE
C. P. 2 - 8 RELAY 932 / 1530 - 168 FAILS TO CLOSE
9321530-168-2FC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
LOCK IN RELAY FAILS - 932/ 1530-168
G-LPCI-572
NO SIGNAL FROM RELAYS 932/ 1530-176, 932/ 1530-175
G-LPCI-594
RELAY 932/1530-115 FAILS TO REMAIN DEENERGIZED
9321530-115-FRD
6
C. P. 1 - 7 RELAY 932 / 1530 - 168 FAILS TO CLOSE
9321530-168-1FC
C.P. 11-12 932/1530-115 FAILS TO REMAIN CLOSED
9321530-115-BRC

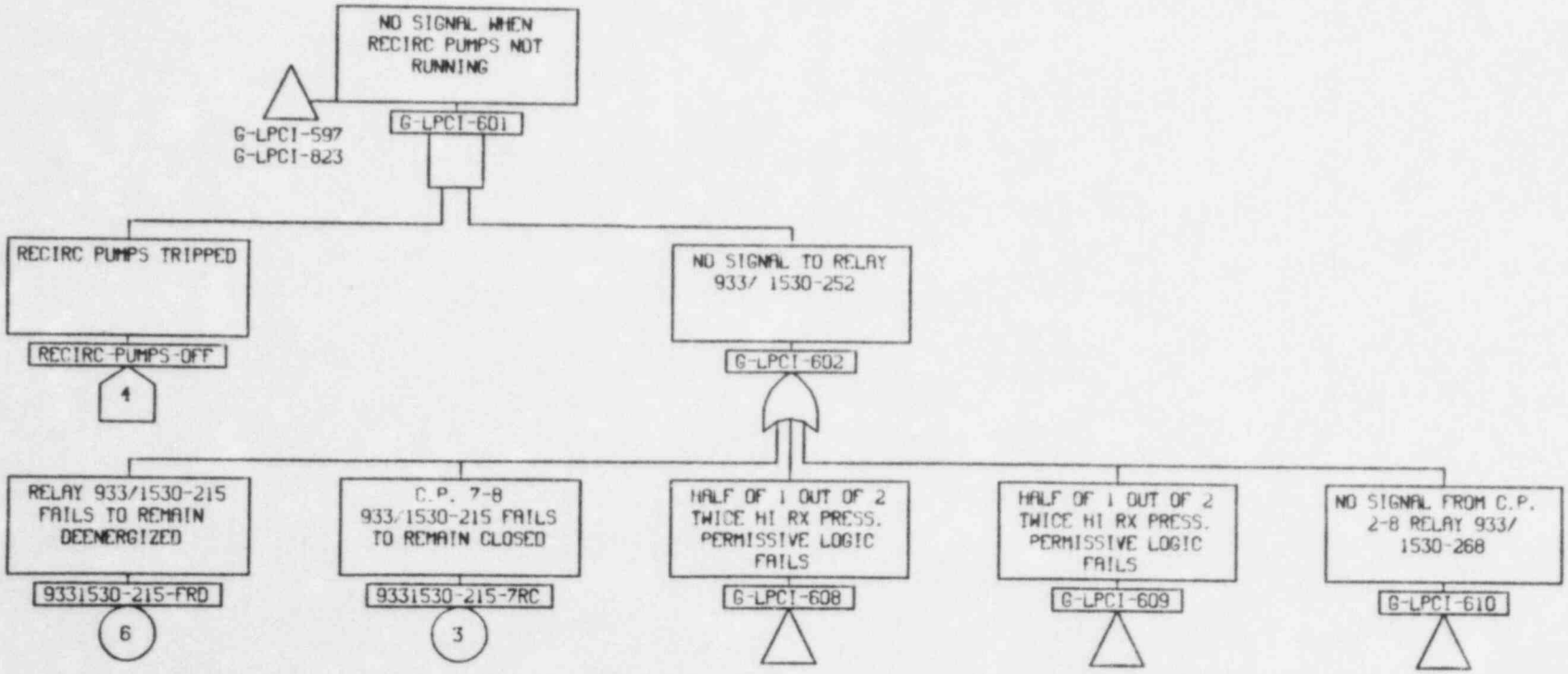

LOCK IN CIRCUIT FAILS
G-LPCI-575
G-LPCI-576
RELAY 932/1530-115 FAILS TO REMAIN DEENERGIZED
C. P. 1 - 2 RELAY 932 / 1530 - 181 FAILS TO CLOSE
C.P. 7-8 932/1530-115 FAILS TO REMAIN CLOSED
9321530-115-FRD
9321530-181-1FC
9321530-115-7RC
6
3
2
NO SIGNAL WHEN RECIRC PUMPS NOT RUNNING
G-LPCI-575
G-LPCI-577
RECIRC PUMPS TRIPPED
RECIRC PUMP NOT RUNNING - LOGIC FAILS
RECIRC-PUMPS-OFF
G-LPCI-578
4
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE FAILS
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE FAILS
NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-168
G-LPCI-579
G-LPCI-580
G-LPCI-581

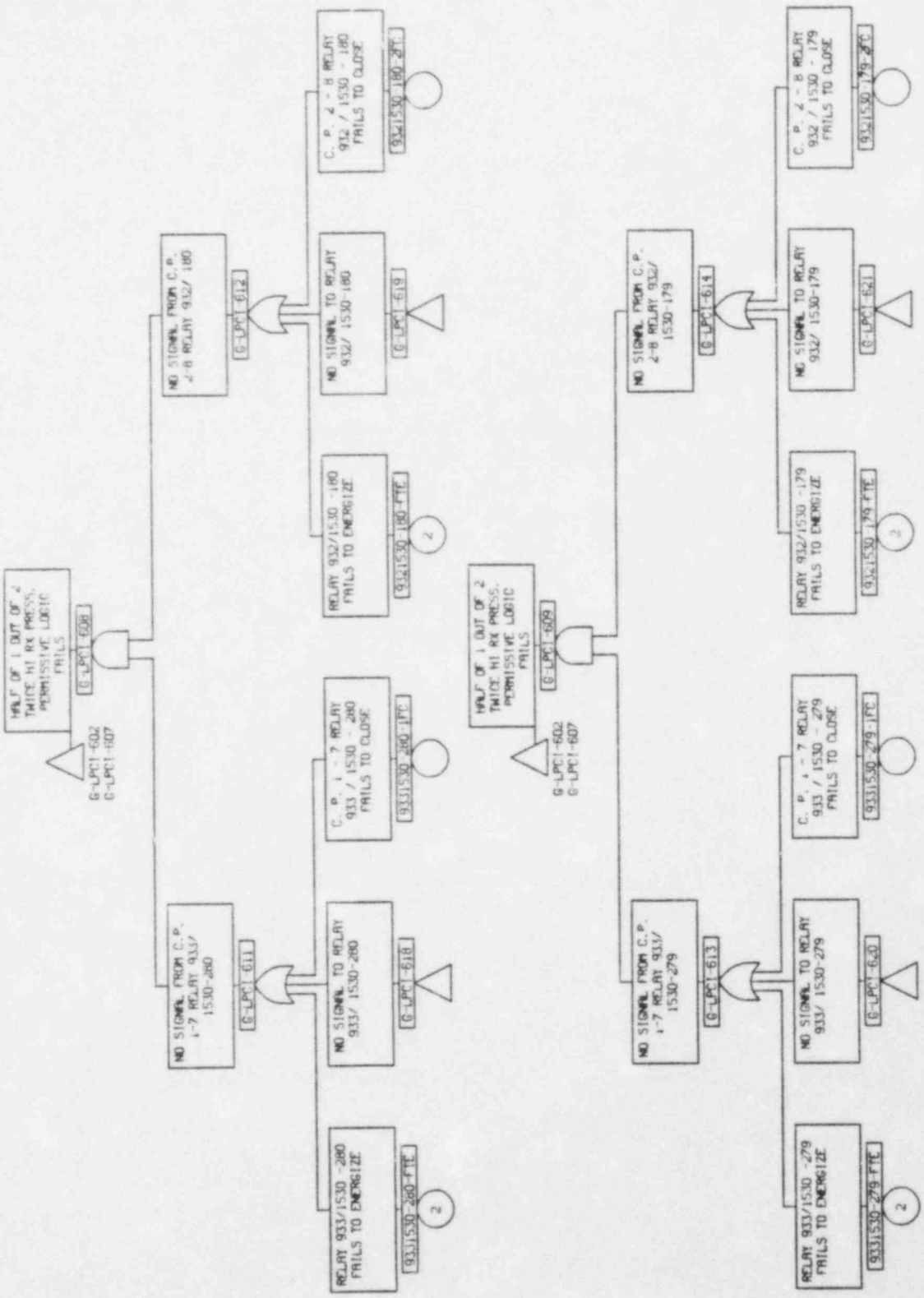

NO SIGNAL TO RELAY
932/ 1530-180
G-LPCI-582
G-LPCI-587
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL ON RX
PRESS LE 900 PSIG PS
2251/ 263-111C
G-LPCI-589
NO SIGNAL TO RELAY
933/ 1530-280
G-LPCI-583
G-LPCI-588
PS 2251/263-111C
FAILS TO CLOSE ON
LOW RX PRESS.
2251263-111C-XFC
2
PS 2251/263-111C
MISCALIBRATED VERY
LOW
2251263-111C-OMC
2
PS 2251/263-111C OUT
FOR TEST OR
MAINTENANCE
2251263-111C-TOM
2
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL ON RX
PRESS LE 900 PSIG PS
2251/ 263-111D
G-LPCI-590
PS 2252/263-111D
FAILS TO CLOSE ON
LOW RX PRESS.
2252263-111D-XFC
2
PS 2252/263-111D
MISCALIBRATED VERY
LOW
2252263-111D-OMC
2
PS 2252/263-111D OUT
FOR TEST OR
MAINTENANCE
2252263-111D-TOM
2

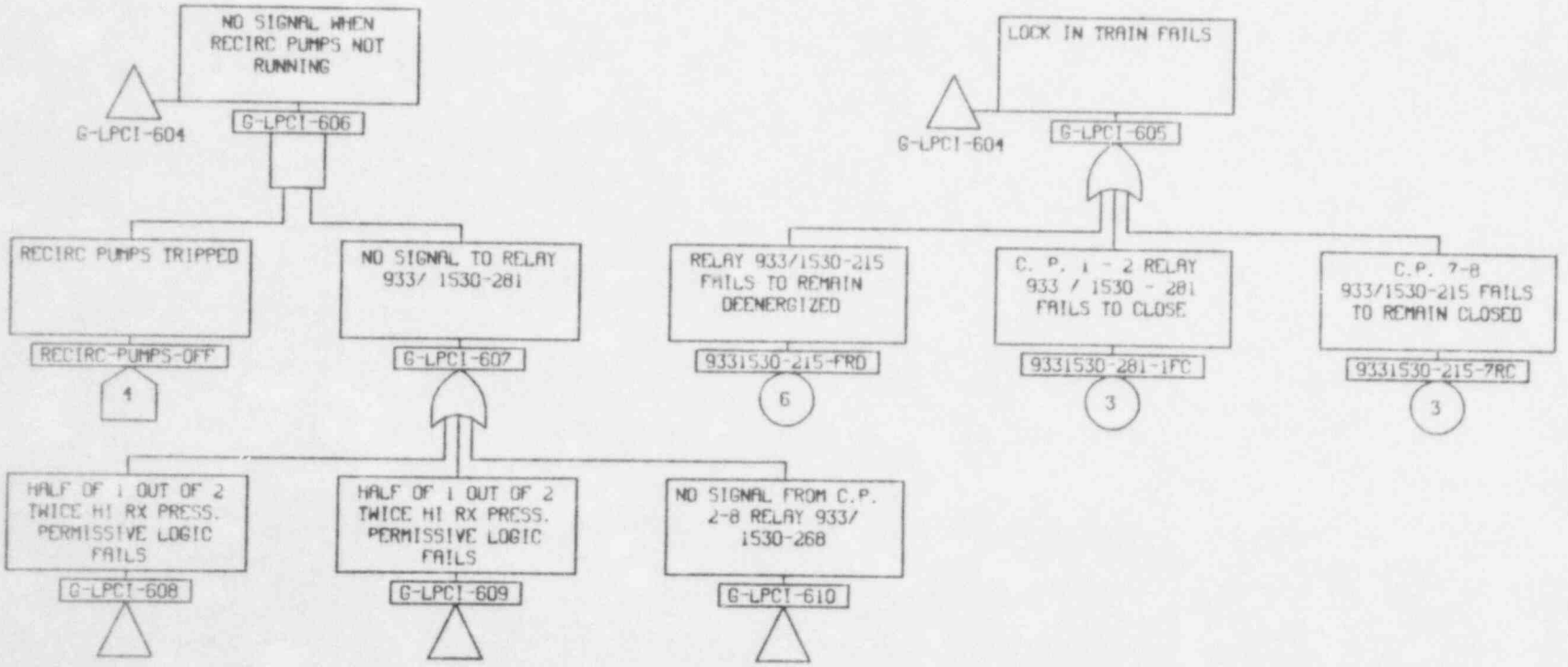

NO SIGNAL TO RELAY
933/ 1530-280
G-LPCI-595
G-LPCI-585
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL ON RX
PRESS LE 900 PSIG PS
2252/ 263-111B
G-LPCI-593
NO SIGNAL TO RELAY
932/ 1530-179
G-LPCI-591
G-LPCI-584
PS 2252/263-111B
FAILS TO CLOSE ON
LOW RX PRESS.
2252263-111B-XFC
2
PS 2252/263-111B
MISCALIBRATED VERY
LOW
2252263-111B-OMC
2
PS 2252/263-111B OUT
FOR TEST OR
MAINTENANCE
2252263-111B-TOM
2
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL ON RX
PRESS LE 900 PSIG PS
2251/ 263-111A
G-LPCI-592
PS 2251/263-111A
FAILS TO CLOSE ON
LOW RX PRESS.
2251263-111A-XFC
2
PS 2251/263-111A
MISCALIBRATED VERY
LOW
2251263-111A-OMC
2
PS 2251/263-111A OUT
FOR TEST OR
MAINTENANCE
2251263-111A-TOM
2

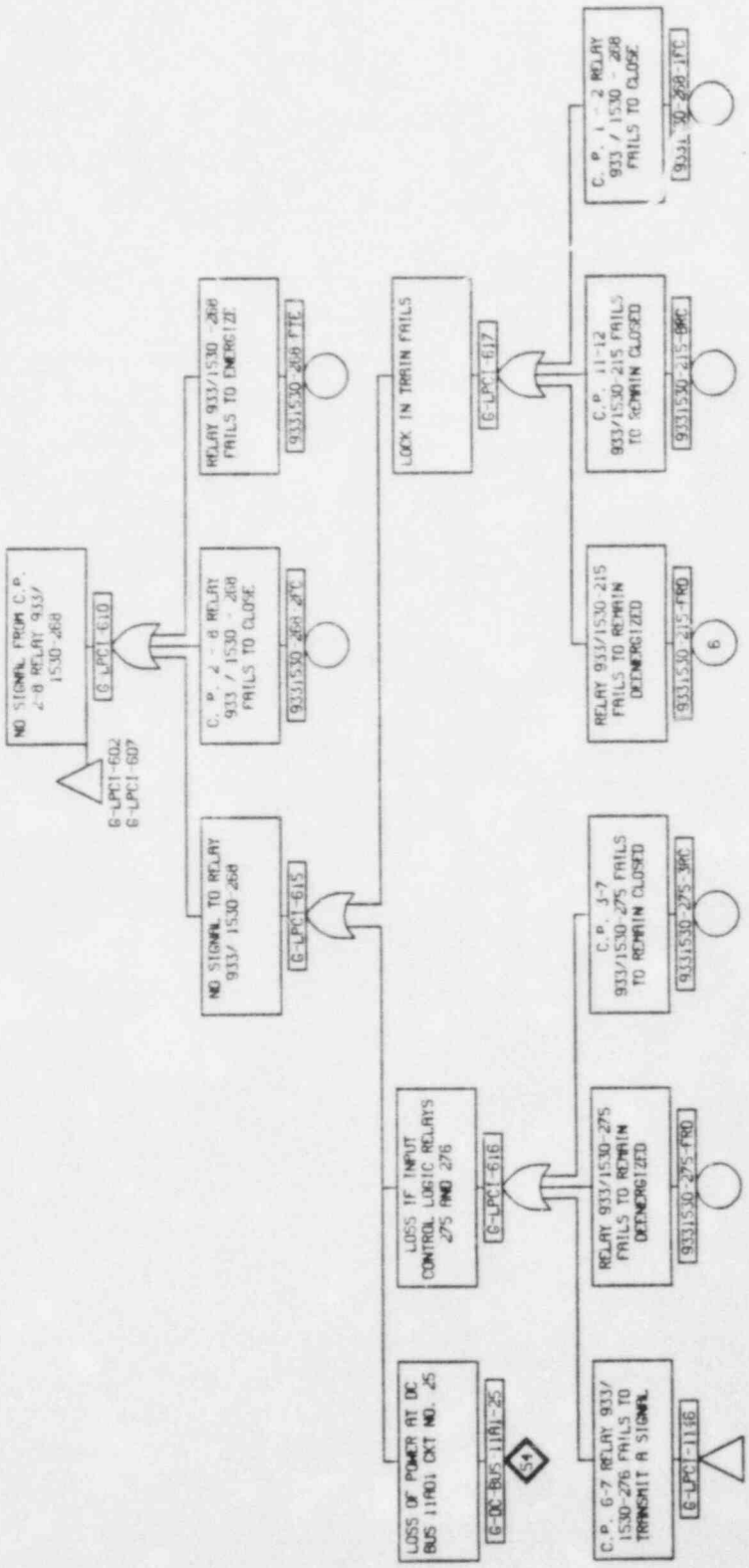

NO SIGNAL FROM RELAYS 932/ 1530-176, 932/ 1530-175
G-LPCI-506
G-LPCI-504
C.P. G-7 RELAY 932/ 1530-176 FAILS TO TRANSMIT SIGNAL
G-LPCI-704
C.P. 3-7 932/1530-175 FAILS TO REMAIN CLOSED
9321530-175-3MC
RELAY 932/1530-175 FAILS TO REMAIN DEENERGIZED
9321530-175-FRD
C.P. 6-7 RELAY 932 / 1530-176 FAILS TO CLOSE
9321530-176-6SC
RELAY 932/1530-176 FAILS TO ENERGIZE
9321530-176-FTE
2
NO SIGNAL TO RELAY 932/ 1530-176
G-LPCI-703
C.P. 2-3 RELAY 932 / 1530-176 FAILS TO CLOSE
9321530-176-2SC
NO SIGNAL TO RELAY 932/ 1530-176
G-LPCI-704
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707
RELAY 932/1530-176 FAILS TO ENERGIZE
9321530-176-FTE
2
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56

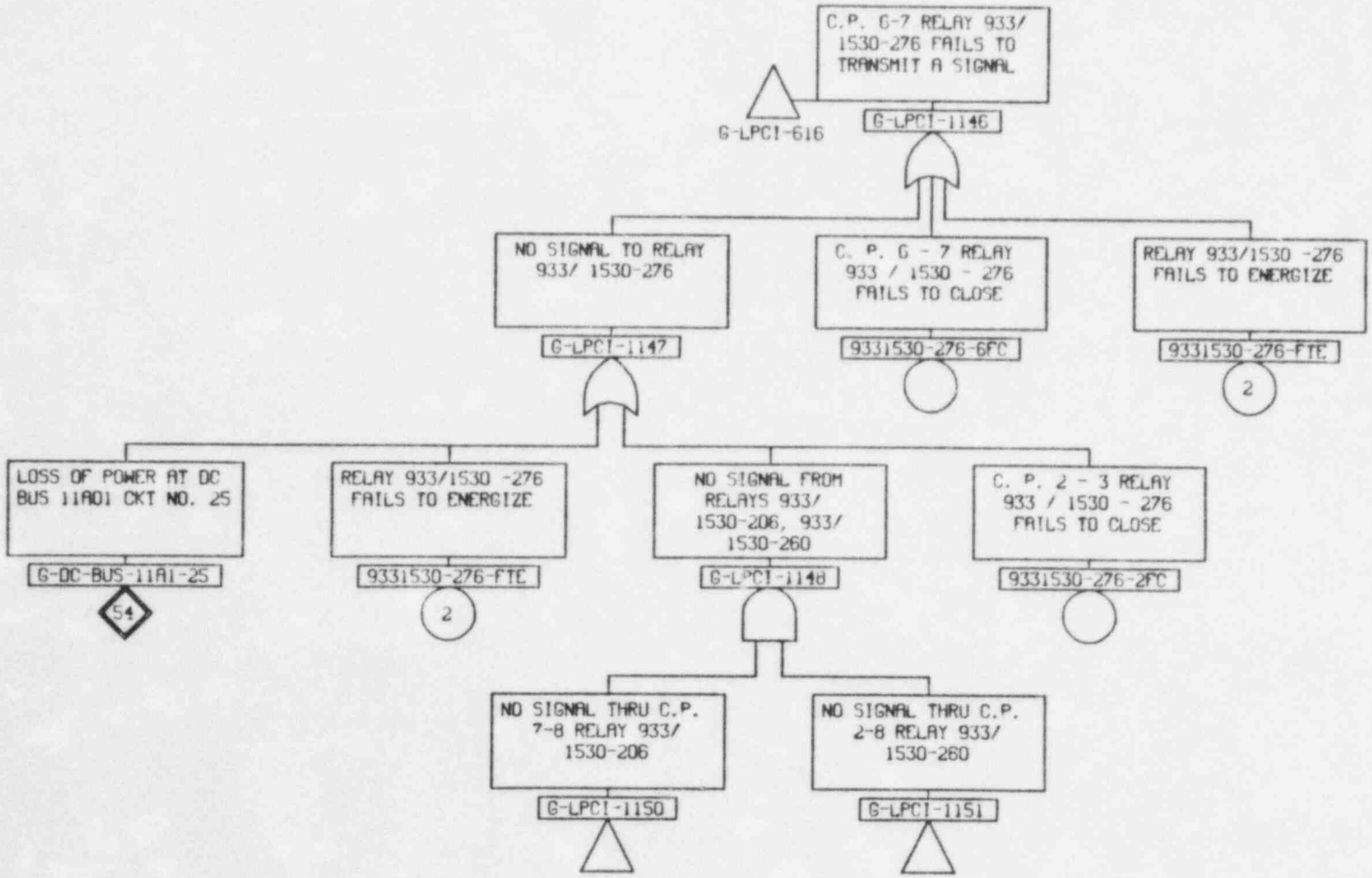

ONE-FIFTH OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-693
ONE-FIFTH OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-664
ONE-FIFTH OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-667
ONE-FIFTH OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-666
ONE-FIFTH OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-665
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
RELAY 933/1530-275 FAILS TO ENERGIZE
933/1530-275-FTE
C. P. 2-8 933/1530-275 FAILS TO CLOSE
933/1530-275-FTC
NO SIGNAL FROM C.P. 2-8 RELAY 933/1530-275
G-LPCI-600
C. P. 7-8 933/1530-215 FAILS TO REMAIN CLOSED
933/1530-215-FTRC
3
NO SIGNAL TO RELAY 933/1530-275
G-LPCI-664
NO SIGNAL TO RELAY 933/1530-282
G-LPCI-599
RELAY 933/1530-215 FAILS TO REMAIN DEENERGIZED
933/1530-215-FRD
6
RECIRC. PUMP RUNNING
RECIRC-PMPS-RNNG
2
NO SIGNAL WHEN RECIRC PUMPS RUNNING
G-LPCI-596
G-LPCI-597
G-LPCI-604
G-LPCI-823

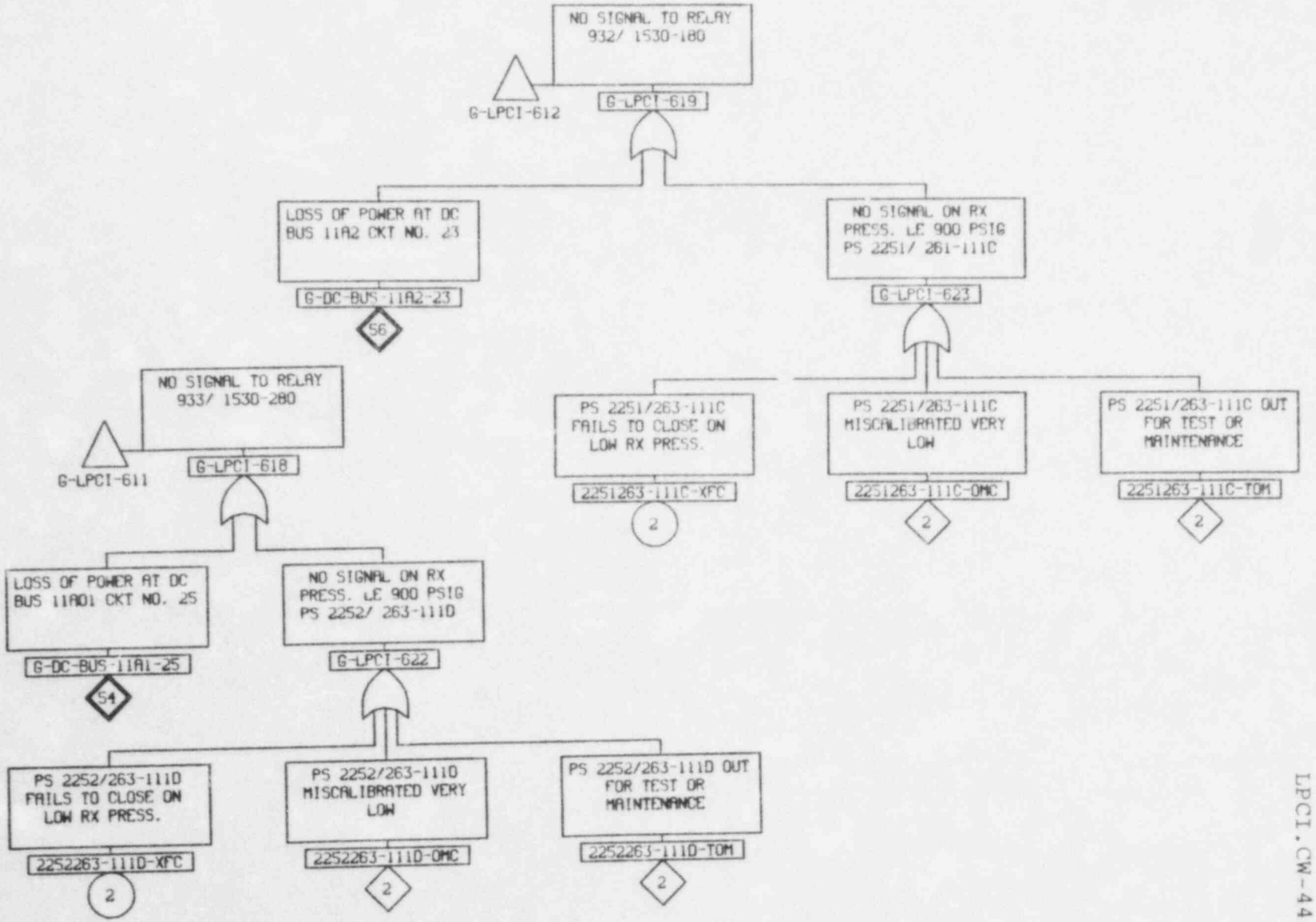

NO SIGNAL WHEN RECIRC PUMPS NOT RUNNING
G-LPCI-601
G-LPCI-597
G-LPCI-823
RECIRC PUMPS TRIPPED
RECIRC-PUMPS-OFF
4
NO SIGNAL TO RELAY 933/ 1530-252
G-LPCI-602
RELAY 933/1530-215 FAILS TO REMAIN DEENERGIZED
9331530-215-FRD
6
C.P. 7-8 933/1530-215 FAILS TO REMAIN CLOSED
9331530-215-7RC
3
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE LOGIC FAILS
G-LPCI-608
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE LOGIC FAILS
G-LPCI-609
NO SIGNAL FROM C.P. 2-8 RELAY 933/ 1530-268
G-LPCI-610

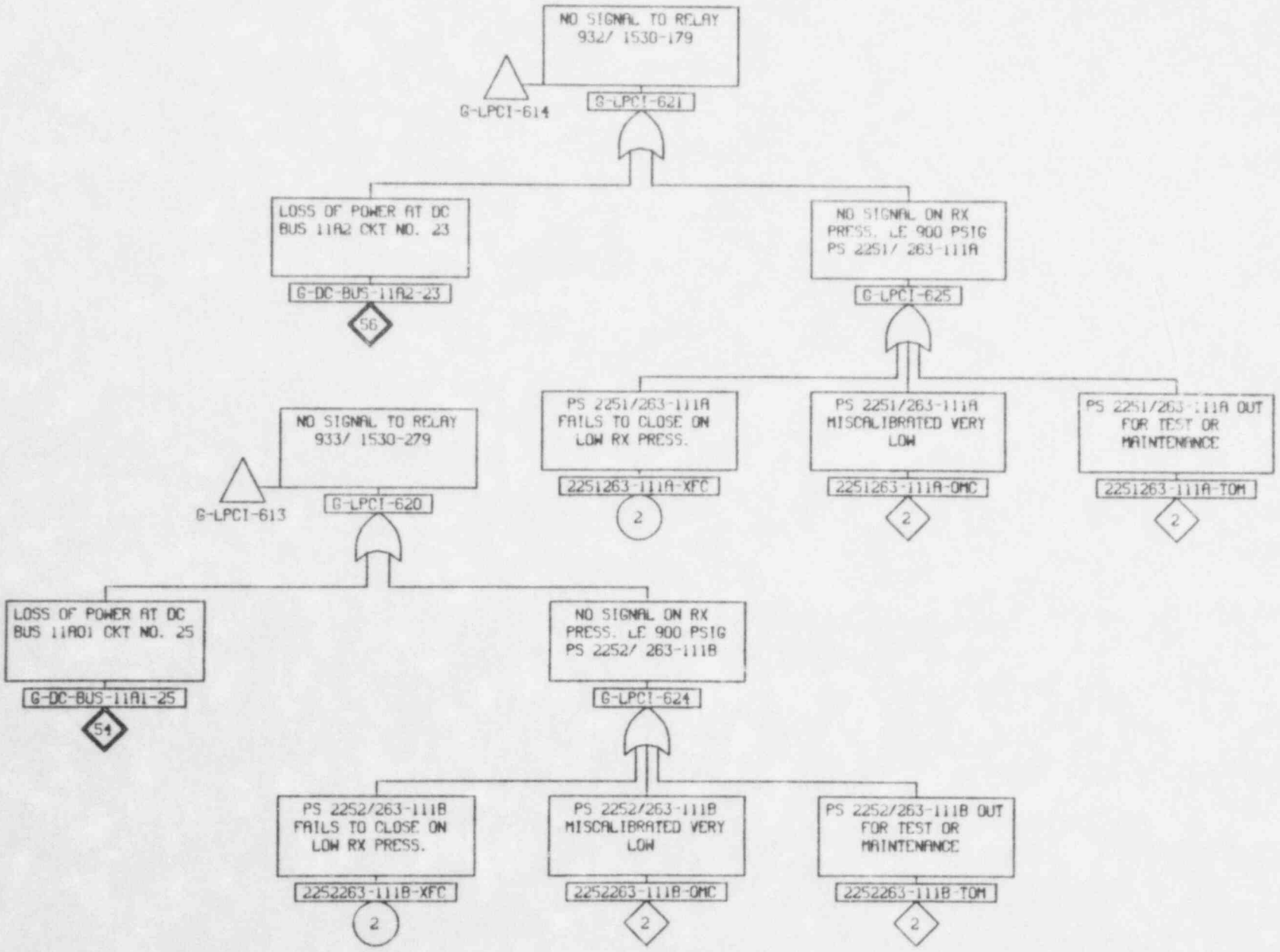

HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE LOGIC FAILS
G-LPCI-606
G-LPCI-602
G-LPCI-607
NO SIGNAL FROM C.P. 1-7 RELAY 933/ 1530-280
G-LPCI-611
NO SIGNAL FROM C.P. 2-8 RELAY 932/ 180
G-LPCI-612
NO SIGNAL TO RELAY 933/ 1530-280
G-LPCI-618
NO SIGNAL TO RELAY 932/ 1530-180
G-LPCI-619
C. P. 1 - 7 RELAY 933 / 1530 - 280 FAILS TO CLOSE
933/1530-280-FTC
C. P. 2 - 8 RELAY 932 / 1530 - 180 FAILS TO CLOSE
932/1530-180-FTC
RELAY 933/1530 -280 FAILS TO ENERGIZE
933/1530-280-FTE
RELAY 932/1530 -180 FAILS TO ENERGIZE
932/1530-180-FTE
2
2
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE LOGIC FAILS
G-LPCI-609
G-LPCI-602
G-LPCI-607
NO SIGNAL FROM C.P. 1-7 RELAY 933/ 1530-279
G-LPCI-613
NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-179
G-LPCI-614
NO SIGNAL TO RELAY 933/ 1530-279
G-LPCI-620
NO SIGNAL TO RELAY 932/ 1530-179
G-LPCI-621
C. P. 1 - 7 RELAY 933 / 1530 - 279 FAILS TO CLOSE
933/1530-279-FTC
C. P. 2 - 8 RELAY 932 / 1530 - 179 FAILS TO CLOSE
932/1530-179-FTC
RELAY 933/1530 -279 FAILS TO ENERGIZE
933/1530-279-FTE
RELAY 932/1530 -179 FAILS TO ENERGIZE
932/1530-179-FTE
2
2

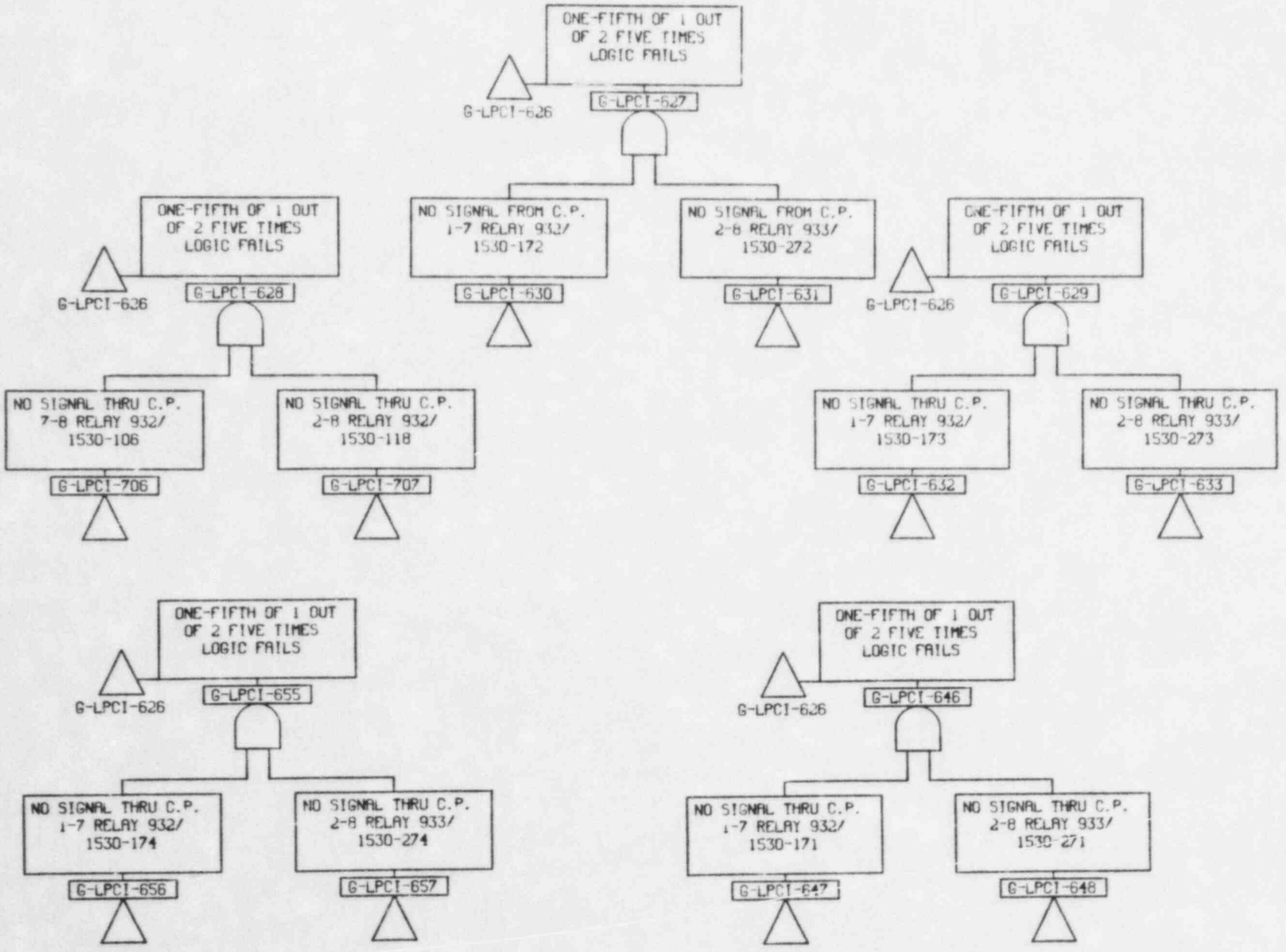

NO SIGNAL WHEN RECIRC PUMPS NOT RUNNING
G-LPCI-606
G-LPCI-604
RECIRC PUMPS TRIPPED
RECIRC-PUMPS-OFF
4
NO SIGNAL TO RELAY 933/ 1530-281
G-LPCI-607
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE LOGIC FAILS
G-LPCI-608
HALF OF 1 OUT OF 2 TWICE HI RX PRESS. PERMISSIVE LOGIC FAILS
G-LPCI-609
NO SIGNAL FROM C.P. 2-8 RELAY 933/ 1530-268
G-LPCI-610
LOCK IN TRAIN FAILS
G-LPCI-605
G-LPCI-604
RELAY 933/1530-215 FAILS TO REMAIN DEENERGIZED
9331530-215-FRD
6
C. P. 1 - 2 RELAY 933 / 1530 - 281 FAILS TO CLOSE
9331530-281-1FC
3
C.P. 7-8 933/1530-215 FAILS TO REMAIN CLOSED
9331530-215-7RC
3

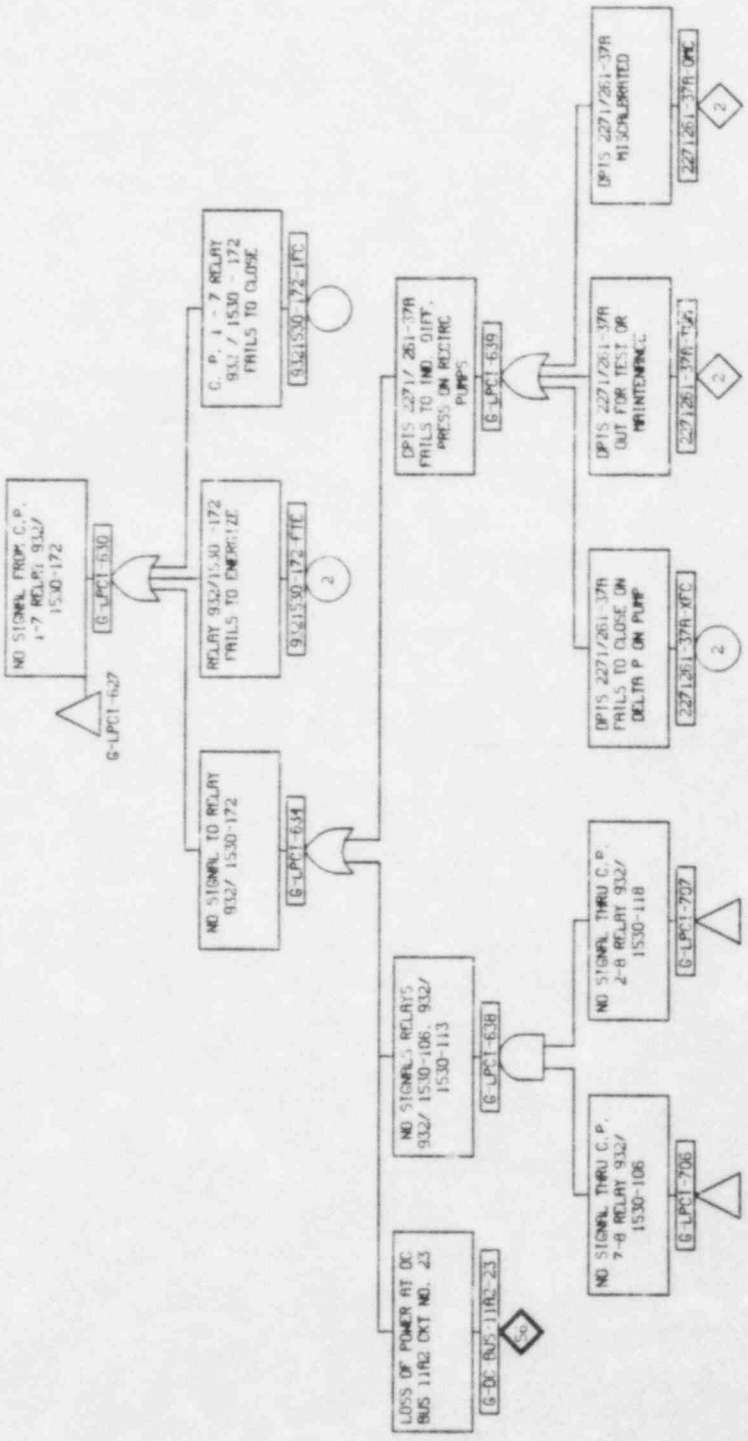

NO SIGNAL FROM C.P. 2-8 RELAY 933/ 1530-268
6-LPCI-610
6-LPCI-602
6-LPCI-607
RELAY 933/1530-268 FAILS TO ENERGIZE
933/1530-268-PTE
C. P. 2 - 8 RELAY 933 / 1530 - 268 FAILS TO CLOSE
933/1530-268-PTC
NO SIGNAL TO RELAY 933/ 1530-268
6-LPCI-615
LOCK IN TRAIN FAILS
6-LPCI-617
C. P. 11-12 933/1530-215 FAILS TO REMAIN CLOSED
933/1530-215-PMC
RELAY 933/1530-215 FAILS TO REMAIN DEENERGIZED
933/1530-215-PRO
6
C. P. 1 - 2 RELAY 933 / 1530 - 268 FAILS TO CLOSE
933/1530-268-PTC
LOSS IF INPUT CONTROL LOGIC RELAYS 275 AND 276
6-LPCI-616
C. P. J-7 933/1530-275 FAILS TO REMAIN CLOSED
933/1530-275-PMC
RELAY 933/1530-275 FAILS TO REMAIN DEENERGIZED
933/1530-275-PRO
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
6-DC-BUS-11A1-25
54
C. P. 6-7 RELAY 933/ 1530-276 FAILS TO TRANSMIT A SIGNAL
6-LPCI-1136

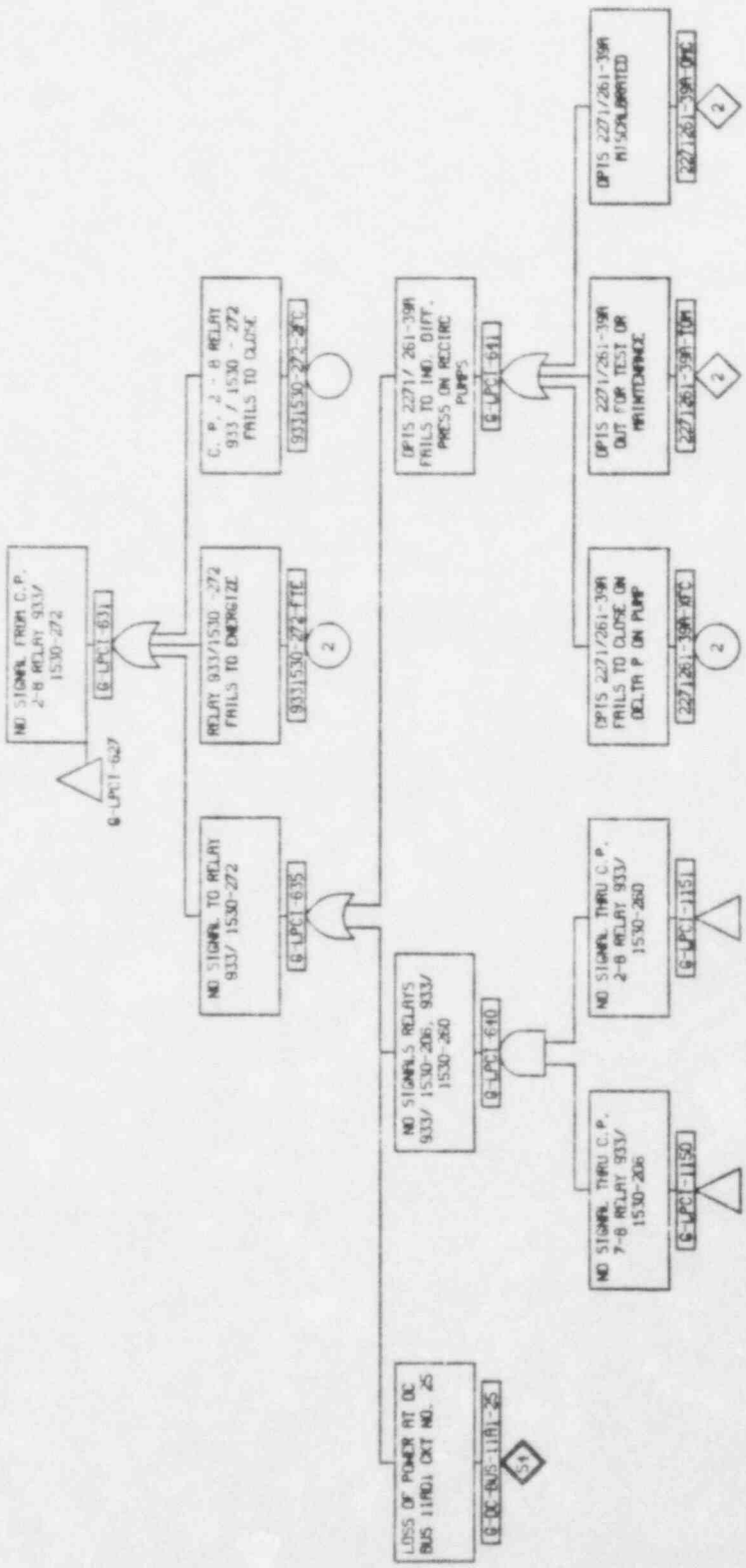

C.P. G-7 RELAY 933/ 1530-276 FAILS TO TRANSMIT A SIGNAL
G-LPCI-1146
G-LPCI-616
NO SIGNAL TO RELAY 933/ 1530-276
G-LPCI-1147
C. P. G - 7 RELAY 933 / 1530 - 276 FAILS TO CLOSE
9331530-276-6FC
RELAY 933/1530 -276 FAILS TO ENERGIZE
9331530-276-FTE
2
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
RELAY 933/1530 -276 FAILS TO ENERGIZE
9331530-276-FTE
2
NO SIGNAL FROM RELAYS 933/ 1530-206, 933/ 1530-260
G-LPCI-1148
C. P. 2 - 3 RELAY 933 / 1530 - 276 FAILS TO CLOSE
9331530-276-2FC
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
G-LPCI-1151

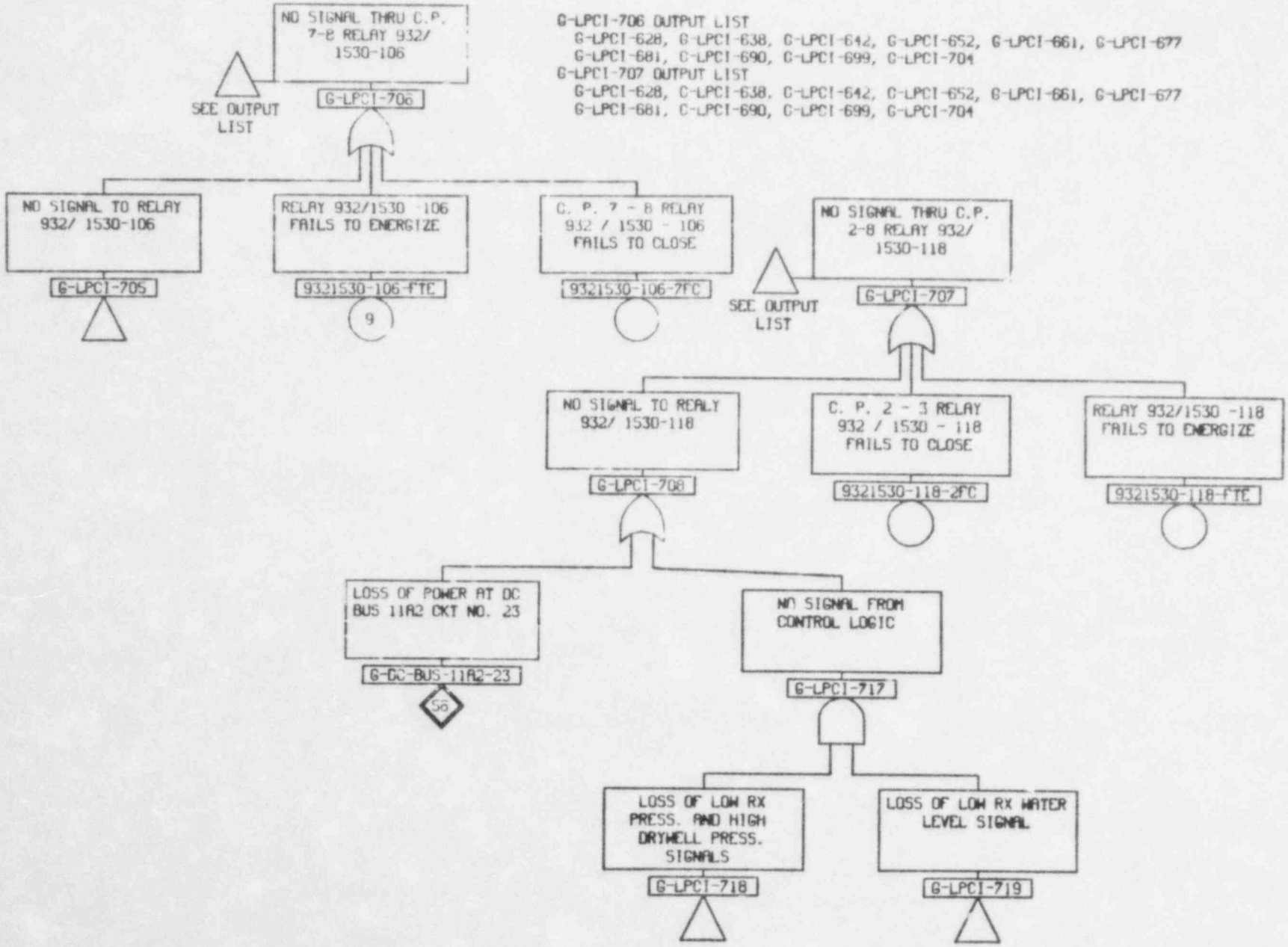

NO SIGNAL TO RELAY
932/ 1530-180
G-LPCI-612
G-LPCI-619
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL ON RX
PRESS. LE 900 PSIG
PS 2251/ 261-111C
G-LPCI-623
NO SIGNAL TO RELAY
933/ 1530-280
G-LPCI-611
G-LPCI-618
PS 2251/263-111C
FAILS TO CLOSE ON
LOW RX PRESS.
2251263-111C-XFC
2
PS 2251/263-111C
MISCALIBRATED VERY
LOW
2251263-111C-OMC
2
PS 2251/263-111C OUT
FOR TEST OR
MAINTENANCE
2251263-111C-TOM
2
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL ON RX
PRESS. LE 900 PSIG
PS 2252/ 263-111D
G-LPCI-622
PS 2252/263-111D
FAILS TO CLOSE ON
LOW RX PRESS.
2252263-111D-XFC
2
PS 2252/263-111D
MISCALIBRATED VERY
LOW
2252263-111D-OMC
2
PS 2252/263-111D OUT
FOR TEST OR
MAINTENANCE
2252263-111D-TOM
2

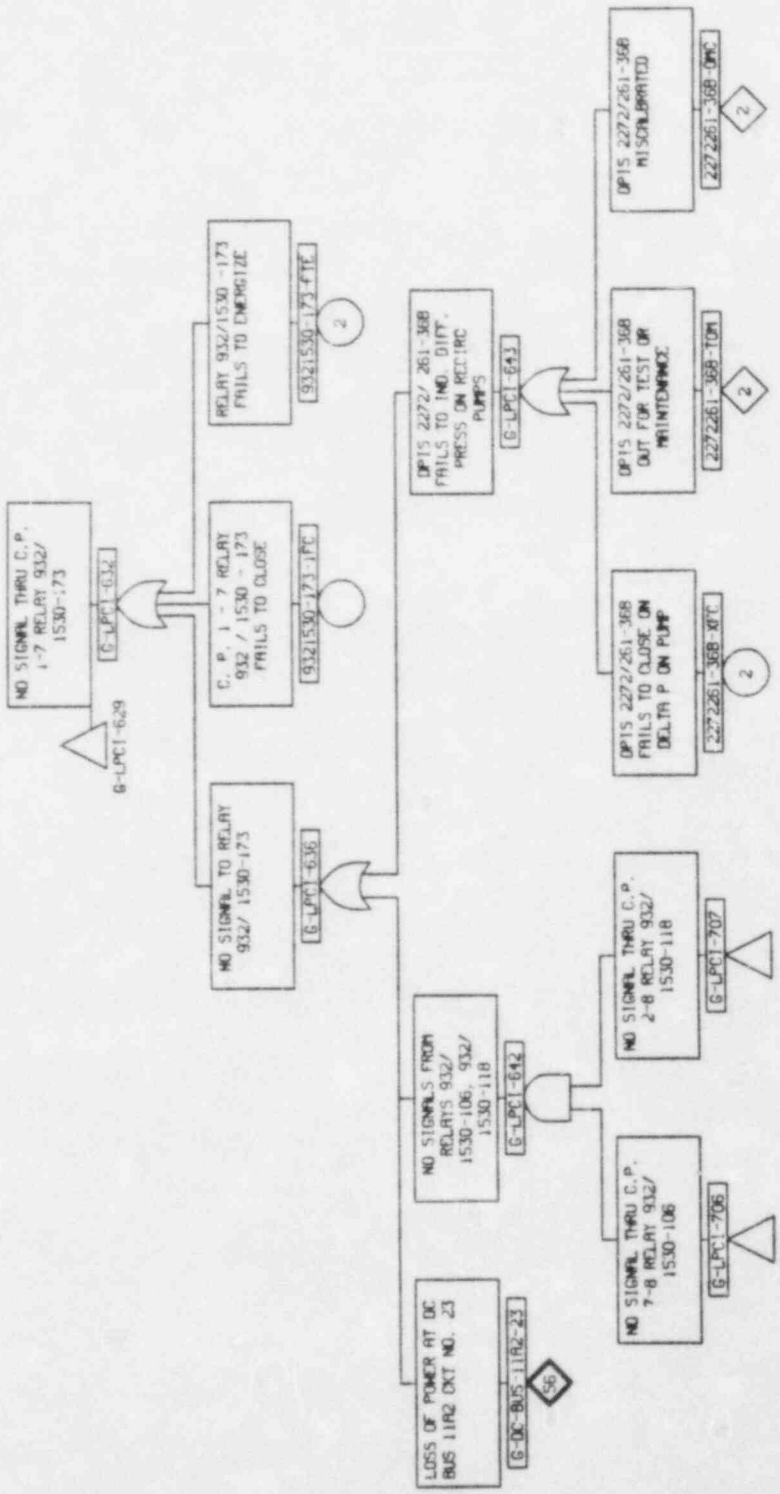

NO SIGNAL TO RELAY
932/ 1530-179
G-LPCI-614
G-LPCI-621
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL ON RX
PRESS. LE 900 PSIG
PS 2251/ 263-111A
G-LPCI-625
NO SIGNAL TO RELAY
933/ 1530-279
G-LPCI-613
G-LPCI-620
PS 2251/263-111A
FAILS TO CLOSE ON
LOW RX PRESS.
2251263-111A-XFC
2
PS 2251/263-111A
MISCALIBRATED VERY
LOW
2251263-111A-OMC
2
PS 2251/263-111A OUT
FOR TEST OR
MAINTENANCE
2251263-111A-TOM
2
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL ON RX
PRESS. LE 900 PSIG
PS 2252/ 263-111B
G-LPCI-624
PS 2252/263-111B
FAILS TO CLOSE ON
LOW RX PRESS.
2252263-111B-XFC
2
PS 2252/263-111B
MISCALIBRATED VERY
LOW
2252263-111B-OMC
2
PS 2252/263-111B OUT
FOR TEST OR
MAINTENANCE
2252263-111B-TOM
2

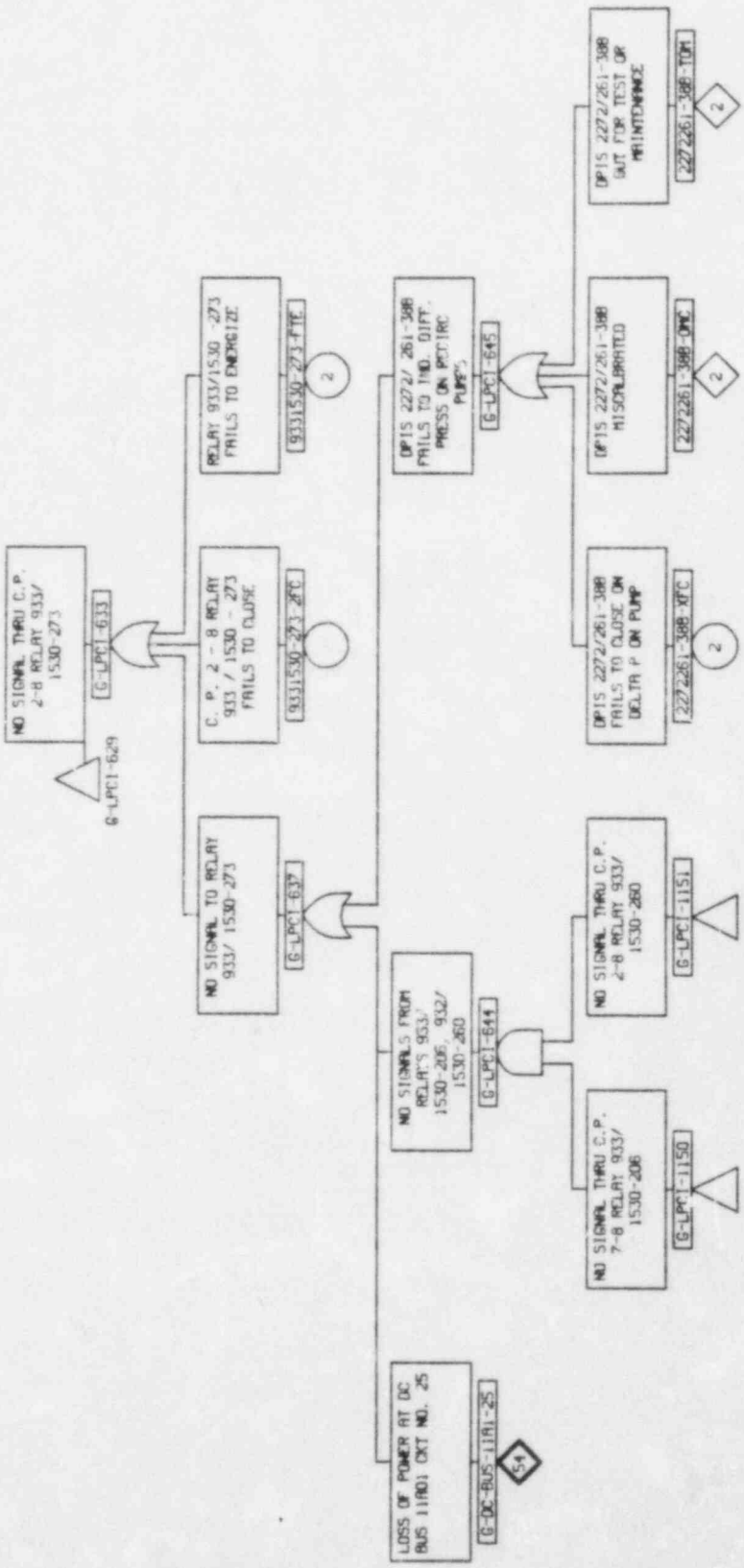

ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-626
G-LPCI-627
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-626
G-LPCI-628
NO SIGNAL FROM C.P. 1-7 RELAY 932/ 1530-172
G-LPCI-630
NO SIGNAL FROM C.P. 2-8 RELAY 933/ 1530-272
G-LPCI-631
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-626
G-LPCI-629
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707
NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-173
G-LPCI-632
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-273
G-LPCI-633
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-626
G-LPCI-655
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-626
G-LPCI-646
NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-174
G-LPCI-656
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-274
G-LPCI-657
NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-171
G-LPCI-647
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-271
G-LPCI-648

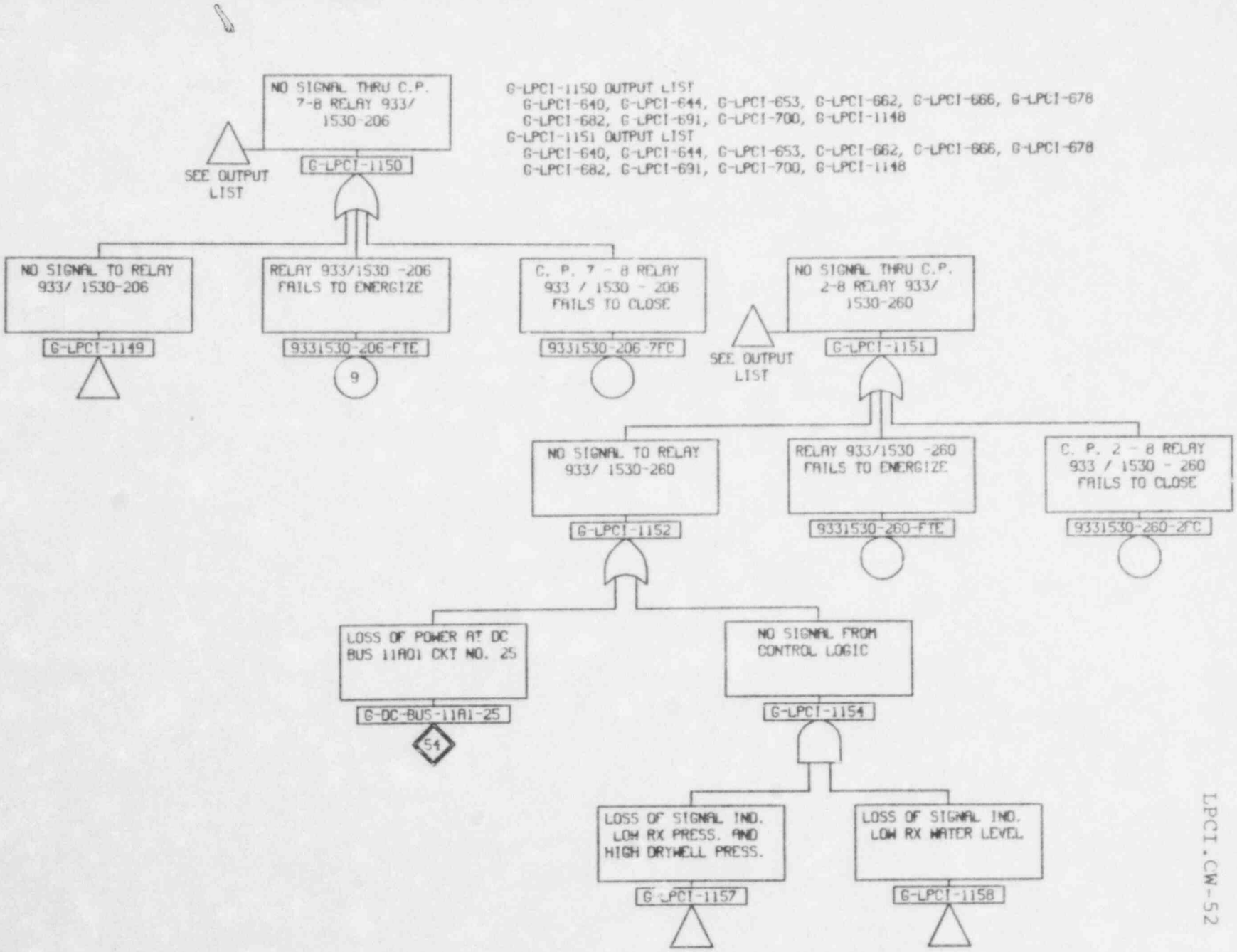

NO SIGNAL FROM C.P. 1-7 RELAY 932/ 1530-172
G-LPCI-627
G-LPCI-630
C. P. 1 - 7 RELAY 932 / 1530 - 172 FAILS TO CLOSE
932/1530-172-FTC
RELAY 932/1530 -172 FAILS TO ENERGIZE
932/1530-172-FTE
2
NO SIGNAL TO RELAY 932/ 1530-172
G-LPCI-634
DPIS 2271/261-37A FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
G-LPCI-639
DPIS 2271/261-37A MISCALIBRATED
2271/261-37A-DPC
DPIS 2271/261-37A OUT FOR TEST OR MAINTENANCE
2271/261-37A-TMC
DPIS 2271/261-37A FAILS TO CLOSE ON DELTA P ON PUMP
2271/261-37A-XFC
NO SIGNALS RELAYS 932/ 1530-106, 932/ 1530-113
G-LPCI-638
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
3

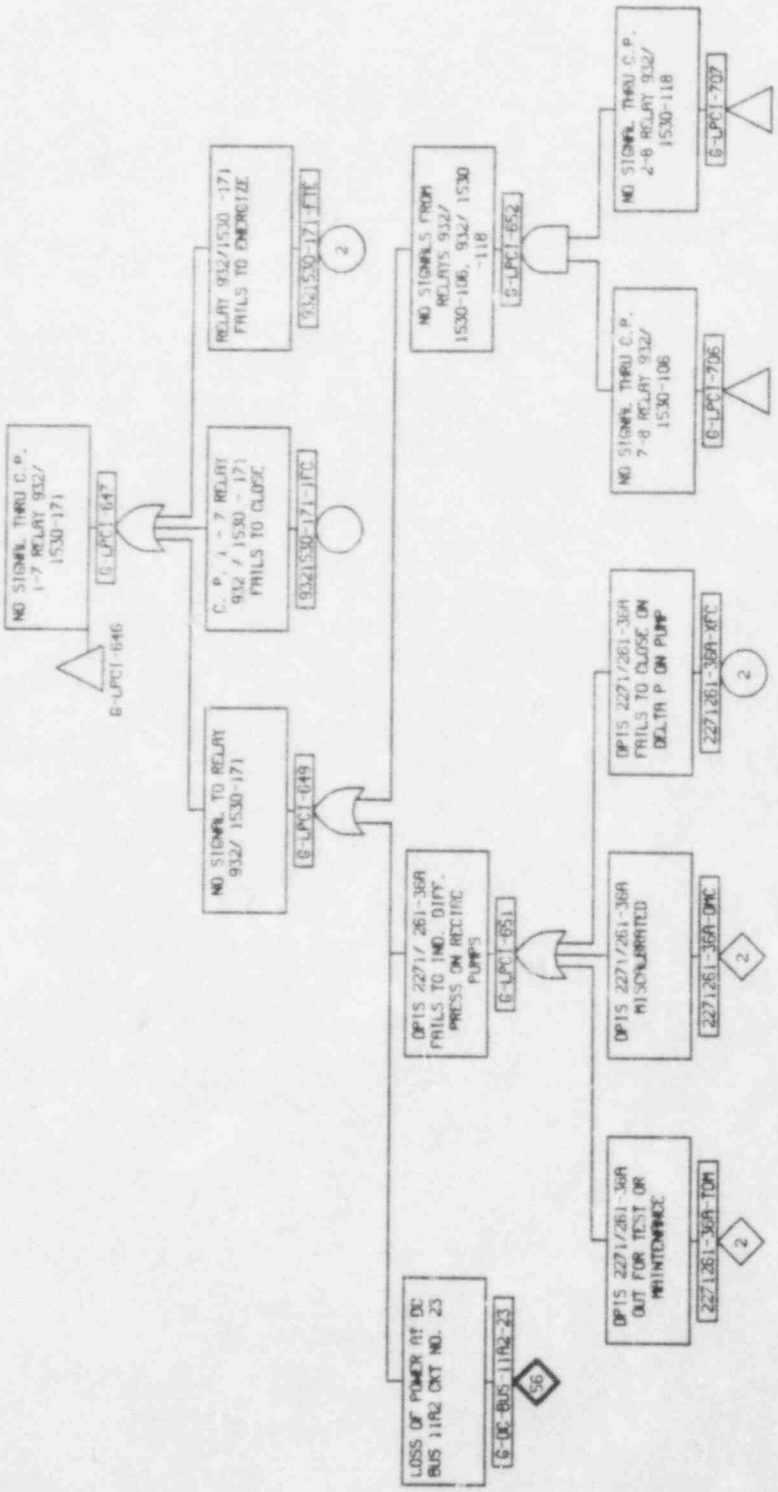

NO SIGNAL FROM C.P. 2-B RELAY 933/ 1530-272
G-LPCI-627
G-LPCI-631
C. P. 2 - B RELAY 933 / 1530 - 272 FAILS TO CLOSE
933/1530-272-BTC
RELAY 933/1530 -272 FAILS TO ENERGIZE
933/1530-272-ETE
2
NO SIGNAL TO RELAY 933/ 1530-272
G-LPCI-635
DPIS 2271/ 261-39A FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
G-LPCI-641
DPIS 2271/261-39A FAILS TO CLOSE ON DELTA P ON PUMP
2271/261-39A-BTC
2
DPIS 2271/261-39A OUT FOR TEST OR MAINTENANCE
2271/261-39A-TOM
2
DPIS 2271/261-39A MISCALIBRATED
2271/261-39A-OMC
2
NO SIGNALS RELAYS 933/ 1530-206, 933/ 1530-260
G-LPCI-610
NO SIGNAL THRU C.P. 2-B RELAY 933/ 1530-260
G-LPCI-1151
NO SIGNAL THRU C.P. 7-B RELAY 933/ 1530-206
G-LPCI-1150
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
S1

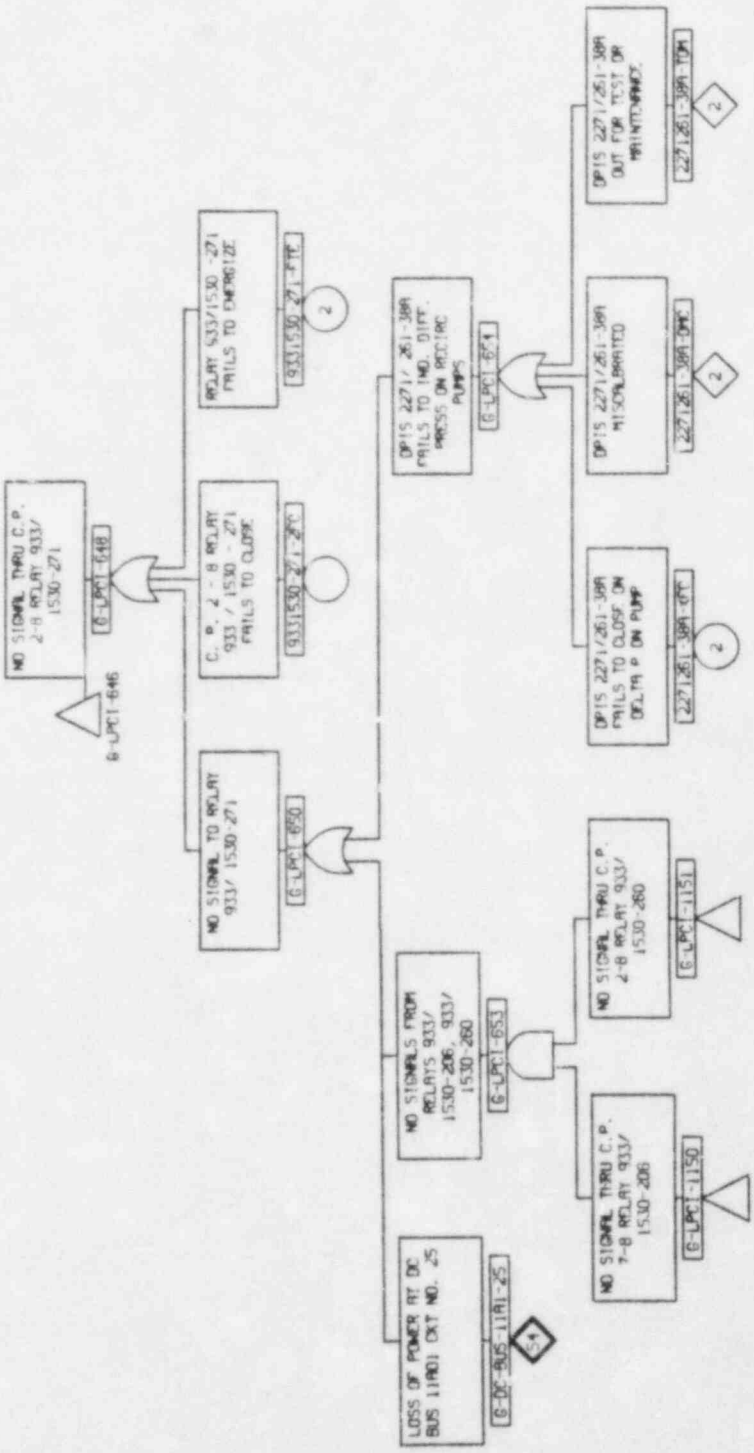

NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
SEE OUTPUT LIST
G-LPCI-706 OUTPUT LIST
G-LPCI-628, G-LPCI-638, G-LPCI-642, G-LPCI-652, G-LPCI-661, G-LPCI-677
G-LPCI-681, G-LPCI-690, G-LPCI-699, G-LPCI-704
G-LPCI-707 OUTPUT LIST
G-LPCI-628, G-LPCI-638, G-LPCI-642, G-LPCI-652, G-LPCI-661, G-LPCI-677
G-LPCI-681, G-LPCI-690, G-LPCI-699, G-LPCI-704
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705
RELAY 932/1530 -106 FAILS TO ENERGIZE
9321530-106-FTE
9
C. P. 7 - 8 RELAY 932 / 1530 - 106 FAILS TO CLOSE
9321530-106-FTC
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707
SEE OUTPUT LIST
NO SIGNAL TO REALY 932/ 1530-118
G-LPCI-708
C. P. 2 - 3 RELAY 932 / 1530 - 118 FAILS TO CLOSE
9321530-118-2FC
RELAY 932/1530 -118 FAILS TO ENERGIZE
9321530-118-FTE
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM CONTROL LOGIC
G-LPCI-717
LOSS OF LOW RX PRESS. AND HIGH DRYWELL PRESS. SIGNALS
G-LPCI-718
LOSS OF LOW Rx WATER LEVEL SIGNAL
G-LPCI-719

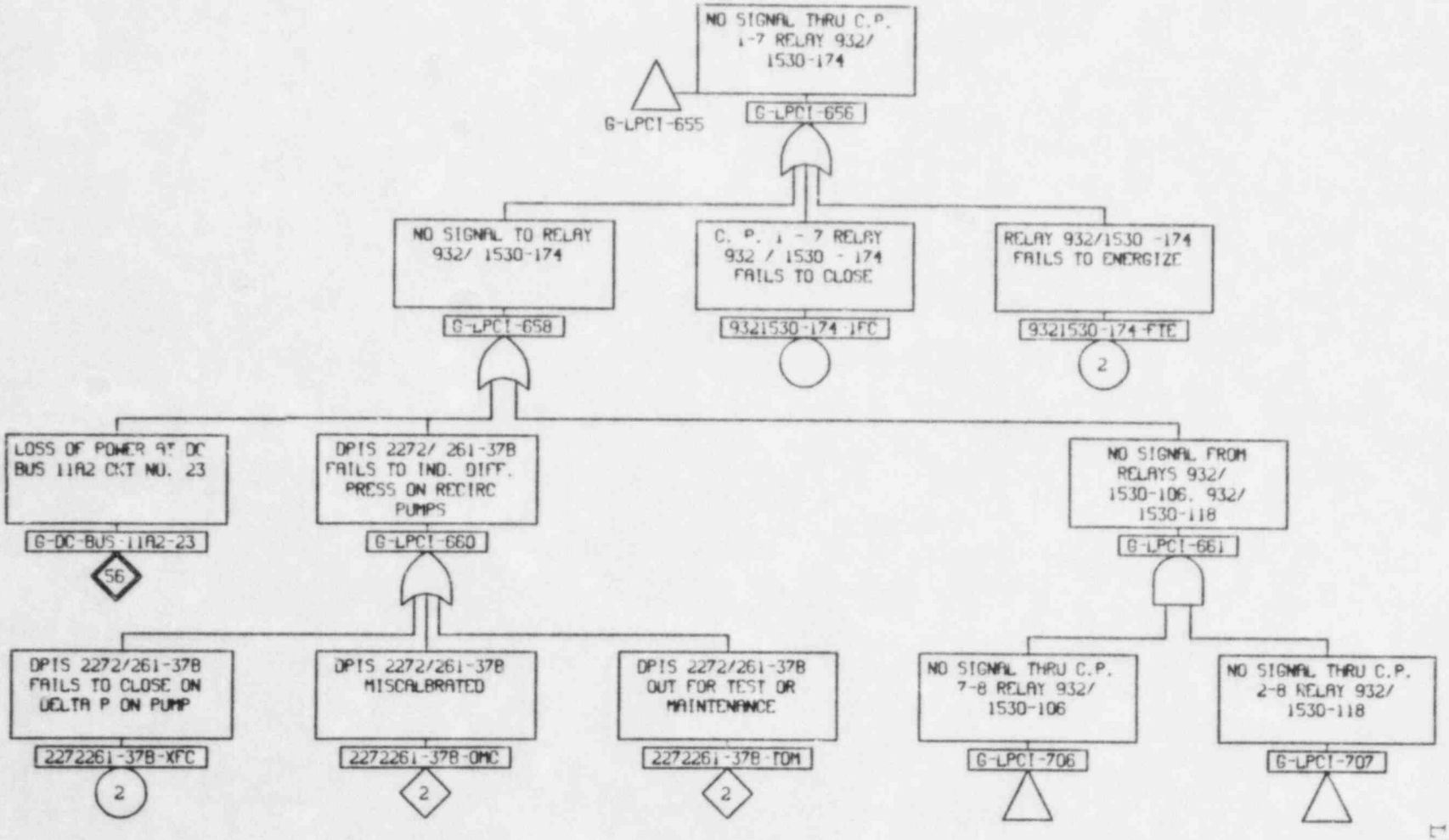

NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-173
G-LPCI-632
G-LPCI-629
RELAY 932/1530-173 FAILS TO ENERGIZE
932/1530-173-FTE
C. P. 1 - 7 RELAY 932 / 1530 - 173 FAILS TO CLOSE
932/1530-173-FTC
NO SIGNAL TO RELAY 932/ 1530-173
G-LPCI-636
DPIS 2272/261-368 FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
G-LPCI-643
DPIS 2272/261-368 MISCALIBRATED
2272261-368-DMC
DPIS 2272/261-368 OUT FOR TEST OR MAINTENANCE
2272261-368-TOM
DPIS 2272/261-368 FAILS TO CLOSE ON DELTA P ON PUMP
2272261-368-XFC
NO SIGNALS FROM RELAYS 932/ 1530-106, 932/ 1530-118
G-LPCI-642
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
36

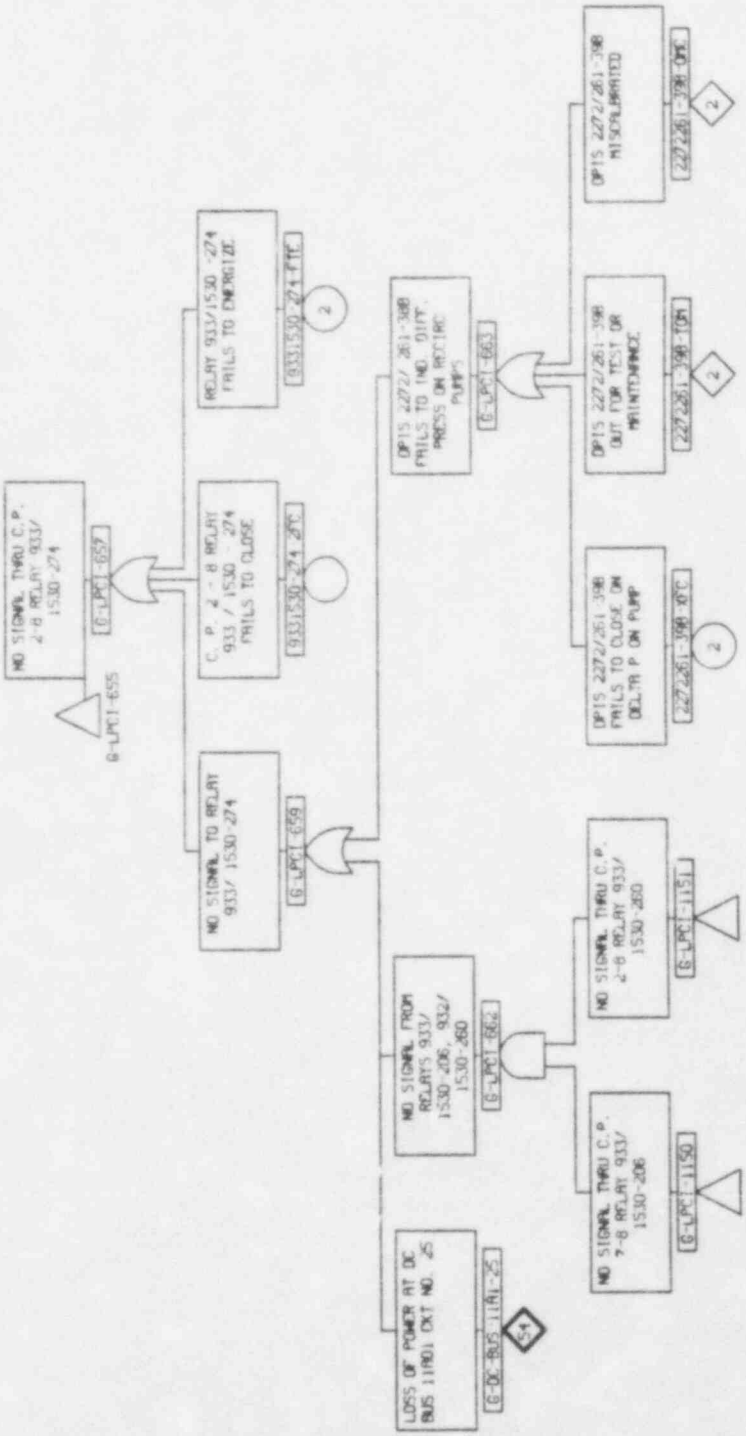

NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-273
G-LPCI-633
G-LPCI-629
RELAY 933/1530 -273 FAILS TO ENERGIZE
933/1530-273-FTE
2
C. P. 2 - 8 RELAY 933 / 1530 - 273 FAILS TO CLOSE
933/1530-273-CTC
NO SIGNAL TO RELAY 933/ 1530-273
G-LPCI-637
DPIS 2272/ 261-388 FAILS TO IND. DIFF. PRESS ON MOTOR PUMPS
G-LPCI-645
DPIS 2272/261-388 FAILS TO CLOSE ON DELTA P ON PUMP
2272261-388-XFC
2
DPIS 2272/261-388 MISCALIBRATED
2272261-388-CMC
2
DPIS 2272/261-388 OUT FOR TEST OR MAINTENANCE
2272261-388-TOM
2
NO SIGNALS FROM RELAYS 933/ 1530-205, 932/ 1530-260
G-LPCI-644
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
G-LPCI-1151
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
G1

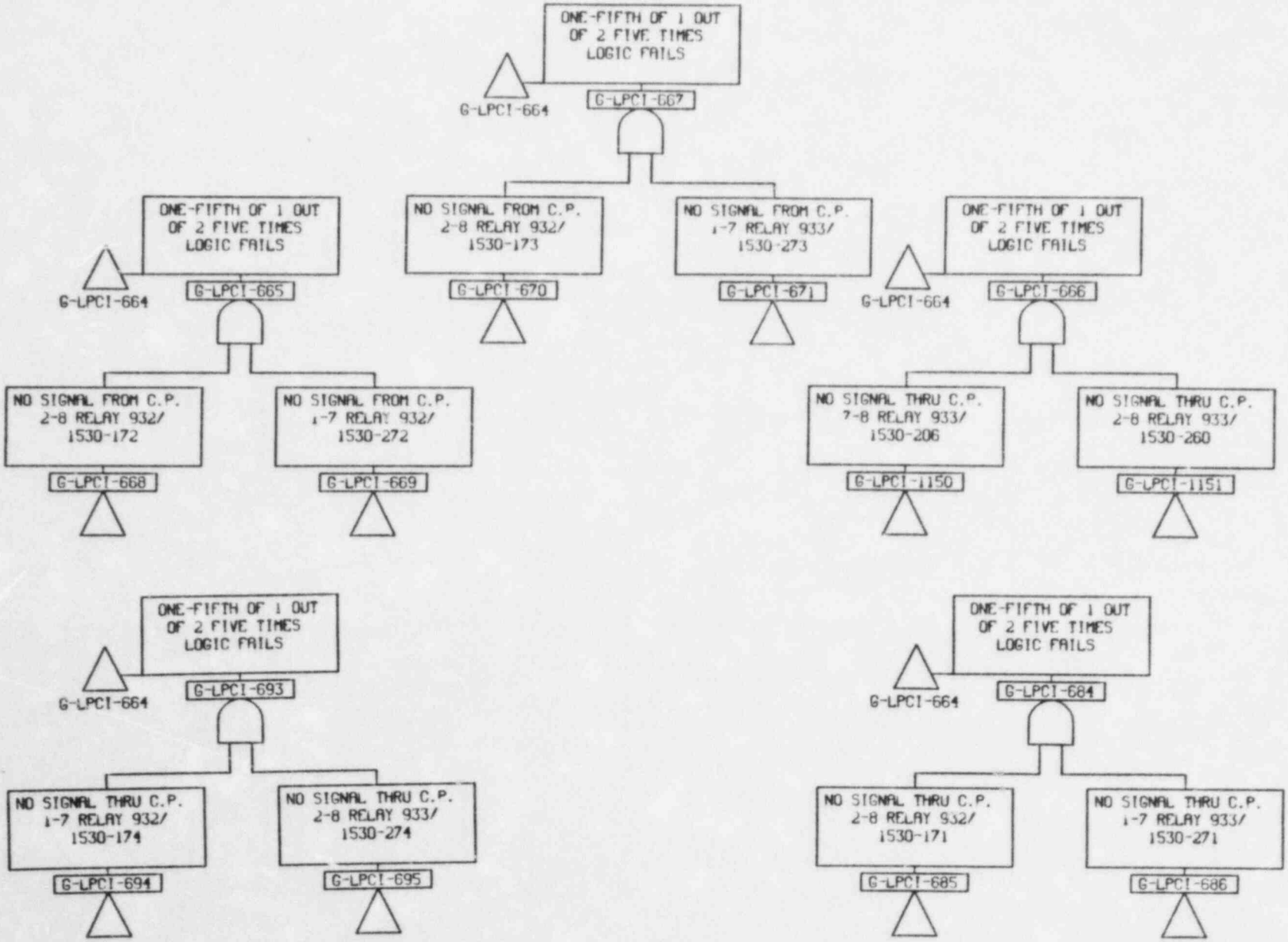

NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
SEE OUTPUT LIST
G-LPCI-1150 OUTPUT LIST
G-LPCI-640, G-LPCI-644, G-LPCI-653, G-LPCI-662, G-LPCI-666, G-LPCI-678
G-LPCI-682, G-LPCI-691, G-LPCI-700, G-LPCI-1148
G-LPCI-1151 OUTPUT LIST
G-LPCI-640, G-LPCI-644, G-LPCI-653, G-LPCI-662, G-LPCI-666, G-LPCI-678
G-LPCI-682, G-LPCI-691, G-LPCI-700, G-LPCI-1148
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
RELAY 933/1530 -206 FAILS TO ENERGIZE
9331530-206-FTE
9
C. P. 7 - 8 RELAY 933 / 1530 - 206 FAILS TO CLOSE
9331530-206-7FC
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
G-LPCI-1151
SEE OUTPUT LIST
NO SIGNAL TO RELAY 933/ 1530-260
G-LPCI-1152
RELAY 933/1530 -260 FAILS TO ENERGIZE
9331530-260-FTE
C. P. 2 - 8 RELAY 933 / 1530 - 260 FAILS TO CLOSE
9331530-260-2FC
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL FROM CONTROL LOGIC
G-LPCI-1154
LOSS OF SIGNAL IND. LOW RX PRESS. AND HIGH DRYWELL PRESS.
G-LPCI-1157
LOSS OF SIGNAL IND. LOW RX WATER LEVEL
G-LPCI-1158

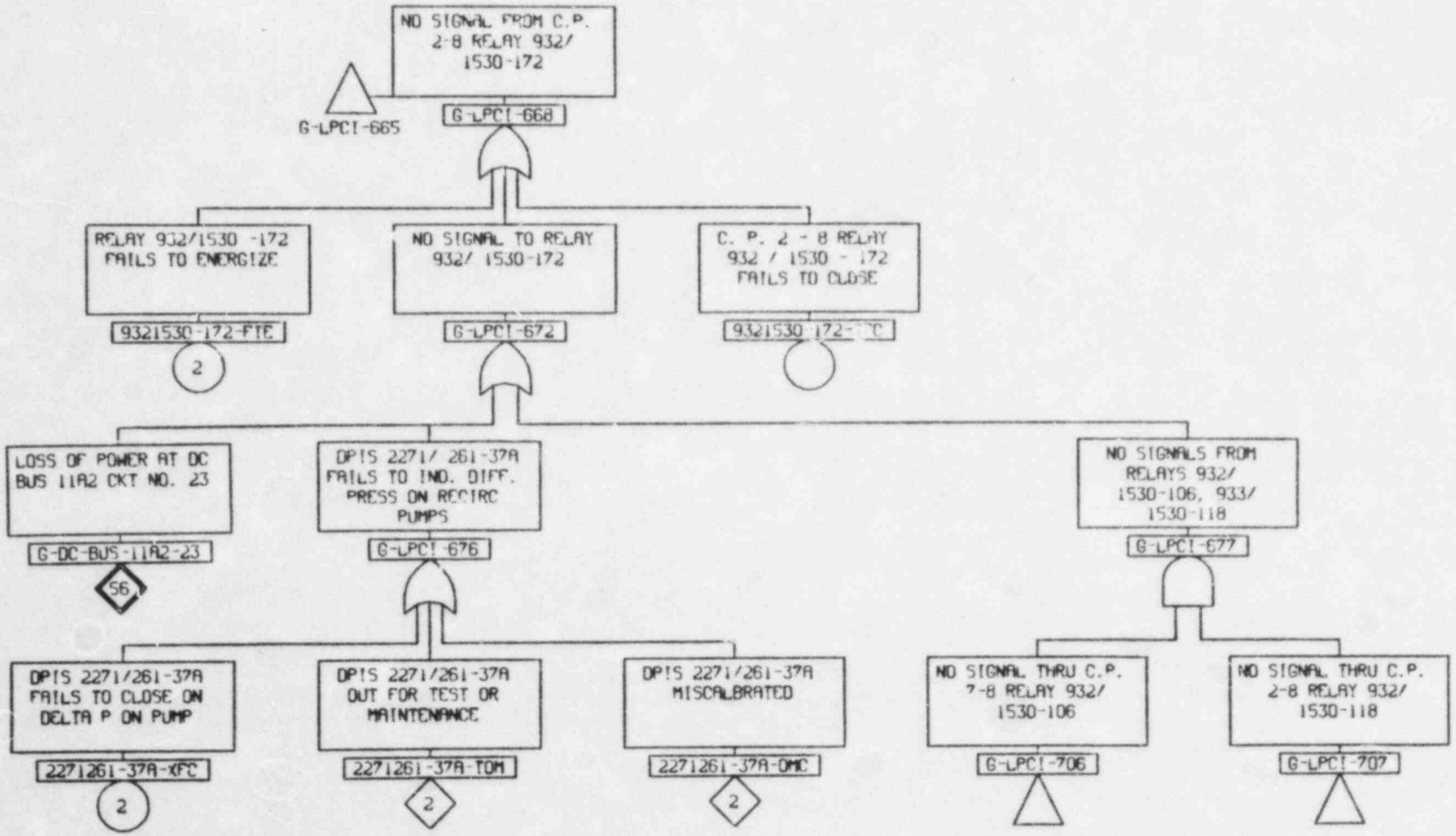

NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-171
G-LPCI-646
G-LPCI-647
RELAY 932/1530-171 FAILS TO ENERGIZE
C.P. 1 - 7 RELAY 932 / 1530 - 171 FAILS TO CLOSE
932/1530-171-FTE
932/1530-171-FTC
NO SIGNAL TO RELAY 932/ 1530-171
G-LPCI-649
NO SIGNALS FROM RELAYS 932/ 1530-106, 932/ 1530-118
G-LPCI-652
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707
DPIS 2271/261-36A FAILS TO CLOSE ON DELTA P ON PUMP
2271/261-36A-DPC
DPIS 2271/261-36A FAILS TO IND. DIFF. PRESS ON ACCTNG PUMPS
G-LPCI-651
DPIS 2271/261-36A MISCALIBRATED
2271/261-36A-DMC
DPIS 2271/261-36A OUT FOR TEST OR MAINTENANCE
2271/261-36A-TOM
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56

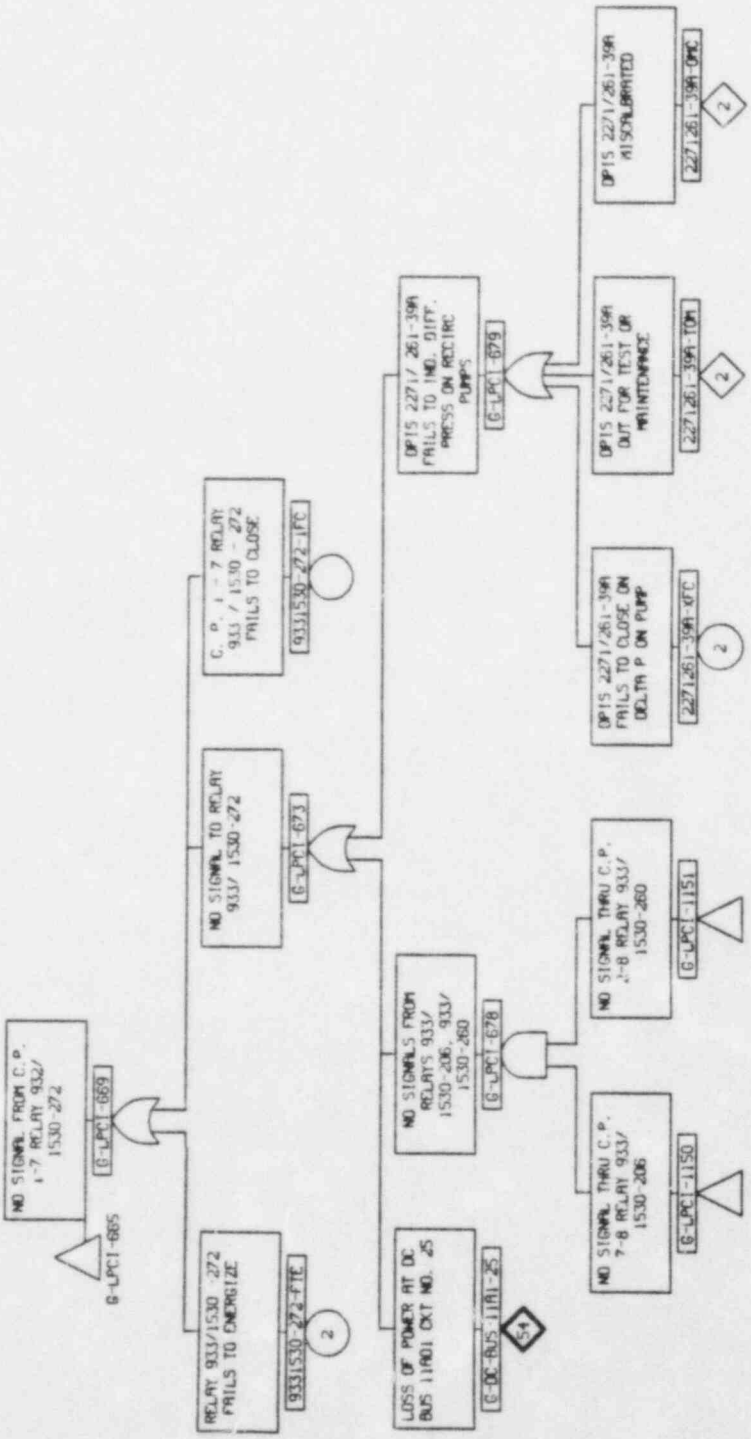

NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-271
G-LPCI-648
G-LPCI-646
C. P. 2 - 8 RELAY 933 / 1530 - 271 FAILS TO CLOSE
933/1530-271-FTC
RELAY 933/1530 -271 FAILS TO ENERGIZE
933/1530-271-FTE
2
NO SIGNAL TO RELAY 933/ 1530-271
G-LPCI-650
DPIS 2271/261-3B/1 FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
G-LPCI-654
DPIS 2271/261-3B/1 FAILS TO CLOSE ON DELTA P ON PUMP
2271/261-3B/1-DPC
DPIS 2271/261-3B/1 MISCALIBRATED
2271/261-3B/1-DMC
DPIS 2271/261-3B/1 OUT FOR TEST OR MAINTENANCE
2271/261-3B/1-DOM
NO SIGNALS FROM RELAYS 933/ 1530-206, 933/ 1530-260
G-LPCI-653
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
G-LPCI-1151
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
G1

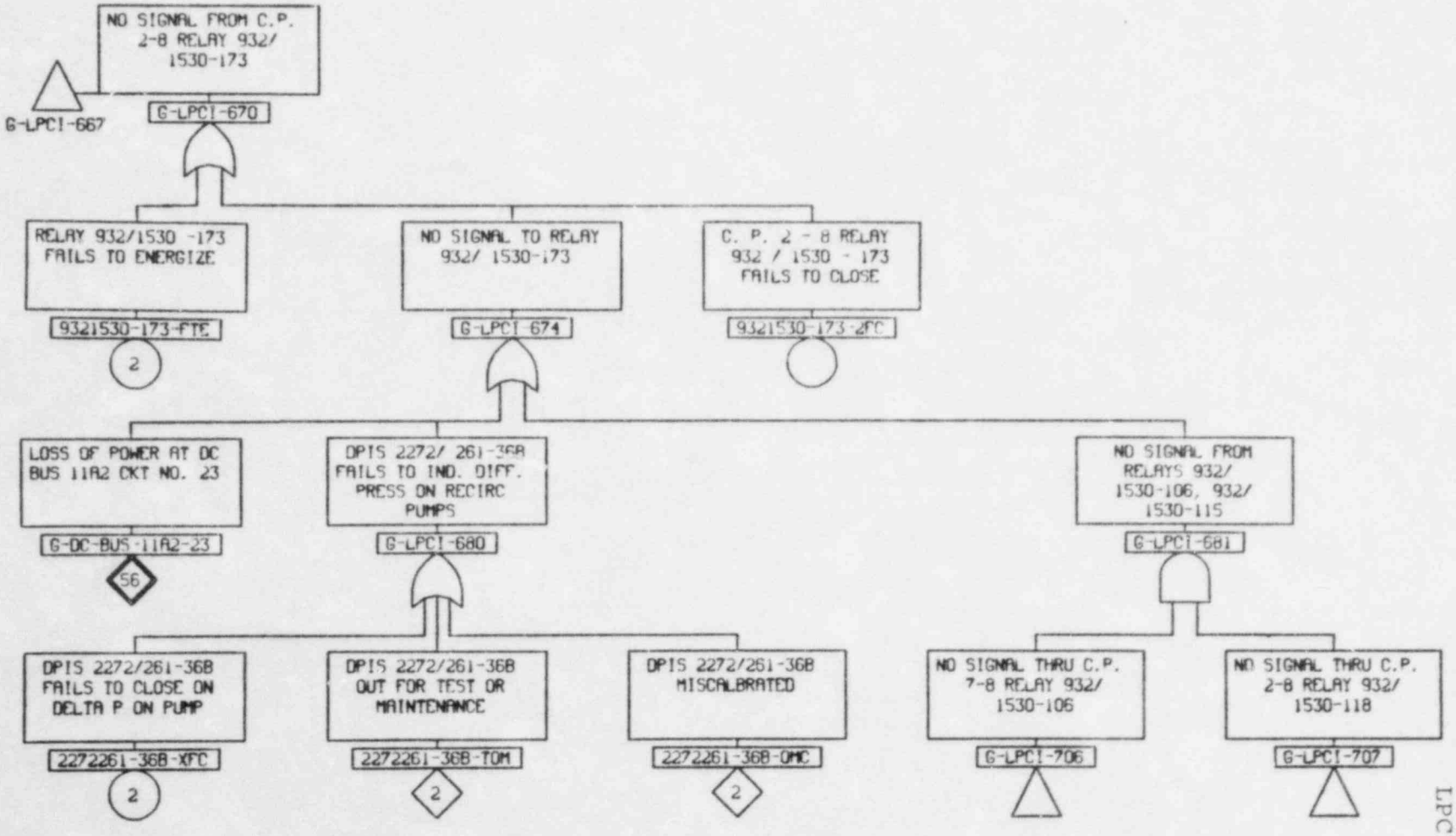

NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-174
G-LPCI-655
G-LPCI-656
NO SIGNAL TO RELAY 932/ 1530-174
C. P. 1 - 7 RELAY 932 / 1530 - 174 FAILS TO CLOSE
RELAY 932/1530 -174 FAILS TO ENERGIZE
G-LPCI-658
9321530-174-1FC
9321530-174-FTE
2
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
DPIS 2272/ 261-37B FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
NO SIGNAL FROM RELAYS 932/ 1530-106, 932/ 1530-118
G-DC-BUS-11A2-23
G-LPCI-660
G-LPCI-661
56
DPIS 2272/261-37B FAILS TO CLOSE ON DELTA P ON PUMP
DPIS 2272/261-37B MISCALBRATED
DPIS 2272/261-37B OUT FOR TEST OR MAINTENANCE
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
2272261-37B-XFC
2272261-37B-OMC
2272261-37B-TOM
G-LPCI-706
G-LPCI-707
2
2
2

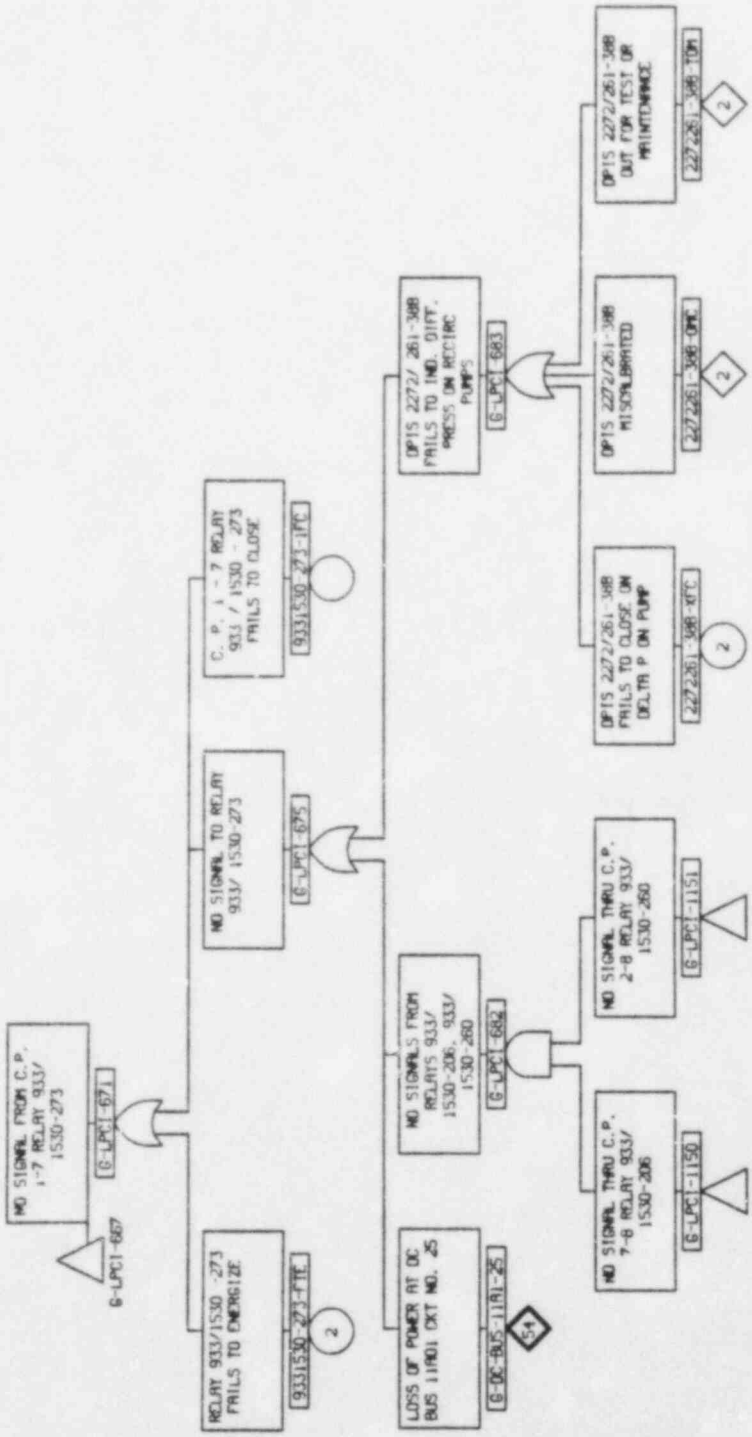

NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-274
G-LPCI-655
G-LPCI-659
NO SIGNAL TO RELAY 933/ 1530-274
G-LPCI-659
C. P. 2 - 8 RELAY 933 / 1530 - 274 FAILS TO CLOSE
933/1530-274-DPC
RELAY 933/1530 -274 FAILS TO ENERGIZE
933/1530-274-FTE
2
DPIS 2272/261-398 FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
G-LPCI-663
DPIS 2272/261-398 FAILS TO CLOSE ON DELTA P ON PUMP
2272261-398-DPC
2
DPIS 2272/261-398 OUT FOR TEST OR MAINTENANCE
2272261-398-TOM
2
DPIS 2272/261-398 MISCALIBRATED
2272261-398-DMC
2
NO SIGNAL FROM RELAYS 933/ 1530-206, 933/ 1530-260
G-LPCI-662
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
G-LPCI-1151
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-R25-11A1-25
G-1

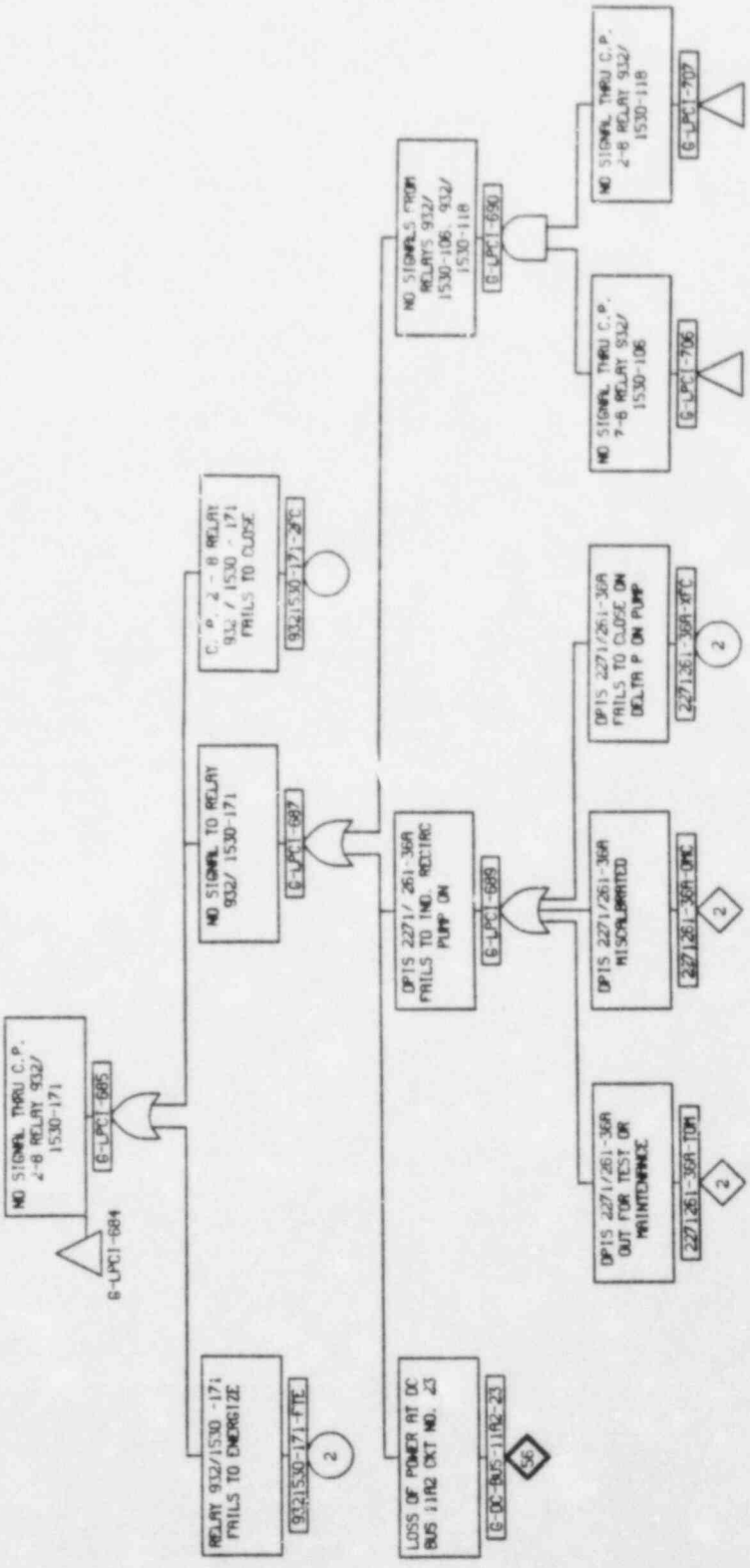

ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-667
G-LPCI-664
NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-173
G-LPCI-670
NO SIGNAL FROM C.P. 1-7 RELAY 933/ 1530-273
G-LPCI-671
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-665
G-LPCI-664
NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-172
G-LPCI-668
NO SIGNAL FROM C.P. 1-7 RELAY 932/ 1530-272
G-LPCI-669
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-666
G-LPCI-664
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
G-LPCI-1151
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-693
G-LPCI-664
NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-174
G-LPCI-694
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-274
G-LPCI-695
ONE-FIFTH OF 1 OUT OF 2 FIVE TIMES LOGIC FAILS
G-LPCI-684
G-LPCI-664
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-171
G-LPCI-685
NO SIGNAL THRU C.P. 1-7 RELAY 933/ 1530-271
G-LPCI-686

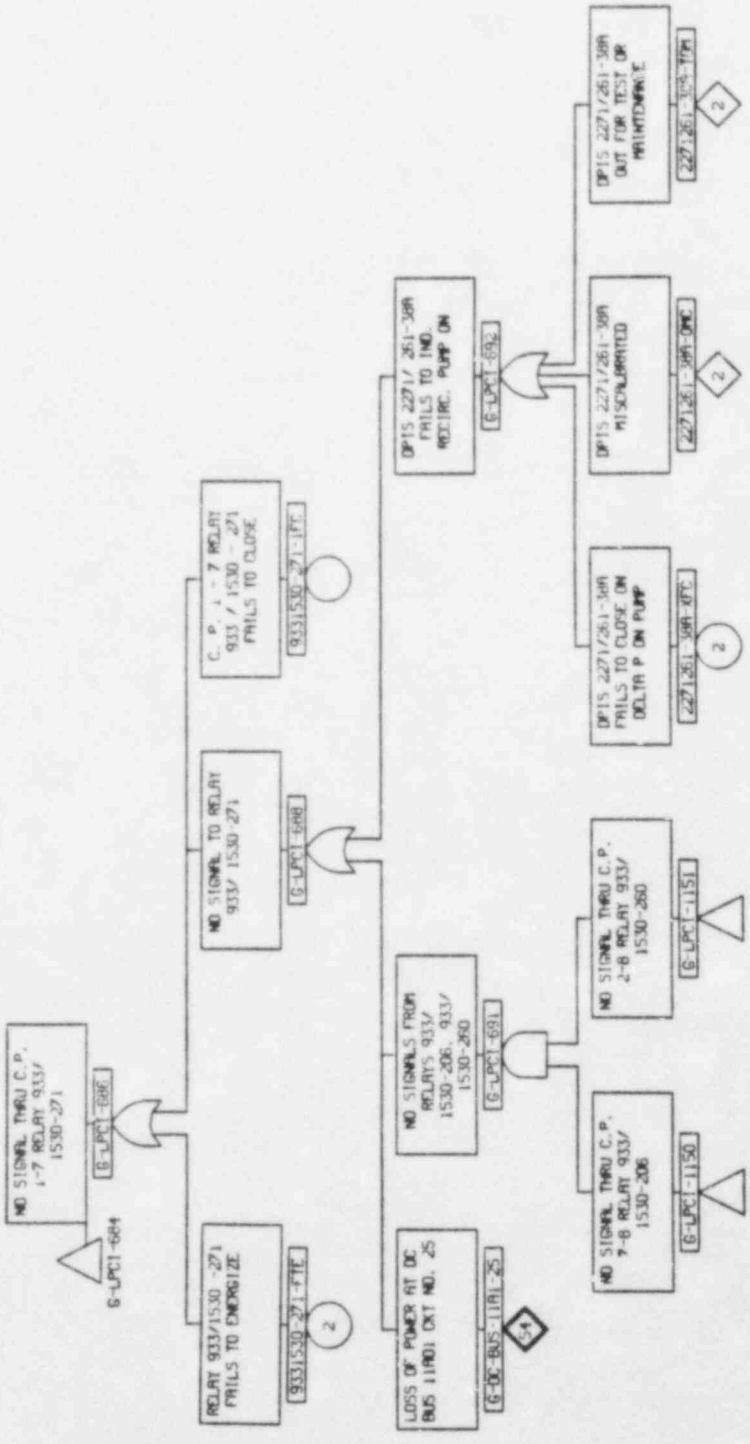

NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-172
G-LPCI-668
G-LPCI-665
RELAY 932/1530 -172 FAILS TO ENERGIZE
9321530-172-FTE
2
NO SIGNAL TO RELAY 932/ 1530-172
G-LPCI-672
C. P. 2 - 8 RELAY 932 / 1530 - 172 FAILS TO CLOSE
9321530-172-
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
DPIS 2271/ 261-37A FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
G-LPCI-676
NO SIGNALS FROM RELAYS 932/ 1530-106, 933/ 1530-118
G-LPCI-677
DPIS 2271/261-37A FAILS TO CLOSE ON DELTA P ON PUMP
2271261-37A-XFC
2
DPIS 2271/261-37A OUT FOR TEST OR MAINTENANCE
2271261-37A-TOM
2
DPIS 2271/261-37A MISCALBRATED
2271261-37A-OMC
2
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-106
G-LPCI-706
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707

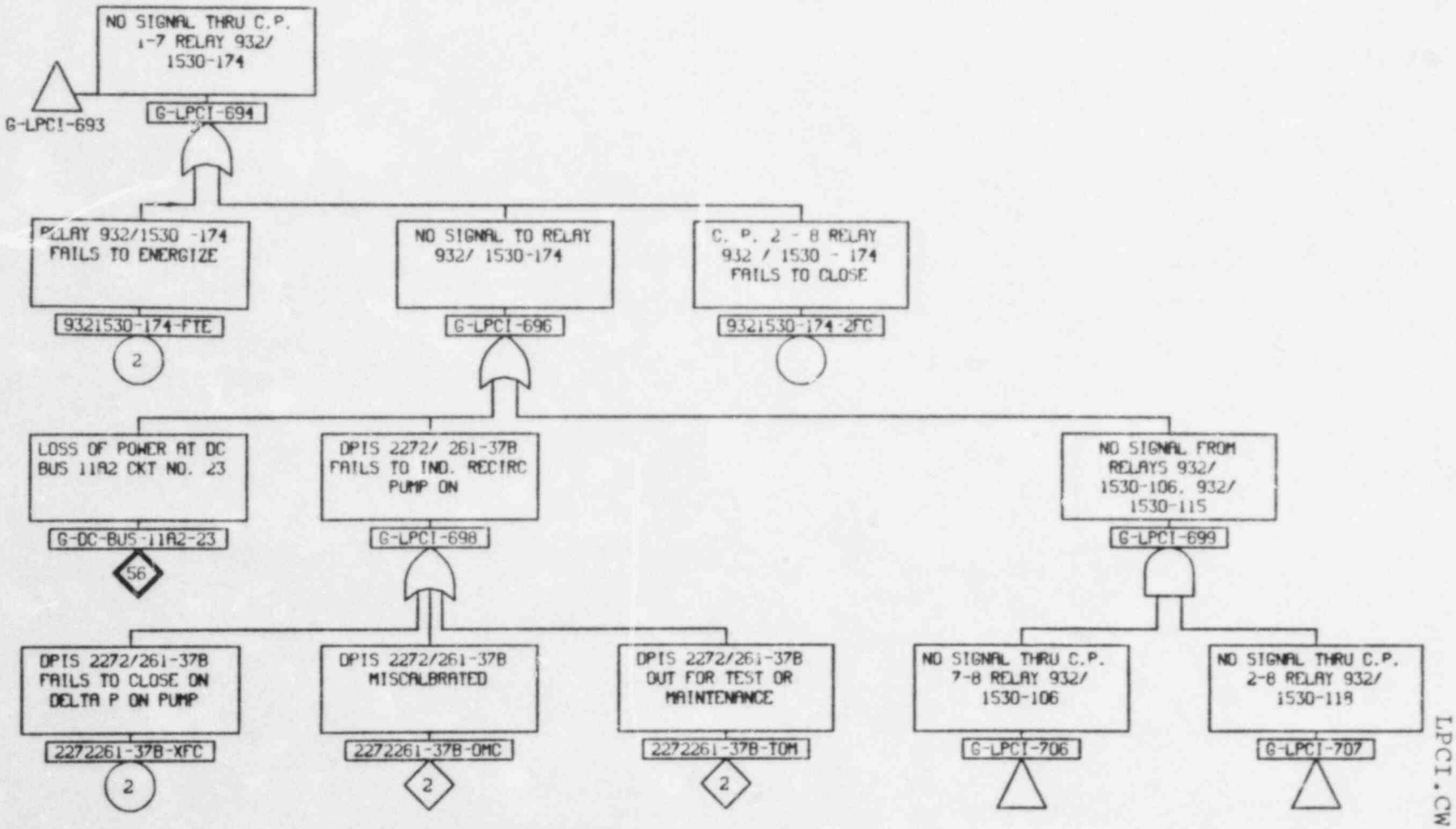

NO SIGNAL FROM C.P. 1-7 RELAY 932/ 1530-272
G-LPCI-669
G-LPCI-685
NO SIGNAL TO RELAY 933/ 1530-272
G-LPCI-673
C. P. 1-7 RELAY 933 / 1530-272 FAILS TO CLOSE
933/1530-272-1PC
RELAY 933/1530-272 FAILS TO ENERGIZE
933/1530-272-FTE
2
NO SIGNALS FROM RELAYS 933/ 1530-206, 933/ 1530-260
G-LPCI-678
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
G1
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-260
G-LPCI-1151
DPIS 2271/261-39A FAILS TO IND. DIFF. PRESS ON ADDIRC PUMPS
G-LPCI-679
DPIS 2271/261-39A FAILS TO CLOSE ON DELTA P ON PUMP
2271261-39A-DPC
2
DPIS 2271/261-39A OUT FOR TEST OR MAINTENANCE
2271261-39A-TOM
2
DPIS 2271/261-39A MISCALIBRATED
2271261-39A-DMC
2

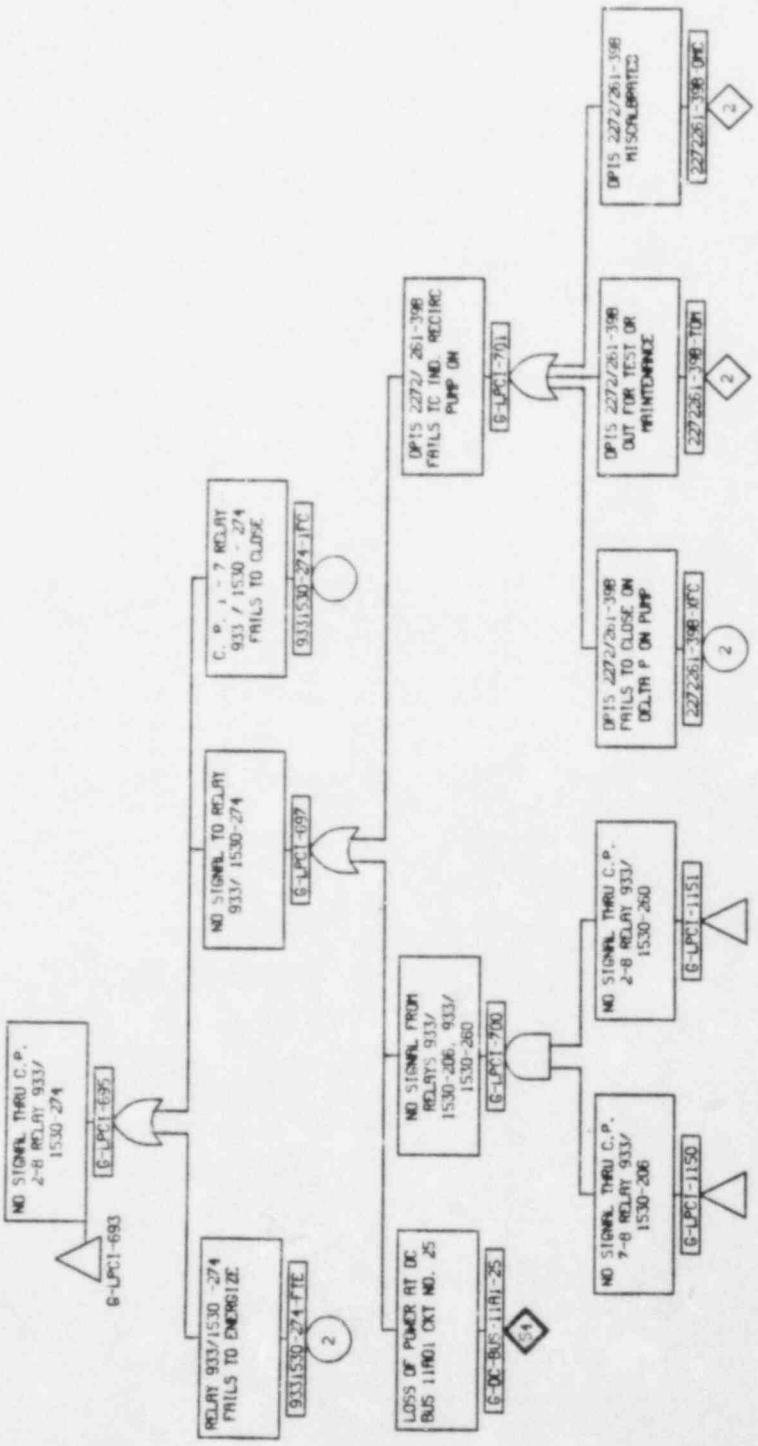

NO SIGNAL FROM C.P. 2-8 RELAY 932/ 1530-173
G-LPCI-667
G-LPCI-670
RELAY 932/1530 -173 FAILS TO ENERGIZE
9321530-173-FTE
2
NO SIGNAL TO RELAY 932/ 1530-173
G-LPCI-674
C. P. 2 - 8 RELAY 932 / 1530 - 173 FAILS TO CLOSE
9321530-173-2FC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
DPIS 2272/ 261-36A FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
G-LPCI-680
NO SIGNAL FROM RELAYS 932/ 1530-106, 932/ 1530-115
G-LPCI-681
DPIS 2272/261-36B FAILS TO CLOSE ON DELTA P ON PUMP
2272261-36B-XFC
2
DPIS 2272/261-36B OUT FOR TEST OR MAINTENANCE
2272261-36B-TOM
2
DPIS 2272/261-36B MISCALBRATED
2272261-36B-OMC
2
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707

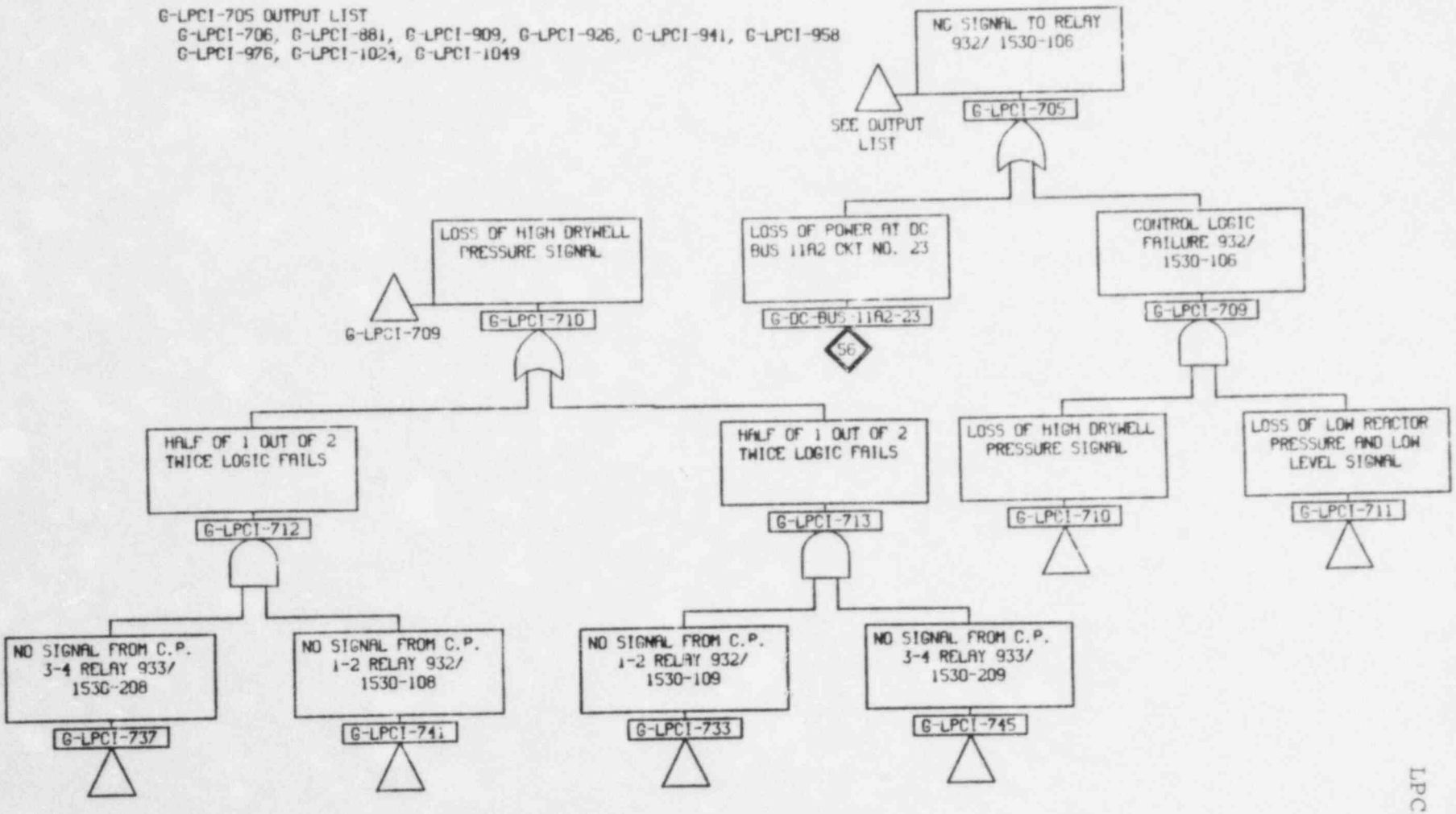

NO SIGNAL FROM C.P. 1-7 RELAY 933/ 1530-273
6-LPCI-671
6-LPCI-667
NO SIGNAL TO RELAY 933/ 1530-273
6-LPCI-695
C. P. 1 - 7 RELAY 933 / 1530 - 273 FAILS TO CLOSE
933/1530-273-1FC
RELAY 933/1530 -273 FAILS TO ENERGIZE
933/1530-273-1FE
2
LOSS OF POWER AT DC BUS 11A01 EXT NO. 25
6-DC-BUS-11A1-25
G-1
NO SIGNALS FROM RELAYS 933/ 1530-206, 933/ 1530-260
6-LPCI-682
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
6-LPCI-1150
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
6-LPCI-1151
DPIS 2272/261-388 FAILS TO IND. DIFF. PRESS ON RECIRC PUMPS
6-LPCI-683
DPIS 2272/261-388 FAILS TO CLOSE ON DELTA P ON PUMP
2272261-388-XFC
2
DPIS 2272/261-388 MISCALIBRATED
2272261-388-DPC
2
DPIS 2272/261-388 OUT FOR TEST OR MAINTENANCE
2272261-388-TOM
2

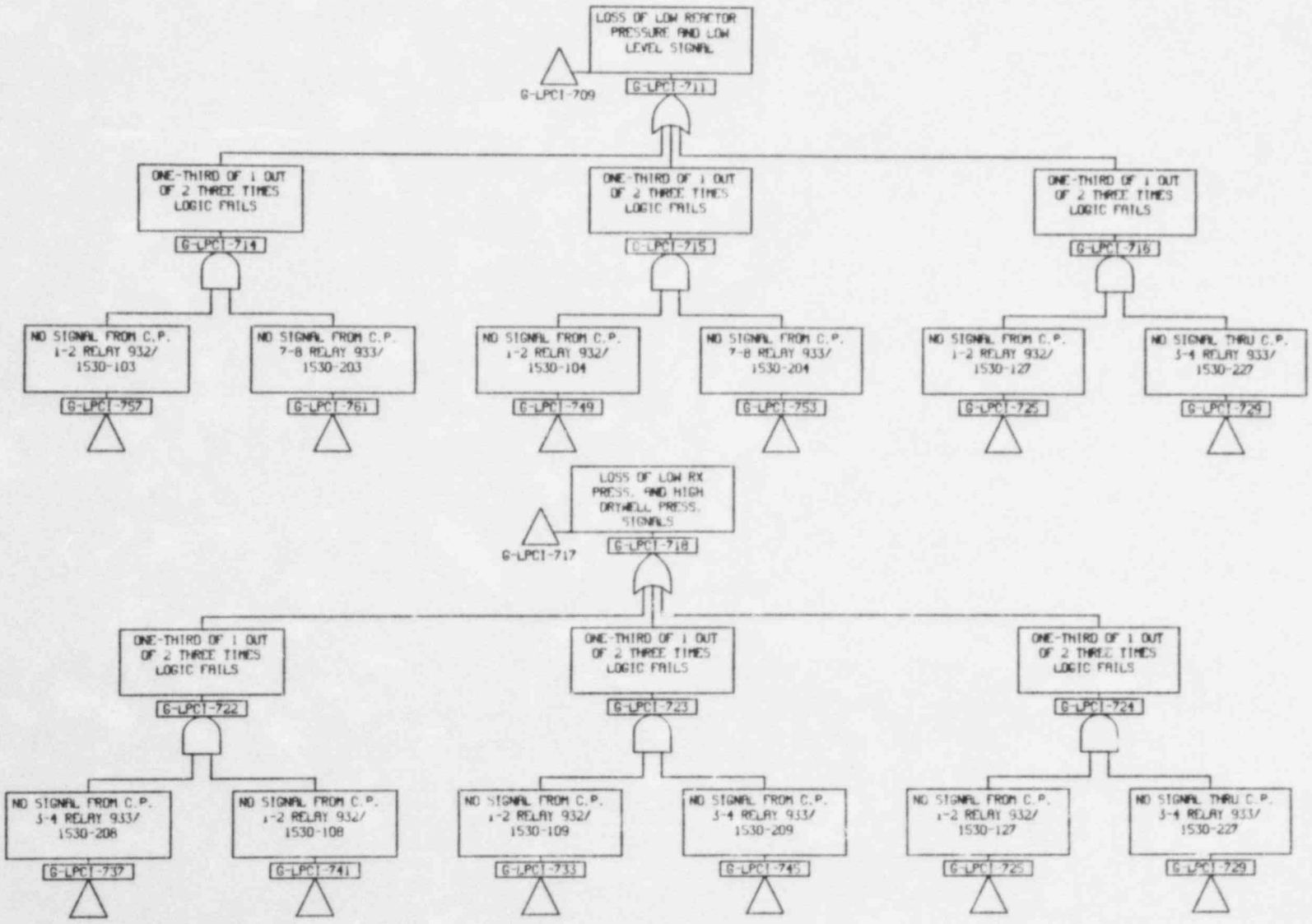

NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-171
G-LPCI-685
G-LPCI-684
NO SIGNAL TO RELAY 932/ 1530-171
G-LPCI-687
C. P. 2 - 8 RELAY 932 / 1530 - 171 FAILS TO CLOSE
932/1530-171-CTC
RELAY 932/1530 -171 FAILS TO ENERGIZE
932/1530-171-FTE
2
DPIS 2271/261-36A FAILS TO IND. REDIRC PUMP ON
G-LPCI-689
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNALS FROM RELAYS 932/ 1530-108, 932/ 1530-118
G-LPCI-690
DPIS 2271/261-36A MISCALIBRATED
2271/261-36A-DMC
2
DPIS 2271/261-36A FAILS TO CLOSE ON DELTA P ON PUMP
2271/261-36A-CTC
2
DPIS 2271/261-36A OUT FOR TEST OR MAINTENANCE
2271/261-36A-TOM
2
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707

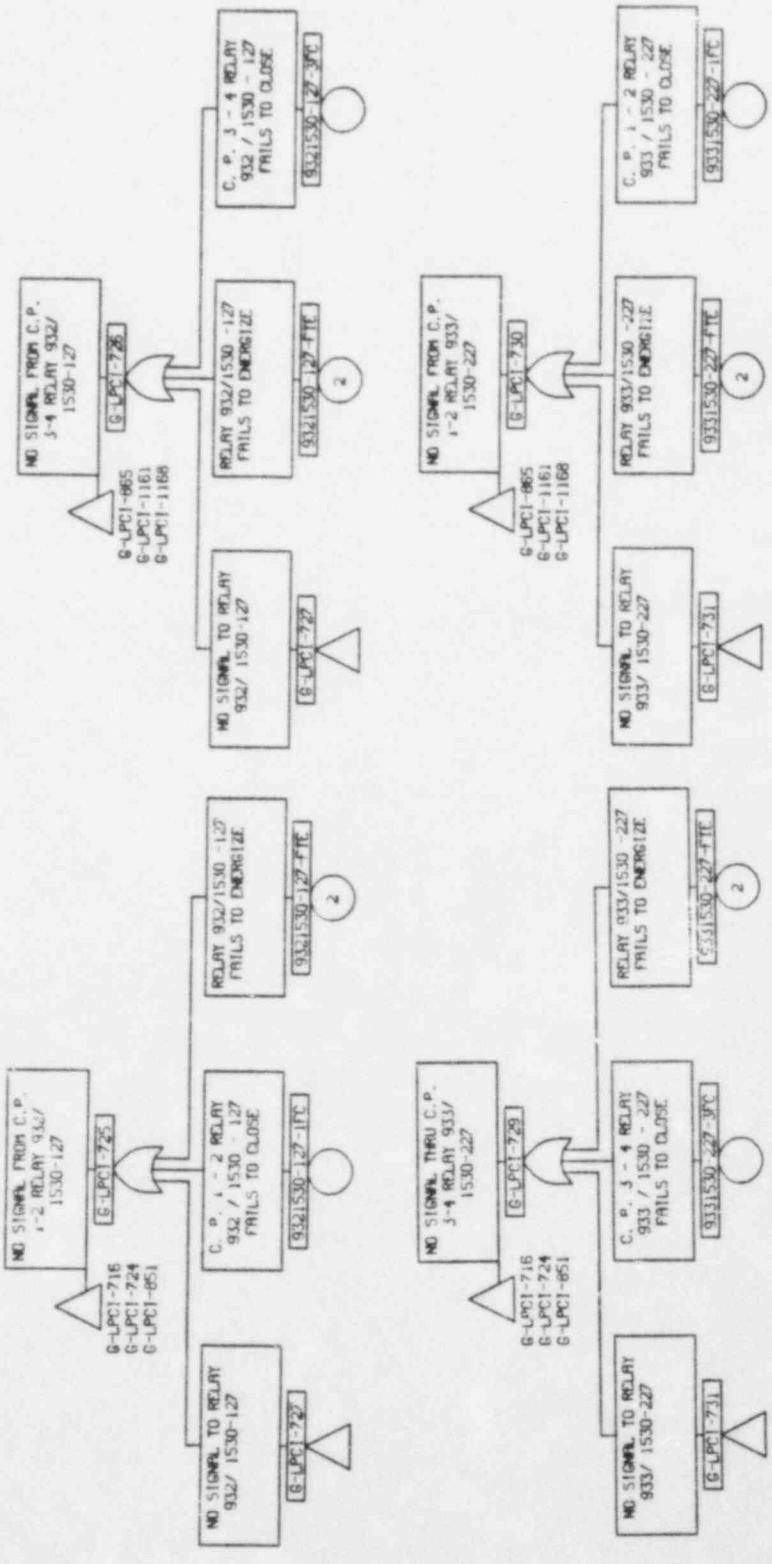

NO SIGNAL THRU C.P. 1-7 RELAY 933/ 1530-271
G-LPCI-684
G-LPCI-686
RELAY 933/1530 -271 FAILS TO ENERGIZE
9331530-271-FRE
2
NO SIGNAL TO RELAY 933/ 1530-271
G-LPCI-688
C. P. 1 - 7 RELAY 933 / 1530 - 271 FAILS TO CLOSE
9331530-271-CPC
LOSS OF POWER AT DC BUS 11A(D1 CKT NO. 25
G-DC-BUS-11A1-25
G-LPCI-691
NO SIGNALS FROM RELAYS 933/ 1530-206, 933/ 1530-260
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
G-LPCI-1151
DPIS 2271/261-36A FAILS TO IND. MOTORC. PUMP ON
G-LPCI-692
DPIS 2271/261-36A FAILS TO CLOSE ON DELTA P ON PUMP
2271261-36A-DPC
2
DPIS 2271/261-36A MISCALIBRATED
2271261-36A-DMC
2
DPIS 2271/261-36A OUT FOR TEST OR MAINTENANCE
2271261-36A-TMM
2

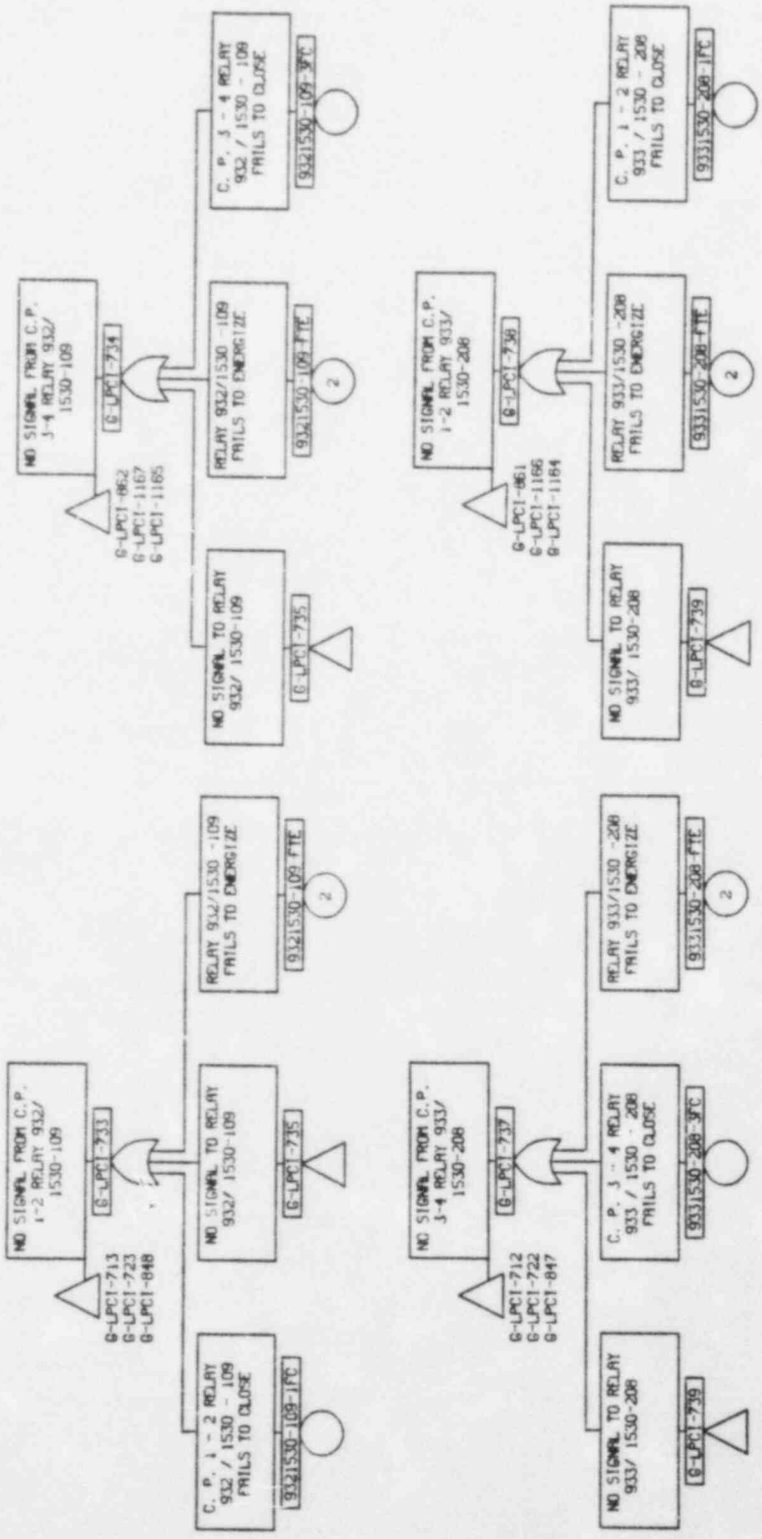

NO SIGNAL THRU C.P. 1-7 RELAY 932/ 1530-174
G-LPCI-693
G-LPCI-694
RELAY 932/1530 -174 FAILS TO ENERGIZE
9321530-174-FTE
2
NO SIGNAL TO RELAY 932/ 1530-174
G-LPCI-696
C. P. 2 - 8 RELAY 932 / 1530 - 174 FAILS TO CLOSE
9321530-174-2FC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
DPIS 2272/ 261-37B FAILS TO IND. RECIRC PUMP ON
G-LPCI-698
NO SIGNAL FROM RELAYS 932/ 1530-106, 932/ 1530-115
G-LPCI-699
DPIS 2272/261-37B FAILS TO CLOSE ON DELTA P ON PUMP
2272261-37B-XFC
2
DPIS 2272/261-37B MISCALBRATED
2272261-37B-DMC
2
DPIS 2272/261-37B OUT FOR TEST OR MAINTENANCE
2272261-37B-TOM
2
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-106
G-LPCI-706
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-118
G-LPCI-707

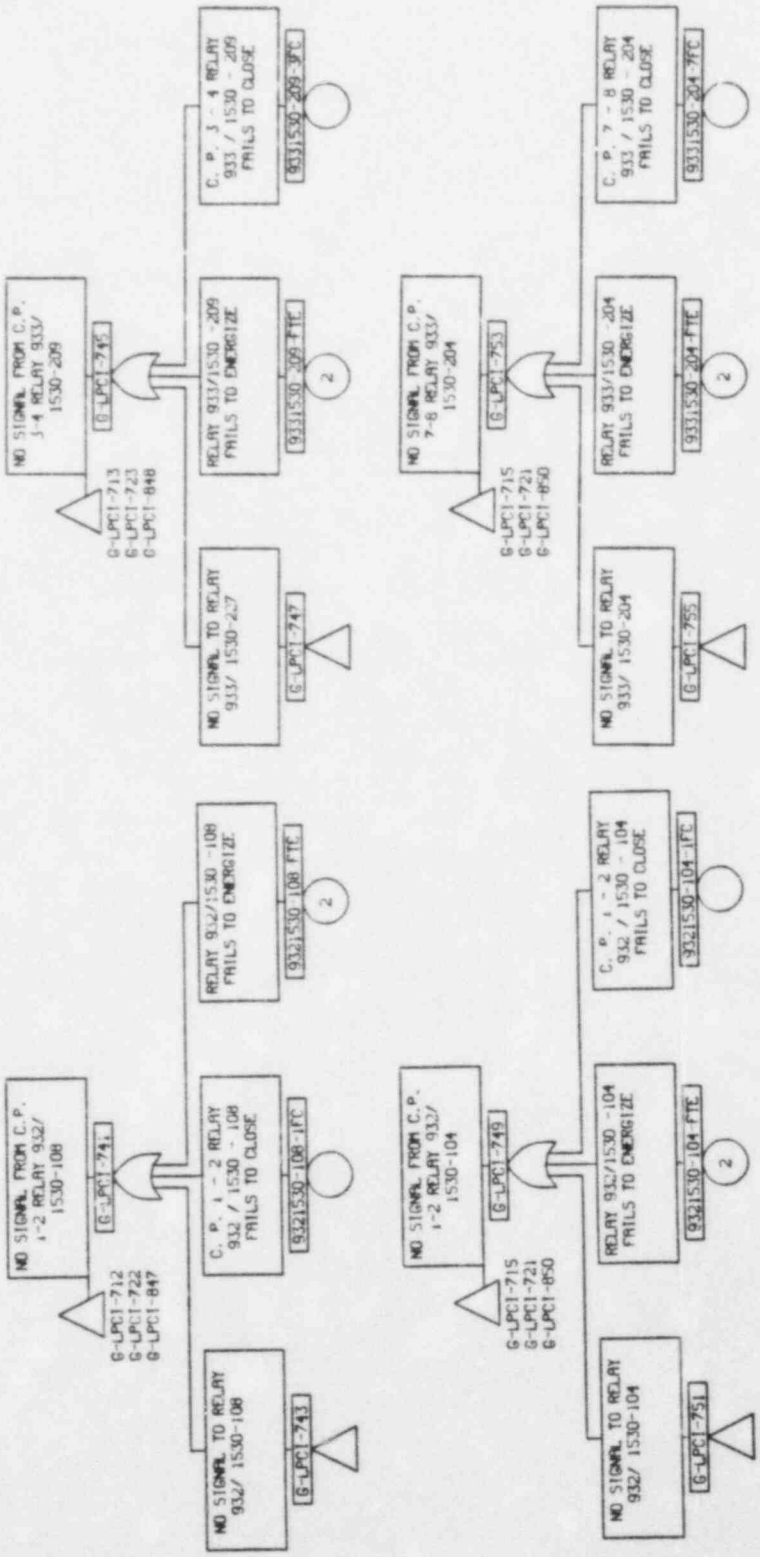

NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-274
G-LPCI-693
G-LPCI-695
RELAY 933/1530-274 FAILS TO ENERGIZE
933/1530-274-FTE
2
NO SIGNAL TO RELAY 933/ 1530-274
G-LPCI-697
C.P. 1-7 RELAY 933 / 1530-274 FAILS TO CLOSE
933/1530-274-FTC
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
S1
NO SIGNAL FROM RELAYS 933/ 1530-206, 933/ 1530-260
G-LPCI-700
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-206
G-LPCI-1150
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-260
G-LPCI-1151
DPIS 2272/261-398 FAILS TO CLOSE ON DELTA P ON PUMP
2272261-398-DPC
2
DPIS 2272/261-398 FAILS TO IND. RECIRC PUMP ON
G-LPCI-701
DPIS 2272/261-398 OUT FOR TEST OR MAINTENANCE
2272261-398-TOM
2
DPIS 2272/261-398 MISCALIBRATED
2272261-398-DMC
2

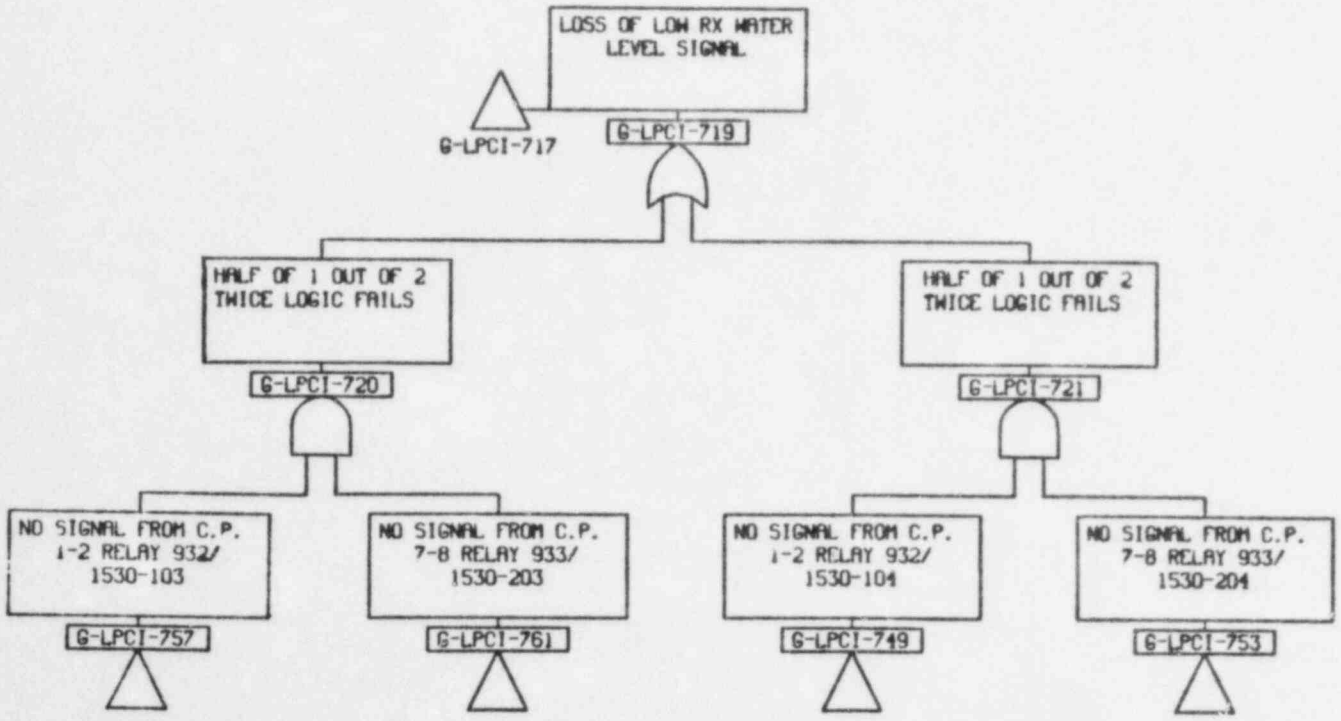

G-LPCI-705 OUTPUT LIST
G-LPCI-706, G-LPCI-881, G-LPCI-909, G-LPCI-926, G-LPCI-941, G-LPCI-958
G-LPCI-976, G-LPCI-1024, G-LPCI-1049
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705
SEE OUTPUT LIST
LOSS OF HIGH DRYWELL PRESSURE SIGNAL
G-LPCI-709
G-LPCI-710
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
S6
CONTROL LOGIC FAILURE 932/ 1530-106
G-LPCI-709
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-712
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-713
LOSS OF HIGH DRYWELL PRESSURE SIGNAL
G-LPCI-710
LOSS OF LOW REACTOR PRESSURE AND LOW LEVEL SIGNAL
G-LPCI-711
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-208
G-LPCI-737
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-108
G-LPCI-741
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-109
G-LPCI-733
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-209
G-LPCI-745

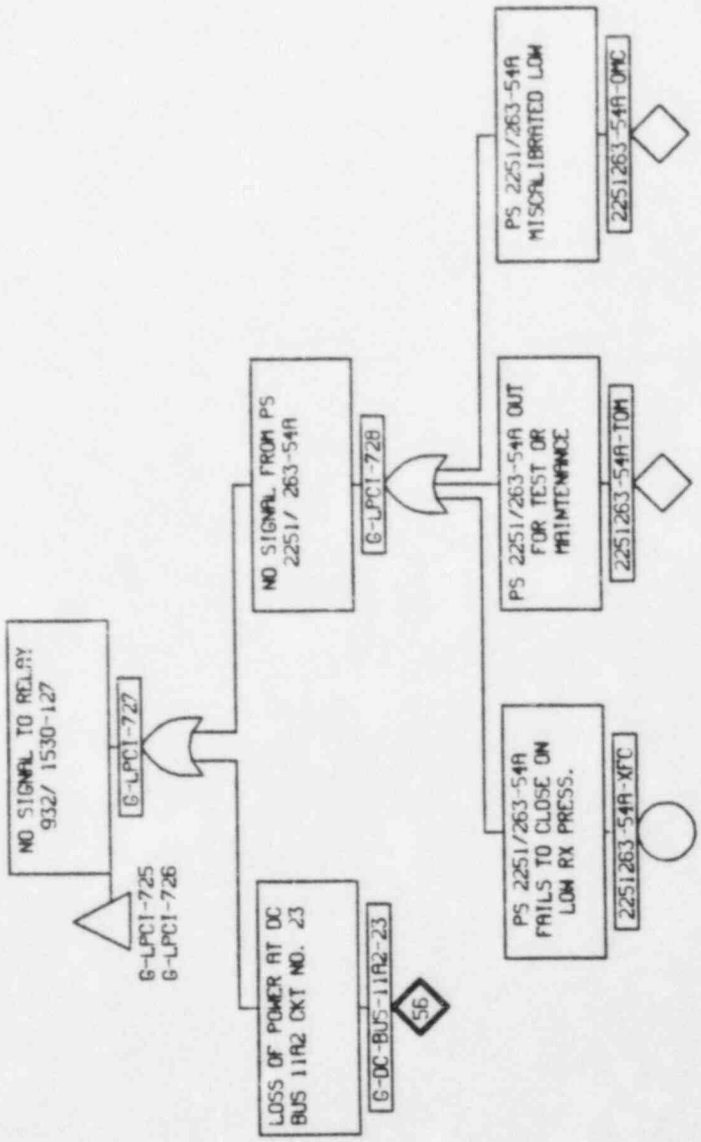

LOSS OF LOW REACTOR PRESSURE AND LOW LEVEL SIGNAL
G-LPCI-711
G-LPCI-709
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-714
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-715
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-716
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-103
G-LPCI-757
NO SIGNAL FROM C.P. 7-8 RELAY 933/ 1530-203
G-LPCI-761
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-104
G-LPCI-749
NO SIGNAL FROM C.P. 7-8 RELAY 933/ 1530-204
G-LPCI-753
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-127
G-LPCI-725
NO SIGNAL THRU C.P. 3-4 RELAY 933/ 1530-227
G-LPCI-729
LOSS OF LOW RX PRESS. AND HIGH DRYWELL PRESS. SIGNALS
G-LPCI-718
G-LPCI-717
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-722
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-723
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-724
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-208
G-LPCI-737
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-108
G-LPCI-741
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-109
G-LPCI-733
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-209
G-LPCI-745
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-127
G-LPCI-725
NO SIGNAL THRU C.P. 3-4 RELAY 933/ 1530-227
G-LPCI-729

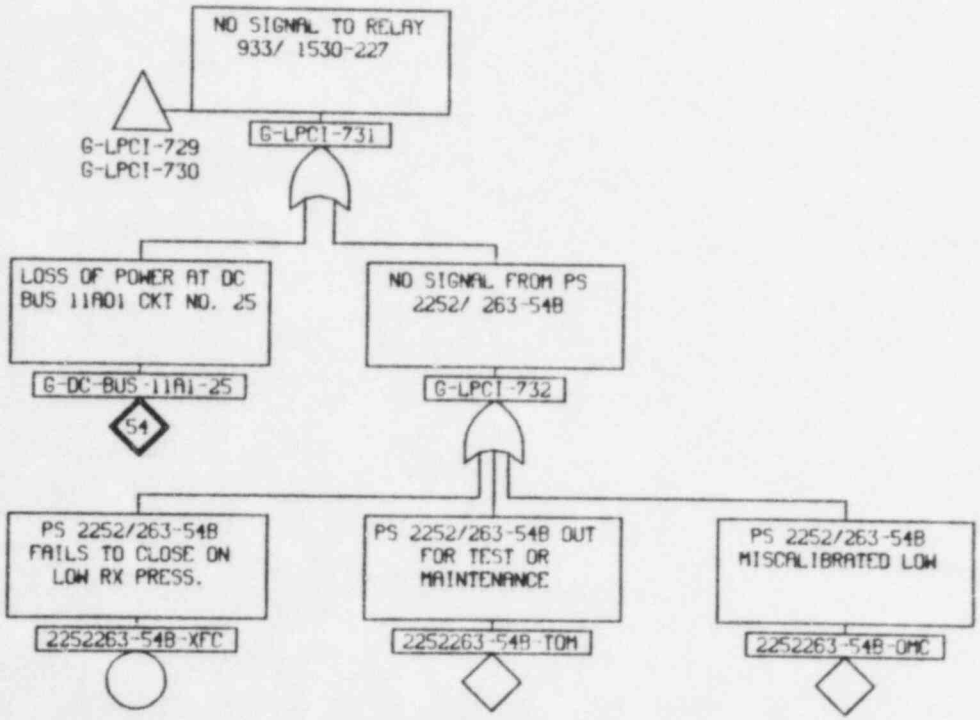

NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-127
G-LPCI-716
G-LPCI-724
G-LPCI-851
G-LPCI-725
C. P. 1 - 2 RELAY 932 / 1530 - 127 FAILS TO CLOSE
932/1530-127-1PC
NO SIGNAL TO RELAY 932/ 1530-127
G-LPCI-727
RELAY 932/1530 -127 FAILS TO ENERGIZE
932/1530-127-FTE
2
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-127
G-LPCI-865
G-LPCI-1161
G-LPCI-1168
G-LPCI-726
C. P. 3 - 4 RELAY 932 / 1530 - 127 FAILS TO CLOSE
932/1530-127-3PC
RELAY 932/1530 -127 FAILS TO ENERGIZE
932/1530-127-FTE
2
NO SIGNAL TO RELAY 932/ 1530-127
G-LPCI-727
NO SIGNAL THRU C.P. 3-4 RELAY 933/ 1530-227
G-LPCI-716
G-LPCI-724
G-LPCI-851
G-LPCI-729
C. P. 3 - 4 RELAY 933 / 1530 - 227 FAILS TO CLOSE
933/1530-227-3PC
RELAY 933/1530 -227 FAILS TO ENERGIZE
933/1530-227-FTE
2
NO SIGNAL TO RELAY 933/ 1530-227
G-LPCI-731
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-227
G-LPCI-865
G-LPCI-1161
G-LPCI-1168
G-LPCI-730
C. P. 1 - 2 RELAY 933 / 1530 - 227 FAILS TO CLOSE
933/1530-227-1PC
RELAY 933/1530 -227 FAILS TO ENERGIZE
933/1530-227-FTE
2
NO SIGNAL TO RELAY 933/ 1530-227
G-LPCI-731

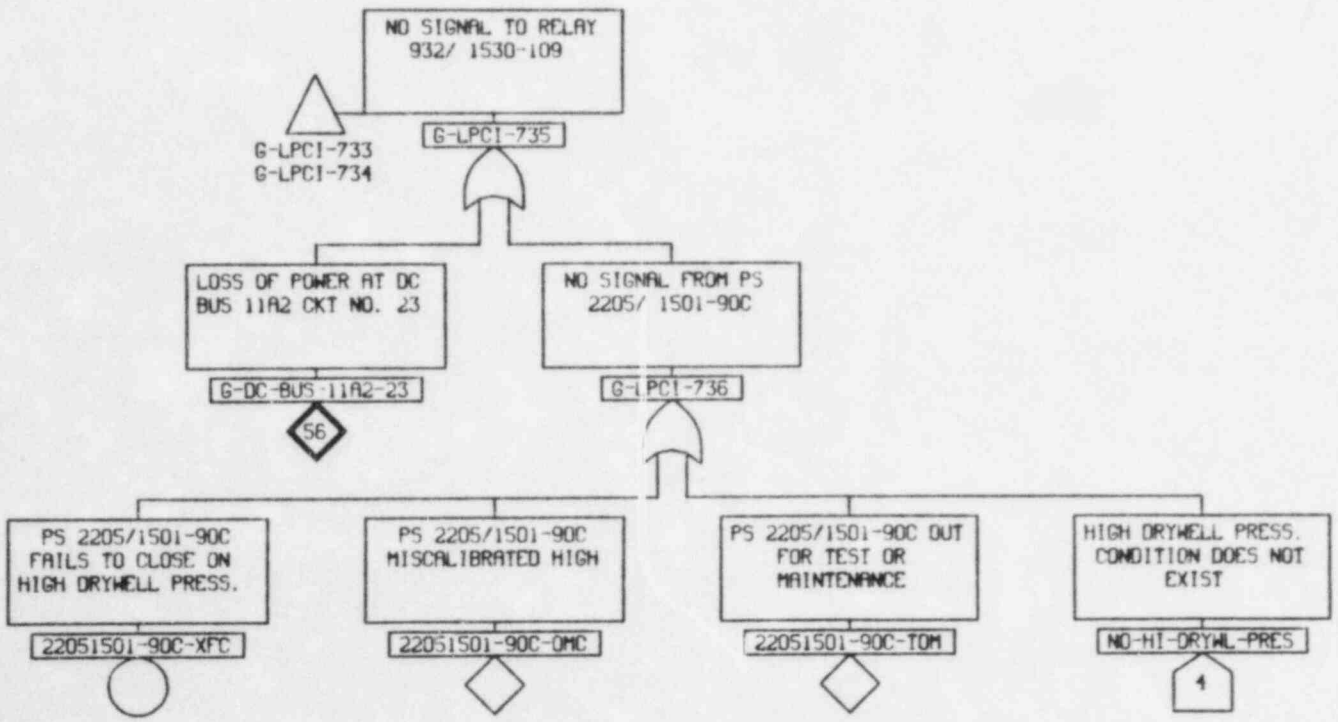

NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-109
G-LPCI-713
G-LPCI-723
G-LPCI-848
G-LPCI-733
C. P. 1 - 2 RELAY 932 / 1530 - 109 FAILS TO CLOSE
932/1530-109-1PC
NO SIGNAL TO RELAY 932/ 1530-109
G-LPCI-735
RELAY 932/1530 -109 FAILS TO ENERGIZE
932/1530-109-FFE
2
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-109
G-LPCI-862
G-LPCI-1167
G-LPCI-1165
G-LPCI-734
C. P. 3 - 4 RELAY 932 / 1530 - 109 FAILS TO CLOSE
932/1530-109-3PC
RELAY 932/1530 -109 FAILS TO ENERGIZE
932/1530-109-FFE
2
NO SIGNAL TO RELAY 932/ 1530-109
G-LPCI-735
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-208
G-LPCI-712
G-LPCI-722
G-LPCI-847
G-LPCI-737
C. P. 1 - 2 RELAY 933 / 1530 - 208 FAILS TO CLOSE
933/1530-208-1PC
RELAY 933/1530 -208 FAILS TO ENERGIZE
933/1530-208-FFE
2
NO SIGNAL TO RELAY 933/ 1530-208
G-LPCI-739
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-208
G-LPCI-861
G-LPCI-1166
G-LPCI-1164
G-LPCI-738
C. P. 3 - 4 RELAY 933 / 1530 - 208 FAILS TO CLOSE
933/1530-208-3PC
RELAY 933/1530 -208 FAILS TO ENERGIZE
933/1530-208-FFE
2
NO SIGNAL TO RELAY 933/ 1530-208
G-LPCI-739

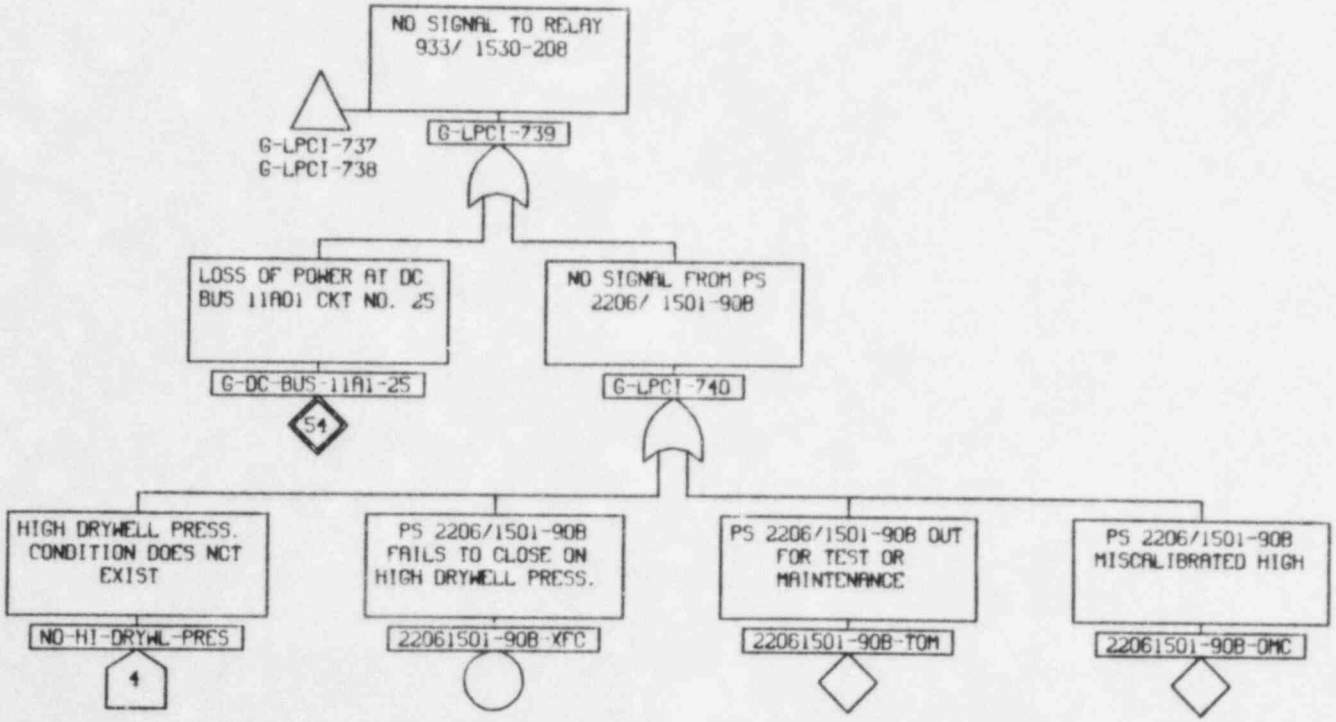

NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-108
G-LPCI-712
G-LPCI-722
G-LPCI-847
G-LPCI-741
C. P. 1 - 2 RELAY 932 / 1530 - 108 FAILS TO CLOSE
932/1530-108-1FC
NO SIGNAL TO RELAY 932/ 1530-108
G-LPCI-743
RELAY 932/1530 -108 FAILS TO ENERGIZE
932/1530-108-FTE
2
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-104
G-LPCI-715
G-LPCI-721
G-LPCI-850
G-LPCI-749
RELAY 932/1530 -104 FAILS TO ENERGIZE
932/1530-104-FTE
2
C. P. 1 - 2 RELAY 932 / 1530 - 104 FAILS TO CLOSE
932/1530-104-1FC
NO SIGNAL TO RELAY 932/ 1530-104
G-LPCI-751
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-209
G-LPCI-713
G-LPCI-723
G-LPCI-848
G-LPCI-745
RELAY 933/1530 -209 FAILS TO ENERGIZE
933/1530-209-FTE
2
C. P. 3 - 4 RELAY 933 / 1530 - 209 FAILS TO CLOSE
933/1530-209-1FC
NO SIGNAL TO RELAY 933/ 1530-209
G-LPCI-747
NO SIGNAL FROM C.P. 7-8 RELAY 933/ 1530-204
G-LPCI-715
G-LPCI-721
G-LPCI-850
G-LPCI-753
RELAY 933/1530 -204 FAILS TO ENERGIZE
933/1530-204-FTE
2
C. P. 7 - 8 RELAY 933 / 1530 - 204 FAILS TO CLOSE
933/1530-204-1FC
NO SIGNAL TO RELAY 933/ 1530-204
G-LPCI-755

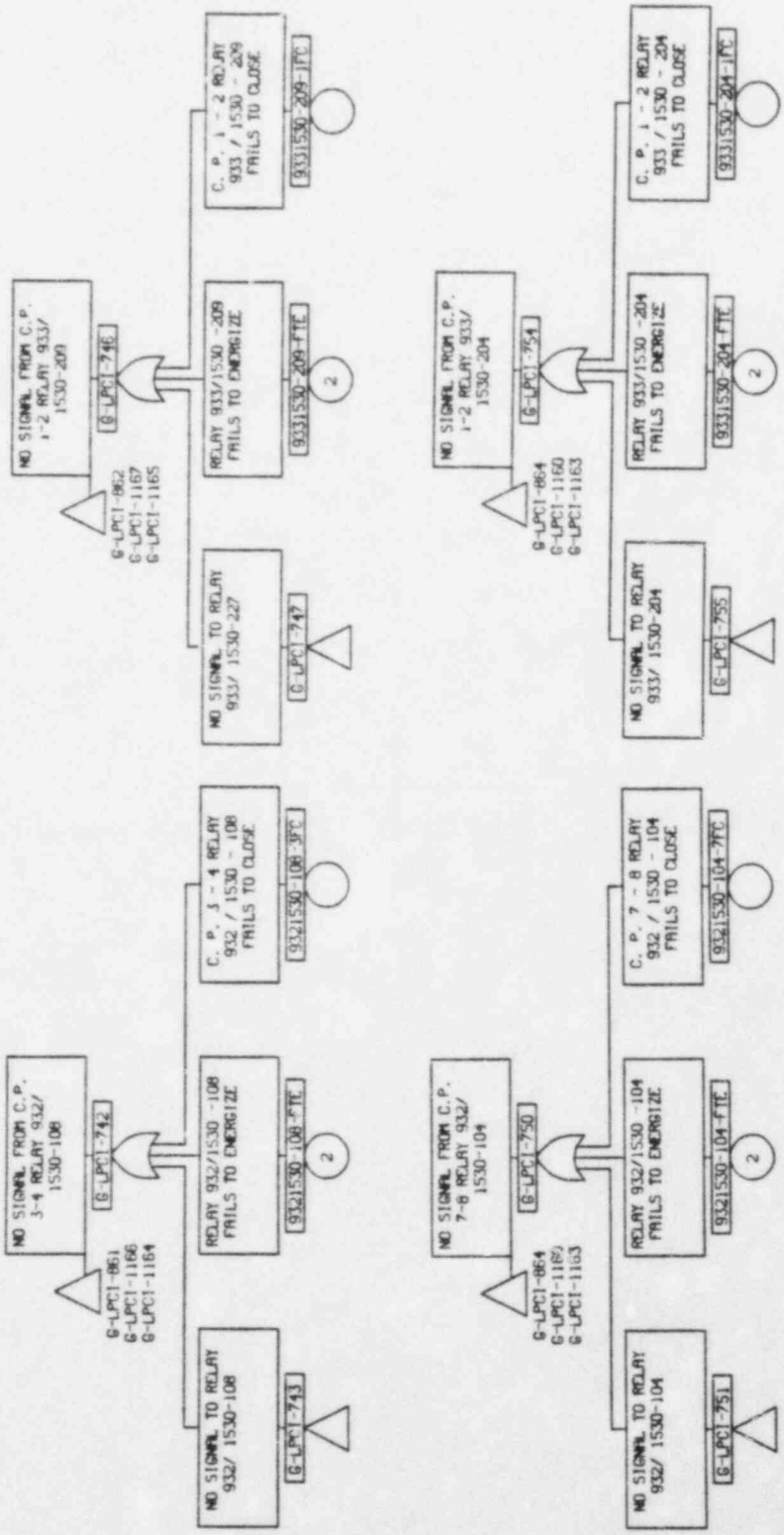

LOSS OF LOW RX WATER LEVEL SIGNAL
G-LPCI-719
G-LPCI-717
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-720
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-721
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-103
G-LPCI-757
NO SIGNAL FROM C.P. 7-8 RELAY 933/ 1530-203
G-LPCI-761
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-104
G-LPCI-749
NO SIGNAL FROM C.P. 7-8 RELAY 933/ 1530-204
G-LPCI-753

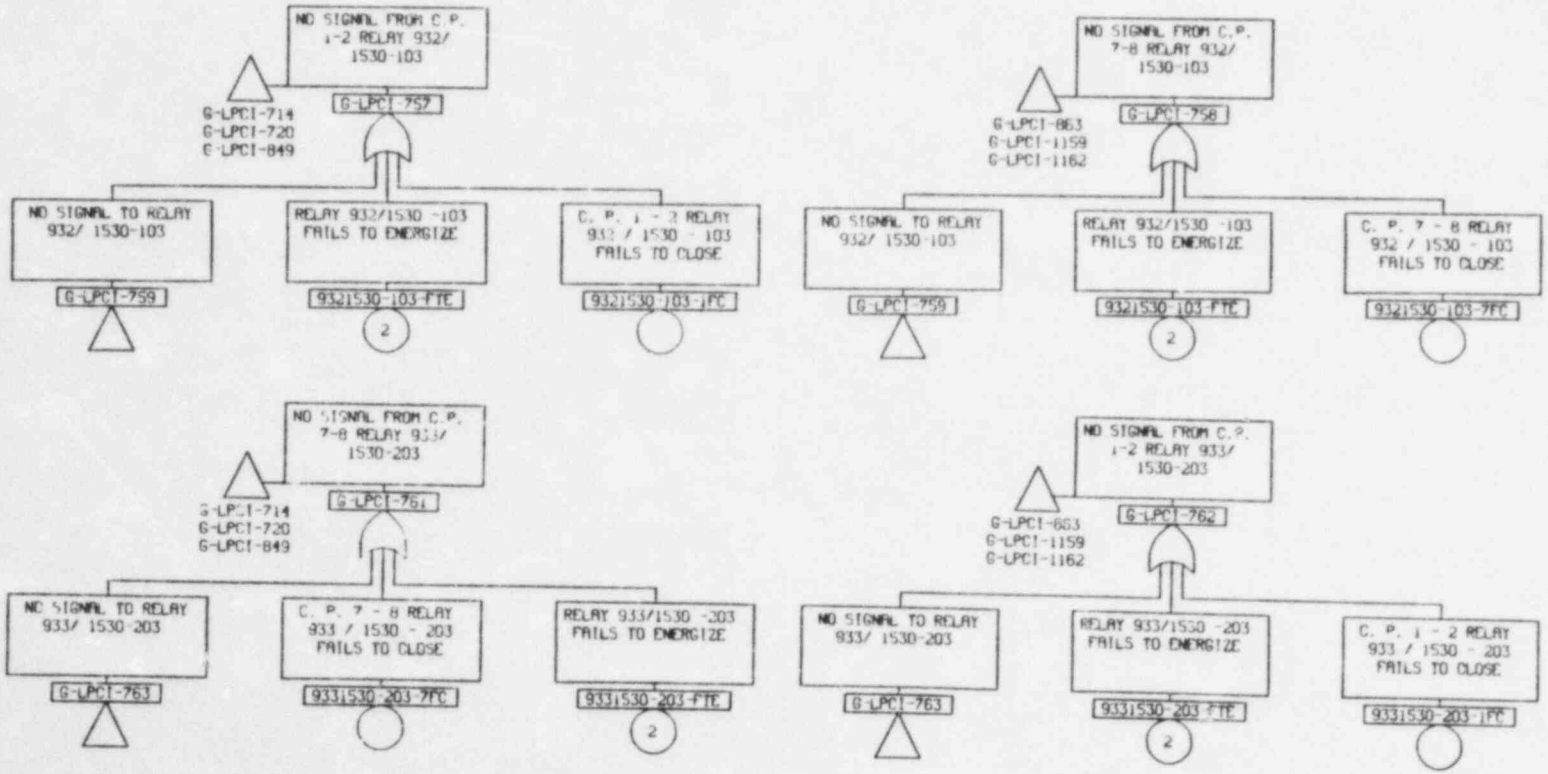

NO SIGNAL TO RELAY
932/ 1530-127
G-LPCI-727
G-LPCI-725
G-LPCI-726
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM PS
2251/ 263-54A
G-LPCI-728
PS 2251/263-54A
FAILS TO CLOSE ON
LOW RX PRESS.
2251263-54A-XFC
PS 2251/263-54A OUT
FOR TEST OR
MAINTENANCE
2251263-54A-TOM
PS 2251/263-54A
MISCALIBRATED LOW
2251263-54A-OMC

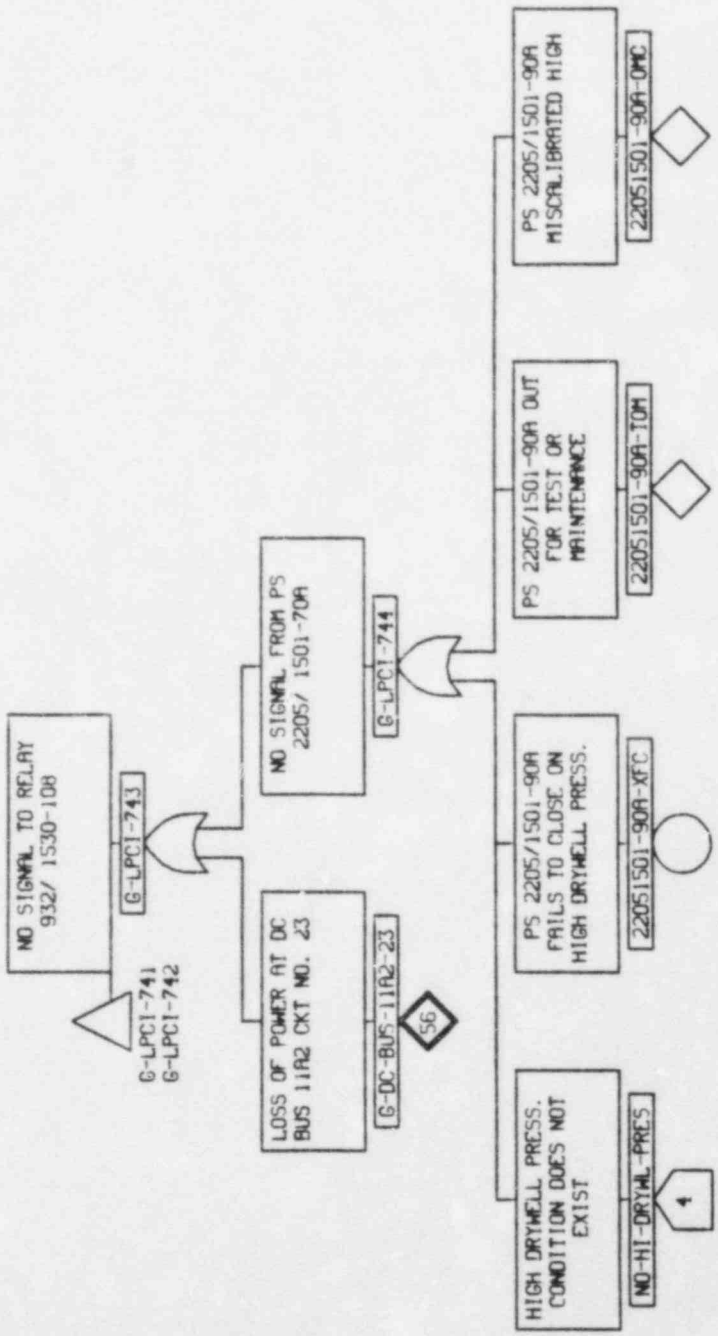

NO SIGNAL TO RELAY
933/ 1530-227
G-LPCI-731
G-LPCI-729
G-LPCI-730
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
NO SIGNAL FROM PS
2252/ 263-54B
G-DC-BUS-11A1-25
54
G-LPCI-732
PS 2252/263-54B
FAILS TO CLOSE ON
LOW RX PRESS.
PS 2252/263-54B OUT
FOR TEST OR
MAINTENANCE
PS 2252/263-54B
MISCALIBRATED LOW
2252263-54B-XFC
2252263-54B-TOM
2252263-54B-OMC

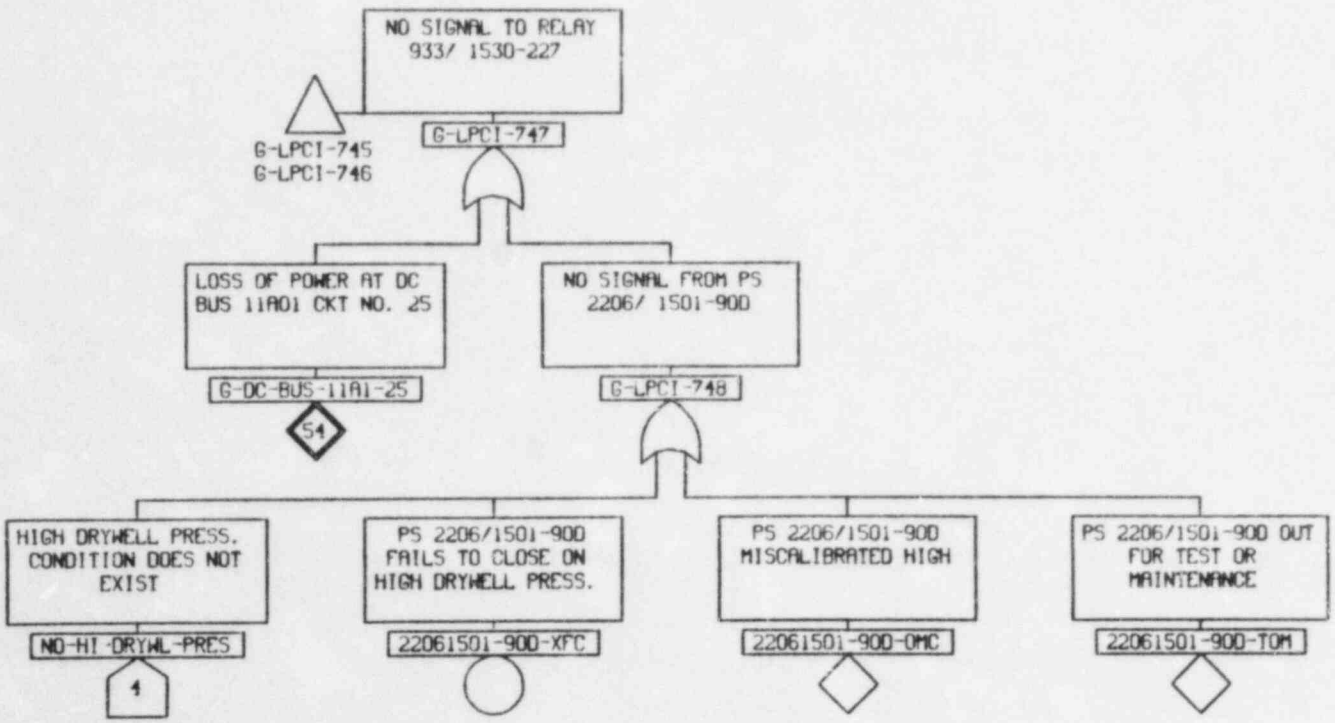

NO SIGNAL TO RELAY 932/ 1530-109
G-LPCI-735
G-LPCI-733
G-LPCI-734
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM PS 2205/ 1501-90C
G-LPCI-736
PS 2205/1501-90C FAILS TO CLOSE ON HIGH DRYWELL PRESS.
22051501-90C-XFC
PS 2205/1501-90C MISCALIBRATED HIGH
22051501-90C-OMC
PS 2205/1501-90C OUT FOR TEST OR MAINTENANCE
22051501-90C-TOM
HIGH DRYWELL PRESS. CONDITION DOES NOT EXIST
NO-HI-DRYWL-PRES
1

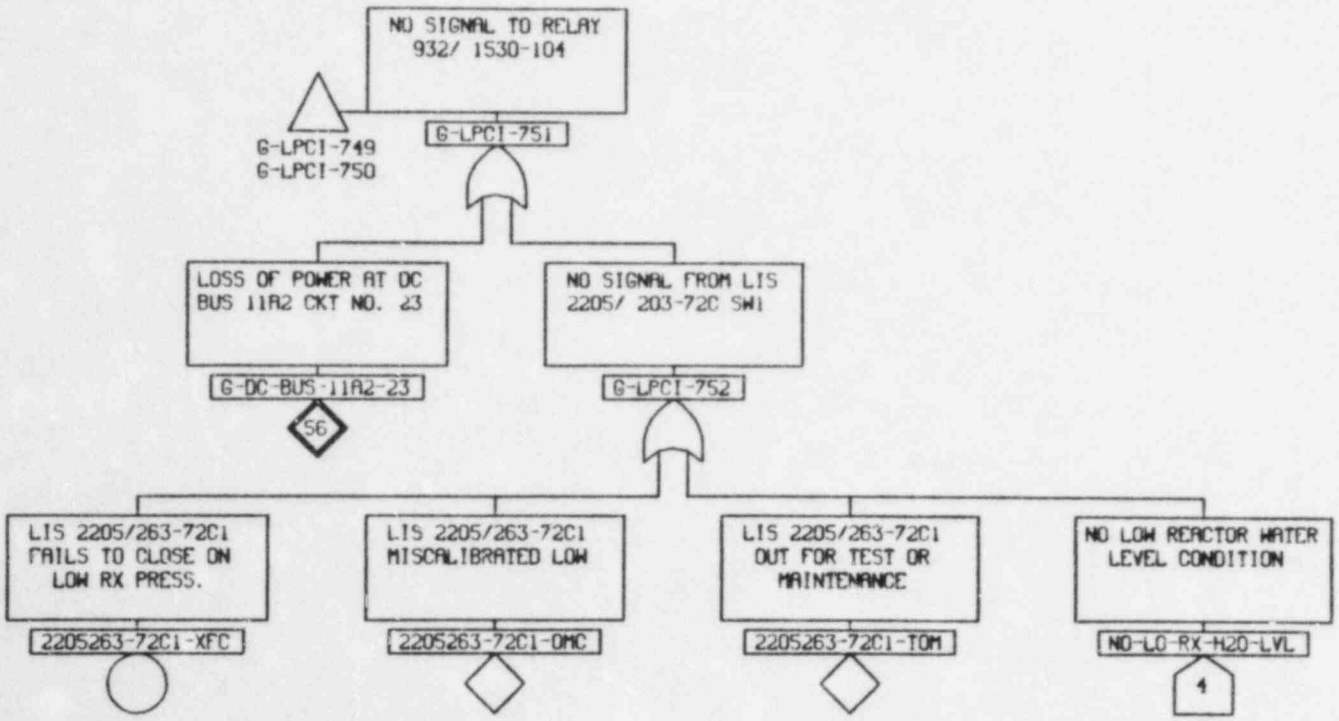

NO SIGNAL TO RELAY 933/ 1530-208
G-LPCI-739
G-LPCI-737
G-LPCI-738
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
NO SIGNAL FROM PS 2206/ 1501-90B
G-DC-BUS-11A1-25
G-LPCI-740
51
HIGH DRYWELL PRESS. CONDITION DOES NOT EXIST
PS 2206/1501-90B FAILS TO CLOSE ON HIGH DRYWELL PRESS.
PS 2206/1501-90B OUT FOR TEST OR MAINTENANCE
PS 2206/1501-90B MISCALIBRATED HIGH
NO-HI-DRYWL-PRES
22061501-90B-XFC
22061501-90B-TOM
22061501-90B-OMC
1

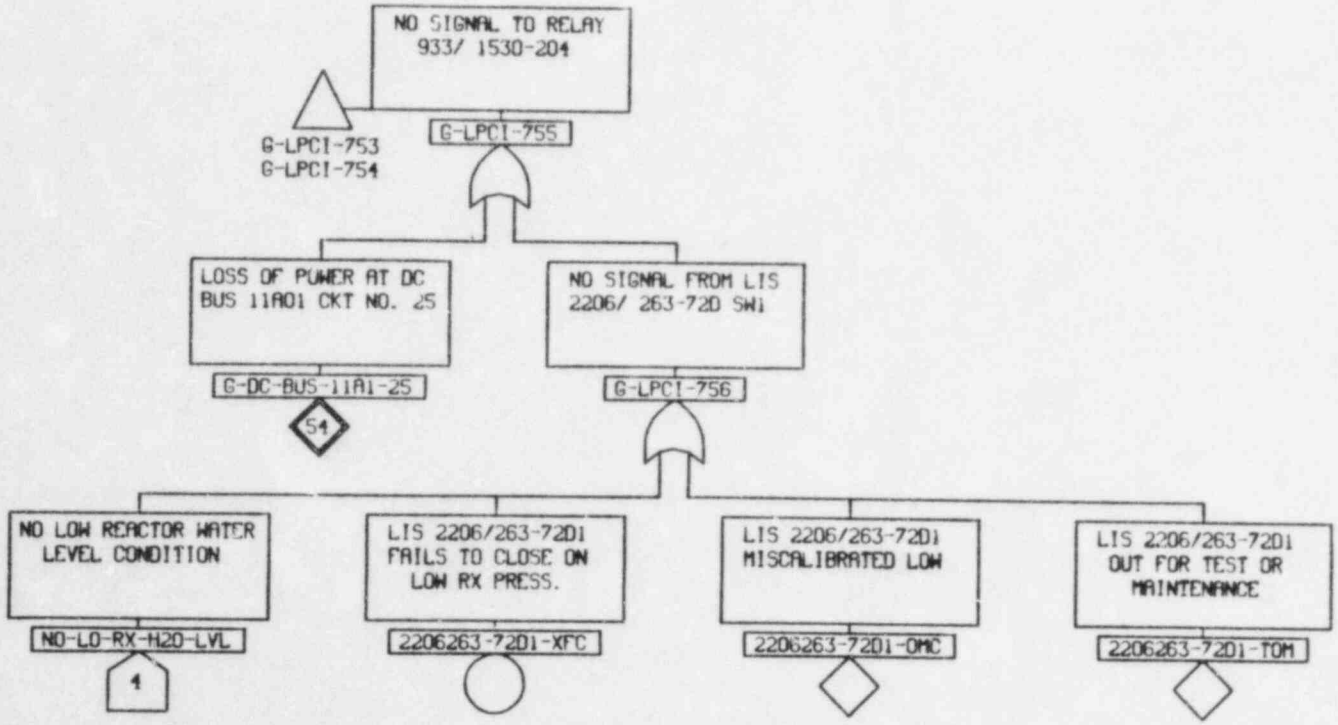

NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-108
G-LPCI-742
G-LPCI-861
G-LPCI-1166
G-LPCI-1164
RELAY 932/1530 -108 FAILS TO ENERGIZE
932/1530-108-FFE
2
C. P. 3 - 4 RELAY 932 / 1530 - 108 FAILS TO CLOSE
932/1530-108-3FC
NO SIGNAL TO RELAY 932/ 1530-108
G-LPCI-743
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-209
G-LPCI-746
G-LPCI-862
G-LPCI-1167
G-LPCI-1165
RELAY 933/1530 -209 FAILS TO ENERGIZE
933/1530-209-FFE
2
C. P. 1 - 2 RELAY 933 / 1530 - 209 FAILS TO CLOSE
933/1530-209-1FC
NO SIGNAL TO RELAY 933/ 1530-227
G-LPCI-747
NO SIGNAL FROM C.P. 7-8 RELAY 932/ 1530-104
G-LPCI-750
G-LPCI-864
G-LPCI-1169
G-LPCI-1163
RELAY 932/1530 -104 FAILS TO ENERGIZE
932/1530-104-FFE
2
C. P. 7 - 8 RELAY 932 / 1530 - 104 FAILS TO CLOSE
932/1530-104-7FC
NO SIGNAL TO RELAY 932/ 1530-104
G-LPCI-751
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-204
G-LPCI-754
G-LPCI-864
G-LPCI-1160
G-LPCI-1163
RELAY 933/1530 -204 FAILS TO ENERGIZE
933/1530-204-FFE
2
C. P. 1 - 2 RELAY 933 / 1530 - 204 FAILS TO CLOSE
933/1530-204-1FC
NO SIGNAL TO RELAY 933/ 1530-204
G-LPCI-755

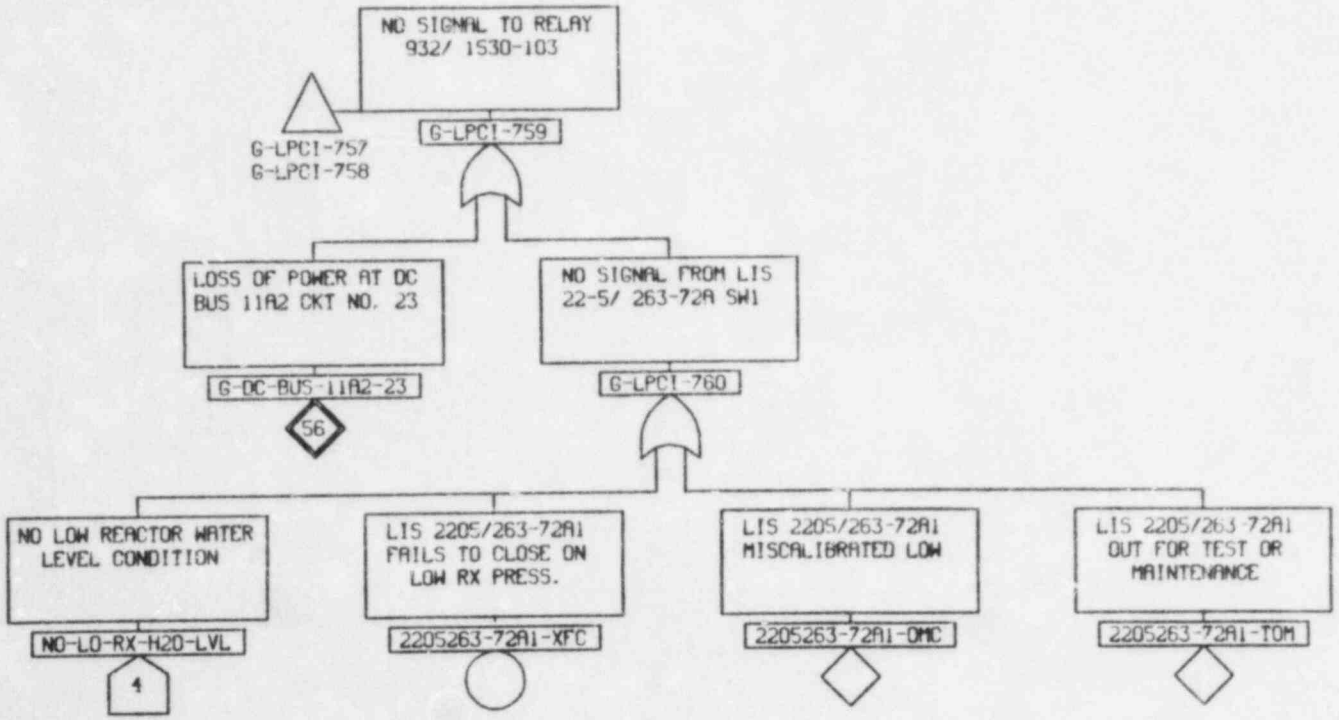

NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-103
G-LPCI-757
G-LPCI-714
G-LPCI-720
G-LPCI-849
NO SIGNAL TO RELAY 932/ 1530-103
G-LPCI-759
RELAY 932/1530 -103 FAILS TO ENERGIZE
932/1530-103-FTE
2
C. P. 1 - 2 RELAY 932 / 1530 - 103 FAILS TO CLOSE
932/1530-103-FTC
NO SIGNAL FROM C.P. 7-8 RELAY 932/ 1530-103
G-LPCI-758
G-LPCI-863
G-LPCI-1159
G-LPCI-1162
NO SIGNAL TO RELAY 932/ 1530-103
G-LPCI-759
RELAY 932/1530 -103 FAILS TO ENERGIZE
932/1530-103-FTE
2
C. P. 7 - 8 RELAY 932 / 1530 - 103 FAILS TO CLOSE
932/1530-103-FTC
NO SIGNAL FROM C.P. 7-8 RELAY 933/ 1530-203
G-LPCI-761
G-LPCI-714
G-LPCI-720
G-LPCI-849
NO SIGNAL TO RELAY 933/ 1530-203
G-LPCI-763
C. P. 7 - 8 RELAY 933 / 1530 - 203 FAILS TO CLOSE
933/1530-203-FTC
RELAY 933/1530 -203 FAILS TO ENERGIZE
933/1530-203-FTE
2
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-203
G-LPCI-762
G-LPCI-863
G-LPCI-1159
G-LPCI-1162
NO SIGNAL TO RELAY 933/ 1530-203
G-LPCI-763
RELAY 933/1530 -203 FAILS TO ENERGIZE
933/1530-203-FTE
2
C. P. 1 - 2 RELAY 933 / 1530 - 203 FAILS TO CLOSE
933/1530-203-FTC

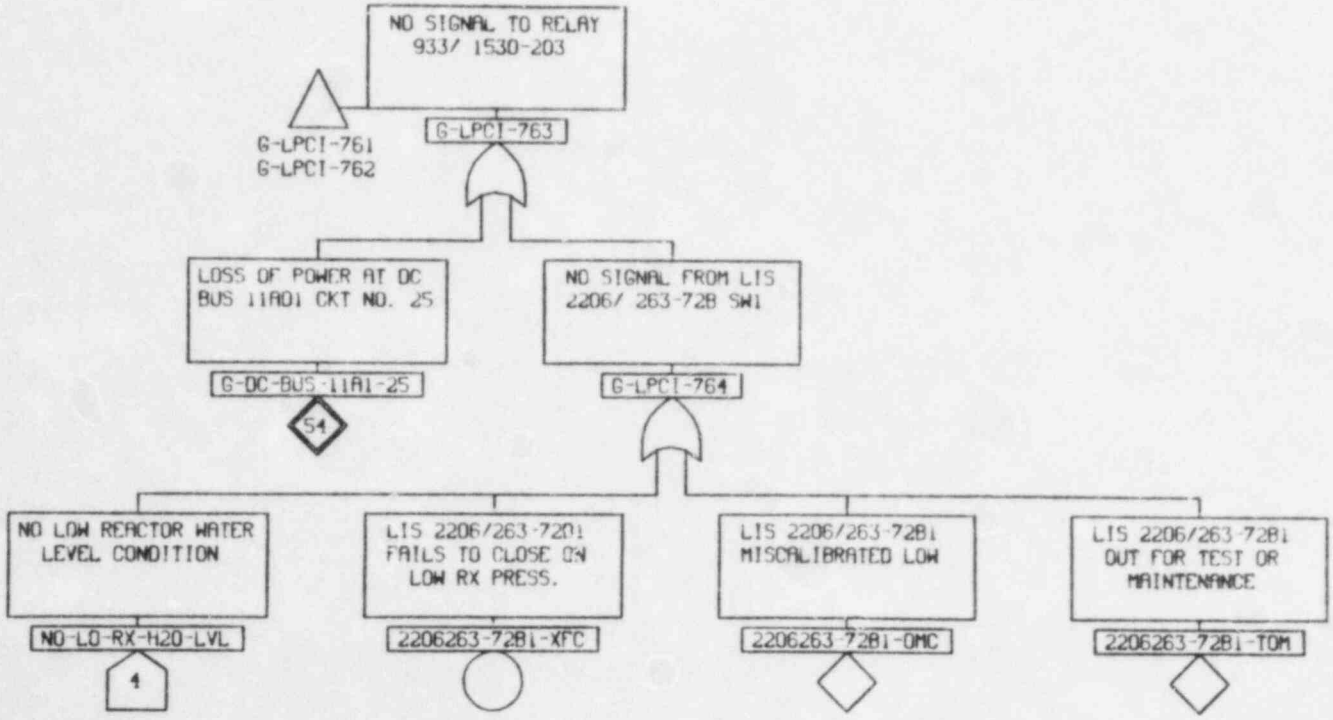

NO SIGNAL TO RELAY 932/ 1530-108
G-LPCI-741
G-LPCI-742
G-LPCI-743
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
S6
NO SIGNAL FROM PS 2205/ 1501-70A
G-LPCI-744
HIGH DRYWELL PRESS. CONDITION DOES NOT EXIST
NO-HI-DRYWL-PRES
1
PS 2205/1501-90A FAILS TO CLOSE ON HIGH DRYWELL PRESS.
2205150I-90A-XFC
PS 2205/1501-90A OUT FOR TEST OR MAINTENANCE
2205150I-90A-TOM
PS 2205/1501-90A MISCALIBRATED HIGH
2205150I-90A-DMC


NO SIGNAL TO RELAY
933/ 1530-227
G-LPCI-745
G-LPCI-746
G-LPCI-747
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
NO SIGNAL FROM PS
2206/ 1501-90D
G-DC-BUS-11A1-25
G-LPCI-748
54
HIGH DRYWELL PRESS.
CONDITION DOES NOT
EXIST
PS 2206/1501-90D
FAILS TO CLOSE ON
HIGH DRYWELL PRESS.
PS 2206/1501-90D
MISCALIBRATED HIGH
PS 2206/1501-90D OUT
FOR TEST OR
MAINTENANCE
NO-HI-DRYWL-PRES
22061501-90D-XFC
22061501-90D-OMC
22061501-90D-TOM
4

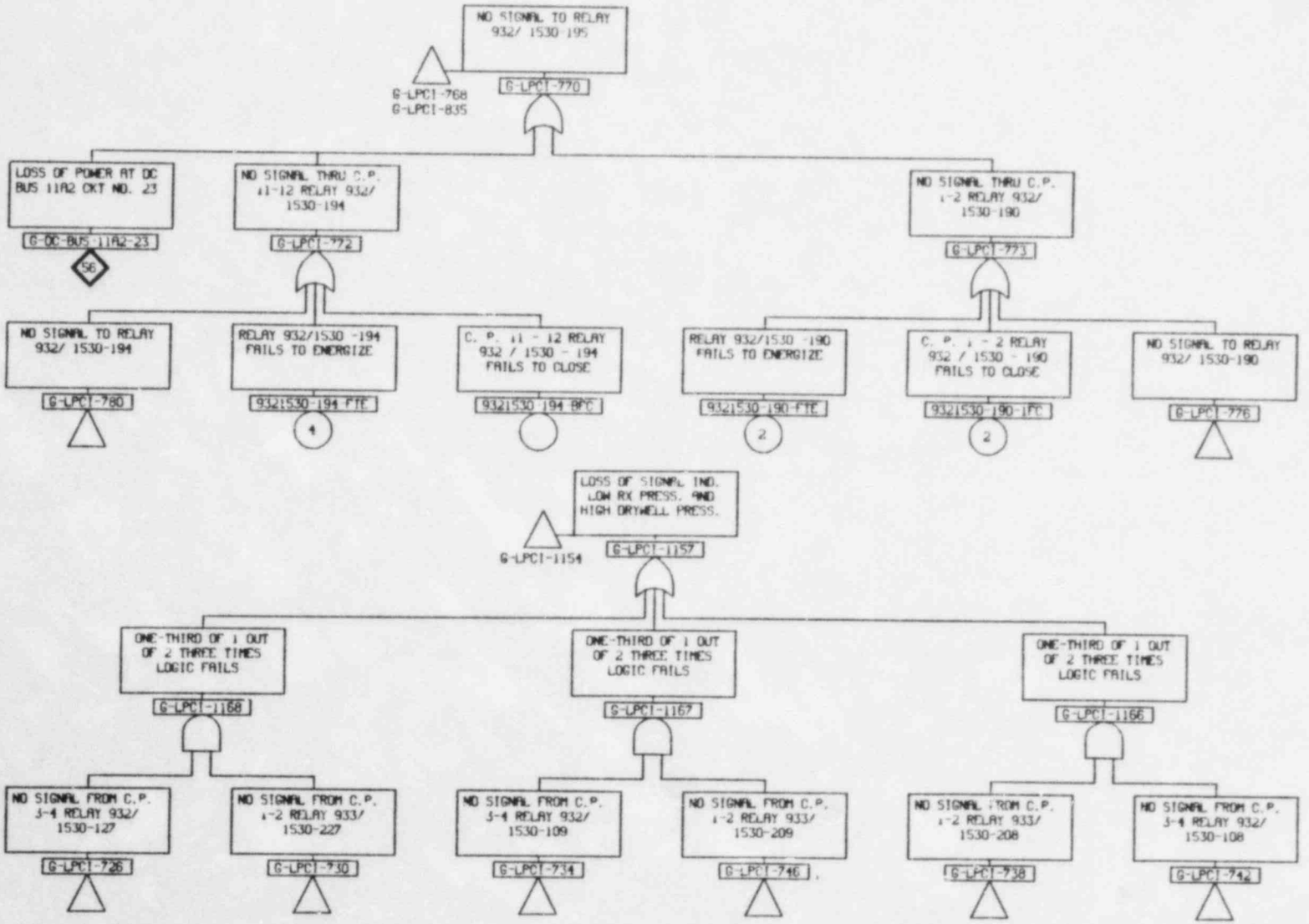

NO SIGNAL TO RELAY 932/ 1530-104
G-LPCI-749
G-LPCI-750
G-LPCI-751
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
NO SIGNAL FROM LIS 2205/ 203-72C SW1
G-DC-BUS-11A2-23
G-LPCI-752
56
LIS 2205/263-72C1 FAILS TO CLOSE ON LOW RX PRESS.
LIS 2205/263-72C1 MISCALIBRATED LOW
LIS 2205/263-72C1 OUT FOR TEST OR MAINTENANCE
NO LOW REACTOR WATER LEVEL CONDITION
2205263-72C1-XFC
2205263-72C1-OMC
2205263-72C1-TOM
NO-LO-RX-H2O-LVL
1

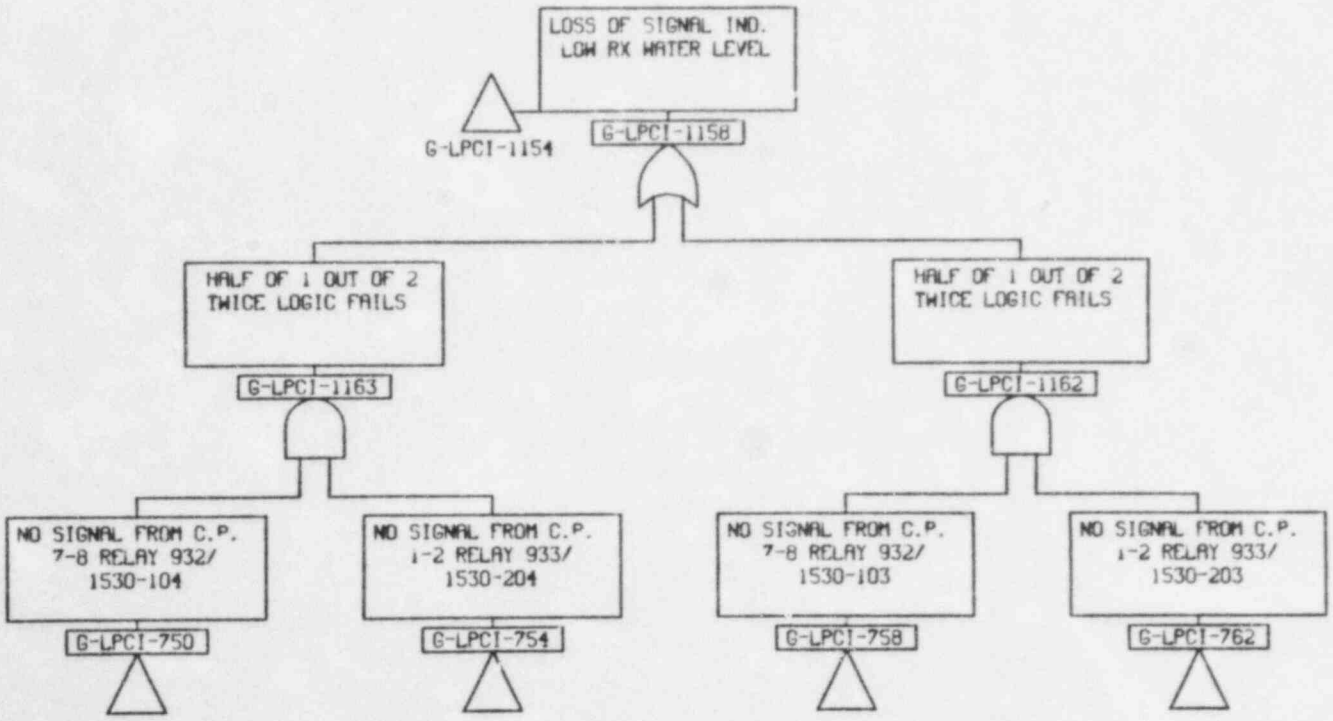

NO SIGNAL TO RELAY 933/ 1530-204
G-LPCI-755
G-LPCI-753
G-LPCI-754
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL FROM LIS 2206/ 263-72D SW1
G-LPCI-756
NO LOW REACTOR WATER LEVEL CONDITION
NO-LO-RX-H2O-LVL
4
LIS 2206/263-72D1 FAILS TO CLOSE ON LOW RX PRESS.
2206263-72D1-XFC
LIS 2206/263-72D1 MISCALIBRATED LOW
2206263-72D1-OMC
LIS 2206/263-72D1 OUT FOR TEST OR MAINTENANCE
2206263-72D1-TOM

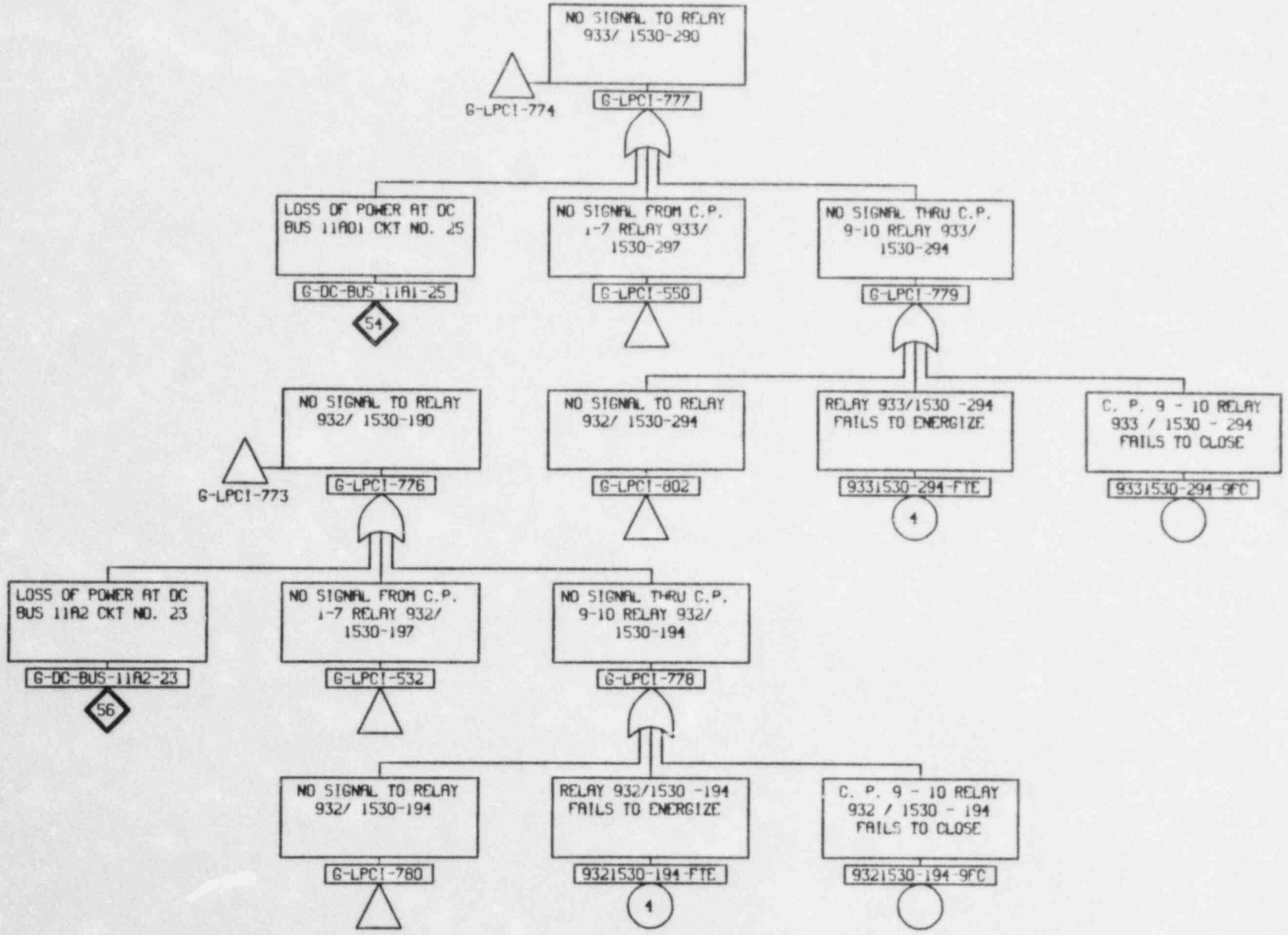

NO SIGNAL TO RELAY 932/ 1530-103
G-LPCI-759
G-LPCI-757
G-LPCI-758
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM LIS 22-5/ 263-72A SW1
G-LPCI-760
NO LOW REACTOR WATER LEVEL CONDITION
NO-LO-RX-H2O-LVL
4
LIS 2205/263-72A1 FAILS TO CLOSE ON LOW RX PRESS.
2205263-72A1-XFC
LIS 2205/263-72A1 MISCALIBRATED LOW
2205263-72A1-OMC
LIS 2205/263-72A1 OUT FOR TEST OR MAINTENANCE
2205263-72A1-TOM

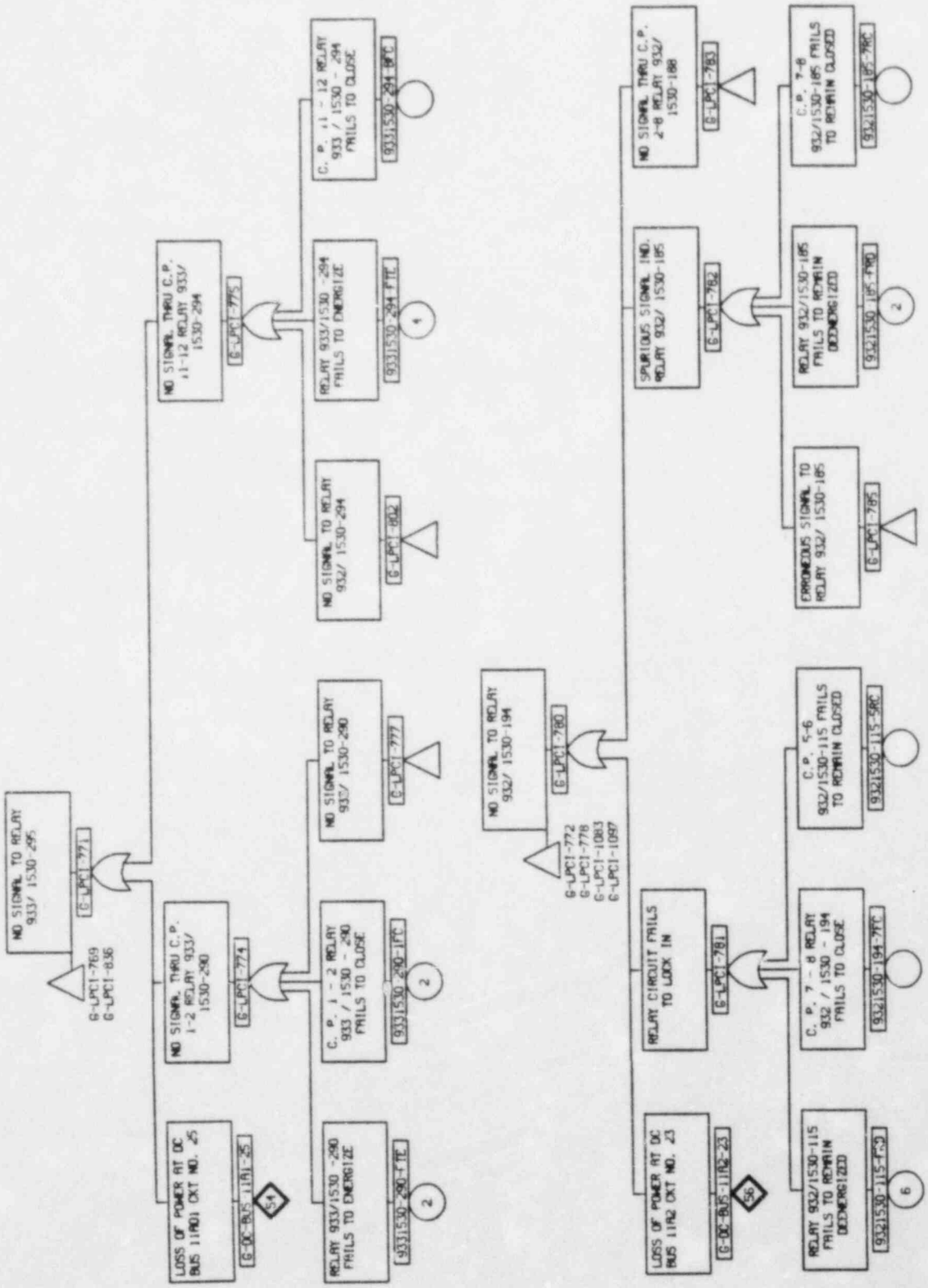

NO SIGNAL TO RELAY
933/ 1530-203
G-LPCI-763
G-LPCI-761
G-LPCI-762
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
NO SIGNAL FROM LIS
2206/ 263-72B SW1
G-DC-BUS-11A1-25
54
G-LPCI-764
NO LOW REACTOR WATER
LEVEL CONDITION
LIS 2206/263-72B1
FAILS TO CLOSE ON
LOW RX PRESS.
LIS 2206/263-72B1
MISCALIBRATED LOW
LIS 2206/263-72B1
OUT FOR TEST OR
MAINTENANCE
NO-LO-RX-H2O-LVL
2206263-72B1-XFC
2206263-72B1-OMC
2206263-72B1-TOM
4

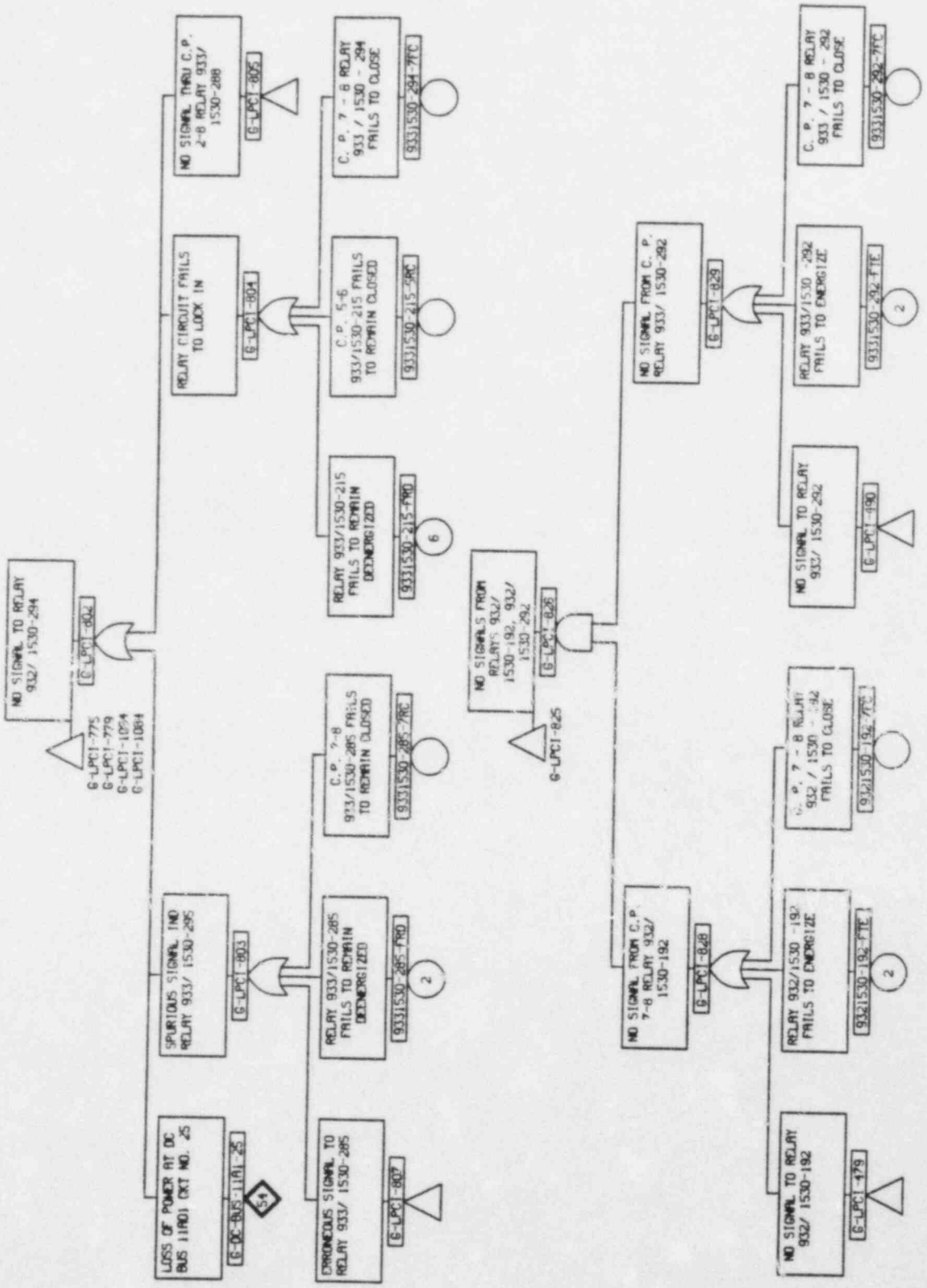

VALVE 1-LP-108 CONTROL SIGNAL FAILURE
G-LPCI-765
BREAKER MCC E-F3 COMPT 1C FAILS
NO SIGNAL TO BREAKER MCC E-F3 COMPT 1C
G-LPCI-766
NO CONTROL SIGNAL TO BREAKER MCC E-F3 COMPT 1C
G-LPCI-767
LOSS OF POWER AT DC BUS 101-AB-2 EXT D20
G-DC-BUS-AB2-20
NO SIGNAL THRU C.P. J-4 RELAY 933/ 1530-295
G-LPCI-769
NO SIGNAL TO RELAY 933/ 1530-295
G-LPCI-771
C. P. J - 4 RELAY 933 / 1530 - 295 FAILS TO CLOSE
RELAY 933/1530 -295 FAILS TO ENERGIZE
NO SIGNAL THRU C.P. J-4 RELAY 932/ 1530-195
G-LPCI-768
NO SIGNAL TO RELAY 932/ 1530-195
G-LPCI-770
C. P. J - 4 RELAY 932 / 1530 - 195 FAILS TO CLOSE
RELAY 932/1530 -195 FAILS TO ENERGIZE

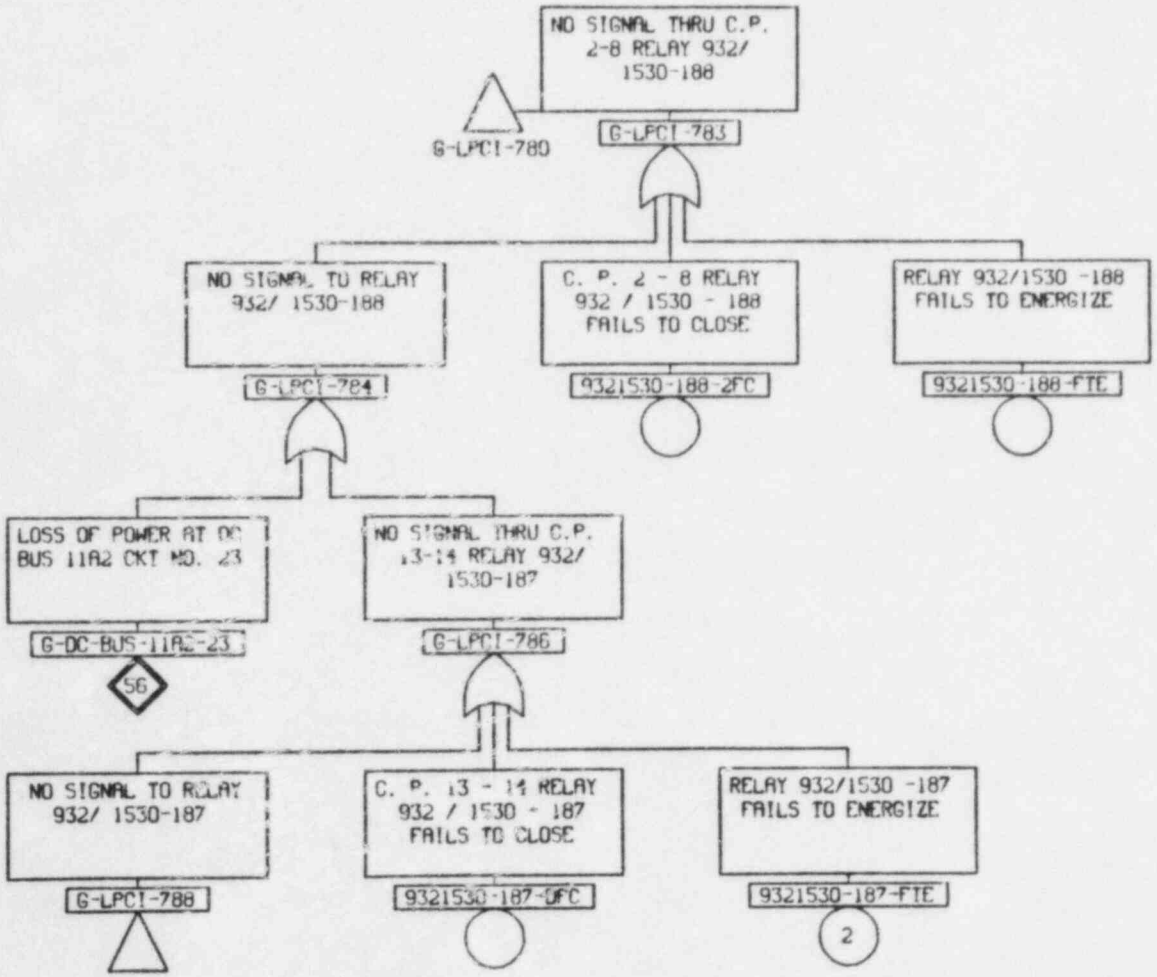

NO SIGNAL TO RELAY 932/ 1530-195
G-LPCI-770
G-LPCI-768
G-LPCI-835
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL THRU C.P. 1-12 RELAY 932/ 1530-194
G-LPCI-772
NO SIGNAL THRU C.P. 1-2 RELAY 932/ 1530-190
G-LPCI-773
NO SIGNAL TO RELAY 932/ 1530-194
G-LPCI-780
RELAY 932/1530-194 FAILS TO ENERGIZE
932/1530-194 FTE
1
C. P. 11 - 12 RELAY 932 / 1530 - 194 FAILS TO CLOSE
932/1530-194 BPC
RELAY 932/1530-190 FAILS TO ENERGIZE
932/1530-190-FTE
2
C. P. 1 - 2 RELAY 932 / 1530 - 190 FAILS TO CLOSE
932/1530-190-1PC
2
NO SIGNAL TO RELAY 932/ 1530-190
G-LPCI-776
LOSS OF SIGNAL IND. LOW RX PRESS. AND HIGH DRYWELL PRESS.
G-LPCI-1154
G-LPCI-1159
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-1168
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-1167
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-1166
NO SIGNAL FROM C.P. J-4 RELAY 932/ 1530-127
G-LPCI-726
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-227
G-LPCI-730
NO SIGNAL FROM C.P. J-4 RELAY 932/ 1530-109
G-LPCI-734
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-209
G-LPCI-746
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-208
G-LPCI-738
NO SIGNAL FROM C.P. J-4 RELAY 932/ 1530-108
G-LPCI-742

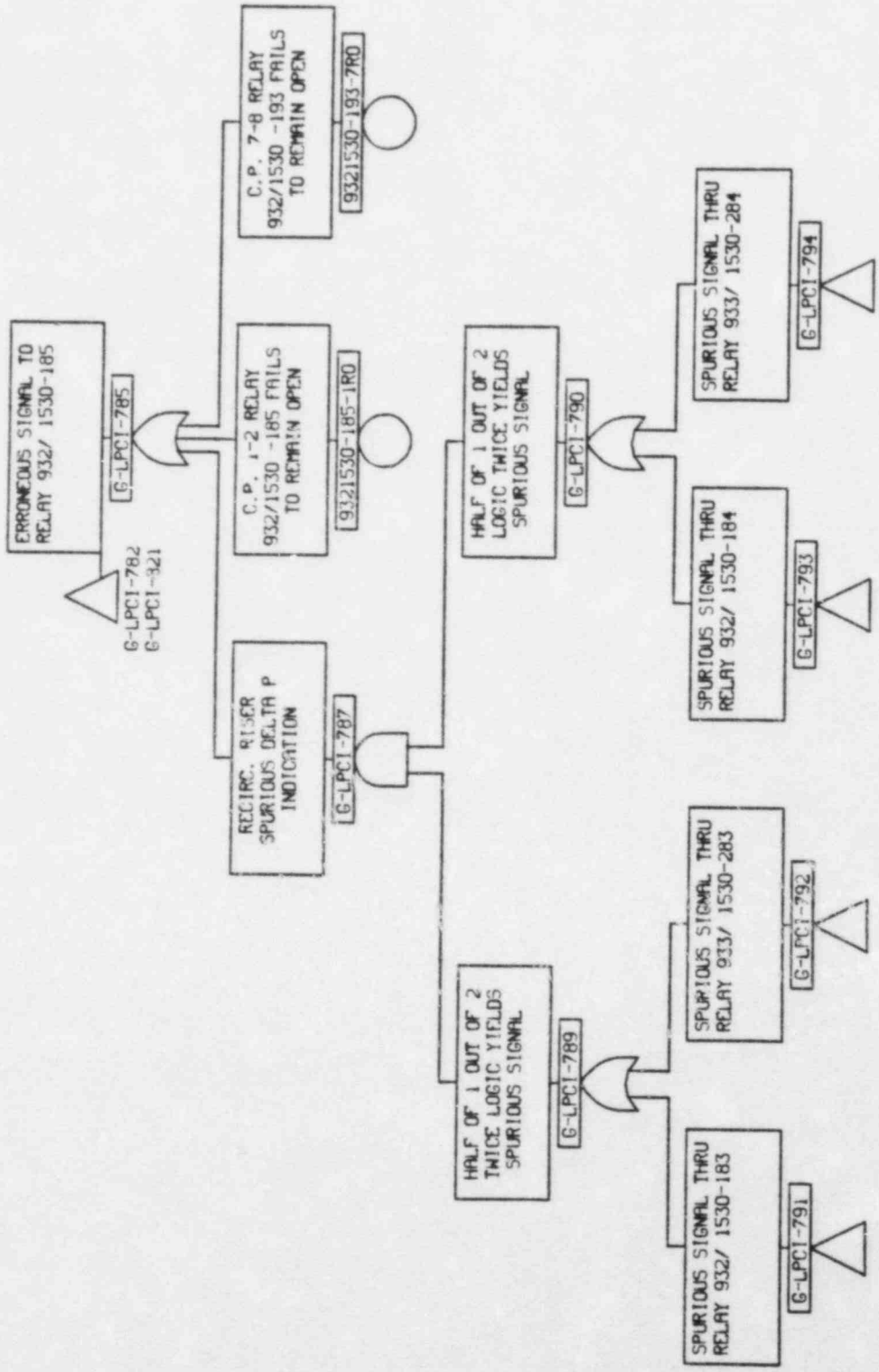

LOSS OF SIGNAL IND.
LOW RX WATER LEVEL
G-LPCI-1158
G-LPCI-1154
HALF OF 1 OUT OF 2
TWICE LOGIC FAILS
G-LPCI-1163
HALF OF 1 OUT OF 2
TWICE LOGIC FAILS
G-LPCI-1162
NO SIGNAL FROM C.P.
7-8 RELAY 932/
1530-104
G-LPCI-750
NO SIGNAL FROM C.P.
1-2 RELAY 933/
1530-204
G-LPCI-754
NO SIGNAL FROM C.P.
7-8 RELAY 932/
1530-103
G-LPCI-758
NO SIGNAL FROM C.P.
1-2 RELAY 933/
1530-203
G-LPCI-762

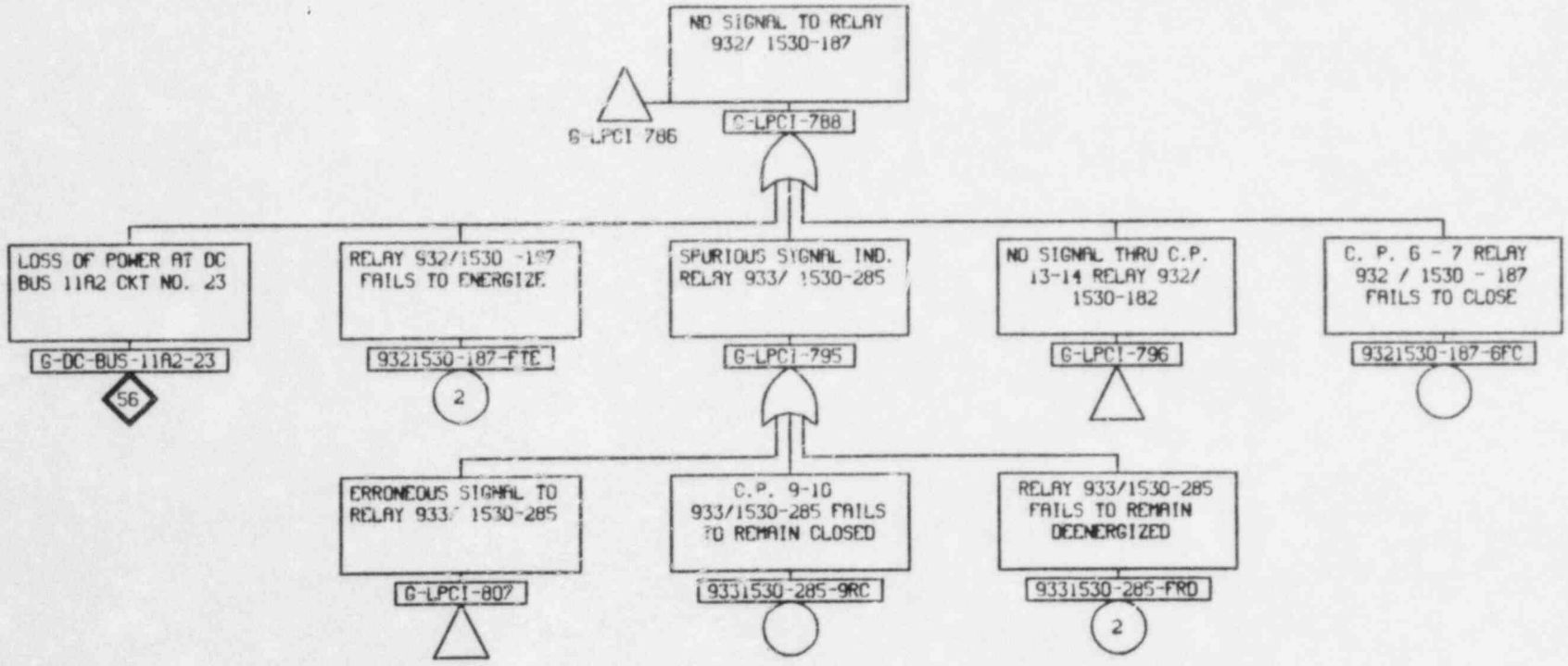

NO SIGNAL TO RELAY 933/ 1530-290
G-LPCI-774
G-LPCI-777
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL FROM C.P. 1-7 RELAY 933/ 1530-297
G-LPCI-550
NO SIGNAL THRU C.P. 9-10 RELAY 933/ 1530-294
G-LPCI-779
NO SIGNAL TO RELAY 932/ 1530-190
G-LPCI-773
G-LPCI-776
NO SIGNAL TO RELAY 932/ 1530-294
G-LPCI-802
RELAY 933/1530 -294 FAILS TO ENERGIZE
9331530-294-FTE
1
C. P. 9 - 10 RELAY 933 / 1530 - 294 FAILS TO CLOSE
9331530-294-9FC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM C.P. 1-7 RELAY 932/ 1530-197
G-LPCI-532
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-194
G-LPCI-778
NO SIGNAL TO RELAY 932/ 1530-194
G-LPCI-780
RELAY 932/1530 -194 FAILS TO ENERGIZE
9321530-194-FTE
1
C. P. 9 - 10 RELAY 932 / 1530 - 194 FAILS TO CLOSE
9321530-194-9FC

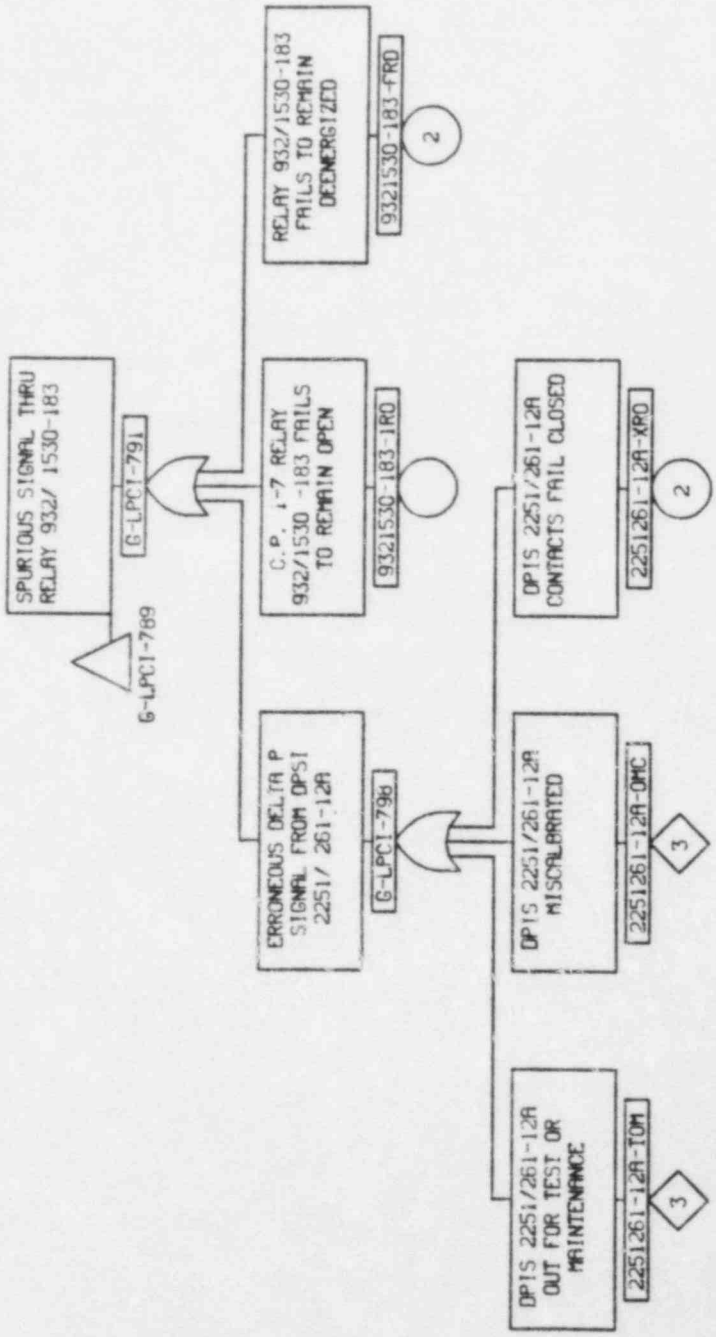

NO SIGNAL TO RELAY 933/ 1530-295
G-LPCI-769
G-LPCI-836
G-LPCI-771
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A01-25
G-1
NO SIGNAL THRU C.P. 1-2 RELAY 933/ 1530-290
G-LPCI-774
C. P. 1 - 2 RELAY 933 / 1530 - 290 FAILS TO CLOSE
933/1530-290-FTC
2
RELAY 933/1530 -290 FAILS TO ENERGIZE
933/1530-290-FTE
2
NO SIGNAL TO RELAY 933/ 1530-290
G-LPCI-777
NO SIGNAL THRU C.P. 11-12 RELAY 933/ 1530-294
G-LPCI-775
C. P. 11 - 12 RELAY 933 / 1530 - 294 FAILS TO CLOSE
933/1530-294-FTC
RELAY 933/1530 -294 FAILS TO ENERGIZE
933/1530-294-FTE
1
NO SIGNAL TO RELAY 932/ 1530-294
G-LPCI-802
NO SIGNAL TO RELAY 932/ 1530-194
G-LPCI-780
G-LPCI-772
G-LPCI-778
G-LPCI-1083
G-LPCI-1087
RELAY CIRCUIT FAILS TO LOCK IN
G-LPCI-781
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
G-5
C. P. 7 - 8 RELAY 932 / 1530 - 194 FAILS TO CLOSE
932/1530-194-FTC
C. P. 5-6 932/1530-115 FAILS TO REMAIN CLOSED
932/1530-115-FRC
RELAY 932/1530-115 FAILS TO REMAIN ENERGIZED
932/1530-115-FRE
6
SPURIOUS SIGNAL IND. RELAY 932/ 1530-185
G-LPCI-782
NO SIGNAL THRU C.P. 2-8 RELAY 932/ 1530-188
G-LPCI-783
C. P. 7-8 932/1530-185 FAILS TO REMAIN CLOSED
932/1530-185-FRC
RELAY 932/1530-185 FAILS TO REMAIN ENERGIZED
932/1530-185-FRE
2
ERRONEOUS SIGNAL TO RELAY 932/ 1530-185
G-LPCI-785

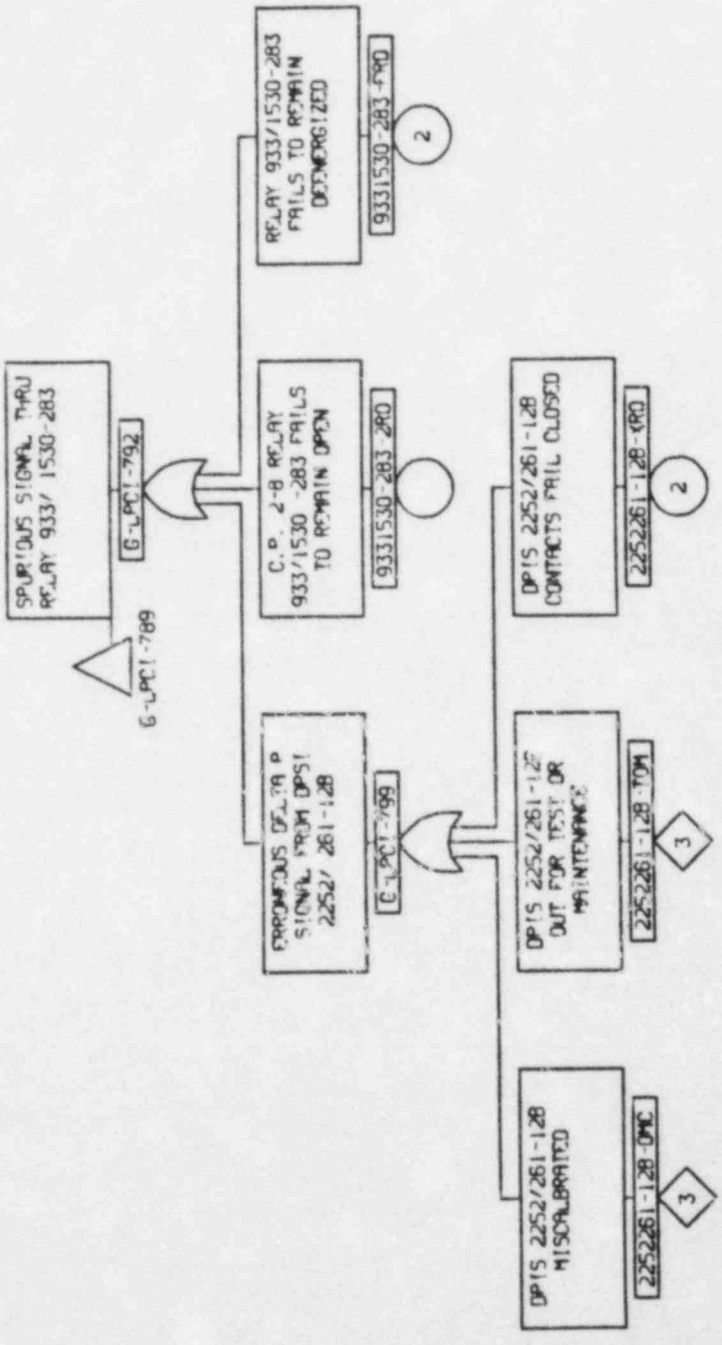

NO SIGNAL TO RELAY 932/ 1530-294
G-LPCI-804
G-LPCI-775
G-LPCI-779
G-LPCI-1054
G-LPCI-1064
NO SIGNAL THRU C.P. 2-8 RELAY 933/ 1530-288
G-LPCI-805
C. P. 7 - 8 RELAY 933 / 1530 - 294 FAILS TO CLOSE
9331530-294-7PC
RELAY CIRCUIT FAILS TO LOCK IN
G-LPCI-804
C. P. 5-6 933/1530-215 FAILS TO REMAIN CLOSED
9331530-215-5RC
RELAY 933/1530-215 FAILS TO REMAIN DEENERGIZED
9331530-215-7RD
6
C. P. 7-8 933/1530-285 FAILS TO REMAIN CLOSED
9331530-285-7RC
SPURIOUS SIGNAL IND RELAY 933/ 1530-285
G-LPCI-803
RELAY 933/1530-285 FAILS TO REMAIN DEENERGIZED
9331530-285-7RD
2
LOSS OF POWER AT DC BUS 11AD1 CKT NO. 25
G-DC-BUS-11A1-25
54
ERRONEOUS SIGNAL TO RELAY 933/ 1530-285
G-LPCI-807
NO SIGNALS FROM RELAYS 932/ 1530-192, 932/ 1530-292
G-LPCI-826
G-LPCI-825
NO SIGNAL FROM C.P. RELAY 933/ 1530-292
G-LPCI-829
NO SIGNAL FROM C.P. 7-8 RELAY 932/ 1530-192
G-LPCI-828
C. P. 7 - 8 RELAY 933 / 1530 - 292 FAILS TO CLOSE
9331530-292-7PC
RELAY 933/1530 -292 FAILS TO ENERGIZE
9331530-292-7PE
2
NO SIGNAL TO RELAY 933/ 1530-292
G-LPCI-490
C. P. 7 - 8 RELAY 932 / 1530 - 192 FAILS TO CLOSE
9321530-192-7PC
RELAY 932/1530 -192 FAILS TO ENERGIZE
9321530-192-7PE
2
NO SIGNAL TO RELAY 932/ 1530-192
G-LPCI-479

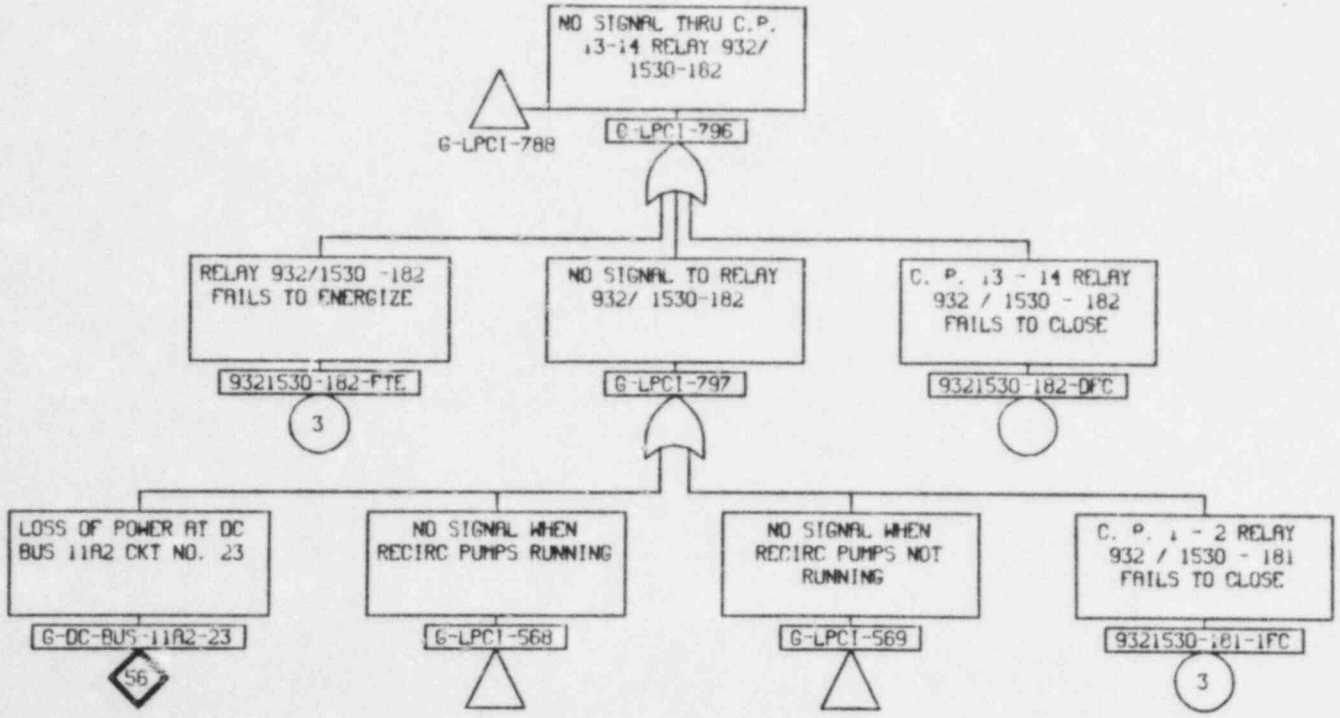

NO SIGNAL THRU C.P.
2-8 RELAY 932/
1530-188
G-LPCI-780
G-LPCI-783
NO SIGNAL TO RELAY
932/ 1530-188
C. P. 2 - 8 RELAY
932 / 1530 - 188
FAILS TO CLOSE
RELAY 932/1530 -188
FAILS TO ENERGIZE
G-LPCI-784
9321530-188-CFC
9321530-188-FTE
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
NO SIGNAL THRU C.P.
13-14 RELAY 932/
1530-187
G-DC-BUS-11A2-23
G-LPCI-786
56
NO SIGNAL TO RELAY
932/ 1530-187
C. P. 13 - 14 RELAY
932 / 1530 - 187
FAILS TO CLOSE
RELAY 932/1530 -187
FAILS TO ENERGIZE
G-LPCI-788
9321530-187-CFC
9321530-187-FTE
2

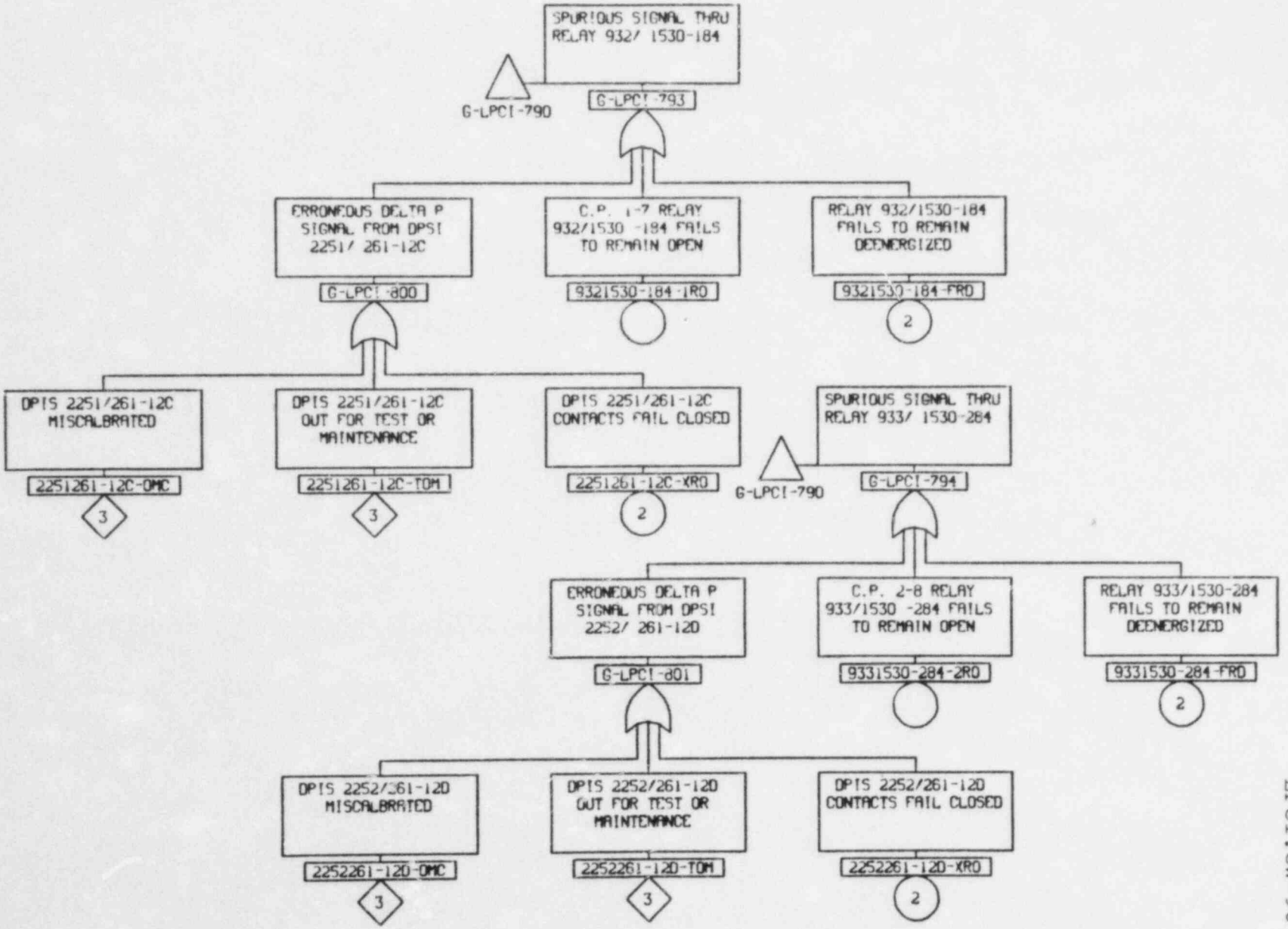

ERRONEOUS SIGNAL TO RELAY 932/ 1530-185
G-LPCI-785
G-LPCI-782
G-LPCI-321
C.P. 1-2 RELAY 932/1530 -185 FAILS TO REMAIN OPEN
9321530-185-1RO
C.P. 7-8 RELAY 932/1530 -193 FAILS TO REMAIN OPEN
9321530-193-7RO
RECIRC. RISER SPURIOUS DELTA P INDICATION
G-LPCI-787
HALF OF 1 OUT OF 2 LOGIC TWICE YIELDS SPURIOUS SIGNAL
G-LPCI-790
SPURIOUS SIGNAL THRU RELAY 933/ 1530-284
G-LPCI-794
SPURIOUS SIGNAL THRU RELAY 932/ 1530-184
G-LPCI-793
HALF OF 1 OUT OF 2 TWICE LOGIC YIELDS SPURIOUS SIGNAL
G-LPCI-789
SPURIOUS SIGNAL THRU RELAY 933/ 1530-283
G-LPCI-792
SPURIOUS SIGNAL THRU RELAY 932/ 1530-183
G-LPCI-791

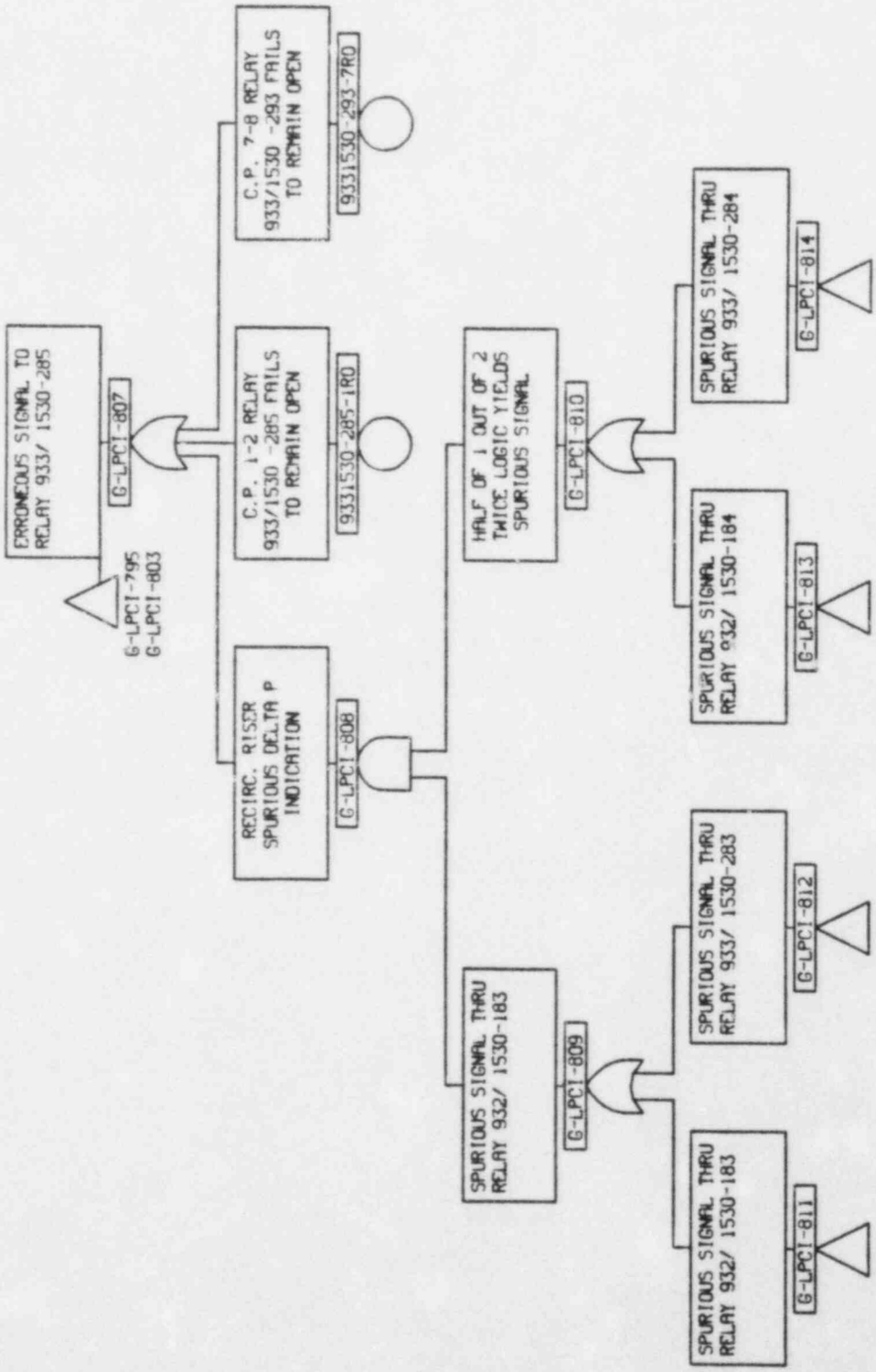

NO SIGNAL TO RELAY 932/ 1530-187
G-LPCI-788
G-LPCI 786
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
RELAY 932/1530 -187 FAILS TO ENERGIZE
9321530-187-FTE
2
SPURIOUS SIGNAL IND. RELAY 933/ 1530-285
G-LPCI-795
NO SIGNAL THRU C.P. 13-14 RELAY 932/ 1530-182
G-LPCI-796
C. P. G - 7 RELAY 932 / 1530 - 187 FAILS TO CLOSE
9321530-187-GFC
ERRONEOUS SIGNAL TO RELAY 933/ 1530-285
G-LPCI-807
C.P. 9-10 933/1530-285 FAILS TO REMAIN CLOSED
9331530-285-9RC
RELAY 933/1530-285 FAILS TO REMAIN DEENERGIZED
9331530-285-FRD
2

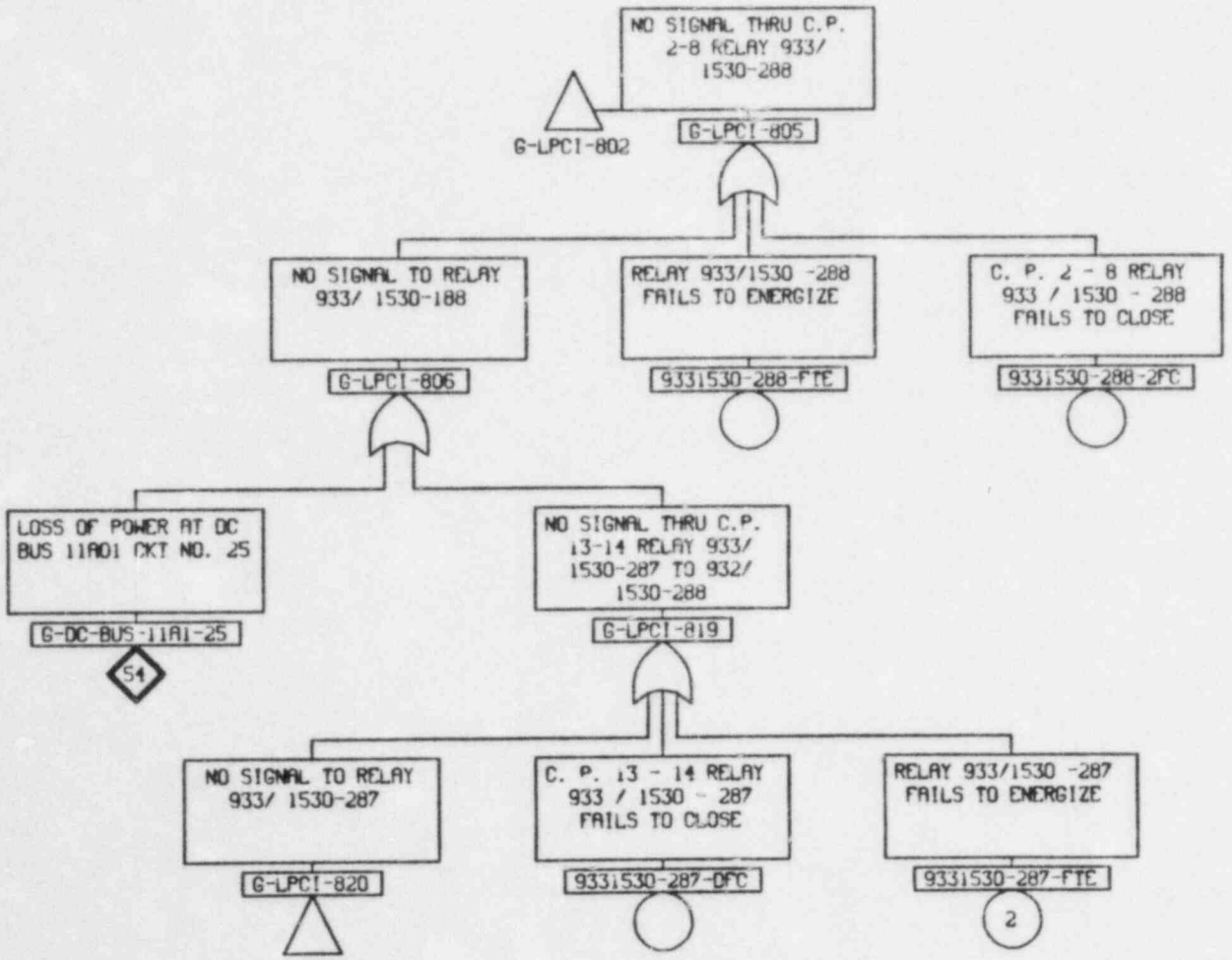

SPURIOUS SIGNAL THRU RELAY 932/ 1530-183
G-LPCI-789
G-LPCI-791
RELAY 932/1530-183 FAILS TO REMAIN DEENERGIZED
9321530-183-FRO
2
C.P. 1-7 RELAY 932/1530 -183 FAILS TO REMAIN OPEN
9321530-183-1RO
2
DPIS 2251/261-12A CONTACTS FAIL CLOSED
2251261-12A-XPO
2
ERRONEOUS DELTA P SIGNAL FROM DPSI 2251/ 261-12A
G-LPCI-79B
DPIS 2251/261-12A MISCALIBRATED
2251261-12A-DMC
3
DPIS 2251/261-12A OUT FOR TEST OR MAINTENANCE
2251261-12A-TOM
3

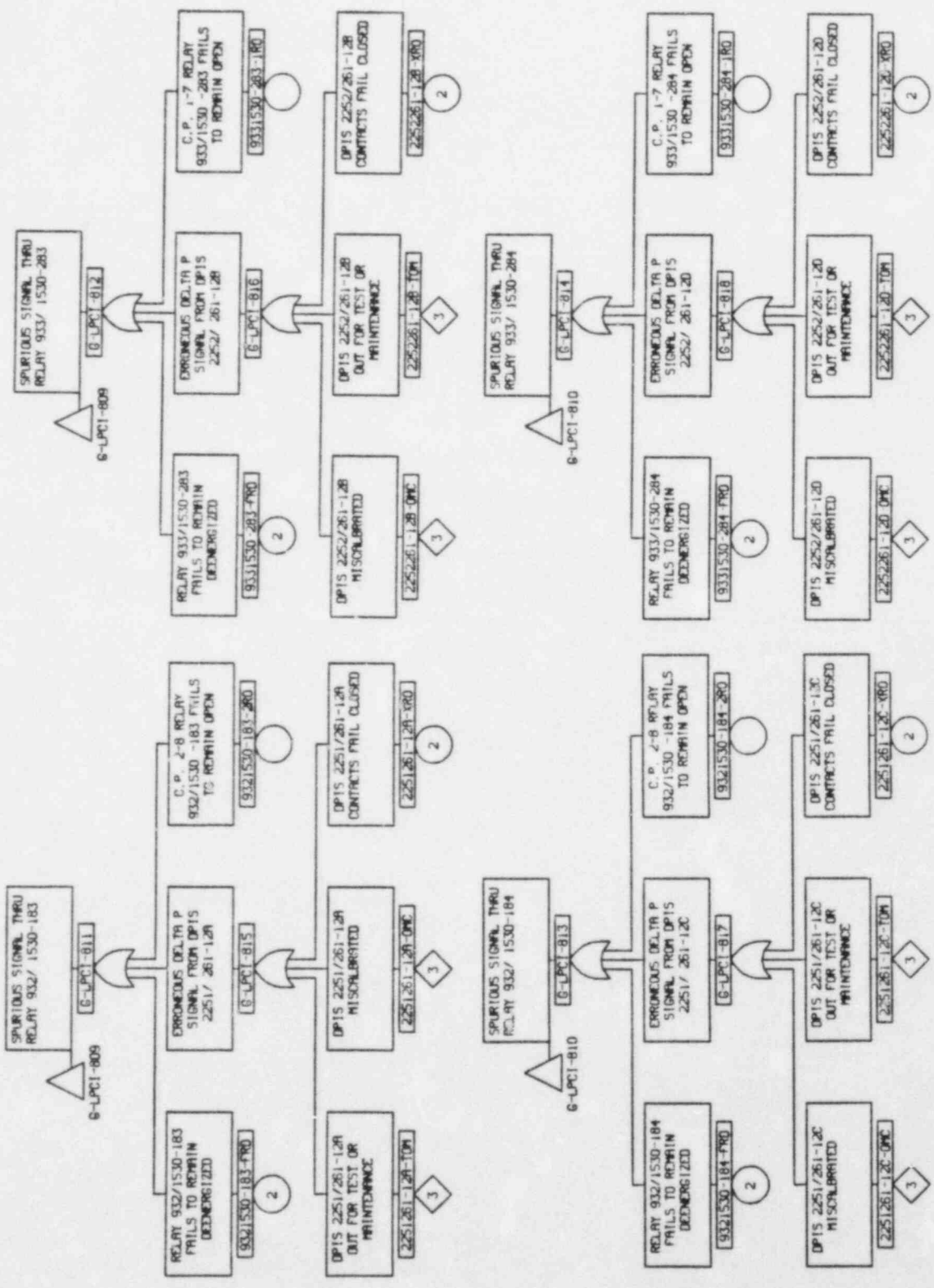

SPURIOUS SIGNAL THRU RELAY 933/1530-283
G-LPCI-789
G-LPCI-792
C.O. 2-B RELAY 933/1530-283 FAILS TO REMAIN OPEN
9331530-283-2BO
RELAY 933/1530-283 FAILS TO REMAIN DEENERGIZED
9331530-283-FBD
2
SPURIOUS SIGNAL FROM DPIS 2252/261-128
G-LPCI-799
DPIS 2252/261-128 OUT FOR TEST OR MAINTENANCE
2252261-128-TOM
3
DPIS 2252/261-128 MISCALIBRATED
2252261-128-DMC
3
DPIS 2252/261-128 CONTACTS FAIL CLOSED
2252261-128-CBD
2

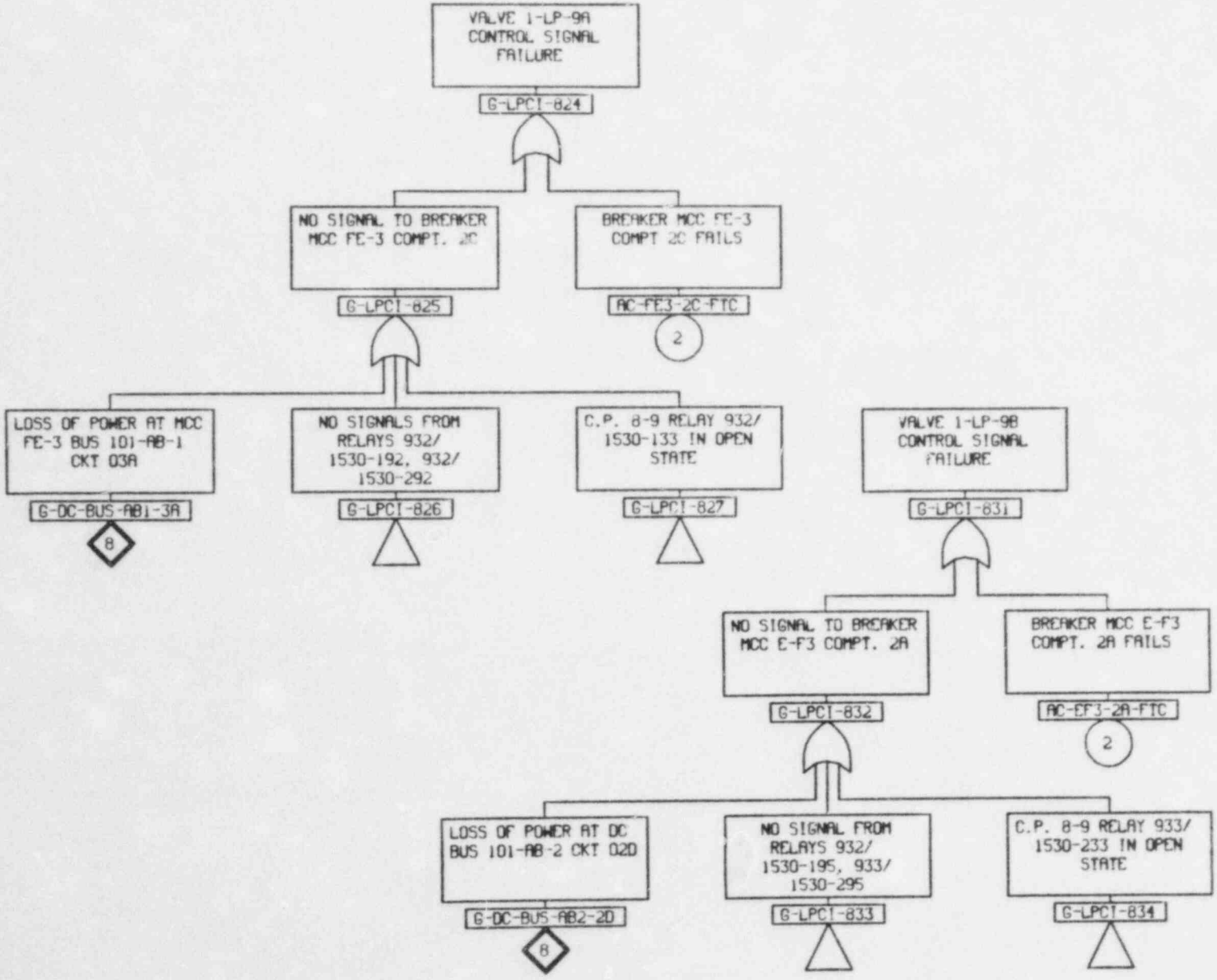

NO SIGNAL THRU C.P. 13-14 RELAY 932/ 1530-182
G-LPCI-796
G-LPCI-788
RELAY 932/1530 -182 FAILS TO ENERGIZE
9321530-182-FTE
3
NO SIGNAL TO RELAY 932/ 1530-182
G-LPCI-797
C. P. 13 - 14 RELAY 932 / 1530 - 182 FAILS TO CLOSE
9321530-182-DFC
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL WHEN RECIRC PUMPS RUNNING
G-LPCI-568
NO SIGNAL WHEN RECIRC PUMPS NOT RUNNING
G-LPCI-569
C. P. 1 - 2 RELAY 932 / 1530 - 181 FAILS TO CLOSE
9321530-181-1FC
3

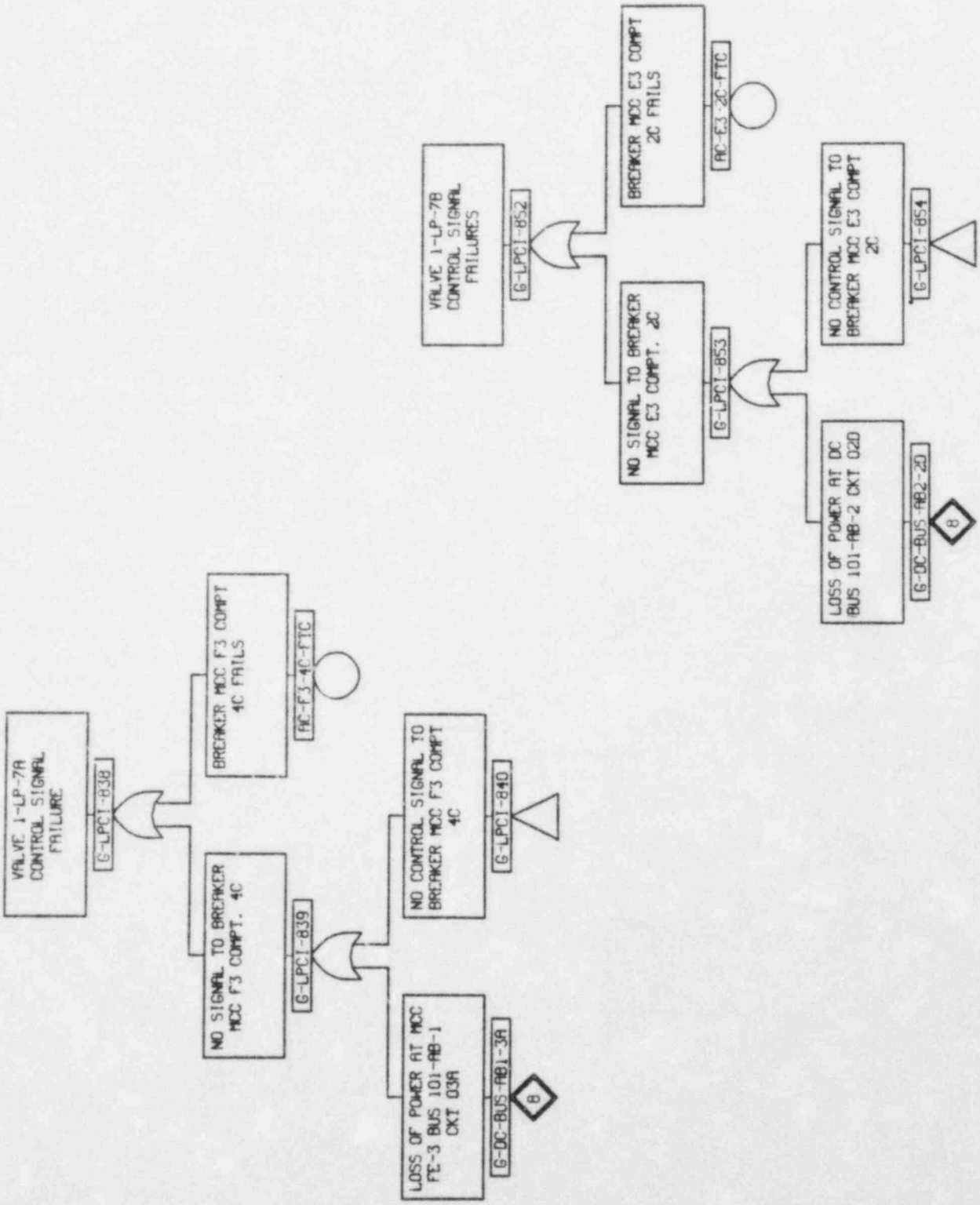

SPURIOUS SIGNAL THRU RELAY 932/ 1530-184
G-LPCI-790
G-LPCI-793
ERRONEOUS DELTA P SIGNAL FROM DPSI 2251/ 261-12C
C.P. 1-7 RELAY 932/1530 -184 FAILS TO REMAIN OPEN
RELAY 932/1530-184 FAILS TO REMAIN DEENERGIZED
G-LPCI-800
9321530-184-1RO
9321530-184-FRO
2
DPIS 2251/261-12C MISCALBRATED
DPIS 2251/261-12C OUT FOR TEST OR MAINTENANCE
DPIS 2251/261-12C CONTACTS FAIL CLOSED
SPURIOUS SIGNAL THRU RELAY 933/ 1530-284
2251261-12C-OMC
2251261-12C-TOM
2251261-12C-XRO
G-LPCI-790
G-LPCI-794
3
3
2
ERRONEOUS DELTA P SIGNAL FROM DPSI 2252/ 261-12D
C.P. 2-8 RELAY 933/1530 -284 FAILS TO REMAIN OPEN
RELAY 933/1530-284 FAILS TO REMAIN DEENERGIZED
G-LPCI-801
9331530-284-2RO
9331530-284-FRO
2
DPIS 2252/261-12D MISCALBRATED
DPIS 2252/261-12D OUT FOR TEST OR MAINTENANCE
DPIS 2252/261-12D CONTACTS FAIL CLOSED
2252261-12D-OMC
2252261-12D-TOM
2252261-12D-XRO
3
3
2

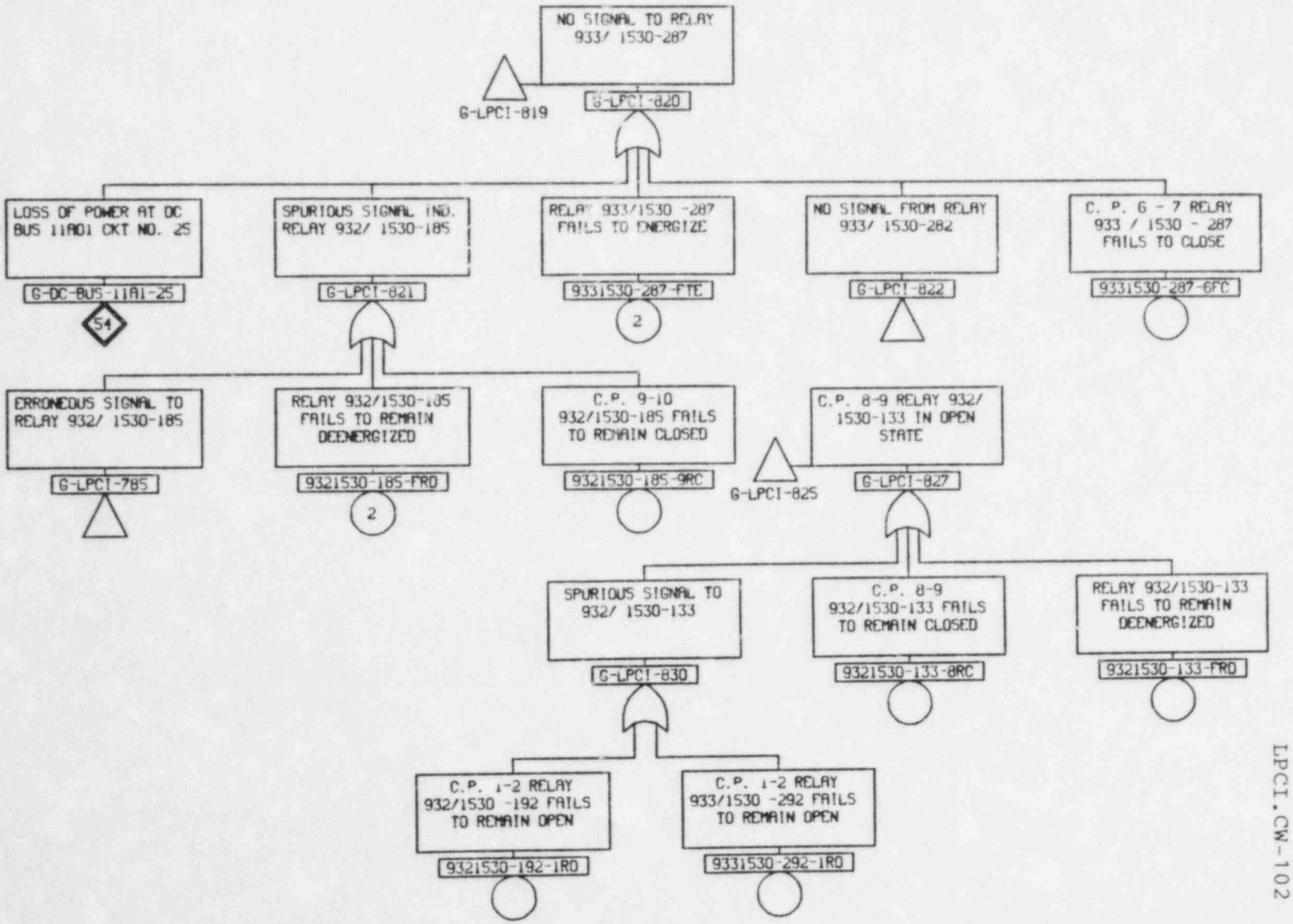

ERRONEOUS SIGNAL TO RELAY 933/ 1530-285
G-LPCI-807
G-LPCI-795
G-LPCI-803
C.P. 1-2 RELAY 933/1530 -285 FAILS TO REMAIN OPEN
9331530-285-1RO
C.P. 7-8 RELAY 933/1530 -293 FAILS TO REMAIN OPEN
9331530-293-7RO
RECIRC. RISER SPURIOUS DELTA P INDICATION
G-LPCI-808
HALF OF 1 OUT OF 2 TWICE LOGIC YIELDS SPURIOUS SIGNAL
G-LPCI-810
SPURIOUS SIGNAL THRU RELAY 932/ 1530-183
G-LPCI-809
SPURIOUS SIGNAL THRU RELAY 933/ 1530-283
G-LPCI-812
SPURIOUS SIGNAL THRU RELAY 932/ 1530-183
G-LPCI-811
SPURIOUS SIGNAL THRU RELAY 932/ 1530-184
G-LPCI-813
SPURIOUS SIGNAL THRU RELAY 933/ 1530-284
G-LPCI-814

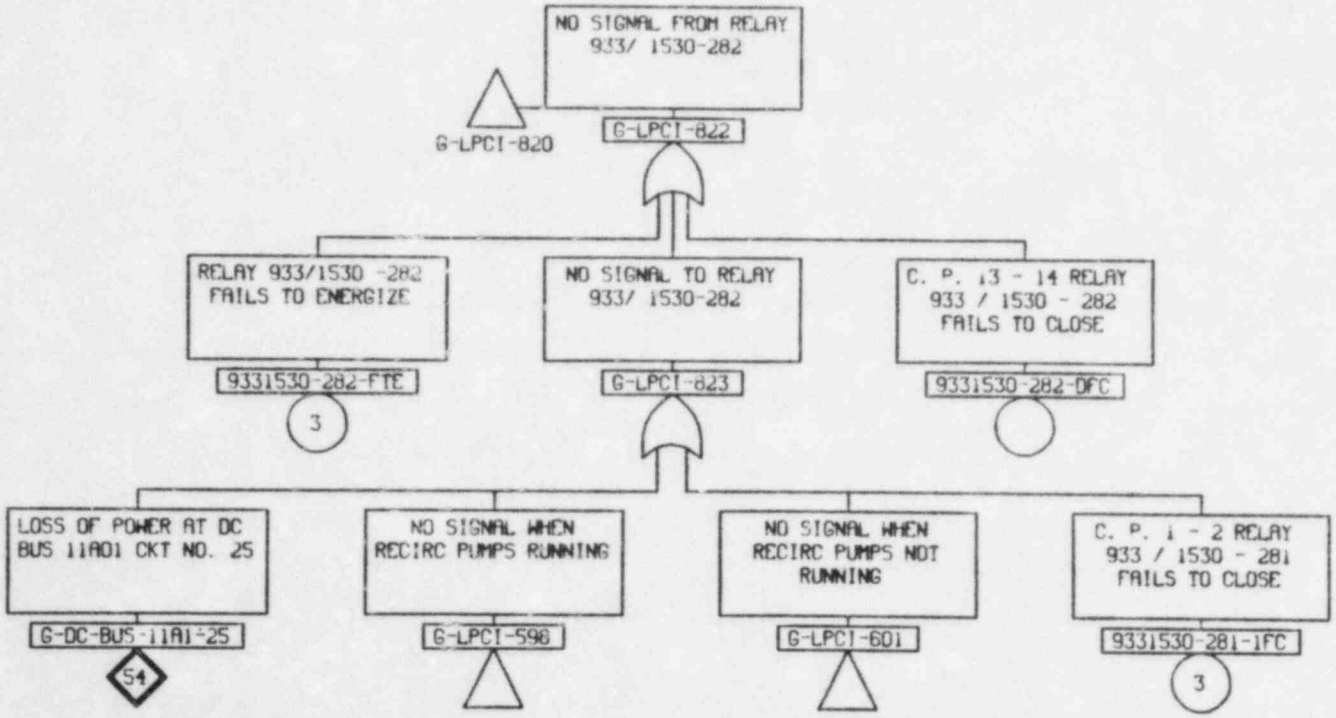

NO SIGNAL THRU C.P.
2-8 RELAY 933/
1530-288
G-LPCI-802
G-LPCI-805
NO SIGNAL TO RELAY
933/ 1530-188
RELAY 933/1530 -288
FAILS TO ENERGIZE
C. P. 2 - 8 RELAY
933 / 1530 - 288
FAILS TO CLOSE
G-LPCI-806
933\1530-288-FTE
933\1530-288-2FC
LOSS OF POWER AT DC
BUS 11A01 CKT NO. 25
NO SIGNAL THRU C.P.
13-14 RELAY 933/
1530-287 TO 932/
1530-288
G-DC-BUS-11A1-25
54
G-LPCI-819
NO SIGNAL TO RELAY
933/ 1530-287
C. P. 13 - 14 RELAY
933 / 1530 - 287
FAILS TO CLOSE
RELAY 933/1530 -287
FAILS TO ENERGIZE
G-LPCI-820
933\1530-287-DFC
933\1530-287-FTE
2

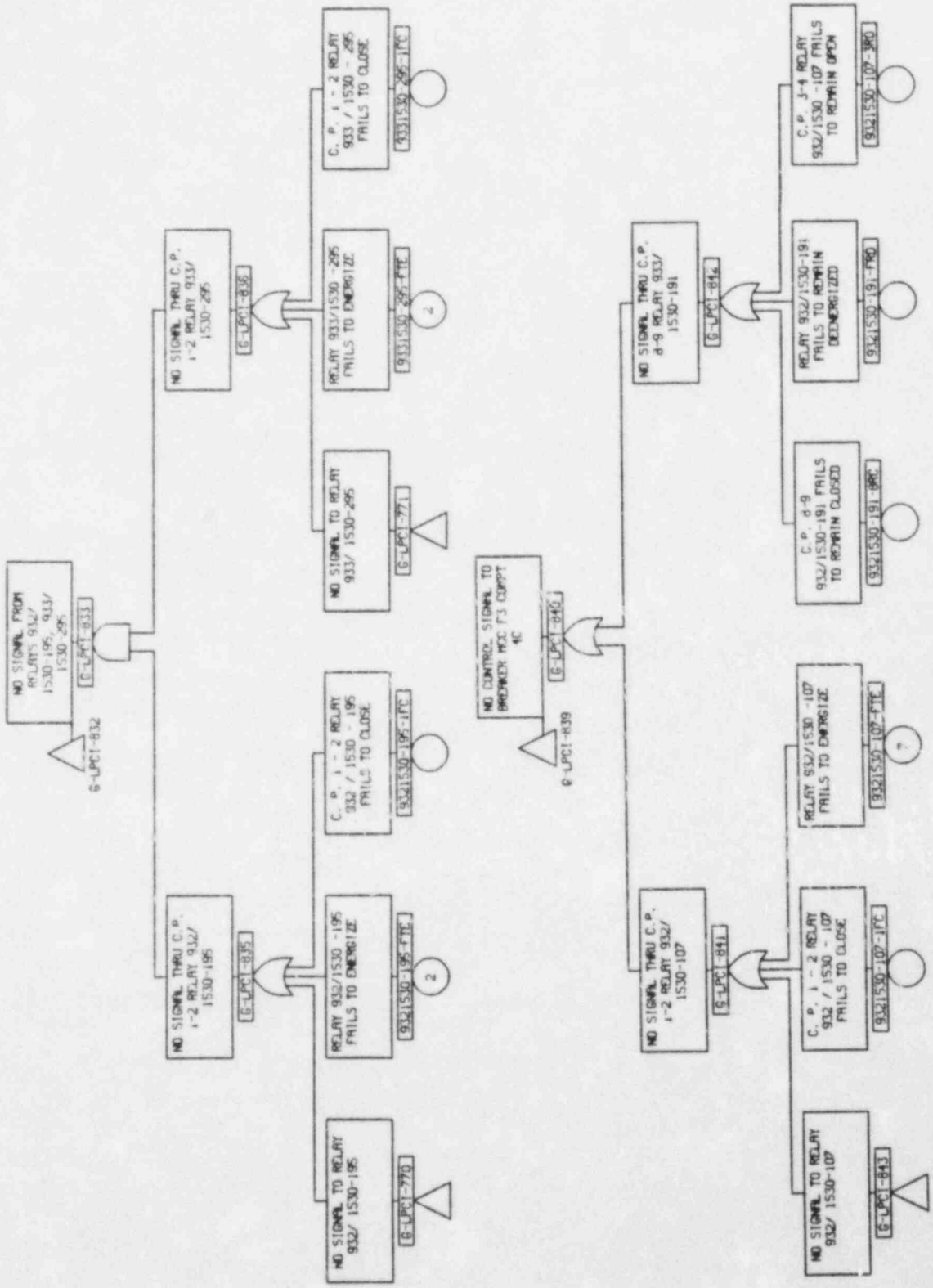

SPURIOUS SIGNAL THRU RELAY 932/ 1530-183
G-LPCI-809
G-LPCI-811
RELAY 932/1530-183 FAILS TO REMAIN DEENERGIZED
932J1530-183-PRO
2
DRIVEN DELTA P SIGNAL FROM DPIS 2251/ 261-12A
G-LPCI-815
DPIS 2251/261-12A MISCALIBRATED
2251261-12A-DMC
3
DPIS 2251/261-12A OUT FOR TEST OR MAINTENANCE
2251261-12A-TOM
3
C.P. 2-8 RELAY 932/1530 -183 FAILS TO REMAIN OPEN
932J1530-183-2RO
2
DPIS 2251/261-12A CONTACTS FAIL CLOSED
2251261-12A-2RO
2
SPURIOUS SIGNAL THRU RELAY 933/ 1530-283
G-LPCI-809
G-LPCI-812
RELAY 933/1530-283 FAILS TO REMAIN DEENERGIZED
933J1530-283-PRO
2
DRIVEN DELTA P SIGNAL FROM DPIS 2252/ 261-12B
G-LPCI-816
DPIS 2252/261-12B MISCALIBRATED
2252261-12B-DMC
3
DPIS 2252/261-12B OUT FOR TEST OR MAINTENANCE
2252261-12B-TOM
3
C.P. 1-7 RELAY 933/1530 -283 FAILS TO REMAIN OPEN
933J1530-283-1RO
2
DPIS 2252/261-12B CONTACTS FAIL CLOSED
2252261-12B-1RO
2
SPURIOUS SIGNAL THRU RELAY 932/ 1530-184
G-LPCI-810
G-LPCI-813
RELAY 932/1530-184 FAILS TO REMAIN DEENERGIZED
932J1530-184-PRO
2
DRIVEN DELTA P SIGNAL FROM DPIS 2251/ 261-12C
G-LPCI-817
DPIS 2251/261-12C MISCALIBRATED
2251261-12C-DMC
3
DPIS 2251/261-12C OUT FOR TEST OR MAINTENANCE
2251261-12C-TOM
3
C.P. 2-8 RELAY 932/1530 -184 FAILS TO REMAIN OPEN
932J1530-184-2RO
2
DPIS 2251/261-12C CONTACTS FAIL CLOSED
2251261-12C-2RO
2
SPURIOUS SIGNAL THRU RELAY 933/ 1530-284
G-LPCI-810
G-LPCI-814
RELAY 933/1530-284 FAILS TO REMAIN DEENERGIZED
933J1530-284-PRO
2
DRIVEN DELTA P SIGNAL FROM DPIS 2252/ 261-12D
G-LPCI-818
DPIS 2252/261-12D MISCALIBRATED
2252261-12D-DMC
3
DPIS 2252/261-12D OUT FOR TEST OR MAINTENANCE
2252261-12D-TOM
3
C.P. 1-7 RELAY 933/1530 -284 FAILS TO REMAIN OPEN
933J1530-284-1RO
2
DPIS 2252/261-12D CONTACTS FAIL CLOSED
2252261-12D-1RO
2

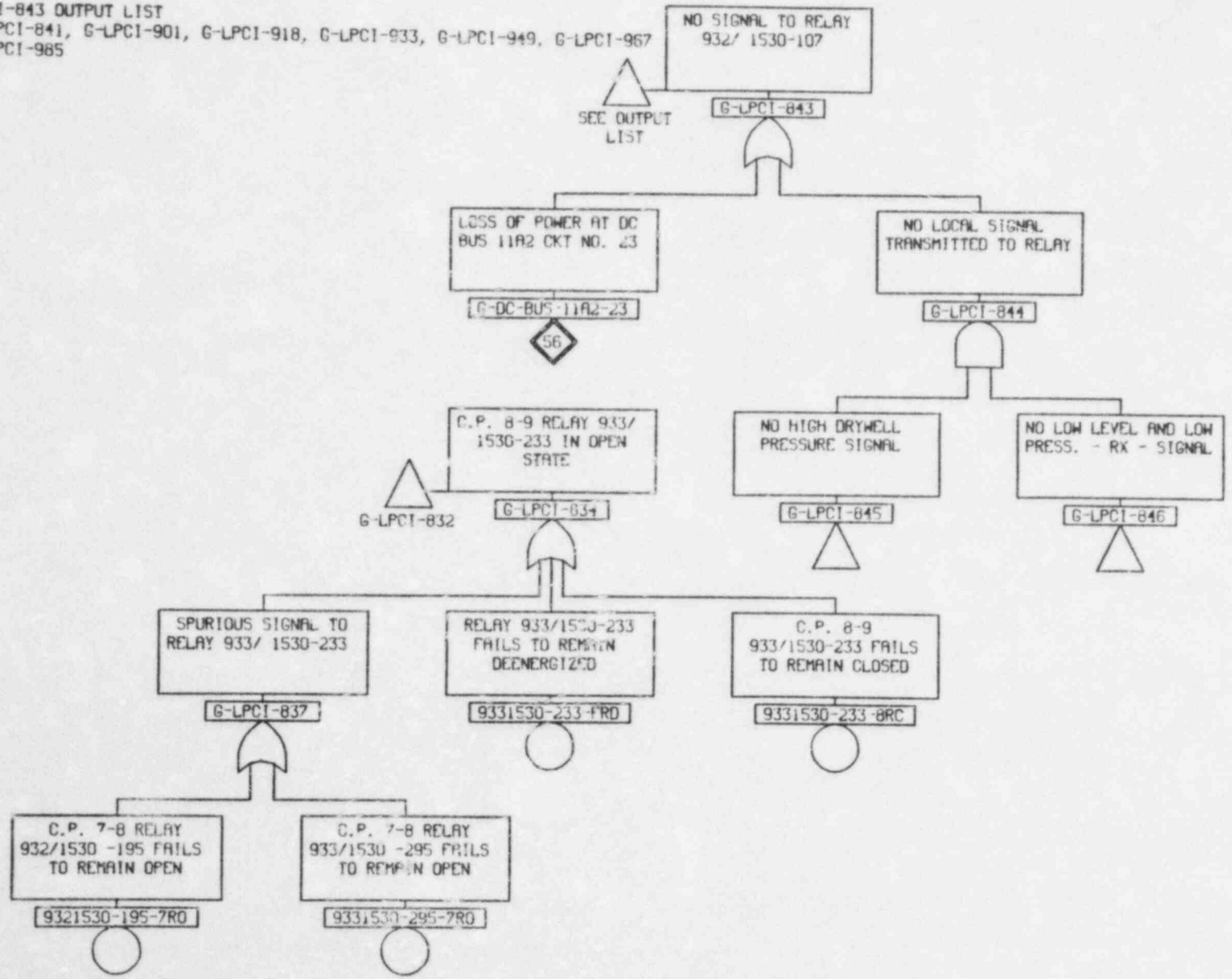

VALVE 1-LP-9A CONTROL SIGNAL FAILURE
G-LPCI-824
NO SIGNAL TO BREAKER MCC FE-3 COMPT. 2C
BREAKER MCC FE-3 COMPT 2C FAILS
G-LPCI-825
AC-FE3-2C-FTC
2
LOSS OF POWER AT MCC FE-3 BUS 101-AB-1 CKT 03A
NO SIGNALS FROM RELAYS 932/ 1530-192, 932/ 1530-292
C.P. 8-9 RELAY 932/ 1530-133 IN OPEN STATE
G-DC-BUS-AB1-3A
G-LPCI-826
G-LPCI-827
8
VALVE 1-LP-9B CONTROL SIGNAL FAILURE
G-LPCI-831
NO SIGNAL TO BREAKER MCC E-F3 COMPT. 2A
BREAKER MCC E-F3 COMPT. 2A FAILS
G-LPCI-832
AC-EF3-2A-FTC
2
LOSS OF POWER AT DC BUS 101-AB-2 CKT 02D
NO SIGNAL FROM RELAYS 932/ 1530-195, 933/ 1530-295
C.P. 8-9 RELAY 933/ 1530-233 IN OPEN STATE
G-DC-BUS-AB2-2D
G-LPCI-833
G-LPCI-834
8

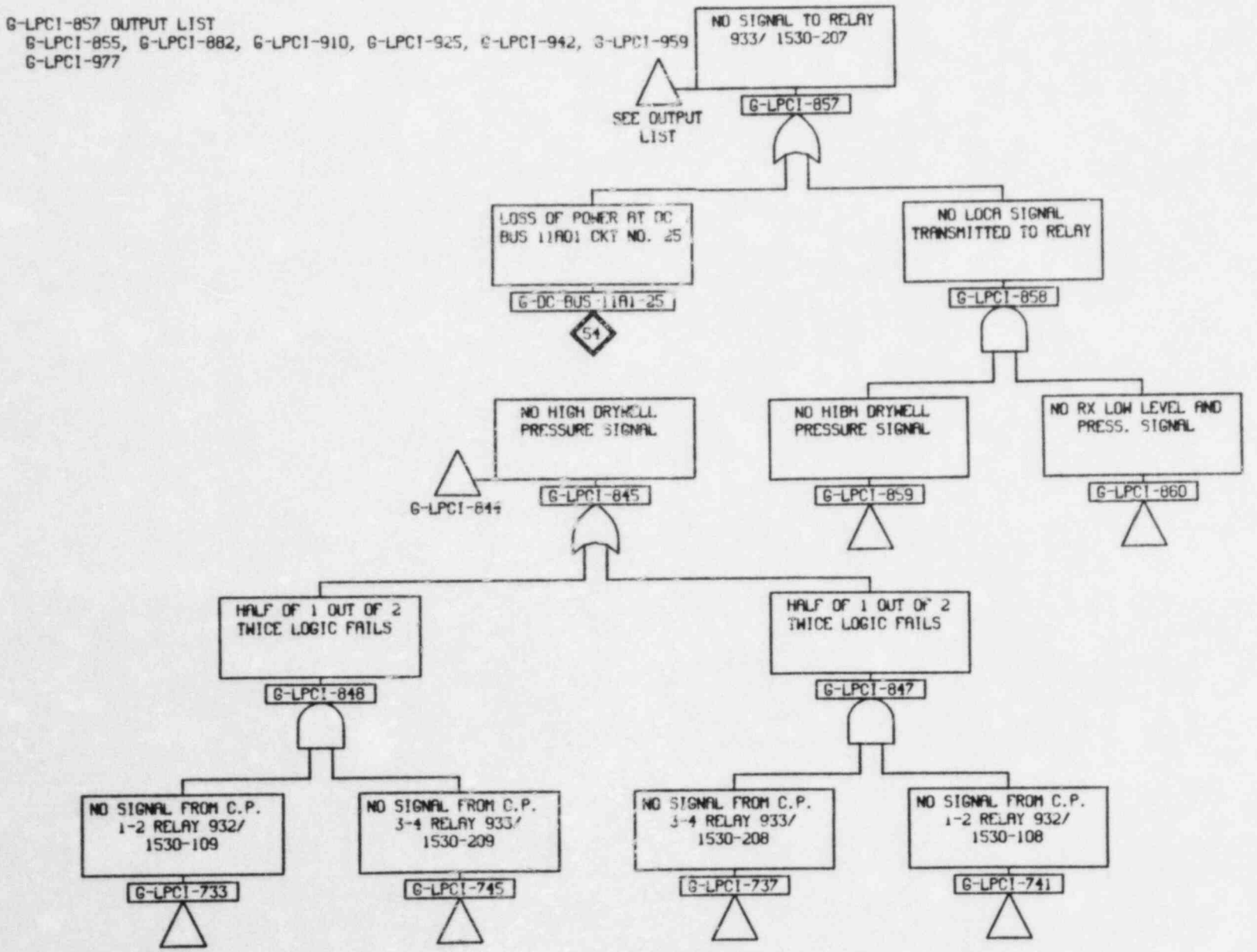

VALVE 1-LP-7A CONTROL SIGNAL FAILURE
G-LPCI-838
NO SIGNAL TO BREAKER MCC F3 COMPT. 4C
G-LPCI-839
BREAKER MCC F3 COMPT 4C FAILS
AC-F3-4C-FTC
NO CONTROL SIGNAL TO BREAKER MCC F3 COMPT 4C
G-LPCI-840
LOSS OF POWER AT MCC FE-3 BUS 101-AB-1 CKT 03A
G-DC-BUS-AB1-3A
8
VALVE 1-LP-7B CONTROL SIGNAL FAILURES
G-LPCI-852
NO SIGNAL TO BREAKER MCC E3 COMPT. 2C
G-LPCI-853
BREAKER MCC E3 COMPT 2C FAILS
AC-E3-2C-FTC
NO CONTROL SIGNAL TO BREAKER MCC E3 COMPT 2C
G-LPCI-854
LOSS OF POWER AT DC BUS 101-AB-2 CKT 02D
G-DC-BUS-AB2-2D
8

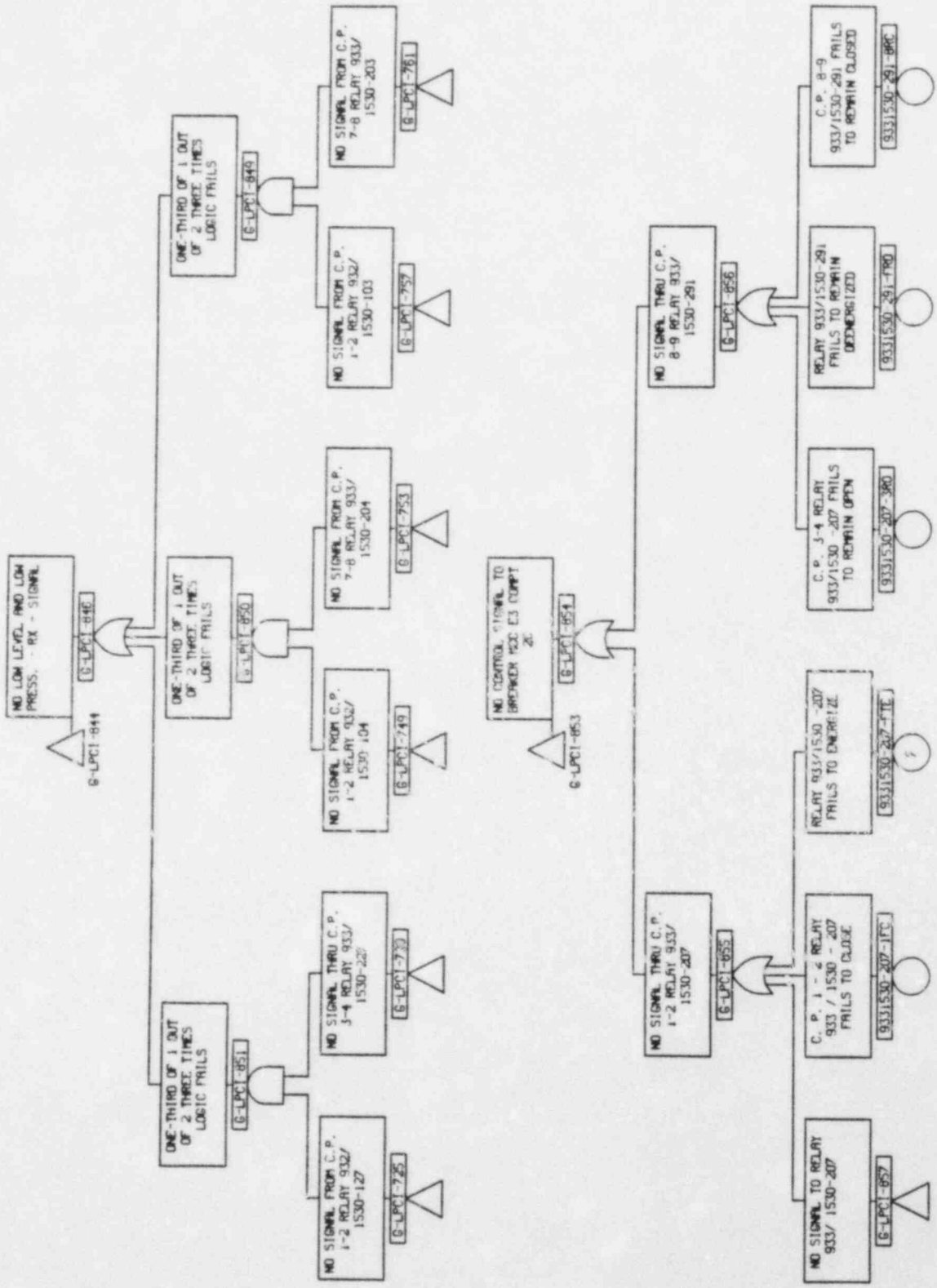

NO SIGNAL TO RELAY 933/ 1530-287
G-LPCI-819
G-LPCI-820
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
SPURIOUS SIGNAL (NO.) RELAY 932/ 1530-185
RELAY 933/1530 -287 FAILS TO ENERGIZE
NO SIGNAL FROM RELAY 933/ 1530-282
C. P. 6 - 7 RELAY 933 / 1530 - 287 FAILS TO CLOSE
G-DC-BUS-11A1-25
G-LPCI-821
9331530-287-FTE
G-LPCI-822
9331530-287-6FC
S4
2
ERRONEOUS SIGNAL TO RELAY 932/ 1530-185
RELAY 932/1530-185 FAILS TO REMAIN DEENERGIZED
C.P. 9-10 932/1530-185 FAILS TO REMAIN CLOSED
C.P. 8-9 RELAY 932/ 1530-133 IN OPEN STATE
G-LPCI-785
9321530-185-FRD
9321530-185-9RC
G-LPCI-825
G-LPCI-827
2
SPURIOUS SIGNAL TO 932/ 1530-133
C.P. 8-9 932/1530-133 FAILS TO REMAIN CLOSED
RELAY 932/1530-133 FAILS TO REMAIN DEENERGIZED
G-LPCI-830
9321530-133-8RC
9321530-133-FRD
C.P. 1-2 RELAY 932/1530 -192 FAILS TO REMAIN OPEN
C.P. 1-2 RELAY 933/1530 -292 FAILS TO REMAIN OPEN
9321530-192-1RO
9331530-292-1RO

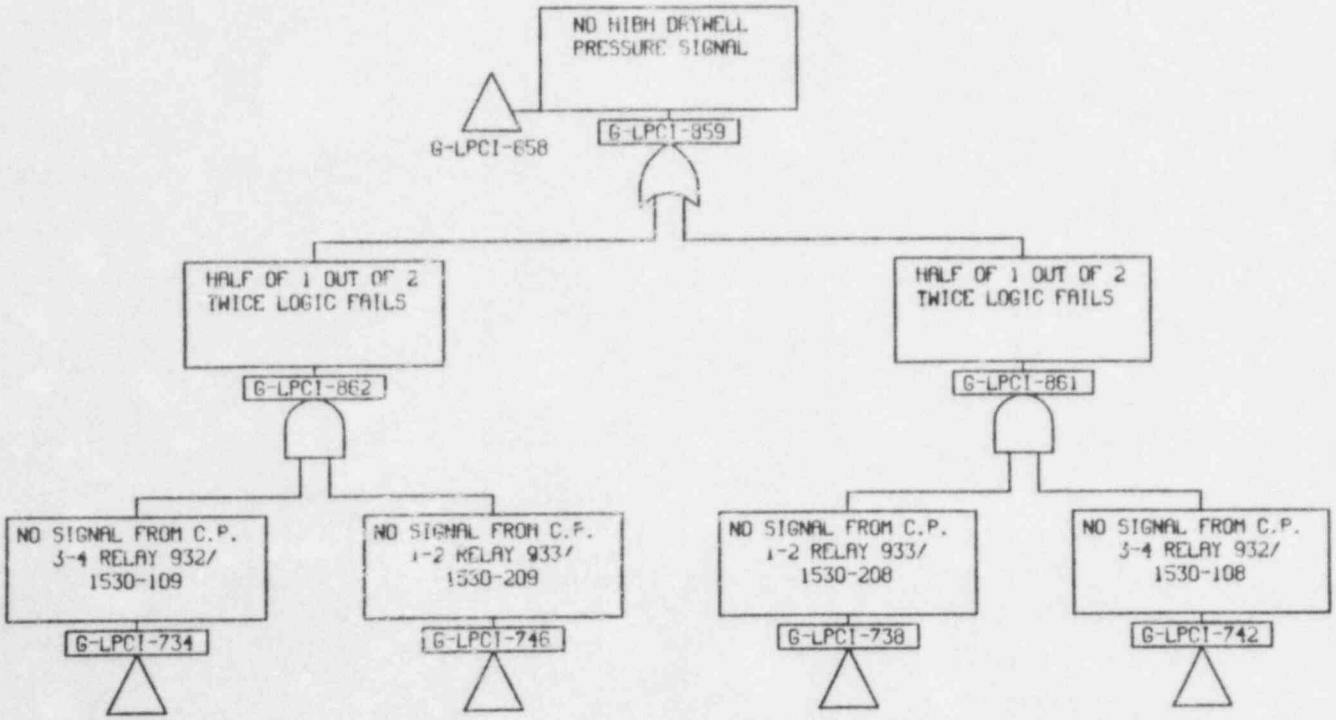

NO SIGNAL FROM RELAY 933/ 1530-282
G-LPCI-820
G-LPCI-822
RELAY 933/1530 -282 FAILS TO ENERGIZE
9331530-282-FTE
3
NO SIGNAL TO RELAY 933/ 1530-282
G-LPCI-823
C. P. 13 - 14 RELAY 933 / 1530 - 282 FAILS TO CLOSE
9331530-282-DFC
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL WHEN RECIRC PUMPS RUNNING
G-LPCI-598
NO SIGNAL WHEN RECIRC PUMPS NOT RUNNING
G-LPCI-601
C. P. 1 - 2 RELAY 933 / 1530 - 281 FAILS TO CLOSE
9331530-281-1FC
3

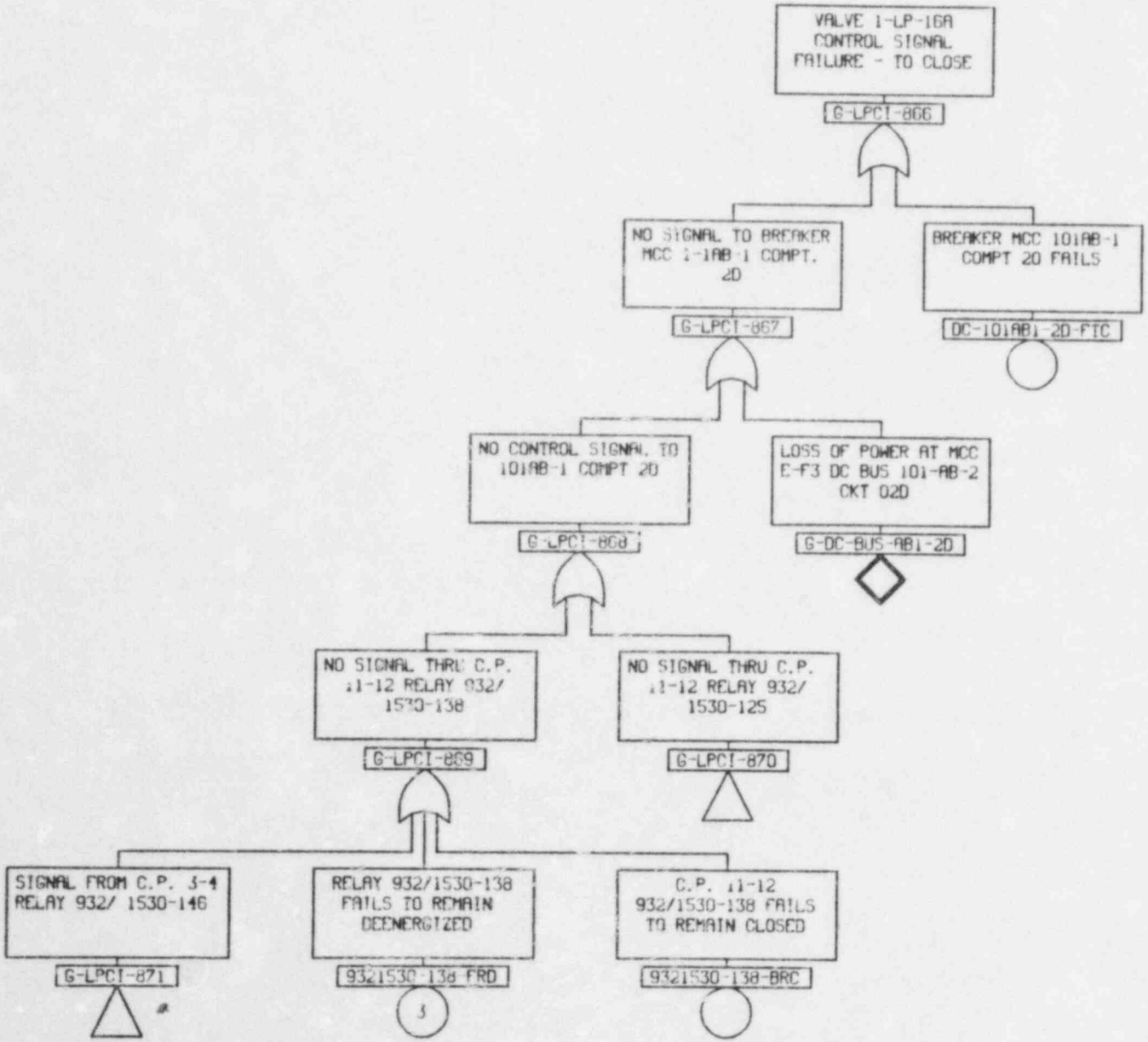

NO SIGNAL FROM RELAYS 932/ 1530-195, 933/ 1530-295
6-LPCI-833
6-LPCI-832
NO SIGNAL THRU C.P. 1-2 RELAY 933/ 1530-295
6-LPCI-836
NO SIGNAL THRU C.P. 1-2 RELAY 932/ 1530-195
6-LPCI-835
NO SIGNAL TO RELAY 933/ 1530-295
6-LPCI-971
RELAY 933/1530-295 FAILS TO ENERGIZE
933/1530-295-FTE
2
C.P. 1-2 RELAY 933/1530-295 FAILS TO CLOSE
933/1530-295-FTC
C.P. 1-2 RELAY 932/1530-195 FAILS TO CLOSE
932/1530-195-FTC
RELAY 932/1530-195 FAILS TO ENERGIZE
932/1530-195-FTE
2
NO SIGNAL TO RELAY 932/1530-195
6-LPCI-970
NO CONTROL SIGNAL TO BREAKER MOC F3 COMPT 4C
6-LPCI-840
6-LPCI-839
NO SIGNAL THRU C.P. d-9 RELAY 933/ 1530-191
6-LPCI-842
NO SIGNAL THRU C.P. 1-2 RELAY 932/ 1530-107
6-LPCI-841
C.P. d-9 RELAY 932/1530-191 FAILS TO REMAIN CLOSED
932/1530-191-FTC
RELAY 932/1530-191 FAILS TO REMAIN DEENERGIZED
932/1530-191-FTDE
RELAY 932/1530-107 FAILS TO ENERGIZE
932/1530-107-FTE
4
C.P. 1-2 RELAY 932/1530-107 FAILS TO CLOSE
932/1530-107-FTC
C.P. d-9 RELAY 932/1530-107 FAILS TO REMAIN OPEN
932/1530-107-FTOP
NO SIGNAL TO RELAY 932/ 1530-107
6-LPCI-843

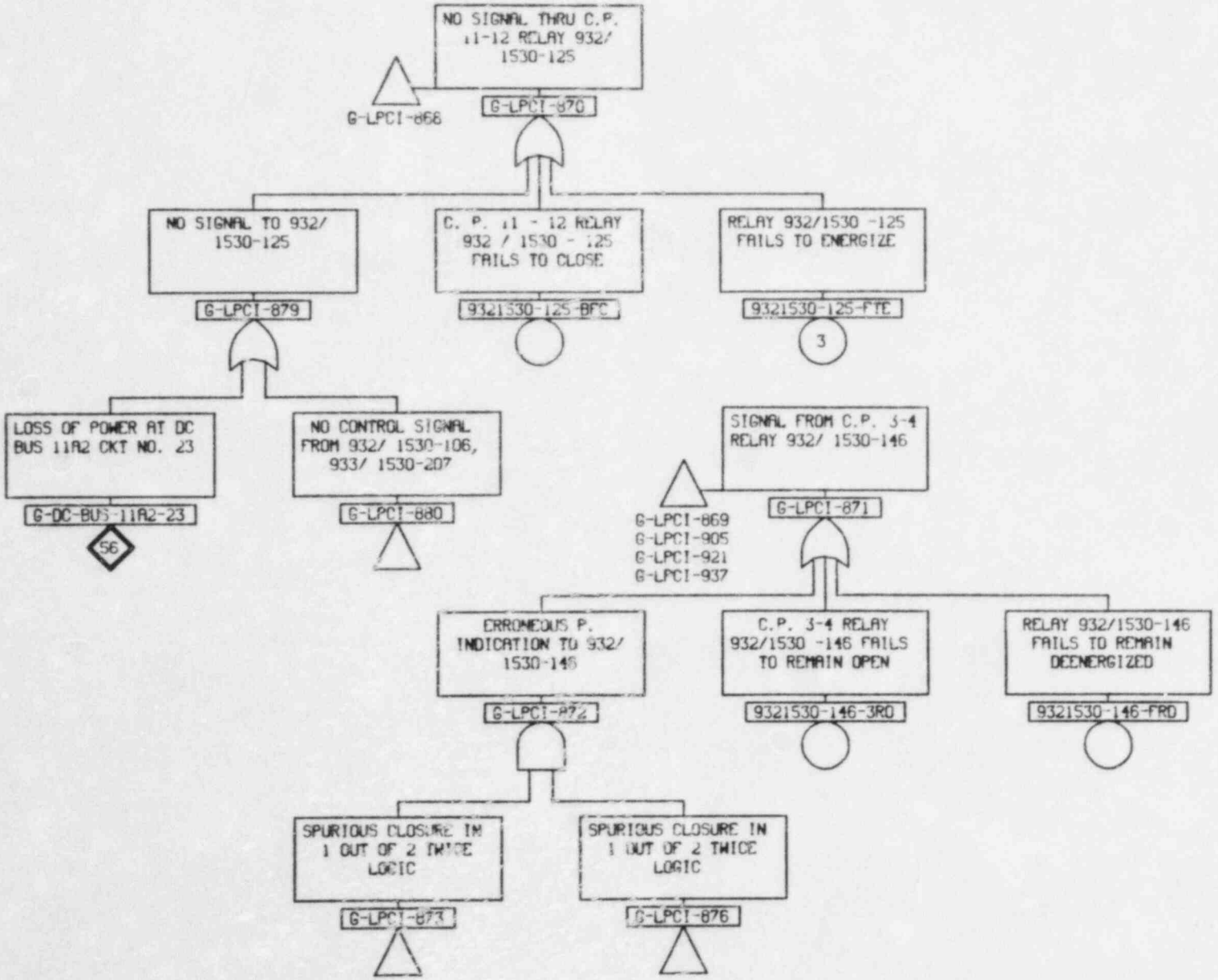

G-LPCI-843 OUTPUT LIST
G-LPCI-841, G-LPCI-901, G-LPCI-918, G-LPCI-933, G-LPCI-949, G-LPCI-967
G-LPCI-985
NO SIGNAL TO RELAY 932/ 1530-107
G-LPCI-843
SEE OUTPUT LIST
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO LOCAL SIGNAL TRANSMITTED TO RELAY
G-LPCI-844
C.P. 8-9 RELAY 933/ 1530-233 IN OPEN STATE
G-LPCI-832
G-LPCI-834
NO HIGH DRYWELL PRESSURE SIGNAL
G-LPCI-845
NO LOW LEVEL AND LOW PRESS. - RX - SIGNAL
G-LPCI-846
SPURIOUS SIGNAL TO RELAY 933/ 1530-233
G-LPCI-837
RELAY 933/1530-233 FAILS TO REMAIN DEENERGIZED
9331530-233-FRD
C.P. 8-9 933/1530-233 FAILS TO REMAIN CLOSED
9331530-233-BRC
C.P. 7-8 RELAY 932/1530 -195 FAILS TO REMAIN OPEN
9321530-195-7RO
C.P. 7-8 RELAY 933/1530 -295 FAILS TO REMAIN OPEN
9331530-295-7RO

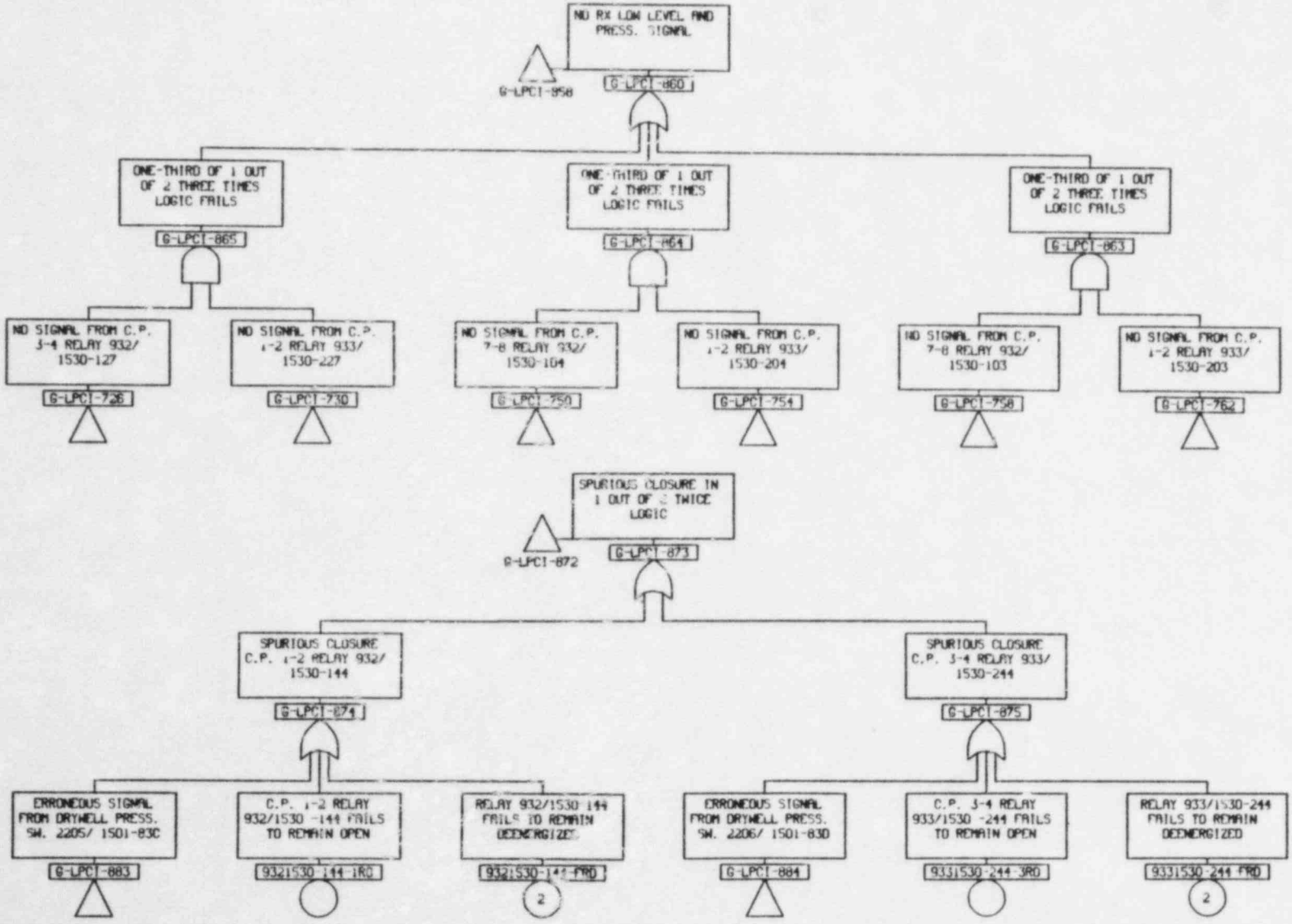

G-LPCI-857 OUTPUT LIST
G-LPCI-855, G-LPCI-882, G-LPCI-910, G-LPCI-925, G-LPCI-942, G-LPCI-959
G-LPCI-977
NO SIGNAL TO RELAY 933/ 1530-207
G-LPCI-857
SEE OUTPUT LIST
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO LOCA SIGNAL TRANSMITTED TO RELAY
G-LPCI-858
NO HIGH DRYWELL PRESSURE SIGNAL
G-LPCI-844
G-LPCI-845
NO HIGH DRYWELL PRESSURE SIGNAL
G-LPCI-859
NO RX LOW LEVEL AND PRESS. SIGNAL
G-LPCI-860
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-848
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-847
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-109
G-LPCI-733
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-209
G-LPCI-745
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-208
G-LPCI-737
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-108
G-LPCI-741

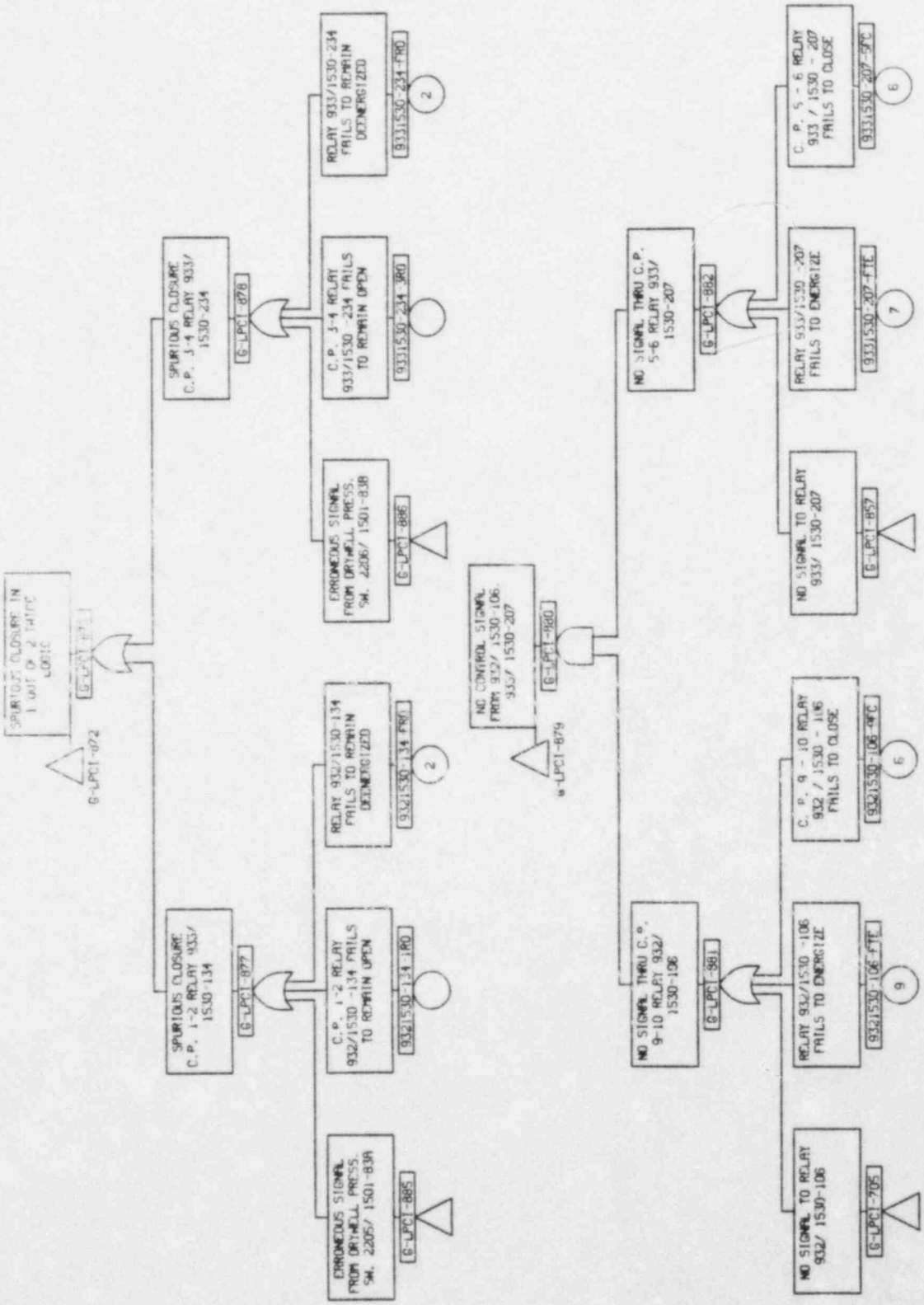

NO LOW LEVEL AND LOW PRESS. - RX - SIGNAL
G-LPCI-844
G-LPCI-846
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-851
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-127
G-LPCI-725
NO SIGNAL THRU C.P. J-4 RELAY 933/ 1530-227
G-LPCI-730
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-850
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-104
G-LPCI-749
NO SIGNAL FROM C.P. 7-8 RELAY 933/ 1530-204
G-LPCI-753
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-849
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-103
G-LPCI-757
NO SIGNAL FROM C.P. 7-8 RELAY 933/ 1530-203
G-LPCI-761
NO CONTROL SIGNAL TO BROKEN PCC ES COMPT 2C
G-LPCI-853
G-LPCI-854
NO SIGNAL THRU C.P. 1-2 RELAY 933/ 1530-207
G-LPCI-855
NO SIGNAL TO RELAY 933/ 1530-207
G-LPCI-859
C.P. 1 - 2 RELAY 933 / 1530 - 207 FAILS TO CLOSE
933/1530-207-1FC
RELAY 933/1530 -207 FAILS TO ENERGIZE
933/1530-207-FTE
NO SIGNAL THRU C.P. 8-9 RELAY 933/ 1530-291
G-LPCI-856
C.P. J-4 RELAY 933/1530 -207 FAILS TO REMAIN OPEN
933/1530-207-3RO
RELAY 933/1530-291 FAILS TO REMAIN DEENERGIZED
933/1530-291-FRD
C.P. 8-9 933/1530-291 FAILS TO REMAIN CLOSED
933/1530-291-FRC

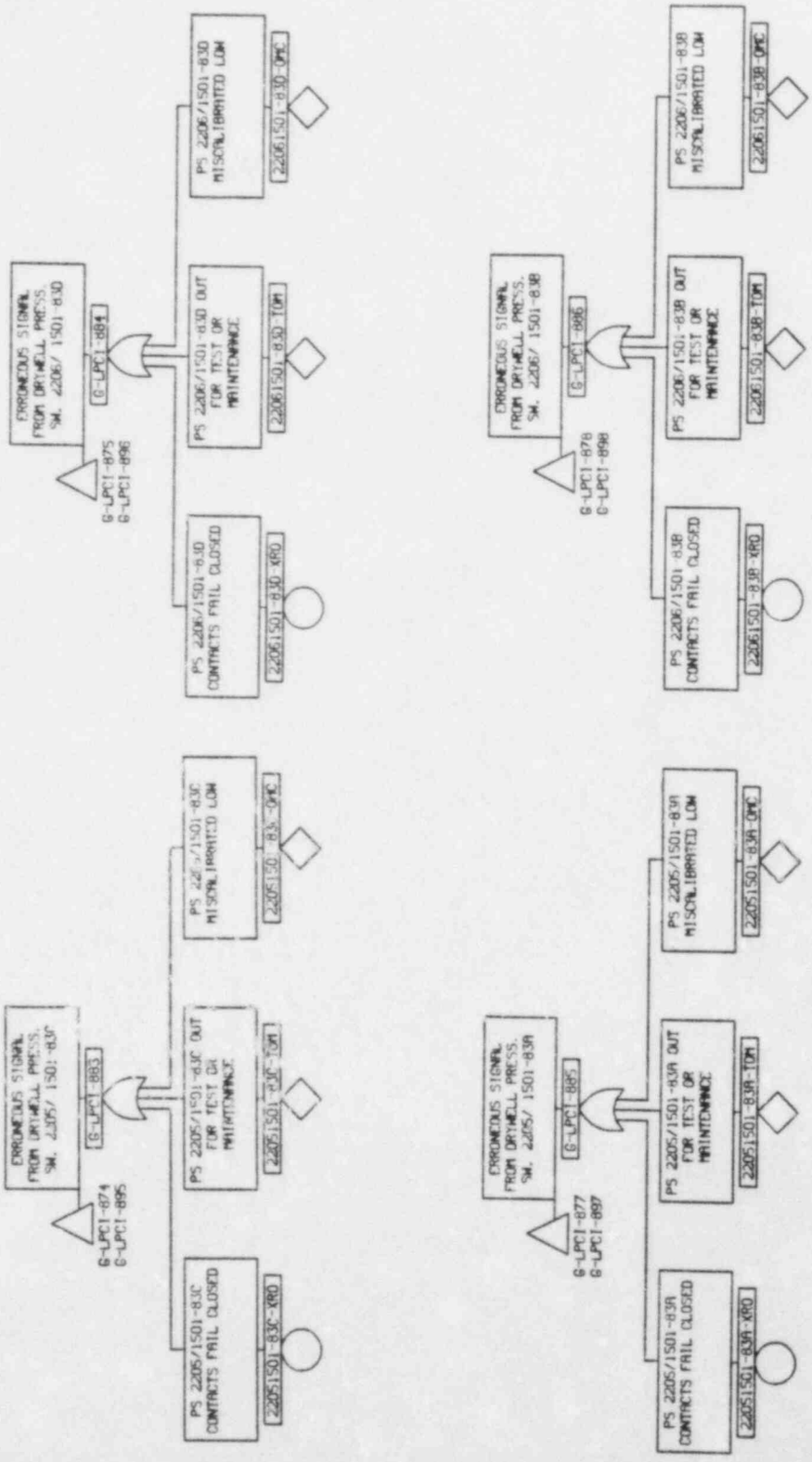

NO HIGH DRYWELL PRESSURE SIGNAL
G-LPCI-658
G-LPCI-859
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-862
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-861
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-109
G-LPCI-734
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-209
G-LPCI-746
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-208
G-LPCI-738
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-108
G-LPCI-742

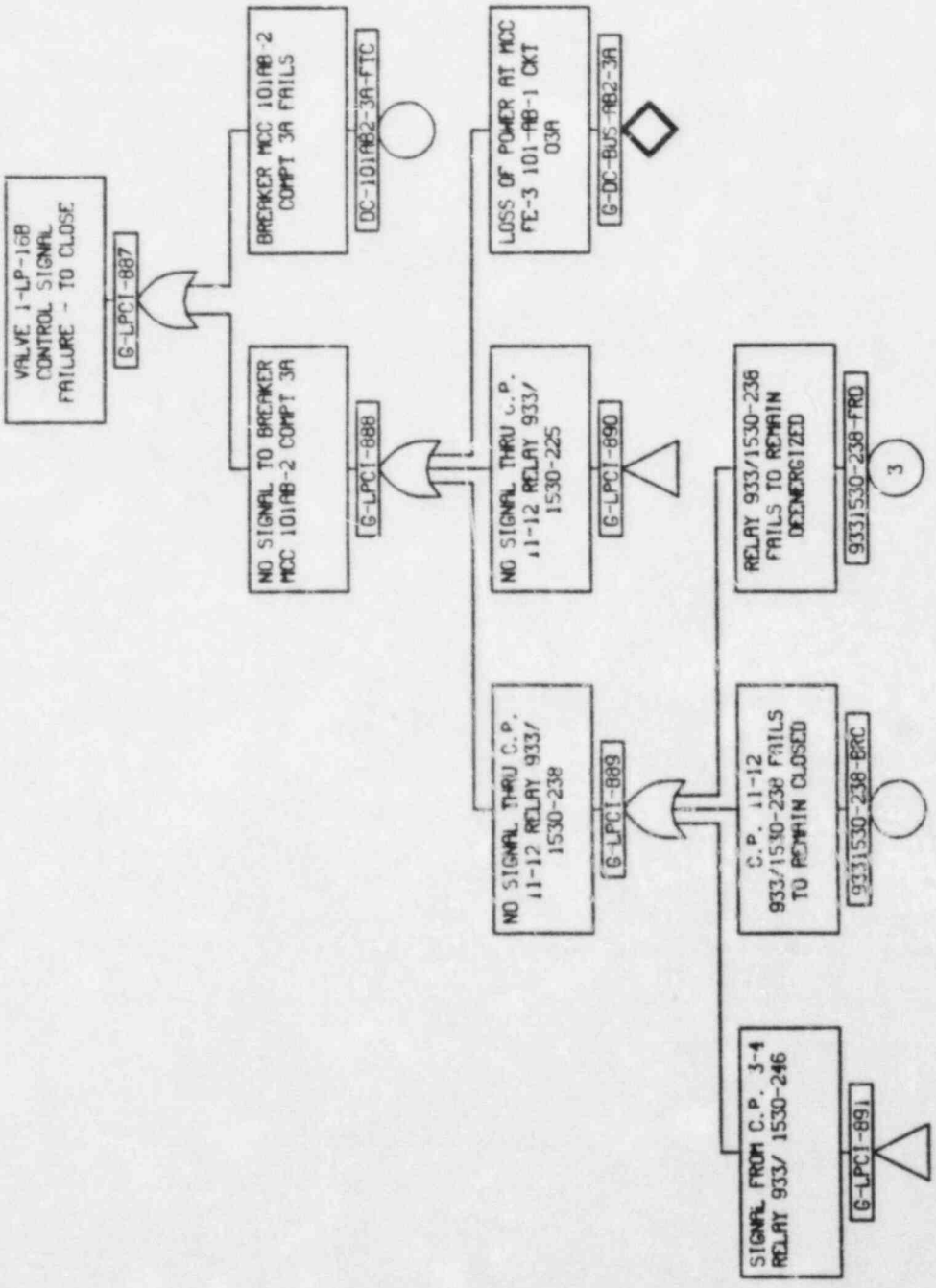

VALVE 1-LP-16A
CONTROL SIGNAL
FAILURE - TO CLOSE
G-LPCI-866
NO SIGNAL TO BREAKER
MCC 1-1AB-1 COMPT.
2D
G-LPCI-867
BREAKER MCC 101AB-1
COMPT 2D FAILS
DC-101AB1-2D-FTC
NO CONTROL SIGNAL TO
101AB-1 COMPT 2D
G-LPCI-868
LOSS OF POWER AT MCC
E-F3 DC BUS 101-AB-2
CKT 02D
G-DC-BUS-AB1-2D
NO SIGNAL THRU C.P.
11-12 RELAY 932/
1530-138
G-LPCI-869
NO SIGNAL THRU C.P.
11-12 RELAY 932/
1530-125
G-LPCI-870
SIGNAL FROM C.P. 3-4
RELAY 932/ 1530-146
G-LPCI-871
RELAY 932/1530-138
FAILS TO REMAIN
DEENERGIZED
9321530-138-FRD
C.P. 11-12
932/1530-138 FAILS
TO REMAIN CLOSED
9321530-138-BRC
3

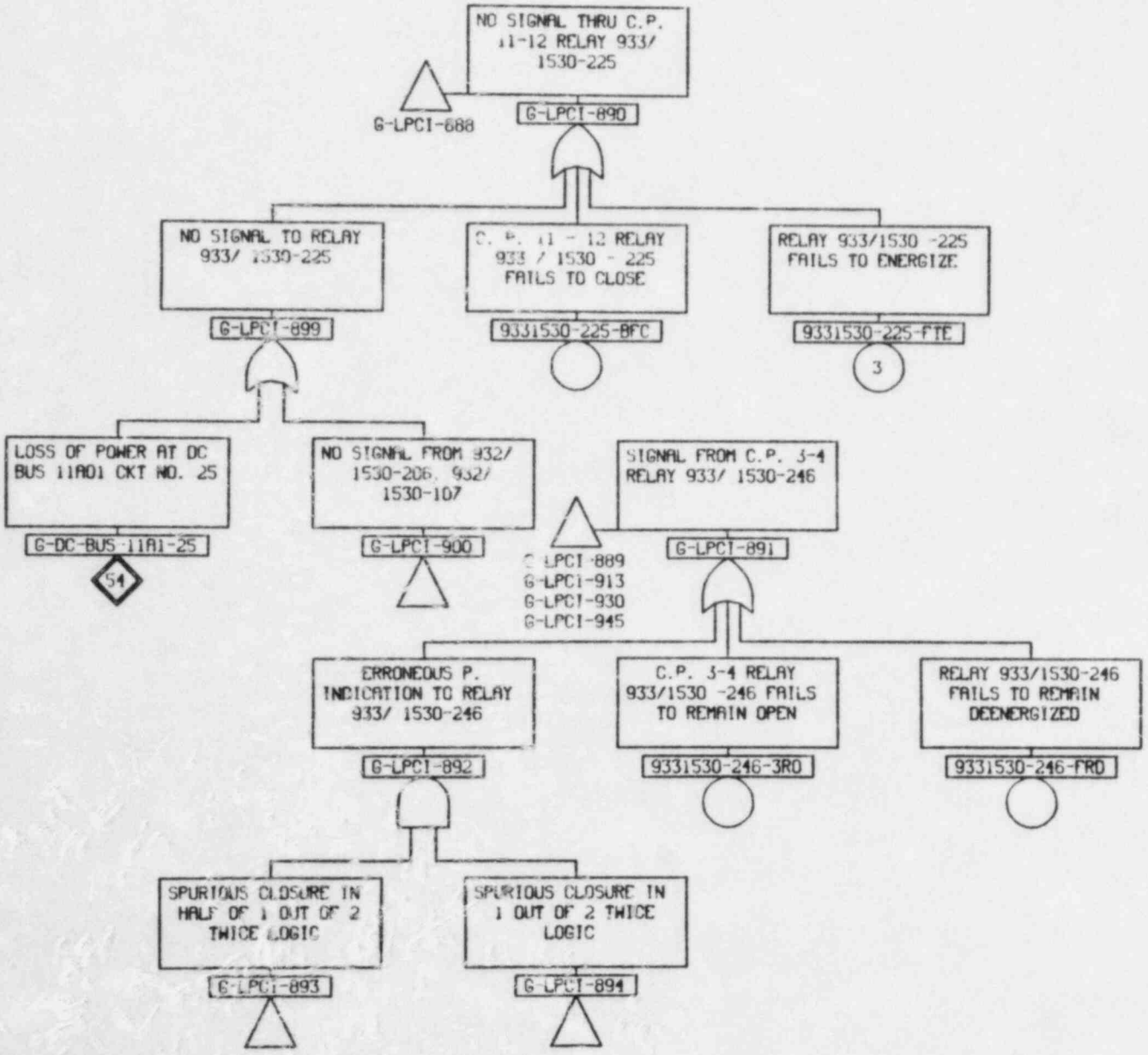

NO SIGNAL THRU C.P. 1-12 RELAY 932/ 1530-125
G-LPCI-868
G-LPCI-870
NO SIGNAL TO 932/ 1530-125
C. P. 1-12 RELAY 932 / 1530 - 125 FAILS TO CLOSE
RELAY 932/1530 -125 FAILS TO ENERGIZE
G-LPCI-879
9321530-125-BFC
9321530-125-FTE
3
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
NO CONTROL SIGNAL FROM 932/ 1530-106, 933/ 1530-207
G-DC-BUS-11A2-23
56
G-LPCI-880
SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-146
G-LPCI-871
G-LPCI-869
G-LPCI-905
G-LPCI-921
G-LPCI-937
ERRONEOUS P. INDICATION TO 932/ 1530-146
C.P. 3-4 RELAY 932/1530 -146 FAILS TO REMAIN OPEN
RELAY 932/1530-146 FAILS TO REMAIN DEENERGIZED
G-LPCI-872
9321530-146-3RO
9321530-146-FRO
SPURIOUS CLOSURE IN 1 OUT OF 2 TWICE LOGIC
SPURIOUS CLOSURE IN 1 OUT OF 2 TWICE LOGIC
G-LPCI-873
G-LPCI-876

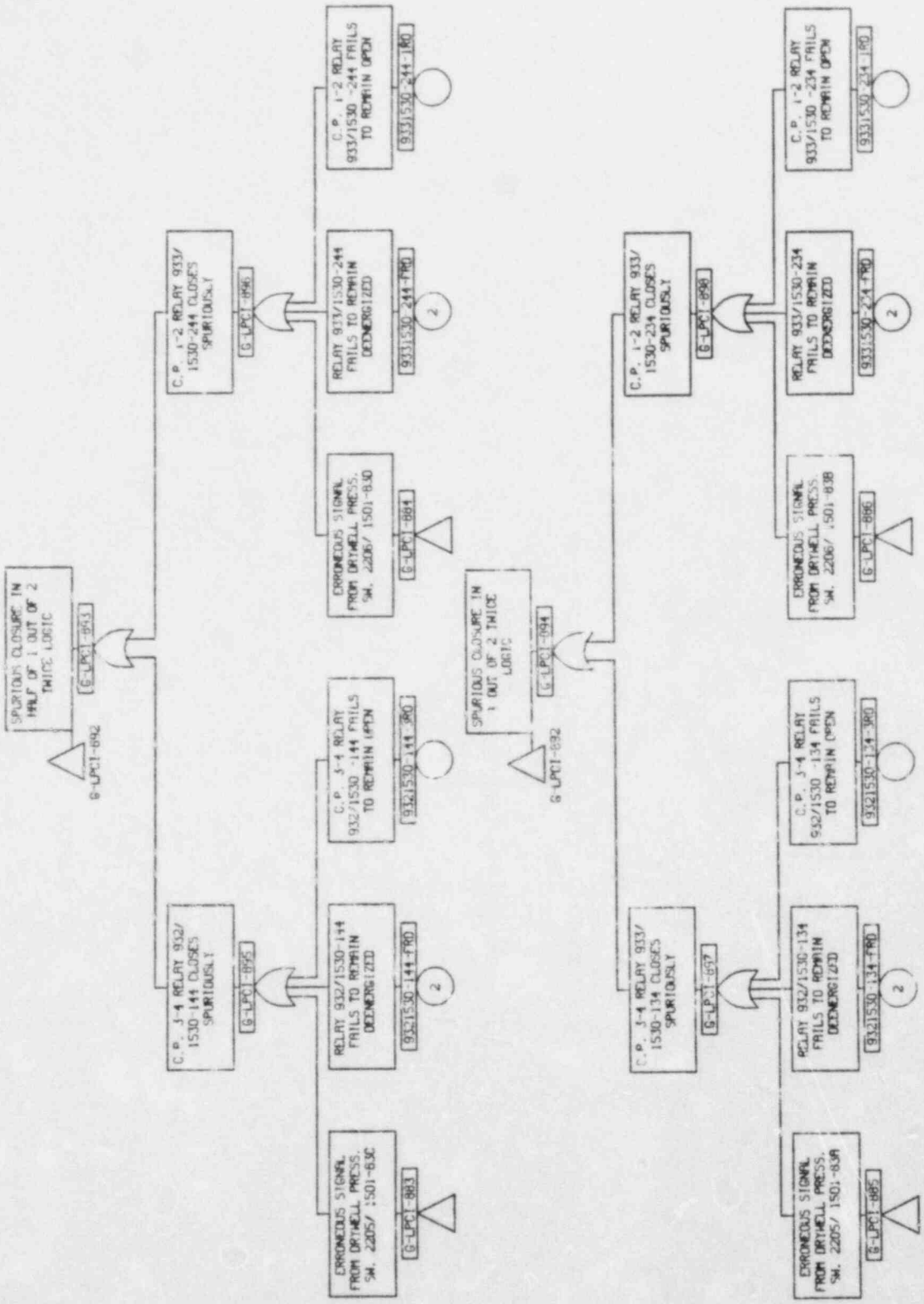

NO RX LOW LEVEL AND PRESS. SIGNAL
G-LPCI-860
G-LPCI-858
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-865
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-864
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-863
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-127
G-LPCI-726
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-227
G-LPCI-730
NO SIGNAL FROM C.P. 7-8 RELAY 932/ 1530-104
G-LPCI-750
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-204
G-LPCI-754
NO SIGNAL FROM C.P. 7-8 RELAY 932/ 1530-103
G-LPCI-758
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-203
G-LPCI-762
SPURIOUS CLOSURE IN 1 OUT OF 2 TWICE LOGIC
G-LPCI-872
G-LPCI-873
SPURIOUS CLOSURE C.P. 1-2 RELAY 932/ 1530-144
G-LPCI-874
SPURIOUS CLOSURE C.P. 3-4 RELAY 933/ 1530-244
G-LPCI-875
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2205/ 1501-83C
G-LPCI-883
C.P. 1-2 RELAY 932/1530 -144 FAILS TO REMAIN OPEN
932/1530 144 1RO
RELAY 932/1530 144 FAILS TO REMAIN DEENERGIZED
932/1530-144 2RD
2
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2206/ 1501-83D
G-LPCI-884
C.P. 3-4 RELAY 933/1530 -244 FAILS TO REMAIN OPEN
933/1530 244 3RO
RELAY 933/1530-244 FAILS TO REMAIN DEENERGIZED
933/1530 244 4RD
2

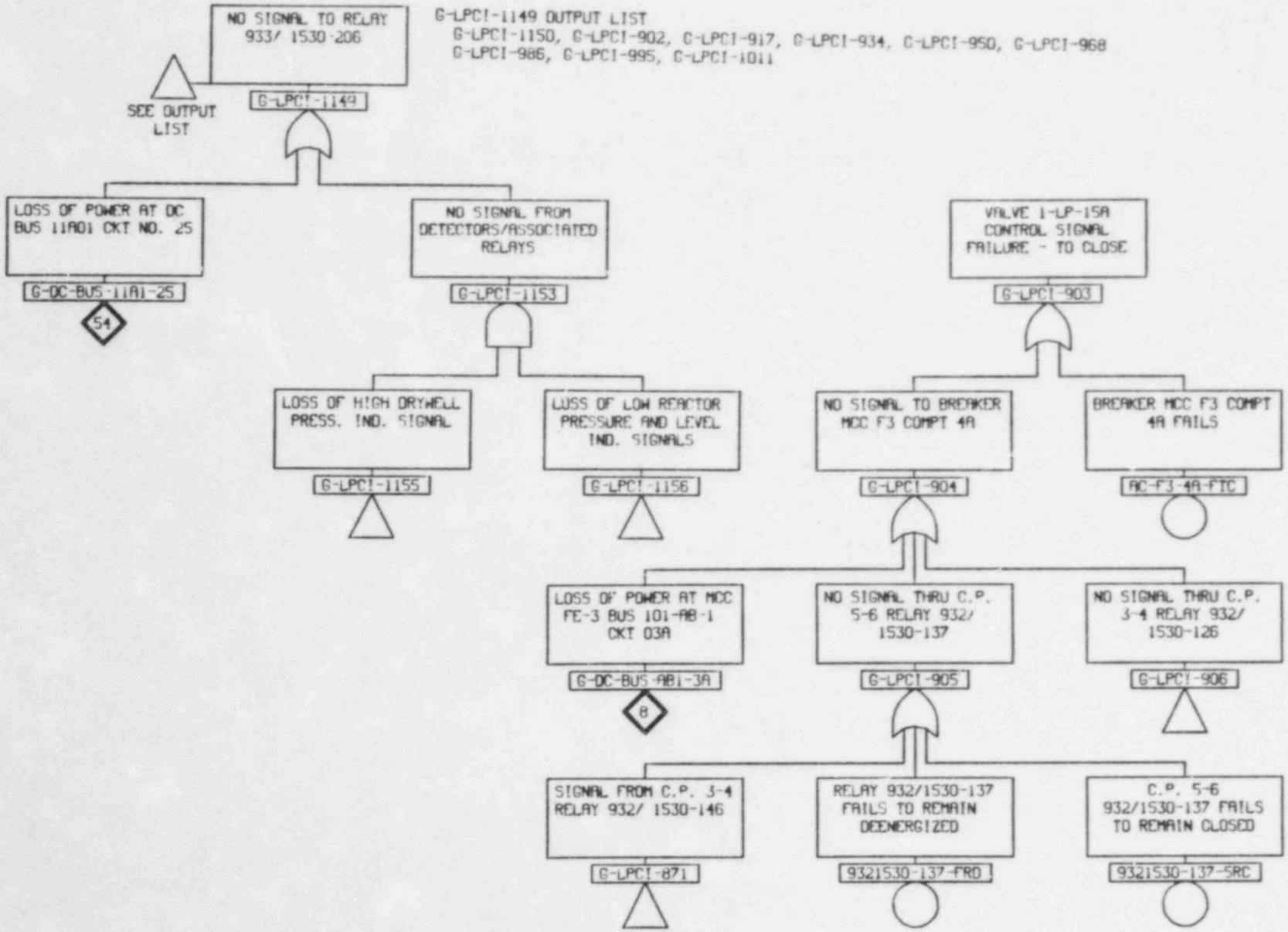

SPURIOUS CLOSURE IN 1 OUT OF 2 TWICE LOGIC
G-LPCI-872
SPURIOUS CLOSURE C.P. 1-2 RELAY 933/ 1530-134
G-LPCI-877
SPURIOUS CLOSURE C.P. 3-4 RELAY 933/ 1530-234
G-LPCI-878
C.P. 1-2 RELAY 932/1530-134 FAILS TO REMAIN OPEN
9321530-134-TRO
RELAY 932/1530-134 FAILS TO REMAIN DEENERGIZED
9321530-134-FRD
2
C.P. 3-4 RELAY 933/1530-234 FAILS TO REMAIN OPEN
9331530-234-TRO
RELAY 933/1530-234 FAILS TO REMAIN DEENERGIZED
9331530-234-FRD
2
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2205/ 1501-83A
G-LPCI-885
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2206/ 1501-83B
G-LPCI-886
NO CONTROL SIGNAL FROM 932/ 1530-106, 933/ 1530-207
G-LPCI-880
G-LPCI-879
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-106
G-LPCI-881
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-207
G-LPCI-882
RELAY 932/1530-106 FAILS TO ENERGIZE
9321530-106-FTE
9
C.P. 9 - 10 RELAY 932 / 1530 - 106 FAILS TO CLOSE
9321530-106-AFC
6
RELAY 933/1530-207 FAILS TO ENERGIZE
9331530-207-FTE
7
C.P. 5 - 6 RELAY 933 / 1530 - 207 FAILS TO CLOSE
9331530-207-AFC
6
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705
NO SIGNAL TO RELAY 933/ 1530-207
G-LPCI-859

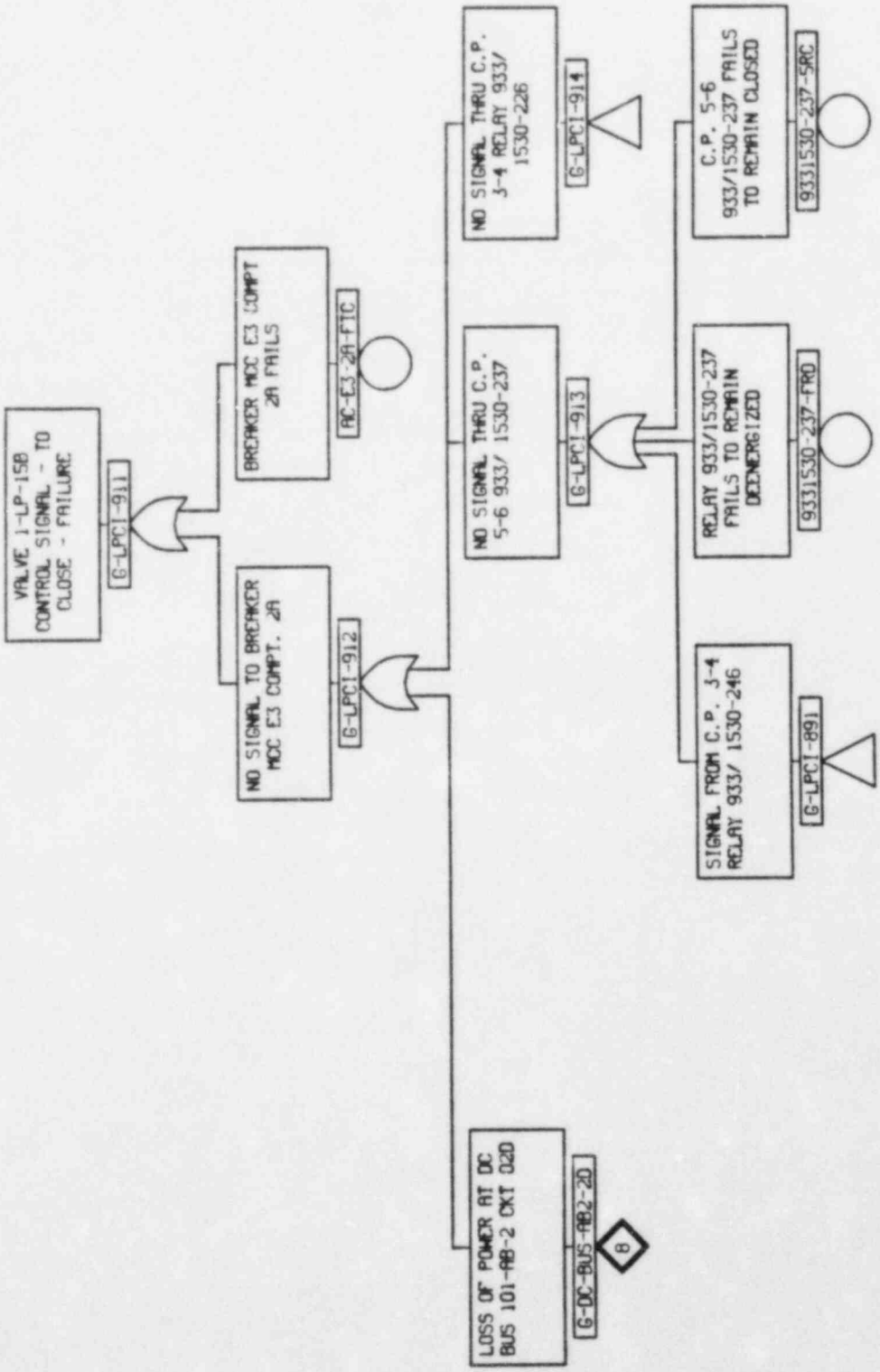

ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2206/ 1501-830
G-LPCI-884
G-LPCI-875
G-LPCI-896
PS 2206/1501-830 OUT FOR TEST OR MAINTENANCE
2206150I-830-TOM
PS 2206/1501-830 CONTACTS FAIL CLOSED
2206150I-830-XRO
PS 2206/1501-830 MISCALIBRATED LOW
2206150I-830-DMC
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2206/ 1501-838
G-LPCI-886
G-LPCI-878
G-LPCI-898
PS 2206/1501-838 OUT FOR TEST OR MAINTENANCE
2206150I-838-TOM
PS 2206/1501-838 CONTACTS FAIL CLOSED
2206150I-838-XRO
PS 2206/1501-838 MISCALIBRATED LOW
2206150I-838-DMC
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2205/ 1501-83C
G-LPCI-883
G-LPCI-874
G-LPCI-895
PS 2205/1501-83C OUT FOR TEST OR MAINTENANCE
2205150I-83C-TOM
PS 2205/1501-83C CONTACTS FAIL CLOSED
2205150I-83C-XRO
PS 2205/1501-83C MISCALIBRATED LOW
2205150I-83C-DMC
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2205/ 1501-83A
G-LPCI-885
G-LPCI-877
G-LPCI-897
PS 2205/1501-83A OUT FOR TEST OR MAINTENANCE
2205150I-83A-TOM
PS 2205/1501-83A CONTACTS FAIL CLOSED
2205150I-83A-XRO
PS 2205/1501-83A MISCALIBRATED LOW
2205150I-83A-DMC

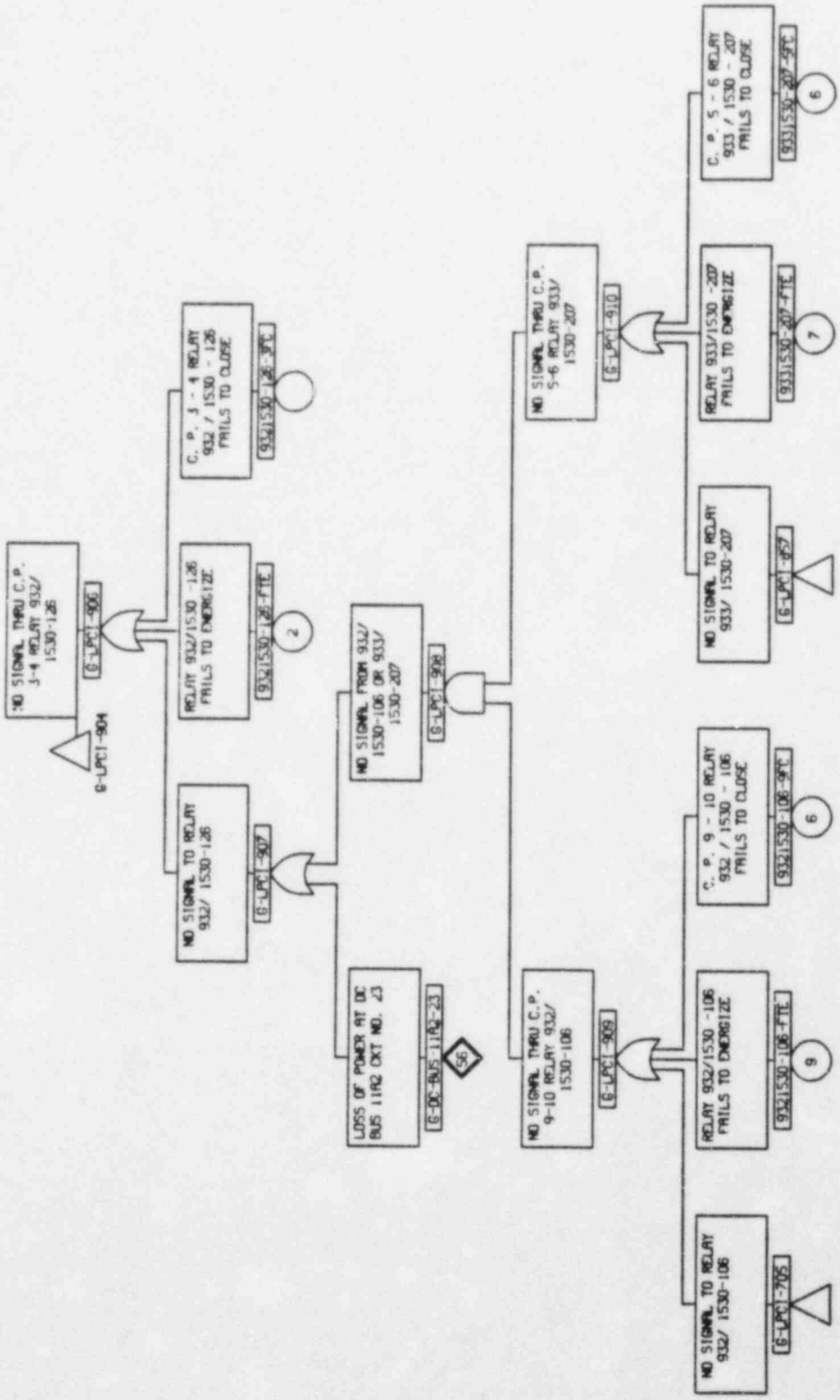

VALVE 1-LP-168 CONTROL SIGNAL FAILURE - TO CLOSE
G-LPCI-887
BREAKER MCC 101AB-2 COMPT 3A FAILS
DC-101AB2-3A-FTC
NO SIGNAL TO BREAKER MCC 101AB-2 COMPT 3A
G-LPCI-888
LOSS OF POWER AT MCC FE-3 101-AB-1 CKT 03A
G-DC-BUS-AB2-3A
NO SIGNAL THRU C.P. 11-12 RELAY 933/ 1530-225
G-LPCI-890
RELAY 933/1530-236 FAILS TO REMAIN DEENERGIZED
9331530-236-FRD
3
NO SIGNAL THRU C.P. 11-12 RELAY 933/ 1530-238
G-LPCI-889
C.P. 11-12 933/1530-238 FAILS TO REMAIN CLOSED
9331530-238-BRC
SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-246
G-LPCI-891

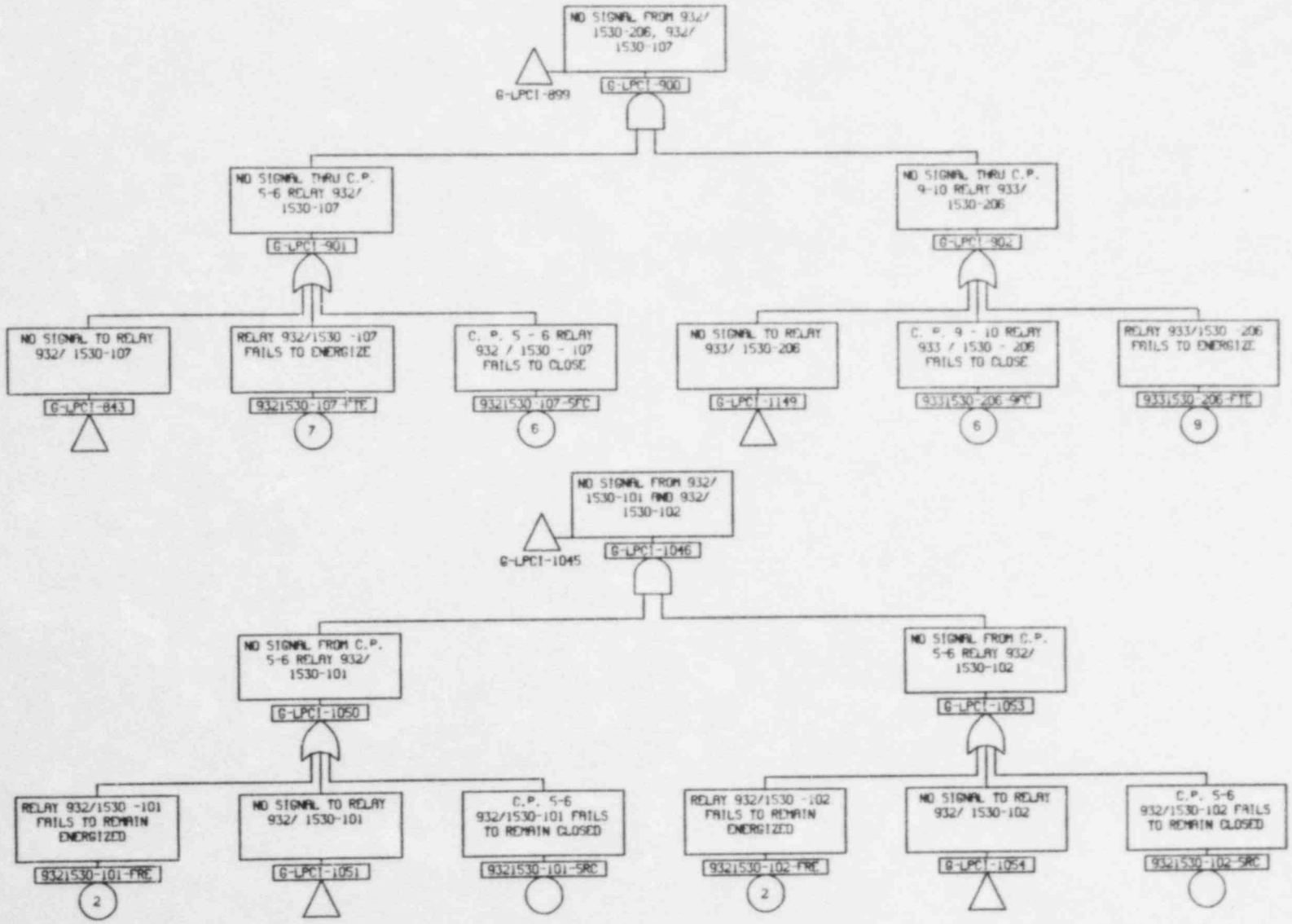

NO SIGNAL THRU C.P. 11-12 RELAY 933/ 1530-225
G-LPCI-888
G-LPCI-890
NO SIGNAL TO RELAY 933/ 1530-225
C. P. 11 - 12 RELAY 933 / 1530 - 225 FAILS TO CLOSE
RELAY 933/1530 -225 FAILS TO ENERGIZE
G-LPCI-899
9331530-225-BFC
9331530-225-FTE
3
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
NO SIGNAL FROM 932/ 1530-206, 932/ 1530-107
SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-246
G-DC-BUS-11A1-25
54
G-LPCI-900
G-LPCI-889
G-LPCI-913
G-LPCI-930
G-LPCI-945
G-LPCI-891
ERRONEOUS P. INDICATION TO RELAY 933/ 1530-246
C.P. 3-4 RELAY 933/1530 -246 FAILS TO REMAIN OPEN
RELAY 933/1530-246 FAILS TO REMAIN DEENERGIZED
G-LPCI-892
9331530-246-3RO
9331530-246-FRO
SPURIOUS CLOSURE IN HALF OF 1 OUT OF 2 TWICE LOGIC
SPURIOUS CLOSURE IN 1 OUT OF 2 TWICE LOGIC
G-LPCI-893
G-LPCI-894

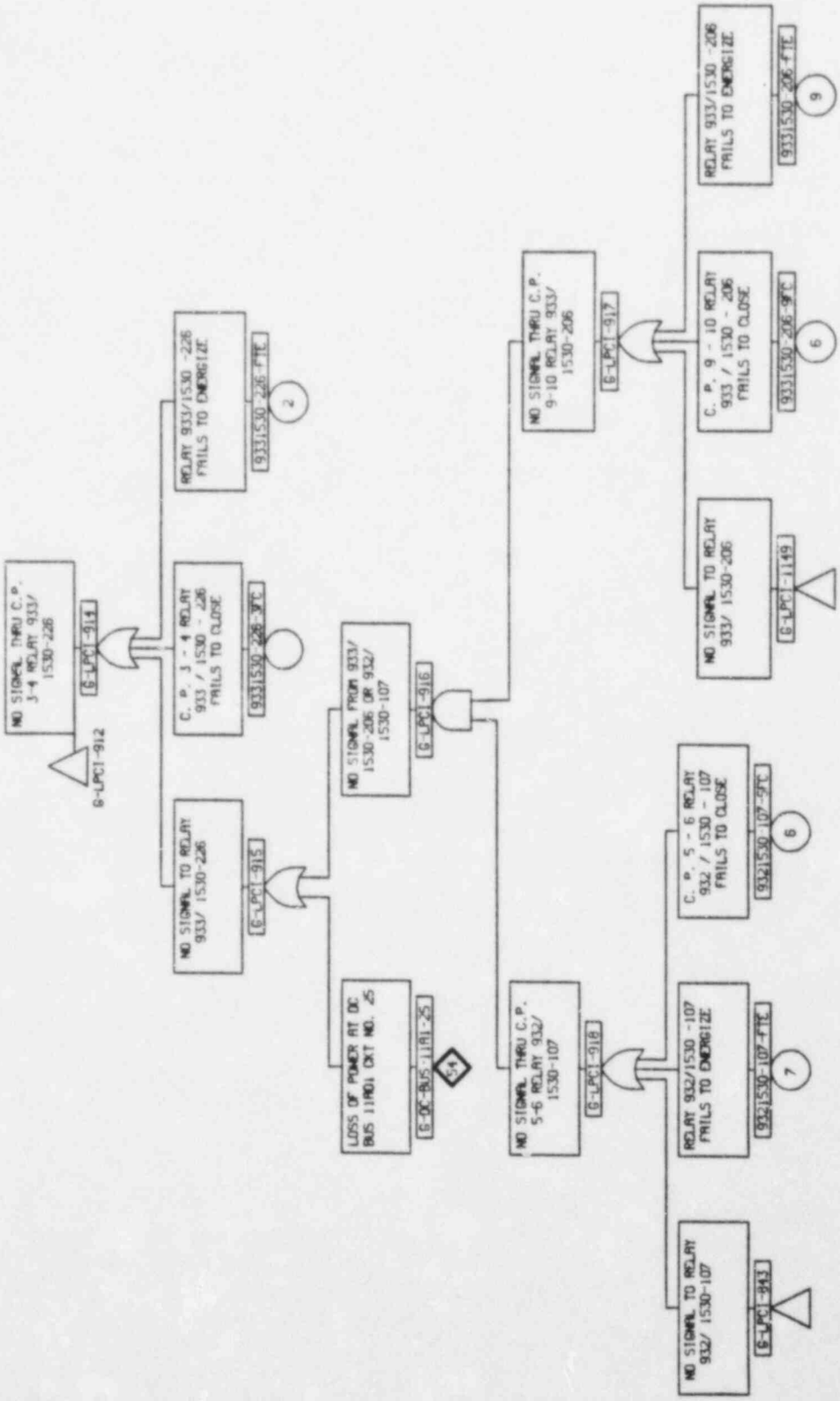

SPURIOUS CLOSURE IN HALF OF 1 OUT OF 2 TWICE LOGIC
G-LPCI-693
G-LPCI-692
C.P. J-4 RELAY 932/1530-144 CLOSES SPURIOUSLY
G-LPCI-695
C.P. J-4 RELAY 932/1530-144 FAILS TO REMAIN OPEN
932/1530-144-380
RELAY 932/1530-144 FAILS TO REMAIN DEENERGIZED
932/1530-144-480
2
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2205/ 1501-83C
G-LPCI-883
C.P. 1-2 RELAY 933/1530-244 CLOSES SPURIOUSLY
G-LPCI-696
C.P. 1-2 RELAY 933/1530-244 FAILS TO REMAIN OPEN
933/1530-244-380
RELAY 933/1530-244 FAILS TO REMAIN DEENERGIZED
933/1530-244-480
2
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2206/ 1501-83D
G-LPCI-884
SPURIOUS CLOSURE IN 1 OUT OF 2 TWICE LOGIC
G-LPCI-694
G-LPCI-692
C.P. J-4 RELAY 933/1530-134 CLOSES SPURIOUSLY
G-LPCI-697
C.P. J-4 RELAY 932/1530-134 FAILS TO REMAIN OPEN
932/1530-134-380
RELAY 932/1530-134 FAILS TO REMAIN DEENERGIZED
932/1530-134-480
2
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2205/ 1501-83A
G-LPCI-885
C.P. 1-2 RELAY 933/1530-234 CLOSES SPURIOUSLY
G-LPCI-698
C.P. 1-2 RELAY 933/1530-234 FAILS TO REMAIN OPEN
933/1530-234-380
RELAY 933/1530-234 FAILS TO REMAIN DEENERGIZED
933/1530-234-480
2
ERRONEOUS SIGNAL FROM DRYWELL PRESS. SW. 2206/ 1501-83B
G-LPCI-886

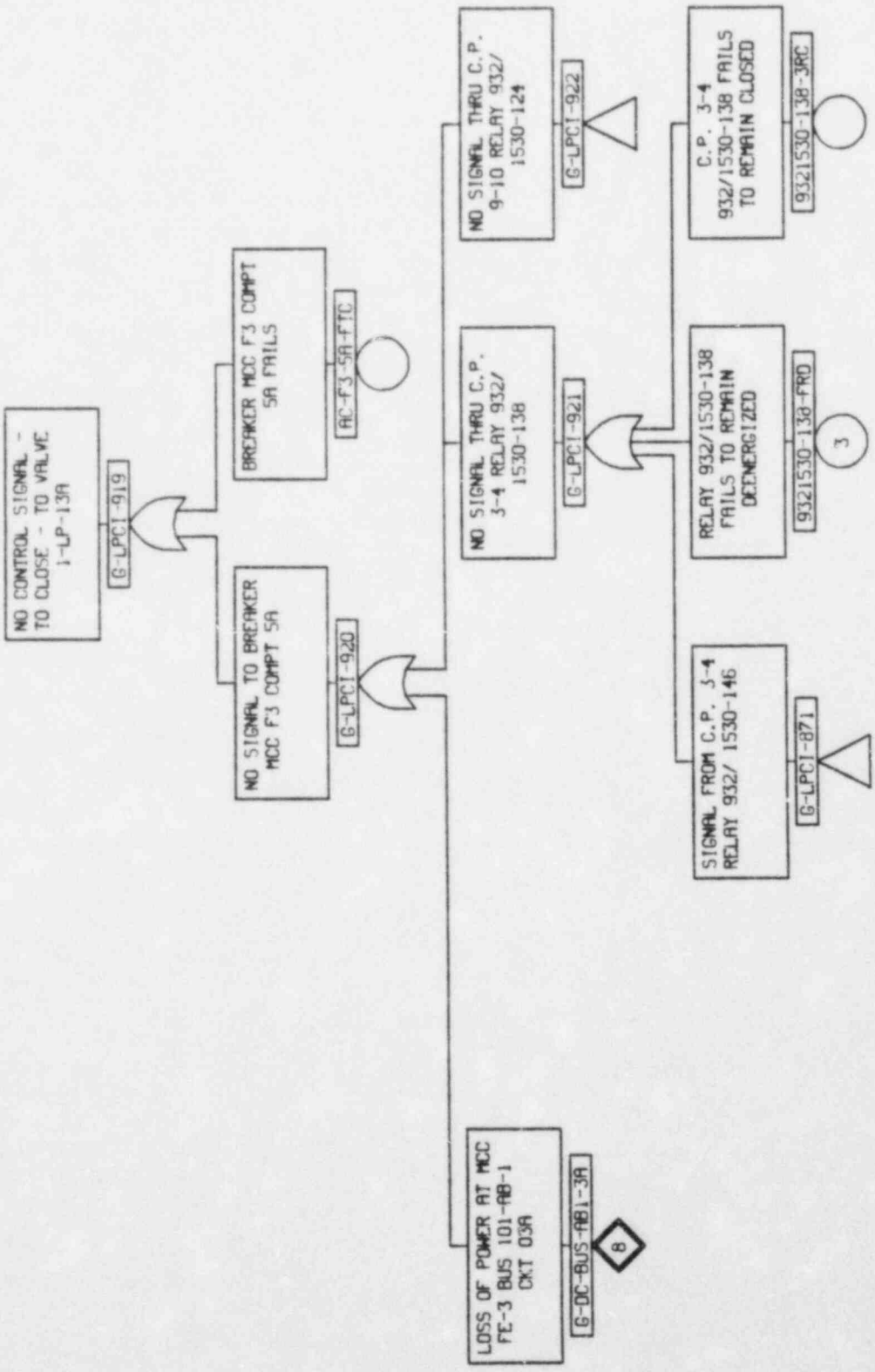

NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
SEE OUTPUT LIST
G-LPCI-1149 OUTPUT LIST
G-LPCI-1150, G-LPCI-902, G-LPCI-917, G-LPCI-934, G-LPCI-950, G-LPCI-968
G-LPCI-986, G-LPCI-995, G-LPCI-1011
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL FROM DETECTORS/ASSOCIATED RELAYS
G-LPCI-1153
LOSS OF HIGH DRYWELL PRESS. IND. SIGNAL
G-LPCI-1155
LOSS OF LOW REACTOR PRESSURE AND LEVEL IND. SIGNALS
G-LPCI-1156
VALVE 1-LP-15A CONTROL SIGNAL FAILURE - TO CLOSE
G-LPCI-903
NO SIGNAL TO BREAKER MCC F3 COMPT 4A
G-LPCI-904
BREAKER MCC F3 COMPT 4A FAILS
AC-F3-4A-FTC
LOSS OF POWER AT MCC FE-3 BUS 101-AB-1 CKT 03A
G-DC-BUS-AB1-3A
8
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-137
G-LPCI-905
NO SIGNAL THRU C.P. 3-4 RELAY 932/ 1530-126
G-LPCI-906
SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-146
G-LPCI-871
RELAY 932/1530-137 FAILS TO REMAIN DEENERGIZED
9321530-137-FRO
C.P. 5-6 932/1530-137 FAILS TO REMAIN CLOSED
9321530-137-SRC

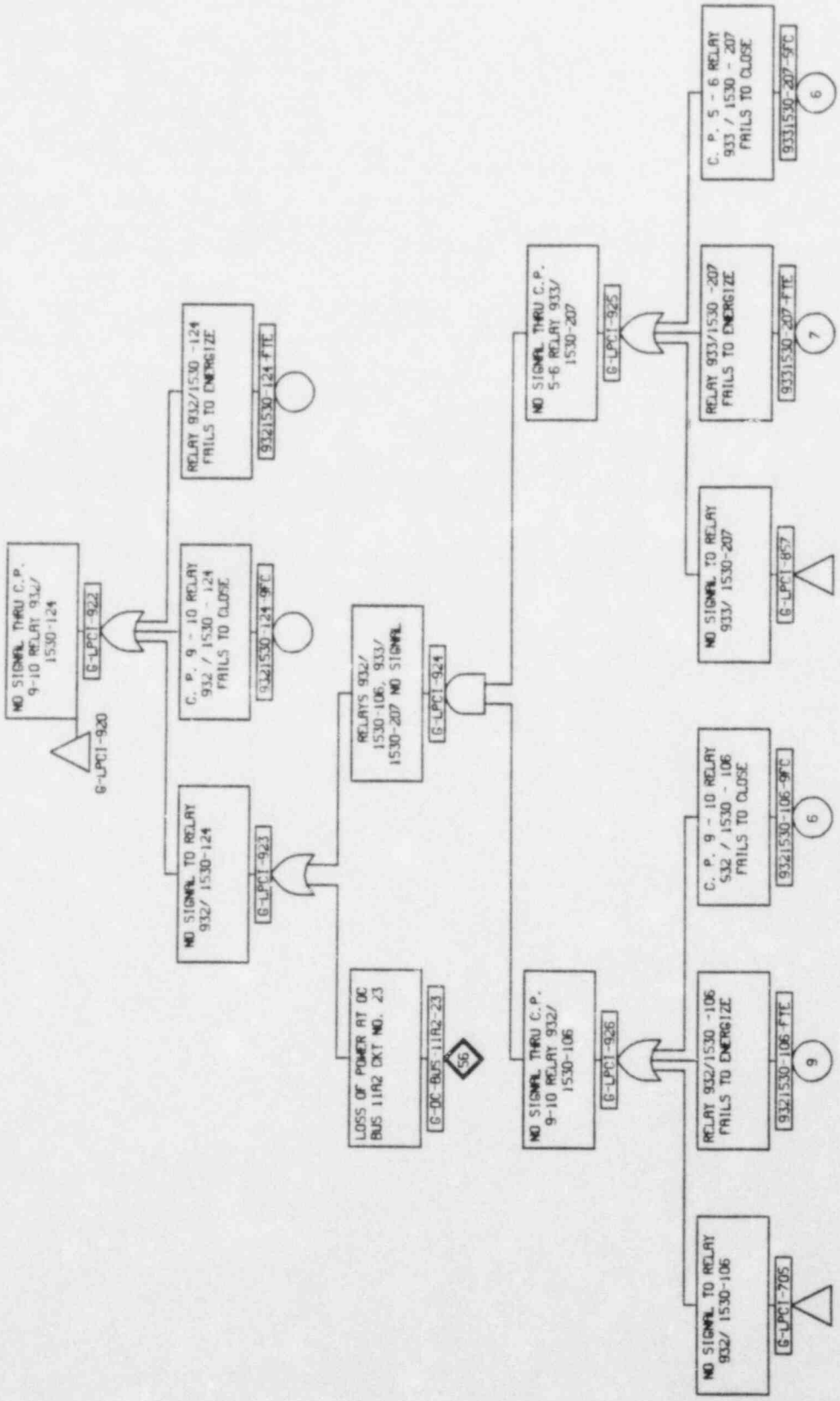

VALVE 1-LP-15B
CONTROL SIGNAL - TO
CLOSE - FAILURE
G-LPCI-911
NO SIGNAL TO BREAKER
MCC E3 COMPT. 2A
G-LPCI-912
BREAKER MCC E3 COMPT
2A FAILS
AC-E3-2A-FTC
LOSS OF POWER AT DC
BUS 101-AB-2 CKT D2D
G-DC-BUS-AB2-2D
8
NO SIGNAL THRU C.P.
5-6 933/ 1530-237
G-LPCI-913
NO SIGNAL THRU C.P.
J-4 RELAY 933/
1530-226
G-LPCI-914
SIGNAL FROM C.P. J-4
RELAY 933/ 1530-246
G-LPCI-891
RELAY 933/1530-237
FAILS TO REMAIN
DEENERGIZED
9331530-237-FRD
C.P. 5-6
933/1530-237 FAILS
TO REMAIN CLOSED
9331530-237-SRC

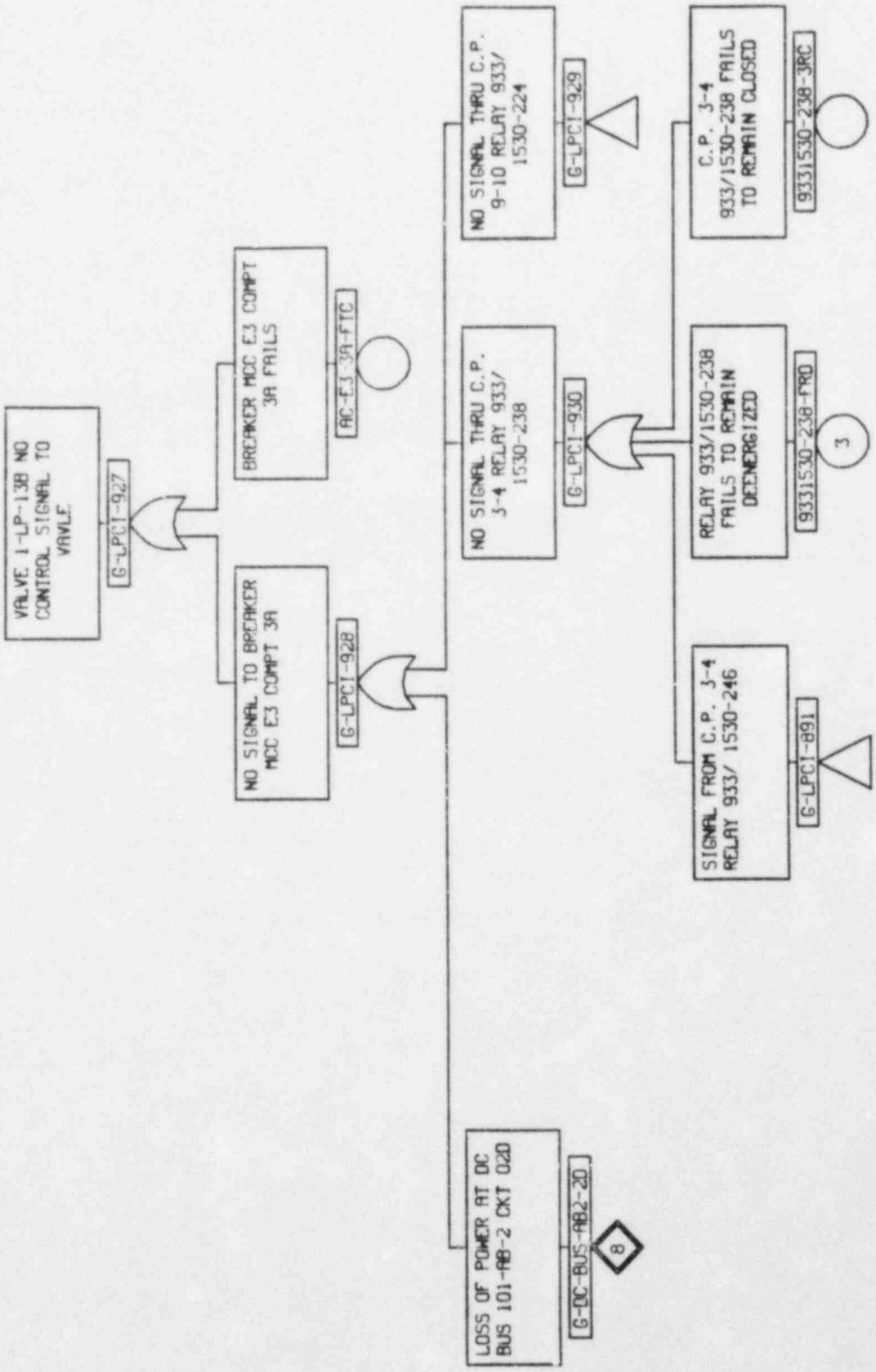

NO SIGNAL THRU C.P. J-4 RELAY 932/ 1530-126
G-LPCI-904
G-LPCI-906
NO SIGNAL TO RELAY 932/ 1530-126
G-LPCI-907
RELAY 932/1530 -126 FAILS TO ENERGIZE
932/1530-126-FTE
2
C. P. J - 4 RELAY 932 / 1530 - 126 FAILS TO CLOSE
932/1530-126-FTC
NO SIGNAL FROM 932/ 1530-106 OR 933/ 1530-207
G-LPCI-908
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-207
G-LPCI-910
NO SIGNAL TO RELAY 933/ 1530-207
G-LPCI-957
RELAY 933/1530 -207 FAILS TO ENERGIZE
933/1530-207-FTE
7
C. P. 5 - 6 RELAY 933 / 1530 - 207 FAILS TO CLOSE
933/1530-207-FTC
6
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-106
G-LPCI-909
C. P. 9 - 10 RELAY 932 / 1530 - 106 FAILS TO CLOSE
932/1530-106-FTC
6
RELAY 932/1530 -106 FAILS TO ENERGIZE
932/1530-106-FTE
9
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705

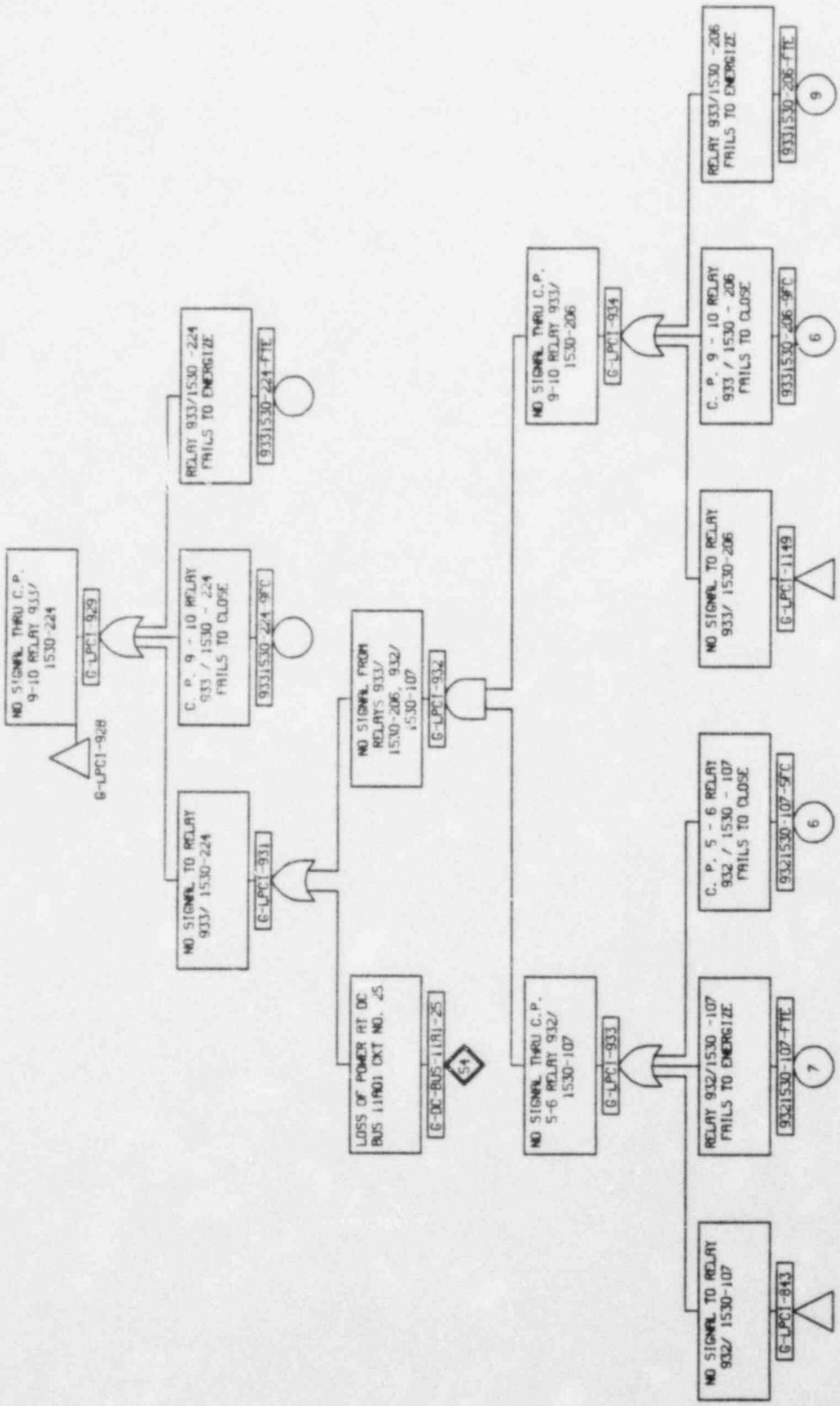

NO SIGNAL FROM 932/ 1530-206, 932/ 1530-107
G-LPCI-899
G-LPCI-900
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-107
G-LPCI-901
NO SIGNAL THRU C.P. 9-10 RELAY 933/ 1530-206
G-LPCI-902
NO SIGNAL TO RELAY 932/ 1530-107
G-LPCI-843
RELAY 932/1530 -107 FAILS TO ENERGIZE
932/1530-107-FTE
7
C. P. 5 - 6 RELAY 932 / 1530 - 107 FAILS TO CLOSE
932/1530-107-SPC
6
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
C. P. 9 - 10 RELAY 933 / 1530 - 206 FAILS TO CLOSE
933/1530-206-SPC
6
RELAY 933/1530 -206 FAILS TO ENERGIZE
933/1530-206-FTE
9
NO SIGNAL FROM 932/ 1530-101 AND 932/ 1530-102
G-LPCI-1045
G-LPCI-1046
NO SIGNAL FROM C.P. 5-6 RELAY 932/ 1530-101
G-LPCI-1050
NO SIGNAL FROM C.P. 5-6 RELAY 932/ 1530-102
G-LPCI-1053
RELAY 932/1530 -101 FAILS TO REMAIN ENERGIZED
932/1530-101-FRC
2
NO SIGNAL TO RELAY 932/ 1530-101
G-LPCI-1051
C.P. 5-6 932/1530-101 FAILS TO REMAIN CLOSED
932/1530-101-SRC
RELAY 932/1530 -102 FAILS TO REMAIN ENERGIZED
932/1530-102-FRC
2
NO SIGNAL TO RELAY 932/ 1530-102
G-LPCI-1054
C.P. 5-6 932/1530-102 FAILS TO REMAIN CLOSED
932/1530-102-SRC

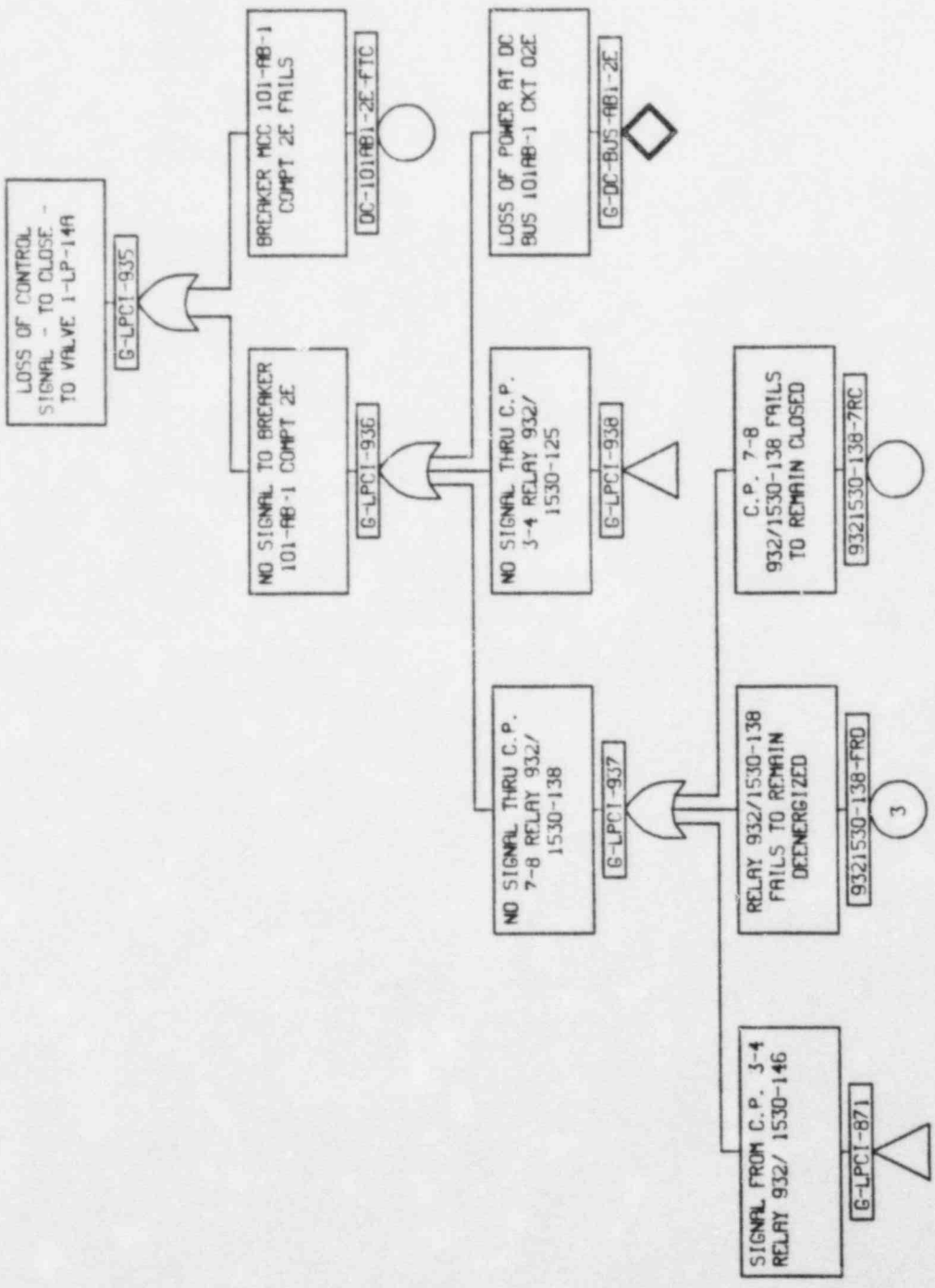

NO SIGNAL THRU C.P. 3-4 RELAY 933/ 1530-226
G-LPCI-914
G-LPCI-912
C. P. 3 - 4 RELAY 933 / 1530 - 226 FAILS TO CLOSE
933/1530-226-SYC
RELAY 933/1530 -226 FAILS TO ENERGIZE
933/1530-226-FYE
2
NO SIGNAL TO RELAY 933/ 1530-226
G-LPCI-915
NO SIGNAL FROM 933/ 1530-206 OR 932/ 1530-107
G-LPCI-916
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
G1
NO SIGNAL THRU C.P. 9-10 RELAY 933/ 1530-206
G-LPCI-917
C. P. 9 - 10 RELAY 933 / 1530 - 206 FAILS TO CLOSE
933/1530-206-SYC
6
RELAY 933/1530 -206 FAILS TO ENERGIZE
933/1530-206-FYE
9
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-107
G-LPCI-918
C. P. 5 - 6 RELAY 932 / 1530 - 107 FAILS TO CLOSE
932/1530-107-SYC
6
RELAY 932/1530 -107 FAILS TO ENERGIZE
932/1530-107-FYE
7
NO SIGNAL TO RELAY 932/ 1530-107
G-LPCI-943

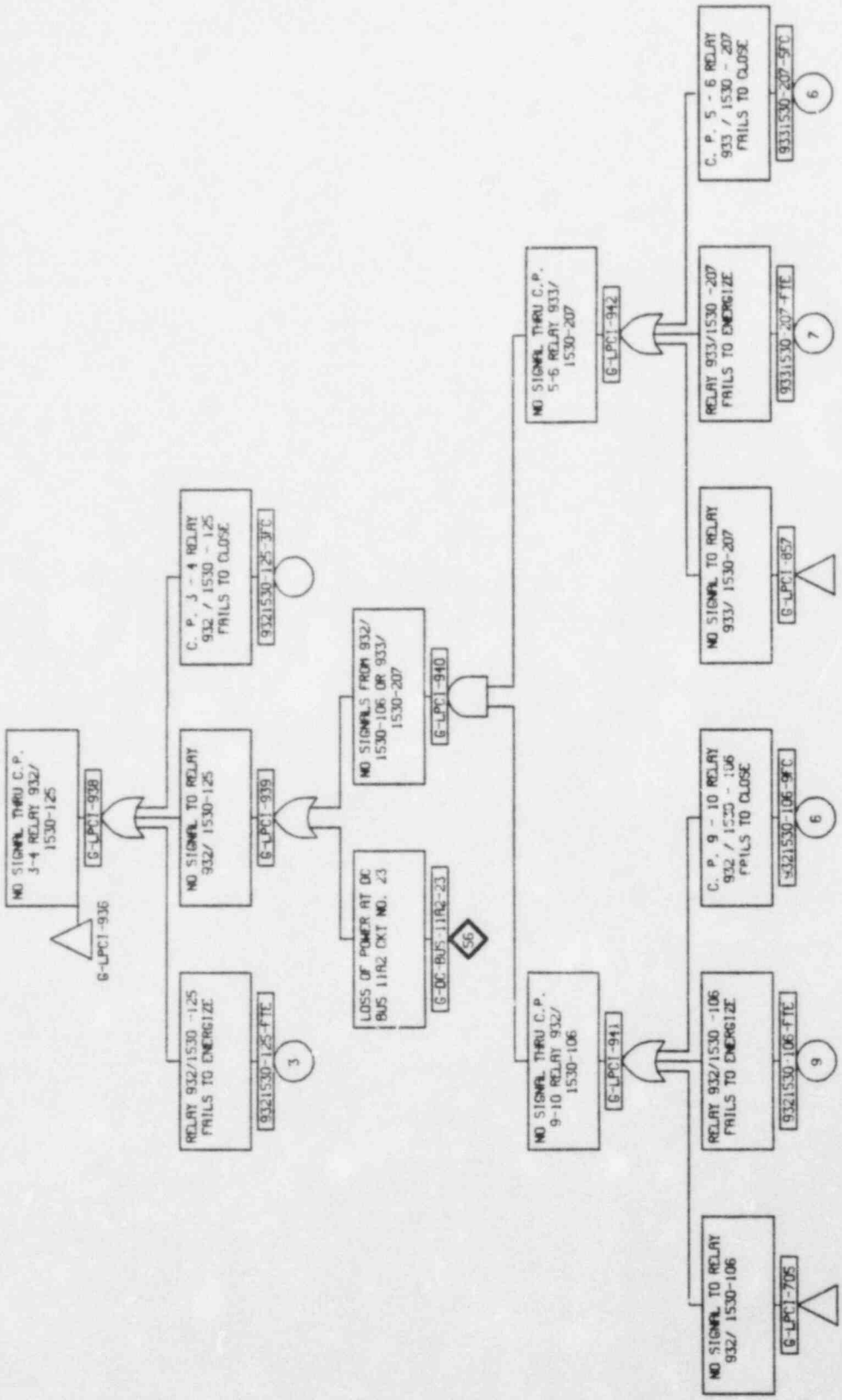

NO CONTROL SIGNAL - TO CLOSE - TO VALVE 1-LP-13A
G-LPCI-919
BREAKER MCC F3 COMPT 5A FAILS
AC-F3-5A-FTC
NO SIGNAL TO BREAKER MCC F3 COMPT 5A
G-LPCI-920
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-124
G-LPCI-922
NO SIGNAL THRU C.P. 3-4 RELAY 932/ 1530-138
G-LPCI-921
C.P. 3-4 932/1530-138 FAILS TO REMAIN CLOSED
9321530-138-3RC
RELAY 932/1530-138 FAILS TO REMAIN DENERGIZED
9321530-138-FRO
3
SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-146
G-LPCI-871
LOSS OF POWER AT MCC FE-3 BUS 101-AB-1 CKT 03A
G-DC-BUS-AB1-3A
8

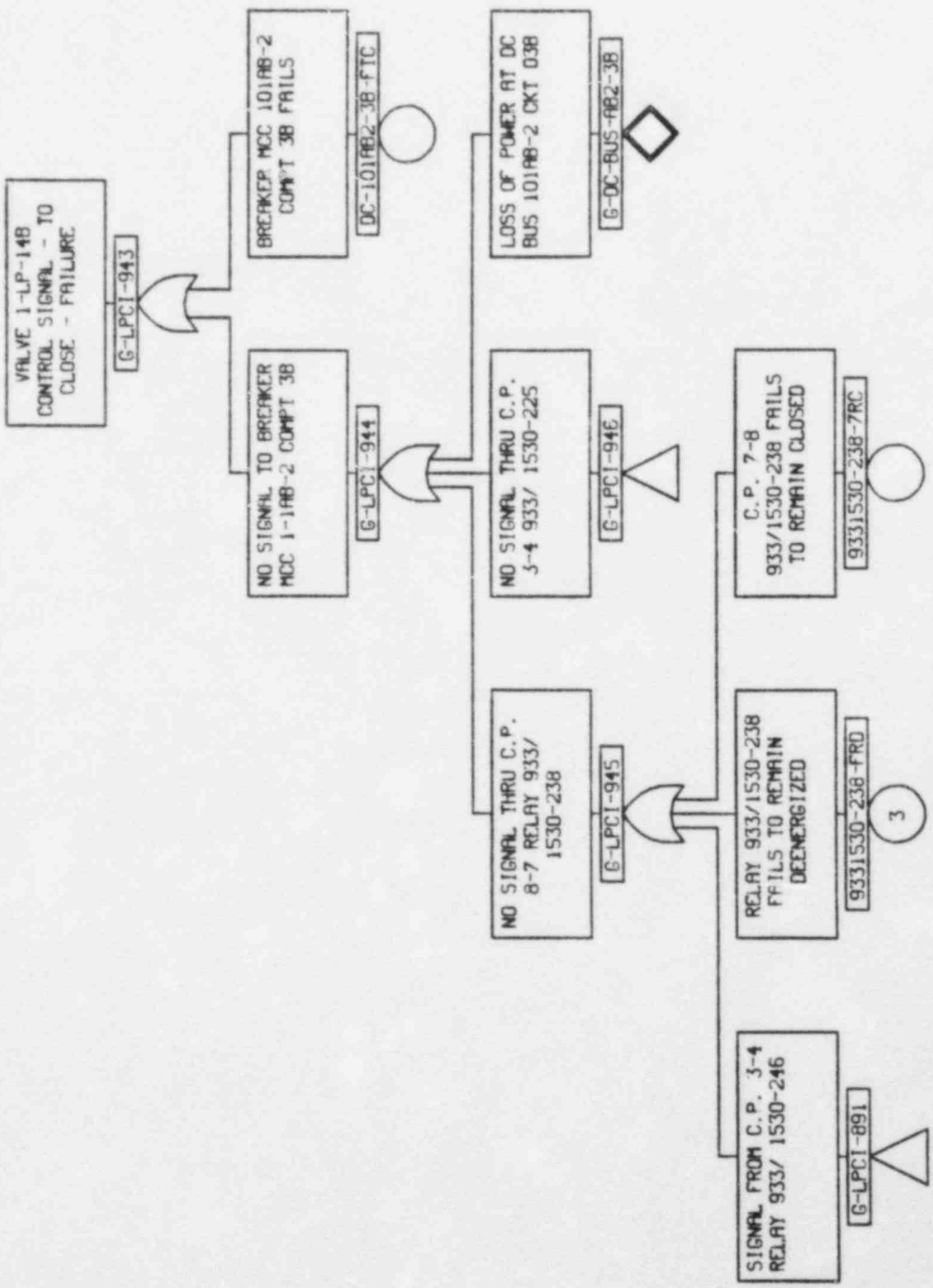

NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-124
G-LPCI-922
G-LPCI-920
C. P. 9 - 10 RELAY 932 / 1530 - 124 FAILS TO CLOSE
932/1530-124-SFC
RELAY 932/1530 -124 FAILS TO ENERGIZE
932/1530-124-FTE
NO SIGNAL TO RELAY 932/ 1530-124
G-LPCI-923
RELAYS 932/ 1530-106, 933/ 1530-207 NO SIGNAL
G-LPCI-924
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-207
G-LPCI-925
NO SIGNAL TO RELAY 933/ 1530-207
G-LPCI-857
RELAY 933/1530 -207 FAILS TO ENERGIZE
933/1530-207-FTE
7
C. P. 5 - 6 RELAY 933 / 1530 - 207 FAILS TO CLOSE
933/1530-207-SFC
6
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-106
G-LPCI-926
C. P. 9 - 10 RELAY 932 / 1530 - 106 FAILS TO CLOSE
932/1530-106-SFC
6
RELAY 932/1530 -106 FAILS TO ENERGIZE
932/1530-106-FTE
9
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705

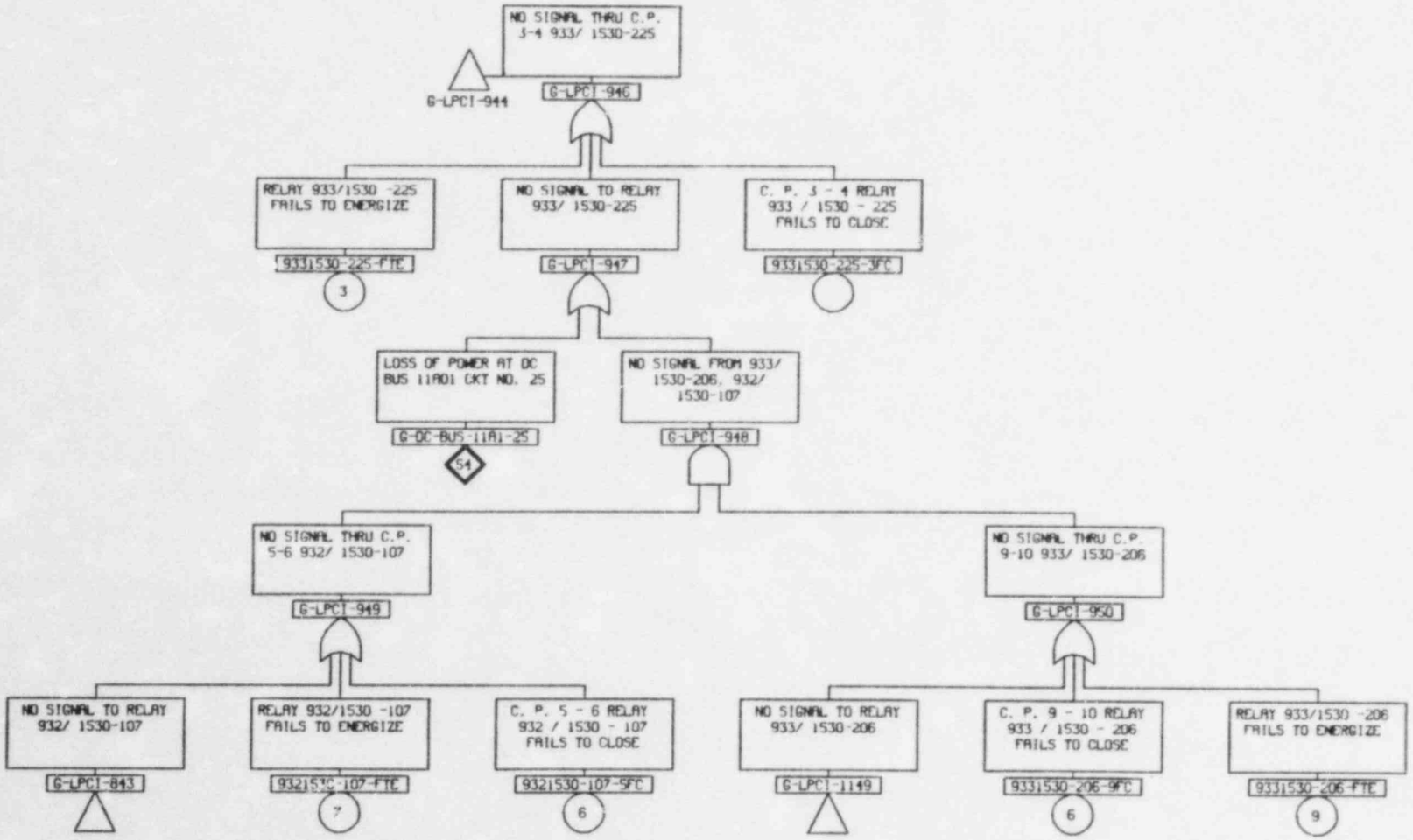

VALVE 1-LP-138 NO CONTROL SIGNAL TO VAVLE
G-LPCI-927
NO SIGNAL TO BREAKER MCC E3 COMPT 3A
G-LPCI-928
BREAKER MCC E3 COMPT 3A FAILS
AC-E3-3A-FTC
LOSS OF POWER AT DC BUS 101-AB-2 CKT 020
G-DC-BUS-AB2-20
8
NO SIGNAL THRU C.P. J-4 RELAY 933/ 1530-238
G-LPCI-930
NO SIGNAL THRU C.P. 9-10 RELAY 933/ 1530-224
G-LPCI-929
SIGNAL FROM C.P. J-4 RELAY 933/ 1530-246
G-LPCI-891
RELAY 933/1530-238 FAILS TO REMAIN DEENERGIZED
9331530-238-FRO
3
C.P. J-4 933/1530-238 FAILS TO REMAIN CLOSED
9331530-238-3RC

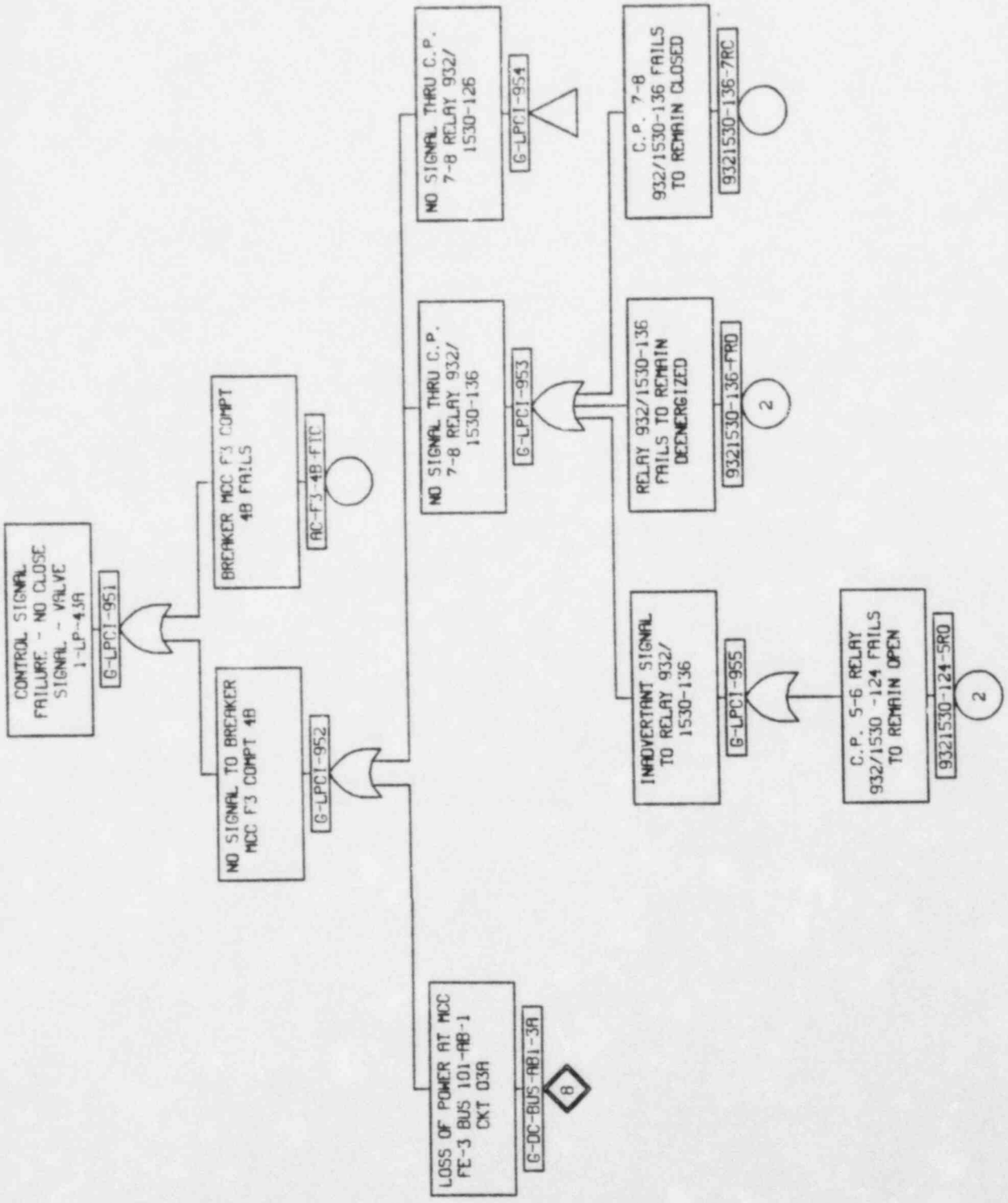

NO SIGNAL THRU C.P. 9-10 RELAY 933/ 1530-224
G-LPCI-929
G-LPCI-928
NO SIGNAL TO RELAY 933/ 1530-224
G-LPCI-931
RELAY 933/1530-224 FAILS TO ENERGIZE
9331530-224-FTE
C. P. 9 - 10 RELAY 933 / 1530 - 224 FAILS TO CLOSE
9331530-224-SFC
NO SIGNAL FROM RELAYS 933/ 1530-206, 932/ 1530-107
G-LPCI-932
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
NO SIGNAL THRU C.P. 9-10 RELAY 933/ 1530-206
G-LPCI-934
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-107
G-LPCI-933
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
C. P. 9 - 10 RELAY 933 / 1530 - 206 FAILS TO CLOSE
9331530-206-SFC
6
RELAY 933/1530 -206 FAILS TO ENERGIZE
9331530-206-FTE
9
C. P. 5 - 6 RELAY 932 / 1530 - 107 FAILS TO CLOSE
9321530-107-SFC
6
RELAY 932/1530 -107 FAILS TO ENERGIZE
9321530-107-FTE
7
NO SIGNAL TO RELAY 932/ 1530-107
G-LPCI-843

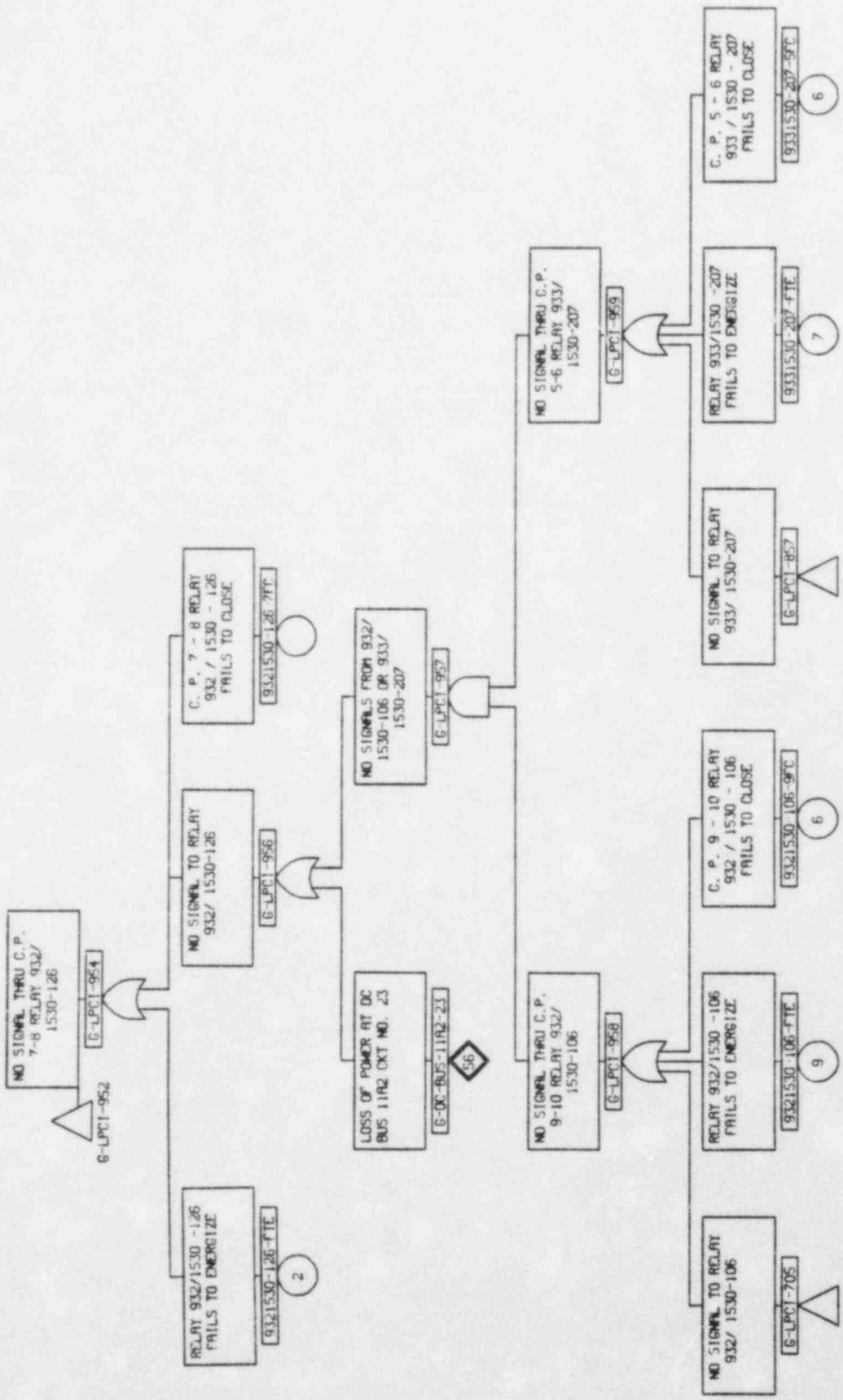

LOSS OF CONTROL SIGNAL - TO CLOSE - TO VALVE 1-LP-14A
G-LPCI-935
BREAKER MCC 101-AB-1 COMPT 2E FAILS
DC-101AB1-2E-FTC
NO SIGNAL TO BREAKER 101-AB-1 COMPT 2E
G-LPCI-936
LOSS OF POWER AT DC BUS 101AB-1 CKT 02E
G-DC-BUS-AB1-2E
NO SIGNAL THRU C.P. 3-4 RELAY 932/ 1530-125
G-LPCI-938
C.P. 7-8 932/1530-138 FAILS TO REMAIN CLOSED
9321530-138-7RC
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-138
G-LPCI-937
RELAY 932/1530-138 FAILS TO REMAIN DEENERGIZED
9321530-138-FRD
3
SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-146
G-LPCI-871

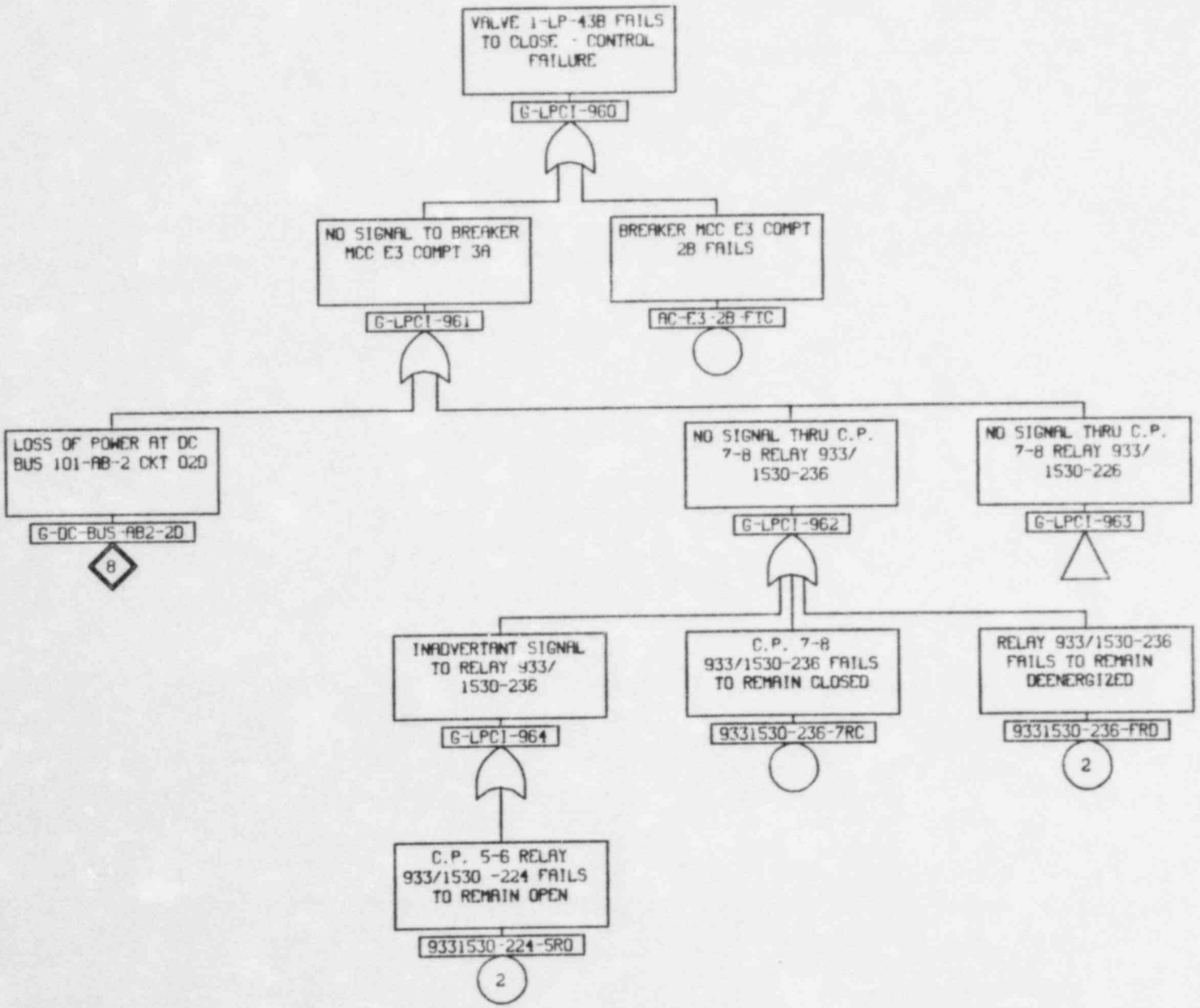

NO SIGNAL THRU C.P. 3-4 RELAY 932/ 1530-125
G-LPCI-938
G-LPCI-936
NO SIGNAL TO RELAY 932/ 1530-125
G-LPCI-939
RELAY 932/1530 -125 FAILS TO ENERGIZE
9321530-125-FTE
3
C. P. 3 - 4 RELAY 932 / 1530 - 125 FAILS TO CLOSE
9321530-125-SPC
NO SIGNALS FROM 932/ 1530-106 OR 933/ 1530-207
G-LPCI-940
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-106
G-LPCI-941
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-207
G-LPCI-942
C. P. 9 - 10 RELAY 932 / 1530 - 106 FAILS TO CLOSE
9321530-106-SPC
6
RELAY 932/1530 -106 FAILS TO ENERGIZE
9321530-106-FTE
9
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705
NO SIGNAL TO RELAY 933/ 1530-207
G-LPCI-857
RELAY 933/1530 -207 FAILS TO ENERGIZE
9331530-207-FTE
7
C. P. 5 - 6 RELAY 933 / 1530 - 207 FAILS TO CLOSE
9331530-207-SPC
6

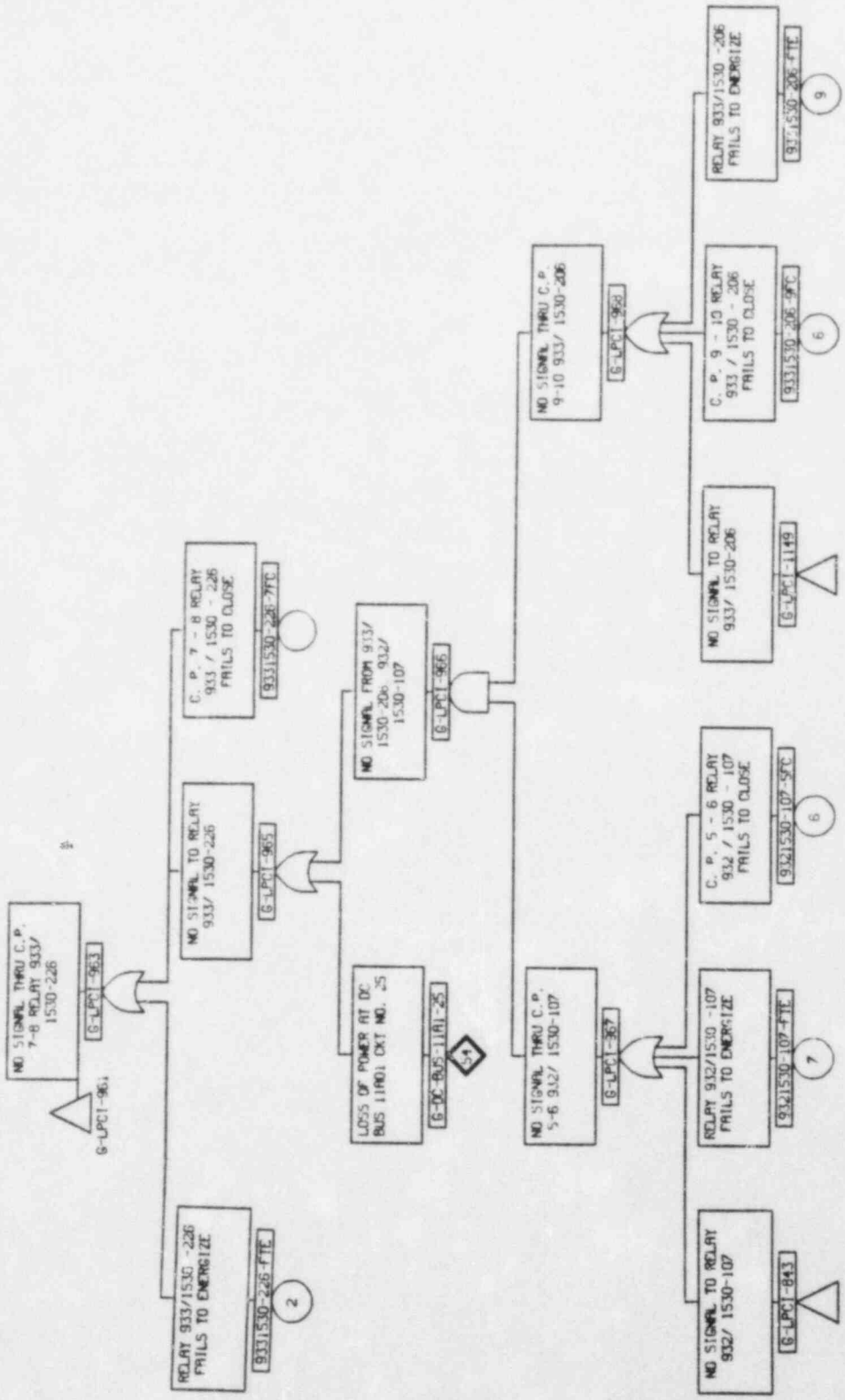

VALVE 1-LP-148
CONTROL SIGNAL - TO
CLOSE - FAILURE
G-LPCI-943
BREAKER MCC 101AB-2
COMPT 3B FAILS
DC-101AB2-3B-FTC
LOSS OF POWER AT DC
BUS 101AB-2 CKT 03B
G-DC-BUS-AB2-3B
NO SIGNAL TO BREAKER
MCC 1-1AB-2 COMPT 3B
G-LPCI-944
NO SIGNAL THRU C.P.
3-4 933/ 1530-225
G-LPCI-94E
C.P. 7-8
933/1530-238 FAILS
TO REMAIN CLOSED
9331530-238-7RC
NO SIGNAL THRU C.P.
8-7 RELAY 933/
1530-238
G-LPCI-945
RELAY 933/1530-238
FAILS TO REMAIN
DEENERGIZED
9331530-238-FRD
3
SIGNAL FROM C.P. 3-4
RELAY 933/ 1530-246
G-LPCI-891

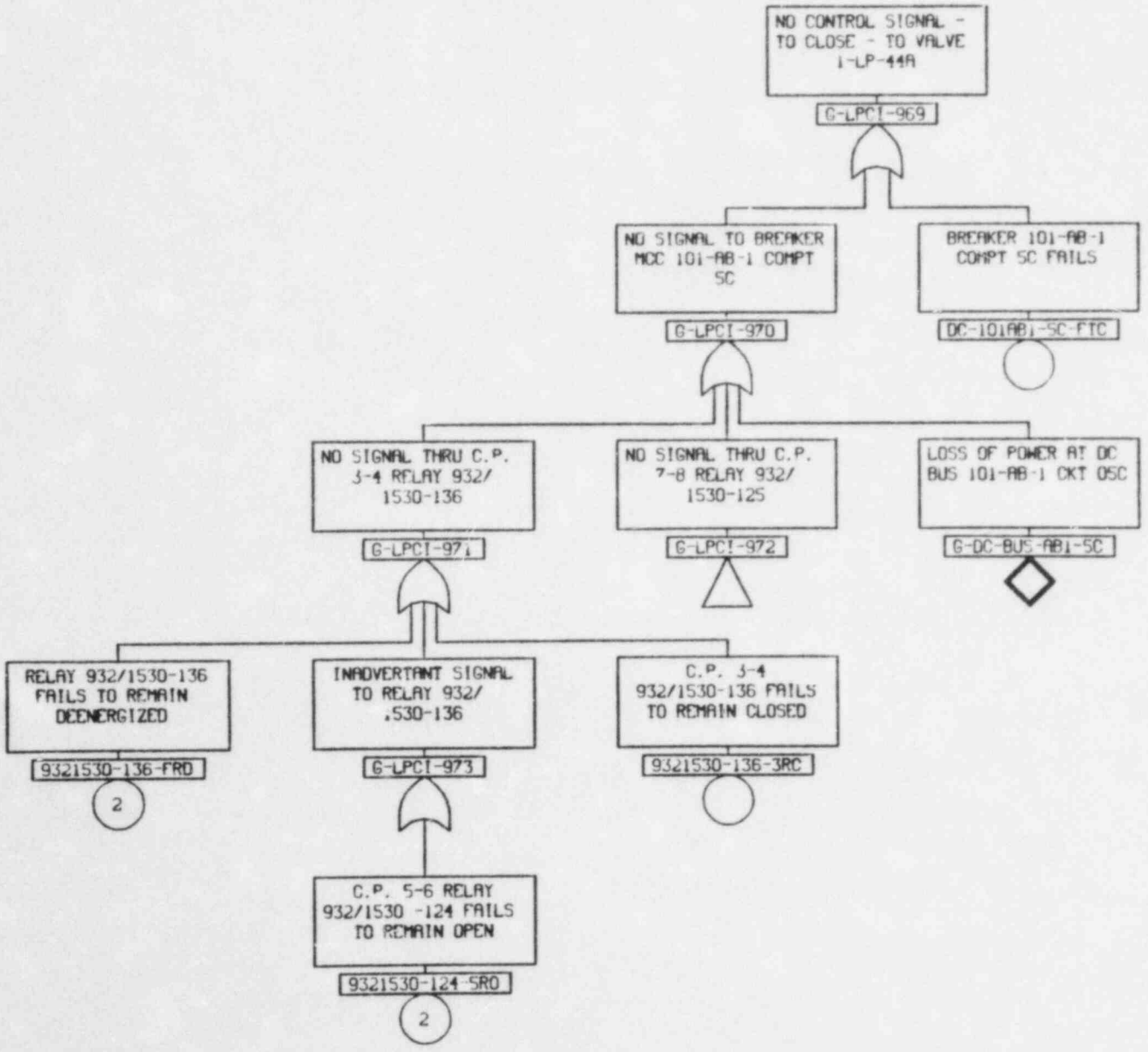

NO SIGNAL THRU C.P. 3-4 933/ 1530-225
G-LPCI-946
G-LPCI-944
RELAY 933/1530 -225 FAILS TO ENERGIZE
933J530-225-FTE
3
NO SIGNAL TO RELAY 933/ 1530-225
G-LPCI-947
C. P. 3 - 4 RELAY 933 / 1530 - 225 FAILS TO CLOSE
933J530-225-3FC
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
S4
NO SIGNAL FROM 933/ 1530-206, 932/ 1530-107
G-LPCI-948
NO SIGNAL THRU C.P. 5-6 932/ 1530-107
G-LPCI-949
NO SIGNAL THRU C.P. 9-10 933/ 1530-206
G-LPCI-950
NO SIGNAL TO RELAY 932/ 1530-107
G-LPCI-843
RELAY 932/1530 -107 FAILS TO ENERGIZE
932J530-107-FTE
7
C. P. 5 - 6 RELAY 932 / 1530 - 107 FAILS TO CLOSE
932J530-107-5FC
6
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
C. P. 9 - 10 RELAY 933 / 1530 - 206 FAILS TO CLOSE
933J530-206-9FC
6
RELAY 933/1530 -206 FAILS TO ENERGIZE
933J530-206-FTE
9

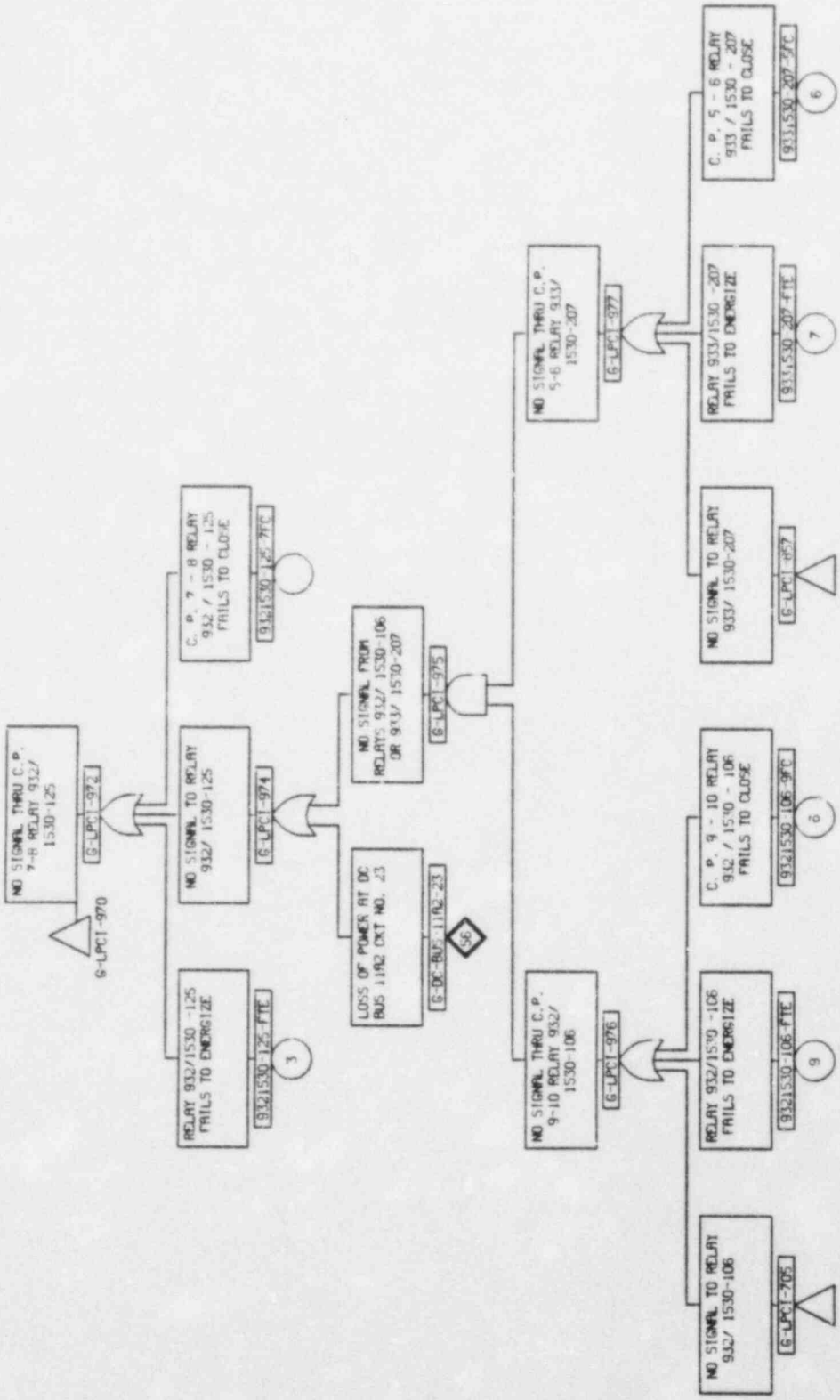

CONTROL SIGNAL FAILURE - NO CLOSE SIGNAL - VALVE 1-LP-43A
G-LPCI-951
BREAKER MCC F3 COMPT 4B FAILS
AC-F3-4B-FIC
NO SIGNAL TO BREAKER MCC F3 COMPT 4B
G-LPCI-952
NO SIGNAL THRU C.P. 7-8 RELAY 932/1530-126
G-LPCI-954
NO SIGNAL THRU C.P. 7-8 RELAY 932/1530-136
G-LPCI-953
C.P. 7-8 932/1530-136 FAILS TO REMAIN CLOSED
9321530-136-7RC
RELAY 932/1530-136 FAILS TO REMAIN DENERGIZED
9321530-136-FRD
2
INADVERTANT SIGNAL TO RELAY 932/1530-136
G-LPCI-955
C.P. 5-6 RELAY 932/1530 -124 FAILS TO REMAIN OPEN
9321530-124-5RO
2
LOSS OF POWER AT MCC FE-3 BUS 101-AB-1 CKT 03A
G-DC-BUS-AB1-3A
8

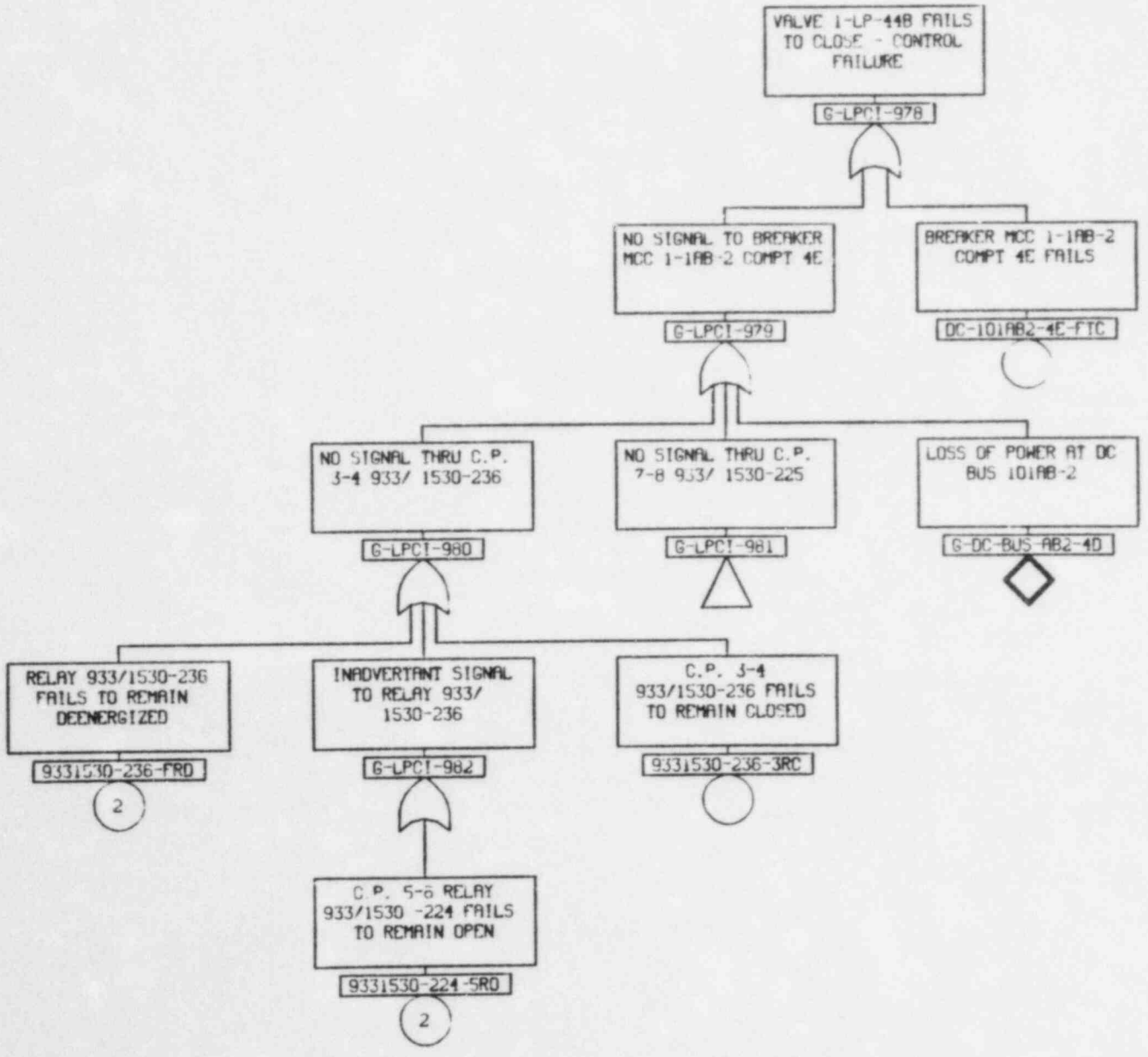

NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-126
G-LPCI-954
G-LPCI-952
NO SIGNAL TO RELAY 932/ 1530-126
G-LPCI-956
C. P. 7 - 8 RELAY 932 / 1530 - 126 FAILS TO CLOSE
93211530-126-7FC
RELAY 932/1530 -126 FAILS TO ENERGIZE
93211530-126-FTE
2
NO SIGNALS FROM 932/ 1530-106 OR 933/ 1530-207
G-LPCI-957
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-207
G-LPCI-959
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-106
G-LPCI-958
C. P. 5 - 6 RELAY 933 / 1530 - 207 FAILS TO CLOSE
93311530-207-5FC
6
RELAY 933/1530 -207 FAILS TO ENERGIZE
93311530-207-FTE
7
NO SIGNAL TO RELAY 933/ 1530-207
G-LPCI-857
C. P. 9 - 10 RELAY 932 / 1530 - 106 FAILS TO CLOSE
93211530-106-9FC
6
RELAY 932/1530 -106 FAILS TO ENERGIZE
93211530-106-FTE
9
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705

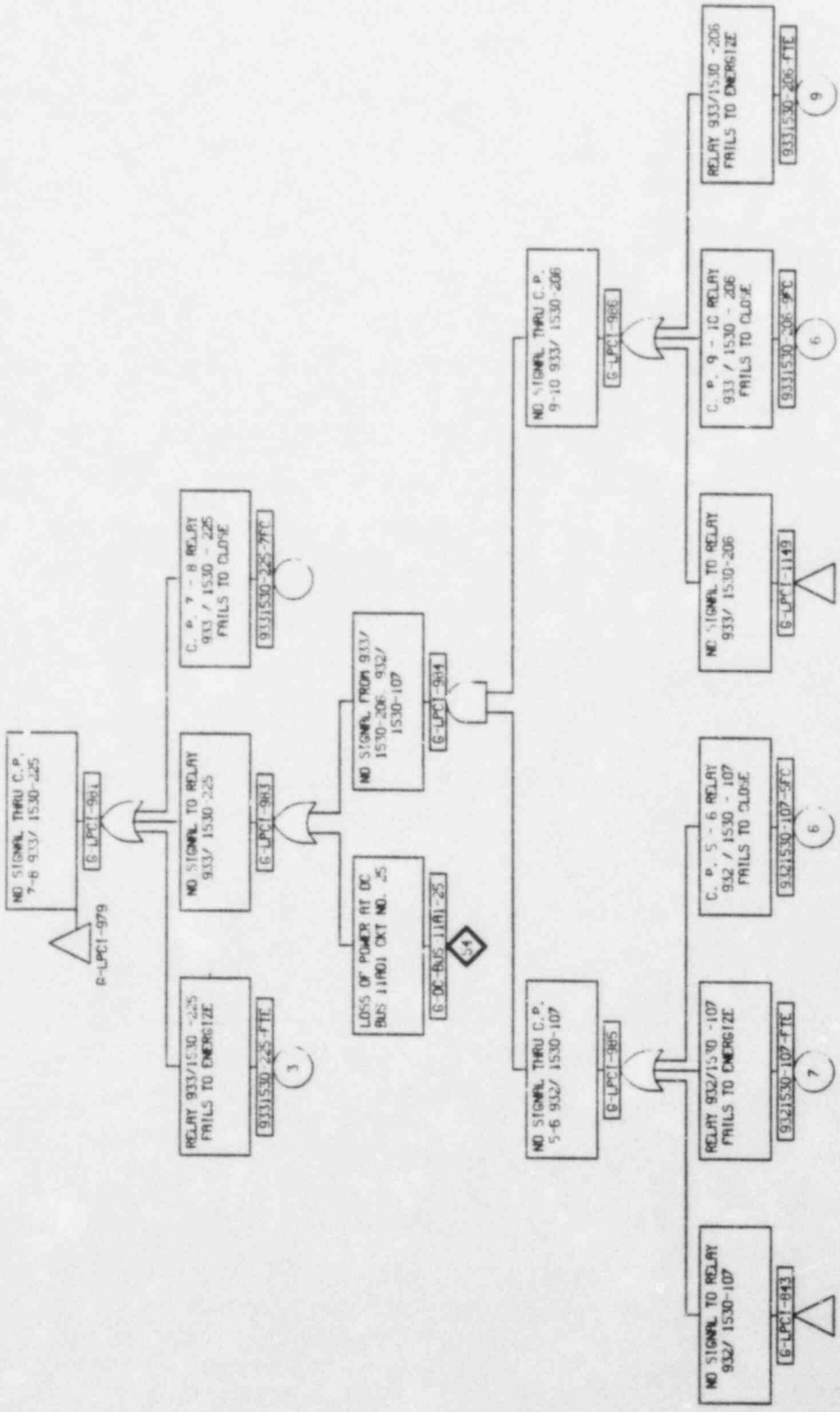

VALVE 1-LP-43B FAILS TO CLOSE - CONTROL FAILURE
G-LPCI-960
NO SIGNAL TO BREAKER MCC E3 COMPT 3A
G-LPCI-961
BREAKER MCC E3 COMPT 2B FAILS
AC-E3-2B-FTC
LOSS OF POWER AT DC BUS 101-AB-2 CKT 02D
G-DC-BUS-AB2-2D
8
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-236
G-LPCI-962
NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-226
G-LPCI-963
INADVERTANT SIGNAL TO RELAY 933/ 1530-236
G-LPCI-964
C.P. 7-8 933/1530-236 FAILS TO REMAIN CLOSED
9331530-236-7RC
RELAY 933/1530-236 FAILS TO REMAIN DEENERGIZED
9331530-236-FRD
2
C.P. 5-6 RELAY 933/1530 -224 FAILS TO REMAIN OPEN
9331530-224-5RO
2

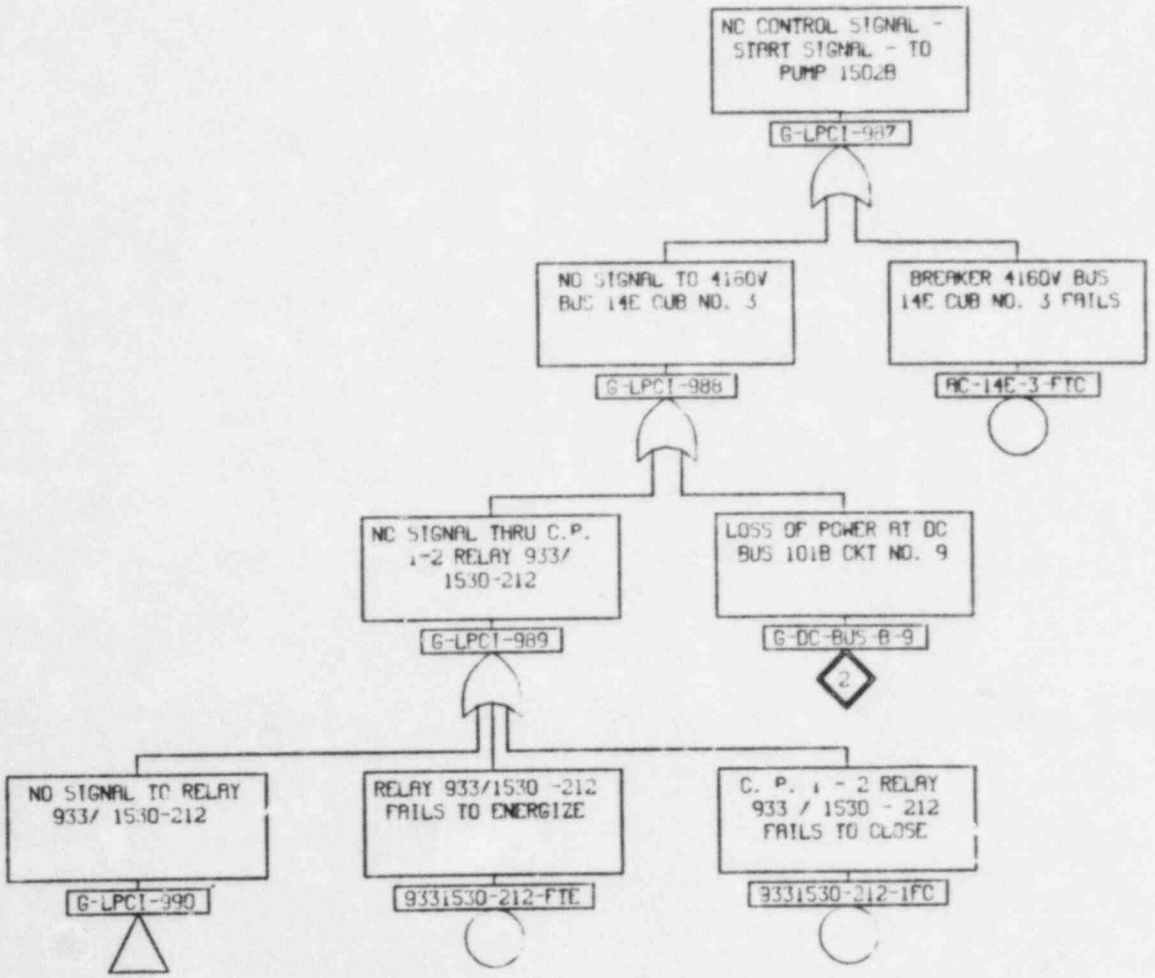

NO SIGNAL THRU C.P. 7-8 RELAY 933/ 1530-226
G-LPCI-963
G-LPCI-963
NO SIGNAL TO RELAY 933/ 1530-226
G-LPCI-965
C. P. 7 - 8 RELAY 933 / 1530 - 226 FAILS TO CLOSE
933/1530-226-FTC
RELAY 933/1530 -226 FAILS TO ENERGIZE
933/1530-226-FTE
2
NO SIGNAL FROM 933/ 1530-206 932/ 1530-107
G-LPCI-966
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
G1
NO SIGNAL THRU C.P. 9-10 933/ 1530-206
G-LPCI-968
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
C. P. 9 - 10 RELAY 933 / 1530 - 206 FAILS TO CLOSE
933/1530-206-FTC
9
RELAY 933/1530 -206 FAILS TO ENERGIZE
933/1530-206-FTE
9
NO SIGNAL THRU C.P. 5-6 932/ 1530-107
G-LPCI-967
C. P. 5 - 6 RELAY 932 / 1530 - 107 FAILS TO CLOSE
932/1530-107-FTC
6
RELAY 932/1530 -107 FAILS TO ENERGIZE
932/1530-107-FTE
7
NO SIGNAL TO RELAY 932/ 1530-107
G-LPCI-843

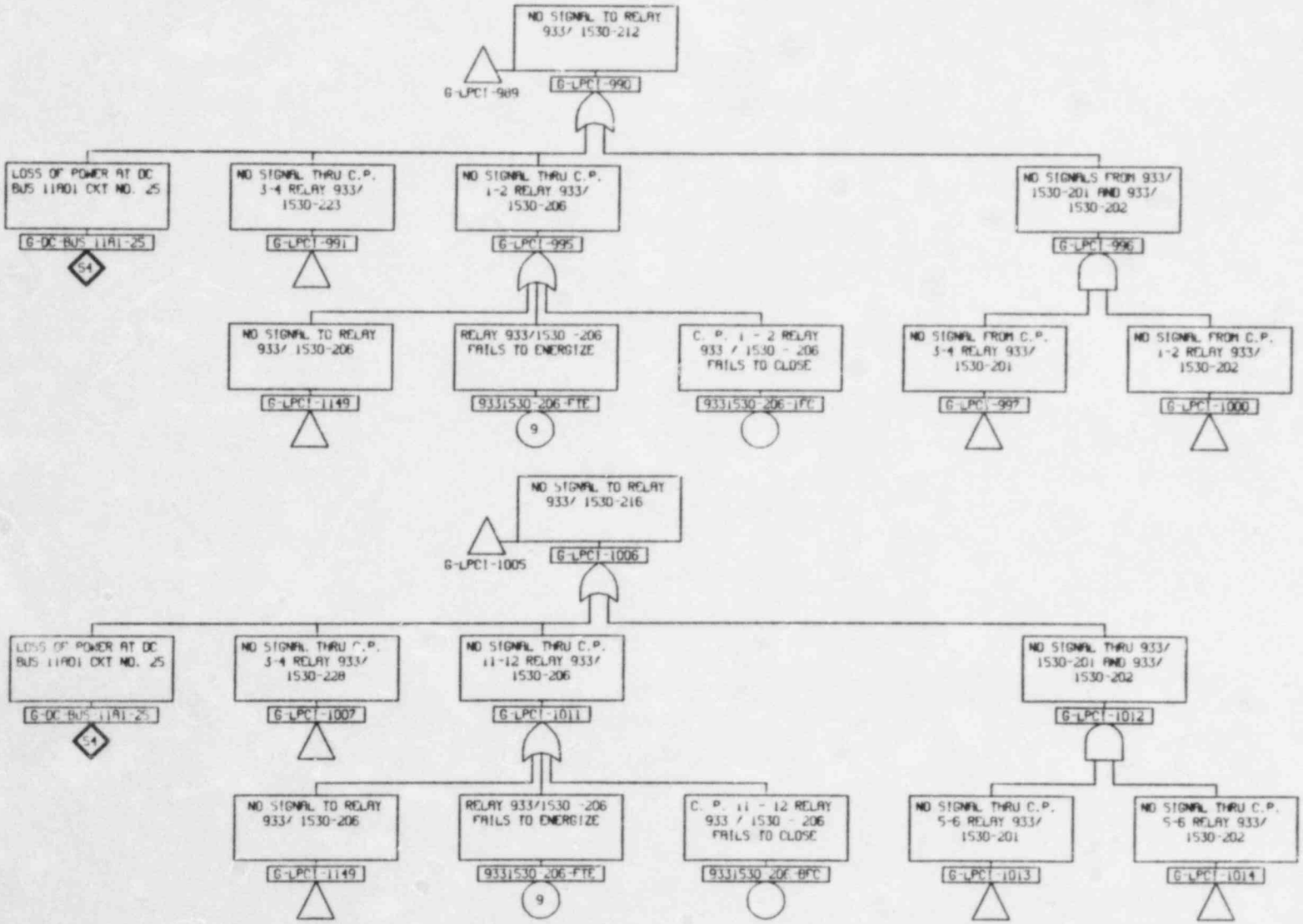

NO CONTROL SIGNAL - TO CLOSE - TO VALVE 1-LP-44A
G-LPCI-969
NO SIGNAL TO BREAKER MCC 101-AB-1 COMPT 5C
G-LPCI-970
BREAKER 101-AB-1 COMPT 5C FAILS
DC-101AB1-5C-FTC
NO SIGNAL THRU C.P. 3-4 RELAY 932/ 1530-136
G-LPCI-971
NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-125
G-LPCI-972
LOSS OF POWER AT DC BUS 101-AB-1 CKT 05C
G-DC-BUS-AB1-5C
RELAY 932/1530-136 FAILS TO REMAIN DEENERGIZED
9321530-136-FRO
2
INADVERTANT SIGNAL TO RELAY 932/ 1530-136
G-LPCI-973
C.P. 3-4 932/1530-136 FAILS TO REMAIN CLOSED
9321530-136-3RC
C.P. 5-6 RELAY 932/1530 -124 FAILS TO REMAIN OPEN
9321530-124-5RO
2

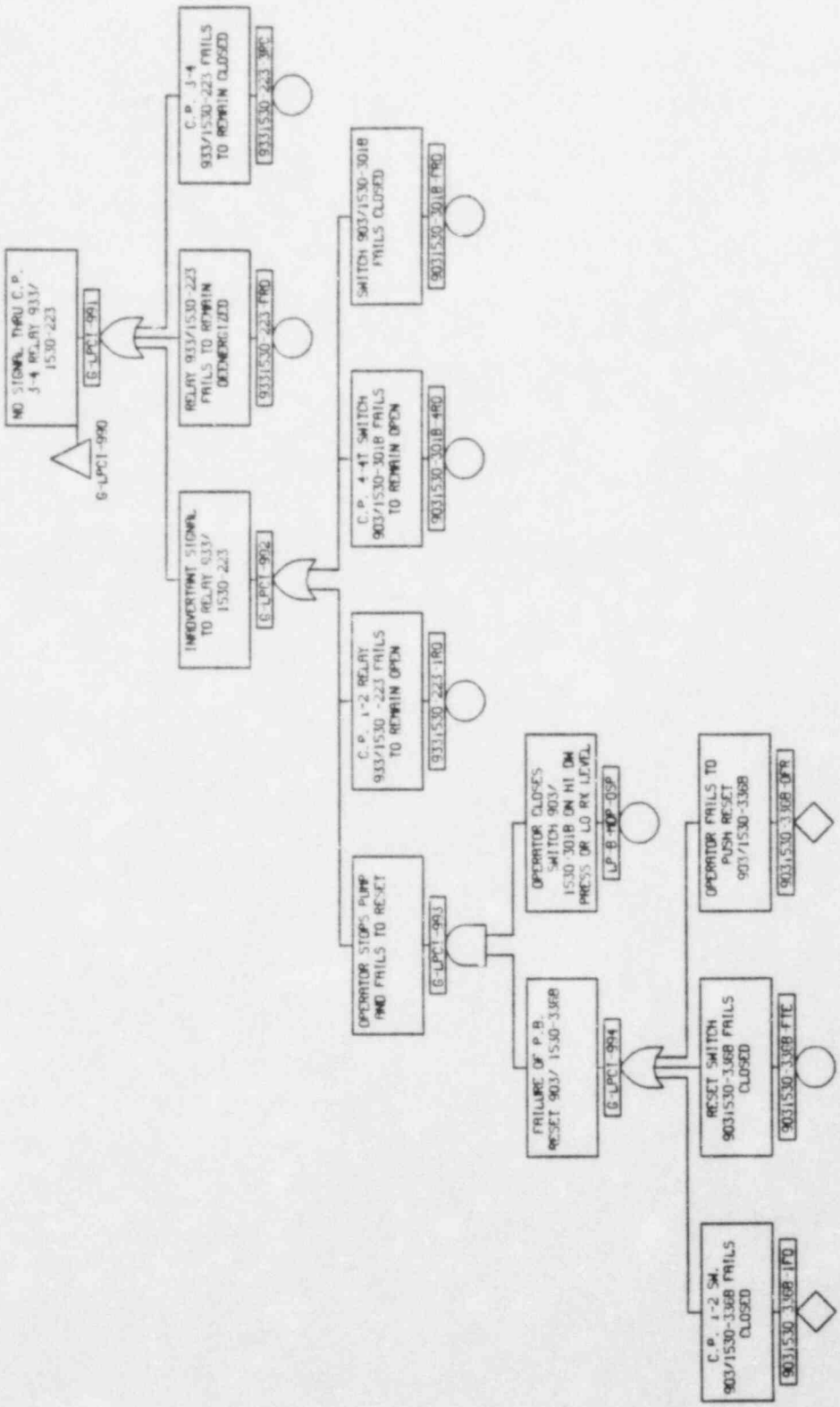

NO SIGNAL THRU C.P. 7-8 RELAY 932/ 1530-125
G-LPCI-970
G-LPCI-972
NO SIGNAL TO RELAY 932/ 1530-125
G-LPCI-974
C. P. 7 - 8 RELAY 932 / 1530 - 125 FAILS TO CLOSE
9321530-125-SYC
RELAY 932/1530 -125 FAILS TO ENERGIZE
9321530-125-FTE
3
NO SIGNAL FROM RELAYS 932/ 1530-106 OR 933/ 1570-207
G-LPCI-975
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-106
G-LPCI-976
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-207
G-LPCI-977
C. P. 9 - 10 RELAY 932 / 1570 - 106 FAILS TO CLOSE
9321530-106-SYC
RELAY 932/1570 -106 FAILS TO ENERGIZE
9321530-106-FTE
9
NO SIGNAL TO RELAY 933/ 1530-207
G-LPCI-978
RELAY 933/1530 -207 FAILS TO ENERGIZE
9331530-207-FTE
7
C. P. 5 - 6 RELAY 933 / 1530 - 207 FAILS TO CLOSE
9331530-207-SYC
6
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705

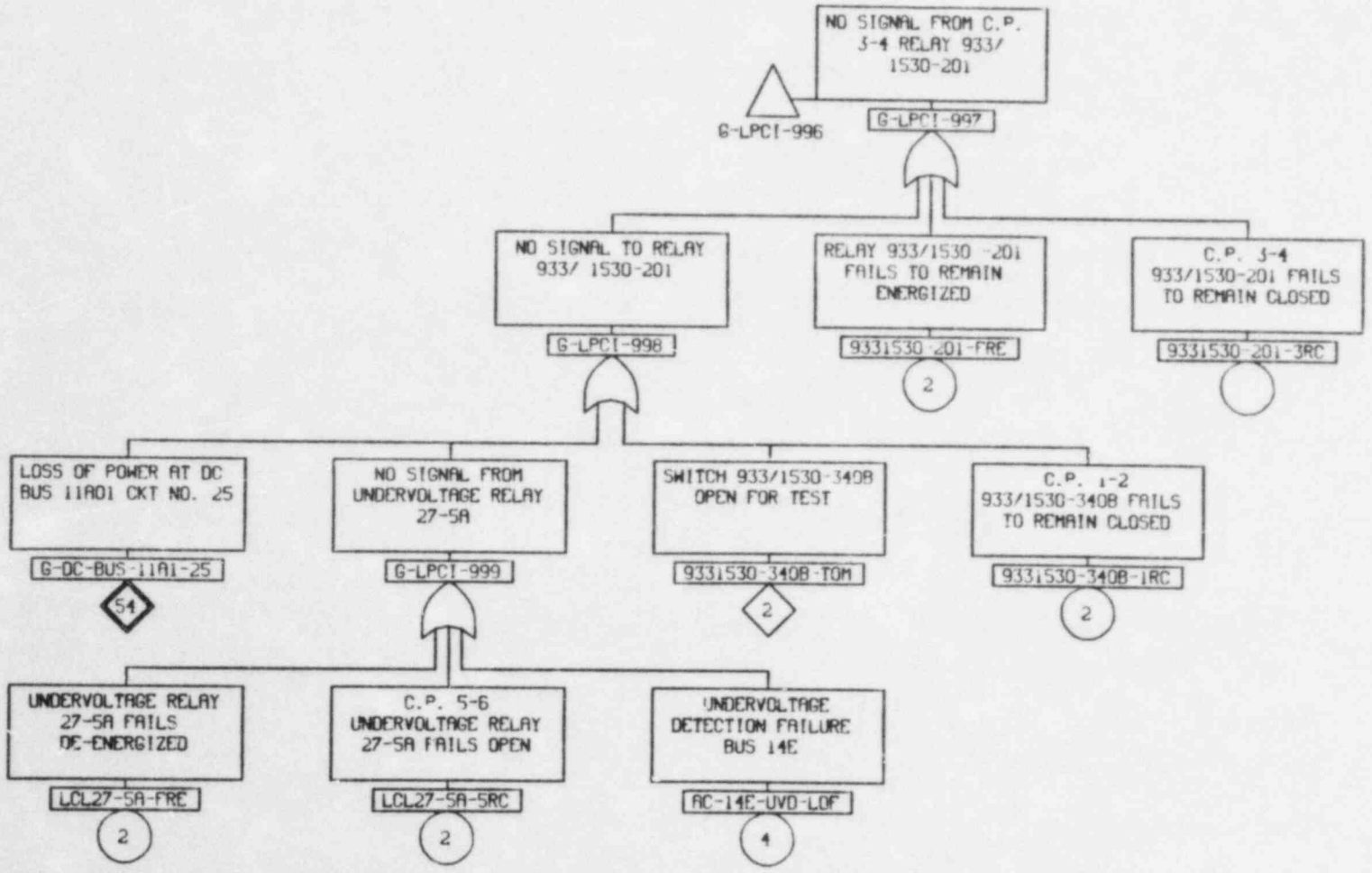

VALVE 1-LP-44B FAILS TO CLOSE - CONTROL FAILURE
G-LPCI-978
NO SIGNAL TO BREAKER MCC 1-1AB-2 COMPT 4E
G-LPCI-979
BREAKER MCC 1-1AB-2 COMPT 4E FAILS
DC-101AB2-4E-FTC
NO SIGNAL THRU C.P. 3-4 933/ 1530-236
G-LPCI-980
NO SIGNAL THRU C.P. 7-8 933/ 1530-225
G-LPCI-981
LOSS OF POWER AT DC BUS 101AB-2
G-DC-BUS-AB2-4D
RELAY 933/1530-236 FAILS TO REMAIN DEENERGIZED
9331530-236-FRD
2
INADVERTANT SIGNAL TO RELAY 933/ 1530-236
G-LPCI-982
C.P. 3-4 933/1530-236 FAILS TO REMAIN CLOSED
9331530-236-3RC
C.P. 5-6 RELAY 933/1530 -224 FAILS TO REMAIN OPEN
9331530-224-5RO
2

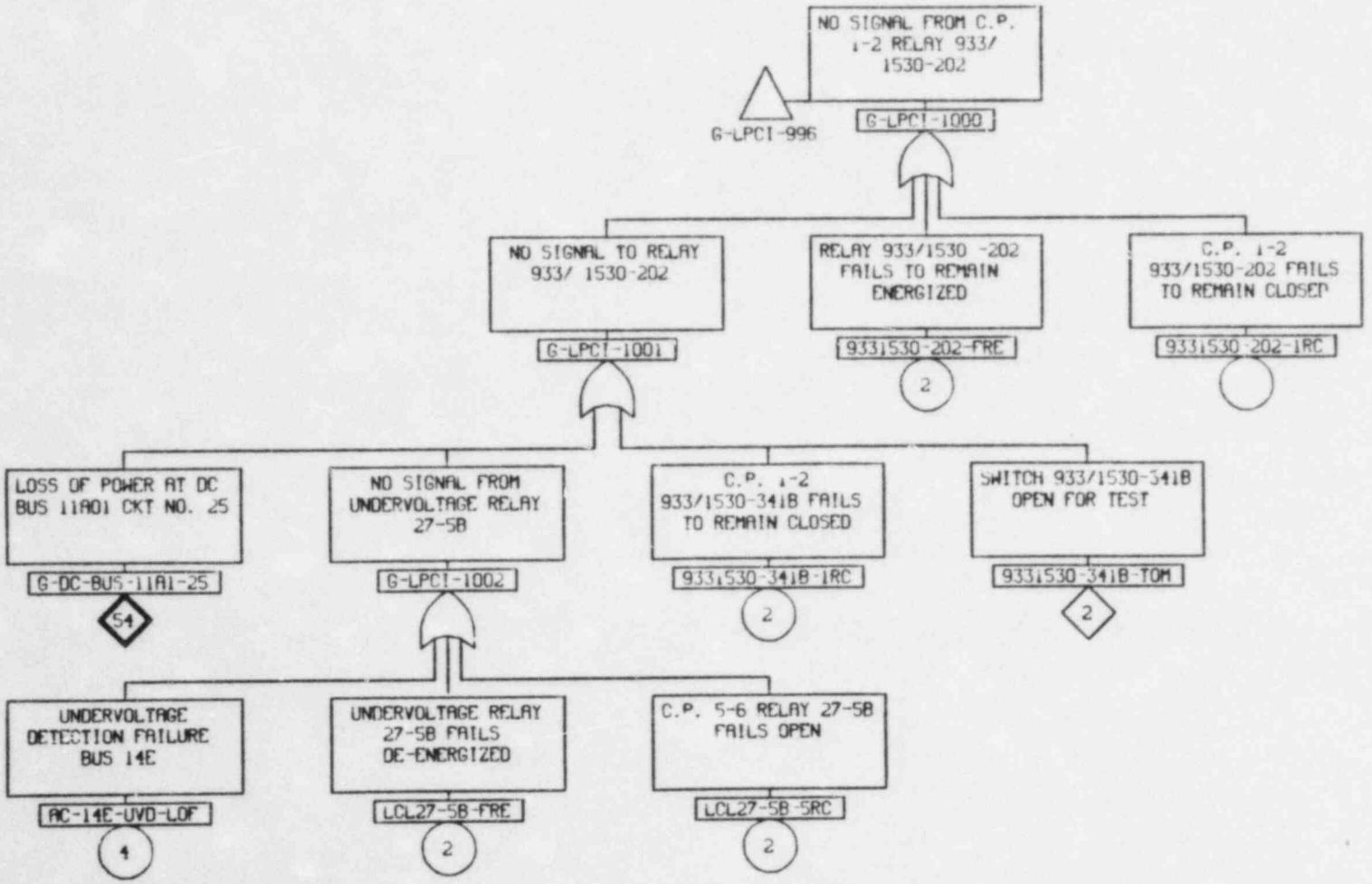

NO SIGNAL THRU C.P. 7-8 933/ 1530-225
G-LPCI-961
G-LPCI-979
NO SIGNAL TO RELAY 933/ 1530 225
G-LPCI-963
RELAY 933/1530 -225 FAILS TO ENERGIZE
933J1530-225-FTE
3
C. P. 7 - 8 RELAY 933 / 1530 - 225 FAILS TO CLOSE
933J1530-225-SPC
NO SIGNAL FROM 933/ 1530-206 932/ 1530-107
G-LPCI-964
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS 11A01-25
2-1
NO SIGNAL THRU C.P. 5-6 932/ 1530-107
G-LPCI-965
NO SIGNAL THRU C.P. 9-10 933/ 1530-206
G-LPCI-966
NO SIGNAL TO RELAY 932/ 1530-107
G-LPCI-843
RELAY 932/1530 -107 FAILS TO ENERGIZE
932J1530-107-FTE
7
C. P. 5 - 6 RELAY 932 / 1530 - 107 FAILS TO CLOSE
932J1530-107-SPC
6
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-149
C. P. 9 - 10 RELAY 933 / 1530 - 206 FAILS TO CLOSE
933J1530-206-SPC
6
RELAY 933/1530 -206 FAILS TO ENERGIZE
933J1530-206-FTE
9

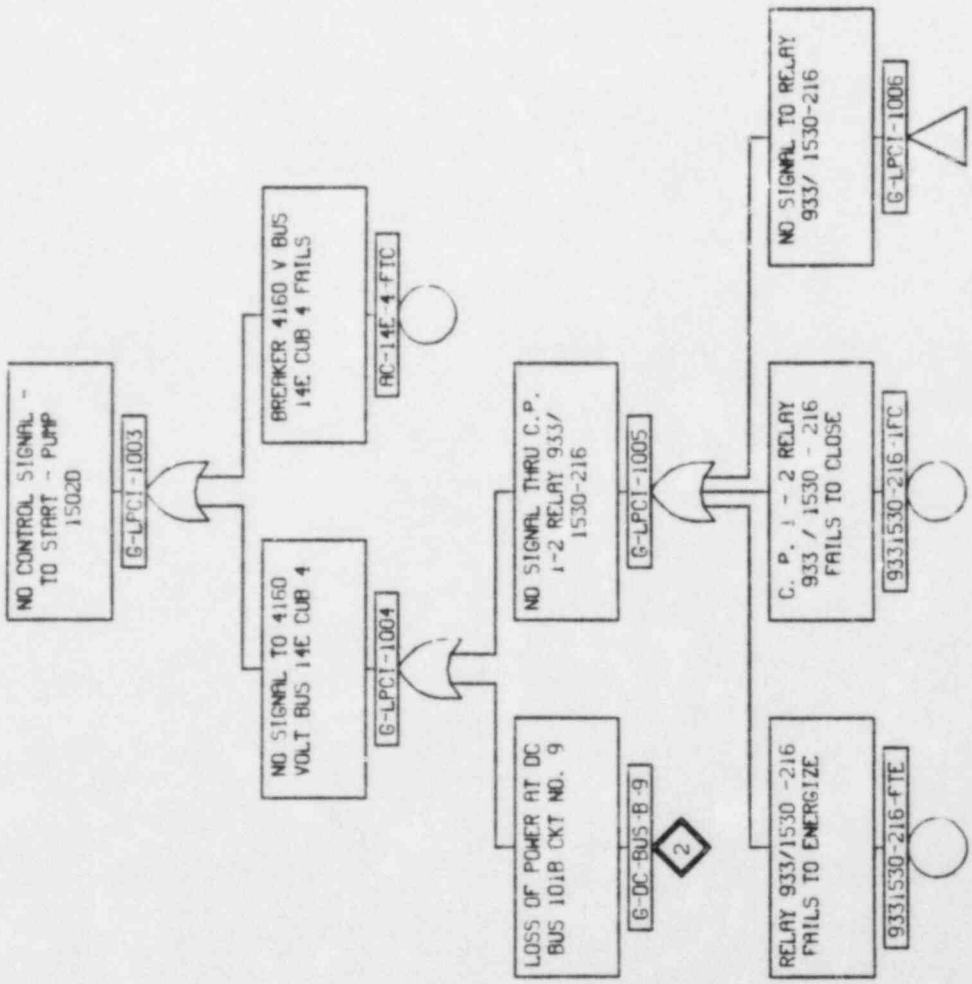

NC CONTROL SIGNAL - START SIGNAL - TO PUMP 1502B
G-LPCI-987
NO SIGNAL TO 4160V BUS 14E CUB NO. 3
G-LPCI-986
BREAKER 4160V BUS 14E CUB NO. 3 FAILS
BC-14E-3-FTC
NC SIGNAL THRU C.P. 1-2 RELAY 933/ 1530-212
G-LPCI-989
LOSS OF POWER AT DC BUS 101B CKT NO. 9
G-DC-BUS-B-9
2
NO SIGNAL TO RELAY 933/ 1530-212
G-LPCI-990
RELAY 933/1530 -212 FAILS TO ENERGIZE
9331530-212-FTE
C. P. 1 - 2 RELAY 933 / 1530 - 212 FAILS TO CLOSE
9331530-212-1FC

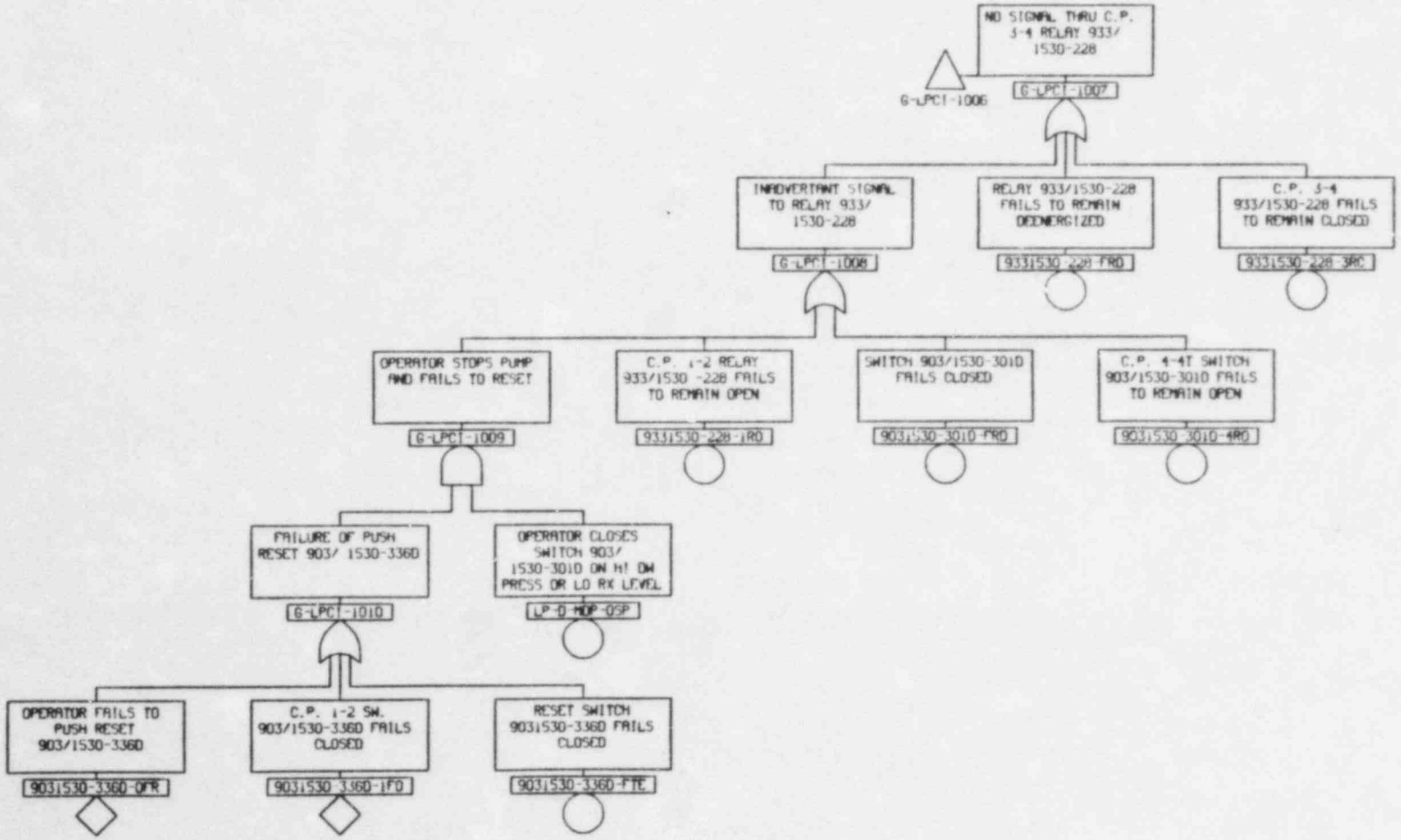

NO SIGNAL TO RELAY 933/ 1530-212
G-LPCI-989
G-LPCI-990
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
S4
NO SIGNAL THRU C.P. 3-4 RELAY 933/ 1530-223
G-LPCI-991
NO SIGNAL THRU C.P. 1-2 RELAY 933/ 1530-206
G-LPCI-995
NO SIGNALS FROM 933/ 1530-201 AND 933/ 1530-202
G-LPCI-996
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
RELAY 933/1530-206 FAILS TO ENERGIZE
933/1530-206-FTE
9
C. P. 1 - 2 RELAY 933 / 1530 - 206 FAILS TO CLOSE
933/1530-206-FTC
NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-201
G-LPCI-997
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-202
G-LPCI-1000
NO SIGNAL TO RELAY 933/ 1530-216
G-LPCI-1005
G-LPCI-1006
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
S4
NO SIGNAL THRU C.P. 3-4 RELAY 933/ 1530-228
G-LPCI-1007
NO SIGNAL THRU C.P. 11-12 RELAY 933/ 1530-206
G-LPCI-1011
NO SIGNAL THRU 933/ 1530-201 AND 933/ 1530-202
G-LPCI-1012
NO SIGNAL TO RELAY 933/ 1530-206
G-LPCI-1149
RELAY 933/1530-206 FAILS TO ENERGIZE
933/1530-206-FTE
9
C. P. 11 - 12 RELAY 933 / 1530 - 206 FAILS TO CLOSE
933/1530-206-BFC
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-201
G-LPCI-1013
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-202
G-LPCI-1014

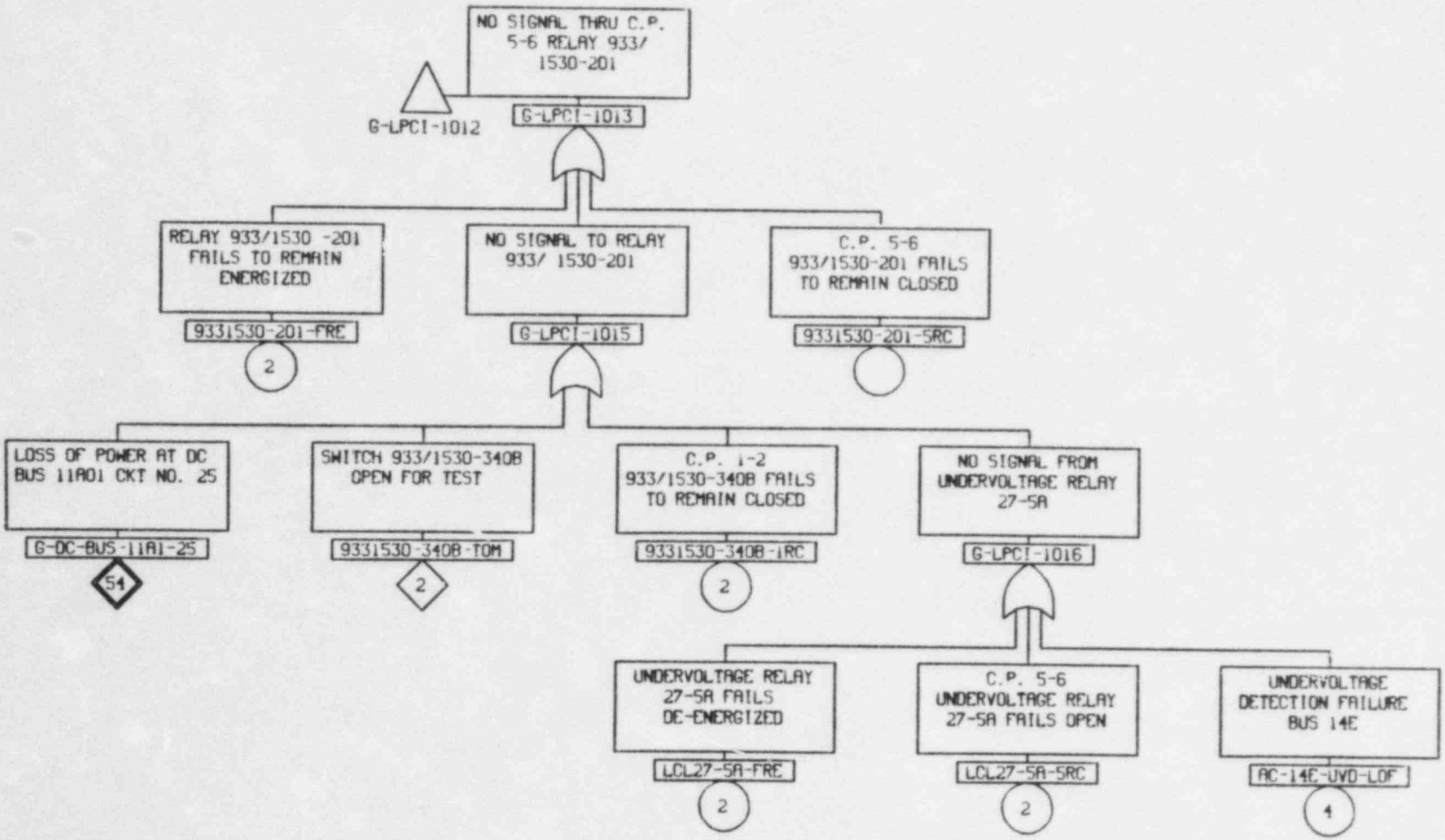

NO SIGNAL THRU C.P. 3-4 RELAY 933/ 1530-223
G-LPCI-991
G-LPCI-990
RELAY 933/1530-223 FAILS TO REMAIN ENERGIZED
C.P. 3-4 933/1530-223 FAILS TO REMAIN CLOSED
933/1530-223 SPC
933/1530-223 FRO
INDEPENDENT SIGNAL TO RELAY 933/ 1530-223
G-LPCI-992
C.P. 4-4T SWITCH 903/1530-3018 FAILS TO REMAIN OPEN
SWITCH 903/1530-3018 FAILS CLOSED
903/1530-3018 FRO
903/1530-3018 4RO
C.P. 1-2 RELAY 933/1530 -223 FAILS TO REMAIN OPEN
933/1530-223 1RO
OPERATOR STOPS PUMP AND FAILS TO RESET
G-LPCI-993
OPERATOR CLOSES SWITCH 903/ 1530-3018 ON HI DW PRESS OR LO RX LEVEL
LP-B-MOP-05F
FAILURE OF P.B. RESET 903/ 1530-3368
G-LPCI-994
OPERATOR FAILS TO PUSH RESET 903/1530-3368
903/1530-3368 OPR
RESET SWITCH 903/1530-3368 FAILS CLOSED
903/1530-3368 FTC
C.P. 1-2 SW. 903/1530-3368 FAILS CLOSED
903/1530-3368 1TO

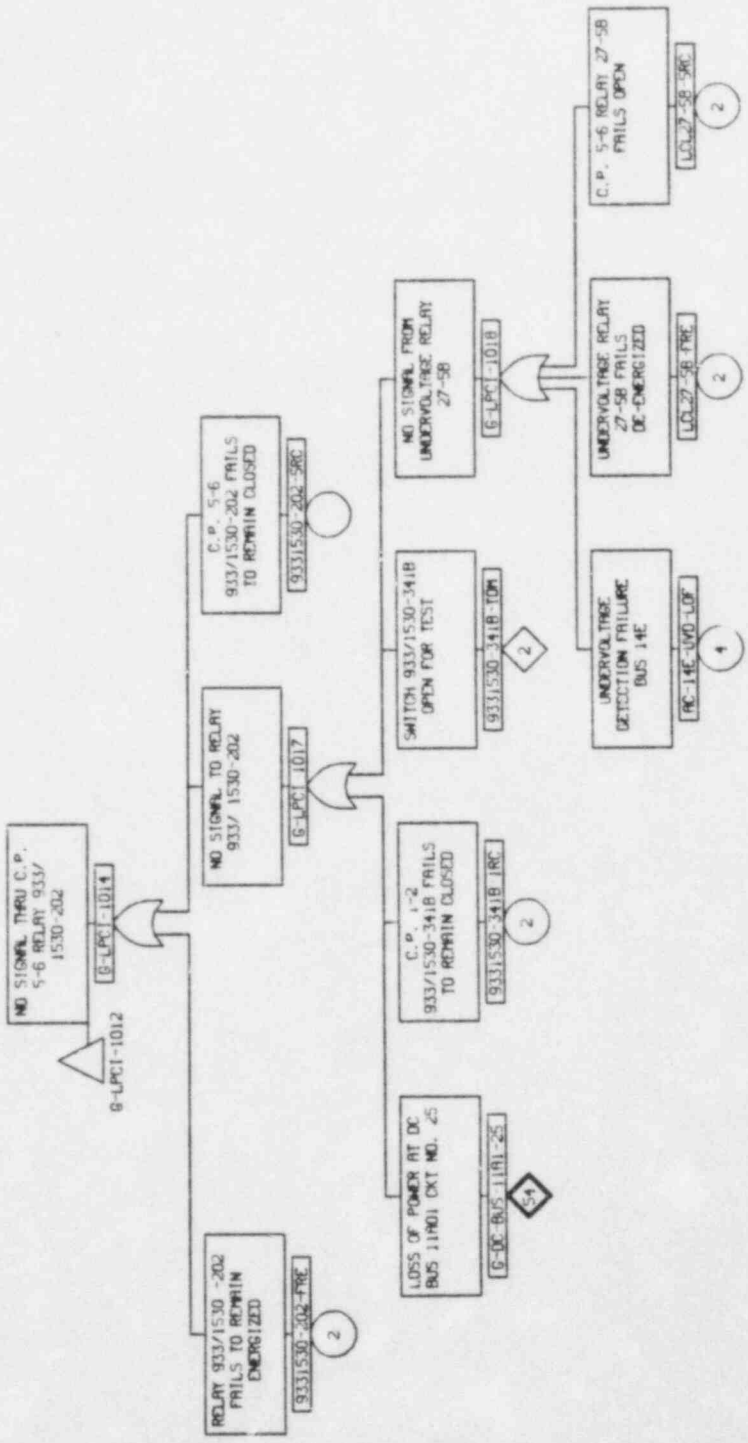

NO SIGNAL FROM C.P. 3-4 RELAY 933/ 1530-201
G-LPCI-996
G-LPCI-997
NO SIGNAL TO RELAY 933/ 1530-201
RELAY 933/1530 -201 FAILS TO REMAIN ENERGIZED
C.P. 3-4 933/1530-201 FAILS TO REMAIN CLOSED
G-LPCI-998
9331530-201-FRE
9331530-201-3RC
2
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
NO SIGNAL FROM UNDERVOLTAGE RELAY 27-5A
SWITCH 933/1530-340B OPEN FOR TEST
C.P. 1-2 933/1530-340B FAILS TO REMAIN CLOSED
G-DC-BUS-11A1-25
G-LPCI-999
9331530-340B-TOM
9331530-340B-1RC
54
2
2
UNDERVOLTAGE RELAY 27-5A FAILS DE-ENERGIZED
C.P. 5-6 UNDERVOLTAGE RELAY 27-5A FAILS OPEN
UNDERVOLTAGE DETECTION FAILURE BUS 14E
LCL27-5A-FRE
LCL27-5A-5RC
AC-14E-UVD-LOF
2
2
4

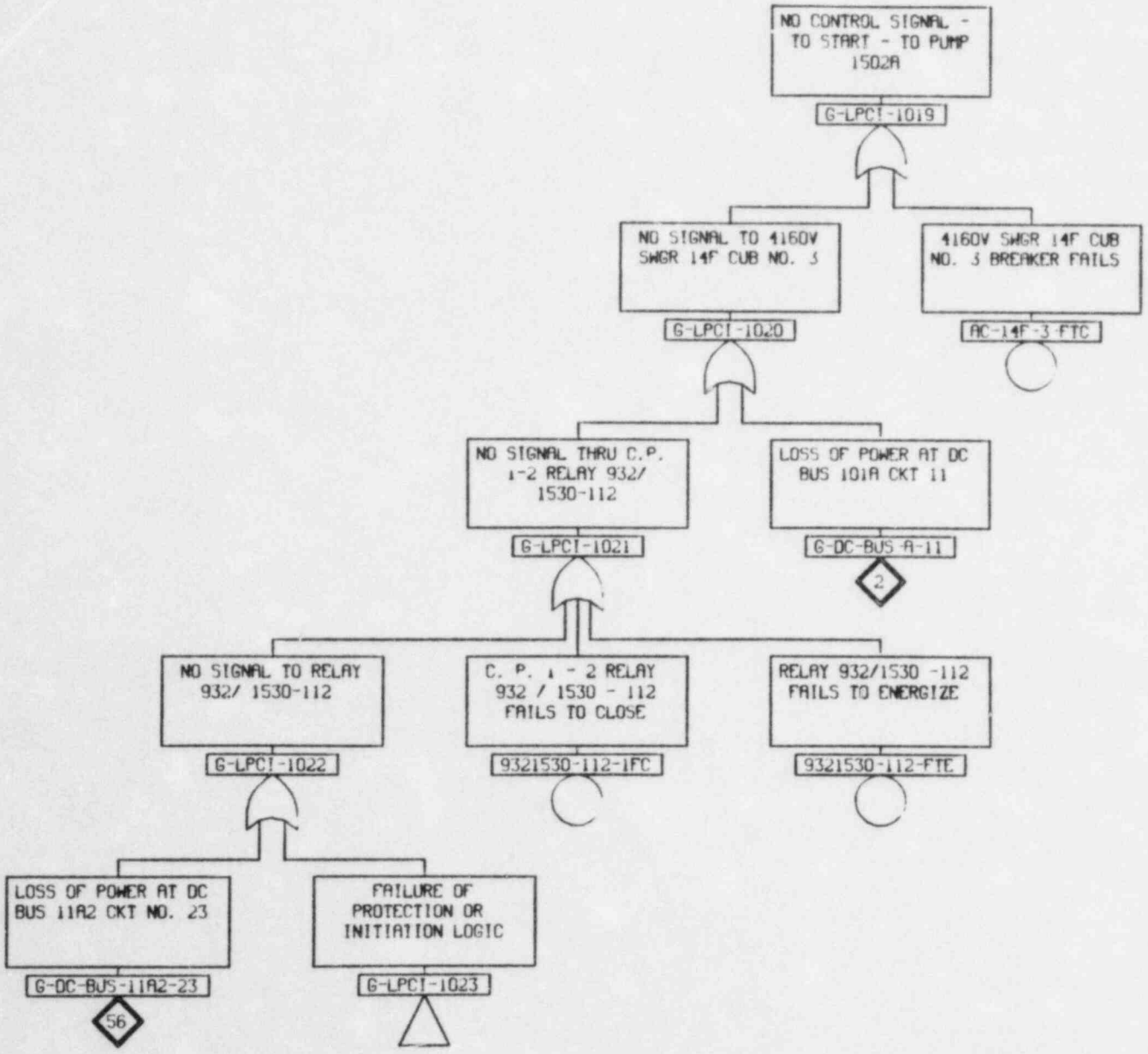

NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-202
G-LPCI-996
G-LPCI-1000
NO SIGNAL TO RELAY 933/ 1530-202
RELAY 933/1530 -202 FAILS TO REMAIN ENERGIZED
C.P. 1-2 933/1530-202 FAILS TO REMAIN CLOSED
G-LPCI-1001
933/530-202-FRE
2
933/530-202-1RC
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
NO SIGNAL FROM UNDERVOLTAGE RELAY 27-5B
C.P. 1-2 933/1530-341B FAILS TO REMAIN CLOSED
SWITCH 933/1530-341B OPEN FOR TEST
G-DC-BUS-11A1-25
G-LPCI-1002
933/530-341B-1RC
933/530-341B-TOM
S4
2
2
UNDERVOLTAGE DETECTION FAILURE BUS 14E
UNDERVOLTAGE RELAY 27-5B FAILS DE-ENERGIZED
C.P. 5-6 RELAY 27-5B FAILS OPEN
AC-14E-UVD-LOF
LCL27-5B-FRE
LCL27-5B-5RC
4
2
2

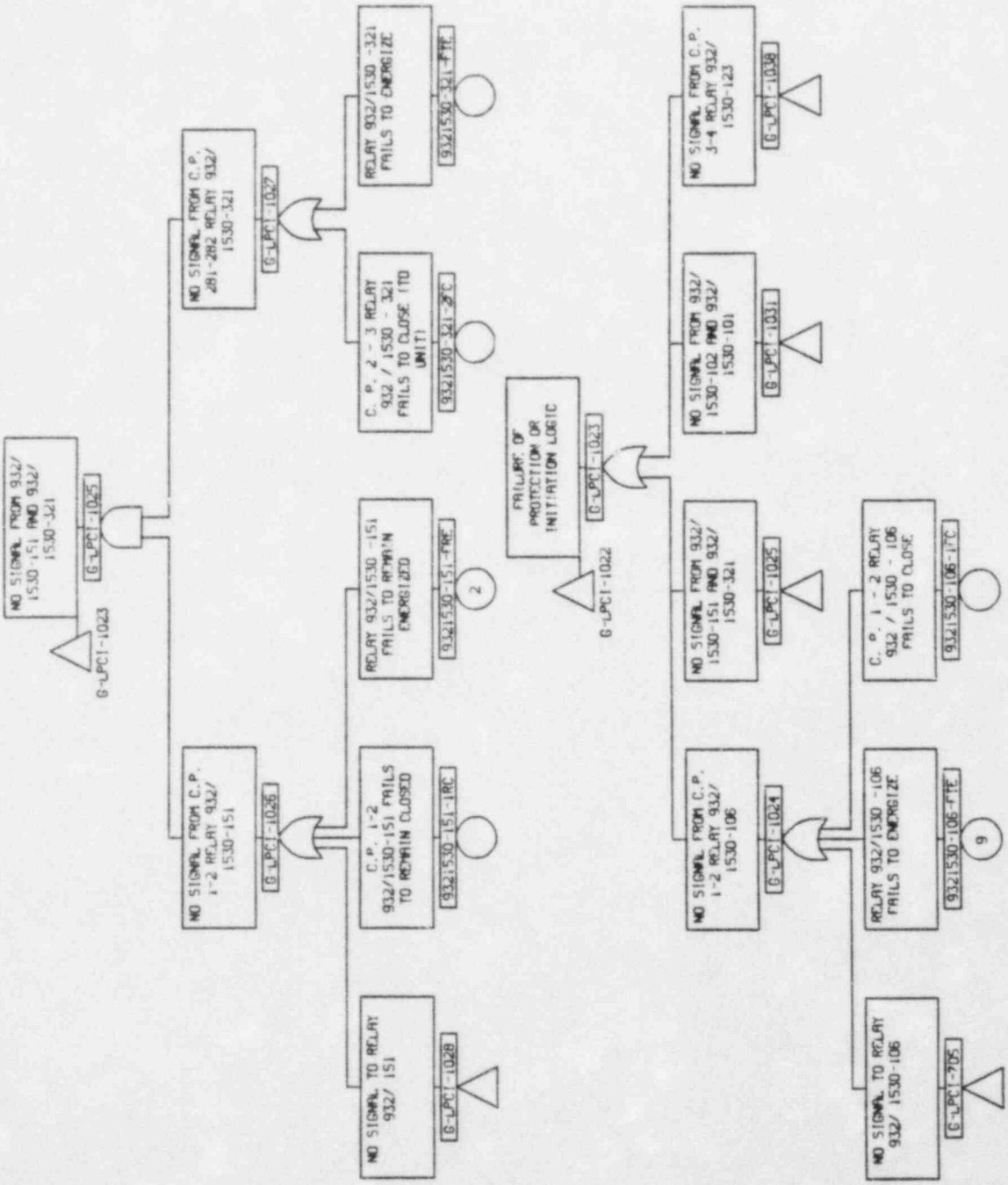

NO CONTROL SIGNAL - TO START - PUMP 1502D
G-LPCI-1003
NO SIGNAL TO 4160 VOLT BUS 14E CUB 4
BREAKER 4160 V BUS 14E CUB 4 FAILS
AC-14E-4-FTC
G-LPCI-1004
LOSS OF POWER AT DC BUS 101B CKT NO. 9
G-DC-BUS-B-9
2
NO SIGNAL THRU C.P. 1-2 RELAY 933/ 1530-216
G-LPCI-1005
RELAY 933/1530 -216 FAILS TO ENERGIZE
9331530-216-FTE
C. P. 1 - 2 RELAY 933 / 1530 - 216 FAILS TO CLOSE
9331530-216-FTC
NO SIGNAL TO RELAY 933/ 1530-216
G-LPCI-1006

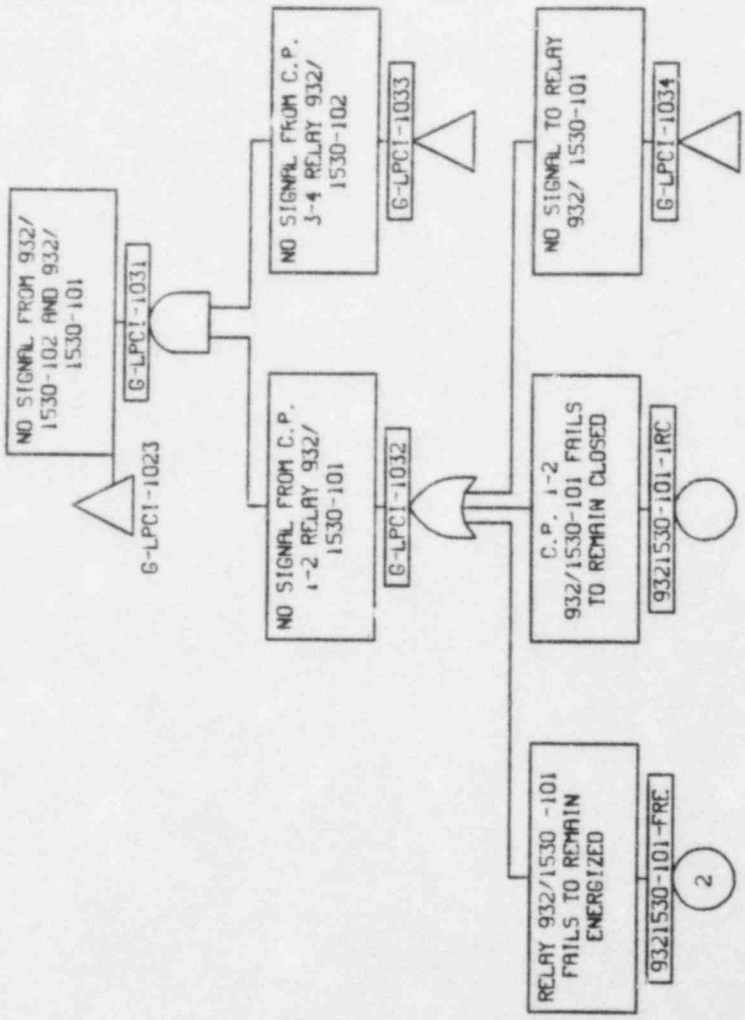

NO SIGNAL THRU C.P. 3-4 RELAY 933/ 1530-228
G-LPCI-1007
G-LPCI-1006
INADVERTANT SIGNAL TO RELAY 933/ 1530-228
RELAY 933/1530-228 FAILS TO REMAIN DEENERGIZED
C.P. 3-4 933/1530-228 FAILS TO REMAIN CLOSED
G-LPCI-1008
933J1530-228-FRO
933J1530-228-3RC
OPERATOR STOPS PUMP AND FAILS TO RESET
C.P. 1-2 RELAY 933/1530 -228 FAILS TO REMAIN OPEN
SWITCH 903/1530-3010 FAILS CLOSED
C.P. 4-4T SWITCH 903/1530-3010 FAILS TO REMAIN OPEN
G-LPCI-1009
933J1530-228-1RO
903J1530-3010-FRO
903J1530-3010-4RO
FAILURE OF PUSH RESET 903/ 1530-336D
OPERATOR CLOSES SWITCH 903/ 1530-3010 ON HI DW PRESS OR LO RX LEVEL
G-LPCI-1010
LP-D-MOP-OSP
OPERATOR FAILS TO PUSH RESET 903/1530-336D
C.P. 1-2 SW. 903/1530-336D FAILS CLOSED
RESET SWITCH 903J530-336D FAILS CLOSED
903J530-336D-OPR
903J530-336D-1FO
903J530-336D-FTE

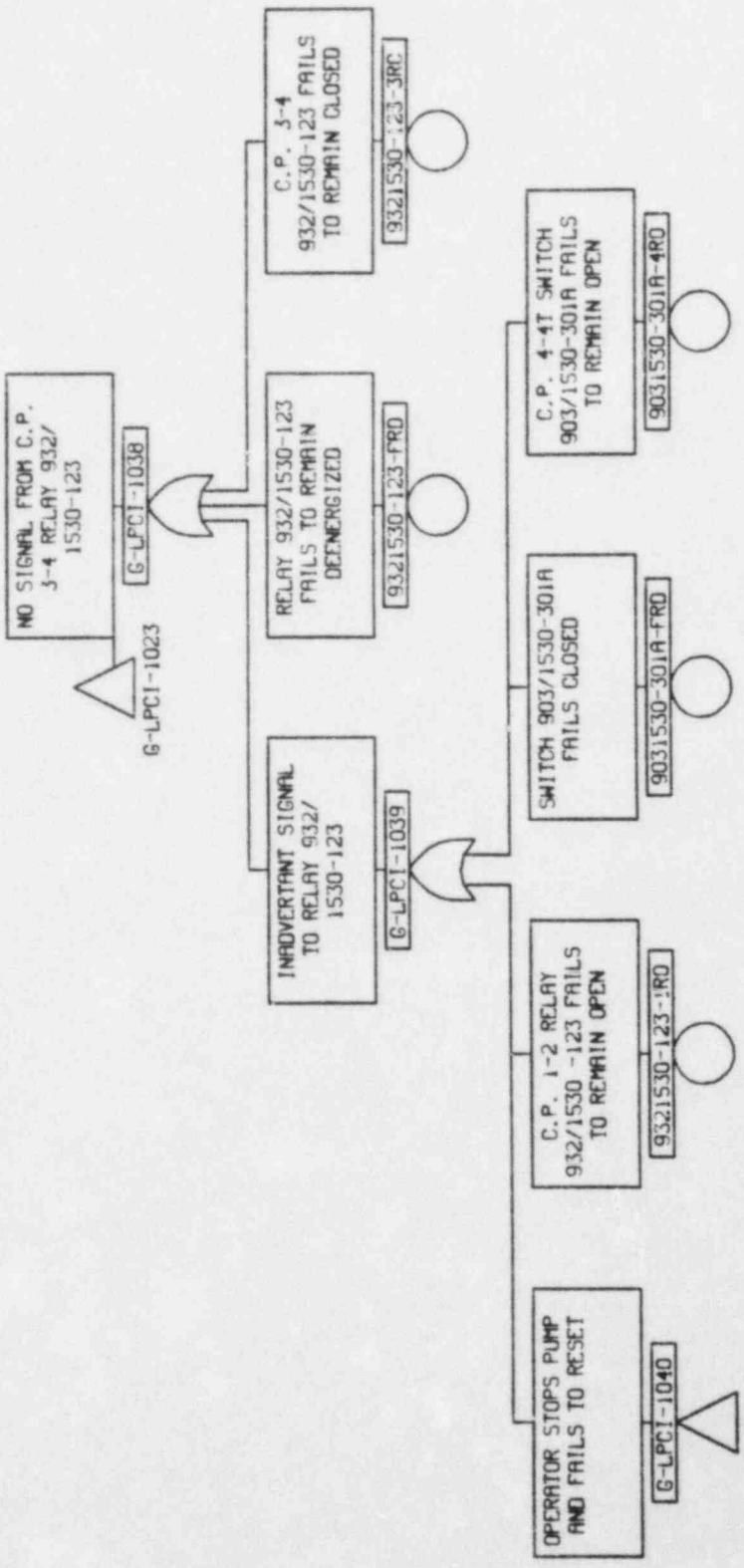

NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-201
G-LPCI-1012
G-LPCI-1013
RELAY 933/1530 -201 FAILS TO REMAIN ENERGIZED
9331530-201-FRE
2
NO SIGNAL TO RELAY 933/ 1530-201
G-LPCI-1015
C.P. 5-6 933/1530-201 FAILS TO REMAIN CLOSED
9331530-201-5RC
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS-11A1-25
54
SWITCH 933/1530-340B OPEN FOR TEST
9331530-340B-TOM
2
C.P. 1-2 933/1530-340B FAILS TO REMAIN CLOSED
9331530-340B-1RC
2
NO SIGNAL FROM UNDERVOLTAGE RELAY 27-5A
G-LPCI-1016
UNDERVOLTAGE RELAY 27-5A FAILS DE-ENERGIZED
LCL27-5A-FRE
2
C.P. 5-6 UNDERVOLTAGE RELAY 27-5A FAILS OPEN
LCL27-5A-5RC
2
UNDERVOLTAGE DETECTION FAILURE BUS 14E
AC-14E-UVD-LOF
4

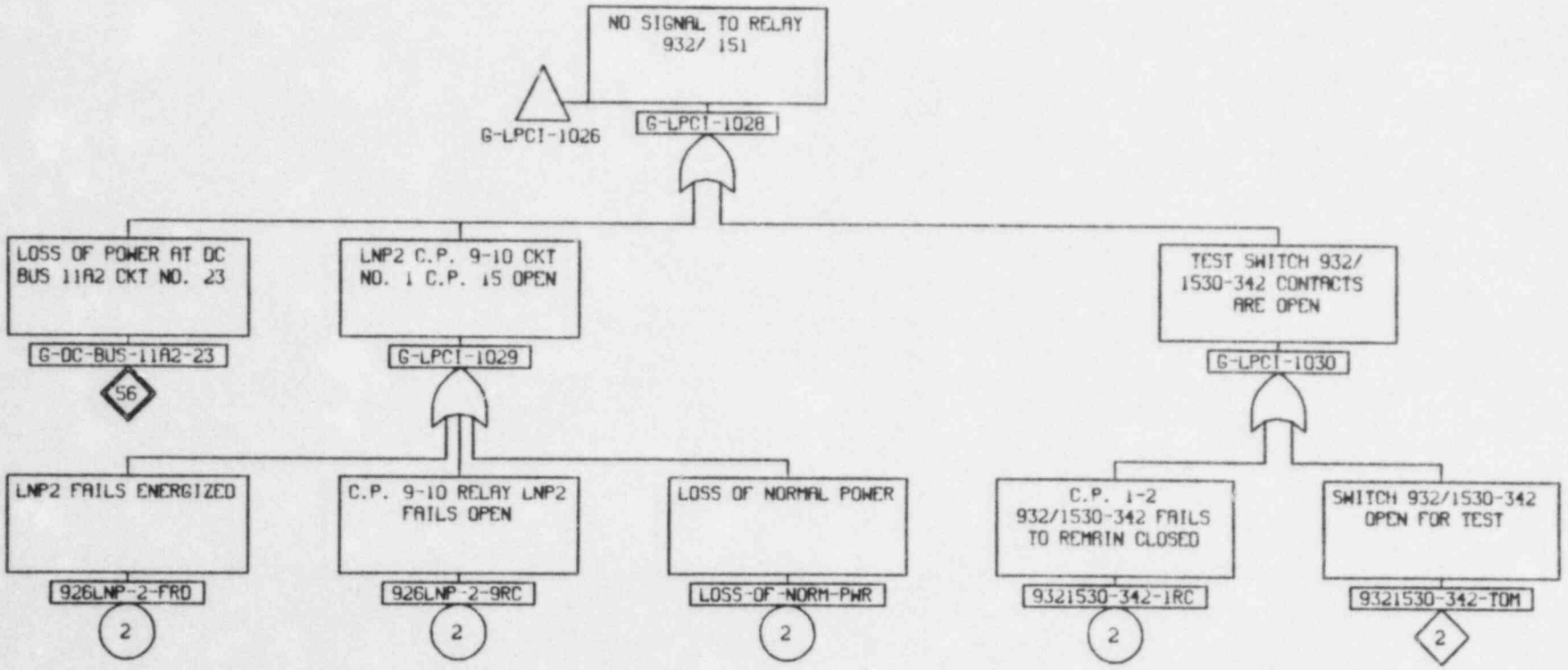

NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-202
G-LPCI-1011
G-LPCI-1012
NO SIGNAL TO RELAY 933/ 1530-202
G-LPCI-1017
RELAY 933/1530 -202 FAILS TO REMAIN ENERGIZED
933J1530-202-PRE
2
C.P. 5-6 933/1530-202 FAILS TO REMAIN CLOSED
933J1530-202-SRC
2
LOSS OF POWER AT DC BUS 11A01 CKT NO. 25
G-DC-BUS 11A1-25
54
C.P. 1-2 933/1530-3418 FAILS TO REMAIN CLOSED
933J1530-3418-IRC
2
SWITCH 933/1530-3418 OPEN FOR TEST
933J1530-3418-TOM
2
NO SIGNAL FROM UNDERVOLTAGE RELAY 27-58
G-LPCI-1018
UNDERVOLTAGE DETECTION FAILURE BUS 14E
RE-14E-UVD-LOF
1
UNDERVOLTAGE RELAY 27-58 FAILS DE-ENERGIZED
LOU27-58-PRE
2
C.P. 5-6 RELAY 27-58 FAILS OPEN
LOU27-58-SRC
2

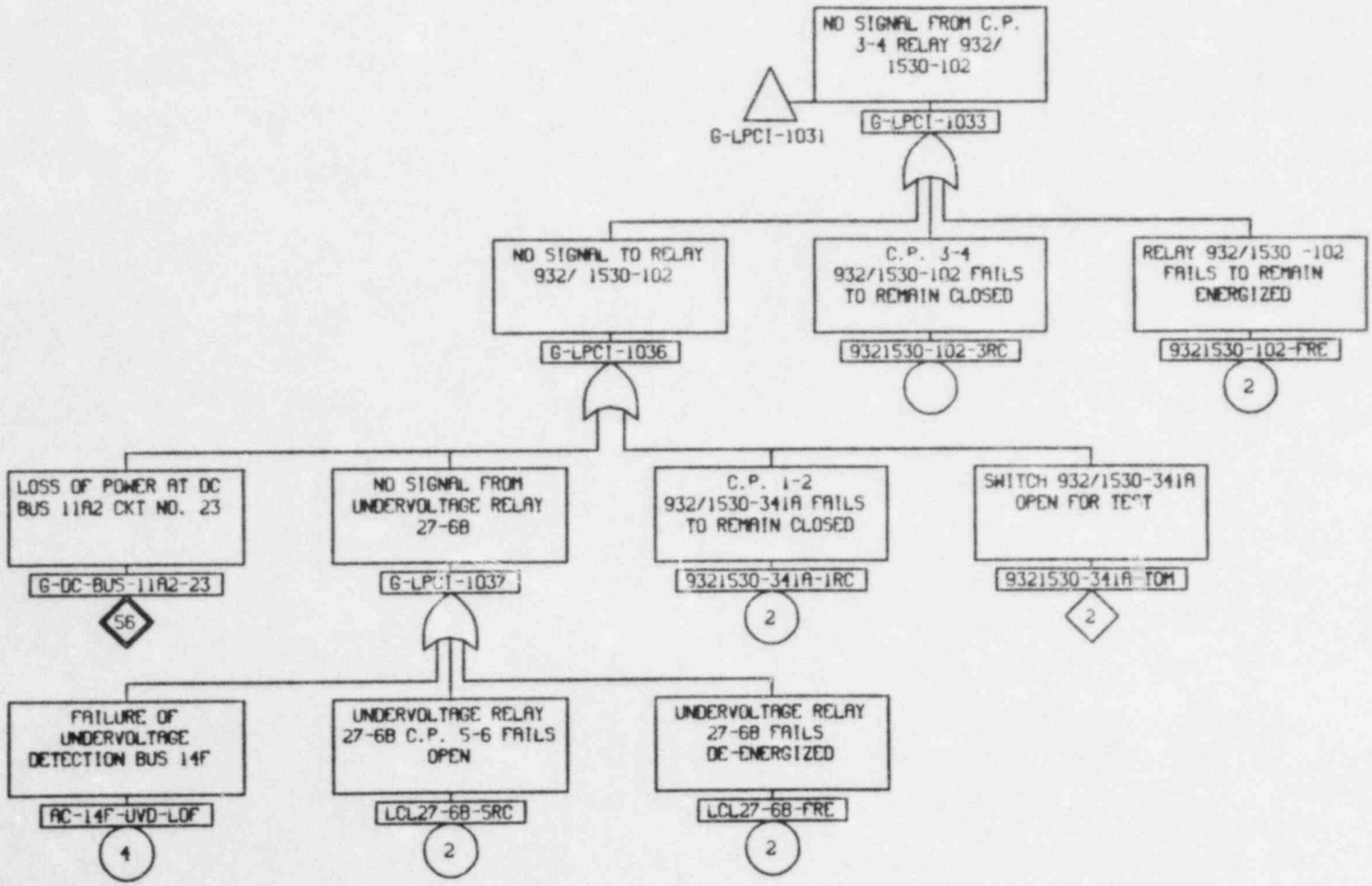

NO CONTROL SIGNAL - TO START - TO PUMP 1502A
G-LPCI-1019
NO SIGNAL TO 4160V SWGR 14F CUB NO. 3
G-LPCI-1020
4160V SWGR 14F CUB NO. 3 BREAKER FAILS
AC-14F-3-FTC
NO SIGNAL THRU C.P. 1-2 RELAY 932/ 1530-112
G-LPCI-1021
LOSS OF POWER AT DC BUS 101A CKT 11
G-DC-BUS-A-11
2
NO SIGNAL TO RELAY 932/ 1530-112
G-LPCI-1022
C. P. 1 - 2 RELAY 932 / 1530 - 112 FAILS TO CLOSE
9321530-112-1FC
RELAY 932/1530 -112 FAILS TO ENERGIZE
9321530-112-FTE
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
FAILURE OF PROTECTION OR INITIATION LOGIC
G-LPCI-1023

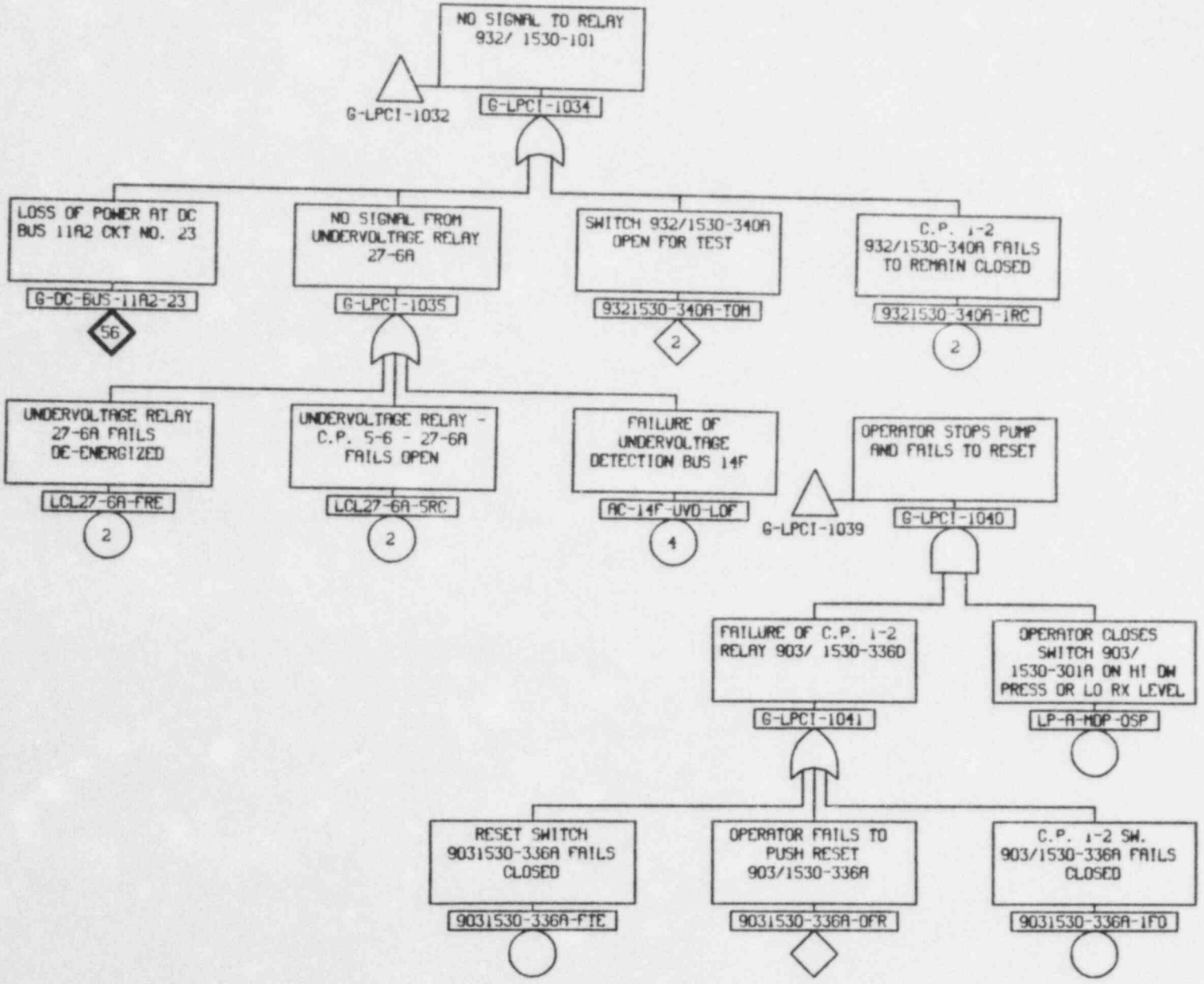

NO SIGNAL FROM 932/ 1530-151 AND 932/ 1530-321
G-LPCI-1025
G-LPCI-1023
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-151
G-LPCI-1026
C.P. 1-2 932/1530-151 FAILS TO REMAIN CLOSED
932/1530-151-1RC
NO SIGNAL TO RELAY 932/ 151
G-LPCI-1028
RELAY 932/1530-151 FAILS TO REMAIN ENERGIZED
932/1530-151-RRF
2
NO SIGNAL FROM C.P. 291-282 RELAY 932/ 1530-321
G-LPCI-1027
C. P. 2 - 3 RELAY 932 / 1530 - 321 FAILS TO CLOSE (TO UNIT)
932/1530-321-2TC
RELAY 932/1530-321 FAILS TO ENERGIZE
932/1530-321-FRF
FAILURE OF PROTECTION OR INITIATION LOGIC
G-LPCI-1022
G-LPCI-1023
NO SIGNAL FROM 932/ 1530-102 AND 932/ 1530-101
G-LPCI-1031
NO SIGNAL FROM C.P. J-4 RELAY 932/ 1530-123
G-LPCI-1030
NO SIGNAL FROM 932/ 1530-151 AND 932/ 1530-321
G-LPCI-1025
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-106
G-LPCI-1024
C. P. 1 - 2 RELAY 932 / 1530 - 106 FAILS TO CLOSE
932/1530-106-1RC
RELAY 932/1530-106 FAILS TO ENERGIZE
9
932/1530-106-FRF
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-1029

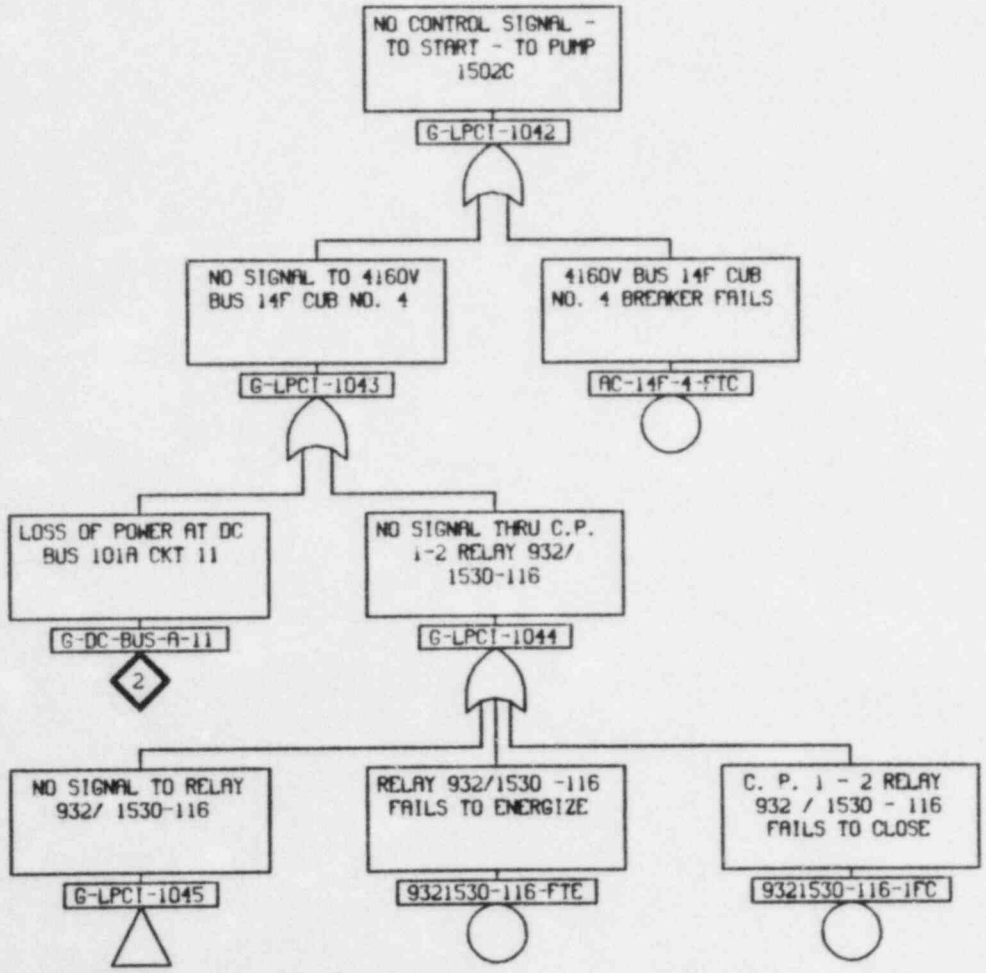

NO SIGNAL FROM 932/ 1530-102 AND 932/ 1530-101
G-LPCI-1023
G-LPCI-1031
NO SIGNAL FROM C.P. J-4 RELAY 932/ 1530-102
G-LPCI-1033
NO SIGNAL FROM C.P. 1-2 RELAY 932/ 1530-101
G-LPCI-1032
NO SIGNAL TO RELAY 932/ 1530-101
G-LPCI-1034
C.P. 1-2 932/1530-101 FAILS TO REMAIN CLOSED
9321530-101-1RC
RELAY 932/1530 -101 FAILS TO REMAIN ENERGIZED
9321530-101-1RE
2

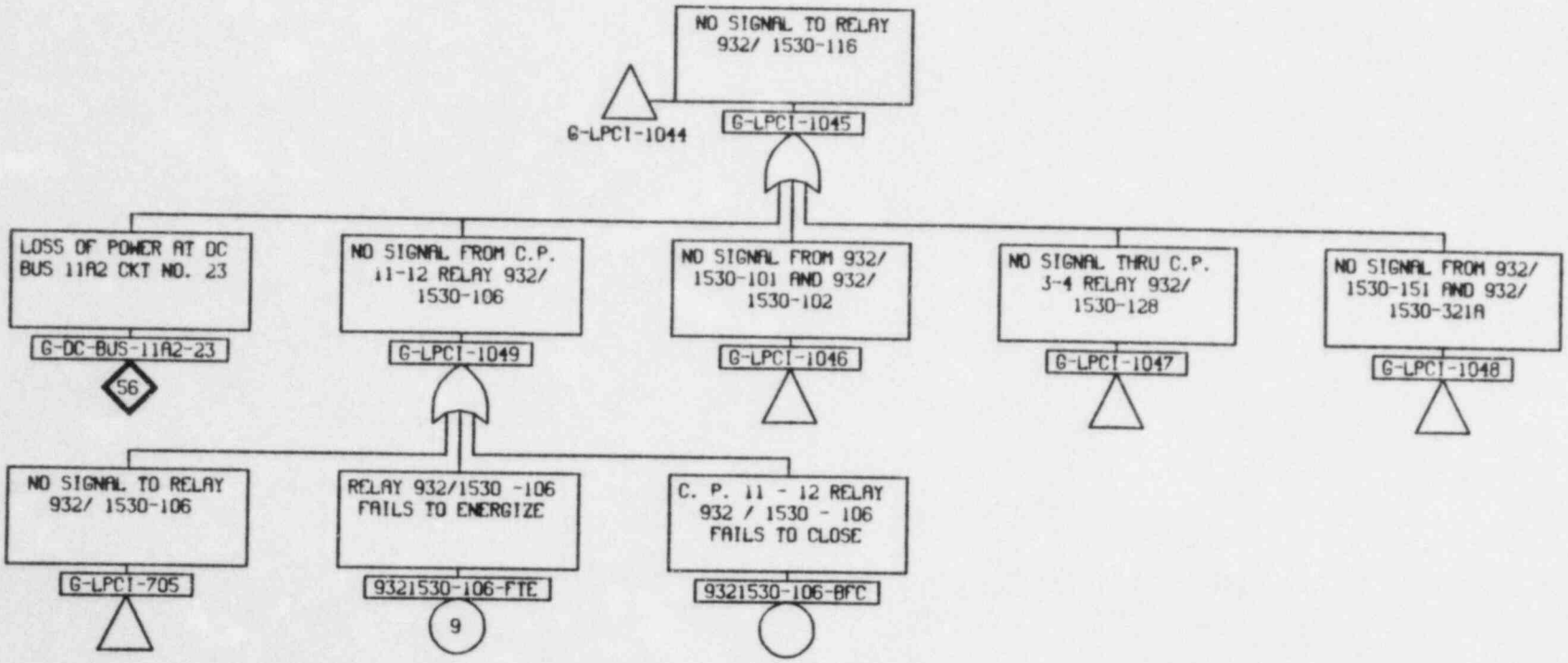

NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-123
G-LPCI-1038
G-LPCI-1023
C.P. 3-4 932/1530-123 FAILS TO REMAIN CLOSED
9321530-123-3RC
RELAY 932/1530-123 FAILS TO REMAIN DEENERGIZED
9321530-123-1RD
INADVERTANT SIGNAL TO RELAY 932/ 1530-123
G-LPCI-1039
C.P. 4-4T SWITCH 903/1530-301A FAILS TO REMAIN OPEN
9031530-301A-4RD
SWITCH 903/1530-301A FAILS CLOSED
9031530-301A-1RD
C.P. 1-2 RELAY 932/1530 -123 FAILS TO REMAIN OPEN
9321530-123-1RD
OPERATOR STOPS PUMP AND FAILS TO RESET
G-LPCI-1040

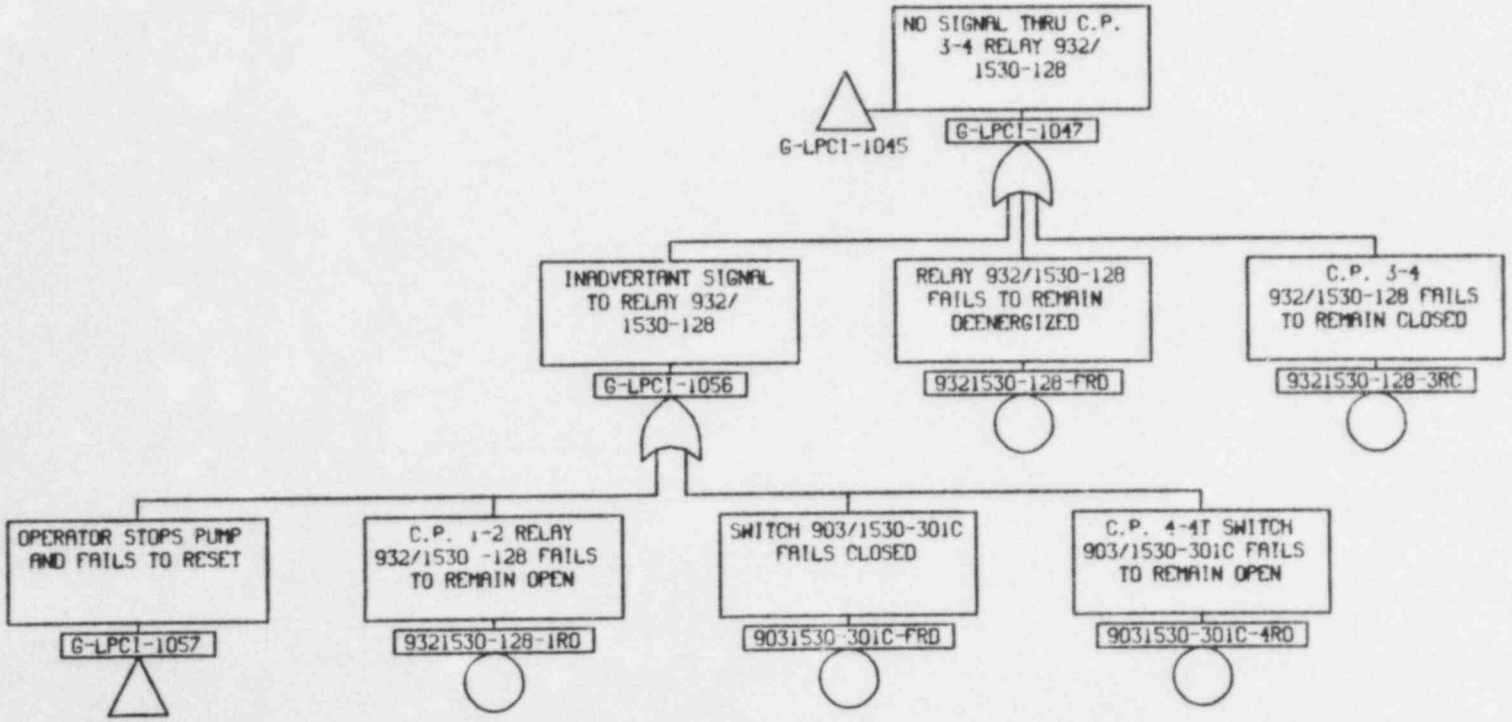

NO SIGNAL TO RELAY 932/ 151
G-LPCI-1026
G-LPCI-1028
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
LNP2 C.P. 9-10 CKT NO. 1 C.P. 15 OPEN
TEST SWITCH 932/ 1530-342 CONTACTS ARE OPEN
G-DC-BUS-11A2-23
G-LPCI-1029
G-LPCI-1030
56
LNP2 FAILS ENERGIZED
C.P. 9-10 RELAY LNP2 FAILS OPEN
LOSS OF NORMAL POWER
C.P. 1-2 932/1530-342 FAILS TO REMAIN CLOSED
SWITCH 932/1530-342 OPEN FOR TEST
926LNP-2-FRD
926LNP-2-9RC
LOSS-OF-NORM-PWR
9321530-342-1RC
9321530-342-TOM
2
2
2
2
2

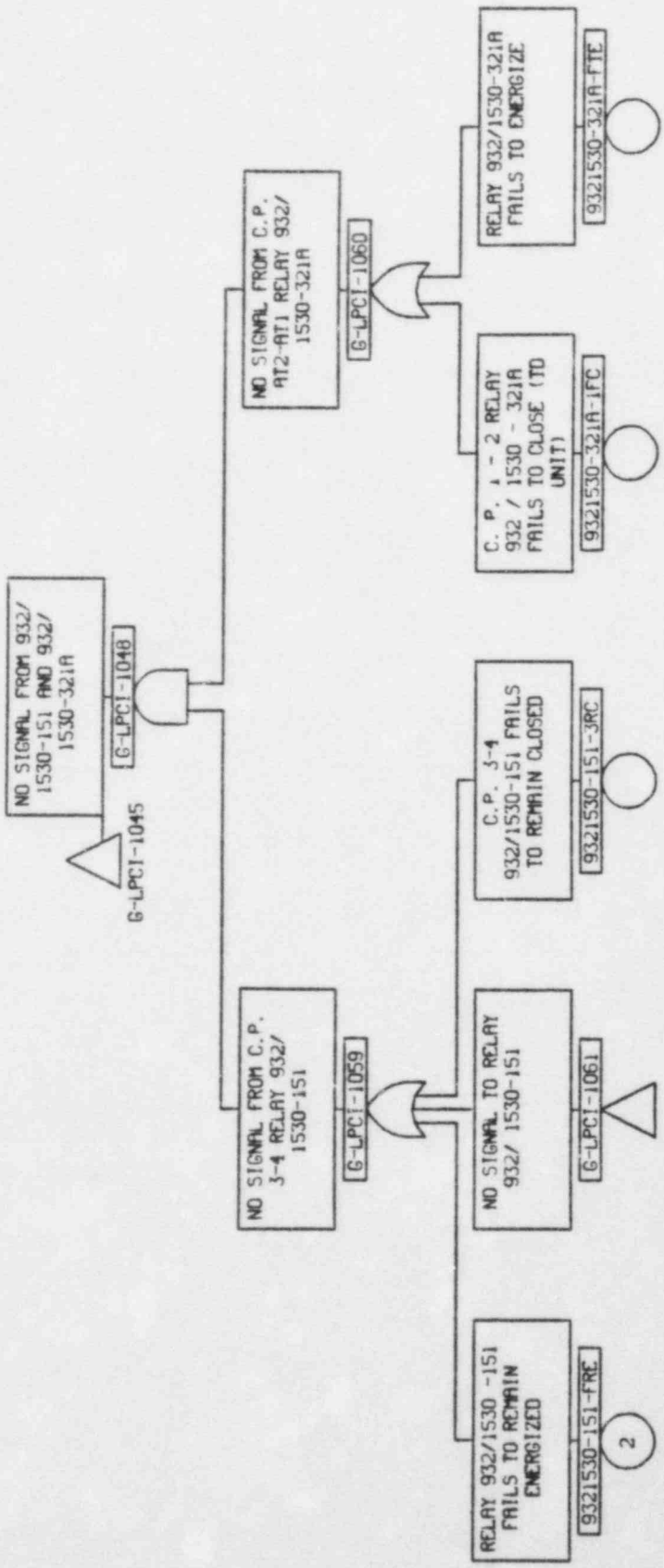

NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-102
G-LPCI-1031
G-LPCI-1033
NO SIGNAL TO RELAY 932/ 1530-102
G-LPCI-1036
C.P. 3-4 932/1530-102 FAILS TO REMAIN CLOSED
9321530-102-3RC
RELAY 932/1530 -102 FAILS TO REMAIN ENERGIZED
9321530-102-FRE
2
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM UNDERVOLTAGE RELAY 27-68
G-LPCI-1037
C.P. 1-2 932/1530-341A FAILS TO REMAIN CLOSED
9321530-341A-1RC
2
SWITCH 932/1530-341A OPEN FOR TEST
9321530-341A-TOM
2
FAILURE OF UNDERVOLTAGE DETECTION BUS 14F
AC-14F-UVD-LOF
4
UNDERVOLTAGE RELAY 27-68 C.P. 5-6 FAILS OPEN
LCL27-68-SRC
2
UNDERVOLTAGE RELAY 27-68 FAILS DE-ENERGIZED
LCL27-68-FRE
2

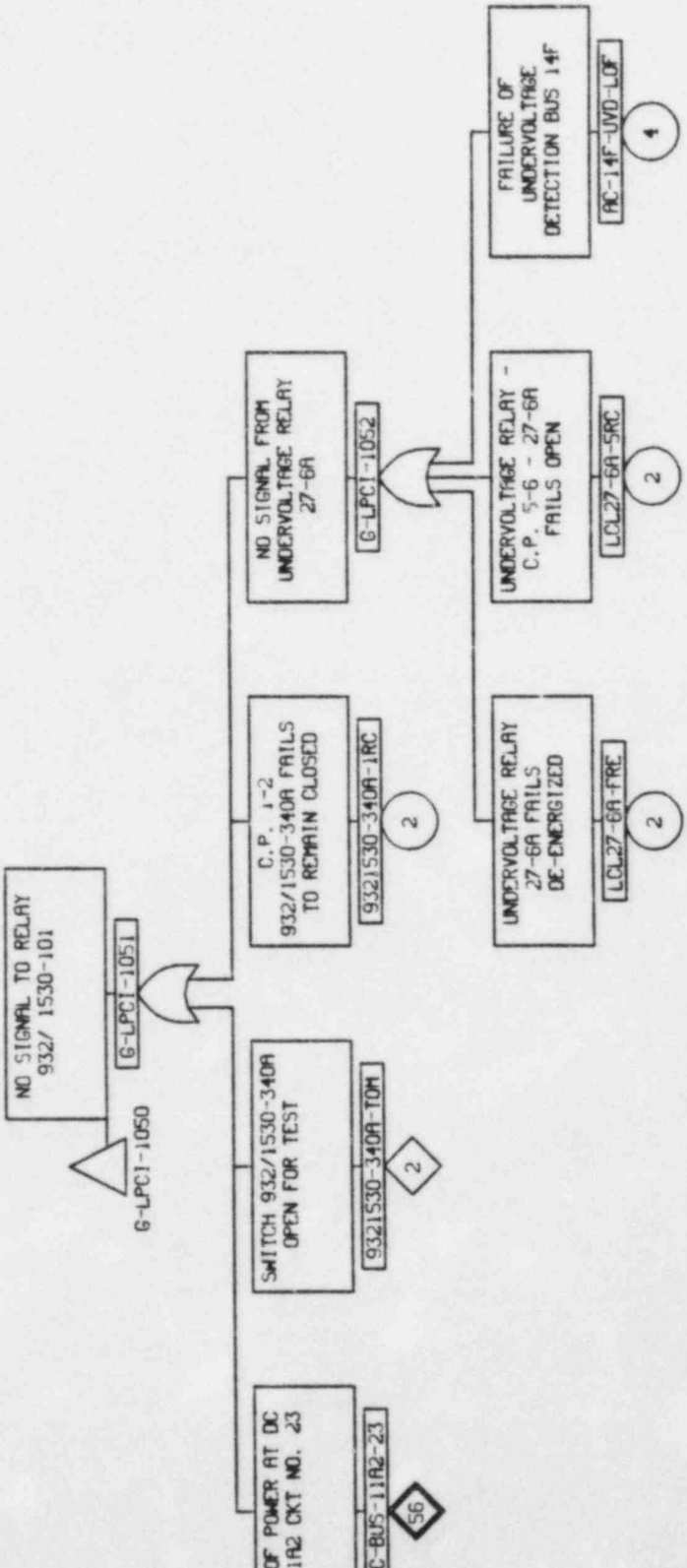

NO SIGNAL TO RELAY 932/ 1530-101
G-LPCI-1032
G-LPCI-1034
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM UNDERVOLTAGE RELAY 27-6A
G-LPCI-1035
SWITCH 932/1530-340A OPEN FOR TEST
9321530-340A-TOM
2
C.P. 1-2 932/1530-340A FAILS TO REMAIN CLOSED
9321530-340A-1RC
2
UNDERVOLTAGE RELAY 27-6A FAILS DE-ENERGIZED
LCL27-6A-FRE
2
UNDERVOLTAGE RELAY - C.P. 5-6 - 27-6A FAILS OPEN
LCL27-6A-5RC
2
FAILURE OF UNDERVOLTAGE DETECTION BUS 14F
AC-14F-UVD-LOF
4
OPERATOR STOPS PUMP AND FAILS TO RESET
G-LPCI-1039
G-LPCI-1040
FAILURE OF C.P. 1-2 RELAY 903/ 1530-336D
G-LPCI-1041
OPERATOR CLOSES SWITCH 903/ 1530-301A ON HI DW PRESS OR LO RX LEVEL
LP-A-MDP-OSP
RESET SWITCH 9031530-336A FAILS CLOSED
9031530-336A-FTE
OPERATOR FAILS TO PUSH RESET 903/1530-336A
9031530-336A-OFR
C.P. 1-2 SW. 903/1530-336A FAILS CLOSED
9031530-336A-1FO

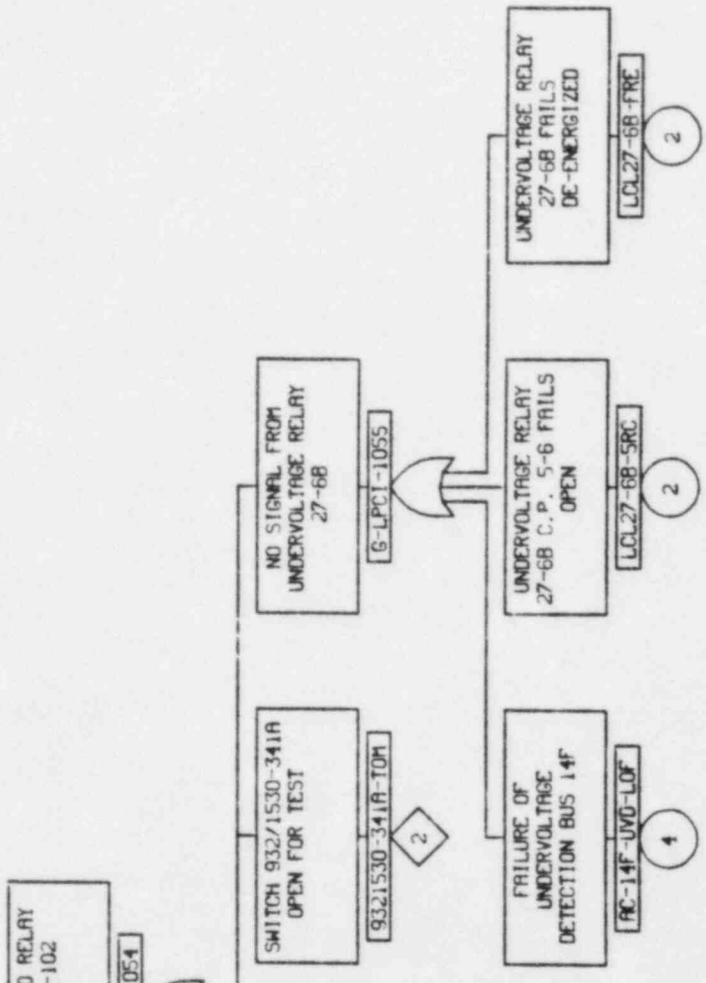

NO CONTROL SIGNAL - TO START - TO PUMP 1502C
G-LPCI-1042
NO SIGNAL TO 4160V BUS 14F CUB NO. 4
G-LPCI-1043
4160V BUS 14F CUB NO. 4 BREAKER FAILS
AC-14F-4-FTC
LOSS OF POWER AT DC BUS 101A CKT 11
G-DC-BUS-A-11
2
NO SIGNAL THRU C.P. 1-2 RELAY 932/ 1530-116
G-LPCI-1044
NO SIGNAL TO RELAY 932/ 1530-116
G-LPCI-1045
RELAY 932/1530 -116 FAILS TO ENERGIZE
9321530-116-FTE
C. P. 1 - 2 RELAY 932 / 1530 - 116 FAILS TO CLOSE
9321530-116-1FC

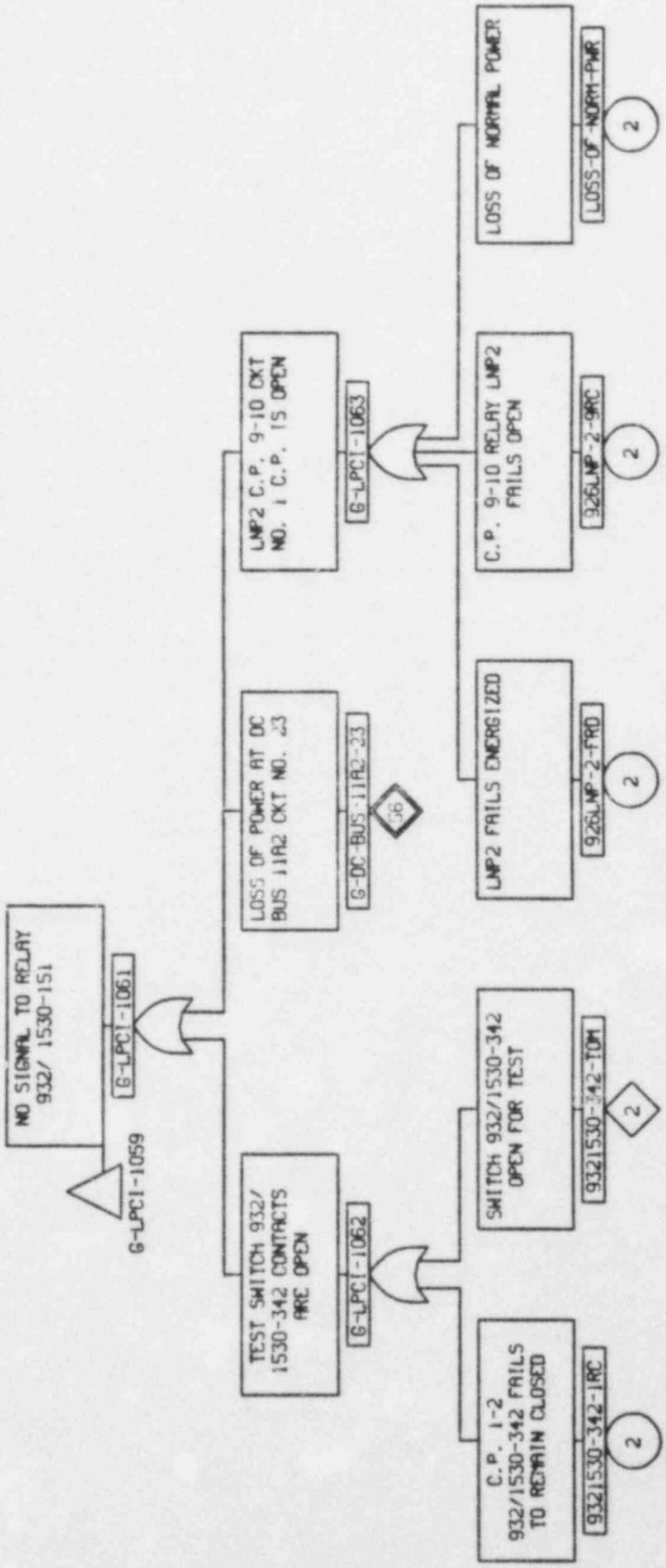

NO SIGNAL TO RELAY 932/ 1530-116
G-LPCI-1044
G-LPCI-1045
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
NO SIGNAL FROM C.P. 11-12 RELAY 932/ 1530-106
G-LPCI-1049
NO SIGNAL FROM 932/ 1530-101 AND 932/ 1530-102
G-LPCI-1046
NO SIGNAL THRU C.P. 3-4 RELAY 932/ 1530-128
G-LPCI-1047
NO SIGNAL FROM 932/ 1530-151 AND 932/ 1530-321A
G-LPCI-1048
NO SIGNAL TO RELAY 932/ 1530-106
G-LPCI-705
RELAY 932/1530 -106 FAILS TO ENERGIZE
9321530-106-FTE
9
C. P. 11 - 12 RELAY 932 / 1530 - 106 FAILS TO CLOSE
9321530-106-BFC

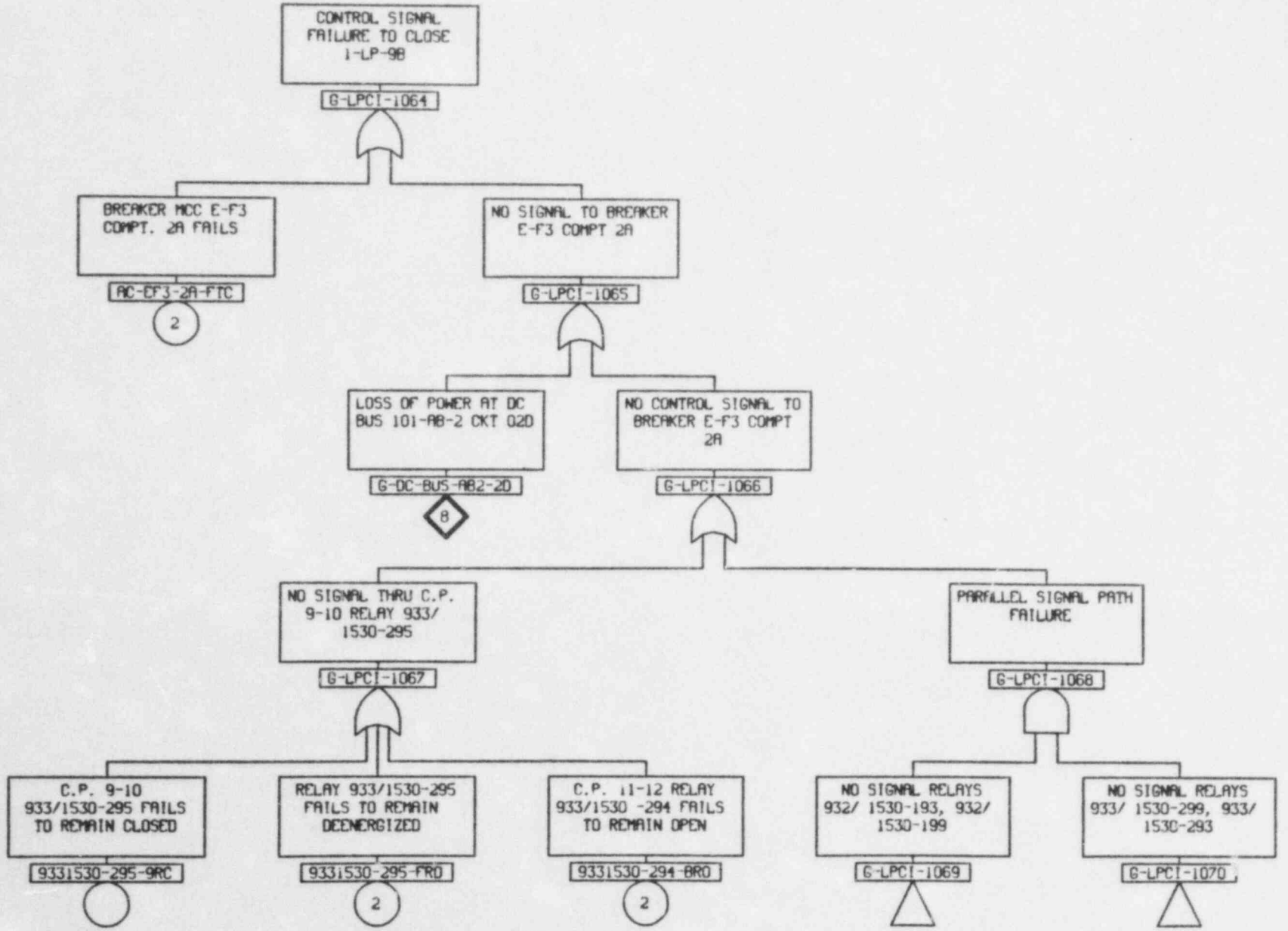

NO SIGNAL THRU C.P.
3-4 RELAY 932/
1530-128
G-LPCI-1045
G-LPCI-1047
INADVERTANT SIGNAL
TO RELAY 932/
1530-128
RELAY 932/1530-128
FAILS TO REMAIN
DEENERGIZED
C.P. 3-4
932/1530-128 FAILS
TO REMAIN CLOSED
G-LPCI-1056
9321530-128-FRD
9321530-128-3RC
OPERATOR STOPS PUMP
AND FAILS TO RESET
C.P. 1-2 RELAY
932/1530 -128 FAILS
TO REMAIN OPEN
SWITCH 903/1530-301C
FAILS CLOSED
C.P. 4-4T SWITCH
903/1530-301C FAILS
TO REMAIN OPEN
G-LPCI-1057
9321530-128-1RO
9031530-301C-FRD
9031530-301C-4RO

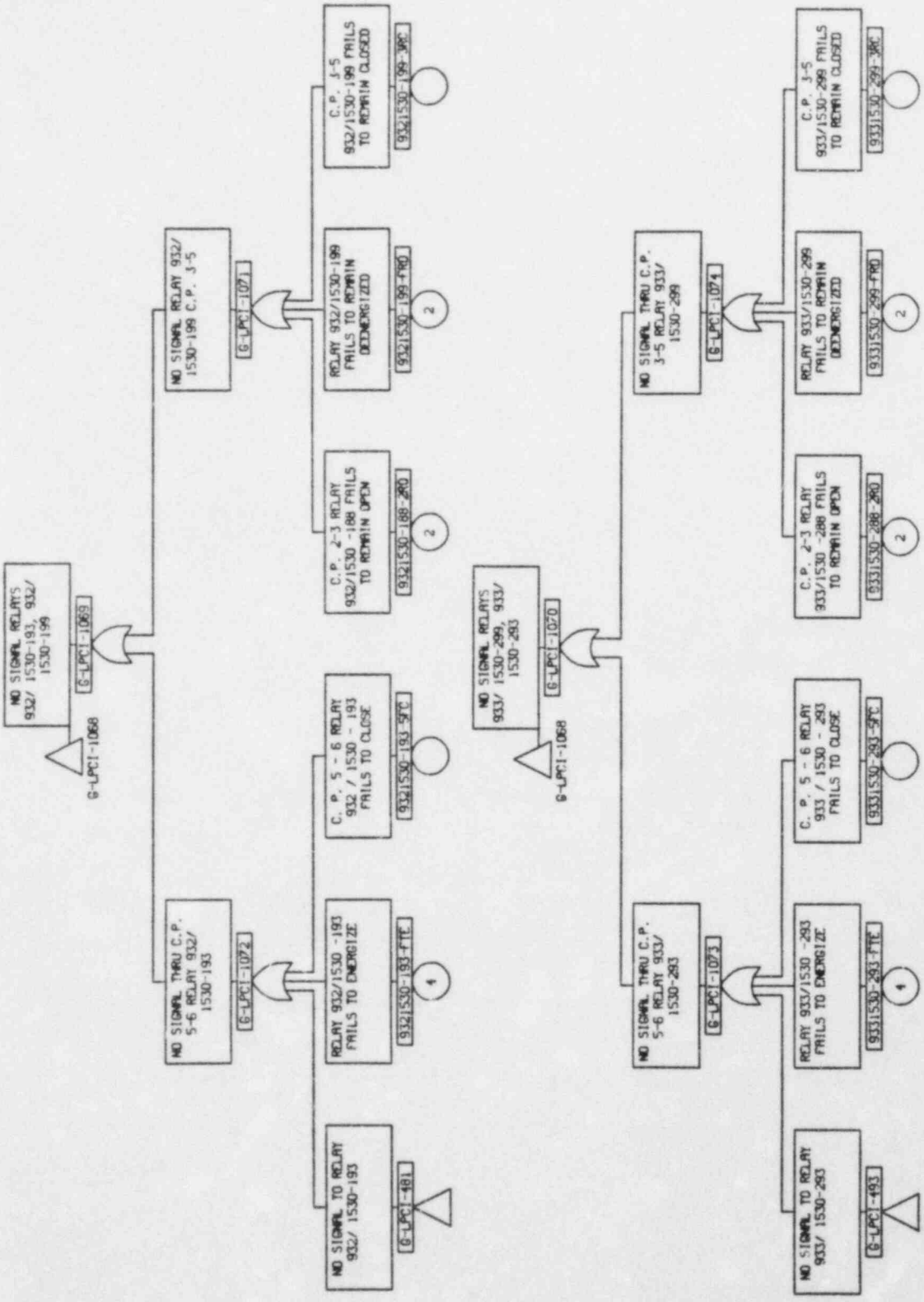

NO SIGNAL FROM 932/ 1530-151 AND 932/ 1530-321A
G-LPCI-1048
G-LPCI-1045
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-151
G-LPCI-1059
NO SIGNAL FROM C.P. A12-AT1 RELAY 932/ 1530-321A
G-LPCI-1060
RELAY 932/1530 -151 FAILS TO REMAIN ENERGIZED
9321530-151-FRE
2
NO SIGNAL TO RELAY 932/ 1530-151
G-LPCI-1061
C.P. 3-4 932/1530-151 FAILS TO REMAIN CLOSED
9321530-151-3RC
C. P. 1 - 2 RELAY 932 / 1530 - 321A FAILS TO CLOSE (TO UNIT)
9321530-321A-1FC
RELAY 932/1530-321A FAILS TO ENERGIZE
9321530-321A-FTE

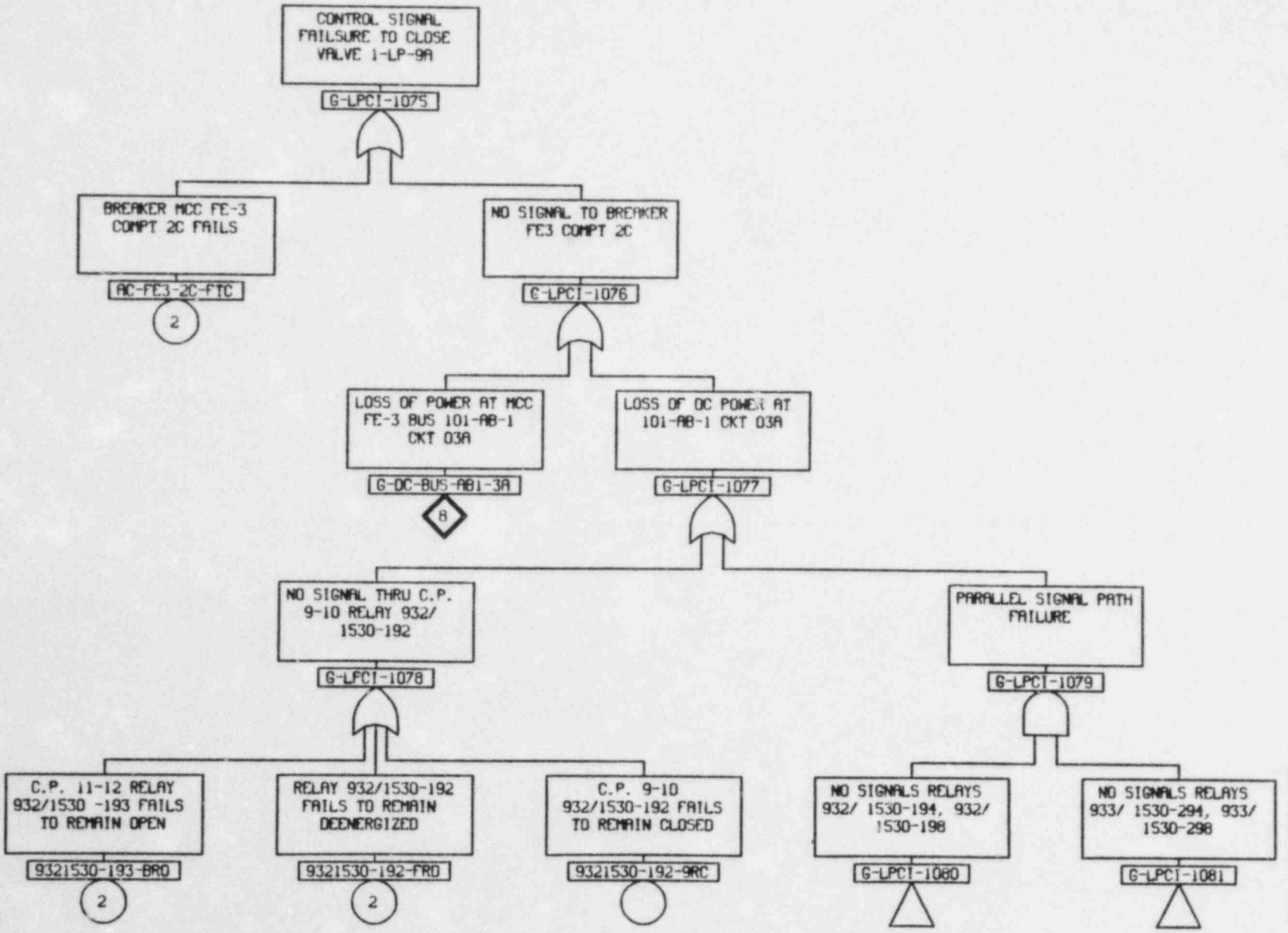

NO SIGNAL TO RELAY 932/ 1530-101
G-LPCI-1051
G-LPCI-1050
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
S6
SWITCH 932/1530-340A OPEN FOR TEST
9321530-340A-TOM
2
C.P. 1-2 932/1530-340A FAILS TO REMAIN CLOSED
9321530-340A-1RC
2
NO SIGNAL FROM UNDERVOLTAGE RELAY 27-6A
G-LPCI-1052
UNDERVOLTAGE RELAY 27-6A FAILS DE-ENERGIZED
LCL27-6A-FRE
2
UNDERVOLTAGE RELAY - C.P. 5-6 - 27-6A FAILS OPEN
LCL27-6A-SRC
2
FAILURE OF UNDERVOLTAGE DETECTION BUS 14F
AC-14F-UVD-LOF
4

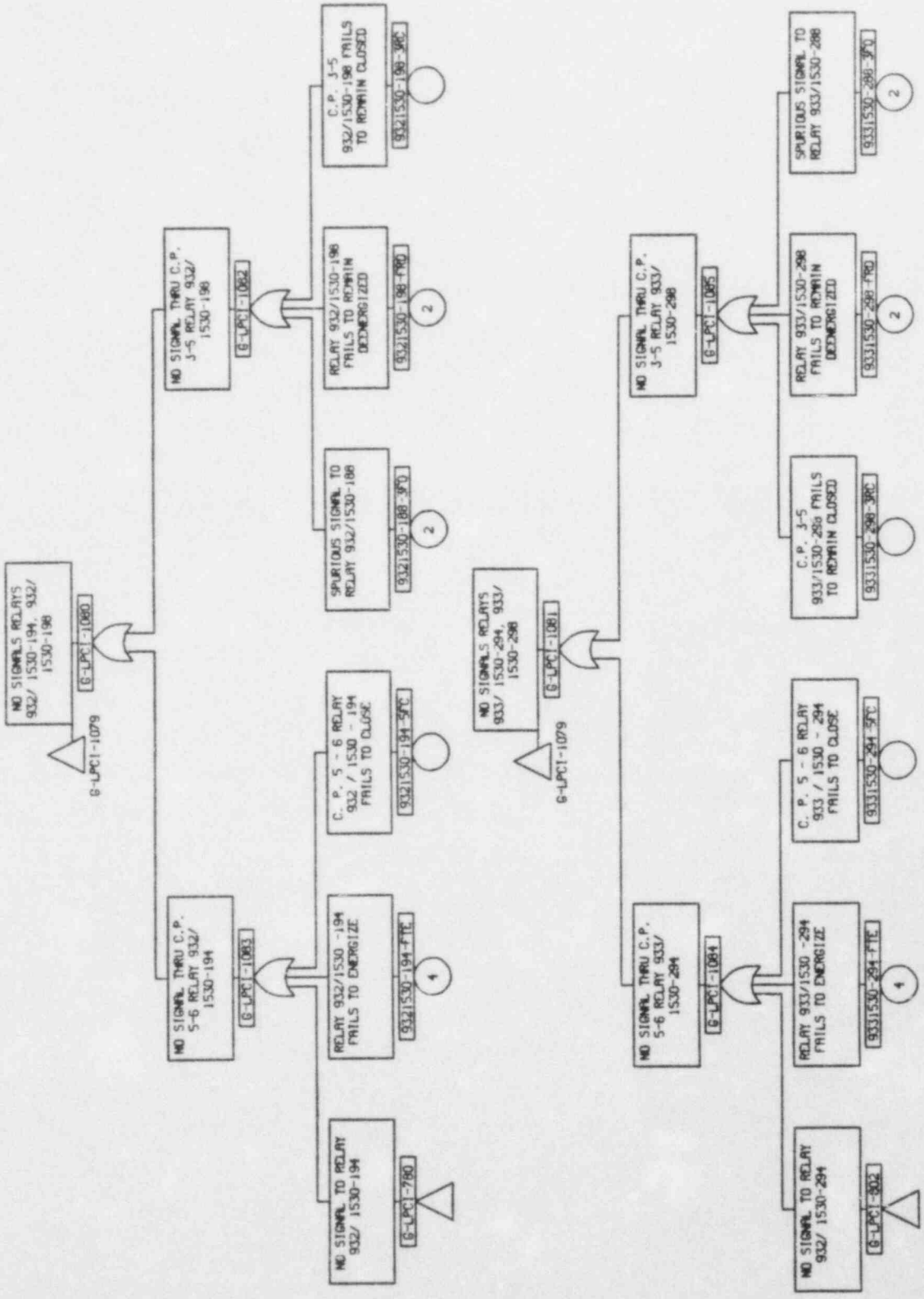

NO SIGNAL TO RELAY
932/ 1530-102
G-LPCI-1053
G-LPCI-1054
LOSS OF POWER AT DC
BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
56
C.P. i-2
932/1530-341A FAILS
TO REMAIN CLOSED
9321530-341A-1RC
2
SWITCH 932/1530-341A
OPEN FOR TEST
9321530-341A-TOM
2
NO SIGNAL FROM
UNDERVOLTAGE RELAY
27-68
G-LPCI-1055
FAILURE OF
UNDERVOLTAGE
DETECTION BUS 14F
RC-14F-UVD-LOF
4
UNDERVOLTAGE RELAY
27-68 C.P. 5-6 FAILS
OPEN
LCL27-68-SRC
2
UNDERVOLTAGE RELAY
27-68 FAILS
DE-ENERGIZED
LCL27-68-FRE
2

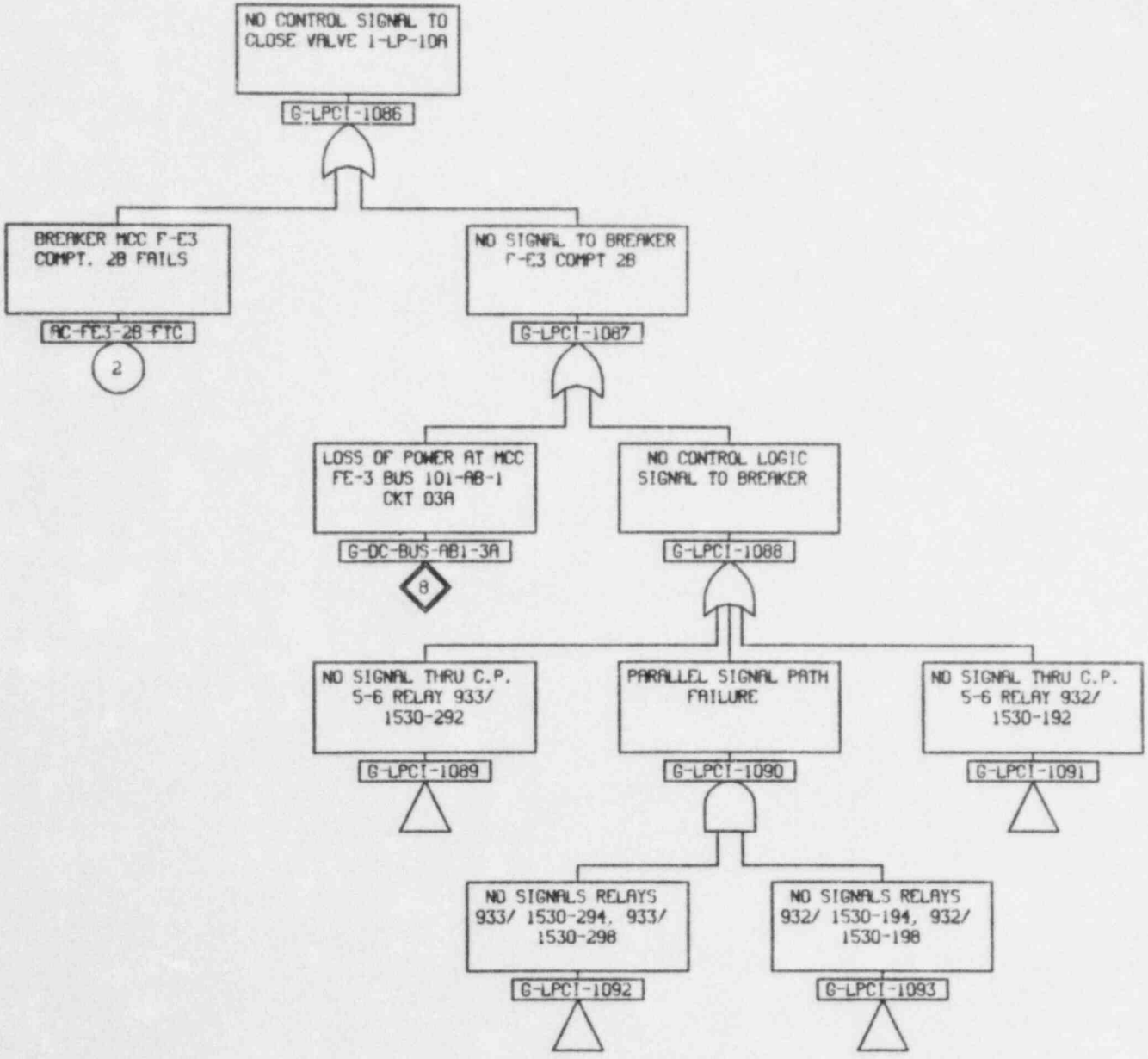

NO SIGNAL TO RELAY 932/ 1530-151
G-LPCI-1061
G-LPCI-1059
TEST SWITCH 932/ 1530-342 CONTACTS ARE OPEN
G-LPCI-1062
LOSS OF POWER AT DC BUS 11A2 CKT NO. 23
G-DC-BUS-11A2-23
36
LNP2 C.P. 9-10 CKT NO. 1 C.P. IS OPEN
G-LPCI-1063
SWITCH 932/1530-342 OPEN FOR TEST
93215330-342-TOM
2
C.P. 1-2 932/1530-342 FAILS TO REMAIN CLOSED
93215330-342-1RC
2
LNP2 FAILS ENERGIZED
926LNP-2-FRD
2
C.P. 9-10 RELAY LNP2 FAILS OPEN
926LNP-2-9RC
2
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
2

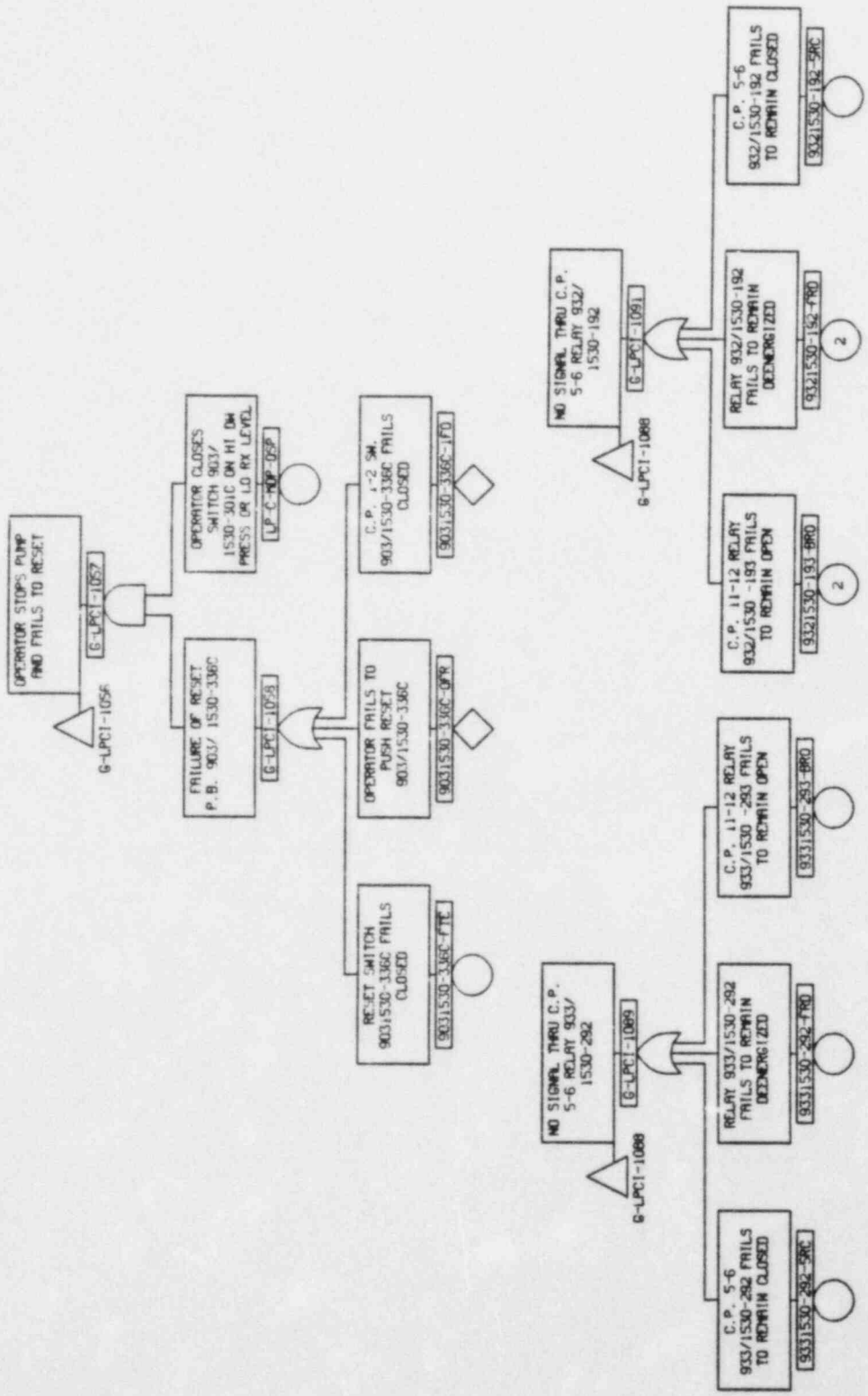

CONTROL SIGNAL FAILURE TO CLOSE 1-LP-9B
G-LPCI-1064
BREAKER MCC E-F3 COMPT. 2A FAILS
AC-EF3-2A-FTC
2
NO SIGNAL TO BREAKER E-F3 COMPT 2A
G-LPCI-1065
LOSS OF POWER AT DC BUS 101-AB-2 CKT 02D
G-DC-BUS-AB2-2D
8
NO CONTROL SIGNAL TO BREAKER E-F3 COMPT 2A
G-LPCI-1066
NO SIGNAL THRU C.P. 9-10 RELAY 933/ 1530-295
G-LPCI-1067
PARALLEL SIGNAL PATH FAILURE
G-LPCI-1068
C.P. 9-10 933/1530-295 FAILS TO REMAIN CLOSED
9331530-295-9RC
RELAY 933/1530-295 FAILS TO REMAIN DEENERGIZED
9331530-295-FRD
2
C.P. 11-12 RELAY 933/1530 -294 FAILS TO REMAIN OPEN
9331530-294-BRO
2
NO SIGNAL RELAYS 932/ 1530-193, 932/ 1530-199
G-LPCI-1069
NO SIGNAL RELAYS 933/ 1530-299, 933/ 1530-293
G-LPCI-1070

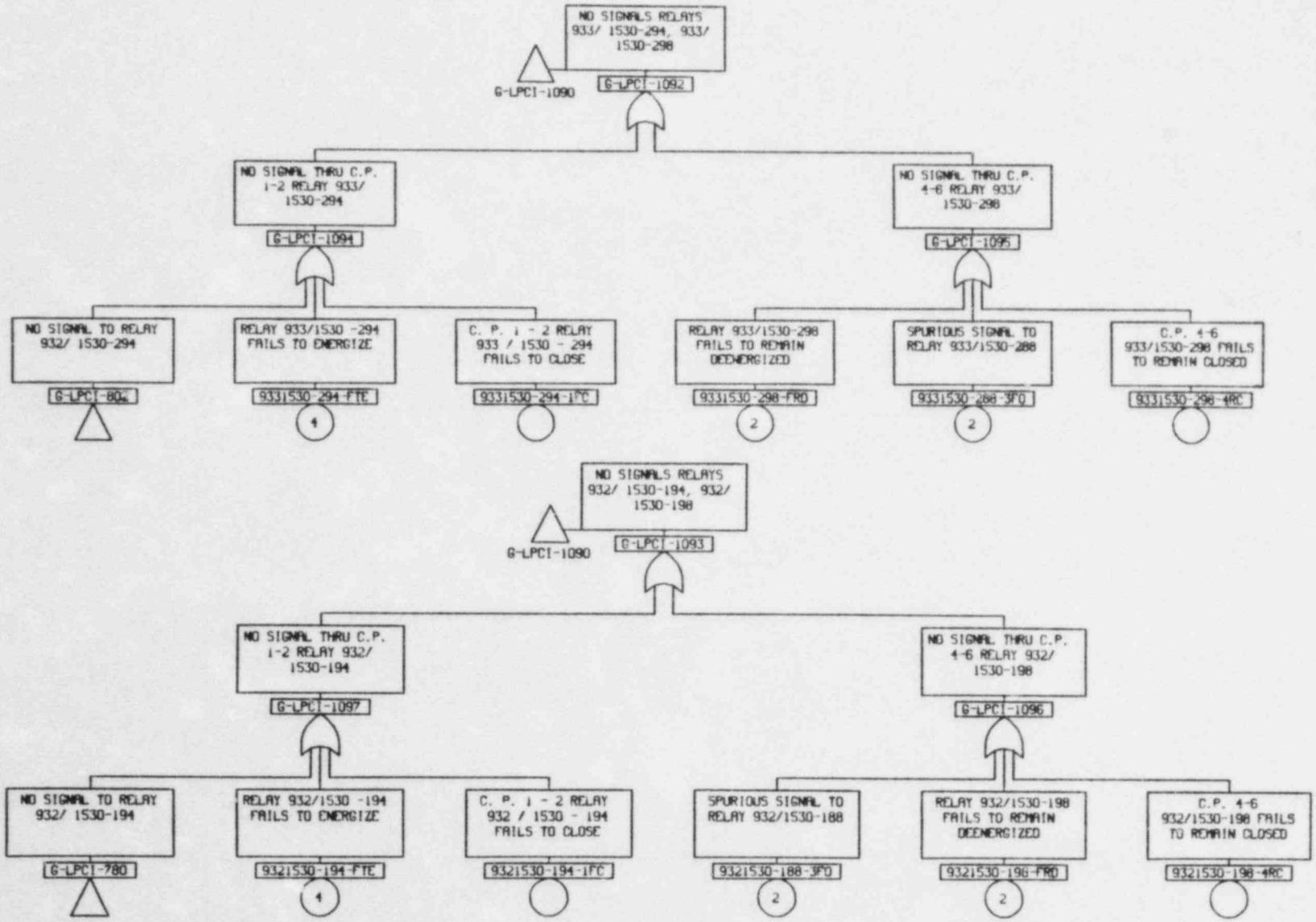

NO SIGNAL RELAYS 932/ 1530-193, 932/ 1530-199
G-LPCI-1068
G-LPCI-1069
NO SIGNAL RELAY 932/ 1530-199 C.P. J-5
G-LPCI-1071
C.P. J-5 932/1530-199 FAILS TO REMAIN CLOSED
932/1530-199-SPC
RELAY 932/1530-199 FAILS TO REMAIN DEENERGIZED
932/1530-199-FRD
2
C.P. 2-3 RELAY 932/1530 -188 FAILS TO REMAIN OPEN
932/1530-188-2RO
2
C. P. 5 - 6 RELAY 932 / 1530 - 193 FAILS TO CLOSE
932/1530-193-SPC
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-193
G-LPCI-1072
RELAY 932/1530 -193 FAILS TO ENERGIZE
932/1530-193-FTE
1
NO SIGNAL TO RELAY 932/ 1530-193
G-LPCI-481
NO SIGNAL RELAYS 933/ 1530-299, 933/ 1530-293
G-LPCI-1070
G-LPCI-1068
NO SIGNAL THRU C.P. J-5 RELAY 933/ 1530-299
G-LPCI-1074
C.P. J-5 933/1530-299 FAILS TO REMAIN CLOSED
933/1530-299-SPC
RELAY 933/1530-299 FAILS TO REMAIN DEENERGIZED
933/1530-299-FRD
2
C.P. 2-3 RELAY 933/1530 -288 FAILS TO REMAIN OPEN
933/1530-288-2RO
2
C. P. 5 - 6 RELAY 933 / 1530 - 293 FAILS TO CLOSE
933/1530-293-SPC
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-293
G-LPCI-1073
RELAY 933/1530 -293 FAILS TO ENERGIZE
933/1530-293-FTE
1
NO SIGNAL TO RELAY 933/ 1530-293
G-LPCI-493

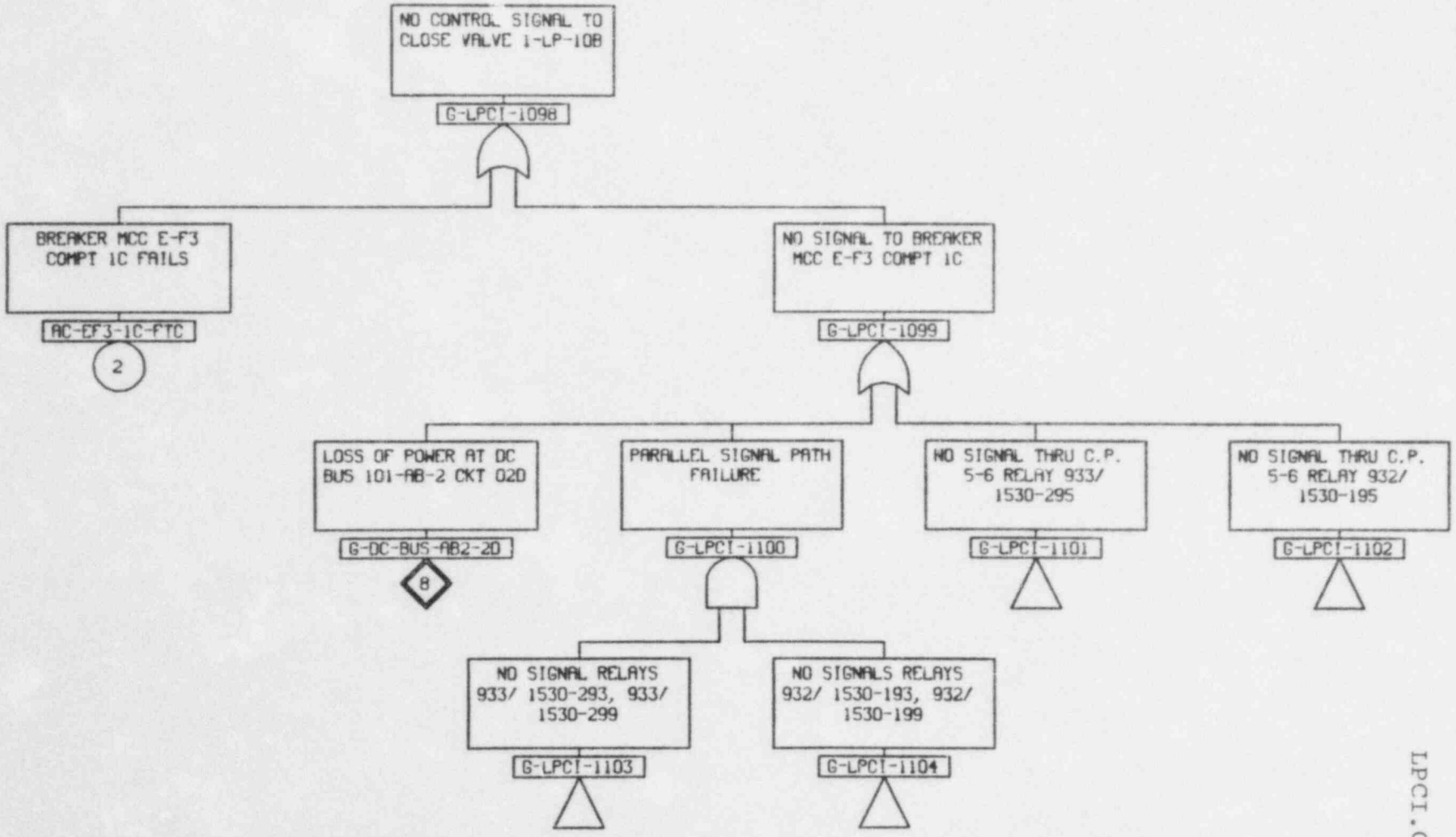

CONTROL SIGNAL FAILSURE TO CLOSE VALVE 1-LP-9A
G-LPCI-1075
BREAKER MCC FE-3 COMPT 2C FAILS
AC-FE3-2C-FTC
2
NO SIGNAL TO BREAKER FE3 COMPT 2C
G-LPCI-1076
LOSS OF POWER AT MCC FE-3 BUS 101-AB-1 CKT 03A
G-DC-BUS-AB1-3A
8
LOSS OF DC POWER AT 101-AB-1 CKT 03A
G-LPCI-1077
NO SIGNAL THRU C.P. 9-10 RELAY 932/ 1530-192
G-LPCI-1078
PARALLEL SIGNAL PATH FAILURE
G-LPCI-1079
C.P. 11-12 RELAY 932/1530 -193 FAILS TO REMAIN OPEN
9321530-193-BRO
2
RELAY 932/1530-192 FAILS TO REMAIN DEENERGIZED
9321530-192-FRD
2
C.P. 9-10 932/1530-192 FAILS TO REMAIN CLOSED
9321530-192-9RC
NO SIGNALS RELAYS 932/ 1530-194, 932/ 1530-198
G-LPCI-1080
NO SIGNALS RELAYS 933/ 1530-294, 933/ 1530-298
G-LPCI-1081

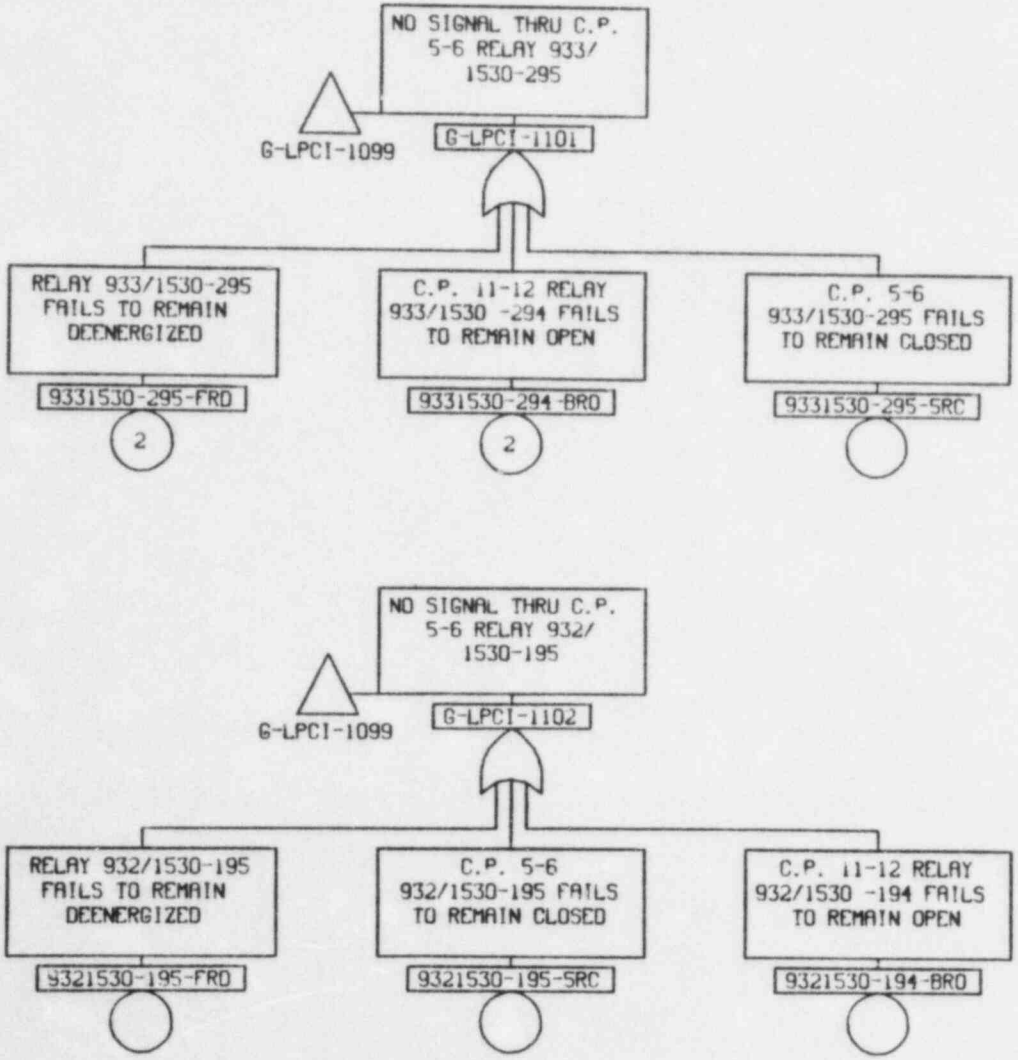

NO SIGNALS RELAYS 932/ 1530-194, 932/ 1530-198
G-LPCI-1080
G-LPCI-1079
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-194
G-LPCI-1083
NO SIGNAL THRU C.P. J-5 RELAY 932/ 1530-198
G-LPCI-1082
NO SIGNAL TO RELAY 932/ 1530-194
G-LPCI-780
RELAY 932/1530 -194 FAILS TO ENERGIZE
932/1530-194-FTE
1
C. P. 5 - 6 RELAY 932 / 1530 - 194 FAILS TO CLOSE
932/1530-194-SPC
RELAY 932/1530-198 FAILS TO REMAIN DEENERGIZED
932/1530-198-FRD
2
SPURIOUS SIGNAL TO RELAY 932/1530-188
932/1530-188-SPO
2
C.P. J-5 932/1530-198 FAILS TO REMAIN CLOSED
932/1530-198-SPC
NO SIGNALS RELAYS 933/ 1530-294, 933/ 1530-298
G-LPCI-1081
G-LPCI-1079
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-294
G-LPCI-1084
NO SIGNAL THRU C.P. J-5 RELAY 933/ 1530-298
G-LPCI-1085
NO SIGNAL TO RELAY 932/ 1530-294
G-LPCI-802
RELAY 933/1530 -294 FAILS TO ENERGIZE
933/1530-294-FTE
1
C. P. 5 - 6 RELAY 933 / 1530 - 294 FAILS TO CLOSE
933/1530-294-SPC
RELAY 933/1530-298 FAILS TO REMAIN DEENERGIZED
933/1530-298-FRD
2
C.P. J-5 933/1530-298 FAILS TO REMAIN CLOSED
933/1530-298-SPC
SPURIOUS SIGNAL TO RELAY 933/1530-288
933/1530-288-SPO
2

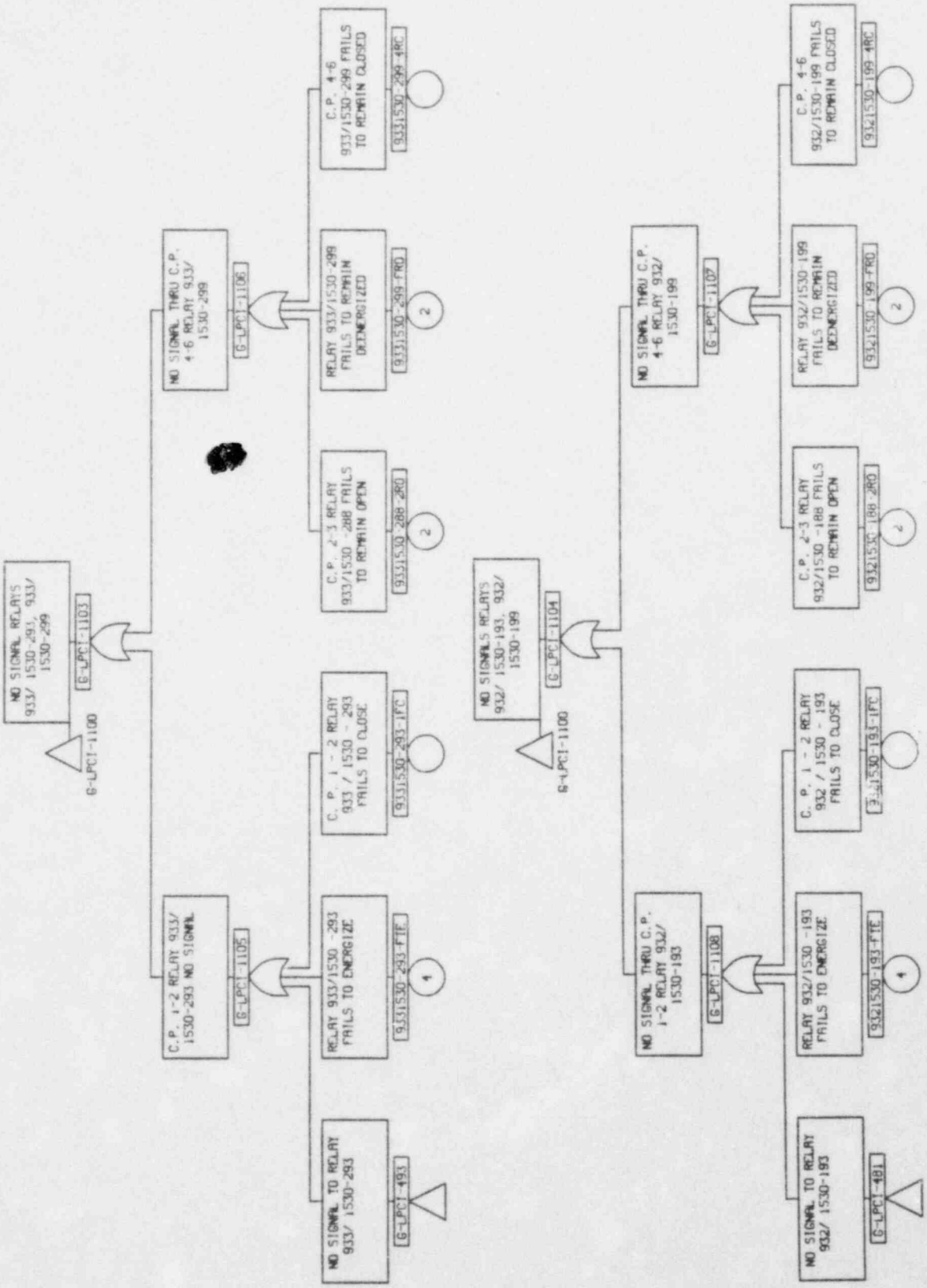

NO CONTROL SIGNAL TO CLOSE VALVE 1-LP-10A
G-LPCI-1086
BREAKER MCC F-E3 COMPT. 2B FAILS
AC-FE3-2B-FTC
2
NO SIGNAL TO BREAKER F-E3 COMPT 2B
G-LPCI-1087
LOSS OF POWER AT MCC FE-3 BUS 101-AB-1 CKT 03A
G-DC-BUS-AB1-3A
8
NO CONTROL LOGIC SIGNAL TO BREAKER
G-LPCI-1088
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-292
G-LPCI-1089
PARALLEL SIGNAL PATH FAILURE
G-LPCI-1090
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-192
G-LPCI-1091
NO SIGNALS RELAYS 933/ 1530-294, 933/ 1530-298
G-LPCI-1092
NO SIGNALS RELAYS 932/ 1530-194, 932/ 1530-198
G-LPCI-1093

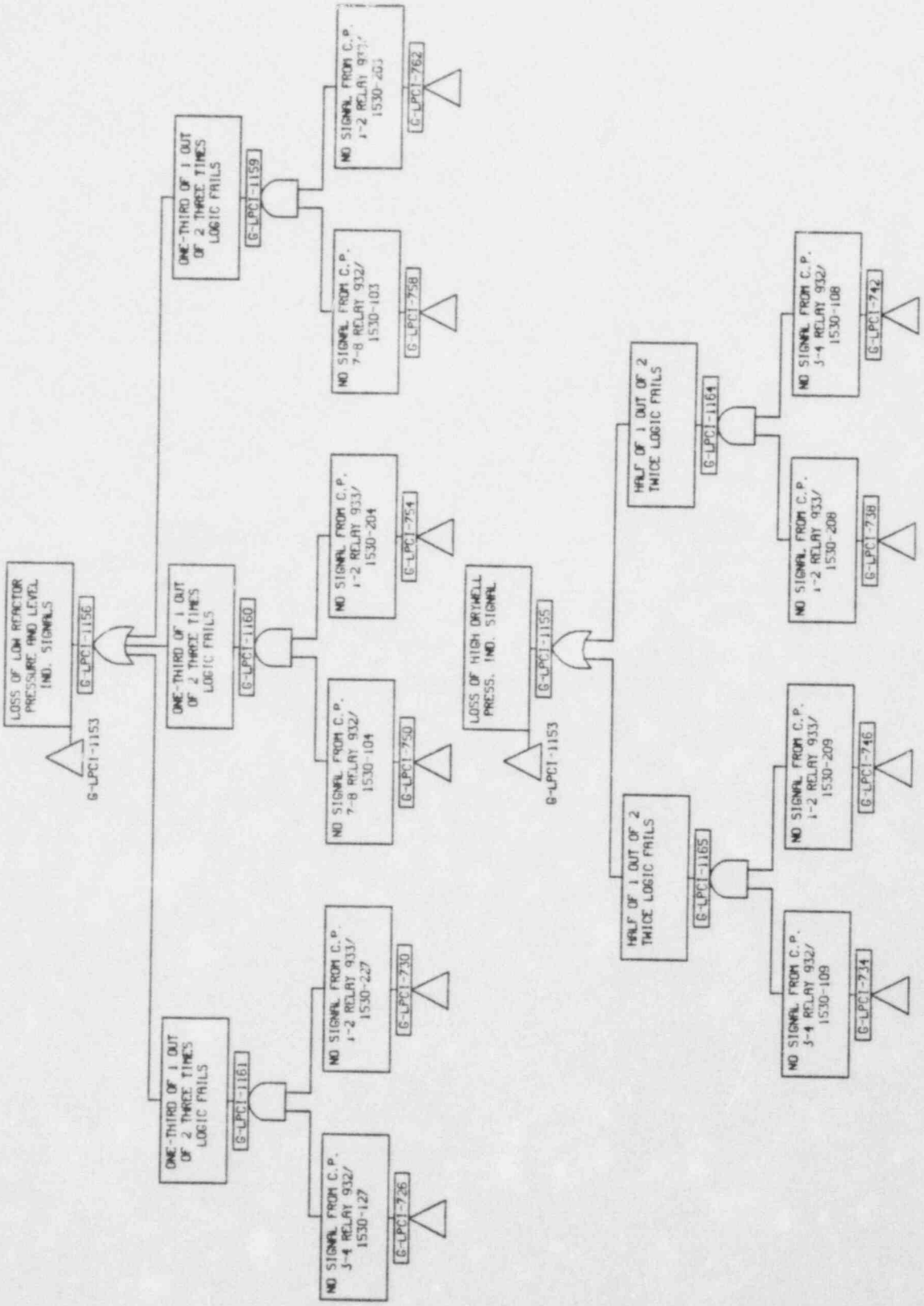

OPERATOR STOPS PUMP AND FAILS TO RESET
G-LPCI-1057
G-LPCI-1056
FAILURE OF RESET P.B. 903/ 1530-336C
OPERATOR CLOSES SWITCH 903/ 1530-301C ON HI DW PRESS OR LO RX LEVEL
G-LPCI-1058
LP-C-PUMP-DSF
OPERATOR FAILS TO PUSH RESET 903/1530-336C
903I1530-336C-OPR
RESET SWITCH 903I1530-336C FAILS CLOSED
903I1530-336C-FTR
C.P. 1-2 SW. 903/1530-336C FAILS CLOSED
903I1530-336C-1FO
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-192
G-LPCI-1091
G-LPCI-1088
RELAY 932/1530-192 FAILS TO REMAIN DEENERGIZED
932I1530-192-FRD
2
C.P. 5-6 932/1530-192 FAILS TO REMAIN CLOSED
932I1530-192-SMC
C.P. 11-12 RELAY 932/1530 -193 FAILS TO REMAIN OPEN
932I1530-193-FRO
2
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-292
G-LPCI-1089
G-LPCI-1088
RELAY 933/1530-292 FAILS TO REMAIN DEENERGIZED
933I1530-292-FRD
C.P. 11-12 RELAY 933/1530 -293 FAILS TO REMAIN OPEN
933I1530-293-FRO
C.P. 5-6 933/1530-292 FAILS TO REMAIN CLOSED
933I1530-292-SMC


NO SIGNALS RELAYS 933/ 1530-294, 933/ 1530-298
G-LPCI-1090
G-LPCI-1092
NO SIGNAL THRU C.P. 1-2 RELAY 933/ 1530-294
G-LPCI-1094
NO SIGNAL THRU C.P. 4-6 RELAY 933/ 1530-298
G-LPCI-1095
NO SIGNAL TO RELAY 932/ 1530-294
G-LPCI-80%
RELAY 933/1530 -294 FAILS TO ENERGIZE
9331530-294-FTE
C. P. 1 - 2 RELAY 933 / 1530 - 294 FAILS TO CLOSE
9331530-294-1FC
RELAY 933/1530-298 FAILS TO REMAIN DEENERGIZED
9331530-298-FRD
SPURIOUS SIGNAL TO RELAY 933/1530-288
9331530-288-SPO
C.P. 4-6 933/1530-298 FAILS TO REMAIN CLOSED
9331530-298-4RC
NO SIGNALS RELAYS 932/ 1530-194, 932/ 1530-198
G-LPCI-1090
G-LPCI-1093
NO SIGNAL THRU C.P. 1-2 RELAY 932/ 1530-194
G-LPCI-1097
NO SIGNAL THRU C.P. 4-6 RELAY 932/ 1530-198
G-LPCI-1096
NO SIGNAL TO RELAY 932/ 1530-194
G-LPCI-780
RELAY 932/1530 -194 FAILS TO ENERGIZE
9321530-194-FTE
C. P. 1 - 2 RELAY 932 / 1530 - 194 FAILS TO CLOSE
9321530-194-1FC
SPURIOUS SIGNAL TO RELAY 932/1530-188
9321530-188-SPO
RELAY 932/1530-198 FAILS TO REMAIN DEENERGIZED
9321530-198-FRD
C.P. 4-6 932/1530-198 FAILS TO REMAIN CLOSED
9321530-198-4RC


NO CONTROL SIGNAL TO CLOSE VALVE 1-LP-108
G-LPCI-1098
BREAKER MCC E-F3 COMPT 1C FAILS
AC-EF3-1C-FTC
2
NO SIGNAL TO BREAKER MCC E-F3 COMPT 1C
G-LPCI-1099
LOSS OF POWER AT DC BUS 101-AB-2 CKT 02D
G-DC-BUS-AB2-2D
8
PARALLEL SIGNAL PATH FAILURE
G-LPCI-1100
NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-295
G-LPCI-1101
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-195
G-LPCI-1102
NO SIGNAL RELAYS 933/ 1530-293, 933/ 1530-299
G-LPCI-1103
NO SIGNALS RELAYS 932/ 1530-193, 932/ 1530-199
G-LPCI-1104


NO SIGNAL THRU C.P. 5-6 RELAY 933/ 1530-295
G-LPCI-1099
G-LPCI-1101
RELAY 933/1530-295 FAILS TO REMAIN DEENERGIZED
C.P. 11-12 RELAY 933/1530 -294 FAILS TO REMAIN OPEN
C.P. 5-6 933/1530-295 FAILS TO REMAIN CLOSED
9331530-295-FRD
9331530-294-BRO
9331530-295-SRC
2
2
NO SIGNAL THRU C.P. 5-6 RELAY 932/ 1530-195
G-LPCI-1099
G-LPCI-1102
RELAY 932/1530-195 FAILS TO REMAIN DEENERGIZED
C.P. 5-6 932/1530-195 FAILS TO REMAIN CLOSED
C.P. 11-12 RELAY 932/1530 -194 FAILS TO REMAIN OPEN
9321530-195-FRD
9321530-195-SRC
9321530-194-BRO


NO SIGNAL RELAYS 933/ 1530-293, 933/ 1530-299
G-LPCI-1103
G-LPCI-1100
NO SIGNAL THRU C.P. 4-6 RELAY 933/ 1530-299
G-LPCI-1106
C.P. 4-6 933/1530-299 FAILS TO REMAIN CLOSED
933J1530-299-4BC
RELAY 933/1530-299 FAILS TO REMAIN DEENERGIZED
933J1530-299-FRO
2
C.P. 2-3 RELAY 933/1530 -288 FAILS TO REMAIN OPEN
933J1530-288-2RO
2
C.P. 1 - 2 RELAY 933 / 1530 - 293 FAILS TO CLOSE
933J1530-293-1FC
C.P. 1-2 RELAY 933/ 1530-293 NO SIGNAL
G-LPCI-1105
RELAY 933/1530 -293 FAILS TO ENERGIZE
933J1530-293-FTE
1
NO SIGNAL TO RELAY 933/ 1530-293
G-LPCI-493
NO SIGNALS RELAYS 932/ 1530-193, 932/ 1530-199
G-LPCI-1104
G-LPCI-1100
NO SIGNAL THRU C.P. 4-6 RELAY 932/ 1530-199
G-LPCI-1107
C.P. 4-6 932/1530-199 FAILS TO REMAIN CLOSED
932J1530-199-4BC
RELAY 932/1530-199 FAILS TO REMAIN DEENERGIZED
932J1530-199-FRO
2
C.P. 2-3 RELAY 932/1530 -188 FAILS TO REMAIN OPEN
932J1530-188-2RO
2
C.P. 1 - 2 RELAY 932 / 1530 - 193 FAILS TO CLOSE
932J1530-193-1FC
NO SIGNAL THRU C.P. 1-2 RELAY 932/ 1530-193
G-LPCI-1108
RELAY 932/1530 -193 FAILS TO ENERGIZE
932J1530-193-FTE
1
NO SIGNAL TO RELAY 932/ 1530-193
G-LPCI-481


LOSS OF LOW REACTOR PRESSURE AND LEVEL IND. SIGNALS
G-LPCI-1156
G-LPCI-1153
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-1159
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-203
G-LPCI-762
NO SIGNAL FROM C.P. 7-8 RELAY 932/ 1530-103
G-LPCI-758
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-1160
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-204
G-LPCI-754
NO SIGNAL FROM C.P. 7-8 RELAY 932/ 1530-104
G-LPCI-750
ONE-THIRD OF 1 OUT OF 2 THREE TIMES LOGIC FAILS
G-LPCI-1161
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-227
G-LPCI-730
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-127
G-LPCI-726
LOSS OF HIGH DRYWELL PRESS. IND. SIGNAL
G-LPCI-1155
G-LPCI-1153
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-1164
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-108
G-LPCI-742
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-208
G-LPCI-738
HALF OF 1 OUT OF 2 TWICE LOGIC FAILS
G-LPCI-1165
NO SIGNAL FROM C.P. 1-2 RELAY 933/ 1530-209
G-LPCI-746
NO SIGNAL FROM C.P. 3-4 RELAY 932/ 1530-109
G-LPCI-734

# APPENDIX B.6

# ISOLATION CONDENSER SYSTEM

## B.6.1. Isolation Condenser System Description

### B.6.1.1 Purpose

The purpose of the isolation condenser system is to remove fission-product decay heat after a reactor "isolation scram," when the main turbine condenser is not available as a heat sink, or when all feedwater flow is lost.

### B.6.1.2 Description

The Isolation Condenser System operates by natural circulation without the need for driving power other than the DC electrical system. The system consists of a condenser, associated piping, four motor operated isolation valves, and necessary instrumentation and controls (see Figures B.6-1 and B.6-2). The condenser consists of two tube bundles immersed in a large water storage vessel. Additional water is available for makeup to the isolation condenser.

When the isolation condenser system is in operation, steam flows from the reactor through the tubes of the condenser. After condensing, the condensate returns by gravity to the reactor. The isolation condenser is located high in the reactor building to facilitate natural circulation. The two isolation valves on the steam inlet line are normally open so that the tube bundles are at reactor operating pressure. One of the two outlet isolation valves is closed to keep the isolation condenser inoperative. The isolation condenser is placed in operation by opening the closed condensate return valve (IC-3) to the reactor. This is done automatically on high reactor pressure or low reactor water level. It can be done at any time by manual control. The normally closed isolation valve (IC-3) on the return line is DC-operated and thus remains available on loss of AC eletrical power. During operation, the water on the shell side of the condenser boils and is vented to the atmosphere.

Radiation monitors and alarms are provided on the shell vents so that in the event of abnormal radiation levels, the tube side of the isolation condenser can be isolated from the reactor by closing valves. Two motor operated isolation valves are provided on both the inlet and return lines connecting the isolation condenser to the reactor. On the steam supply line, the AC-operated isolation valve IC-1 is located inside the drywell, and the DC-operated isolation valve IC-2, outside the drywell. On the condensate return line, the DC-operated isolation valve IC-3 is located just outside the drywell penetration and the DC-operated isolation valve IC-4 is located inside the drywell.

The water stored in the shell of the isolation condenser can be supplemented by makeup from the condensate storage tank or from the station fire water storage tanks. The makeup water can be pumped by the condensate transfer pumps or by either the diesel-driven or electric fire pumps.

### B.6.1.3 System Interfaces

System interfaces for the isolation condenser are shown on Table B.6-1.

B.6.1.4 Instrumentation and Control

The steam supply line and the condensate return line have pipeline break detectors located on elbows inside the drywell, close to the connections to the primary system. Differential pressure switches are set to automatically close the steam supply and condensate return isolation valves in the event of a line flow greater than three times rated flow. Area temperature monitors located in the pipe chases and in the vicinity of the isolation condenser will annunciate upon excessive temperature. These devices protect the primary system from pipeline breaks in the isolation condenser system.

The power for the DC-operated isolation valves is supplied from DC 125 volt bus 101AB-1, and the normal power for the AC-operated isolation valves is backed up with power from the emergency gas turbine generator.

The steam supply isolation valves are normally open, with the control room switch in the AUTOMATIC position, and both the AC-operated and the DC-operated valves will be closed automatically by the pipline-break differential pressure switches. Each isolation valve can be closed or opened from the three-position control room switch, and the remote manual OPEN demand overrides the automatic closure signal.

The AC-operated condensate return isolation valve is normally open, and will be automatically closed in the event of a pipe break, but it can be manually operated as described above for the steam supply valves.

The DC-operated condensate return valve is normally closed with the control room switch in the AUTOMATIC position, and the valve is opened automatically by a high reactor pressure or low reactor water level. Only this valve (IC-3) must be actuated to place the isolation condenser system into operation. There is no automatic reset to close the condensate return valve on reduced reactor vessel pressure and normal reactor water level. This must be done manually by pressing the ISOLATION CONDENSER RESET button on Panel 905, which closes the valve if the valve mode switch is in the AUTOMATIC position. Each valve can be opened or closed from its three-position control room switch, overriding the automatic signals. Figure B.6-2 illustrates the control wiring for the isolation condenser system.

A summary of the isolation condenser instrumentation is shown in Table B.6-2.

B.6.1.5 Testing

There are seven primary tests of the isolation condenser system, or its components.

SP412L Isolation Condenser Isolation Instrument Functional and Calibration Test

The objective of this procedure is to test and calibrate the high flow isolation condenser line trip function. The procedure calls for checking the closure of isolation valves IC-1, 2 and 4 and the

"Off-Normal" and "Steam Line Break" alarm annunciation on panel 903. The test is conducted monthly. During the test, the isolation condenser is removed from service.

SP412M Isolation Condenser System Automatic Actuation Functional Test

The objective of this procedure is to test the operability of the reactor pressure switches (1070 psig $\leq$ p $\leq$ 1098 psig) and the TDDO relays (to operate in $\leq$ 15 seconds). The procedure provides for checking the opening of isolation valve IC-3 and all the associated actuation logic. The test is conducted after each refueling and after major repairs.

SP412P Isolation Condenser Pressure Actuation Instrument Functional Test and Calibration

The objective of this procedure is to test and calibrate the reactor pressure switches. The procedure calls for checking the reactor pressure switches and the actuation logic up to coil 903/595-118A or B (see Figure B.6-2). The pressure switch instrument isolation valves are closed during the performance of the test. The test is performed monthly.

SP412C Reactor Low-Low Water Level Functional and Calibration Test

The objective of this procedure is to test and calibrate the low-low water level instruments LIS 2205/263-72A, B, C, and D. The procedure calls for checking the reactor level switches, the actuation logic up through the deenergization of relays 903/595-118A and B (see Figure B.6-2) and the "Reactor Hi/Lo Level" alarm annunciation on panel 903. The functional check is conducted monthly; the calibration is performed quarterly.

SP623.18 Emergency Systems Valve Position Check

The objective of this procedure is to ensure that specified valves are in the position indicated on the checkoff sheet. The procedure calls for visually checking the position of isolation valves IC-1, -2, -3, and -4 by the red or green indicator light in the control room. The check is conducted weekly.

SP627.3 Isolation Condenser Heat Removal Capability Determination

The objective of this procedure is to demonstrate the heat removal capability of the isolation condenser system. The procedure calls for operating the isolation condenser system for five minutes on reactor heat. The capability of the isolation condenser is determined by performing a heat balance. The test is performed after each isolation condenser automatic initiation or at least every five years.

SP627.5 Isolation Condenser Initiation Valve Functional Test

The objective of this procedure is to check the opening and the closure times of isolation valve IC-3. The procedure calls for manually opening valve IC-3 and measuring the opening time (< 19 seconds) and the length of the valve stroke (about 1-5/8"). The manual switch is then placed in AUTO and the closure time measured. The condensate return valve IC-4 is manually closed during the performance of the test. The test is performed quarterly.

B.6.1.6 Maintenance

There is no routinely scheduled maintenance for this system. Maintenance is performed only as required.

B.6.1.7 Technical Specifications

A. Limiting condition for operation of the isolation condenser

1) Whenever the reactor pressure is greater than 90 psig and irradiated fuel is in the reactor vessel, the isolation condenser shall be operable except as specified in section 2 below and the shell side water level shall be greater than 66 inches.

2) When the isolation condenser is inoperable, for any reason, power operation shall be restricted to a maximum of 40 percent of full power, (i.e., 804$MW_{th}$) within 24 hours until the isolation condenser is returned to service.

3) If these requirements are not met, an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

4) Whenever emergency core cooling and primary containment integrity is required for the instrumentation (see Table B.6-2), there shall be two operable or tripped trip systems available.

5) a. During reactor power operating conditions , all isolation valves (IC-1, IC-2, IC-3, IC-4) shall be operable.

b. In the event any isolation valve specified in 5.a becomes inoperable, reactor power operation may continue provided at least one valve in each line having an inoperable valve is in the mode corresponding to the isolated condtion.

6) If Specification 5a and 5b cannot be met, the reactor must be in the cold shutdown condition within 24 hours.

B. Surveillance requirements for the isolation condenser

1) Isolation Condenser System Testing:

a. The shell side water level and temperature shall be checked daily.

b. Simulated automatic actuation and functional system testing shall be performed during each refueling outage or whenever major repairs are completed on the system.

c. The system heat removal capability shall be determined once every five years.

d. Vent line radiation monitors are calibrated quarterly.

2) When it is determined that the isolation condenser system is inoperable, the FWCI subsystem and gas turbine generator shall be demonstrated to be operable immediately and daily thereafter.

3) The instrumentation is to be functionally tested and calibrated as indicated in Table B.6-3.

4) The primary containment isolation valves surveillance shall be performed as follows:

a. At least once per operating cycle the operable isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and closure times.

b. At least once per quarter:

All normally open power-operated isolation valves (except for the main steamline power-operated isolation valves) shall be fully closed and reopened.

c. Whenever an isolation valve is inoperable, the position of at least one other valve in each line having an operable valve shall be recorded daily.

B.6.1.8 Operation

Whenever reactor pressure is greater than 90 psig and radiated fuel is in the reactor vessel, the isolation condenser shall be operable.

The isolation condenser is activated by sustained high reactor pressure or sustained low reactor water level, and will continue in opertion until another heat sink is available.

The isolation condenser operates by natural circulation, with steam flowing from the reactor through the condenser tubes, with the condensate returning by gravity to the reactor vessel via recirculation loop 'B'. The

isolation valves in the steam supply lines are normally open so that the tube bundles are at reactor pressure during standby operation. The isolation condenser is placed in operation by opening the (DC-operated) condensate return valve, IC-3, to the reactor vessel. The shell side of the condenser has a normal water level above the tube bundles. This level is normally maintained by operation of fill valve IC-10. The fill valve is automatically opened by actuation of the low water level alarm at 69" in the condenser. Normal supply to the condenser is fire water with backup from the condensate transfer system. Fill valve IC-10 will automatically close when the level in the condenser has increased to 72". The low level alarm point is at 69 inches vessel level and the high level at 73 + 3 inches tank level. There is, in addition, a high high level alarm at 91".

During operation of the system, the water in the shell will boil, and the steam will vent to the atmosphere. At the normal water level in the shell, the system provides cooling for approximately 40 minutes, without makeup water, before beginning to uncover the tube bundles.

B.6.2 Analysis

B.6.2.1 Success/Failure Criteria

To succeed the isolation condenser system must supply a high pressure cooling capability by using natural circulation to carry steam to the isolation condenser, where it is cooled, and return the condensate to the reactor vessel.

B.6.2.2 Assumptions

There are no system specific assumptions for the Isolation Condenser System.

Table B.6-1

Isolation Condenser Interfaces Failure Modes and Effects

| Front Line System | | | Support System | | | Failure Mode | Failure Effect |
|---|---|---|---|---|---|---|---|
| System | Div. | Comp. | System | Div. | Comp. | | |
| IC | | IC-1 | AC Pwr | G/T | Bus E-3 | Zero or low voltage | Valve fails as is (N.O.) |
| | | IC-2 | DC Pwr | | Bus 101-AB-1 | | |
| IC | | IC-3 | DC Pwr | | Bus 101-AB-1 | Zero or low voltage | Valve fails as is (N.C.), no flow |
| IC | | IC-4 | AC Pwr | G/T | Bus E-3 | Zero or low voltage | Valve fails as is (N.O.) |

Table B.6-2

Isolation Condenser Instrumentation

| Sensors | Function | Setpoint |
|---|---|---|
| 2257/1349A | Isolation Condenser steam line break detection | 39.5" of $H_2O$ |
| 2257/1349B | | 39.5" of $H_2O$ |
| 2257/1350A | | 157" of $H_2O$ |
| 2257/1350B | | 157" of $H_2O$ |
| 2205/263-53A<br>2205/263-53B<br>2206/263-53C<br>2206/263-53D | Reactor High pressure indication | $\leq$ 1084 psig |
| 2205/263-72A<br>2205/263-72C<br>2206/263-72B<br>2206/263-72D | Low-low Reactor water level indication | $\geq$ 77.59" above top of active fuel |

Table B.6-3

Minimum Test and Calibration Frequency for Core Cooling Instrumentation

| Instrument Channel ECCS Instrumentation | Instrument Functional Test[2] | Calibration[2] | Instrument Check[2] |
|---|---|---|---|
| 1. Reactor low-low water level | 1 | Once/3 months | |
| 2. Reactor high pressure | | Once/3 months | |
| 3. Steam line high flow | 1 | Once/3 months | 1 |
| 4. Condensate line high flow | 1 | Once/3 months | 1 |

1. Initially once per month until exposure hours is $2.0 \times 10^5$, thereafter according to Figure 4.1.1 with an interval not less than one month nor more than three months. Millstone will use data compiled by Commonwealth Edison on the Dresden 2 Unit in addition to Millstone Unit 1 data.

2. Functional test calibrations and instrument checks are not required when these instruments are not required to be oerable or are tripped.

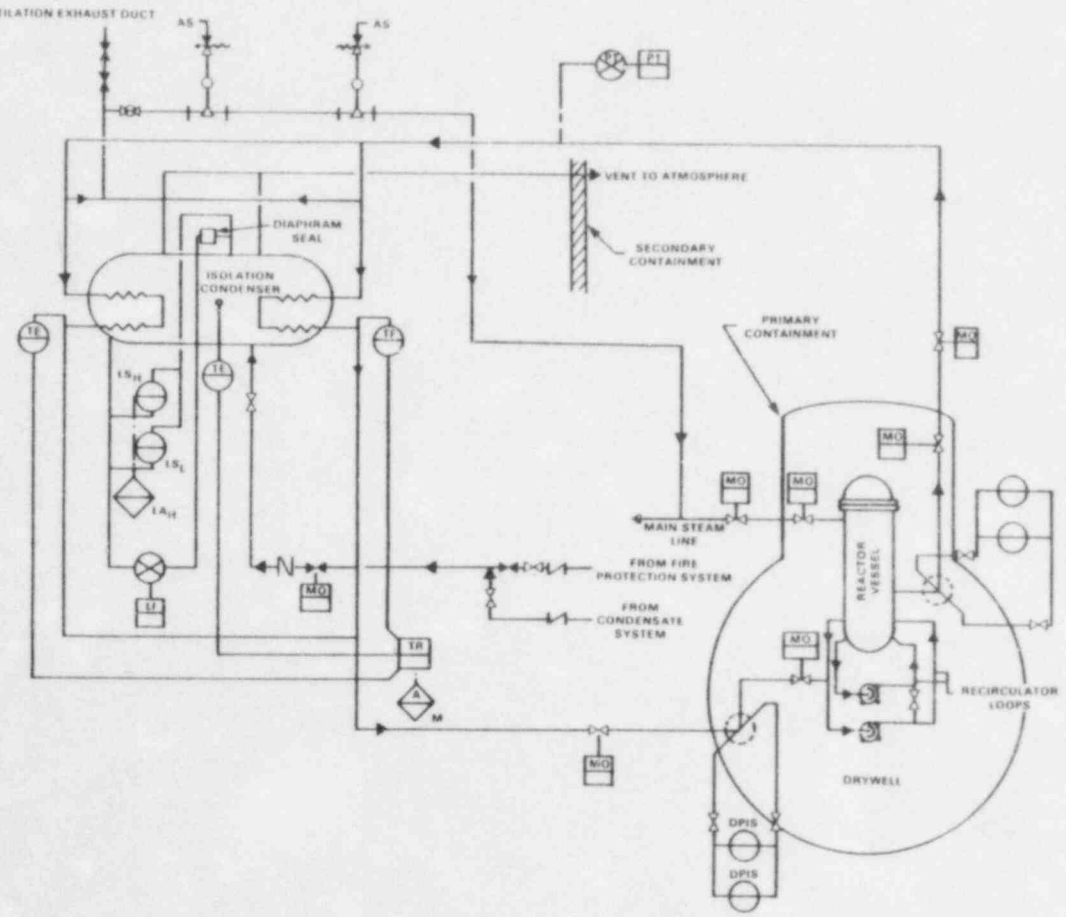



**FIGURE B.6-1. ISOLATION CONDENSER SYSTEM PIPING DIAGRAM (SHEET 1 OF 2)**

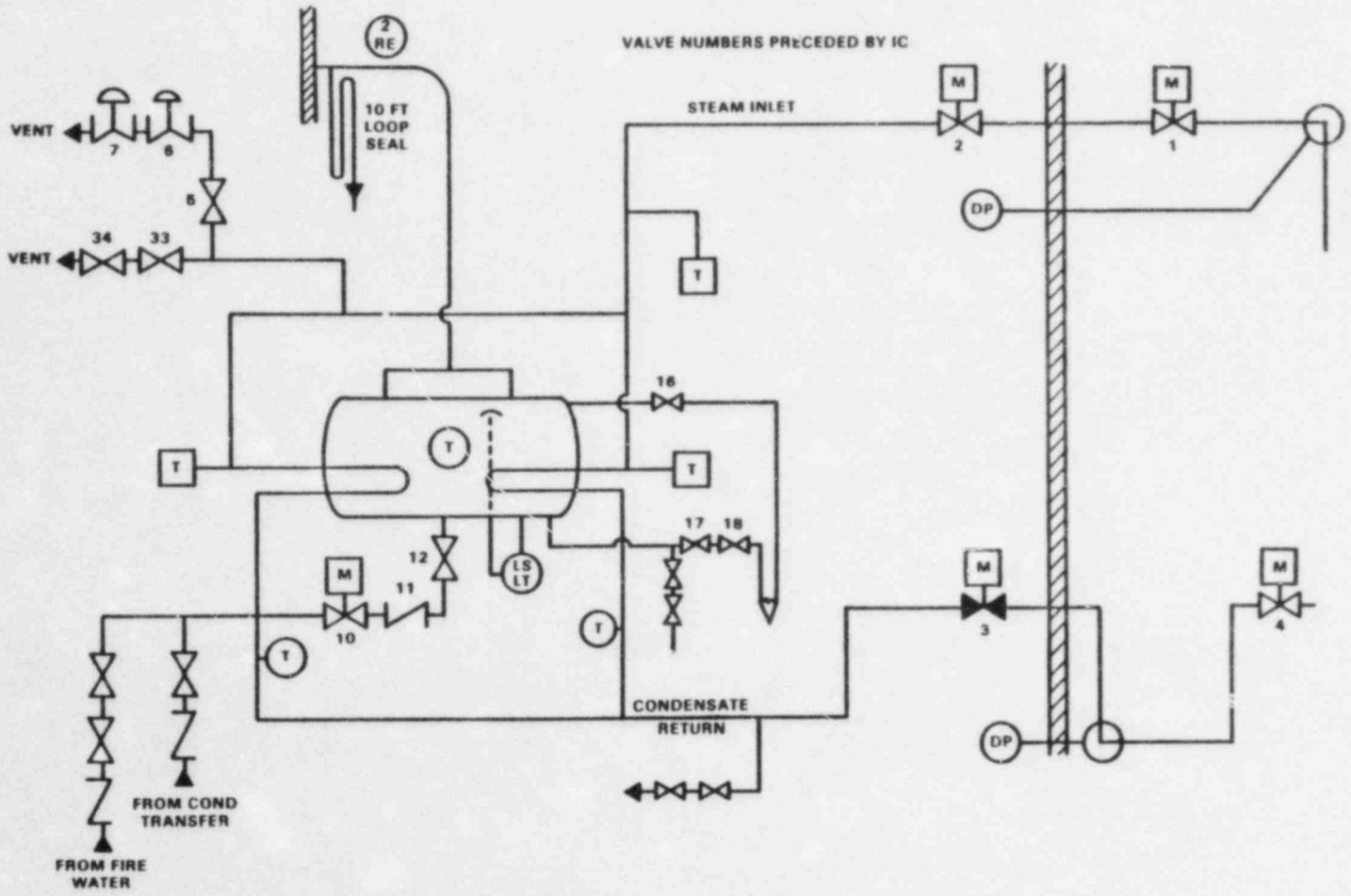



**FIGURE B.6-1. ISOLATION CONDENSER SYSTEM DIAGRAM (SHEET 2 OF 2)**

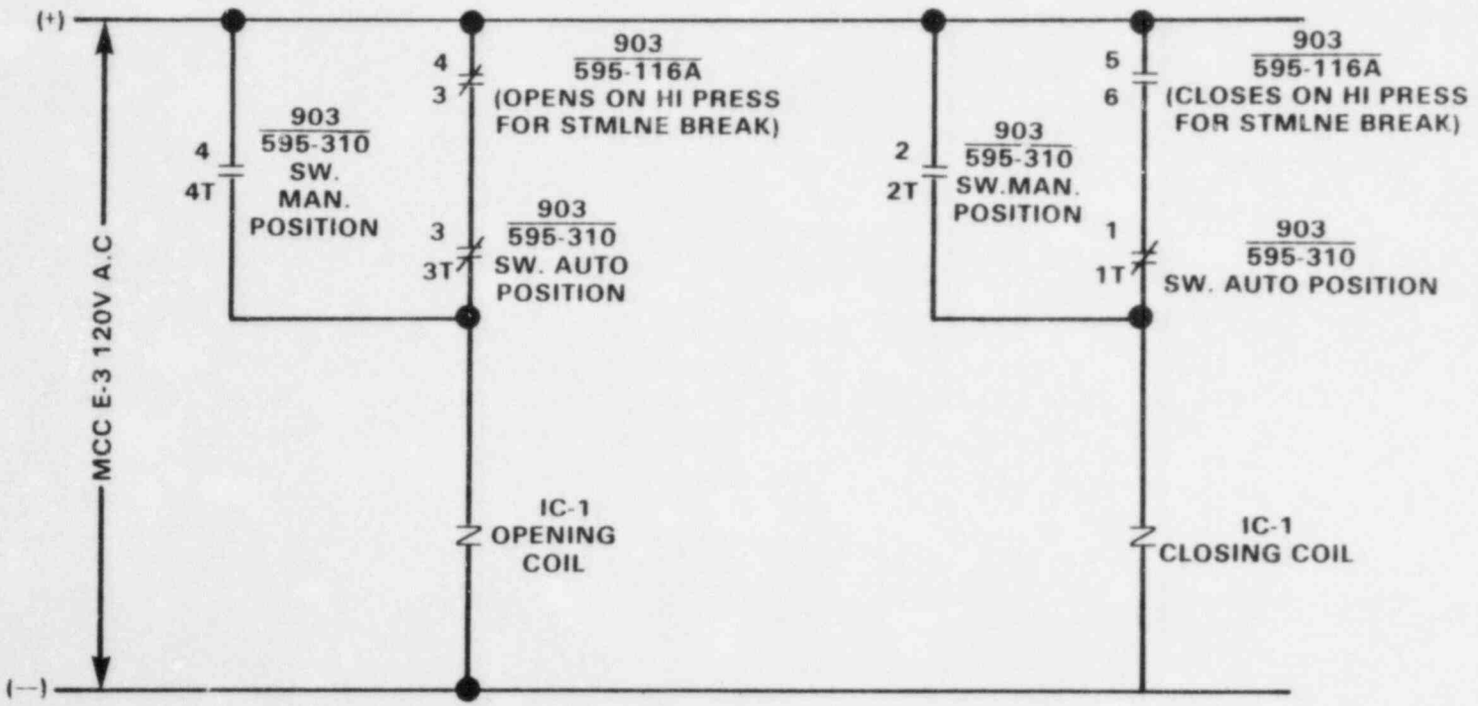



**FIGURE B.6-2. ISOLATION CONDENSER CONTROL WIRING SCHEMATICS MOV IC-1 OPENING/CLOSING CIRCUIT (SHEET 1 OF 8)**

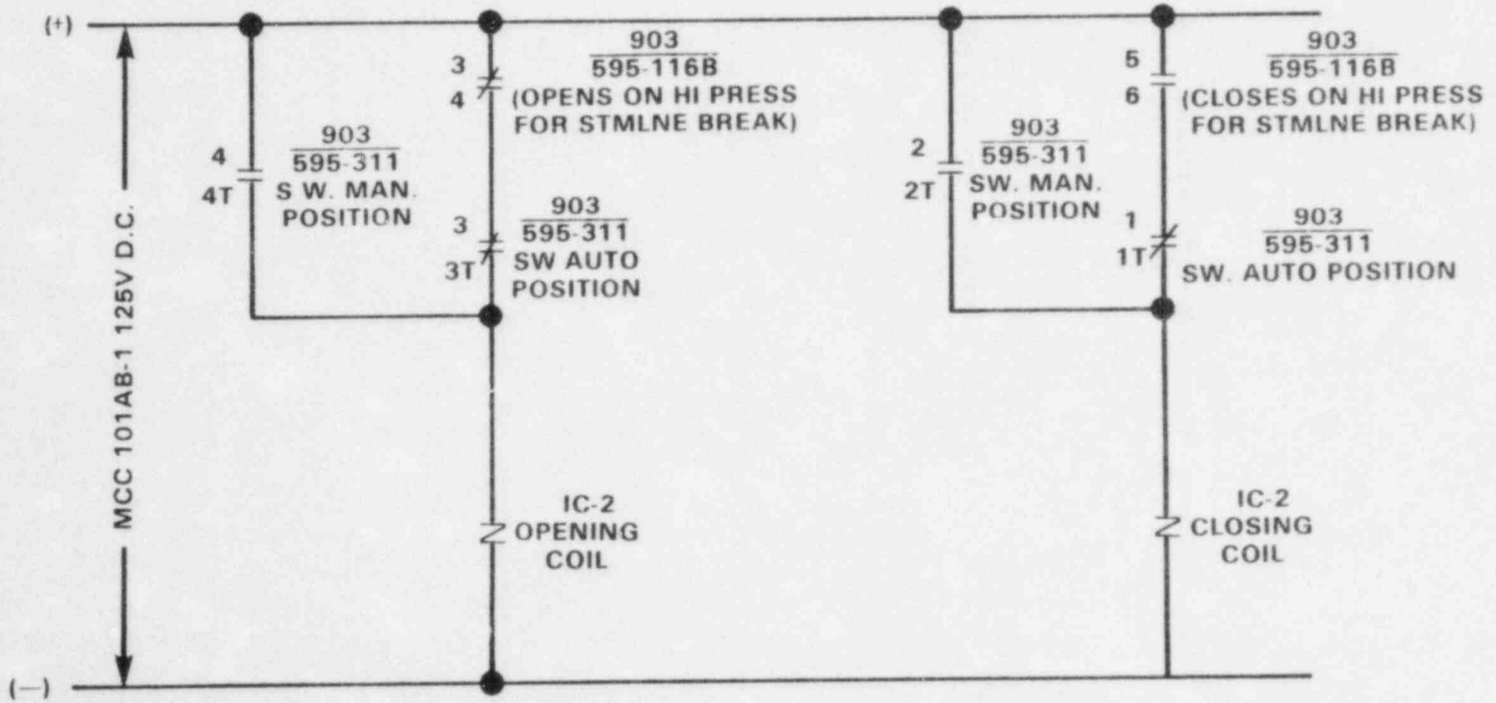



**FIGURE B.6-2. ISOLATION CONDENSER CONTROL WIRING SCHEMATICS MOV IC-2 OPENING/CLOSING CIRCUIT (SHEET 2 OF 8)**

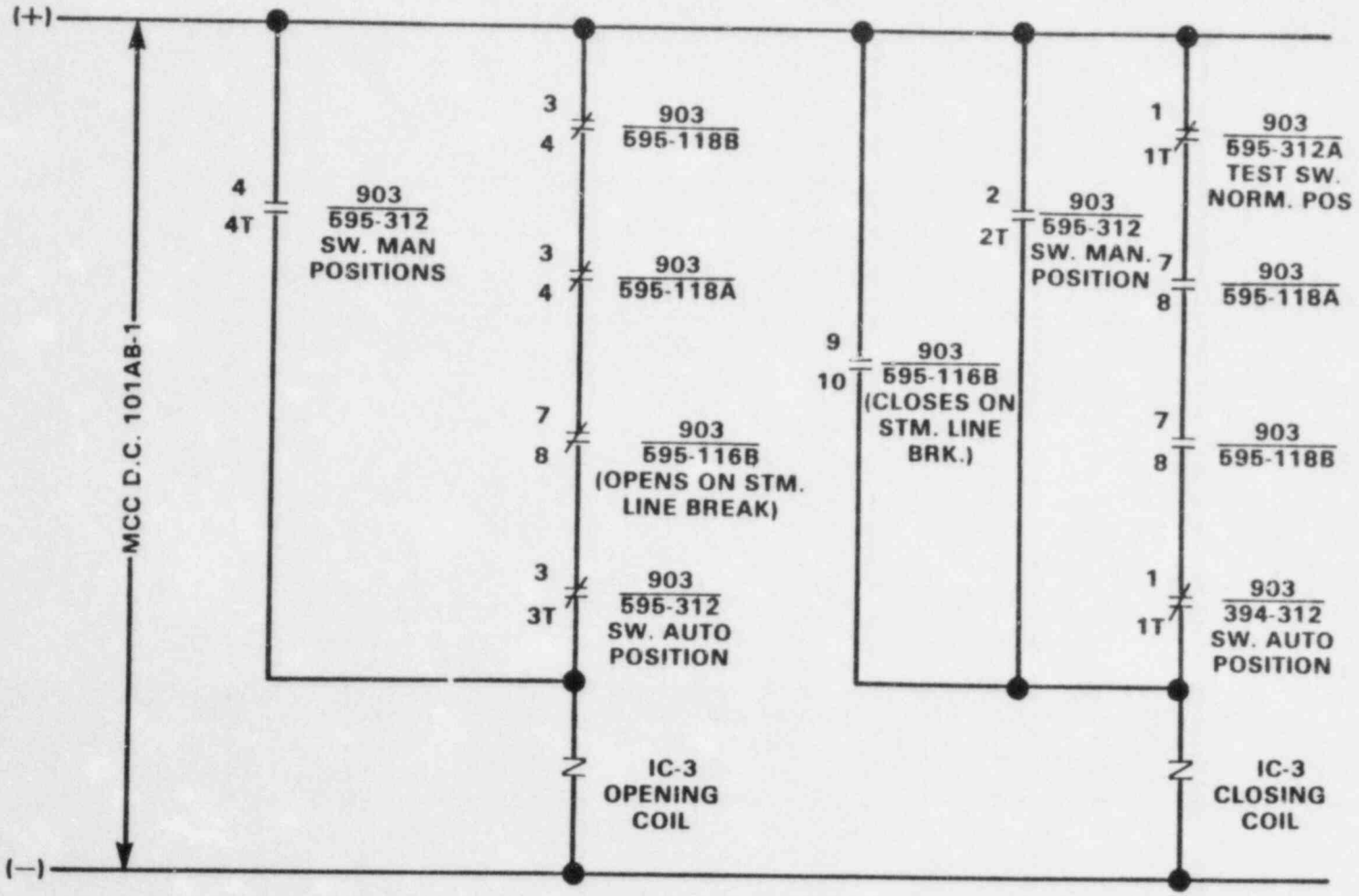



**FIGURE B.6-2. ISOLATION CONDENSER CONTROL WIRING SCHEMATICS MOV IC-3 OPENING/CLOSING CIRCUIT (SHEET 3 OF 8)**

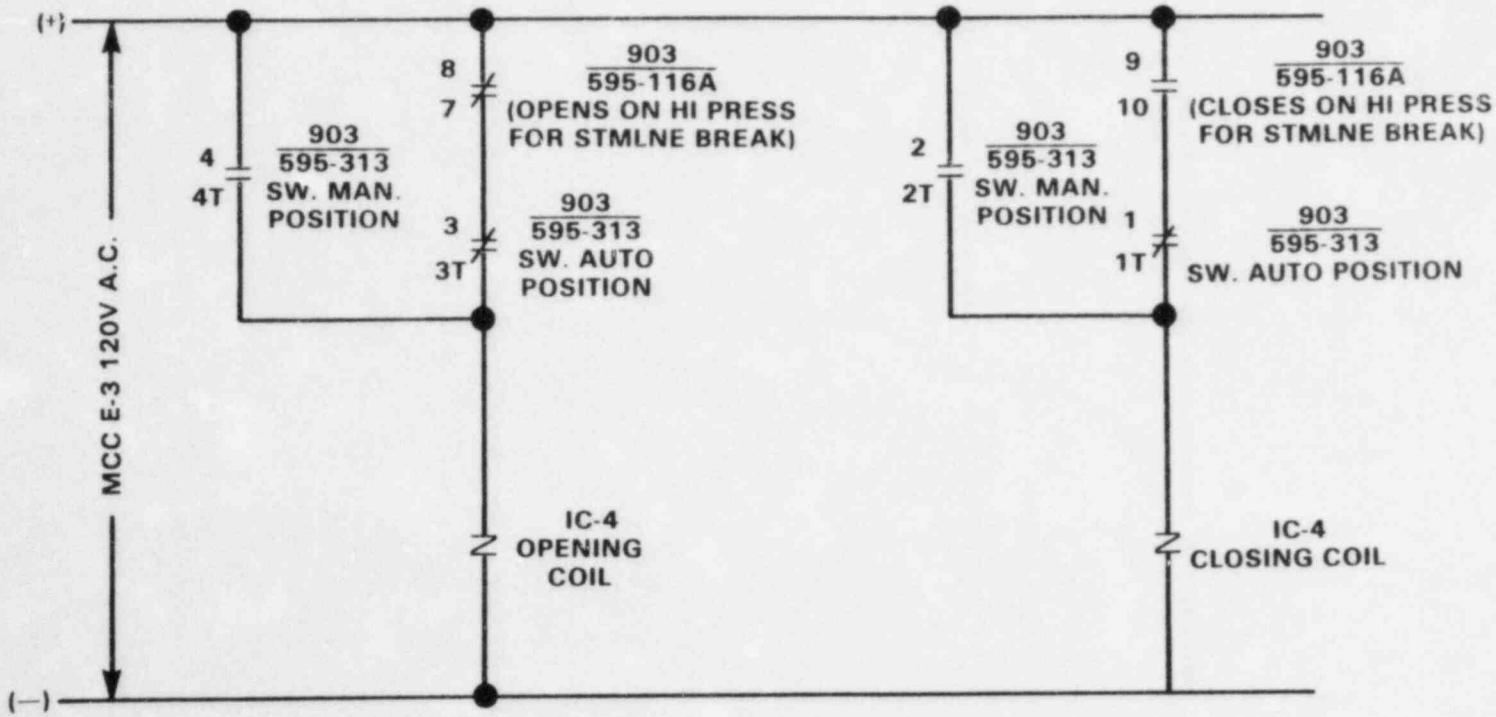
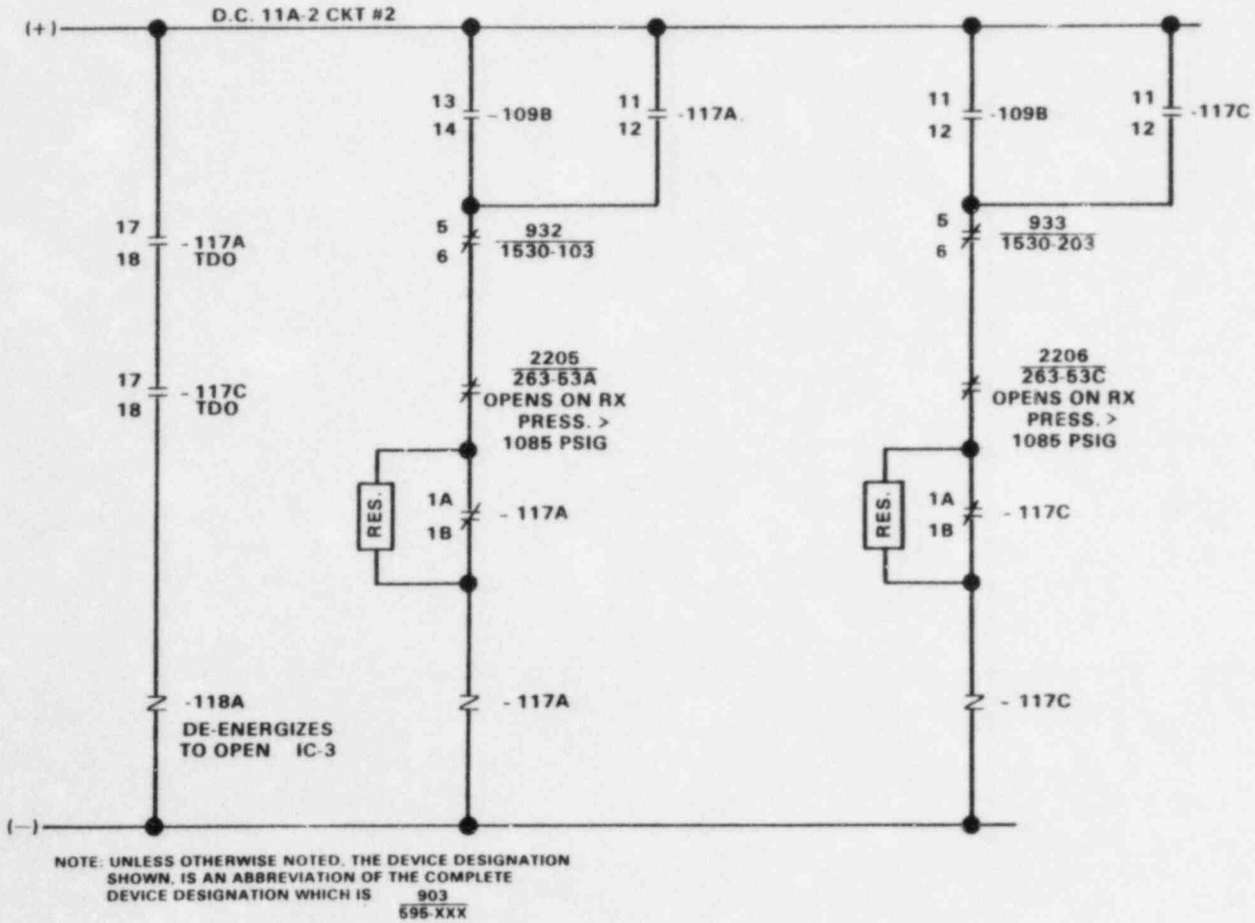
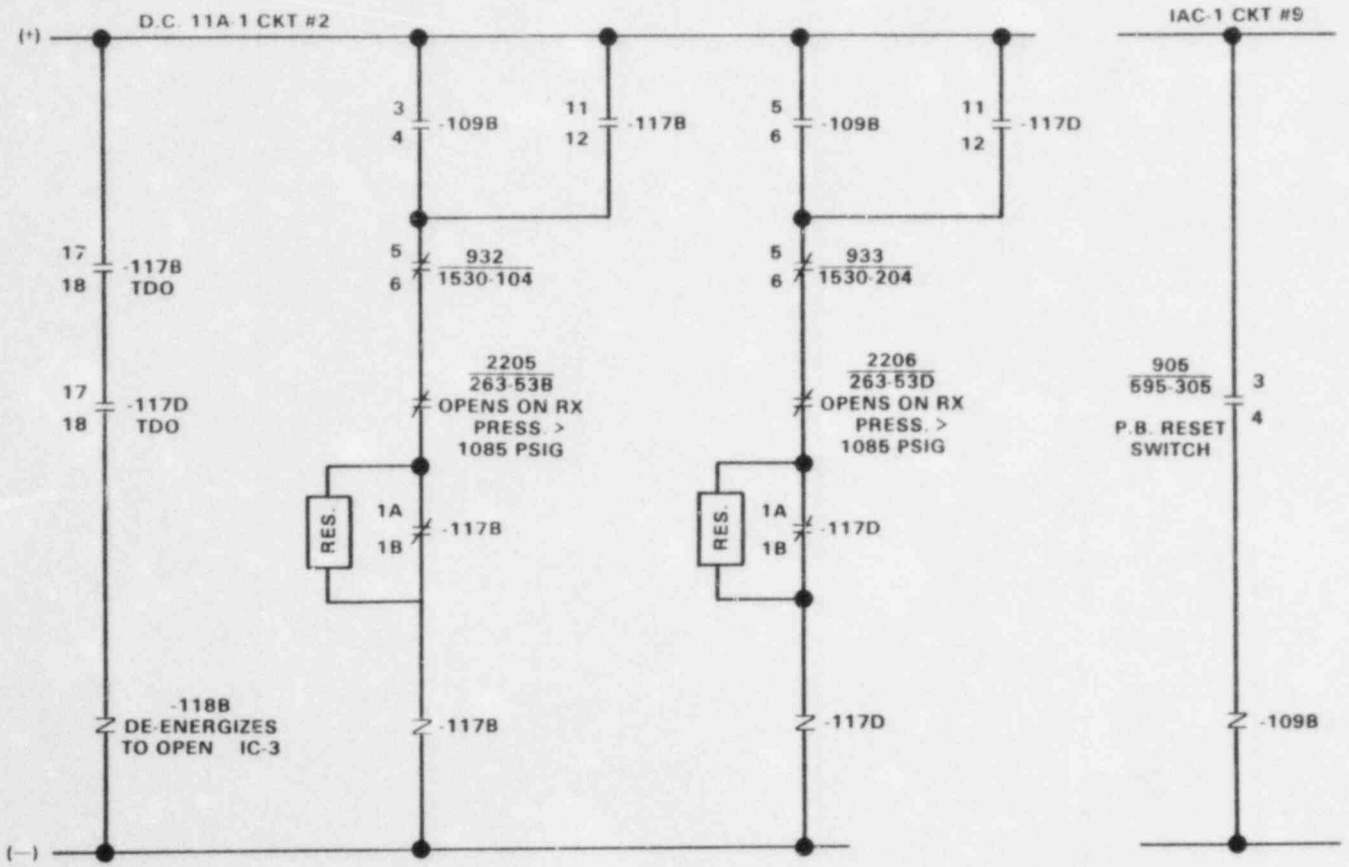



**FIGURE B.6-2. ISOLATION CONDENSER CONTROL WIRING SCHEMATICS MOV IC-4 OPENING/CLOSING CIRCUIT (SHEET 4 OF 8)**




NOTE: UNLESS OTHERWISE NOTED, THE DEVICE DESIGNATION SHOWN, IS AN ABBREVIATION OF THE COMPLETE DEVICE DESIGNATION WHICH IS $\frac{903}{595\text{-}XXX}$

**FIGURE B.6-2. ISOLATION CONDENSER CONTROL WIRING SCHEMATIC MOV IC-3 INITIATION LOGIC (SHEET 5 OF 8)**




NOTE: UNLESS OTHERWISE NOTED, THE DEVICE DESIGNATION SHOWN, IS AN ABBREVIATION OF THE COMPLETE DEVICE DESIGNATION WHICH IS $\frac{903}{595\text{-}XXX}$

**FIGURE B.6-2. ISOLATION CONDENSER CONTROL WIRING SCHEMATIC MOV IC-3 INITIATION LOGIC (SHEET 6 OF 8)**

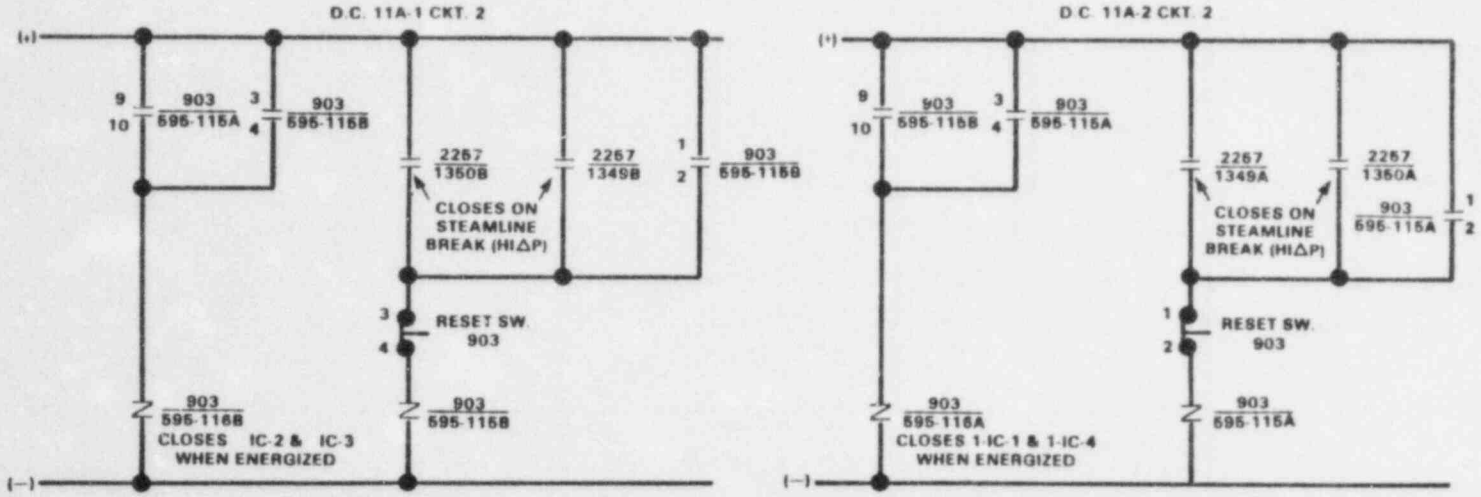
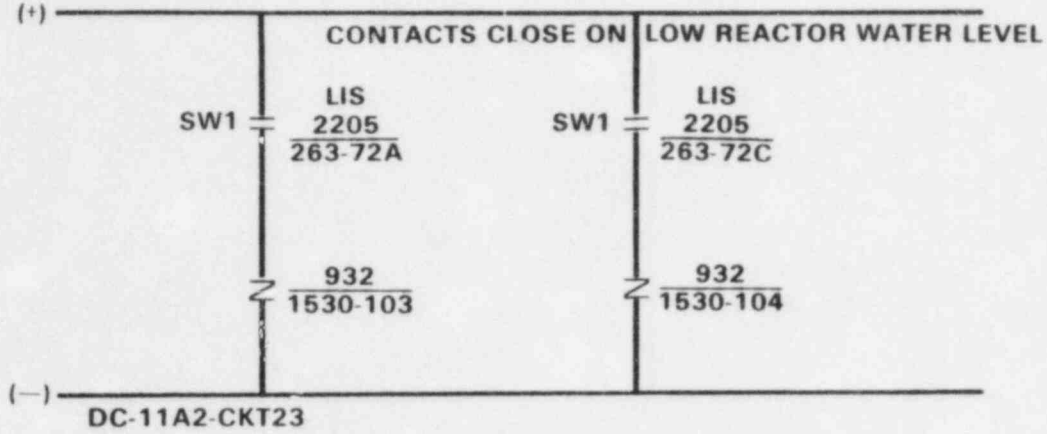



**FIGURE B.6-2. ISOLATION CONDENSER CONTROL WIRING SCHEMATIC MOV IC-3 INITIATION LOGIC (SHEET 7 OF 8)**



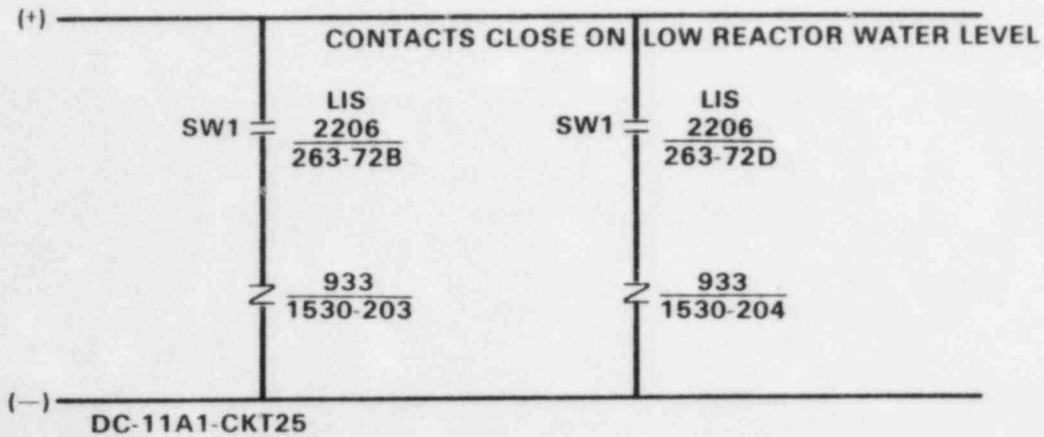




**FIGURE B.6-2. ISOLATION CONDENSER CONTROL WIRING SCHEMATIC MOV IC-3 INITIATION LOGIC (SHEET 8 OF 8)**

ISOLATION CONDENSER SYSTEM

FAULT TREE AND FAULT SUMMARY SHEETS

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| IC-1302-HTX-LOF | Mechanical failure of isolation condenser (1302) | After every auto-initiation, but as a minimum, once every 5 years | Heat removal capability test performed by Station Procedure SP 627.3 | $2X10^{-5}$ |
| IC-4-MOV-TMC | MOV IC-4 closed due to test or maintenance | Valve position checked weekly. IC "off normal" alarm prompt in c.r. | Valve is closed during implementa- of the following procedures (or maint.): SP 412M, SP 412L, and SP 627.5 /1/ Valve pos. checked as per SP 623.18, weekly | $2.3x10^{-3}$ |
| IC-3-MOV-FTO | MOV IC-3 fails to open when required to do so | Valve functional test performed quarterly | Valve closure time determined as per Station Procedure SP 627.5 | $1.0x10^{-3}$ |
| 903595-313-2RO<br>903595-311-3RO<br>903595-310-2RO | Switch contacts on MOV closing circuit fail to remain open | Valve position checked weekly | Weekly valve position check using control room panel indicators as per SP 623.18 | $2.5x10^{-6}$ |

/1/ Procedure - Frequency
SP412M - refuel or after major repair
SP412L - Monthly
SP627.5 - Quarterly

MILLSTONE 1
SYSTEM IC
SHEET #1

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| IC-4-MOV-OPC<br>IC-2-MOV-OPC<br>IC-1-MOV-OPC | Operator closes switch on MOV closing circuit during accident | | Operator action--no detection interval | $3 \times 10^{-3}$ |
| IC-2-MOV-TMC<br>IC-1-MOV-TMC | MOV closed due to test or maintenance | Valve position checked weekly, IC "off normal "alarm prompt in control room | Valve closed during monthly functional and calibration test or unsched. maint. as per SP 412L. Weekly vlv. pos. check as per SP 623.18 | $2.3 \times 10^{-3}$ |
| 903595-312-2RO<br><br><br>903595-116B-9RO | Switch contacts on MOV IC-3 closing circuit fail to remain open. Relay contacts Fail as in above | Quarterly detection | Valve opening & closure time determined as per SP 627.5 (Valve normally closed) | $2.2 \times 10^{-5}$<br><br><br>$1.0 \times 10^{-4}$ |
| IC-3-MOV-OPC | Operator closes control switch on MOV IC-3 closing circuit during accident | | | $3 \times 10^{-3}$ |
| IC-4-MOV-FRO<br>IC-2-MOV-FRO<br>IC-1-MOV-FRO | MOV fails to remain in open position | After every initiation but as a minimum once every 5 years | Heat removal capability test performed as per SP 627.3 | $3 \times 10^{-4}$ |

MILLSTONE 1
SYSTEM IC
SHEET #2

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| IC-3-MOV-TMC | MOV IC-3 inoperable due to test or maint. | Quarterly detection | Valve inop. during unscheduled maint. Valve opening & closing test performed as per SP 627.5 | $8x10^{-4}$ |
| DC-101AB1-5B-FRC | Local Faults on D.C. supply 6Kv. to IC-3 | One week | Lights indicating valve position supplied by 6Kv to IC-3, weekly check as per SP 623.18 | $8.5x10^{5}$ |
| 2257PS-1349A-OMC<br>2257PS-1349B-OMC<br>2257PS-1350A-OMC<br>2257PS-1350B-OMC | Operator miscalibrates pressure switch | One month | Isolation condenser instu. functional & calib. test procedure SP 512L | $1.0x10^{-3}$ |
| 903595-116A-9RO<br>903595-115A-3RO<br>903595-115A-1RO<br>903595-115B-9RO<br>903595-115B-1RO<br>903595-116B-5RO<br>903595-115A-9RO<br>903595-115B-3RO<br>903595-116A-5RO | Relay contacts fail to remain open | One week | Weekly check of valve position (as per SP 623.18) checks contacts position | $8.5x10^{-6}$ |
| 903595-116A-FRD<br>903595-115A-FRD<br>903595-115B-FRD<br>903595-116B-FRD | Relay coil fails to remain de-energized | One week | Weekly check of valve position (as per SP 623.18) checks relay condition | $8.5x10^{-7}$ |

MILLSTONE 1
SYSTEM IC
SHEET #3

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 2257PS-1349A-XRO<br>2257PS-1349B-XRO<br>2257PS-1350A-XRO<br>2257PS-1350B-XRO | Pressure switch contacts fail to remain open | One week | Weekly check of valve position (as per SP 623.18) checks pressure switch spurious actuation | $8.5 \times 10^{-6}$ |
| 903595-312-FTE | Sw. fails to operate. | Quarterly detection | Valve opened manually, closed by AUTO logic as per SP 627.5. Valve position check weekly SP 623.18 | $1 \times 10^{-5}$<br>.01 |
| 903595-312-OFR | Operator fails to place sw. in AUTO | Quarterly detection | Valve opened manually, closed by AUTO logic as per SP 627.5. Valve position checked weekly SP 623.18 | $1 \times 10^{-2}$ |
| 903595-312-3RC | Control sw. contacts fail to remain closed | (Simulated AUTO actuation each refuel outage) 12000 hrs | Valve IC-3 opened by simulated AUTO actuation signal as per SP 412M | $1.8 \times 10^{-4}$ |
| 903595-118A-3FC<br>903595-118B-3RC | Relay contacts fail to close | (Simulated AUTO actuation each refuel outage) 12000 hrs | Valve IC-3 opened by simulated AUTO actuation signal as per SP 412M | $1.8 \times 10^{-3}$ |

MILLSTONE 1
SYSTEM IC
SHEET #4

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 903595-118A-FTD<br>903595-118B-FTD<br>903595-117A-FTD<br>903595-117B-FTD<br>903595-117C-FTD<br>903595-117D-FTD | Relay coil fails to de-energize | One month | Rx hi press. functional test performed monthly as per SP 412P & Rx lo lo Water functional test also performed monthly as per SP 412C (118A & B tested as per SP 412P only) | $1x10^{-4}$ |
| 903595-117A-HFO<br>903595-117B-HFO<br>903595-117C-HFO<br>903595-117D-HOF<br>9321530-103-5FO<br>9331530-203-5FO<br>9321530-104-5FO<br>9331530-204-5FO | Relay contacts fail to open | One month | Rx hi press. and Rx lo lo water functional test performed as per SP 412P & SP 412C, respectively | $1x10^{-4}$ |
| 9321530-103-FTE<br>9331530-203-FTE<br>9321530-104-FTE<br>9331530-204-FTE | Relay coil fails to energize | One month | Checked during the Rx lo lo water level functional test as per SP 412C | $1x10^{-4}$ |
| 2205263-72A1-TOM<br>2205263-72C1-TOM<br>2205263-72B1-TOM<br>2205263-72C1-TOM | Water level lo lo indication switch out of service due to test (i.e. not restored to service) | One month | Rx lo lo water level functional test, as per SP 412C, checks these switches | $1x10^{-2}$ |

MILLSTONE 1
SYSTEM 1C
SHEET #5

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 2205263-72A1-XFC<br>2205263-72C1-XFC<br>2206263-72B1-XFC<br>2206263-72D1-XFC | Water level lo lo switch contacts fail to close | One month | Rx lo lo water level functional test as per SP 412C | $1x10^{-4}$ |
| 2205263-72A1-CMC<br>2205263-72C1-OMC<br>2206263-72B1-OMC<br>2206263-72D1-OMC | Water level lo lo indication instruments miscalibrated | One month | Rx lo lo water level instrument calibration as per procedure SP 412C | $1x10^{-3}$ |
| 2205263-53A-XFO<br>2205263-53B-XFO<br>2206263-53C-XFO<br>2206263-53D-XFO | Pressure switch contacts fail to open | One month | Rx hi pressure actuation instrument functional test & calibration, as per SP 412P, checks switch | $1.4x10^{-4}$ |
| 2205263-53A-TOM<br>2205263-53B-TOM<br>2206263-53C-TOM<br>2206263-53D-TOM | Pressure switch out of service due to test & calibration (i.e. not restored to service) | One month | Rx hi presure actuation instrument functional test as per SP 412P | $1x10^{-2}$ |
| 2205263-53A-OMC<br>2205263-53B-OMC<br>2206263-53D-OMC<br>2206263-53C-OMC | Hi pressure actuation instrument miscalibrated | One month | Calibration of Rx hi pressure actuation instrument, as per SP 412P | $1x10^{-3}$ |

MILLSTONE 1
SYSTEM 1C
SHEET #6

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 903595-117A-BFO<br>903595-117B-BFO<br>903595-117C-BFO<br>903595-117D-BFO | Seal in contacts on relay fail to open | N/A | Never tested - can not detect failure through implementation of monthly tests | $3x10^{-2}$ |
| 903595-109B-3RO<br>903595-109B-5RO<br>903595-109B-7RO<br>903595-109B-BRO<br>903595-305-3RO | Contacts fail to remain open | N/A | Never specifically tested | $1x10^{-2}$ |
| 903595-109B-FRD | Relay coil fails to reamin de-energized | N/A | Never specifically tested | $1x10^{-3}$ |
| 903595-116B-7RC | Relay contacts fail to remain closed | (Simulated AUTO actuation once per refuel) 12000 hrs | MOV IC-3 opened with simulated actuation signal as per SP 412M. Relay failure could occur during monthly test of steamline brk. actuation system as per SP 412L | $6.0x10^{-4}$ |
| IC-1302-HTX-EMTY | No water in Isolation Condenser (1302) | Prompt | Alarm and level indicator in control room | 0.0 |

MILLSTONE 1
SYSTEM IC
SHEET #7

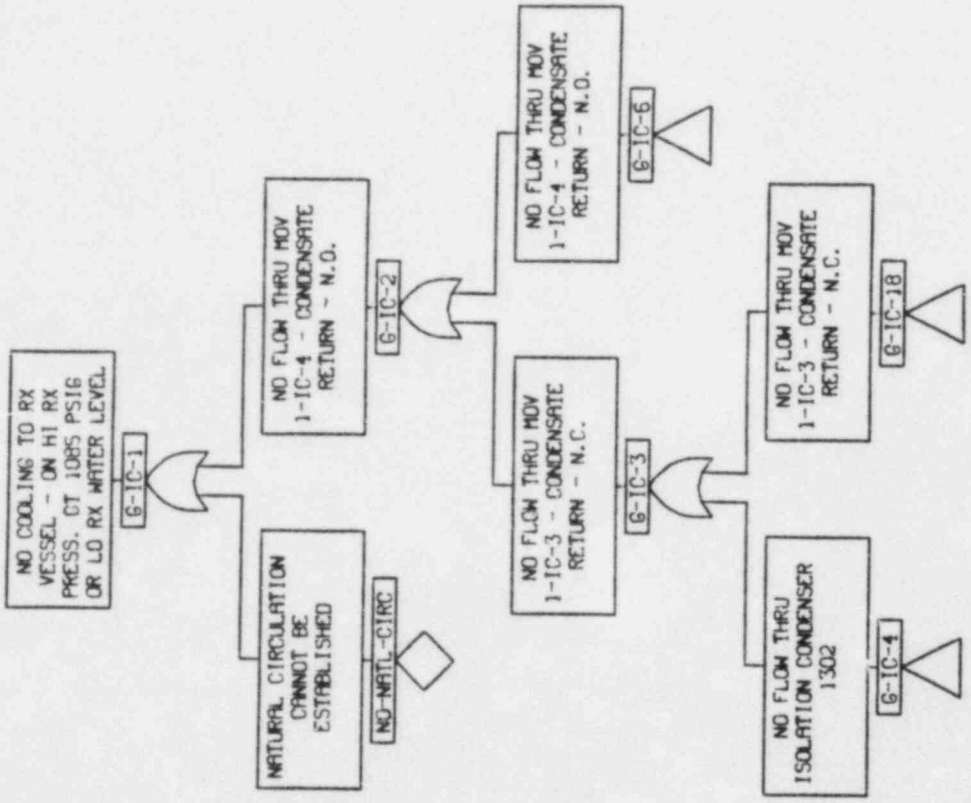
FAULT SUMMARY SHEETS

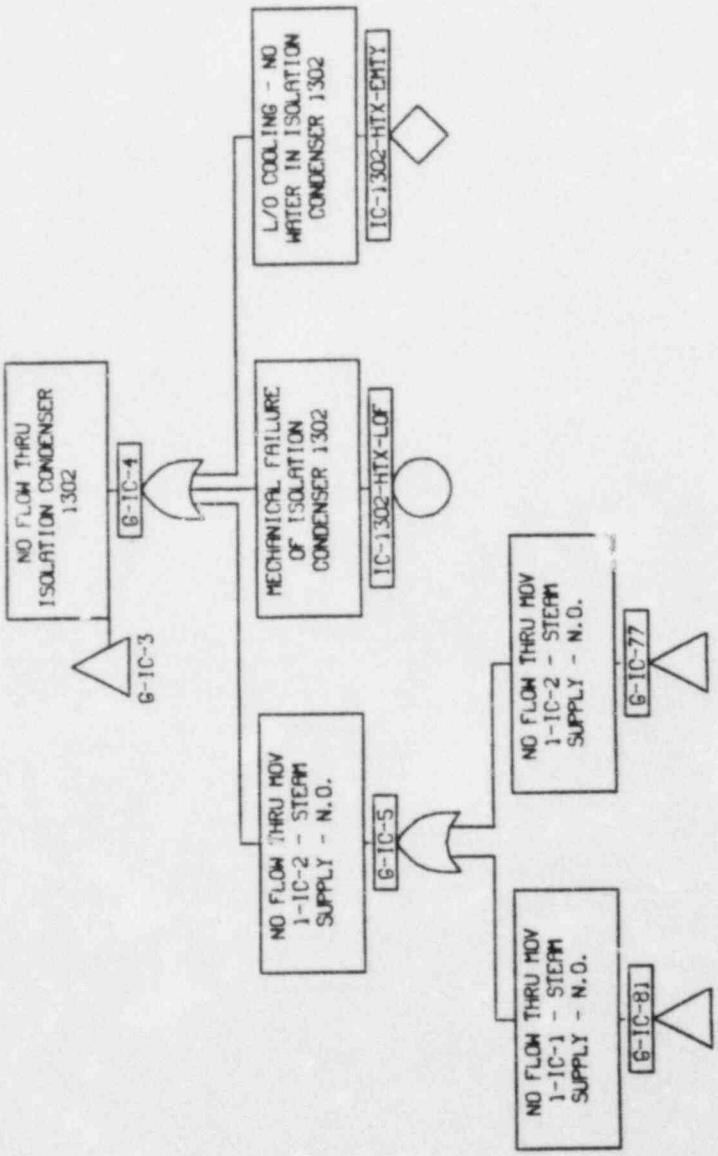
| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| NO-NATL-CIRC | Natural circulation cannot be established | | | |
| IC-LINE-BREAK | Break in Iso-Cond. piping | | Conditional Events | |
| NO-LO-RX-PRESS | Rx pressure < 1085 PSIG | | | |
| NO-LO-RX-H2O-LVL | Rx water level > 79" above T.A.F. | | | |

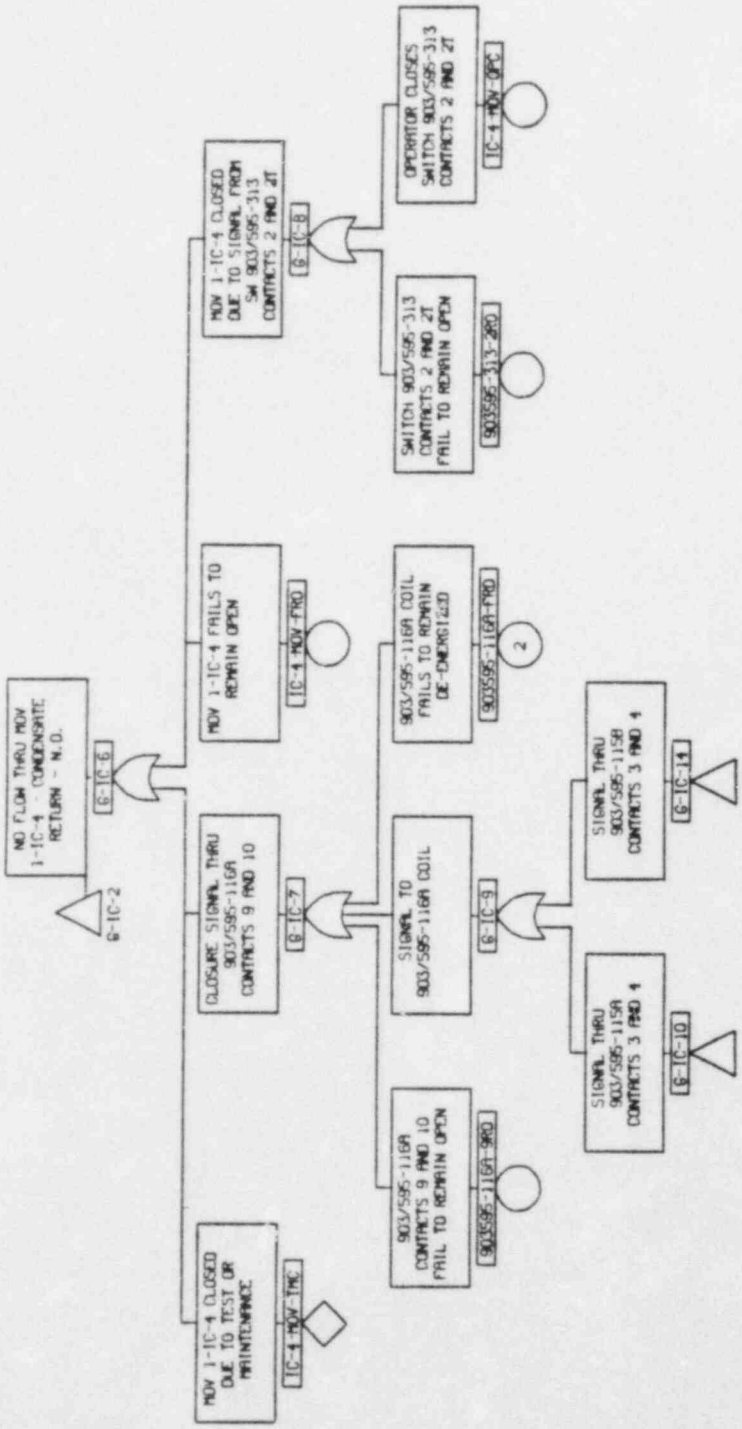
MILLSTONE 1
SYSTEM IC
SHEET #8

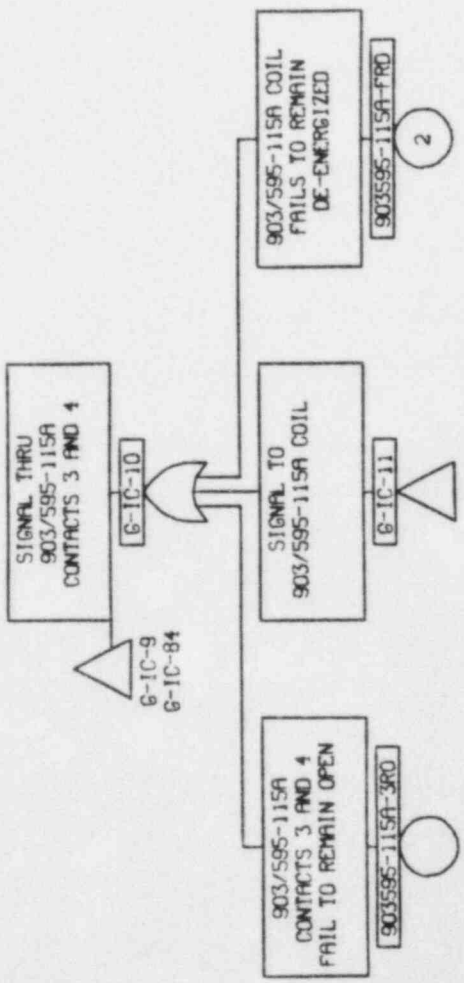
## IC FAULT TREE PAGE INDEX

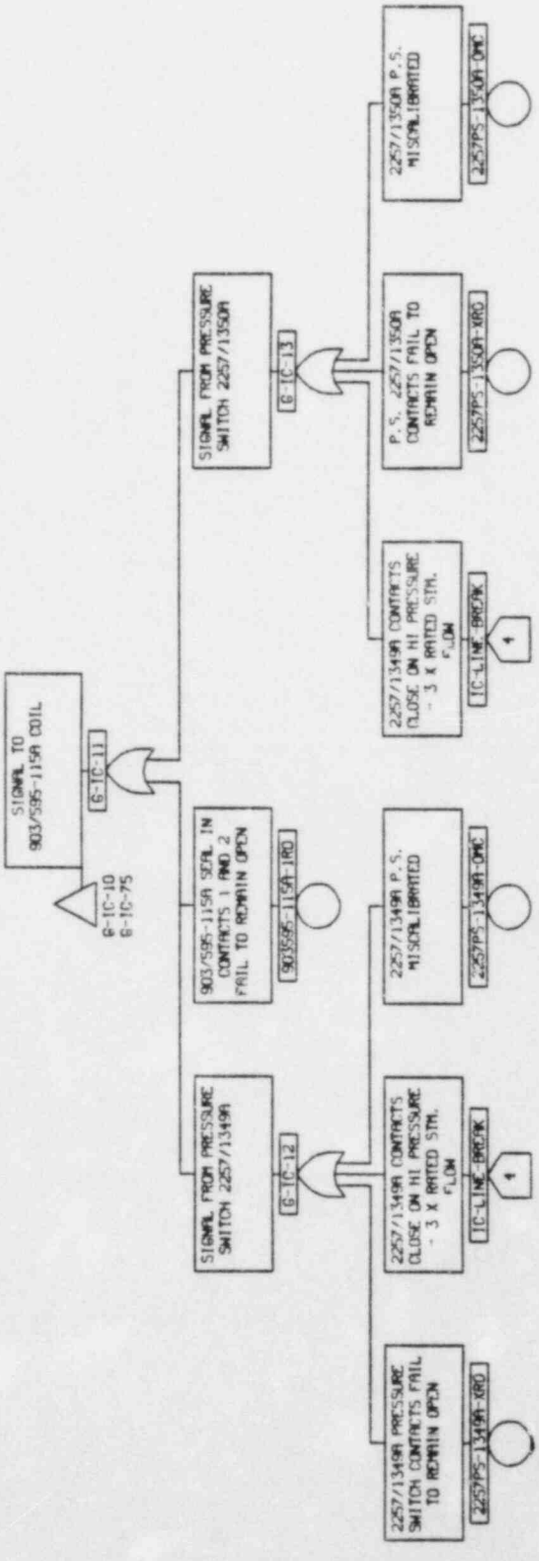
| GATE NAME | DEFINED ON PAGE | TRANSFERS TO PAGE(S) |
|---|---|---|
| G-IC-1 | IC-1 | -- |
| G-IC-4 | IC-2 | IC-1 |
| G-IC-6 | IC-3 | IC-1 |
| G-IC-10 | IC-4 | IC-3,IC-33 |
| G-IC-11 | IC-5 | IC-4,IC-30 |
| G-IC-14 | IC-6 | IC-3,IC-33 |
| G-IC-15 | IC-7 | IC-6,IC-30 |
| G-IC-18 | IC-8 | IC-1 |
| G-IC-22 | IC-9 | IC-8 |
| G-IC-25 | IC-11 | IC-9 |
| G-IC-29 | IC-12 | IC-11 |
| G-IC-30 | IC-13 | IC-12 |
| G-IC-31 | IC-14 | IC-12 |
| G-IC-37 | IC-15 | IC-11 |
| G-IC-38 | IC-16 | IC-15 |
| G-IC-39 | IC-17 | IC-15 |
| G-IC-45 | IC-18 | IC-12 |
| G-IC-47 | IC-19 | IC-15 |
| G-IC-49 | IC-20 | IC-9 |
| G-IC-53 | IC-21 | IC-20 |
| G-IC-54 | IC-22 | IC-21 |
| G-IC-55 | IC-23 | IC-21 |
| G-IC-61 | IC-24 | IC-20 |
| G-IC-62 | IC-25 | IC-24 |
| G-IC-63 | IC-26 | IC-24 |
| G-IC-69 | IC-27 | IC-21 |
| G-IC-70 | IC-10 | IC-8 |
| G-IC-71 | IC-28 | IC-24 |
| G-IC-73 | IC-29 | IC-9 |
| G-IC-75 | IC-30 | IC-29,IC-32 |
| G-IC-76 | IC-30 | IC-29,IC-32 |
| G-IC-77 | IC-31 | IC-2 |
| G-IC-80 | IC-32 | IC-10,IC-31 |
| G-IC-81 | IC-33 | IC-2 |

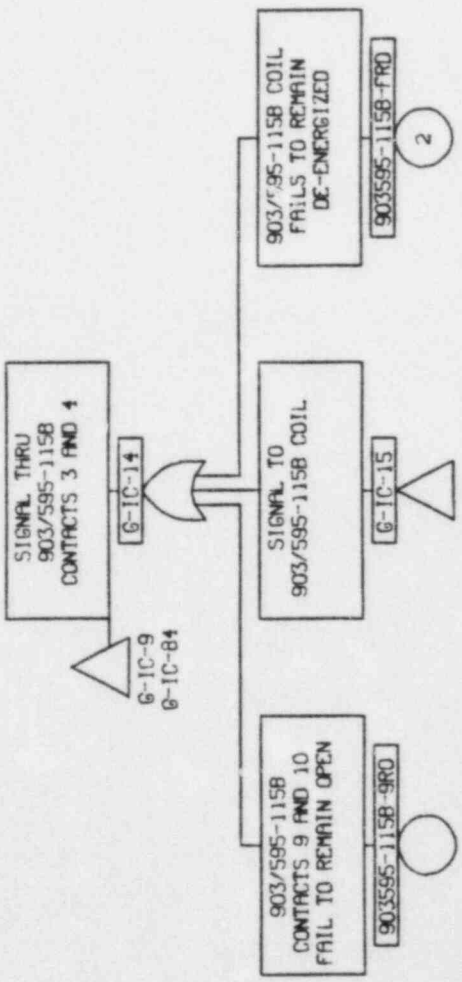

NO COOLING TO RX VESSEL - ON HI RX PRESS. OR LO RX WATER LEVEL
G-IC-1
NATURAL CIRCULATION CANNOT BE ESTABLISHED
NO-NATL.-CIRC
NO FLOW THRU MOV 1-IC-4 - CONDENSATE RETURN - N.O.
G-IC-2
NO FLOW THRU MOV 1-IC-3 - CONDENSATE RETURN - N.C.
G-IC-3
NO FLOW THRU MOV 1-IC-4 - CONDENSATE RETURN - N.O.
G-IC-6
NO FLOW THRU ISOLATION CONDENSER 1302
G-IC-4
NO FLOW THRU MOV 1-IC-3 - CONDENSATE RETURN - N.C.
G-IC-18

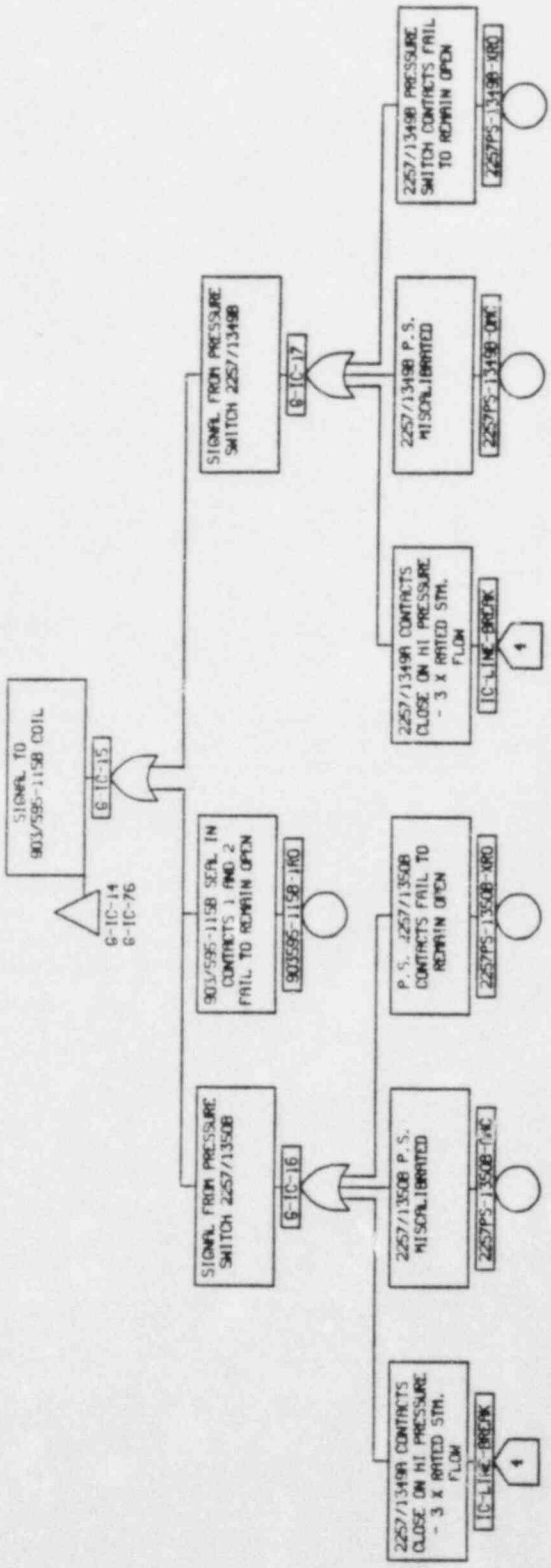

NO FLOW THRU ISOLATION CONDENSER 1302
6-IC-4
6-IC-3
L/O COOLING - NO WATER IN ISOLATION CONDENSER 1302
IC-1302-HTX-EMTY
MECHANICAL FAILURE OF ISOLATION CONDENSER 1302
IC-1302-HTX-LOF
NO FLOW THRU MOV 1-IC-2 - STEAM SUPPLY - N.O.
6-IC-5
NO FLOW THRU MOV 1-IC-2 - STEAM SUPPLY - N.O.
6-IC-77
NO FLOW THRU MOV 1-IC-1 - STEAM SUPPLY - N.O.
6-IC-81

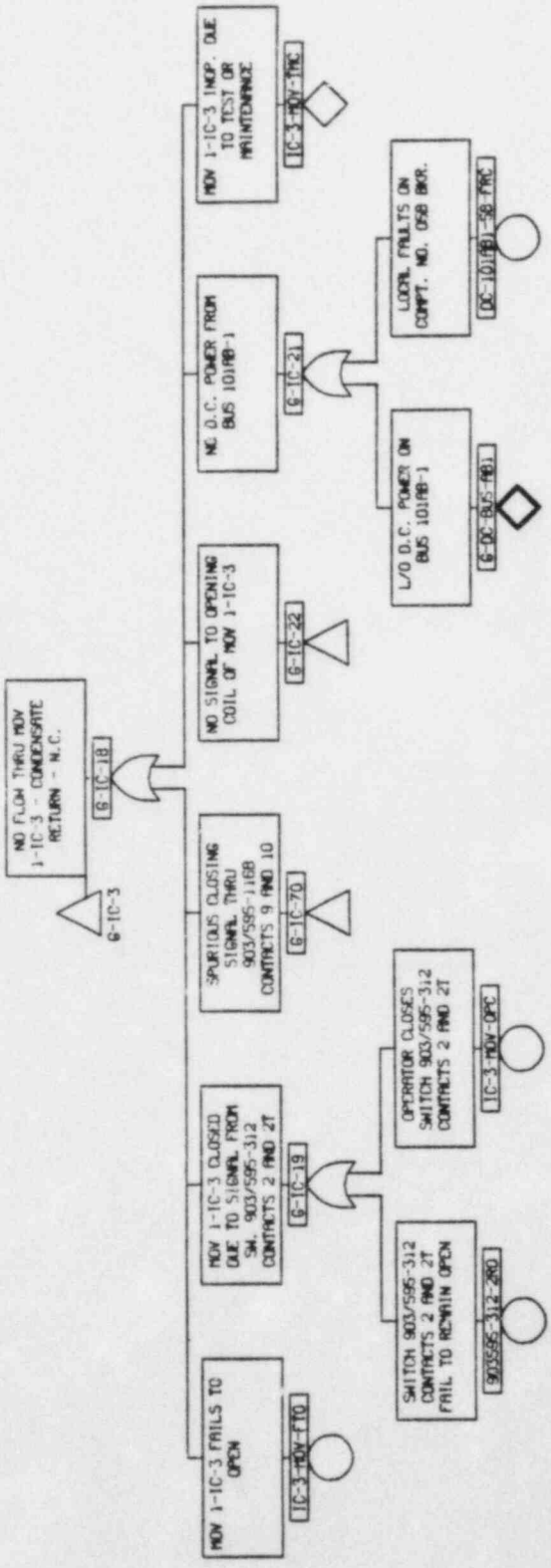

NO FLOW THRU MOV 1-IC-4 CONDENSATE RETURN - N.O.
G-IC-2
G-IC-6
MOV 1-IC-4 CLOSED DUE TO TEST OR MAINTENANCE
IC-4 MOV-TMC
CLOSURE SIGNAL THRU 903/595-116A CONTACTS 9 AND 10
G-IC-7
MOV 1-IC-4 FAILS TO REMAIN OPEN
IC-4 MOV-FRO
MOV 1-IC-4 CLOSED DUE TO SIGNAL FROM SW 903/595-313 CONTACTS 2 AND 2T
G-IC-8
SWITCH 903/595-313 CONTACTS 2 AND 2T FAIL TO REMAIN OPEN
903595-313-2RO
OPERATOR CLOSES SWITCH 903/595-313 CONTACTS 2 AND 2T
IC-4 MOV-OPC
903/595-116A CONTACTS 9 AND 10 FAIL TO REMAIN OPEN
903595-116A-2RO
SIGNAL TO 903/595-116A COIL
G-IC-9
903/595-116A COIL FAILS TO REMAIN DE-ENERGIZED
903595-116A-FRO
2
SIGNAL THRU 903/595-115A CONTACTS 3 AND 4
G-IC-10
SIGNAL THRU 903/595-115B CONTACTS 3 AND 4
G-IC-11

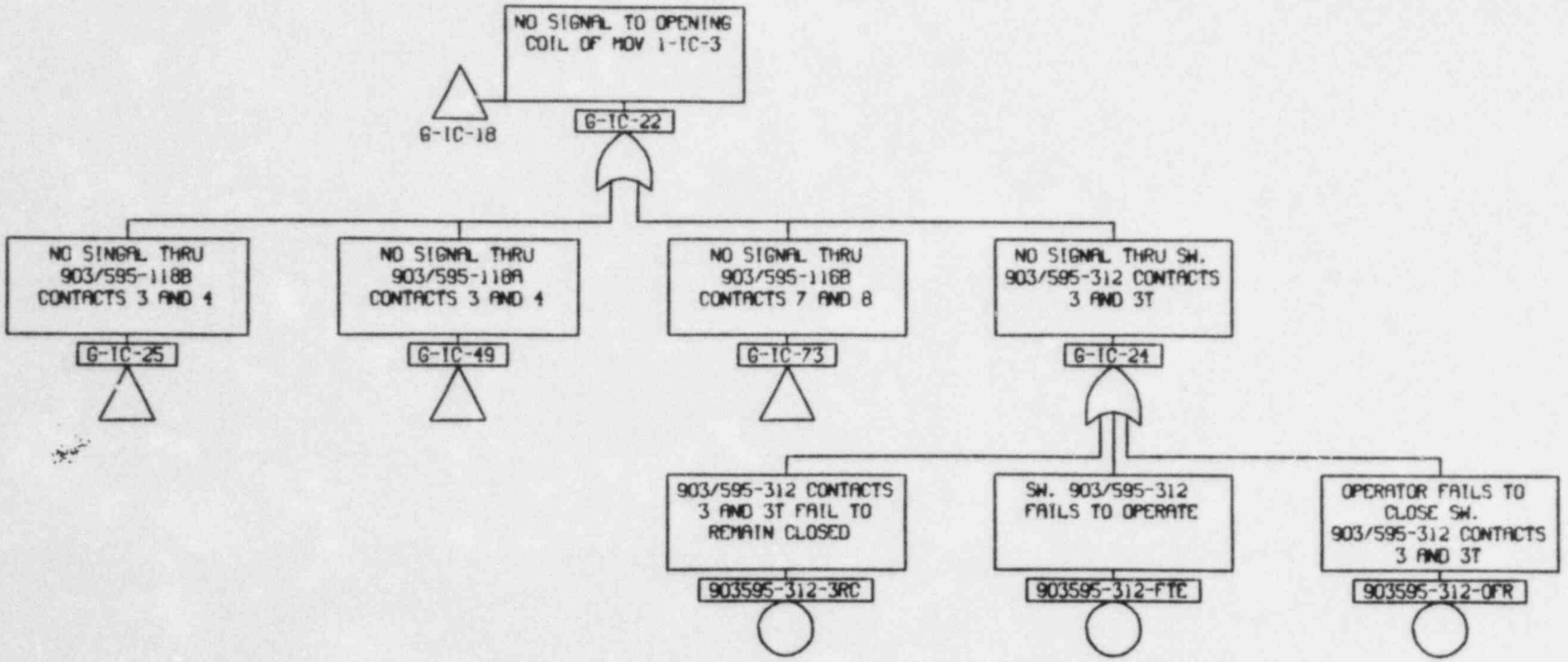

SIGNAL THRU
903/595-115A
CONTACTS 3 AND 4
6-IC-10
6-IC-9
6-IC-84
SIGNAL TO
903/595-115A COIL
6-IC-11
903/595-115A COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-115A-FRD
2
903/595-115A
CONTACTS 3 AND 4
FAIL TO REMAIN OPEN
903595-115A-3RD

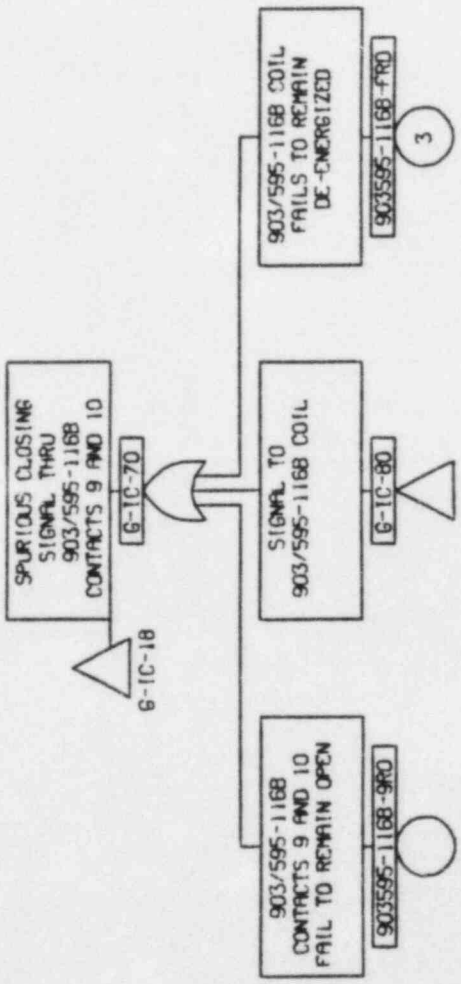

SIGNAL TO 903/595-115A COIL
G-IC-11
G-IC-10
G-IC-75
903/595-115A SEAL IN CONTACTS 1 AND 2 FAIL TO REMAIN OPEN
903595-115A-IRD
SIGNAL FROM PRESSURE SWITCH 2257/1349A
G-IC-12
2257/1349A PRESSURE SWITCH CONTACTS FAIL TO REMAIN OPEN
2257PS-1349A-IRD
2257/1349A CONTACTS CLOSE ON HI PRESSURE - 3 X RATED STM. FLOW
IC-LINE BREAK
4
2257/1349A P.S. MISCAL.BRATED
2257PS-1349A-DMC
SIGNAL FROM PRESSURE SWITCH 2257/1350A
G-IC-13
P.S. 2257/1350A CONTACTS FAIL TO REMAIN OPEN
2257PS-1350A-IRD
2257/1350A CONTACTS CLOSE ON HI PRESSURE - 3 X RATED STM. FLOW
IC-LINE BREAK
4
2257/1350A P.S. MISCAL.BRATED
2257PS-1350A-DMC

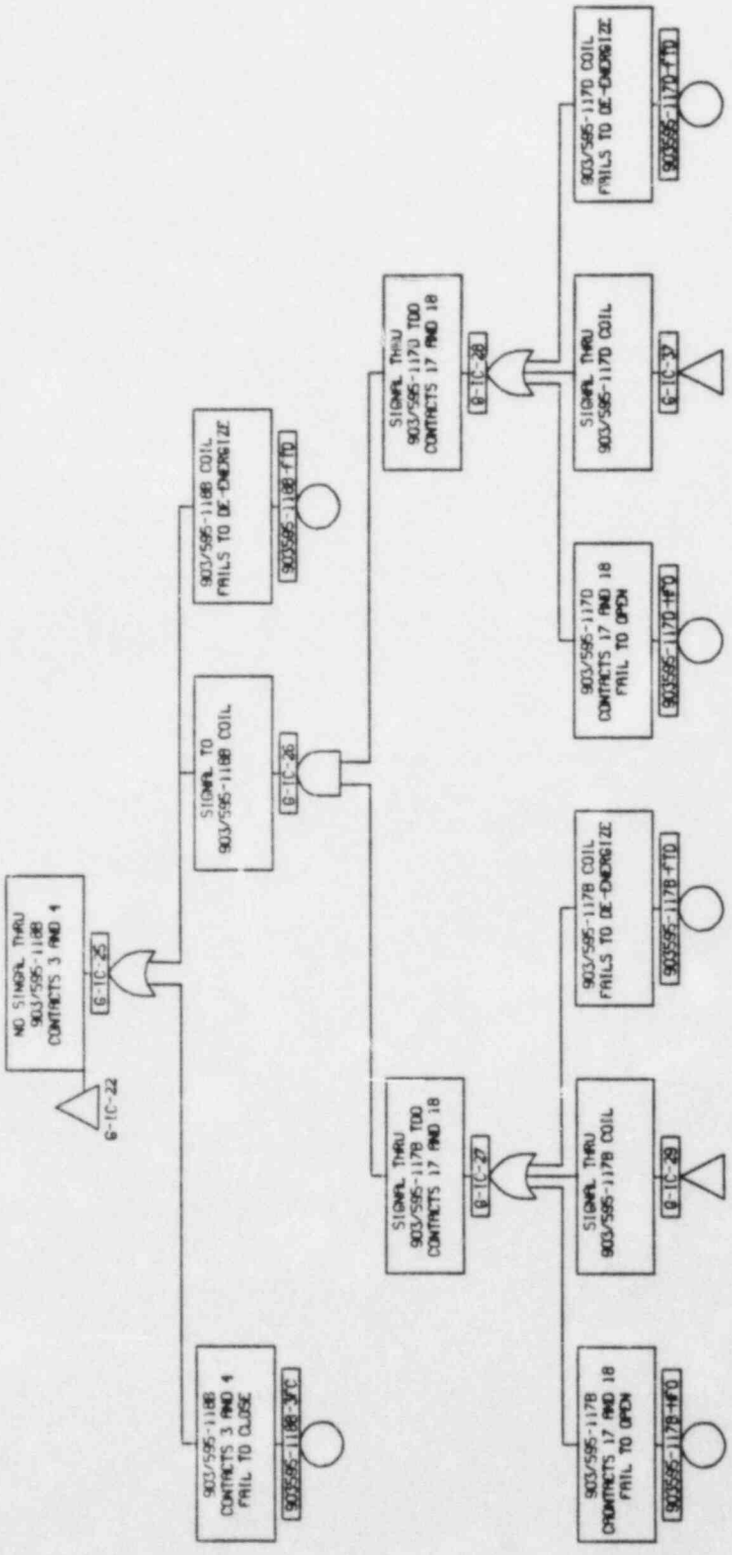

SIGNAL THRU
903/595-1158
CONTACTS 3 AND 4
6-IC-14
6-IC-9
8-IC-84
SIGNAL TO
903/595-1158 COIL
6-IC-15
903/595-1158
CONTACTS 9 AND 10
FAIL TO REMAIN OPEN
903595-1158-9RO
903/595-1158 COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-1158-FRO
2

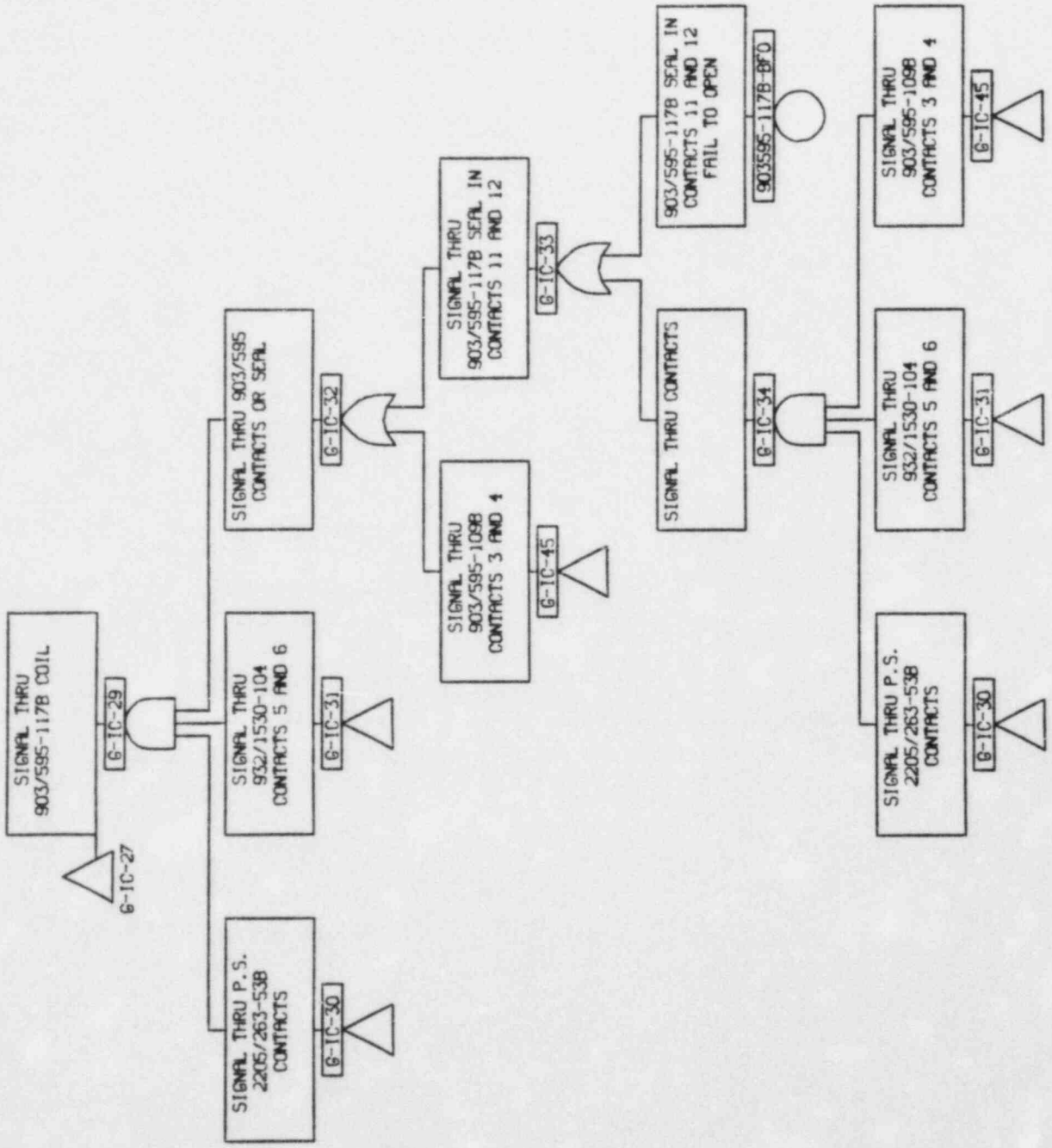

SIGNAL TO 903/595-1158 COIL
6-IC-14
6-IC-76
6-IC-15
SIGNAL FROM PRESSURE SWITCH 2257/13508
SIGNAL FROM PRESSURE SWITCH 2257/13498
903/595-1158 SEAL IN CONTACTS 1 AND 2 FAIL TO REMAIN OPEN
903595-1158-IRO
6-IC-16
6-IC-17
2257/13508 P.S. MISCALIBRATED
P.S. 2257/13508 CONTACTS FAIL TO REMAIN OPEN
2257PS-13508-IRO
2257PS-13508-CAL
2257/13498 P.S. MISCALIBRATED
2257/13498 PRESSURE SWITCH CONTACTS FAIL TO REMAIN OPEN
2257PS-13498-IRO
2257PS-13498-CAL
2257/13498 CONTACTS CLOSE ON HI PRESSURE - 3 X RATED STM. FLOW
IC-1-1C-BRCPK
1
2257/13498 CONTACTS CLOSE ON HI PRESSURE - 3 X RATED STM. FLOW
IC-1-1C-BRCPK
1

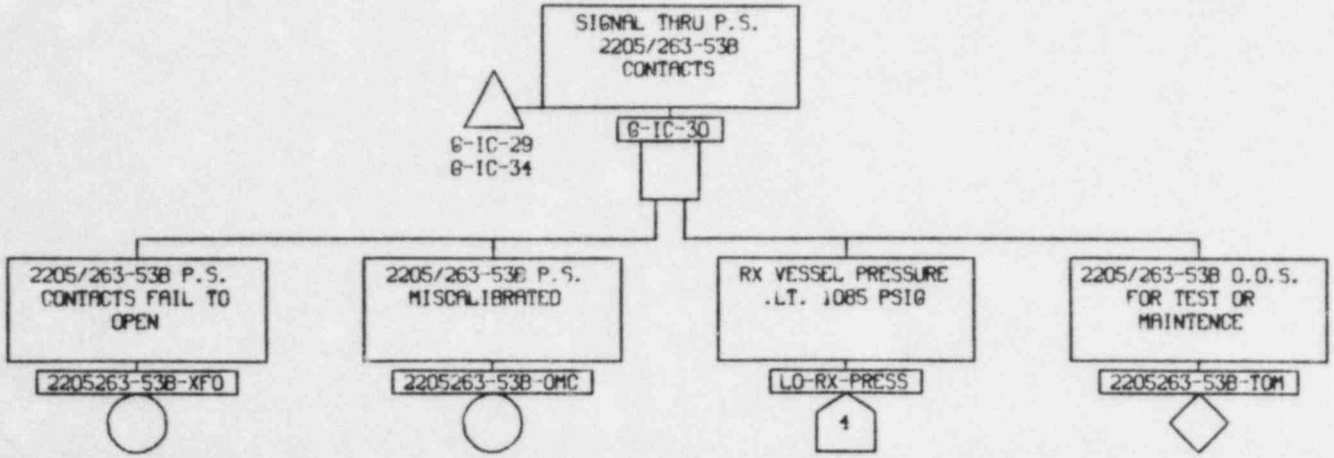

NO FLOW THRU MOV
1-IC-3 - CONDENSATE
RETURN - N.C.
6-IC-3
6-IC-18
MOV 1-IC-3 FAILS TO
OPEN
IC-3-MOV-FTO
MOV 1-IC-3 CLOSED
DUE TO SIGNAL FROM
SW. 903/595-312
CONTACTS 2 AND 2T
6-IC-19
SPURIOUS CLOSING
SIGNAL THRU
903/595-1168
CONTACTS 9 AND 10
6-IC-70
NO SIGNAL TO OPENING
COIL OF MOV 1-IC-3
6-IC-22
NO D.C. POWER FROM
BUS 101AB-1
6-IC-21
MOV 1-IC-3 INOP. DUE
TO TEST OR
MAINTENANCE
IC-3-MOV-TMC
LOCAL FAULTS ON
COMPT. NO. 058 BKR.
DC-101AB1-58-FMC
L/O D.C. POWER ON
BUS 101AB-1
6-DC-BUS-AB1
OPERATOR CLOSES
SWITCH 903/595-312
CONTACTS 2 AND 2T
IC-3-MOV-OPC
SWITCH 903/595-312
CONTACTS 2 AND 2T
FAIL TO REMAIN OPEN
903595-312-2BO

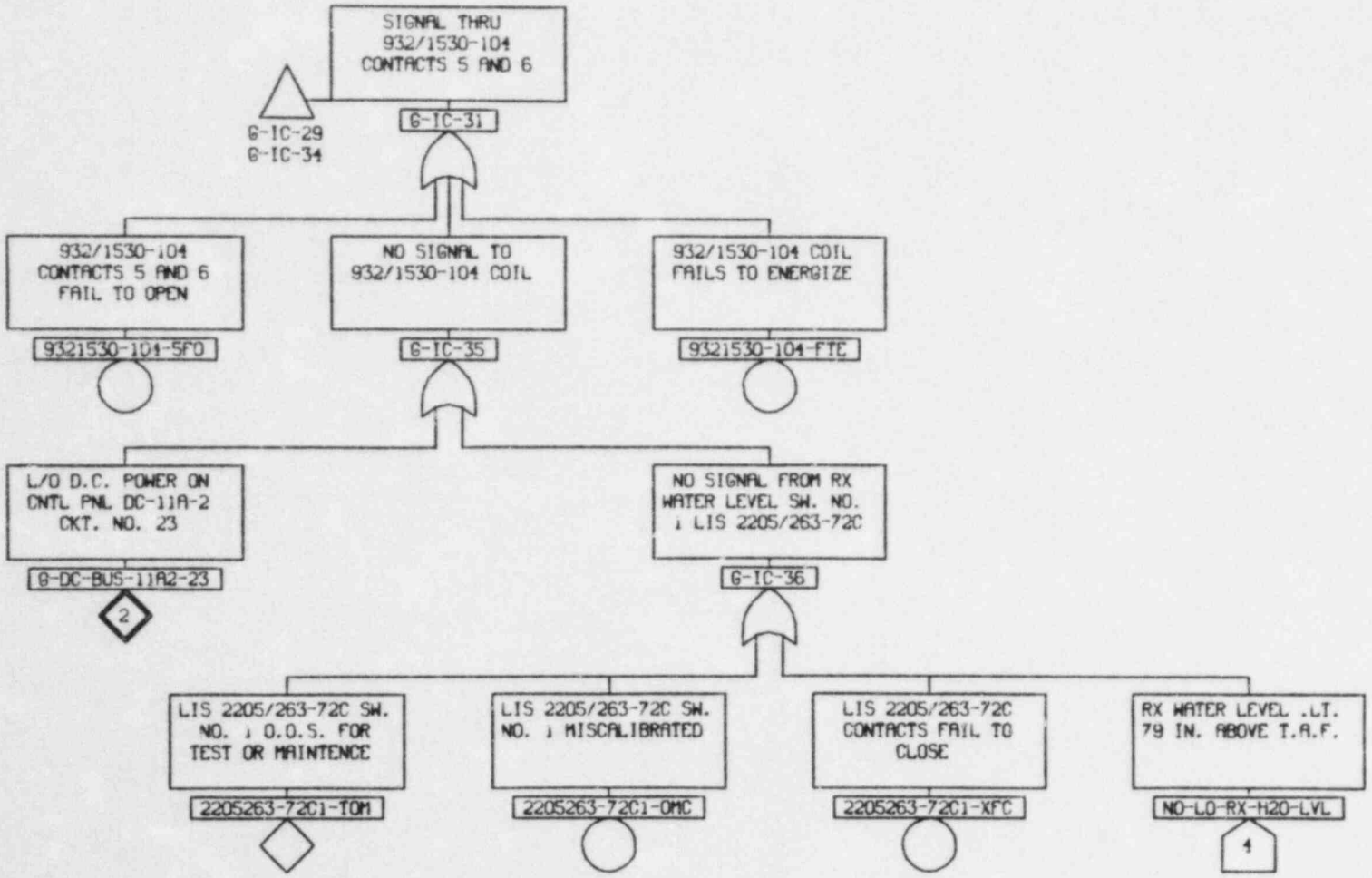

NO SIGNAL TO OPENING COIL OF MOV 1-IC-3
G-IC-18
G-IC-22
NO SINGAL THRU 903/595-118B CONTACTS 3 AND 4
G-IC-25
NO SIGNAL THRU 903/595-118A CONTACTS 3 AND 4
G-IC-49
NO SIGNAL THRU 903/595-116B CONTACTS 7 AND 8
G-IC-73
NO SIGNAL THRU SW. 903/595-312 CONTACTS 3 AND 3T
G-IC-24
903/595-312 CONTACTS 3 AND 3T FAIL TO REMAIN CLOSED
903595-312-3RC
SW. 903/595-312 FAILS TO OPERATE
903595-312-FTE
OPERATOR FAILS TO CLOSE SW. 903/595-312 CONTACTS 3 AND 3T
903595-312-OFR

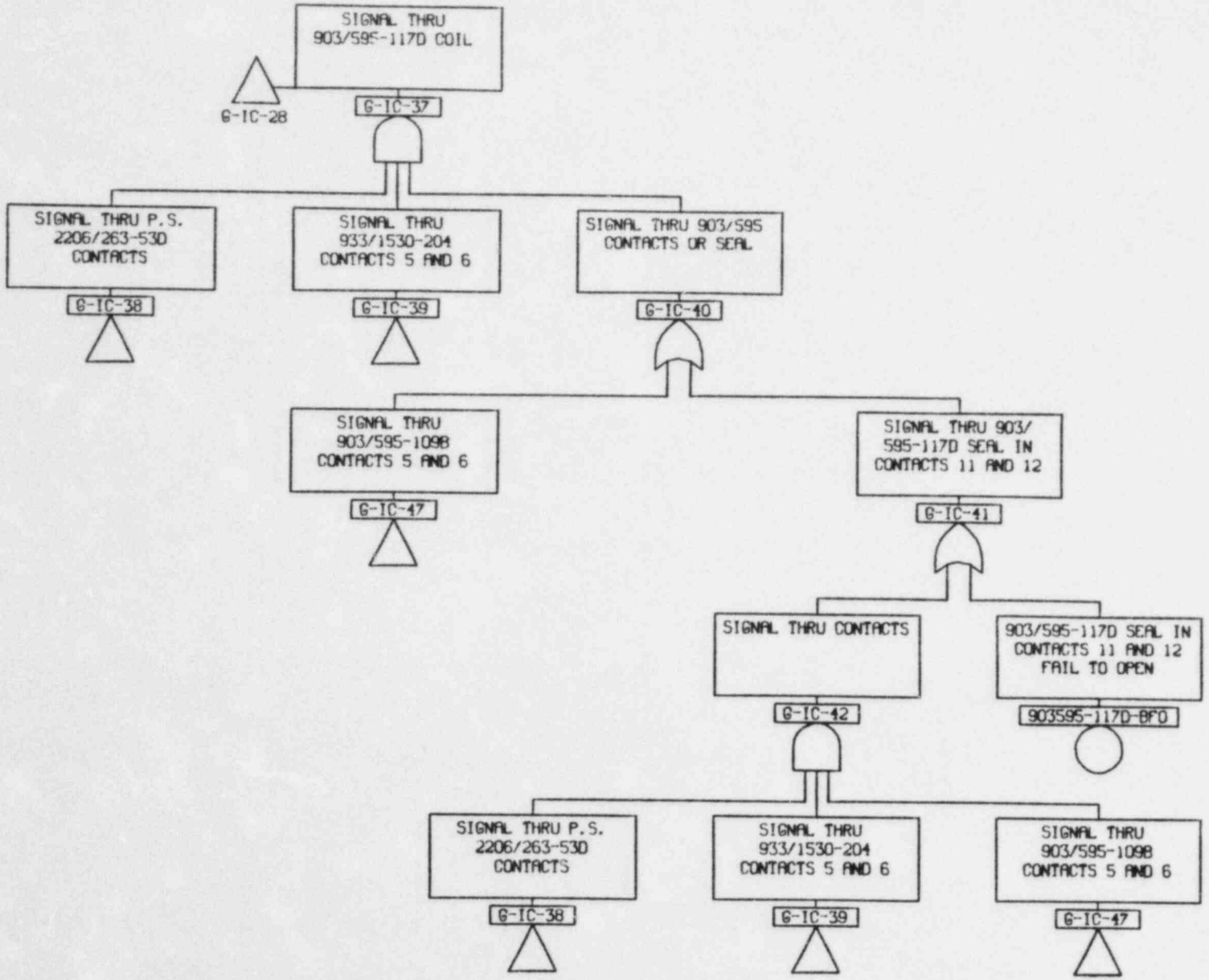

SPURIOUS CLOSING SIGNAL THRU 903/595-1168 CONTACTS 9 AND 10
G-IC-70
G-IC-18
SIGNAL TO 903/595-1168 COIL
G-IC-80
903/595-1168 COIL FAILS TO REMAIN DE-ENERGIZED
903595-1168-FRO
3
903/595-1168 CONTACTS 9 AND 10 FAIL TO REMAIN OPEN
903595-1168-SRO

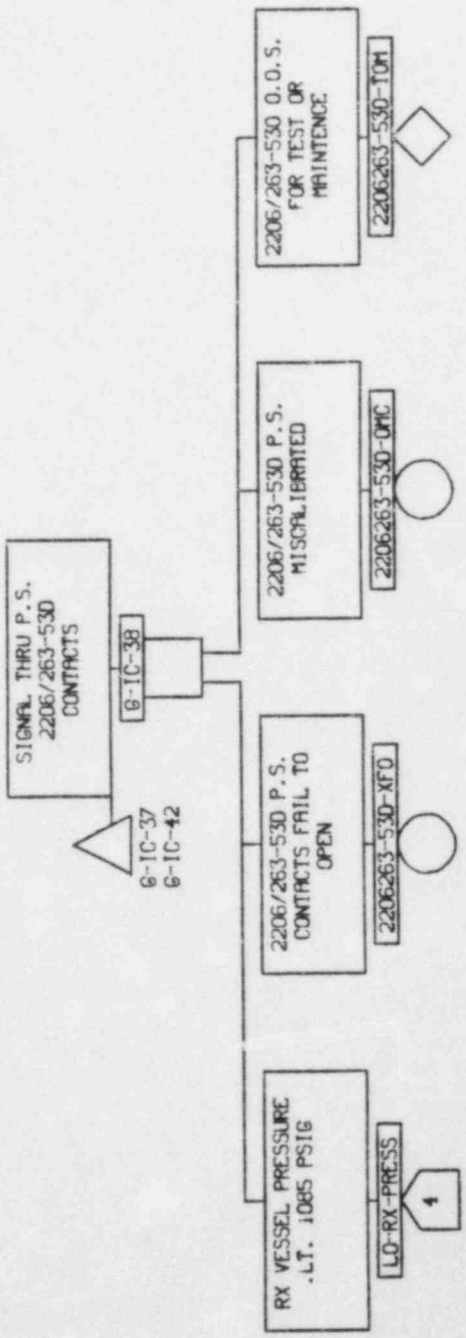

NO SIGNAL THRU 903/595-1188 CONTACTS 3 AND 4
6-IC-25
6-IC-22
SIGNAL TO 903/595-1188 COIL
6-IC-26
903/595-1188 COIL FAILS TO DE-ENERGIZE
903/595-1188 CONTACTS 3 AND 4 FAIL TO CLOSE
SIGNAL THRU 903/595-1170 TDO CONTACTS 17 AND 18
6-IC-28
SIGNAL THRU 903/595-1170 COIL
6-IC-29
903/595-1170 COIL FAILS TO DE-ENERGIZE
903/595-1170 CONTACTS 17 AND 18 FAIL TO OPEN
SIGNAL THRU 903/595-1178 TDO CONTACTS 17 AND 18
6-IC-27
SIGNAL THRU 903/595-1178 COIL
6-IC-28
903/595-1178 COIL FAILS TO DE-ENERGIZE
903/595-1178 CONTACTS 17 AND 18 FAIL TO OPEN

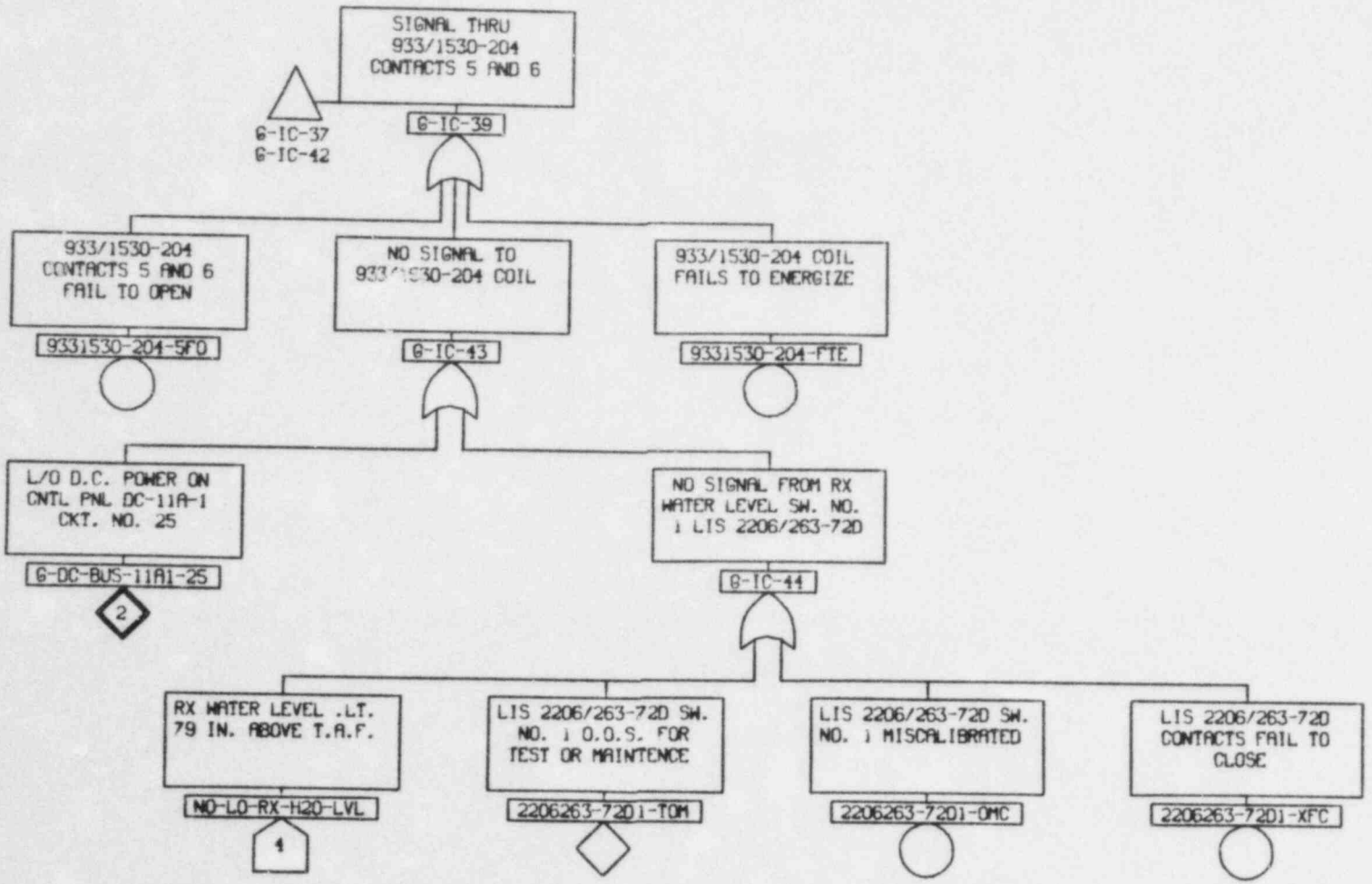

SIGNAL THRU 903/595-1178 COIL
6-IC-29
6-IC-27
SIGNAL THRU P.S. 2205/263-538 CONTACTS
6-IC-30
SIGNAL THRU 932/1530-104 CONTACTS 5 AND 6
6-IC-31
SIGNAL THRU 903/595 CONTACTS OR SEAL
6-IC-32
SIGNAL THRU 903/595-1098 CONTACTS 3 AND 4
6-IC-45
SIGNAL THRU 903/595-1178 SEAL IN CONTACTS 11 AND 12
6-IC-33
SIGNAL THRU CONTACTS
6-IC-34
903/595-1178 SEAL IN CONTACTS 11 AND 12 FAIL TO OPEN
903595-1178-BF0
SIGNAL THRU P.S. 2205/263-538 CONTACTS
6-IC-30
SIGNAL THRU 932/1530-104 CONTACTS 5 AND 6
6-IC-31
SIGNAL THRU 903/595-1098 CONTACTS 3 AND 4
6-IC-45

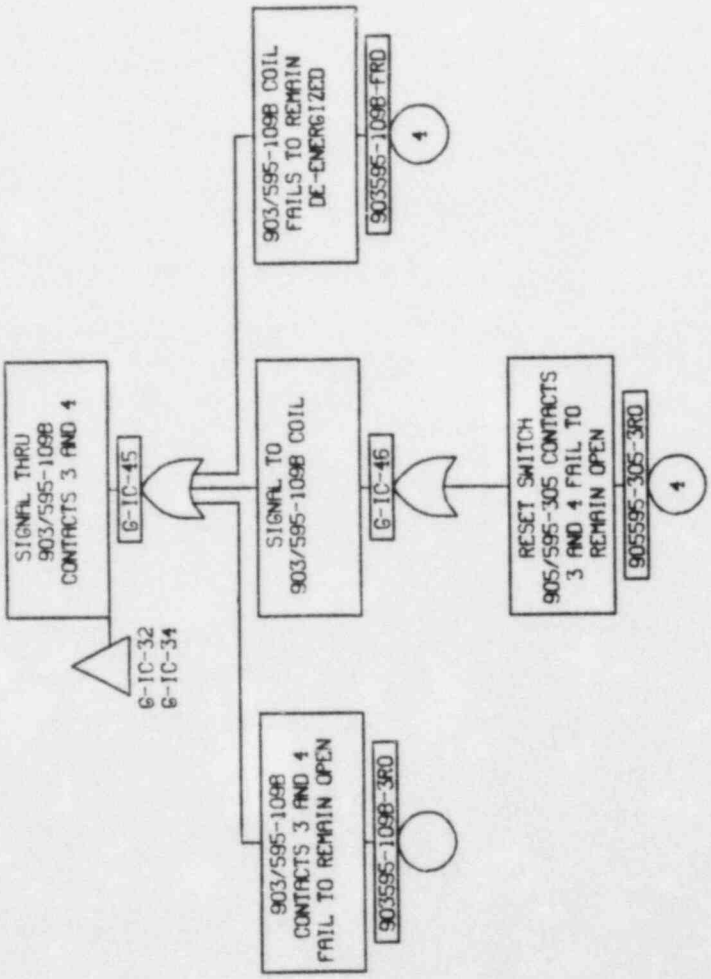

SIGNAL THRU P.S.
2205/263-538
CONTACTS
G-IC-30
G-IC-29
G-IC-34
2205/263-538 P.S.
CONTACTS FAIL TO
OPEN
2205/263-538 P.S.
MISCALIBRATED
RX VESSEL PRESSURE
.LT. 1085 PSIG
2205/263-538 O.O.S.
FOR TEST OR
MAINTENCE
2205263-538-XFO
2205263-538-OMC
LO-RX-PRESS
1
2205263-538-TOM

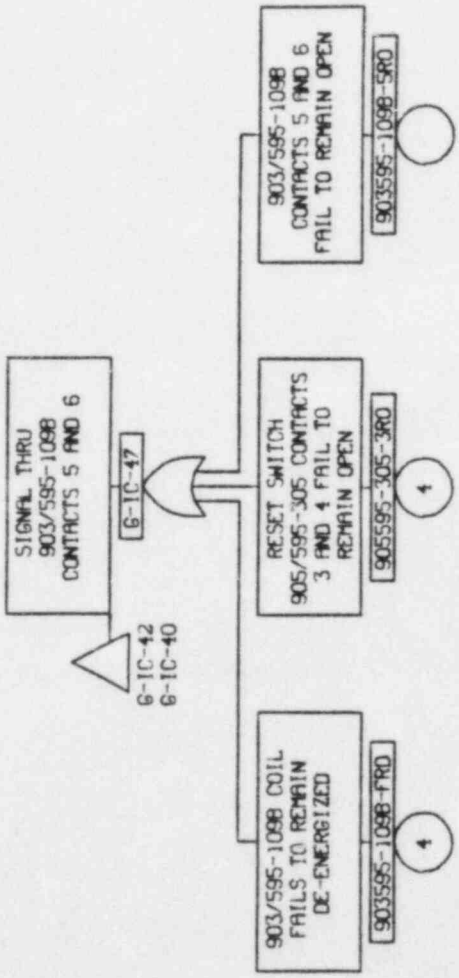

SIGNAL THRU
932/1530-104
CONTACTS 5 AND 6
G-IC-31
G-IC-29
G-IC-34
932/1530-104
CONTACTS 5 AND 6
FAIL TO OPEN
9321530-104-SFO
NO SIGNAL TO
932/1530-104 COIL
G-IC-35
932/1530-104 COIL
FAILS TO ENERGIZE
9321530-104-FTE
L/O D.C. POWER ON
CNTL PNL DC-11A-2
CKT. NO. 23
G-DC-BUS-11A2-23
2
NO SIGNAL FROM RX
WATER LEVEL SW. NO.
1 LIS 2205/263-72C
G-IC-36
LIS 2205/263-72C SW.
NO. 1 O.O.S. FOR
TEST OR MAINTENCE
2205263-72C1-TOM
LIS 2205/263-72C SW.
NO. 1 MISCALIBRATED
2205263-72C1-OMC
LIS 2205/263-72C
CONTACTS FAIL TO
CLOSE
2205263-72C1-XFC
RX WATER LEVEL .LT.
79 IN. ABOVE T.A.F.
NO-LO-RX-H2O-LVL
1

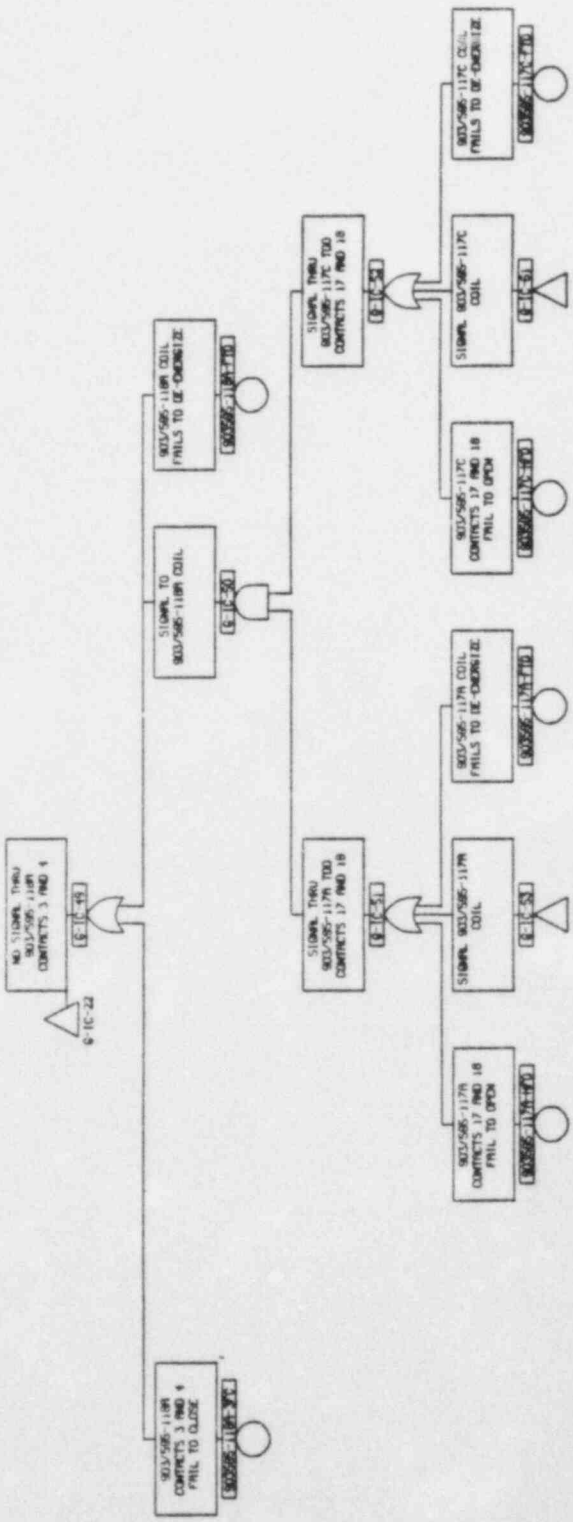

SIGNAL THRU
903/595-117D COIL
G-IC-28
G-IC-37
SIGNAL THRU P.S.
2206/263-530
CONTACTS
G-IC-38
SIGNAL THRU
933/1530-204
CONTACTS 5 AND 6
G-IC-39
SIGNAL THRU 903/595
CONTACTS OR SEAL
G-IC-40
SIGNAL THRU
903/595-1098
CONTACTS 5 AND 6
G-IC-47
SIGNAL THRU 903/
595-117D SEAL IN
CONTACTS 11 AND 12
G-IC-41
SIGNAL THRU CONTACTS
G-IC-42
903/595-117D SEAL IN
CONTACTS 11 AND 12
FAIL TO OPEN
903595-117D-BFO
SIGNAL THRU P.S.
2206/263-530
CONTACTS
G-IC-38
SIGNAL THRU
933/1530-204
CONTACTS 5 AND 6
G-IC-39
SIGNAL THRU
903/595-1098
CONTACTS 5 AND 6
G-IC-47

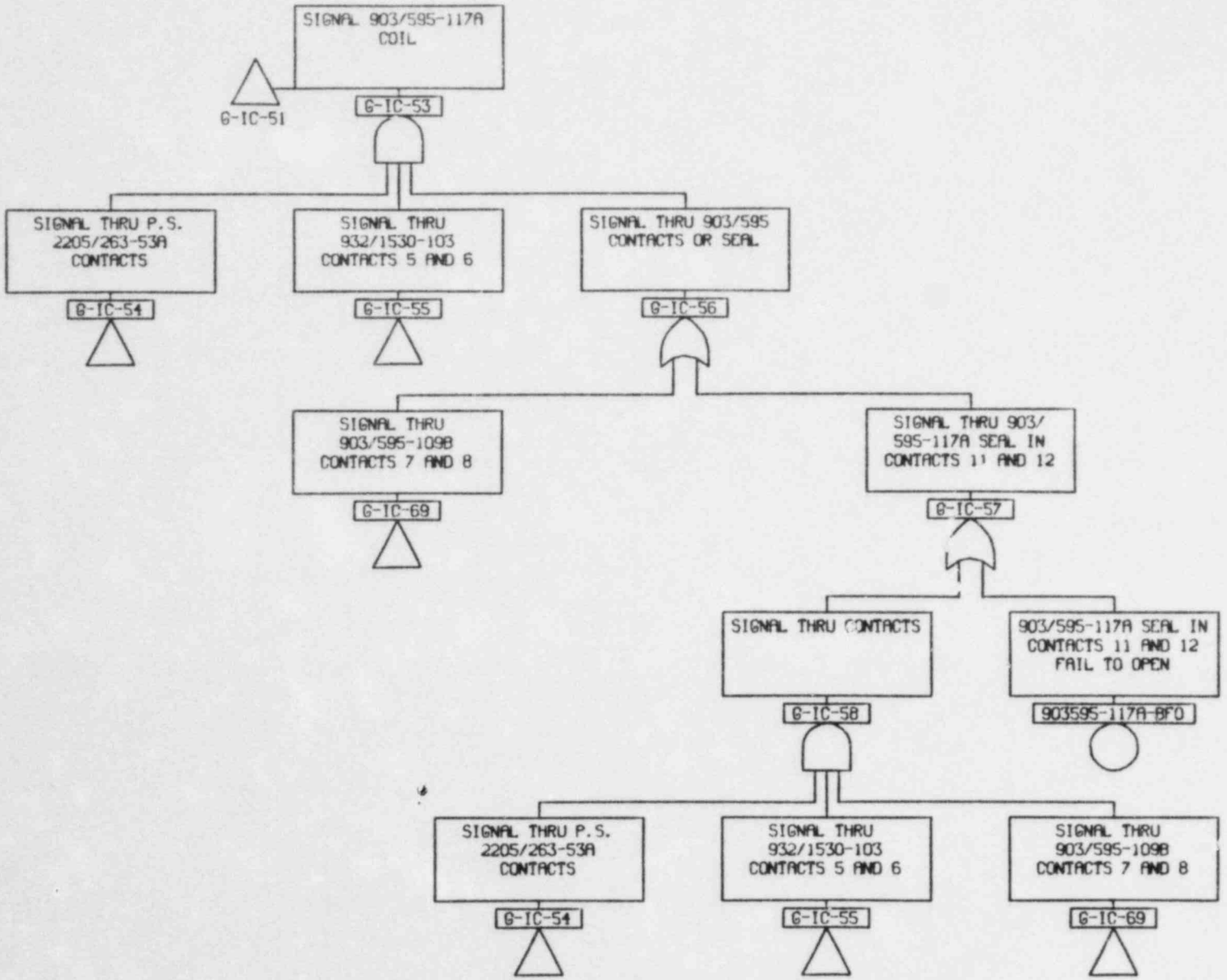

SIGNAL THRU P.S.
2206/263-530
CONTACTS
6-IC-38
6-IC-37
6-IC-42
2206/263-530 P.S.
MISCALIBRATED
2206263-530-CMC
2206/263-530 O.O.S.
FOR TEST OR
MAINTENCE
2206263-530-TOM
2206/263-530 P.S.
CONTACTS FAIL TO
OPEN
2206263-530-XFO
RX VESSEL PRESSURE
.LT. 1085 PSIG
LO-RX-PRESS
1

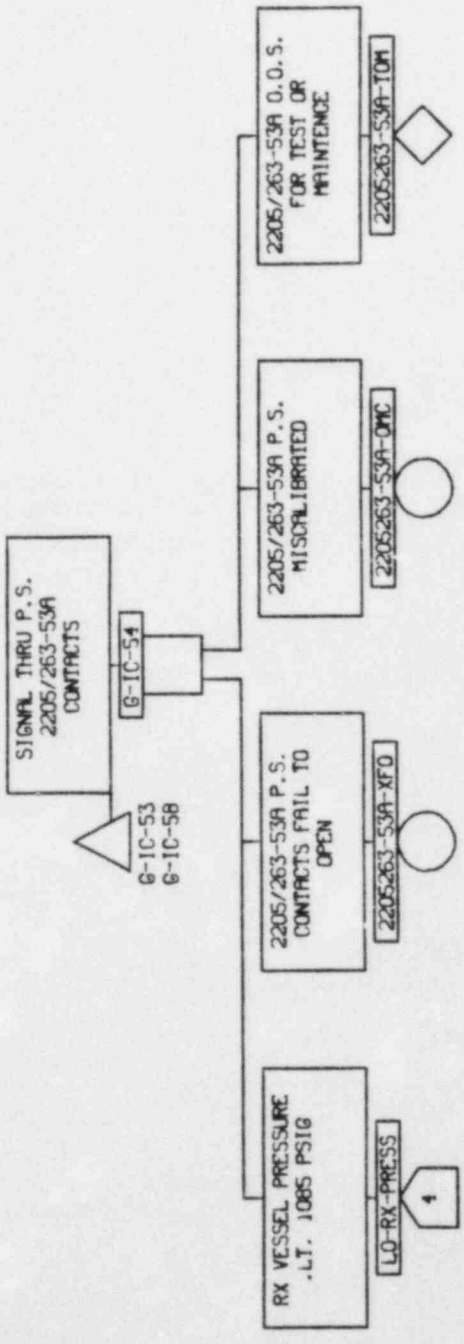

SIGNAL THRU
933/1530-204
CONTACTS 5 AND 6
G-IC-39
G-IC-37
G-IC-42
933/1530-204
CONTACTS 5 AND 6
FAIL TO OPEN
9331530-204-5FO
NO SIGNAL TO
933/1530-204 COIL
G-IC-43
933/1530-204 COIL
FAILS TO ENERGIZE
9331530-204-FTE
L/O D.C. POWER ON
CNTL PNL DC-11A-1
CKT. NO. 25
G-DC-BUS-11A1-25
2
NO SIGNAL FROM RX
WATER LEVEL SW. NO.
1 LIS 2206/263-72D
G-IC-44
RX WATER LEVEL .LT.
79 IN. ABOVE T.A.F.
NO-LO-RX-H2O-LVL
1
LIS 2206/263-72D SW.
NO. 1 O.O.S. FOR
TEST OR MAINTENCE
2206263-72D1-TOM
LIS 2206/263-72D SW.
NO. 1 MISCALIBRATED
2206263-72D1-OMC
LIS 2206/263-72D
CONTACTS FAIL TO
CLOSE
2206263-72D1-XFC

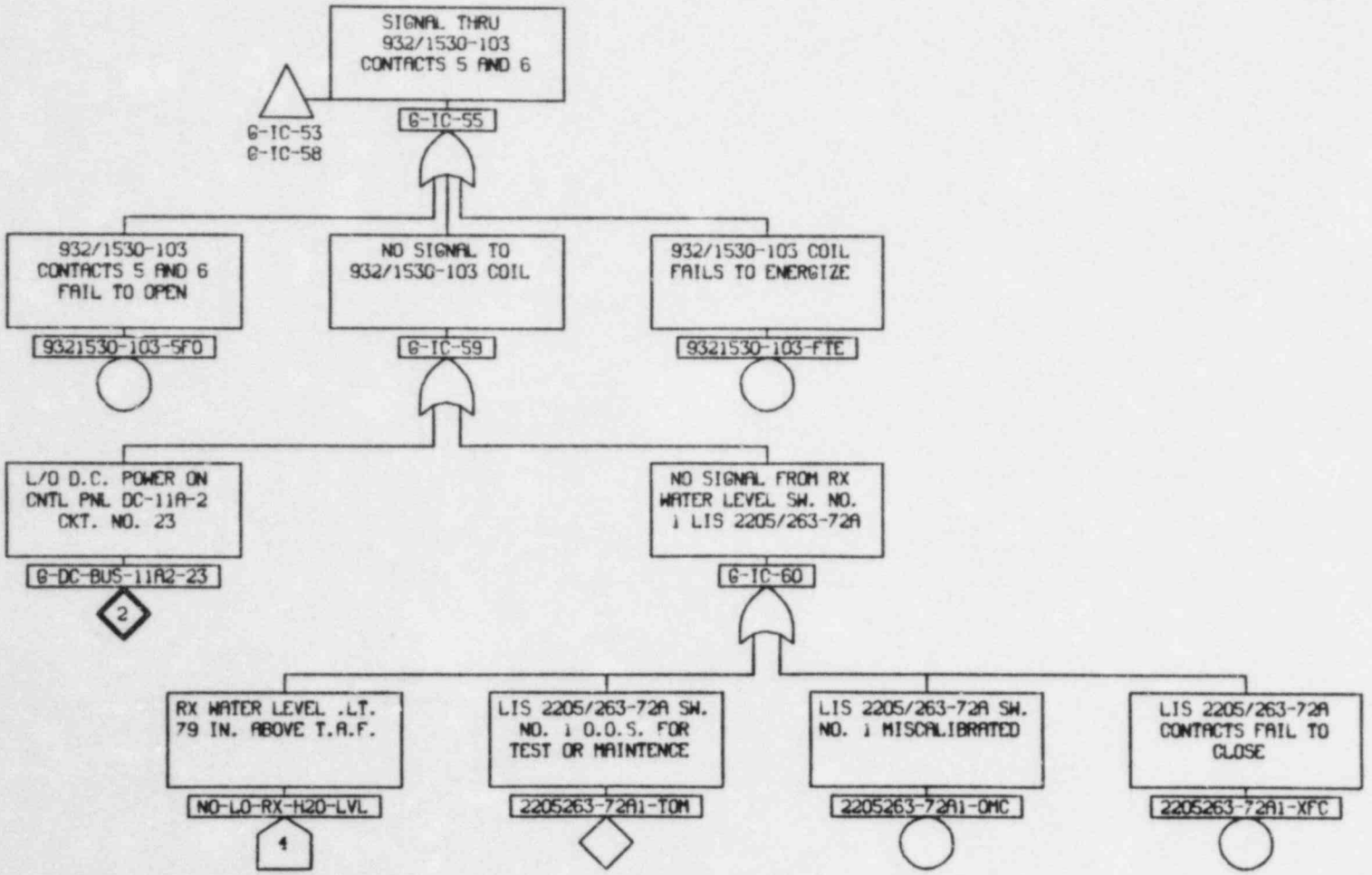

SIGNAL THRU
903/595-1098
CONTACTS 3 AND 4
G-IC-32
G-IC-34
G-IC-45
903/595-1098 COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-1098-FRD
4
SIGNAL TO
903/595-1098 COIL
G-IC-46
RESET SWITCH
905/595-305 CONTACTS
3 AND 4 FAIL TO
REMAIN OPEN
905595-305-3RD
4
903/595-1098
CONTACTS 3 AND 4
FAIL TO REMAIN OPEN
903595-1098-3RD

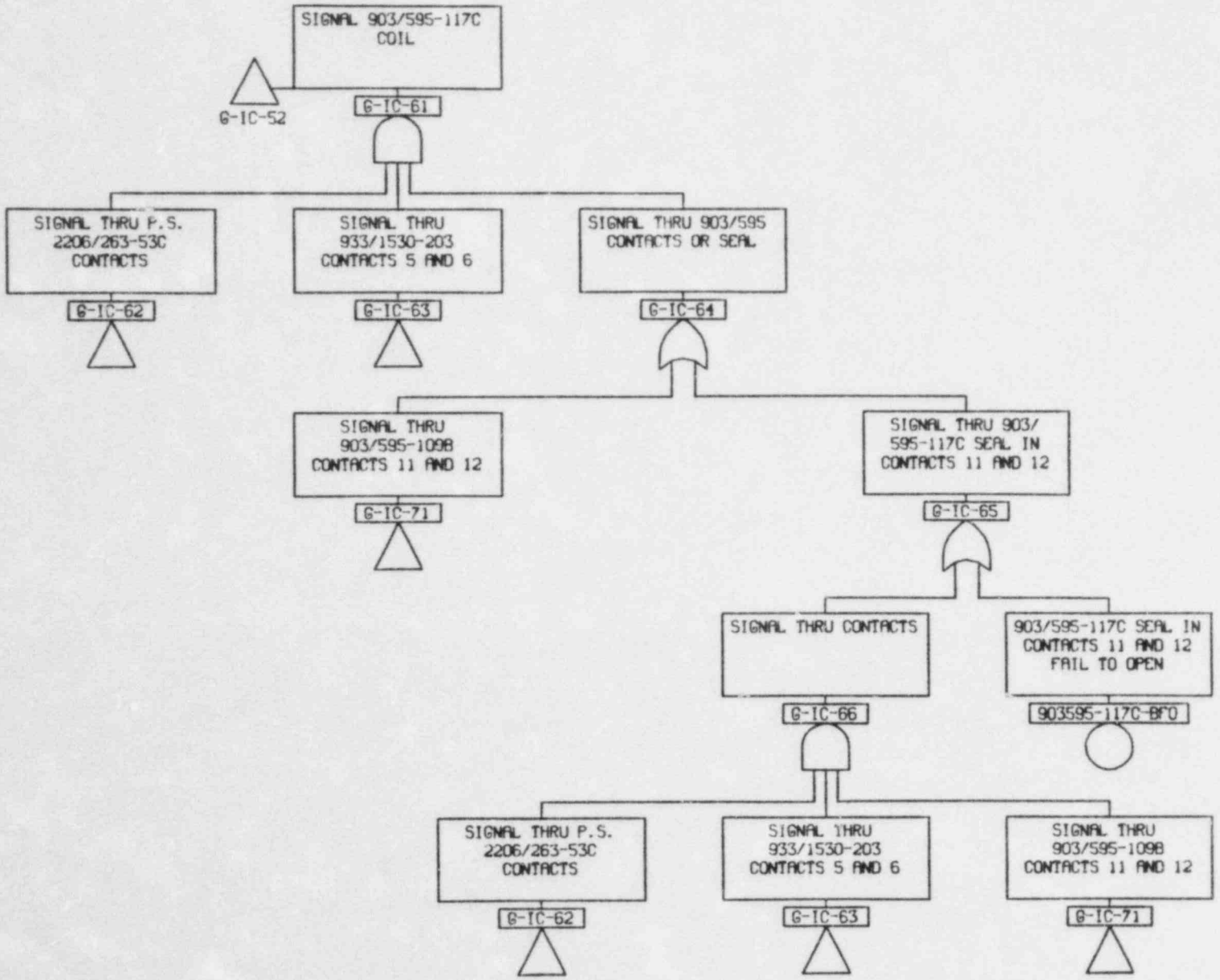

SIGNAL THRU
903/595-1098
CONTACTS 5 AND 6
6-IC-42
6-IC-40
6-IC-47
903/595-1098 COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-1098-FRD
4
RESET SWITCH
905/595-305 CONTACTS
3 AND 4 FAIL TO
REMAIN OPEN
905595-305-3RD
4
903/595-1098
CONTACTS 5 AND 6
FAIL TO REMAIN OPEN
903595-1098-5RD

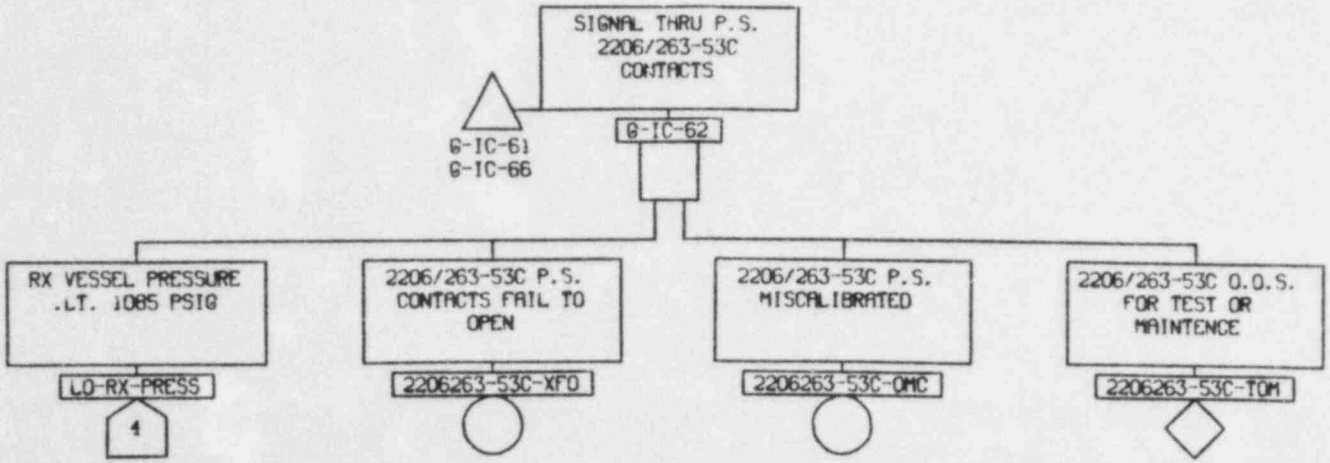


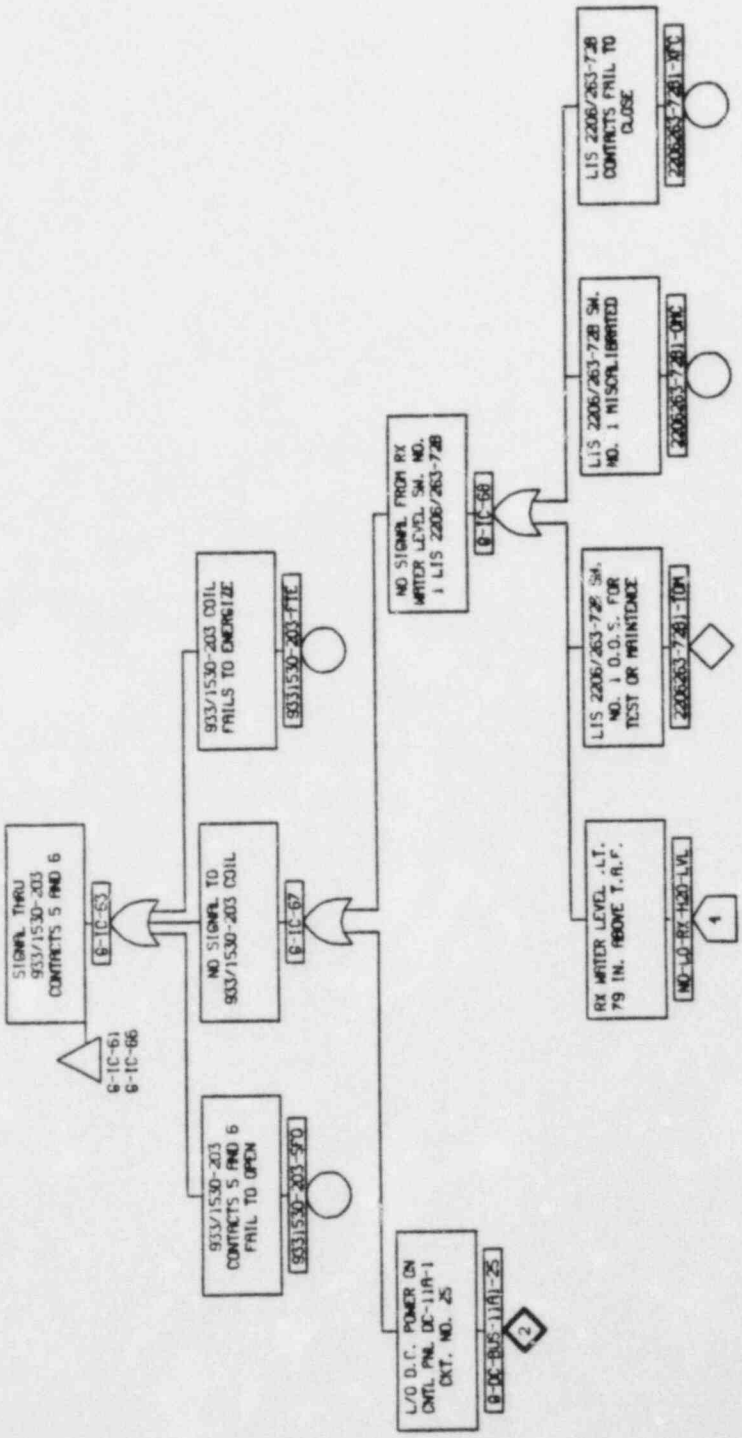

SIGNAL 903/595-117A COIL
G-IC-51
G-IC-53
SIGNAL THRU P.S. 2205/263-53A CONTACTS
G-IC-54
SIGNAL THRU 932/1530-103 CONTACTS 5 AND 6
G-IC-55
SIGNAL THRU 903/595 CONTACTS OR SEAL
G-IC-56
SIGNAL THRU 903/595-109B CONTACTS 7 AND 8
G-IC-69
SIGNAL THRU 903/595-117A SEAL IN CONTACTS 11 AND 12
G-IC-57
SIGNAL THRU CONTACTS
G-IC-58
903/595-117A SEAL IN CONTACTS 11 AND 12 FAIL TO OPEN
903595-117A-BFO
SIGNAL THRU P.S. 2205/263-53A CONTACTS
G-IC-54
SIGNAL THRU 932/1530-103 CONTACTS 5 AND 6
G-IC-55
SIGNAL THRU 903/595-109B CONTACTS 7 AND 8
G-IC-69

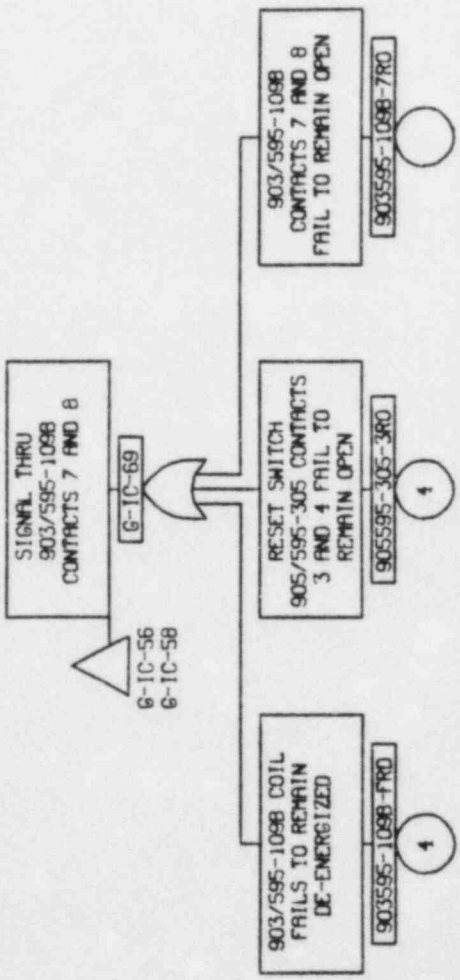

SIGNAL THRU P.S.
2205/263-53A
CONTACTS
6-IC-53
6-IC-58
6-IC-54
2205/263-53A P.S.
MISCALIBRATED
2205263-53A-CMC
2205/263-53A O.O.S.
FOR TEST OR
MAINTENCE
2205263-53A-TOM
2205/263-53A P.S.
CONTACTS FAIL TO
OPEN
2205263-53A-XFO
RX VESSEL PRESSURE
.LT. 1085 PSIG
LO-RX-PRESS
1

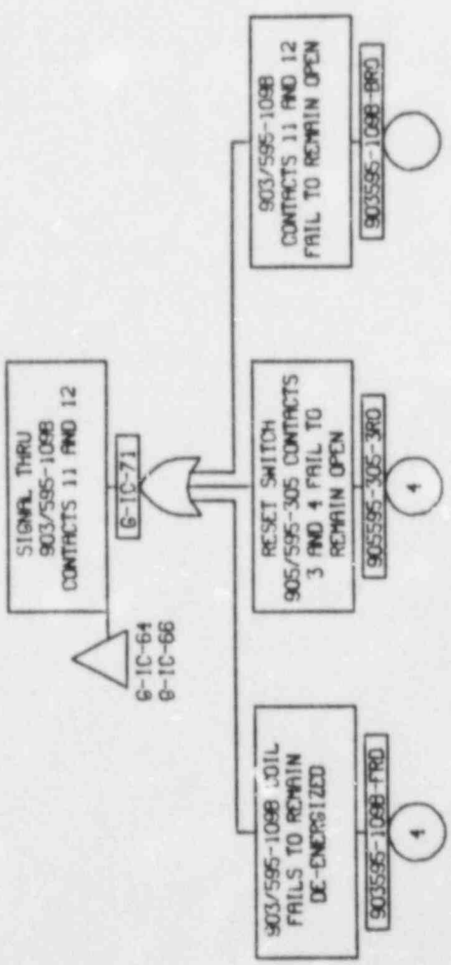

SIGNAL THRU
932/1530-103
CONTACTS 5 AND 6
G-IC-55
G-IC-53
G-IC-58
932/1530-103
CONTACTS 5 AND 6
FAIL TO OPEN
9321530-103-5FO
NO SIGNAL TO
932/1530-103 COIL
G-IC-59
932/1530-103 COIL
FAILS TO ENERGIZE
9321530-103-FTE
L/O D.C. POWER ON
CNTL PNL DC-11A-2
CKT. NO. 23
G-DC-BUS-11A2-23
2
NO SIGNAL FROM RX
WATER LEVEL SW. NO.
1 LIS 2205/263-72A
G-IC-60
RX WATER LEVEL .LT.
79 IN. ABOVE T.A.F.
NO-LO-RX-H2O-LVL
4
LIS 2205/263-72A SW.
NO. 1 O.O.S. FOR
TEST OR MAINTENCE
2205263-72A1-TOM
LIS 2205/263-72A SW.
NO. 1 MISCALIBRATED
2205263-72A1-OMC
LIS 2205/263-72A
CONTACTS FAIL TO
CLOSE
2205263-72A1-XFC

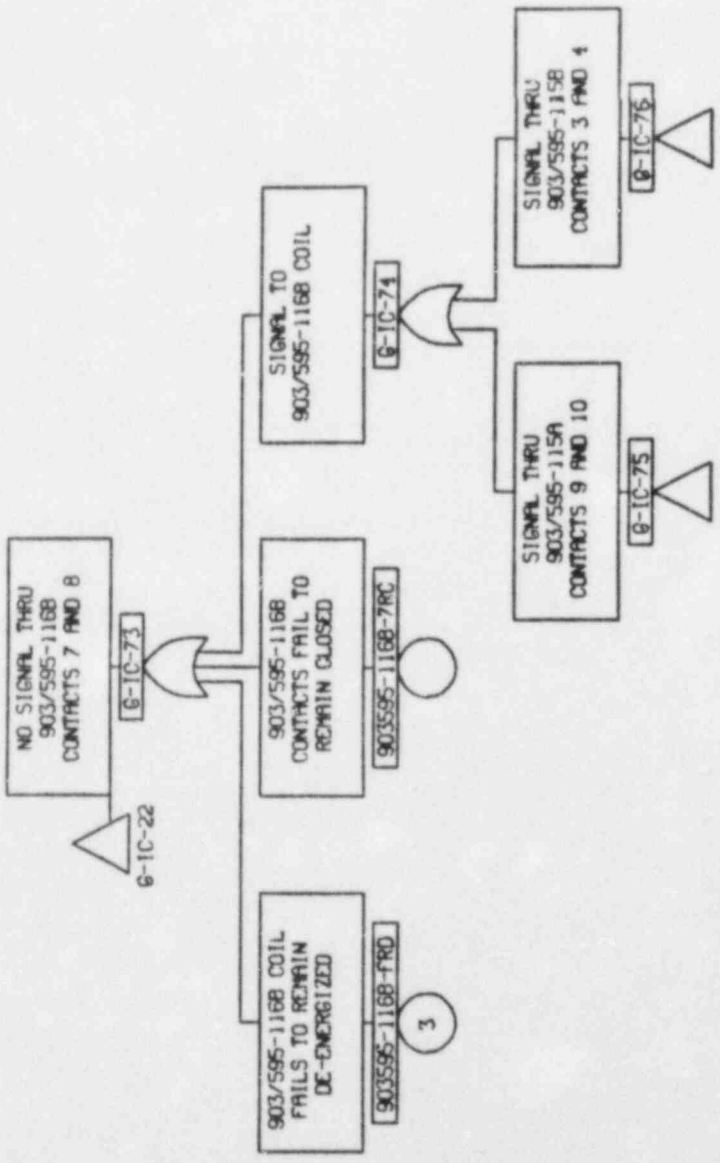

SIGNAL 903/595-117C COIL
G-IC-52
G-IC-61
SIGNAL THRU P.S. 2206/263-53C CONTACTS
G-IC-62
SIGNAL THRU 933/1530-203 CONTACTS 5 AND 6
G-IC-63
SIGNAL THRU 903/595 CONTACTS OR SEAL
G-IC-64
SIGNAL THRU 903/595-1098 CONTACTS 11 AND 12
G-IC-71
SIGNAL THRU 903/595-117C SEAL IN CONTACTS 11 AND 12
G-IC-65
SIGNAL THRU CONTACTS
G-IC-66
903/595-117C SEAL IN CONTACTS 11 AND 12 FAIL TO OPEN
903595-117C-BFO
SIGNAL THRU P.S. 2206/263-53C CONTACTS
G-IC-62
SIGNAL THRU 933/1530-203 CONTACTS 5 AND 6
G-IC-63
SIGNAL THRU 903/595-1098 CONTACTS 11 AND 12
G-IC-71

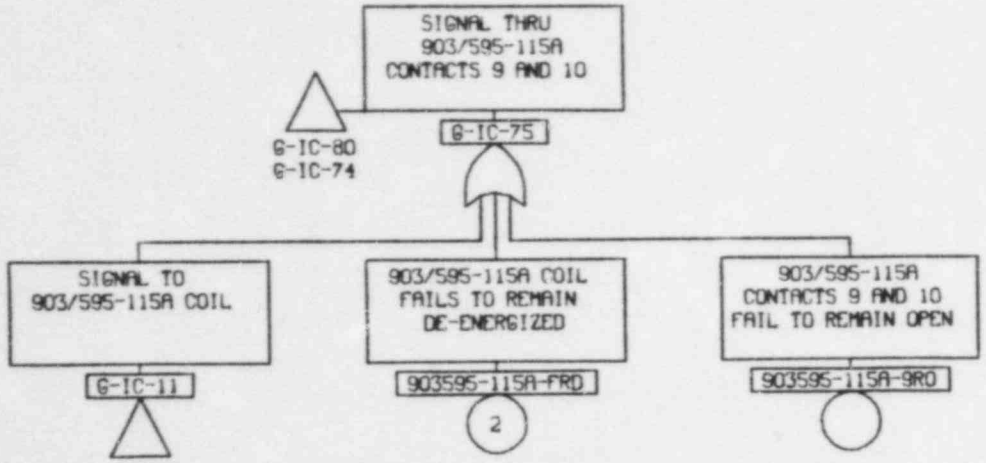

SIGNAL THRU P.S.
2206/263-53C
CONTACTS
G-IC-61
G-IC-66
G-IC-62
RX VESSEL PRESSURE
.LT. 1085 PSIG
2206/263-53C P.S.
CONTACTS FAIL TO
OPEN
2206/263-53C P.S.
MISCALIBRATED
2206/263-53C O.O.S.
FOR TEST OR
MAINTENCE
LO-RX-PRESS
4
2206263-53C-XFO
2206263-53C-OMC
2206263-53C-TOM

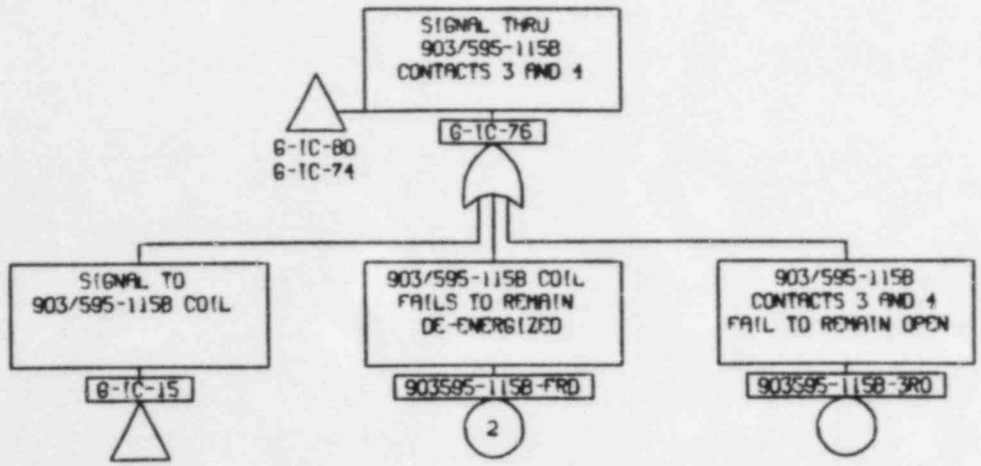

SIGNAL THRU 933/1530-203 CONTACTS 5 AND 6
6-IC-63
6-IC-61
6-IC-66
933/1530-203 CONTACTS 5 AND 6 FAIL TO OPEN
933/1530-203-5/6
NO SIGNAL TO 933/1530-203 COIL
6-IC-67
933/1530-203 COIL FAILS TO ENERGIZE
933/1530-203-FTE
L/O D.C. POWER ON CNTL PNL DC-11A-1 EXT. NO. 25
6-DC-865-1161-25
2
NO SIGNAL FROM RX WATER LEVEL SW. NO. 1 LIS 2206/263-728
6-IC-68
RX WATER LEVEL -LT- 79 IN. ABOVE T.A.F.
NO-LO-RX-H20-LVL
1
LIS 2206/263-728 SW. NO. 1 O.O.S. FOR TEST OR MAINTENCE
2206263-728-1-TOM
LIS 2206/263-728 SW. NO. 1 MISCALIBRATED
2206263-728-1-CMC
LIS 2206/263-728 CONTACTS FAIL TO CLOSE
2206263-728-1-CFC

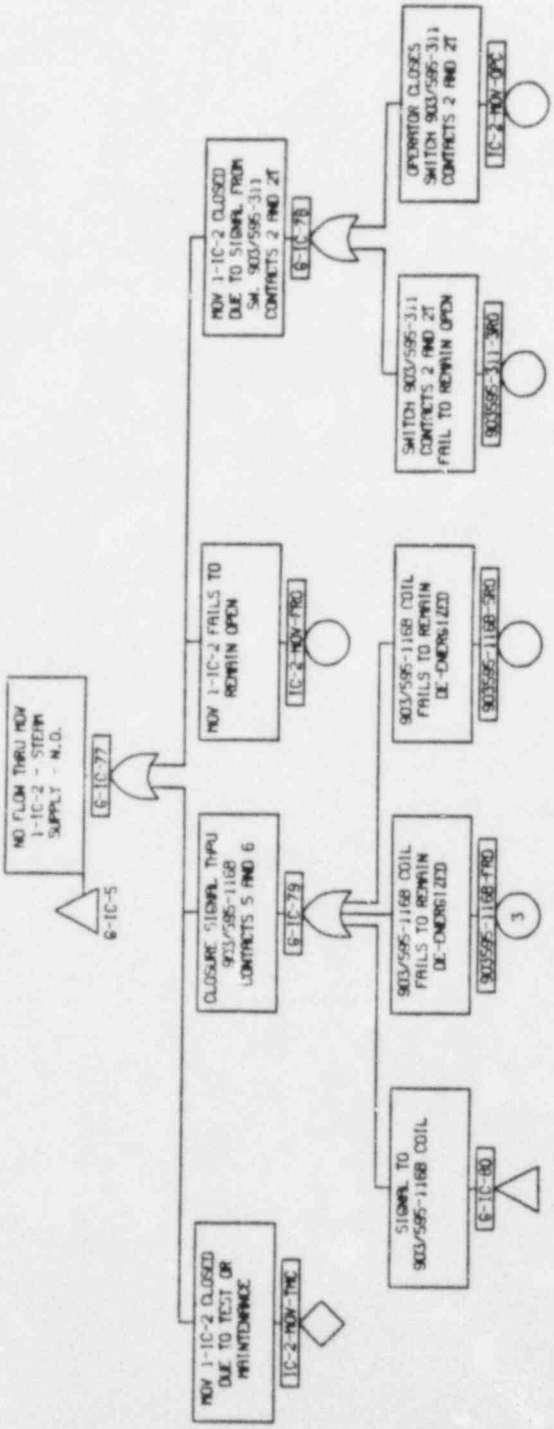

SIGNAL THRU
903/595-1098
CONTACTS 7 AND 8
G-IC-56
G-IC-58
G-IC-69
RESET SWITCH
905/595-305 CONTACTS
3 AND 4 FAIL TO
REMAIN OPEN
905595-305-3RD
4
903/595-1098
CONTACTS 7 AND 8
FAIL TO REMAIN OPEN
903595-1098-7RD
903/595-1098 COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-1098-FRD
4

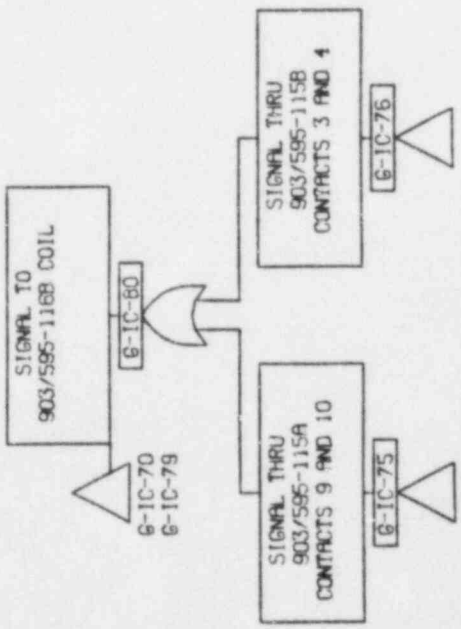

SIGNAL THRU
903/595-1098
CONTACTS 11 AND 12
6-IC-71
6-IC-64
8-IC-66
903/595-1098 COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-1098-FRD
4
RESET SWITCH
905/595-305 CONTACTS
3 AND 4 FAIL TO
REMAIN OPEN
905595-305-3RD
4
903/595-1098
CONTACTS 11 AND 12
FAIL TO REMAIN OPEN
903595-1098-6RD

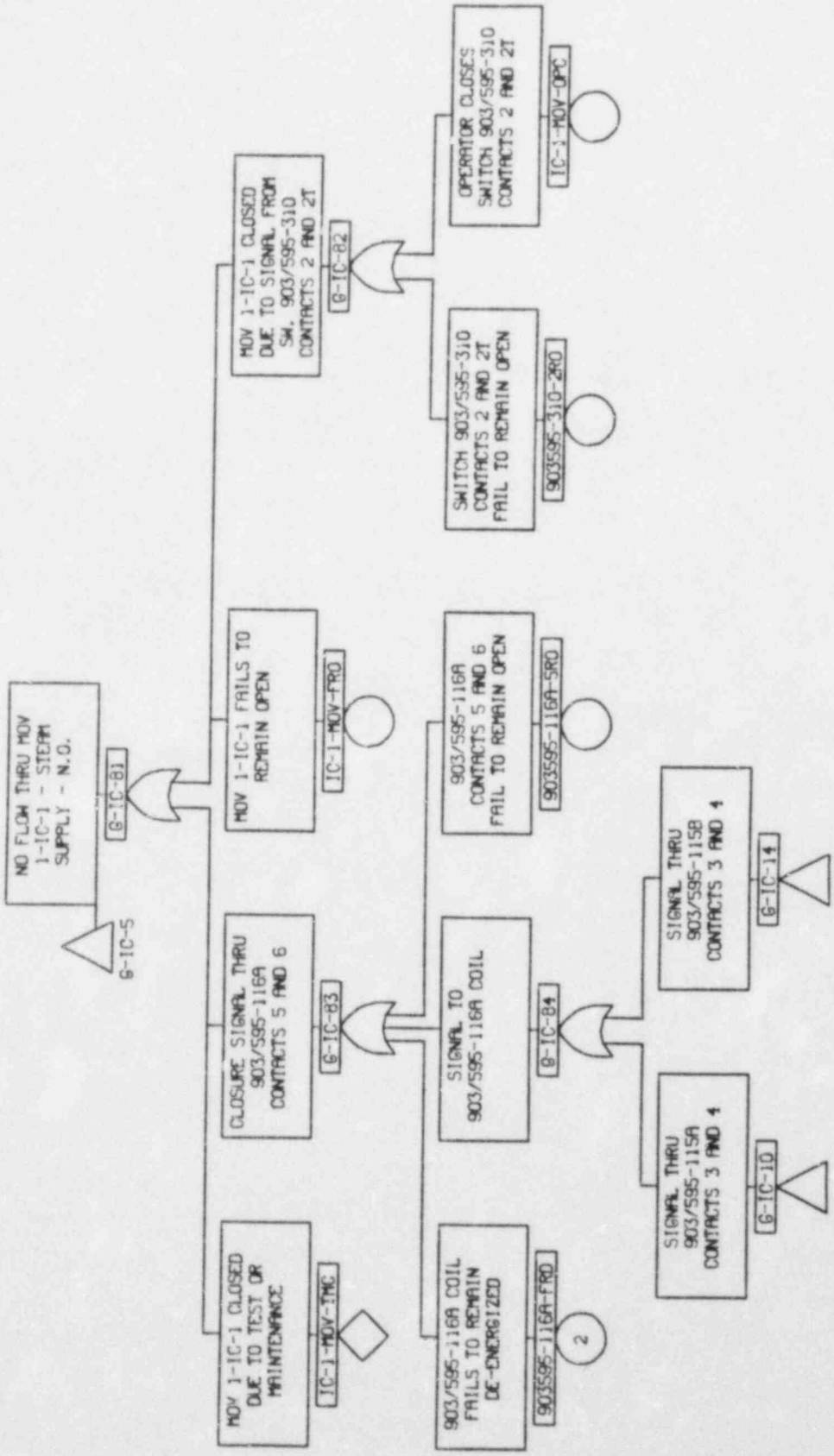

NO SIGNAL THRU
903/595-1168
CONTACTS 7 AND 8
G-IC-73
G-IC-22
903/595-1168
CONTACTS FAIL TO
REMAIN CLOSED
903595-1168-7RC
SIGNAL TO
903/595-1168 COIL
G-IC-74
SIGNAL THRU
903/595-115A
CONTACTS 9 AND 10
0-IC-75
SIGNAL THRU
903/595-115B
CONTACTS 3 AND 4
0-IC-76
903/595-1168 COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-1168-FRD
3


SIGNAL THRU
903/595-115A
CONTACTS 9 AND 10
G-IC-80
G-IC-74
G-IC-75
SIGNAL TO
903/595-115A COIL
G-IC-11
903/595-115A COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-115A-FRO
2
903/595-115A
CONTACTS 9 AND 10
FAIL TO REMAIN OPEN
903595-115A-9RO


SIGNAL THRU
903/595-115B
CONTACTS 3 AND 4
G-IC-80
G-IC-74
G-IC-76
SIGNAL TO
903/595-115B COIL
G-IC-15
903/595-115B COIL
FAILS TO REMAIN
DE-ENERGIZED
903595-115B-FRO
2
903/595-115B
CONTACTS 3 AND 4
FAIL TO REMAIN OPEN
903595-115B-3RO


NO FLOW THRU MDV 1-1C-2 - STEAM SUPPLY N.O.
S-1C-6
1C-2-MDV-FTO
MDV 1-1C-2 FAILS TO REMAIN OPEN
1C-2-MDV-FRO
MDV 1-1C-2 CLOSED DUE TO SIGNAL FROM SW. 903/595-311 CONTACTS 2 AND 2T
1C-2-MDV-SPU
CLOSURE SIGNAL THRU 903/595-1168 CONTACTS 5 AND 6
1C-2-MDV-CSC
MDV 1-1C-2 CLOSED DUE TO TEST OR MAINTENANCE
1C-2-MDV-TM
903/595-1168 COIL FAILS TO REMAIN DE-ENERGIZED
1C-2-MDV-FRO
903/595-1168 COIL FAILS TO REMAIN DE-ENERGIZED
1C-2-MDV-FRO
SIGNAL TO 903/595-1168 COIL
OR-3
OPERATOR CLOSES SWITCH 903/595-311 CONTACTS 2 AND 2T
1C-2-MDV-OC
SWITCH 903/595-311 CONTACTS 2 AND 2T FAIL TO REMAIN OPEN
1C-2-MDV-FRO


SIGNAL TO
903/595-116B COIL
6-IC-70
6-IC-79
6-IC-80
SIGNAL THRU
903/595-115A
CONTACTS 9 AND 10
6-IC-75
SIGNAL THRU
903/595-115B
CONTACTS 3 AND 4
6-IC-76


NO FLOW THRU MOV 1-IC-1 - STEAM SUPPLY - N.O.
G-IC-81
G-IC-5
MOV 1-IC-1 CLOSED DUE TO TEST OR MAINTENANCE
IC-1-MOV-TMC
CLOSURE SIGNAL THRU 903/595-116A CONTACTS 5 AND 6
G-IC-83
MOV 1-IC-1 FAILS TO REMAIN OPEN
IC-1-MOV-FRO
MOV 1-IC-1 CLOSED DUE TO SIGNAL FROM SW. 903/595-310 CONTACTS 2 AND 2T
G-IC-82
OPERATOR CLOSES SWITCH 903/595-310 CONTACTS 2 AND 2T
IC-1-MOV-OPC
SWITCH 903/595-310 CONTACTS 2 AND 2T FAIL TO REMAIN OPEN
903595-310-2RO
903/595-116A COIL FAILS TO REMAIN DE-ENERGIZED
903595-116A-FRO
2
SIGNAL TO 903/595-116A COIL
G-IC-84
903/595-116A CONTACTS 5 AND 6 FAIL TO REMAIN OPEN
903595-116A-5RO
SIGNAL THRU 903/595-115A CONTACTS 3 AND 4
G-IC-10
SIGNAL THRU 903/595-115B CONTACTS 3 AND 4
G-IC-14

# APPENDIX B.7

# AUTOMATIC PRESSURE RELIEF SYSTEM

## B.7.1 Automatic Pressure Relief System Description

### B.7.1.1 Purpose

The purpose of the automatic pressure relief (APR) system is to provide a backup method for reducing reactor pressure rapidly in the event of feedwater coolant injection system failure. Since each of the four APR valves also functions as a safety valve, they are additionally able to prevent the reactor vessel pressure safety limit of 1375 psig from being exceeded. All together, there are six valves that perform this safety/ relief valve function.

### B.7.1.2 Description and Configuration

The four APR valves are considered dual purpose since they are self-actuating at the set relieving pressure and are air operated at pressures below the setpoint, which permits remote manual or automatic opening.

The dual valve consists of two main sections (see Figure B.7-1). The pilot valve section is a relatively small selfactuated relief valve, integral with the main valve, which provides pressure sensing and main valve control functions. The main element of this pilot valve is a precision machined spring-bellows, the expansion of which accurately controls pilot valve opening pressure. The main relief-safety valve section is a hydraulically-operated, reverse-seated globe valve which, when actuated by the pilot valve via the second stage disk, provides the pressure relief function. Thus, the four APR valves are capable of functioning (see Figure B.7-2) as safety/relief valves opening automatically at the following setpoints:

1) APR valve MS-3A opens at 1095 psig
2) APR valve MS-3D opens at 1110 psig
3) APR valves MS-3C and MS-3F open at 1125 psig

In addition, the two remaining safety/relief valves which are not capable of automatic remote actuation open at 1125 psig.

When the APR valves operate in the remote actuation mode, the air operator performs the function of the pilot valve section, causing the second stage disk to open. This results in main valve actuation, as shown in Figure B.7-3, similar to the safety mode except here the pilot valve remains closed.

The APR system is capable of operation without reliance on offsite power or station air. Control power to the air operator solenoid is supplied by redundant 125 volt DC power sources, and sufficient air is stored in emergency accumulators for several valve cycling operations.

APR valves MS-3A, 3C, 3D, and 3F are located on horizontal sections of main steam lines A, C, B, and D, respectively. The two safety/relief valves MS-3B and 3E are similarly installed on steam lines B and C. Each valve discharge is piped through its own discharge line to a point below the water level in the primary containment suppression pool (torus) to permit steam to condense in the pool. Each exhaust line is equipped with a vacuum relief valve to prevent drawing water up into the line due to steam condensation following termination of operation.

B.7.1.3 System Interfaces

See attached Table B.7-1.

B.7.1.4 Instrumentation and Control

Automatic actuation of the APR system requires coincident indication of reactor water lo-lo level and high drywell pressure, as well as persistance of the lo-lo water level signal for two minutes. An interlock prevents actuation of the APR function until the discharge pressure of at least one LPCI or core spray pump exceeds 100 psig. This ensures that the system will not operate until the low pressure ECCS pumps are running. System instrumentation is listed in Table B.7-2.

The actuation logic consists of two redundant trip systems, either of which is capabale of initiating auto blowdown upon receipt of the accident signal. Each of these trip systems is further divided into two trip logic channels. Both channels within a given trip system must actuate in order to initiate the trip system logic. A channel consists of lo-lo reactor water level instrumentation, high drywell pressure instrumentation and an a ECCS "pump running" interlock, all in series with each other. Since every core spray and LPCI pump has two pressure switches on its discharge side, each switch acts as an interlock on one of the two trip channels.

A time delay circuit is located in series with one of the trip logic channels in each trip system to allow time for the FWCI system to achieve proper operation. If the FWCI system maintains water level in the reactor vessel, the blowdown circuit is de-energized and the automatic blowdown signal is blocked. If, however, the FWCI system fails to deliver sufficient flow, the blowdown actuates upon termination of the time delay (two minutes). The APR system initiation logic is shown in Figure B.7-4.

The time delay also provides surveillance time so that the operator can evaluate possible spurious activation signals and override them if necessary. A permissive signal from the time delay circuit serves as the confirming signal to activate the APR valves when the control station switch is in the automatic position. Manual blowdown of the reactor vessel is accomplished independently of the automatic circuitry.

The automatic pressure relief system is provided with redundant power supplies to each auto-relief valve and auto blowdown trip system. Upon loss of the primary DC power supply to these circuits, automatic transfer to an alternate DC power supply will be accomplished. Hence, the pressure relief system will be maintained for both manual and automatic operation in the event that a station battery is lost.

B.7.1.5 Testing

There are two primary tests of the APR system, SP 413B and SP 413C, which are conducted during each refueling outage (approximately every 12,000 hours), and three related tests which are performed monthly to check the function and

calibration of the accident detection instrumentation. Bench testing of the safety/relief valves is performed during each refueling outage, and functional tests are performed at normal and low reactor operating pressures.

SP413B Auto Blowdown Logic Test

One of the objectives of this test is to verify the logic sequence of the automatic blowdown (APR) system by simulated auto-initiation. A simulated accident signal is placed separately on each of the four trip logic channels (two channels per trip system). The test is considered to be satisfactory if each channel actuates as required. In addition, the two trip channels having time delay circuits must actuate a "blowdown" at or less than 120 seconds from initiation.

The other objective of this test is to verify autotransfer of DC control power to the alternate source upon loss of the primary. Fuses are pulled on the primary DC power supply and successful transfer to the alternate supply, along with control room panel annunciation is checked. This test is peformed on both auto-blowdown trip system power supplies as well as each auto-relief valve solenoid power supply.

SP 413C Automatic Actuation of Automatic Pressure Relief Subsystem

The objective of this test is to verify that a simulated auto-initiation signal will open all four APR valve solenoids. A simulated accident signal is placed on both trip logic channels of trip system "A". A successful test occurs if after 120 seconds the green APR indicating lights on control room panel 903 go out and the red indicating light comes on, indicating power to the APR actuation solenoid.

SP 413A LP Core Cooling Pump Interlock Functional and Calibration Test

The objective of this monthly test is to check the function of the LPCI and core spray pump interlock pressure sensors, and calibrate them if necessary. The test is considered to be satisfactorily completed provided the switches trip at 100 psig ($\pm$ 10 psig).

SP 412C Reactor Low Low Water Level Functional and Calibration Test

The objective of this monthly test is to determine if the four water level switches (as listed in Table B.7-2) will trip at the setpoint of 79" above the top of the active fuel, and to calibrate them if necessary.

SP 412D High Drywell Pressure Functional and Calibration Test

The objective of this monthly test is to demonstrate that the four drywell pressure detection switches (as listed in Table B.7-2) will trip at a pressure less than or equal to 2 psig.

SP 626.2 Manual Operation of Relief Valves When at Low Pressure

Once during each refueling cycle each safety/relief valve must be manually operated while the reactor is at low pressure.

SP 626.3 Manual Operation of Relief Valves when at Operating Pressure

The safety/relief valves are to be opened, one at a time, while the reactor is at operating pressure. There is no set interval for the performance of this test.

SP 778.1 Inspection of Safety/Relief Valves

During each refueling outage one safety/relief valve is disassembled and inspected.

SP 778.2 Bench Check of Safety/Relief Valves

During each refueling outage three of the six safety/relief valves "top works" are bench tested. All six valves are tested during a span of two refuelings.

B.7.1.6 Maintenance

The four APR valves and the two safety/relief valves are maintained in accordance with the surveillance requirements spelled out by the Technical Specifications. At each refueling outage, three of the six valves have their "top works" either bench checked or replaced with bench checked "top works," so that all six valves are maintained by the end of two refueling outages (approx. 24,000 hours). In addition, at least one of the six valves is disassembled and inspected during each refueling outage so that all of the valves will be overhauled by the end of six refueling outages, at most.

B.7.1.7 Technical Specifications

The limiting conditions for operation require that all six safety/relief valves be operable in the safety valve mode whenever reactor pressure and temperature are greater than 90 psig and 320°F, respectively. Failure of any one valve to operate in this mode (as a safety valve) mandates cold shutdown within 24 hours. The same limiting condition for operation applies to the four safety/relief valves functioning in the automatic pressure relief mode, with the following exception. Reactor operation is allowed for a period of 7 days with one of the APR valves inoperable, provided that the remaining APR valves, the FWCI system and the gas turbine generator are all operable. If the inoperable APR valve cannot be repaired within that time, the reactor is required to be in cold shutdown as stated earlier.

The surveillance requirements similarly address the dual function of the six safety/relief valves. All six valves must be opened manually, with the reactor at low pressure, once during each operating cycle to demonstrate operability in the safety valve mode. Additional surveillance requirements regarding valve maintenance have already been discussed in the preceding section, B.7.1.6.

Surveillance of the four APR valves includes all of the requirements stated for the safety valve mode. Additionally, during each operating cycle a simulated automated initiation of the system, excluding actual valve opening, is performed. Also, if one of the APR valves is found to be inoperable, the actuation logic of the remaining APR valves, the FWCI system, and the gas turbine generator must be demonstrated to be operable on a daily basis.

B.7.1.8 Operation

The APR system operates automatically to depressurize the reactor whenever the FWCI system is unable to maintain proper vessel water inventory under accident conditions. The system is actuated upon indication of high drywell pressure coincident with a 120 second persistant low reactor water level signal, and if at least one LPCI or core spray pump is running.

If the APR control switch is not in the automatic position or if there is a failure in the automatic actuation logic, the system can be operated manually from the 903 control room panel. Each of the four safety/relief valves that operates in the remote automatic actuation mode is clearly identified by a large "APR" label under its control switch. Next to the control switch layout is another label which keys the operator to the manual relief valve opening sequence. Unlike the remote automatic actuation mode all six saftey/relief valves may be opened manually. Actual APR valve opening has already been discussed in section B.7.1.2.

B.7.2 Analysis

B.7.2.1 Success/Failure Criteria

Three modes of operation were considered for the safety/ relief valves. A fault tree was constructed for the APR system which utilizes four of the six safety/relief valves. Additionally, the pressure relief function and manual depressurization operation were examined.

Successful operation of the APR system requires that two out of the four APR valves operate to blowdown the reactor vessel when required to do so. Loss of two of the relief valves does not materially affect the pressure relieving capability.

System failure occurs whenever three of the four APR valves fail to open when demanded. However, since all six safety/ relief valves can be remotely operated by the reactor operator, five out of six would have to fail if manual recovery were considered.

To perform the pressure relief function four of the six safety/relief valves must open to relieve reactor vessel pressure. Failure of three of the four valves was analyzed and it was determined that the system failure probability was sufficiently negligable to be treated as epsilon for this analysis.

Failure of the system in the manual depressurization mode, requiring that three of the six safety/relief valves do not open, is dominated by operator failure to initiate manual depressurization. A THERP analysis has been performed for this event (see Appendix B Section 19).

B.7.2.2 Assumptions

No specific assumptions were made for the automatic pressure relief system.

Table B.7-1

APR System Interfaces Failure Modes and Effects

| Front Line System | | Support System | | Failure Mode | Failure Effect |
|---|---|---|---|---|---|
| System | Comp. | System | Comp. | | |
| APR | Air operated valve<br>MS-3A<br>MS-3C<br>MS-3D<br>MS-3F | Instrument Air | Air Operator | Loss of air | Emergency air accumulators act as back-up air supply; complete loss of air supply causes valve to fail as is (N.C.) |
| APR | Air valve solenoid<br>MS-3A<br>MS-3C<br>MS-3D<br>MS-3F | 125V DC Power | Bus 11A-2 | Low or zero voltage | Auto bus transfer to DC Bus 11A-1 valve fails as is (N.C.) if bus transfer fails |

Table B.7-2

APR Instrumentation

| Sensors | Function | Setpoint |
|---|---|---|
| 2205/1620A<br>2206/1620B<br>2205/1620C<br>2206/1620D | Hi drywell pressure indication | 2 psig |
| 2205/263-72A<br>2206/263-72B<br>2205/263-72C<br>2206/263-72D | Reactor low-low water indication | 79" above the top of active fuel |
| Local/1462C<br>2201A/1462A<br>2201B/1462B<br>Local/1462D | Core spray pumps discharge pressure switch | 100 psig |
| 2201A/1501-82A<br>2201B/1501-82B<br>2201C/1501-82C<br>2201D/1501-82D | LPCI pumps discharge pressure switch | 100 psig |

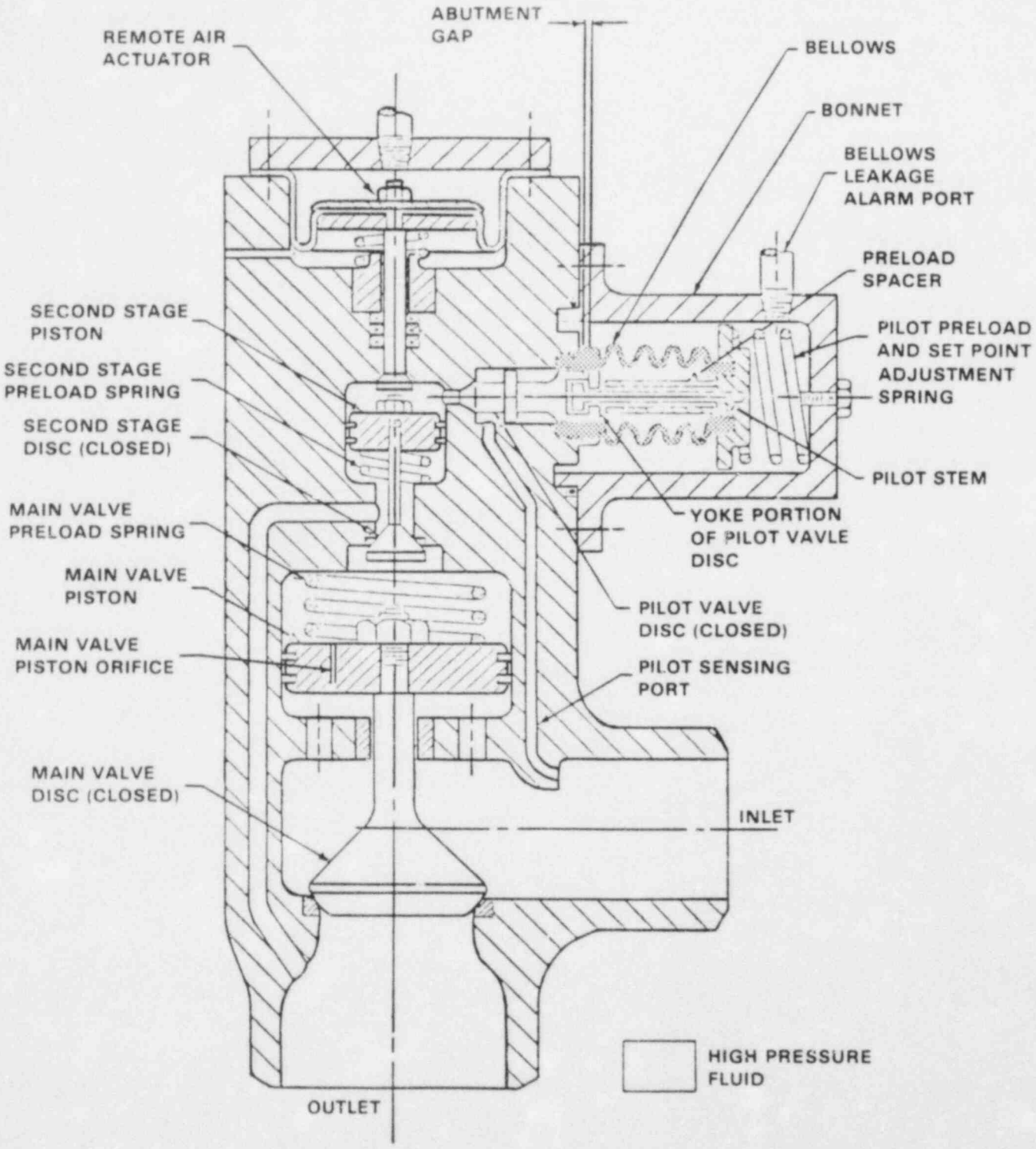



**FIGURE B.7-1. VALVE SCHEMATIC (CLOSED)**

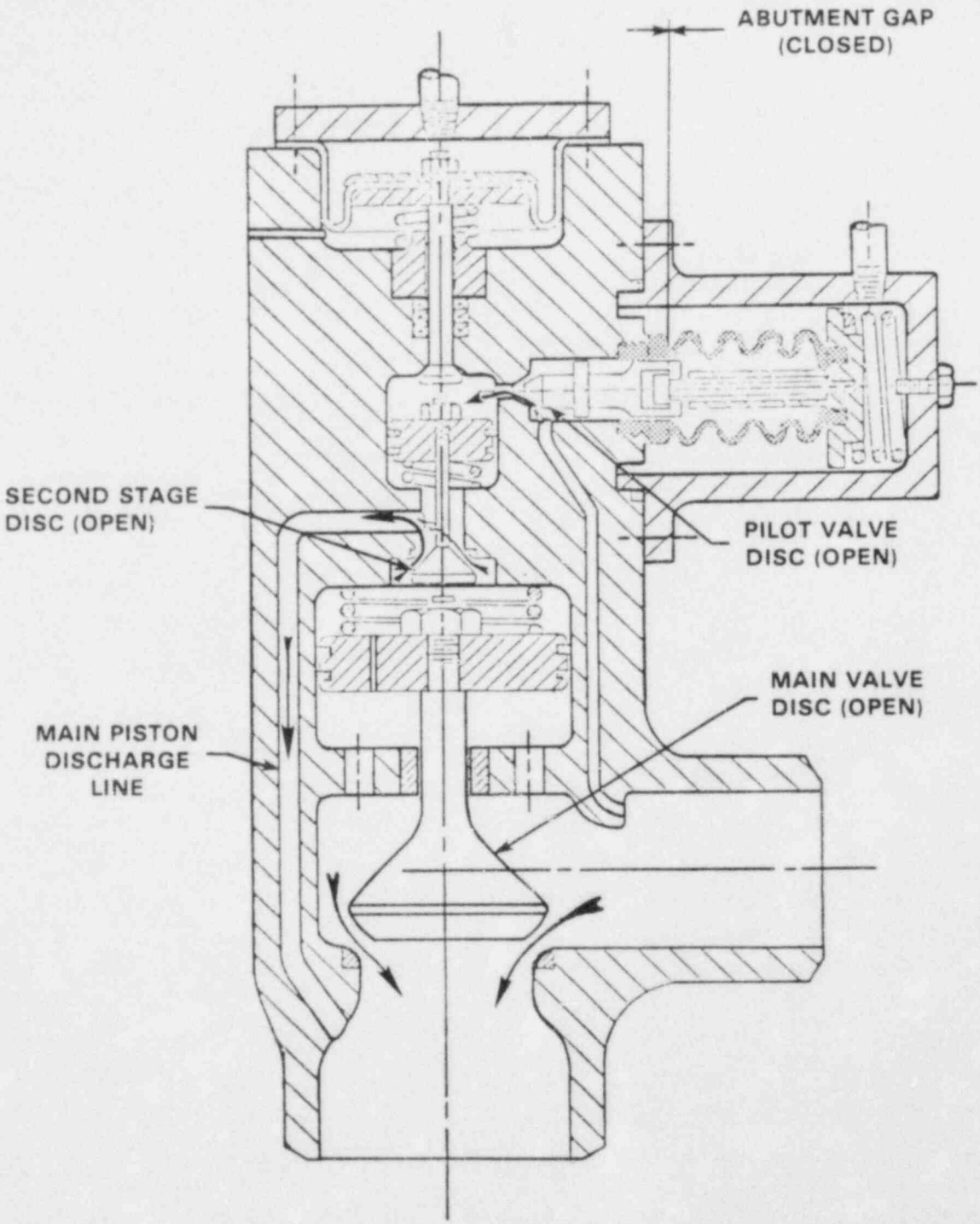



**FIGURE B.7-2. VALVE SCHEMATIC (OPEN)
SAFETY/RELIEF VALVE OPERATION**

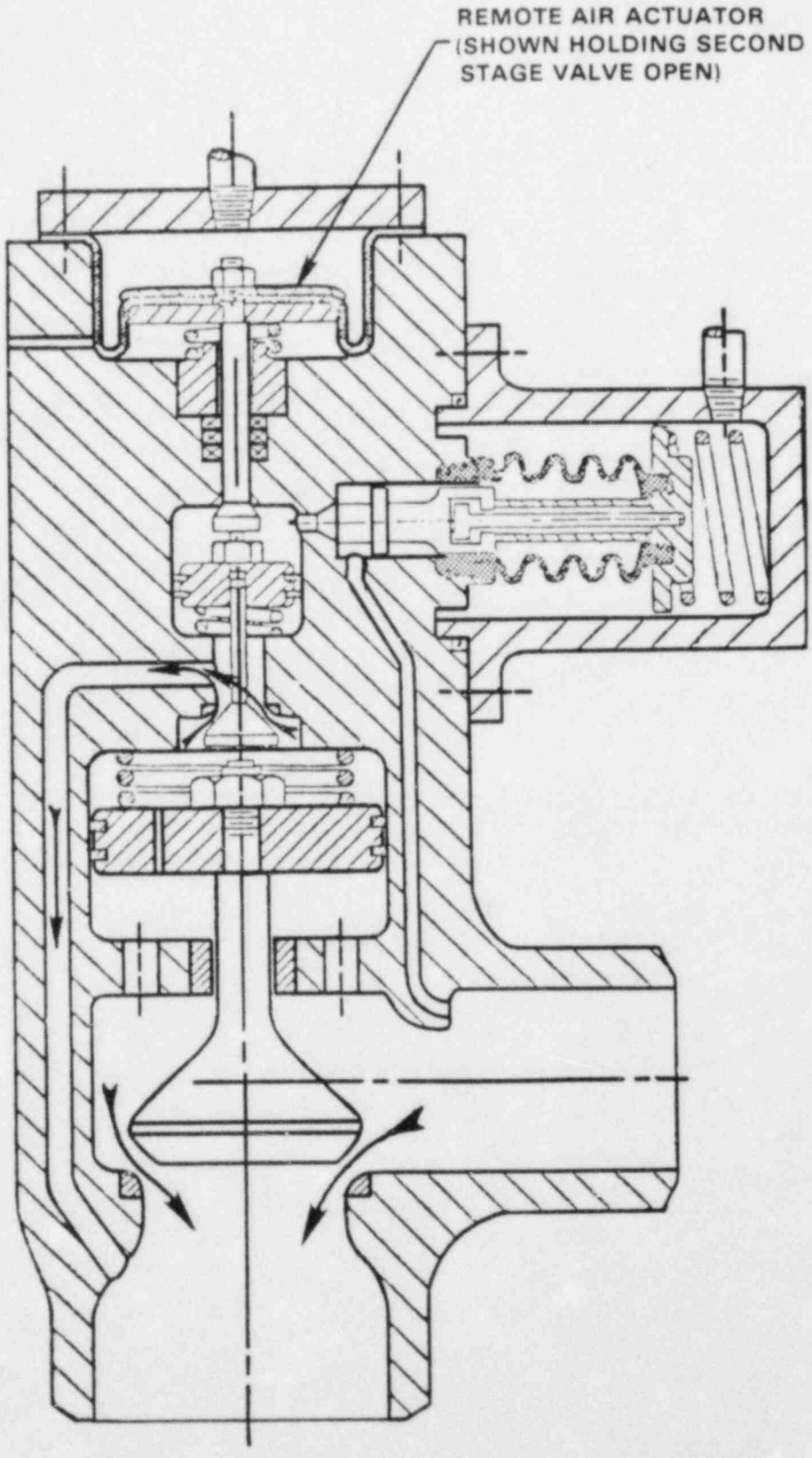
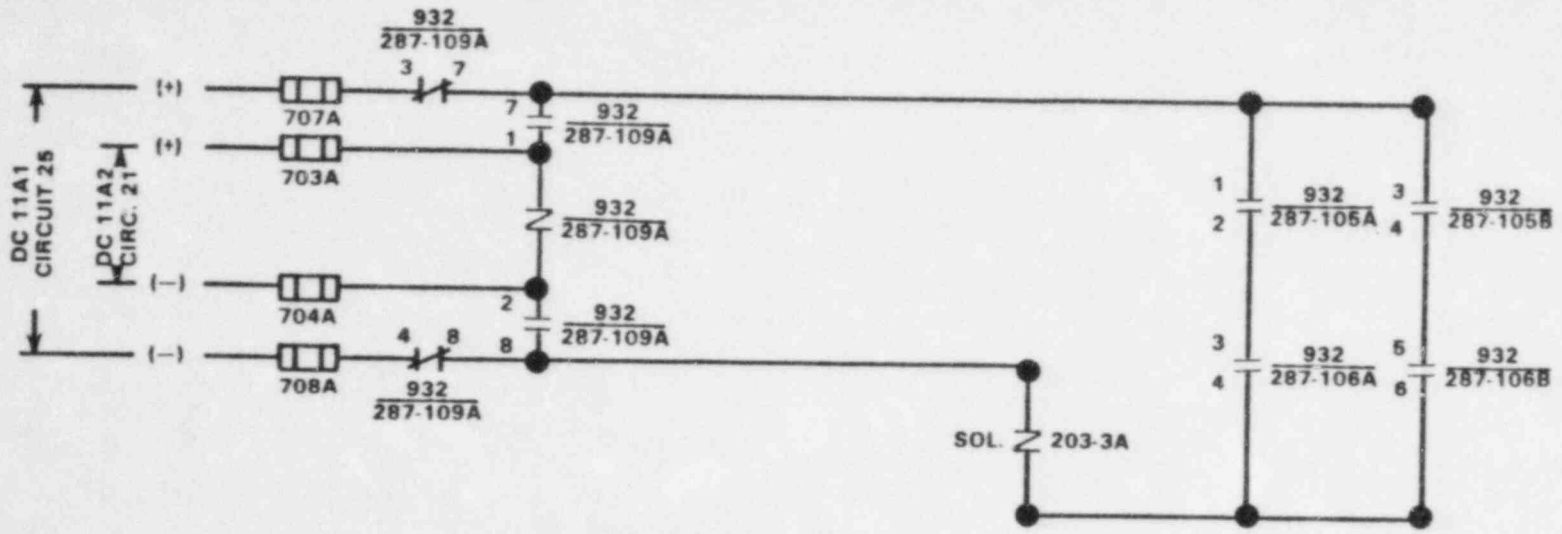
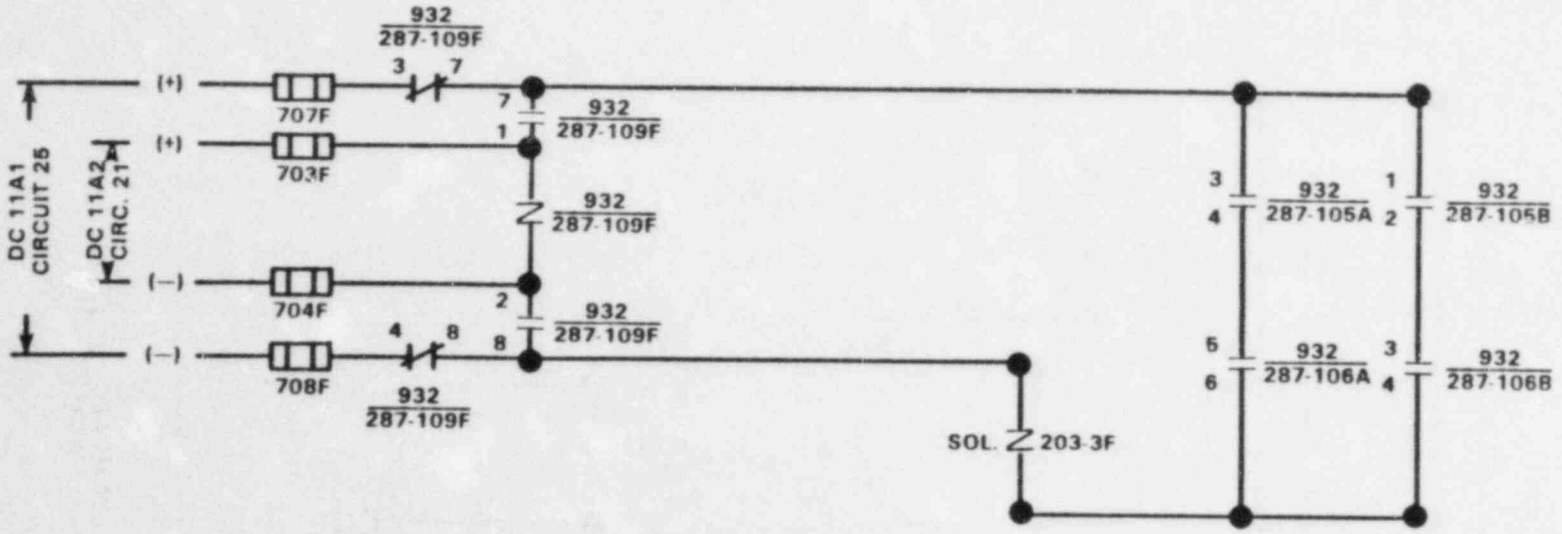



**FIGURE B.7-3. VALVE SCHEMATIC REMOTE ACTUATION**

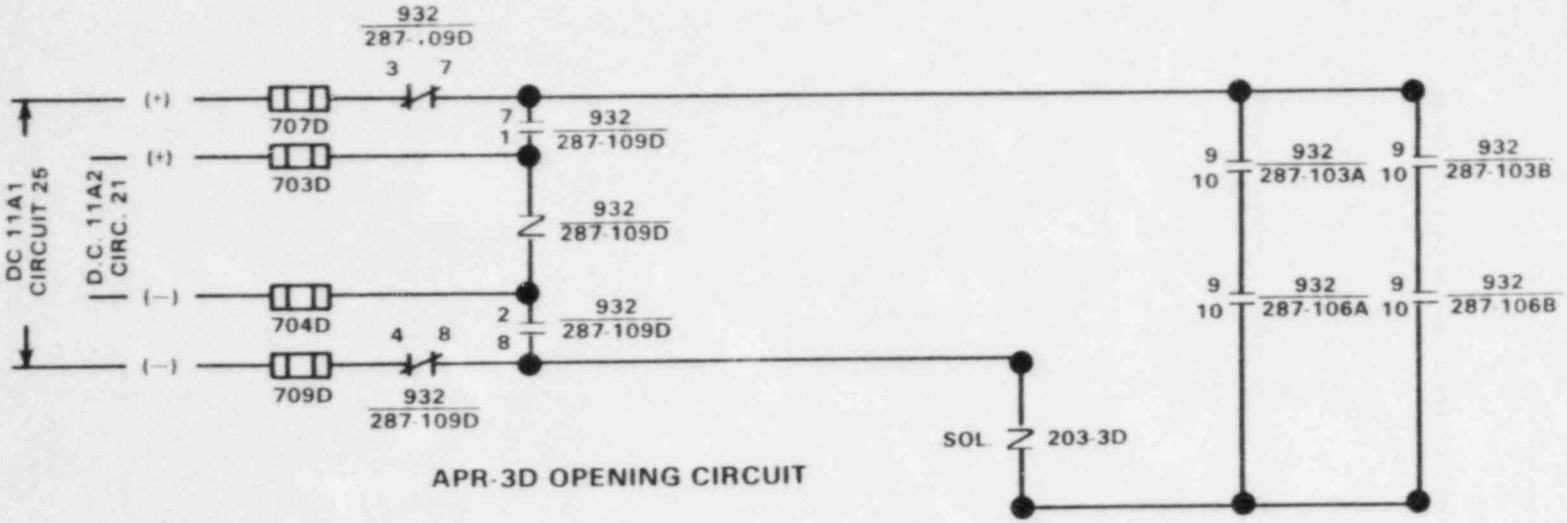



APR-3A OPENING CIRCUIT

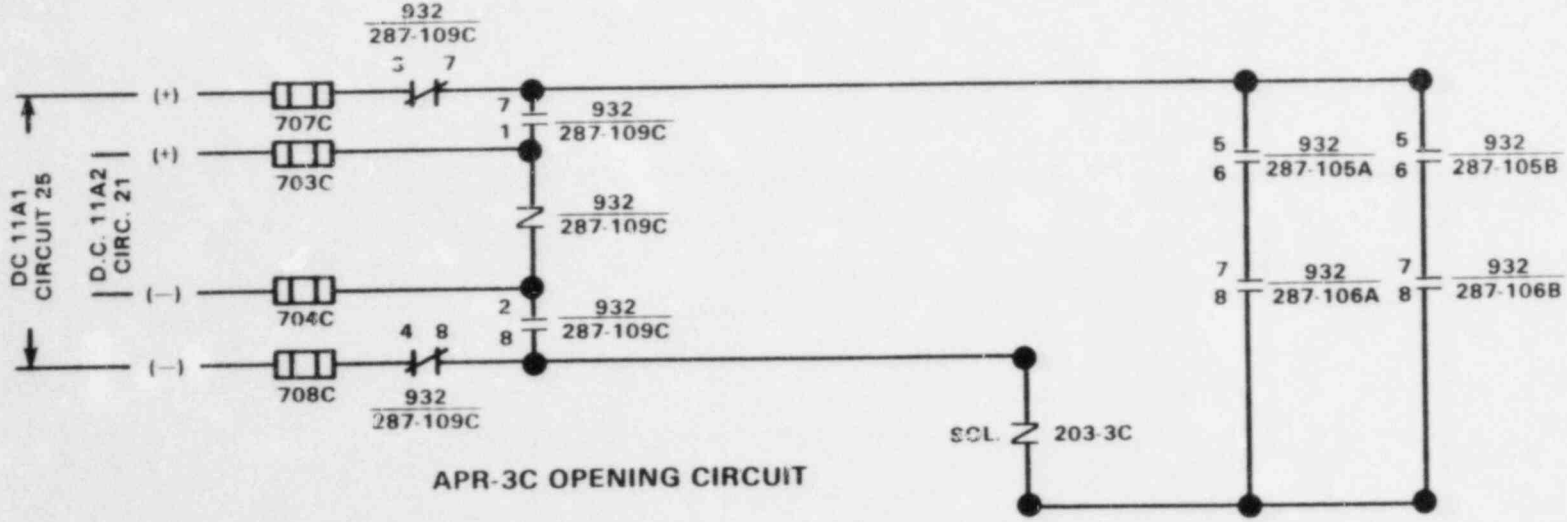



APR-3F OPENING CIRCUIT

**FIGURE B.7-4. APR CONTROL WIRING SCHEMATICS VALVE OPENING CIRCUITS (SHEET 1 OF 6)**

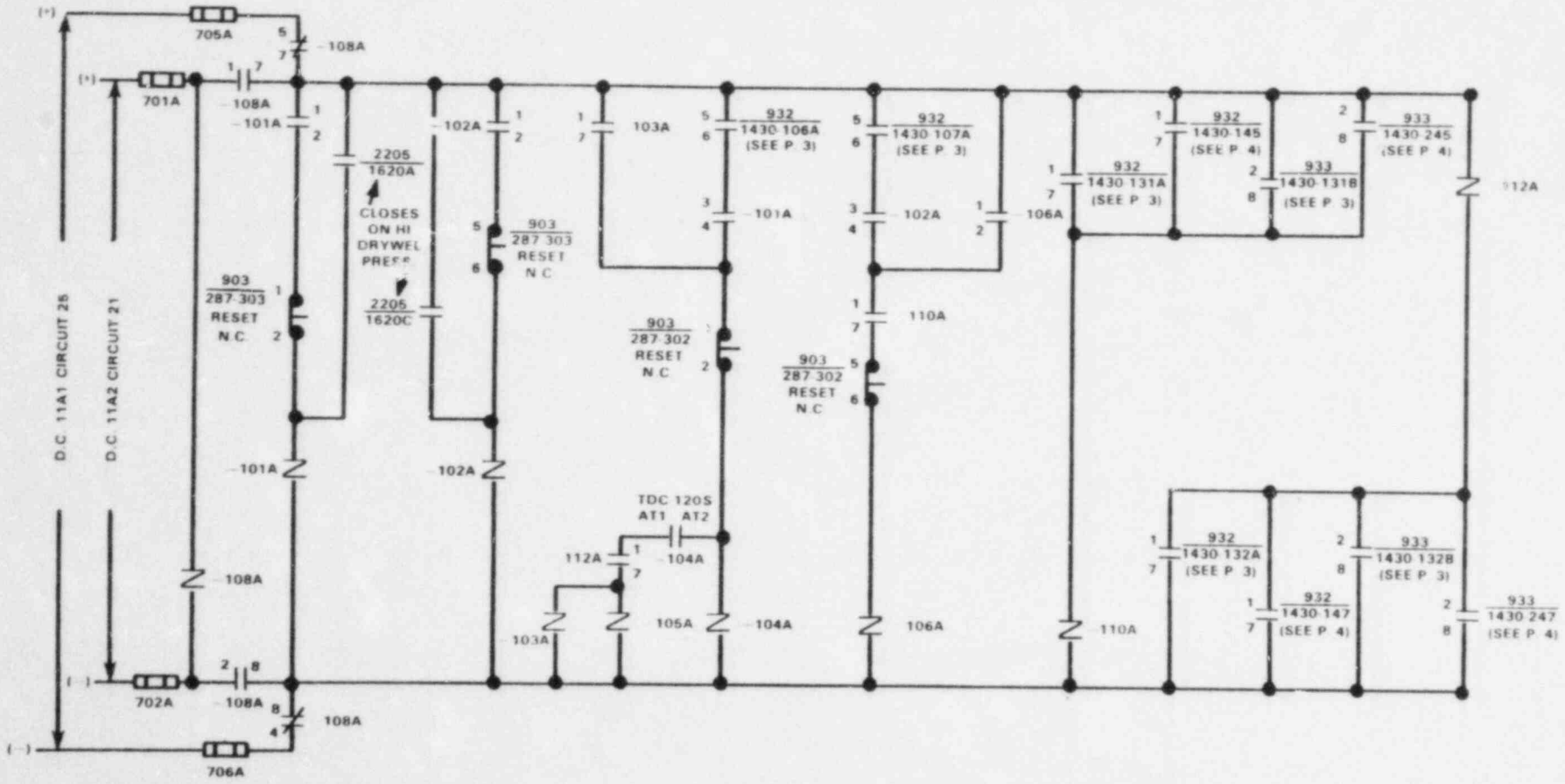



APR-3D OPENING CIRCUIT



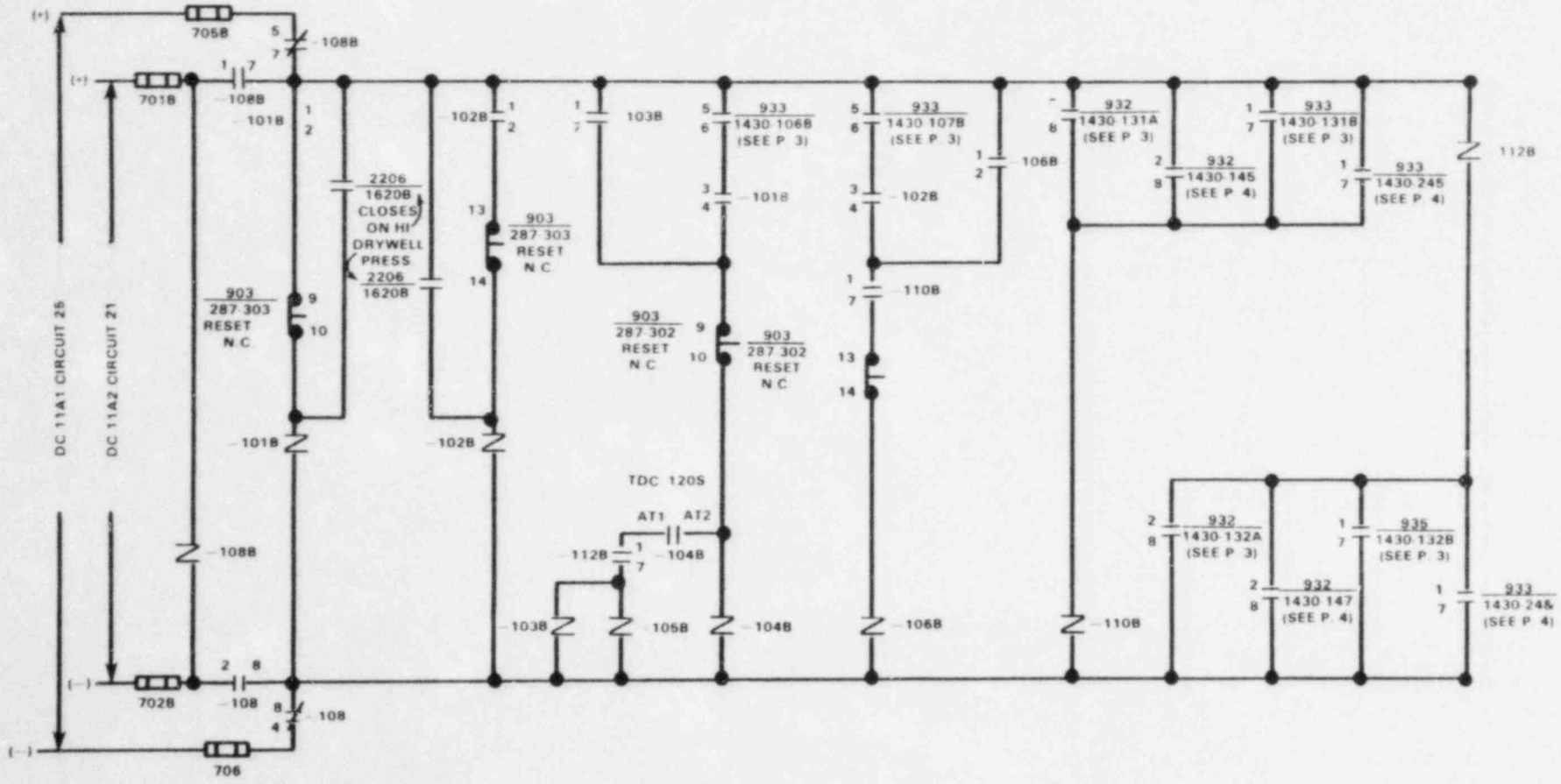

APR-3C OPENING CIRCUIT

**FIGURE B.7-4. APR CONTROL WIRING SCHEMATICS VALVE OPENING CIRCUITS (SHEET 2 OF 6)**




NOTE: UNLESS OTHERWISE NOTED, THE DEVICE DESIGNATION SHOWN IS AN ABBREVIATION OF THE COMPLETE DEVICE DESIGNATION WHICH IS $\frac{932}{287\text{ XXX}}$

**FIGURE B.7-4. APR CONTROL WIRING SCHEMATICS ACTUATION LOGIC (SHEET 3 OF 6)**




NOTE: UNLESS OTHERWISE NOTED, THE DEVICE DESIGNATION SHOWN IS AN ABREVIATION OF THE COMPLETE DEVICE DESIGNATION WHICH IS $\frac{932}{287\text{-}XXX}$

**FIGURE B.7-4. APR CONTROL WIRING SCHEMATICS ACTUATION LOGIC (SHEET 4 OF 6)**

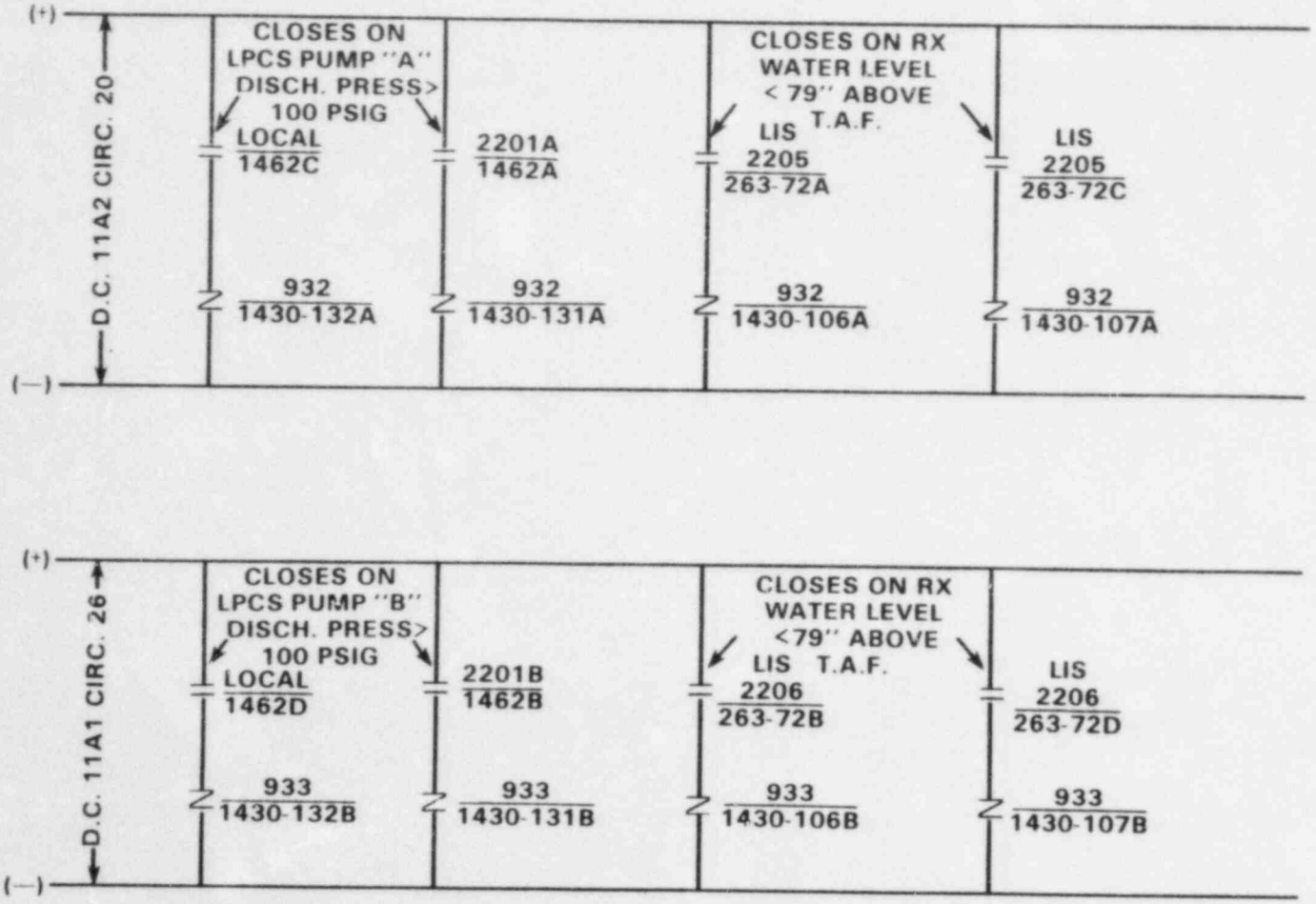



**FIGURE B.7-4. APR CONTROL WIRING SCHEMATICS ACTUATION LOGIC (SHEET 5 OF 6)**

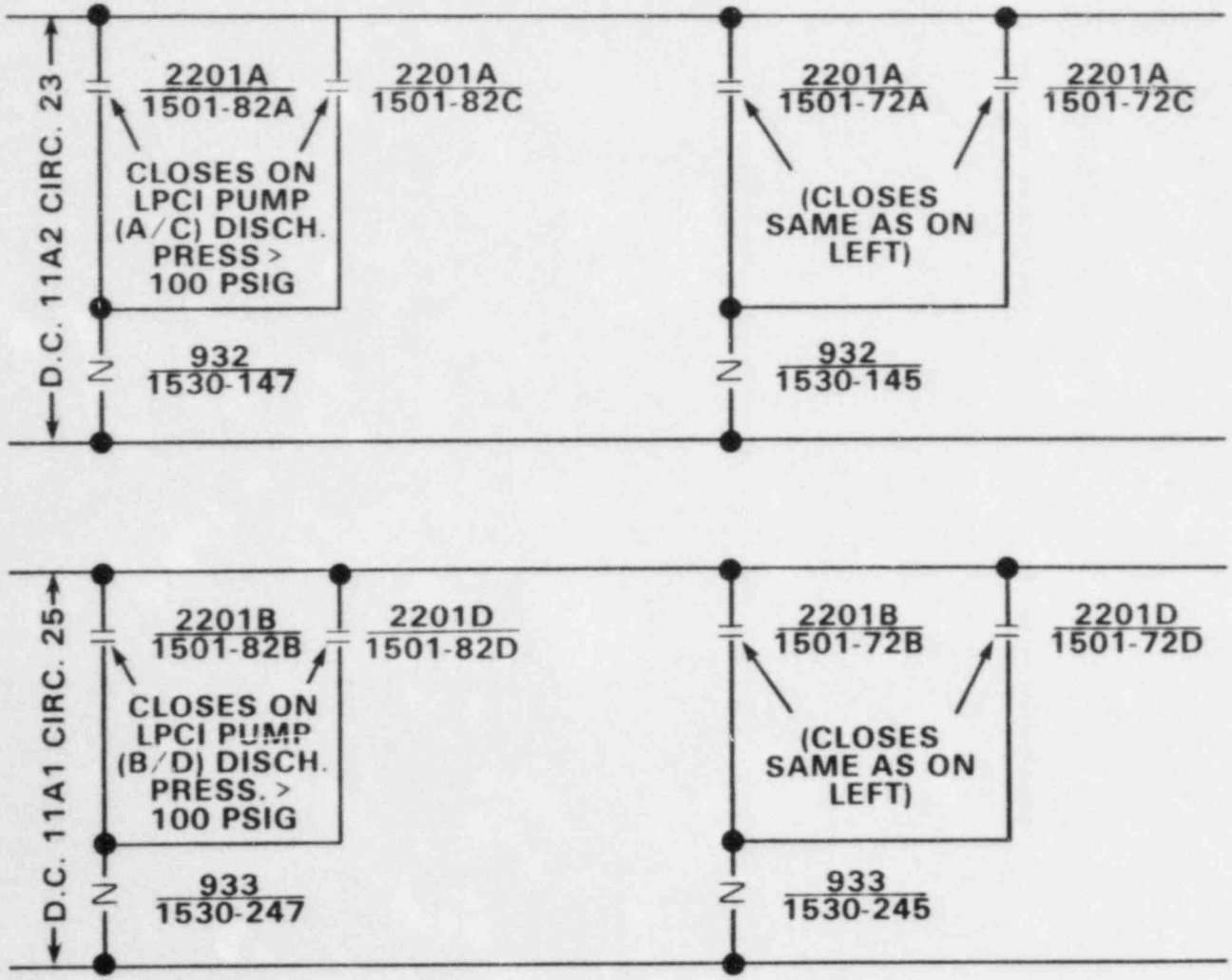



**FIGURE B.7-4. APR CONTROL WIRING SCHEMATICS ACTUATION LOGIC (SHEET 6 OF 6)**

AUTOMATIC PRESSURE RELIEF SYSTEM

FAULT TREE AND FAULT SUMMARY SHEETS

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| MS-3A-PHV-FTO<br>MS-3C-PHV-FTO<br>MS-3D-PHV-FTO<br>MS-3F-PHV-FTO | APR valve fails to open | 12000 hrs (detected during refueling outages) | Tested as per SP 626.2 | $1x10^{-3}$ |
| 2Ø3-3A-FTE<br>2Ø3-3C-FTE<br>2Ø3-3D-FTE<br>2Ø3-3F-FTE | APR valve solenoid fails to energize | 12000 hrs (detected during refueling outages) | Tested when valve cycled in SP 626.2 | $1.7x10^{-3}$ |
| 2Ø3-3A-SOV-FTO<br>2Ø3-3C-SOV-FTO<br>2Ø3-3D-SOV-FTO<br>2Ø3-3F-SOV-FTO | Solenoid operated air valve fails to open | 12000 hrs (detected during refueling outages) | Tested when valve cycled in SP 626.2 | $1.7x10^{-2}$ |
| 932287-1Ø9A-2RC<br>932287-1Ø9C-2RC<br>932287-1Ø9D-2RC<br>932287-1Ø9F-2RC<br>932287-1Ø9A-1RC<br>932287-1Ø9C-1RC<br>932287-1Ø9D-1RC<br>932287-1Ø9F-1RC | Relay contacts fail to remain closed | 12000 hrs (detected during refueling outages) | Auto actuation of APR subsystem as per SP 413B | $6x10^{-4}$ |
| 932287-1Ø9A-FRE<br>932287-1Ø9C-FRE<br>932287-1Ø9D-FRE<br>932287-1Ø9F-FRE | Failure of relay coil to remain energized | 12000 hrs (detected during refueling outages) | Auto blowdown logic test as per SP 413B | $6x10^{-4}$ |

MILLSTONE 1
SYSTEM APR
SHEET #1

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 287-703A-FUS-LOF<br>287-703C-FUS-LOF<br>287-703D-FUS-LOF<br>287-703F-FUS-LOF<br>287-704A-FUS-LOF<br>287-704C-FUS-LOF<br>287-704D-FUS-LOF<br>287-704F-FUS-LOF | Failure of fuses on DC power supply | Prompt | "Fuse Monitor" annunciator on CRP 903 alerts operators | $2.4 \times 10^{-5}$ |
| DC-11A2-21-FRC | Local faults on breaker | Prompt | Annunciated in the control room | $2.4 \times 10^{-5}$ |
| 932287-109A-3FC<br>932287-109C-3FC<br>932287-109D-3FC<br>932287-109F-3FC<br>932287-109A-4FC<br>932287-109C-4FC<br>932287-109D-4FC<br>932287-109F-4FC | Relay contacts fail to close | 12000 hrs (detected during refueling outages) | Auto blowdown logic test as per SP 413B | $1.8 \times 10^{-3}$ |
| 287-707A-FUS-LOF<br>287-707C-FUS-LOF<br>287-707D-FUS-LOF<br>287-707F-FUS-LOF<br>287-708A-FUS-LOF<br>287-708C-FUS-LOF<br>287-708D-FUS-LOF<br>287-708F-FUS-LOF | Failure of fuses on alt. D.C. supply | 12000 hrs (detected during refueling outages) | Auto blowdown logic test as per SP 413B | $6 \times 10^{-3}$ |

MILLSTONE 1
SYSTEM APR
SHEET #2

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 932287-1Ø6A-FTE<br>932287-1Ø5A-FTE<br>932287-1Ø4A-FTE<br>932287-1Ø3A-FTE | Relay coil fails to energize | 12000 hrs (detected during refueling outages) | Auto blowdown logic test as per SP 413B and auto actuation of APR subsystem as per SP 413C tests these relay coils | $1.7 \times 10^{-3}$ |
| 932287-1Ø6A-3FC<br>932287-1Ø6A-5FC<br>932287-1Ø6A-7FC<br>932287-1Ø6A-9FC<br>932287-1Ø5A-1FC<br>932287-1Ø5A-3FC<br>932287-1Ø5A-5FC<br>932287-1Ø4A-1FC<br>932287-1Ø3A-9FC | Relay contacts fail to close | 12000 hrs (detected during refueling outages) | Auto actuation of APR subsystem as per SP 413C (energizes APR valve solenoids) | $1.8 \times 10^{-3}$ |
| 9Ø3287-3Ø2-1RC } A<br>903287-3Ø2-5RC<br>903287-3Ø2-9RC } B<br>903287-3Ø2-DRC<br>903287-3Ø2-FRD | Failure of reset switch or contact pair to remain | 12000 hrs (detected during refueling outages) | Auto blowdown logic test as per SP 413B. Procedure SP 413C will also test "A" logic contact pairs yearly | $1.8 \times 10^{-4}$<br>$6.3 \times 10^{-5}$ |
| 9Ø3287-3Ø2-OER<br>9Ø3287-3Ø3-OER | Operator resets APR actuation logic during accident | No detection interval | Reset of timer will delay auto actuation by 120sec | $3 \times 10^{-3}$ |
| 932287-1Ø8A-2RC<br>932287-1Ø8A-1RC<br>932287-1Ø8B-2RC<br>932287-1Ø8B-1RC | Failure of relay contacts to remain closed | One month | Tests on hi drywell pressure sensors and AC interlocks as per SP 412D and SP 413A respectively | $3.6 \times 10^{-5}$ |

MILLSTONE 1
SYSTEM APR
SHEET #3

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 932287-1Ø8A-FRE<br>932287-1Ø8B-FRE | Failure of relay coil to remain energized | 12000 hrs (detected during refueling outages) | Auto blowdown logic test as per SP 413B | $6x10^{-4}$ |
| 287-7Ø1A-FUS-LOF<br>287-7Ø2A-FUS-LOF<br>287-7Ø1B-FUS-LOF<br>287-7Ø2B-FUS-LOF | Failure of fuses on prime DC supply | Immediate | "Fuse monitor" annunciator on CRP 903 | $2.4x10^{-5}$ |
| 932287-1Ø8A-4FC<br>932287-1Ø8A-3FC<br>932287-1Ø8B-4FC<br>932287-1Ø8B-3FC | Relay contacts fail to close | 12000 hrs (detected during refueling outages) | Auto blowdown logic test as per SP 413B | $1.8x10^{-3}$ |
| 287-7Ø6A-FUS-LOF<br>287-7Ø5A-FUS-LOF<br>287-7Ø6B-FUS-LOF<br>287-7Ø5B-FUS-LOF | Failure of fuses on alternate D.C. supply | 12000 hrs (detected during refueling outages) | Auto blowdown logic test as per SP 413B | $6x10^{-3}$ |
| 932287-112A-FTE<br>9321530-147-FTE<br>9331530-247-FTE<br>9321430-132A-FTE<br>9331430-132B-FTE<br>932287-112B-FTE | Relay coil fails to energize | One month | LPCI/LPCS pump interlock test as per SP 413A | $1x10^{-4}$ |
| 9321530-147-1FC<br>9331530-247-2FC<br>9321430-132A-1FC<br>9331430-132B-2FC | Relay contacts fail to close | One month | LPCI/LPCS pump interlock test as per SP 413A | $1x10^{-4}$ |

MILLSTONE 1
SYSTEM APR
SHEET #4

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| DC-11A2-23-FRC<br>DC-11A2-20-FRC<br>DC-11A1-25-FRC<br>DC-11A1-26-FRC | Local faults on breaker | One month | LPCI/1LPCS pump interlock test as per SP 413A | $3.6 \times 10^{-4}$ |
| 22Ø1A15Ø182A-XFC<br>2201A150182C-XFC<br>22Ø1B15Ø182B-XFC<br>2201B150182D-XFC<br>LCLPS-1462D-XFC<br>LCLPS-1462C-XFC | Contacts fail to close on pressure switch | One month | LPCI/LPCS pump interlock test as per SP 413A | $1.4 \times 10^{-4}$ |
| 22Ø1A15Ø182A-TOM<br>22Ø1A15Ø182C-TOM<br>22Ø1B15Ø182B-TOM<br>22Ø1B15Ø182D-TOM<br>LCLPS-1462C-TOM<br>LCLPS-1462D-TOM | Pressure switch o.o.s. as a result of test or maintenance (i.e. not restored to service) | One month | LPCI/LPCS pump interlock test as per SP 413A | $1 \times 10^{-2}$ |
| 22Ø1A15Ø182A-OMC<br>22Ø1A15Ø182C-OMC<br>22Ø1B15Ø182B-OMC<br>22Ø1B15Ø182D-OMC<br>LCLPS-1462C-OMC<br>LCLPS-1462D-OMC | Pressure switch miscalibrated | One month | LPCI/LPCS pump interlock test as per SP 413A | $1 \times 10^{-3}$ |
| LPCI-PUMP-A-OFF<br>LPCI-PUMP-B-OFF<br>LPCI-PUMP-C-OFF<br>LPCI-PUMP-D-OFF | LPCI pump not running | N/A | Conditional events | |
| CS-PUMP-A-OFF<br>CS-PUMP-B-OFF | Core spray pump not running | N/A | Conditional events | |

MILLSTONE 1
SYSTEM APR
SHEET #5

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 932287-1Ø1A-FTE<br>932287-1Ø1B-FTE<br>932287-1Ø2A-FTE<br>932287-1Ø2B-FTE | Relay coil fails to energize | One month | Hi drywell pressure sensor test as per SP 412D | $1x10^{-4}$ |
| 932287-1Ø1A-1FC<br>932287-1Ø1A-3FC<br>932287-1Ø1B-1FC<br>932287-1Ø1B-3FC<br>932287-1Ø2A-1FC<br>932287-1Ø2A-3FC<br>932287-1Ø2B-1FC<br>932287-1Ø2B-3FC | Relay contacts fail to close | None (assume $10^5$ hrs) | SP 412D only checks if relay energizes, not contacts closing; contacts never specifically tested | $3x10^{-2}$ |
| 9Ø3287-3Ø3-1RC<br>9Ø3287-3Ø3-5RC<br>9Ø3287-3Ø3-9RC<br>9Ø3287-3Ø3-DRC | Failure of reset switch contacts to remain closed | None ($10^5$ hrs assumed) | Part of seal-in circuit which is never tested separately | $3x10^{-3}$ |
| 9Ø3287-3Ø3-FRD | Reset switch fails to remain closed | None ($10^5$ hrs assumed) | Never specifically tested | $1x10^{-3}$ |
| 22Ø5PS-162ØA-XFC<br>22Ø6PS-162ØB-XFC<br>22Ø5PS-162ØC-XFC<br>22Ø6PS-162ØD-XFC | Failure of pressure switch contacts to close | One month | Hi drywell pressure sensor test as per SP 412D | $1.4x10^{-4}$ |

MILLSTONE 1
SYSTEM APR
SHEET #6

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 22Ø5PS-162ØA-TOM<br>22Ø6PS-162ØB-TOM<br>22Ø5PS-162ØC-TOM<br>22Ø6PS-162ØD-TOM | Pressure switch O.O.S. as a result of test or maint. (i.e. not restored to service) | One month | Sensor tested as per SP 412D | $1x10^{-2}$ |
| 22Ø5PS-162ØA-OMC<br>22Ø6PS-162ØB-OMC<br>22Ø5PS-162ØC-OMC<br>22Ø6PS-162ØD-OMC | Pressure switch miscalibrated | One month | Sensor tested as per SP 412D | $1x10^{-3}$ |
| NO-HI-DRYWL-PRES<br><br>NO-LO-RX-H2O-LVL | Drywell pressure < 2 PSIG<br><br>Rx water level > 79" above TAF | N/A | Conditional events | |
| 9321430-1Ø6A-FTE<br>9321430-1Ø6B-FTE<br>9321430-1Ø7A-FTE<br>9321430-1Ø7B-FTE | Relay coil fails | One month | Rx lo lo water level sensor test as per SP 412C | $1x10^{-4}$ |
| 9321430-1Ø6A-5FC<br>9321430-1Ø6B-5FC<br>9321430-1Ø7A-5FC<br>9321430-1Ø7B-5FC | Relay contacts fail to close | None (assume $10^5$ hrs) | SP 412C only checks for relay coil energizing not contact pair closing, contact pair never specifically tested | $3x10^{-2}$ |

MILLSTONE 1
SYSTEM APR
SHEET #7

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 2205263-72A2-XFC<br>2206263-72B2-XFC<br>2205263-72C2-XFC<br>2206263-72D2-XFC | Water level switch contacts fail to close | One month | Rx lo lo water level sensor test as per SP 412C | $1.4 \times 10^{-4}$ |
| 2205263-72A2-TOM<br>2206263-72B2-TOM<br>2205263-72C2-TOM<br>2206263-72D2-TOM | Water level sensor O.O.S. as result of test or maint. (i.e. not restored to service) | One month | Rx low water level sensor test as per SP 412C | $1 \times 10^{-2}$ |
| 2205263-72A2-OMC<br>2206263-72B2-OMC<br>2205263-72C2-OMC<br>2206263-72D2-OMC | Water level sensor miscalibrated | One month | Sensor tested as per SP 412C | $1 \times 10^{-3}$ |
| 932287-105B-FTE<br>932287-104B-FTE<br>932287-103B-FTE<br>932287-106B-FTE | Relay coil fails to energize | 12000 hrs (tested during refueling outage) | Auto blowdown logic test as per SP 413B | $1.7 \times 10^{-3}$ |
| 9321530-147-2FC<br>9331530-247-1FC<br>9321430-132A-2FC<br>9331430-132B-1FC | Relay contacts fail to close | One month | LPCI/LPCS pump interlock test as per SP 413A | $1 \times 10^{-4}$ |
| 932287-110A-FTE<br>932287-110B-FTE<br>9321430/-131A-FTE<br>9331430/-131B-FTE<br>9321530/-145-FTE<br>9331530/-245-FTE | Relay coil fails to energize | One month | LPCI/LPCS pump interlock test as per SP 413A | $1 \times 10^{-4}$ |

MILLSTONE 1
SYSTEM APR
SHEET #8

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 9321430-131A-1FC<br>9331430-131B-2FC<br>9321530-145-1FC<br>9331530-245-2FC | Relay contacts fail to close | One month | LPCI/LPCS pump interlock test as per SP 413A | $1.x10^{-4}$ |
| 2201APS1462A-XFC<br>2201BPS1462B-XFC<br>2201AP150172A-XFC<br>2201AP150172C-XFC<br>2201B150172B-XFC<br>2201B150172D-XFC | Pressure switch contacts fail to close | One month | LPCI/LPCS pump interlock test as per SP 413A | $1.4x10^{-4}$ |
| 2201APS1462A-TOM<br>2201APS1462B-TOM<br>2201A150172A-TOM<br>2201A150172C-TOM<br>2201B150172B-TOM<br>2201B150172D-TOM | Pressure switch O.O.S. due to test or maint. (i.e. not returned to service | One month | LPCI/LPCS pump interlock test as per SP 413A | $1x10^{-2}$ |
| 2201APS1462A-OMC<br>2201BPS1462A-OMC<br>2201A150172A-OMC<br>2201A150172C-OMC<br>2201B150172B-OMC<br>2201B150172D-OMC | Relay contacts fail to close | One month | LPCI/LPCS pump test as per SP 413A tests these contact pairs | $1x10^{-3}$ |

MILLSTONE 1
SYSTEM APR
SHEET #9

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 932287-1Ø3A-1FC<br>932287-112A-1FC<br>932287-1Ø5B-3FC<br>932287-1Ø4B-1FC<br>932287-1Ø3B-1FC<br>932287-112B-1FC<br>932287-1Ø6A-1FC<br>932287-11ØA-1FC<br>932287-1Ø6B-5FC<br>932287-1Ø6B-1FC<br>932287-11ØB-1FC<br>932287-1Ø6B-7FC<br>932287-1Ø5B-5FC | Relay contacts fail to close | None | SP 413A & SP 413B only check for coil energizing not contact pair closing-- Faults would be detected during system auto-actuation | $3x10^{-2}$ |
| 932287-1Ø5B-1FC<br>932287-1Ø6B-3FC | Relay contacts fail to close | None | Procedures SP 413A & 413B check for relay coil energizing not contact pair closing, faults would be detected during system auto-actuation | $3x10^{-2}$ |
| 9331430-1Ø6B-5FC<br>9331430-1Ø7B-5FC | Relay contacts fail to close | None (assume $10^5$ hrs) | SP 412C only checks relay coil not contact pairs | $3x10^{-2}$ |
| 9331430-1Ø6B-FTE<br>9331430-1Ø7B-FTE | Relay coil fails to energize | One month | Tested during the performance of SP 412C | $1x10^{-4}$ |

MILLSTONE 1
SYSTEM APR
SHEET #10

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 932287-1Ø3B-9FC<br>932287-1Ø6B-9FC | Relay contacts fail to close | None (assume $10^5$ hrs) | Only relay coil tested not contact pair | $3 \times 10^{-2}$ |

MILLSTONE 1
SYSTEM APR
SHEET #11

## APR FAULT TREE PAGE INDEX

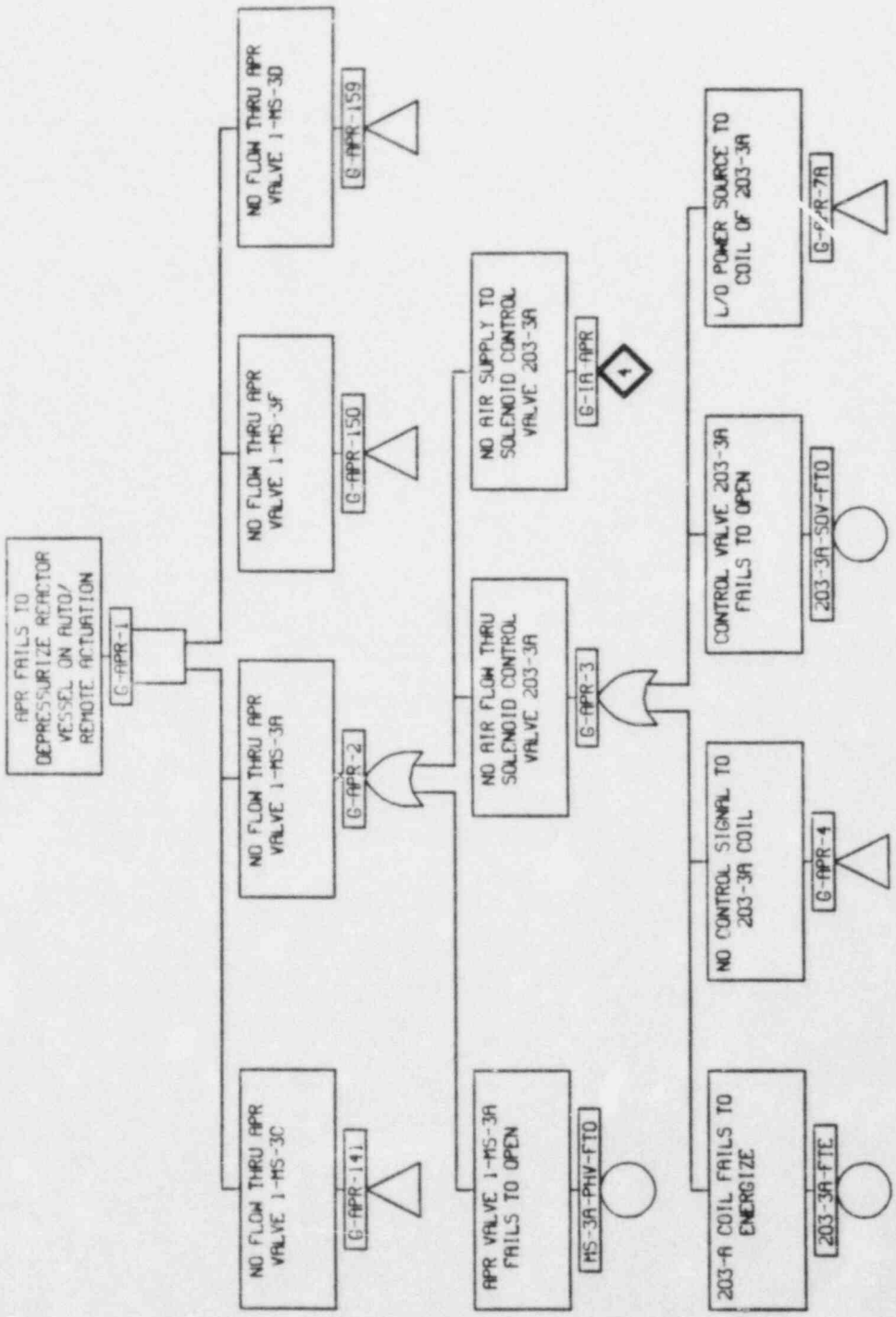
| GATE NAME | DEFINED ON PAGE | TRANSFERS TO PAGE(S) |
|---|---|---|
| G-APR-1 | APR-1 | -- |
| G-APR-4 | APR-2 | APR-1 |
| G-APR-7A | APR-3 | APR-1 |
| G-APR-7C | APR-4 | APR-89 |
| G-APR-7D | APR-5 | APR-97 |
| G-APR-7F | APR-6 | APR-93 |
| G-APR-9A | APR-7 | APR-3 |
| G-APR-9C | APR-8 | APR-4 |
| G-APR-9D | APR-9 | APR-5 |
| G-APR-9F | APR-10 | APR-6 |
| G-APR-11 | APR-15 | APR-7,APR-8,APR-9,APR-10 |
| G-APR-12A | APR-11 | APR-3 |
| G-APR-12C | APR-12 | APR-4 |
| G-APR-12D | APR-13 | APR-5 |
| G-APR-12F | APR-14 | APR-6 |
| G-APR-13 | APR-15 | APR-11,APR-12,APR-13,APR-14 |
| G-APR-14 | APR-16 | APR-2 |
| G-APR-15 | APR-17 | APR-16,APR-91,APR-95 |
| G-APR-16 | APR-18 | APR-17 |
| G-APR-18 | APR-19 | APR-17 |
| G-APR-19 | APR-20 | APR-19,APR-98 |
| G-APR-20 | APR-25 | APR-17,APR-18,APR-20 |
| G-APR-21-101A | APR-21 | APR-40 |
| G-APR-21-102A | APR-21 | APR-67 |
| G-APR-21-103A | APR-23 | APR-20 |
| G-APR-21-104A | APR-22 | APR-18 |
| G-APR-21-105A | APR-22 | APR-17 |
| G-APR-21-106A | APR-23 | APR-66 |
| G-APR-21-110A | APR-24 | APR-68 |
| G-APR-21-112A | APR-24 | APR-28 |
| G-APR-22 | APR-26 | APR-25 |
| G-APR-25 | APR-27 | APR-25 |
| G-APR-27 | APR-25 | APR-21,22,23,24 |
| G-APR-28 | APR-28 | APR-17,APR-20 |
| G-APR-30 | APR-29 | APR-28 |
| G-APR-31 | APR-30 | APR-29 |
| G-APR-32 | APR-30 | APR-29 |
| G-APR-33 | APR-31 | APR-29 |
| G-APR-34 | APR-31 | APR-29 |
| G-APR-35 | APR-32 | APR-30,APR-58 |
| G-APR-38 | APR-33 | APR-32 |
| G-APR-39 | APR-34 | APR-32 |
| G-APR-40 | APR-35 | APR-30,APR-59 |
| G-APR-43 | APR-36 | APR-31,APR-58 |
| G-APR-46 | APR-37 | APR-36 |
| G-APR-47 | APR-38 | APR-36 |
| G-APR-48 | APR-39 | APR-31,APR-59 |
| G-APR-51 | APR-40 | APR-17,APR-18,APR-20 |
| G-APR-53 | APR-41 | APR-40 |

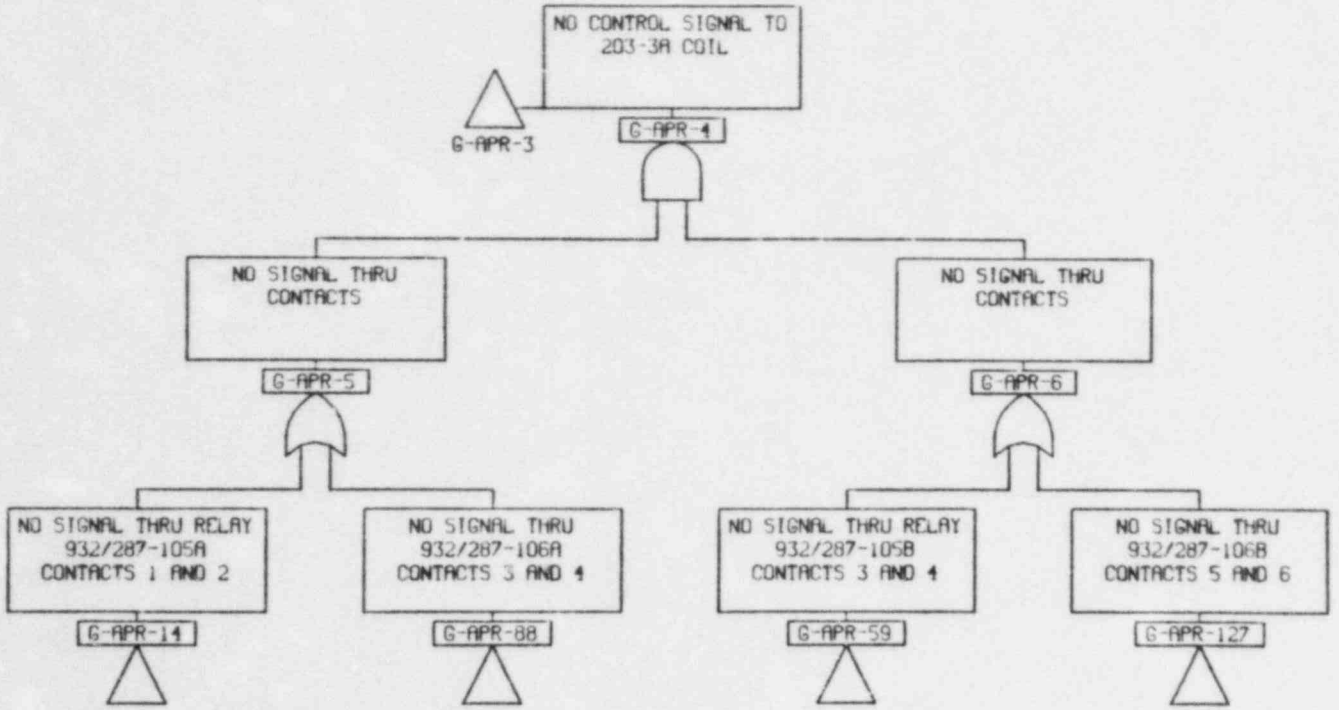
APR FAULT TREE PAGE INDEX (Cont.)

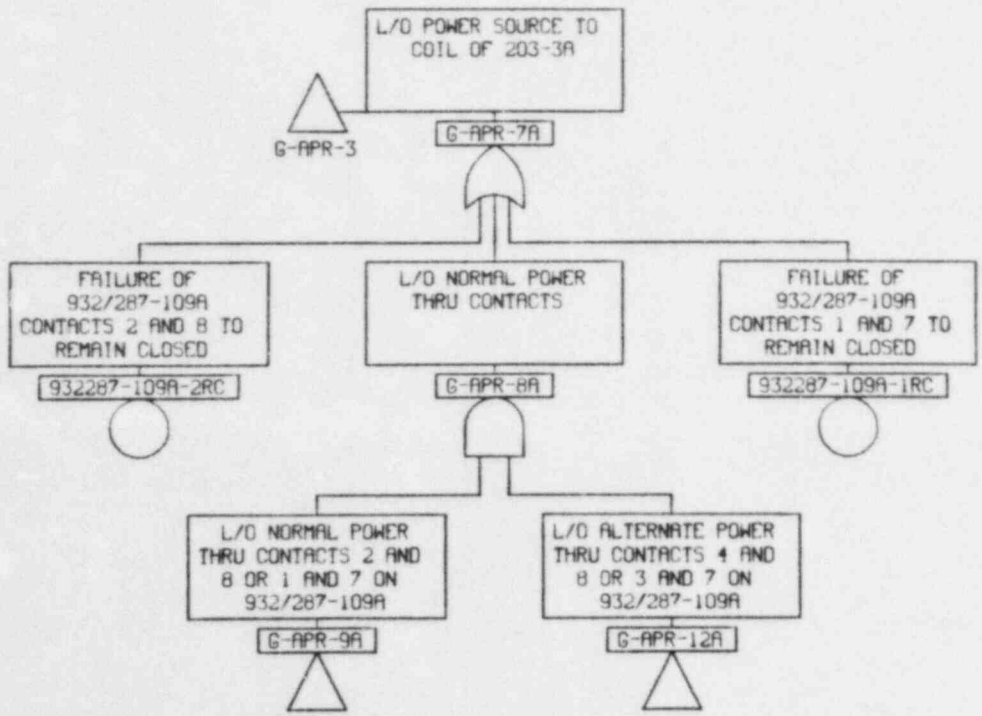
| GATE NAME | DEFINED ON PAGE | TRANSFERS TO PAGE(S) |
|---|---|---|
| G-APR-54 | APR-42 | APR-40 |
| G-APR-55 | APR-43 | APR-17,APR-18,APR-20 |
| G-APR-57 | APR-44 | APR-43 |
| G-APR-58 | APR-44 | APR-43 |
| G-APR-59 | APR-45 | APR-2 |
| G-APR-60 | APR-46 | APR-45,APR-92,APR-96 |
| G-APR-61 | APR-47 | APR-46 |
| G-APR-63 | APR-48 | APR-46 |
| G-APR-64 | APR-49 | APR-48,APR-99 |
| G-APR-65 | APR-50 | APR-46,APR-47,APR-49 |
| G-APR-66-101B | APR-50 | APR-60 |
| G-APR-66-102B | APR-51 | APR-83 |
| G-APR-66-103B | APR-51 | APR-49 |
| G-APR-66-104B | APR-52 | APR-47 |
| G-APR-66-105B | APR-52 | APR-46 |
| G-APR-66-106B | APR-53 | APR-82 |
| G-APR-66-110B | APR-53 | APR-86 |
| G-APR-66-112B | APR-54 | APR-57 |
| G-APR-67 | APR-54 | APR-50,51,52,53,54 |
| G-APR-68 | APR-55 | APR-54 |
| G-APR-71 | APR-56 | APR-54 |
| G-APR-73 | APR-57 | APR-46,APR-49 |
| G-APR-75 | APR-58 | APR-57 |
| G-APR-77 | APR-59 | APR-58 |
| G-APR-78 | APR-59 | APR-58 |
| G-APR-80 | APR-60 | APR-46,APR-47,APR-49 |
| G-APR-82 | APR-61 | APR-60 |
| G-APR-83 | APR-62 | APR-60 |
| G-APR-84 | APR-63 | APR-46,APR-47,APR-49 |
| G-APR-86 | APR-64 | APR-63 |
| G-APR-87 | APR-64 | APR-63 |
| G-APR-88 | APR-65 | APR-2 |
| G-APR-89 | APR-66 | APR-65,APR-91,APR-95,APR-98 |
| G-APR-92 | APR-67 | APR-66 |
| G-APR-95 | APR-68 | APR-66 |
| G-APR-98 | APR-69 | APR-68 |
| G-APR-99 | APR-69 | APR-68 |
| G-APR-100 | APR-70 | APR-68 |
| G-APR-101 | APR-70 | APR-68 |
| G-APR-102 | APR-71 | APR-69,APR-87 |
| G-APR-105 | APR-72 | APR-69,APR-88 |
| G-APR-108 | APR-73 | APR-72 |
| G-APR-109 | APR-74 | APR-72 |
| G-APR-110 | APR-75 | APR-66 |
| G-APR-114 | APR-76 | APR-70,APR-88 |
| G-APR-117 | APR-77 | APR-70,APR-87 |
| G-APR-121 | APR-78 | APR-77 |
| G-APR-122 | APR-79 | APR-77 |
| G-APR-123 | APR-80 | APR-82 |

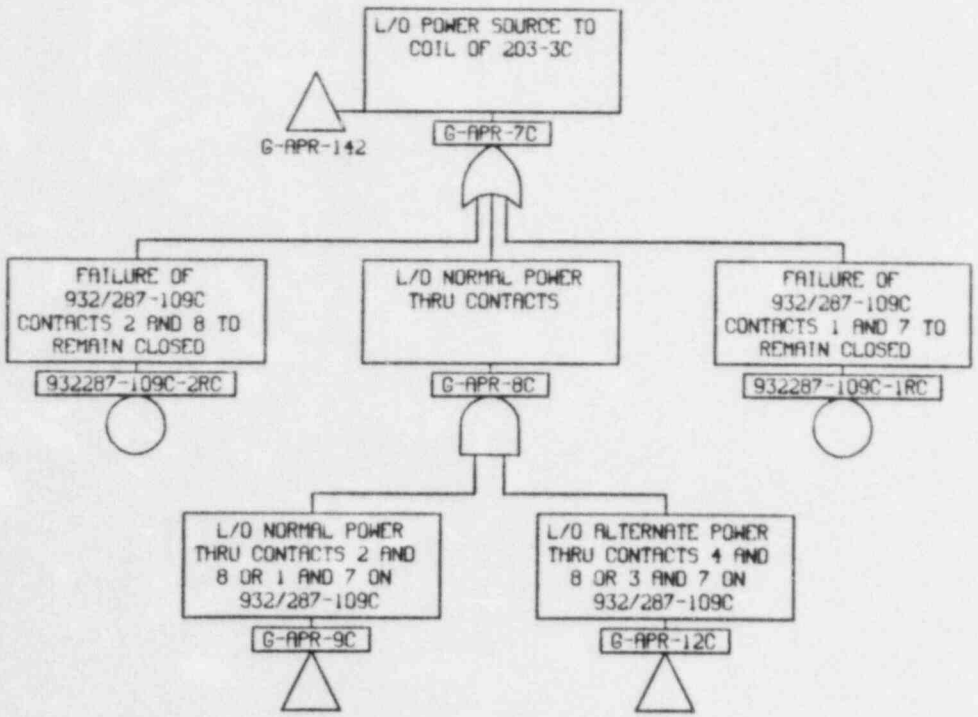
APR FAULT TREE PAGE INDEX (Cont.)

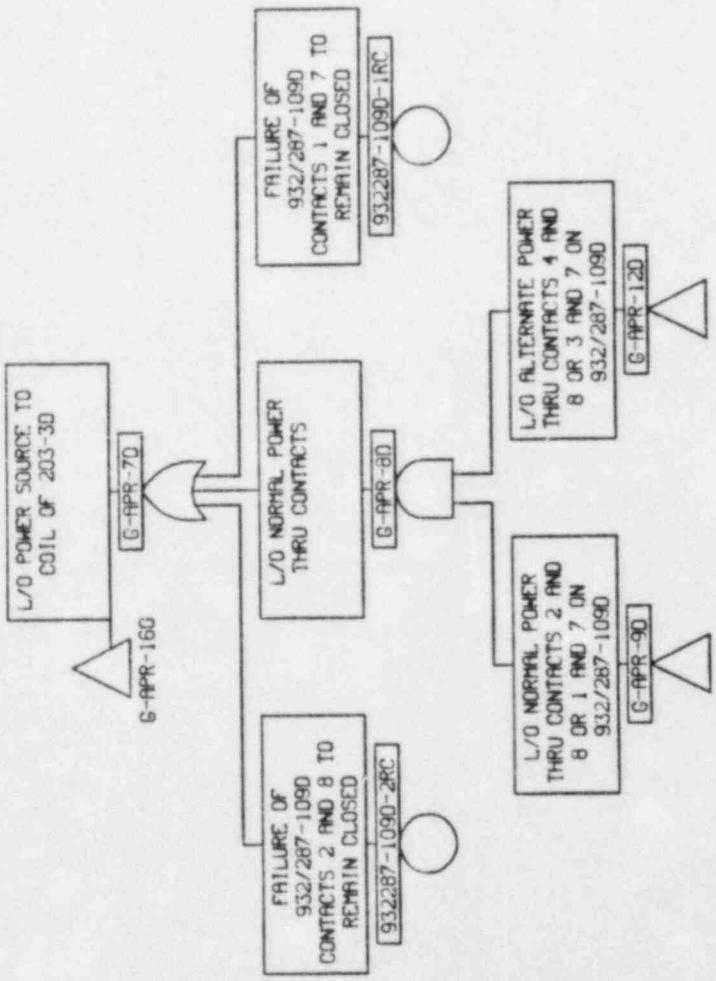
| GATE NAME | DEFINED ON PAGE | TRANSFERS TO PAGE(S) |
|---|---|---|
| G-APR-127 | APR-81 | APR-2 |
| G-APR-128 | APR-82 | APR-81,APR-92,APR-96,APR-99 |
| G-APR-131 | APR-83 | APR-82 |
| G-APR-132 | APR-84 | APR-83 |
| G-APR-133 | APR-85 | APR-83 |
| G-APR-134 | APR-86 | APR-82 |
| G-APR-136 | APR-87 | APR-86 |
| G-APR-138 | APR-88 | APR-87 |
| G-APR-139 | APR-88 | APR-87 |
| G-APR-141 | APR-89 | APR-1 |
| G-APR-143 | APR-90 | APR-89 |
| G-APR-146 | APR-91 | APR-90 |
| G-APR-147 | APR-91 | APR-90 |
| G-APR-148 | APR-92 | APR-90 |
| G-APR-149 | APR-92 | APR-90 |
| G-APR-150 | APR-93 | APR-1 |
| G-APR-152 | APR-94 | APR-93 |
| G-APR-155 | APR-95 | APR-94 |
| G-APR-156 | APR-95 | APR-94 |
| G-APR-157 | APR-96 | APR-94 |
| G-APR-158 | APR-96 | APR-94 |
| G-APR-159 | APR-97 | APR-1 |
| G-APR-164 | APR-98 | APR-97 |
| G-APR-165 | APR-98 | APR-97 |
| G-APR-166 | APR-99 | APR-97 |
| G-APR-167 | APR-99 | APR-97 |

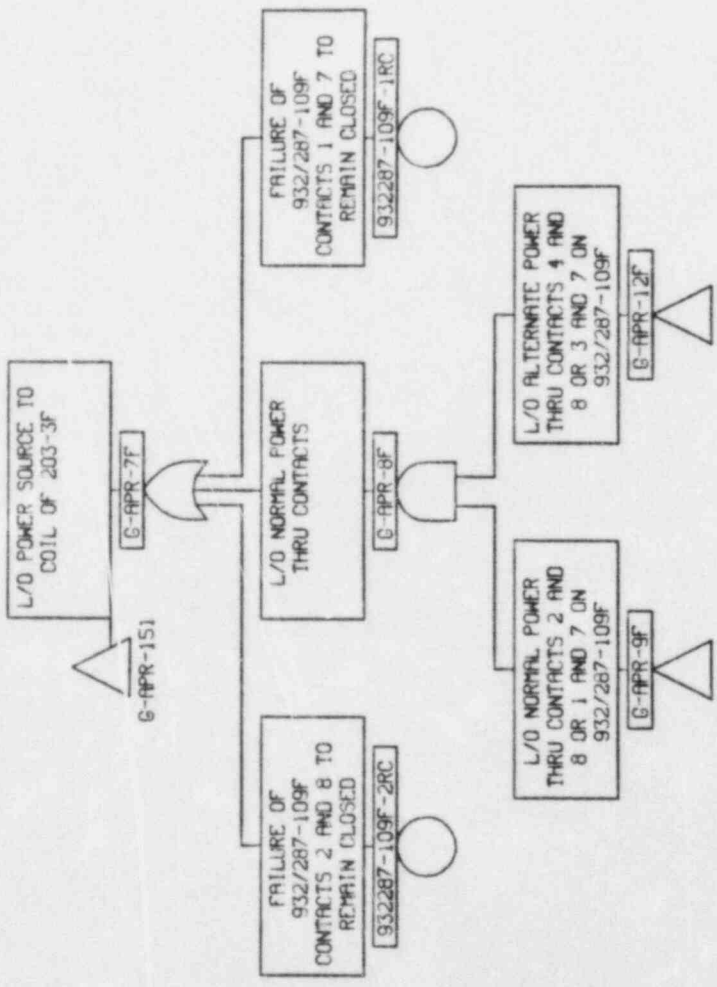

APR FAILS TO DEPRESSURIZE REACTOR VESSEL ON AUTO/ REMOTE ACTUATION
G-APR-1
NO FLOW THRU APR VALVE 1-MS-3D
G-APR-159
NO FLOW THRU APR VALVE 1-MS-3F
G-APR-150
NO FLOW THRU APR VALVE 1-MS-3A
G-APR-2
NO FLOW THRU APR VALVE 1-MS-3C
G-APR-141
NO AIR SUPPLY TO SOLENOID CONTROL VALVE 203-3A
G-1A-APR
NO AIR FLOW THRU SOLENOID CONTROL VALVE 203-3A
G-APR-3
APR VALVE 1-MS-3A FAILS TO OPEN
MS-3A-PNV-FTO
L/O POWER SOURCE TO COIL OF 203-3A
G-APR-7A
CONTROL VALVE 203-3A FAILS TO OPEN
203-3A-SOV-FTO
NO CONTROL SIGNAL TO 203-3A COIL
G-APR-4
203-A COIL FAILS TO ENERGIZE
203-3A-FTE

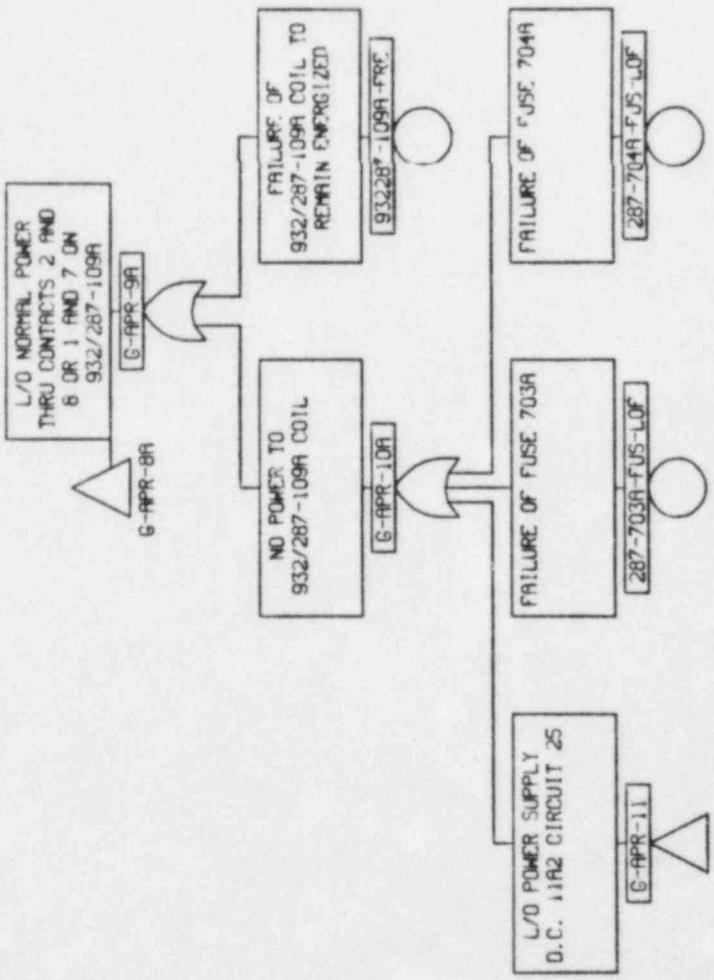

NO CONTROL SIGNAL TO
203-3A COIL
G-APR-3
G-APR-4
NO SIGNAL THRU
CONTACTS
NO SIGNAL THRU
CONTACTS
G-APR-5
G-APR-6
NO SIGNAL THRU RELAY
932/287-105A
CONTACTS 1 AND 2
NO SIGNAL THRU
932/287-106A
CONTACTS 3 AND 4
NO SIGNAL THRU RELAY
932/287-105B
CONTACTS 3 AND 4
NO SIGNAL THRU
932/287-106B
CONTACTS 5 AND 6
G-APR-14
G-APR-88
G-APR-59
G-APR-127

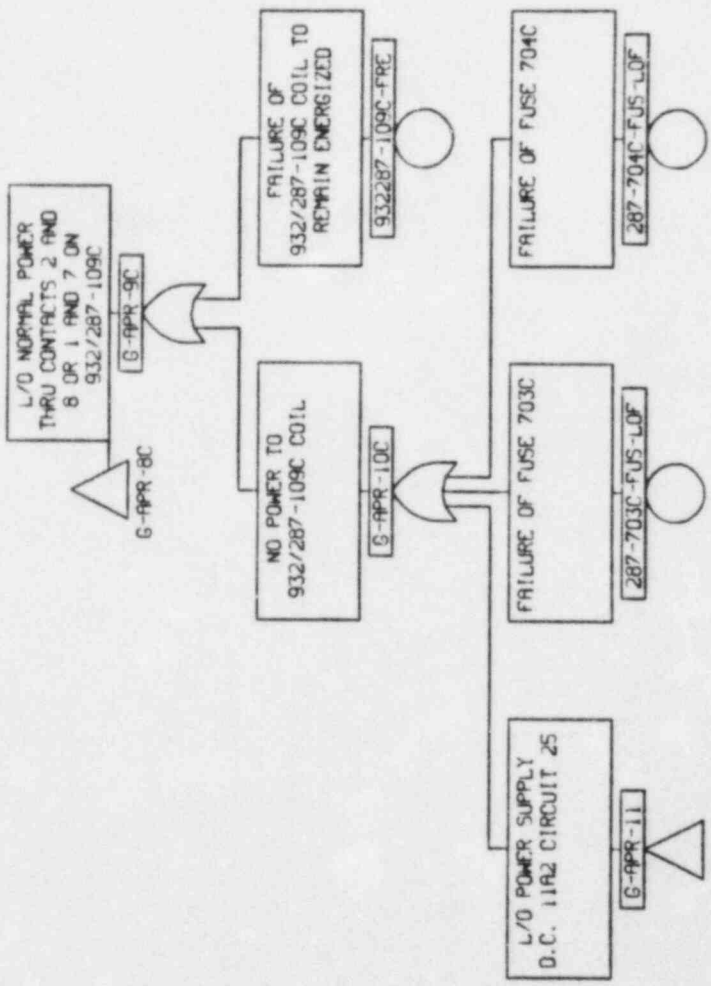

L/O POWER SOURCE TO COIL OF 203-3A
G-APR-3
G-APR-7A
FAILURE OF 932/287-109A CONTACTS 2 AND 8 TO REMAIN CLOSED
932287-109A-2RC
L/O NORMAL POWER THRU CONTACTS
G-APR-8A
FAILURE OF 932/287-109A CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-109A-1RC
L/O NORMAL POWER THRU CONTACTS 2 AND 8 OR 1 AND 7 ON 932/287-109A
G-APR-9A
L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-109A
G-APR-12A

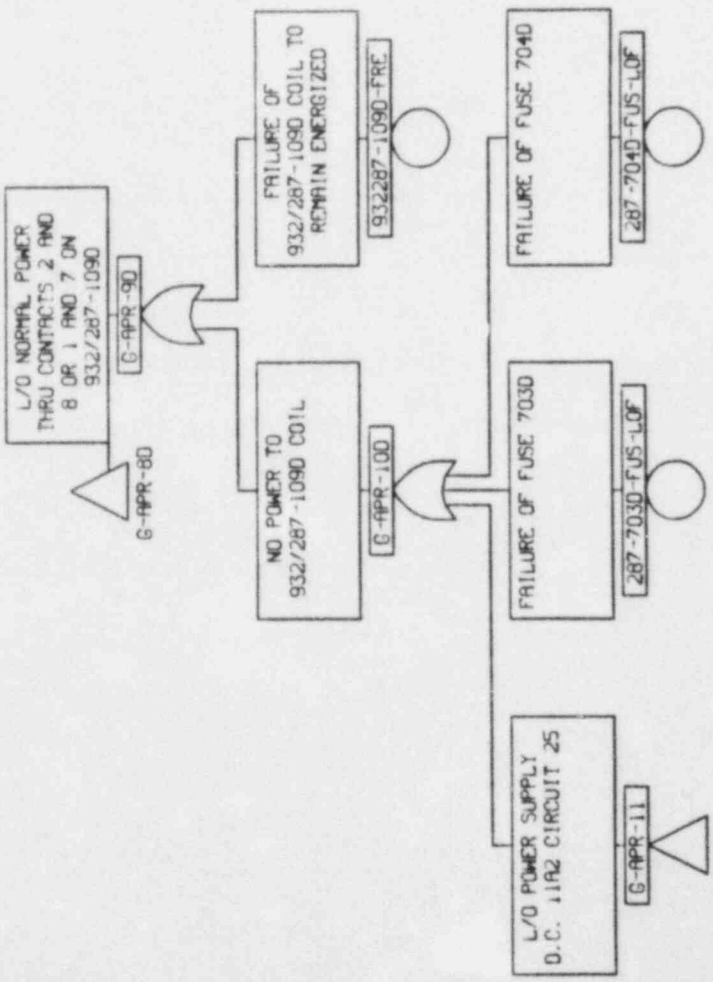

L/O POWER SOURCE TO COIL OF 203-3C
G-APR-142
G-APR-7C
FAILURE OF 932/287-109C CONTACTS 2 AND 8 TO REMAIN CLOSED
932287-109C-2RC
L/O NORMAL POWER THRU CONTACTS
G-APR-8C
FAILURE OF 932/287-109C CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-109C-1RC
L/O NORMAL POWER THRU CONTACTS 2 AND 8 OR 1 AND 7 ON 932/287-109C
G-APR-9C
L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-109C
G-APR-12C

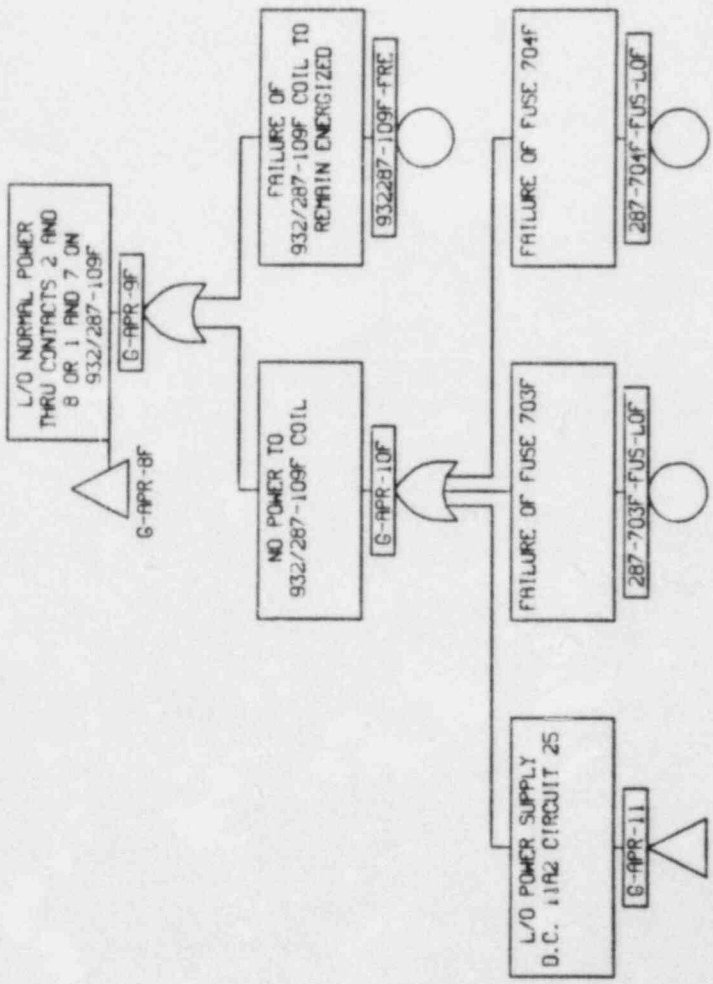

L/O POWER SOURCE TO COIL OF 203-30
G-APR-160
G-APR-70
FAILURE OF 932/287-1090 CONTACTS 2 AND 8 TO REMAIN CLOSED
932287-1090-2RC
L/O NORMAL POWER THRU CONTACTS
G-APR-80
FAILURE OF 932/287-1090 CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-1090-1RC
L/O NORMAL POWER THRU CONTACTS 2 AND 8 OR 1 AND 7 ON 932/287-1090
G-APR-90
L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-1090
G-APR-120

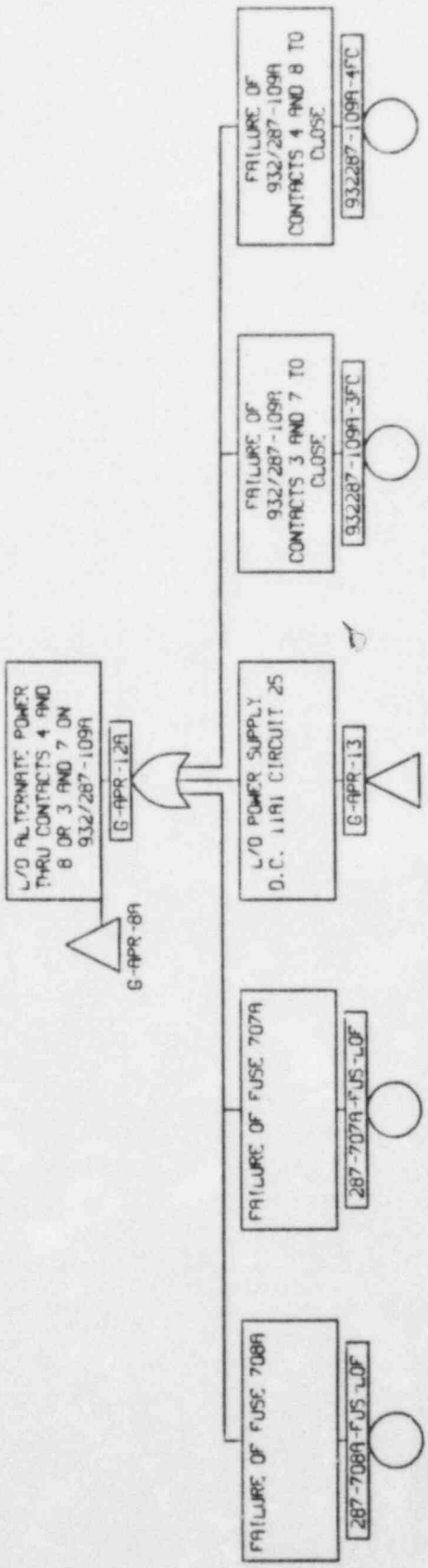

L/O POWER SOURCE TO COIL OF 203-3F
G-APR-151
G-APR-7F
L/O NORMAL POWER THRU CONTACTS
G-APR-8F
FAILURE OF 932/287-109F CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-109F-1RC
FAILURE OF 932/287-109F CONTACTS 2 AND 8 TO REMAIN CLOSED
932287-109F-2RC
L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-109F
G-APR-12F
L/O NORMAL POWER THRU CONTACTS 2 AND 8 OR 1 AND 7 ON 932/287-109F
G-APR-9F

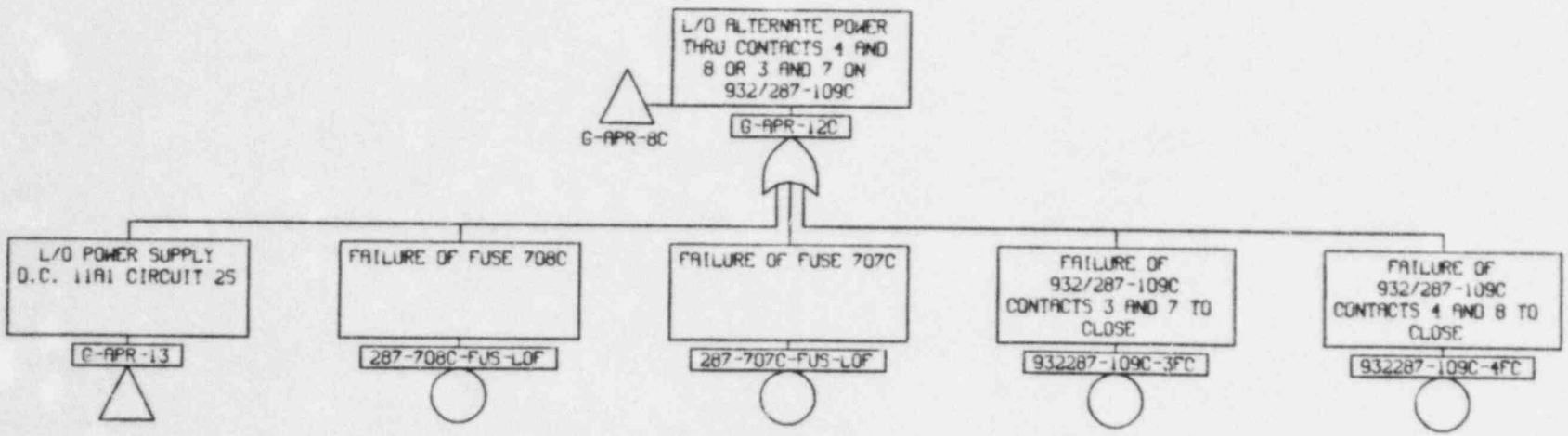

L/O NORMAL POWER
THRU CONTACTS 2 AND
6 OR 1 AND 7 ON
932/287-109A
G-APR-8A
G-APR-9A
NO POWER TO
932/287-109A COIL
G-APR-10A
FAILURE OF
932/287-109A COIL TO
REMAIN ENERGIZED
93228*-109A-FRF
FAILURE OF FUSE 703A
287-703A-FUS-LOF
FAILURE OF FUSE 704A
287-704A-FUS-LOF
L/O POWER SUPPLY
D.C. 1A2 CIRCUIT 25
G-APR-11


L/O NORMAL POWER
THRU CONTACTS 2 AND
8 OR 1 AND 7 ON
932/287-109C
G-APR-9C
G-APR-8C
FAILURE OF
932/287-109C COIL TO
REMAIN ENERGIZED
932287-109C-FRC
NO POWER TO
932/287-109C COIL
G-APR-10C
FAILURE OF FUSE 704C
287-704C-FUS-LOF
FAILURE OF FUSE 703C
287-703C-FUS-LOF
L/O POWER SUPPLY
D.C. 11A2 CIRCUIT 25
G-APR-11

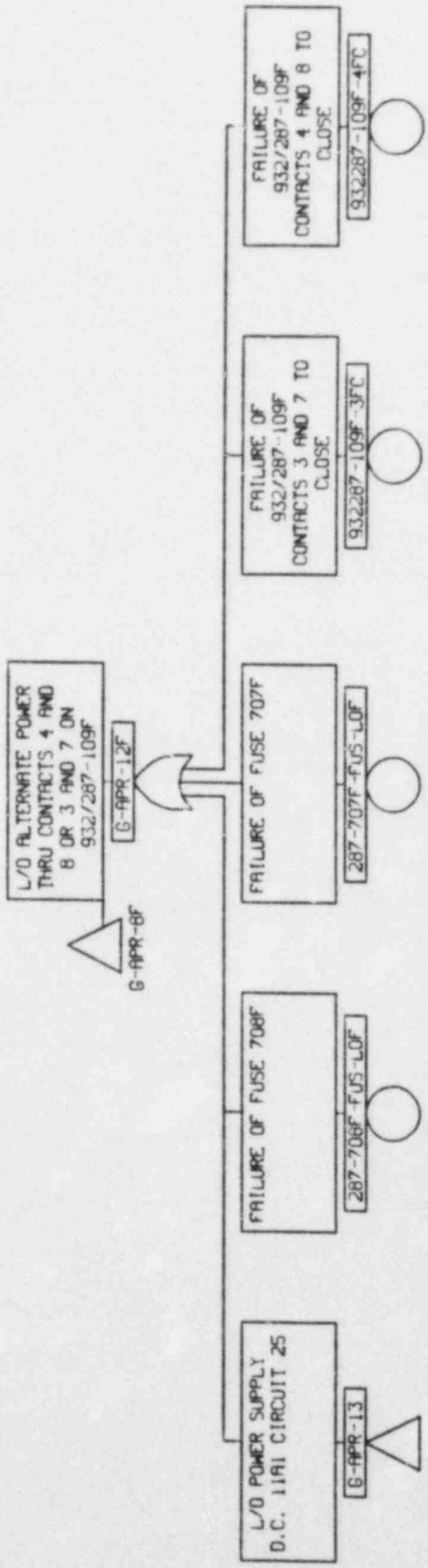

L/O NORMAL POWER
THRU CONTACTS 2 AND
8 OR 1 AND 7 ON
932/287-1090
G-APR-90
G-APR-80
FAILURE OF
932/287-1090 COIL TO
REMAIN ENERGIZED
932287-1090-FRE
NO POWER TO
932/287-1090 COIL
G-APR-100
FAILURE OF FUSE 7040
287-7040-FUS-LOF
FAILURE OF FUSE 7030
287-7030-FUS-LOF
L/O POWER SUPPLY
D.C. 11A2 CIRCUIT 25
G-APR-11

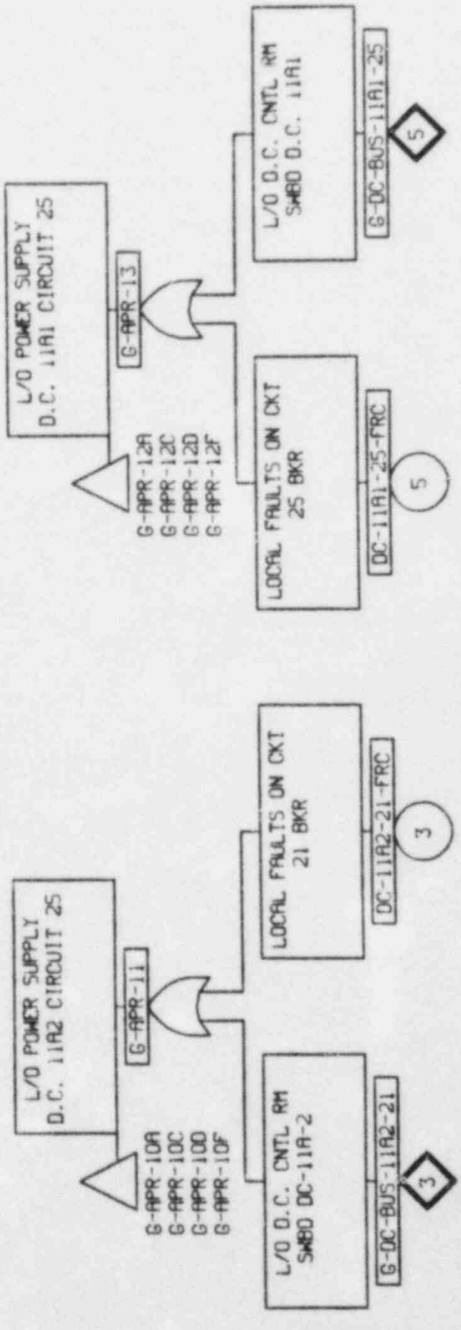

L/O NORMAL POWER
THRU CONTACTS 2 AND
8 OR 1 AND 7 ON
932/287-109F
G-APR-8F
G-APR-9F
FAILURE OF
932/287-109F COIL TO
REMAIN ENERGIZED
932287-109F-FRE
NO POWER TO
932/287-109F COIL
G-APR-10F
FAILURE OF FUSE 703F
287-703F-FUS-LOF
FAILURE OF FUSE 704F
287-704F-FUS-LOF
L/O POWER SUPPLY
D.C. BUS CIRCUIT 25
G-APR-11

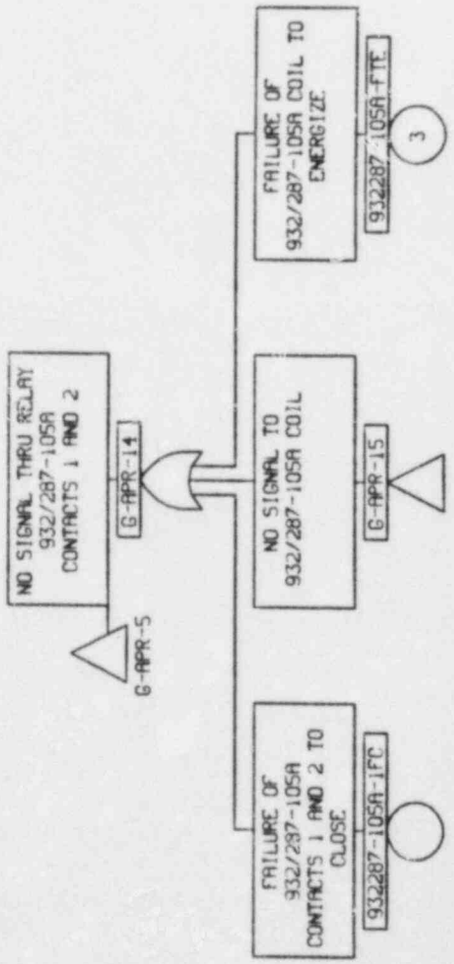

L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-1099
G-APR-89
G-APR-129
L/O POWER SUPPLY D.C. 1191 CIRCUIT 25
G-APR-13
FAILURE OF 932/287-1099 CONTACTS 4 AND 8 TO CLOSE
932287-1099-4FC
FAILURE OF 932/287-1099 CONTACTS 3 AND 7 TO CLOSE
932287-1099-3FC
FAILURE OF FUSE 7079
287-7079-FUS-OF
FAILURE OF FUSE 7089
287-7089-FUS-OF

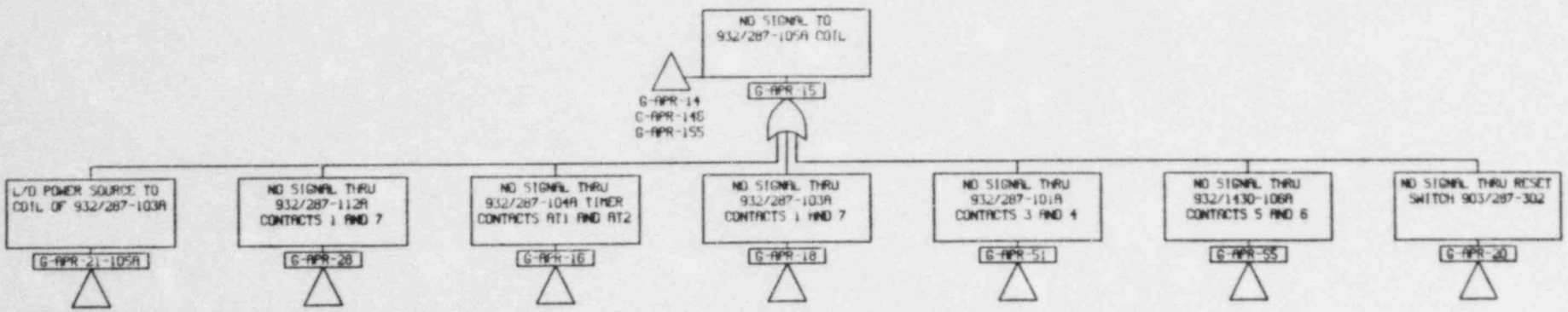

L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-109C
G-APR-12C
G-APR-8C
L/O POWER SUPPLY D.C. MAI CIRCUIT 25
G-APR-13
FAILURE OF FUSE 708C
287-708C-FUS-LOF
FAILURE OF FUSE 707C
287-707C-FUS-LOF
FAILURE OF 932/287-109C CONTACTS 3 AND 7 TO CLOSE
932287-109C-3FC
FAILURE OF 932/287-109C CONTACTS 4 AND 8 TO CLOSE
932287-109C-4FC

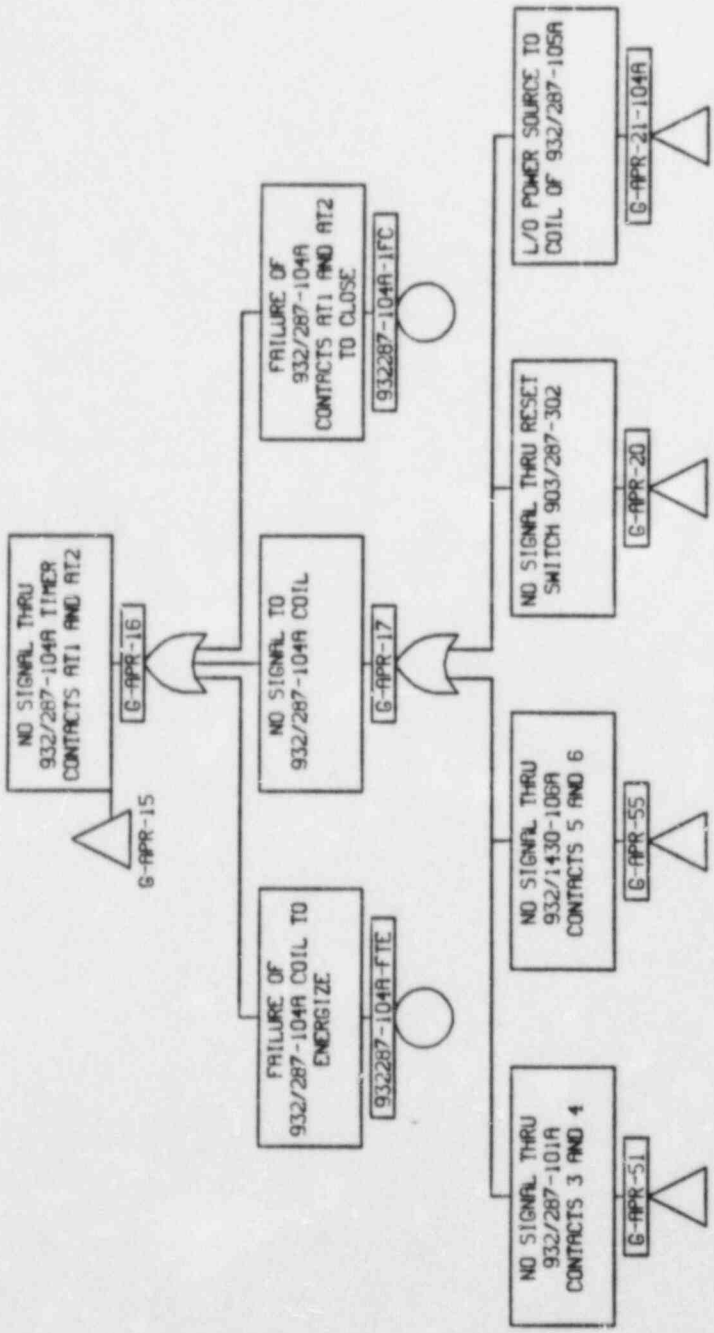
L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-1090
G-APR-120
G-APR-80
FAILURE OF 932/287-1090 CONTACTS 4 AND 8 TO CLOSE
932287-1090-4FC
FAILURE OF 932/287-1090 CONTACTS 3 AND 7 TO CLOSE
932287-1090-3FC
FAILURE OF FUSE 7070
287-7070-FUS-LOF
FAILURE OF FUSE 7080
287-7080-FUS-LOF
L/O POWER SUPPLY D.C. 11A1 CIRCUIT 25
G-APR-13

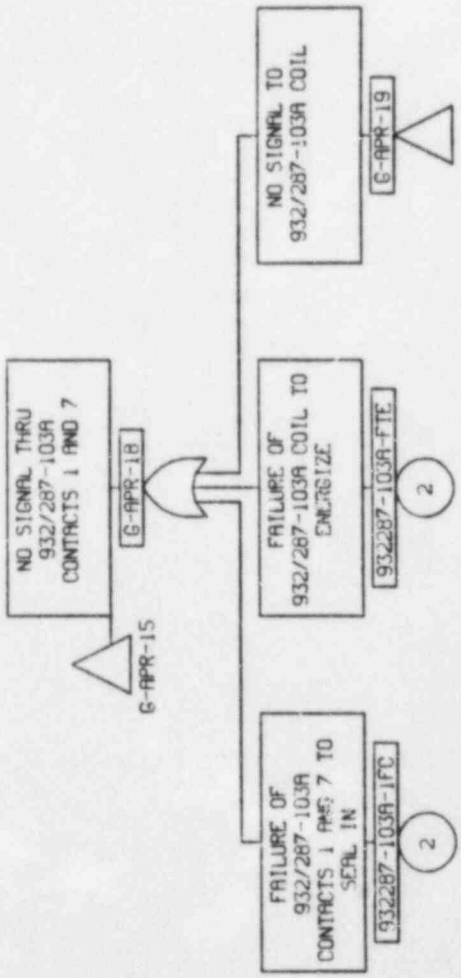

L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-109F
G-APR-8F
G-APR-12F
FAILURE OF FUSE 707F
287-707F-FUS-LOF
FAILURE OF 932/287-109F CONTACTS 3 AND 7 TO CLOSE
932287-109F-3FC
FAILURE OF 932/287-109F CONTACTS 4 AND 8 TO CLOSE
932287-109F-4FC
L/O POWER SUPPLY D.C. 1IA1 CIRCUIT 25
G-APR-13
FAILURE OF FUSE 706F
287-706F-FUS-LOF

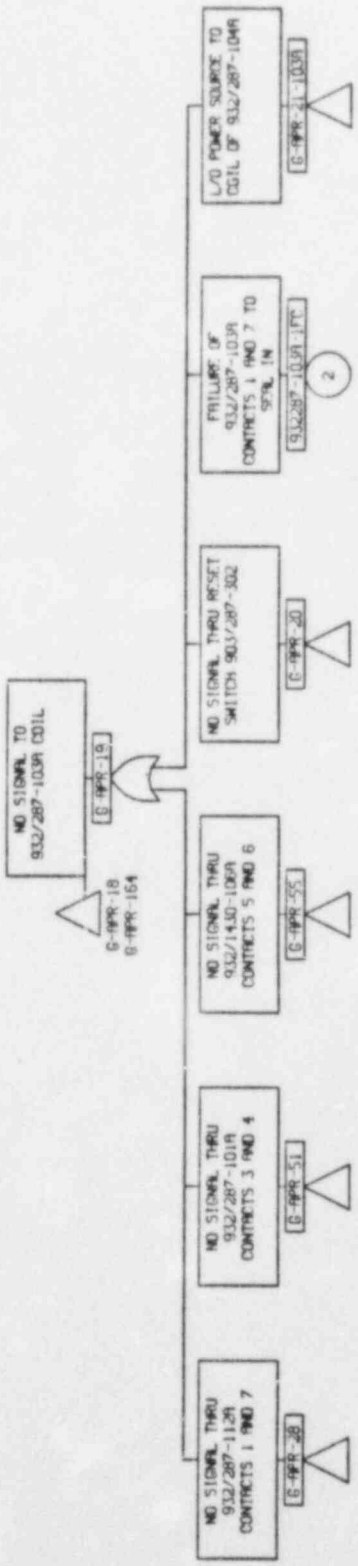

L/O POWER SUPPLY
D.C. 11A2 CIRCUIT 25
G-APR-10A
G-APR-10C
G-APR-10D
G-APR-10F
G-APR-11
L/O D.C. CNTL RM
SWBD DC-11A-2
G-DC-BUS-11A2-21
3
LOCAL FAULTS ON CKT
21 BKR
DC-11A2-21-FRC
3
L/O POWER SUPPLY
D.C. 11A1 CIRCUIT 25
G-APR-12A
G-APR-12C
G-APR-12D
G-APR-12F
G-APR-13
LOCAL FAULTS ON CKT
25 BKR
DC-11A1-25-FRC
5
L/O D.C. CNTL RM
SWBD D.C. 11A1
G-DC-BUS-11A1-25
5

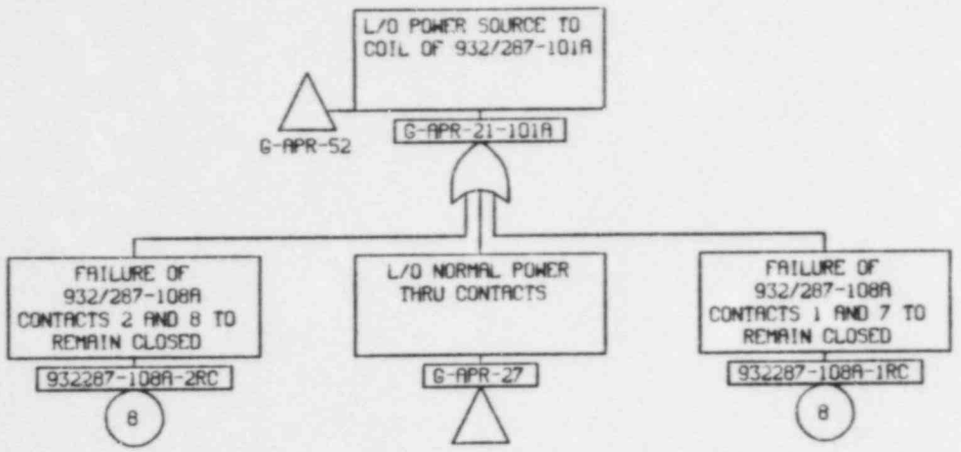

NO SIGNAL THRU RELAY 932/287-105A CONTACTS 1 AND 2
G-APR-14
G-APR-5
NO SIGNAL TO 932/287-105A COIL
G-APR-15
FAILURE OF 932/287-105A CONTACTS 1 AND 2 TO CLOSE
932287-105A-1FC
FAILURE OF 932/287-105A COIL TO ENERGIZE
932287-105A-FTE
3

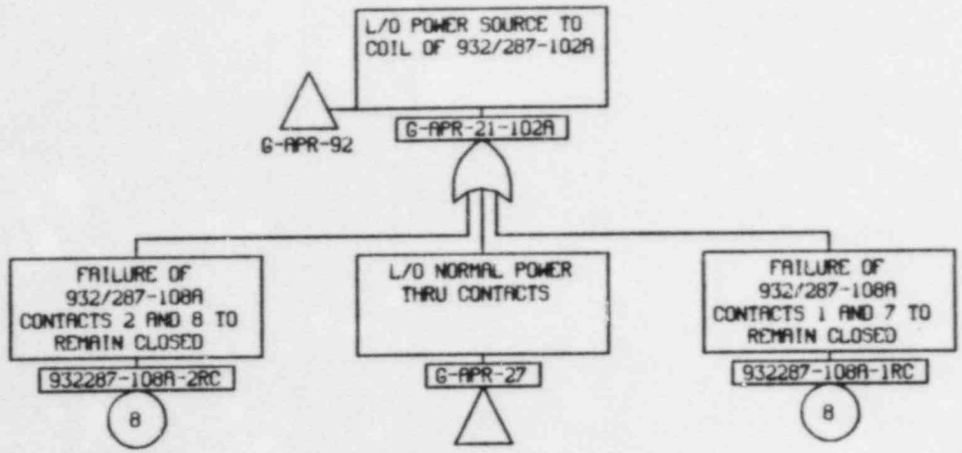

NO SIGNAL TO
932/287-105A COIL
G-APR-15
G-APR-14
C-APR-14S
G-APR-15S
L/O POWER SOURCE TO
COIL OF 932/287-103A
G-APR-21-105A
NO SIGNAL THRU
932/287-112A
CONTACTS 1 AND 7
G-APR-28
NO SIGNAL THRU
932/287-104A TIMER
CONTACTS AT1 AND AT2
G-APR-16
NO SIGNAL THRU
932/287-103A
CONTACTS 1 AND 7
G-APR-18
NO SIGNAL THRU
932/287-101A
CONTACTS 3 AND 4
G-APR-51
NO SIGNAL THRU
932/1430-106A
CONTACTS 5 AND 6
G-APR-55
NO SIGNAL THRU RESET
SWITCH 903/287-302
G-APR-20

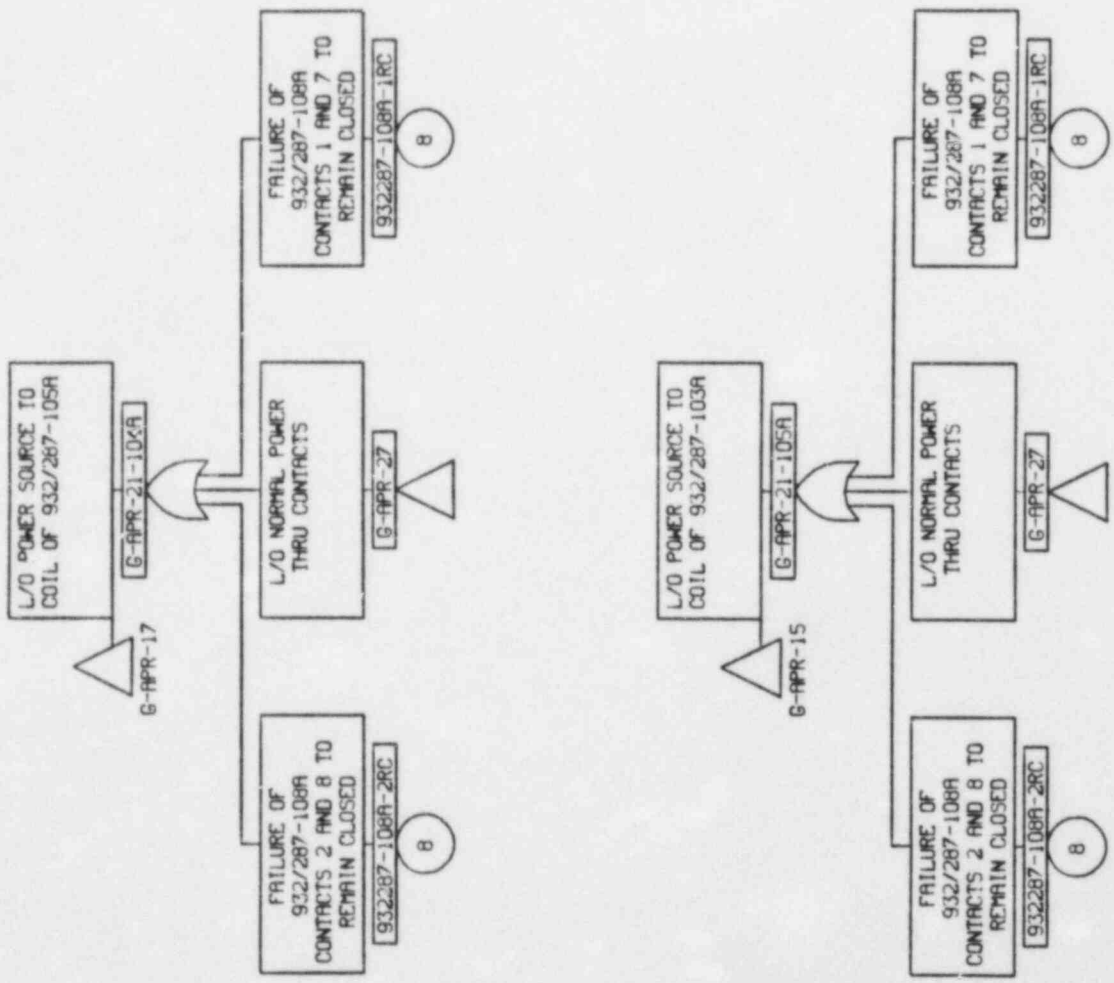

NO SIGNAL THRU 932/287-104A TIMER CONTACTS AT1 AND AT2
G-APR-16
G-APR-15
NO SIGNAL TO 932/287-104A COIL
G-APR-17
FAILURE OF 932/287-104A CONTACTS AT1 AND AT2 TO CLOSE
932287-104A-1FC
FAILURE OF 932/287-104A COIL TO ENERGIZE
932287-104A-FTE
NO SIGNAL THRU 932/287-101A CONTACTS 3 AND 4
G-APR-51
NO SIGNAL THRU 932/1430-106A CONTACTS 5 AND 6
G-APR-55
NO SIGNAL THRU RESET SWITCH 903/287-302
G-APR-20
L/O POWER SOURCE TO COIL OF 932/287-105A
G-APR-21-104A

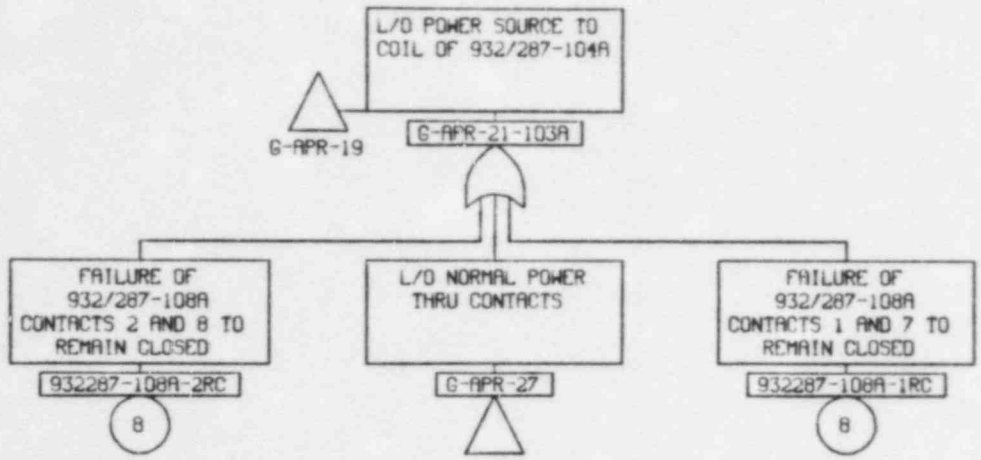

NO SIGNAL THRU
932/287-103A
CONTACTS 1 AND 7
G-APR-15
G-APR-18
FAILURE OF
932/287-103A COIL TO
ENERGIZE
932287-103A-FTE
2
NO SIGNAL TO
932/287-103A COIL
G-APR-19
FAILURE OF
932/287-103A
CONTACTS 1 AND 7 TO
SEAL IN
932287-103A-FTC
2

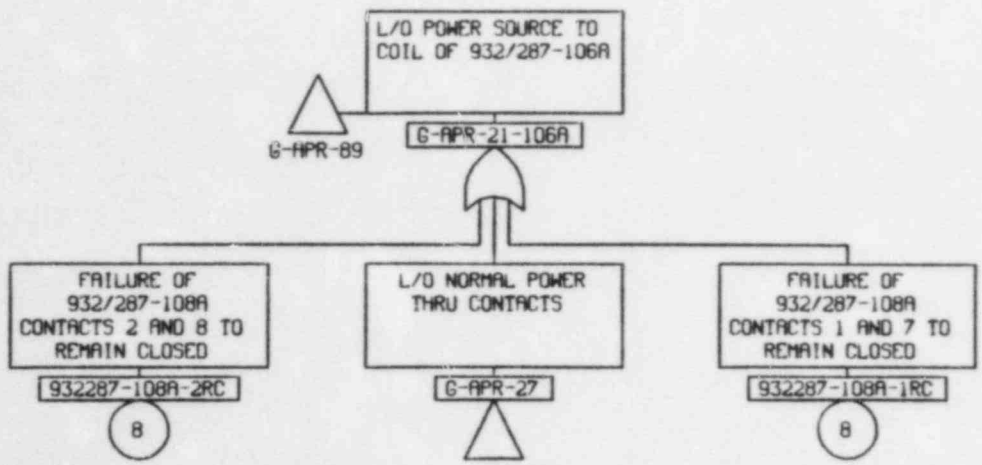

NO SIGNAL TO
932/287-101A COIL
6-APR-19
6-APR-18
6-APR-164
NO SIGNAL THRU
932/287-112A
CONTACTS 1 AND 7
6-APR-28
NO SIGNAL THRU
932/287-101A
CONTACTS 3 AND 4
6-APR-51
NO SIGNAL THRU
932/14-101A
CONTACTS 5 AND 6
6-APR-55
NO SIGNAL THRU RESET
SWITCH 903/287-302
6-APR-20
FAILURE OF
932/287-103A
CONTACTS 1 AND 7 TO
OPEN
932287-103A:1FU
2
L/O POWER SOURCE TO
COIL OF 932/287-104A
6-APR-3
932287-103A:1

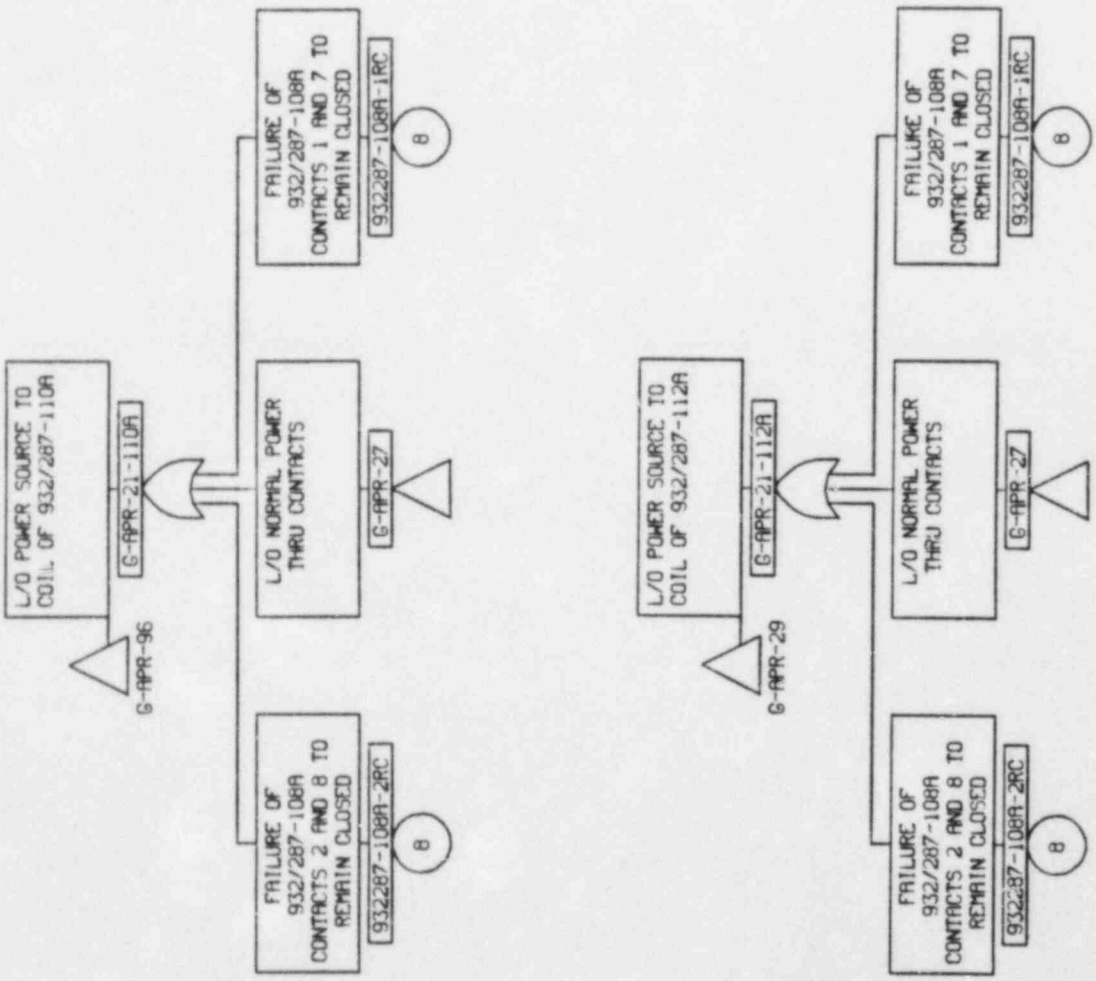

L/O POWER SOURCE TO COIL OF 932/287-101A
G-APR-52
G-APR-21-101A
FAILURE OF 932/287-108A CONTACTS 2 AND 8 TO REMAIN CLOSED
L/O NORMAL POWER THRU CONTACTS
FAILURE OF 932/287-108A CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-108A-2RC
G-APR-27
932287-108A-1RC
8
8

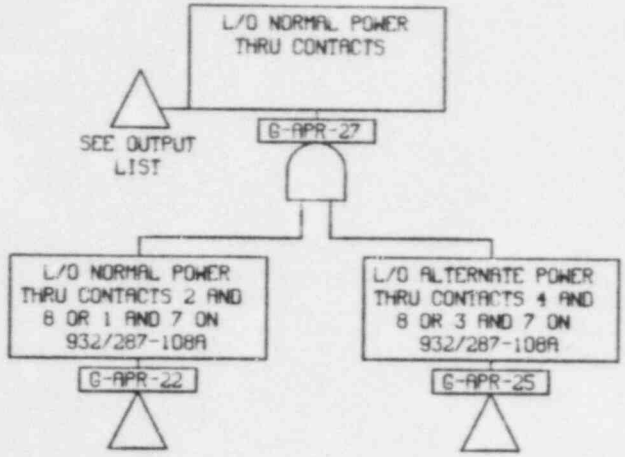

L/O POWER SOURCE TO COIL OF 932/287-102A
G-APR-92
G-APR-21-102A
FAILURE OF 932/287-108A CONTACTS 2 AND 8 TO REMAIN CLOSED
L/O NORMAL POWER THRU CONTACTS
FAILURE OF 932/287-108A CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-108A-2RC
G-APR-27
932287-108A-1RC
8
8


L/O POWER SOURCE TO COIL OF 932/287-105A
G-APR-17
G-APR-21-104A
L/O NORMAL POWER THRU CONTACTS
G-APR-27
FAILURE OF 932/287-108A CONTACTS 2 AND 8 TO REMAIN CLOSED
932287-108A-2RC
8
FAILURE OF 932/287-108A CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-108A-1RC
8
L/O POWER SOURCE TO COIL OF 932/287-103A
G-APR-15
G-APR-21-105A
L/O NORMAL POWER THRU CONTACTS
G-APR-27
FAILURE OF 932/287-108A CONTACTS 2 AND 8 TO REMAIN CLOSED
932287-108A-2RC
8
FAILURE OF 932/287-108A CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-108A-1RC
8

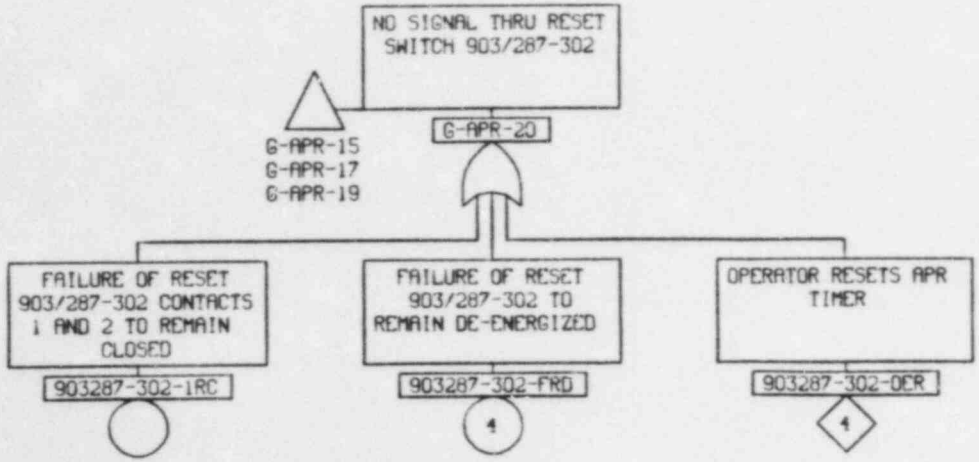

L/O POWER SOURCE TO
COIL OF 932/287-104A
G-APR-19
G-APR-21-103A
FAILURE OF
932/287-108A
CONTACTS 2 AND 8 TO
REMAIN CLOSED
932287-108A-2RC
8
L/O NORMAL POWER
THRU CONTACTS
G-APR-27
FAILURE OF
932/287-108A
CONTACTS 1 AND 7 TO
REMAIN CLOSED
932287-108A-1RC
8

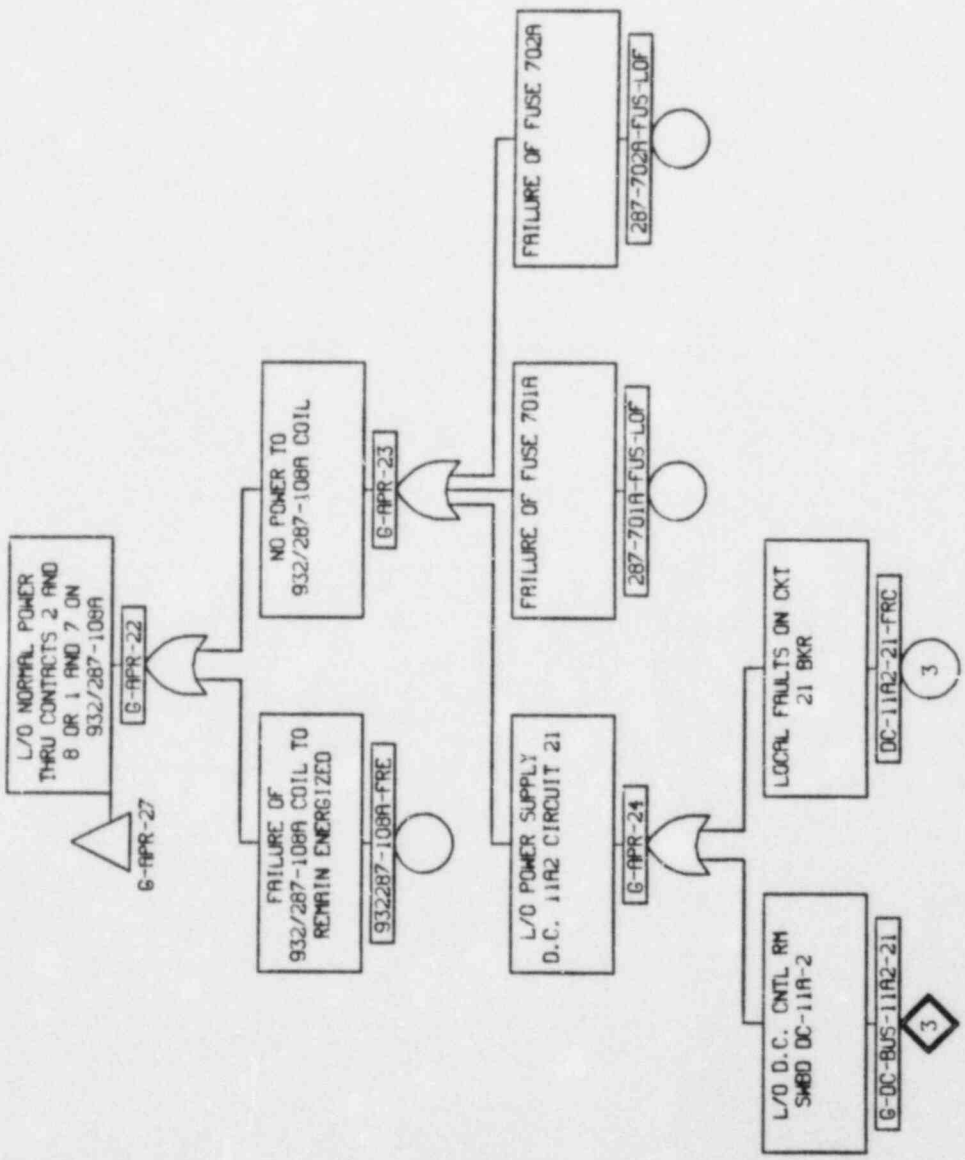

L/O POWER SOURCE TO
COIL OF 932/287-106A
G-APR-89
G-APR-21-106A
FAILURE OF
932/287-108A
CONTACTS 2 AND 8 TO
REMAIN CLOSED
932287-108A-2RC
8
L/O NORMAL POWER
THRU CONTACTS
G-APR-27
FAILURE OF
932/287-108A
CONTACTS 1 AND 7 TO
REMAIN CLOSED
932287-108A-1RC
8

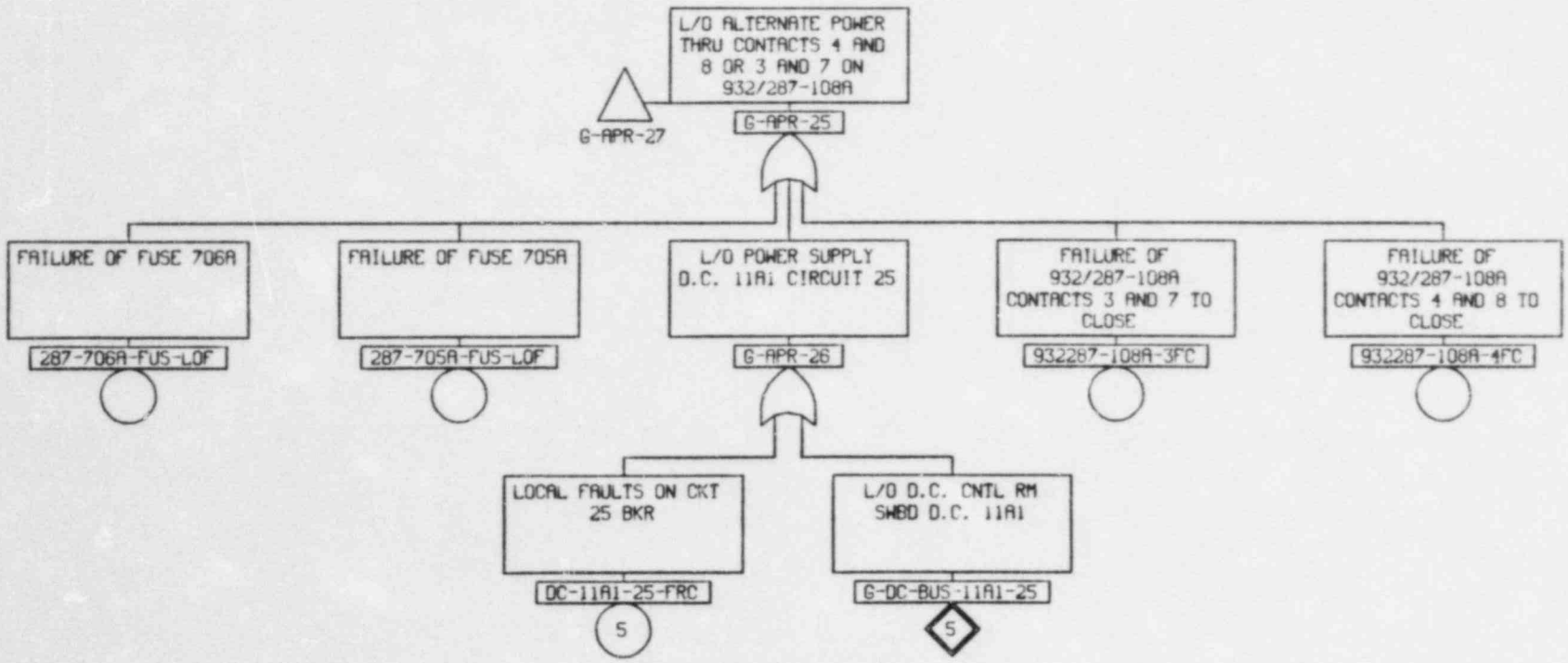

L/O POWER SOURCE TO COIL OF 932/287-110A
G-APR-96
G-APR-21-110A
L/O NORMAL POWER THRU CONTACTS
G-APR-27
FAILURE OF 932/287-108A CONTACTS 2 AND 8 TO REMAIN CLOSED
932287-108A-2RC
8
FAILURE OF 932/287-108A CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-108A-1RC
8
L/O POWER SOURCE TO COIL OF 932/287-112A
G-APR-29
G-APR-21-112A
L/O NORMAL POWER THRU CONTACTS
G-APR-27
FAILURE OF 932/287-108A CONTACTS 2 AND 8 TO REMAIN CLOSED
932287-108A-2RC
8
FAILURE OF 932/287-108A CONTACTS 1 AND 7 TO REMAIN CLOSED
932287-108A-1RC
8

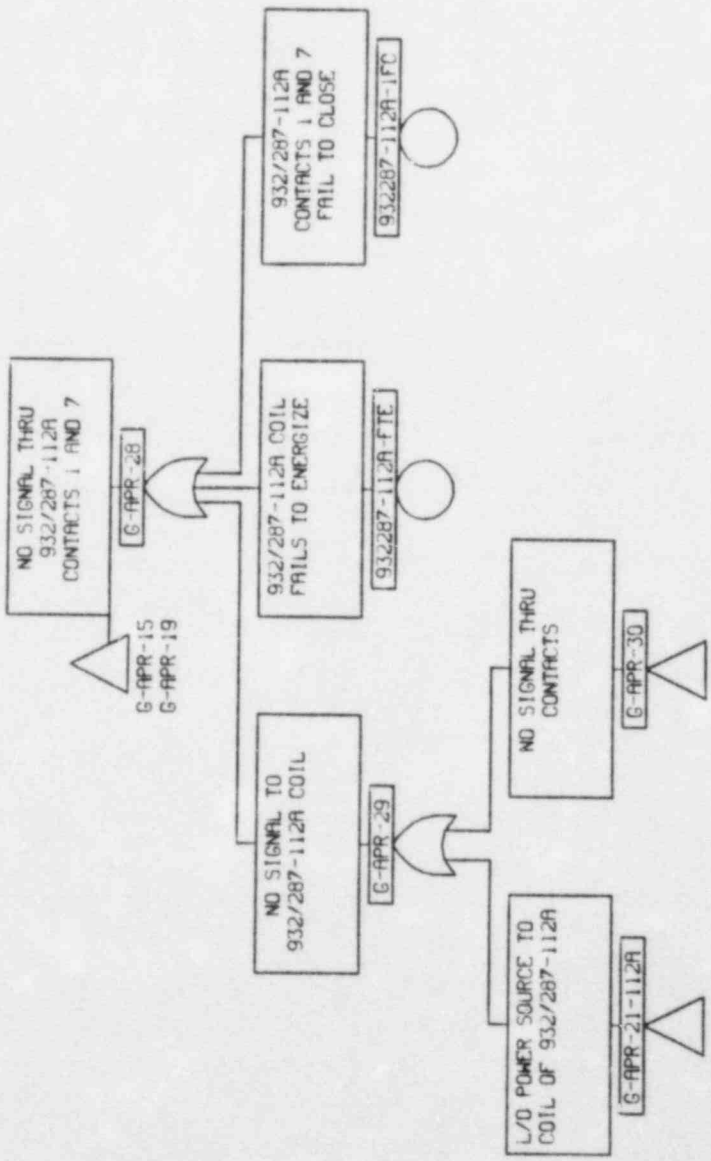


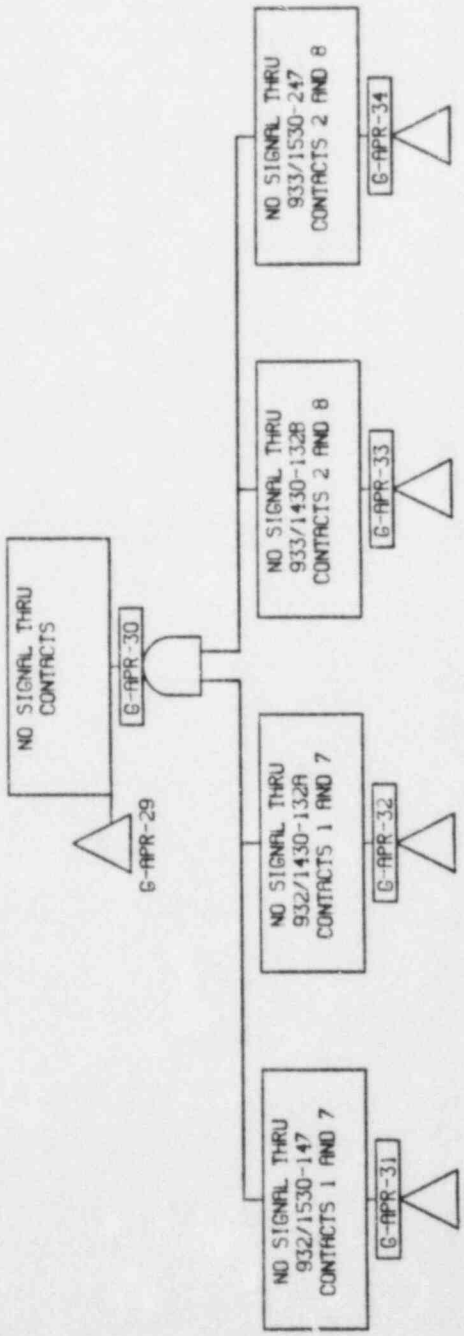

G-APR-27 OUTPUT LIST
G-APR-21-105A, G-APR-21-104A, G-APR-21-103A, G-APR-21-112A, G-APR-21-101A
G-APR-21-106A, G-APR-21-102A, G-APR-21-110A

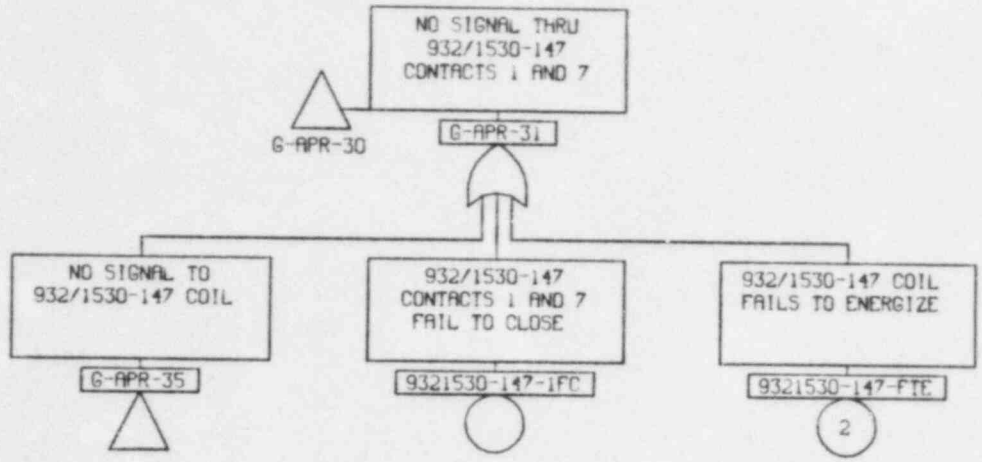


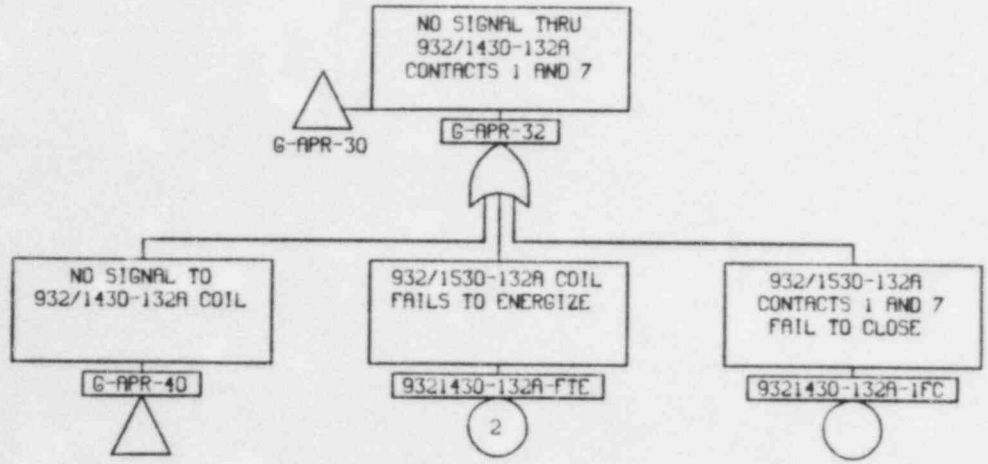

L/O NORMAL POWER THRU CONTACTS 2 AND 8 OR 1 AND 7 ON 932/287-108A
6-APR-27
6-APR-22
FAILURE OF 932/287-108A COIL TO REMAIN ENERGIZED
932287-108A-FRE
NO POWER TO 932/287-108A COIL
6-APR-23
L/O POWER SUPPLY D.C. 11A2 CIRCUIT 21
6-APR-24
FAILURE OF FUSE 701A
287-701A-FUS-LOF
FAILURE OF FUSE 702A
287-702A-FUS-LOF
L/O D.C. CNTL RM SWBD DC-11A-2
6-DC-BUS-11A2-21
3
LOCAL FAULTS ON CKT 21 BKR
DC-11A2-21-FRC
3

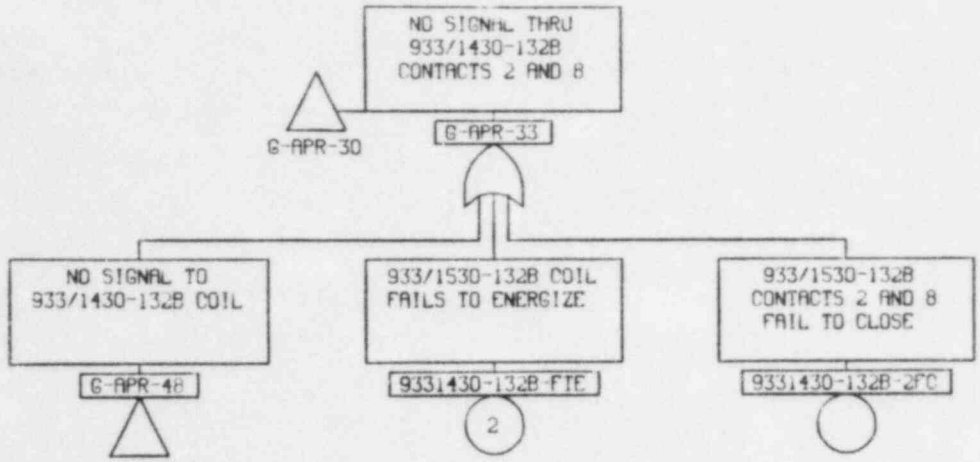

L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-108A
G-APR-25
G-APR-27
FAILURE OF FUSE 706A
287-706A-FUS-LOF
FAILURE OF FUSE 705A
287-705A-FUS-LOF
L/O POWER SUPPLY D.C. 11A1 CIRCUIT 25
G-APR-26
FAILURE OF 932/287-108A CONTACTS 3 AND 7 TO CLOSE
932287-108A-3FC
FAILURE OF 932/287-108A CONTACTS 4 AND 8 TO CLOSE
932287-108A-4FC
LOCAL FAULTS ON CKT 25 BKR
DC-11A1-25-FRC
5
L/O D.C. CNTL RM SWBD D.C. 11A1
G-DC-BUS-11A1-25
5

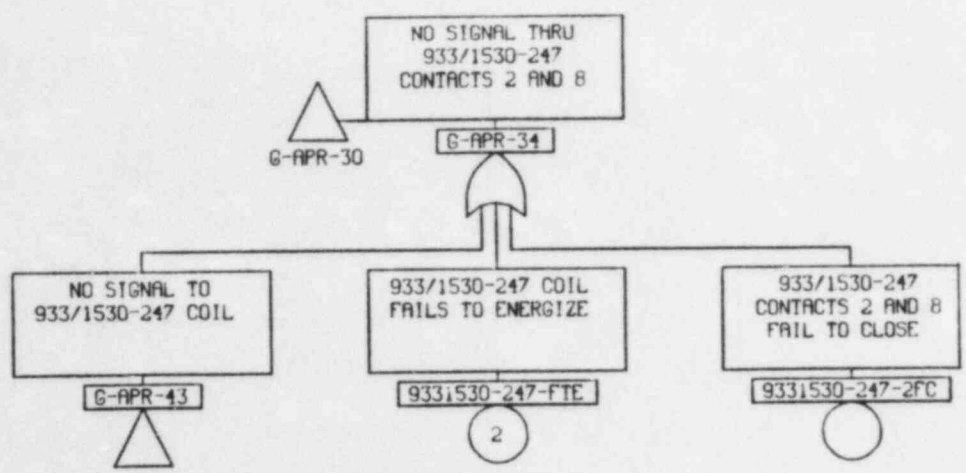

NO SIGNAL THRU
932/287-112A
CONTACTS 1 AND 7
G-APR-15
G-APR-19
G-APR-28
932/287-112A
CONTACTS 1 AND 7
FAIL TO CLOSE
932287-112A-1FC
932/287-112A COIL
FAILS TO ENERGIZE
932287-112A-FTE
NO SIGNAL TO
932/287-112A COIL
G-APR-29
NO SIGNAL THRU
CONTACTS
G-APR-30
L/O POWER SOURCE TO
COIL OF 932/287-112A
G-APR-21-112A

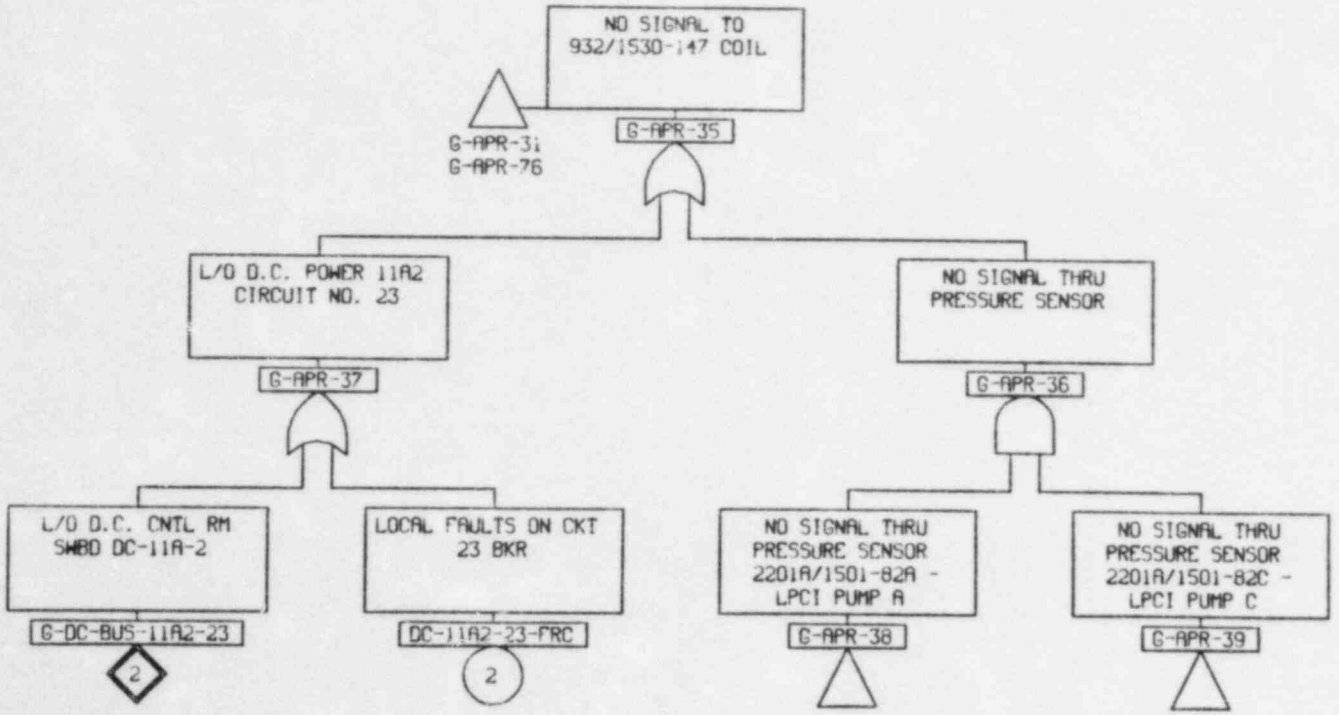

NO SIGNAL THRU CONTACTS
6-APR-29
6-APR-30
NO SIGNAL THRU 932/1530-147 CONTACTS 1 AND 7
6-APR-31
NO SIGNAL THRU 932/1430-132A CONTACTS 1 AND 7
6-APR-32
NO SIGNAL THRU 933/1430-132B CONTACTS 2 AND 8
6-APR-33
NO SIGNAL THRU 933/1530-247 CONTACTS 2 AND 8
6-APR-34

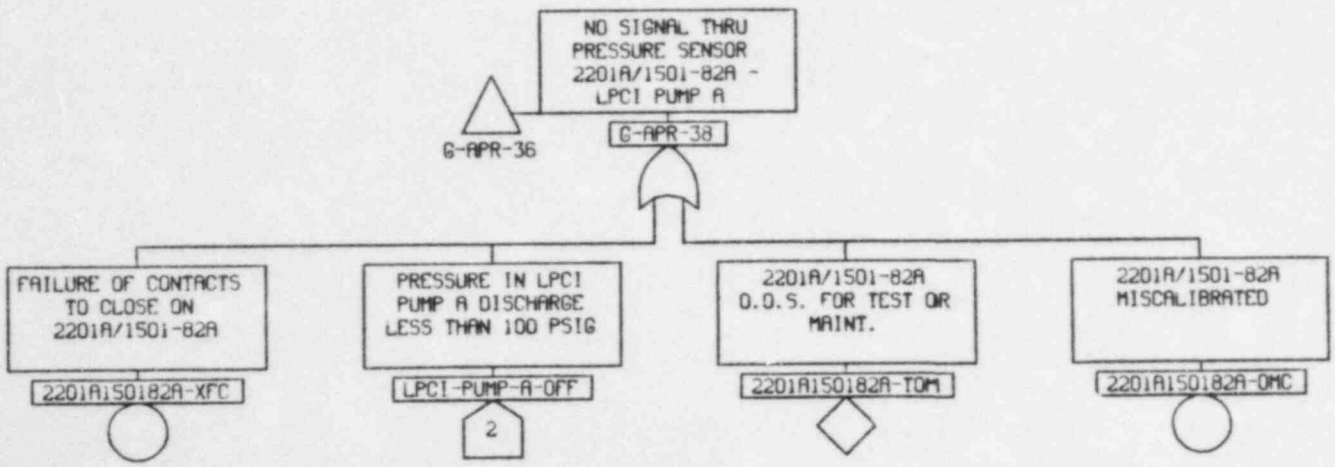

NO SIGNAL THRU
932/1530-147
CONTACTS 1 AND 7
G-APR-30
G-APR-31
NO SIGNAL TO
932/1530-147 COIL
G-APR-35
932/1530-147
CONTACTS 1 AND 7
FAIL TO CLOSE
9321530-147-1FC
932/1530-147 COIL
FAILS TO ENERGIZE
9321530-147-FTE
2

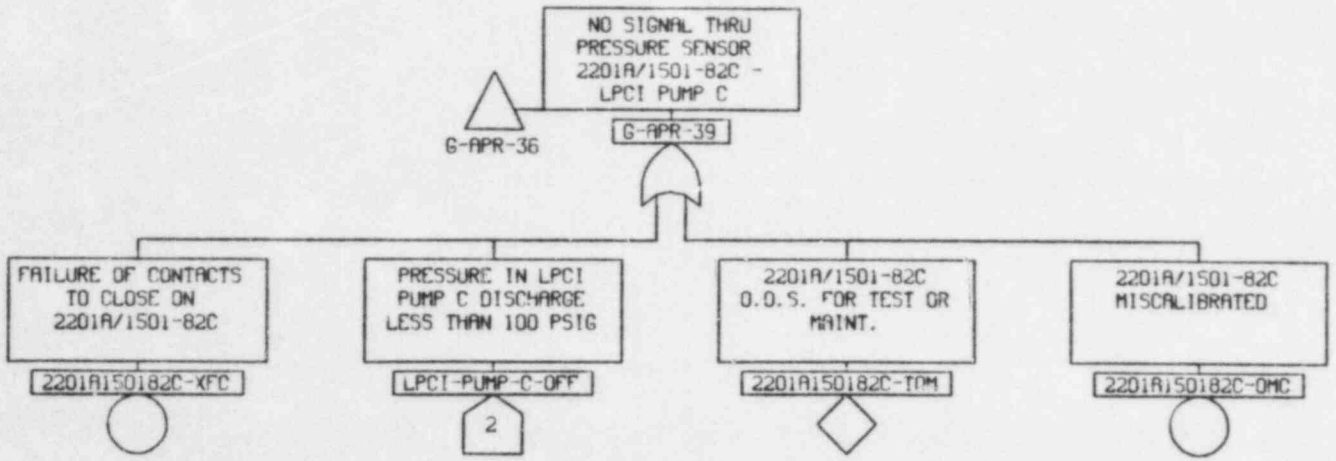

NO SIGNAL THRU
932/1430-132A
CONTACTS 1 AND 7
G-APR-30
G-APR-32
NO SIGNAL TO
932/1430-132A COIL
G-APR-40
932/1530-132A COIL
FAILS TO ENERGIZE
9321430-132A-FTE
2
932/1530-132A
CONTACTS 1 AND 7
FAIL TO CLOSE
9321430-132A-1FC

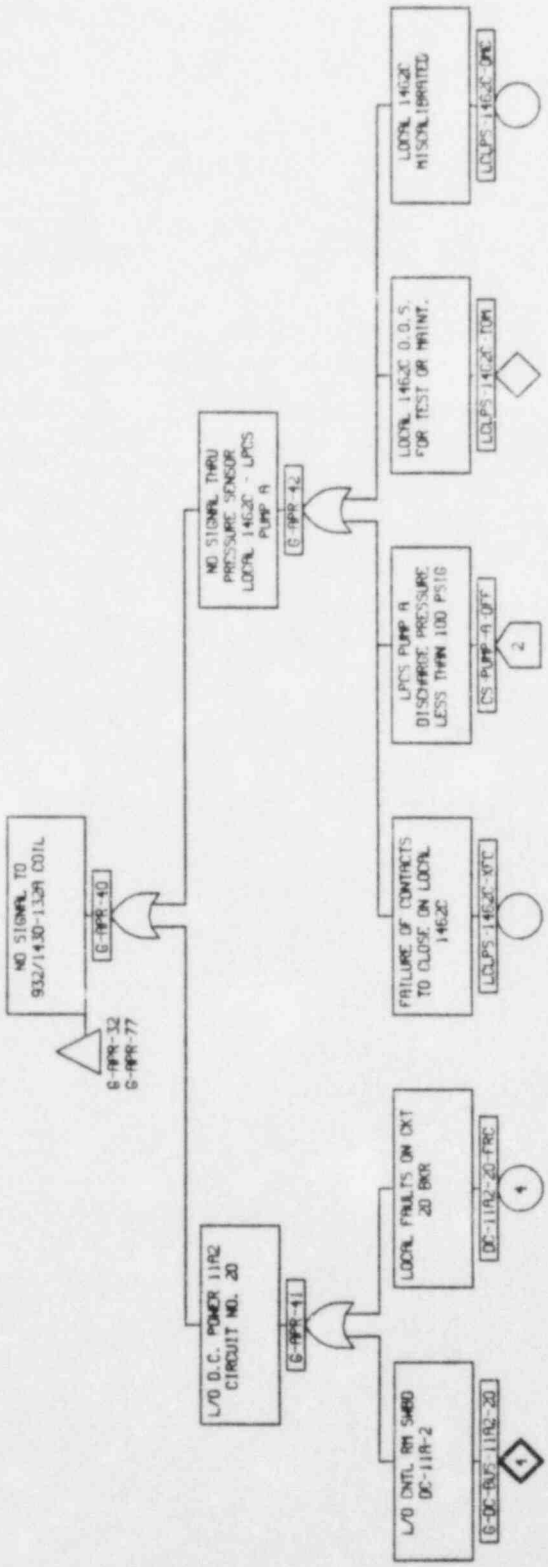

NO SIGNAL THRU
933/1430-132B
CONTACTS 2 AND 8
G-APR-30
G-APR-33
NO SIGNAL TO
933/1430-132B COIL
G-APR-48
933/1530-132B COIL
FAILS TO ENERGIZE
9331430-132B-FTE
2
933/1530-132B
CONTACTS 2 AND 8
FAIL TO CLOSE
9331430-132B-2FC

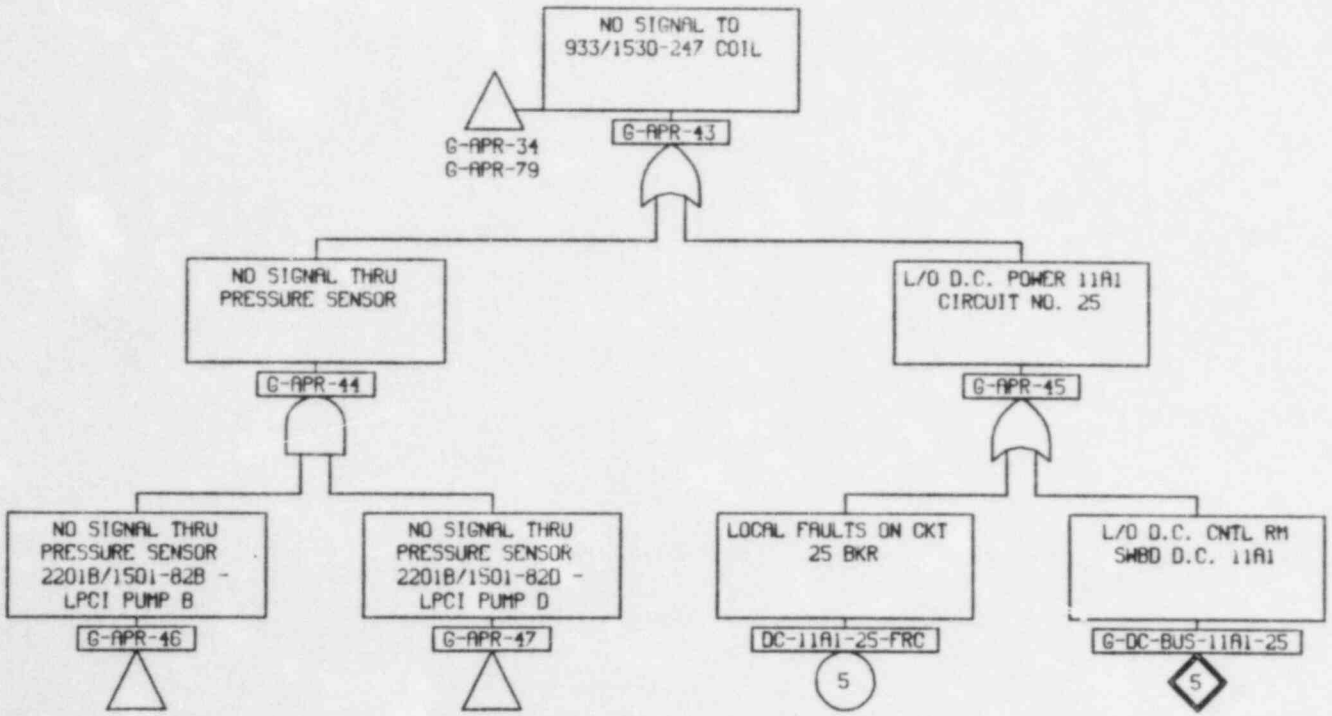

NO SIGNAL THRU
933/1530-247
CONTACTS 2 AND 8
G-APR-30
G-APR-34
NO SIGNAL TO
933/1530-247 COIL
G-APR-43
933/1530-247 COIL
FAILS TO ENERGIZE
9331530-247-FTE
2
933/1530-247
CONTACTS 2 AND 8
FAIL TO CLOSE
9331530-247-2FC

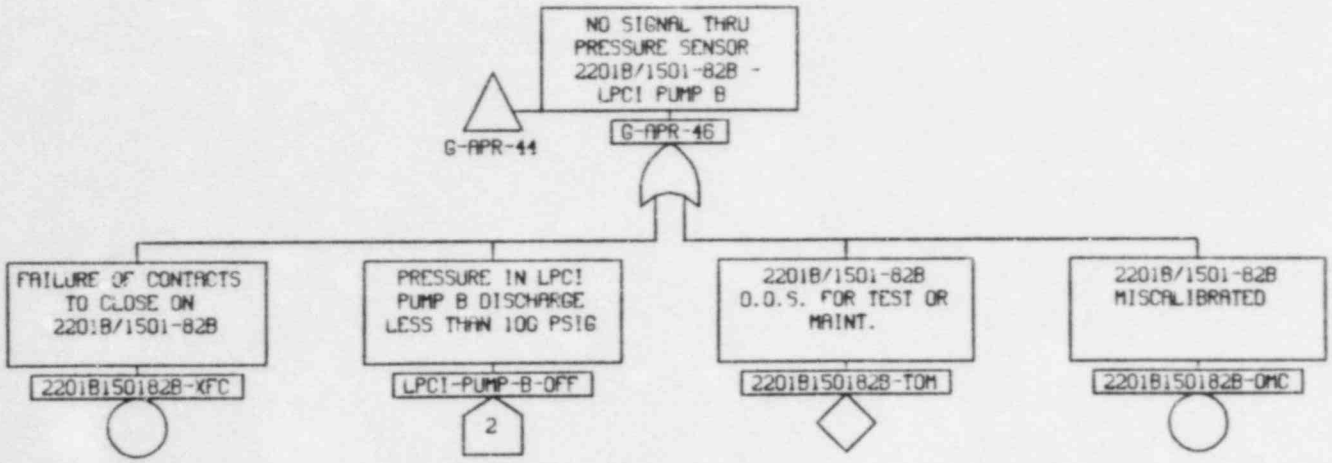

NO SIGNAL TO
932/1530-147 COIL
G-APR-35
G-APR-31
G-APR-76
L/O D.C. POWER 11A2
CIRCUIT NO. 23
G-APR-37
NO SIGNAL THRU
PRESSURE SENSOR
G-APR-36
L/O D.C. CNTL RM
SWBD DC-11A-2
LOCAL FAULTS ON CKT
23 BKR
NO SIGNAL THRU
PRESSURE SENSOR
2201A/1501-82A -
LPCI PUMP A
NO SIGNAL THRU
PRESSURE SENSOR
2201A/1501-82C -
LPCI PUMP C
G-DC-BUS-11A2-23
DC-11A2-23-FRC
G-APR-38
G-APR-39
2
2

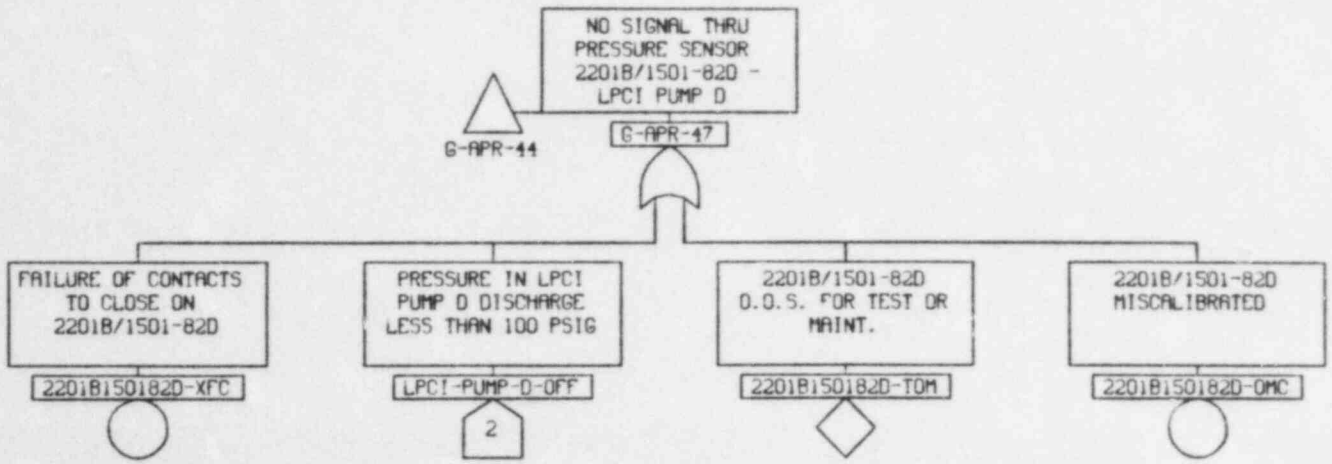

NO SIGNAL THRU PRESSURE SENSOR 2201A/1501-82A - LPCI PUMP A
G-APR-36
G-APR-38
FAILURE OF CONTACTS TO CLOSE ON 2201A/1501-82A
2201A150182A-XFC
PRESSURE IN LPCI PUMP A DISCHARGE LESS THAN 100 PSIG
LPCI-PUMP-A-OFF
2
2201A/1501-82A O.O.S. FOR TEST OR MAINT.
2201A150182A-TOM
2201A/1501-82A MISCALIBRATED
2201A150182A-OMC

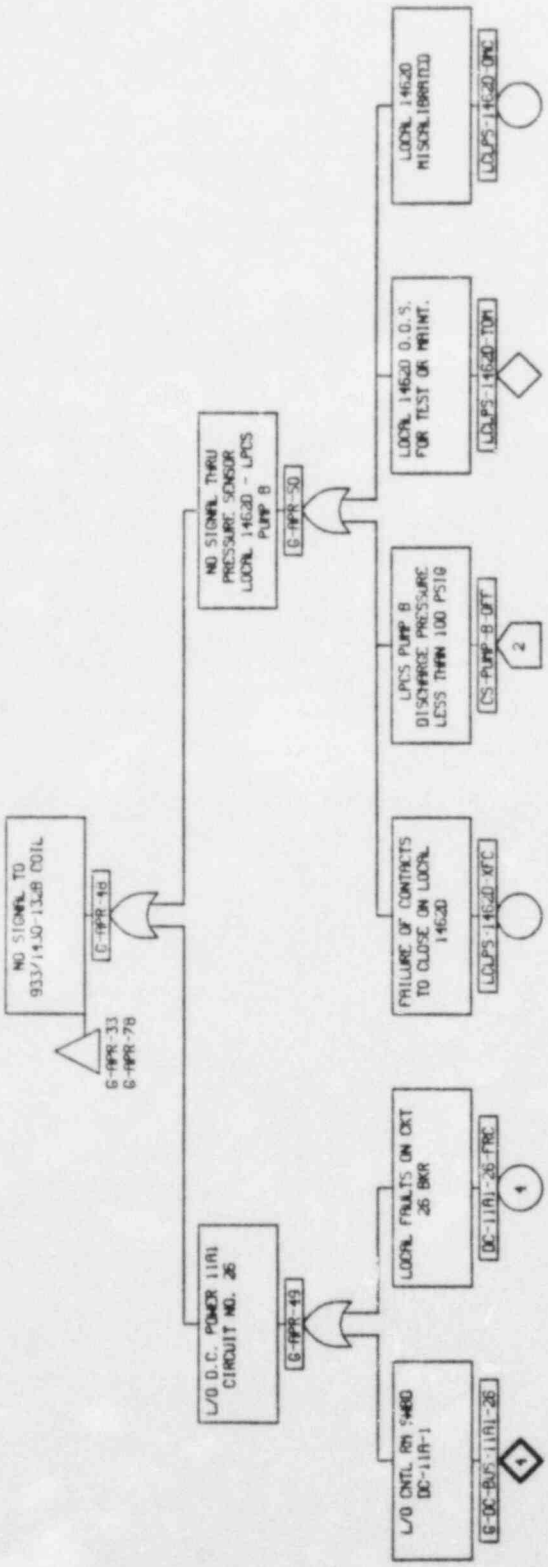

NO SIGNAL THRU
PRESSURE SENSOR
2201A/1501-82C -
LPCI PUMP C
G-APR-36
G-APR-39
FAILURE OF CONTACTS
TO CLOSE ON
2201A/1501-82C
PRESSURE IN LPCI
PUMP C DISCHARGE
LESS THAN 100 PSIG
2201A/1501-82C
O.O.S. FOR TEST OR
MAINT.
2201A/1501-82C
MISCALIBRATED
2201A150182C-XFC
LPCI-PUMP-C-OFF
2201A150182C-TOM
2201A150182C-OMC
2

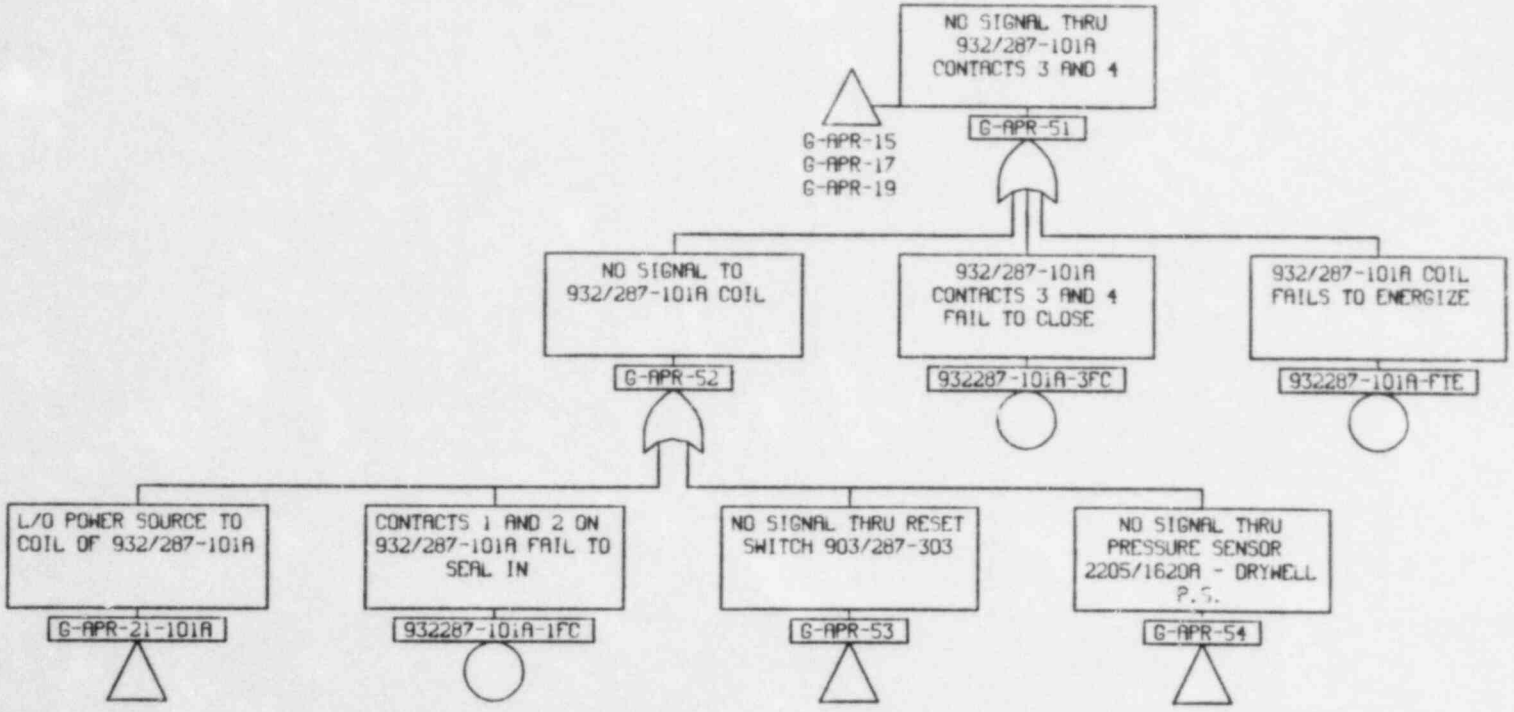

NO SIGNAL TO
93J/1430-13A4 COIL
G-APR-32
G-APR-77
G-APR-10
L/O D.C. POWER 11A2
CIRCUIT NO. 20
G-APR-11
L/O CNTL RM SWBD
DC-11A-2
G-DC-APR-11A2-20
LOCAL FAULTS ON CKT
20 BKR
DC-11A2-20-FRC
1
FAILURE OF CONTACTS
TO CLOSE ON LOCAL
146ZC
LOCPS-146ZC-XFC
LPCS PUMP A
DISCHARGE PRESSURE
LESS THAN 100 PSIG
CS PUMP A OFF
2
NO SIGNAL THRU
PRESSURE SENSOR
LOCAL 146ZC - LPCS
PUMP A
G-APR-12
LOCAL 146ZC O.O.S.
FOR TEST OR MAINT.
LOCPS-146ZC-TOM
LOCAL 146ZC
MISCAL IBRATED
LOCPS-146ZC-ONC

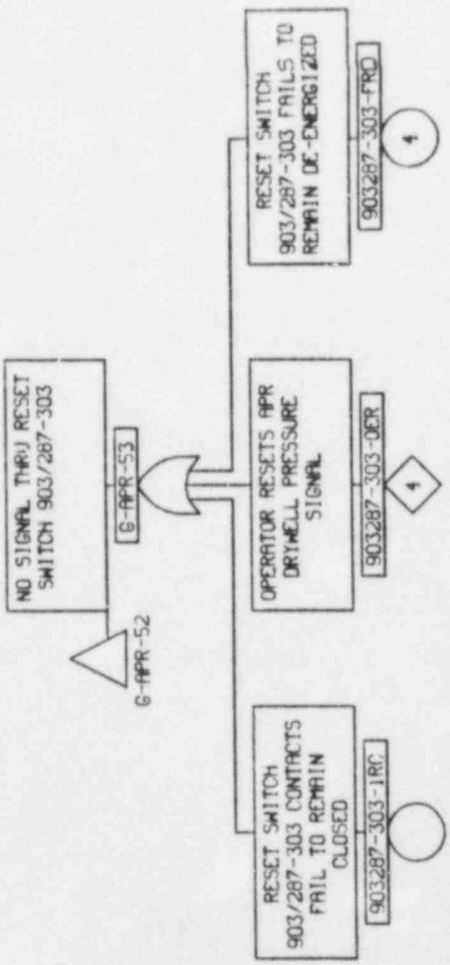

NO SIGNAL TO
933/1530-247 COIL
G-APR-43
G-APR-34
G-APR-79
NO SIGNAL THRU
PRESSURE SENSOR
G-APR-44
L/O D.C. POWER 11A1
CIRCUIT NO. 25
G-APR-45
NO SIGNAL THRU
PRESSURE SENSOR
2201B/1501-82B -
LPCI PUMP B
G-APR-46
NO SIGNAL THRU
PRESSURE SENSOR
2201B/1501-82D -
LPCI PUMP D
G-APR-47
LOCAL FAULTS ON CKT
25 BKR
DC-11A1-25-FRC
5
L/O D.C. CNTL RM
SWBD D.C. 11A1
G-DC-BUS-11A1-25
5

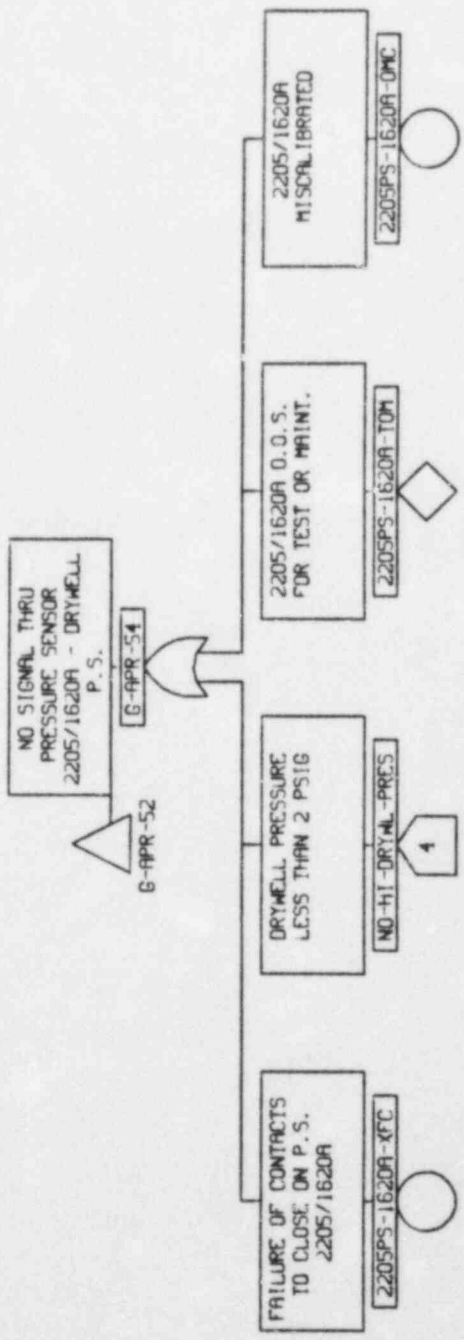

NO SIGNAL THRU
PRESSURE SENSOR
2201B/1501-82B -
LPCI PUMP B
G-APR-46
G-APR-44
FAILURE OF CONTACTS
TO CLOSE ON
2201B/1501-82B
2201B150182B-XFC
PRESSURE IN LPCI
PUMP B DISCHARGE
LESS THAN 106 PSIG
LPCI-PUMP-B-OFF
2
2201B/1501-82B
O.O.S. FOR TEST OR
MAINT.
2201B150182B-TOM
2201B/1501-82B
MISCALIBRATED
2201B150182B-OMC

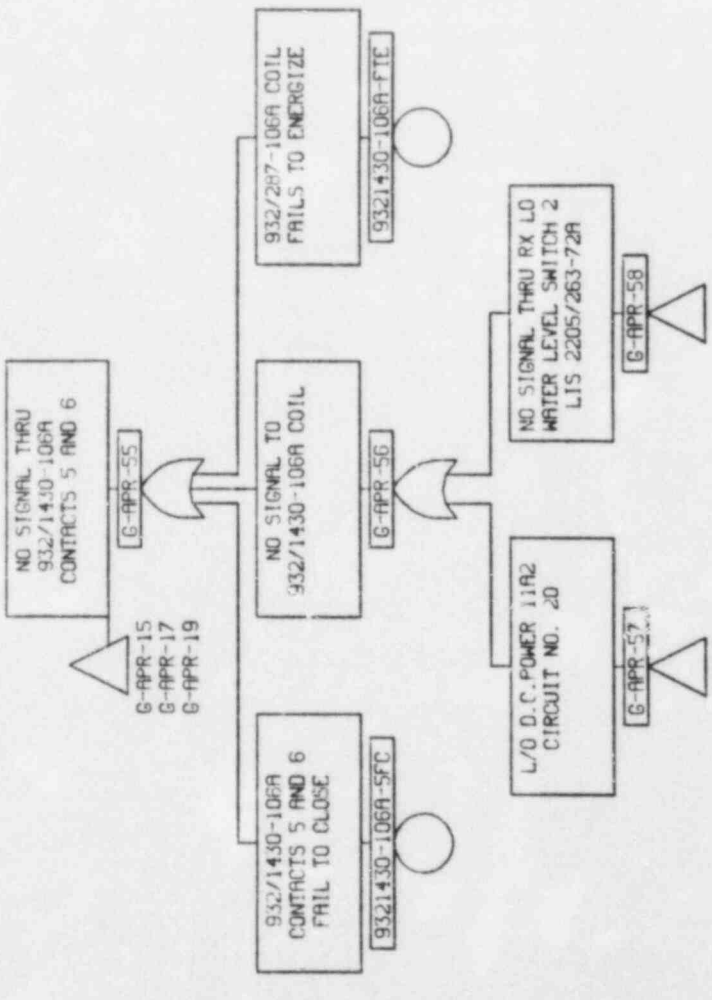

NO SIGNAL THRU PRESSURE SENSOR 2201B/1501-82D - LPCI PUMP D
G-APR-44
G-APR-47
FAILURE OF CONTACTS TO CLOSE ON 2201B/1501-82D
PRESSURE IN LPCI PUMP D DISCHARGE LESS THAN 100 PSIG
2201B/1501-82D O.O.S. FOR TEST OR MAINT.
2201B/1501-82D MISCALIBRATED
2201B150182D-XFC
LPCI-PUMP-D-OFF
2201B150182D-TOM
2201B150182D-OMC
2

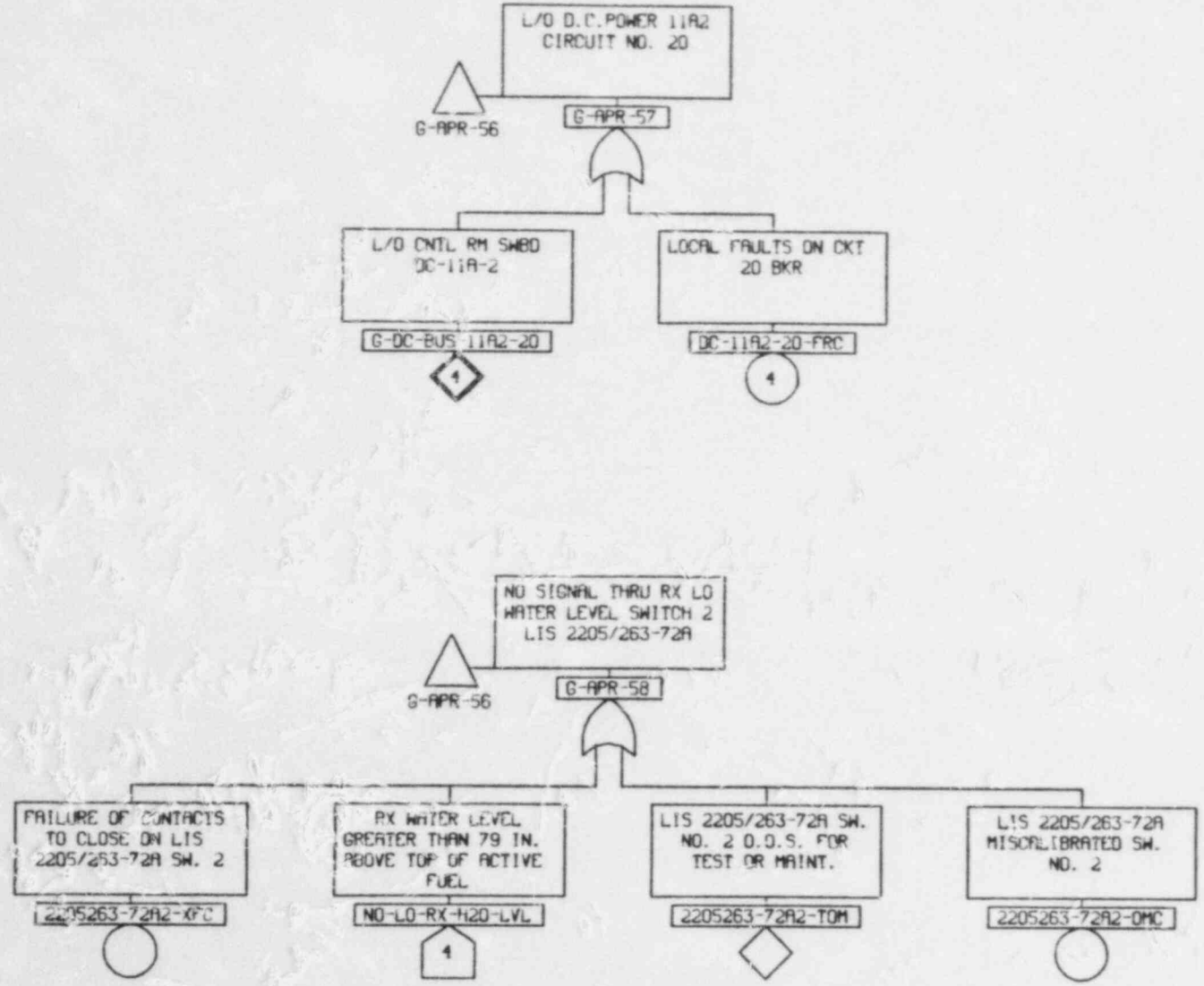

NO SIGNAL TO
93J/1450-1348 COIL
G-APR-33
G-APR-78
G-APR-48
L/O D.C. POWER (1A)
CIRCUIT NO. 26
G-APR-49
L/O CNTL RM 5480
DC-11A-1
G-DC-BUS-11A1-26
LOCAL FAULTS ON CKT
26 BKR
DC-11A1-26-FBC
1
FAILURE OF CONTACTS
TO CLOSE ON LOCAL
14620
LOCPS-14620-XFC
LPCS PUMP B
DISCHARGE PRESSURE
LESS THAN 100 PSIG
CS-PUMP-B-OFF
2
NO SIGNAL THRU
PRESSURE SENSOR
LOCAL 14620 - LPCS
PUMP B
G-APR-50
LOCAL 14620
MISSNLIBRATED
LOCPS-14620-CMC
LOCAL 14620 O.O.S.
FOR TEST OR MAINT.
LOCPS-14620-TOM

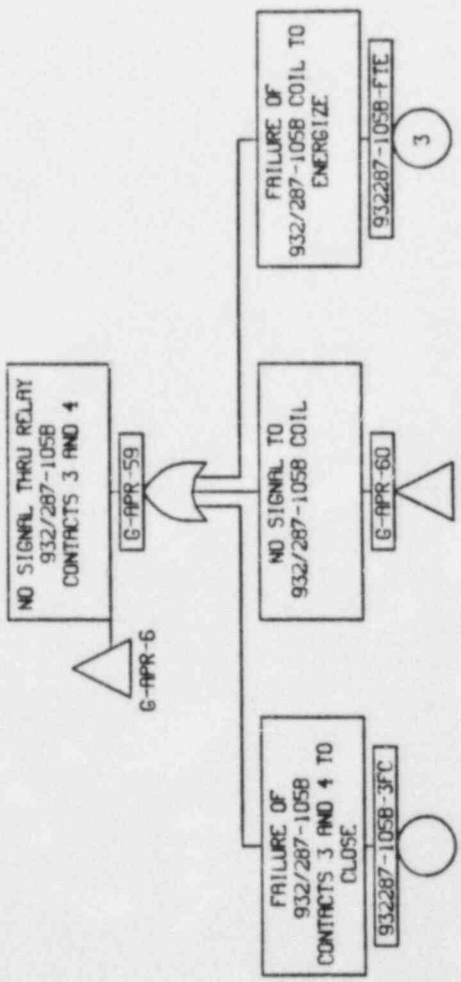

NO SIGNAL THRU
932/287-101A
CONTACTS 3 AND 4
G-APR-51
G-APR-15
G-APR-17
G-APR-19
NO SIGNAL TO
932/287-101A COIL
G-APR-52
932/287-101A
CONTACTS 3 AND 4
FAIL TO CLOSE
932287-101A-3FC
932/287-101A COIL
FAILS TO ENERGIZE
932287-101A-FTE
L/O POWER SOURCE TO
COIL OF 932/287-101A
G-APR-21-101A
CONTACTS 1 AND 2 ON
932/287-101A FAIL TO
SEAL IN
932287-101A-1FC
NO SIGNAL THRU RESET
SWITCH 903/287-303
G-APR-53
NO SIGNAL THRU
PRESSURE SENSOR
2205/1620A - DRYWELL
P.S.
G-APR-54


NO SIGNAL THRU RESET SWITCH 903/287-303
G-APR-52
G-APR-53
RESET SWITCH 903/287-303 CONTACTS FAIL TO REMAIN CLOSED
903287-303-IRC
OPERATOR RESETS APR DRYWELL PRESSURE SIGNAL
903287-303-OER
RESET SWITCH 903/287-303 FAILS TO REMAIN DE-ENERGIZED
903287-303-FRD

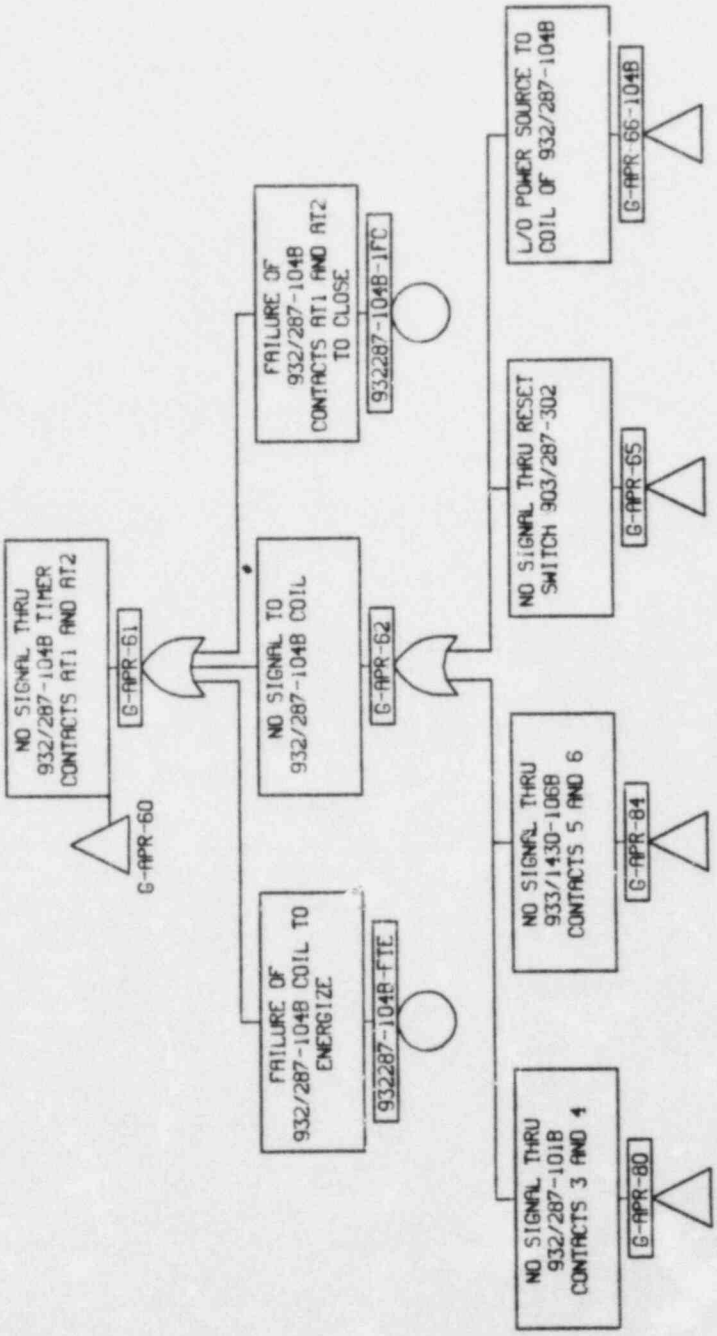

NO SIGNAL THRU PRESSURE SENSOR 2205/1620A - DRYWELL P.S.
G-APR-52
G-APR-54
2205/1620A O.O.S. FOR TEST OR MAINT.
2205PS-1620A-TOM
2205/1620A MISCALIBRATED
2205PS-1620A-OMC
DRYWELL PRESSURE LESS THAN 2 PSIG
NO-HI-DRYWL-PRES
4
FAILURE OF CONTACTS TO CLOSE ON P.S. 2205/1620A
2205PS-1620A-XFC

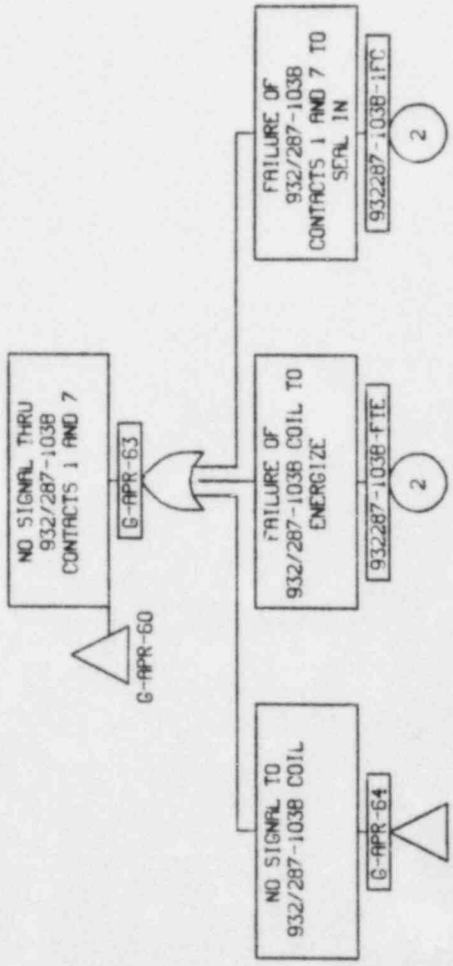

NO SIGNAL THRU
932/1430-106A
CONTACTS 5 AND 6
G-APR-15
G-APR-17
G-APR-19
G-APR-55
932/1430-106A
CONTACTS 5 AND 6
FAIL TO CLOSE
9321430-106A-5FC
NO SIGNAL TO
932/1430-106A COIL
G-APR-56
932/287-106A COIL
FAILS TO ENERGIZE
9321430-106A-FTE
L/O D.C.POWER 1IA2
CIRCUIT NO. 20
G-APR-57
NO SIGNAL THRU RX LO
WATER LEVEL SWITCH 2
LIS 2205/263-72A
G-APR-58

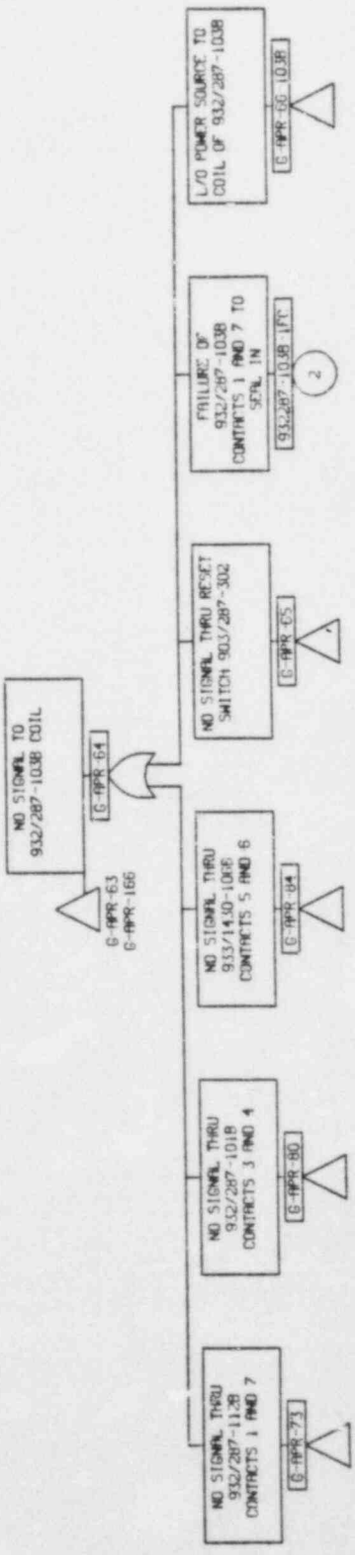

L/O D.C. POWER 11A2
CIRCUIT NO. 20
G-APR-56
G-APR-57
L/O CNTL RM SWBD
DC-11A-2
LOCAL FAULTS ON CKT
20 BKR
G-DC-BUS 11A2-20
DC-11A2-20-FRC
4
4
NO SIGNAL THRU RX LO
WATER LEVEL SWITCH 2
LIS 2205/263-72A
G-APR-56
G-APR-58
FAILURE OF CONTACTS
TO CLOSE ON LIS
2205/263-72A SW. 2
RX WATER LEVEL
GREATER THAN 79 IN.
ABOVE TOP OF ACTIVE
FUEL
LIS 2205/263-72A SW.
NO. 2 O.O.S. FOR
TEST OR MAINT.
LIS 2205/263-72A
MISCALIBRATED SW.
NO. 2
2205263-72A2-XFC
NO-LO-RX-H20-LVL
2205263-72A2-TOM
2205263-72A2-OMC
4

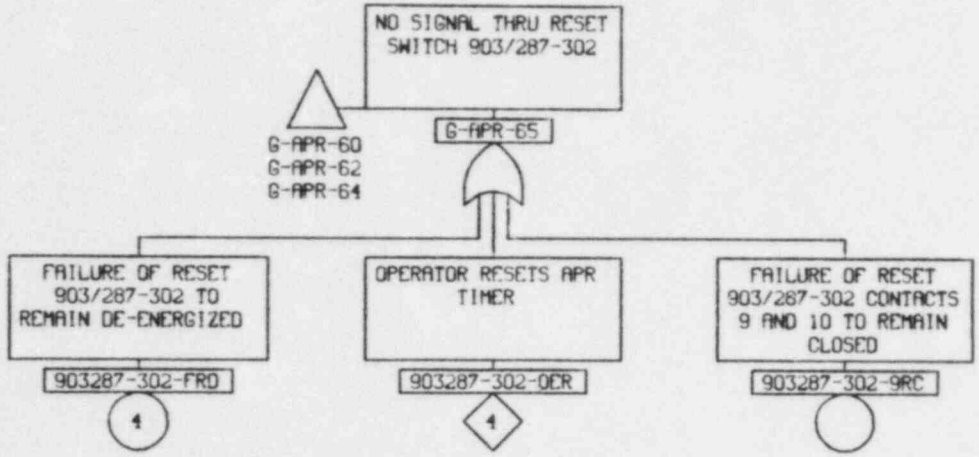

NO SIGNAL THRU RELAY 932/287-1058 CONTACTS 3 AND 4
G-APR-59
G-APR-6
FAILURE OF 932/287-1058 CONTACTS 3 AND 4 TO CLOSE
932287-1058-3FC
NO SIGNAL TO 932/287-1058 COIL
G-APR-60
FAILURE OF 932/287-1058 COIL TO ENERGIZE
932287-1058-FTE
3

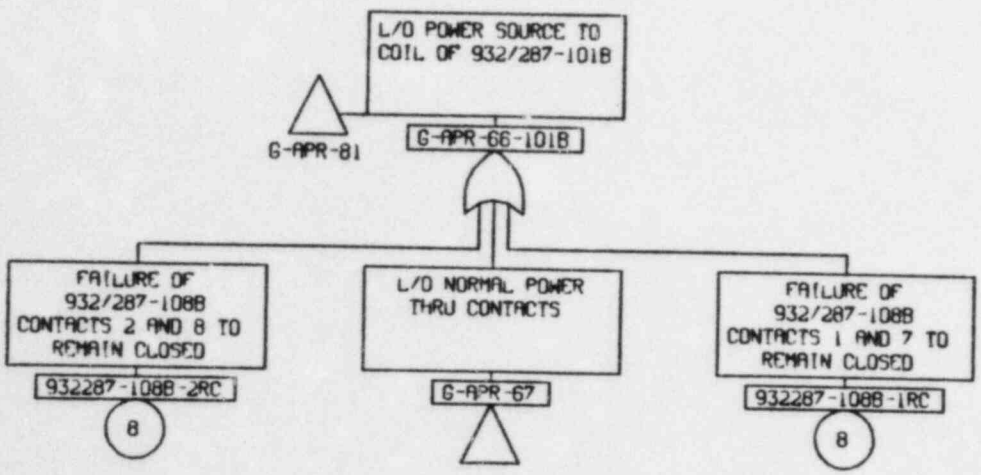
NO SIGNAL TO 932/287-1058 COIL
G-APR-59
G-APR-157
G-APR-148
G-APR-60
NO SIGNAL THRU 932/287-1018 CONTACTS 3 AND 4
G-APR-60
NO SIGNAL THRU 933/1430-1008 CONTACTS 5 AND 6
G-APR-84
NO SIGNAL THRU RESET SWITCH 943/287-302
G-APR-65
NO SIGNAL THRU 932/287-1038 CONTACTS 1 AND 7
G-APR-63
NO SIGNAL THRU 932/287-1048 TIMER CONTACTS AT1 AND AT2
G-APR-61
NO SIGNAL THRU 932/287-1128 CONTACTS 1 AND 7
G-APR-73
L/O POWER SOURCE TO COIL OF 932/287-1058
G-APR-66-1058

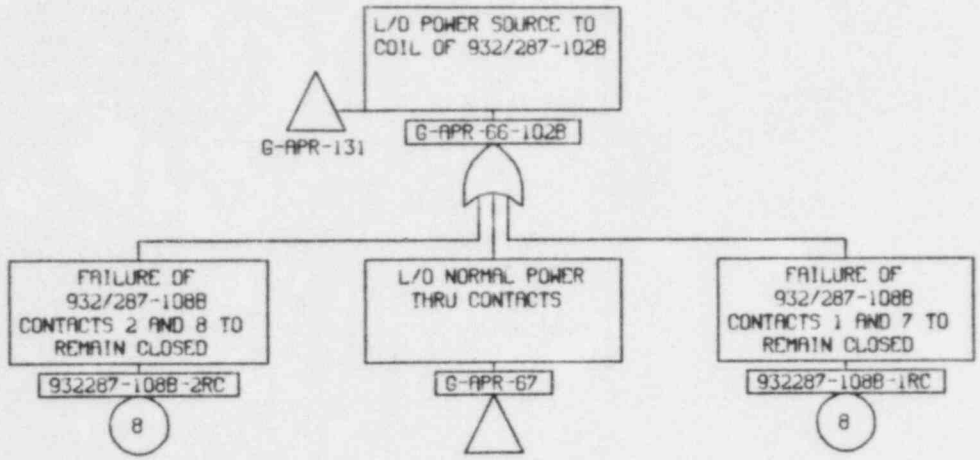

NO SIGNAL THRU 932/287-104B TIMER CONTACTS AT1 AND AT2
G-APR-60
G-APR-61
NO SIGNAL TO 932/287-104B COIL
G-APR-62
FAILURE OF 932/287-104B CONTACTS AT1 AND AT2 TO CLOSE
932287-104B-1FC
FAILURE OF 932/287-104B COIL TO ENERGIZE
932287-104B-FTE
NO SIGNAL THRU RESET SWITCH 903/287-302
G-APR-65
L/O POWER SOURCE TO COIL OF 932/287-104B
G-APR-66-104B
NO SIGNAL THRU 933/1430-106B CONTACTS 5 AND 6
G-APR-64
NO SIGNAL THRU 932/287-101B CONTACTS 3 AND 4
G-APR-80

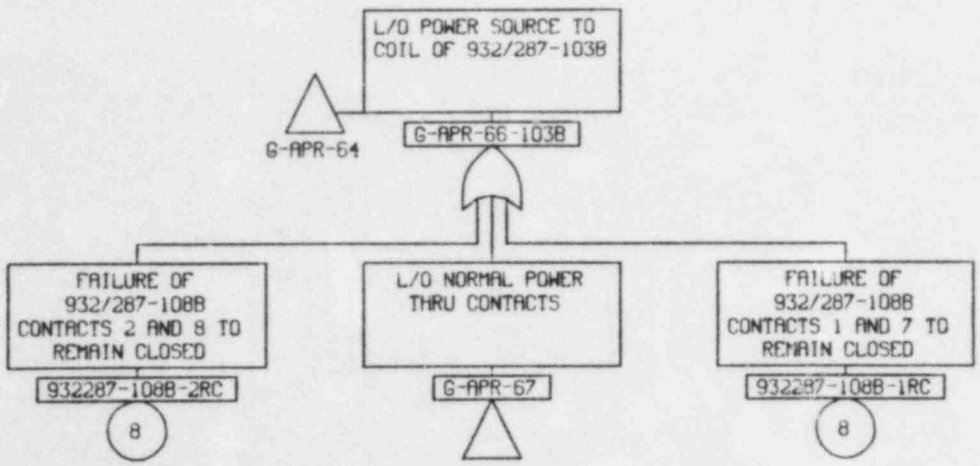

NO SIGNAL THRU
932/287-1038
CONTACTS 1 AND 7
G-APR-60
G-APR-63
FAILURE OF
932/287-1038 COIL TO
ENERGIZE
932287-1038-FTE
2
FAILURE OF
932/287-1038
CONTACTS 1 AND 7 TO
SEAL IN
932287-1038-FTC
2
NO SIGNAL TO
932/287-1038 COIL
G-APR-64

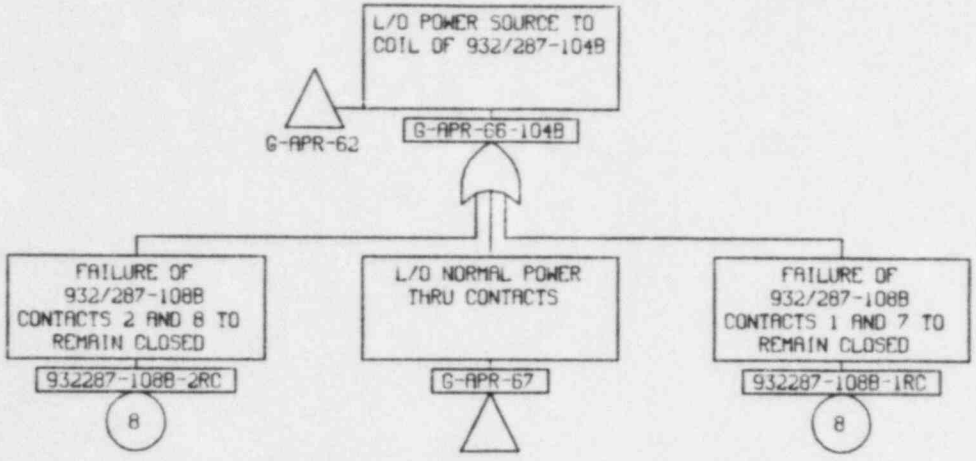

NO SIGNAL TO 932/287-103B COIL
6-APR-63
6-APR-166
6-APR-64
NO SIGNAL THRU RESET SWITCH 903/287-302
6-APR-65
1
NO SIGNAL THRU 933/1430-1008 CONTACTS 5 AND 6
6-APR-04
NO SIGNAL THRU 932/287-101B CONTACTS 3 AND 4
6-APR-80
NO SIGNAL THRU 932/287-113B CONTACTS 1 AND 7
6-APR-73
FAILURE OF 932/287-103B CONTACTS 1 AND 7 TO SEAL IN
932/287-103B-1FF
2
L/O POWER SOURCE TO COIL OF 932/287-103B
6-APR-66-103B

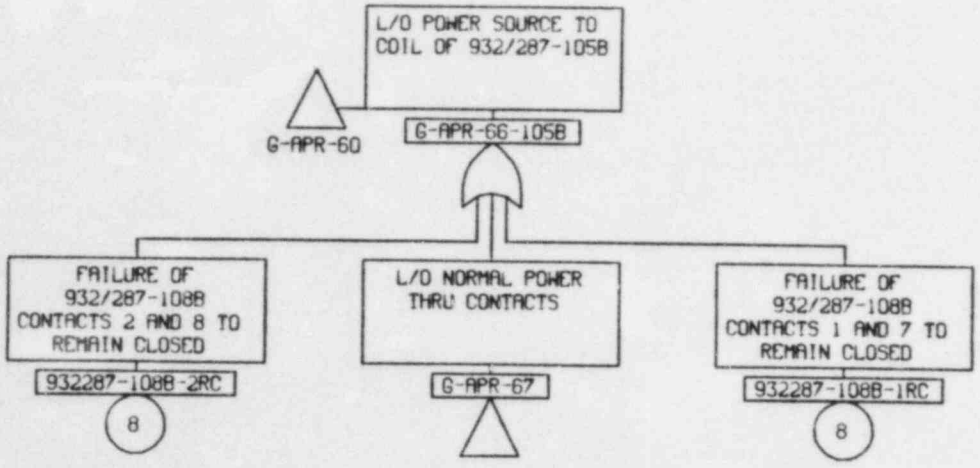

NO SIGNAL THRU RESET SWITCH 903/287-302
G-APR-65
G-APR-60
G-APR-62
G-APR-64
FAILURE OF RESET 903/287-302 TO REMAIN DE-ENERGIZED
OPERATOR RESETS APR TIMER
FAILURE OF RESET 903/287-302 CONTACTS 9 AND 10 TO REMAIN CLOSED
903287-302-FRD
903287-302-OER
903287-302-9RC
4
4

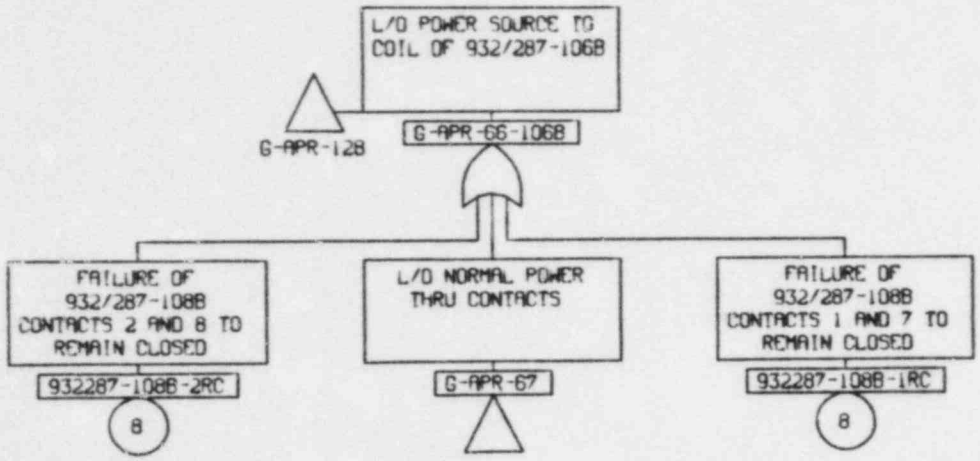

L/O POWER SOURCE TO COIL OF 932/287-1018
G-APR-66-1018
G-APR-81
FAILURE OF 932/287-1088 CONTACTS 2 AND 8 TO REMAIN CLOSED
L/O NORMAL POWER THRU CONTACTS
FAILURE OF 932/287-1088 CONTACTS 1 AND 7 TO REMAIN CLOSED
G-APR-67
932287-1088-2RC
932287-1088-1RC
8
8

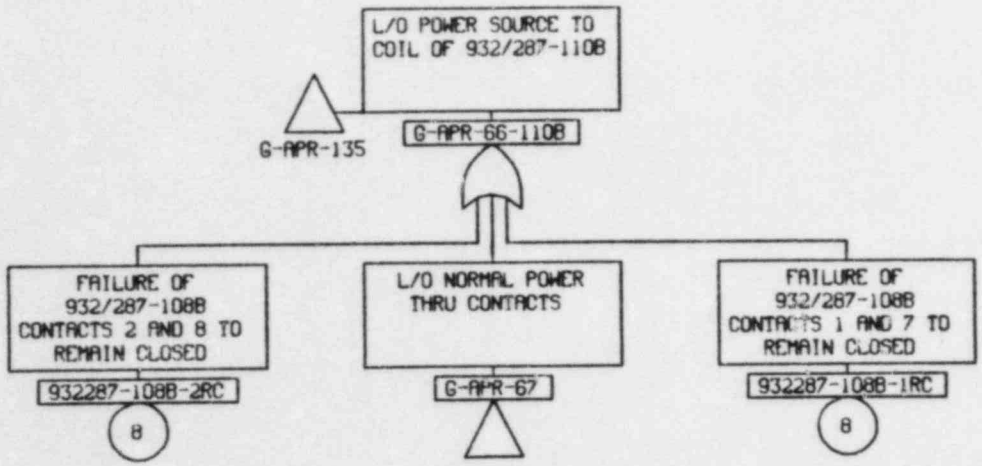

L/O POWER SOURCE TO
COIL OF 932/287-102B
G-APR-131
G-APR-66-102B
FAILURE OF
932/287-108B
CONTACTS 2 AND 8 TO
REMAIN CLOSED
932287-108B-2RC
8
L/O NORMAL POWER
THRU CONTACTS
G-APR-67
FAILURE OF
932/287-108B
CONTACTS 1 AND 7 TO
REMAIN CLOSED
932287-108B-1RC
8

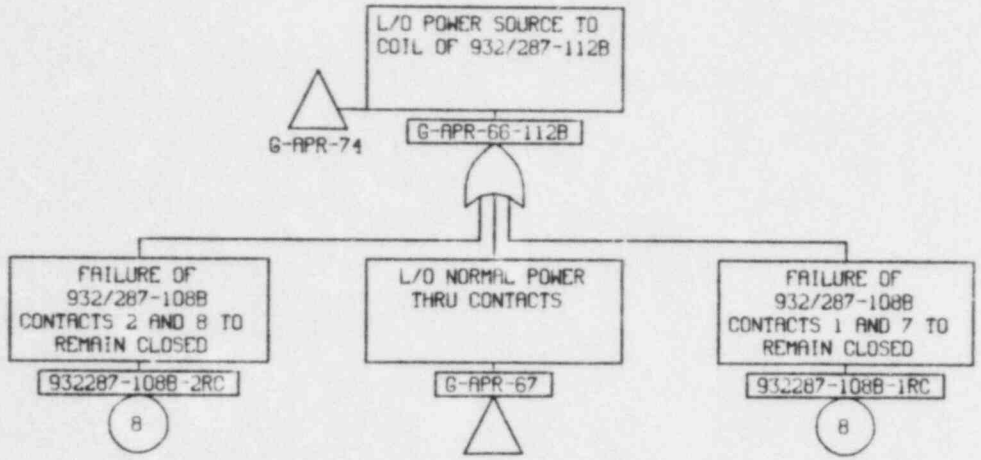

L/O POWER SOURCE TO
COIL OF 932/287-103B
G-APR-64
G-APR-66-103B
FAILURE OF
932/287-108B
CONTACTS 2 AND 8 TO
REMAIN CLOSED
932287-108B-2RC
8
L/O NORMAL POWER
THRU CONTACTS
G-APR-67
FAILURE OF
932/287-108B
CONTACTS 1 AND 7 TO
REMAIN CLOSED
932287-108B-1RC
8

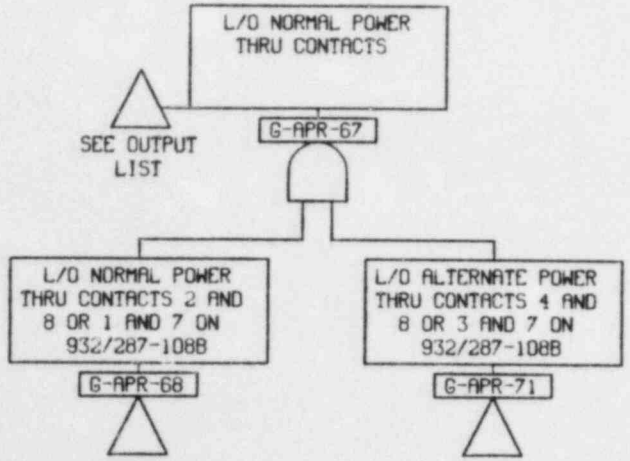

L/O POWER SOURCE TO
COIL OF 932/287-104B
G-APR-62
G-APR-66-104B
FAILURE OF
932/287-108B
CONTACTS 2 AND 8 TO
REMAIN CLOSED
932287-108B-2RC
8
L/O NORMAL POWER
THRU CONTACTS
G-APR-67
FAILURE OF
932/287-108B
CONTACTS 1 AND 7 TO
REMAIN CLOSED
932287-108B-1RC
8


L/O POWER SOURCE TO
COIL OF 932/287-105B
G-APR-60
G-APR-66-105B
FAILURE OF
932/287-108B
CONTACTS 2 AND 8 TO
REMAIN CLOSED
932287-108B-2RC
8
L/O NORMAL POWER
THRU CONTACTS
G-APR-67
FAILURE OF
932/287-108B
CONTACTS 1 AND 7 TO
REMAIN CLOSED
932287-108B-1RC
8

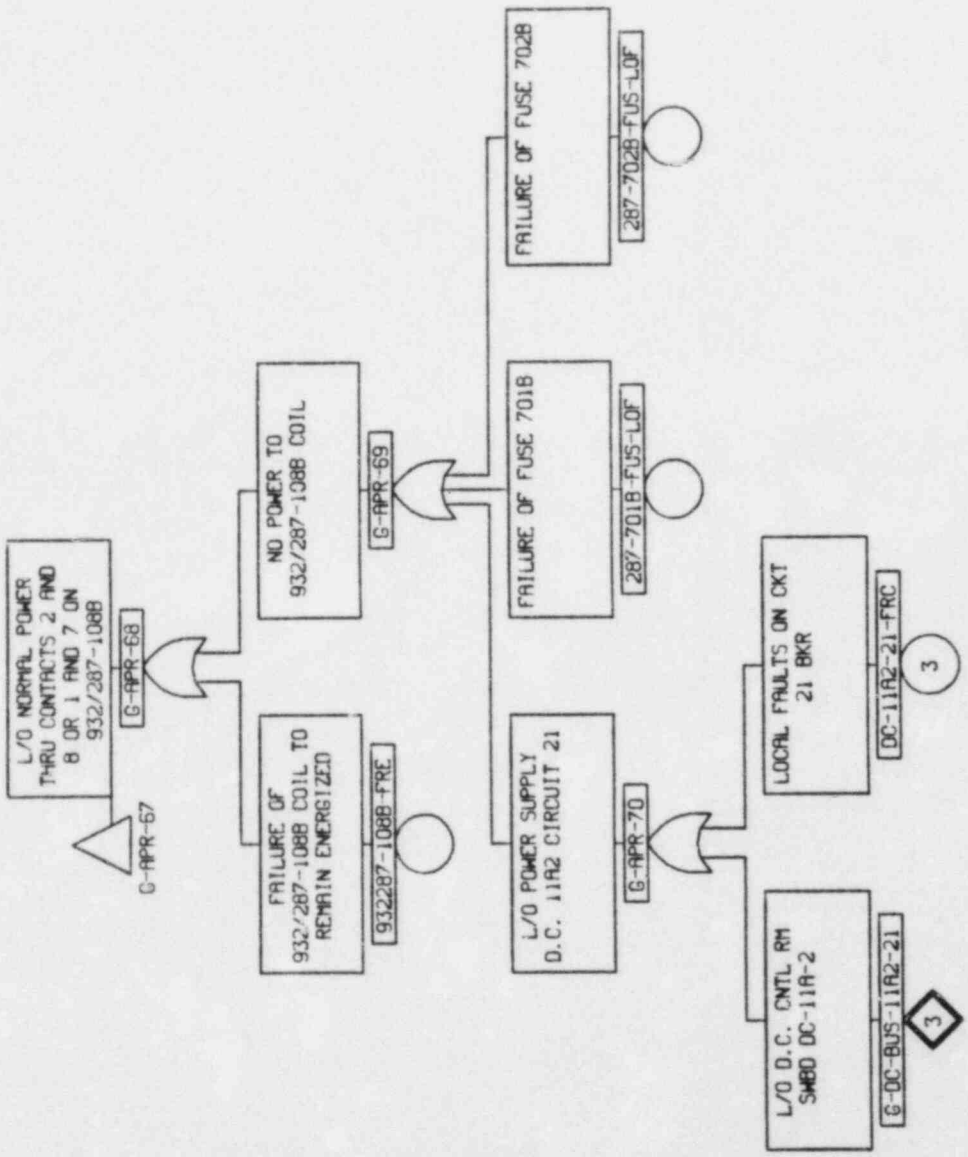

L/O POWER SOURCE TO
COIL OF 932/287-1068
G-APR-128
G-APR-66-1068
FAILURE OF
932/287-1088
CONTACTS 2 AND 8 TO
REMAIN CLOSED
932287-1088-2RC
8
L/O NORMAL POWER
THRU CONTACTS
G-APR-67
FAILURE OF
932/287-1088
CONTACTS 1 AND 7 TO
REMAIN CLOSED
932287-1088-1RC
8

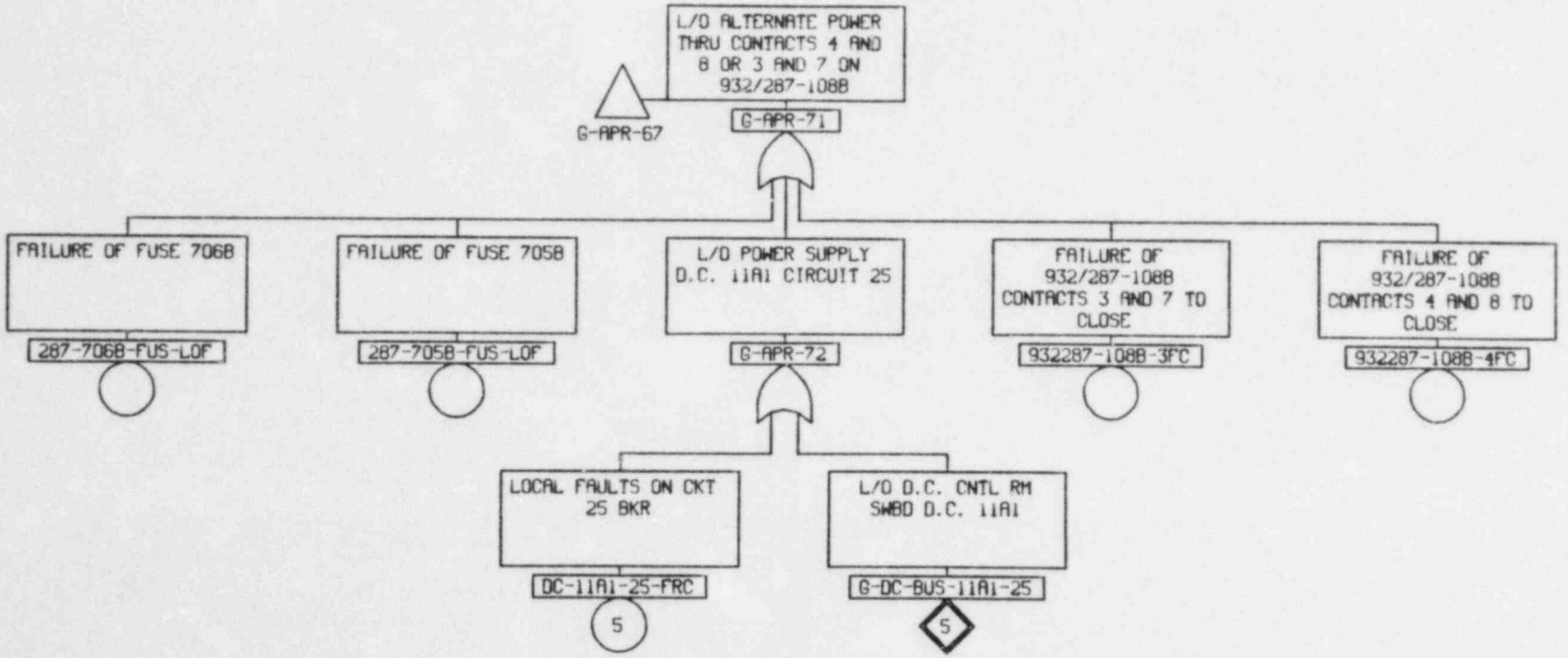

L/O POWER SOURCE TO
COIL OF 932/287-1108
G-APR-135
G-APR-66-1108
FAILURE OF
932/287-1088
CONTACTS 2 AND 8 TO
REMAIN CLOSED
932287-1088-2RC
8
L/O NORMAL POWER
THRU CONTACTS
G-APR-67
FAILURE OF
932/287-1088
CONTACTS 1 AND 7 TO
REMAIN CLOSED
932287-1088-1RC
8

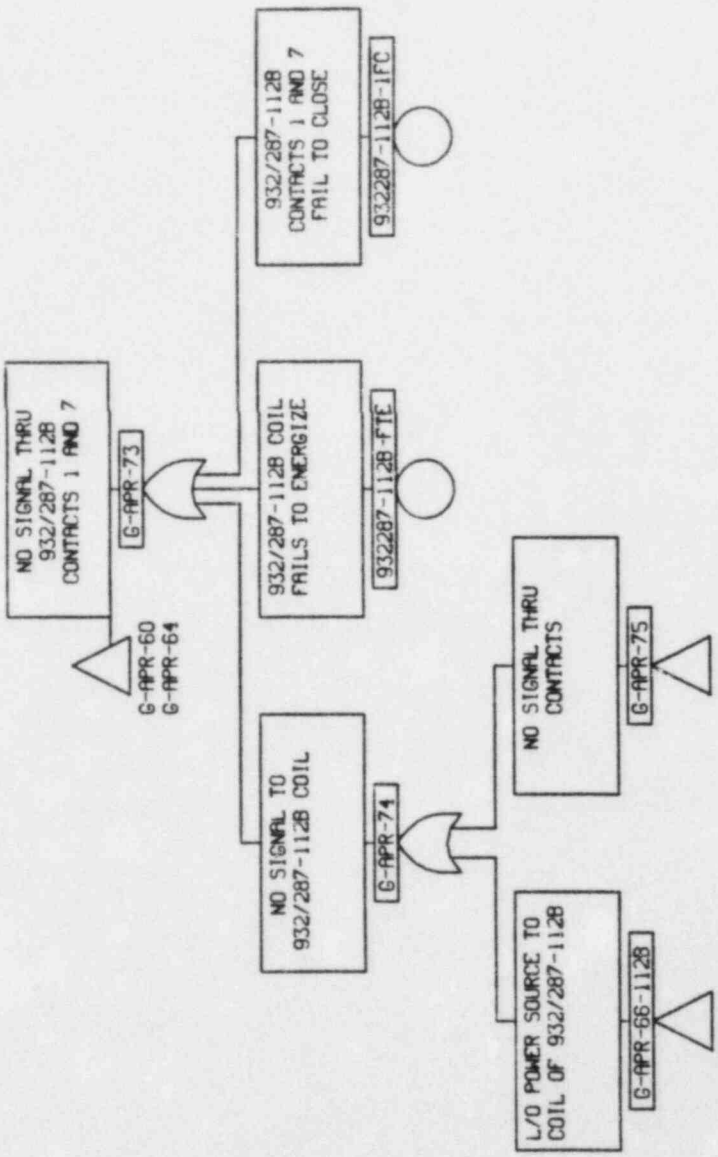


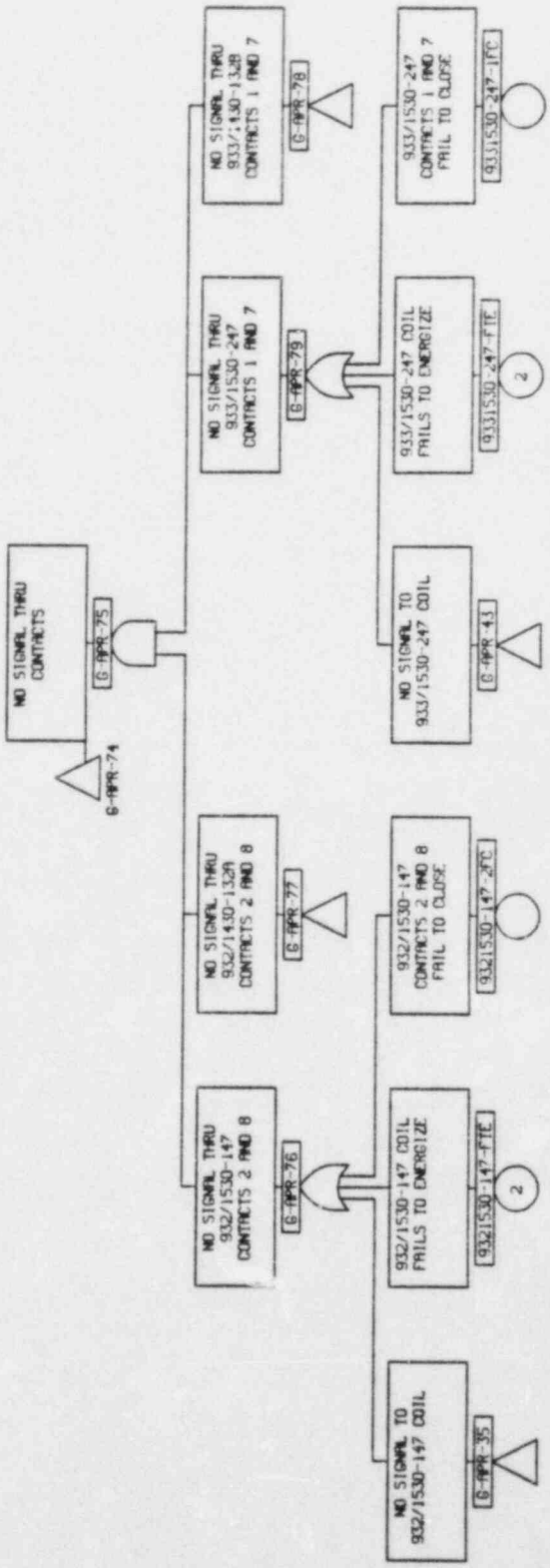



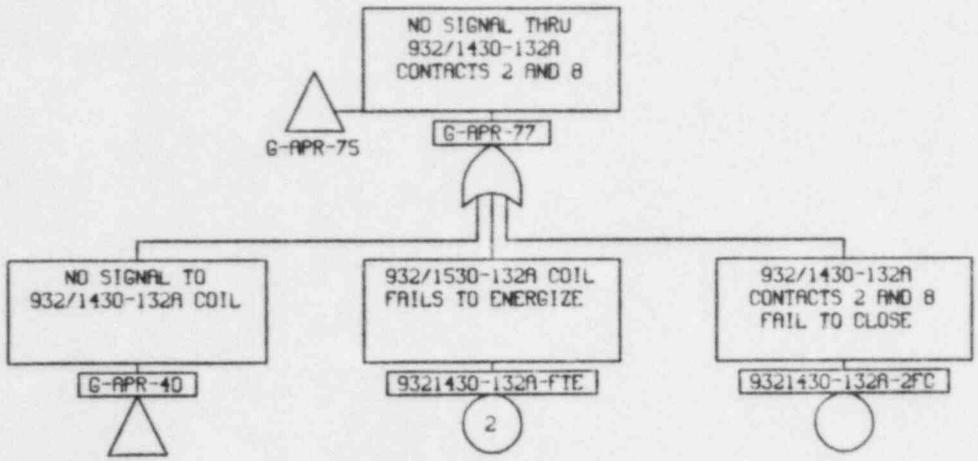

G-APR-67 OUTPUT LIST
G-APR-66-105B, C-APR-66-104B, C-APR-66-103B, C-APR-66-112B, C-APR-66-101B
C-APR-66-106B, G-APR-66-102B, C-APR-66-110B

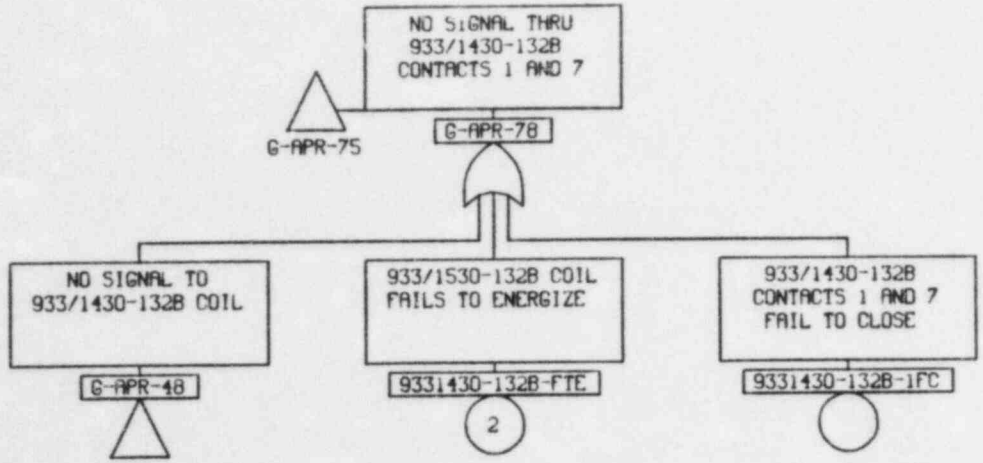

L/O NORMAL POWER THRU CONTACTS 2 AND 8 OR 1 AND 7 ON 932/287-1088
G-APR-67
G-APR-68
NO POWER TO 932/287-1088 COIL
FAILURE OF 932/287-1088 COIL TO REMAIN ENERGIZED
932287-1088-FRE
G-APR-69
FAILURE OF FUSE 7028
287-7028-FUS-LOF
FAILURE OF FUSE 7018
287-7018-FUS-LOF
L/O POWER SUPPLY D.C. 11A2 CIRCUIT 21
G-APR-70
LOCAL FAULTS ON CKT 21 BKR
DC-11A2-21-FRC
3
L/O D.C. CNTL RM SWBD DC-11A-2
G-DC-BUS-11A2-21
3

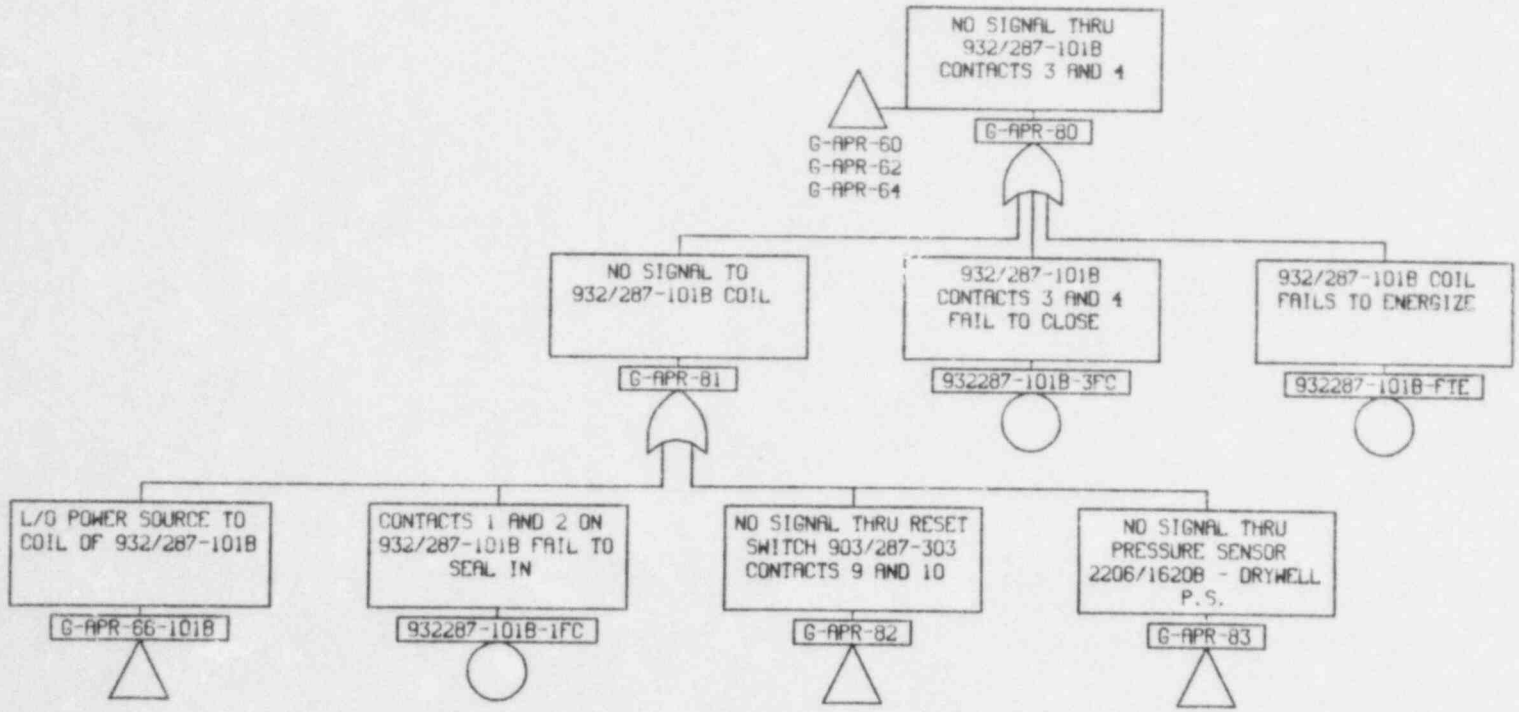

L/O ALTERNATE POWER THRU CONTACTS 4 AND 8 OR 3 AND 7 ON 932/287-108B
G-APR-71
G-APR-67
FAILURE OF FUSE 706B
287-706B-FUS-LOF
FAILURE OF FUSE 705B
287-705B-FUS-LOF
L/O POWER SUPPLY D.C. 11A1 CIRCUIT 25
G-APR-72
FAILURE OF 932/287-108B CONTACTS 3 AND 7 TO CLOSE
932287-108B-3FC
FAILURE OF 932/287-108B CONTACTS 4 AND 8 TO CLOSE
932287-108B-4FC
LOCAL FAULTS ON CKT 25 BKR
DC-11A1-25-FRC
5
L/O D.C. CNTL RM SWBD D.C. 11A1
G-DC-BUS-11A1-25
5

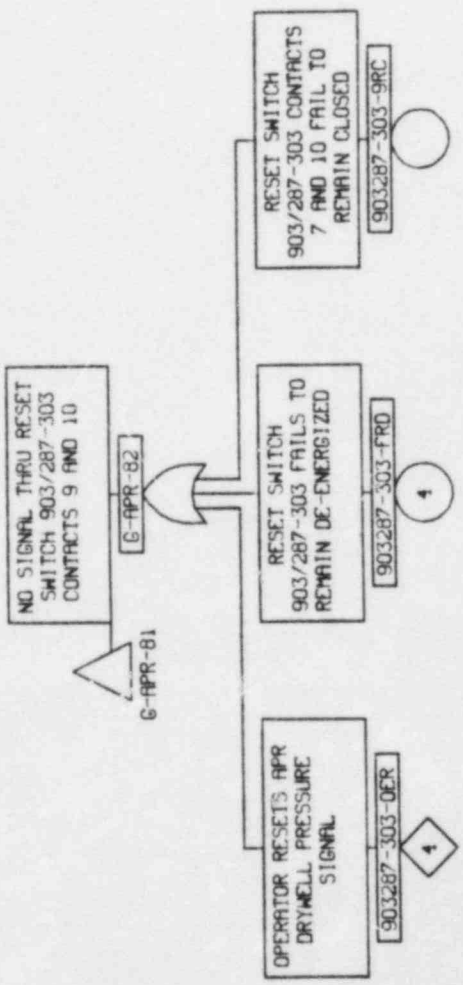

NO SIGNAL THRU
932/287-1128
CONTACTS 1 AND 7
G-APR-60
G-APR-64
G-APR-73
932/287-1128 COIL
FAILS TO ENERGIZE
932287-1128-FTE
932/287-1128
CONTACTS 1 AND 7
FAIL TO CLOSE
932287-1128-1FC
NO SIGNAL TO
932/287-1128 COIL
G-APR-74
NO SIGNAL THRU
CONTACTS
G-APR-75
L/O POWER SOURCE TO
COIL OF 932/287-1128
G-APR-66-1128

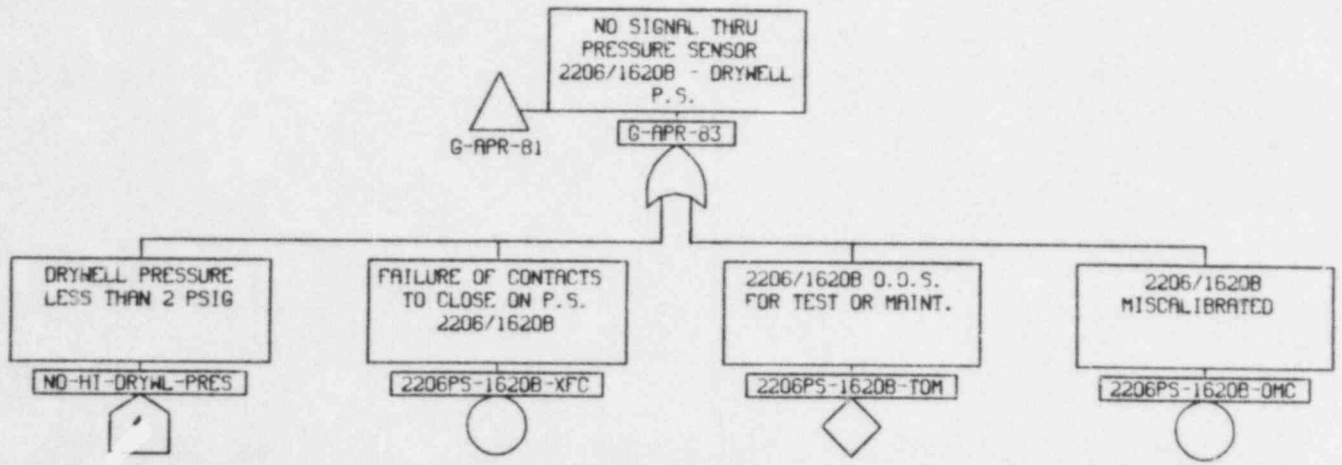

NO SIGNAL THRU CONTACTS
6-APR-74
6-APR-75
NO SIGNAL THRU 932/1530-147 CONTACTS 2 AND 8
6-APR-76
NO SIGNAL TO 932/1530-147 COIL
6-APR-35
932/1530-147 COIL FAILS TO ENERGIZE
932153O-147-FTE
2
NO SIGNAL THRU 932/1530-1328 CONTACTS 2 AND 8
6-APR-77
932/1530-147 CONTACTS 2 AND 8 FAIL TO CLOSE
932153O-147-FTC
NO SIGNAL THRU 933/1530-247 CONTACTS 1 AND 7
6-APR-79
NO SIGNAL TO 933/1530-247 COIL
6-APR-43
933/1530-247 COIL FAILS TO ENERGIZE
933153O-247-FTE
2
NO SIGNAL THRU 933/1530-1328 CONTACTS 1 AND 7
6-APR-78
933/1530-247 CONTACTS 1 AND 7 FAIL TO CLOSE
933153O-247-FTC

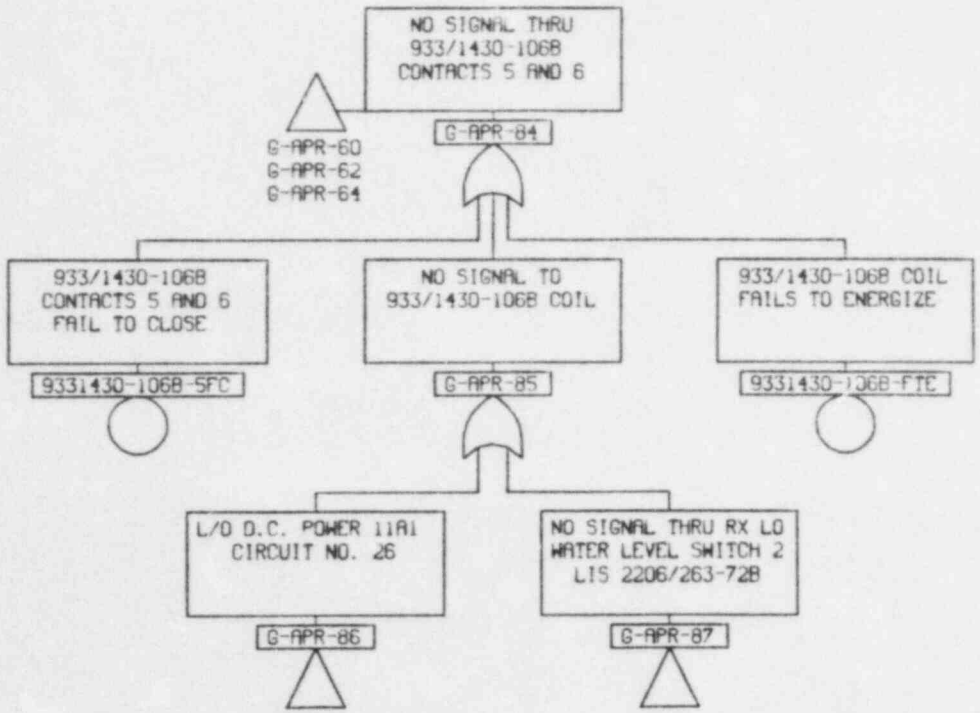

NO SIGNAL THRU
932/1430-132A
CONTACTS 2 AND 8
G-APR-75
G-APR-77
NO SIGNAL TO
932/1430-132A COIL
G-APR-40
932/1530-132A COIL
FAILS TO ENERGIZE
9321430-132A-FTE
2
932/1430-132A
CONTACTS 2 AND 8
FAIL TO CLOSE
9321430-132A-2FC

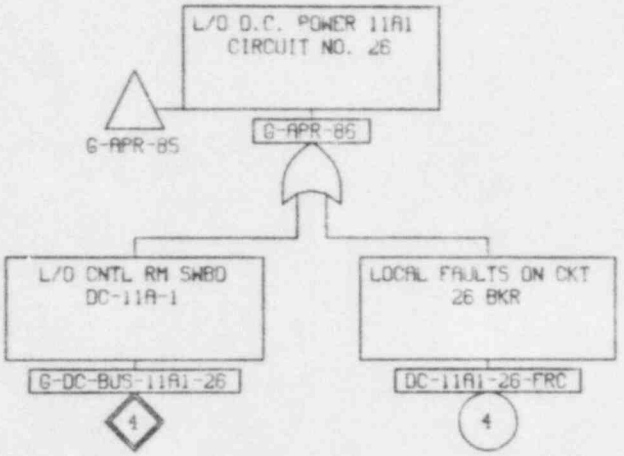

NO SIGNAL THRU
933/1430-132B
CONTACTS 1 AND 7
G-APR-75
G-APR-78
NO SIGNAL TO
933/1430-132B COIL
G-APR-48
933/1530-132B COIL
FAILS TO ENERGIZE
9331430-132B-FTE
2
933/1430-132B
CONTACTS 1 AND 7
FAIL TO CLOSE
9331430-132B-1FC

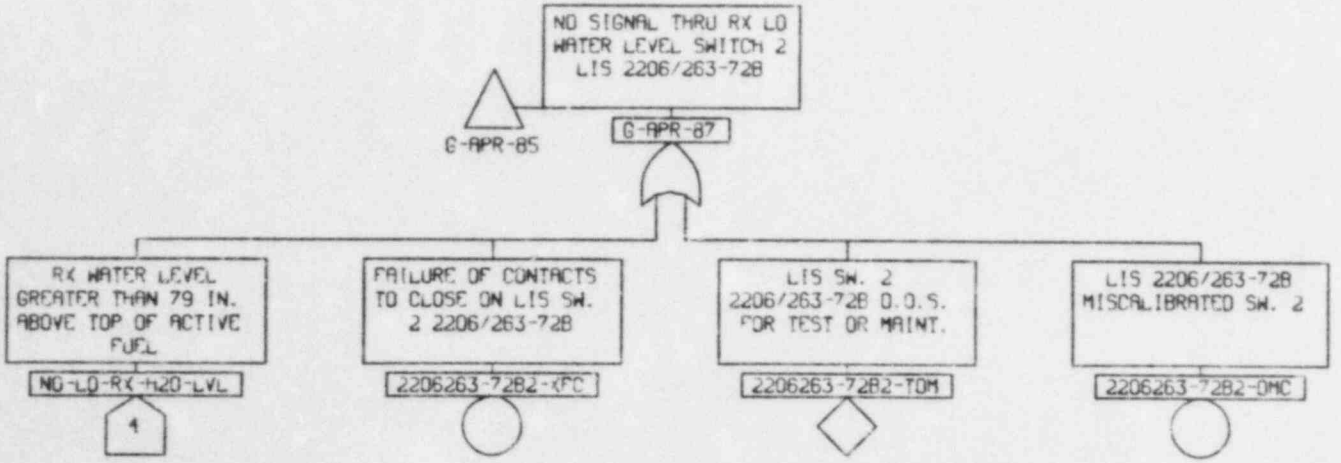

NO SIGNAL THRU
932/287-101B
CONTACTS 3 AND 4
G-APR-80
G-APR-60
G-APR-62
G-APR-64
NO SIGNAL TO
932/287-101B COIL
G-APR-81
932/287-101B
CONTACTS 3 AND 4
FAIL TO CLOSE
932287-101B-3FC
932/287-101B COIL
FAILS TO ENERGIZE
932287-101B-FTE
L/O POWER SOURCE TO
COIL OF 932/287-101B
G-APR-66-101B
CONTACTS 1 AND 2 ON
932/287-101B FAIL TO
SEAL IN
932287-101B-1FC
NO SIGNAL THRU RESET
SWITCH 903/287-303
CONTACTS 9 AND 10
G-APR-82
NO SIGNAL THRU
PRESSURE SENSOR
2206/1620B - DRYWELL
P.S.
G-APR-83

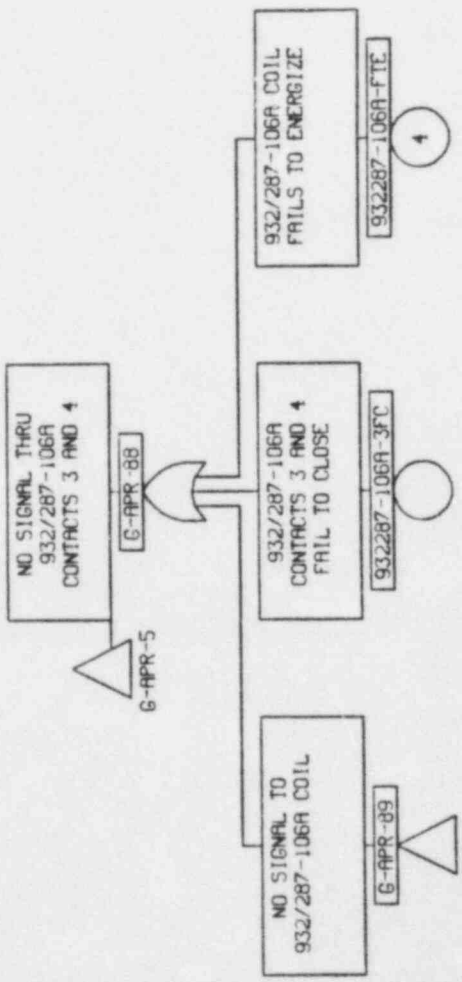

NO SIGNAL THRU RESET SWITCH 903/287-303 CONTACTS 9 AND 10
6-APR-82
6-APR-81
RESET SWITCH 903/287-303 CONTACTS 7 AND 10 FAIL TO REMAIN CLOSED
903287-303-9RC
RESET SWITCH 903/287-303 FAILS TO REMAIN DE-ENERGIZED
903287-303-FRD
4
OPERATOR RESETS APR DRYWELL PRESSURE SIGNAL
903287-303-OER
4

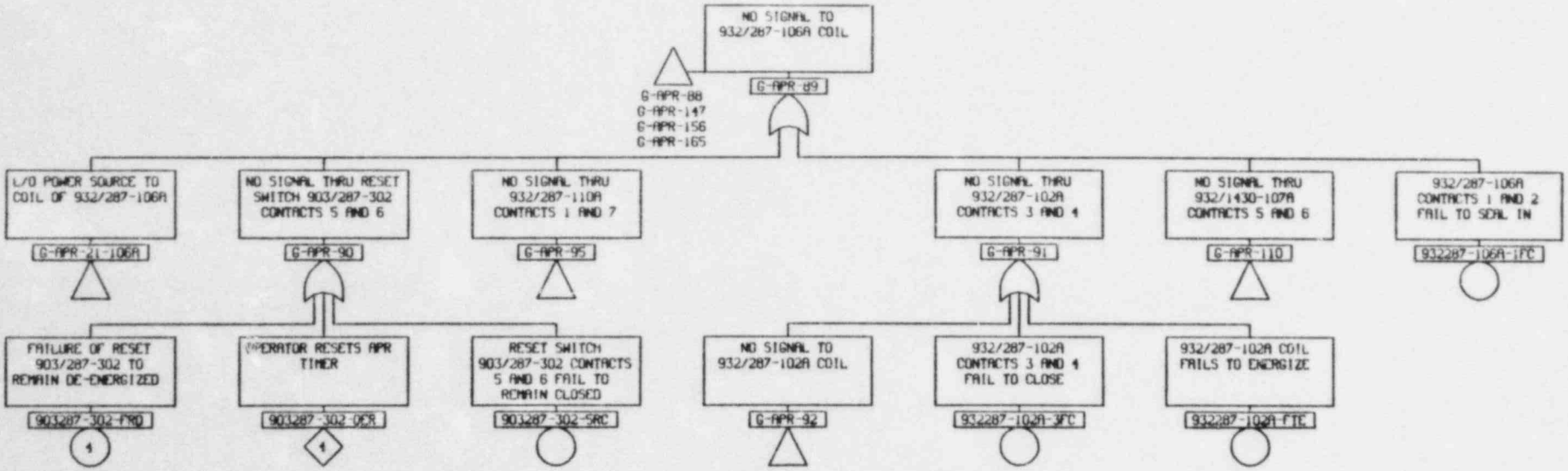

NO SIGNAL THRU PRESSURE SENSOR 2206/1620B - DRYWELL P.S.
G-APR-83
G-APR-81
DRYWELL PRESSURE LESS THAN 2 PSIG
NO-HI-DRYWL-PRES
FAILURE OF CONTACTS TO CLOSE ON P.S. 2206/1620B
2206PS-1620B-XFC
2206/1620B O.O.S. FOR TEST OR MAINT.
2206PS-1620B-TOM
2206/1620B MISCALIBRATED
2206PS-1620B-OMC

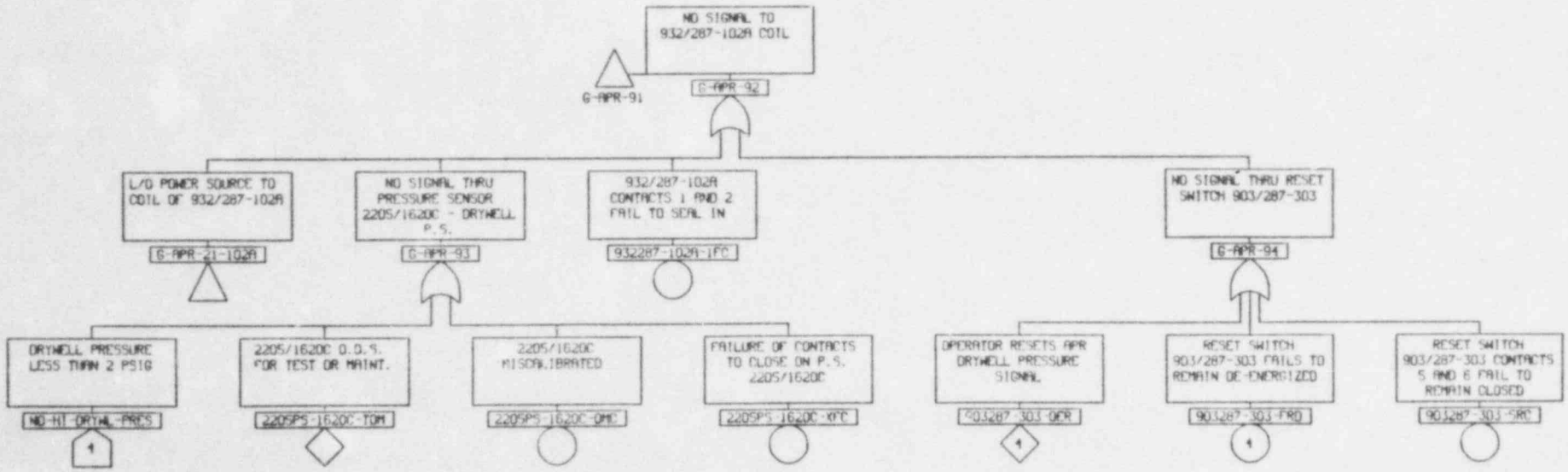

NO SIGNAL THRU
933/1430-106B
CONTACTS 5 AND 6
G-APR-84
G-APR-60
G-APR-62
G-APR-64
933/1430-106B
CONTACTS 5 AND 6
FAIL TO CLOSE
9331430-106B-5FC
NO SIGNAL TO
933/1430-106B COIL
G-APR-85
933/1430-106B COIL
FAILS TO ENERGIZE
9331430-106B-FTE
L/O D.C. POWER 11A1
CIRCUIT NO. 26
G-APR-86
NO SIGNAL THRU RX LO
WATER LEVEL SWITCH 2
LIS 2206/263-72B
G-APR-87

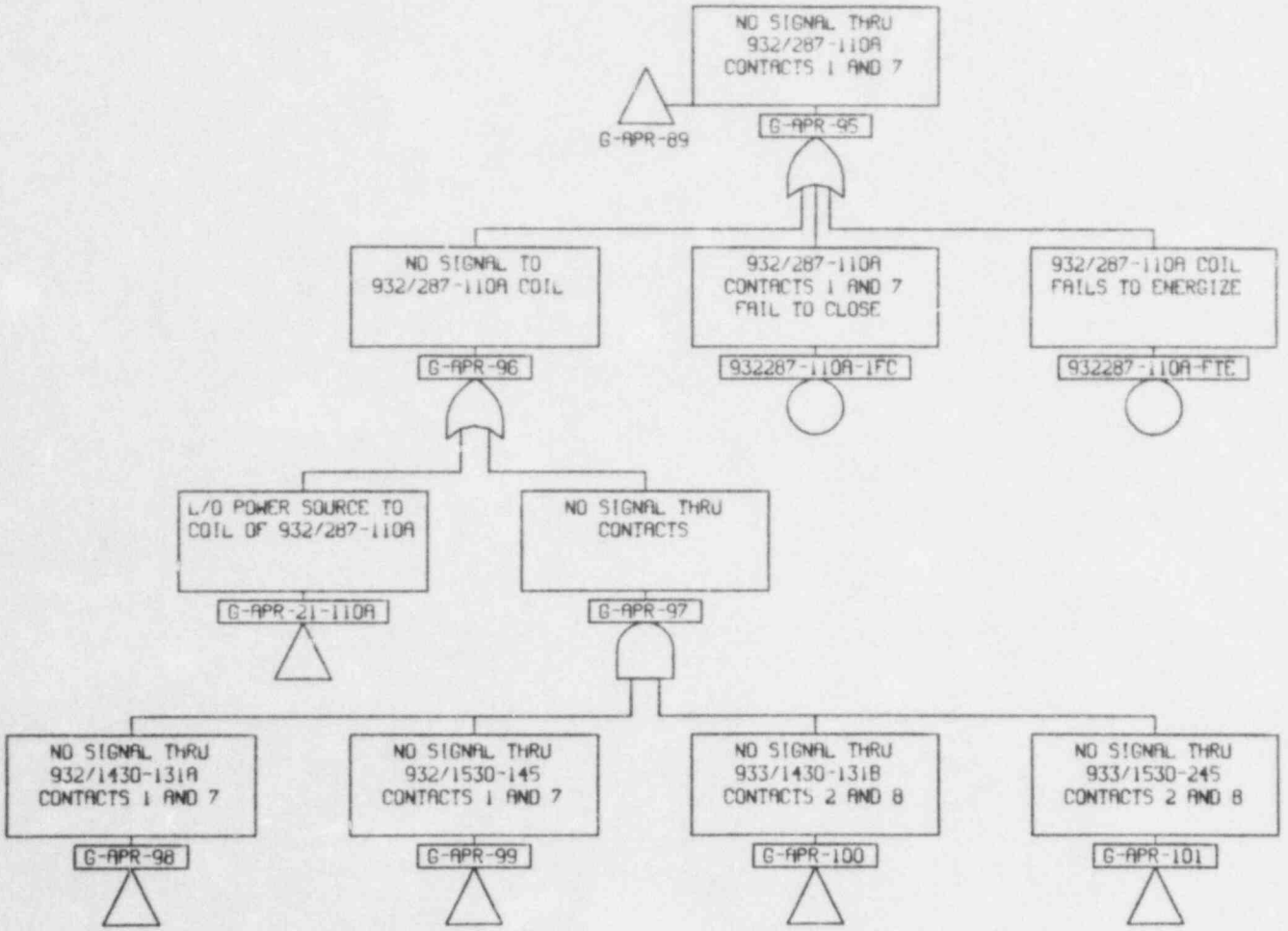

L/O D.C. POWER 11A1
CIRCUIT NO. 26
G-APR-85
G-APR-86
L/O CNTL RM SWBD
DC-11A-1
LOCAL FAULTS ON CKT
26 BKR
G-DC-BUS-11A1-26
DC-11A1-26-FRC
4
4

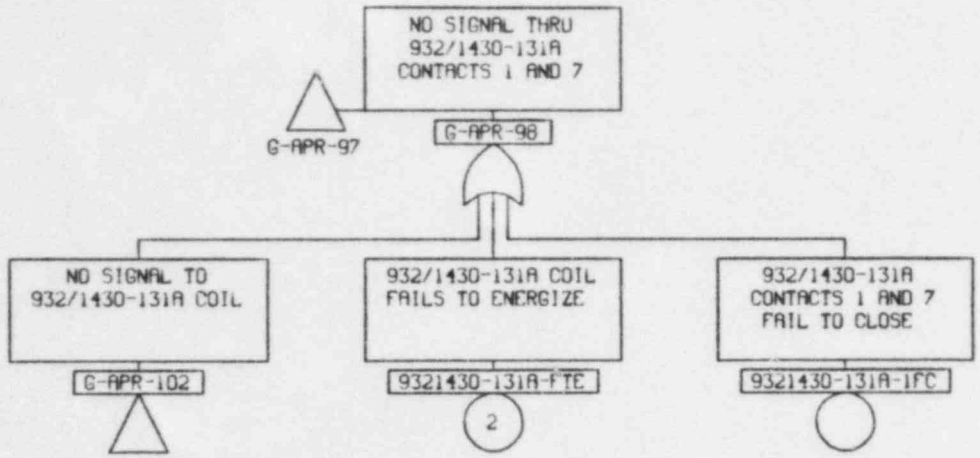

NO SIGNAL THRU RX LO
WATER LEVEL SWITCH 2
LIS 2206/263-72B
G-APR-85
G-APR-87
RX WATER LEVEL
GREATER THAN 79 IN.
ABOVE TOP OF ACTIVE
FUEL
FAILURE OF CONTACTS
TO CLOSE ON LIS SW.
2 2206/263-72B
LIS SW. 2
2206/263-72B O.O.S.
FOR TEST OR MAINT.
LIS 2206/263-72B
MISCALIBRATED SW. 2
NO-LO-RX-H2O-LVL
2206263-72B2-XFC
2206263-72B2-TOM
2206263-72B2-OMC
4

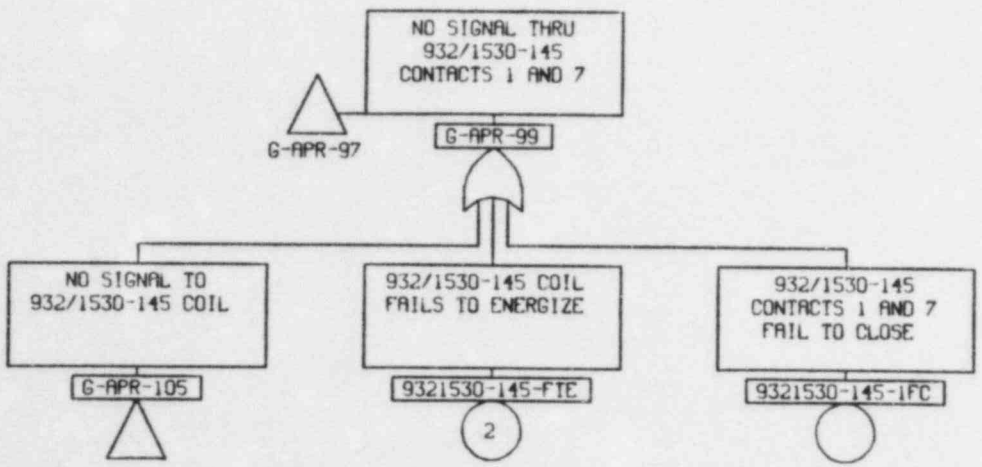

NO SIGNAL THRU
932/287-106A
CONTACTS 3 AND 4
6-APR-88
6-APR-5
932/287-106A
CONTACTS 3 AND 4
FAIL TO CLOSE
932287-106A-3FC
932/287-106A COIL
FAILS TO ENERGIZE
932287-106A-FTE
4
NO SIGNAL TO
932/287-106A COIL
6-APR-89

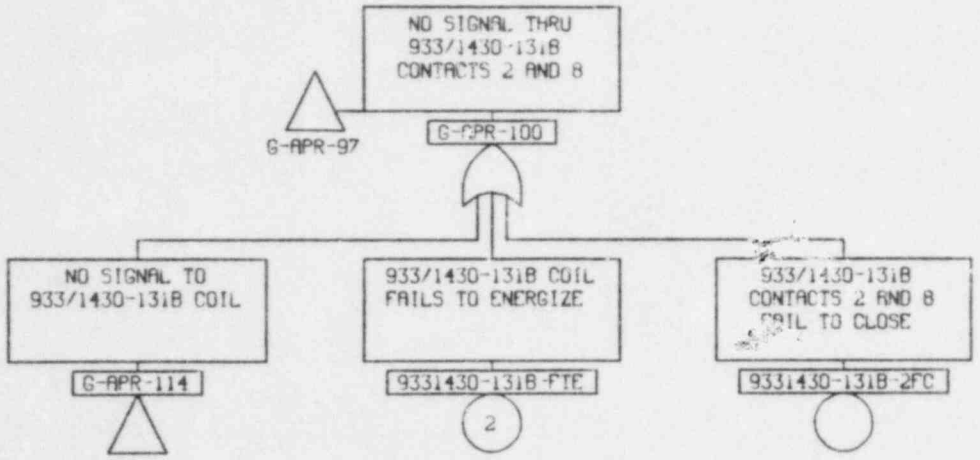

NO SIGNAL TO 932/287-106A COIL
G-APR-89
G-APR-88
G-APR-147
G-APR-156
G-APR-165
L/O POWER SOURCE TO COIL OF 932/287-106A
G-APR-21-106A
NO SIGNAL THRU RESET SWITCH 903/287-302 CONTACTS 5 AND 6
G-APR-90
NO SIGNAL THRU 932/287-110A CONTACTS 1 AND 7
G-APR-95
NO SIGNAL THRU 932/287-102A CONTACTS 3 AND 4
G-APR-91
NO SIGNAL THRU 932/1430-107A CONTACTS 5 AND 6
G-APR-110
932/287-106A CONTACTS 1 AND 2 FAIL TO SEAL IN
932287-106A-1FC
FAILURE OF RESET 903/287-302 TO REMAIN DE-ENERGIZED
903287-302-FRD
OPERATOR RESETS APR TIMER
903287-302-OCR
RESET SWITCH 903/287-302 CONTACTS 5 AND 6 FAIL TO REMAIN CLOSED
903287-302-SRC
NO SIGNAL TO 932/287-102A COIL
G-APR-92
932/287-102A CONTACTS 3 AND 4 FAIL TO CLOSE
932287-102A-3FC
932/287-102A COIL FAILS TO ENERGIZE
932287-102A-FTE

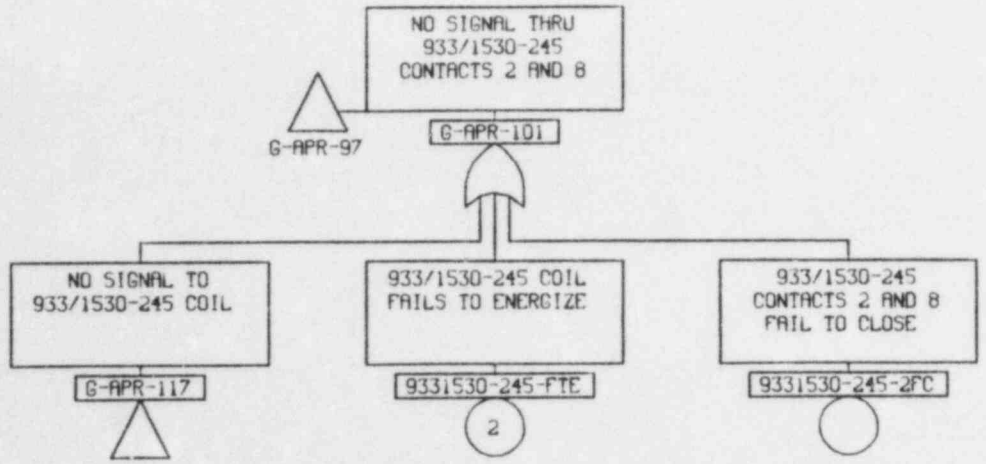

NO SIGNAL TO 932/287-102A COIL
G-APR-92
G-APR-91
L/O POWER SOURCE TO COIL OF 932/287-102A
G-APR-21-102A
NO SIGNAL THRU PRESSURE SENSOR 2205/1620C - DRYWELL P.S.
G-APR-93
932/287-102A CONTACTS 1 AND 2 FAIL TO SEAL IN
932287-102A-IFC
NO SIGNAL THRU RESET SWITCH 903/287-303
G-APR-94
DRYWELL PRESSURE LESS THAN 2 PSIG
NO-HI-DRYWL-PRES
2205/1620C O.O.S. FOR TEST OR MAINT.
2205PS-1620C-TOM
2205/1620C MISCALIBRATED
2205PS-1620C-OMC
FAILURE OF CONTACTS TO CLOSE ON P.S. 2205/1620C
2205PS-1620C-XFC
OPERATOR RESETS APR DRYWELL PRESSURE SIGNAL
903287-303-OCR
RESET SWITCH 903/287-303 FAILS TO REMAIN DE-ENERGIZED
903287-303-FRO
RESET SWITCH 903/287-303 CONTACTS 5 AND 6 FAIL TO REMAIN CLOSED
903287-303-SRC

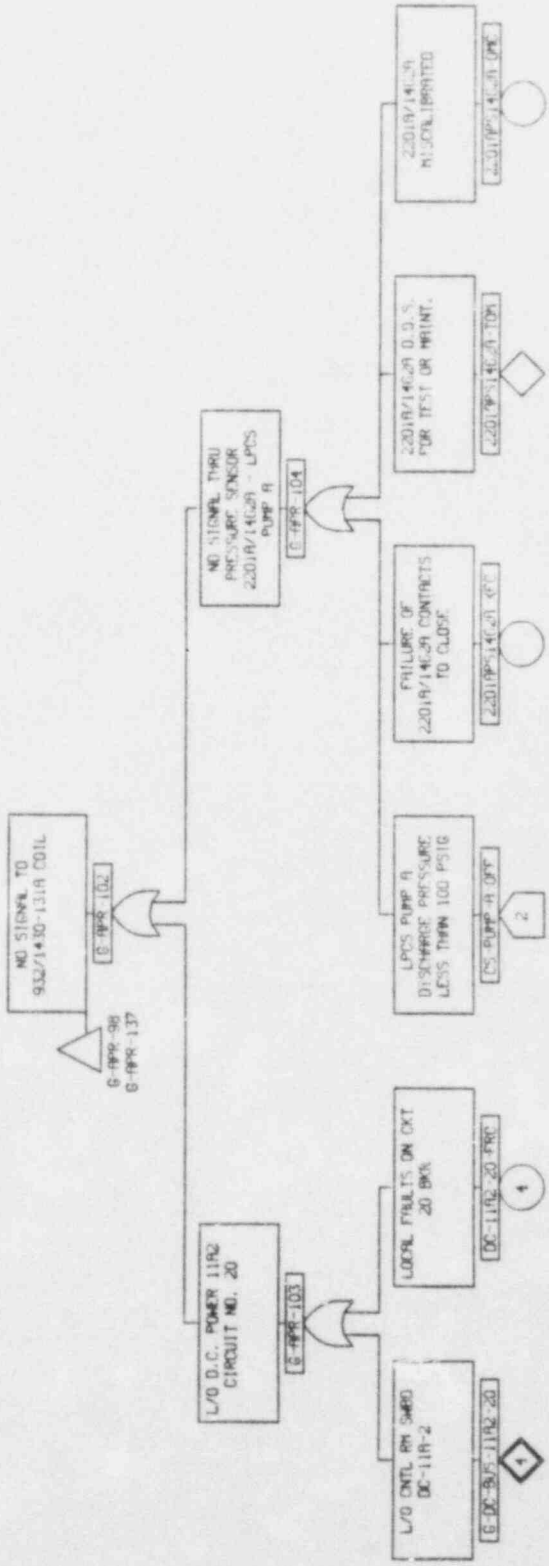

NO SIGNAL THRU
932/287-110A
CONTACTS 1 AND 7
G-APR-89
G-APR-95
NO SIGNAL TO
932/287-110A COIL
932/287-110A
CONTACTS 1 AND 7
FAIL TO CLOSE
932/287-110A COIL
FAILS TO ENERGIZE
G-APR-96
932287-110A-IFC
932287-110A-FTE
L/O POWER SOURCE TO
COIL OF 932/287-110A
NO SIGNAL THRU
CONTACTS
G-APR-21-110A
G-APR-97
NO SIGNAL THRU
932/1430-131A
CONTACTS 1 AND 7
NO SIGNAL THRU
932/1530-145
CONTACTS 1 AND 7
NO SIGNAL THRU
933/1430-131B
CONTACTS 2 AND 8
NO SIGNAL THRU
933/1530-245
CONTACTS 2 AND 8
G-APR-98
G-APR-99
G-APR-100
G-APR-101

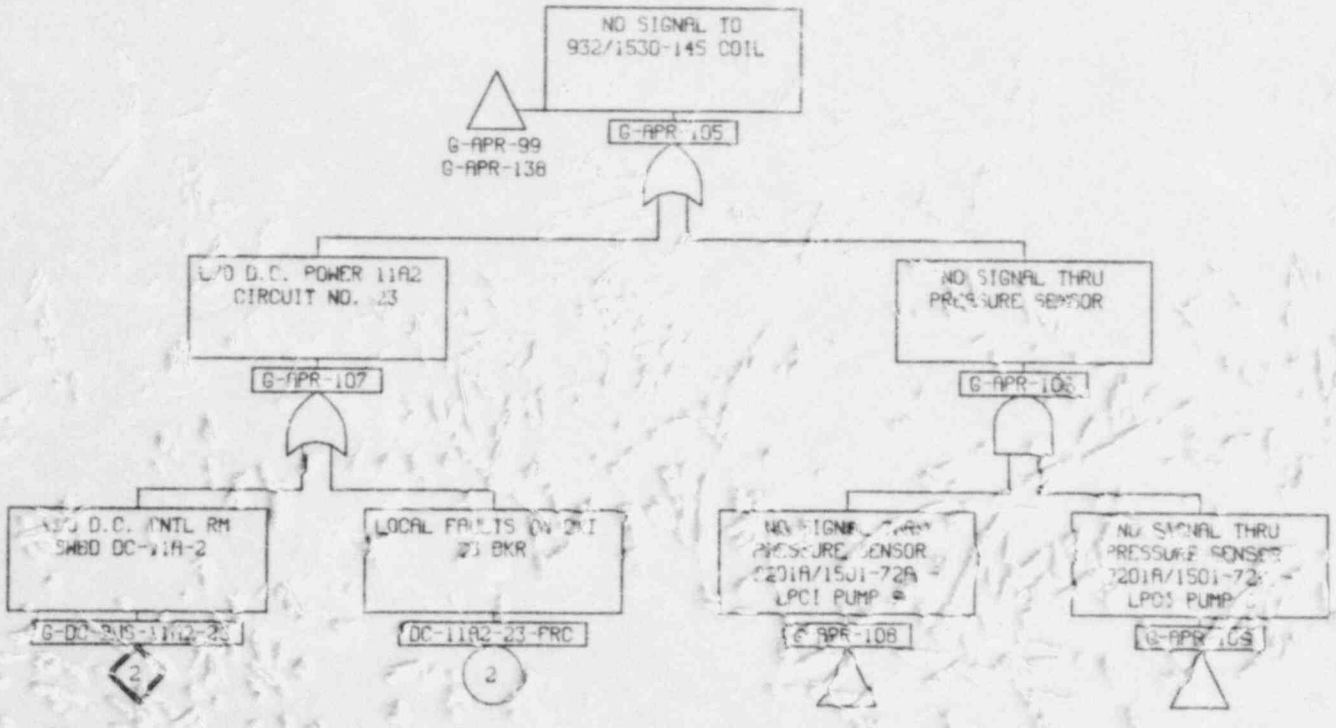

NO SIGNAL THRU
932/1430-131A
CONTACTS 1 AND 7
G-APR-97
G-APR-98
NO SIGNAL TO
932/1430-131A COIL
G-APR-102
932/1430-131A COIL
FAILS TO ENERGIZE
9321430-131A-FTE
2
932/1430-131A
CONTACTS 1 AND 7
FAIL TO CLOSE
9321430-131A-IFC

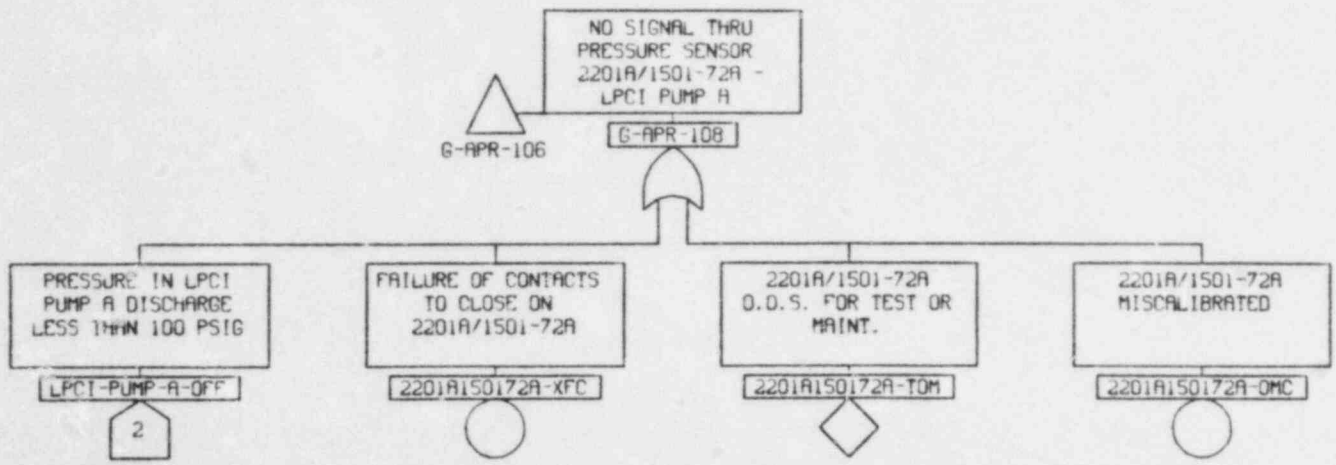

NO SIGNAL THRU
932/1530-145
CONTACTS 1 AND 7
G-APR-97
G-APR-99
NO SIGNAL TO
932/1530-145 COIL
G-APR-105
932/1530-145 COIL
FAILS TO ENERGIZE
9321530-145-FTE
2
932/1530-145
CONTACTS 1 AND 7
FAIL TO CLOSE
9321530-145-IFC

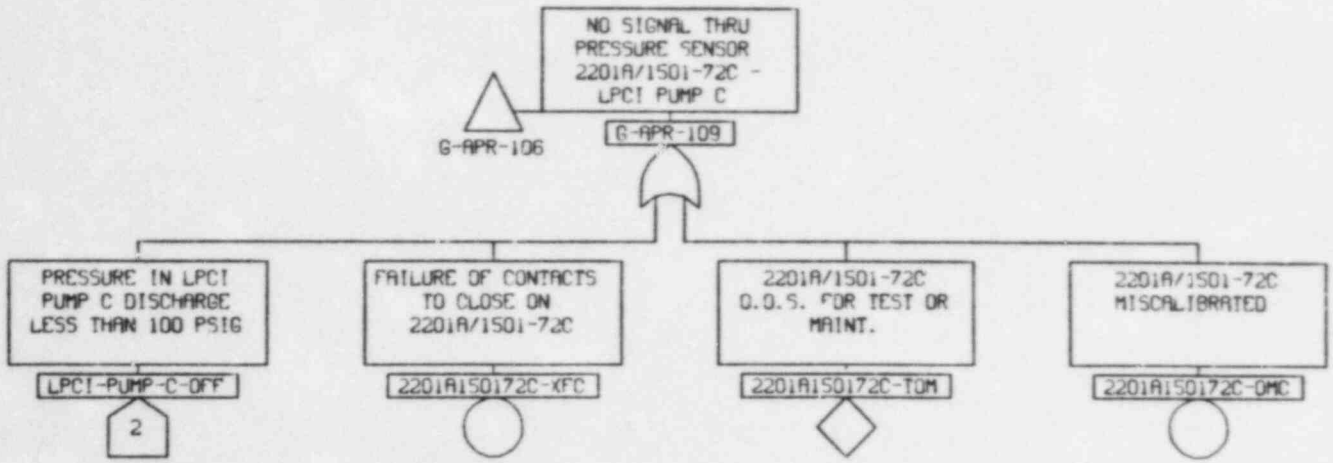

NO SIGNAL THRU
933/1430-131B
CONTACTS 2 AND 8
G-APR-97
G-APR-100
NO SIGNAL TO
933/1430-131B COIL
933/1430-131B COIL
FAILS TO ENERGIZE
933/1430-131B
CONTACTS 2 AND 8
FAIL TO CLOSE
G-APR-114
9331430-131B-FTE
9331430-131B-2FC
2

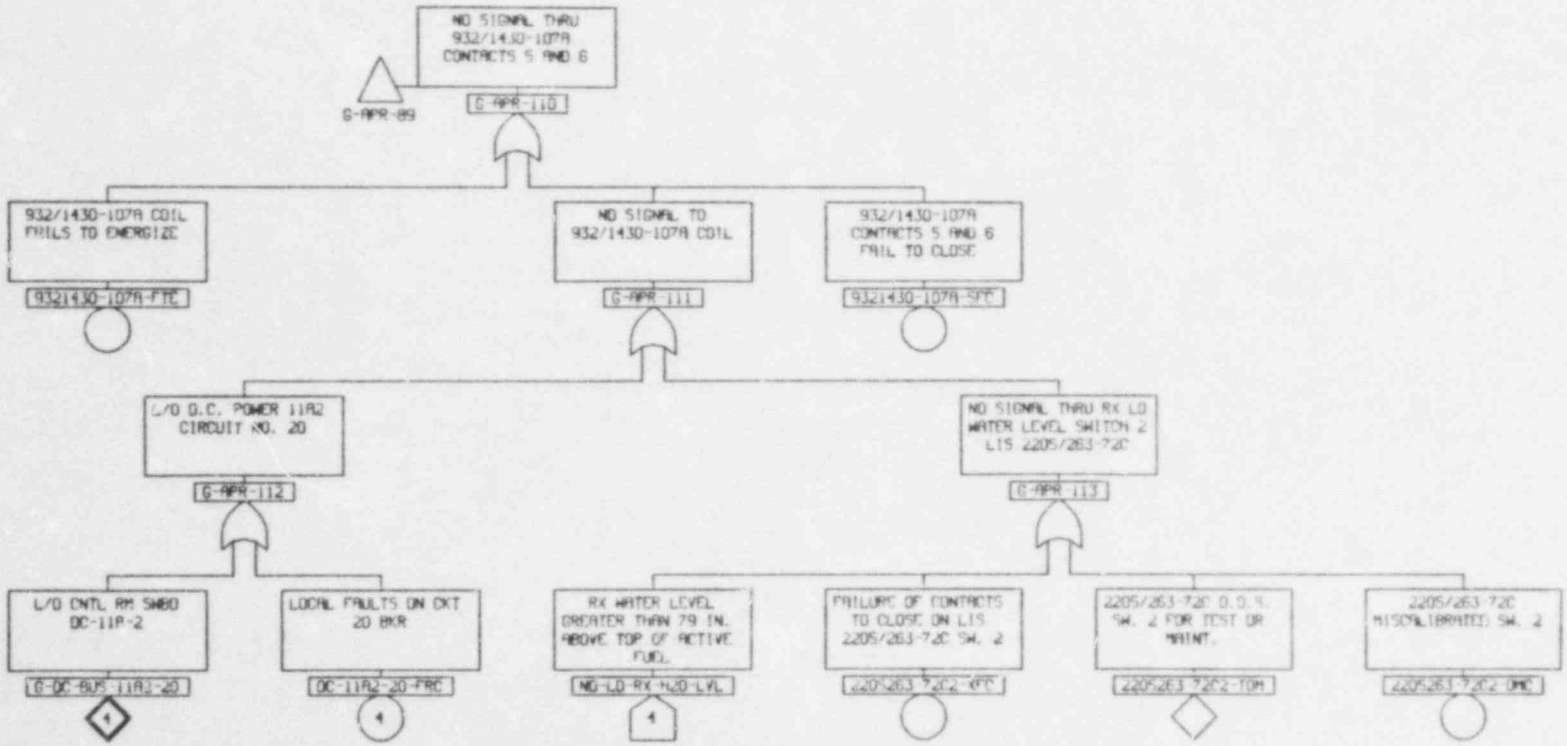

NO SIGNAL THRU
933/1530-245
CONTACTS 2 AND 8
G-APR-97
G-APR-101
NO SIGNAL TO
933/1530-245 COIL
933/1530-245 COIL
FAILS TO ENERGIZE
933/1530-245
CONTACTS 2 AND 8
FAIL TO CLOSE
G-APR-117
9331530-245-FTE
9331530-245-2FC
2

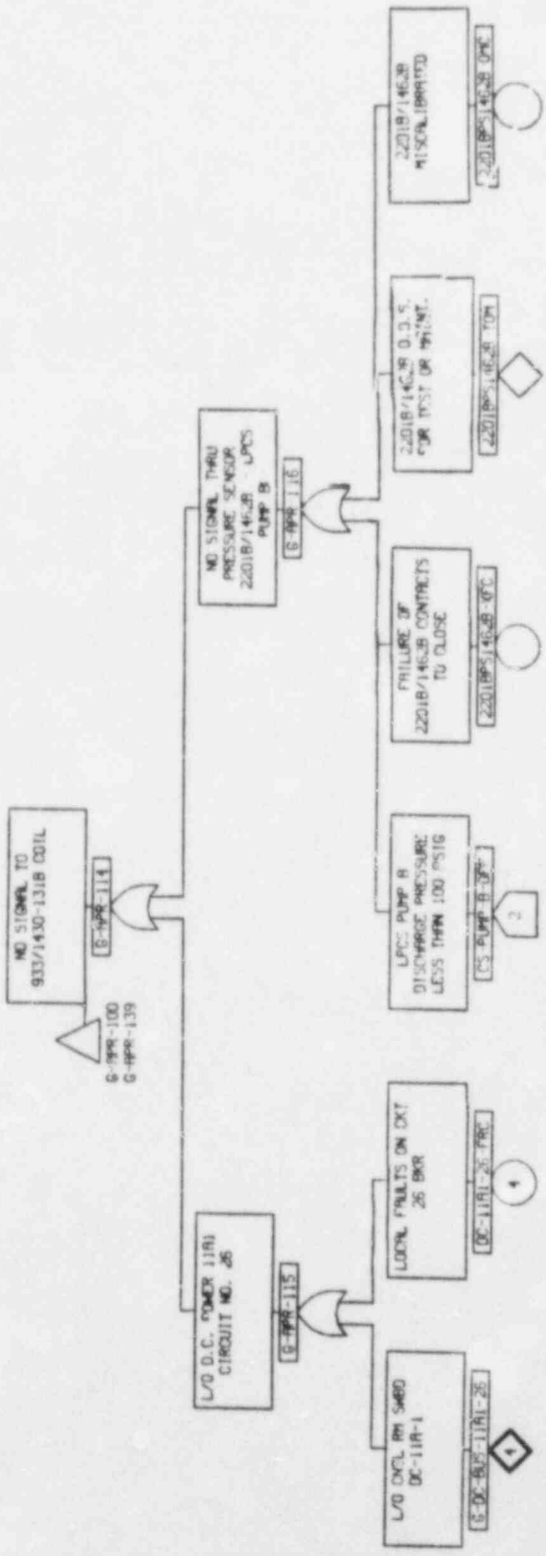

NO SIGNAL TO
93A/1430-13A COIL
G-APR-102
G-APR-98
G-APR-137
L/O D.C. POWER 11A2
CIRCUIT NO. 20
G-APR-103
L/O CNTL RM SWBD
DC-11A-2
G-DC-BUS-11A2-20
LOCAL FAULTS ON CKT
20 BRK
DC-11A2-20-FAIL
1
NO SIGNAL THRU
PRESSURE SENSOR
220A/1403 - LPCS
PUMP A
G-APR-104
LPCS PUMP A
DISCHARGE PRESSURE
LESS THAN 100 PSIG
LPCS-PUMP-A OPR
2
FAILURE OF
220A/1403 CONTACTS
TO CLOSE
220A/1403 OPR
220A/1403 O.O.S.
FOR TEST OR MAINT.
220A/1403 O.O.S.
220A/1403
INOPERABLE
220A/1403 INOP

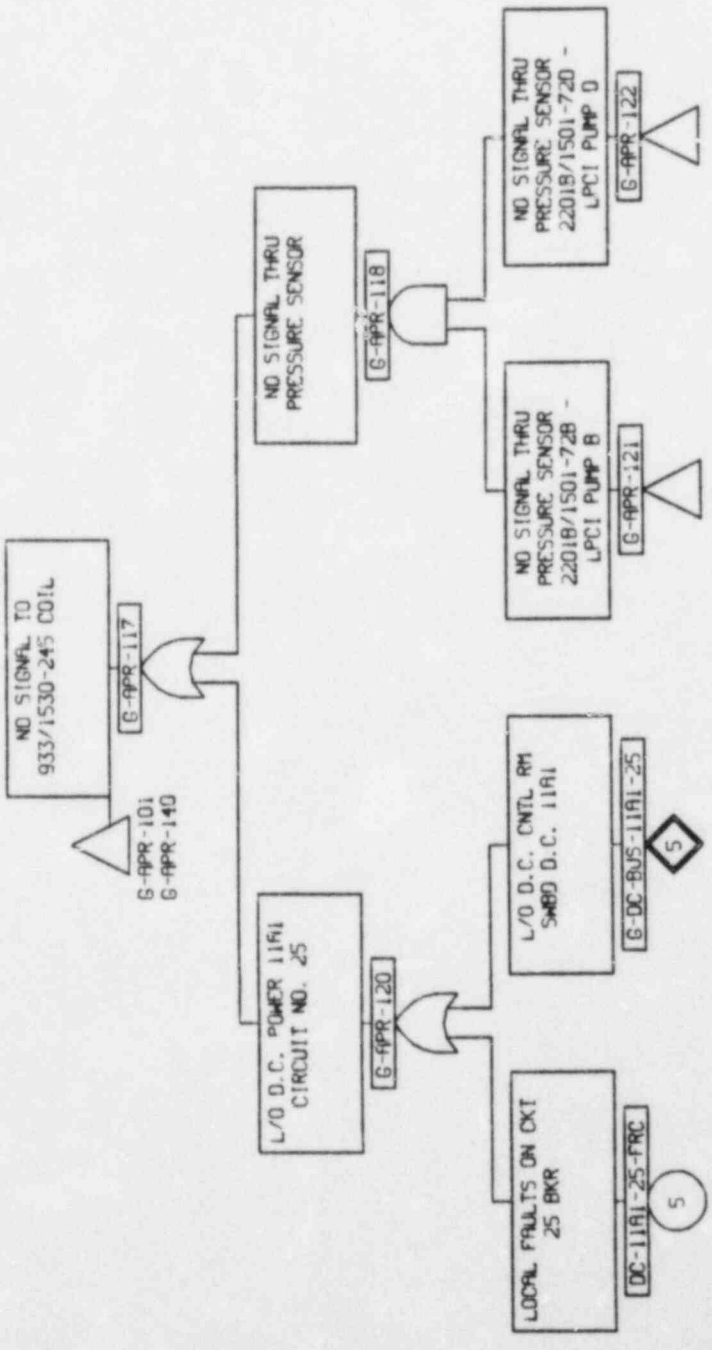

NO SIGNAL TO
932/1530-14S COIL
G-APR-99
G-APR-138
G-APR-105
L/O D.C. POWER 11A2
CIRCUIT NO. 23
G-APR-107
NO SIGNAL THRU
PRESSURE SENSOR
G-APR-106
LOCAL FAILS ON 2XI
2) BKR
DC-11A2-23-FRC
2
G-APR-108
G-APR-105

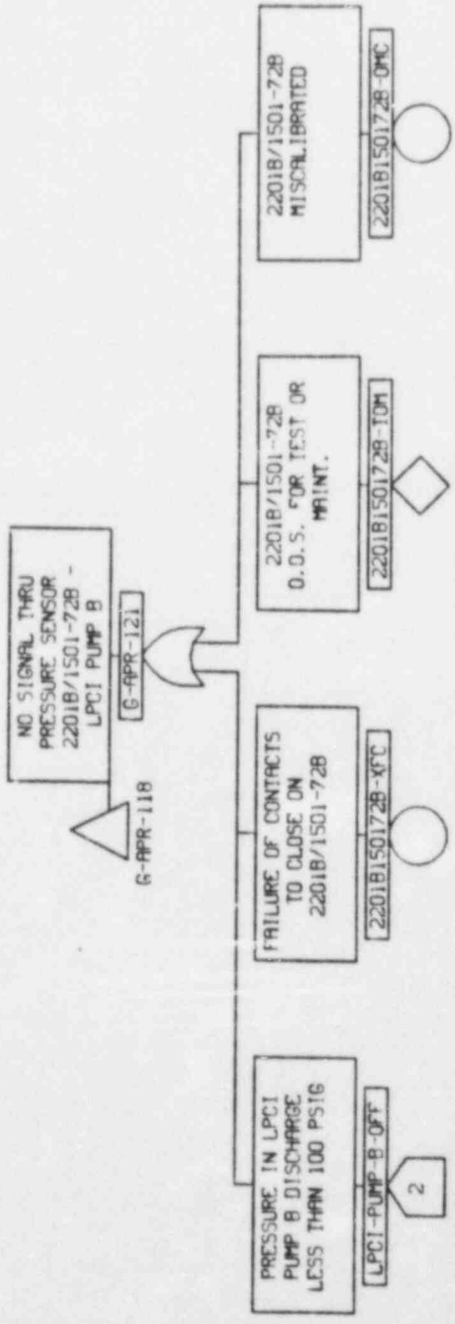

NO SIGNAL THRU PRESSURE SENSOR 2201A/1501-72A - LPCI PUMP A
G-APR-106
G-APR-108
PRESSURE IN LPCI PUMP A DISCHARGE LESS THAN 100 PSIG
FAILURE OF CONTACTS TO CLOSE ON 2201A/1501-72A
2201A/1501-72A O.O.S. FOR TEST OR MAINT.
2201A/1501-72A MISCALIBRATED
LPCI-PUMP-A-OFF
2201A150172A-XFC
2201A150172A-TOM
2201A150172A-OMC
2

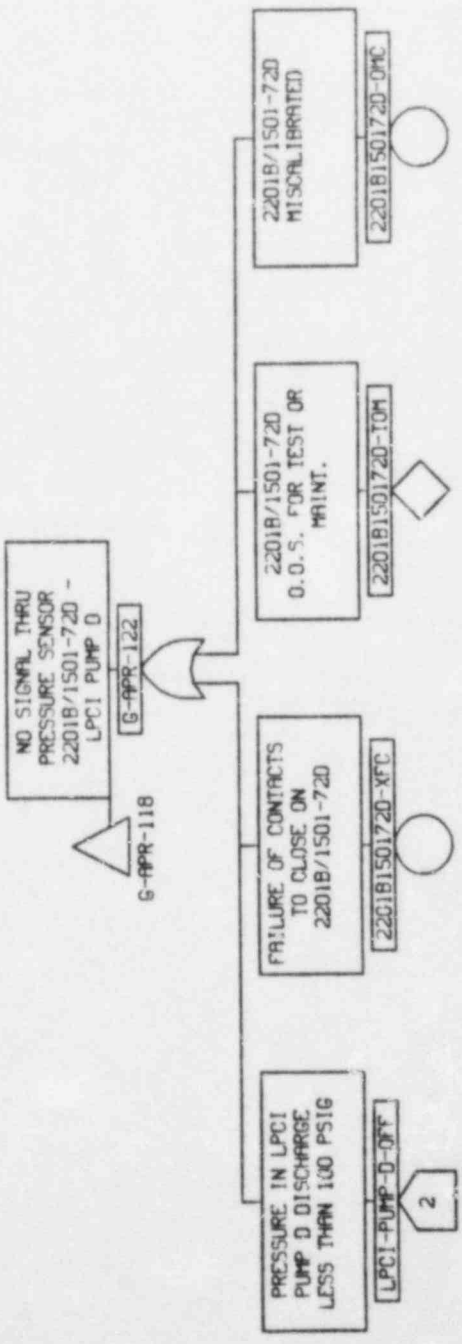

NO SIGNAL THRU PRESSURE SENSOR 2201A/1501-72C - LPCI PUMP C
G-APR-106
G-APR-109
PRESSURE IN LPCI PUMP C DISCHARGE LESS THAN 100 PSIG
FAILURE OF CONTACTS TO CLOSE ON 2201A/1501-72C
2201A/1501-72C O.O.S. FOR TEST OR MAINT.
2201A/1501-72C MISCALIBRATED
LPCI-PUMP-C-OFF
2201A1501I72C-XFC
2201A1501I72C-TOM
2201A1501I72C-OMC
2

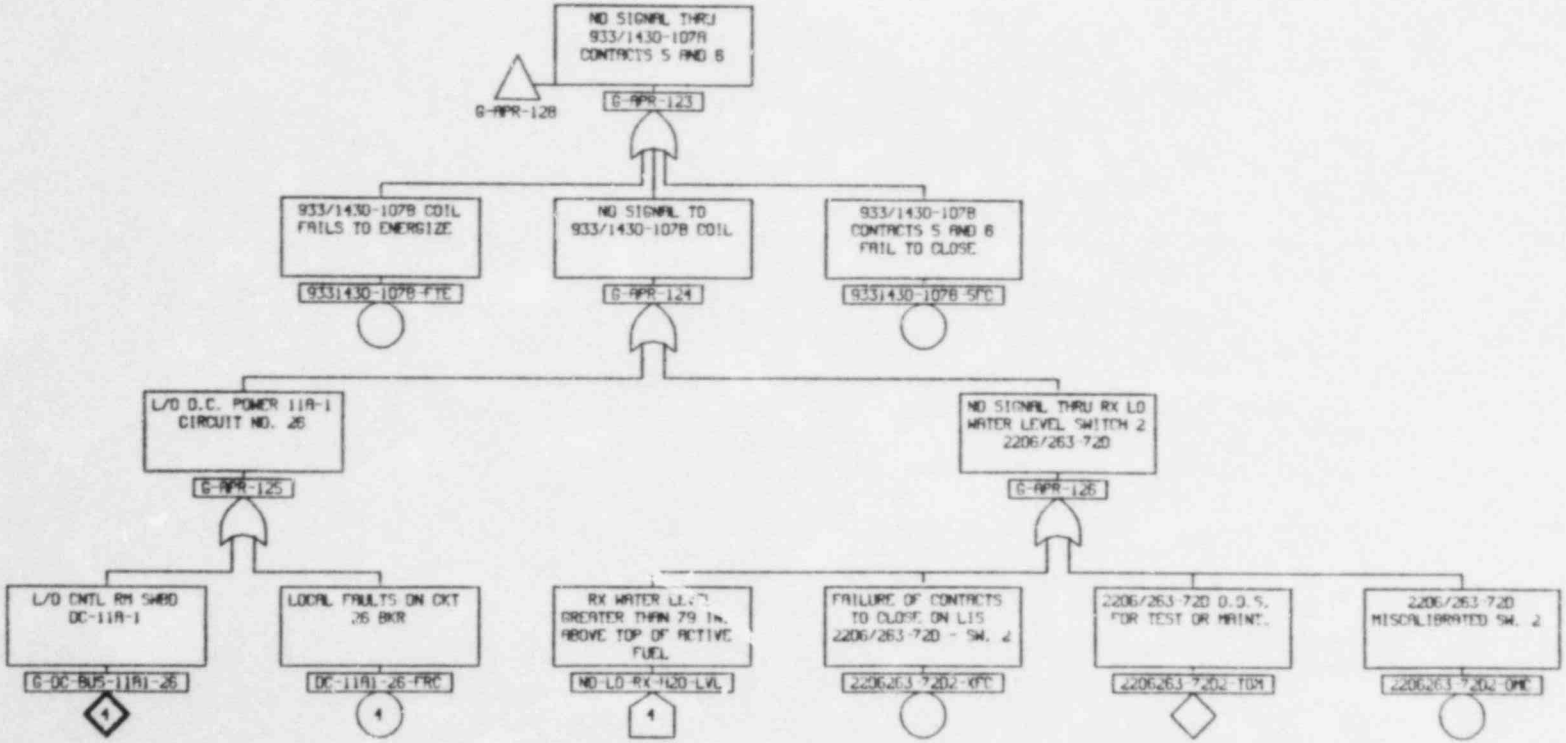

NO SIGNAL THRU
932/1430-107A
CONTACTS 5 AND 6
G-APR-110
G-APR-89
932/1430-107A COIL
FAILS TO ENERGIZE
9321430-107A-FTC
NO SIGNAL TO
932/1430-107A COIL
G-APR-111
932/1430-107A
CONTACTS 5 AND 6
FAIL TO CLOSE
9321430-107A-SPC
L/O D.C. POWER 11A2
CIRCUIT NO. 20
G-APR-112
NO SIGNAL THRU RX LO
WATER LEVEL SWITCH 2
LIS 2205/263-72C
G-APR-113
L/O CNTL RM SWBD
DC-11P-2
LOCAL FAULTS ON CKT
20 BKR
RX WATER LEVEL
GREATER THAN 79 IN.
ABOVE TOP OF ACTIVE
FUEL
FAILURE OF CONTACTS
TO CLOSE ON LIS
2205/263-72C SW. 2
2205/263-72C D.O.S.
SW. 2 FOR TEST OR
MAINT.
2205/263-72C
MISCALIBRATED SW. 2
G-DC-BUS 11A2-20
DC-11A2-20-PRC
NO-LO-RX-H2O-LVL
2205-263-72C2-FTC
2205-263-72C2-TOM
2205-263-72C2-DMC

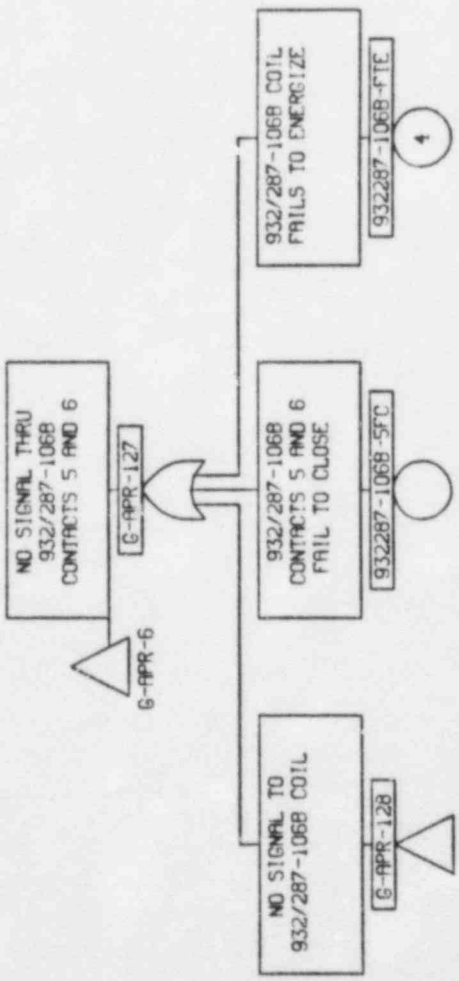

NO SIGNAL TO
933/1430-1318 COIL
G-APR-100
G-APR-139
G-APR-114
L/O D.C. POWER (1A)
CIRCUIT NO. 25
G-APR-115
NO SIGNAL THRU
PRESSURE SENSOR
2201B/1463B - LPCS
PUMP B
G-APR-116
LOCAL FAULTS ON CKT
25 BKR
DC-11A1-25 FREC
L/O CKTS ON SWBD
DC-11A-1
G-DC-APC-11A1-25
2201B/1463B MISCAL(BRANCH)
2201B/1463B O.O.S.
FOR TEST OR MAINT.
2201B/1463B TOM
FAILURE OF
2201B/1463B CONTACTS
TO CLOSE
2201B/1463B OPC
LPCS PUMP B
DISCHARGE PRESSURE
LESS THAN 100 PSIG
LPCS PUMP B OPC

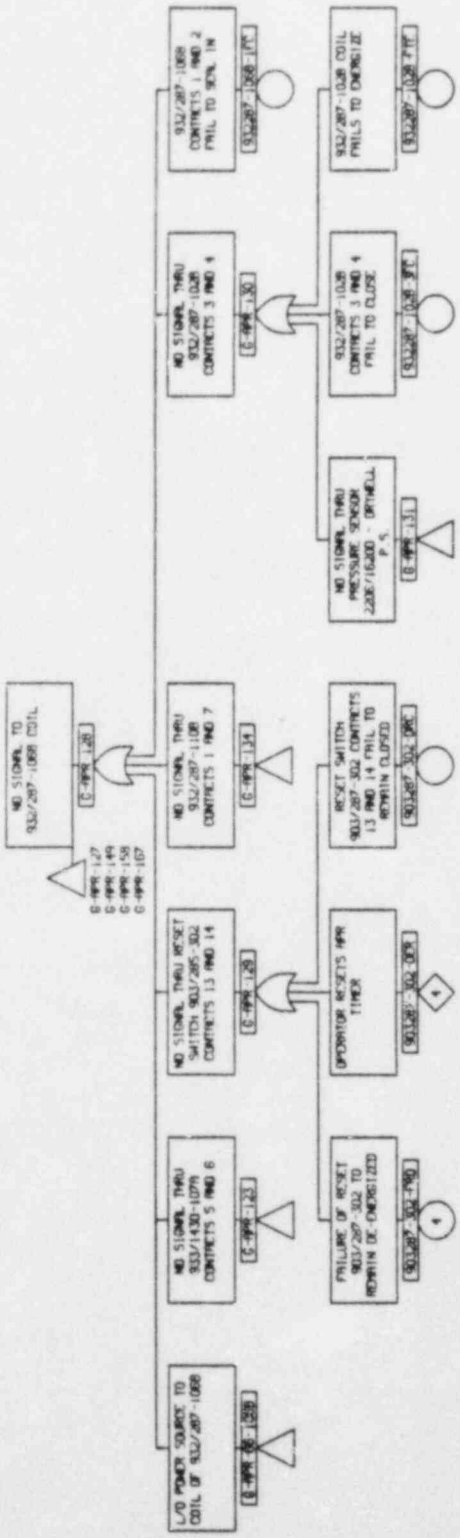

NO SIGNAL TO
933/1530-245 COIL
G-APR-101
G-APR-140
G-APR-117
L/O D.C. POWER 11A1
CIRCUIT NO. 25
G-APR-120
NO SIGNAL THRU
PRESSURE SENSOR
G-APR-118
NO SIGNAL THRU
PRESSURE SENSOR
2201B/1501-72B -
LPCI PUMP B
G-APR-121
NO SIGNAL THRU
PRESSURE SENSOR
2201B/1501-72D -
LPCI PUMP D
G-APR-122
L/O D.C. CNTL RM
SWBD D.C. 11A1
G-DC-BUS-11A1-25
5
LOCAL FAULTS ON CKT
25 BKR
DC-11A1-25-FRC
5

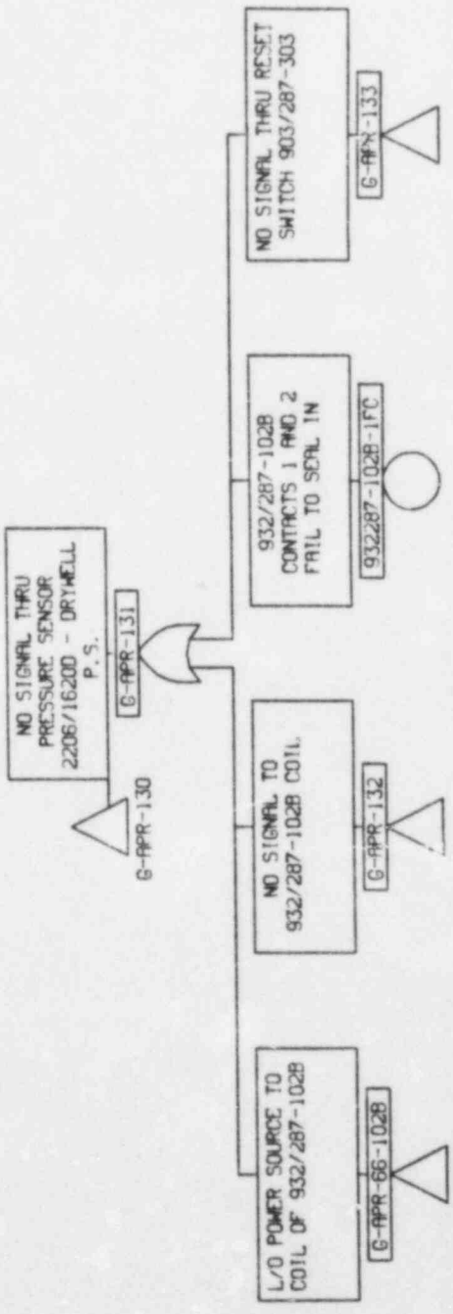

NO SIGNAL THRU PRESSURE SENSOR 2201B/1501-72B - LPCI PUMP B
G-APR-121
G-APR-118
2201B/1501-72B O.O.S. FOR TEST OR MAINT.
2201B1501728-TOM
2201B/1501-72B MISCALIBRATED
2201B1501728-OMC
FAILURE OF CONTACTS TO CLOSE ON 2201B/1501-72B
2201B1501728-XFC
PRESSURE IN LPCI PUMP B DISCHARGE LESS THAN 100 PSIG
LPCI-PUMP-B-OFF
2

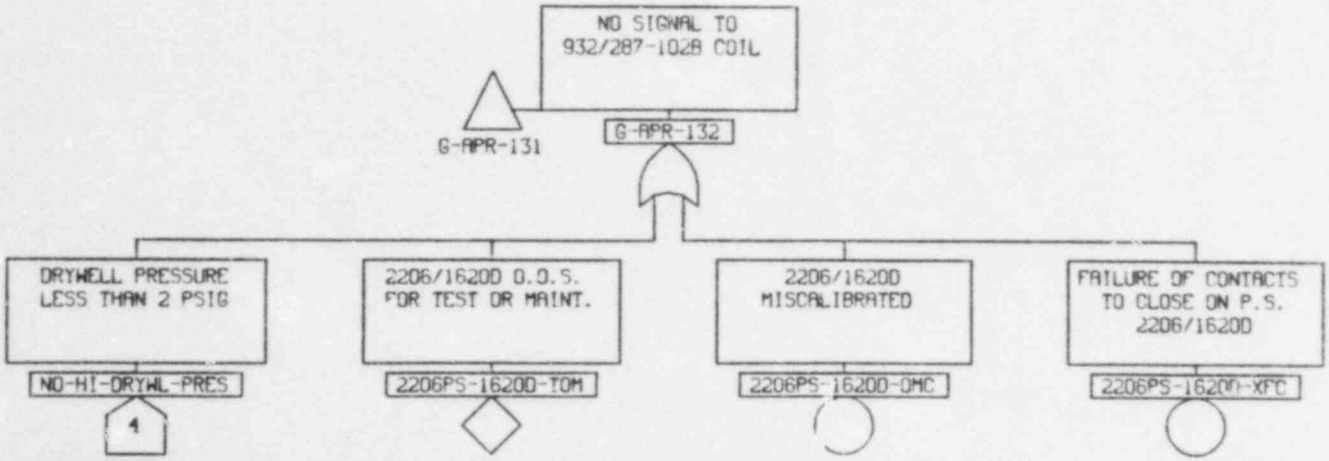

NO SIGNAL THRU PRESSURE SENSOR 2201B/1501-720 - LPCI PUMP D
G-APR-122
G-APR-118
PRESSURE IN LPCI PUMP D DISCHARGE LESS THAN 100 PSIG
LPCI-PUMP-D-OFF
2
FAILURE OF CONTACTS TO CLOSE ON 2201B/1501-720
2201B1501720-XFC
2201B/1501-720 O.O.S. FOR TEST OR MAINT.
2201B1501720-TOM
2201B/1501-720 MISCALIBRATED
2201B1501720-OMC

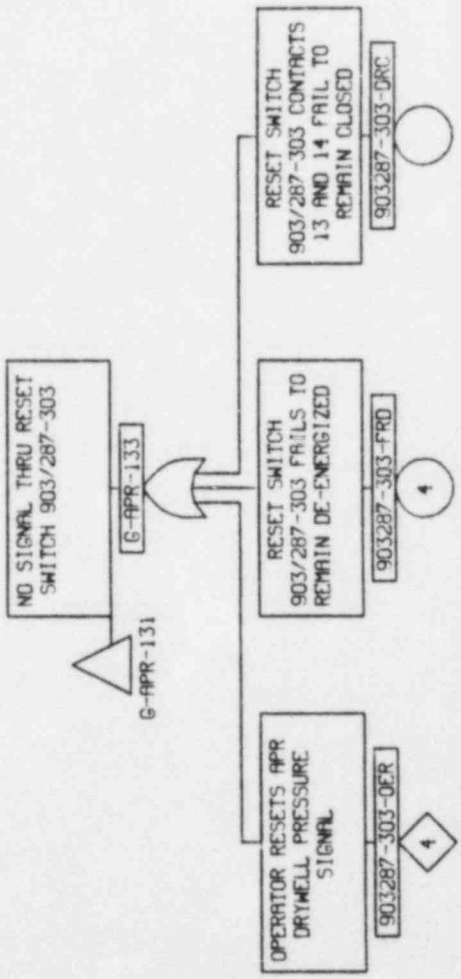

NO SIGNAL THRU
933/1430-107A
CONTACTS 5 AND 6
G-APR-123
G-APR-128
933/1430-107B COIL
FAILS TO ENERGIZE
933/1430-107B-FTE
NO SIGNAL TO
933/1430-107B COIL
G-APR-124
933/1430-107B
CONTACTS 5 AND 6
FAIL TO CLOSE
933/1430-107B-5FC
L/O D.C. POWER 11A-1
CIRCUIT NO. 26
G-APR-125
NO SIGNAL THRU RX LO
WATER LEVEL SWITCH 2
2206/263-72D
G-APR-126
L/O CNTL RM SWBD
DC-11A-1
LOCAL FAULTS ON CKT
26 BKR
RX WATER LEVEL
GREATER THAN 79 In.
ABOVE TOP OF ACTIVE
FUEL
FAILURE OF CONTACTS
TO CLOSE ON LIS
2206/263-72D - SW. 2
2206/263-72D O.O.S.
FOR TEST OR MAINT.
2206/263-72D
MISCALIBRATED SW. 2
G-DC-BUS-11A1-26
DC-11A1-26-FRC
NO-LO-RX-H2O-LVL
2206263-72D2-FTC
2206263-72D2-TOM
2206263-72D2-OME

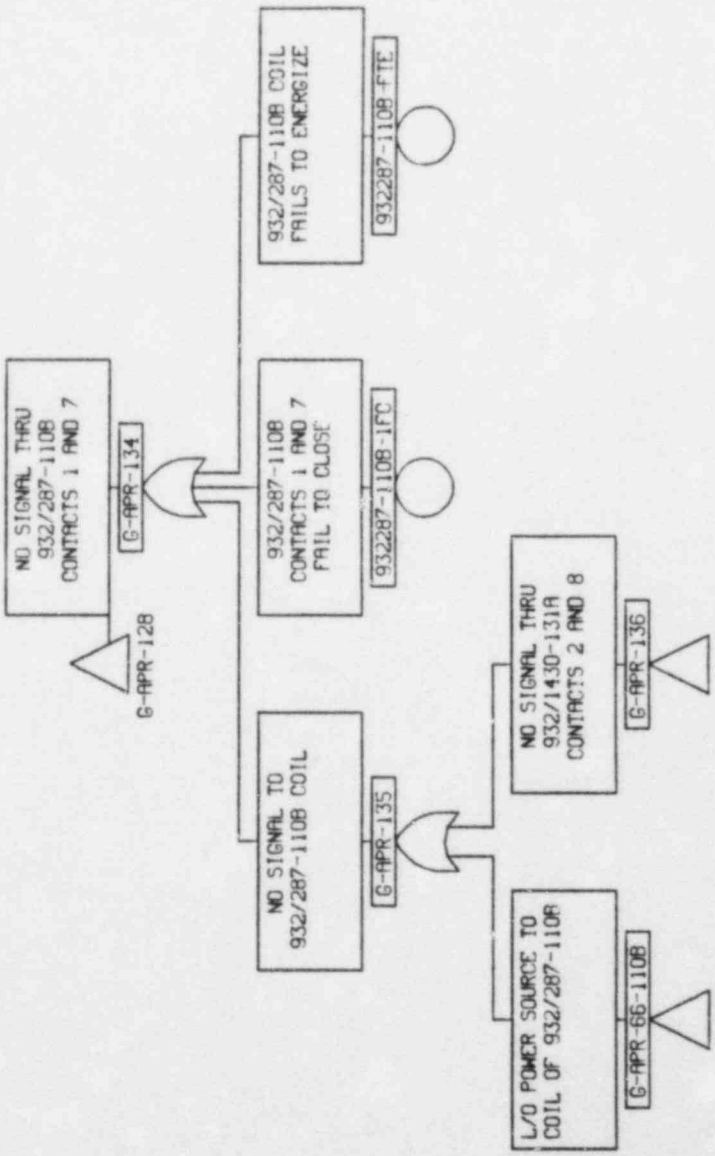

NO SIGNAL THRU
932/287-1068
CONTACTS 5 AND 6
G-APR-127
G-APR-6
932/287-1068
CONTACTS 5 AND 6
FAIL TO CLOSE
932287-1068-SFC
932/287-1068 COIL
FAILS TO ENERGIZE
932287-1068-FTE
1
NO SIGNAL TO
932/287-1068 COIL
G-APR-128

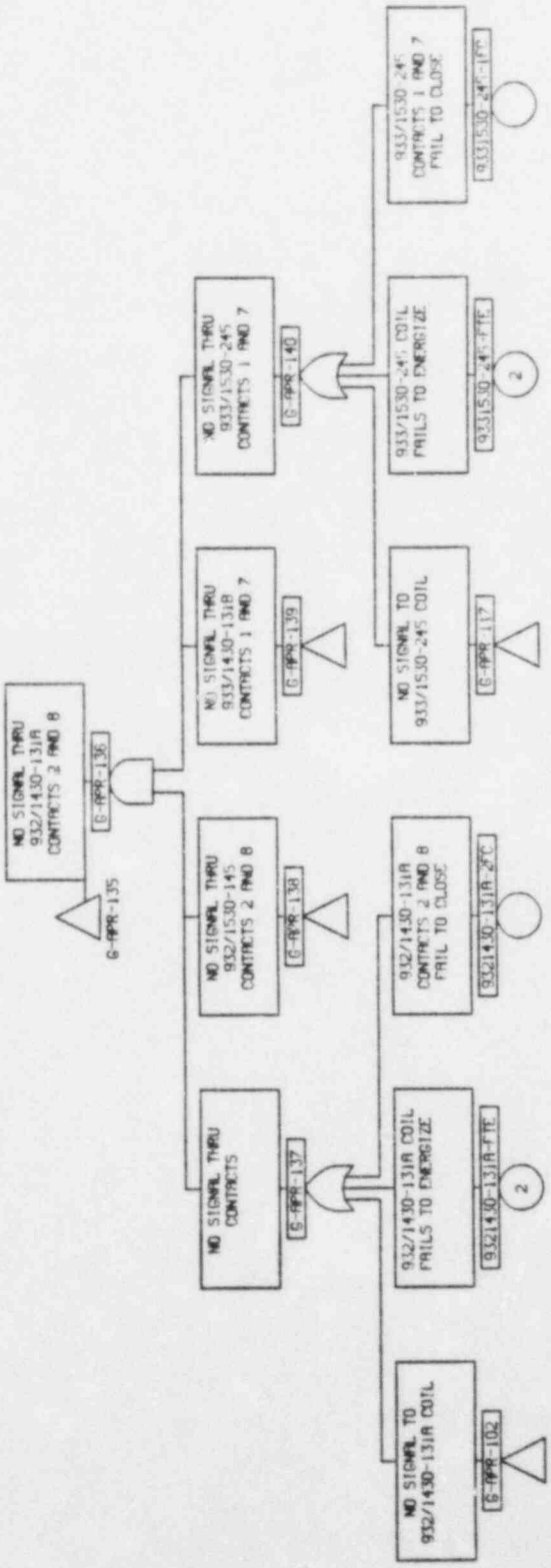


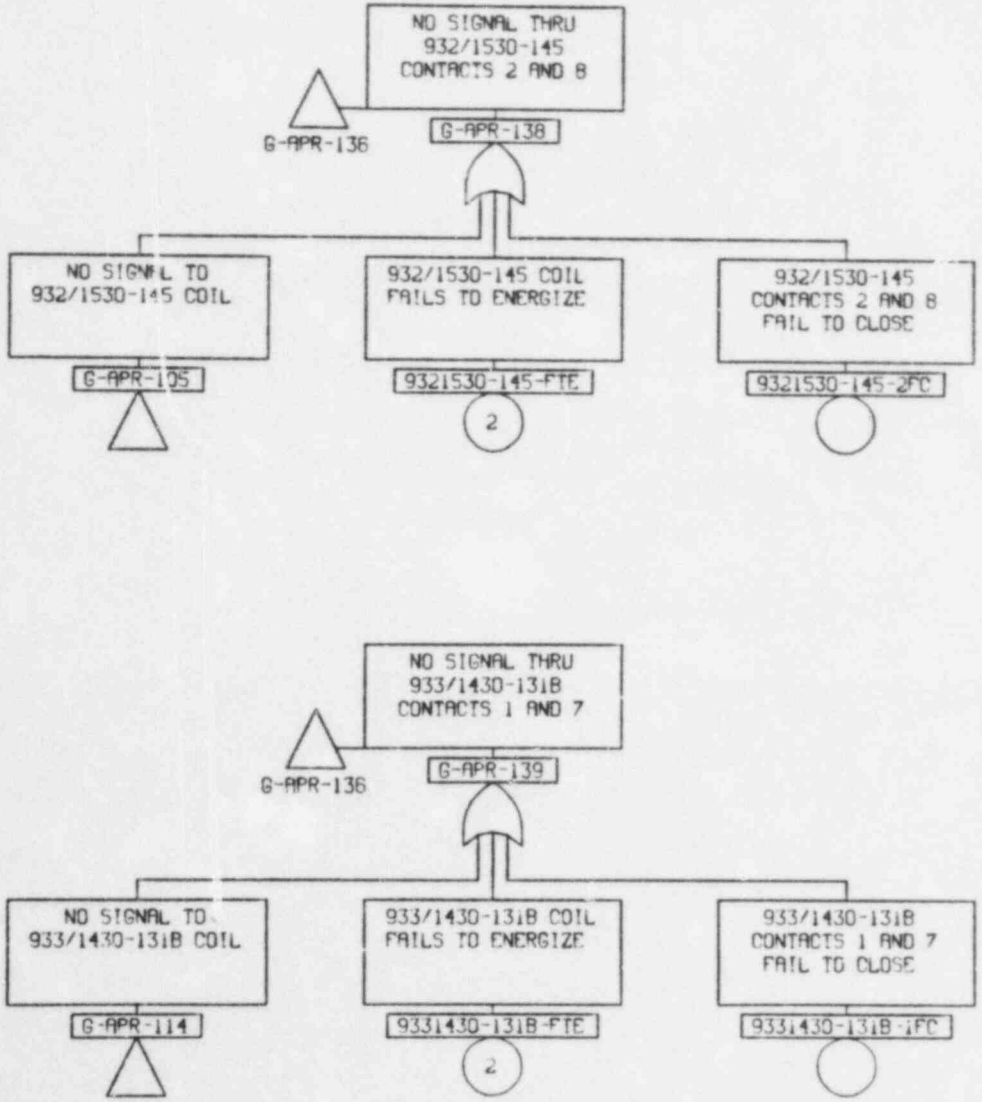

NO SIGNAL THRU PRESSURE SENSOR 2206/16200 - DRYWELL P.S.
G-APR-130
G-APR-131
NO SIGNAL TO 932/287-102B COIL
G-APR-132
L/O POWER SOURCE TO COIL OF 932/287-102B
G-APR-66-102B
932/287-102B CONTACTS 1 AND 2 FAIL TO SEAL IN
932287-102B-1FC
NO SIGNAL THRU RESET SWITCH 903/287-303
G-APR-133

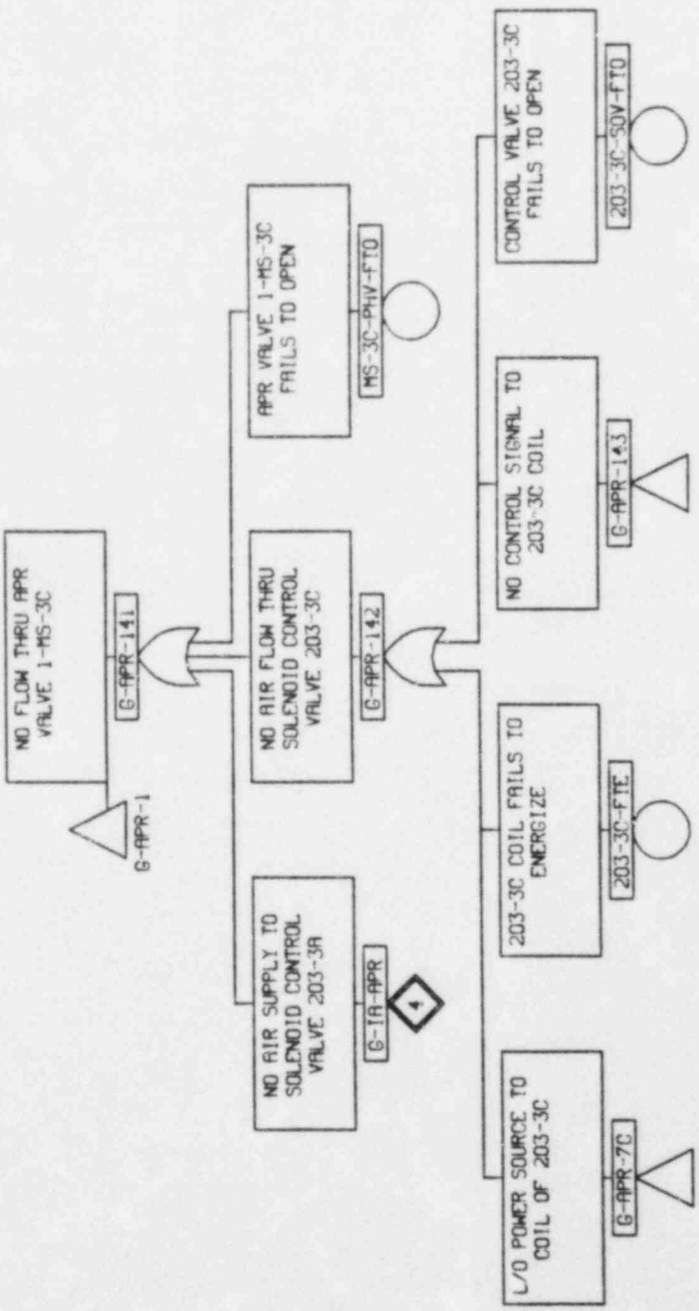

NO SIGNAL TO
932/287-102B COIL
G-APR-131
G-APR-132
DRYWELL PRESSURE
LESS THAN 2 PSIG
NO-HI-DRYWL-PRES
4
2206/16200 O.O.S.
FOR TEST OR MAINT.
2206PS-16200-TOM
2206/16200
MISCALIBRATED
2206PS-16200-OMC
FAILURE OF CONTACTS
TO CLOSE ON P.S.
2206/16200
2206PS-16200-XFC

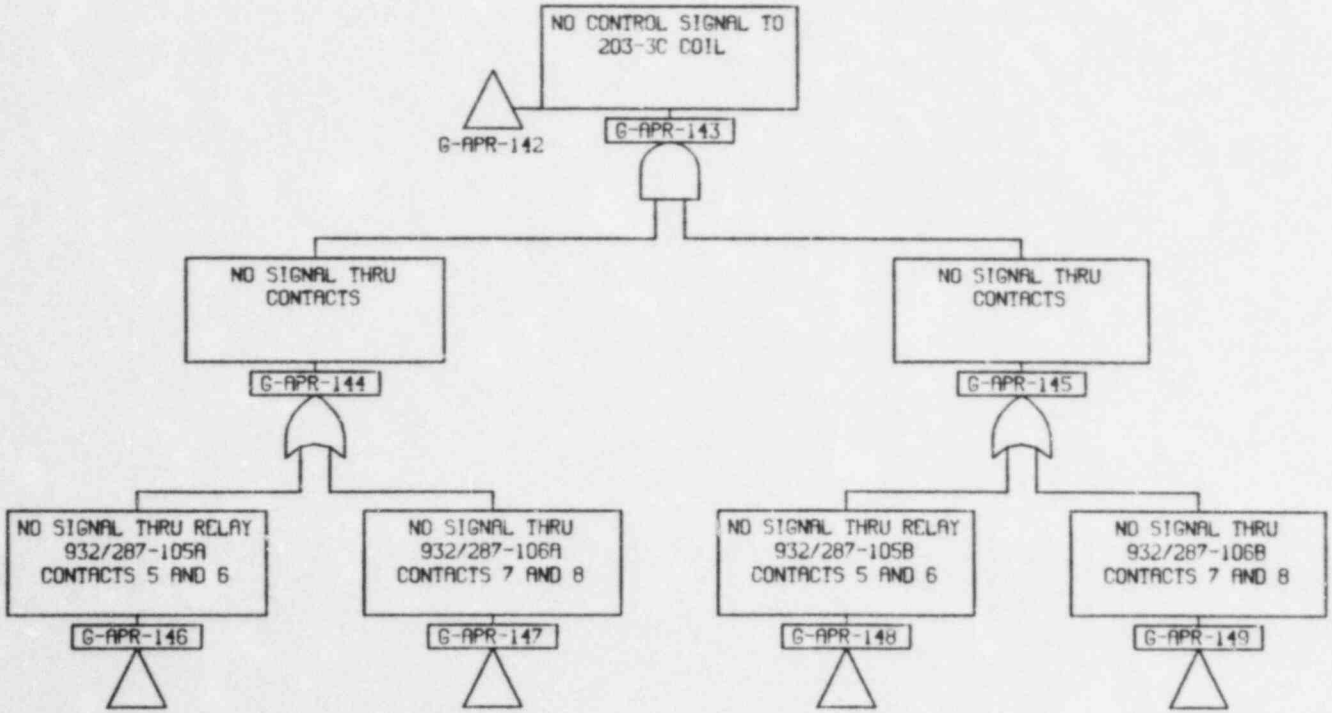

NO SIGNAL THRU RESET SWITCH 903/287-303
G-APR-131
G-APR-133
RESET SWITCH 903/287-303 FAILS TO REMAIN DE-ENERGIZED
903287-303-FRD
1
RESET SWITCH 903/287-303 CONTACTS 13 AND 14 FAIL TO REMAIN CLOSED
903287-303-DRC
OPERATOR RESETS APR DRYWELL PRESSURE SIGNAL
903287-303-OER
4

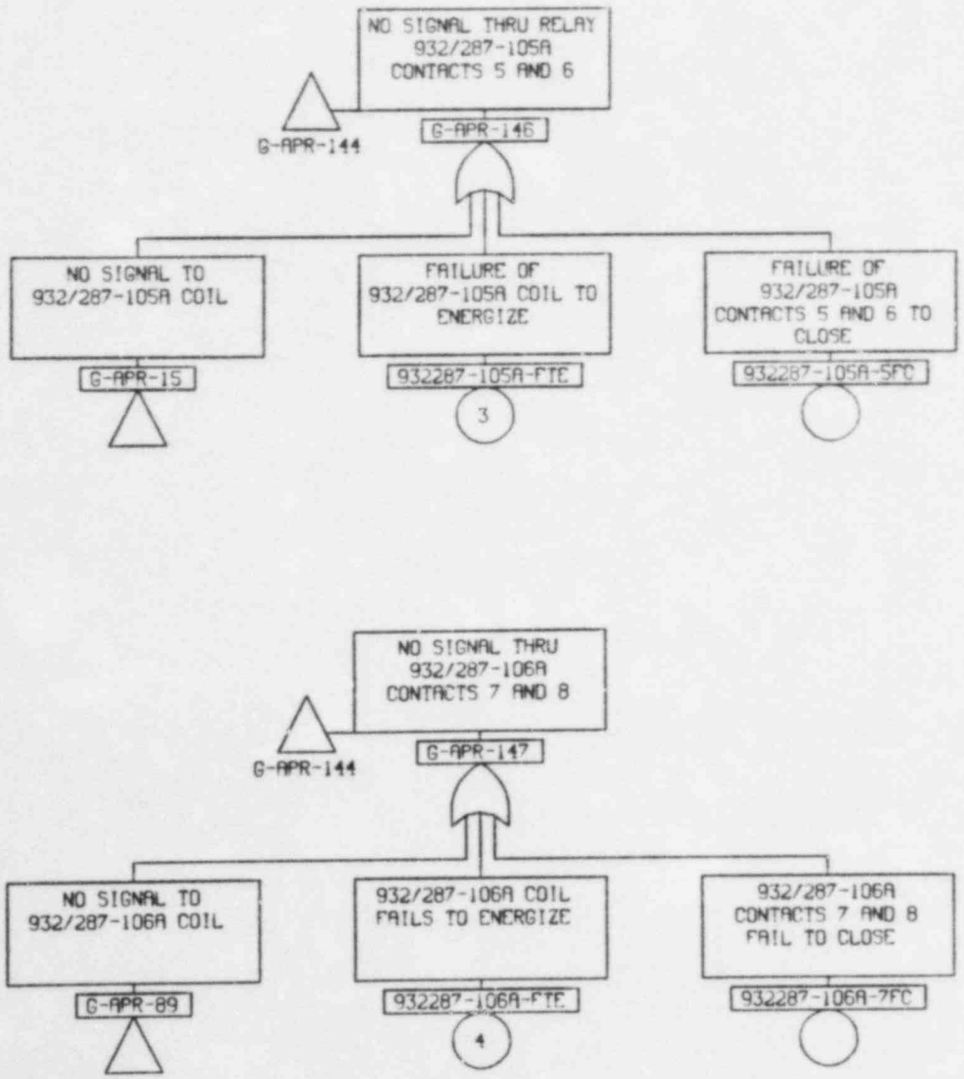

932/287-1108 COIL FAILS TO ENERGIZE
932287-1108-FTE
NO SIGNAL THRU 932/287-1108 CONTACTS 1 AND 7
G-APR-134
932/287-1108 CONTACTS 1 AND 7 FAIL TO CLOSE
932287-1108-1FC
G-APR-128
NO SIGNAL TO 932/287-1108 COIL
G-APR-135
NO SIGNAL THRU 932/1430-131A CONTACTS 2 AND 8
G-APR-136
L/O POWER SOURCE TO COIL OF 932/287-1108
G-APR-66-1108

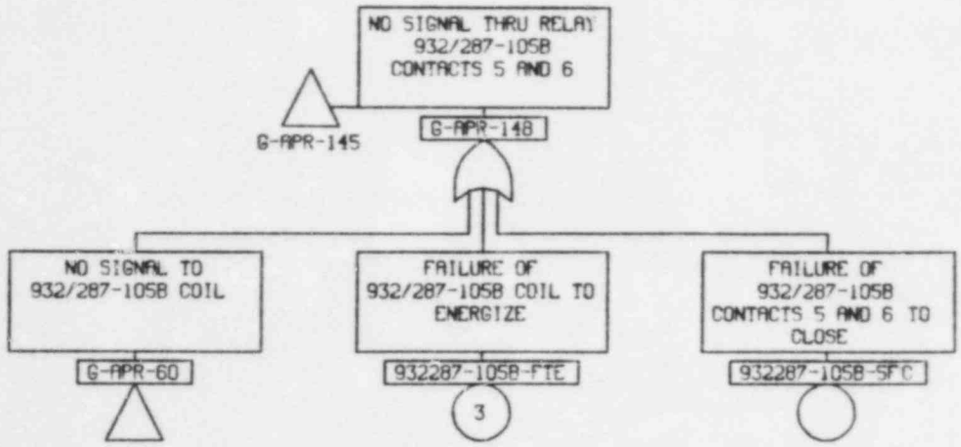

NO SIGNAL THRU 932/1430-131A CONTACTS 2 AND 8
G-APR-135
G-APR-136
NO SIGNAL THRU CONTACTS
G-APR-137
NO SIGNAL THRU 932/1530-145 CONTACTS 2 AND 8
G-APR-138
NO SIGNAL THRU 933/1430-131A CONTACTS 1 AND 7
G-APR-139
NO SIGNAL THRU 933/1530-245 CONTACTS 1 AND 7
G-APR-140
NO SIGNAL TO 932/1430-131A COIL
G-APR-102
932/1430-131A COIL FAILS TO ENERGIZE
932/1430-131A-FTE
2
932/1430-131A CONTACTS 2 AND 8 FAIL TO CLOSE
932/1430-131A-FTC
NO SIGNAL TO 933/1530-245 COIL
G-APR-117
933/1530-245 COIL FAILS TO ENERGIZE
933/1530-245-FTE
2
933/1530-245 CONTACTS 1 AND 7 FAIL TO CLOSE

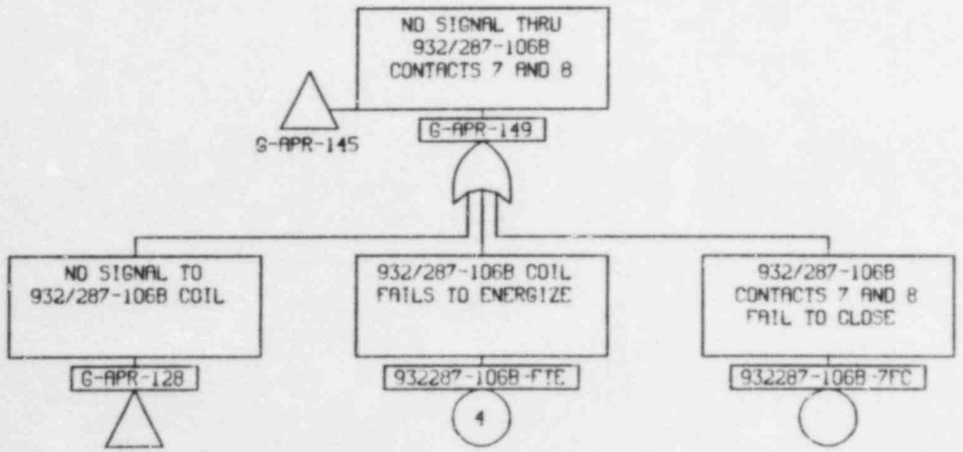

NO SIGNAL THRU
932/1530-145
CONTACTS 2 AND 8
G-APR-136
G-APR-138
NO SIGNAL TO
932/1530-145 COIL
G-APR-105
932/1530-145 COIL
FAILS TO ENERGIZE
9321530-145-FTE
2
932/1530-145
CONTACTS 2 AND 8
FAIL TO CLOSE
9321530-145-FTC
NO SIGNAL THRU
933/1430-131B
CONTACTS 1 AND 7
G-APR-136
G-APR-139
NO SIGNAL TO
933/1430-131B COIL
G-APR-114
933/1430-131B COIL
FAILS TO ENERGIZE
9331430-131B-FTE
2
933/1430-131B
CONTACTS 1 AND 7
FAIL TO CLOSE
9331430-131B-FTC

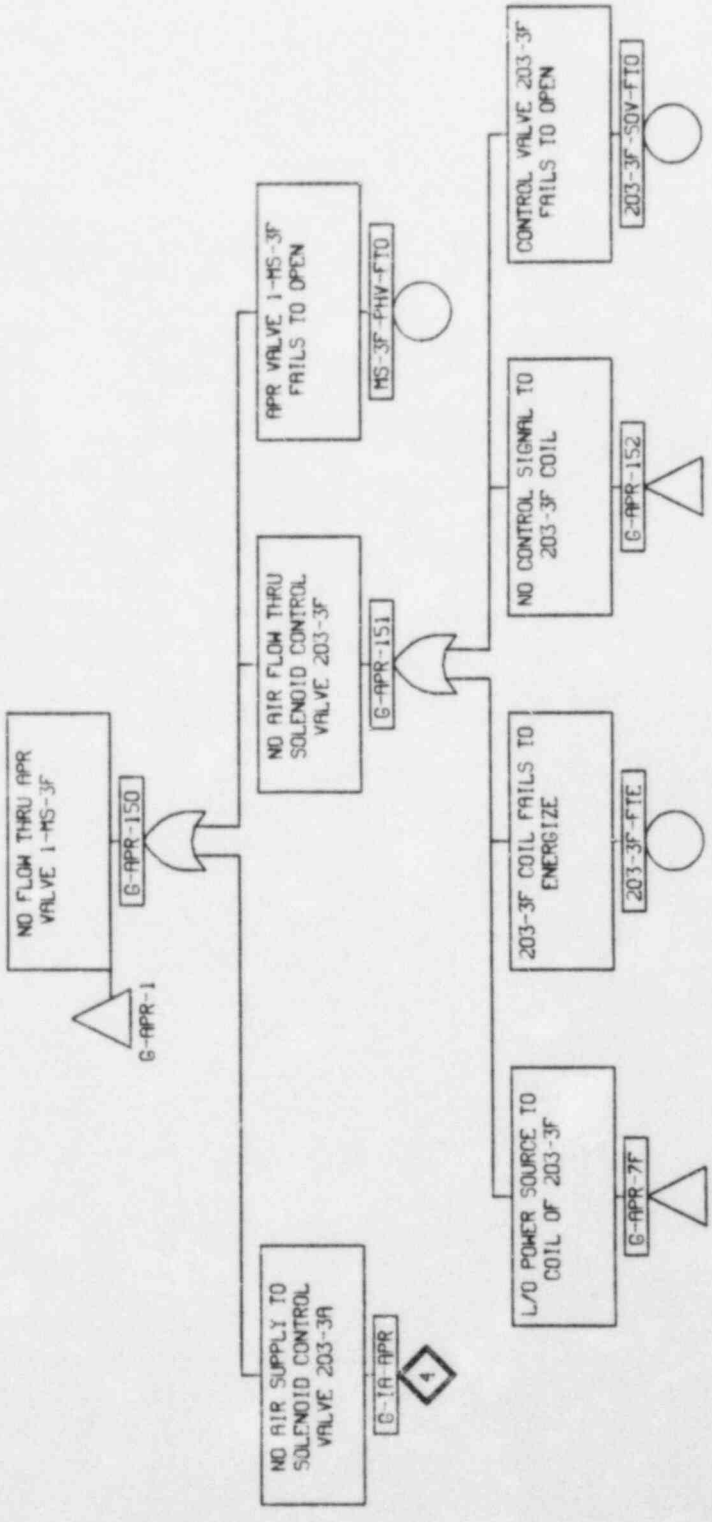

NO FLOW THRU APR VALVE 1-MS-3C
G-APR-141
G-APR-1
NO AIR FLOW THRU SOLENOID CONTROL VALVE 203-3C
G-APR-142
APR VALVE 1-MS-3C FAILS TO OPEN
MS-3C-PHV-FTO
NO AIR SUPPLY TO SOLENOID CONTROL VALVE 203-3A
G-IA-APR
NO CONTROL SIGNAL TO 203-3C COIL
G-APR-143
CONTROL VALVE 203-3C FAILS TO OPEN
203-3C-SOV-FTO
203-3C COIL FAILS TO ENERGIZE
203-3C-FTE
L/O POWER SOURCE TO COIL OF 203-3C
G-APR-7C

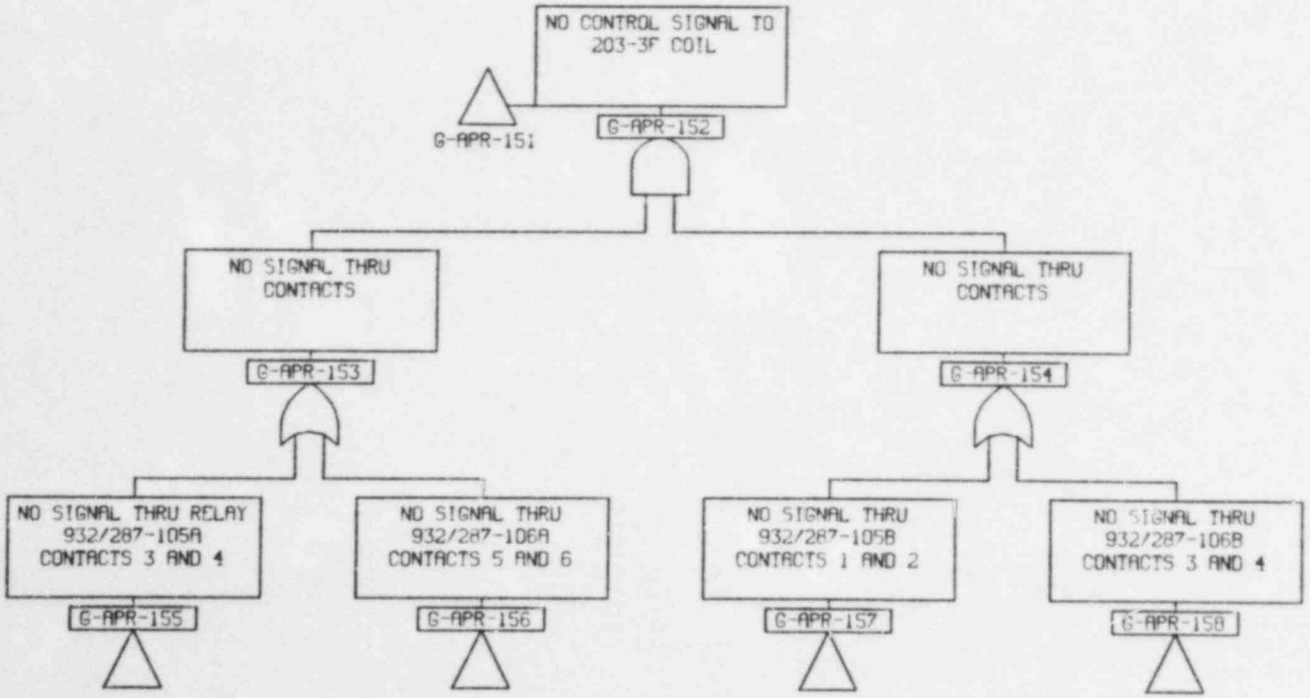

NO CONTROL SIGNAL TO
203-3C COIL
G-APR-142
G-APR-143
NO SIGNAL THRU
CONTACTS
NO SIGNAL THRU
CONTACTS
G-APR-144
G-APR-145
NO SIGNAL THRU RELAY
932/287-105A
CONTACTS 5 AND 6
NO SIGNAL THRU
932/287-106A
CONTACTS 7 AND 8
NO SIGNAL THRU RELAY
932/287-105B
CONTACTS 5 AND 6
NO SIGNAL THRU
932/287-106B
CONTACTS 7 AND 8
G-APR-146
G-APR-147
G-APR-148
G-APR-149

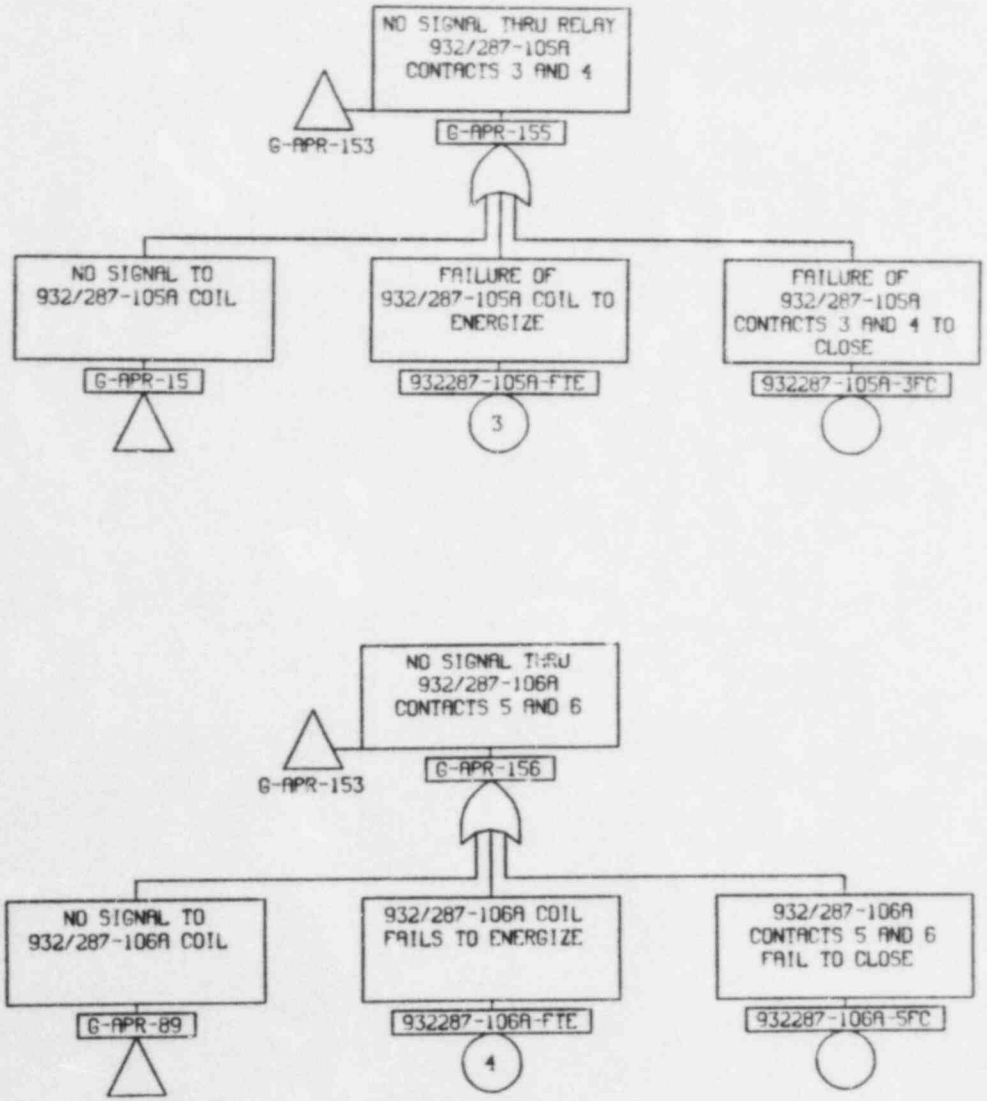

NO SIGNAL THRU RELAY
932/287-105A
CONTACTS 5 AND 6
G-APR-144
G-APR-146
NO SIGNAL TO
932/287-105A COIL
FAILURE OF
932/287-105A COIL TO
ENERGIZE
FAILURE OF
932/287-105A
CONTACTS 5 AND 6 TO
CLOSE
G-APR-15
932287-105A-FTE
932287-105A-SFC
3
NO SIGNAL THRU
932/287-106A
CONTACTS 7 AND 8
G-APR-144
G-APR-147
NO SIGNAL TO
932/287-106A COIL
932/287-106A COIL
FAILS TO ENERGIZE
932/287-106A
CONTACTS 7 AND 8
FAIL TO CLOSE
G-APR-89
932287-106A-FTE
932287-106A-7FC
4

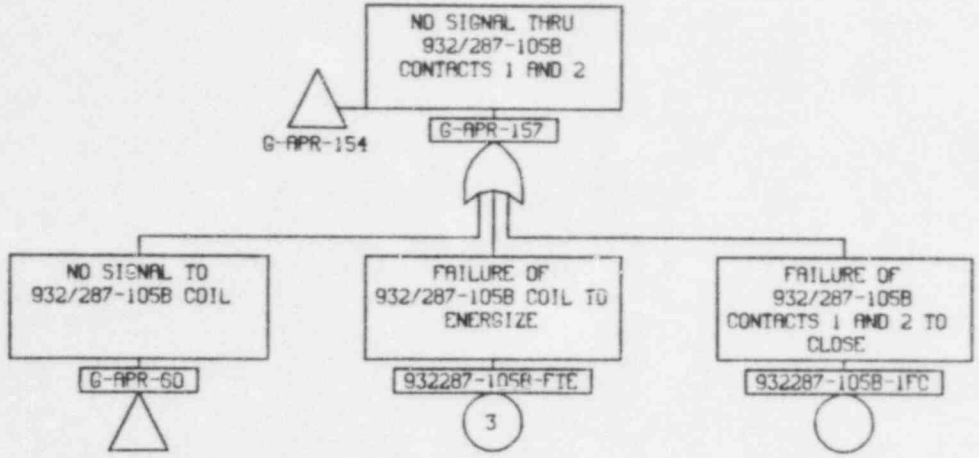

NO SIGNAL THRU RELAY
932/287-105B
CONTACTS 5 AND 6
G-APR-145
G-APR-148
NO SIGNAL TO
932/287-105B COIL
FAILURE OF
932/287-105B COIL TO
ENERGIZE
FAILURE OF
932/287-105B
CONTACTS 5 AND 6 TO
CLOSE
G-APR-60
932287-105B-FTE
932287-105B-SFC
3

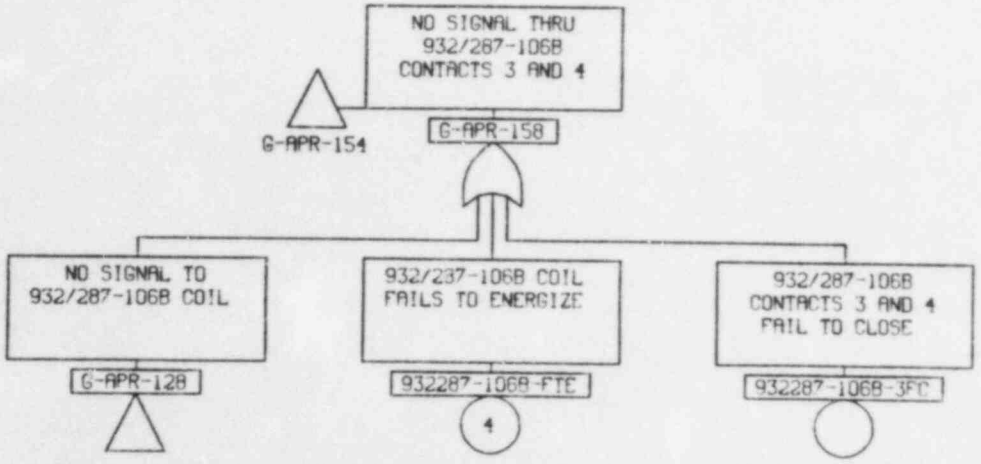

NO SIGNAL THRU
932/287-106B
CONTACTS 7 AND 8
G-APR-145
G-APR-149
NO SIGNAL TO
932/287-106B COIL
932/287-106B COIL
FAILS TO ENERGIZE
932/287-106B
CONTACTS 7 AND 8
FAIL TO CLOSE
G-APR-128
932287-106B-FTE
932287-106B-7FC
4

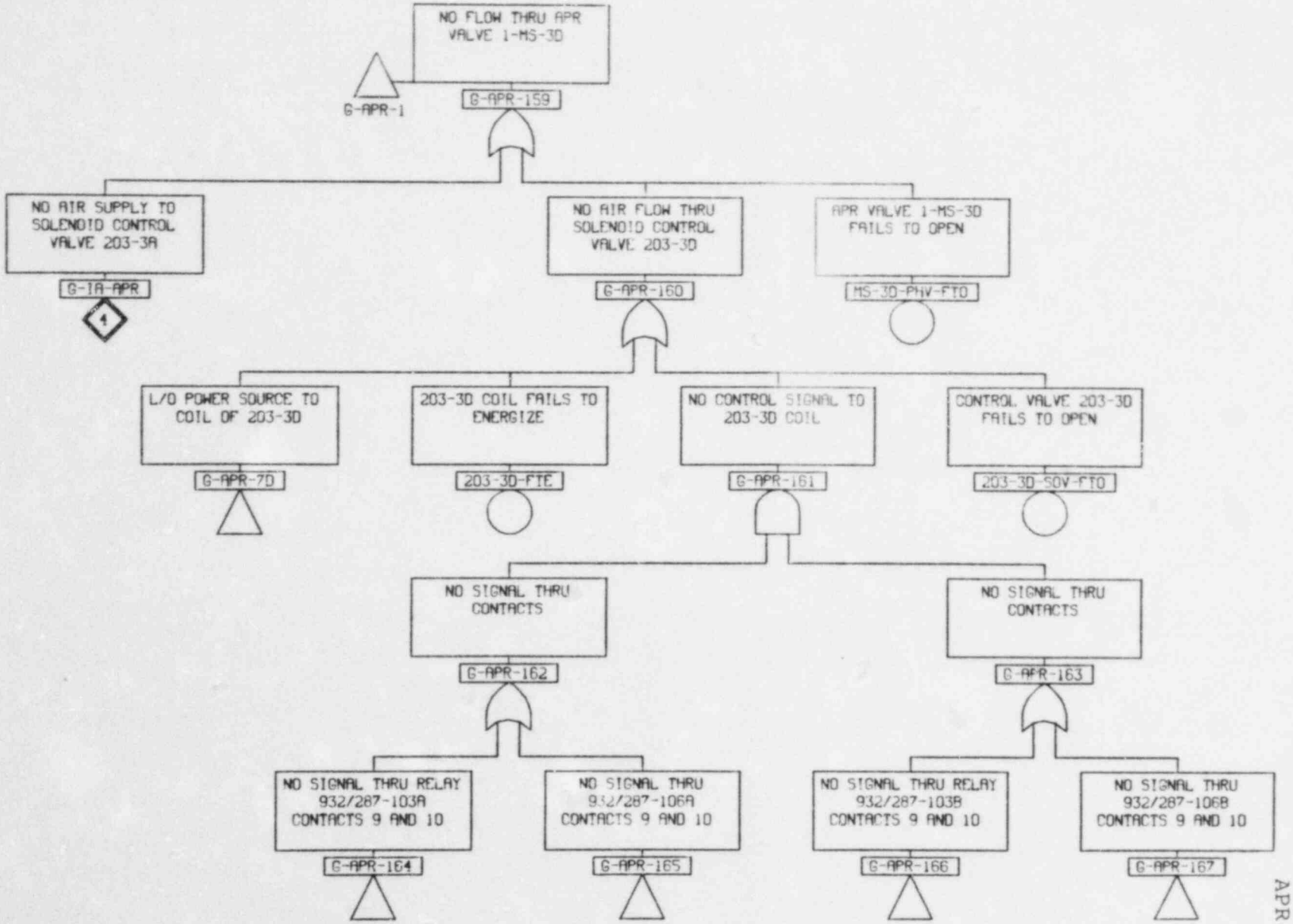

NO FLOW THRU APR VALVE 1-MS-3F
G-APR-150
G-APR-1
NO AIR FLOW THRU SOLENOID CONTROL VALVE 203-3F
G-APR-151
APR VALVE 1-MS-3F FAILS TO OPEN
MS-3F-FHV-FTO
NO CONTROL SIGNAL TO 203-3F COIL
G-APR-152
CONTROL VALVE 203-3F FAILS TO OPEN
203-3F-SOV-FTO
203-3F COIL FAILS TO ENERGIZE
203-3F-FTE
L/O POWER SOURCE TO COIL OF 203-3F
G-APR-7F
NO AIR SUPPLY TO SOLENOID CONTROL VALVE 203-3A
G-IA-APR
4

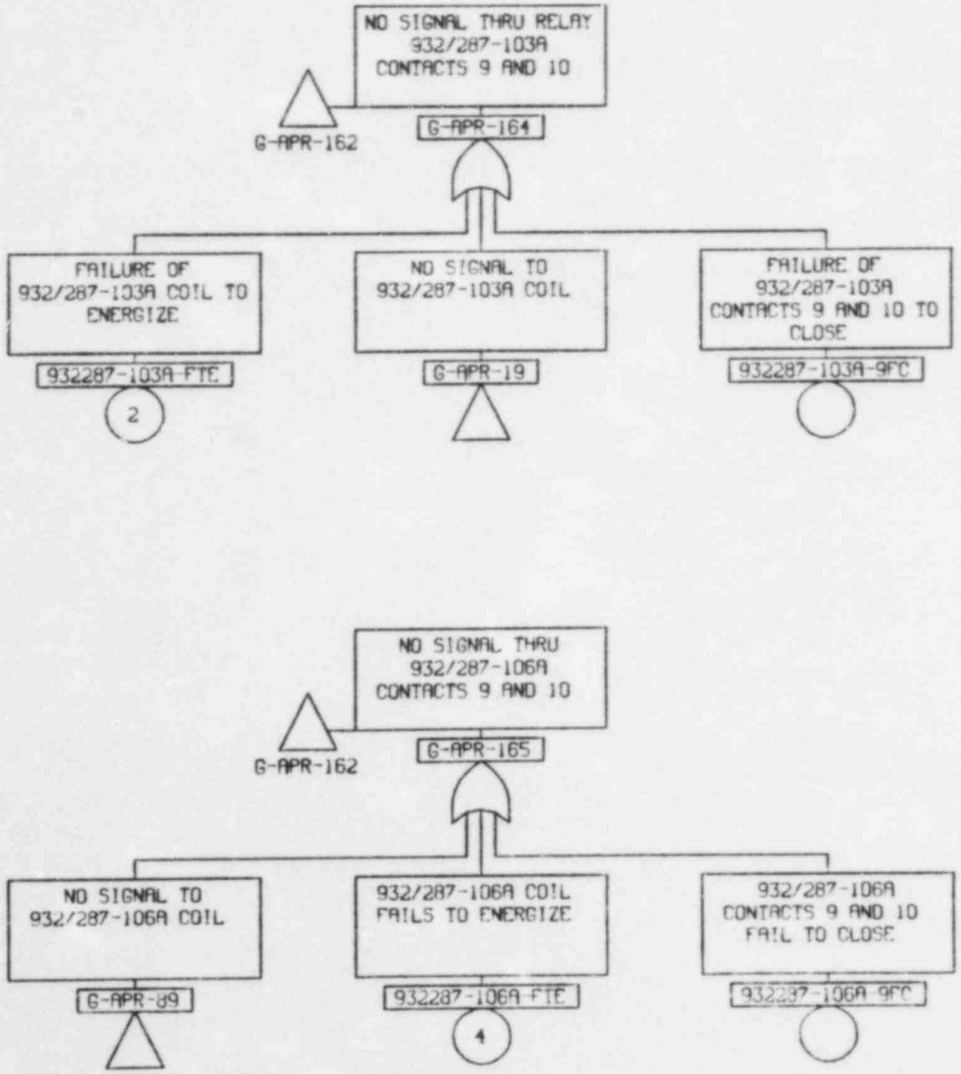

NO CONTROL SIGNAL TO 203-3F COIL
G-APR-151
G-APR-152
NO SIGNAL THRU CONTACTS
G-APR-153
NO SIGNAL THRU CONTACTS
G-APR-154
NO SIGNAL THRU RELAY 932/287-105A CONTACTS 3 AND 4
G-APR-155
NO SIGNAL THRU 932/287-106A CONTACTS 5 AND 6
G-APR-156
NO SIGNAL THRU 932/287-105B CONTACTS 1 AND 2
G-APR-157
NO SIGNAL THRU 932/287-106B CONTACTS 3 AND 4
G-APR-158

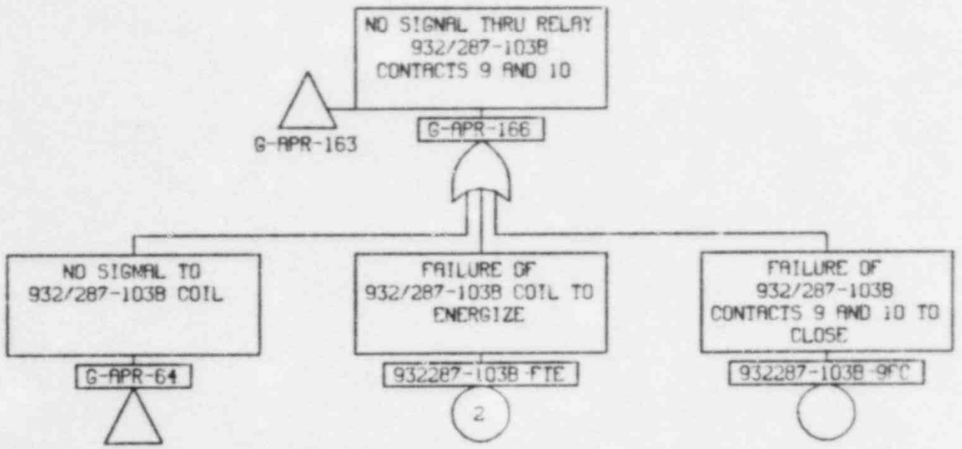

NO SIGNAL THRU RELAY
932/287-105A
CONTACTS 3 AND 4
G-APR-153
G-APR-155
NO SIGNAL TO
932/287-105A COIL
G-APR-15
FAILURE OF
932/287-105A COIL TO
ENERGIZE
932287-105A-FTE
3
FAILURE OF
932/287-105A
CONTACTS 3 AND 4 TO
CLOSE
932287-105A-3FC
NO SIGNAL THRU
932/287-106A
CONTACTS 5 AND 6
G-APR-153
G-APR-156
NO SIGNAL TO
932/287-106A COIL
G-APR-89
932/287-106A COIL
FAILS TO ENERGIZE
932287-106A-FTE
4
932/287-106A
CONTACTS 5 AND 6
FAIL TO CLOSE
932287-106A-5FC

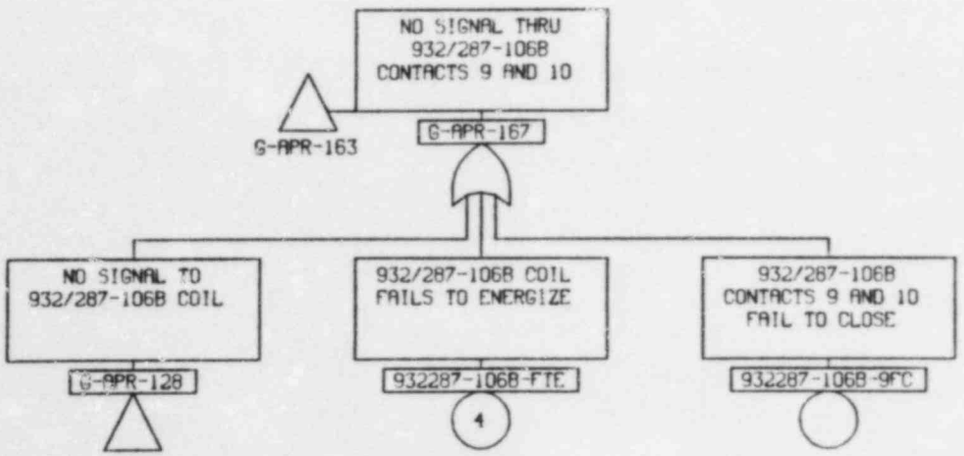

NO SIGNAL THRU
932/287-105B
CONTACTS 1 AND 2
G-APR-154
G-APR-157
NO SIGNAL TO
932/287-105B COIL
FAILURE OF
932/287-105B COIL TO
ENERGIZE
FAILURE OF
932/287-105B
CONTACTS 1 AND 2 TO
CLOSE
G-APR-60
932287-105B-FTE
932287-105B-1FC
3


NO SIGNAL THRU
932/287-106B
CONTACTS 3 AND 4
G-APR-154
G-APR-158
NO SIGNAL TO
932/287-106B COIL
932/237-106B COIL
FAILS TO ENERGIZE
932/287-106B
CONTACTS 3 AND 4
FAIL TO CLOSE
G-APR-128
932287-106B-FTE
932287-106B-3FC
4


NO FLOW THRU APR VALVE 1-MS-3D
G-APR-159
G-APR-1
NO AIR SUPPLY TO SOLENOID CONTROL VALVE 203-3A
G-1A-APR
NO AIR FLOW THRU SOLENOID CONTROL VALVE 203-3D
G-APR-160
APR VALVE 1-MS-3D FAILS TO OPEN
MS-3D-PHV-FTO
L/O POWER SOURCE TO COIL OF 203-3D
G-APR-7D
203-3D COIL FAILS TO ENERGIZE
203-3D-FTE
NO CONTROL SIGNAL TO 203-3D COIL
G-APR-161
CONTROL VALVE 203-3D FAILS TO OPEN
203-3D-SOV-FTO
NO SIGNAL THRU CONTACTS
G-APR-162
NO SIGNAL THRU CONTACTS
G-APR-163
NO SIGNAL THRU RELAY 932/287-103A CONTACTS 9 AND 10
G-APR-164
NO SIGNAL THRU 932/287-106A CONTACTS 9 AND 10
G-APR-165
NO SIGNAL THRU RELAY 932/287-103B CONTACTS 9 AND 10
G-APR-166
NO SIGNAL THRU 932/287-106B CONTACTS 9 AND 10
G-APR-167


NO SIGNAL THRU RELAY
932/287-103A
CONTACTS 9 AND 10
G-APR-164
G-APR-162
FAILURE OF
932/287-103A COIL TO
ENERGIZE
932287-103A-FTE
2
NO SIGNAL TO
932/287-103A COIL
G-APR-19
FAILURE OF
932/287-103A
CONTACTS 9 AND 10 TO
CLOSE
932287-103A-9FC
NO SIGNAL THRU
932/287-106A
CONTACTS 9 AND 10
G-APR-165
G-APR-162
NO SIGNAL TO
932/287-106A COIL
G-APR-89
932/287-106A COIL
FAILS TO ENERGIZE
932287-106A-FTE
4
932/287-106A
CONTACTS 9 AND 10
FAIL TO CLOSE
932287-106A-9FC


NO SIGNAL THRU RELAY
932/287-103B
CONTACTS 9 AND 10
G-APR-163
G-APR-166
NO SIGNAL TO
932/287-103B COIL
FAILURE OF
932/287-103B COIL TO
ENERGIZE
FAILURE OF
932/287-103B
CONTACTS 9 AND 10 TO
CLOSE
G-APR-64
932287-103B-FTE
932287-103B-9FC
2


NO SIGNAL THRU
932/287-106B
CONTACTS 9 AND 10
G-APR-163
G-APR-167
NO SIGNAL TO
932/287-106B COIL
932/287-106B COIL
FAILS TO ENERGIZE
932/287-106B
CONTACTS 9 AND 10
FAIL TO CLOSE
G-APR-128
932287-106B-FTE
932287-106B-9FC
4

# APPENDIX B.8

# SHUTDOWN COOLING SYSTEM

## B.8.1 Shutdown Cooling System Description

### B.8.1.1 Purpose

The purpose of the shutdown cooling system is to take over cooling of the reactor water when temperature and pressure in the vessel reach the point at which the main condenser can no longer be used as a heat sink following reactor shutdown.

### B.8.1.2 Description and Configuration

As shown in Figure B.8-1, hot reactor water enters the shutdown cooling system from the suction line of the "A" recirculation pump. After passing through a header the water is directed into two one-half capacity cooling loops, each containing a pump, heat exchanger and two manually actuated motor operated isolation valves, along with the necessary instrumentation. Cooled water is then returned to the reactor vessel from the "B" recirculation loop via the "B" LPCI line.

The system is intended for operation at reactor pressures of less than 120 psig (350°F). However, the system is designed for 1250 psig operation to prevent system rupture in the event that the isolation valves are opened while the reactor is pressurized.

The shutdown cooling system has a redundant capability after 24 hours of operation and one of the loops may be valved off. If the loss of a loop should occur before this time the reactor will still be cooled although not as quickly.

### B.8.1.3 System Interfaces

System interfaces for the shutdown cooling system are shown in Table B.8-1.

### B.8.1.4 Instrumentation and Control

The cooling water low pressure section is provided with a number of relief valves and instrumentation to protect against over-pressurization. The isolation valves are interlocked so that only one valve can be exercised at a time when reactor pressure is above 120 psig. Pump permissive instrumentation prevents the pumps from operating unless the suction pressure is above four psig and the reactor water temperature below 350°F.

While operating to cool the reactor after shutdown, the shutdown cooling system is automatically isolated by closure of the isolation valves on a signal from the reactor protection system. Low reactor water level causes isolation of the reactor pressure vessel and includes closure of the shutdown cooling system isolation valves. Area temperature detectors are installed at appropriate locations to facilitate automatic system isolation and to initiate an alarm in the control room in case of a line break. Water samples are taken and analyzed for tube leaks from a sample point on the heat exchanger cooling water outlet.

The system control logic is shown in Figure B.8-2 and the sensors used are listed in Table B.8-2.

B.8.1.5 Testing

There is one major test of the shutdown cooling system which is performed every time the reactor is in cold shutdown, but not to exceed one test per month.

SP 623.20 Reactor Shutdown Cooling System Operational Readiness Test

1) Verifies and records that each pump has proper lubricant level

2) measures and records pump suction pressure

3) requires cycling the following isolation valves and recording their stroke times:

   a) pumps A and B suction side isolation valves SD-2A and SD-2B

   b) pumps A and B discharge side isolation valves SD-4A and SD-4B

   c) suction line isolation valve SD-1 and discharge line isolation valve SD-5

4) verifies that each pump discharge check valve, SD-3A and SD-3B, moves away from its seat when the system is placed in operation as per instruction OP 305.

5) requires throttling both pump discharge valves SD-4A and SD-4B to obtain 150 psig discharge pressure, and recording suction pressure along with dicharge pressure for each pump while the system is operating.

B.8.1.6 Maintenance

There is no routinely scheduled maintenance for this system. Maintenance is performed as needed, based on results of test SP 623.20.

B.8.1.7 Technical Specifications

The technical specifications limiting condition for operation states that all isolation valves in the shutdown cooling system be operable during power operation of the reactor. The only exception to this is in the event that one isolation valve becomes inoperable, reactor power operation is allowed providing another valve in the same line is in the isolated mode. Otherwise, the reactor must be in cold shutdown within 24 hours if the isolation valve operable conditions cannot be met.

The surveillance requirements state that all six isolation valves in the shutdown cooling system be tested at least once per operating cycle for simulated automatic initiation and closure times. These requirements further state that isolation valves SD-1, SD-2A, SD-2B, SD-4A, SD-4B and SD-5 all shut within 48 seconds or be declared inoperable.

B.8.1.8 Operation

The shutdown cooling system is normally placed into operation once the reactor water has been cooled to about 280°F by either the main or isolation condenser. Before placing the system in operation, it must be filled from the condensate transfer system through connections at the suction side of each shutdown cooling pump A and B.

During normal cooldown/decay heat removal, hot reactor water is taken from the suction line of "A" recirculation pump, through both shut down cooling pumps, to the heat exchangers, and back to the "B" recirculation loop via the "B" LPCI line. The cooldown can be controlled by valving out one of the shutdown cooling loops, throttling the shutdown cooling flow through the heat exchangers, or throttling the RBCCW flow through the heat exchangers with valve RC-39 (refer to Figure B.8-1).

During refuel operations or casualty to the fuel pool cooling system, the shutdown cooling system can be cross-connected at the suction of "A" shutdown cooling pump, and at the outlet of "A" shutdown cooling heat exchanger to aid in cooling the spent fuel pool.

The shutdown cooling system is capable of cooling reactor water down to 125°F within 24 hours after reactor shutdown, and maintaining it at this temperature by removing fission product decay heat absorbed by the reactor water.

All of the preceding actions (i.e., placing the system in operation) are manually performed by the plant operator, however, there are several automatic functions.

1) The shutdown cooling system will automatically isolate from the reactor vessel when a low reactor water level signal is received.

2) If recirculation loop temperature is greater than 350°F, the system isolation valves will not open and if the temperature reaches 350°F during operation, the system will isolate.

3) The shutdown cooling pumps cannot be started unless suction pressure is greater than 4 psig and suction temperature less than 350°F.

B.8.2 Analysis

B.8.2.1 Success/Failure Criteria

Successful operation of the shutdown cooling system requires the ability to remove decay heat from the reactor to prevent repressurization following shutdown. In normal operation, both loops of the system are used for cooling reactor water down to 125°F within 24 hours after shutdown. However, cooldown can be achieved over a longer period of time with just one cooling loop. Thus, successful operation depends on at least one of the cooling loops being operational when shutdown heat removal is required.

System failure occurs whenever both cooling loops are unable to provide adequate decay heat removal from the reactor water. This could be due to either equipment failure or human error in lining up the system since it is manually actuated.

B.8.2.2 Assumptions

The following assumptions were made in this system analysis:

1) No flow diversion is assumed via the crosstie between cooling pump A and B suction lines and the test and vent lines since all of their diameters are significantly smaller than the piping in the shutdown cooling lines.

2) No flow diversion from the two heat exchangers via the cooling pump recirculation lines was assumed. Less than ten percent of the flow can be diverted from each loop.

Table B.8-1

Shutdown Cooling System Interfaces Failure Modes and Effects

| Front Line System | | | Support System | | | Failure Mode | Failure Effect |
|---|---|---|---|---|---|---|---|
| System | Div. | Comp. | System | Div. | Comp. | | |
| SDCS | | System Inlet Valve SD-1 | AC Pwr | Diesel | Bus F-3 | Low or zero voltage | Valve fails as is (N.C.), no flow from RCS to SDCS |
| | | System Outlet Valve SD-5 | AC Pwr | G/T | Bus E-3 | | |
| SDCS | A | H.X. Inlet Isol. valve SD-2A | DC Pwr | A | Bus 101-AB-2 | Low or zero voltage | Valve fails as is (N.C.), no flow to heat exchanger "A" |
| | B | H.X. Inlet Isol. valve SD-2B | DC Pwr | B | Bus 101-AB-1 | | Valve fails as is (N.C.), no flow to heat exchanger "B" |
| SDCS | A | Pump-A | AC Pwr | | Bus 12E | Low or zero voltage | No flow to loop "A" |
| | B | Pump-B | AC Pwr | | Bus 12F | | No flow to loop "B" |
| SDCS | A | Pump-A | DC Pwr | | Bus 101-B | Low or zero voltage | Precludes manual start; no effect on running pump |
| | B | Pump-B | DC Pwr | | Bus 101-A | | |

Table B.8-1 (Cont'd)

Shutdown Cooling System Interfaces Failure Modes and Effects

| Front Line System | | | Support System | | | Failure Mode | Failure Effect |
|---|---|---|---|---|---|---|---|
| System | Div. | Comp. | System | Div. | Comp. | | |
| SDCS | A | Heat Exchanger | RBCCW | A | Ht. Ex. A secondary side | No RBCCW to heat exchanger | No cooling from RBCCW system in respective loop |
| | B | Heat Exchanger | RBCCW | B | Ht. Ex. B secondary side | | |
| SDCS | A | H.X. Outlet Isol. valve 1-SD-4A | DC Pwr | A | Bus 101-AB-2 | Low or zero voltage | Valve fails as is (N.C.), no flow from SDCS to RCS in respective loop |
| | B | H.X. Outlet Isol. valve 1-SD-4B | DC Pwr | B | Bus 101-AB-1 | | |

Table B.8-2

Shutdown Cooling System Instrumentation

| Sensor | Function | Setpoint |
|---|---|---|
| 2205/263-57A<br>2205/263-57B<br>2206/263-58A<br>2206/263-58B | Low reactor water level switches (isolates shut-down cooling system from reactor on low Rx water level) | 127" above top of active fuel |
| 918/260-12 | High reactor temperature switch (isolates shut-down cooling system on high reactor temperature) | 350°F |

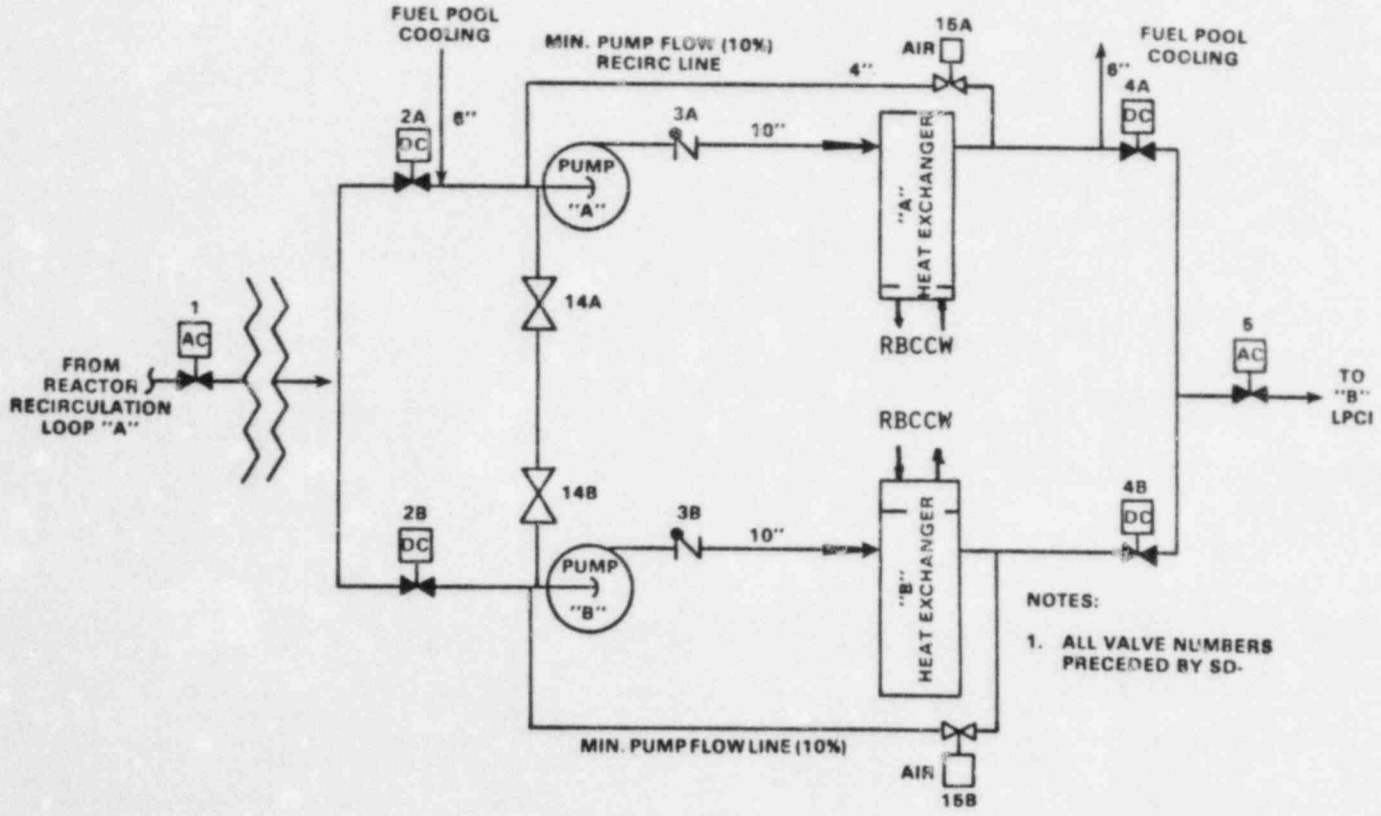



FIGURE B.8-1. SHUTDOWN COOLING SYSTEM DIAGRAM

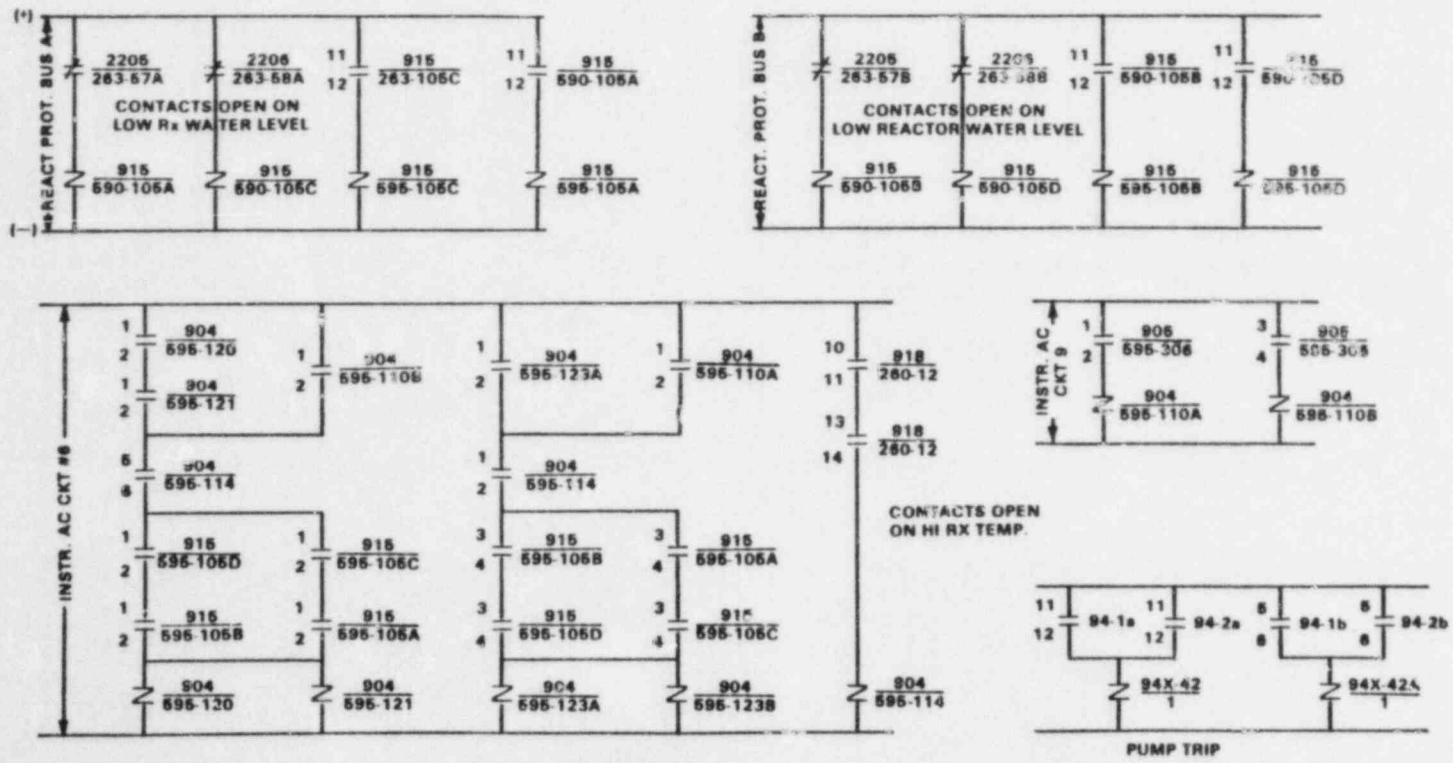



**FIGURE B.8-2. SHUTDOWN COOLING SYSTEM CONTROL WIRING SCHEMATICS (SHEET 1 OF 2)**

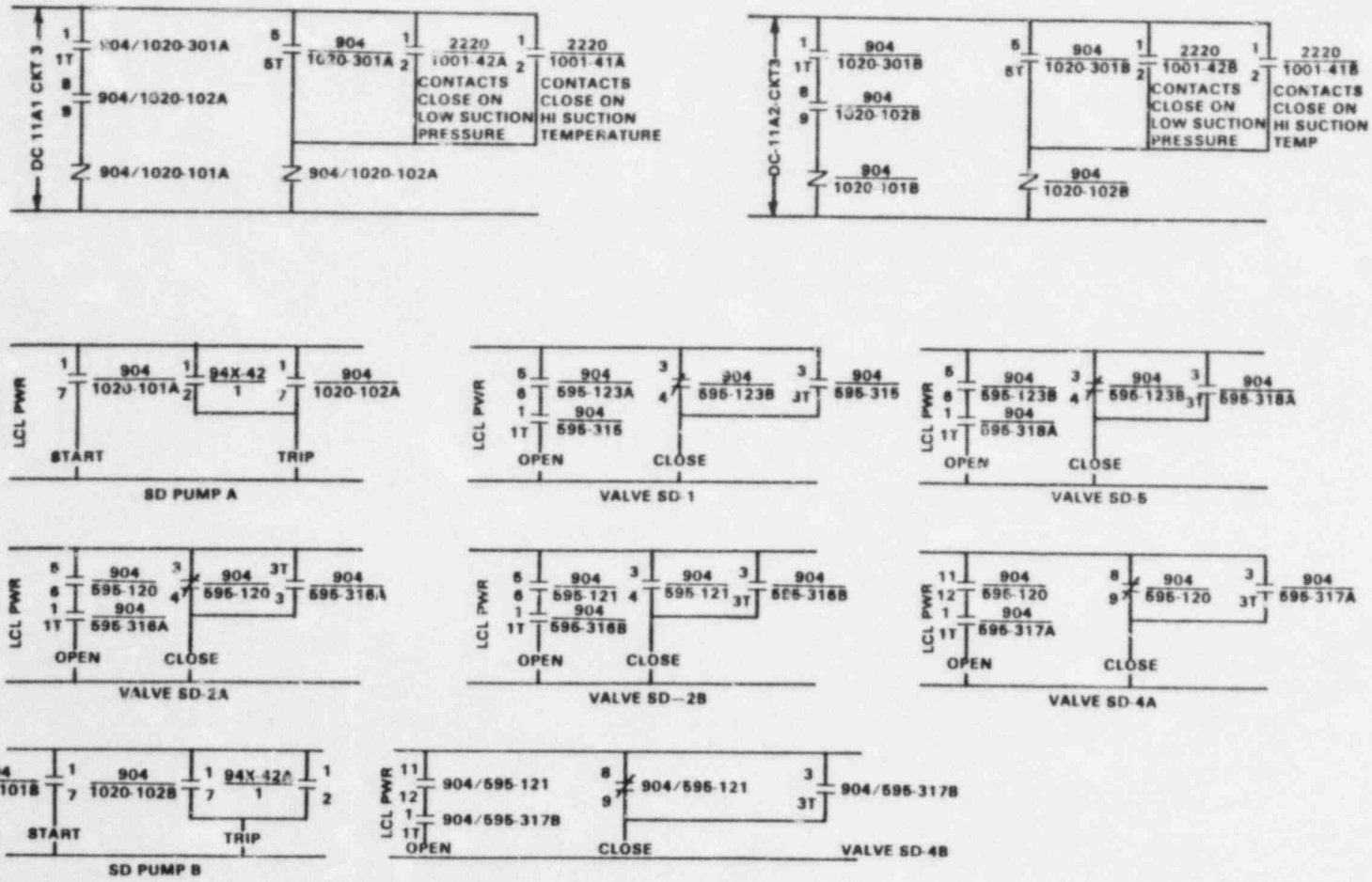



**FIGURE B.8-2. SHUTDOWN COOLING SYSTEM CONTROL WIRING SCHEMATICS (SHEET 2 OF 2)**

SHUTDOWN COOLING SYSTEM

FAULT TREE AND FAULT SUMMARY SHEETS

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| SD-OFA | Operator fails to initiate shutdown cooling system | | | 1E-2 |
| LP-125B-XV-FRO<br>LP-12B-XV-FRO | Manual valve fails to remain open | 12000 hrs (detected during refueling outages) | The shutdown cooling system is used during each refueling outage | 3E-4 |
| LP-125B-XV-TMC<br>LP-12B-XV-TMC | Manual valve closed to allow test or maintenance | 12000 hrs (detected during refueling outages) | The shutdown cooling system is used during each refueling outage | 3.6E-5 |
| LP-11B-CKV-FTO<br>SD-3A-CKV-FTO<br>SD-3B-CKV-FTO | Check valve fails to open | 12000 hrs (detected during refueling outages) | The shutdown cooling system is used during each refueling outage | 1.67E-3 |
| LP-11B-CKV-TMC<br>SD-3A-CKV-TMC<br>SD-3B-CKV-TMC | Check valve closed for test or maint. | 12000 hrs (detected during refueling outages) | failure detected during system use in each refueling outage | 3.7E-5 |
| SD-5-MOV-FTO<br>SD-4A-MOV-FTO<br>SD-4B-MOV-FTO<br>SD-2A-MOV-FTO<br>SD-2B-MOV-FTO<br>SD-1-MOV-FTO | MOV fails to open as a result of local electrical and mechanical faults | 12000 hrs (detected during refueling outages) | failure detected during system use during each refueling outage | 1.67E-2 |

MILLSTONE 1
SYSTEM SD
SHEET #1

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| SD-5-MOV-TMC<br>SD-4A-MOV-TMC<br>SD-4B-MOV-TMC<br>SD-2A-MOV-TMC<br>SD-2B-MOV-TMC<br>SD-1-MOV-TMC | MOV closed for test or maintenance | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 3.6E-4 |
| AC-E3-1D-FTC<br>DC-AB2-2E-FTC<br>DC-AB1-3C-FTC<br>DC-AB2-4D-FTC<br>DC-AB1-4C-FTC<br>AC-F3-11C-FTC<br>AC-12E-14A-FTC<br>AC-12F-13A-FTC | Breaker fails to close | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 3E-3 |
| 904595-123B-FTE<br>905595-110A-FTE<br>904595-110A-FTE<br>904595-318A-FTE<br>905595-306-FTE<br>904595-123A-FTE<br>904595-114-FTE<br>915595-105A-FTE<br>917595-105B-FTE<br>915590-105A-FTE<br>917590-105B-FTE<br>915595-105C-FTE<br>915595-105C-FTE<br>917595-105D-FTE<br>915590-105C-FTE<br>917590-105D-FTE | Relay coil fails to energize | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 1.67E-3 |

MILLSTONE 1
SYSTEM SD
SHEET #2

## FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 904595-110B-FTE<br>904595-120-FTE<br>904595-317A-FTE<br>905595-306-FTE<br>904595-121-FTE<br>904595-114-FTE<br>915595-105A-FTE<br>904595-317B-FTE<br>9041020-101A-FTE<br>9041020-102A-FTE<br>9041020-301A-FTE<br>9041020-101B-FTE<br>9041020-102B-FTE<br>9041020-301B-FTE<br>904595-316A-FTE<br>904595-316B-FTE<br>904595-315-FTE | Relay coil fails to energize | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 1.67E-3 |
| 904595-123B-5FC<br>904595-110A-1FC<br>904595-318A-1FC<br>905595-306-1FC<br>904595-123A-1FC<br>904595-114-1FC<br>918260-12-10FC<br>918260-12-DFC<br>915595-105A-3FC<br>917595-105B-3FC<br>915590-105A-BFC<br>917590-105B-BFC<br>915595-105C-3FC<br>917595-105D-3FC<br>915590-105C-BFC | Relay contacts fail to close | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 1.8E-3 |

MILLSTONE 1
SYSTEM SD
SHEET #3

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 917590-105D-BFC<br>904595-110B-1FC<br>904595-120-BFC<br>904595-317A-1FC<br>905595-306-3FC<br>904595-121-1FC<br>904595-114-5FC<br>915595-105A-1FC<br>917595-105B-1FC<br>915595-105C-1FC<br>917595-105D-1FC<br>904595-121-BFC<br>904595-317B-1FC<br>904595-120-1FC<br>9041020-101A-1FC<br>9041020-102A-4FC<br>9041020-301A-1FC<br>9041020-101B-1FC<br>9041020-102B-4FC<br>9041020-301B-1FC<br>904595-120-5FC<br>904595-316A-1FC<br>904595-121-5FC<br>904595-316B-1FC<br>904595-123A-5FC<br>904595-315-1FC<br>904595-123A-1FC | Relay contacts fail to close | 12000 hrs (detected during refueling outages) | Failure detected during system activation during refueling outages | |
| 904595-318A-OFC<br>904595-317A-OFC<br>904595-316A-OFC<br>904595-316B-OFC<br>904595-315-OFC<br>904595-317B-OFC | Operator fails to close switch | | | 1E-2 |

MILLSTONE 1
SYSTEM SD
SHEET #4

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 905595-306-OFR | Operator fails to reset switch | | | 1E-2 |
| 9041020-301A-OFS<br>9041020-301B-OFS | Operator fails to start pump | | | 1E-2 |
| SD-A-MDP-FSR<br>SD-B-MDP-FSR | SDC pump fails to start or run | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 3.7E-3 |
| SD-A-MDP-TOM<br>SD-B-MDP-TOM | SDC pump out of service for test or maintenance | 12000 hrs (detected during refueling outages) | failure to restore pump to operational mode following maint. detected at each refueling outage | 1.2E-3 |
| 918260-13A-LOF<br>918260-13B-LOF | Failure of MV/I converter | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 6.E-3 |
| LCL261-BA-LOF<br>LCL261-BB-LOF | Temperature sensor fails | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 6E-3 |
| 2205263-57A-XFC<br>2205263-57B-XFC<br>2206263-58A-XFC<br>2206263-58B-XFC | Level switch fails to close | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 2.3E-3 |

MILLSTONE 1
SYSTEM SD
SHEET #5

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 22201001-42A-XRO<br>22201001-42B-XRO<br>22201001-41A-XRO<br>2201001-41B-XRO | Low suction pressure switch fails to remain open | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 1.8E-4 |
| 9041020-102A-FRD<br>9041020-102B-FRD | Relay coil fails to remain deenergized | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 6E-5 |
| 9041020-102A-1RO<br>LCL94X-42-1RO<br>9041020-102B-1RO<br>LCL94X-42A-1RO | Relay contact pair fails to remain open | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 6E-4 |
| LCL94X-42-FTD<br>92694-1A-FTD<br>92694-2A-FTD<br>LCL94X-42A-FTD<br>92694-1B-FTD<br>92694-2B-FTD | Coil fails to deenergize | 12000 hrs (detected during refueling outages) | failure detected during system use during refueling outages | 1.7E-3 |
| 904XXX-301A-OCS<br>904XXX-301B-OCS | Operator places man. switch in stop mode | | | 3E-3 |
| 904XXX-301A-5RO<br>904XXX-301B-5RO | Manual switch contacts fail to remain open | 12000 hrs (detected during refueling outages) | failure detected during system use @ refueling | 1.8E-4 |
| 92694-1B-BFO<br>92694-2A-BFO<br>92694-1B-5FO<br>92694-2B-5FO | Relay contacts fail to open | 12000 hrs (detected during refueling outages) | failure detected during refueling (normal system use) | 1.8E-3 |

MILLSTONE 1
SYSTEM SD
SHEET #6

FAULT SUMMARY SHEETS

| EVENT | DESCRIPTION | DETECTION INTERVAL | COMMENTS | UNAVAILABILITY |
|---|---|---|---|---|
| 92662-1A-XFO<br>92662-1-XFO | Spurious trip signal present | 12000 hrs (detected during refueling outages) | failure detected during normal system operation | 2E-3 |
| 904XXX-301A-FTD<br>904XXX-301B-FTD | Manual switch fails to deenergize | | | 1.7E-4 |

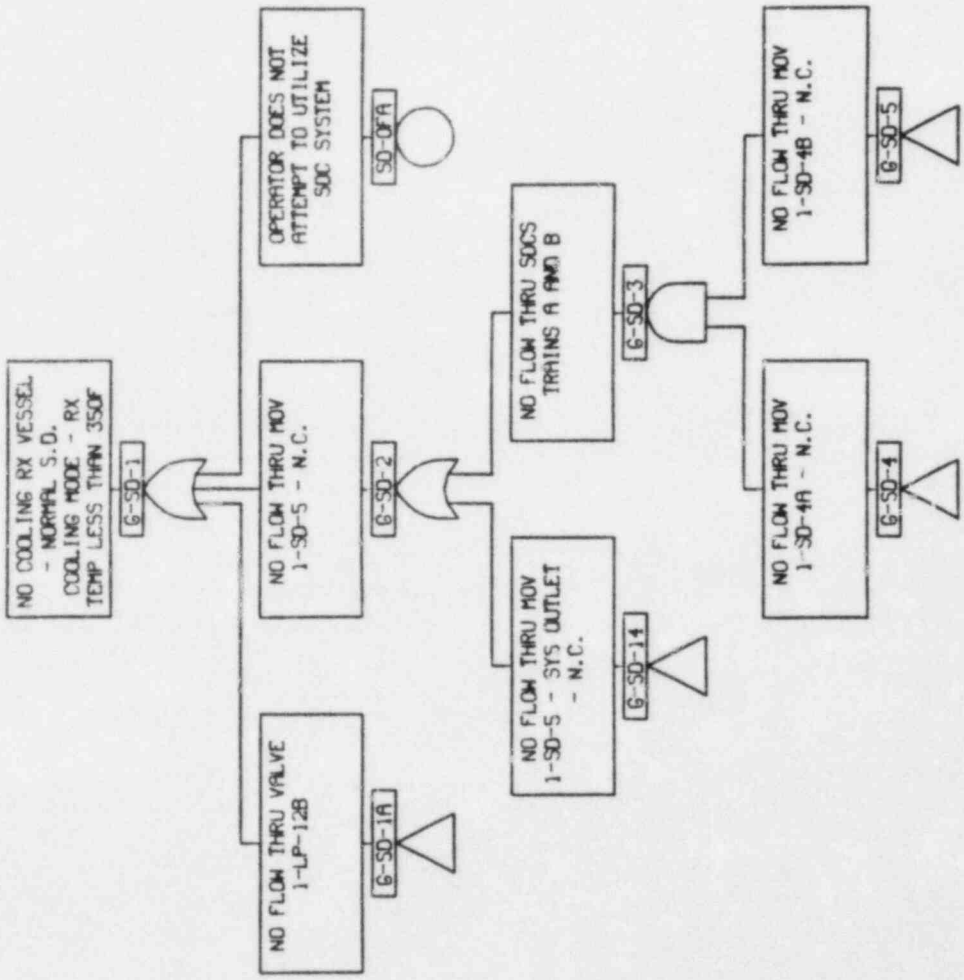
MILLSTONE 1
SYSTEM SD
SHEET #7

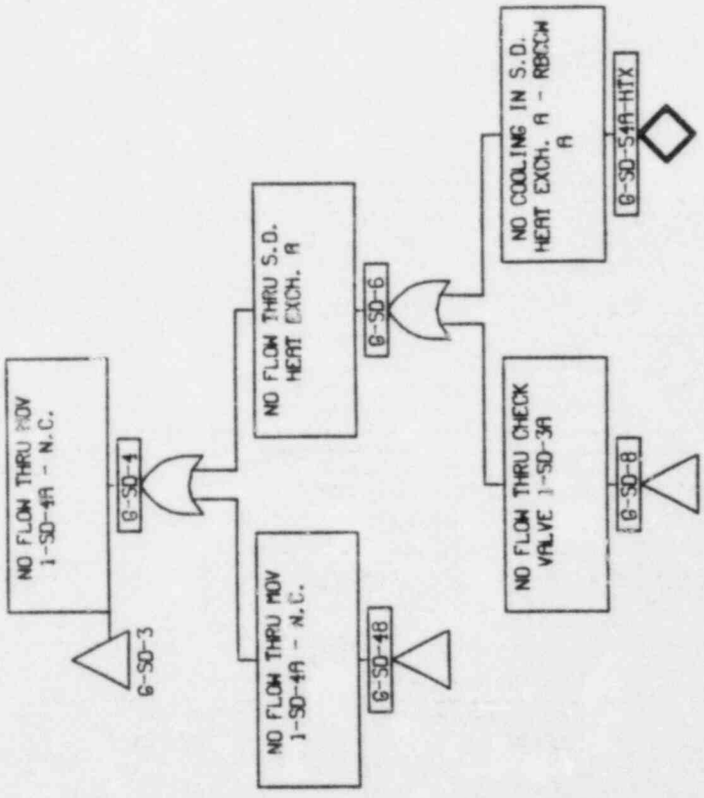
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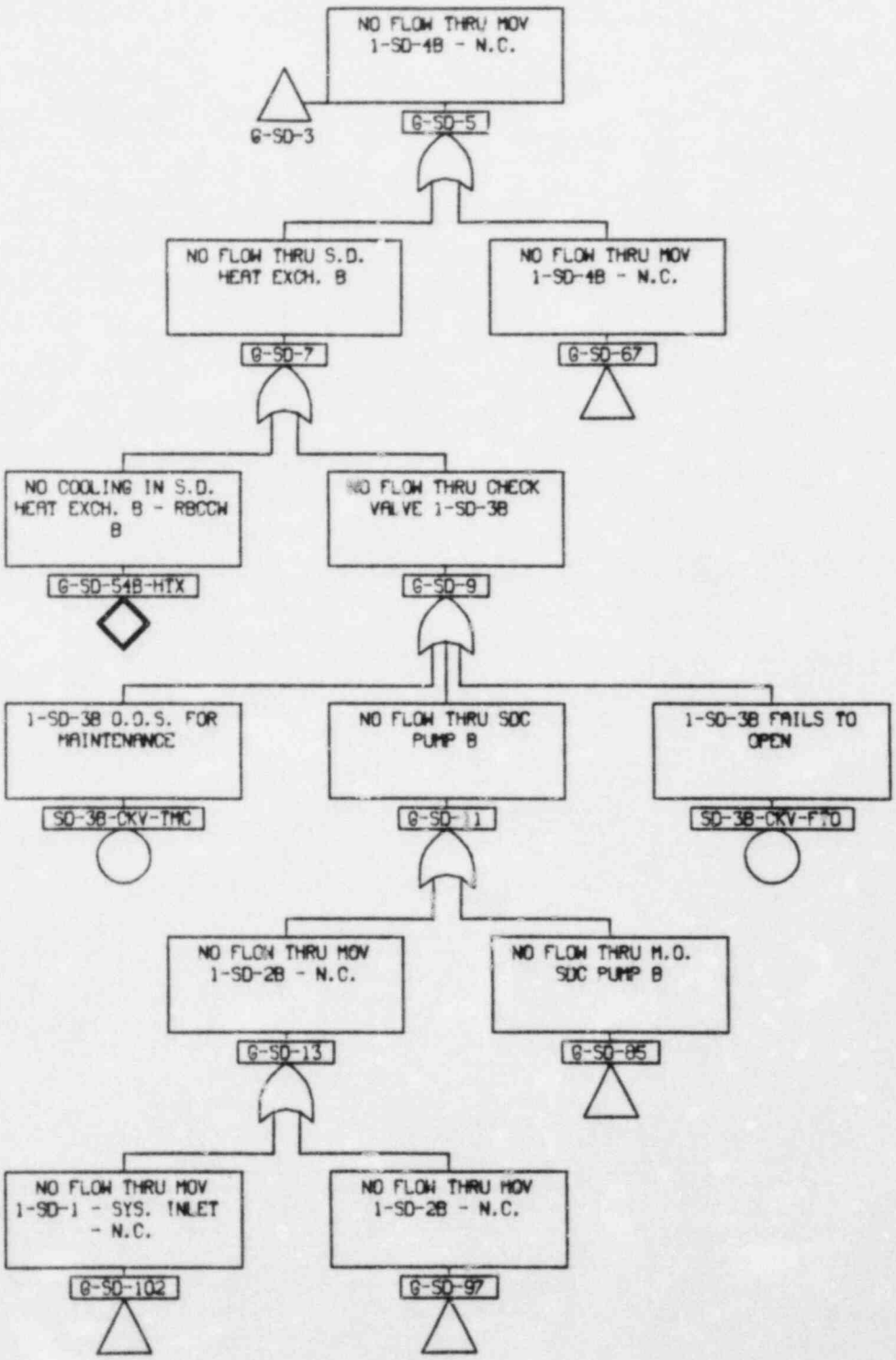
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| G-SD-1A | SD-5 | SD-1 |
| G-SD-4 | SD-2 | SD-1 |
| G-SD-5 | SD-3 | SD-1 |
| G-SD-8 | SD-4 | SD-2 |
| G-SD-14 | SD-6 | SD-1 |
| G-SD-16 | SD-7 | SD-6 |
| G-SD-17 | SD-8 | SD-10,SD-47 |
| G-SD-22 | SD-9 | SD-10 |
| G-SD-23 | SD-10 | SD-7 |
| G-SD-24 | SD-11 | SD-10 |
| G-SD-25 | SD-11 | SD-10 |
| G-SD-26 | SD-12 | SD-10 |
| G-SD-27 | SD-12 | SD-10 |
| G-SD-28 | SD-13 | SD-10,SD-47 |
| G-SD-29 | SD-14 | SD-13,SD-29 |
| G-SD-30 | SD-15 | SD-14 |
| G-SD-31 | SD-16 | SD-14 |
| G-SD-32 | SD-17 | SD-11,SD-48 |
| G-SD-33 | SD-17 | SD-11,SD-12,SD-48,SD-49 |
| G-SD-34 | SD-18 | SD-17,SD-30 |
| G-SD-35 | SD-19 | SD-17,SD-30 |
| G-SD-40 | SD-20 | SD-12,SD-49 |
| G-SD-41 | SD-20 | SD-11,SD-12,SD-48,SD-49 |
| G-SD-42 | SD-21 | SD-20,SD-31 |
| G-SD-43 | SD-22 | SD-20,SD-31 |
| G-SD-48 | SD-23 | SD-2 |
| G-SD-50 | SD-24 | SD-23 |
| G-SD-51 | SD-25 | SD-26,SD-34 |
| G-SD-56 | SD-27 | SD-26 |
| G-SD-57 | SD-26 | SD-24,SD-42 |
| G-SD-58 | SD-27 | SD-26 |
| G-SD-59 | SD-28 | SD-26 |
| G-SD-60 | SD-28 | SD-26 |
| G-SD-61 | SD-28 | SD-26 |
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| G-SD-64 | SD-30 | SD-27,SD-28,SD-35,SD-36 |
| G-SD-65 | SD-31 | SD-28,SD-36 |
| G-SD-66 | SD-31 | SD-28,SD-35,SD-36 |
| G-SD-67 | SD-32 | SD-3 |
| G-SD-69 | SD-33 | SD-32 |
| G-SD-72 | SD-35 | SD-34 |
| G-SD-73 | SD-34 | SD-33,SD-44 |
| G-SD-74 | SD-35 | SD-34 |
| G-SD-75 | SD-35 | SD-34 |
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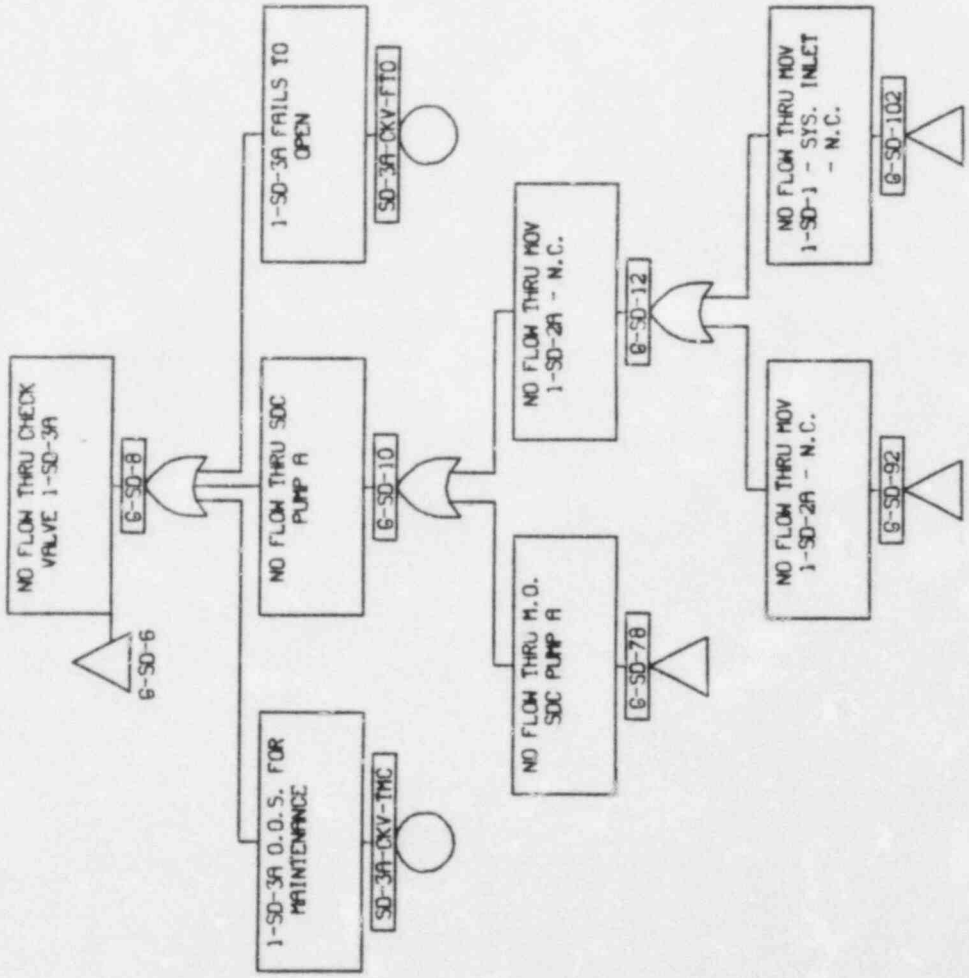
SD FAULT TREE PAGE INDEX (Cont.)

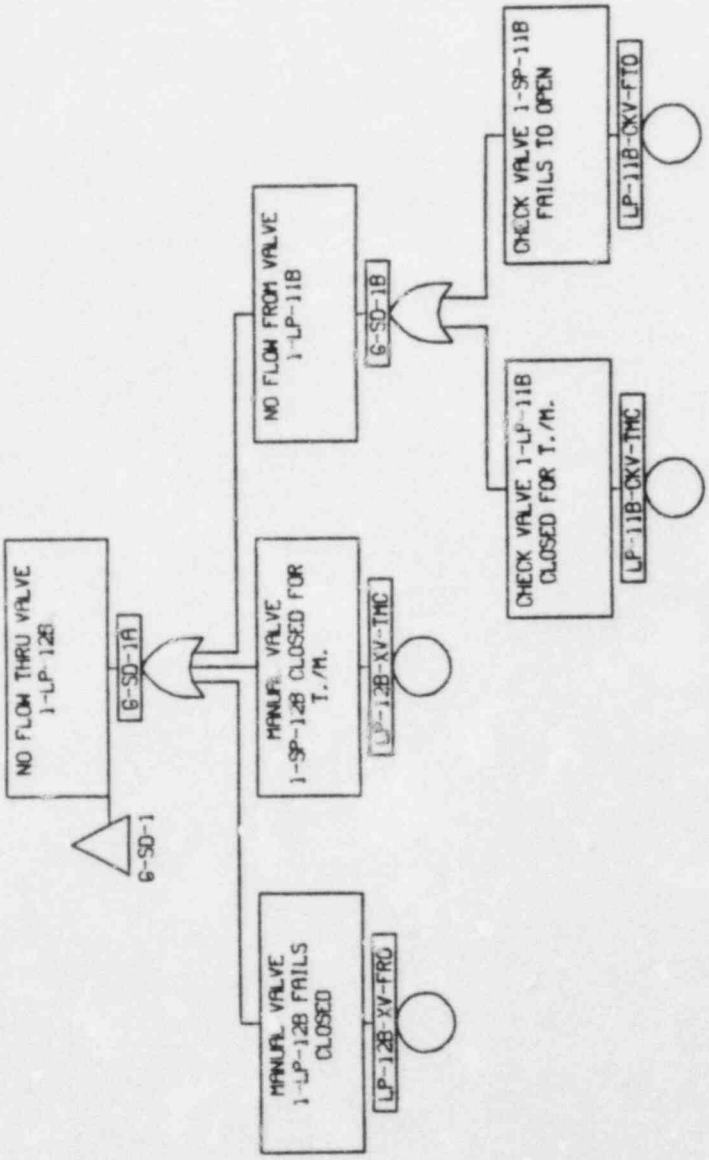
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| G-SD-85 | SD-39 | SD-3 |
| G-SD-89 | SD-40 | SD-39 |
| G-SD-92 | SD-41 | SD-4 |
| G-SD-94 | SD-42 | SD-41 |
| G-SD-97 | SD-43 | SD-3 |
| G-SD-99 | SD-44 | SD-43 |
| G-SD-102 | SD-45 | SD-3,SD-4 |
| G-SD-104 | SD-46 | SD-45 |
| G-SD-107 | SD-47 | SD-9,SD-46 |
| G-SD-108 | SD-48 | SD-47 |
| G-SD-109 | SD-48 | SD-47 |
| G-SD-110 | SD-49 | SD-47 |
| G-SD-111 | SD-49 | SD-47 |
| G-SD-112 | SD-50 | SD-37 |
| G-SD-115 | SD-51 | SD-50 |
| G-SD-119 | SD-52 | SD-39 |
| G-SD-122 | SD-53 | SD-52 |

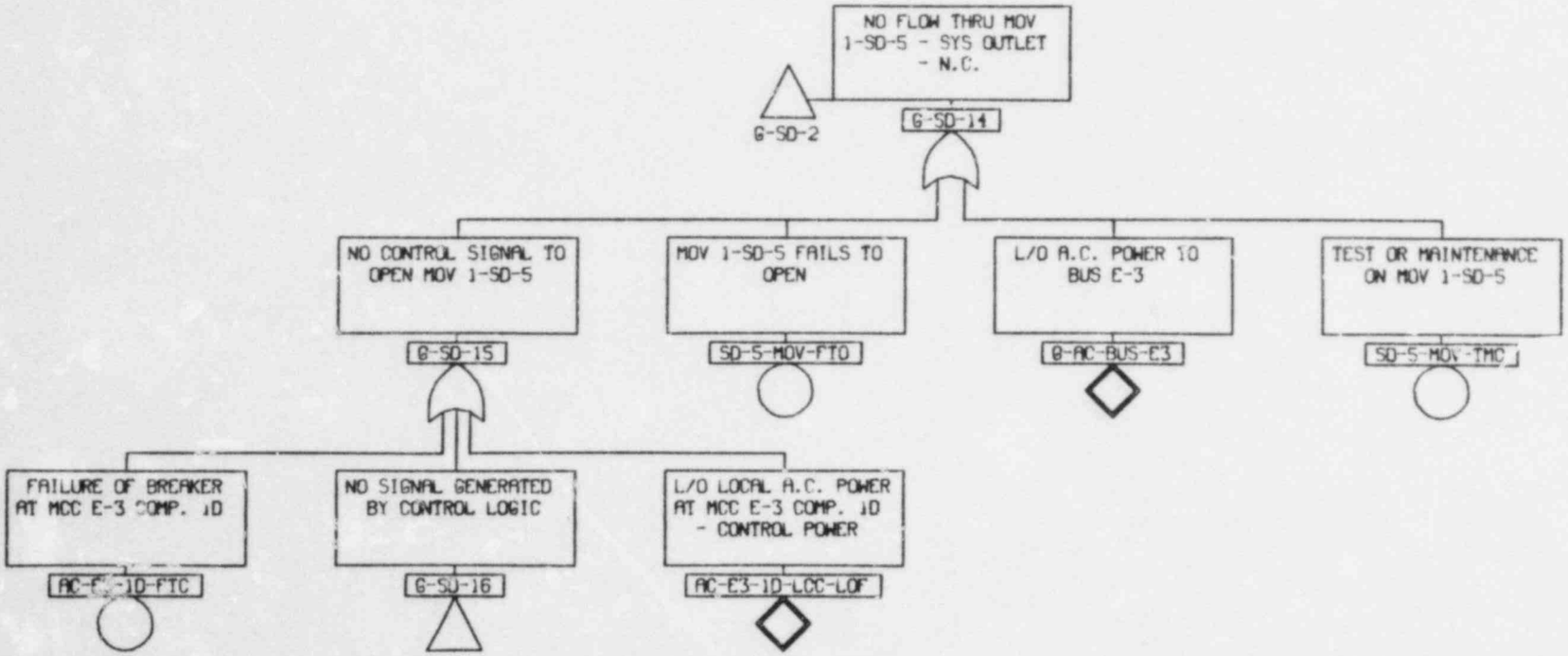

NO COOLING RX VESSEL - NORMAL S.D. COOLING MODE - RX TEMP LESS THAN 350F
G-SD-1
NO FLOW THRU VALVE 1-LP-12B
G-SD-1A
NO FLOW THRU MOV 1-SD-5 - N.C.
G-SD-2
OPERATOR DOES NOT ATTEMPT TO UTILIZE SDC SYSTEM
SD-OPA
NO FLOW THRU SDCS TRAINS A AND B
G-SD-3
NO FLOW THRU MOV 1-SD-5 - SYS OUTLET - N.C.
G-SD-14
NO FLOW THRU MOV 1-SD-4A - N.C.
G-SD-4
NO FLOW THRU MOV 1-SD-4B - N.C.
G-SD-5

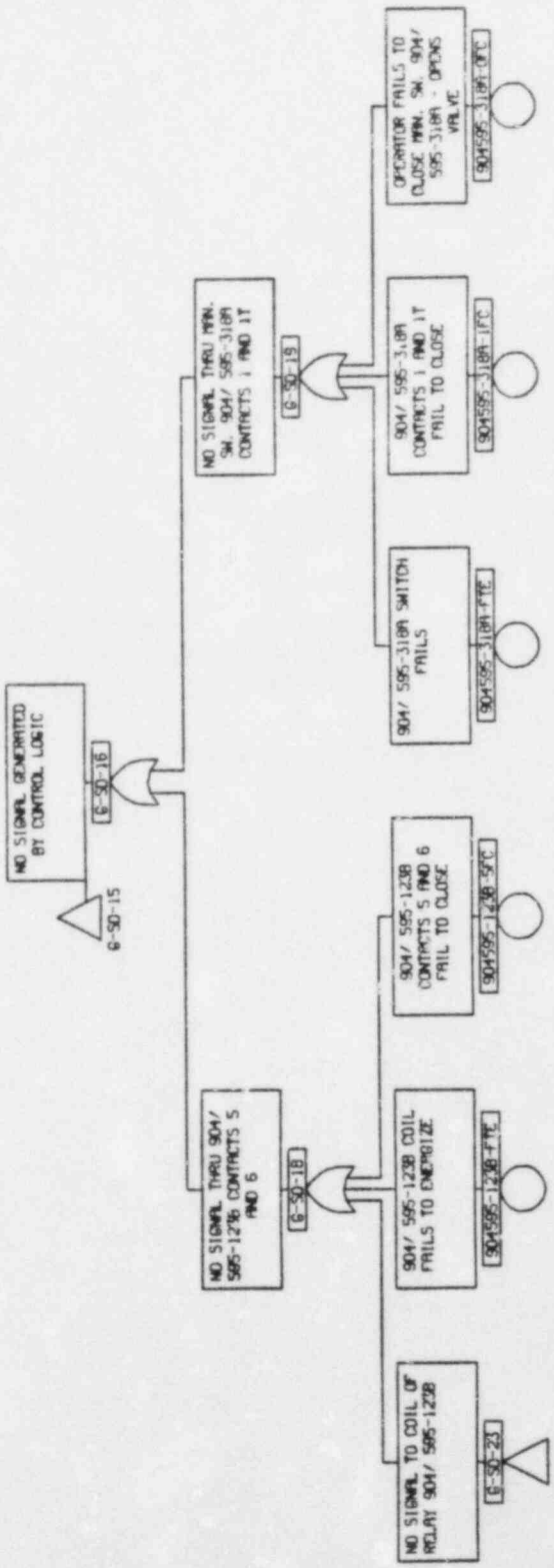

NO FLOW THRU MOV
1-SD-4A - N.C.
6-SD-3
6-SD-4
NO FLOW THRU MOV
1-SD-4A - N.C.
6-SD-4B
NO FLOW THRU S.D.
HEAT EXCH. A
6-SD-6
NO FLOW THRU CHECK
VALVE 1-SD-3A
6-SD-8
NO COOLING IN S.D.
HEAT EXCH. A - RBCCW
A
6-SD-54A-HTX

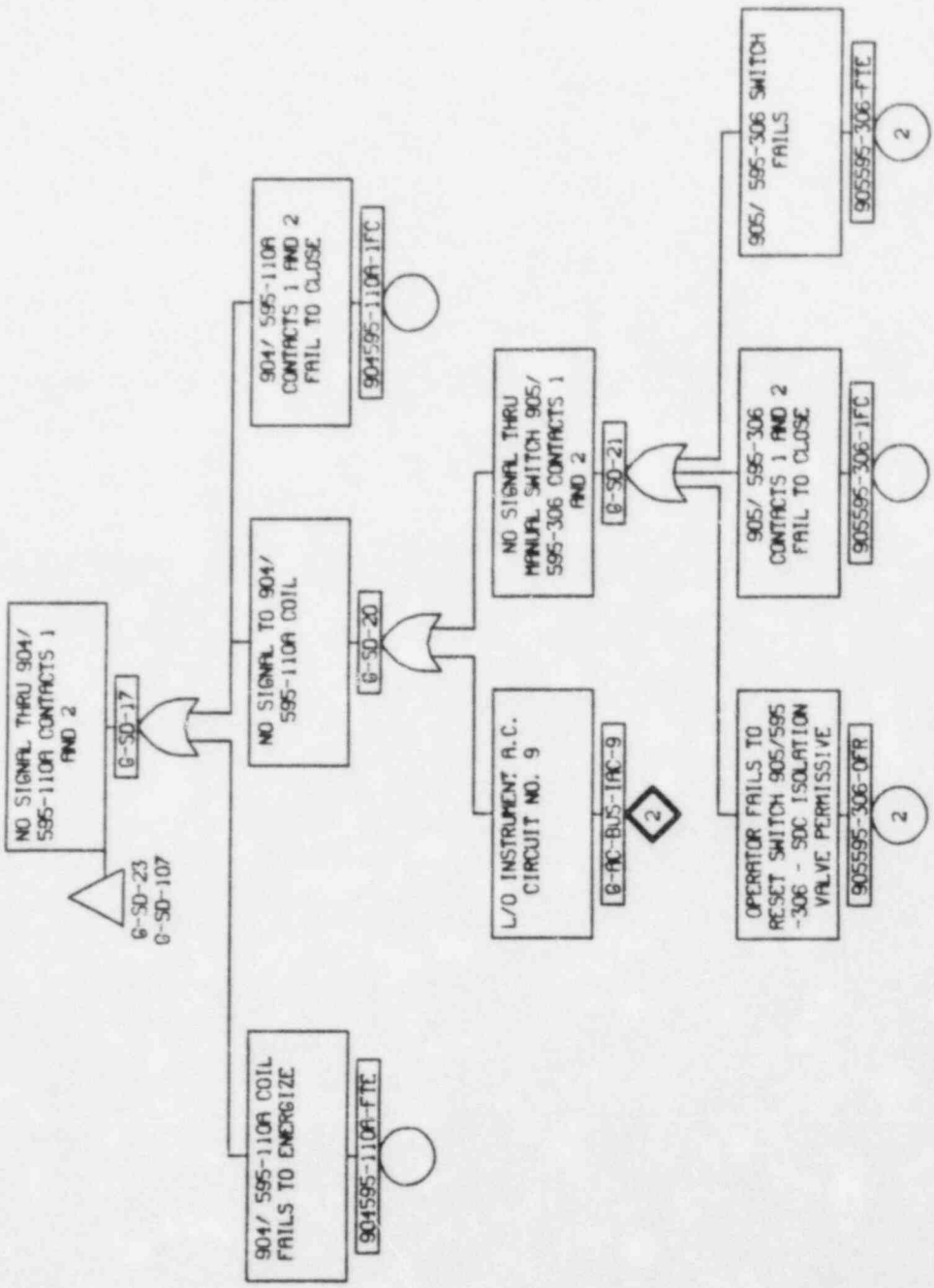

NO FLOW THRU MOV
1-SD-4B - N.C.
G-SD-3
G-SD-5
NO FLOW THRU S.D.
HEAT EXCH. B
NO FLOW THRU MOV
1-SD-4B - N.C.
G-SD-7
G-SD-67
NO COOLING IN S.D.
HEAT EXCH. B - RBCCW
B
NO FLOW THRU CHECK
VALVE 1-SD-3B
G-SD-54B-HTX
G-SD-9
1-SD-3B O.O.S. FOR
MAINTENANCE
NO FLOW THRU SDC
PUMP B
1-SD-3B FAILS TO
OPEN
SD-3B-CKV-TMC
G-SD-11
SD-3B-CKV-FTO
NO FLOW THRU MOV
1-SD-2B - N.C.
NO FLOW THRU M.O.
SDC PUMP B
G-SD-13
G-SD-85
NO FLOW THRU MOV
1-SD-1 - SYS. INLET
- N.C.
NO FLOW THRU MOV
1-SD-2B - N.C.
G-SD-102
G-SD-97

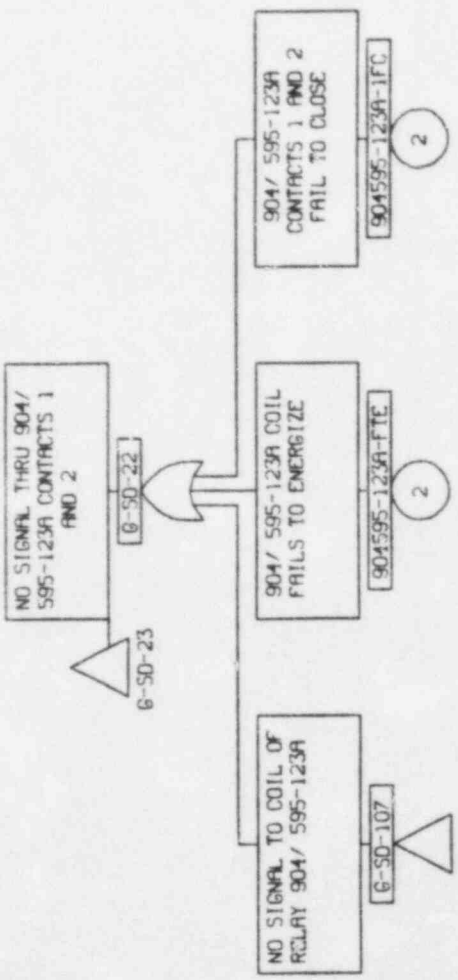

NO FLOW THRU CHECK VALVE 1-SD-3A
6-SD-6
6-SD-8
1-SD-3A O.O.S. FOR MAINTENANCE
SD-3A-CKV-TMC
NO FLOW THRU SDC PUMP A
6-SD-10
1-SD-3A FAILS TO OPEN
SD-3A-CKV-FTO
NO FLOW THRU M.O. SDC PUMP A
6-SD-78
NO FLOW THRU MOV 1-SD-2A - N.C.
6-SD-12
NO FLOW THRU MOV 1-SD-2A - N.C.
6-SD-92
NO FLOW THRU MOV 1-SD-1 - SYS. INLET - N.C.
6-SD-102

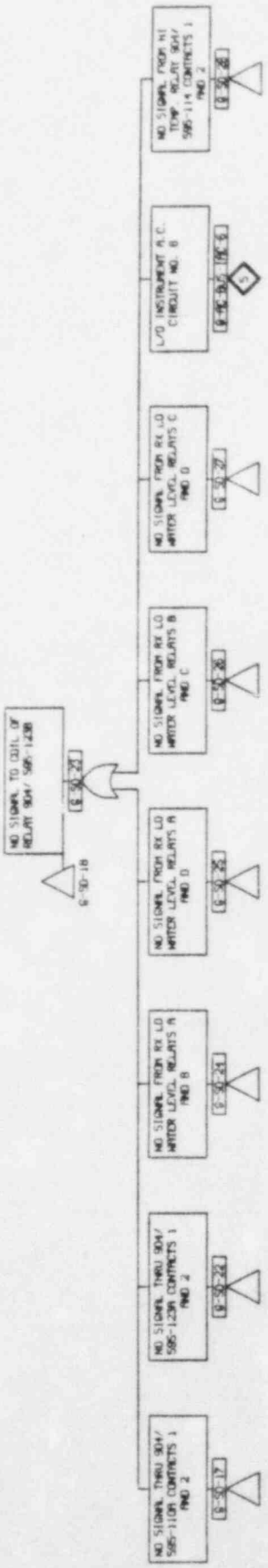

NO FLOW THRU VALVE
1-LP-128
6-SD-1
6-SD-1A
MANUAL VALVE
1-LP-128 FAILS
CLOSED
LP-128-XV-FRC
MANUAL VALVE
1-SP-128 CLOSED FOR
T./M.
LP-128-XV-THC
NO FLOW FROM VALVE
1-LP-118
6-SD-1B
CHECK VALVE 1-LP-118
CLOSED FOR T./M.
LP-118-CKV-THC
CHECK VALVE 1-SP-118
FAILS TO OPEN
LP-118-CKV-FTO

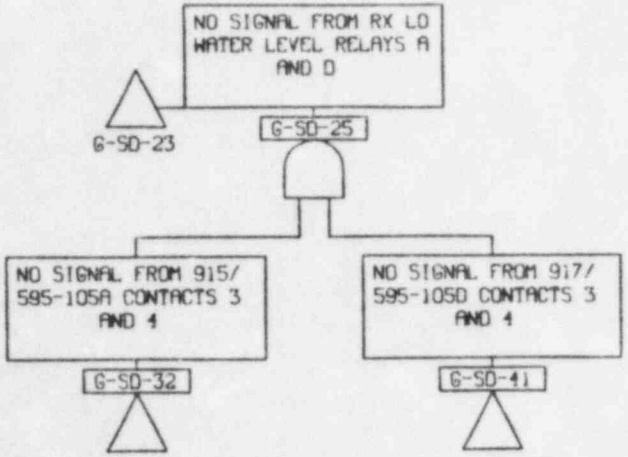

NO FLOW THRU MOV
1-SD-5 - SYS OUTLET
- N.C.
G-SD-14
G-SD-2
NO CONTROL SIGNAL TO
OPEN MOV 1-SD-5
G-SD-15
MOV 1-SD-5 FAILS TO
OPEN
SD-5-MOV-FTO
L/O A.C. POWER TO
BUS E-3
G-AC-BUS-E3
TEST OR MAINTENANCE
ON MOV 1-SD-5
SD-5-MOV-TMC
FAILURE OF BREAKER
AT MCC E-3 COMP. ID
AC-E3-1D-FTC
NO SIGNAL GENERATED
BY CONTROL LOGIC
G-SD-16
L/O LOCAL A.C. POWER
AT MCC E-3 COMP. ID
- CONTROL POWER
AC-E3-1D-LCC-LOF

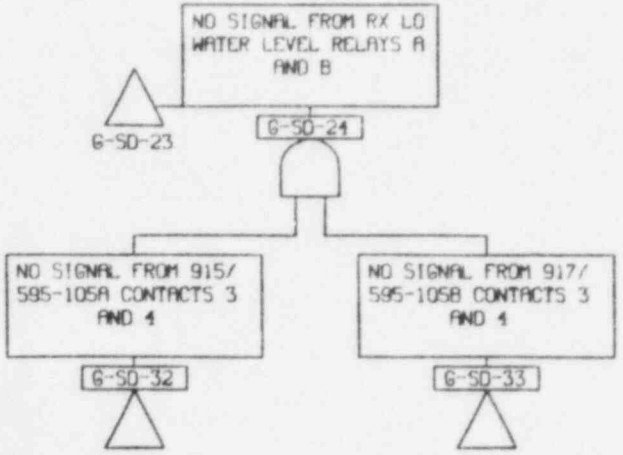

NO SIGNAL GENERATED BY CONTROL LOGIC
6-SD-15
6-SD-16
NO SIGNAL THRU MAN. SW. 904/ 595-3108 CONTACTS 1 AND 11
6-SD-19
OPERATOR FAILS TO CLOSE MAN. SW. 904/ 595-3108 - OPENS VALVE
904595-3108-OPC
904/ 595-3108 CONTACTS 1 AND 11 FAIL TO CLOSE
904595-3108-1FC
904/ 595-3108 SWITCH FAILS
904595-3108-FMF
NO SIGNAL THRU 904/ 595-1238 CONTACTS 5 AND 6
6-SD-18
904/ 595-1238 CONTACTS 5 AND 6 FAIL TO CLOSE
904595-1238-5FC
904/ 595-1238 COIL FAILS TO ENERGIZE
904595-1238-FMF
NO SIGNAL TO COIL OF RELAY 904/ 595-1238
6-SD-23

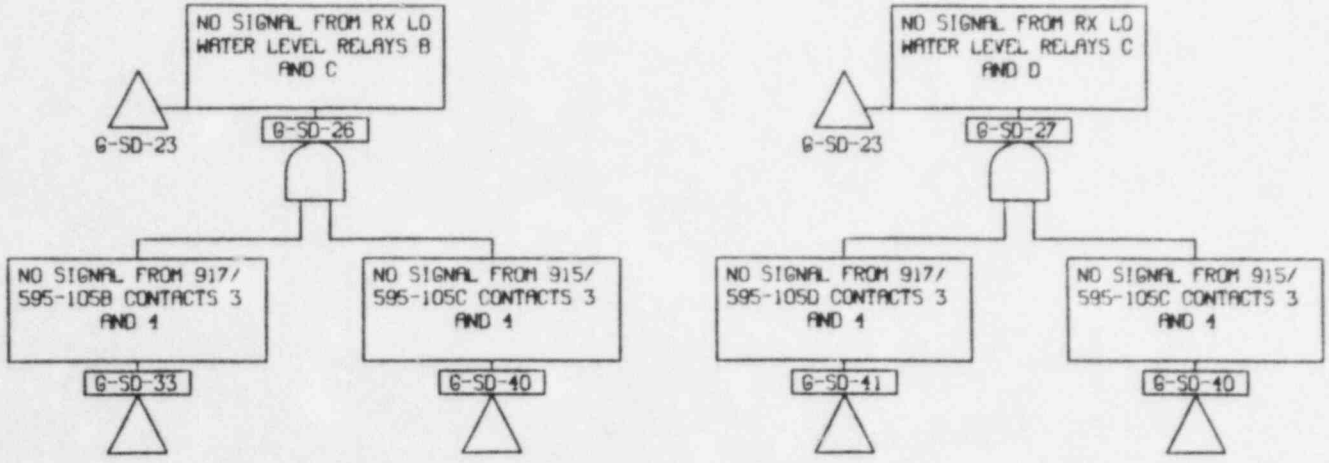

NO SIGNAL THRU 904/ 595-110A CONTACTS 1 AND 2
G-SD-17
G-SD-23
G-SD-107
NO SIGNAL TO 904/ 595-110A COIL
G-SD-20
904/ 595-110A CONTACTS 1 AND 2 FAIL TO CLOSE
904595-110A-1FC
NO SIGNAL THRU MANUAL SWITCH 905/ 595-306 CONTACTS 1 AND 2
G-SD-21
L/O INSTRUMENT A.C. CIRCUIT NO. 9
G-AC-BUS-1AC-9
2
905/ 595-306 SWITCH FAILS
905595-306-FTE
2
905/ 595-306 CONTACTS 1 AND 2 FAIL TO CLOSE
905595-306-1FC
OPERATOR FAILS TO RESET SWITCH 905/595 -306 - SDC ISOLATION VALVE PERMISSIVE
905595-306-OPR
2
904/ 595-110A COIL FAILS TO ENERGIZE
904595-110A-FTE

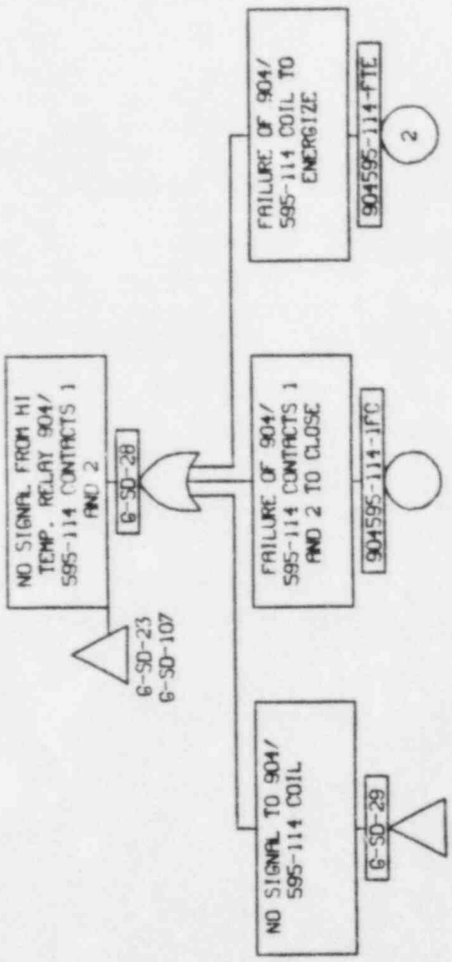

NO SIGNAL THRU 904/ 595-123A CONTACTS 1 AND 2
6-SD-22
6-SD-23
904/ 595-123A CONTACTS 1 AND 2 FAIL TO CLOSE
904595-123A-1FC
2
904/ 595-123A COIL FAILS TO ENERGIZE
904595-123A-FTE
2
NO SIGNAL TO COIL OF RELAY 904/ 595-123A
6-SD-107

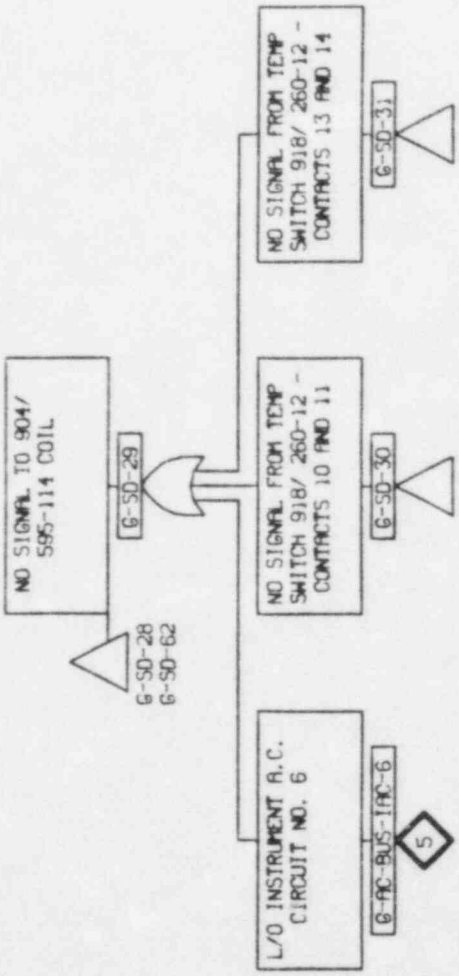

NO SIGNAL TO COIL OF RELAY 94Y-1428
5-90-18
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND D
NO SIGNAL FROM RX LO WATER LEVEL RELAYS B AND C
NO SIGNAL FROM RX LO WATER LEVEL RELAYS C AND D
L/O INSTRUMENT A.C. CIRCUIT NO. 8
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND B
NO SIGNAL THRU 94Y/ 59B-1428 CONTACTS 1 AND 2
NO SIGNAL THRU 94Y/ 59B-1428A CONTACTS 1 AND 2
NO SIGNAL FROM RX LO TEMP RELAY 94Y/ 59B-114 CONTACTS 1 AND 2

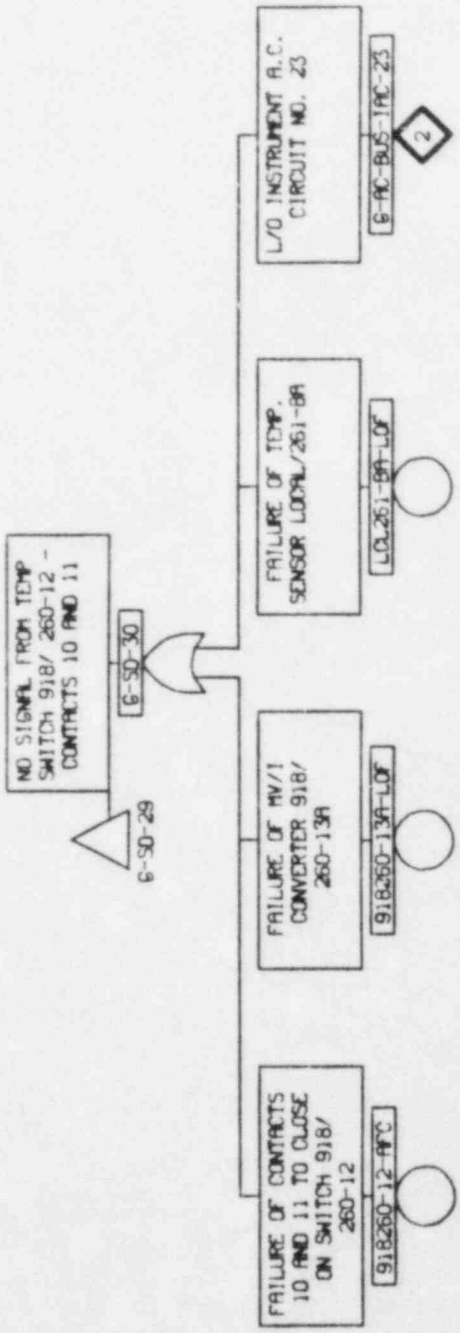

NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND D
G-SD-23
G-SD-25
NO SIGNAL FROM 915/ 595-105A CONTACTS 3 AND 4
NO SIGNAL FROM 917/ 595-105D CONTACTS 3 AND 4
G-SD-32
G-SD-41

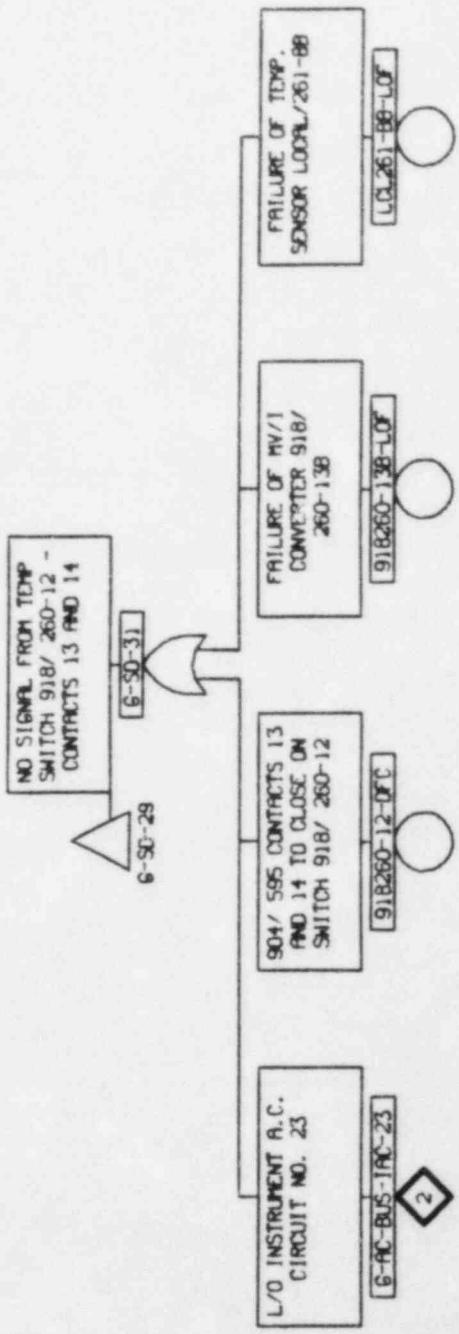

NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND B
G-SD-23
G-SD-24
NO SIGNAL FROM 915/ 595-105A CONTACTS 3 AND 4
NO SIGNAL FROM 917/ 595-105B CONTACTS 3 AND 4
G-SD-32
G-SD-33

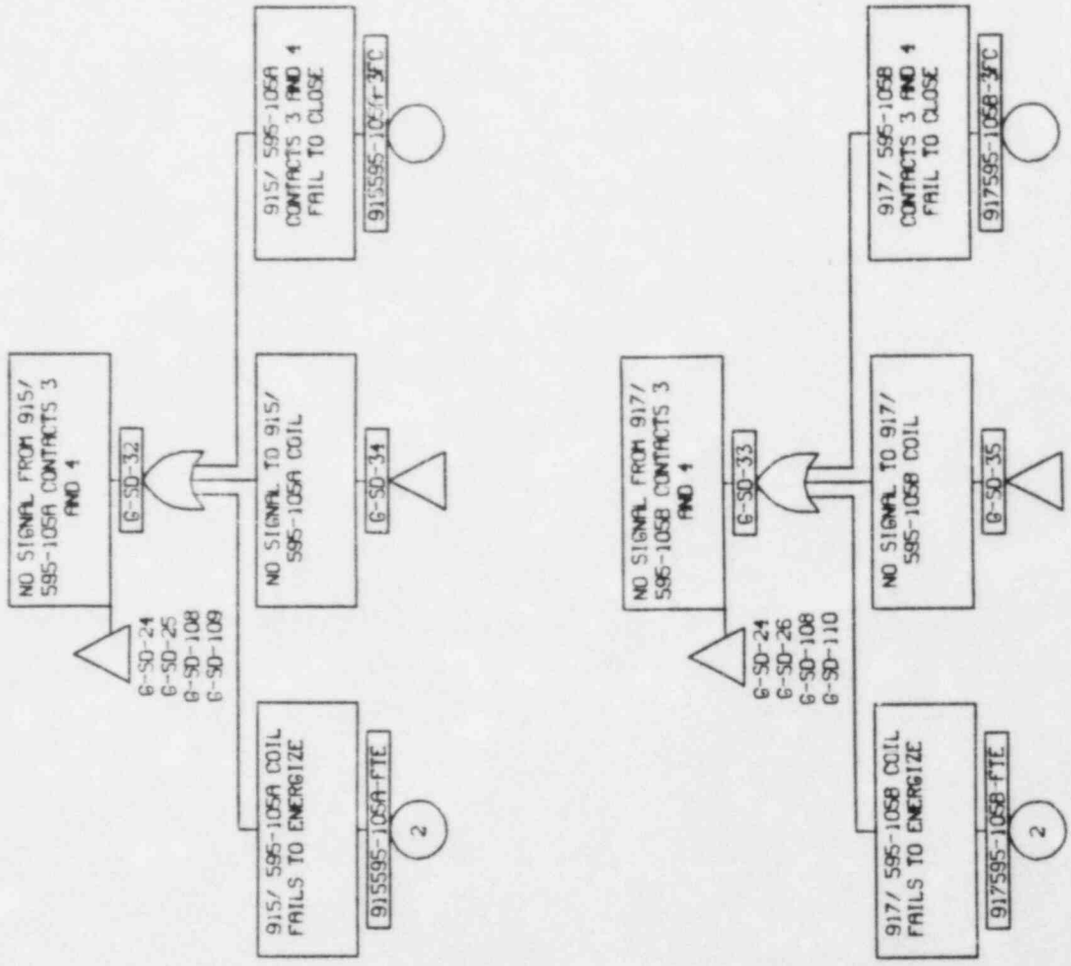

NO SIGNAL FROM RX LO WATER LEVEL RELAYS B AND C
G-SD-23
G-SD-26
NO SIGNAL FROM 917/ 595-105B CONTACTS 3 AND 4
NO SIGNAL FROM 915/ 595-105C CONTACTS 3 AND 4
G-SD-33
G-SD-40
NO SIGNAL FROM RX LO WATER LEVEL RELAYS C AND D
G-SD-23
G-SD-27
NO SIGNAL FROM 917/ 595-105D CONTACTS 3 AND 4
NO SIGNAL FROM 915/ 595-105C CONTACTS 3 AND 4
G-SD-41
G-SD-40

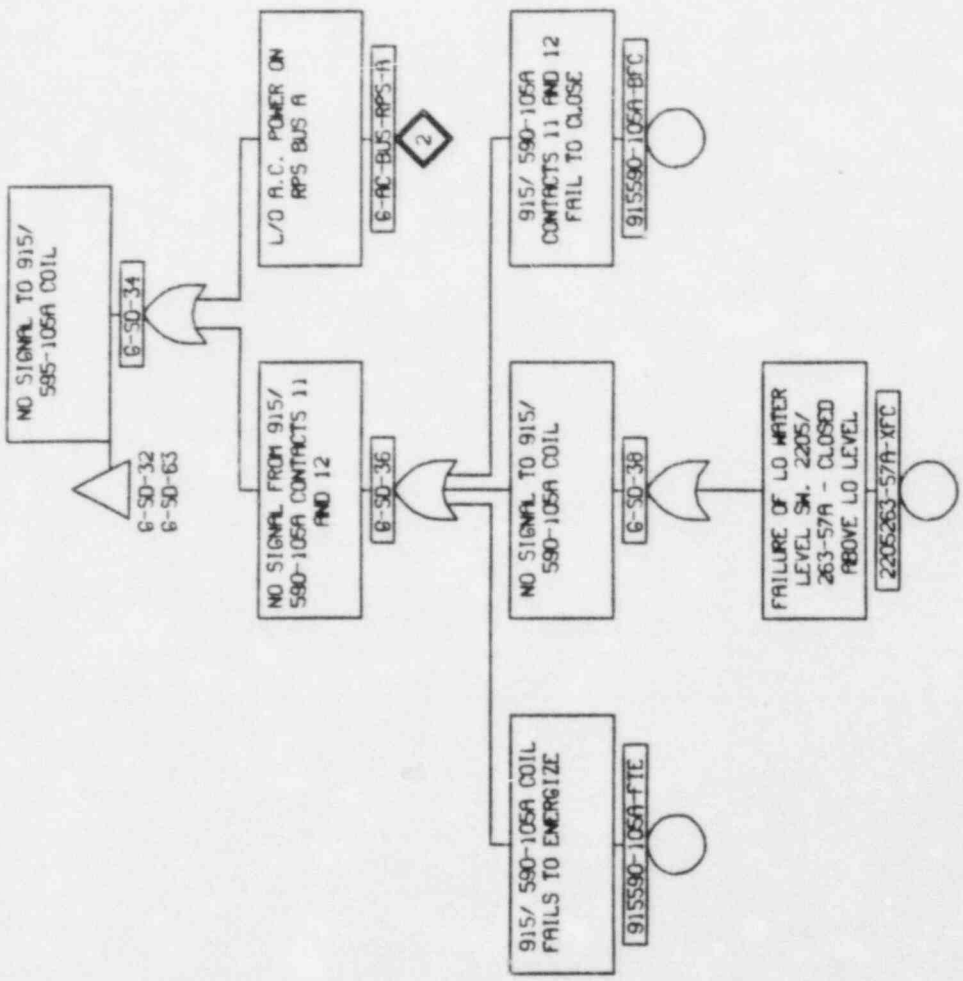

FAILURE OF 904/ 595-114 COIL TO ENERGIZE
904595-114-FTE
2
NO SIGNAL FROM HI TEMP. RELAY 904/ 595-114 CONTACTS 1 AND 2
6-SD-28
6-SD-23
6-SD-107
FAILURE OF 904/ 595-114 CONTACTS 1 AND 2 TO CLOSE
904595-114-1FC
NO SIGNAL TO 904/ 595-114 COIL
6-SD-29

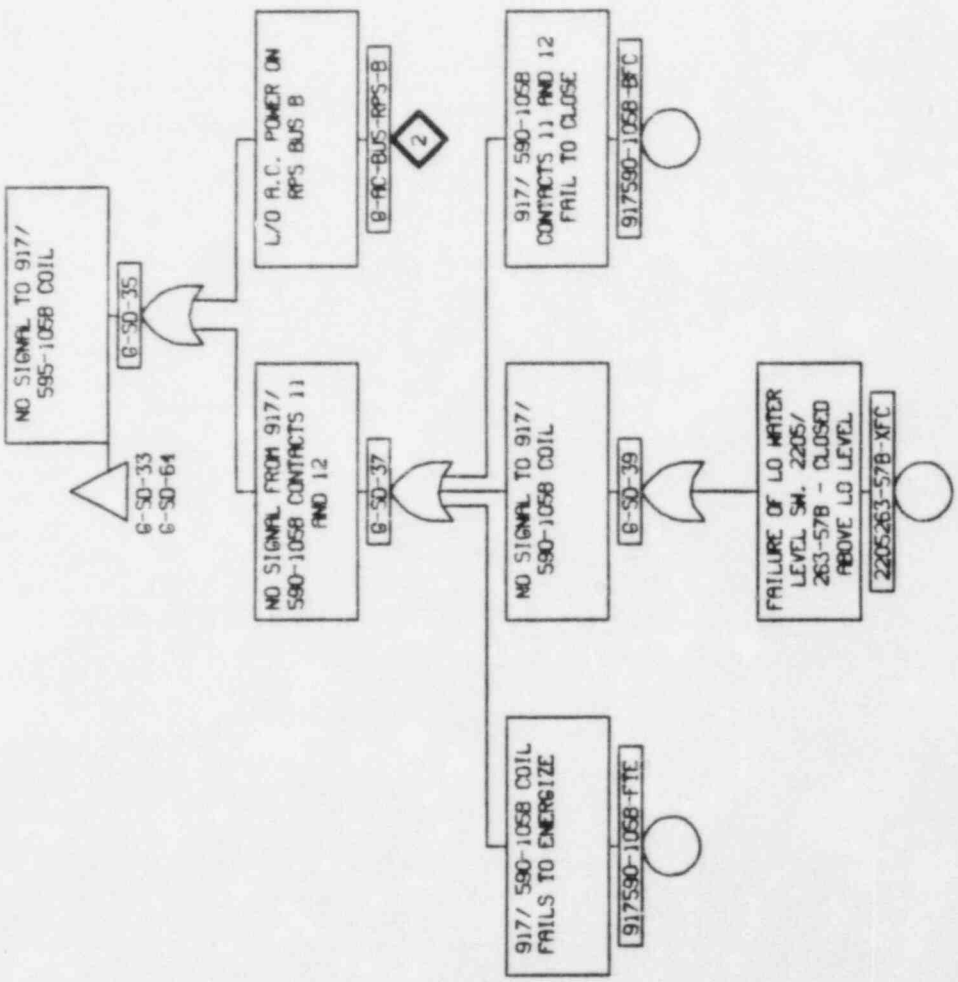

NO SIGNAL TO 904/ 595-114 COIL
G-SO-28
G-SO-62
G-SO-29
NO SIGNAL FROM TEMP SWITCH 918/ 260-12 - CONTACTS 10 AND 11
G-SO-30
NO SIGNAL FROM TEMP SWITCH 918/ 260-12 - CONTACTS 13 AND 14
G-SO-31
L/O INSTRUMENT A.C. CIRCUIT NO. 6
G-AC-BUS-1AC-6
5

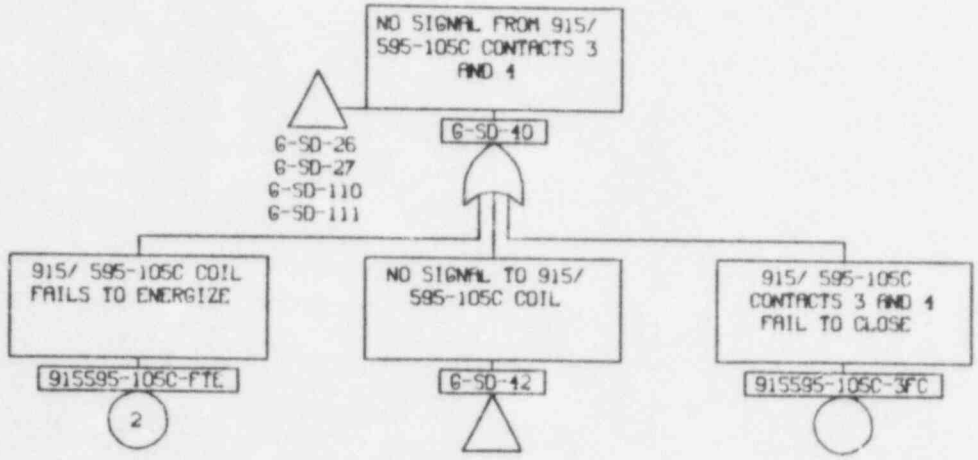

NO SIGNAL FROM TEMP SWITCH 918/ 260-12 - CONTACTS 10 AND 11
6-SO-29
6-SO-30
FAILURE OF CONTACTS 10 AND 11 TO CLOSE ON SWITCH 918/ 260-12
9182S0-12-FTC
FAILURE OF MV/I CONVERTER 918/ 260-13A
9182S0-13A-LOF
FAILURE OF TEMP. SENSOR LOOP#/261-8A
LOL261-8A-LOF
L/O INSTRUMENT A.C. CIRCUIT NO. 23
6-AC-BUS-1AC-23
2

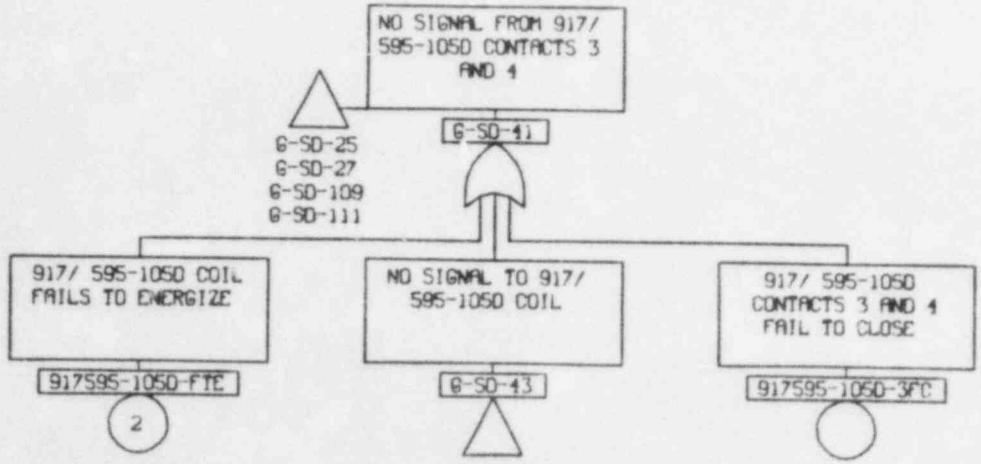

NO SIGNAL FROM TDHP SWITCH 918/ 260-12 - CONTACTS 13 AND 14
6-SD-29
6-SD-31
L/O INSTRUMENT A.C. CIRCUIT NO. 23
6-AC-BUS-1AC-23
2
904/ 595 CONTACTS 13 AND 14 TO CLOSE ON SWITCH 918/ 260-12
918260-12-OFC
FAILURE OF MV/I CONVERTER 918/ 260-13B
918260-13B-LOF
FAILURE OF TDHP, SENSOR LOOP#/261-BB
LOL261-BB-LOF

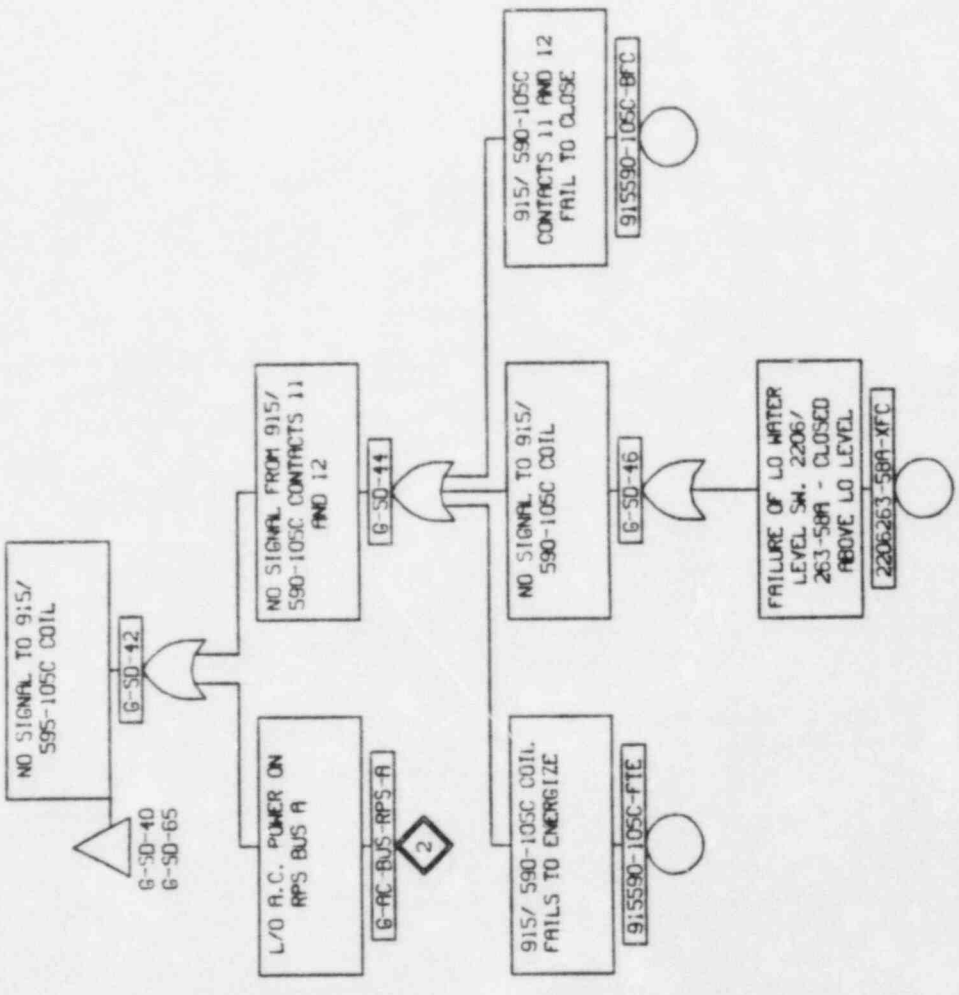

NO SIGNAL FROM 915/ 595-105A CONTACTS 3 AND 4
6-SD-24
6-SD-25
6-SD-108
6-SD-109
6-SD-32
NO SIGNAL TO 915/ 595-105A COIL
6-SD-34
915/ 595-105A COIL FAILS TO ENERGIZE
915595-105A-FTE
2
915/ 595-105A CONTACTS 3 AND 4 FAIL TO CLOSE
915595-105A-FTC
NO SIGNAL FROM 917/ 595-105B CONTACTS 3 AND 4
6-SD-24
6-SD-26
6-SD-108
6-SD-110
6-SD-33
NO SIGNAL TO 917/ 595-105B COIL
6-SD-35
917/ 595-105B COIL FAILS TO ENERGIZE
917595-105B-FTE
2
917/ 595-105B CONTACTS 3 AND 4 FAIL TO CLOSE
917595-105B-FTC

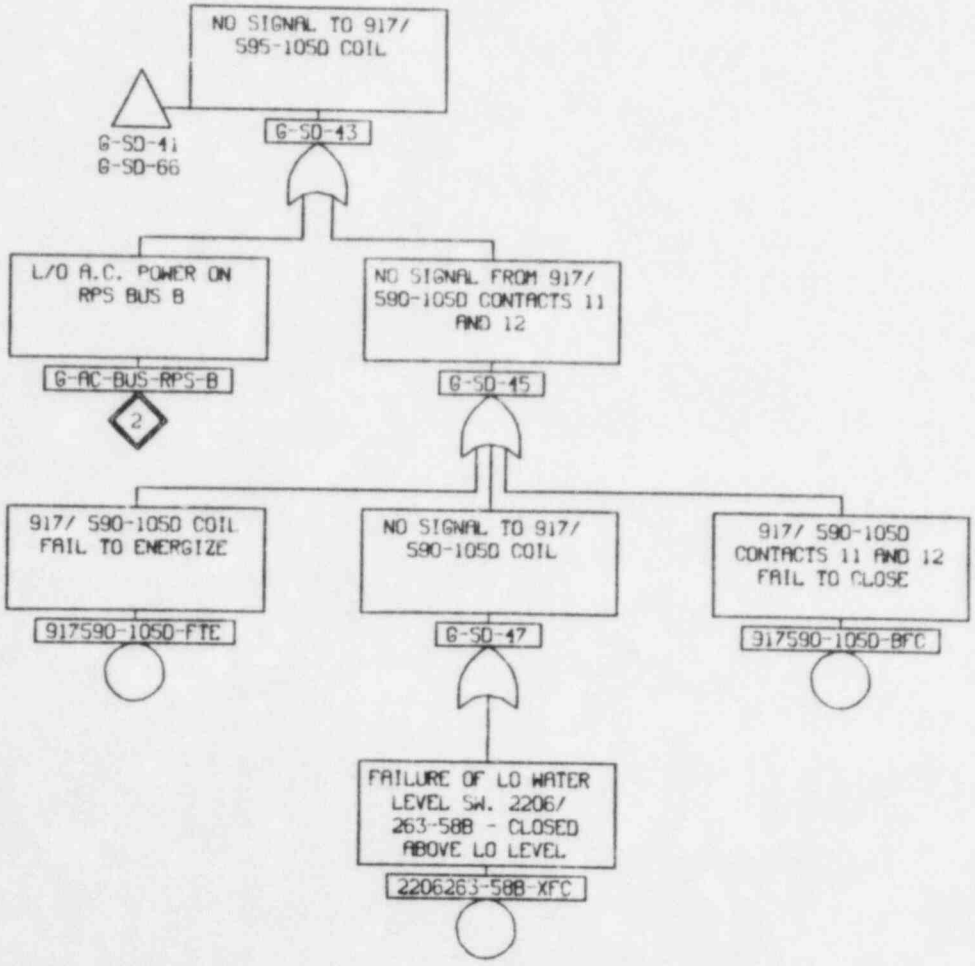

NO SIGNAL TO 915/ 585-105A COIL
6-50-32
6-50-63
6-50-34
L/O A.C. POWER ON RPS BUS A
6-AC-BUS-RPS-A
2
NO SIGNAL FROM 915/ 580-105A CONTACTS 11 AND 12
6-50-36
915/ 590-105A CONTACTS 11 AND 12 FAIL TO CLOSE
915590-105A-CFC
NO SIGNAL TO 915/ 590-105A COIL
6-50-38
915/ 590-105A COIL FAILS TO ENERGIZE
915590-105A-FTE
FAILURE OF LO WATER LEVEL SW. 2205/ 263-57A - CLOSED ABOVE LO LEVEL
2205263-57A-XFC

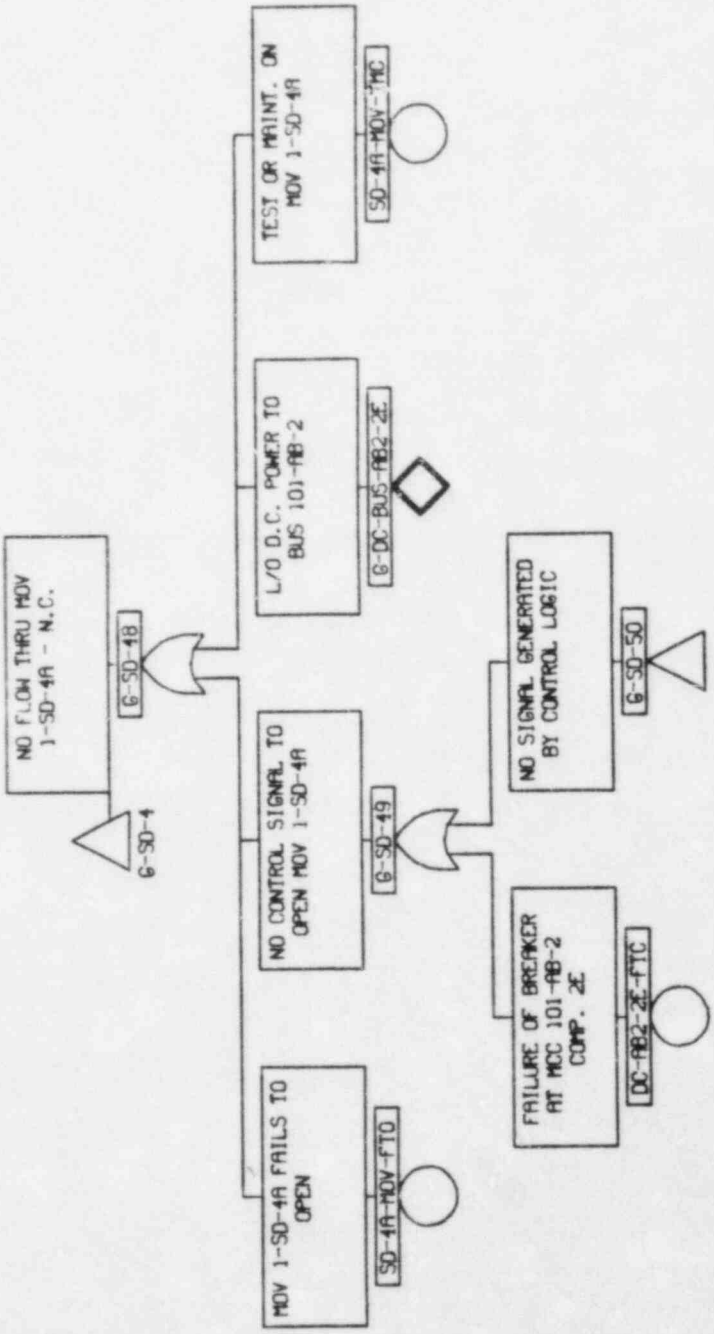

NO SIGNAL TO 917/ 595-1058 COIL
G-SD-35
G-SD-33
G-SD-64
L/O A.C. POWER ON RPS BUS B
G-RPC-BUS-RPS-B
2
NO SIGNAL FROM 917/ 590-1058 CONTACTS 11 AND 12
G-SD-37
917/ 590-1058 CONTACTS 11 AND 12 FAIL TO CLOSE
917590-1058-BFC
NO SIGNAL TO 917/ 590-1058 COIL
G-SD-39
FAILURE OF LO WATER LEVEL SW. 2205/ 263-578 - CLOSED ABOVE LO LEVEL
2205263-578-XFC
917/ 590-1058 COIL FAILS TO ENERGIZE
917590-1058-FTE

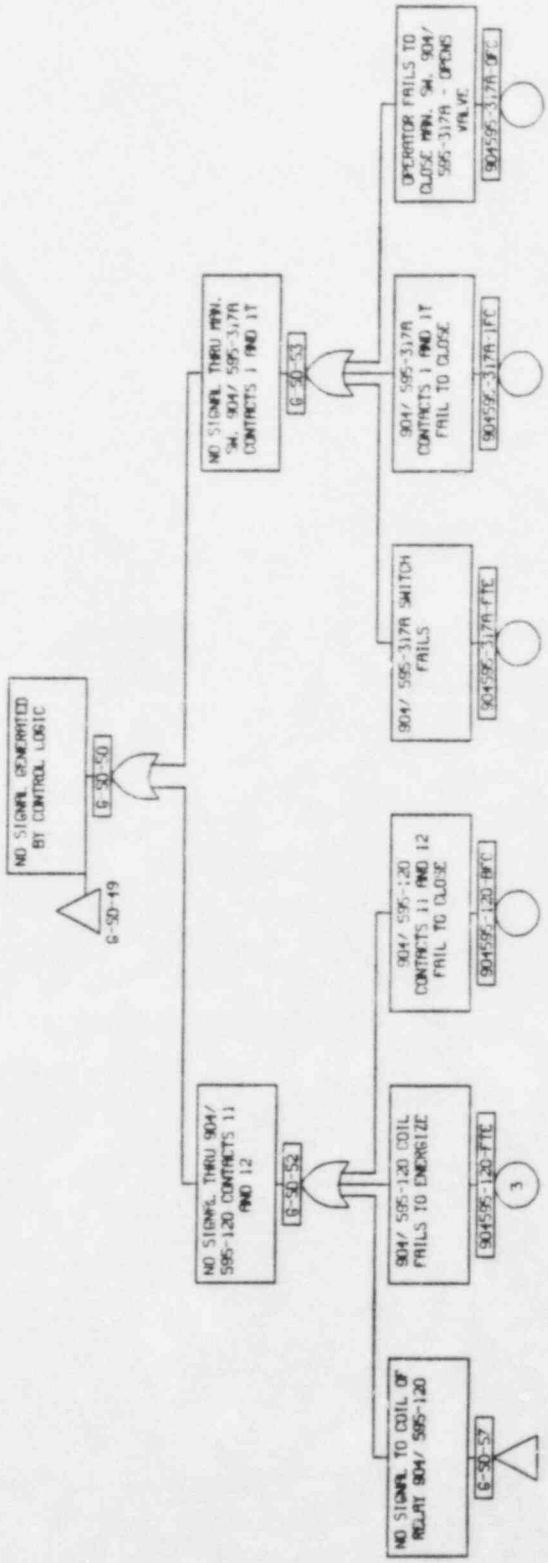

NO SIGNAL FROM 915/ 595-105C CONTACTS 3 AND 4
G-SD-40
G-SD-26
G-SD-27
G-SD-110
G-SD-111
915/ 595-105C COIL FAILS TO ENERGIZE
915595-105C-FTE
2
NO SIGNAL TO 915/ 595-105C COIL
G-SD-42
915/ 595-105C CONTACTS 3 AND 4 FAIL TO CLOSE
915595-105C-3FC

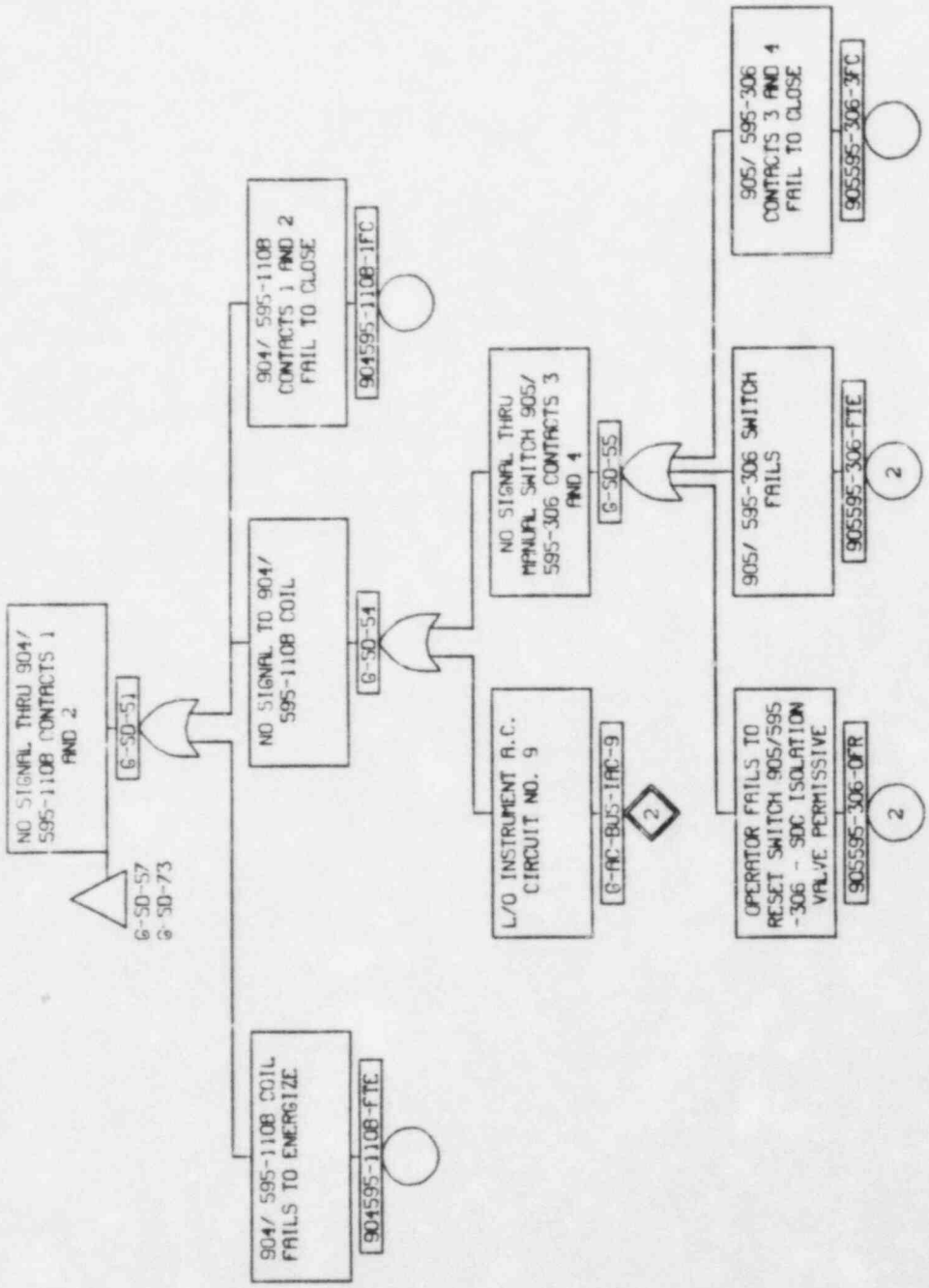

NO SIGNAL FROM 917/ 595-105D CONTACTS 3 AND 4
G-SD-41
G-SD-25
G-SD-27
G-SD-109
G-SD-111
917/ 595-105D COIL FAILS TO ENERGIZE
917595-105D-FTE
2
NO SIGNAL TO 917/ 595-105D COIL
G-SD-43
917/ 595-105D CONTACTS 3 AND 4 FAIL TO CLOSE
917595-105D-3FC

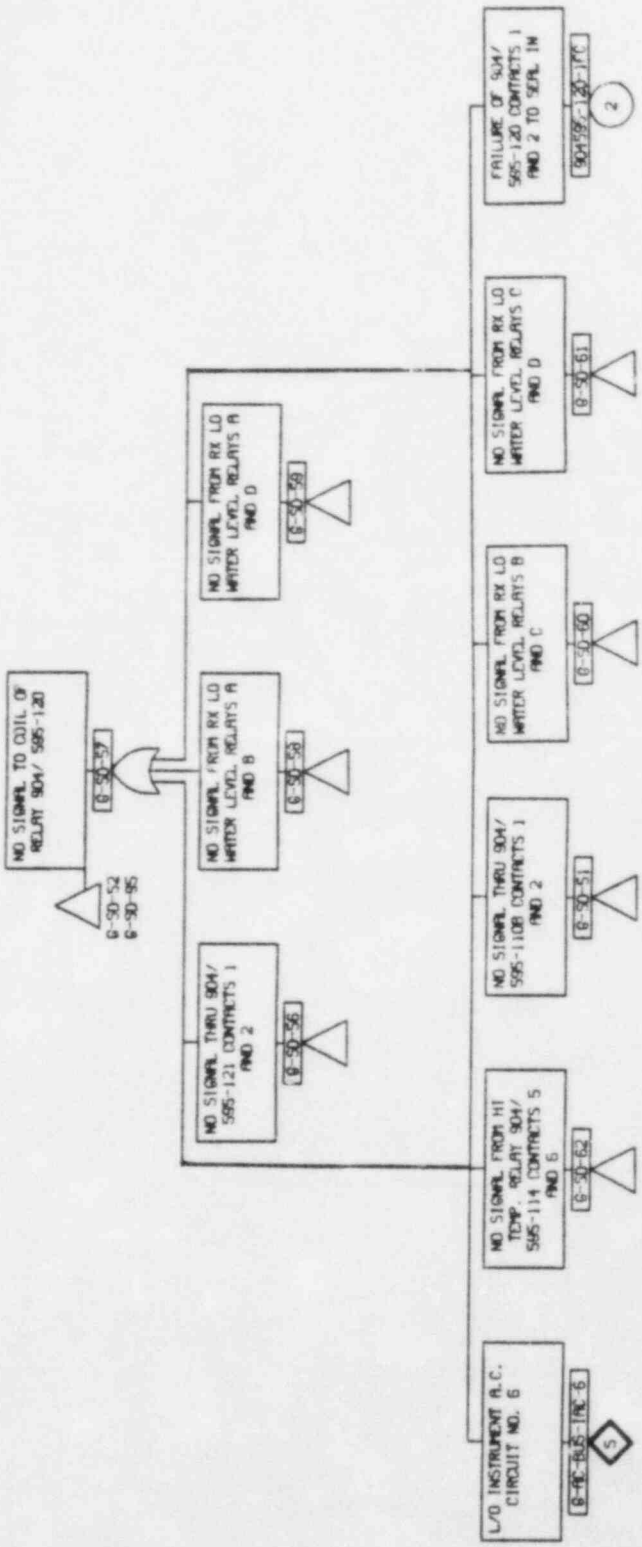

NO SIGNAL TO 915/ 595-105C COIL
G-SD-40
G-SD-65
G-SD-42
L/O A.C. POWER ON RPS BUS A
G-AC-BUS-RPS-A
2
NO SIGNAL FROM 915/ 590-105C CONTACTS 11 AND 12
G-SD-41
915/ 590-105C FAILS TO ENERGIZE
915590-105C-FTE
NO SIGNAL TO 915/ 590-105C COIL
G-SD-46
915/ 590-105C CONTACTS 11 AND 12 FAIL TO CLOSE
915590-105C-BFC
FAILURE OF LO WATER LEVEL SW. 2206/ 263-58A - CLOSED ABOVE LO LEVEL
2206263-58A-XFC

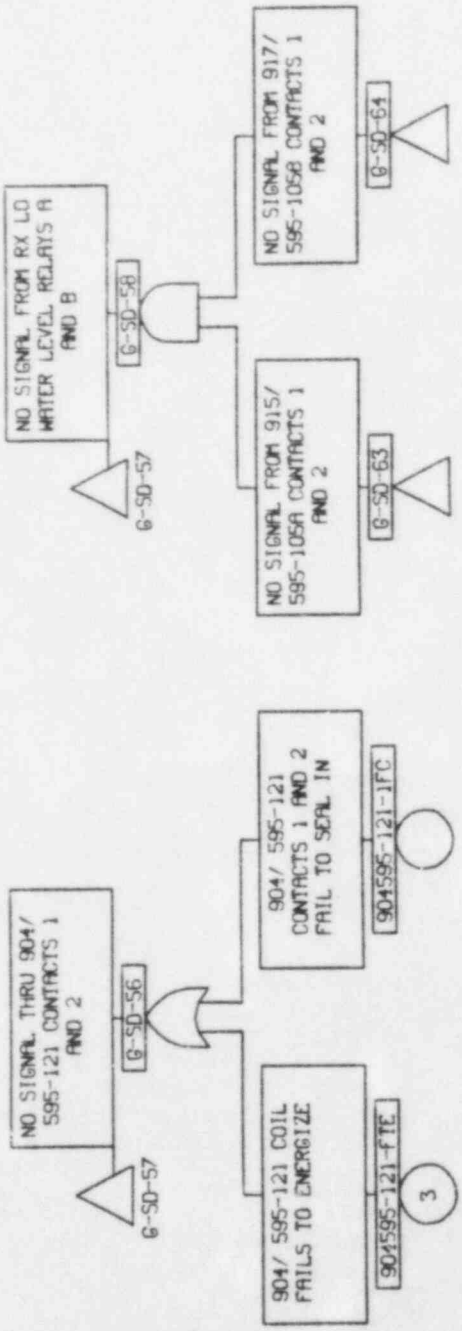

NO SIGNAL TO 917/ 595-105D COIL
G-SD-43
G-SD-41
G-SD-66
L/O A.C. POWER ON RPS BUS B
G-AC-BUS-RPS-B
2
NO SIGNAL FROM 917/ 590-105D CONTACTS 11 AND 12
G-SD-45
917/ 590-105D COIL FAIL TO ENERGIZE
917590-105D-FTE
NO SIGNAL TO 917/ 590-105D COIL
G-SD-47
917/ 590-105D CONTACTS 11 AND 12 FAIL TO CLOSE
917590-105D-BFC
FAILURE OF LO WATER LEVEL SW. 2206/ 263-58B - CLOSED ABOVE LO LEVEL
2206263-58B-XFC

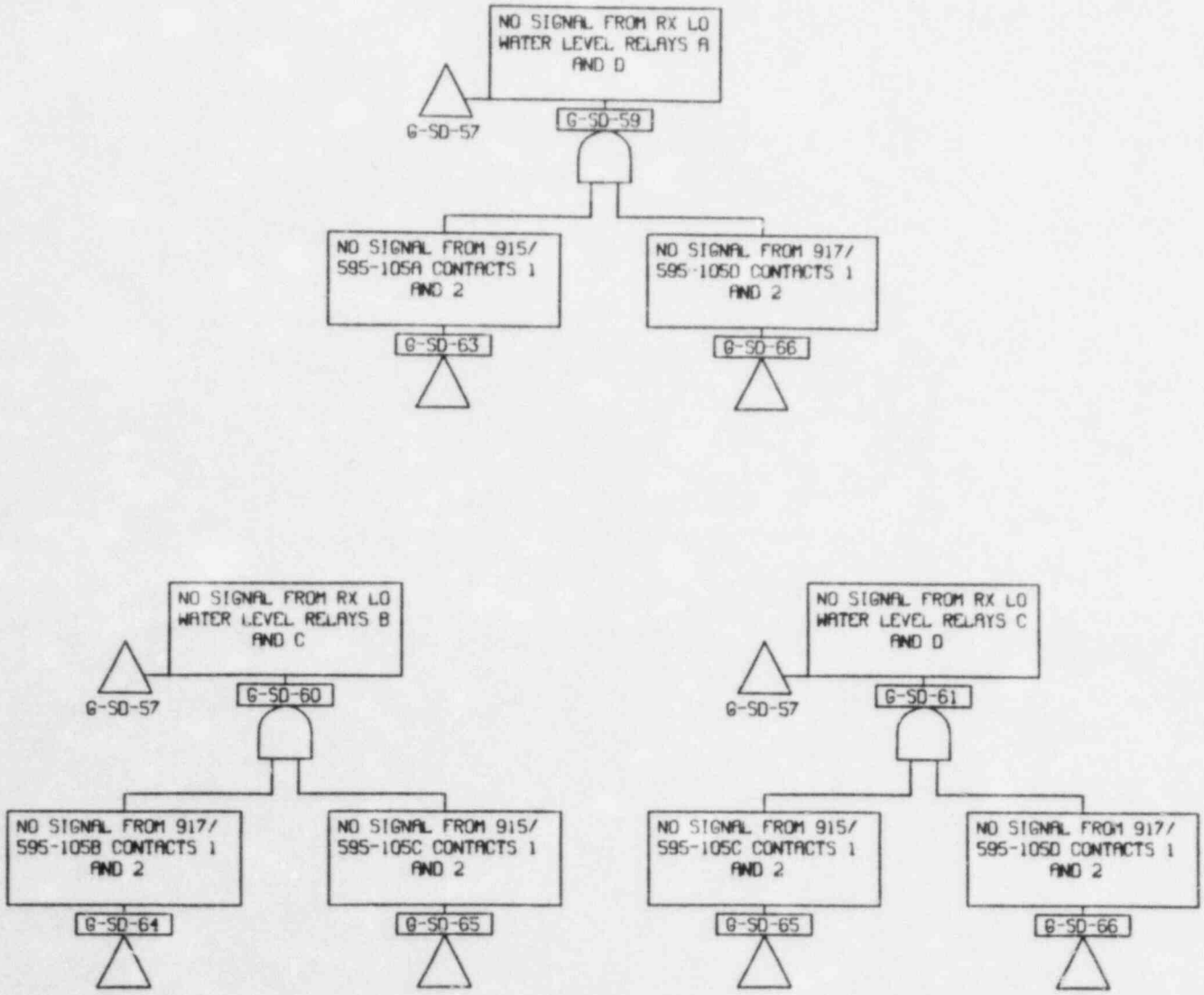

NO FLOW THRU MOV 1-SD-4A - N.C.
G-SD-4
G-SD-48
L/O D.C. POWER TO BUS 101-AB-2
G-DC-BUS-AB2-2E
TEST OR MAINT. ON MOV 1-SD-4A
SD-4A-MOV-TMC
NO CONTROL SIGNAL TO OPEN MOV 1-SD-4A
G-SD-49
NO SIGNAL GENERATED BY CONTROL LOGIC
G-SD-50
MOV 1-SD-4A FAILS TO OPEN
SD-4A-MOV-FTO
FAILURE OF BREAKER AT MCC 101-AB-2 COMP. 2E
DC-AB2-2E-FTC

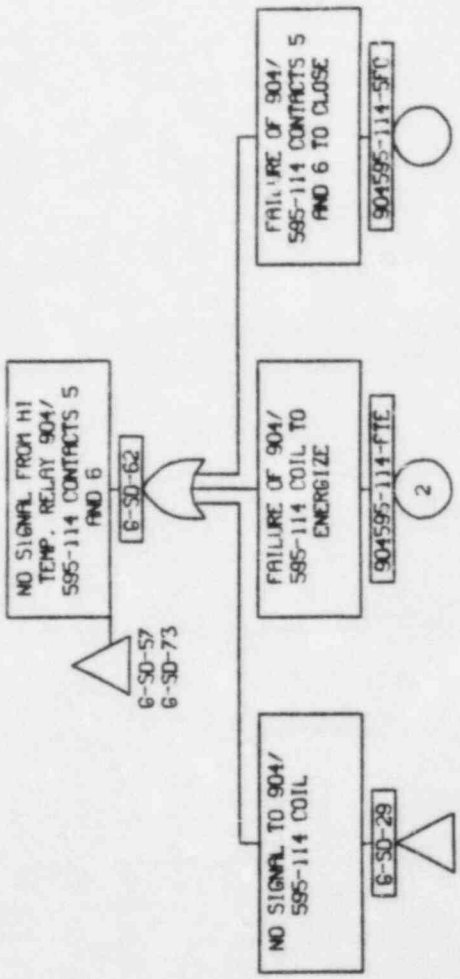

NO SIGNAL GENERATED BY CONTROL LOGIC
G-50-49
G-50-50
NO SIGNAL THRU MAN. SW. 904/ 595-317A CONTACTS 1 AND 1T
G-50-53
NO SIGNAL THRU 904/ 595-120 CONTACTS 11 AND 12
G-50-52
904/ 595-317A SWITCH FAILS
904595-317A-FME
904/ 595-317A CONTACTS 1 AND 1T FAIL TO CLOSE
904595-317A-1FC
OPERATOR FAILS TO CLOSE MAN. SW. 904/ 595-317A - OPENS VALVE
904595-317A-OPC
904/ 595-120 COIL FAILS TO ENERGIZE
904595-120-FME
3
904/ 595-120 CONTACTS 11 AND 12 FAIL TO CLOSE
904595-120-1&2C
NO SIGNAL TO COIL OF RELAY 904/ 595-120
G-50-57

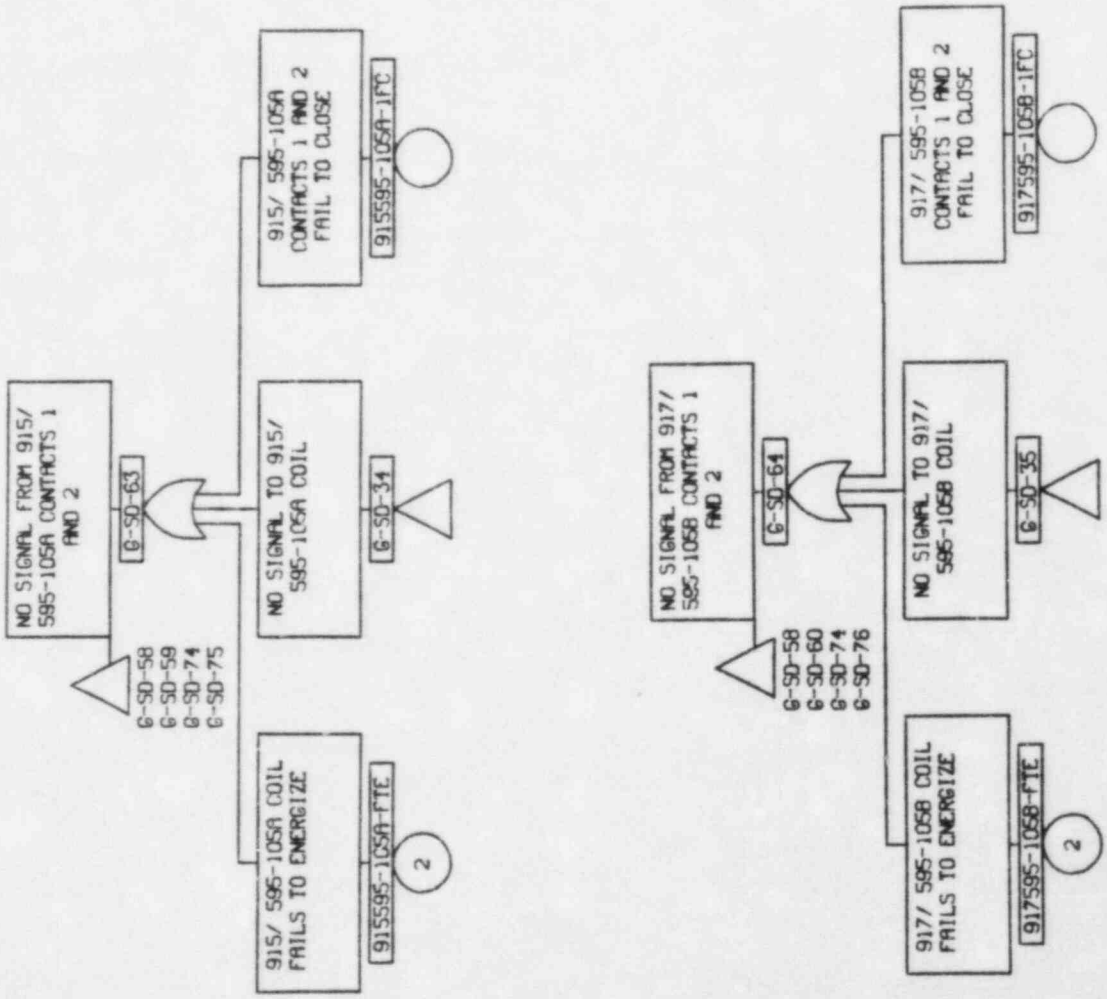

NO SIGNAL THRU 904/ 595-1108 CONTACTS 1 AND 2
G-50-51
G-50-57
G-50-73
NO SIGNAL TO 904/ 595-1108 COIL
G-50-54
904/ 595-1108 CONTACTS 1 AND 2 FAIL TO CLOSE
904595-1108-1FC
NO SIGNAL THRU MANUAL SWITCH 905/ 595-306 CONTACTS 3 AND 4
G-50-55
905/ 595-306 CONTACTS 3 AND 4 FAIL TO CLOSE
905595-306-3FC
904/ 595-1108 COIL FAILS TO ENERGIZE
904595-1108-FTE
L/O INSTRUMENT A.C. CIRCUIT NO. 9
G-AC-BUS-1AC-9
2
905/ 595-306 SWITCH FAILS
905595-306-FTE
2
OPERATOR FAILS TO RESET SWITCH 905/595 -306 - SDC ISOLATION VALVE PERMISSIVE
905595-306-OPR
2

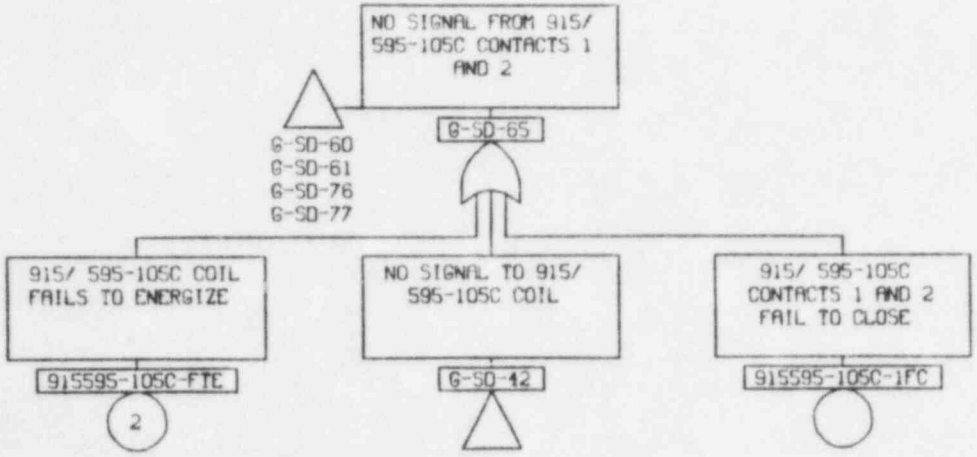

NO SIGNAL TO COIL OF RELAY 504/ 595-120
6-90-52
6-90-95
6-90-59
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND B
6-90-58
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND D
6-90-56
NO SIGNAL THRU 504/ 595-121 CONTACTS 1 AND 2
6-90-57
NO SIGNAL THRU 504/ 595-1108 CONTACTS 1 AND 2
6-90-51
NO SIGNAL FROM RX LO WATER LEVEL RELAYS B AND C
6-90-60
NO SIGNAL FROM RX LO WATER LEVEL RELAYS C AND D
6-90-61
NO SIGNAL FROM HI TEMP. RELAY 504/ 595-1114 CONTACTS 5 AND 6
6-90-62
FAILURE OF 504/ 595-120 CONTACTS 1 AND 2 TO SEAL IN
6-90-55
2
L/O INSTRUMENT A.C. CIRCUIT NO. 6
6-AE-AC5-INC 6
S

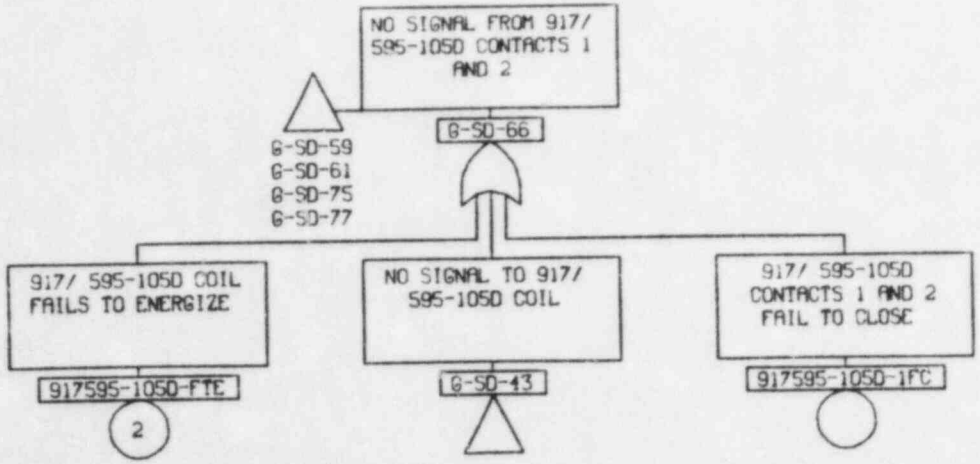

NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND B
6-SD-57
6-SD-58
NO SIGNAL FROM 915/ 595-105A CONTACTS 1 AND 2
6-SD-63
NO SIGNAL FROM 917/ 595-105B CONTACTS 1 AND 2
6-SD-64
NO SIGNAL THRU 904/ 595-121 CONTACTS 1 AND 2
6-SD-57
6-SD-56
904/ 595-121 CONTACTS 1 AND 2 FAIL TO SEAL IN
904595-121-1FC
904/ 595-121 COIL FAILS TO ENERGIZE
904595-121-FTE
3

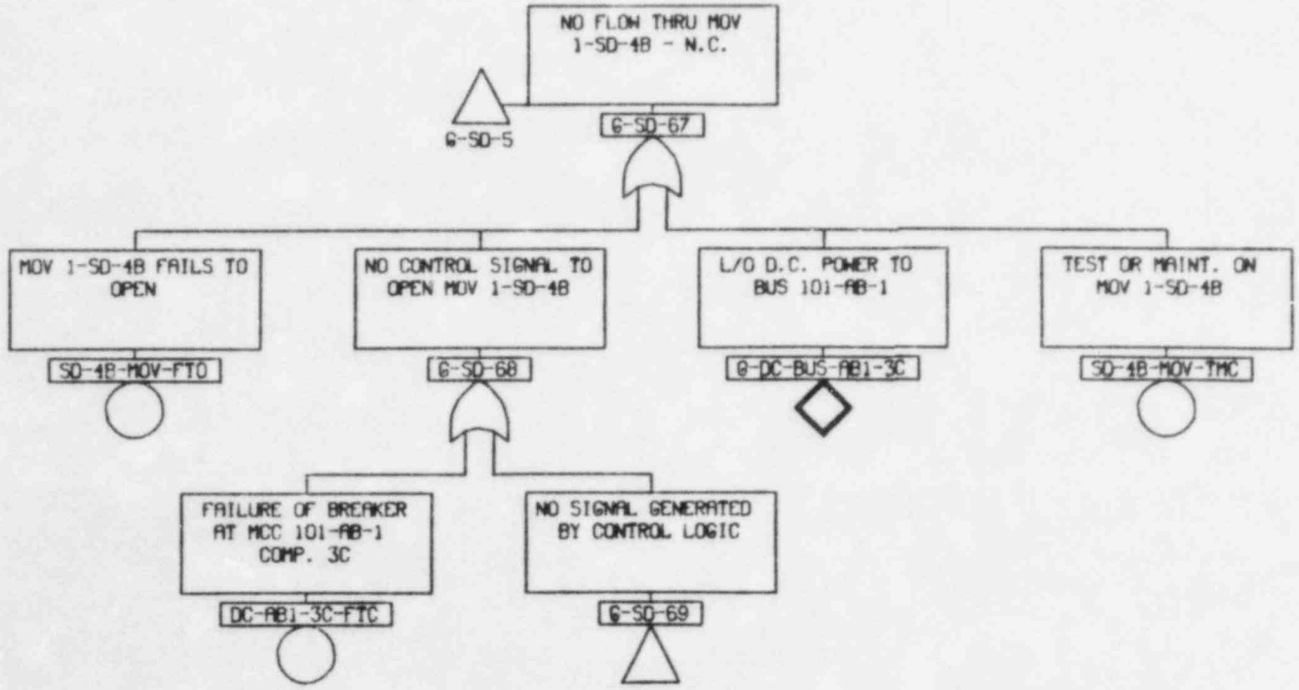

NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND D
G-SD-57
G-SD-59
NO SIGNAL FROM 915/ 595-105A CONTACTS 1 AND 2
NO SIGNAL FROM 917/ 595-105D CONTACTS 1 AND 2
G-SD-63
G-SD-66
NO SIGNAL FROM RX LO WATER LEVEL RELAYS B AND C
G-SD-57
G-SD-60
NO SIGNAL FROM 917/ 595-105B CONTACTS 1 AND 2
NO SIGNAL FROM 915/ 595-105C CONTACTS 1 AND 2
G-SD-64
G-SD-65
NO SIGNAL FROM RX LO WATER LEVEL RELAYS C AND D
G-SD-57
G-SD-61
NO SIGNAL FROM 915/ 595-105C CONTACTS 1 AND 2
NO SIGNAL FROM 917/ 595-105D CONTACTS 1 AND 2
G-SD-65
G-SD-66

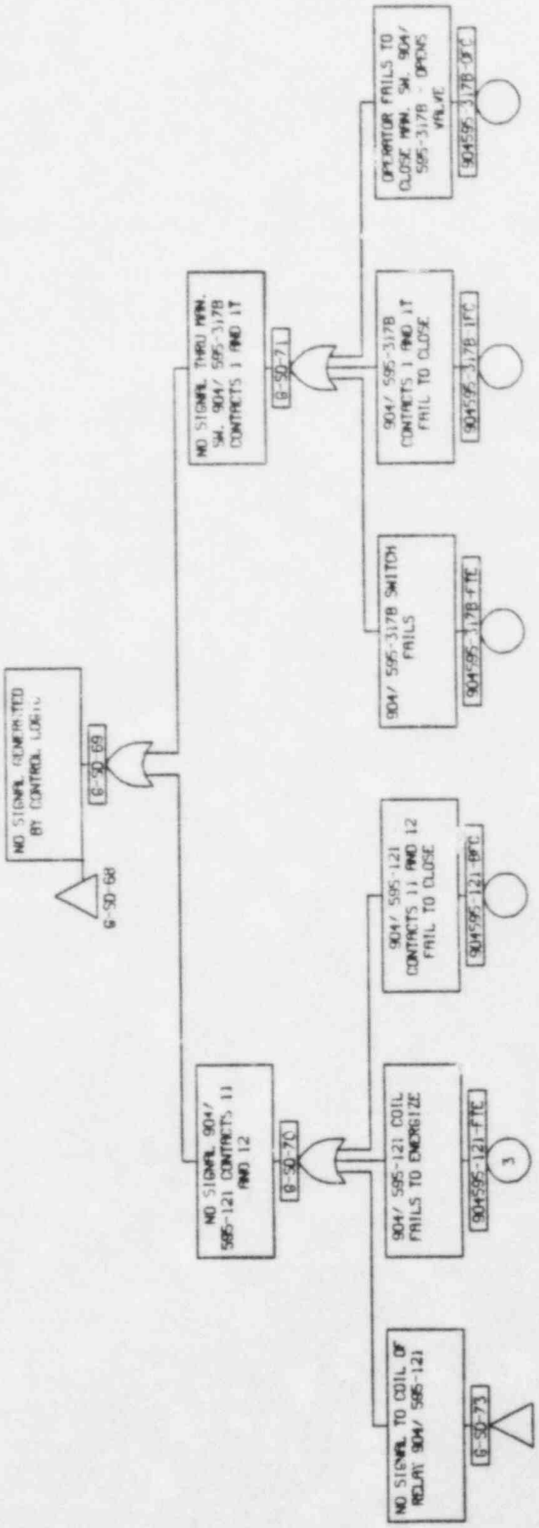

NO SIGNAL FROM HI TEMP. RELAY 904/595-114 CONTACTS 5 AND 6
6-SD-62
6-SD-57
6-SD-73
FAILURE OF 904/595-114 COIL TO ENERGIZE
904595-114-FTE
2
FAILURE OF 904/595-114 CONTACTS 5 AND 6 TO CLOSE
904595-114-SFC
NO SIGNAL TO 904/595-114 COIL
6-SD-29

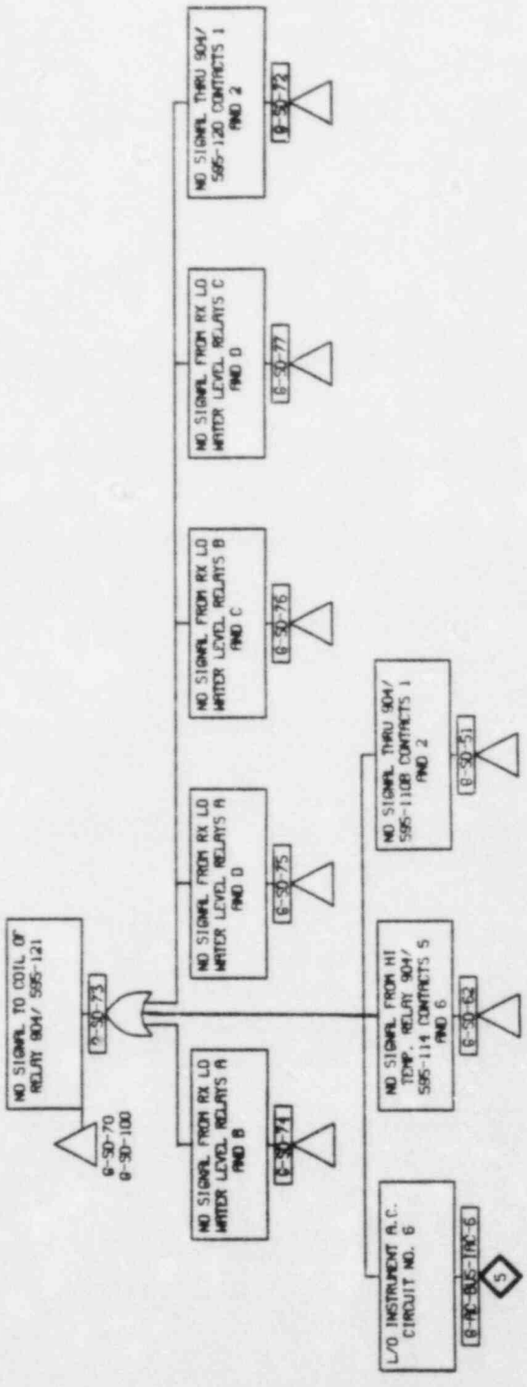

NO SIGNAL FROM 915/ 595-105A CONTACTS 1 AND 2
6-SD-58
6-SD-59
6-SD-74
6-SD-75
6-SD-63
915/ 595-105A COIL FAILS TO ENERGIZE
915595-105A-FTE
2
NO SIGNAL TO 915/ 595-105A COIL
6-SD-34
915/ 595-105A CONTACTS 1 AND 2 FAIL TO CLOSE
915595-105A-1FC
NO SIGNAL FROM 917/ 595-105B CONTACTS 1 AND 2
6-SD-58
6-SD-60
6-SD-74
6-SD-76
6-SD-64
917/ 595-105B COIL FAILS TO ENERGIZE
917595-105B-FTE
2
NO SIGNAL TO 917/ 595-105B COIL
6-SD-35
917/ 595-105B CONTACTS 1 AND 2 FAIL TO CLOSE
917595-105B-1FC

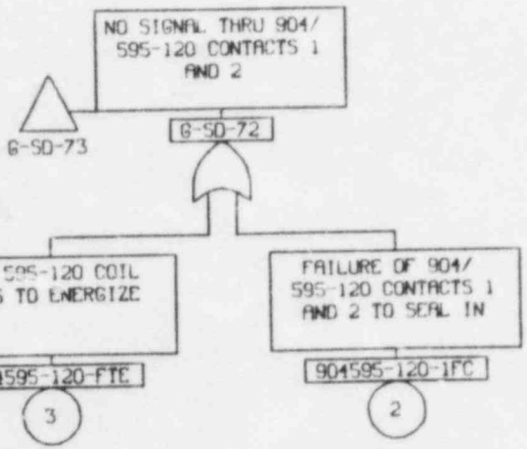

NO SIGNAL FROM 915/ 595-105C CONTACTS 1 AND 2
G-SD-65
G-SD-60
G-SD-61
G-SD-76
G-SD-77
915/ 595-105C COIL FAILS TO ENERGIZE
915595-105C-FTE
2
NO SIGNAL TO 915/ 595-105C COIL
G-SD-42
915/ 595-105C CONTACTS 1 AND 2 FAIL TO CLOSE
915595-105C-1FC

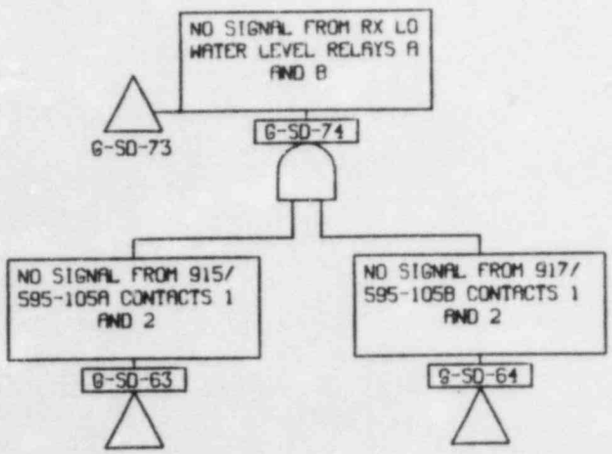

NO SIGNAL FROM 917/ 595-105D CONTACTS 1 AND 2
G-SD-66
G-SD-59
G-SD-61
G-SD-75
G-SD-77
917/ 595-105D COIL FAILS TO ENERGIZE
917595-105D-FTE
2
NO SIGNAL TO 917/ 595-105D COIL
G-SD-43
917/ 595-105D CONTACTS 1 AND 2 FAIL TO CLOSE
917595-105D-1FC

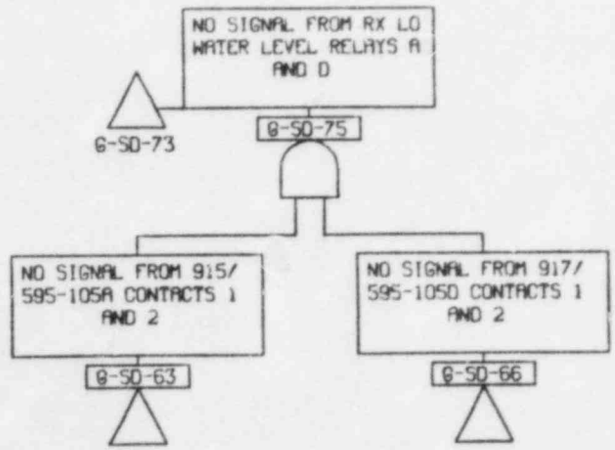

NO FLOW THRU MOV
1-SD-4B - N.C.
G-SD-67
G-SD-5
MOV 1-SD-4B FAILS TO
OPEN
SD-4B-MOV-FTO
NO CONTROL SIGNAL TO
OPEN MOV 1-SD-4B
G-SD-68
L/O D.C. POWER TO
BUS 101-AB-1
Q-DC-BUS-AB1-3C
TEST OR MAINT. ON
MOV 1-SD-4B
SD-4B-MOV-TMC
FAILURE OF BREAKER
AT MCC 101-AB-1
COMP. 3C
DC-AB1-3C-FTC
NO SIGNAL GENERATED
BY CONTROL LOGIC
G-SD-69

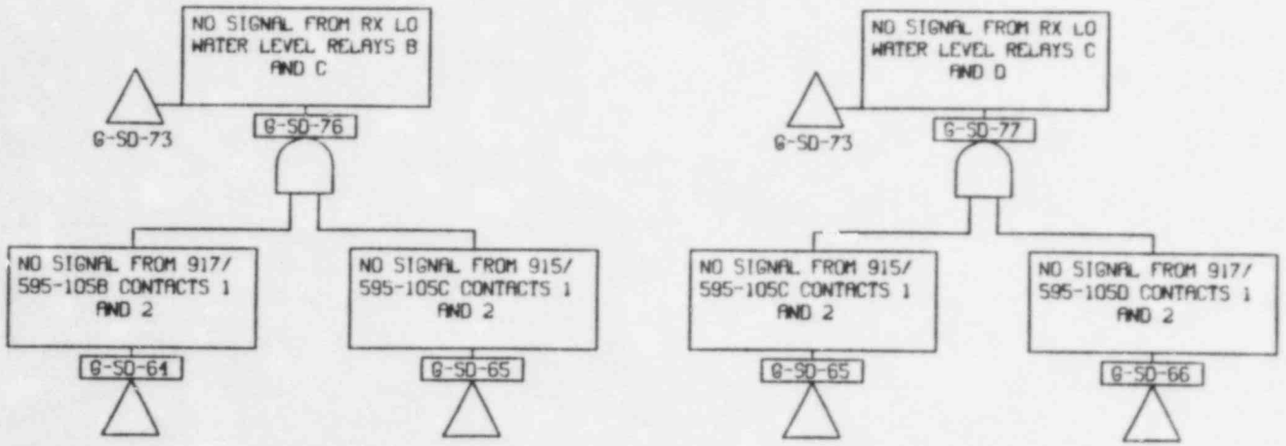

NO SIGNAL GENERATED BY CONTROL LOGIC
G-SD-68
G-SD-69
NO SIGNAL THRU MAN. SW. 904/ 595-3178 CONTACTS 1 AND 11
G-SD-71
OPERATOR FAILS TO CLOSE MAN. SW. 904/ 595-3178 - OPENS VALVE
904595-3178-OPC
904/ 595-3178 CONTACTS 1 AND 11 FAIL TO CLOSE
904595-3178-1PC
904/ 595-3178 SWITCH FAILS
904595-3178-FTC
904/ 595-121 CONTACTS 11 AND 12 FAIL TO CLOSE
904595-121-BPC
NO SIGNAL 904/ 595-121 CONTACTS 11 AND 12
G-SD-70
904/ 595-121 COIL FAILS TO ENERGIZE
904595-121-FTC
3
NO SIGNAL TO COIL OF RELAY 904/ 595-121
G-SD-73

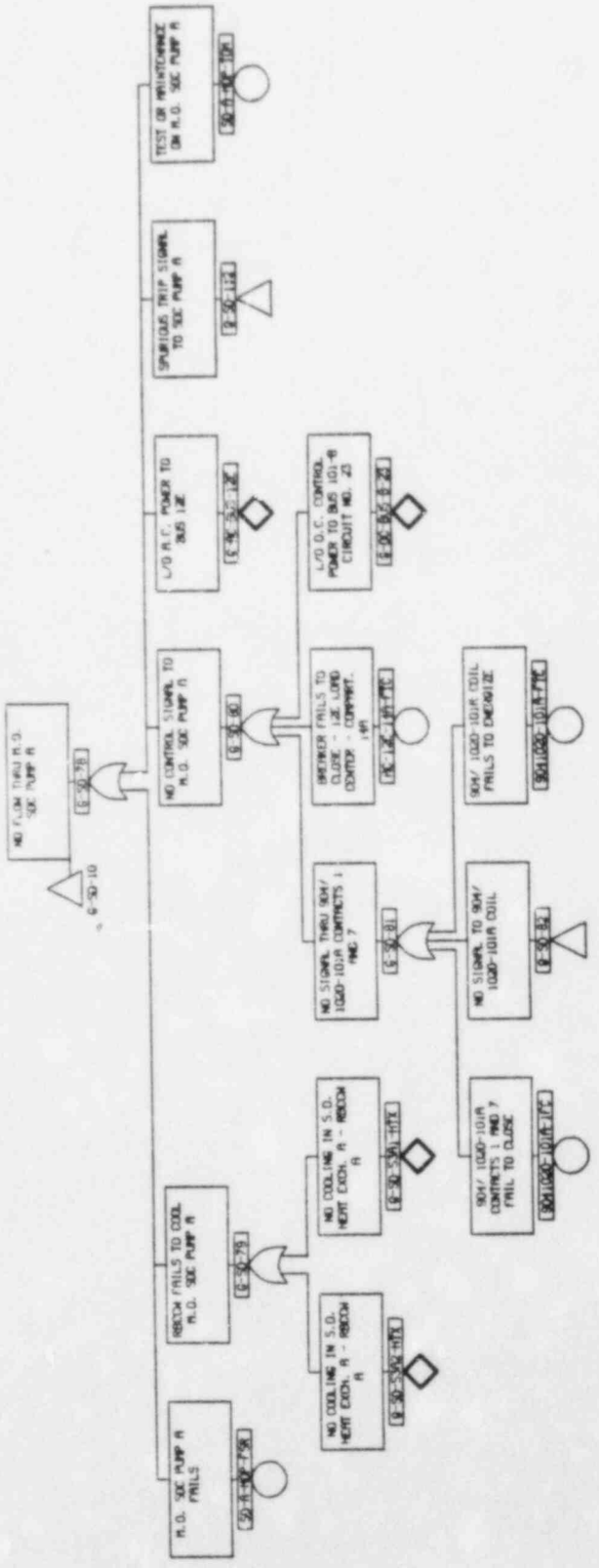

NO SIGNAL TO COIL OF RELAY 904/ 595-121
6-30-73
6-30-70
6-30-100
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND B
6-30-74
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND D
6-30-75
NO SIGNAL FROM RX LO WATER LEVEL RELAYS B AND C
6-30-76
NO SIGNAL FROM RX LO WATER LEVEL RELAYS C AND D
6-30-77
NO SIGNAL THRU 904/ 595-120 CONTACTS 1 AND 2
6-30-72
NO SIGNAL FROM HI TEMP. RELAY 904/ 595-114 CONTACTS 5 AND 6
6-30-52
NO SIGNAL THRU 904/ 595-1108 CONTACTS 1 AND 2
6-30-51
L/O INSTRUMENT A.C. CIRCUIT NO. 6
6-AC-6-INC-6
S

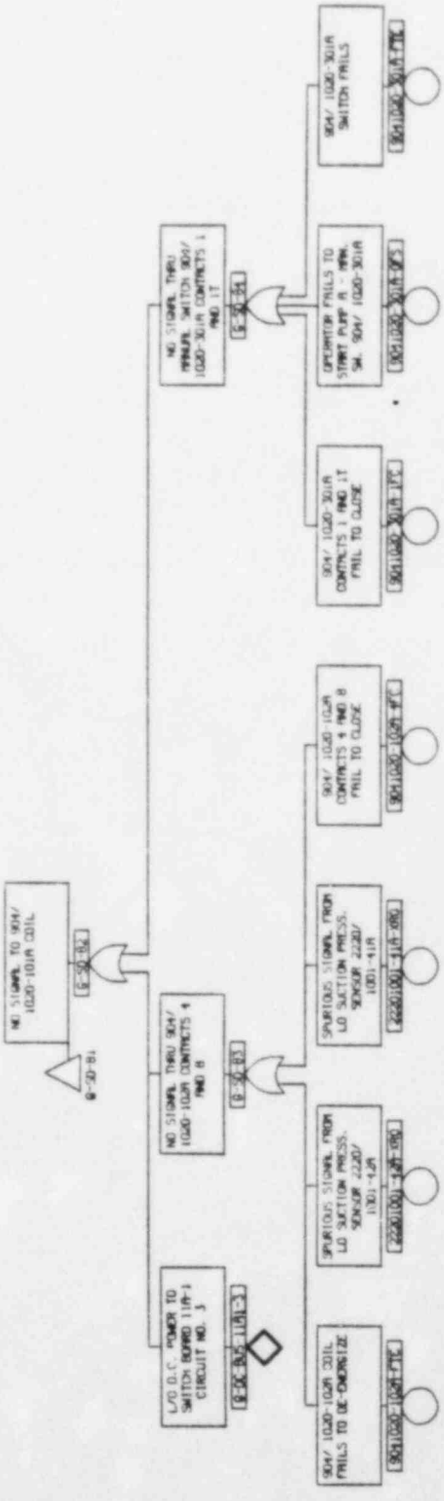

NO SIGNAL THRU 904/
595-120 CONTACTS 1
AND 2
G-SD-73
G-SD-72
904/ 595-120 COIL
FAILS TO ENERGIZE
FAILURE OF 904/
595-120 CONTACTS 1
AND 2 TO SEAL IN
904595-120-FTE
904595-120-1FC
3
2

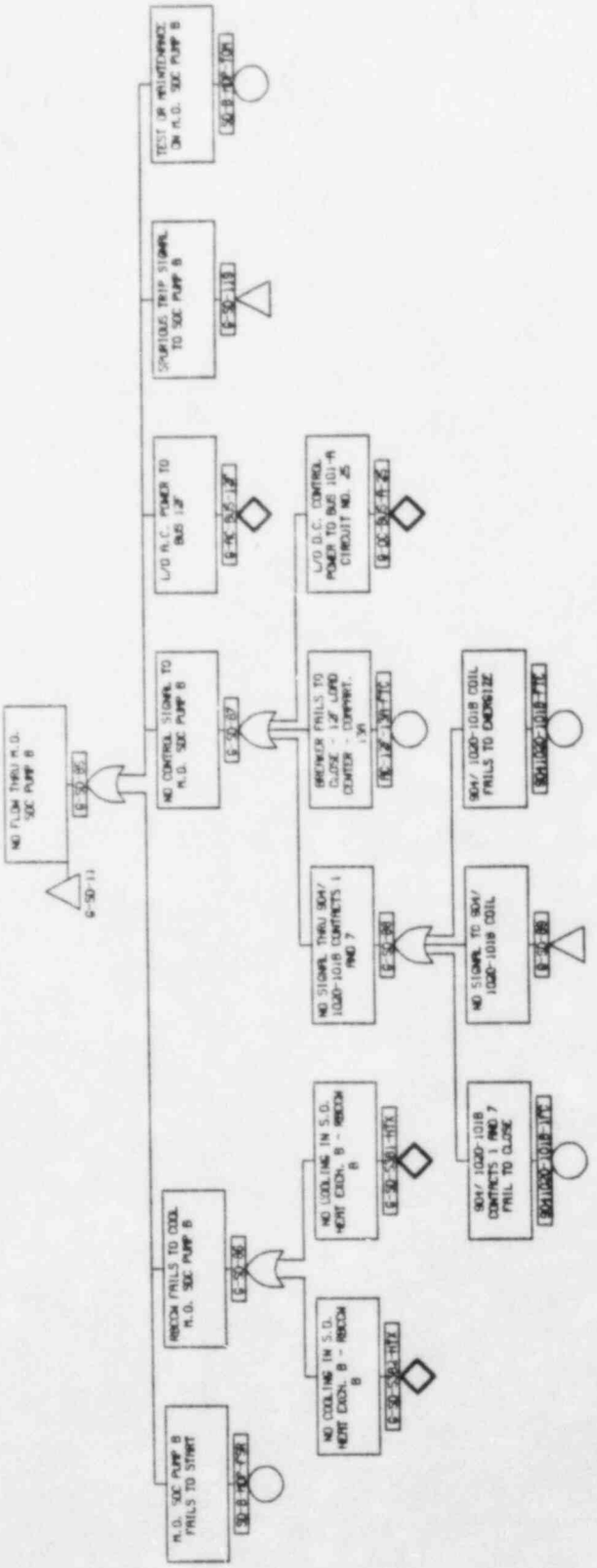

NO SIGNAL FROM RX LO
WATER LEVEL RELAYS A
AND B
G-SD-73
G-SD-74
NO SIGNAL FROM 915/
595-105A CONTACTS 1
AND 2
NO SIGNAL FROM 917/
595-105B CONTACTS 1
AND 2
G-SD-63
G-SD-64

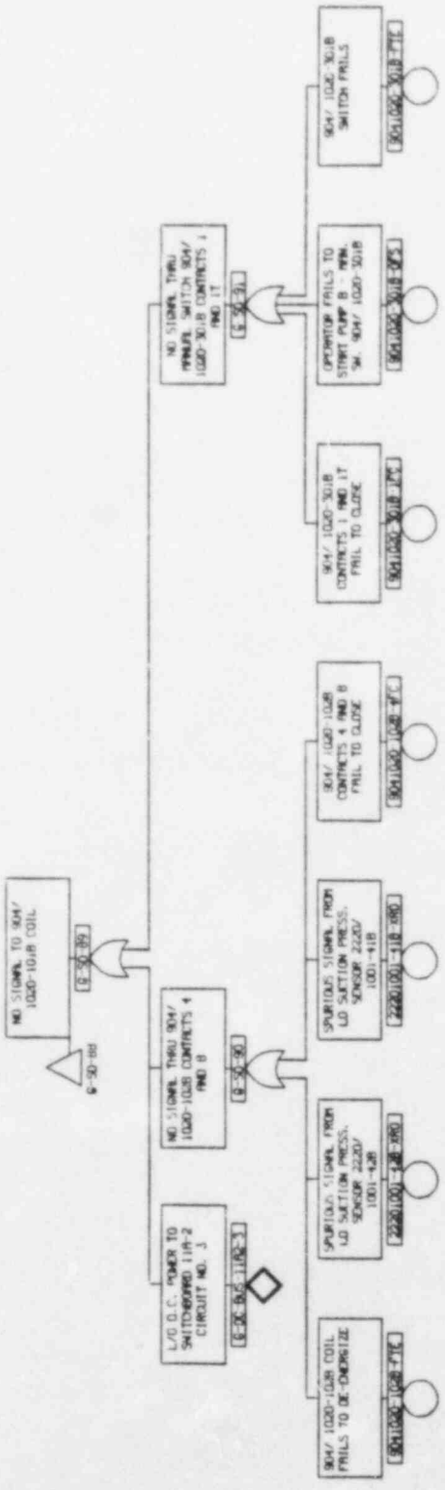

NO SIGNAL FROM RX LO
WATER LEVEL RELAYS A
AND D
G-SD-73
G-SD-75
NO SIGNAL FROM 915/
595-105A CONTACTS 1
AND 2
NO SIGNAL FROM 917/
595-105D CONTACTS 1
AND 2
G-SD-63
G-SD-66

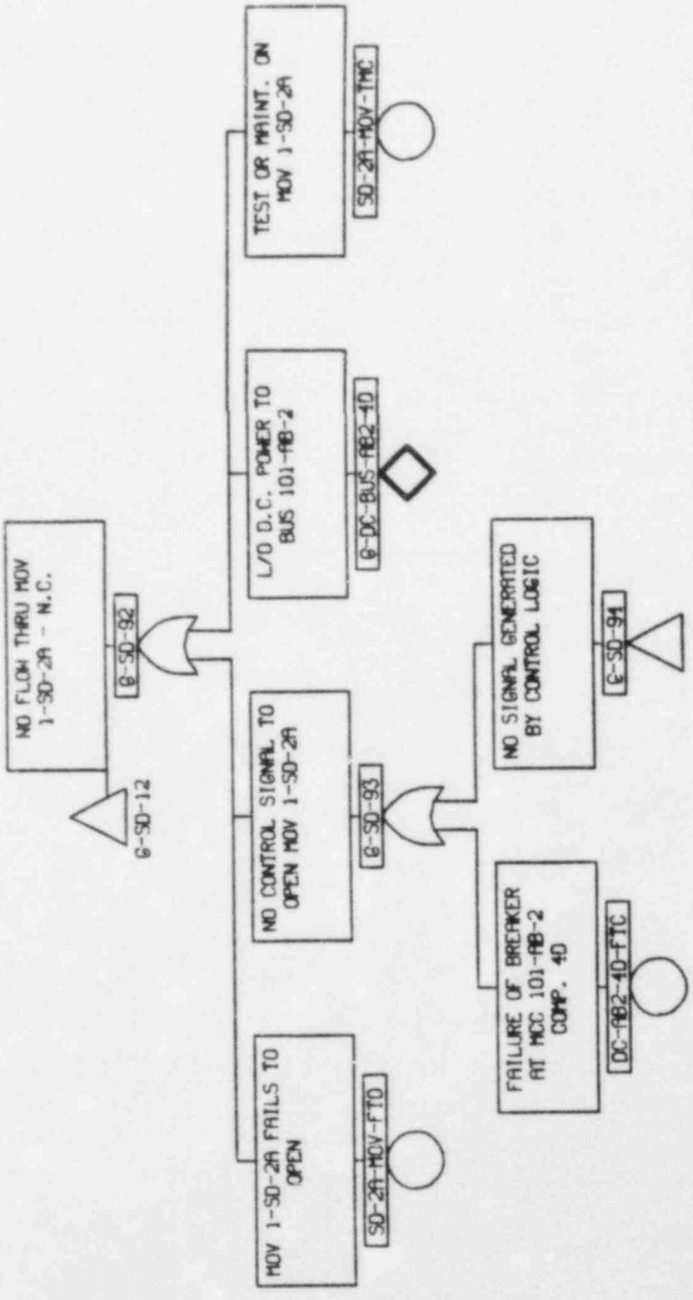

NO SIGNAL FROM RX LO WATER LEVEL RELAYS B AND C
G-SD-73
G-SD-76
NO SIGNAL FROM 917/ 595-105B CONTACTS 1 AND 2
G-SD-64
NO SIGNAL FROM 915/ 595-105C CONTACTS 1 AND 2
G-SD-65
NO SIGNAL FROM RX LO WATER LEVEL RELAYS C AND D
G-SD-73
G-SD-77
NO SIGNAL FROM 915/ 595-105C CONTACTS 1 AND 2
G-SD-65
NO SIGNAL FROM 917/ 595-105D CONTACTS 1 AND 2
G-SD-66

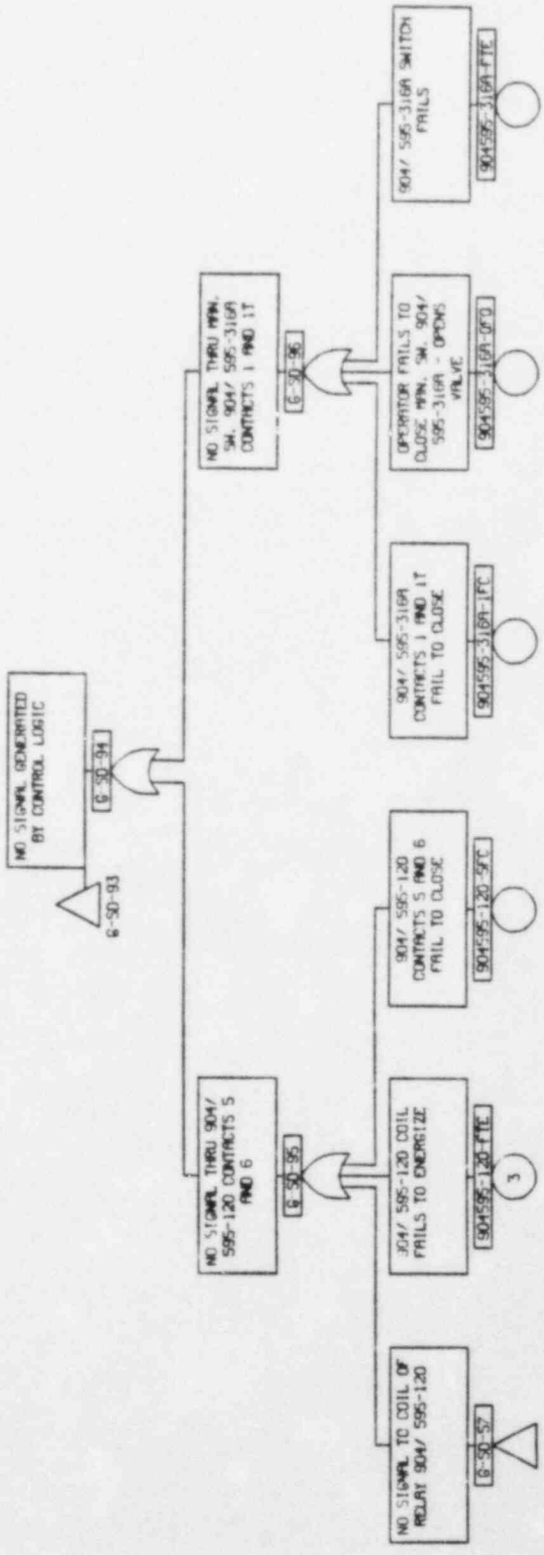

NO FLOW THRU R.O. SDC PUMP A
G-SD-10
NO CONTROL SIGNAL TO R.O. SDC PUMP A
L/O A.C. POWER TO BUS 1ZE
SPURIOUS TRIP SIGNAL TO SDC PUMP A
TEST OR MAINTENANCE ON R.O. SDC PUMP A
BREAKER FAILS TO CLOSE - 1ZE LOAD CONTR. COMPART. 1M1
L/O D.C. CONTROL POWER TO BUS 1D1-1 CIRCUIT NO. 23
NO SIGNAL THRU 90H/ 1GD1-101A CONTACTS 1 AND 7
90H/ 1GD1-101A COIL FAILS TO ENERGIZE
NO SIGNAL TO 90H/ 1GD1-101A COIL
90H/ 1GD1-101A CONTACTS 1 AND 7 FAIL TO CLOSE
R.O. SDC PUMP A FAILS
RSDCH FAILS TO COOL R.O. SDC PUMP A
NO COOLING IN S.D. HEAT EXCH. A - RSDCH A
NO COOLING IN S.D. HEAT EXCH. A - RSDCH A

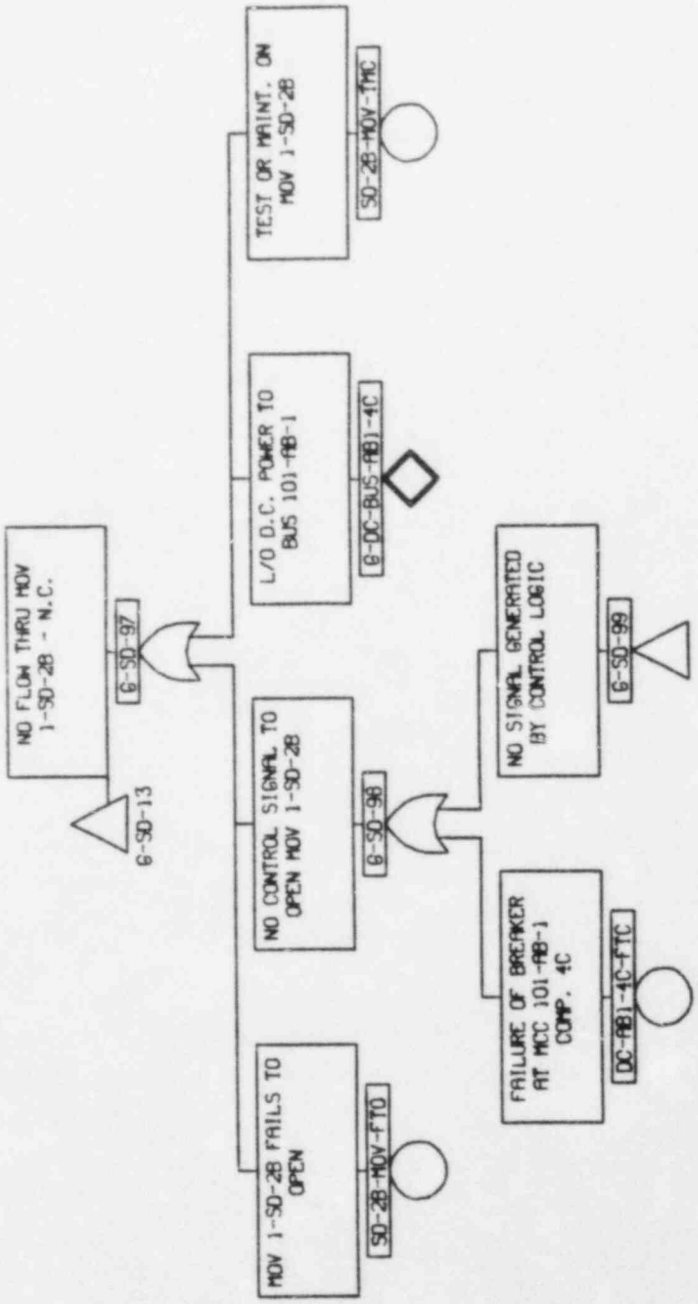

NO SIGNAL TO 90A/ 100D-10UA COIL
G-2D-81
E-5C-82
NO SIGNAL THRU 90A/ 100D-10UA CONTACTS 9 AND 8
E-5C-83
NO SIGNAL THRU MANUAL SWITCH 90A/ 100D-30UA CONTACTS 1 AND 1T
E-5C-84
L/O D.C. POWER TO SWITCH BOARD 11A-1 CIRCUIT NO. 3
E-5C-85
90A/ 100D-10UA COIL FAILS TO DE-ENERGIZE
SPURIOUS SIGNAL FROM LO SUCTION PRESS. SENSOR 222D/ 100J-4UA
SPURIOUS SIGNAL FROM LO SUCTION PRESS. SENSOR 222D/ 100J-4UA
90A/ 100D-10UA CONTACTS 9 AND 8 FAIL TO CLOSE
90A/ 100D-30UA CONTACTS 1 AND 1T FAIL TO CLOSE
OPERATOR FAILS TO START PUMP A - MAN. SW. 90A/ 100D-30UA
90A/ 100D-30UA SWITCH FAILS

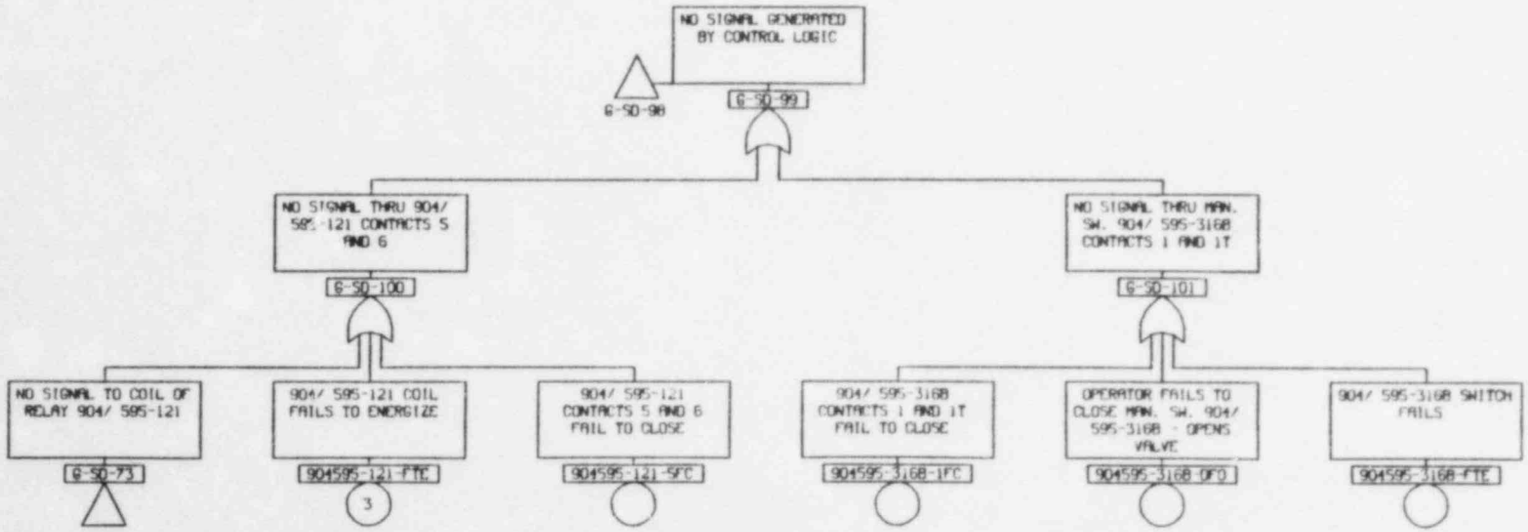

NO FLOW THRU R.O. SDC PUMP B
6-SD 11
NO CONTROL SIGNAL TO R.O. SDC PUMP B
L/O A.C. POWER TO BUS 12F
SPURIOUS TRIP SIGNAL TO SDC PUMP B
TEST OR MAINTENANCE ON R.O. SDC PUMP B
L/O D.C. CONTROL POWER TO BUS 101-A CIRCUIT NO. 25
BREAKER FAILS TO CLOSE - 12F LOAD CENTER - COMPART. 3A
NO SIGNAL THRU 90A/1GXD-101B CONTACTS 1 AND 7
90A/1GXD-101B COIL FAILS TO ENERGIZE
NO SIGNAL TO 90A/1GXD-101B COIL
90A/1GXD-101B CONTACTS 1 AND 7 FAIL TO CLOSE
RBCCW FAILS TO COOL R.O. SDC PUMP B
NO COOLING IN S.O. HEAT EXCH. B - RBCCW B
NO COOLING IN S.O. HEAT EXCH. B - RBCCW B
R.O. SDC PUMP B FAILS TO START

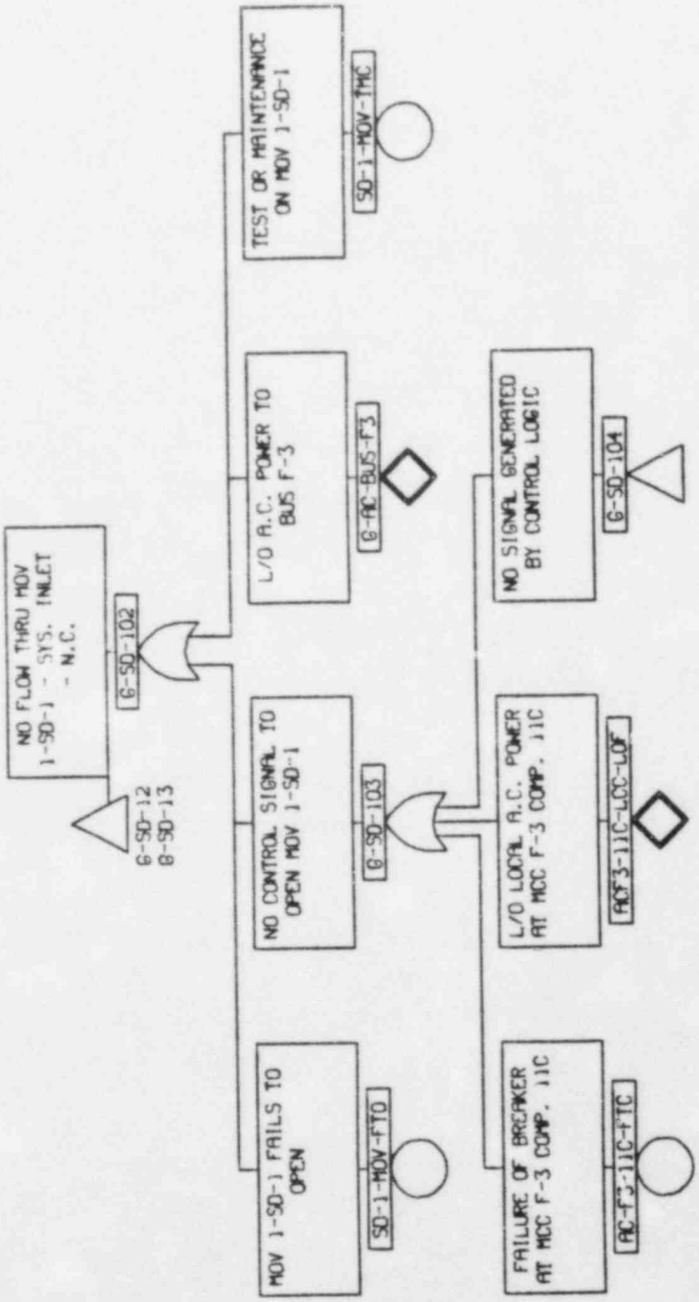

NO SIGNAL TO 904/ 1GD-1GB COIL
G-30-189
L/O D.C. POWER TO SWITCHBOARD 1A-2 CIRCUIT NO. 3
NO SIGNAL THRU 904/ 1GD-1GB CONTACTS 4 AND 8
NO SIGNAL THRU PANEL SWITCH 904/ 1GD-30J8 CONTACTS 1 AND 17
SPURIOUS SIGNAL FROM LO SUCTION PRESS. SENSOR 2220/ 1001-4B
SPURIOUS SIGNAL FROM LO SUCTION PRESS. SENSOR 2220/ 1001-4B
904/ 1GD-1GB COIL FAILS TO DE-ENERGIZE
904/ 1GD-1GB CONTACTS 4 AND 8 FAIL TO CLOSE
904/ 1GD-30J8 CONTACTS 1 AND 17 FAIL TO CLOSE
OPERATOR FAILS TO START PUMP B - MAN. SW. 904/ 1GD-30J8
904/ 1GD-30J8 SWITCH FAILS

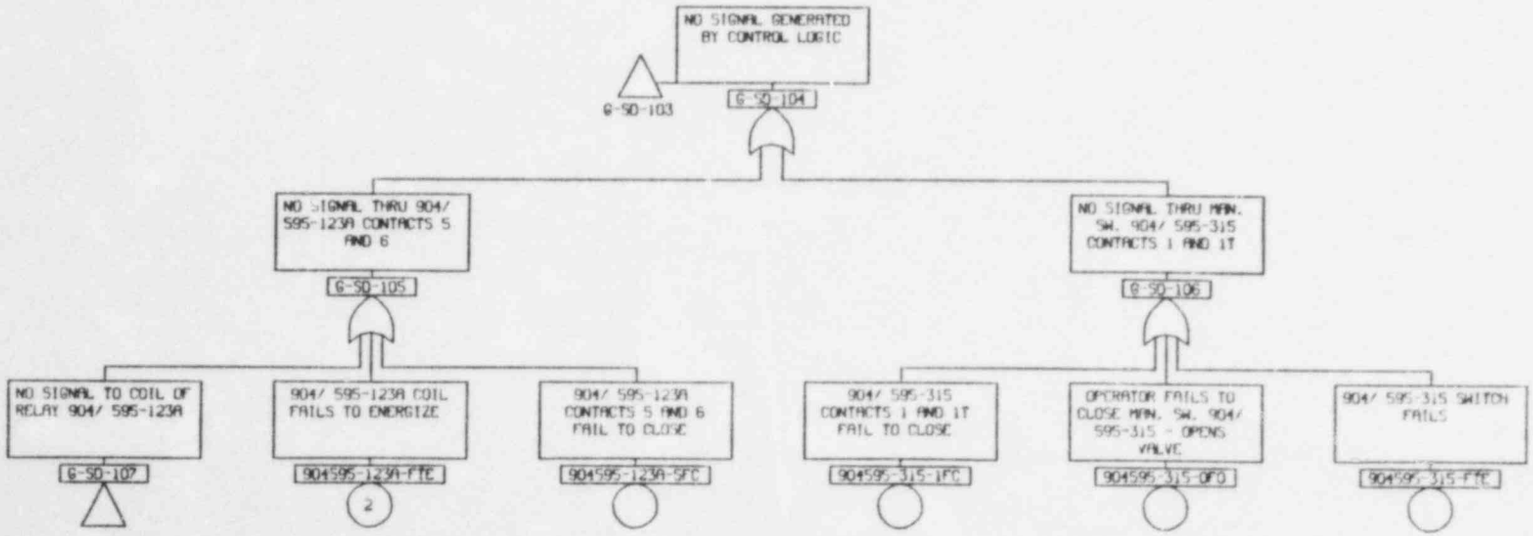

NO FLOW THRU MOV
1-SD-2A - N.C.
G-SD-92
G-SD-12
L/O D.C. POWER TO
BUS 101-PB-2
G-DC-BUS-PB2-10
TEST OR MAINT. ON
MOV 1-SD-2A
SD-2A-MOV-TMC
NO CONTROL SIGNAL TO
OPEN MOV 1-SD-2A
G-SD-93
NO SIGNAL GENERATED
BY CONTROL LOGIC
G-SD-91
MOV 1-SD-2A FAILS TO
OPEN
SD-2A-MOV-FTO
FAILURE OF BREAKER
AT MCC 101-PB-2
COMP. 40
DC-PB2-40-FTC

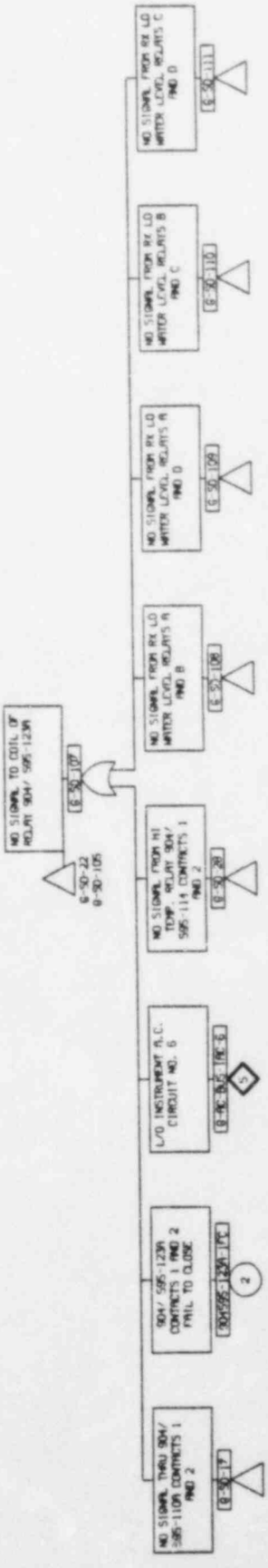

NO SIGNAL GENERATED BY CONTROL LOGIC
G-50-93
G-50-94
NO SIGNAL THRU 904/ 595-120 CONTACTS 5 AND 6
G-50-95
NO SIGNAL THRU MAN. SW. 904/ 595-316A CONTACTS 1 AND 17
G-50-96
904/ 595-120 CONTACTS 5 AND 6 FAIL TO CLOSE
904595-120-5FC
904/ 595-316A CONTACTS 1 AND 17 FAIL TO CLOSE
904595-316A-1FC
OPERATOR FAILS TO CLOSE MAN. SW. 904/ 595-316A - OPENS VALVE
904595-316A-OPO
904/ 595-316A SWITCH FAILS
904595-316A-FTC
904/ 595-120 COIL FAILS TO ENERGIZE
904595-120-FTE
3
NO SIGNAL TO COIL OF RELAY 904/ 595-120
G-50-97

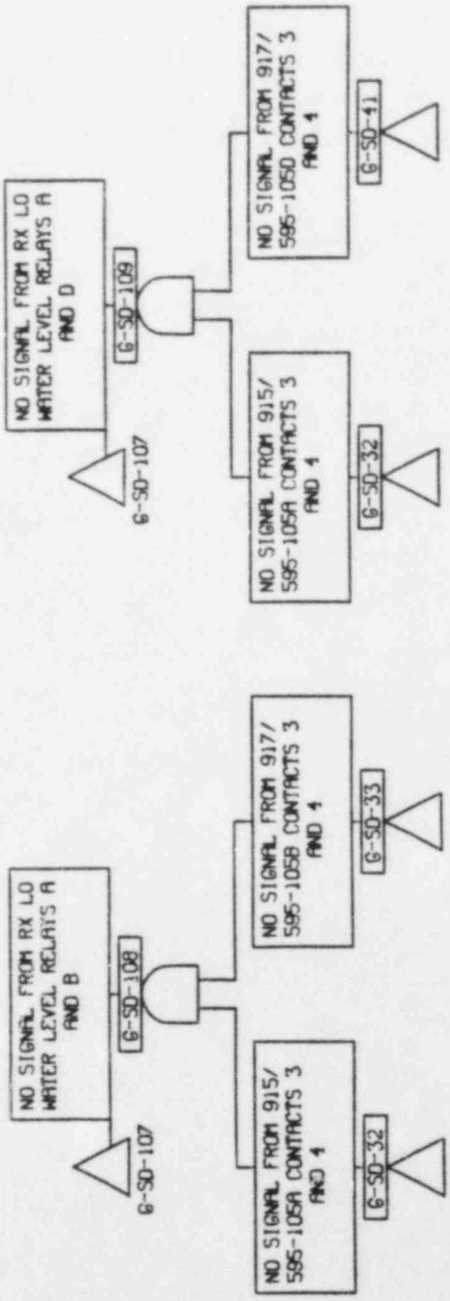

NO FLOW THRU MOV
1-SD-28 - N.C.
6-SD-97
6-SD-13
L/O D.C. POWER TO
BUS 101-AB-1
6-DC-BUS-AB1-4C
TEST OR MAINT. ON
MOV 1-SD-28
SD-28-MOV-TMC
NO CONTROL SIGNAL TO
OPEN MOV 1-SD-28
6-SD-98
NO SIGNAL GENERATED
BY CONTROL LOGIC
6-SD-99
MOV 1-SD-28 FAILS TO
OPEN
SD-28-MOV-FTO
FAILURE OF BREAKER
AT MCC 101-AB-1
COMP. 4C
DC-AB1-4C-FTC

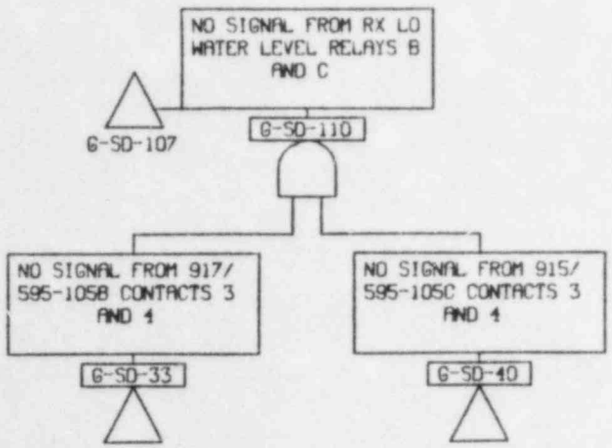

NO SIGNAL GENERATED BY CONTROL LOGIC
G-SD-99
G-SD-98
NO SIGNAL THRU 904/ 595-121 CONTACTS 5 AND 6
G-SD-100
NO SIGNAL THRU MAN. SW. 904/ 595-316B CONTACTS 1 AND 1T
G-SD-101
NO SIGNAL TO COIL OF RELAY 904/ 595-121
G-SD-73
904/ 595-121 COIL FAILS TO ENERGIZE
904595-121-FTE
3
904/ 595-121 CONTACTS 5 AND 6 FAIL TO CLOSE
904595-121-5FC
904/ 595-316B CONTACTS 1 AND 1T FAIL TO CLOSE
904595-316B-1FC
OPERATOR FAILS TO CLOSE MAN. SW. 904/ 595-316B - OPENS VALVE
904595-316B-OPO
904/ 595-316B SWITCH FAILS
904595-316B-FTE

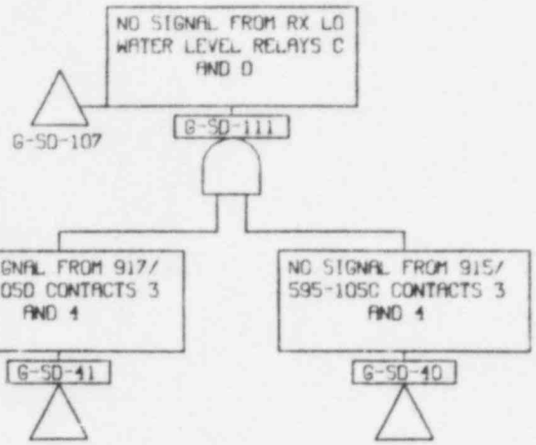

NO FLOW THRU MOV 1-SD-1 - SYS. INLET - N.C.
6-SD-102
6-SD-12
8-SD-13
MOV 1-SD-1 FAILS TO OPEN
SD-1-MOV-FTO
NO CONTROL SIGNAL TO OPEN MOV 1-SD-1
8-SD-103
L/O A.C. POWER TO BUS F-3
6-AC-BUS-F3
TEST OR MAINTENANCE ON MOV 1-SD-1
SD-1-MOV-TMC
FAILURE OF BREAKER AT MCC F-3 COMP. 11C
AC-F3-11C-FTC
L/O LOCAL A.C. POWER AT MCC F-3 COMP. 11C
ACF3-11C-LOC-LOF
NO SIGNAL GENERATED BY CONTROL LOGIC
6-SD-104

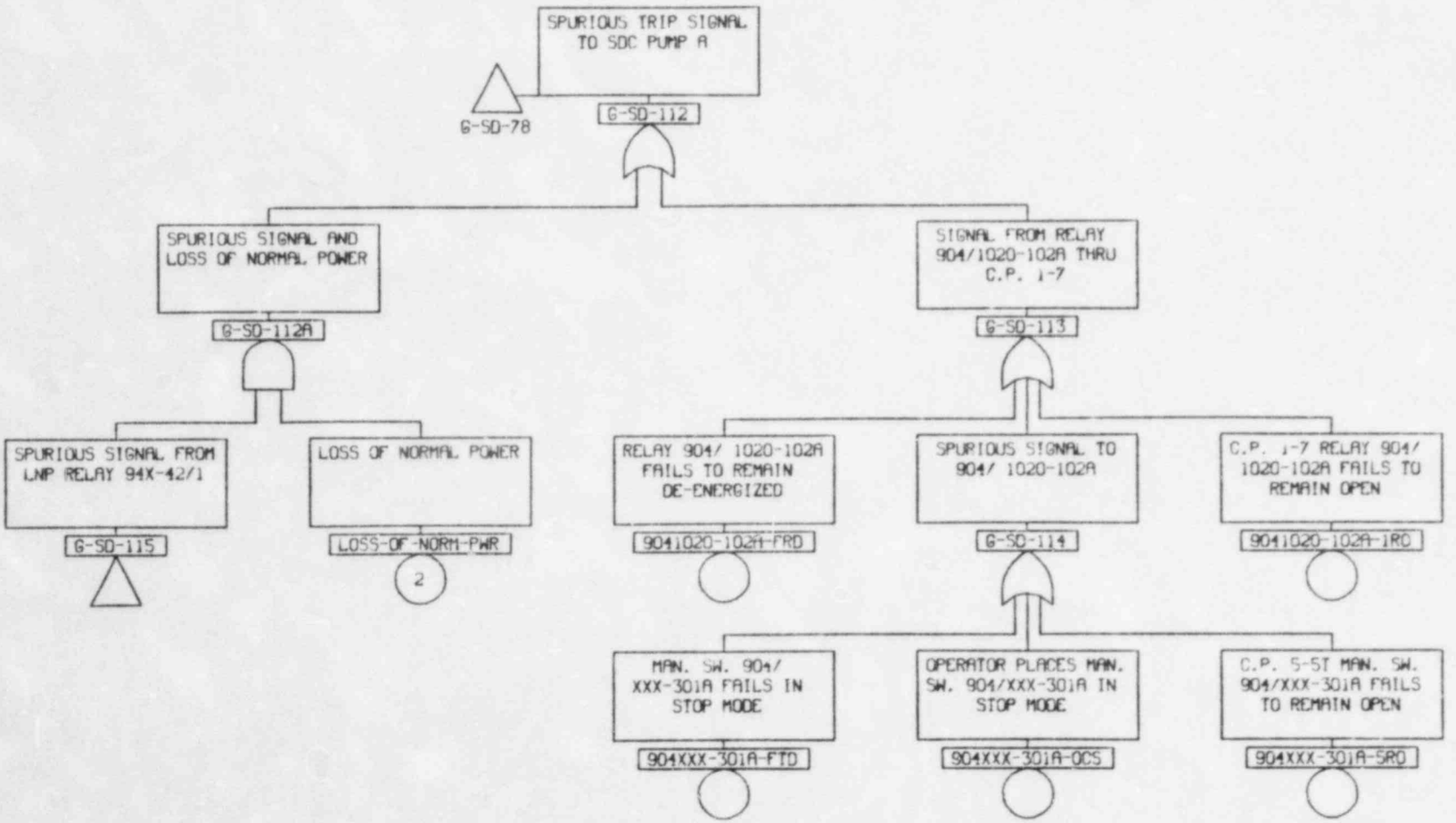

NO SIGNAL GENERATED BY CONTROL LOGIC
G-SD-104
G-SD-103
NO SIGNAL THRU 904/ 595-123A CONTACTS 5 AND 6
G-SD-105
NO SIGNAL THRU MAN. SW. 904/ 595-315 CONTACTS 1 AND 1T
G-SD-106
NO SIGNAL TO COIL OF RELAY 904/ 595-123A
G-SD-107
904/ 595-123A COIL FAILS TO ENERGIZE
904595-123A-FTE
2
904/ 595-123A CONTACTS 5 AND 6 FAIL TO CLOSE
904595-123A-5FC
904/ 595-315 CONTACTS 1 AND 1T FAIL TO CLOSE
904595-315-1FC
OPERATOR FAILS TO CLOSE MAN. SW. 904/ 595-315 - OPENS VALVE
904595-315-OFO
904/ 595-315 SWITCH FAILS
904595-315-FTE

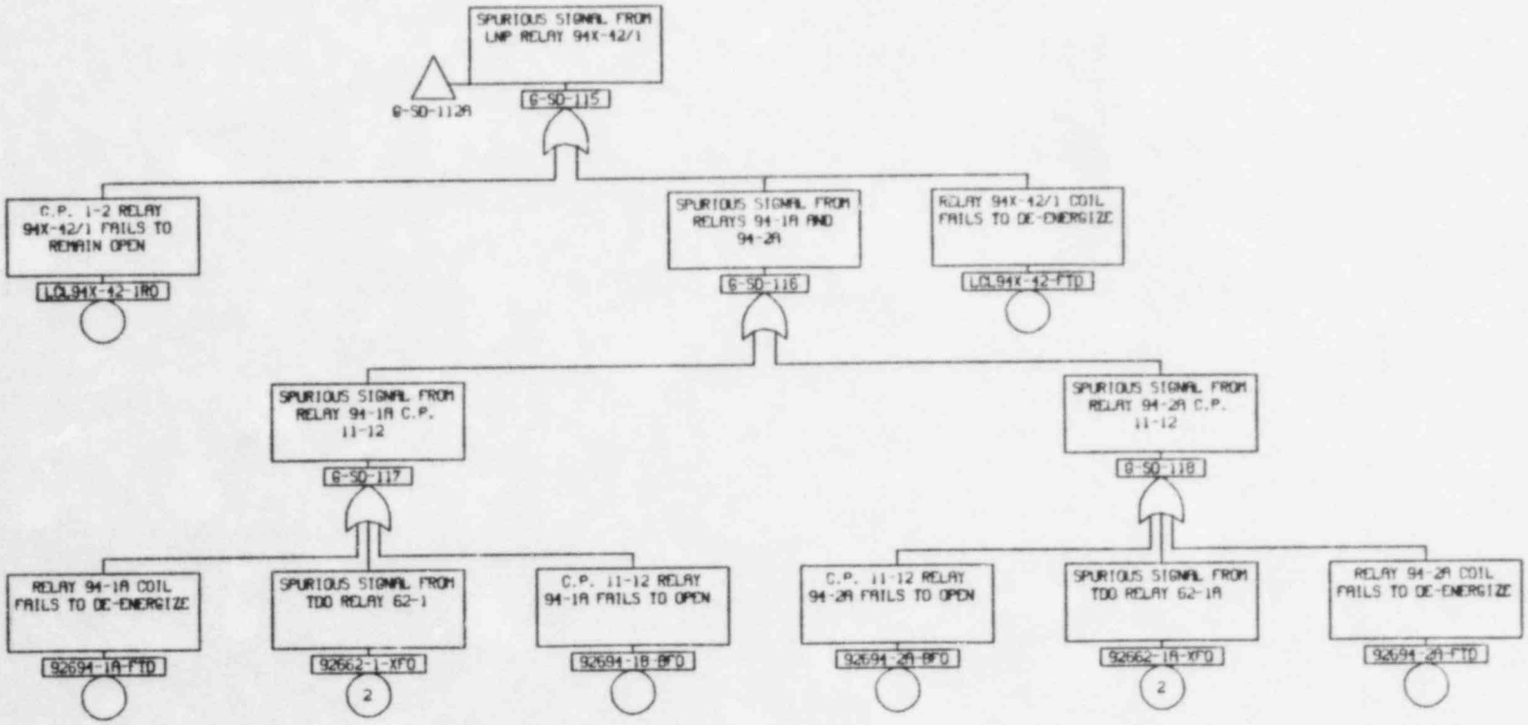

NO SIGNAL FROM RX LO WATER LEVEL RELAYS C AND D
NO SIGNAL FROM RX LO WATER LEVEL RELAYS B AND C
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND D
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND B
NO SIGNAL FROM HI TEMP. RELAY 90H/ 59S-114 CONTACTS 1 AND 2
L/O INSTRUMENT A.C. CIRCUIT NO. 6
90H/ 59S-123A CONTACTS 1 AND 2 FAIL TO CLOSE
NO SIGNAL THRU 90H/ 59S-110A CONTACTS 1 AND 2
NO SIGNAL TO COIL OF RELAY 90H/ 59S-123A
6-30-22
6-30-105

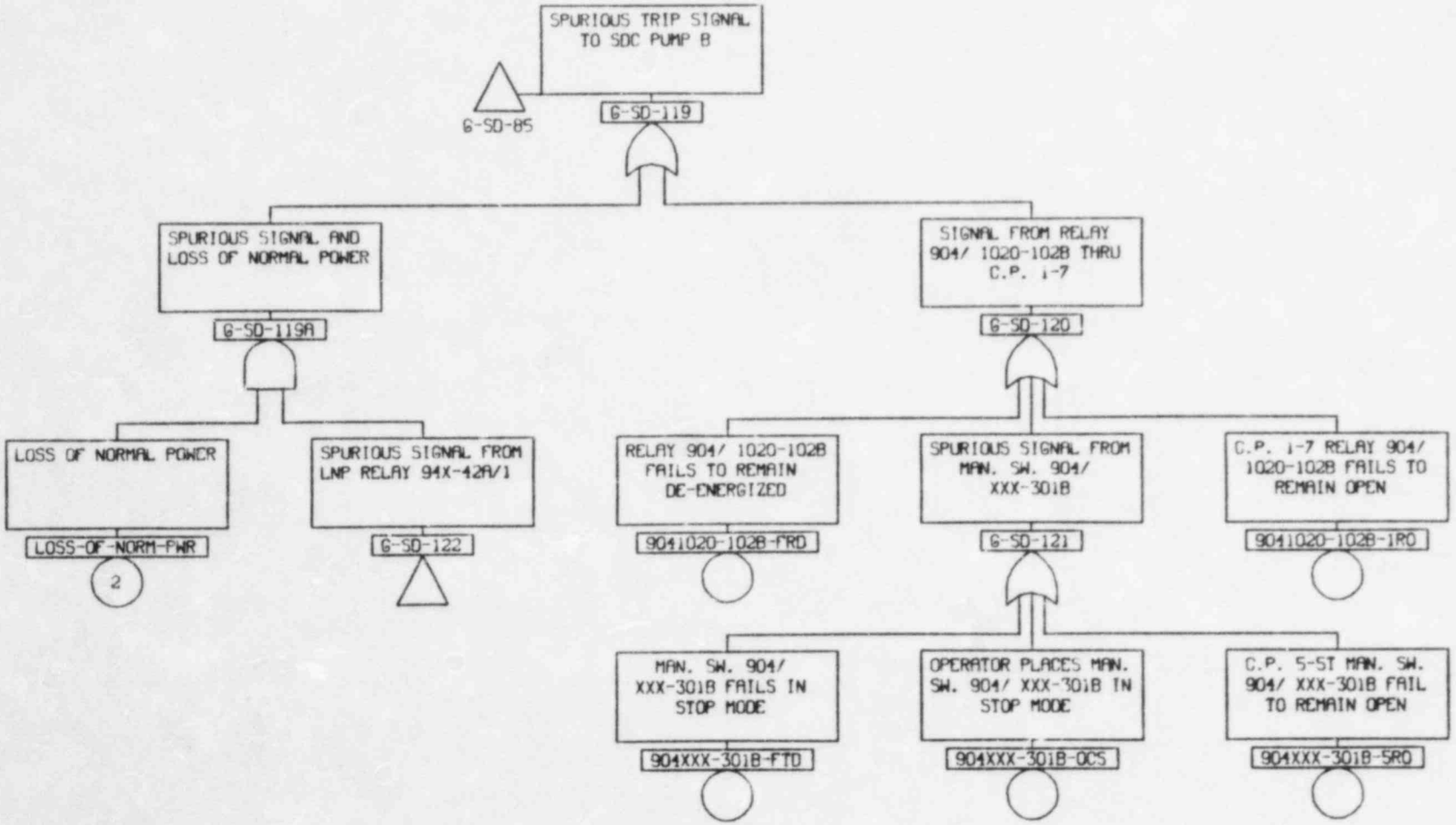

NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND B
G-SD-108
G-SD-107
NO SIGNAL FROM 915/ 595-105A CONTACTS 3 AND 4
G-SD-32
NO SIGNAL FROM 917/ 595-105B CONTACTS 3 AND 4
G-SD-33
NO SIGNAL FROM RX LO WATER LEVEL RELAYS A AND D
G-SD-109
G-SD-107
NO SIGNAL FROM 915/ 595-105A CONTACTS 3 AND 4
G-SD-32
NO SIGNAL FROM 917/ 595-105D CONTACTS 3 AND 4
G-SD-41

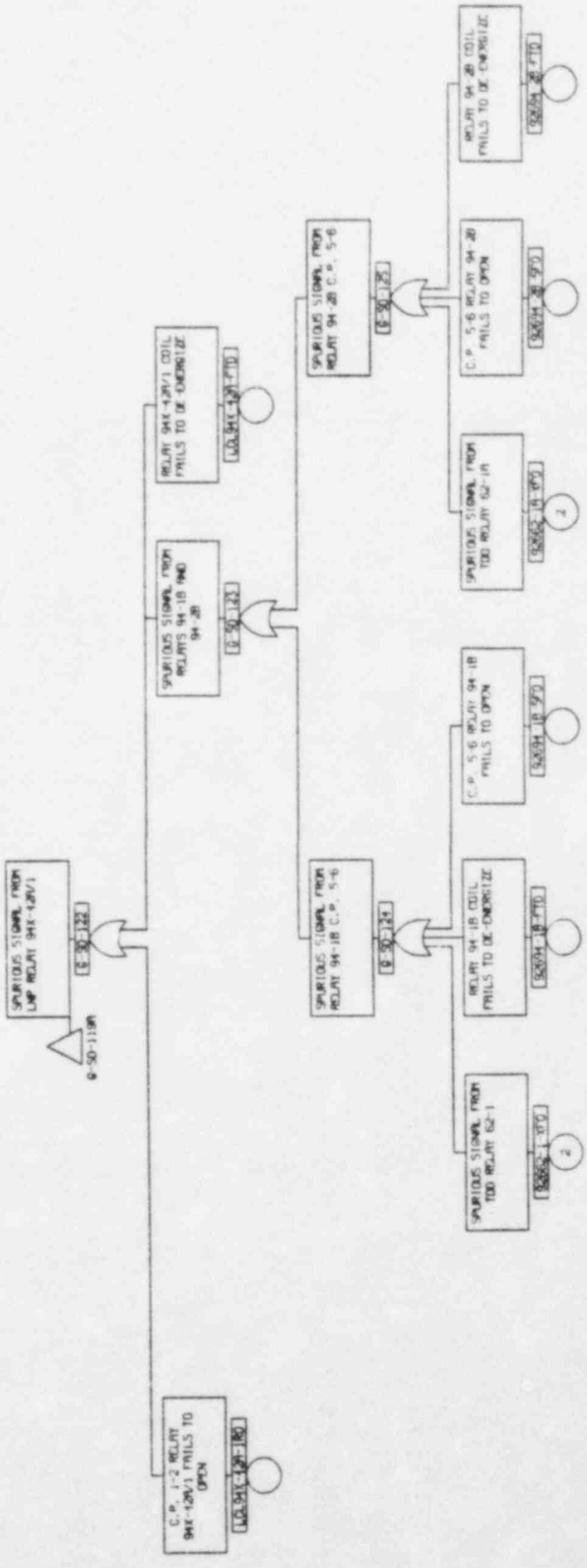

NO SIGNAL FROM RX LO WATER LEVEL RELAYS B AND C
G-SD-107
G-SD-110
NO SIGNAL FROM 917/ 595-105B CONTACTS 3 AND 4
NO SIGNAL FROM 915/ 595-105C CONTACTS 3 AND 4
G-SD-33
G-SD-40


NO SIGNAL FROM RX LO WATER LEVEL RELAYS C AND D
G-SD-107
G-SD-111
NO SIGNAL FROM 917/ 595-105D CONTACTS 3 AND 4
NO SIGNAL FROM 915/ 595-105C CONTACTS 3 AND 4
G-SD-41
G-SD-40


SPURIOUS TRIP SIGNAL TO SDC PUMP A
G-SD-78
G-SD-112
SPURIOUS SIGNAL AND LOSS OF NORMAL POWER
G-SD-112A
SIGNAL FROM RELAY 904/1020-102A THRU C.P. 1-7
G-SD-113
SPURIOUS SIGNAL FROM LNP RELAY 94X-42/1
G-SD-115
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
2
RELAY 904/ 1020-102A FAILS TO REMAIN DE-ENERGIZED
904102O-102A-FRD
SPURIOUS SIGNAL TO 904/ 1020-102A
G-SD-114
C.P. 1-7 RELAY 904/ 1020-102A FAILS TO REMAIN OPEN
904102O-102A-1RO
MAN. SW. 904/ XXX-301A FAILS IN STOP MODE
904XXX-301A-FTD
OPERATOR PLACES MAN. SW. 904/XXX-301A IN STOP MODE
904XXX-301A-OCS
C.P. 5-ST MAN. SW. 904/XXX-301A FAILS TO REMAIN OPEN
904XXX-301A-5RO


SPURIOUS SIGNAL FROM LNP RELAY 94X-42/1
G-SD-112A
G-SD-115
C.P. 1-2 RELAY 94X-42/1 FAILS TO REMAIN OPEN
LOL94X-42-1RO
SPURIOUS SIGNAL FROM RELAYS 94-1A AND 94-2A
G-SD-116
RELAY 94X-42/1 COIL FAILS TO DE-ENERGIZE
LOL94X-42-FTD
SPURIOUS SIGNAL FROM RELAY 94-1A C.P. 11-12
G-SD-117
SPURIOUS SIGNAL FROM RELAY 94-2A C.P. 11-12
G-SD-118
RELAY 94-1A COIL FAILS TO DE-ENERGIZE
92694-1A-FTD
SPURIOUS SIGNAL FROM TDO RELAY 62-1
92662-1-XFO
2
C.P. 11-12 RELAY 94-1A FAILS TO OPEN
92694-1B-BFO
C.P. 11-12 RELAY 94-2A FAILS TO OPEN
92694-2A-BFO
SPURIOUS SIGNAL FROM TDO RELAY 62-1A
92662-1A-XFO
2
RELAY 94-2A COIL FAILS TO DE-ENERGIZE
92694-2A-FTD


SPURIOUS TRIP SIGNAL TO SDC PUMP B
G-SD-85
G-SD-119
SPURIOUS SIGNAL AND LOSS OF NORMAL POWER
G-SD-119A
SIGNAL FROM RELAY 904/ 1020-102B THRU C.P. 1-7
G-SD-120
LOSS OF NORMAL POWER
LOSS-OF-NORM-PWR
2
SPURIOUS SIGNAL FROM LNP RELAY 94X-42A/1
G-SD-122
RELAY 904/ 1020-102B FAILS TO REMAIN DE-ENERGIZED
904I020-102B-FRD
SPURIOUS SIGNAL FROM MAN. SW. 904/ XXX-301B
G-SD-121
C.P. 1-7 RELAY 904/ 1020-102B FAILS TO REMAIN OPEN
904I020-102B-1RO
MAN. SW. 904/ XXX-301B FAILS IN STOP MODE
904XXX-301B-FTD
OPERATOR PLACES MAN. SW. 904/ XXX-301B IN STOP MODE
904XXX-301B-OCS
C.P. 5-ST MAN. SW. 904/ XXX-301B FAIL TO REMAIN OPEN
904XXX-301B-5RO


SPURIOUS SIGNAL FROM LMF RELAY 94X-42V/1
E-50-124
G-50-115A
C.P. 1-2 RELAY 94X-42V/1 FAILS TO OPEN
SPURIOUS SIGNAL FROM RELAYS 94-1B AND 94-2B
E-50-124
RELAY 94X-42V/1 COIL FAILS TO DE-ENERGIZE
SPURIOUS SIGNAL FROM RELAY 94-1B C.P. 5-6
E-50-124
SPURIOUS SIGNAL FROM TDD RELAY 62-1
RELAY 94-1B COIL FAILS TO DE-ENERGIZE
C.P. 5-6 RELAY 94-1B FAILS TO OPEN
SPURIOUS SIGNAL FROM RELAY 94-2B C.P. 5-6
E-50-124
SPURIOUS SIGNAL FROM TDD RELAY 62-1A
C.P. 5-6 RELAY 94-2B FAILS TO OPEN
RELAY 94-2B COIL FAILS TO DE-ENERGIZE

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This report presents the results of the analysis of Millstone Unit One nuclear power plant, which was performed as part of the Interim Reliability Evaluation Program (IREP). Two of the IREP objectives have been achieved by this analysis. They are (1) the identification of those accident sequences which can be expected to dominate the risk related to the operation of Millstone 1, and (2) the development of system models that can be used for future, more extensive probabilistic risk assessments of Millstone 1.

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