

TENNESSEE VALLEY AUTHORITY  
SEQUOYAH NUCLEAR PLANT

ABNORMAL OPERATING INSTRUCTION

AOI-25.1

LOSS OF 120V AC VITAL INSTRUMENT  
POWER BOARD 1-I

Unit 1

Revision 5

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APPROVED BY: [Signature]  
Plant Manager

DATE APPROVED: MAY 15 1987

Reason for revision (include all Instruction Change Form Nos.):

Streamline Operator actions, delete erroneous Appendices "A" and  
"B". This revision constitutes a biennial revision in accordance  
with AI-4, Appendix H.

The last page of this instruction is number: 5



I. SYMPTOMS

A. Alarms

1. 120V AC VITAL PWR BD 1-I UV OR BREAKER TRIP
2. 120V AC VITAL INVERTER 1-I ABNORMAL

B. Indications

1. Power Range N-41 failure
2. Auto and manual Rod Block and Rod Stop due to High Flux Rod Stop, and C-5 Interlock.
3. Loss of steam flow portion of signal to feedwater control system resulting in failure to control steam generator level if channel 1 is selected.
4. Loss of steam generator level control due to loss of input signal to program on steam generators 2 and 3.
5. Main feed pumps go to minimum speed due to loss of input signal (PT-1-33) to speed controller.
6. Possible reactor trip due to steam generator level changes.
7. Malfunction of trip status lights and safeguards systems annunciators.
8. Loss of auto-makeup to volume control tank.

C. System Partial Failures

1. Loss of CVCS Auto-Makeup to Volume Control Tank.
  - a. FCV-62-89 fails open (Charging Line Flow Controller)
2. Possible swap-over of charging system from volume control tank to refueling water storage tank.
3. Letdown divert valve LCV-62-118 diverts to hold-up tank and TIS-62-79 bypasses letdown demineralizers.



I. SYMPTOMS (cont.)

C. System Partial Failures (cont.)

4. Loss of power to Solid State Protection System input and output relays (Train A) and Channel 1 input relays (Trains A and B).
5. If pressurizer level is selected to channel LT-68-339 for control, pressurizer low level auto actions will occur.
6. If pressurizer pressure is selected to channel PT-68-339, The sprays will be closed and the back-up heaters energized until locked out by the low level signal if LT-68-339 was selected for level control.
7. Loss of condenser steam dump capability.
8. Loss of automatic control in AFW system of LCV-3-164, 156, (Level control for S/G's 1 and 2) for Motor Driven AFW Pump 1A-A.
9. Loss of automatic control in AFW system of LCV-3-172, 175 (Level control for S/G's 3 and 4) for Turbine Driven AFW Pump 1A-S.

NOTE: The above failures are of greatest immediate consequence, for complete loads list of vital board 1-I see Appendix A.

II. AUTOMATIC ACTIONS

- A. Possible reactor trip due to low-low S/G level.

III. IMMEDIATE OPERATOR ACTIONS

- A. None

IV. SUBSEQUENT OPERATOR ACTIONS

- A. If reactor trip occurs, then refer to emergency instructions.
- B. If reactor does not trip, then, at the MTS panel, defeat the PR rod stop.

IV. SUBSEQUENT OPERATOR ACTIONS (cont.)

- C. Assume and maintain manual rod control (TREF signal is lost).

NOTE: Do not use bank select; use of bank select will cause the bank overlap program to be lost.

- D. Dispatch operator to restore power to failed board (transfer to auxiliary power supply).

- E. Assume manual control of steam generator water level on the affected steam generators.

- F. Assume manual control of main feedwater pumps speed to adjust feedwater pressure.

- G. Verify pressurizer level and pressure are not selected to LT-68-339 and PT-68-340 respectively.

1. Transfer FCV-62-89 to Auxiliary control room.

NOTE: Verify charging line flow controller functioning to restore program level.

- H. Assume manual control of volume control tank level

NOTE: If RWST suction valves to charging pump suctions are opened automatically - verify VCT level prior to returning to VCT suction valves.

- I. If power is restored to the failed boards return systems to normal operating mode.

NOTE: Due to feedback signals and time delays in circuitry, controllers may not control immediately.

- J. Evaluate need to shutdown per TS 6.3.8.2.1 if power cannot be restored to the affected board. If necessary, commence orderly shutdown to the hot standby condition per GOI-5 and GOI-3. Initiate REP per IP-1 (Engineered Safety Features) as required.

1. Steam Generator power operated relief valves are operable for cooldown using hand switch.

NOTE: Operation in this mode may be continued at the discretion of the Manager, Operations Group, with respect to Tech. Spec. section 3.

IV. SUBSEQUENT OPERATOR ACTIONS (cont.)

2. If shutdown is to continue to mode 5, follow GOI-3 with the following exception: 74-1 valve will require placing transfer sw. to Aux position at breaker to open valve when RCS pressure is below 380 psig. Refer to TS 3.8.2.2
3. Transfer FCV-74-16 and 32 to Aux. mode and control RHR cooldown temperature from Aux. control room.



APPENDIX A  
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Load List: 120V AC VITAL INST. POWER BD. 1-I

SSPS (A) CH I input and train A output relays (1-R-48)  
SSPS (B) CH I input relays (1-R-49)  
NIS instr. power CH I  
NIS I control power CH I  
Process protection set I (1-R-1)  
FSV-87-21 UHI accumulator isol. valve (CH I)  
ERCW and containment rad. monitor 1-RE-90-106  
Instrument Bus A  
Aux. relay rack, SSPS aux. relays (1-R-73)  
RB isol. valve FCV-32-80A, 80B, 110A, 110B  
Aux. compressor A, AB isol. valve FCV-32-82  
Rad. rate meters and 1-RI-90-106  
Rad. monitor O-RE-90-125  
125V dc vital battery board I instruments  
Letdown flow temperature switch TIS-62-79  
Chlorine detector CLAN-43-205A  
Post accident sampling solenoid valves  
PCO-65-81 and 86 aux. relays (1-R-73)  
Toilet, locker, spreading, and cont. rooms isol. dampers  
FCO-31A-17, 103, FCV-31A-105A, 105B (1-R-73)  
BOP process instr. control rack (1-R-128)  
AB instr. Bus A  
O-FCV-12-82  
Containment purge air exhaust rad. monitor 1-RE-90-130  
NSSS aux. relay rack, A bus (1-R-54)  
Aux. relay rack sep. and aux. relays (1-R-73)  
Aux. control panel, A relay bus  
Aux. control panel, A instr. bus  
Reactor vessel level instrumentation system (1-R-148)  
Aux. dryer train A  
Aux. relay rack sep. and aux. relays (1-R-74)  
BAT A htr. A-A controller TIT-62-239  
AB gas treatment fan A-A press. controller  
BAT C htr. A-A controller TIT-62-243  
Rad. monitor O-RE-90-205  
Process control group 1 (1-R-14)  
Instrument bus 1 (O-M-27B)  
Plugmold instr. bus 1 (1-M-5, 1-M-6)  
Instrument bus 1 and PIC-1-6A, 31A (1-M-4)  
Fire pump 2A-A sep. relays  
AB general exhaust fan 1A flow controller  
UHI instr. bus 1

0153H/SAT/1gm