

Approval  
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Vogtle Electric Generating Plant  
NUCLEAR OPERATIONS



Georgia Power

Procedure No.  
18034-1  
Revision No.  
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Unit 1

NOT ADDRESS MID LOOP SPECIFICALLY

*05-89-90*

LOSS OF CLASS 1E 125V DC POWER

PURPOSE

This procedure provides the actions to be followed in the event that power is lost to one of the 125V DC Vital Busses (1AD1, 1BD1, 1CD1, or 1DD1).

Specific instructional steps will be found in the following sub-procedures:

- A. Loss of 125V DC Bus 1AD1 Page 2
- B. Loss of 125V DC Bus 1BD1 Page 27
- C. Loss of 125V DC Bus 1CD1 Page 52
- D. Loss of 125V DC Bus 1DD1 Page 57

SYMPTOMS

Symptoms are identified in the individual sub-procedures.

FOR  
INFORMATION  
ONLY

A. LOSS OF 125V DC BUS 1AD1SYMPTOMS

- 125V DC Vital Bus 1AD1 voltage low.
- Loss of power to 1AY1A and 1AY2A 120V AC Vital Instrument Panels.
- Loss of indicating lights on 1AA02 and 1AB04, 1AB05 and 1AB15 Switchgear Controls.
- Train A Main Steamline Isolation.
- Train A Main Feedwater Isolation.

## NOTE

See Attachment A for Equipment Responses, Breaker and Valve Control Loss, Valve Failures from loss of instrument air, and Annunciator Failures.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

A1. Dispatch an operator to the 1AA02 SWGR Room to:

a. Verify offsite power is available to AC Emergency Bus 1AA02

- Ensure Normal Feeder Breaker 1AA02-05 is CLOSED.

a. IF Diesel Generator DG1A is not running, it can not be started.

- Loss of Train A.
- Go to Step A3.

b. IF Emergency Diesel Generator DG1A is running, and no offsite power is available to 1AA02 Bus, THEN do not perform Step A2 until offsite power to Bus 1AA02 is restored.

c. Go to Step A3.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

## NOTE

Diesel Generator Electrical Protective Trips are inoperable.

- A2. Dispatch an operator to locally remove Diesel Generator DG1A from service.
- a. Ensure 1AA02 Bus Feed Breaker 1AA02-19 is OPEN.
  - b. Stop the Diesel Generator by placing the "Pull-To-Run/ Push-To-Stop" handswitch at the south end of the engine to STOP.
- A3. Dispatch an operator to restore power to 120V AC Instrument Panel 1AY1A.
- a. Open Normal Feeder Breaker from Inverter 1AD11:
    - 1AY1A-02.
  - b. Ensure the Regulated Transformer Supply Breaker for 1ABC09X is CLOSED:
    - 1ABC-09.
  - c. Close Alternate Source Breaker to 1AY1A Instrument Panel:
    - 1AY1A-01.
- A3. Initiate 18032-1, LOSS OF 120V AC INSTRUMENT POWER Sub-procedure A.

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ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

A4. Dispatch an operator to restore power to 120V AC Instrument Panel 1AY2A

a. Open Normal Feeder Breaker from Inverter 1AD1111:

- 1AY2A-02.

b. Ensure the Regulated Transformer Supply Breaker for 1ABB40X is CLOSED:

- 1ABB-40.

c. Close Alternate Source Breaker to 1AY2A Instrument Panel:

- 1AY2A-01.

A5. IF an RCP 1 undervoltage or underfrequency condition arises, trip the pump using 1-HS-0495B on QMCB.

A5. IF the pump does not trip, dispatch an operator to PSDA to trip the pump:

- 1-HS-0495D.

A6. Dispatch an operator to restore power to Bus 1AD1.

A6. Initiate to 13405-1, 125V DC 1E ELECTRICAL DISTRIBUTION SYSTEM.

a. Ensure Bus Feeder Breakers are CLOSED:

- Continue attempts to restore power to 1AD1.

- 1AD1-01 - From Battery 1AD1B,
- 1AD1-06 - From Charger 1AD1CA,
- 1AD1-07 - From Charger 1AD1CB.

b. Ensure Panel Feeder Breakers are CLOSED:

- 1AD1-05 - Feeder to 1AD11,
- 1AD1-09 - Feeder to 1AD12,
- 1AD1-11 - Feeder to 1AD1M.

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ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

- A7. Ensure Train B Fuel Handling Building Post Accident Filtration System has actuated on low differential pressure.
- A8. Manually actuate Control Room Isolation by placing Train B Actuate Switch 1-HS-12196A on QHVC to actuate.
- A9. Start Train B Electrical Penetration Room Filter Exhaust Fan using 1-HS-2555 on QHVC.
- A10. Start Train B Piping Penetration Filter Exhaust Fan using 1-HS-2549 on QHVC.

- A7. Initiate 13320-C, FUEL HANDLING BUILDING HVAC SYSTEM and place Train B Post Accident Filtration System in service.
- A8. Initiate 13301-C, CONTROL BUILDING CONTROL ROOM NORMAL AND ESSENTIAL HVAC SYSTEM and place Train B Control Room Filter Unit in service.
- A9. Initiate 13302-1, CONTROL BUILDING ESF VENTILATION SYSTEMS and place Train B Electrical Penetration Area Filter Exhaust Unit in service.
- A10. Initiate 13305-1, AUXILIARY BUILDING HVAC SYSTEM and place Train B Piping Penetration Filter Exhaust Unit in service.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

## NOTE

Step All applies only if the Train A Diesel Generator is still running and Bus 1AD1 has not been re-energized.

All. De-energize or stop the following:

- a. De-energize the Generator Space Heater:
  - Control Switch in OFF,  
OR
  - 1NBI-18 OPEN.
- b. Stop the Jacket Water Keep-Warm Pump:
  - Control Switch in OFF,  
OR
  - 1NBI-12 OPEN.
- c. Stop the Lube Oil Keep Warm Pump:
  - Control Switch in OFF,  
OR
  - 1NBI-15 OPEN.
- d. De-energize the Jacket Water Heater:
  - Control Switch in OFF,  
OR
  - 1NBI-13 OPEN.
- e. De-energize the Lube Oil Heater:
  - Control Switch in OFF,  
OR
  - 1NBI-16 OPEN.

A12. Inform the Radwaste Building Operator that steam to the Radwaste System has been ISOLATED.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

A13. Check power to Bus 1AD1 -  
RESTORED.

A13. Return to Step A6.

A14. Re-establish power to  
Diesel Generator DG1A  
accessories if applicable.

a. Energize Generator Space  
Heater:

- 1NBI-18 CLOSED,
- Control Switch in  
AUTO.

b. Energize the Jacket  
Water Keep-Warm Pump:

- 1NBI-12 CLOSED,
- Control Switch in  
AUTO.

c. Energize the Lube Oil  
Keep-Warm Pump:

- 1NBI-15 CLOSED,
- Control Switch in  
AUTO.

d. Energize the Jacket  
Water Heater:

- 1NBI-13 CLOSED,
- Control Switch in  
AUTO.

e. Energize the Lube Oil  
Heater:

- 1NBI-16 CLOSED,  
Control Switch in  
AUTO.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

A15. Establish Instrument Air to the Containment:

- 1-HV-9378 OPEN.

A16. Establish Normal Letdown by initiating 13006-1, CHEMICAL AND VOLUME CONTROL SYSTEM STARTUP AND NORMAL OPERATION.

A16. Initiate 13008-1, CHEMICAL AND VOLUME CONTROL SYSTEM EXCESS LETDOWN and establish excess letdown.

A17. Return 120V AC Instrument Panels 1AY1A and 1AY2A to their normal supply by initiating 13431-1, 120V AC VITAL INSTRUMENT DISTRIBUTION SYSTEM.

A18. Return Control Room ventilation to normal operation by initiating 13301-C, CONTROL BUILDING CONTROL ROOM NORMAL AND ESSENTIAL HVAC SYSTEM.

A19. Return Fuel Handling Building ventilation to normal operation by initiating 13320-C, FUEL HANDLING BUILDING HVAC SYSTEM.

A20. Return the Electrical Penetration Filtration and Exhaust System to normal operation by initiating 13302-1, CONTROL BUILDING ESF VENTILATION SYSTEMS.



ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

A21. Return the Piping Penetration Filtration and Exhaust System to normal operation by initiating 13305-1, AUXILIARY BUILDING HVAC SYSTEM.

A22. Align systems and components as required for present operational mode.

END OF SUB-PROCEDURE TEXT

## ATTACHMENT A

LOSS OF 125V DC BUS 1AD1EQUIPMENT RESPONSE DUE TO  
LOSS OF TRAIN A 125V DC POWER

- Main Feedwater Isolation, Isolation Bypass, Main Flow Control, and Startup Flow Control Valves close resulting in Feedwater Isolation.
- Main Steam Isolation and Isolation Bypass Train A Valves Close resulting in steamline isolation.
- Reactor and Turbine trip occurs from loss of main feedwater.
- Control Power is lost to 1AA and 1AB SWCR Breakers.
- Diesel Generator DG1A control power to Generator Control Panel PDG1 and Engine Control Panel PI<sup>2</sup> is lost rendering the Diesel Generator inoperable; if running, it will fail as is with a loss of electrical protective trips, frequency, and voltage control. Due to loss of power to the Low Speed Relay, the generator space, Engine Lube Oil and Jacket Water Heaters and Lube Oil and Jacket Water Keep-Warm Pumps will come on.
- Power to Inverters 1AD111 and 1AD113 is lost causing 120V AC Vital Busses 1AY1A and 1AY2A to de-energize.
- Instrument Air Containment Isolation Valve 1-HV-9378 closes resulting in loss of instrument air inside Containment.
- Power To Isolation Panel 1ACQIP1 is lost rendering the annunciators in Train A inoperable.

## NOTE

Feeder Breakers must be manually controlled in the event the transfer to an alternate power supply is required. IF the Diesel Generator (DG1A) is not running, it may not be selected as an alternate power source.

ATTACHMENT A

LOSS OF 125V DC BUS 1AD1

LOSS OF 1AA02 BUS BREAKER CONTROL  
DUE TO LOSS OF 125V DC TO 1AD11

The following 1AA02 Bus Feeder Breakers will fail as aligned prior to loss of Bus 1AD1:

1AA02-05	Normal Power from RAT XFMR 1NXRA	Normally Closed
1AA02-19	Emergency Backup from Diesel Generator (DG1A)	Normally Open

NOTE

Output Breakers must be manually controlled in order to START/STOP the following listed pumps or to ENERGIZE/DE-ENERGIZE 480V Load Centers 1AB04, 1AB05 and 1AB15.

1AA02-03	CCW PMP 1
1AA02-04	NSCW PMP 1
1AA02-06	CB ESF CHLR A
1AA02-07	CCW PMP 3
1AA02-08	NSCW PMP 3
1AA02-09	RHR PMP A
1AA02-11	CCW PMP 5
1AA02-12	NSCW PMP 5
1AA02-13	CCP A
1AA02-14	CS PMP A
1AA02-15	ACCW PMP A
1AA02-16	SIP A
1AA02-17	MDAFW PMP A
1AA02-10	Supply To Load Center 1AB15
1AA02-20	Supply To Load Center 1AB04
1AA02-21	Supply To Load Center 1AB05
1AA02-22	Supply To Load Center 1NB01

## ATTACHMENT A

LOSS OF 125V DC BUS 1AD1

LOSS OF 1AB04 BUS BREAKER CONTROL  
DUE TO LOSS OF 125V DC TO 1AD11

## NOTE

The following Feeder and Output Breakers must be manually controlled at 1AB04 Bus.

1AB04-01	1AB04 Bus Feeder Breaker
1AB04-02	1AB04 Feeder To MCC-1ABE
1AB04-04	CC Fan 1 Hi Speed
1AB04-05	CC Fan 1 Low Speed
1AB04-08	CC Fan 2 Hi Speed
1AB04-09	CC Fan 2 Low Speed
1AB04-12	CC Fan 5 Hi Speed
1AB04-13	CC Fan 5 Low Speed
1AB04-16	CC Fan 6 Hi Speed
1AB04-17	CC Fan 6 Low Speed

## ATTACHMENT A

LOSS OF 125V DC BUS 1AD

LOSS OF 1AB05 BUS BREAKER CONTROL  
DUE TO LOSS OF 125V DC TO 1AD11

## NOTE

The following Feeder and Output Breakers must be manually controlled at 1AB05 Bus.

LAB05-01	1AB05 Bus Feeder Breaker
LAB05-02	1AB05 Feeder To MCC-1ABA
LAB05-04	CBCR Fltr Unit 1
LAB05-05	1AB05 Feeder To MCC-1ABC
LAB05-06	CBCR Htr 1
LAB05-08	CTB H <sub>2</sub> Recombiner 1
LAB05-09	CB Elec Pen Fltr Unit Fan 1
LAB05-12	DG1A Vent Fan 1
LAB05-13	DG1A Vent Fan 3
LAB05-14	1AB05 Feeder To MCC-1ABF

ATTACHMENT A

LOSS OF 125V DC BUS 1AD1

LOSS OF 1AB15 BUS BREAKER CONTROL  
DUE TO LOSS OF 125V DC TO 1AD11

NOTE

The following Feeder and Output Breakers must be manually controlled at 1AB15 Bus.

LAB15-04	Pipe Pen Fltr & Exh Unit Htr 1
LAB15-05	NSCW Clg Twr Tr A Fan 1
LAB15-06	NSCW Clg Twr Tr A Fan 2
LAB15-08	NSCW Clg Twr Tr A fan 4
LAB15-09	LAB15 Feeder to MCC-1ABB
LAB15-10	LAB15 Feeder to MCC-1ABD
LAB15-12	Spend Fuel Pit Pump 2
LAB15-13	NSCW Clg Twr Tr A Fan 3
LAB15-14	Pipe Pen Fltr & Exh Unit Fan 1

## ATTACHMENT A

LOSS OF 125V DC BUS 1AD1LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1AD12FAILED  
POSITION

## REACTOR COOLANT SYSTEM

1-HV-8032	Reactor Vessel Flange Leakoff	Open
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## WASTE PROCESSING SYSTEM - LIQUID

1-HV-7127	RCDT To Drain Pump Suction	Open
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1-HV-7144	RCDT Recirc Isolation Valve	Open
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## CONTAINMENT AND AUXILIARY BUILDING DRAINS - RADIOACTIVE

1-HV-17091	CTB Cooling Units To CNMT Sump	Open
1-HV-17095	CTB Cooling Units To CNMT Sump	Open

## MAIN TEAM SYSTEM

1-PV-5238	Steam Generator N <sub>2</sub> Blanketing System	Open
1-PV-5239	Steam Generator N <sub>2</sub> Blanketing System	Open
1-PV-5240	Steam Generator N <sub>2</sub> Blanketing System	Open
1-PV-5241	Steam Generator N <sub>2</sub> Blanketing System	Open
1-PV-15250	Steam Generator N <sub>2</sub> Blanketing System	Open
1-PV-15252	Steam Generator N <sub>2</sub> Blanketing System	Open

## ATTACHMENT A

LOSS OF 125V DC BUS 1AD1

LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1AD12

FAILED  
POSITION

## REACTOR COOLANT SYSTEM

1-PV-0455B	Pressurizer Spray Isolation Valves	Closed
1-PV-0455C	Pressurizer Spray Isolation Valves	Closed
1-HV-8145	Pressurizer Spray Isolation Valves	Closed
1-HV-8031	PRT Drain To The RCDT	Closed
1-HV-8047	PRT Vent To The WGDT	Closed
1-HV-8030	RMWST Fill To The PRT	Closed



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## ATTACHMENT A

LOSS OF 125V DC BUS 1AD1LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1AD12FAILED  
POSITION

## CHEMICAL AND VOLUME CONTROL SYSTEM

1-LV-0178	RCP Standpipe Fill Valves	Closed
1-LV-0179	RCP Standpipe Fill Valves	Closed
1-LV-0180	RCP Standpipe Fill Valves	Closed
1-LV-0181	RCP Standpipe Fill Valves	Closed
1-HV-8141A	Number 1 RCP Seal Leakoff Valves	Closed
1-HV-8141B	Number 1 RCP Seal Leakoff Valves	Closed
1-HV-8141C	Number 1 RCP Seal Leakoff Valves	Closed
1-HV-8141D	Number 1 RCP Seal Leakoff Valves	Closed
1-LV-0459	RCS Letdown Isolation Valves	Closed
1-LV-0460	RCS Letdown Isolation Valves	Closed
1-HV-8149A	RCS Letdown Isolation Valves	Closed
1-HV-8149B	RCS Letdown Isolation Valves	Closed
1-HV-8149C	RCS Letdown Isolation Valves	Closed
1-HV-15214	RCS Letdown Isolation Valves	Closed
1-HV-8160	RCS Letdown Isolation Valves	Closed
1-HV-8153	RCS Excess Letdown Isolation Valves	Closed
1-HV-8154	RCS Excess Letdown Isolation Valves	Closed
1-HV-0123	RCS Excess Letdown Isolation Valves	Closed
1-HV-8143	RCS Excess Letdown Divert Valve	To VCT

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## ATTACHMENT A

LOSS OF 125V DC BUS 1AD1LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1AD12FAILED  
POSITION

## SAFETY INJECTION SYSTEM

1-HV-8878A	Accumulator Fill Isolation Valves	Closed
1-HV-8878B	Accumulator Fill Isolation Valves	Closed
1-HV-8878C	Accumulator Fill Isolation Valves	Closed
1-HV-8878D	Accumulator Fill Isolation Valves	Closed
1-HV-8871	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8881	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8823	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8824	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8825	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8843	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8877A, B,C, and D	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8879A, B,C, and D	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8882	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8889A, B,C, and D	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8890A and B	SIS Check Valve And System Test Line Isolation Valves	Closed

## ATTACHMENT A

LOSS OF 125V DC BUS 1AD1

LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1AD1?

FAILED  
POSITION

## WASTE PROCESSING SYSTEM - LIQUID

1-HV-7699	RCDT Pumps Discharge Containment Isolation Valve	Closed
1-HV-1003	RCDT Level Control Valve	Closed
1-HV-7126	RCDT Vent To GWPS	Closed
1-HV-7143	RCDT Recirc Valve	Closed
1-HV-7141	RCDT To PRT Isolation Valve	Closed

## NUCLEAR SAMPLING SYSTEM - LIQUID

1-HV-3507	Pressurizer Liquid And Steam Space Sample Isolation Valves	Closed
1-HV-3513	Pressurizer Liquid And Steam Space Sample Isolation Valves	Closed
1-HV-3501	RCD Hot Leg 3 To Failed Fuel Detector Isolation Valve	Closed

## ATTACHMENT A

LOSS OF 125V DC BUS 1AD1

LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1AD12

FAILED  
POSITION

## CONTAINMENT AND AUXILIARY BUILDING DRAINS - RADIOACTIVE

1-HV-0780	Reactor Cavity And CNMT Sumps Discharge Isolation Valve	Closed
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## STEAM GENERATOR BLOWDOWN SYSTEM

1-HV-15212A	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15212B	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15212C	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15212D	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15216A	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15216B	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15216C	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15216D	Steam Generator Blowdown Isolation Valves	Closed

## CONTAINMENT PURIFICATION AND CLEANUP SYSTEM

1-HV-2626B	CNMT Mini-Purge Supply Isolation Damper	Closed
1-HV-2628B	CNMT Mini-Purge Exhaust Isolation Damper	Closed
1-HV-12985	CTB Preaccess Filter Unit Diluge	Closed
1-HV-12987	CTB Preaccess Filter Unit Diluge	Closed

## ATTACHMENT A

LOSS OF 125V DC TO BUS 1AD1

TRAIN A ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1ACQIP1 FROM 1AD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB02-B1	NSCW TRAIN A LO HDR PRESS
ALB02-B2	NSCW TRAIN A TRANSF PMP LO DISCH PRESS
ALB02-D2	NSCW TRAIN A CNMT CLR 1&2 LO FLOW
ALB02-E2	NSCW TRAIN A CNMT CLR 5&6 LO FLOW
ALB02-F2	NSCW TRN A RX CVTY CLG COIL LOW FLOW
ALB02-C3	NSCW TRAIN A DG CLR LO FLOW
ALB02-E3	NSCW TRAIN A NORM/BYP VLV MISPOSITIONED
ALB02-C4	NSCW TRAIN A RHR PMP & MTR CLR LO FLOW
ALB02-A5	CCW TRAIN A SURGE TK LO-LO LVL
ALB02-E5	CCW TRAIN A RHR PMP SEAL LO FLOW
ALB02-A6	CCW TRAIN A LO HDR PRESS
ALB02-B6	CCW TRAIN A LO FLOW
ALB02-D6	CCW TRAIN A RHR HX LO FLOW
ALB04-E1	TRAIN A SYS STATUS MON PNL ALERT
ALB04-F3	TRAIN A SHUTDOWN PNL ON LOCAL CNTL
ALB04-F5	TRAIN C SHUTDOWN PNL ON LOCAL CNTL

## ATTACHMENT A

LOSS OF 125V DC TO BUS 1AD1

TRAIN A ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1ACQIP1 FROM 1AD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB05-A5	GROUP 1 MONITOR LIGHT COMP OFF NORM
ALB05-B5	GROUP 2 MONITOR LIGHT COMP OFF NORM
ALB05-C5	GROUP 3 MONITOR LIGHT COMP OFF NORM
ALB05-D5	GROUP 4 MONITOR LIGHT COMP OFF NORM
ALB05-E5	GROUP 5 MONITOR LIGHT COMP OFF NORM
ALB06-C1	RHR PMP OVERLOAD TRIP
ALB06-F6	SI PMP OVERLOAD TRIP
ALB07-C6	CHARGING PUMP OVERLOAD TRIP
ALB09-E1	MANUAL REACTOR TRIP
ALB09-F1	MANUAL SAFETY INJ REACTOR TRIP
ALB12-E4	PCV-455A OPEN SIGNAL
ALB12-E6	A COLD OP ACTU VLV HV-8000A NOT FULL OPEN

## ATTACHMENT A

LOSS OF 125V DC TO BUS 1AD1

TRAIN A ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1ACQIP1 FROM 1AD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB14-A4	MN STM LOOP 1 TRN A ISO VLV GAS LO PRESS
ALB14-B4	MN STM LOOP 2 TRN A ISO VLV GAS LO PRESS
ALB14-C4	MN STM LOOP 3 TRN A ISO VLV GAS I.O PRESS
ALB14-D4	MN STM LOOP 4 TRN A ISO VLV GAS LO PRES
ALB14-A5	MN STM LOOP 1 TRN A ISO VLV TROUBLE
ALB14-B5	MN STM LOOP 2 TRN A ISO VLV TROUBLE
ALB14-C5	MN STM LOOP 3 TRN A ISO VLV TROUBLE
ALB14-D5	MN STM LOOP 4 TRN A ISO VLV TROUBLE
ALB14-F6	MN STM ISO VALVES NOT FULL OPEN
ALB16-F5	AFW AUTO START MFPT TRIP RLY CNTRL PWR LOSS
ALB16-F6	AFW P-3 DISCH HDR LO PRESS
ALB34-D1	125V DC SWGR 1AD1 TROUBLE
ALB34-E1	BAT CHARGERS 1AD1CA 1AD1CB TROUBLE
ALB34-D2	125V DC MCC 1AD1M TROUBLE
ALB34-E2	INVERTERS 1AD1I1 1AD1I11 TROUBLE
ALB34-F2	125V DC PNL 1AD11 TROUBLE
ALB34-D3	125V DC PNL 1AD12 TROUBLE
ALB34-E3	120V AC PANELS 1AY1A 1AY2A TROUBLE
ALB34-A6	13.8KV SWGR 1AAA TROUBLE

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## ATTACHMENT A

LOSS OF 125V DC TO BUS 1AD1

TRAIN A ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1ACQIP1 FROM 1AD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB34-B6	13.8KV SWGR 1BAB TROUBLE
ALB34-A7	13.8KV SWGR 1CAC TROUBLE
ALB34-B7	13.8KV SWGR 1DAD TROUBLE
ALB36-A1	4160V SWGR 1AA02 TROUBLE
ALB36-B1	4160V SWGR 1AA02 NEG PH SEQ BUS PT
ALB36-C1	480V MCC 1ABA TROUBLE
ALB36-D1	480V MCC 1ABD TROUBLE
ALB36-E1	4160V/480V SWGR TRN A TRANSFER SW ON LOCAL
ALB36-F1	ISO DEVICE PNL TRN A QIP5 TROUBLE
ALB36-A2	480V SWGR 1AB04 TROUBLE
ALB36-B2	480V SWGR 1AB15 TROUBLE
ALB36-C2	480V MCC 1ABB TROUBLE
ALB36-D2	480V MCC 1ABE TROUBLE
ALB36-F2	BAT 1AD1B BRKR OPEN
ALB36-A3	480V SWGR 1AB05 TROUBLE
ALB36-B3	SEQ A PNL DOORS OPEN
ALB36-C3	480V MCC 1ABC TROUBLE
ALB36-D3	480V MCC 1ABF TROUBLE
ALB36-F3	ISO DEVICE PNL TRN A QIP1 TROUBLE



## ATTACHMENT A

LOSS OF 125V DC TO BUS 1AD1

TRAIN A ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1ACQIP1 FROM 1AD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB50-B3	CR HI/LO DIFF PRESS
ALB50-B4	CR TRAIN A FLTR TROUBLE
ALB50-A7	BAT RM TRN A SPLY FAN LO AIR FLOW
ALB50-B9	ELEC PEN TRAIN A FLTR TROUBLE
ALB51-A1	DG TRN A CBL TUNNEL HI TEMP
ALB51-B1	NSCW TRN A CBL TUNNEL HI TEMP
ALB51-C1	AB CBL TUNNEL HI TEMP
ALB51-A3	SWGR AB15 RM HI TEMP
ALB51-B3	MCC ABD RM HI TEMP
ALB51-C3	MCC ABB RM HI TEMP
ALB51-D3	RHR TRAIN A PMP RM HI TEMP
ALB51-E3	CCS TRAIN A PMP RM HI TEMP
ALB51-A4	CCW TRAIN A PMP RM HI TEMP
ALB51-B4	CVCS TRAIN A PMP RM HI TEMP
ALB51-C4	SI TRAIN A PMP RM HI TEMP
ALB51-D4	SFCS & HX TRAIN A RM HI TEMP
ALB52-B2	PIPE PEN TRAIN A FLTR TROUBLE
ALB52-C8	CNMT POST LOCA F-1 LO AIR FLOW

## ATTACHMENT A

LOSS OF 125V DC TO BUS 1AD1

TRAIN A ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1ACQIP1 FROM 1AD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB53-A2	AFW TRN A PMP HOUSE HI TEMP
ALB53-C2	AFW TRN A PMP HOUSE FAN LO AIR FLOW
ALB53-C7	CHLR TRN A EVAP WTR HI/LO TEMP
ALB53-D7	CHLR TRN A EVAP OR COND WTR LO FLOW
ALB53-E7	CHLR TRN A TROUBLE
ALB54-A1	FHB POST ACCIDENT FLTR 1 TROUBLE
ALB54-F2	FHB AREA LO DIFF PRESS
ALB61-D6	LVL B LEAK DETECTED
ALB61-E6	LVL C LEAK DETECTED
ALB61-F6	LVL D LEAK DETECTED
ALB62-F5	CNMT H <sub>2</sub> MON TRAIN A ALERT

END OF ATTACHMENT A

B. LOSS OF 125V DC BUS 1BD1SYMPTOMS

- 125V DC Vital Bus 1BD1 voltage low.
- Loss of power to 1BY1A and 1BY2B 120V AC Vital Instrument Panels.
- Loss of Indicating Lights on 1EA03 and 1BB06, 1BB07 and 1BB16 Switchgear Controls.
- Train B Main Steam Line Isolation.
- Train B Main Feedwater Isolation.

## NOTE

See Attachment B for Equipment Responses, Breaker and Valve Control Loss, Valve Failures from loss of instrument air, and Annunciator Failures.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

B1. Dispatch an operator to the 1BA03 SWGR Room to:

a. Verify offsite power is available to AC Emergency Bus 1BA03:

- Ensure Normal Feeder Breaker 1BA03-01 is CLOSED.

a. IF Diesel Generator DG1B is not running, it can not be started.

- Loss of Train B.
- Go to Step B3.

b. IF Emergency Diesel Generator DG1B is running, and no offsite power is available to 1BA03 Bus, THEN do not perform Step B2 until offsite power to Bus 1BA03 is restored.

c. Go to Step B3.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

## NOTE

Diesel Generator Electrical Protective Trips are inoperable.

- B2. Dispatch an operator to locally remove Diesel Generator DG1B from service.
- a. Ensure 1BA03 Bus Feed Breaker 1BA03-19 is OPEN.
  - b. Stop the Diesel Generator by placing the "Pull-To-Run/ Push-To-Stop" handswitch at the south end of the engine to STOP.
- B3. Dispatch an operator to restore power to 120V AC Instrument Panel 1BY1B.
- a. Open Normal Feeder Breaker From Inverter 1BD112:
    - 1BY1B-02.
  - b. Ensure the Regulated Transformer Supply Breaker for 1EBA07X is CLOSED:
    - 1BBA-07.
  - c. Close Alternate Source Breaker To 1BY1B Instrument Panel:
    - 1BY1B-01.
- B3. Initiate 18032-1, LOSS OF 120V AC INSTRUMENT POWER Sub-procedure C.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

- B4. Dispatch an operator to restore power to 120V AC Instrument Panel 1BY2B.
- a. Open Normal Feeder Breaker from Inverter 1BD1112:
- 1BY2B-02.
- b. Ensure the Regulated Transformer Supply Breaker for 1BBB40X is CLOSED:
- 1BBB-40.
- c. Close Alternate Source Breaker To 1BY2B Instrument Panel:
- 1BY2B-01.
- B5. IF an RCP 2 undervoltage or underfrequency condition arises, trip the pump using 1-HS-0496B on QMCB.

- B4. Initiate 18032-1 LOSS OF 120V AC INSTRUMENT PANEL Sub-procedure D.
- B5. IF the pump does not trip, dispatch an operator to PSDB to trip the pump.
- 1-HS-0496D.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

B6. Dispatch an operator to restore power to Bus 1BD1.

a. Ensure Bus Feeder Breakers are CLOSED:

- 1BD1-01 - From Battery 1BD1R,
- 1BD1-06 - From Charger 1BD1CB,
- 1BD1-07 - From Charger 1BD1CA

b. Ensure Panel Feeder Breakers are CLOSED:

- 1BD1-05 - Feeder to 1BD11,
- 1BD1-09 - Feeder to 1BD12,
- 1BD1-11 - Feeder to 1BD1M.

B6. Initiate 13405-1, 125V DC 1E ELECTRICAL DISTRIBUTION SYSTEM.

a. Continue attempts to restore power to 1BD1.

B7. Manually actuate Train A Fuel Handling Building Post Accident Filtration System by placing A-HS-2532A on QHVC to ACTUATE.

B7. Initiate 13320-C, FUEL HANDLING BUILDING HVAC SYSTEM and place Train A Post Accident Filtration System in service.

B8. Manually Actuate Control Room Isolation by placing Train A Actuate Switch 1-HS-12195A on QHVC to ACTUATE.

B8. Initiate 13301-C, CONTROL BUILDING CONTROL ROOM NORMAL AND ESSENTIAL HVAC SYSTEM and place Train A Control Room Filter Unit in service.

B9. Start Train A Electrical Penetration Room Filter Exhaust Fan using 1-HS-2554 on QHVC.

B9. Initiate 13302-1, CONTROL BUILDING ESF VENTILATION SYSTEMS and place Train A Electrical Penetration Area Filter Exhaust Unit in service.

ACTION/EXPECTED RESPONSE

B10. Start Train A Piping Penetration Filter Exhaust Fan using 1-HS-2548 on QHVC.

RESPONSE NOT OBTAINED

B10. Initiate 13305-1, AUXILIARY BUILDING HVAC SYSTEM and place Train A Piping Penetration Filter Exhaust Unit in service.

## NOTE

Step B11 applies only, IF the Train B Diesel Generator is still running and Bus 1BD1 has not been re-energized.

B11. De-energize or stop the following:

- a. De-energize the Generator Space Heater:
  - Control Switch in OFF,  
OR
  - 1NBO-18 OPEN.
- b. Stop the Jacket Water Keep-Warm Pump:
  - Control Switch in OFF,  
OR
  - 1NBI-12 OPEN.
- c. Stop the Lube Oil Keep-Warm Pump:
  - Control Switch in OFF,  
OR
  - 1NBO-15 OPEN.
- d. De-energize the Jacket Water Heater:
  - Control Switch in OFF,  
OR
  - 1NBO-13 OPEN.
- e. De-energize the Lube Oil Heater:
  - Control Switch in OFF,  
OR
  - 1NBO-16 OPEN.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

B12. Inform the Radwaste Building Operator that steam to the Radwaste System has been isolated.

B13. Check power to Bus 1BD1 - RESTORED.

B13. Return to Step B6.

B14. Re-establish power to Diesel DGLB Generator accessories if applicable.

a. Energize Generator Space Heater:

- 1NBO-18 CLOSED,
- Control Switch in AUTO.

b. Energize the Jacket Water Keep-Warm Pump:

- 1NBO-12 CLOSED,
- Control Switch in AUTO.

c. Energize the Lube Oil Keep-Warm Pump:

- 1NBO-15 CLOSED,
- Control Switch in AUTO.

d. Energize the Jacket Water Heater:

- 1NBO-13 CLOSED,
- Control Switch in AUTO.

e. Energize the Lube Oil Heater:

- 1NBO-16 CLOSED,
- Control Switch in AUTO.



ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

B15. Establish instrument air to the Containment:

- 1-HV-9378 OPEN.

B16. Establish Normal Letdown by initiating 13006-1, CHEMICAL AND VOLUME CONTROL SYSTEM STARTUP AND NORMAL OPERATION.

B16. Initiate 13008-1, CHEMICAL AND VOLUME CONTROL EXCESS LETDOWN and establish excess letdown.

B17. Return 120V AC Instrument Panels 1BY1B and 1BY2B to their normal supply by initiating 13431-1, 120V AC VITAL INSTRUMENT DISTRIBUTION SYSTEM.

B18. Return Control Room ventilation to normal operation by initiating 13301-C, CONTROL BUILDING CONTROL ROOM NORMAL AND ESSENTIAL HVAC SYSTEM.

B19. Return Fuel Handling ventilation to normal operation by initiating 13320-C, FUEL HANDLING BUILDING HVAC SYSTEM.

B20. Return the Electrical Penetration Filtration and Exhaust System to normal operation by initiating 13302-1, CONTROL BUILDING ESF VENTILATION SYSTEMS.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

B21. Return the Piping Penetration Filtration and Exhaust System to normal operation by initiating 13305-1, AUXILIARY BUILDING HVAC SYSTEM.

B22. Align systems and components as required for present operational mode.

END OF SUB-PROCEDURE TEXT

## ATTACHMENT B

LOSS OF 125V DC BUS 1BD1EQUIPMENT RESPONSE DUE TO  
LOSS OF TRAIN B 125V DC POWER

- Main Feedwater Isolation, Isolation Bypass, Main Flow Control, and Startup Flow Control Valves close resulting in feedwater isolation.
- Main Steam Isolation and Isolation Bypass Train B Valves close resulting in steam line isolation.
- Reactor and Turbine trip occurs from loss of main feedwater.
- Control Power is lost to 1BA and 1BB Breakers.
- Diesel Generator DG1B Control Power to Generator Control Panel PDG3 and Engine Control Panel PDG4 is lost rendering the Diesel Generator inoperable; if running, it will fail as is with a loss of electrical protective trips, frequency, and voltage control. Due to loss of power to the Low Speed Relay, the generator space, Engine Lube Oil and Jacket Water Heaters, and Lube Oil and Jacket Water Keep-Warm Pumps will come on.
- Power to Inverters 1BD1I1 and 1BD1I2 is lost causing 120V AC Vital Busses 1BY1B and 1BY2B to de-energize.
- Instrument Air Containment Isolation Valve 1-HV-9378 closes resulting in loss of instrument air inside Containment.
- Power to Isolation Panel 1BCQIP2 is lost rendering the annunciators in Train B inoperable.

## NOTE

Feeder Breakers must be manually controlled in the event the transfer to an alternate power supply is required. If the Diesel Generator (DG1B) is not running, it may not be selected as an alternate power source.

ATTACHMENT B

LOSS OF 125V DC BUS 1BD1

LOSS OF 1BA03 BUS BREAKER CONTROL  
DUE TO LOSS OF 125V DC TO 1BD11

The following 1BA03 Bus Feeder Breakers will fail as aligned prior to loss of Bus 1BD1:

1BA03-01	Normal Power from RAT XFMR 1NXRB	Normally Closed
1BA03-19	Emergency Backup from Diesel Generator (DG1B)	Normally Open

NOTE

Output Breakers must be manually controlled in order to START/STOP the following listed pumps or to ENERGIZE/DE-ENERGIZE 480V Load Centers 1BB06, 1BB07 and 1BB16.

1BA03-07	NSCWP 2
1BA03-08	CCWP 2
1BA03-10	RHRP B
1BA03-11	NSCWP 4
1BA03-12	CCWP 4
1BA03-13	CCP B
1BA03-14	CSP B
1BA03-15	NSCWP 6
1BA03-16	CCWP 6
1BA03-17	SIP B
1BA03-20	ACCWP B
1BA03-21	MDAFWP B
1BA03-22	.B ESF CHLR B
1BA03-04	Supply to Load Center 1BB07
1BA03-06	Supply to Load Center 1BB06
1BA03-09	Supply to Load Center 1BB16
1BA03-18	Supply to Load Center 1NB10

## ATTACHMENT B

LOSS OF 125V DC BUS 1BD1

LOSS OF 1BB06 BUS BREAKER CONTROL  
DUE TO LOSS OF 125V DC TO 1BD11

## NOTE

The following Feeder and Output Breakers must be manually controlled at 1BB06 Bus.

1BB06-01	1BB06 Bus Feeder Breaker
1BB06-02	1BB06 Feeder to MCC-1BBE
1BB06-04	CC Fan 3 Hi Speed
1BB06-05	CC Fan 3 Low Speed
1BB06-08	CC Fan 4 Hi Speed
1BB06-09	CC Fan 4 Low Speed
1BB06-12	CC Fan 7 Hi Speed
1BB06-13	CC Fan 7 Low Speed
1BB06-16	CC Fan 8 Hi Speed
1BB06-17	CC Fan 8 Low Speed

## ATTACHMENT B

LOSS OF 125V DC BUS 1BD1

LOSS OF 1BB07 BUS BREAKER CONTROL  
DUE TO LOSS OF 125V DC TO 1BD11

## NOTE

The following Feeder and Output Breakers must be manually controlled at 1BB07 Bus.

1BB07-01	1BB07 Bus Feeder Breaker
1BB07-02	1BB07 Feeder to MCC-1BBA
1BB07-04	CBCR Fltr Unit 2
1BB07-05	1BB07 Feeder to MCC-1BBC
1BB07-06	CBCF. Htr 2
1BB07-08	CTB H <sub>2</sub> Recombiner 2
1BB07-09	CB Elect Pen Fltr Unit Fan 2
1BB07-12	DG1B Vent Fan 2
1BB07-13	DG1B Vent Fan 4
1BB07-14	1BB07 Feeder to MCC-1BBF

## ATTACHMENT B

LOSS OF 125V DC BUS 1BD1

LOSS OF 1BB16 BUS BREAKER CONTROL  
DUE TO LOSS OF 125V DC TO 1BD11

## NOTE

The following Feeder and Output Breakers must be manually controlled at 1BB16 Bus.

1BB16-01	1BB16 Bus Feeder Breaker
1BB16-04	Pipe Pen Fltr & Exh Unit Htr 2
1BB16-05	NSCW Clg Twr Tr B Fan 1
1BB16-16	NSCW Clg Twr Tr B Fan 2
1BB16-08	NSCW Clg Twr Tr B Fan 4
1BB16-09	1BB16 Feeder to MCC-1BBB
1BB16-10	1BB16 Feeder to MCC-1BBD
1BB16-12	Spent Fuel Pit Pump 5
1BB16-13	NSCW Clg Twr Tr A Fan 3
1BB16-14	Pipe Pen Fltr 7 Exh Unit Fan 2

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## ATTACHMENT B

LOSS OF 125V DC BUS 1BD1LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1BD12FAILED  
POSITION

## REACTOR COOLANT SYSTEM

1-HV-8032 Reactor Vessel Flange Leakoff Open

## WASTE PROCESSING SYSTEM - LIQUID

1-HV-7127 RCDT To Drain Pump Suction Open

1-HV-7144 RCDT Recirc Isolation Valve Open

## CONTAINMENT AND AUXILIARY BUILDING DRAINS - RADIOACTIVE

1-HV-17091 CTB Cooling Units To CNMT Sump Open

1-HV-17095 CTB Cooling Units To CNMT Sump Open

## MAIN STEAM SYSTEM

1-PV-5238	Steam Generator N <sub>2</sub>	Blanketing System	Open
1-PV-5239	Steam Generator N <sub>2</sub>	Blanketing System	Open
1-PV-5240	Steam Generator N <sub>2</sub>	Blanketing System	Open
1-PV-5241	Steam Generator N <sub>2</sub>	Blanketing System	Open
1-PV-15250	Steam Generator N <sub>2</sub>	Blanketing System	Open
1-PV-15252	Steam Generator N <sub>2</sub>	Blanketing System	Open



ATTACHMENT B

LOSS OF 125V DC BUS 1BD1

LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1BD12

FAILED  
POSITION

REACTOR COOLANT SYSTEM

1-PV-0455B	Pressurizer Spray Isolation Valves	Closed
1-PV-0455C	Pressurizer Spray Isolation Valves	Closed
1-HV-8145	Pressurizer Spray Isolation Valves	Closed
1-HV-8031	PRT Drain To The RCDT	Closed
1-HV-8047	PRT Vent To The WGDT	Closed
1-HV-8030	RMWST Fill To The PRT	Closed

ATTACHMENT B

LOSS OF 125V DC BUS 1BD1

LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1BD12

FAILED  
POSITION

CHEMICAL AND VOLUME CONTROL SYSTEM

1-LV-0178	RCP Standpipe Fill Valves	Closed
1-LV-0179	RCP Standpipe Fill Valves	Closed
1-LV-0180	RCP Standpipe Fill Valves	Closed
1-LV-0181	RCP Standpipe Fill Valves	Closed
1-HV-8141A	Number 1 RCP Seal Leakoff Valves	Closed
1-HV-8141B	Number 1 RCP Seal Leakoff Valves	Closed
1-HV-8141C	Number 1 RCP Seal Leakoff Valves	Closed
1-HV-8141D	Number 1 RCP Seal Leakoff Valves	Closed
1-LV-0459	RCS Letdown Isolation Valves	Closed
1-LV-0460	RCS Letdown Isolation Valves	Closed
1-HV-8149A	RCS Letdown Isolation Valves	Closed
1-HV-8149B	RCS Letdown Isolation Valves	Closed
1-HV-8149C	RCS Letdown Isolation Valves	Closed
1-HV-15214	RCS Letdown Isolation Valves	Closed
1-HV-8160	RCS Letdown Isolation Valves	Closed
1-HV-8153	RCS Excess Letdown Isolation Valves	Closed
1-HV-8154	RCS Excess Letdown Isolation Valves	Closed
1-HV-0123	RCS Excess Letdown Isolation Valves	Closed
1-HV-8143	RCS Excess Letdown Divert Valve	To VCT

## ATTACHMENT B

LOSS OF 125V DC BUS 1BD1LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1BD12FAILED  
POSITION

## SAFETY INJECTION SYSTEM

1-HV-8878A	Accumulator Fill Isolation Valves	Closed
1-HV-8878B	Accumulator Fill Isolation Valves	Closed
1-HV-8878C	Accumulator Fill Isolation Valves	Closed
1-HV-8878D	Accumulator Fill Isolation Valves	Closed
1-HV-8871	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8881	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8873	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8824	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8825	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8843	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8877A, B,C, and D	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8879A, B,C, and D	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8882	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8889A, B,C, and D	SIS Check Valve And System Test Line Isolation Valves	Closed
1-HV-8890A and B	SIS Check Valve And System Test Line Isolation Valves	Closed

## ATTACHMENT B

LOSS OF 125V DC BUS 1BD1LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1BD1?FAILED  
POSITION

## WASTE PROCESSING SYSTEM - LIQUID

1-HV-7699	RCDT Pumps Discharge Containment Isolation Valve	Closed
1-HV-1003	RCDT Level Control Valve	Closed
1-HV-7126	RCDT Vent To GWPS	Closed
1-HV-7143	RCDT Recirc Valve	Closed
1-HV-7141	RCDT To PRT Isolation Valve	Closed

## NUCLEAR SAMPLING SYSTEM - LIQUID

1-HV-3507	Pressurizer Liquid And Steam Space Sample Isolation Valves	Closed
1-HV-3513	Pressurizer Liquid And Steam Space Sample Isolation Valves	Closed
1-HV-3501	RCD Hot Leg 3 To Failed Fuel Detector Isolation Valve	Closed

## ATTACHMENT B

LOSS OF 125V DC BUS 1BD1LOSS OF INSTRUMENT AIR TO CONTAINMENT  
DUE TO LOSS OF 125V DC TO 1BD12FAILED  
POSITION

## CONTAINMENT AND AUXILIARY BUILDING DRAINS - RADIOACTIVE

1-HV-0780	Reactor Cavity And CNMT Sumps Discharge Isolation Valve	Closed
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## STEAM GENERATOR BLOWDOWN SYSTEM

1-HV-15212A	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15212B	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15212C	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15212D	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15216A	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15216B	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15216C	Steam Generator Blowdown Isolation Valves	Closed
1-HV-15216D	Steam Generator Blowdown Isolation Valves	Closed

## CONTAINMENT PURIFICATION AND CLEANUP SYSTEM

1-HV-2626B	CNMT Mini-Purge Supply Isolation Damper	Closed
1-HV-2628B	CNMT Mini-Purge Exhaust Isolation Damper	Closed
1-HV-12985	CTB Preaccess Filter Unit Diluge	Closed
1-HV-12987	CTB Preaccess Filter Unit Diluge	Closed

## ATTACHMENT B

LOSS OF 125V DC TO BUS 1BD1

TRAIN B ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1BCQIP2 FROM 1BD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB02-F4	RX MAKEUP STOR TK HI/LO LVL
ALB03-B1	NSCW TRAIN B LO HDR PRESS
ALB03-B2	NSCW TRAIN B TRANSF PMP LO DISCH PRESS
ALB03-D2	NSCW TRAIN B CNMT CLR 3&4 LO FLOW
ALB03-E2	NSCW TRAIN B CNMT CLR 7&8 LO FLOW
ALB03-F2	NSCW TRN B RX CVTY CLG COIL LO FLOW
ALB03-C3	NSCW TRAIN B DG CLR LO FLOW
ALB03-E3	NSCW TRAIN B NORM/BYP VLV MISPOSITIONED
ALB03-C4	NSCW TRAIN B RHR PMP & MTR CLR LO FLOW
ALB03-A5	CCW TRAIN B SURGE TK LO-LO LVL
ALB03-E5	CCW TRAIN B RHR PMP SEAL LO FLOW
ALB03-A6	CCW TRAIN B LO HDR PRESS
ALB03-B6	CCW TRAIN B LO FLOW
ALB03-D6	CCW TRAIN B RHR HX LO FLOW
ALB04-E2	TRAIN B SYS STATUS NON PNL ALERT
ALB04-F4	TRAIN B SHUTDOWN PNL ON LOCAL CNTL
ALB04-F5	TRAIN C SHUTDOWN PNL ON LOCAL CNTL

## ATTACHMENT B

LOSS OF 125V DC TO BUS 1BD1

TRAIN B ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1BCQIP2 FROM 1BD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB05-A5	GROUP 1 MONITOR LIGHT COMP OFF NORM
ALB05-B5	GROUP 2 MONITOR LIGHT COMP OFF NORM
ALB05-C5	GROUP 3 MONITOR LIGHT COMP OFF NORM
ALB05-D5	GROUP 4 MONITOR LIGHT COMP OFF NORM
ALB05-E5	GROUP 5 MONITOR LIGHT COMP OFF NORM
ALB06-C1	RHR PMP OVERLOAD TRIP
ALB06-F6	SI PMP OVERLOAD TRIP
ALB07-C6	CHARGING PUMP OVERLOAD TRIP
ALB12-F4	PCV-456 OPEN SIGNAL
ALB12-F6	B COLD OP ACTU VLV HV-8000B NOT FULL OPEN
ALB14-A6	MN STM LOOP 1 TRN B ISO VLV GAS LO PRESS
ALB14-B6	MN STM LOOP 2 TRN B ISO VLV GAS LO PRESS
ALB14-C6	MN STM LOOP 3 TRN B ISO VLV GAS LO PRESS
ALB14-D6	MN STM LOOP 4 TRN B ISO VLV GAS LO PRESS
ALB14-F6	MN STM ISO VALVES NOT FULL OPEN

## ATTACHMENT B

LOSS OF 125V DC TO BUS 1BD1

TRAIN B ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1BCQIP2 FROM 1BD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB15-A1	MN STM LOOP 1 TRN B ISO VLV TROUBLE
ALB15-B1	MN STM LOOP 2 TRN B ISO VLV TROUBLE
ALB15-C1	MN STM LOOP 3 TRN B ISO VLV TROUBLE
ALB15-D1	MN STM LOOP 4 TRN B ISO VLV TROUBLE
ALB16-F5	AFW AUTO START MFPT TRIP RLY CNTRL PWR LOSS
ALB16-E6	AFW P-3 DISCH HDR LO PRESS
ALB34-B1	125V DC SWGR 1BD1 TROUBLE
ALB34-C1	120V AC PANELS 1BY1B 1BY2B TROUBLE
ALB34-B2	125V DC MCC 1BD1M TROUBLE
ALB34-C2	INVERTERS 1BD1I2 1BD1I12 TROUBLE
ALB34-B3	125V DC PNL 1BD11 TROUBLE
ALB34-C3	125V DC PNL 1BD12 TROUBLE
ALB34-B4	BAT CHARGERS 1BD1CA 1BD1CB TROUBLE
ALB34-A6	13.8KV SWGR 1AAA TROUBLE
ALB34-B6	13.8KV SWGR 1BAB TROUBLE
ALB34-A7	13.8KV SWGR 1CAC TROUBLE
ALB34-B7	13.8KV SWGR 1DAD TROUBLE



## ATTACHMENT B

LOSS OF 125V DC TO BUS 1BD1

TRAIN B ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1BCQIP2 FROM 1BD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB36-E2	BAT 1BD1B BRKR OPEN
ALB37-A1	4160V SWGR 1BA03 TROUBLE
ALB37-B1	4160V SWGR 1BA03 NEG PH SEQ BUS PT
ALB37-C1	480V MCC 1BBA TROUBLE
ALB37-D1	480V MCC 1BBD TROUBLE
ALB37-E1	4160/480V SWGR TRN B TRANSFER SW ON LOCAL
ALB37-A2	480V SWGR 1BB06 TROUBLE
ALB37-B2	480V SWGR 1BB16 TROUBLE
ALB37-C2	480V MCC 1BBB TROUBLE
ALB37-D2	480V MCC 1BBE TROUBLE
ALB37-F2	ISO DEVICE PNL TRN B QIP6 TROUBLE
ALB37-A3	480V SWGR 1BB07 TROUBLE
ALB37-B3	SEQ B PNL DOORS OPEN
ALB37-C3	480V MCC 1BBC TROUBLE
ALB37-D3	480V MCC 1BBF TROUBLE
ALB37-F3	ISO DEVICE PNL TRN B QIP2 TROUBLE

## ATTACHMENT B

LOSS OF 125V DC TO BUS 1BD1

TRAIN B ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1BCQIP2 FROM 1BD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB50-B3	CR HI/LO DIFF PRESS
ALB50-B5	CR TRAIN B FLTR TROUBLE
ALB50-A8	BAT RM TRN B SPLY FAN LO AIR FLOW
ALB50-B10	ELECT PEN TRAIN B FLTR TROUBLE
ALB51-B2	NSCW TRN B CBL TUNNEL HI TEMP
ALB51-A5	SWGR 1BB16 RM HI TEMP
ALB51-B5	MCC 1BBD ROOM HI TEMP
ALB51-C5	MCC 1BBB RM HI TEMP
ALB51-D5	RHR TRAIN B PMP RM HI TEMP
ALB51-E5	CCS TRAIN B PMP RM HI TEMP
ALB52-A1	CCW TRAIN B PMP RM HI TEMP
ALB52-B1	CVCS TRAIN B PMP RM HI TEMP
ALB52-C1	SI TRAIN B PMP RM HI TEMP
ALB52-D1	SFCS & HX TRAIN B RM HI TEMP
ALB52-B3	PIPE PEN TRAIN B FLTR TROUBLE
ALB52-D8	CNMT POST LOCA F-2 LO AIR FLOW

## ATTACHMENT B

LOSS OF 125V DC TO BUS 1BD1

TRAIN B ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1BCQIP2 FROM 1BD12

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB53-A3	AFW TRN B PMP HOUSE HI TEMP
ALB53-C3	AFW TRN B PMP HOUSE LO AIR FLOW
ALB53-C8	CHLR TRN B EVAP WTR HI/LO TEMP
ALB53-D8	CHLR TRN B EVAP OR COND WTR LO FLOW
ALB53-E8	CHLR TRN B TROUBLE
ALB54-A2	FHB POST ACCIDENT FLTR 2 TROUBLE
ALB54-F2	FHB AREA LO DIFF PRESS
ALB61-D6	LVL B LEAK DETECTED
ALB61-E6	LVL C LEAK DETECTED
ALB61-F6	LVL D LEAK DETECTED
ALB62-F6	CNMT H <sub>2</sub> MON TRAIN B ALERT

END OF ATTACHMENT B

C. LOSS OF 125V DC BUS 1CD1SYMPTOMS

- 125V DC Vital Bus 1CD1 voltage low.
- Loss of power to 1CY1A 120V AC Vital Instrument Panel.
- TDAFW Pump loss of control and indication.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

## CAUTION

IF TDAFW Pump is not running, it can only be started by local manual per 13610-1, AUXILIARY FEEDWATER SYSTEM.  
 IF TDAFW Pump is running, it may overspeed because Speed Governor Valve 1-SV-15133 fails full open.

## NOTE

See Attachment C for Equipment Responses and Annunciator Failures.

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <p>Cl. Dispatch an operator to restore power to 120V AC Instrument Panel 1CY1A.</p> <p>a. Open Normal Feeder Breaker from Inverter 1CD113:</p> <ul style="list-style-type: none"> <li>● 1CY1A-02.</li> </ul> <p>b. Ensure the Regulated Transformer Supply Breaker for 1ABA07X is CLOSED:</p> <ul style="list-style-type: none"> <li>● 1ABA-07.</li> </ul> <p>c. Close Alternate Source Breaker to 1CY1A instrument panel:</p> <ul style="list-style-type: none"> <li>● 1CY1A-01.</li> </ul> | <p>Cl. Initiate 18032-1, LOSS OF 120V AC INSTRUMENT POWER Sub-procedure E.</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|

VEGP

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ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

C2. IF an RCP 3 undervoltage or underfrequency condition arises, trip the pump using 1-HS-0497B on QMCB.

C2. IF the pump does not trip, dispatch an operator to PSDB to trip the pump:

- 1-HS-0497D.

C3. Dispatch an operator to restore power to Bus LCD1.

C3. Initiate 13405-1, 125V DC 1E ELECTRICAL DISTRIBUTION SYSTEM.

a. Ensure Bus Feeder Breakers are CLOSED:

- LCD1-01 - From Battery LCD1B,
- LCD1-06 - From Charger LCD1CA,
- LCD1-07, From Charger LCD1CB.

- Continue attempts to restore power to LCD1.

b. Ensure Panel Feeder Breakers are CLOSED:

- LCD1-04 - Feeder to LCD11,
- LCD1-11 - Feeder to LCD1M.

C4. Power restored to Bus LCD1.

C4. Go to Step C2.

C5. Return 120V AC Instrument Panel 1CY1A to its normal supply by initiating 13431-1, 120V AC VITAL INSTRUMENT DISTRIBUTION SYSTEM.

C6. IF applicable, return the TDAFW Pump to normal operation by initiating 13610-1, AUXILIARY FEEDWATER SYSTEM.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

- C7. Restore the Auxiliary Feedwater Ventilation System to normal operation by initiating 13325-1, AUXILIARY FEEDWATER PUMP HOUSE AND DIESEL GENERATOR HVAC SYSTEMS.

END OF SUB-PROCEDURE TEXT

## ATTACHMENT C

LOSS OF 125V DC BUS 1CD1EQUIPMENT RESPONSE DUE TO  
LOSS OF TRAIN C 125V DC POWER

- Power to Inverter 1CD1I3 is lost causing 120V AC Vital Bus 1CY1A to de-energize.
- TDAFW Pump Mechanical Trip and Throttle Valve 1-PV-15129 will fail as is with no control capability.
- TDAFW Pump Speed Governor Valve 1-SV-15133 will fail full open.
- Power to Isolation Panel 1CCQIP3 is lost rendering the annunciators in Train C inoperable.

## ATTACHMENT C

LOSS OF 125V DC TO BUS 1CD1

TRAIN C ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1CCQIP3 FROM 1CD11

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB04-F1	TRAIN C SYS STATUS MON PNL ALERT
ALB04-F3	TRAIN A SHUTDOWN PNL ON LOCAL CNTL
ALB04-F4	TRAIN B SHUTDOWN PNL ON LOCAL CNTL
ALB04-F5	TRAIN C SHUTDOWN PNL ON LOCAL CNTL
ALB05-B5	GROUP 2 MONITOR LIGHT COMP OFF NORM
ALB05-D5	GROUP 4 MONITOR LIGHT COMP OFF NORM
ALB16-E3	AFW TURB PNL CNTL PWR LOSS
ALB16-F3	AFW TURB OVERSPEED MECH TRIP
ALB16-E4	AFW P-1 DISCH HDR LO PRESS
ALB16-F4	AFW TURB OVERSPEED ELEC TRIP
ALB34-F3	125V DC SWGR 1CD1 TROUBLE
ALB34-D4	BAT CHARGERS 1CD1CA 1CD1CB TROUBLE
ALB34-F4	INVERTER 1CD1I3 TROUBLE
ALB34-D5	125V DC MCC 1CD1M TROUBLE
ALB34-E5	120V AC PNL 1CY1A TROUBLE
ALB34-F5	125V DC PNL 1CD11 TROUBLE
ALB34-E6	STARTER 1CD1I5N TROUBLE
ALB34-F6	INVERTER 1CD1I5 TROUBLE
ALB34-A7	13.8KV SWGR 1CAC TROUBLE
ALB36-E	BAT 1CD1B BRKR OPEN
ALB36-F4	ISO DEVICE PNL TRN C QIP3 TROUBLE



D. LOSS OF 125V DC BUS 1DD1SYMPTOMS

- 125V DC Vital Bus 1DD1 voltage low.
- Loss of power to 1DY1B 120V AC Instrument Panel.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

## NOTE

See Attachment D for Equipment Responses and Annunciator Failures.

D1. Dispatch an operator to restore power to 120V AC Instrument Panel 1DY1B.

a. Open Normal Feeder Breaker from Inverter 1DD1I4:

- 1DY1B-02.

b. Ensure the Regulated Transformer Supply Breaker for 1BBC09X is CLOSED:

- 1BBC-09.

c. Close Alternate Source Breaker to 1DY1B Instrument Panel:

- 1DY1B-01.

D1. Initiate 18032-1, LOSS OF 120V AC INSTRUMENT POWER Sub-procedure F.

D2. IF an RCP-4 undervoltage or underfrequency condition arises, trip the pump using 1-HS-0498B on the Main Control Board.

D2. IF the pump does not trip, dispatch an operator to locally trip the pump:

- 1-HS-0498D.

ACTION/EXPECTED RESPONSERESPONSE NOT OBTAINED

D3. Dispatch an operator to restore power to Bus 1DD1.

a. Ensure Bus Feeder Breakers are CLOSED:

- 1DD1-01 - From Battery 1DD1B,
- 1DD1-06 - From Charger 1DD1CA,
- 1DD1-07 - From Charger 1DD1CB.

b. Ensure Panel Feeder Breakers are CLOSED:

- 1DD1-04 - Feeder to 1DD11.

D4. Power restored to Bus 1DD1.

D5. Return 120V AC Instrument Panel 1DY1B to normal operation by initiating 13431-1, 120V AC VITAL INSTRUMENT DISTRIBUTION SYSTEM.

D3. Initiate 13405-1, 120V DC 1E ELECTRICAL DISTRIBUTION SYSTEM.

- Continue attempts to restore power to 1DD1.

D4. Go to Step D2.

END OF SUB-PROCEDURE TEXT

## ATTACHMENT D

LOSS OF 125V DC TO BUS 1DD1EQUIPMENT RESPONSE DUE TO  
LOSS OF TRAIN D 125V DC POWER

- Power to Inverter 1DD1I4 is lost causing 120V AC Vital Bus 1DY1B to de-energize.
- Power to Isolation Panel 1DCQIP4 is lost rendering the annunciators in Train D inoperable.

TRAIN D ANNUNCIATOR ALARMS LOST  
DUE TO LOSS OF 125V DC TO 1DCQIP4 FROM 1DD11

<u>ALARM BOARD/WINDOW</u>	<u>DESCRIPTION</u>
ALB04-F3	TRAIN A SHUTDOWN PNL ON LOCAL CNTL
ALB04-F4	TRAIN B SHUTDOWN PNL ON LOCAL CNTL
ALB05-B5	GROUP 2 MONITOR LIGHT COMP OFF NORM
ALB34-B5	120V AC PNL 1DY1B TROUBLE
ALB34-C5	125V DC PNL 1DD11 TROUBLE
ALB34-C6	BAT CHARGERS 1DD1CA 1DD1CB TROUBLE
ALB34-B7	13.8KV SWGR 1DAD TROUBLE
ALB34-C7	125V DC SWGR 1DD1 TROUBLE
ALB34-D7	INVERTER 1DD1I4 TROUBLE
ALB34-E7	STARTER 1DD1I6N TROUBLE
ALB34-F7	INVERTER 1DD1I6 TROUBLE
ALB36-E4	BAT 1DD1B BRKR OPEN
ALB37-F4	ISO DEVICE PNL TRN D QIP4 TROUBLE

END OF ATTACHMENT D