CALVERT CLIFFS NUCLEAR POWER PLANT
TECHNICAL PROCEDURE

UNIT ONE

AOP-9A

CONTROL ROOM EVACUATION AND SAFE SHUTDOWN DUE TO A SEVERE CONTROL ROOM FIRE

REVISION 14

Safety Related

Approval Authority: E.D. Dean III 1/30/08
signature/date

Effective Date: 2/1/08

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	REVISION
1-90	14

APPENDIX NUMBER	REVISION
1	14

PROCEDURE ALTERATIONS

REVISION/CHANGE	PAGE NUMBERS
1400	7,11,12,13,16,19,63,73

TABLE OF CONTENTS

I. PURPOSE

The purpose of this procedure is to place the plant in Cold Shutdown within 72 hours after a severe Control Room fire.

II. ENTRY CONDITIONS

A. This procedure is to be implemented in the event a severe fire has occurred or is in progress. A severe fire is a fire located in an Alternate/Dedicated Shutdown area which inhibits or prohibits the use of normal shutdown procedures, such as OPs, EOPs, and OIs.

III. PRECAUTIONS

The following specific precautions apply prior to or throughout this procedure.

A. **WARNINGS**

1. None

B. **CAUTIONS**

1. All Outside Operator actions will be performed under this procedure. Unit 2 AOP-9A contains identical steps as a placekeeper. If the step is not performed using this procedure, then the OSO step should be performed with the Unit 2 AOP-9A.

2. Valid ESFAS and AFAS signals to equipment shall **NOT** be overridden or blocked unless specifically directed in this procedure. A valid signal is a signal that at the time of initiation, correlated to plant parameters (e.g., the monitored parameter actually reached its setpoint value).

3. This procedure contains reactivity sensitive steps, actions or consequences. Caution should be used to control plant parameters that affect reactivity.

4. A fire in this room could affect all four(4) safety related DGs. The 0C DG will be used to supply 24 4KV Bus in addition to 11 4KV Bus. Loading of the 0C DG onto 11 4KV Bus, as well as operation of the other four(4) DGs will be controlled from this procedure. Unit 2 procedures will load the 0C DG onto 24 4KV Bus. Actions should be coordinated with Unit 2 and 0C DG loading carefully monitored. The continuous load limit for the 0C DG is 5400 KW. The 2 hour load limit is 5940 KW.

(continue)

III. (continued)

C. **NOTES**

1. Offsite power may be lost at any time during this event. Evolutions are performed to place 0C Diesel Generator on 4KV Bus 24 and 4KV Bus 11 and to secure the remaining 4KV Busses. In the event a loss of offsite power occurs within the first hour, a Station Blackout will be in effect until the 0C Diesel Generator and necessary support equipment are re-aligned.

2. The 0C DG must be started within 30 minutes of a loss of power to 07 4KV Bus to prevent the need for prelubing the 0C DG using the pneumatic prelube pumps.

3. It is important to establish Auxiliary Feedwater flow within 30 minutes and Charging flow within 60 minutes.

4. During the post-fire shutdown, the Reactor Coolant System parameters shall be maintained within those predicted for a loss of offsite power. The fission product boundary integrity shall not be affected. The Reactor Coolant makeup function shall be capable of maintaining level indication in the Pressurizer. No other plant accidents are assumed to occur except as precipitated by the fire.

IV. ACTIONS

A. **(SM)** DETERMINE IF A SEVERE FIRE IS IN PROGRESS OR HAS OCCURRED IN THE CONTROL ROOM

NOTE

This procedure has parallel operations assigned to specific watchstations. When a boxed function is completed, it shall be reported to 1C43 and the next boxed function specific to that Operator shall be implemented. Where it is necessary to ensure supporting evolutions are completed before execution of another, a conditional statement is used.

NOTE

A severe fire is a fire located in an Alternate/Dedicated Shutdown area which inhibits or prohibits the use of normal shutdown procedures, such as OPs, EOPs, and OIs.

1. Evaluate plant conditions to determine if a severe fire condition exists.

2. Consider the following characteristics to determine if the fire will require implementation of this procedure:

   - Physical damage to redundant Safe Shutdown equipment trains which renders them incapable of performing their design function as a result of the fire and/or fire fighting efforts.

   - Fires which occur in an Alternative/Dedicated Shutdown area and it can **NOT** be readily determined that Safe Shutdown equipment is free of fire damage.

B. **(RO)** TRIP THE REACTOR

NOTE

This procedure has parallel operations assigned to specific watchstations. When a boxed function is completed, it shall be reported to 1C43 and the next boxed function specific to that Operator shall be implemented. Where it is necessary to ensure supporting evolutions are completed before execution of another, a conditional statement is used.

1. Trip the Reactor by depressing **ONE** set of Manual Reactor Trip Buttons at 1C05 or 1C15.

2. **GO TO** the Main Turbine Front Standard.

IV. ACTIONS

C. **(CRO OR RO)** ATTEMPT TO TRIP THE MAIN TURBINE, SGFPS, AND SHUT MSIVS

NOTE

This procedure has parallel operations assigned to specific watchstations. When a boxed function is completed, it shall be reported to 1C43 and the next boxed function specific to that Operator shall be implemented. Where it is necessary to ensure supporting evolutions are completed before execution of another, a conditional statement is used.

1. Before leaving the Control Room:

   a. Attempt to trip the Main Turbine at 1C02.

   b. Attempt to trip 11 and 12 SGFPs at 1C03.

   c. Attempt to shut 11 and 12 MSIVs at 1C03.

   d. Attempt to trip **ALL** RCPs at 1C06 or 1C19. | 1400

   e. Attempt to depress the 0C DG EMERGENCY START Pushbutton on 1C19C.

D. **(ALL PERSONNEL)** EVACUATE THE CONTROL ROOM

1. **WHEN** evacuation is ordered,
   THEN ALL personnel are to leave the Control Room.

2. Personnel assigned to operate Safe Shutdown Equipment are to report to their Safe Shutdown Station.

E. **(RO)** MANUALLY TRIP THE MAIN TURBINE

1. Manually trip the Unit 1 Main Turbine at the Front Standard.

2. **GO TO** Unit 1 45' Switchgear Room.

3. Notify 1C43 that the Main Turbine is tripped.

IV. ACTIONS

F. **(UNIT 1 PERSONNEL)** UNLOCK SAFE SHUTDOWN KEY LOCKER AND EQUIPMENT LOCKER

1. Open 11 ADV Handvalve enclosure.
2. Obtain the Safe Shutdown Key Locker door key.
3. Open the Safe Shutdown Key Locker.

NOTE
The key for the Safe Shutdown Equipment Locker is on the 1C43 Panel key ring.

4. Obtain the Safe Shutdown Equipment Locker key.
5. Open the Safe Shutdown Equipment Locker.

G. **(CRO)** OBTAIN SAFE SHUTDOWN EQUIPMENT

1. Obtain designated key ring and equipment at Safe Shutdown Key and Equipment Lockers.

H. **(CRO)** SHUTDOWN 11 AND 12 CEDM MG SETS

1. On the CEDM MG Set Control Panel:
   a. Depress the Local LOAD OFF Pushbutton.
   b. Depress the Remote LOAD OFF Pushbutton.
   c. Depress and hold the Local MOTOR OFF Pushbutton until the MOTOR ON light deenergizes.
   d. Depress and hold the Remote MOTOR OFF Pushbutton until the MOTOR ON light deenergizes.

IV. ACTIONS

I. **(CRO)** VERIFY REACTOR IS SHUTDOWN

1. Isolate Channel B WRNI from the Control Room.
   a. Open OPT. ISOL, 1-NX-002B1 (behind CEDM MG Set).
   b. Place 1-HS-002B1 in OFF.
   c. On 1C43, verify 1-HS-015B selected to B.
2. Verify Reactor Power is trending to or is less than 10^{-4}% power and lowering.
3. **WHEN** Reactor Power is less than 10^{-4}% power and constant or lowering,
   THEN Reactivity Control is satisfactory.

J. **(SM)** DETERMINE EMERGENCY RESPONSE ACTION

NOTE
The Shift Manager may designate personnel to notify the Offsite Agencies.

1. Determine the appropriate emergency response actions **PER** the ERPIP.

IV. ACTIONS

K. **(CRO)** CONSERVE RCS AND S/G INVENTORY

1. Insert the key for RCP Bleedoff Isolation, 1-CV-505-CV.
2. Rotate the key to CLOSE.
3. Insert the key for CVCS Letdown Isolation, 1-CV-516-CV.
4. Rotate the key to CLOSE.
5. Insert the key for RCS Sample Isolation, 1-PS-5464-SV.
6. Rotate the key to CLOSE.
7. Insert the key for 11 S/G SURF AND BOT B/D, 1-BD-4010-CV / 1-BD-4011-CV.
8. Rotate the key to CLOSE.
9. Insert the key for 12 S/G SURF AND BOT B/D, 1-BD-4012-CV / 1-BD-4013-CV.
10. Rotate the key to CLOSE.

L. **(CRO)** SECURE PRESSURIZER BACKUP HEATER BANKS 11 AND 13

1. Insert the key for 11 BACK UP HTR TRANSFER CONTR, in 1-HS-100-4A.
2. Rotate the key to OFF.
3. Insert the key for 13 BACK UP HTR TRANSFER CONTR, in 1-HS-100-6A.
4. Rotate the key to OFF.

IV. ACTIONS

M. **(TBO)** OBTAIN SAFE SHUTDOWN EQUIPMENT 1400

NOTE 1400

This procedure has parallel operations assigned to specific watchstations. When a boxed function is completed, it shall be reported to 1C43 and the next boxed function specific to that Operator shall be implemented. Where it is necessary to ensure supporting evolutions are completed before execution of another, a conditional statement is used.

1. Obtain designated key ring and equipment (including headlamp) at Safe Shutdown Key and Equipment Lockers.

2. **GO TO** U-1 Cable Spreading Room to perform Step N.

N. **(TBO)** DE-ENERGIZE CV-517, CV-518, CV-519 AND PRZR AND REACTOR VESSEL HEAD VENTS. 1400

NOTE

Step N should be reported complete after Step O is completed. 1400

1. Open CONTROL ROOM 1C07 Breaker, 1D17-01.

2. Open CONTROL ROOM 1C07 Breaker, 1D11-05

3. **GO TO** 27' Switchgear Room to perform Step O.

O. **(TBO)** TRIP MCC 114R LOAD CENTER BREAKER 1400

1. ON 11B 480V Load Center, trip 114R REACTOR MCC, Breaker 52-1119 1400

2. Notify 1C43 Load Center Breaker for MCC 114 is tripped and CV-517, CV-518, CV-519, PZR and Head Vents are de-energized.

3. **GO TO** the SGFPs 12' Turbine Building to perform Step W.

IV. ACTIONS

P. **(RO)** OBTAIN SAFE SHUTDOWN EQUIPMENT 1400

1. Obtain designated key ring and equipment (including headlamp and PPE for operating 13KV breakers) at Safe Shutdown Key and Equipment Lockers. 1400

2. **GO TO** 14A 480V Load Center to perform Step Q.

Q. **(RO)** TRIP MCC 104R LOAD CENTER BREAKER 1400

1. ON 14A 480V Load Center, trip 104R REACTOR MCC, Breaker 52-1409. 1400

2. Notify 1C43 Load Center Breaker MCC 104 is tripped.

IV. ACTIONS

R. **(RO)** TRIP 11B AND 12B REACTOR COOLANT PUMPS

WARNING

If available, a Safety Observer should be stationed when working on energized equipment.

1. Trip each Reactor Coolant Pump Breaker in the 45' Switchgear Room:

   - (11B RCP) 252-13P01:
     - Remove the CLOSE CIR fuses
     - Push the PUSH TO TRIP button
   - (12B RCP) 252-14P01:
     - Remove the CLOSE CIR fuses
     - Push the PUSH TO TRIP button
   - (11B RCP) 252-13P02:
     - Remove the CLOSE CIR fuses
     - Push the PUSH TO TRIP button
   - (12B RCP) 252-14P02:
     - Remove the CLOSE CIR fuses
     - Push the PUSH TO TRIP button

NOTE

PPE for operating 13KV breakers will be required in the 27' Switchgear Room. 1400

2. Notify 1C43 that 11B and 12B Reactor Coolant Pumps are tripped.

IV. ACTIONS

S. **(RO)** DE-ENERGIZE PRESSURIZER HEATER 112 PH AND NO. 12 PRESSURIZER PROPORTIONAL HEATER (MCC 1N430)

NOTE

Control Power fuses for 112 PH PRESS HTR MCC Breaker are located inside the left-hand cabinet (1B03B), bottom row, third set from the left.

1. Remove the Control Power Fuses for 112 PH PRESS HTR. MCC Breaker, 52-1318.

2. Depress the TRIP pushbutton for 112 PH PRESS HTR. MCC Breaker, 52-1318.

NOTE

Control Power fuses for NO. 12 PRESS HTR PROP. CONT. are located inside the left-hand cabinet (1B04A), top row, second set from the left.

3. Remove the Control Power Fuses for NO.12 PRESS. HTR. PROP. CONT. Breaker, 52-1430.

4. Depress the TRIP pushbutton for NO.12 PRESS. HTR. PROP. CONT. Breaker, 52-1430.

T. **(RO)** TAKE LOCAL CONTROL AND OPEN 1B DIESEL GENERATOR OUTPUT BREAKER

1. Insert the Local/Remote Key into 1B DIESEL GENERATOR OUTPUT BREAKER handswitch, 1-HS-1403A.

2. Rotate the key to LOCAL.

3. Place the Local Control handswitch, 1-HS-1403B, to TRIP.

4. Notify 1C43 that 1B DIESEL GENERATOR OUTPUT BREAKER is in local control.

5. **GO TO** 27' Switchgear Room to perform Step AK.

IV. ACTIONS

U. **(OSO)** OBTAIN RADIOS AND REPORT TO 1C43 AND 2C43

NOTE

This procedure has parallel operations assigned to specific watchstations. When a boxed function is completed, it shall be reported to 1C43 and the next boxed function specific to that Operator shall be implemented. Where it is necessary to ensure supporting evolutions are completed before execution of another, a conditional statement is used.

1. **GO TO** the Fire Brigade Locker and retrieve two portable radios.
2. **GO TO** 1C43 and give one radio to the SM.
3. Obtain designated key ring and equipment (including headlamp) at Safe Shutdown Key and Equipment Lockers.
4. **GO TO** 2C43 and give the other radio to the CRS.
5. **GO TO** the 2B Diesel Building to perform Step V.

CAUTION

If offsite power has been lost, the next boxed function will cause a loss of both 4KV Vital Buses on Unit 2 and a loss of 14 4KV Vital Bus on Unit 1 while the 0C DG is being aligned to 11 and 24 4KV Vital Bus.

V. **(OSO)** SHUTDOWN FAIRBANKS DIESEL GENERATORS

1. Depress the 2B DG EMERGENCY SHUTDOWN Pushbutton (trip the fuel racks).
2. **GO TO** 1B Diesel Building.
3. Depress the 1B DG EMERGENCY SHUTDOWN Pushbutton (trip the fuel racks).
4. **GO TO** 2A Diesel Building.
5. Depress the 2A DG EMERGENCY SHUTDOWN Pushbutton (trip the fuel racks).
6. Notify **1C43** and **2C43** that the 1B DG, 2A DG and 2B DG are shutdown **AND** the fuel racks are tripped.
7. **GO TO** 0C Diesel Building to perform Step AH.

IV. ACTIONS

W. **(TBO)** TRIP 11 AND 12 SGFPS 1400

1. Manually trip the SGFPs.

   - PULL-TO-TRIP 11 SGFP
   - PULL-TO-TRIP 12 SGFP

2. **GO TO** Condenser Makeup Control Valve, 1-CD-4406-CV at the North End of the Condenser Pit to perform Step X.

X. **(TBO)** ISOLATE CONDENSER MAKEUP

1. Shut Instrument Air Isolation to Main Condenser Makeup Control Valve, 1-IA-387.

2. Using a wrench, disconnect the air fitting between the solenoid and the valve actuator to relieve air pressure.

3. Notify 1C43 that the SGFPs have been tripped, and condenser makeup is isolated.

4. **GO TO** the AFW Pump Room to perform step AD.

Y. **(ABO)** OBTAIN SAFE SHUTDOWN EQUIPMENT THEN STRIP MCC 114R

NOTE

This procedure has parallel operations assigned to specific watchstations. When a boxed function is completed, it shall be reported to 1C43 and the next boxed function specific to that Operator shall be implemented. Where it is necessary to ensure supporting evolutions are completed before execution of another, a conditional statement is used.

1. Obtain designated key ring and equipment (including headlamp) at Safe Shutdown Key and Equipment Lockers.

2. **GO TO** MCC 114R in the Auxiliary Building.

(continue)

IV. ACTIONS

Y. (continued)

NOTE

Chemistry does **NOT** have to be notified for placing MAIN VENT PARTICULATE/TRITIUM SAMPLE SKID Breaker, 52-11451 in OFF.

CAUTION

Do NOT place ANY breakers on the P-Panel to OFF.

3. Place **ALL** 480V breakers on MCC 114R to OFF.

NOTE

The following breakers are arranged from left to right, facing the MCC.

4. Place the following Breakers to ON:

   - 11 SALTWATER AIR COMPRESSOR.....52-11404
   - 11 INSTRUMENT BUS TRANSFORMER.....52-11429
   - MAIN FEEDER BREAKER.....52-11401
   - AUX. FDWTR. FAN VENT FAN 11.....52-11412
   - SWGR ROOM HVAC UNIT 11 FAN.....52-11436
   - CAVITY COOLING FAN 11 DAMPER.....52-11454
   - MAIN LIGHTING BREAKER.....52-11427

5. **GO TO** the MSIV Room to perform Step AC.

Z. **(CRO)** INITIALIZE ADV CONTROLLERS ON 1C43

NOTE

Adjustment of ADV Controllers past the controller detent pin will stop valve motion.

1. Place 11 ADV CONTR, 1-HC-4056A, to SHUT.
2. Place 12 ADV CONTR, 1-HC-4056B, to SHUT.

IV. ACTIONS

AA. **(CRO)** ALIGN 11 AND 12 ADVS TO 1C43

1. Place the following Handvalves to POSITION 2:
   - 11 ADV Aux Shutdown Control Transfer, 1-HV-3938A
   - 11 ADV Quick Open Override Handvalve, 1-HV-3938B
   - 12 ADV Aux Shutdown Control Transfer, 1-HV-3939A
   - 12 ADV Quick Open Override Handvalve, 1-HV-3939B

AB. **(CRO)** COMPLETE INITIALIZATION OF CONTROLLERS ON 1C43

NOTE
Adjustment of Controllers past the controller detent pin will stop valve motion.

1. Place 11 AFW PP SPEED CONTR, 1-HC-3987B, to MIN SPD.
2. Place 12 AFW PP SPEED CONTR, 1-HC-3989B, to MIN SPD.
3. Place 11 S/G FLOW CONTR, 1-HC-4511B, to MIN FLOW.
4. Place 12 S/G FLOW CONTR, 1-HC-4512B, to MIN FLOW.
5. Place 11 S/G FLOW CONTR, 1-HC-4525B, to MIN FLOW.
6. Place 12 S/G FLOW CONTR, 1-HC-4535B, to MIN FLOW.
7. Notify the TBO to align AFW Pump Speed Control to 1C43 **PER** Step AD.

IV. ACTIONS

AC. **(ABO)** VERIFY MSIVS ARE SHUT

1. Shut Instrument Air Isolation to 11 MSIV Hydraulic Pump, 1-IA-1069.

2. **IF** 11 MSIV is open,
   THEN:

   a. Remove the Dump Solenoid Valve Cap on **ONE** of the following:

      - 11 MSIV Dump SV Channel A, 1-MSH-4042A-SV

      OR

      - 11 MSIV Dump SV Channel B, 1-MSH-4042B-SV

   b. Place a wrench on the selected Dump Solenoid stem nut.

   c. Rotate the wrench in the clockwise direction (approximately five turns) to bleed hydraulic fluid back to the reservoir. 1400

3. Shut Instrument Air Isolation to 12 MSIV Hydraulic Pump, 1-IA-1070.

4. **IF** 12 MSIV is open,
   THEN:

   a. Remove the Dump Solenoid Valve Cap on **ONE** of the following:

      - 12 MSIV Dump SV Channel A, 1-MSH-4047A-SV

      OR

      - 12 MSIV Dump SV Channel B, 1-MSH-4047B-SV

   b. Place a wrench on the selected Dump Solenoid stem nut.

   c. Rotate the wrench in the clockwise direction (approximately five turns) to bleed hydraulic fluid back to the reservoir. 1400

5. Notify 1C43 the MSIVs are shut.

6. **GO TO** 5' Auxiliary Building level to the CONTMT NORMAL SUMP DRN valve 1-EAD-5462-MOV to perform Step AQ.

IV. ACTIONS

AD. **(TBO)** ALIGN AFW PUMP SPEED CONTROL TO 1C43

1. **WHEN** notified to align AFW Pump Speed Control to 1C43,
   THEN:

   a. Place 11 AFW Pump Speed Control Handvalve, 1-HV-3987, to POSITION 2.

   b. Place 12 AFW Pump Speed Control Handvalve, 1-HV-3989, to POSITION 2.

2. Insert the key for 11 AFW Pump Trip Solenoid, 1-HS-3986A.

3. Rotate the key to DISABLE.

4. Insert the key for 12 AFW Pump Trip Solenoid, 1-HS-3988A.

5. Rotate the key to DISABLE.

6. **IF** the in-service AFW Pump Trip Solenoid has actuated,
   THEN reset the Throttle/Stop Valve:

   a. Turn the handwheel clockwise until the Trip Latch and Hook are fully engaged.

   b. Slowly rotate the handwheel counterclockwise until the 11(12) AFW PP TURB THROTTLE/STOP valve, 1-MS-3986 (1-MS-3988), is fully open.

7. Notify 1C43 that AFW Speed Control is aligned to 1C43.

8. **GO TO** Unit 1 SRW Pump Room to perform Step AE.

IV. ACTIONS

AE. **(TBO)** ALIGN AFW FLOW CONTROL TO 1C43

1. In the SRW Room Upper Level,
   Place in POSITION 2 **ALL** AFW System Valves listed below:

   - **NORTH WALL** (Left to Right)

   NOTE
   1-IA -4511-HV and 1-IA-4512 are located in the Hand Transfer Box.

   - 1-IA-4511-HV
   - 1-IA-4512-HV
   - 1-IA-4531-HV
   - 1-IA-4521-HV
   - 1-IA-4530-HV
   - 1-IA-4520-HV
   - 1-IA-4532-HV
   - 1-IA-4522-HV
   - 1-IA-4533-HV
   - 1-IA-4523-HV

   - **Stanchion L.O.9** between 1-AFW-4525-CV and 1-AFW-4535-CV (In Hand Transfer Box)
     - 1-IA-4525-HV
     - 1-IA-4535-HV

   - **Southwest Corner** next to U-1 to U-2 AFW X-conn CV, 1-AFW-4550-CV. (Left to right)
     - 1-IA-4070-HV
     - 1-IA-4071-HV
     - 1-IA-4550-HV

NOTE
SWAC TO IA AMP STA ISOL, 1-IA-728 is located directly above the AFW Air Amplifier in the Unit 1 SRW Room Lower Level

2. Open SWAC TO IA AMP STA ISOL, 1-IA-728.

3. Notify 1C43 that AFW flow control is aligned to 1C43 and SWAC air is aligned to the AFW CVs.

4. **GO TO** the AFW Pump Room to briefly monitor the operating AFW Pump **PER** Step AG,
   THEN return to the SRW Pump Room to perform Step AP.

IV. ACTIONS

AF. **(CRO)** INITIATE AFW FLOW

NOTE
11 and 12 AFW Pumps fail to maximum speed on loss of Instrument Air.

1. **WHEN** notified by the TBO that the AFW flow control is aligned to 1C43,
   THEN slowly feed the S/Gs by **ANY** of the following methods
   AND restore S/G level to 0 inches indicated.

   - Adjusting 11 AFW PP SPEED CONTR, 1-HC-3987B
   - Adjusting 12 AFW PP SPEED CONTR, 1-HC-3989B
   - Direct the TBO to control AFW Pump discharge pressure locally **PER** Step AG
   - Adjusting 11 SG STM DRIVEN AFW CONTR, 1-HC-4511B
   - Adjusting 12 SG STM DRIVEN AFW CONTR, 1-HC-4512B

2. **IF** the AFW Pump trips,
   THEN inform the TBO to reset the AFW Pump **PER** Step AG.

3. **WHEN** AFW flow is established,
   THEN perform Step AN.

IV. ACTIONS

AG. **(TBO)** OPERATE THE SELECTED AFW PUMP

NOTE
11 and 12 AFW Pumps fail to maximum speed on loss of Instrument Air.

1. **IF** 1C43 directs,
   THEN control AFW Pump discharge pressure locally as follows:

   a. Isolate the Instrument Air to the Turbine Governor Controller(s) by shutting the following valves:

      11 AFW PP
      - 1-AFW-3987A I/P ISOL, 1-IA-24
      - 1-AFW-3987B I/P ISOL, 1-IA-23

      12 AFW PP
      - 1-AFW-3989A I/P ISOL, 1-IA-22
      - 1-AFW-3989B I/P ISOL, 1-IA-21

   b. Adjust 11 or 12 AFW PP governor MANUAL ADJUSTMENT knob to maintain discharge pressure at least 100 PSI greater than S/G pressure.

(continue)

IV. ACTIONS

AG. (continued)

2. **IF** the in-service AFW Pump has tripped,
   THEN reset the Throttle/Stop Valve, 1-MS-3986 (1-MS-3988):

NOTE
Cycling the governor MANUAL ADJUSTMENT knob after Turbine Operation releases a hydraulic lock on the speed setting piston.

a. Reset the Turbine Governor Speed Control as follows:

   (1) Turn the governor MANUAL ADJUSTMENT knob fully counterclockwise to MINIMUM position.

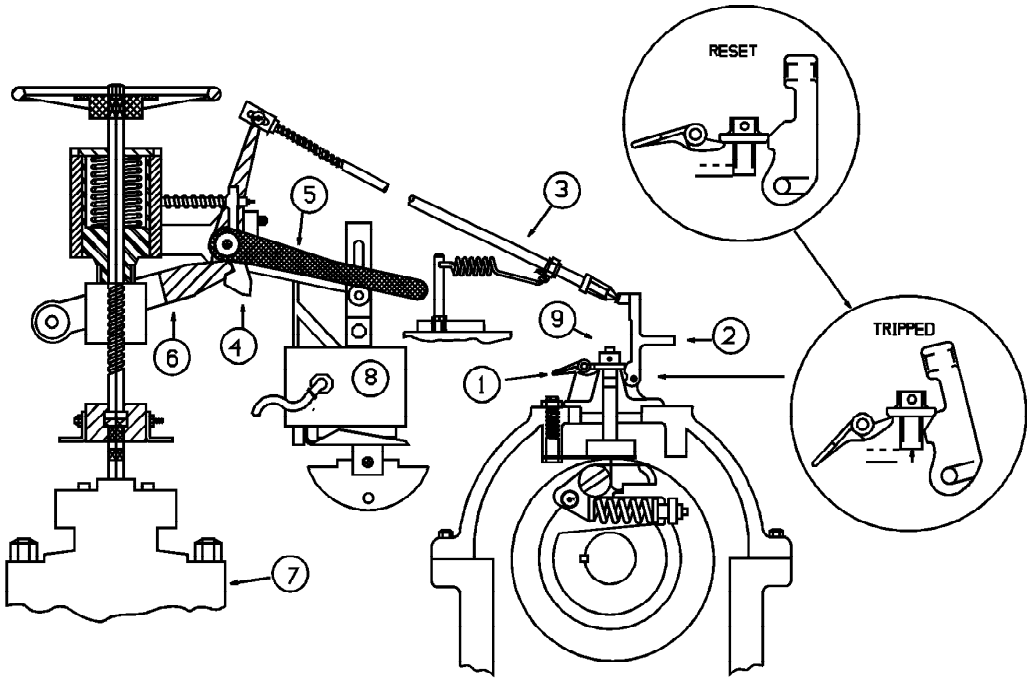
   (2) Turn the governor MANUAL ADJUSTMENT knob fully clockwise to MAXIMUM position.

b. **IF** the Overspeed Device has been tripped,
   THEN reset the Overspeed Trip by momentarily pulling the VALVE TRIP LEVER LINKAGE Connecting Rod (3) against spring tension toward the AFW Pump Turbine.

(continue)

IV. ACTIONS

AG.2.b (continued)



1. TURBINE MANUAL TRIP LEVER
2. HEAD LEVER
3. VALVE TRIP LEVER LINKAGE
4. TRIP HOOK
5. TRIP LEVER (VALVE)
6. VALVE TRIP/LATCH LEVER
7. TURBINE THROTTLE STOP VALVE
8. TURBINE TRIP SOLENOID
9. TAPPET NUT

NOTE

Proper engagement between the Tappet Nut and the Head Lever is critical to prevent inadvertent tripping of the AFW Pump.

c. Ensure the flat side of the TAPPET NUT (9) is seated firmly against the HEAD LEVER (2).

(continue)

IV. ACTIONS

AG.2 (continued)

d. Reset the Throttle/Stop Valve:

(1) Rotate the handwheel clockwise until the Trip/Latch Lever is lifted over the Trip Hook.

(2) Ensure the Trip/Latch Lever and the Trip Hook are fully engaged.

e. Slowly rotate the handwheel counterclockwise until the Throttle/Stop Valve, 1-MS-3986 (1-MS-3988), is fully open.

3. Periodically monitor the operating AFW Pump.

4. Perform the next TBO assigned step.

AH. **(OSO)** TAKE LOCAL CONTROL AND START 0C DIESEL GENERATOR

1. **IF** 0C Diesel Generator is **NOT** running
AND the 07 4KV Bus has been de-energized for 30 minutes or longer,
THEN initiate pneumatic prelube as follows:

a. Open 0C1 PNEUMATIC PRELUBE PUMP SUCTION VALVE, 0C1-DLO-2 (at 0C1 pneumatic prelube pump).

b. Open 0C1 PNEUMATIC PRELUBE PUMP DISCHARGE VALVE, 0C1-DLO-14 (under 0C1 Aux Desk).

c. Open 0C2 PNEUMATIC PRELUBE PUMP SUCTION VALVE, 0C2-DLO-2 (at 0C2 pneumatic prelube pump).

d. Open 0C2 PNEUMATIC PRELUBE PUMP DISCHARGE VALVE, 0C2-DLO-14 (under 0C2 Aux Desk).

e. Open one 0C Pneumatic Prelube Pump Air Bottle outlet valve (35' elevation).

f. Adjust 0C PNEUMATIC PRELUBE PUMP AIR REGULATOR, 0-DLO-10180-PCV, to a maximum of 110 PSIG on 0C PNEUMATIC PRELUBE PUMP AIR SUPPLY REGULATOR OUTLET PI, 0-PI-10180, to start the Prelube Pump turning.

(continue)

IV. ACTIONS

AH.1 (continued)

g. **WHEN** both Prelube Pumps have been started,
THEN THROTTLE 0C PNEUMATIC PRELUBE PUMP AIR REGULATOR, 0-DLO-10180-PCV, to obtain 35 (30 to 40) psig on 0C PNEUMATIC PRELUBE PUMP AIR SUPPLY REGULATOR OUTLET PI, 0-PI-10180.

h. Note time prelube started. _____

2. Perform the following to open 0C DG Output Breaker, 152-0703:

   a. Insert the Local/Remote Key into 0C DG Output Breaker LOCAL/REMOTE handswitch 0-HS-152-0703A and unlock it.

   b. Place 0C DG Output Breaker LOCAL/REMOTE handswitch 0-HS-152-0703A to LOCAL.

   c. Place 0C DG OUT BKR Local Control handswitch 0-HS-152-0703B to TRIP **AND** verify Breaker 152-0703 open.

3. Perform the following to place 07 4KV Feeder Breaker, 152-0704 in local control:

   a. Insert the Local/Remote key into 07 4KV Feeder Breaker LOCAL/REMOTE handswitch 0-HS-152-0704A and unlock it.

   b. Place 07 4KV Feeder Breaker LOCAL/REMOTE handswitch 0-HS-152-0704A to LOCAL
   AND verify Breaker 152-0704 open.

4. Perform the following to place 07 4KV Bus Tie Breaker, 152-0701 in local control:

   a. Insert the Local/Remote key into 07 4KV Bus Tie LOCAL/REMOTE handswitch 0-HS-152-0701A and unlock it.

   b. Place 07 4KV Bus Tie LOCAL/REMOTE handswitch 0-HS-152-0701A to LOCAL **AND** verify Breaker 152-0701 open.

5. Perform the following to place U440-07 4KV Feeder Breaker, 152-0702 in local control:

   a. Insert the Local/Remote key into U440-07 4KV Feeder Breaker LOCAL/REMOTE handswitch 0-HS-152-0702A and unlock it.

   b. Place U440-07 4KV Feeder Breaker LOCAL/REMOTE handswitch 0-HS-152-0702A to LOCAL
   AND verify Breaker 152-0702 closed.

(continue)

IV. ACTIONS

AH. (continued)

NOTE
The next breaker is a **480V** Breaker.

6. Perform the following to place 07 480V Bus Feeder Breaker, 52-0701 in local control:

   a. Insert the Local/Remote Key into 07 480V Bus Feeder Breaker LOCAL/REMOTE handswitch 0-HS-52-0701A and unlock it.

   b. Place 07 480V Bus Feeder Breaker LOCAL/REMOTE handswitch 0-HS-52-0701A to LOCAL.

7. **GO TO** the back of the 0C DG LOCAL CONTROL PANEL, 0C188-4 (second door from left) and open door.

8. Insert key and unlock the 43/LR switch.

9. Place the 43/LR switch handle in the upper, LOCAL position.

10. Lock 43/LR switch, remove key, and close the door.

11. **IF** 0C Diesel Generator is running,
    THEN:

    a. Simultaneously depress **BOTH** local emergency stop pushbuttons, 0C LOCAL EMER STOP PB, 0-HS-10335 AND 0-HS-10336.

    b. Reset 0C Diesel Generator by depressing 0C GEN EMER S/D RESET PB, 0-HS-10337.

12. Verify 0C GEN CONTR MODE SEL SW, 0-HS-10322, in REMOTE/AUTO.

13. **IF** pneumatic prelube of 0C DG was initiated,
    THEN ensure at least 5 minutes has elapsed since prelube was started.

14. Start 0C DG by momentarily depressing 0C MANUAL EMER START PB, 0-HS-10334.

15. CHECK 0C DG rated frequency (58.8 to 61.2 HZ)
    AND voltage (3.74KV to 4.58KV) are established:

    - 0C GEN FREQ IND, 0-SI-10332
    - 0C GEN PHASE A VOLT IND, 0-EI-10321

16. Place Synchronizing Jack 0SJ to SYNC.

(continue)

IV. ACTIONS

AH. (continued)

17. Close 0C DG OUT BKR 152-0703, by placing 0-HS-152-0703C to CLOSE.

18. Place Synchronizing Jack 0SJ to OFF.

19. Verify the following equipment RUNNING by observing the associated red indicating light is illuminated on 0C188:

    - 0C1 HT RAD FAN SEL SW, 0-HS-10082
    - 0C2 HT RAD FAN SEL SW, 0-HS-10102
    - 0C1 FO B/U PP SEL SW, 0-HS-10051
    - 0C2 FO B/U PP SEL SW, 0-HS-10061

20. Notify **1C43** and **2C43** that the 0C Diesel Generator is running on 07 4KV Bus with its breakers in local control.

21. Close the 07 4KV Bus Tie Breaker, 152-0701 per Step AI.

AI. **(OSO)** CLOSE 07 4KV BUS TIE BREAKER, 152-0701.

1. Close 07 4KV BUS TIE breaker 152-0701, using 0-HS-152-0701B.

2. Notify **1C43** and **2C43** that 07 4KV BUS TIE Breaker, 152-0701 is closed.

3. **GO TO** 1A DG building to perform Step AM.

IV. ACTIONS

AJ. **(STA)** COMMENCE SAFETY PARAMETERS CHECKLIST

1. Monitor the status of both Units **PER** Section V., SAFETY PARAMETERS CHECKLIST.

2. **IF** notified to attempt to monitor parameters at PAMS Cabinet, 1C144A (in the 27' Switchgear Room),
   THEN:

   a. Obtain PAMS Cabinet Door key from 1C43.

   b. Unlock and open PAMS Cabinet, 1C144A (in 27' Switchgear Room).

NOTE

Proper operation is indicated by green lit fonts. Degraded operation is indicated by back lit magenta fonts.

   c. Touch the desired function menus on the FPD to:

   - Obtain CET temperature
   - Monitor Reactor Vessel level for voiding

IV. ACTIONS

AK. **(RO)** TRIP 11A AND 12A REACTOR COOLANT PUMPS

WARNING

A Safety Observer, if available, should be stationed when working on energized equipment.

1. Trip each Reactor Coolant Pump Breaker in the 27' Switchgear Room:

   - (11A RCP) 252-11P01:
     - Remove the CLOSE CIR fuses
     - Push the PUSH TO TRIP button
   - (12A RCP) 252-12P01:
     - Remove the CLOSE CIR fuses
     - Push the PUSH TO TRIP button
   - (11A RCP) 252-11P02:
     - Remove the CLOSE CIR fuses
     - Push the PUSH TO TRIP button
   - (12A RCP) 252-12P02:
     - Remove the CLOSE CIR fuses
     - Push the PUSH TO TRIP button

2. Notify 1C43 that 11A and 12A Reactor Coolant Pumps are TRIPPED.

IV. ACTIONS

AL. **(RO)** DE-ENERGIZE PRESSURIZER HEATER MCC 110PH AND NO. 11 PRESSURIZER PROPORTIONAL HEATER (MCC 1N130)

NOTE

Control Power Fuses are located inside the cabinet (1B01A), on the end of the Load Center, top row, second set from the left.

1. Remove the Control Power Fuses for NO.11 PRESS. HTR. PROP. CONT. BKR, 52-1130.

2. At 11A 480V Load Center, depress the TRIP pushbutton for NO.11 PRESS. HTR. PROP. CONT. BKR, 52-1130.

NOTE

Control Power Fuses are located inside the right-hand cabinet (1B02B), bottom row, third set from the left.

3. Remove the Control Power Fuses for 110PH PRESS HTR. MCC BKR, 52-1218.

4. At 12B 480V Load Center, depress the TRIP pushbutton for 110PH PRESS HTR. MCC BKR, 52-1218.

5. Perform Step AO.

AM. **(OSO)** TAKE LOCAL CONTROL AND OPEN 1A DIESEL GENERATOR OUTPUT BREAKER

1. Perform the following to open 1A DG Output Breaker, 152-1703:

   a. Place a Local/Remote Key into 1A DG Output Breaker LOCAL/REMOTE handswitch, 1-HS-152-1703A, and unlock it.

   b. Place 1A DG Output Breaker LOCAL/REMOTE handswitch, 1-HS-152-1703A to LOCAL.

   c. Place 1A DG OUT BKR Local Control handswitch, 1-HS-152-1703B to TRIP.

2. Notify 1C43 that 1A Diesel Generator Output Breaker is in LOCAL and TRIPPED.

3. Perform Step AZ.

IV. ACTIONS

AN. (**CRO)** CONTROL RCS TEMPERATURE AND VERIFY NATURAL CIRCULATION

1. Adjust 11 and 12 ADV CONTRS, 1-HC-4056A and 1-HC-4056B, to achieve RCS Tcold of 515° F to 535° F.

   - **IF** ADV(s) do **NOT** operate from 1C43,
     THEN contact the ABO to manually operate ADV(s) locally.

2. Attempt to monitor parameters at PAMS cabinet:

   a. Unlock and open PAMS Cabinet, 1C144B (in 45' Switchgear Room).

NOTE

Proper operation is indicated by green lit fonts. Degraded operation is indicaed by back lit magenta fonts.

   b. Touch the desired function menus on the FPD to:

      - Obtain CET temperature
      - Monitor Reactor Vessel level for voiding

   c. **IF** parameters can **NOT** be monitored at 1C144B,
      THEN notify the STA to attempt to monitor parameters at PAMS Cabinet, 1C144A (in the 27' Switchgear Room) **PER** Step AJ.2.

3. Verify Natural Circulation in at least one loop:

   - **IF** CETs can be monitored:

     - RCS subcooling is at least 30° F based on CET Temperatures
     - CET temperatures trend consistent with T_{HOT}

   - T_{HOT} minus T_{COLD} less than 50° F

   - T_{COLD} constant or lowering

   - T_{HOT} constant or lowering

   - Steaming rate affects RCS temperature

IV. ACTIONS

AO. **(RO)** ELECTRICALLY ISOLATE 4KV BUS 11 FROM THE CONTROL ROOM

1. Pull the CLOSE Fuses
   AND depress the TRIP pushbutton for the following 4KV Breakers:

   - 13 AFW Pump.....152-1116
   - 11 CONTAINMENT SPRAY PUMP.....152-1107
   - 11 HIGH PRESS SAFETY INJ. PUMP.....152-1108
   - 13 HIGH PRESS SAFETY INJ. PUMP.....152-1110
   - SWITCHYARD FEEDER (500KVA).....152-1113
   - U-440-11A SERVICE TRANSF.....152-1114

2. Insert the Local/Remote Keys into the following breakers
   AND rotate the key to LOCAL:

   - BKR 152-1112 13 SW PUMP.....1-HS-5201C
   - BKR 152-1111 13 SRW PUMP.....1-HS-1572C
   - BKR 152-1109 11 SRW PUMP.....1-HS-1570A
   - BKR 152-1105 11 SW PUMP.....1-HS-5199A
   - BKR 152-1104 11 LPSI PUMP.....1-HS-302XB
   - BKR 152-1103 11-17 4KV BUS TIE.....1-HS-1103A
   - BKR 152-1102 U-440-11B SERVICE TRANSF... 1-HS-1102A

(continue)

IV. ACTIONS

AO. (continued)

3. Place the following Local Control handswitches to STOP **OR** TRIP:

   - BKR 152-1102 U-440-11B SERVICE TRANSF....1-HS-1102B
   - BKR 152-1103 11-17 4KV BUS TIE.....1-HS-1103B
   - BKR 152-1104 11 LPSI PUMP.....1-HS-302XC
   - BKR 152-1105 11 SW PUMP.....1-HS-5199B
   - BKR 152-1109 11 SRW PUMP.....1-HS-1570B
   - BKR 152-1111 13 SRW PUMP.....1-HS-1572D
   - BKR 152-1112 13 SW PUMP.....1-HS-5201D

4. Notify 1C43 of the following:

   - 4KV Bus 11 is electrically isolated from the Control Room.
   - Loads are secured that support energizing 11 4KV Bus

5. Have 1C43 notify the TBO to override Saltwater to the Service Water Heat Exchangers **PER** Step AP.

6. Perform Step AT.

AP. **(TBO)** OVERRIDE SALTWATER TO THE SERVICE WATER HEAT EXCHANGERS

1. **WHEN** notified to override Saltwater to the Service Water Heat Exchangers, **THEN** insert the Key into 1-HS-5149 and place the Saltwater System Emergency Overboard, 1-CV-5149, to OVERRIDE TO CLOSE.

(continue)

IV. ACTIONS

AP. (continued)

2. Place the following Handvalves to OVERRIDE (from left to right):

   - East HV transfer stanchion
     a. 11B SRW HX SW OUTLET, 1-HV-5210
     b. 11A SRW HX SW OUTLET, 1-HV-5209
     c. 11A & 11B SRW HXs SW BYPASS, 1-HV-5154
     d. 11B SRW HX SW STNR FLUSH, 1-HV-5151A
     e. 11B SRW HX SW STNR DIVERTER, 1-HV-5151
     f. 11A SRW HX SW STNR FLUSH, 1-HV-5148A
     g. 11A SRW HX SW STNR DIVERTER, 1-HV-5148
     h. 12A & 12B SRW HXs SW AUX OUT, 1-HV-5155
     i. 12A & 12B SRW HXs SW AUX B/U OUT, 1-HV-5156
     j. 11A & 11B SRW HXs SW INLET, 1-HV-5150
   - West HV transfer stanchion
     a. 12A SRW HX SW STNR DIVERTER, 1-HV-5158
     b. 12A SRW HX SW STNR FLUSH, 1-HV-5158A
     c. 12B SRW HX SW STNR DIVERTER, 1-HV-5159
     d. 12B SRW HX SW STNR FLUSH, 1-HV-5159A
     e. 12A & 12B SRW HXs SW INLET, 1-HV-5152
     f. 12A & 12B SRW HXs SW B/U OUT, 1-HV-5153
     g. 12A & 12B SRW HXs SW BYPASS, 1-HV-5157
     h. 12A SRW HX SW OUTLET, 1-HV-5211
     i. 12B SRW HX SW OUTLET, 1-HV-5212

3. Perform the next TBO assigned step.

IV. ACTIONS

AQ. **(ABO)** MANUALLY SHUT CONTAINMENT NORMAL SUMP VALVE

1. Manually shut CNTMT NORMAL SUMP DRN valve, 1-EAD-5462-MOV.
2. Notify 1C43 that the Containment Normal Sump Drain valve, 1-EAD-5462-MOV is shut.
3. **GO TO** the Boric Acid Storage Tank Room to perform Step AS.

AR. **(TBO)** ISOLATE SERVICE WATER TO THE TURBINE BUILDING

1. Isolate Instrument Air to the Turbine Building SRW Isolation, 1-SRW-1600-CV as follows:
   a. Shut 1-SRW-1600-CV ISOL, 1-IA-789.
   b. Using a wrench, disconnect the air fitting between the solenoid and the valve actuator to relieve air pressure.
2. Isolate Instrument Air to the Turbine Building SRW Isolation, 1-SRW-1637-CV as follows:
   a. Shut 1-SRW-1637-CV ISOL, 1-IA-786.
   b. Using a wrench, disconnect the air fitting between the solenoid and the valve actuator to relieve air pressure.
3. Notify 1C43 that Service Water has been isolated to the Turbine Building.
4. **WHEN** notified that a Salt Water Pump is running,
   THEN Perform Step AY.

IV. ACTIONS

AS. **(ABO)** LINEUP CHARGING PUMP SUCTION TO THE BORIC ACID STORAGE TANKS

1. Manually open the 11 BAST GRAVITY FD, 1-CVC-509-MOV.
2. Manually open the 12 BAST GRAVITY FD, 1-CVC-508-MOV.
3. Manually shut BA DIRECT M/U, 1-CVC-514-MOV.
4. **GO TO** the VCT Room.
5. Manually shut RWT CHG PP SUCT, 1-CVC-504-MOV.
6. **GO TO** the Charging Pump Room.
7. Manually shut the VCT OUT, 1-CVC-501-MOV.
8. Manually shut CHG DISCH TO SI, 1-CVC-269-MOV.
9. Notify 1C43 that Charging Pump suction is aligned to the Boric Acid Storage Tanks.
10. **GO TO** the 69' Electrical Penetration Room to perform Step BH.

AT. **(RO)** OPEN THE FEEDER BREAKERS FOR 4KV BUS 11

1. Remove the CLOSE Fuses for U-4000-21 SERVICE TRANSF. BKR, 152-1101.
2. Trip U-4000-21 SERVICE TRANSF. BKR, 152-1101.
3. Remove the CLOSE Fuses for U-4000-11 SERVICE TRANSF. BKR, 152-1115.
4. Trip U-4000-11 SERVICE TRANSF. BKR, 152-1115.
5. Notify 1C43 **BOTH** 4KV Bus 11 feeder breakers are open.

IV. ACTIONS

AU. **(RO)** ALIGN 0C DIESEL GENERATOR TO 4KV BUS 11

1. Take local control of 0C DG Output Breaker to 11 4KV bus, 152-1106 by performing the following:

   a. Insert Local/Remote Key into 0C DG Output Breaker handswitch, 1-HS-1106A.

   b. Rotate the key to LOCAL.

   c. Place the Local Control handswitch, 1-HS-1106B, to TRIP.

   d. Verify 0C DG Output Breaker, 152-1106 is open.

WARNING

Improper operation of disconnects can result in serious injury. Keep body and head clear of the operating arc of the disconnect handle. Do NOT release handle prior to full travel. When the disconnect is opened, a very loud bang will be heard, and a switch position flag indication will be visible indicating disconnect position.

2. Close 0C DG to 4KV Bus 11 Disconnect 189-1106 by performing the following:

   a. Insert upper keys
   AND unlock 0C DG to 4KV Bus 11 Disconnect, 189-1106.

   b. Close disconnect 189-1106.

   c. Insert lower key
   AND lock disconnect 189-1106, in the closed position.

3. Notify 1C43 that 0C Diesel Generator Output Breaker to 11 4 KV Bus, 152-1106 is in local and tripped and the 0C DG Disconnect to 4KV bus 11, 189-1106 is closed.

IV. ACTIONS

AV. **(CRO)** COORDINATE WITH UNIT 2 FOR 0C DIESEL GENERATOR LOADING ON 4KV BUS 11

CAUTION

Careful coordination is required between Unit 1 and Unit 2 CRO's to ensure 0C DG loading is performed in a controlled manner. Loading of 11 and 24 4KV Buses (Salt Water and Service Water Pumps) onto the OC Diesel Generator shall NOT be performed at the same time.

CAUTION

After the 0C DG 11 4KV Output Breaker is shut, 11 SW and 11 SRW Pumps should be started prior to Unit 2 shutting 0C DG 24 4KV Output Breaker, unless Unit 2 has already placed 24 4KV Bus on the 0C DG.

CAUTION

The continuous load limit for the 0C DG is 5400 KW. The 2 hour load limit is 5940 KW.

1. Coordinate placing 0C Diesel Generator on 4kV Bus 11 as follows:

   a. Verify the following:

   - 07 4KV Bus Tie Breaker, 152-0701 is closed **PER** Step AI
   - 1A Diesel Generator Output Breaker is open **PER** Step AM
   - 4KV Bus 11 is isolated from the Control Room **PER** Step AO
   - 4KV Bus 11 Feeder Breakers are open **PER** Step AT
   - 0C Diesel Generator is aligned to 4KV Bus 11 **PER** Step AU

   b. Notify Unit 2 (2C43) that Unit 1 will be placing the 0C DG on 11 4KV Bus.

   c. Notify the RO to close 0C DG 11 4KV BUS FDR, 152-1106 **PER** Step AW.

AW. **(RO)** ENERGIZE 11 4KV BUS.

1. **WHEN** notified by 1C43,
   THEN close 0C DG 11 4KV BUS FDR, 152-1106.

2. Notify 1C43 that 0C DG 11 4KV BUS FDR, 152-1106, is closed
   AND 0C Diesel Generator is supplying 4KV Bus 11.

3. Perform Step AX.

IV. ACTIONS

AX. **(RO)** START 11 SERVICE WATER AND 11 SALTWATER PUMPS

1. **WHEN** the 0C D/G is supplying 11 4KV Bus,
   THEN place 11 Service Water Pump Local Control handswitch, 1-HS-1570B, to START.

2. **WHEN** 11 Service Water pump has been running for at least 5 seconds,
   THEN Start 11 Saltwater Pump by placing its Local Control handswitch, 1-HS-5199B, to START.

3. Notify 1C43 11 Service Water and 11 Saltwater Pumps are running
   AND to have 1C43 notify the TBO to monitor SRW HX flow **PER** Step AY.

4. Have 1C43 notify the OSO that SW and SRW Pumps are energized and to monitor the 0C Diesel Generator **PER** Step BG.

5. Perform Step BB.

AY. (**TBO**) MONITOR SRW HX FLOW

1. Periodically monitor SRW HX Flow
   AND flush strainer as needed:

   a. Check in-service HX flow greater than 4,150 GPM.

(continue)

IV. ACTIONS

AY.1 (continued)

b. **IF** HX flow is less than 4,150 GPM,
THEN perform the following:

(1) Place the associated strainer flush valve to NORMAL:

- 11A SRW HX SW STNR FLUSH, 1-HV-5148A
- 11B SRW HX SW STNR FLUSH, 1-HV-5151A
- 12A SRW HX SW STNR FLUSH, 1-HV-5158A
- 12B SRW HX SW STNR FLUSH, 1-HV-5159A

NOTE

1-SW-1623 is located on the north side of the east valve hand transfer stanchion. All other valves are located with their respective CVs.

(2) Shut the associated strainer SV Outlet valve:

- 11A SRW HX SW STNR FLUSHING CV 1-SW-5148A-SV OUTLET VALVE, 1-SW-1623
- 11B SRW HX SW STNR FLUSHING CV 1-SW-5151A-SV OUTLET VALVE, 1-SW-1625
- 12A SRW HX SW STNR FLUSHING CV 1-SW-5158A-SV OUTLET VALVE, 1-SW-1627
- 12B SRW HX SW STNR FLUSHING CV 1-SW-5159A-SV OUTLET VALVE, 1-SW-1629

NOTE

1-SW-1622 is located on the north side of the east valve hand transfer stanchion. All other valves are located with their respective CVs.

(3) Open the associated strainer SV bypass valve:

- 11A SRW HX SW STNR FLUSHING CV 1-SW-5148A-SV BYPASS VALVE, 1-SW-1622
- 11B SRW HX SW STNR FLUSHING CV 1-SW-5151A-SV BYPASS VALVE, 1-SW-1624
- 12A SRW HX SW STNR FLUSHING CV 1-SW-5158A-SV BYPASS VALVE, 1-SW-1626
- 12B SRW HX SW STNR FLUSHING CV 1-SW-5159A-SV BYPASS VALVE, 1-SW-1628

(continue)

IV. ACTIONS

AY.1.b (continued)

(4) **WHEN** flush is complete,
THEN shut the associated strainer SV bypass valve:

- 11A SRW HX SW STNR FLUSHING CV 1-SW-5148A-SV BYPASS VALVE, 1-SW-1622
- 11B SRW HX SW STNR FLUSHING CV 1-SW-5151A-SV BYPASS VALVE, 1-SW-1624
- 12A SRW HX SW STNR FLUSHING CV 1-SW-5158A-SV BYPASS VALVE, 1-SW-1626
- 12B SRW HX SW STNR FLUSHING CV 1-SW-5159A-SV BYPASS VALVE, 1-SW-1628

(5) Open the associated strainer SV Outlet valve:

- 11A SRW HX SW STNR FLUSHING CV 1-SW-5148A-SV OUTLET VALVE, 1-SW-1623
- 11B SRW HX SW STNR FLUSHING CV 1-SW-5151A-SV OUTLET VALVE, 1-SW-1625
- 12A SRW HX SW STNR FLUSHING CV 1-SW-5158A-SV OUTLET VALVE, 1-SW-1627
- 12B SRW HX SW STNR FLUSHING CV 1-SW-5159A-SV OUTLET VALVE, 1-SW-1629

(6) Place the associated strainer flush valve to OVERRIDE TO CLOSE:

- 11A SRW HX SW STNR FLUSH, 1-HV-5148A
- 11B SRW HX SW STNR FLUSH, 1-HV-5151A
- 12A SRW HX SW STNR FLUSH, 1-HV-5158A
- 12B SRW HX SW STNR FLUSH, 1-HV-5159A

AZ. **(OSO)** TAKE LOCAL CONTROL OF 1A DIESEL GENERATOR AND BREAKERS

1. Place 4KV Bus Tie Breaker, 152-1701 in local control as follows:

   a. Insert the Local/Remote Key into 17-11 4KV Bus Tie Breaker LOCAL/REMOTE handswitch 1-HS-152-1701A and unlock it.

   b. Place 17-11 4KV Bus Tie Breaker LOCAL/REMOTE handswitch 1-HS-152-1701A to LOCAL.

(continue)

IV. ACTIONS

AZ. (continued)

2. Place U440-17 4KV Feeder Breaker, 152-1702 in local control as follows:

   a. Insert the Local/Remote key into U440-17 4KV Feeder Breaker LOCAL/REMOTE handswitch 1-HS-152-1702A and unlock it.

   b. Place U440-17 4KV Feeder Breaker LOCAL/REMOTE handswitch 1-HS-152-1702A to LOCAL.

NOTE
The next breaker is a **480V** breaker.

3. Place 17 480V Bus Feeder Breaker, 52-1701 in local control as follows:

   a. Insert a Local/Remote Key into 17 480V Bus Feeder Breaker LOCAL/REMOTE handswitch 1-HS-52-1701A and unlock it.

   b. Place 17 480V Bus Feeder Breaker LOCAL/REMOTE handswitch 1-HS-52-1701A to LOCAL.

4. **GO TO** the back of the 1A DG LOCAL CONTROL PANEL, 1C188-4 (second door from left) and open door.

5. Insert key and unlock the 43/LR switch.

6. Place the 43/LR switch handle in the upper, LOCAL position.

7. Lock 43/LR switch, remove key, and close the door.

8. **IF** 1A Diesel Generator is running,
   THEN:

   a. Simultaneously depress **BOTH** local emergency stop pushbuttons, 1A LOCAL EMER STOP PB, 1-HS-10335
   AND 1-HS-10336.

   b. Reset 1A Diesel Generator by depressing 1A GEN EMER S/D RESET PB, 1-HS-10337.

9. Notify 1C43 that 1A Diesel and Breakers are in local control.

10. **GO TO** the desired Fairbank's Diesel Generator Room to perform Step BA.

IV. ACTIONS

BA. **(OSO)** PLACE FAIRBANKS DIESEL GENERATORS IN LOCAL CONTROL

1. Place the Fairbanks DGs in Local Control in the desired order.

   - Place 2A Diesel Generator in LOCAL Control as follows:
     a. Insert the key in 2A DG CONTR MODE SEL SW, 2-HS-4839.
     b. Rotate the key to unlock 2A DG CONTR MODE SEL SW transfer switch.
     c. Place the 2A DG CONTR MODE SEL SW transfer switch to LOCAL.
   - Place 1B Diesel Generator in LOCAL Control as follows:
     a. Insert the key in 1B DG CONTR MODE SEL SW, 1-HS-4840.
     b. Rotate the key to unlock 1B DG CONTR MODE SEL SW transfer switch.
     c. Place the 1B DG CONTR MODE SEL SW transfer switch to LOCAL.
   - Place 2B Diesel Generator in LOCAL Control as follows:
     a. Insert the key in 2B DG CONTR MODE SEL SW, 2-HS-4841.
     b. Rotate the key to unlock 2B DG CONTR MODE SEL SW transfer switch.
     c. Place the 2B DG CONTR MODE SEL SW transfer switch to LOCAL.

2. Notify **1C43** and **2C43** that 1B, 2A and 2B Diesel Generators are in LOCAL.

3. **GO TO** 0C DG Room to perform Step BG.

BB. **(RO)** START A CHARGING PUMP

1. Ask 1C43 to verify that Charging Pump suction has been lined up to BASTs **PER** Step AS.

CAUTION
13 Charging Pump should only be used if 11 Charging Pump is unavailable.

2. Determine with 1C43 if 11 **OR** 13 Charging Pump is to be started.

(continue)

IV. ACTIONS

BB. (continued)

3. **IF** 11 Charging Pump is **NOT** available for use,
   THEN PROCEED to Step BB.9.

4. Establish 11 Charging Pump power supply:

   a. Strip 480V Load Center 11B **PER** Step BC.

   b. Energize 480V Load Center 11B **PER** Step BD.

5. Charge the Closing Spring for 11 Charging Pump breaker, 52-1115 if necessary.

6. Depress the PUSH TO CLOSE button for 11 Charging Pump breaker, 52-1115.

7. Notify 1C43 that boration is in progress
   AND to note the time that boration was commenced.

8. **IF** 11 Charging Pump is running,
   THEN PROCEED to Step BE.

9. Verify 13 CHG Pp is aligned to 11A 480V Bus.

10. Establish 13 Charging Pump power supply:

    a. Strip 480V Load Center 11A **PER** Step BE.

    b. Energize 480V Load Center 11A **PER** Step BF.

11. Charge the Closing Spring for 13 Charging Pump breaker, 52-1104 if necessary.

12. Depress the PUSH TO CLOSE button for 13 Charging Pump breaker, 52-1104.

13. Notify 1C43 that boration is in progress
    AND to note the time that boration was commenced.

14. **IF** 13 Charging Pump is running,
    THEN PROCEED to Step BC.

IV. ACTIONS

BC. **(RO)** STRIP 480V LOAD CENTER 11B

NOTE
Fuses are located in two different places:

- Inside the cabinet on the end of the Load Center (1B01B)
- Inside the Load Center Relay cabinet (cubicle door with the Bus Potential Light on the front)

WARNING
If available, a Safety Observer should be stationed when working on energized equipment.

1. **REMOVE ALL LABELED** Control Power Fuses from 480V Load Center 11B.

2. Trip **ALL** breakers **EXCEPT THE FOLLOWING**:

   - U-440-11B LOW SIDE BKR.....52-1113
   - 12 CONTAINMENT AIR COOLER.....52-1114

3. Manually charge,
   THEN shut 114 R REACTOR MCC Breaker, 52-1119.

BD. **(RO)** ENERGIZE 480V LOAD CENTER 11B

1. At Breaker 152-1102, Place the local handswitch for U-440-11B Breaker, 1-HS-1102B, to CLOSE.

2. Notify 1C43 that 480V Load Center 11B is energized.

3. **IF** starting 11 Charging Pump,
   THEN PROCEED to Step BB.5.

4. **IF** 13 Charging Pump is running,
   THEN PROCEED to Step BO.

IV. ACTIONS

BE. **(RO)** STRIP 480V LOAD CENTER 11A

NOTE
Fuses are located in two different places:

- Inside the cabinet on the end of the Load Center (1B01A)
- Inside the Load Center Relay cabinet (cubicle door with the Bus Potential Light on the front).

WARNING
If available, a Safety Observer should be stationed when working on energized equipment.

1. **REMOVE ALL LABELED** Breaker Control Power Fuses.

2. Trip **ALL** breakers **EXCEPT THE FOLLOWING**:

   - U-440-11A LOW SIDE BRK. 52-1112
   - 11 CONTAINMENT AIR COOLER 52-1102

IV. ACTIONS

BF. **(RO)** ENERGIZE 480V LOAD CENTER 11A

1. Manually close the Supply Breaker, U-440-11A SERVICE TRANSF, 152-1114:

   a. Charge the Closing Spring for U-440-11A SERVICE TRANSF, 152-1114, if necessary.

      (1) Insert the Maintenance Handle into the Manual Charging opening.

      (2) Position the Maintenance Handle hooked section around the end of the pawl carrier.

NOTE

Between each stroke maintain a slight upward pressure so that the handle does **NOT** slip off the pawl carrier.

      (3) Pump the Maintenance Handle until pressure is **NOT** felt when stroking the maintenance handle upward. (Approximately 7-10 strokes)

      - The Spring indicator should indicate "SPRINGS CHARGED".

   b. Manually close the Breaker by pushing upward on the Manual Close Lever.

2. Notify 1C43 that 480V Load Center 11A is energized.

3. **IF** starting 13 Charging Pump,
   THEN PROCEED to Step BB.11.

4. **IF** 11 Charging Pump is running,
   THEN PROCEED to Step BO.

BG. **(OSO)** MONITOR 0C DIESEL GENERATOR

1. Coordinate with **1C43** and **2C43** to ensure the continuous load limit of 5400 KW and the 2 hour load limit of 5940 KW is **NOT** exceeded on the 0C Diesel Generator.

(continue)

IV. ACTIONS

BG. (continued)

2. Monitor the 0C Diesel Generator as follows:

   a. Verify 0C Diesel radiator fans are running:

   - 0C1 Radiator Fan 11
   - 0C1 Radiator Fan 12
   - 0C1 Radiator Fan 13
   - 0C2 Radiator Fan 11
   - 0C2 Radiator Fan 12
   - 0C2 Radiator Fan 13

NOTE
The 0C Diesel Generator Building Ventilation Fans are temperature controlled and automatically operate above the listed temperature.

   b. Verify the following 0C Diesel Generator Building Ventilation is running:

   - 0C Battery Room Fan F-5
   - 0C Basement & Tank Room Exhaust Fan F-6
   - 0C DG Room Exhaust Fan F-1 (75° F start)
   - 0C DG Room Exhaust Fan F-2 (85° F start)
   - 0C DG Room Exhaust Fan F-3 (95° F start)
   - 0C DG Room Exhaust Fan F-4 (105° F start)

(continue)

IV. ACTIONS

BG.2 (continued)

c. **IF** the 0C Diesel Generator was pneumatically prelubed,
THEN perform the following:

(1) Adjust 0C PNEUMATIC PRELUBE PUMP AIR REGULATOR, 0-DLO-10180-PCV, to approximately zero PSIG on 0C PNEUMATIC PRELUBE PUMP AIR SUPPLY REGULATOR OUTLET PI, 0-PI-10180.

(2) Shut the 0C Pneumatic Prelube Pump Air Bottle outlet valve (35' elevation).

(3) Shut the following valves:

- 0C1 PNEUMATIC PRELUBE PUMP SUCTION VALVE, 0C1-DLO-2 (at 0C1 pneumatic prelube pump).
- 0C2 PNEUMATIC PRELUBE PUMP SUCTION VALVE, 0C2-DLO-2 (at 0C2 pneumatic prelube pump).
- 0C1 PNEUMATIC PRELUBE PUMP DISCHARGE VALVE, 0C1-DLO-14 (under 0C1 Aux Desk).
- 0C2 PNEUMATIC PRELUBE PUMP DISCHARGE VALVE, 0C2-DLO-14 (under 0C2 Aux Desk).

d. Monitor 0C Fuel Oil Day Tank Level and transfer fuel oil **PER** OI-21C, 0C DIESEL GENERATOR, as necessary.

e. Periodically monitor 0C Diesel performance.

3. **WHEN U-1** and **U-2** have reported that both their respective SW and SRW Pumps are running,
THEN report total KW load to **1C43** and **2C43**.

4. **GO TO** the Fire Pump House to perform Step CA.

BH. **(ABO)** ISOLATE CHANNEL D WRNI FROM THE CONTROL ROOM.

1. Open OPT. ISOL, 1-NX-004D1.

2. Place 1-HS-004D1 in OFF.

3. Notify 1C43 that Channel D WRNI has been isolated from the Control Room.

4. Perform Step BI.

IV. ACTIONS

BI. **(ABO)** START 11 SALTWATER AIR COMPRESSOR

1. Contact 1C43 to verify Load Center 11B is energized **PER** Step BD,
   THEN On the North end of MCC 114R, Insert the key into 11 Saltwater Air Compressor Local/Remote Handswitch, 1-HS-5204A1.
2. Place 11 Saltwater Air Compressor Local/Remote Handswitch to LOCAL.
3. Place 11 Saltwater Air Compressor Local Control Handswitch, 1-HS-5204A to START.
4. Notify 1C43 that 11 Saltwater Air Compressor is operating.
5. Perform Step BJ.

BJ. **(ABO)** ISOLATE FIRE EFFECTS FOR 11 CAVITY COOLING FAN DAMPER

NOTE

11 Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A is located on breaker 52-11454.

1. Insert Key into 11 Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A.
2. Place 11 Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A, to CR ISOL.
3. Notify the RO 11 Cavity Cooling Fan is available to start **PER** Step BT.
4. **GO TO** 69' Unit 1 Fan Room to perform Step BK.

BK. **(ABO)** RESTORE SWITCHGEAR ROOM VENTILATION

1. Place 11 Switchgear Room Vent Fan handswitch, 1-HS-5426, to START.
2. Notify 1C43 that 11 Switchgear HVAC Fan has been started.
3. **GO TO** 45' West Penetration Room to perform Step BL.

IV. ACTIONS

BL. **(ABO)** START 11 AND 12 CONTAINMENT AIR COOLERS

1. START 12 Containment Air Cooler in HIGH speed:
   a. Place a Local/Remote Key into 12 Containment Air Cooler Load Contactor Panel handswitch, 1-HS-5300A1, and unlock the handswitch.
   b. Rotate the handswitch to LOCAL.
   c. Place 12 Containment Air Cooler Local Handswitch, 1-HS-5300A, to HIGH.
   d. **GO TO** the 45' East Electrical Penetration Room.
2. START 11 Containment Air Cooler in HIGH speed:
   a. Place a Local/Remote Key into 11 Containment Air Cooler Load Contactor Panel handswitch, 1-HS-5299A1, and unlock the handswitch.
   b. Rotate the handswitch to LOCAL.
   c. Place 11 Containment Air Cooler Local Handswitch, 1-HS-5299A, to HIGH.
3. Notify 1C43 that 11 and 12 Containment Air Coolers are in high speed.
4. **GO TO** the 5' Fan Room to perform Step BM.

BM. **(ABO)** START 11 AFW PUMP ROOM EMERGENCY VENTILATION FAN

1. Inform Radiation Safety Supervision of the starting of AFW Pump Room Emergency Ventilation Fan.
2. **WHEN** informed by 1C43 that Load Center 11B is energized **PER** Step BD, **THEN** Remove the Emergency Air Inlet Damper Cover, 1-HVAC-345.
3. Start 11 AFW Emergency Vent Fan using 1-HS-5470.
4. Notify 1C43 11 AFW Pump Room Emergency Ventilation Fan has been started.
5. **GO TO** the 5' Hot Machine Shop to perform Step BN.

IV. ACTIONS

BN. **(ABO)** DE-ENERGIZE UNIT 1 5' FAN ROOM LIGHTING

NOTE

Lighting Panel 1L06, located on the East wall of the Hot Machine Shop in the 5' Aux Bldg.

1. **GO TO** 1L06.
2. Place Breakers 19, 21 and 23 in OFF.
3. **GO TO** the 45' Electrical Penetration Room to perform Step BQ.

BO. **(RO)** ENERGIZE PRESSURIZER HEATER MCC 109PH

1. Manually close 109 PH PRESS HTR MCC Breaker, 52-1127:
   a. If necessary, charge the Closing Spring for 109 PH PRESS HTR MCC Breaker, 52-1127.
   b. Depress the PUSH TO CLOSE button to energize MCC 109PH
2. Notify 1C43 that power is available to Pressurizer Backup Heater Bank 11 and to perform Step BP.

IV. ACTIONS

BP. **(CRO)** ENERGIZE PRESSURIZER BACKUP HEATER BANK 11

CAUTION

The Pressurizer Heater Low Level cutout at 101" is inoperable when Heaters are operated at 1C43.

1. **WHEN** notified power is restored to Pressurizer Backup Heater Bank 1
   AND RCS Pressure is less than 1900 psia,
   THEN operate Pressurizer Backup Heater Bank 1 as follows:

   a. Ensure Pressurizer level is greater than 101".

   b. Rotate the key for 11 BACKUP HTR TRANSFER CONTR, 1-HS-100-4A to ON.

   c. Cycle Pressurizer Backup Heater Bank 11 within the following limits:

      - Maintain RCS pressure within the limits of ATTACHMENT (1), RCS PRESSURE TEMPERATURE LIMITS
      - Do **NOT** exceed 1900 PSIA.
      - Maintain RCS subcooling at least 30° F.

BQ. **(ABO)** OPEN MCC 104R FEEDER BREAKER

1. Open MCC 104R Feeder Breaker, 52-10401.
2. Notify 1C43 that MCC 104R Feeder Breaker has been opened.
3. **GO TO** the 27' East Penetration Room to perform Step BS.

IV. ACTIONS

BR. **(CRO)** BORATE THE RCS

1. Obtain the last RCS Boron and BAST Concentration sample results.

CAUTION

To prevent air binding the Charging Pumps, do NOT exceed Maximum Charging Time for the available BAST levels.

2. Based on initial RCS Boron, determine Charging Time Required for Boration **PER** ATTACHMENT (2), CHARGING TIME REQUIRED FOR BORATION:

   - **IF** the average BAST Concentration is 7.25% or greater,
     THEN use the BAST 7.25% graph for the number of Charging Pumps operating.

   - **IF** the average BAST Concentration is less than 7.25%,
     THEN use the BAST 6.25% graph for the number of Charging Pumps operating.

3. **IF** Pressurizer level is nearing 250 inches,
   THEN reduce RCS temperature, as necessary to continue boration.

   a. Slowly raise steam flow through the ADVs.

   b. Control cooldown so that the capacity of 11(13) Charging Pump is **NOT** exceeded.

   c. Maintain RCS cooldown less than 100° F in any one hour.

   d. Maintain RCS subcooling between 30° F and 140° F.

   e. **IF** required,
      THEN have the RO operate 11(13) Charging Pump to maintain Pressurizer level near 250 inches.

4. **WHEN** the Charging Time To Reach 2300 ppm,
   OR the Maximum Charging Time has been achieved,
   THEN perform the following actions:

   a. Secure the RCS cooldown, if in progress.

   b. Have the RO operate 11(13) Charging Pump to maintain Pressurizer level near 160 inches.

   c. Notify the ABO to shift Charging Pump suction to the RWT **PER** Step CG.

IV. ACTIONS

BS. **(ABO)** ESTABLISH SERVICE WATER FLOW TO 11 CONTAINMENT AIR COOLER

1. Shut 1-IA-1207 to isolate Instrument Air to 11 Containment Air Cooler Normal Inlet Control Valve, 1-SRW-1581-CV.
2. Disconnect the air fitting between the solenoid and the valve operator and bleed the air off.
3. Shut 1-IA 917 to isolate Instrument Air to 11 Containment Air Cooler Emergency Outlet Valve, 1-SRW-1582-CV.
4. Disconnect the air fitting between the solenoid and the valve operator and bleed the air off.
5. **GO TO** the 5' West Penetration Room to perform Step BY.

BT. **(RO)** START 11 CAVITY COOLING FAN

1. If necessary, charge the Closing Spring for 11 Cavity Cooling Fan breaker 52-1101.
2. **WHEN** notified by the ABO to start 11 Cavity Cooling Fan,
   THEN depress the PUSH TO CLOSE button on breaker 52-1101.
3. Notify 1C43 that 11 Cavity Cooling Fan has been started.

BU. **(RO)** DE-ENERGIZE 4KV BUS 12

1. Open the Feeder Breakers for 4KV Bus 12:
   a. Remove the CLOSE Fuses for SERVICE TRANSF. U-4000-11, Breaker 152-1201.
   b. Depress the TRIP pushbutton for breaker 152-1201.
   c. Remove the CLOSE Fuses for SERVICE TRANSF. U-4000-21, Breaker 152-1209.
   d. Depress the TRIP pushbutton for breaker 152-1209.
2. Notify 1C43 that 4KV Bus 12 has been de-energized.

IV. ACTIONS

BV. **(CRO)** DE-ENERGIZE 4KV BUS 13

1. Open the Feeder Breakers for 4KV Bus 13:
   a. Remove the CLOSE Fuses for SERVICE TRANSF. U-4000-21, Breaker 152-1301.
   b. Depress the TRIP pushbutton for breaker 152-1301.
   c. Remove the CLOSE Fuses for SERVICE TRANSF. U-4000-11, Breaker 152-1311.
   d. Depress the TRIP pushbutton for breaker 152-1311.

BW. **(TBO)** ENERGIZE 1Y09 AND TIE 1Y10 TO 1Y09

1. Tie 1Y10 to 1Y09
   a. On 1Y09, ensure INSTR. TRANSF. 11 1X08 MAIN FEEDER BREAKER, in ON.
   b. On 1Y10, Place INSTRUMENT TRANSF-12 1X09 1Y10 MAIN FEEDER BREAKER, to OFF.
   c. On 1Y10, Place BUS TIE 208/120V BUS 11, to ON.
   d. Place 1Y09-1Y10 Bus Tie Switch 1SY09, located between 1Y09 and 1Y10 to ON.
2. Notify 1C43 that 1Y09 is energized and 1Y10 is tied to 1Y09.
3. **GO TO** the Main Generator Hydrogen Charging Station to perform Step CB.

IV. ACTIONS

BX. **(CRO)** DE-ENERGIZE 4KV BUS 14

1. Open the Feeder Breakers for 4KV Bus 14:
   a. Remove the CLOSE Fuses for SERVICE TRANSF. U-4000-11, Breaker 152-1401.
   b. Depress the TRIP pushbutton for breaker 152-1401.
   c. Remove the CLOSE Fuses for SERVICE TRANSF. U-4000-21, Breaker 152-1414.
   d. Depress the TRIP pushbutton for breaker 152-1414.

BY. **(ABO)** ESTABLISH SERVICE WATER FLOW TO 12 CONTAINMENT AIR COOLER

1. Shut 1-IA-882 to isolate Instrument Air to 12 Containment Air Cooler Normal Inlet Control Valve, 1-SRW-1584-CV.
2. Disconnect the air fitting between the the solenoid and the valve operator and bleed the air off.
3. **GO TO** the Unit 1 27' West Piping Penetration Room.
4. Shut 1-IA-892 to isolate Instrument Air to 12 Containment Air Cooler Emergency Outlet Control Valve, 1-SRW-1585-CV.
5. Disconnect the air fitting between the the solenoid and the valve operator and bleed the air off.
6. Notify 1C43 that Service Water has been established to 11 and 12 Containment Air Coolers.
7. **GO TO** the 5' Component Cooling Room to perform Step CE.

IV. ACTIONS

BZ. **(RO)** PLACE 11 AND 14 BATTERY CHARGERS IN SERVICE

1. **IF** necessary,
   THEN charge the Closing Spring for breaker 52-1111.

2. Place 11 Battery Charger in service by depressing the PUSH TO CLOSE button.

3. **IF** necessary,
   THEN charge the Closing Spring for breaker 52-1120.

4. Place 14 Battery Charger in service by depressing the PUSH TO CLOSE button.

5. Notify 1C43 that 11 and 14 Battery Chargers are in service.

CA. **(OSO)** START 12 WELL WATER PUMP

1. **WHEN** notified by 2C43 to START 12 Well Water Pump,
   THEN place 12 Well Water Pump handswitch, 0-HS-5565 to START.

2. Notify 2C43 that 12 Well Water Pump has been started.

3. Perform Step CD.

IV. ACTIONS

CB. **(TBO)** VENT THE MAIN GENERATOR TO 2 PSIG

1. Ensure Two-Position Valve CO_2 Charge Generator Bottom Vent, 1-G-01, is in the ALIGN CO_2 TO GENERATOR Position.

2. Open Generator Top and H_2 Supply Vent, 1-G-02.

3. Throttle open Generator Vent Line Isolation Valve, 1-G-03.

NOTE

After the Main Generator vent has been established, it is permissible to continue with the next block function.

4. Notify 1C43 that venting of the Main Generator is in progress.

5. **WHEN** Main Generator hydrogen pressure is vented to 2 PSIG,
   THEN shut Generator Vent Line Isolation Valve, 1-G-03.

6. **GO TO** the U-1 Main Condenser Pit near the SGFP Seal Water Booster Pumps to perform Step CC.

IV. ACTIONS

CC. **(TBO)** ISOLATE DI WATER AND CONDENSATE MAKEUP TO THE SERVICE WATER AND COMPONENT COOLING HEAD TANKS

NOTE
1-CD-429 is located above the SGFP Seal Water Booster Pumps.

1. Shut the Combined Supply to SRW and Component Cooling Head Tanks, 1-CD-429.

NOTE
0-DW-248 is located outside the AFW Pump Room on the South side.

2. Shut the Quench Tank, Component Cooling, and Service Water Head Tank Isolation, 0-DW-248.

NOTE
1-CD-457 is located Southwest of the 12' Sample Sink in corner.

3. Connect a fire hose from Hose Station HS-12-16 to Condensate System Fire Hose Connection Isolation, 1-CD-457.

4. Open Condensate System Fire Hose Connection Isolation, 1-CD-457.

5. Open the Hose Station HS-12-16 Isolation Valve.

6. Notify 1C43 that Fire System Water is available to fill the Service Water and Component Cooling Head Tanks.

7. Have 1C43 notify the ABO to restore makeup to the Service Water and Component Cooling Head Tanks **PER** Step CF.

8. Report to 1C43 to provide additional assistance where needed (e.g., help ABO in Containment).

IV. ACTIONS

CD. **(OSO)** MONITOR DIESEL FIRE PUMP FUEL OIL DAY TANK LEVEL

1. **IF** the Diesel Fire Pump Fuel Oil Day Tank level is approaching 2 feet,
   THEN fill the Day Tank:

   a. Check open **ONE** of the following:

      - 11 FOST to the Auxiliary Boilers, 0-DFO-102
      - 21 FOST to the Auxiliary Boilers, 0-DFO-108

   b. Check open the Unloading Pump Suction, 0-DFO-116.

   c. Open the Fire Pump Fuel Oil Day Tank Fill valve, 0-DFO-132. | 1400

   d. **WHEN** the desired level is reached,
      THEN shut the Fire Pump Fuel Oil Day Tank Fill valve, 0-DFO-132.

2. Monitor CST inventory **PER** Step CT. | 1400

IV. ACTIONS

CE. **(ABO)** ESTABLISH SALTWATER LINEUP FOR COMPONENT COOLING HEAT EXCHANGERS

NOTE

This step can be interrupted to perform other more urgent tasks as the procedure warrents. This is due to the time required to set up ladders to reach some of the regulators for 12 CC HX.

1. Perform the following for the below listed valves for 11 Component Cooling Heat Exchanger:

   a. Back off the air regulators.

   b. Disconnect the air line between the regulator and the actuator.

      - 11 CC HX Saltwater Inlet, 1-SW-5160-CV
      - 11 CC HX Saltwater Outlet, 1-SW-5206-CV

2. Notify 1C43 that 11 Component Cooling Heat Exchanger Saltwater Valves are open.

3. Perform the following for the below listed valves for 12 Component Cooling Heat Exchanger:

   a. Back off the air regulators.

   b. Disconnect the air line between the regulator and the actuator.

      - 12 CC HX Emergency Saltwater Outlet, 1-SW-5165-CV
      - 12 CC HX Emergency Saltwater Outlet, 1-SW-5166-CV
      - 12 CC HX Saltwater Inlet, 1-SW-5162-CV
      - 12 CC HX Saltwater Outlet, 1-SW-5163-CV
      - 12 CC HX Saltwater Outlet, 1-SRW-5208-CV

4. Notify 1C43 that 12 Component Cooling Heat Exchanger Saltwater Valves are open.

5. **GO TO** the 69' by the Component Cooling Head Tank to perform Step CF.

IV. ACTIONS

CF. **(ABO)** RESTORE MAKEUP TO THE SERVICE WATER AND COMPONENT COOLING HEAD TANKS

1. **WHEN** notified that makeup has been restored to fill the Service Water and Component Cooling Head Tanks,
   THEN:

   - Open Component Cooling Head Tank Condensate Supply, 1-CD-145.
   - Open SRW Head Tank Condensate Supply, 1-CD-144.

2. Operate, as necessary, to maintain level indication for the Component Cooling and Service Water Head Tanks:

   a. Component Cooling Head Tank:

      (1) Open Component Cooling Head Tank Makeup Bypass, 1-CC-108

      (2) Shut 1-CC-3820-CV Inlet Isol, 1-CC-107

   b. 11 Service Water Head Tank:

      (1) Open 11 Service Water Head Tank Makeup Bypass, 1-SRW-106

      (2) Shut 11 Service Water Head Tank LCV Inlet Isol, 1-SRW-104

   c. 12 Service Water Head Tank:

      (1) Open 12 Service Water Head Tank Makeup Bypass, 1-SRW-114

      (2) Shut 12 Service Water Head Tank LCV Inlet Isol, 1-SRW-112

3. Periodically monitor Component Cooling and Service Water Head Tanks levels and fill as necessary.

IV. ACTIONS

CG. **(ABO)** SHIFT CHARGING PUMP SUCTION TO THE RWT

1. **WHEN** notified to shift Charging Pump Suction to the RWT,
   THEN:

   a. Manually open the RWT CHG PP SUCT, 1-CVC-504-MOV.

   b. Manually shut the 11 BAST GRAVITY FD, 1-CVC-509-MOV.

   c. Manually shut the 12 BAST GRAVITY FD, 1-CVC-508-MOV.

2. Notify 1C43 that Charging Pump suction has been shifted to the RWT.

3. Prepare for Containment entry.

4. **GO TO** the 69' SFP Exhaust Fan Room Lantern Locker and obtain the following equipment that is stored there for Containment entry:

   - Portable Handlanterns
   - Portable Air Bottle
   - Air Regulator
   - Air jumper to operate the Aux Spray Control Valve, 1-CVC-517-CV.

5. Notify 1C43 to have the TBO assist with evolutions in the Containment.

CH. **(CRO)** COMMENCE RCS COOLDOWN

1. **WHEN** at least one hour has elapsed after completing RCS boration,
   THEN slowly raise steam flow through the ADVs.

2. Control the cooldown so that the capacity of 11 (13) Charging Pump is **NOT** exceeded.

3. Do **NOT** exceed an RCS cooldown rate of 100° F per hour.

4. Maintain RCS pressure and temperature within the limits of ATTACHMENT (1), RCS PRESSURE TEMPERATURE LIMITS.

5. Have the RO operate 11 (13) Charging Pump to maintain Pressurizer level near 160 inches indicated.

6. Maintain RCS subcooling between 30° F and 140° F.

IV. ACTIONS

CI. **(CRO)** PREPARE TO DEPRESSURIZE THE RCS

1. If necessary, place 11 BACK UP HTR TRANSFER CONTR, 1-HS-100-4A keyswitch to OFF.
2. Notify the ABO to install the Portable Air Supply to the Aux Spray Control Valve, 1-CVC-517, **PER** Step CJ.
3. **WHEN** 1-CVC-517-CV is open,
   THEN notify the ABO to commence depressurization using Aux Spray **PER** Step CK.

CJ. **(ABO)** INSTALL PORTABLE AIR SUPPLY TO AUX SPRAY CONTROL VALVE

1. **WHEN** notified to install the Portable Air Bottle,
   THEN go to the 45' West side of the Containment to 1-CVC-517-CV.
2. Shut Instrument Air to Aux Spray Control Valve, 1-IA-451.
3. Disconnect the air line at the fitting closest to the valve actuator (i.e., downstream of the solenoid valve underneath the valve actuator).
4. Connect the Portable Air Supply Bottle to the valve actuator.
5. Very slowly open the regulator valve.
6. Notify 1C43 when 1-CVC-517-CV is open.

CK. **(ABO)** OPERATE AUX SPRAY CONTROL VALVE

1. **WHEN** notified by 1C43 that Aux Spray operation is desired,
   THEN:
   - Shut 12B Loop Charging Isolation, 1-CVC-395.
   - Shut 11A Loop Charging Isolation, 1-CVC-392.
2. Notify 1C43 that Aux Spray has been initiated.
3. Be prepared to secure air to the Aux Spray Control Valve.

IV. ACTIONS

CL. **(CRO)** DEPRESSURIZE THE RCS

1. Depressurize the RCS until one of the following criteria are met:

WARNING

Consider Breathing Air reserve, high ambient temperature and other environmental factors when determining stay times.

- The ABO is nearing the maximum stay time.
- RCS subcooling has been reduced to 30° F.
- Pressurizer level is nearing 250 inches and increasing. **IF** Pressurizer level is rapidly approaching 250 inches,
  THEN notify the RO to trip 11 (13) Charging Pump.

2. Notify the ABO to secure air to the Aux Spray Control Valve **PER** Step CM.

CAUTION

The Pressurizer Heater Low Level cutout at 101" is inoperable when Heaters are operated at 1C43.

3. If necessary, use Pressurizer Backup Heater Bank 11 to maintain 30° F subcooling:
   a. Ensure Pressurizer level is greater than 101".
   b. Cycle Pressurizer Backup Heater Bank 11 as necessary to maintain 30° F subcooling.
4. **IF** 11 (13) Charging Pump was tripped due to Pressurizer level
   AND Pressurizer level permits restoration of charging,
   THEN have the RO START 11 (13) Charging Pump.
5. Continue the cooldown until RCS subcooling is 140° F.
6. Have the RO operate 11 (13) Charging Pump to maintain Pressurizer level near 160 inches indicated.

(continue)

IV. ACTIONS

CL. (continued)

CAUTION
Do NOT exceed an RCS cooldown rate of 100° F per hour.

7. Control the cooldown so that the capacity of 11 (13) Charging Pump is **NOT** exceeded.

8. Maintain RCS pressure and temperature within the limits of ATTACHMENT (1), RCS PRESSURE TEMPERATURE LIMITS.

CM. **(ABO)** SECURE AUX SPRAY

NOTE
It may be desired to have Charging flow realigned through the Loop Charging Isolations, since 11A Charging CV Bypass, 1-CVC-188 may **NOT** be able to pass sufficient flow, causing the Charging Pump discharge Relief Valve to open.

1. **WHEN** notified that Aux Spray operation is no longer needed,
   AND IF directed by 1C43,
   THEN open the following valves:

   - 12B Charging Line Isolation, 1-CVC-395
   - 11A Charging Line Isolation, 1-CVC-392

2. **WHEN** notified by the CRO to secure Aux Spray,
   THEN shut the Portable Air Bottle Regulator valve.

3. Disconnect the Portable Air Bottle to bleed air.

4. Notify 1C43 that Aux Spray has been secured.

NOTE
The portable air bottle, regulator and jumper should be left in the vicinity of Aux Spray Control Valve.

5. Exit the Containment.

IV. ACTIONS

CN. **(CRO)** SECURE RCS COOLDOWN AND PREPARE TO DEPRESSURIZE THE RCS

1. **WHEN** RCS subcooling approaches 140° F,
   THEN secure the cooldown
   AND notify the ABO to go to Containment and initiate Aux Spray **PER** Step CO.

2. If necessary, place Pressurizer Backup Heater Bank 11 keyswitch to OFF.

CO. **(ABO)** INITIATE AUX SPRAY

1. **WHEN** notified by the CRO to initiate Aux Spray,
   THEN enter Unit 1 Containment.

2. Connect the Portable Air Bottle to 1-CVC-517-CV, valve actuator.

3. Very slowly open the Regulator valve.

4. **WHEN** notified by 1C43 that Aux Spray is desired,
   THEN verify shut the following valves:

   - 12B Charging Line Isolation, 1-CVC-395
   - 11A Charging Line Isolation, 1-CVC-392

NOTE

The portable air bottle, regulator and jumper should be left in the vicinity of Aux Spray Control Valve, 1-CVC-517-CV.

5. Notify 1C43 that Aux Spray has been initiated.

6. Be prepared to secure air to the Aux Spray Control Valve.

IV. ACTIONS

CP. **(CRO)** DEPRESSURIZE THE RCS

1. Depressurize the RCS until one of the following criteria are met:

WARNING

Consider Breathing Air reserve, high ambient temperature and other environmental factors when determining stay times.

- The ABO is nearing the maximum stay time.
- RCS subcooling has been reduced to 30° F.
- Pressurizer level is nearing 250 inches and increasing. **IF** Pressurizer level is rapidly approaching 250 inches,
  THEN notify the RO to trip 11 (13) Charging Pump.

2. Notify the ABO to secure air to the Aux Spray Control Valve **PER** Step CQ.

CAUTION

The Pressurizer Heater Low Level cutout at 101" is inoperable when Heaters are operated at 1C43.

3. If necessary, use Pressurizer Backup Heater Bank 11 to maintain 30° F subcooling:

   a. Ensure Pressurizer level is greater than 101".

   b. Cycle Pressurizer Backup Heater Bank 11 as necessary to maintain 30° F subcooling.

4. **IF** 11 (13) Charging Pump was tripped due to Pressurizer level
   AND Pressurizer level permits restoration of charging,
   THEN have the RO START 11 (13) Charging Pump.

5. Continue the cooldown until RCS subcooling is 140° F.

6. Have the RO operate 11 (13) Charging Pump to maintain Pressurizer level near 160 inches indicated.

CAUTION

Do NOT exceed an RCS cooldown rate of 100° F per hour.

7. Control the cooldown so that the capacity of 11 (13) Charging Pump is **NOT** exceeded.

(continue)

IV. ACTIONS

CP. (continued)

8. Maintain RCS pressure and temperature within the limits of ATTACHMENT (1), RCS PRESSURE TEMPERATURE LIMITS.

CQ. **(ABO)** SECURE AUX SPRAY

NOTE

It may be desired to have Charging flow realigned through the Loop Charging Isolations, since 11A Charging CV Bypass, 1-CVC-188 may **NOT** be able to pass sufficient flow, causing the Charging Pump discharge Relief Valve to open.

1. **WHEN** notified that Aux Spray operation is no longer needed,
   AND IF directed by 1C43,
   THEN open the following valves:

   - 12B Charging Line Isolation, 1-CVC-395
   - 11A Charging Line Isolation, 1-CVC-392

2. **WHEN** notified by the CRO to secure Aux Spray,
   THEN shut the Portable Air Bottle Regulator valve.

3. Disconnect the Portable Air Bottle to bleed air.

4. Notify 1C43 that Aux Spray is secured.

5. Exit the Containment.

CR. **(CRO)** COOLDOWN AND DEPRESSURIZE THE RCS

1. Repeat Steps CN through CQ, as necessary, to achieve an RCS pressure of 240 to 260 psia and maintaining RCS subcooling between 30° F and 140° F.

2. **WHEN** RCS pressure is between 250 and 300 psia,
   THEN notify the ABO to shut the Safety Injection Tank Outlet Valves and open SDC HDR RETURN ISOL, 1-SI-652-MOV **PER** Step CS.

IV. ACTIONS

CS. **(ABO)** SHUT THE SAFETY INJECTION TANK OUTLET VALVES AND OPEN THE SHUTDOWN COOLING HEADER RETURN ISOLATION

1. **WHEN** notified to shut the Safety Injection Tank Outlet Valves, **THEN** shut the following valves:
   - 11A SIT OUT valve, 1-SI-614-MOV
   - 11B SIT OUT valve, 1-SI-624-MOV
   - 12A SIT OUT valve, 1-SI-634-MOV
   - 12B SIT OUT valve, 1-SI-644-MOV
2. **GO TO** 12B Reactor Coolant Pump Bay.
3. Manually open the SDC HDR RETURN ISOL, 1-SI-652-MOV.
4. Exit the Containment.
5. Notify 1C43 of the following:
   - Safety Injection Tank Outlet Valves are shut
   - SDC HDR RETURN ISOL, 1-SI-652-MOV is open.

CT. **(OSO)** MONITOR CST INVENTORY

NOTE

CST level may be monitored at 1C43, 2C43 **OR** at 1-LI-5609, 2-LI-5609, located on the AFW suction line in the Unit 1 27' Containment Purge Air Supply Room. 1400

1. Periodically monitor 12 CST level.

(continue)

IV. ACTIONS

CT. (continued)

2. **IF** 12 CST level approaches 5 feet, notify 1C43 and 2C43 of the low level, **THEN**:

   a. Align 11 CST to provide a source of water to the Unit 1 AFW Pumps:

      (1) Open 11 CST AFW Pump Suction, 1-AFW-131.

      (2) Open 11 CST AFW Pump Suction, 1-AFW-167.

      (3) Shut 12 CST Unit 1 AFW Pump Suction Valve, 1-AFW-161.

NOTE

CST level may be monitored at 1-LI-5609, located on the AFW suction line in the Unit 1 27' Containment Purge Air Supply Room.

   b. Periodically monitor 11 CST level.

   c. Align 21 CST to provide a source of water to the Unit 2 AFW Pumps:

      (1) Open 21 CST AFW Pump Suction, 2-AFW-131.

      (2) Open 21 CST AFW Pump Suction, 2-AFW-167.

      (3) Shut 12 CST Unit 2 AFW Pump Suction Valve, 2-AFW-161.

NOTE

CST level may be monitored at 2-LI-5609, located on the AFW suction line in the Unit 1 27' Containment Purge Air Supply Room.

   d. Periodically monitor 21 CST level.

(continue)

IV. ACTIONS

CT. (continued)

CAUTION

The use of Fire System water (pre-treated water) is considered drastic action and should only be used under extreme circumstances.

3. **IF** CST inventory is nearing depletion, notify 1C43(2C43) of the intended use of Fire System water,
   THEN:

   a. Emergency fill 11 CST from the Fire System:

      (1) Connect a fire hose between the Fire Pump House Hose Test Manifold and 11 CST Emergency Hose Connection Valve, 1-CD-312.

      (2) Shut the Test Discharge Header Drain, 0-FP-277.

      (3) Open the Test Discharge Header Isolation Valve, 0-FP-246.

      (4) Open 11 CST Emergency Hose Connection Valve, 1-CD-312.

      (5) Open the manifold isolation valve that the fire hose is connected to.

      (6) Ensure 11 CST level is increasing.

   b. Emergency fill 21 CST from the Fire System:

      (1) Connect a fire hose between the Fire Pump House Hose Test Manifold and 21 CST Emergency Hose Connection Valve, 2-CD-312.

      (2) Shut the Test Discharge Header Drain, 0-FP-277.

      (3) Open the Test Discharge Header Isolation Valve, 0-FP-246.

      (4) Open 21 CST Emergency Hose Connection Valve, 2-CD-312.

      (5) Open the manifold isolation valve that the fire hose is connected to.

      (6) Ensure 21 CST level is increasing.

IV. ACTIONS

CU. **(ABO)** ISOLATE COMPONENT COOLING TO CONTAINMENT

1. **GO TO** the 45' Aux. Bldg. South of the RCW Evap Room.
2. Shut RCW EVAPs COMM HDR SUPP ISOL., 1-CC-457.
3. **GO TO** the 5' East Pen Room.
4. Shut Component Cooling Isolation to Containment, 1-CC-284.
5. Notify 1C43 Component Cooling is isolated to the Containment.
6. **GO TO** the Component Cooling Room.

CV. **(ABO)** OPEN COMPONENT COOLING HEAT EXCHANGER ISOLATION CONTROL VALVES

1. Perform the following to open CC HX CV's:
   - 1-CC-3824-CV
     a. Shut Instrument Air to 1-CC-3824-CV, 1-IA-703
     b. Disconnect the Instrument Air line closest to the actuator to bleed off air pressure.
   - 1-CC-3826-CV
     a. Shut Instrument Air to 1-CC-3826-CV, 1-IA-702
     b. Disconnect the Instrument Air line closest to the actuator to bleed off air pressure.
2. Notify 1C43 that the Component Cooling Heat Exchanger Control Valves are open.
3. Tell 1C43 to notify the RO to start 11 and 13 Component Cooling Pumps **PER** Step CW.

IV. ACTIONS

CW. **(RO)** START 11 AND 13 COMPONENT COOLING PUMPS

1. **WHEN** notified,
   THEN start 11 and 13 Component Cooling Pumps as follows:

   a. Start 11 Component Cooling Pump:

      (1) If necessary, charge the Closing Spring for 11 Component Cooling Pump breaker 52-1106.

      (2) Start 11 Component Cooling Pump by depressing the PUSH TO CLOSE button.

   b. Start 13 Component Cooling Pump:

      (1) If necessary, align 13 Component Cooling Pump to 480V Load Center 11B:

         (a) At the disconnect which aligns 13 Component Cooling Pump to 480V Load Center 14B, 89-1416, turn the handswitch to TRIP.

         (b) With the handswitch pulled in the TRIP position, lock the disconnect open and remove the key.

         (c) Insert then rotate the key into disconnect 89-1116, which will align 13 Component Cooling Pump to 480V Load Center 11B.

         (d) Push the handswitch in to release it from the TRIP position, then close the disconnect.

      (2) If necessary, charge the Closing Spring for breaker 52-1116.

      (3) Start 13 Component Cooling Pump by depressing the PUSH TO CLOSE button.

2. Notify 1C43 that 11 and 13 Component Cooling Pumps have been started.

IV. ACTIONS

CX. **(TBO)** ALIGN 13 SALTWATER PUMP TO SUPPLY 12 SALTWATER HEADER

1. **GO TO** the Intake Structure.
2. Align 13 Saltwater Pump to supply 12 Saltwater Header:
   a. Shut 13 Saltwater Pump to 11 Saltwater Header, 1-SW-112
   b. Shut 13 Saltwater Pump to 11 Saltwater Header, 1-SW-113
   c. Open 13 Saltwater Pump to 12 Saltwater Header, 1-SW-114
   d. Open 13 Saltwater Pump to 12 Saltwater Header, 1-SW-115
3. Notify 1C43 that 13 Saltwater Pump is ready to be started.
4. Tell 1C43 to notify the RO to start 13 Saltwater Pump **PER** Step CY.

CY. **(RO)** START 13 SALTWATER PUMP

1. **IF** necessary Align 13 Saltwater Pump to 4KV Bus 11 as follows:
   a. Unlock 13 Saltwater Pump Disconnect to 4KV Bus 14, 189-1412, from the SHUT position (Handle Up) by rotating the lower key 180° in the clockwise direction to the keyswitch stop. Remove the key.

WARNING

Improper operation of disconnects can result in serious injury. Keep body and head clear of the operating arc of the disconnect handle. Do NOT release handle prior to full travel. When the disconnect is opened, a very loud bang will be heard, and a switch position flag indication will be visible indicating disconnect position.

   b. Lower the disconnect handle to its OPEN position (Handle Down) position.
   c. Lock open 13 Saltwater Pump Disconnect to 4KV Bus 14, 189-1412, by rotating the upper key 180° in the counter-clockwise direction to the keyswitch stop. Remove the key.
   d. **GO TO** the 27' Switchgear Room.

(continue)

IV. ACTIONS

CY.1 (continued)

e. Insert the upper key into 13 Saltwater Pump Disconnect to 4KV Bus 11, 189-1112, and rotate the lower key 180° in the clockwise direction to the keyswitch stop.

WARNING

Improper operation of disconnects can result in serious injury. Keep body and head clear of the operating arc of the disconnect handle. Do NOT release handle prior to full travel. When the disconnect is opened, a very loud bang will be heard, and a switch position flag indication will be visible indicating disconnect position.

f. Raise the disconnect handle to its SHUT position (Handle Up) position.

g. Lock 13 Saltwater Pump Disconnect to 4KV Bus 11, 189-1112, in the SHUT position (Handle Up) by inserting then rotating the key in the lower lock 180° in the counter-clockwise direction to the keyswitch stop.

h. Notify 1C43 that 13 Saltwater Pump is aligned to 4KV Bus 11.

2. **WHEN** notified to START 13 Saltwater Pump,
THEN place 13 Saltwater Pump Local Control handswitch, 1-HS-5201D, to START.

3. Notify 1C43 that 13 Saltwater Pump has been started.

CZ. **(ABO)** SHUT THE CONTAINMENT SUMP DISCHARGE

1. Shut the CNTMT SUMP DISCH, 1-SI-4144-MOV.

2. Notify 1C43 that the Containment Sump Discharge, 1-SI-4144-MOV, is shut.

3. **GO TO** 11 ECCS Pump Room.

IV. ACTIONS

DA. **(ABO)** COMMENCE SHUTDOWN COOLING LINEUP

1. Shut 11 Containment Spray Pump Discharge Isolation, 1-SI-314.
2. Shut 12 Containment Spray Pump Discharge Isolation, 1-SI-324.
3. Shut 11 Shutdown Cooling Heat Exchanger Outlet to Spray Header, 1-SI-319.
4. Shut 12 Shutdown Cooling Heat Exchanger Outlet to Spray Header, 1-SI-329.
5. Open 11 Shutdown Cooling Heat Exchanger Inlet from LPSI, 1-SI-452.
6. Open 11 Shutdown Cooling Heat Exchanger Outlet to LPSI, 1-SI-456.
7. Open 12 Shutdown Cooling Heat Exchanger Inlet from LPSI, 1-SI-453.
8. Open 12 Shutdown Cooling Heat Exchanger Outlet to LPSI, 1-SI-457.
9. Open 11 LPSI Pump Suction from Shutdown Cooling, 1-SI-441.
10. Manually shut SDC RECIRC ISOL, 1-SI-399-MOV.
11. Isolate Instrument Air to Shutdown Cooling Temperature Control Valve, 1-SI-657-CV, by shutting 1-IA-649. Disconnect the air line between the solenoid and the actuator. Manually shut 1-SI-657-CV.
12. Isolate Instrument Air to Shutdown Cooling Flow Control Valve, 1-SI-306-CV, by shutting 1-IA-740. Disconnect the air line between the solenoid and the actuator. Manually shut 1-SI-306-CV.
13. Manually open the SDC HX LPSI INL isolation, 1-SI-658-MOV.
14. Shut 12 SDC HX TO HPSI SUCT, 1-SI-662-MOV.
15. Shut 11 SDC HX TO HPSI SUCT, 1-SI-663-MOV.
16. Notify 1C43 that the Shutdown Cooling lineup is complete.
17. Report to 1C43 to provide additional assistance.

IV. ACTIONS

DB. **(CRO)** PREPARE FOR STEAM AND FEED OF THE S/GS

1. **WHEN** RCS temperature (Thot) is 321° F,
   THEN:
   a. Place 11 AFW PP SPEED CONTR, 1-HC-3987B, to MIN.
   b. Place 12 AFW PP SPEED CONTR, 1-HC-3989B, to MIN.
   c. Place 11 S/G FLOW CONTR, 1-HC-4511B, to MIN.
   d. Place 12 S/G FLOW CONTR, 1-HC-4512B, to MIN.
2. Adjust 11 ADV CONTR, 1-HC-4056A, to OPEN.
3. Adjust 12 ADV CONTR, 1-HC-4056B, to OPEN.
4. Notify the TBO to isolate steam to the AFW Pumps **PER** Step DC.
5. Notify the ABO to prepare for Shutdown Cooling initiation **PER** Step DF.

DC. **(TBO)** ISOLATE STEAM TO THE AFW PUMPS

1. **WHEN** notified to secure the Steam Driven AFW Pumps,
   THEN shut the 11 and 12 AFW PP TURB THROTTLE/STOP valves.
2. Notify 1C43 that steam is isolated to the AFW Pumps.
3. **GO TO** 1C43 to obtain a hand held Digital Thermometer.

DD. **(CRO)** LOWER S/G LEVELS TO (-)350 INCHES

1. Steam both S/Gs until indicated level reaches (-)350 inches.
2. **WHEN** indicated S/G level is (-)350 inches,
   THEN notify the RO to START 13 AFW PP **PER** Step DE.

IV. ACTIONS

DE. **(RO)** START 13 AFW PUMP

1. **WHEN** notified to start 13 AFW Pump,
   THEN manually close the Supply breaker for 13 AFW Pump, 152-1116:

   a. Charge the Closing Spring for 13 AFW Pump, 152-1116, if necessary.

      (1) Insert the Maintenance Handle into the Manual Charging opening.

      (2) Position the Maintenance Handle hooked section around the end of the pawl carrier.

NOTE

Between each stroke maintain a slight upward pressure so that the handle does **NOT** slip off the pawl carrier.

      (3) Pump the Maintenance Handle until pressure is **NOT** felt when stroking the maintenance handle upward. (Approximately 7-10 strokes)

      - The Spring indicator should indicate "SPRINGS CHARGED".

   b. Manually close the Breaker by pushing upward on the Manual Close Lever.

2. Notify 1C43 that 13 AFW Pump has been started.

IV. ACTIONS

DF. **(ABO)** PREPARE FOR SHUTDOWN COOLING INITIATION

1. **WHEN** notified by 1C43 to prepare for Shutdown Cooling initiation,
   THEN open the LPSI HDR isolations:
   - 11A LPSI HDR, 1-SI-615-MOV
   - 11B LPSI HDR, 1-SI-625-MOV
   - 12A LPSI HDR, 1-SI-635-MOV
   - 12B LPSI HDR, 1-SI-645-MOV
2. Shut 11 LPSI Minimum Flow Isolation, 1-SI-449.
3. Shut 12 LPSI Minimum Flow Isolation, 1-SI-450.
4. Shut 11 LPSI Normal Suction Isolation, 1-SI-444.
5. Shut 12 LPSI Normal Suction Isolation, 1-SI-432.
6. Isolate Instrument Air to 11 and 12 SDC HX CC OUT valves:
   a. Shut Instrument Air to 1-CC-3828-CV, 1-IA-663
   b. Shut Instrument Air to 1-CC-3830-CV, 1-IA-792
   c. For both Control Valves, disconnect the air line between the solenoid and the actuator to bleed air pressure.
7. Notify 1C43 that the preparations for Shutdown Cooling initiation are complete.

IV. ACTIONS

DG. **(CRO)** INITIATE AFW TO BOTH S/GS

1. **WHEN** 13 AFW Pump has been started,
   THEN feed both S/Gs at 225 gpm per S/G.

2. Maintain Pressurizer level at 150 to 180 inches.

   a. If necessary, notify the RO to START 11 (13) Charging Pump **PER** Step BB.

3. Have the TBO measure AFW temperature by using a hand held Digital Thermometer on 13 AFW Pump Suction Piping.

4. Refer to ATTACHMENT (3), SDC ENTRY WINDOW vs. AFW TEMPERATURE, to determine the MAXIMUM allowable time until Shutdown Cooling MUST be initiated.

5. Fill and maintain both S/Gs at an indicated level of (+)50 inches.

6. **WHEN** RCS temperature (Thot) has been reduced to less than 300° F,
   THEN contact the ABO to open the Shutdown Cooling Return Header Isolation **PER** Step DH.

DH. **(ABO)** OPEN THE SHUTDOWN COOLING RETURN ISOLATION

1. Obtain a hand held Digital Thermometer to measure Shutdown Cooling Heat Exchanger Outlet temperature.

2. **WHEN** notified to open the Shutdown Cooling Return Isolation,
   THEN open the SDC HDR RETURN ISOL, 1-SI-651-MOV.

3. Notify 1C43 that the Shutdown Cooling Header Return Isolation, 1-SI-651-MOV, is open.

4. **GO TO** the Component Cooling Room.

IV. ACTIONS

DI. **(ABO)** THROTTLE OPEN THE SHUTDOWN COOLING FLOW CONTROL VALVE

1. Manually throttle open the Shutdown Cooling Flow Control Valve, 1-SI-306-CV, to obtain a 1 inch stem rise.
2. Notify 1C43 that the Shutdown Cooling Flow Control Valve is throttled.
3. Tell 1C43 to notify the RO to start 11 LPSI Pump **PER** Step DJ.

DJ. **(RO)** START 11 LPSI PUMP

1. **WHEN** notified to START 11 LPSI Pump,
   THEN place 11 LPSI Pump Local Handswitch, 1-HS-302XC, to START.
2. Notify 1C43 that 11 LPSI Pump has been started.
3. Tell 1C43 to notify the ABO to throttle open the Shutdown Cooling Flow Control Valve **PER** Step DK.

DK. **(ABO)** SLOWLY OPEN THE SHUTDOWN COOLING FLOW CONTROL VALVE

1. **WHEN** notified to operate 1-SI-306-CV,
   THEN slowly open the Shutdown Cooling Flow Control Valve, 1-SI-306-CV, until the total stem rise is one and one-half inches.
2. Notify 1C43 that Shutdown Cooling flow has been established.

IV. ACTIONS

DL. **(ABO)** ADJUST SHUTDOWN COOLING TEMPERATURE

1. Establish communications with 1C43.

NOTE

Shutdown Cooling Heat Exchanger heatup rate shall be measured on the inlet side of 1-SI-657-CV.

NOTE

The manual handwheel on 1-SI-657-CV turns clockwise to open.

CAUTION

Do NOT exceed a heatup rate 14° F per minute for the Shutdown Cooling Heat Exchanger.

2. Manually adjust the Shutdown Cooling Temperature Control Valve, 1-SI-657-CV, to approach, but **NOT** exceed, a 14° F per minute heatup rate on the inlet side of 1-SI-657-CV as determined by hand held Digital Thermometer.

3. Adjust 1-SI-657-CV to achieve cooldown rate as directed by CRO.

IV. ACTIONS

DM. **(CRO)** CONTINUE RCS COOLDOWN TO LESS THAN 200° F

1. Coordinate with the ABO to manually adjust 1-SI-657-CV to achieve desired cooldown rate.

2. Observe the following Cooldown Rate limitations:

   - greater than 256° F.....less than 100° F per hour
   - between 256° F and 106° F.....less than 40° F per hour

3. **WHEN** RCS temperature is less than 200° F,
   THEN declare Mode 5.

   a. Declare Mode 5.

   b. Perform the Final Criteria Check.

   c. Commence the Administrative Actions **PER** ATTACHMENT (4), ADMINISTRATIVE ACTIONS.

   d. Implement the appropriate procedure as directed by the Shift Manager.

END of Section IV

V. SAFETY PARAMETERS CHECKLIST

A. The STA (or person designated by the STA) will perform the Safety Parameters Status Check on entry into this procedure.

B. Perform Safety Parameters Status Checks at 15 minute intervals until plant conditions stabilize.

C. Notify the Shift Manager or Control Room Supervisor if any Safety Parameter criteria is **NOT** being met, promptly upon discovery.

D. Review data and verify the Safety Parameters Acceptance Criteria are satisfied. Planned evolutions will cause deviations from the acceptance criteria; thus, effects due to the evolutions must be taken into account when assessing Plant status.

E. **WHEN** this AOP is completed,
THEN perform the Final Criteria Check.

	SAFETY PARAMETERS ACCEPTANCE CRITERIA			
REACTIVITY CONTROL PARAMETERS	**ACCEPTANCE CRITERIA**	**PROGRESS CHECK**	**FINAL CRITERIA**	**FINAL CHECK**
a. WRNI power at 1C43	less than 3% and lowering	___|___|___|___ ___|___|___|___	less than than 10^{-4}%	_____

V. SAFETY PARAMETERS CHECKLIST

RCS PRESSURE AND INVENTORY PARAMETERS	SAFETY PARAMETERS ACCEPTANCE CRITERIA			
	ACCEPTANCE CRITERIA	PROGRESS CHECK	FINAL CRITERIA	FINAL CHECK
a. RCS Pressure and Temperature	in accordance with Attachment 1	___|___|___|___ ___|___|___|___	less than 270 PSIA less than 200° F	_____ _____
b. Pressurizer Level	35 to 250 inches	___|___|___|___ ___|___|___|___	130 to 180 inches	_____
c. RCS subcooling	30 to 140° F	___|___|___|___ ___|___|___|___	greater than or equal to 30° F	_____
d. Reactor Vessel level **(1)**	above the top of the hot leg	___|___|___|___ ___|___|___|___	above the top of the hot leg	_____

(1) N/A if **NOT** available.

V. SAFETY PARAMETERS CHECKLIST

CORE AND RCS HEAT REMOVAL PARAMETERS	SAFETY PARAMETERS ACCEPTANCE CRITERIA			
	ACCEPTANCE CRITERIA	PROGRESS CHECK	FINAL CRITERIA	FINAL CHECK
a. S/G level	(-)350 inches to (+)50 inches	___|___|___|___ ___|___|___|___	(-)24 inches to (+)50 inches	_____
b. S/G Pressure	less than 1020 PSIA	___|___|___|___ ___|___|___|___	less than 70 PSIA	_____
c. T_{HOT} minus T_{COLD}	less than 50° F	___|___|___|___ ___|___|___|___	N/A	N/A
d. CST Levels	greater than 5 feet	___|___|___|___ ___|___|___|___	N/A	N/A
e. CET **(1) (2)**	less than 560° F and consistent with T_{HOT} and T_{COLD}	___|___|___|___ ___|___|___|___	consistent with T_{HOT} and T_{COLD}	_____

(1) N/A if **NOT** available.
(2) CET temperatures may be greater than 560° F while natural circulation is being established.

APPENDIX (1)
Page 1 of 9

PLACEKEEPER

START	FUNCTION	DONE	PAGE
	SECTION IV. ACTIONS		
	A. **(SM)** DETERMINE IF A SEVERE FIRE IS IN PROGRESS OR HAS OCCURRED IN THE CONTROL ROOM		6
	B. **(RO)** TRIP THE REACTOR		6
	C. **(CRO** OR **RO)** ATTEMPT TO TRIP THE MAIN TURBINE, SGFPS, AND SHUT MSIVS		7
	D. **(ALL PERSONNEL)** EVACUATE THE CONTROL ROOM		7
	E. **(RO)** MANUALLY TRIP THE MAIN TURBINE		7
	F. **(UNIT 1 PERSONNEL)** UNLOCK SAFE SHUTDOWN KEY LOCKER AND EQUIPMENT LOCKER		8
	G. **(CRO)** OBTAIN SAFE SHUTDOWN EQUIPMENT		8
	H. **(CRO)** SHUTDOWN 11 AND 12 CEDM MG SETS		8
	I. **(CRO)** VERIFY REACTOR IS SHUTDOWN		9
	J. **(SM)** DETERMINE EMERGENCY RESPONSE ACTION		9
	K. **(CRO)** CONSERVE RCS AND S/G INVENTORY		10
	L. **(CRO)** SECURE PRESSURIZER BACKUP HEATER BANKS 11 AND 13		10
	M. **(TBO)** OBTAIN SAFE SHUTDOWN EQUIPMENT		11
	N. **(TBO)** DE-ENERGIZE CV-517, CV-518, CV-519 AND PRZR AND REACTOR VESSEL HEAD VENTS.		11

PLACEKEEPER
(continued)

START	FUNCTION	DONE	PAGE
	O. **(TBO)** TRIP MCC 114R LOAD CENTER BREAKER		11
	P. **(RO)** OBTAIN SAFE SHUTDOWN EQUIPMENT		12
	Q. **(RO)** TRIP MCC 104R LOAD CENTER BREAKER		12
	R. **(RO)** TRIP 11B AND 12B REACTOR COOLANT PUMPS		13
	S. **(RO)** DE-ENERGIZE PRESSURIZER HEATER 112 PH AND NO. 12 PRESSURIZER PROPORTIONAL HEATER (MCC 1N430)		14
	T. **(RO)** TAKE LOCAL CONTROL AND OPEN 1B DIESEL GENERATOR OUTPUT BREAKER		14
	U. **(OSO)** OBTAIN RADIOS AND REPORT TO 1C43 AND 2C43		15
	V. **(OSO)** SHUTDOWN FAIRBANKS DIESEL GENERATORS		15
	W. **(TBO)** TRIP 11 AND 12 SGFPS		16
	X. **(TBO)** ISOLATE CONDENSER MAKEUP		16
	Y. **(ABO)** OBTAIN SAFE SHUTDOWN EQUIPMENT THEN STRIP MCC 114R		16
	Z. **(CRO)** INITIALIZE ADV CONTROLLERS ON 1C43		17
(Z)	AA. **(CRO)** ALIGN 11 AND 12 ADVS TO 1C43		18
	AB. **(CRO)** COMPLETE INITIALIZATION OF CONTROLLERS ON 1C43		18

Letters in the START column are prerequisite steps that must be completed prior to initiation of the step.

PLACEKEEPER
(continued)

START	FUNCTION	DONE	PAGE
	AC. **(ABO)** VERIFY MSIVS ARE SHUT		19
(AB)	AD. **(TBO)** ALIGN AFW PUMP SPEED CONTROL TO 1C43		20
(AD)	AE. **(TBO)** ALIGN AFW FLOW CONTROL TO 1C43		21
(AE)	AF. **(CRO)** INITIATE AFW FLOW		22
	AG. **(TBO)** OPERATE THE SELECTED AFW PUMP	C	23
	AH. **(OSO)** TAKE LOCAL CONTROL AND START 0C DIESEL GENERATOR		26
	AI. **(OSO)** CLOSE 07 4KV BUS TIE BREAKER, 152-0701.		29
	AJ. **(STA)** COMMENCE SAFETY PARAMETERS CHECKLIST		30
	AK. **(RO)** TRIP 11A AND 12A REACTOR COOLANT PUMPS		31
	AL. **(RO)** DE-ENERGIZE PRESSURIZER HEATER MCC 110PH AND NO. 11 PRESSURIZER PROPORTIONAL HEATER (MCC 1N130)		32
	AM. **(OSO)** TAKE LOCAL CONTROL AND OPEN 1A DIESEL GENERATOR OUTPUT BREAKER		32
(AA)	AN. **(CRO)** CONTROL RCS TEMPERATURE AND VERIFY NATURAL CIRCULATION		33
	AO. **(RO)** ELECTRICALLY ISOLATE 4KV BUS 11 FROM THE CONTROL ROOM		34
(AO)	AP. **(TBO)** OVERRIDE SALTWATER TO THE SERVICE WATER HEAT EXCHANGERS		35

NOTE: Continuously Applicable Steps are designated with a "C" in the Done column.
Letters in the START column are prerequisite steps that must be completed prior to initiation of the step.

PLACEKEEPER
(continued)

START	FUNCTION	DONE	PAGE
	AQ. **(ABO)** MANUALLY SHUT CONTAINMENT NORMAL SUMP VALVE		37
	AR. **(TBO)** ISOLATE SERVICE WATER TO THE TURBINE BUILDING		37
	AS. **(ABO)** LINEUP CHARGING PUMP SUCTION TO THE BORIC ACID STORAGE TANKS		38
	AT. **(RO)** OPEN THE FEEDER BREAKERS FOR 4KV BUS 11		38
	AU. **(RO)** ALIGN 0C DIESEL GENERATOR TO 4KV BUS 11		39
(AI), (AM), (AO), (AT), (AU)	AV. **(CRO)** COORDINATE WITH UNIT 2 FOR 0C DIESEL GENERATOR LOADING ON 4KV BUS 11		40
(AV)	AW. **(RO)** ENERGIZE 11 4KV BUS.		40
(AW)	AX. **(RO)** START 11 SERVICE WATER AND 11 SALTWATER PUMPS		41
(AX)	AY. **(TBO)** MONITOR SRW HX FLOW		41
	AZ. **(OSO)** TAKE LOCAL CONTROL OF 1A DIESEL GENERATOR AND BREAKERS		43
	BA. **(OSO)** PLACE FAIRBANKS DIESEL GENERATORS IN LOCAL CONTROL		45
(AS), (AW)	BB. **(RO)** START A CHARGING PUMP		45
	BC. **(RO)** STRIP 480V LOAD CENTER 11B		47
	BD. **(RO)** ENERGIZE 480V LOAD CENTER 11B		47
	BE. **(RO)** STRIP 480V LOAD CENTER 11A		48

Letters in the START column are prerequisite steps that must be completed prior to initiation of the step.

PLACEKEEPER
(continued)

START	FUNCTION	DONE	PAGE
	BF. **(RO)** ENERGIZE 480V LOAD CENTER 11A		49
	BG. **(OSO)** MONITOR 0C DIESEL GENERATOR		49
	BH. **(ABO)** ISOLATE CHANNEL D WRNI FROM THE CONTROL ROOM.		51
(BD)	BI. **(ABO)** START 11 SALTWATER AIR COMPRESSOR		52
	BJ. **(ABO)** ISOLATE FIRE EFFECTS FOR 11 CAVITY COOLING FAN DAMPER		52
(BD)	BK. **(ABO)** RESTORE SWITCHGEAR ROOM VENTILATION		52
(BD), (BI)	BL. **(ABO)** START 11 AND 12 CONTAINMENT AIR COOLERS		53
(BD)	BM. **(ABO)** START 11 AFW PUMP ROOM EMERGENCY VENTILATION FAN		53
	BN. **(ABO)** DE-ENERGIZE UNIT 1 5' FAN ROOM LIGHTING		54
	BO. **(RO)** ENERGIZE PRESSURIZER HEATER MCC 109PH		54
(BO)	BP. **(CRO)** ENERGIZE PRESSURIZER BACKUP HEATER BANK 11		55
	BQ. **(ABO)** OPEN MCC 104R FEEDER BREAKER		55
	BR. **(CRO)** BORATE THE RCS		56
	BS. **(ABO)** ESTABLISH SERVICE WATER FLOW TO 11 CONTAINMENT AIR COOLER		57
(BJ)	BT. **(RO)** START 11 CAVITY COOLING FAN		57

Letters in the START column are prerequisite steps that must be completed prior to initiation of the step.

PLACEKEEPER
(continued)

START	FUNCTION	DONE	PAGE
	BU. **(RO)** DE-ENERGIZE 4KV BUS 12		57
	BV. **(CRO)** DE-ENERGIZE 4KV BUS 13		58
	BW. **(TBO)** ENERGIZE 1Y09 AND TIE 1Y10 TO 1Y09		58
	BX. **(CRO)** DE-ENERGIZE 4KV BUS 14		59
	BY. **(ABO)** ESTABLISH SERVICE WATER FLOW TO 12 CONTAINMENT AIR COOLER		59
	BZ. **(RO)** PLACE 11 AND 14 BATTERY CHARGERS IN SERVICE		60
	CA. **(OSO)** START 12 WELL WATER PUMP		60
	CB. **(TBO)** VENT THE MAIN GENERATOR TO 2 PSIG		61
	CC. **(TBO)** ISOLATE DI WATER AND CONDENSATE MAKEUP TO THE SERVICE WATER AND COMPONENT COOLING HEAD TANKS		62
	CD. **(OSO)** MONITOR DIESEL FIRE PUMP FUEL OIL DAY TANK LEVEL		63
	CE. **(ABO)** ESTABLISH SALTWATER LINEUP FOR COMPONENT COOLING HEAT EXCHANGERS		64
(CC)	CF. **(ABO)** RESTORE MAKEUP TO THE SERVICE WATER AND COMPONENT COOLING HEAD TANKS		65
(BR)	CG. **(ABO)** SHIFT CHARGING PUMP SUCTION TO THE RWT		66
	CH. **(CRO)** COMMENCE RCS COOLDOWN		66

Letters in the START column are prerequisite steps that must be completed prior to initiation of the step.

PLACEKEEPER
(continued)

START	FUNCTION	DONE	PAGE
	CI. **(CRO)** PREPARE TO DEPRESSURIZE THE RCS		67
(CI.1)	CJ. **(ABO)** INSTALL PORTABLE AIR SUPPLY TO AUX SPRAY CONTROL VALVE		67
(CJ)	CK. **(ABO)** OPERATE AUX SPRAY CONTROL VALVE		67
	CL. **(CRO)** DEPRESSURIZE THE RCS		68
(CL)	CM. **(ABO)** SECURE AUX SPRAY		69
	CN. **(CRO)** SECURE RCS COOLDOWN AND PREPARE TO DEPRESSURIZE THE RCS		70
(CN)	CO. **(ABO)** INITIATE AUX SPRAY		70
	CP. **(CRO)** DEPRESSURIZE THE RCS		71
(CP)	CQ. **(ABO)** SECURE AUX SPRAY		72
	CR. **(CRO)** COOLDOWN AND DEPRESSURIZE THE RCS		72
(CR)	CS. **(ABO)** SHUT THE SAFETY INJECTION TANK OUTLET VALVES AND OPEN THE SHUTDOWN COOLING HEADER RETURN ISOLATION		73
	CT. **(OSO)** MONITOR CST INVENTORY		73
	CU. **(ABO)** ISOLATE COMPONENT COOLING TO CONTAINMENT		76
	CV. **(ABO)** OPEN COMPONENT COOLING HEAT EXCHANGER ISOLATION CONTROL VALVES		76

Letters in the START column are prerequisite steps that must be completed prior to initiation of the step.

PLACEKEEPER
(continued)

START	FUNCTION	DONE	PAGE
(CV)	CW. **(RO)** START 11 AND 13 COMPONENT COOLING PUMPS		77
	CX. **(TBO)** ALIGN 13 SALTWATER PUMP TO SUPPLY 12 SALTWATER HEADER		78
(CX)	CY. **(RO)** START 13 SALTWATER PUMP		78
	CZ. **(ABO)** SHUT THE CONTAINMENT SUMP DISCHARGE		79
	DA. **(ABO)** COMMENCE SHUTDOWN COOLING LINEUP		80
	DB. **(CRO)** PREPARE FOR STEAM AND FEED OF THE S/GS		81
(DB.4)	DC. **(TBO)** ISOLATE STEAM TO THE AFW PUMPS		81
	DD. **(CRO)** LOWER S/G LEVELS TO (-)350 INCHES		81
(DD)	DE. **(RO)** START 13 AFW PUMP		82
(DB.5)	DF. **(ABO)** PREPARE FOR SHUTDOWN COOLING INITIATION		83
(DE)	DG. **(CRO)** INITIATE AFW TO BOTH S/GS		84
(DG)	DH. **(ABO)** OPEN THE SHUTDOWN COOLING RETURN ISOLATION		84
	DI. **(ABO)** THROTTLE OPEN THE SHUTDOWN COOLING FLOW CONTROL VALVE		85
(DI)	DJ. **(RO)** START 11 LPSI PUMP		85
(DJ)	DK. **(ABO)** SLOWLY OPEN THE SHUTDOWN COOLING FLOW CONTROL VALVE		85

Letters in the START column are prerequisite steps that must be completed prior to initiation of the step.

PLACEKEEPER
(continued)

START	FUNCTION	DONE	PAGE
	DL. **(ABO)** ADJUST SHUTDOWN COOLING TEMPERATURE		86
	DM. **(CRO)** CONTINUE RCS COOLDOWN TO LESS THAN 200° F		87

AOP-9A
Unit 1
BASES DOCUMENT

IV. ACTIONS

A. This step describes the affected area, defines a severe fire and gives the Shift Manager guidance in determining if the fire is a severe fire.

B. Manual Reactor TRIP is initiated to promptly change plant modes. Manual Reactor TRIP is an allowable action taken per Generic Letter 86-10, "Questions and Answers," Section 3.8.4.

C. Credit is not taken for Control Room initiated trips of the Main Turbine, SGFPs, and shutting the MSIVs (i.e., an exemption was not requested), but are considered prudent actions to minimize the probability of an over-cooling scenario. If the 0C DG can be emergency started here it will save the time of pneumatically prelubing the DG prior to start. If it can't be started here it will be started later in the procedure. Upon loss of component cooling, the RCPs have been evaluated to operate 20 minutes without seal failure. Since the wiring in the Control Room has not been evaluated, the RCPs must be tripped locally within 20 minutes. It is considered a prudent action to trip the RCPs from the Control Room prior to leaving. (Reference: WCAP-16175-P, Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants) 1100

D. Report to Safe Shutdown Station as assigned by NO-1-100 Attachment.

E. Manual action to TRIP the Main Turbine is taken to minimize the probability of an over-cooling transient.

F/G. No comment.

H. Provide an additional method of ensuring power is removed from the CEDMs. Will also reduce the noise levels in the 45' and 27' Switchgear Rooms if off-site power is still available.

I. We must "...achieve and maintain subcritical reactivity conditions in the reactor,..." per 10CFR50 Appendix R, III.L.1.(a). The criteria for completion of Reactor Shutdown was extracted from EOPs. Fire effects may induce a test signal on the WRNI channels. The isolation switches will ensure the WRNI channel used to validate Reactor Shutdown is not affected.

J. Required per ERPIP 3.0.

K. Minimize RCS inventory loss due to CVCS Letdown, RCP Bleedoff, and RCS Sampling. Fire induced signal(s) associated with Pressurizer Level Control could cause maximum CVCS Letdown flow (i.e., up to the setpoint for CVCS Excess Flow Check Valve operation), which would jeopardize our ability to maintain Pressurizer Level indication. Pressurizer Level indication must be maintained per 10CFR50 III.L.2.b.

Secondary inventory should be maximized in order to maintain a heat sink. When AFW is started, the system must supply adequate flow to restore and maintain S/G level. S/G Blowdown is an additional non-vital secondary discharge from the S/Gs. Therefore, the S/G Blowdown valves are shut. Blowdown is required to be isolated in 15 minutes to prevent S/G dryout in the worst case scenario. (Reference: CA05974, Appendix R Fire Protection Transient Events)

L. Pressurizer Backup Heater Banks 11 and 13 are electrically isolated from fire effects. All Pressurizer Heaters are secured, since Pressurizer Pressure control may not be free of fire effects and Aux Spray is not immediately available.

M. No basis required.

N. CVCS Loop Isolations, 1-CVC-518-CV and 1-CVC-519-CV and Aux. Spray Valve, 1-CVC-517-CV are de-energized to prevent a potential depressurization, due to fire effects, when a Charging Pump is started. The PRZR and Head Vents are de-energized to keep them from opening resulting in a loss of inventory. Performance of this step conflicts with the design bases for the Containment Integrity LCO. Design basis accidents are not assumed to occur concurrent with the fire; therefore, the need to limit fire damage to systems or components which may challenge shutdown capability per 10CFR50, Appendix R, Section III.L.1 takes precedence.

O. MCC 114R load center breaker is tripped by the RO to remove high/low pressure interfaces (PORV 402) to minimize possible RCS inventory lost due to spurious operation. If the PORVs were to open and remain open, a loss of RCS Inventory and Pressure would occur. 10CFR50 Appendix R states, "During the post-fire shutdown, the reactor coolant system process variables shall be maintained within those predicted for a loss of normal AC power,..." PORV operation could violate this requirement. Pressurizer Level indication must be maintained per 10CFR50 III.L.2.b. High-Low pressure interface valves are addressed in "Clarification of Generic Letter 81-12" dated March 22, 1982, Safe Shutdown Capability Section, page 9. Experience, (validation walkdowns) has found that the time for the start of boration is quicker when the load center breaker is opened by the RO, than having the ABO report to the MCCs, take the PORV breaker to off and then report to 1C43 for equipment. MCC-114R load center is also stripped and then re-energized later in the procedure. 1100

P. No basis required.

Q. MCC 104R load center breaker is tripped by the RO to remove high/low pressure interfaces (PORV 402) to minimize possible RCS inventory lost due to spurious operation. If the PORVs were to open and remain open, a loss of RCS Inventory and Pressure would occur. 10CFR50 Appendix R states, "During the post-fire shutdown, the reactor coolant system process variables shall be maintained within those predicted for a loss of normal AC power,..." PORV operation could violate this requirement. Pressurizer Level indication must be maintained per 10CFR50 III.L.2.b. Experience, (validation walkdowns) has found that the time for the start of boration is quicker when the load center breaker is opened by the RO, than having the ABO report to the MCCs, take the PORV breaker to off and then report to 1C43 for equipment. By de-energizing MCC-104R, power is also removed from the SDC Return Isolation Valve, 1-SI-652-MOV to prevent spurious operation of the valve resulting in a potential over-pressure of the Safety Injection suction piping. High-Low pressure interface valves are addressed in "Clarification of Generic Letter 81-12" dated March 22, 1982, Safe Shutdown Capability Section, page 9. The BA DIRECT M/U, 1-CVC-514-MOV will also be de-energized to prevent spurious operation and allow manual closure later on in the procedure. 1100

R. The RCPs are tripped (i.e., Loss of Off-site Power has not occurred):

- To minimize the heat input into the RCS
- Minimize the potential for RCP Seal failure due to inadequate cooling (i.e., loss of Component Cooling)
- Does not qualify as Safe Shutdown Equipment (i.e., cannot be powered from Diesel Generators)

Upon loss of component cooling, the RCPs have been evaluated to operate 20 minutes without seal failure. (Reference: WCAP-16175-P, Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants) 1100

S. All Pressurizer Heaters are secured, since Pressurizer Pressure control may not be free of fire effects and Aux Spray is not immediately available.

T. 1B Diesel Generator Output Breaker is electrically isolated from the Control Room to free it from fire effects. Refer to BG&E letter from A. E. Lundvall, Jr. to R. A. Clark (NRR) dated May 14, 1982 and 50.59, "Implementation of AOP-9A May Cause a Station Blackout for One Hour" dated 11-20-89, POSRC Meeting No. 89-229.

U. The OSO will pickup radios and distribute them to the SS and the CRS to enhance communications with the Fire Brigade.

V. The 2B, 1B and 2A Emergency Diesel Generator (DG) fuel racks are tripped to ensure the Diesel Generators are shutdown or do not startup. Since the Fairbanks DGs are not available due to fire affects and if a loss of offsite power occurs when their respective DG output breaker are opened in a later step, the DG will continue to run due to an Under Voltage (UV) signal present concurrent with the fire. The Diesel will eventually burn up since jacket water cooling high temperature, jacket water cooling low pressure and crankcase high pressure trips are bypassed when an UV signal is present. Although the 2B, 1B and 2A Diesel Generators are not available, it requires only a few minutes to trip all the Fairbanks DGs to ensure they are available at a later time.

W. The SGFPs are manually tripped to minimize the potential of an over-feed event due to fire effects.

X. Condenser Makeup is isolated to ensure the CSTs are not depleted due to a fire-induced failure of the Condenser Makeup Controller.

Y. MCC 114R is completely stripped of all loads. The ABO will then place the required breakers to ON to support shutdown. This method of stripping the bus (all breakers OFF, selected breakers ON) was suggested during initial Operator training on the draft revision of AOP-9A in July 1998. The MCC load center breaker was tripped earlier in the procedure and will be reshut later in the procedure.

Z. The ADV Controllers are placed in SHUT so the CRO can align the ADVs to 1C43 in a controlled manner.

AA. The CRO aligns the ADVs to 1C43 to have control of decay heat removal. ADV positioning signals from the Control Room and RRS (Quick Open) are overridden by these actions.

AB. The CRO completes the alignment of controllers on 1C43 so equipment is placed into service in a known condition.

AC. The MSIVs and MSIV Bypass MOVs are shut to preclude a fire induced over-cooling transient. This will eliminate the following steam flow paths:

- The Turbine Bypass Valves
- The MSR 2nd Stage MOVs
- Turbine Gland Seal System

AD. The TBO aligns Steam Driven AFW Pump speed control to 1C43. Fire induced actuation's of the Trip Solenoid are electrically isolated from the Control Room and instructions are given to reset the Trip Throttle Valve if it has tripped.

AE. The TBO aligns the AFW Flow Control Valves to 1C43 and fails open the AFW Block CVs. This will isolate fire-induced signals and will align flow control capability to 1C43. The SWAC header air supply to the AFW header is opened to supply SWAC air to the AFW valves (AFW air accumulators would bleed off in approximately 2 hours if SWAC air is not cross connected). See Andy Kim memo dated 10/27/93.

AF. This step should be completed within 30 minutes to minimize the potential for Steam Generator dry-out. The Steam Train AFW Pumps will fail to maximum speed on loss of Instrument Air because neither the SWACs nor the AFW Air Accumulators will supply air to the AFW Pumps. AFW flow is verified prior to operating the ADV, to ensure a source of makeup is available prior to moving on to the next step, since there a number of ways to feed the S/Gs using this procedure. (Reference: CA05974, Appendix R Fire Protection Transient Events)

AG. Upon loss of Instrument Air, the AFW Pump speed control will be lost even when aligned to 1C43, because neither the SWACs nor the AFW Air Accumulators will supply air to the AFW Pumps. The AFW Pump should fail to maximum speed and is not expected to trip on overspeed. If desired, 1C43 may direct local control of the AFW Pump. This step also directs reset of the AFW Pump if it has tripped. The TBO should then periodically check AFW Pump operation while performing other assigned steps within the procedure.

AH. The OSO will take local control of and start the 0C DG. The 0C DG will be used to power both the 11 and 24 4KV Buses simultaneously. If the 0C DG was not started prior to leaving the Control Room and the 07 4KV Bus has been de-energized for 30 minutes or longer then the pneumatic prelube must be performed. [B0255]

AI. 07 4KV BUS TIE Breaker is closed to energize the 07 4KV bus in preparation for energizing the vital 4KV Buses.

AJ. The STA will monitor Plant status using the Safety Parameters Checklist. This action is consistent with the requirements of NUREG 0737. The use of PAMS cabinets located in the switchgear rooms are not credited for APPENDIX "R". If necessary, the use of the lowest elevation unheated thermocouple from Reactor Vessel level indication is an acceptable substitute for determining Core Exit Temperature. The lowest elevation unheated thermocouple is 10 inches above the fuel.

AK. The RCPs are tripped (i.e., Loss of Off-site Power has not occurred):

- To minimize the heat input into the RCS
- Minimize the potential for RCP Seal failure due to inadequate cooling (i.e., loss of Component Cooling)
- Does not qualify as Safe Shutdown Equipment (i.e., cannot be powered from Diesel Generators)

Upon loss of component cooling, the RCPs have been evaluated to operate 20 minutes without seal failure. (Reference: WCAP-16175-P, Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants) 1100

AL. All Pressurizer Heaters are secured since Pressurizer Pressure control may not be free of fire effects and Aux Spray is not immediately available.

AM. 1A Diesel Generator Output Breaker is electrically isolated from the Control Room to free it from fire effects. Refer to BG&E letter from A. E. Lundvall, Jr. to R. A. Clark (NRR) dated May 14, 1982 and 50.59, "Implementation of AOP-9A May Cause a Station Blackout for One Hour" dated 11-20-89, POSRC Meeting No. 89-229.

AN. The CRO adjusts the ADVs to achieve RCS Tcold of 515°F to 535°F. Natural Circulation parameters are consistent with the EOPs. The use of PAMS cabinets located in the switchgear rooms are not credited for APPENDIX "R". If necessary, the use of the lowest elevation unheated thermocouple from Reactor Vessel level indication is an acceptable substitute for determining Core Exit Temperature. The lowest elevation unheated thermocouple is 10 inches above the fuel.

AO. The 4KV Breakers are electrically isolated from the Control Room and loads are removed from 4KV Bus 11 prior to energizing the bus with the 0C Diesel Generator. Two methods are employed:

1. For Breakers that do not have isolator switches the CLOSE Fuses are pulled and the Breaker is locally tripped.
2. For Breakers that have isolator switches the LOCAL/REMOTE switch is placed in LOCAL and the Breaker is stopped or tripped by a local handswitch.

AP. The Service Water Heat Exchanger Saltwater valves are isolated from fire effects and placed in their failed position by aligning their handvalves to OVERRIDE.

AQ. The Containment Normal Sump is isolated to ensure the Containment boundary is not breached. This action is consistent with EOP-7.

AR. Service Water is isolated to the Turbine Building so Service Water can be diverted to support loads necessary for Safe Shutdown. Removing air from the Control Valves will cause the valves to shut.

AS. Charging Pump suction is aligned to the BASTs to borate the RCS.

AT. 4KV Bus 11 is temporarily de-energized to support placing 0C Diesel Generator on the bus. At this point, the electrical system is now isolated from the Control Room and is free of fire effects.

AU. The first step places the OC DG output breaker in local to free the breaker of potential fire effects and ensures it is tripped to prepare for alignment to 11 4 KV Bus by the 0C DG. The next step aligns the 0C DG to 11 4KV Bus by closing disconnect 189-1106.

AV. This is a coordination step. The Unit 1 CRO verifies the 1A D/G output breaker is open with the OSO, since due to prelubing and starting the 0C D/G, the OSO may not have the breaker open yet. 11 4KV Bus source breakers, 11 SRW and SW breakers are verified open by both the prerequisites in the placekeeper and the procedure itself. The Unit 1 CRO coordinates with Unit 2 CRO to ensure that both units do not place their respective buses on the 0C DG at the same time. The CRO then directs the RO to energize the bus. Cautions were placed at the beginning of the procedure to ensure the Unit 1 SW and SRW Pumps are loaded on the 0C DG, prior to Unit 2 loading 24 4KV Bus and vice-versa.

AW. When directed by the CRO, the RO energizes 11 4KV Bus by from the 0C DG by closing breaker 152-1106.

AX. Once 11 4KV bus is being supplied from 0C Diesel Generator, 11 Service Water and 11 Saltwater Pumps are then locally started. All support systems are in operation to support Safe Shutdown and have been electrically isolated from the Control Room.

AY. After the Saltwater Pump is restarted, the TBO is instructed to monitor SRW HX flow and flush the strainer if required, since placing the valves in their failed position will require manual operation.

AZ. 1A DG is electrically isolated from the Control Room and shutdown locally due to potential fire effects. This continues the isolation of the 1A DG.

BA. The OSO will place the 1B, 2A and 2B Diesel Generators in LOCAL Control to electrically isolate Diesel Generator Control from the Control Room and provide the capability to start the Diesel Generators when all necessary support equipment has been made free of fire effects.

BB. 11 Charging Pump is started to restore RCS inventory. 13 Charging Pump is available if 11 Charging Pump is inoperable. This step should be completed within 60 minutes to satisfy the requirements outlined in 10CFR50 Appendix R, III.L.2.b. (Reference: ES200100732)

BC. All Control Power Fuses are removed from 480V Load Center 11B to electrically isolate equipment from the Control Room. Equipment not immediately necessary for Safe Shutdown is stripped from the Load Center. MCC-114R Load Center breaker is re-shut for safe shutdown loads.

BD. 480V Load Center 11B is energized to supply power to MCC 114R, 12 Containment Air Cooler, 11 Charging Pump, and 13 Component Cooling Pump.

BE. All Control Power Fuses are removed from 480V Load Center 11A to electrically isolate equipment from the Control Room. Equipment not immediately necessary for Safe Shutdown is stripped from the Load Center.

BF. 480V Load Center 11A is re-energized to supply power to 11 Containment Air Cooler, 11 Component Cooling Pump, and 13 Charging Pump.

BG. Since the 0C DG is used to supply both units, a step is included to monitor 0C DG operation. Although total kW supplied by the 0C DG to both 11 and 24 4KV buses is expected to be well below the continuous load limit of 5400 kW, there is a step for the OSO to inform both 1C43 and 2C43 of current kW load after the SW and SRW Pumps are running on their respective units. This is because the 0C DG Control Panel is the only available place to read 0C DG load.

BH. Fire effects may induce a test signal on the WRNI channels. The isolation switches will ensure the WRNI channel used to validate Reactor Shutdown is not affected. This step isolates the redundant channel.

BI. 11 Saltwater Air Compressor is electrically isolated from the Control Room, then started to provide an air source to the ADVs and AFW System Valves.

BJ. 11 Cavity Cooling Fan Damper indication is electrically isolated from the Control Room so the damper will operate when the fan is started. The NIs will remain operable without ventilation, but ventilation will enhance their operation. Refer to calculation M-90-16.

BK. The Switchgear Room Fan is started to enhance equipment operability and personnel habitability.

BL. 11 and 12 Containment Air Coolers are started to enhance equipment operability and personnel habitability. This is consistent with EOPs.

BM. 11 AFW Pump Room Emergency Ventilation Fan is started to support continued operation of the AFW Pumps since the bearings are air-cooled. The ventilation system is designed to limit AFW Pump Room temperature to less than 130°F, per FSAR Chapter 6. Station Blackout analysis indicates acceptable operation with AFW Pump Room Watertight Doors open. Refer to letter CMU-90-450, dated October 5, 1990. (NOTE: The AFW Pump Room Chiller Unit was not analyzed to be free of fire effects.)

BN. 1L06 breakers are de-energized to reduce the heat load in the Unit 1 5’ Exhaust Fan Room after starting AFW Pump Room Emergency Ventilation Fan.

BO. Pressurizer Heater MCC 109PH is energized to provide power to Pressurizer Heater Bank 11.

BP. The CRO energizes Pressurizer Backup Heater Bank 1 if RCS pressure is less than 1900 PSIA. The goal is to keep Pressurizer pressure as close to 1900 PSIA as possible since Aux Spray is not immediately available. Additionally, by maintaining Pressurizer pressure less than 1900 PSIA, the total time spent in the Containment by the ABO will be reduced.

BQ. MCC 104R feeder breaker is opened to ensure the MCC stays de-energized if 14A 480V Bus is returned to service. The Load Center Breaker was previously opened.

BR. The RCS is borated to a targeted value of 2300 ppm since CEA position indication may not be available. The upper limit on pressurizer level will maintain an adequate pressurizer bubble and accommodate adequate boration to ensure shutdown margin is established. It is permissible to cooldown the RCS to accommodate the extra volume of boric acid that may be required at End of Cycle (EOC). This cooldown will not violate shutdown margin when level is maintained by boration. Adequate boric acid volume may not be available at EOC to achieve 2300 ppm, but will provide significant overboration. (Reference: ES200100724)

BS. Service Water flow is established to remove heat from the Containment environment.

BT. The Cavity Cooling Fan is started to provide ventilation to the NI Detectors. The NIs will remain operable without ventilation, but ventilation will enhance their operation. Refer to calculation M-90-16.

BU. 4KV Bus 12 is de-energized to prevent spurious operation of equipment due to the fire.

BV. 4KV Bus 13 is de-energized to prevent spurious operation of equipment due to the fire.

BW. 1Y10 is tied to 1Y09 to restore instrument power.

BX. 4KV Bus 14 is de-energized to prevent spurious operation of equipment due to the fire.

BY. Service Water flow is established to remove heat from the Containment environment.

BZ. 11 and 14 Battery Chargers are placed in service to ensure continued operation of the 120VAC and 125VDC electrical systems.

CA. When the Unit 2 TBO has energized MCC 201BT (so 12 Well Water Pump can be supplied from 0C Diesel Generator), 2C43 will notify the OSO to start 12 Well Water Pump for a dependable supply of makeup water for decay heat removal. 1100

CB. The Main Generator is vented to prevent Hydrogen gas from accumulating in the Turbine Building.

CC. Demineralized Water and Condensate are isolated to the Service Water and Component Cooling Head Tanks in preparation to use Fire System water to fill these tanks.

CD. This step is performed to ensure continued operation of the Diesel Fire Pump so makeup will be available to the Component Cooling and Service Water Head Tanks. It also will ensure the CSTs can be filled with pre-treated water if CST inventory is nearing depletion.

CE. Instrument Air is isolated to the Component Cooling Heat Exchanger Saltwater Isolation Valves so the valves will fail open. The airlines are disconnected to bleed air off in the event the solenoids are energized, trapping air to keep the valves shut.

CF. Since Instrument Air is not available to the Level Control Valves, they are isolated and the Service Water and Component Cooling Head Tank levels are controlled on the manual bypass valves.

CG. Charging Pump suction is shifted to the RWT to prevent excessive boration of the RCS. A Portable Air Bottle will be used to provide air for the operation of 1-CVC-517-CV.

CH. Waiting at least one hour before starting the cooldown ensures the boron has been adequately mixed in the RCS. Limits are consistent with those found in the OPs.

CI. Coordination step.

CJ. A portable Air Supply is installed to locally operate 1-CVC-517-CV to reduce RCS pressure. At this point, the following valves are open:

- Aux Spray Control Valve, 1-CVC-517-CV
- 12B Loop Charging Isolation Control Valve, 1-CVC-518-CV
- 11A Loop Charging Isolation Control Valve, 1-CVC-519-CV

CK. Aux Spray is initiated when the Charging Loop manual isolations, 1-CVC-395 and 1-CVC-392, are shut.

CL. The RCS is depressurized until one of the following criteria are met:

- RCS subcooling is reduced to 30°F (maintain subcooled conditions in the Reactor Core)
- Pressurizer level is nearing 250 inches (maintain RCS process variables within those predicted for a Loss of Offsite Power)
- ABO is nearing the maximum stay time (personnel safety)

  Pressurizer Backup Heater Bank 11 is used, if necessary, to maintain subcooling above 30°F. RCS cooldown is continued until subcooling is 140°F. Cooldown rates and limits are consistent with the OPs.

CM. The ABO secures and disconnects the air to 1-CVC-517-CV to allow the valve to fail shut.

CN. Coordination step.

CO. The ABO connects and supplies air to 1-CVC-517-CV to allow the valve to open for depressurization.

CP. (This comment is a repeat comment to indicate the cyclic nature of this evolution) The RCS is depressurized until one of the following criteria are met:

- RCS subcooling is reduced to 30°F (maintain subcooled conditions in the Reactor Core)
- Pressurizer level is nearing 250 inches (maintain RCS process variables within those predicted for a Loss of Offsite Power)
- ABO is nearing the maximum stay time (personnel safety)

Pressurizer Backup Heater Bank 11 is used, if necessary, to maintain subcooling above 30°F. RCS cooldown is continued until subcooling is 140°F. Cooldown rates and limits are consistent with the OPs.

CQ. The ABO secures and disconnects the air to 1-CVC-517-CV to allow the valve to fail shut.

CR. This step indicates the cyclic nature of the depressurization process. Direction is provided to have the Safety Injection Tank Outlet MOVs shut and the Shutdown Cooling Return Header Isolation, 1-SI-652-MOV, opened.

CS. The Safety Injection Tank Outlet MOVs are shut to prevent the possibility of adding water to the RCS and subsequently raising Pressurizer level during the cooldown process. The Shutdown Cooling Return Header Isolation is opened at this point to prepare for Shutdown Cooling initiation. It is desirable to open this valve at reduced RCS pressure so a minimal differential pressure exists across the valve (i.e., make operation of the valve easier).

CT. Steps in this Blocked Function are performed to ensure a source of water is available to the AFW Pump at all times. The use of pre-treated water should be considered only after the CSTs associated with that Unit are nearly depleted. Use of this water is considered an extreme measure.

CU. Component Cooling is isolated to the Containment to divert flow that would have been used by Containment loads (i.e., RCPs), to the Shutdown Cooling Heat Exchangers.

CV. Instrument Air is isolated to the Component Cooling Heat Exchanger Isolation Valves so the valves will fail open. The air line is disconnected to bleed air off in the event the solenoid is energized, trapping air to keep the valve shut.

CW. Two Component Cooling Pumps are started to provide flow to the Shutdown Cooling Heat Exchangers for sufficient decay heat removal. At this point during the cooldown, one Component Cooling Pump is sufficient for Shutdown Cooling operations.

CX. 13 Saltwater Pump is aligned to 12 Saltwater Header to support two Component Cooling Heat Exchanger operation.

CY. No comment.

CZ. Valve is shut to prepare for Shutdown Cooling.

DA. The lineup is consistent with OI-3A, Shutdown Cooling. Instrument Air is isolated to the Shutdown Cooling Temperature and Shutdown Cooling Flow Control Valves for easier manual valve operation. All other MOVs are shut to place them in the required position for Shutdown Cooling operation.

DB. Since the ADVs do not have sufficient capacity to permit Plant cooldown and subsequent initiation of Shutdown Cooling operation, cooldown is accomplished by Steam Generator depletion followed by a rapid refill. For further information, see letter NEU 89-397 dated July 17, 1989. The 321°F "Fill and Chill" initiation criteria comes from NEU 93-066 dated March 5, 1993. This is the temperature at which the RCS must be when "Fill and Chill" is started, to ensure there is enough time below 300°F to initiate SDC. In addition see NEU 93-084 dated March 23, 1993.

DC. The Steam Driven AFW Pumps are secured since they are not needed. The Pumps should not be allowed to operate at "idle" since lubrication (via the slinger rings) cannot be assured.

DD. Steam Generator level of -350 inches was chosen so that relatively accurate indication at 1C43 is maintained.

DE. 13 AFW Pump (instead of the Turbine Driven Pumps) is started to provide relatively high AFW flow rate to re-fill the Steam Generators. For further information, see letter NEU 89-397 dated July 17, 1989.

DF. During the Steam Generator depletion process, the ABO completes aligning Shutdown cooling with the exception of the Shutdown Cooling Header Return Isolation, 1-SI-651-MOV.

DG. For further information concerning this Step, see letter NEU 89-397 dated July 17, 1989.

DH. 1-SI-651-MOV is opened when the RCS temperature is less than 300°F. This is consistent with OI-3B.

DI. 1-SI-306-CV is opened to obtain a 1-inch stem rise so the LPSI Pump is not operated at shut-off head.

DJ. 11 LPSI is started to establish flow through the Shutdown Cooling System.

DK. 1-SI-306-CV is opened to obtain a 1 and one-half inch stem rise which will approximate 1500 GPM flow through the Shutdown Cooling System. This position was determined by field inspection during Shutdown Cooling operations.

DL. Shutdown Cooling Heat Exchanger heatup rate is determined by using a contact pyrometer (thermometer) since instrumentation normally used will not be available.

DM. The limits in this Step are consistent with OP-5. When Mode 5 is declared, the Safe Shutdown goals have been achieved.