

HOPE CREEK GENERATING STATION

HC.OP-IO.ZZ-0008(Q) - Rev. 29

SHUTDOWN FROM OUTSIDE CONTROL ROOM

USE CATEGORY: I

FIELD COPY EXISTS

- Biennial Review Performed: Yes No NA
- Packages and Affected Document Numbers incorporated into this revision:
 CP No. _____ CP Rev. _____ AD No. _____ Rev No. _____ None
- The following OTSCs were incorporated into this revision: None

REVISION SUMMARY

70085663-0010

- Step 5.2.2: Changed step to maintain reactor level between -38” and +54” and to maintain the reactor pressure band between 800 and 1000 psig.
- Step 5.5.1.f.4 was added to direct closure of EG-HV-2662, Mn Turb Aux TACs Sup.
- Step 5.9.3.A was deleted. This step states to maintain Torus temperature <95 degrees. With the reactor isolated and cooling down using SRVs, it will be impossible to maintain Torus temperature <95 degrees. This is based upon data from the Hope Creek event of 10/10/2004.

70085373-0010

- Rearranged procedure steps to allow ease of procedure usage, based upon Training input from students.
 Changed previous Section 5.11 to Section 5.9
 Changed previous Section 5.9 to Section 5.10
 Changed previous Section 5.10 to Section 5.11
- Section 4.0: Added Timers (2) to list of equipment
- Section 5.8: Corrected RHR loop “B” flow (10,470) to be consistent with HC.OP-SO.BC- 0001 flow setpoints.
- Changed step 5.8.1.G to two steps and renumbered steps in section 5.8.1
- Attachment 1, Section A, Step 5: Changed to “The OVERLOAD/POWER FAIL MONITOR (OPF) is disabled for all valves mentioned in Steps 1, 2, 3 & 4”.
- Attachment 1, Section A, Step 7: Changed to “The RSP/RSS TAKEOVER, RHR LOGIC A OUT OF SERVICE, AND the BOP SAFETY SYS OUT OF SVCE alarms annunciate.”

(Revision Summary continued on next page)

IMPLEMENTATION REQUIREMENTS

Effective Date 6/23/09

None

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SHUTDOWN FROM OUTSIDE CONTROL ROOM

Revision Summary (Continued)

- Attachment 1, Section B: Add into steps 6, 7, 8, 9, 10 and 11 the nomenclature for the valves listed and the system designation for each valve.
- Attachment 1, Section D, Step 5: Changed to “The RSP/RSS TAKEOVER, RHR LOGIC D OUT OF SERVICE, AND the BOP SAFETY SYS OUT OF SVCE alarms annunciate.”
- Attachment 1, Section E: The following Steps were added:
 1. BB-HV-F031B, Reactor Recirculation Pump BP201 Discharge valve closes AND BP201 B Reactor Recirculation Pump trips (only if step C.4 of HC.OP-AB.HVAC-002 was not performed).
 2. The BOP SAFETY SYS OUT OF SERVICE AND RSP/RSS TAKEOVER alarms are annunciated.

70085399-0010

- Attachment 4: DELETED former Steps 1.6 and 1.7.

70089738-0010

- Attachment 2, Page 1 of 6, Location of Suppression Pool temperature indication corrected to Aux. Bldg., El. 163, Room 5605.

SHUTDOWN FROM OUTSIDE CONTROL ROOM

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	PURPOSE.....	3
2.0	PREREQUISITES	3
3.0	PRECAUTIONS AND LIMITATIONS	3
4.0	EQUIPMENT REQUIRED	5
5.0	PROCEDURE	6
5.1	Establish Control from Outside the Control Room	6
5.2	Place RCIC in Service	13
5.3	Remove RCIC From Service	16
5.4	Place SSW Loop B in Service	17
5.5	Place SACS Loop B in Service	18
5.6	Place Control Area Chilled Water in Service	19
5.7	Place the 1E Panel Room Chilled Water System in Service	19
5.8	RHR Suppression Pool Cooling Mode	20
5.9	Lower Suppression Pool Water Level	22
5.10	Plant Cooldown	24
5.11	Lower Reactor Water Level	27
5.12	Control Room Re-entry	28
6.0	RECORDS	30
7.0	REFERENCES.....	30

SHUTDOWN FROM OUTSIDE CONTROL ROOM

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
ATTACHMENTS		
Attachment 1,	RSP Transfer Switch Automatic Action Not Observed At RSP	31
Attachment 2,	RSP Redundant Instrumentation/Controls	38
Attachment 3,	A RHR Loop Suppression Pool Cooling	44
Attachment 4,	B RHR Loop Shutdown Cooling Operation	48
Attachment 5,	Reactor Coolant System Temperature/Pressure Data	52
Attachment 6,	Communications And Emergency Lighting Systems For Safe Shutdown Areas	56
Attachment 7,	Remote Shutdown Communication System	62
Attachment 8,	HPCI Shutdown From "A" Diesel Generator Control Room	65
Attachment 9,	Vessel Level Instrumentation Temperature Compensation Curves	66
Attachment 10,	Alternate Shutdown Cooling From The Remote Shutdown Panel Room Following A Loss Of Offsite Power	70
Attachment 11,	A RHR Loop Shutdown Cooling Operation	75
Attachment 12,	Operational Limitations Comment Page	86

SHUTDOWN FROM OUTSIDE CONTROL ROOM

START TIME	_____	DATE	_____	BY	_____
TERMINATION TIME	_____	DATE	_____	BY	_____
COMPLETION TIME	_____	DATE	_____	BY	_____

1.0 PURPOSE

This procedure provides guidelines for the shutdown of the plant from outside the Control Room, AND for re-establishing control in the Control Room.

2.0 PREREQUISITES

2.1 HC.OP-AB.HVAC-0002(Q), Control Room Environment, complete if possible. _____

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Administrative

3.1.1. This procedure is to be used as a guideline for shutdown of the plant from outside the Control Room. It is NOT required that each section/step be performed in precise sequence as long as the sections/steps are performed in a timely manner, in keeping with the intent of this procedure. Any deviations and/or limitations of this procedure shall be justified and documented on Attachment 12, Operational Limitations Comment Page. _____

3.1.2. In the event plant conditions require a delay during performance of this procedure, the SM/CRS should retain this procedure UNTIL it is continued OR terminated. _____

3.1.3. IF it is terminated prior to completion, the SM/CRS should note the reason, time, AND date of termination on this procedure. _____

3.1.4. For any unit scram, the Event Classification Guide should be referred to for the appropriate classification and notifications. _____

3.1.5. WHEN RSP Transfer Switches are placed in EMER, all trips and auto starts associated with the following equipment are bypassed: [CD-904B, CD-695A]

- A. SACS PUMPS B and D _____
- B. SSWS PUMPS B and D _____
- C. RHR PUMP B _____
- D. RCIC System _____

3.1.6. A fire in the Relay Room can cause BJ-HV-F008, HPCI TEST BYPASS TO CST to spuriously open. IF HPCI suction is aligned to the Suppression Pool, this valve may be closed from its MCC - 10D251102. _____

3.1.7. IF ruptured, the RCIC Exhaust Diaphragms relieve exhaust steam directly to the Torus Chamber Area, creating a severe personnel safety hazard. **ENSURE** that all personnel are NOTIFIED of this hazard during RCIC system operation. [CD-473G] _____

3.1.8. Interlocks designed to prevent inadvertent draining of the vessel by opening 1BC-HV-F006B are overridden when control is transferred to the Remote Shutdown Panel. _____

3.2 Other

3.2.1. The precautions and limitations in the appropriate SOPs will be applicable when the SOPs are used in this procedure. _____

3.2.2. AP211 (BP211) A (B) FUEL POOL COOLING PUMP(s) may trip due to channel transfers. Fuel Pool Cooling Demineralizers should be placed in hold, as required. _____

3.2.3. The use of this procedure to perform operations following a Loss of Offsite Power is as described by this procedure with the following exceptions: _____

- The Main Turbine AND Reactor Feed Pump Turbines can not be placed on the turning gear. _____
- IF HPCI had not been shutdown from A Diesel Generator Control Room IAW Attachment 8, THEN Attachment 8 will be required to be performed to satisfy the "isolation of HPCI" requirement of Attachment 10, Step 1.2.9. _____

3.2.4. IF the HPCI system fails to trip on Reactor High Level, the Reactor level will rise from normal operating level to the bottom of the steam nozzles in 6 minutes after HPCI is initiated and injects water to the reactor. When HPCI is manually tripped 10 minutes after initiation, the water filled RCIC steam lines will take approximately 32 minutes to drain to the point when steam can be reintroduced to the RCIC turbine. Reactor water level will reach Level 2 in approximately 57 minutes.

3.2.5. To enhance personnel protection from CO2 migration, the proper pathway during a fire occurrence in Control Equipment Mezzanine Room elevation 117' 0" is to use the walk path elevation 137'0" through corridor No.5501 and the back stairs (No.51-02) to access such areas as switchgear rooms if required.

4.0 EQUIPMENT REQUIRED

- Sound powered phones
- Radios
- Keys for Security Doors and MCC Keylock Switches (located in key cabinet, Remote Shutdown Panel Room)
- Screwdriver or equivalent for panel door screws.
- Timers (2)

5.0 PROCEDURE

NOTE

Each step should be initiated upon completion of the step.
 Attachment 2 should be referred to for RSP redundant instrumentation/ controls.
 Attachment 3 should be referred to for placing 'A' Loop RHR in Suppression Pool Cooling.
 Attachments 6 and 7 should be referred to for plant communications information. When dispatching an operator to a remote shutdown control station, the operator should be provided with a sound-powered phone OR radio to assist with communication.

5.1 Establish Control from Outside the Control Room

5.1.1. **ENSURE** that all prerequisites have been satisfied IAW Section 2.0 of this procedure.

NOTE

IF the Reactor was NOT scrammed AND the MSIVs are still open, then the Feedwater System AND the Main Turbine Bypass Valves may be regulating Rx level AND Rx pressure at this time.

Opening the circuit breakers listed in Step 5.1.2 will deenergize the RPS busses, scrambling the plant, AND deenergize the NSSSS busses, closing the MSIVs.

10C410(10C411) RPS PWR Dist. Panels A(B) are located in Control/DG Bldg. El. 54'.

5.1.2. IF required to Scram the reactor or close the MSIVs, **PERFORM** the following:

A. IF the Reactor was NOT scrammed prior to Control Room evacuation, THEN OPEN the following circuit breakers:
[CD-987X]

1. RPS PWR DIST PNL A 10C410
 - CB2A, RPS TRIP SYS A1 TO 10C609
 - CB3A, RPS TRIP SYS A1 TO 10C611
 - CB5A, NSSSS OUTBOARD
 - CB7A, RPS TRIP SYS A2 TO 10C611
 - CB8A, RPS TRIP SYS A2 TO 10C609

(Continued on next page)

5.1.2.A (Continued)

2. RPS PWR DIST PNL B 10C411

- CB2B, RPS TRIP SYS B2 TO 10C611 _____
- CB3B, RPS TRIP SYS B1 TO 10C609 _____
- CB5B, NSSSS OUTBOARD _____
- CB7B, RPS TRIP SYS B2 TO 10C609 _____
- CB8B, RPS TRIP SYS B1 TO 10C611 _____

B. IF required to close the MSIVs,
THEN OPEN the following circuit breakers:

- RPS PWR DIST PNL A 10C410
 CB5A, NSSSS OUTBOARD _____
- RPS PWR DIST PNL A 10C411
 CB5B, NSSSS OUTBOARD _____

5.1.3. IF the Rx scram was NOT verified prior to evacuating the Control Room, THEN VERIFY Rods Full In. (SPDS/CRIDS (TSC) OR RMCS Activity Control Cards OR other). _____

5.1.4. **MONITOR** the RSP System indications
AND CHECK specifically for the following:

A. REACTOR VESSEL PRESSURE PR-7853D
 (905 - 1045 psig) _____

CAUTION

The high level trip may **NOT** function in the event a fire occurs in the relay room.
 [CD-012Z]

B. REACTOR VESSEL LEVEL LR-7854. _____

- Between 12.5" and 54". _____
- IF the rate of rise of RPV level indicates HPCI is injecting
AND the Control Room is unmanned,
PERFORM the following:

PRIOR to exceeding the high level trip (level 8)
OR when HPCI is no longer required,
TRIP HPCI IAW Attachment 8. _____

C. RCIC System status _____

D. PSV-F013F,H,M SRV status
 (standby OR cycling open/closed) _____

E. SUPPRESSION CHAMBER WATER TR-3647J (AND M)
 (average less than 95°F) _____

F. DIESEL GENERATOR 1A (B, C, D) G400 TRIP/CLOSED
 Status (closed IF a loss of offsite power has occurred). _____

NOTE

The following steps include observations, which are made at the RSP only. These steps are adequate in determining 'establishment of control' from the RSP. Actions that occur but cannot be observed at the RSP are contained on Attachment 1.

5.1.5. **ENSURE** the following RSP Switches have been PLACED in EMER: [CD-462Y]:

A. CH "A" TRANSFER, AND OBSERVE the following valves have Auto Closed:

- BC-HV-F021A RHR LOOP A INBD CONT SPRAY MOV. _____
- BC-HV-F006A A RHR PMP SUCT FROM RECIRC LOOP B ISLN MOV. _____

B. CH "C" TRANSFER, AND OBSERVE the following have Auto Opened:

- HD-9370A, REACTOR BUILDING SUPPLY DAMPER. _____
- HD-9414A, REACTOR BUILDING EXHAUST DAMPER. _____

(Continued on next page)

5.1.5 (Continued)

C. CH "B" TRANSFER, AND **OBSERVE** the following:

1. The following valves have Auto Closed:
 - BC-HV-F016B, RHR LP B CONT SPRY VLV. _____
 - BC-HV-F017B, LPCI INJECTION VALVE. _____
 - BC-HV-F021B, RHR LP B CONT SPRY VLV. _____
 - BC-HV-F027B, RHR LP B SUP POOL SPRY VLV. _____
 - BD-HV-F022, RCIC TEST BYP CST VLV. _____

2. The following valves have Auto Opened:
 - BD-HV-F012, RCIC PMP DISCH MOV. _____
 - FC- HV-F059, RCIC EXH ISLN MOV. _____
 - FC-HV-F060, RCIC VAC PMP DSCH ISLN MOV. _____
 - FC-HV-F062, RCIC EXH VAC BKR INBD ISLN VLV. _____
 - HV-2520B, RHR PMP B CLG WTR SUP VLV. _____

3. The RCIC Jockey Pump BP-228 has auto-started. _____

4. RCIC Turbine alarms are enabled at the RSP (may not be ON). _____

(Continued on next page)

5.1.5 (Continued)

D. CH "D" TRANSFER, AND **OBSERVE** the following:

1. The following have Auto Opened:

- BC-HV-F004D, RHR PUMP D SUPP POOL SUCT MOV. _____
- FC-HV-F084, RCIC EXH VAC BKR INBD ISLN MOV. _____
- HD-9370B, REACTOR BLDG SUPPLY DAMPER. _____
- HD-9414B, REACTOR BLDG EXHAUST DAMPER. _____

2. The following have Auto Closed:

- FC-HV-F004, VACUUM TANK CONDENSATE PUMP DISCHARGE TO CRW (Fails Closed). _____
- BC- HV-F010B, RHR LOOP D TEST RET MOV. _____
- FC-HV-F025 STEAM TRAP DRAIN VLV. _____

3. RHR Jockey Pump DP228 has started. _____

NOTE

HV-F031B becomes INOP from Main control Room, which is NOT observed, and the Reactor Recirc Pump Drive Motor (1BG120) BKR should open When valve HV-F031B reaches <90% open.

E. CHANNEL "NON-1E" TRANSFER, AND **OBSERVE** HV-F031B, Reactor Recirculation Pump BP201's Discharge Valve has Closed. _____

F. PMP BP202 XFR - B RHR PUMP _____

G. PMP BP502 XFR - B SERV WTR PUMP _____

H. PMP DP502 XFR - D SERV WTR PUMP _____

I. PMP BP210 XFR - B SACS PUMP _____

J. PMP DP210 XFR - D SACS PUMP _____

(continued on next page)

5.1.5 (continued)

NOTE

IF running, Chillers BK400 and BK403 will trip when their respective transfer switches are taken to emergency.

- K. MOTOR BK400 TRANS _____
- L. MOTOR BK403 TRANS _____
- 5.1.6. IF emergency takeover is successful, notify the Shift Manager that control has been established from the Remote Shutdown Panel _____
- 5.1.7. The remaining steps may be completed concurrently with Section 5.2, Placing RCIC system in Service. _____
- 5.1.8. **ENSURE** that Site Protection has been informed of the Control Room evacuation, and are responding to address the reason for the evacuation, AND IF the Emergency Response Organization is staffed, **DIRECT** the TSC to coordinate response and recovery efforts. _____
- 5.1.9. **NOTIFY** Chemistry to verify that the Hydrogen/Oxygen System has tripped IAW HC.CH-SO.AX-0001(Q). _____
- 5.1.10. IF a loss of offsite power has occurred, THEN SEND an operator to the Diesel Generator Remote Control Panel (Aux. Bldg El. 130') to monitor Diesel Generator operation, AND IMPLEMENT HC.OP-AB.ZZ-0135(Q), Loss of Offsite Power, concurrent with this procedure. _____
- 5.1.11. At MCC 10D251102 (Rx. Bldg., El. 54'), **ENSURE** BJ-HV-F008, HPCI TEST BYPASS TO CST, is CLOSED as follows (2 Keys Required):
 - A. **PLACE** the NORM/EMER Keyswitch to EMER. _____
 - B. **PLACE** the OPEN/CLOSE Keyswitch to CLOSE. _____

5.2 **Place RCIC in Service**

NOTE

The 135,000 gallon reserve capacity of the CST will allow for 3 hours of RCIC operation at the design flow rate of 600 gpm. This will be adequate to cool the Rx to the shutdown cooling range IF a 100°F/hr cooldown rate is initiated. **[FSAR 7.4.1.4.5.2]**

5.2.1. **IF REQUIRED, THEN PLACE RCIC in service as follows:**
[CD-987X, CD-370X]

- A. **ENSURE** RCIC PUMP FIC-4158 FLOW CONTROLLER is set to 600 gpm. _____
- B. **ENSURE** RCIC PUMP FIC-4158 FLOW CONTROLLER AUTO is ON. _____
- C. **START** 0P219 VACUUM PUMP RCIC GLAND SEAL CONDENSER VAC PUMP. _____
- D. **OPEN** HV-F046 LUBE OIL COOLER WTR ISLN VLV. _____
- E. **OPEN** FC-HV-4282 TURB TRIP THROT VLV Limatorque Operator. _____

CAUTION

To prevent RCIC Turbine exhaust piping and check valve vibration problems, RCIC Turbine speed should be rapidly increased to ≥ 2150 rpm.

To prevent possible bearing damage, RCIC Turbine speed should be limited to ≥ 2150 rpm.

F. SIMULTANEOUSLY **PERFORM** the following:

- **PRESS AND HOLD** HV-F045 OPEN P.B., UNTIL the valve is full open. (TURB STM SUP VLV) _____
- **PRESS** HV-F013 OPEN P.B. (RCIC FW ISLN MOV) _____

(continued on next page)

5.2.1 (continued)

G. **ENSURE** the following:

- 1. HV-F025 RCIC STM LINE DRN AOV is CLOSED. _____
- 2. HV-F004 RCIC VAC TANK LVL AOV is CLOSED. _____
- 3. HV-F022 RCIC TEST BYP TO CST MOV is CLOSED. _____
- 4. SI-4280-2 RCIC TURBINE SPEED less than 4500 rpm. _____

NOTE

During normal observed operation of the RCIC Turbine, Gland Seal Condenser Condensate Pump OP220 cycles ON for \approx 1.5 minutes of every 2.5 minutes. This run frequency maintains the collection tank within the 6.75 - 13.25 " level bands.

- 5. Approximately every 2.5 minutes while the RCIC Turbine is in service, **RUN** the RCIC GLAND SEAL CONDENSER CONDENSATE PUMP OP220 by pressing AND holding the START push button for \approx 1.5 min, THEN releasing the START push button. _____
- H. IF desired, THEN manually **CONTROL** RCIC Pump flow as follows:
 - 1. **PRESS** RCIC PUMP FIC-4158 FLOW CONTROLLER MAN push button. _____
 - 2. **ADJUST** flow by pressing RCIC PUMP FIC-4158 FLOW CONTROLLER DECREASE/INCREASE push button as required. _____
- I. Upon receiving LALL N061-1 CONDENSATE STORAGE TANK LO-LO LEVEL light, THEN **ENSURE** the following:
 - 1. HV-F031 RCIC PUMP SUCTION FROM SUPPRESSION POOL MOV is OPEN _____
 - 2. HV-F010 RCIC PUMP SUCTION FROM CST MOV is CLOSED. _____

5.2.2. **MAINTAIN** Rx level at -38" to + 54 "
AND Rx pressure between 800 psig and 1000 psig.

NOTE

Different SRVs should be opened each time to evenly distribute the heat being added to the Suppression Chamber.

CAUTION

Opening SRVs at low Reactor pressures (< 700 psig) may result in failure of SRVs to reclose when required.

5.2.3. IF necessary to regulate Reactor pressure,
THEN PRESS PSV-F013F (H, M) SRV OPEN and/or CLOSE
 push buttons.

CAUTION

The Suppression Chamber temperature requirements of T/S 3.6.2.1 shall be observed.

5.2.4. **MONITOR** SUPPRESSION CHAMBER WATER TEMP
 TR-3647J (M) AND SUPPRESSION CHAMBER LEVEL
 LR-4805-2 during any heat inputs to the Suppression Chamber.

5.3 **Remove RCIC From Service**

5.3.1. IF desired, THEN SHUT DOWN RCIC as follows:

A. **ENSURE** RCIC PUMP FIC-4158 FLOW CONTROLLER is in MAN. _____

CAUTION

To prevent possible bearing damage, RCIC Turbine speed should be limited to ≥ 2150 rpm.

B. **DECREASE** turbine speed by pressing FIC-4158 FLOW CONTROLLER DECREASE push button UNTIL SI-4280-2 RCIC TURBINE SPEED indicates ≈ 2150 rpm. _____

C. **CLOSE** the following valves: _____

1. HV-F045 TURB STM SUP VLV _____

2. HV-4282 TURB TRIP THROTTLE VLV _____

D. WHEN it has been determined that RCIC is no longer required, THEN: _____

1. **CLOSE** HV-F013 RCIC FW ISLN MOV. _____

2. **CYCLE** HV-F013 OPEN and CLOSED. _____

E. **ENSURE** SI-4280-2 RCIC TURBINE SPEED is decreasing to 0 rpm. _____

F. **STOP** OP219 VACUUM PUMP RCIC GLAND SEAL CONDENSER VACUUM PUMP. _____

G. IF open, THEN CLOSE HV-F022 RCIC TEST BYPASS TO CST ISLN MOV. (Local) _____

H. **CLOSE** HV-F046 LUBE OIL COOLER WTR ISLN VLV. _____

5.4 **Place SSW Loop B in Service**

NOTE

IF time permits AND personnel are available, the A RHR Loop should be placed in the Suppression Pool Cooling mode IAW Attachment 3 AND the B Loop left for use during Shutdown Cooling.

5.4.1. IF the B Station Service Water Loop is NOT in service, THEN PLACE in service as follows:

- A. **ENSURE** PMP BP502 XFR Switch in EMER. _____
- B. **START** STATION SERVICE WATER BP502. _____

NOTE

SSW Pump Discharge Valve opening sequence (time delayed), is still in effect when a manual OPEN signal is given to valve, with control at RSP.

- C. **OPEN** HV-2198B PMP B DISCH VLV. _____
- D. **OPEN** HV-2197B BACKWASH VALVE. _____
- E. **OPEN** HV-2355B SACS HX B2 OUTLET VALVE. _____
- F. **OPEN** HV-2371B SACS HX B1 OUTLET VALVE. _____
- G. **ENSURE** PMP DP502 XFR Switch in EMER. _____
- H. **START** STATION SERVICE WATER DP502. _____
- I. **OPEN** HV-2198D PMP D DISCH VALVE. _____
- J. **OPEN** HV-2197D BACKWASH VALVE. _____

5.5 **Place SACS Loop B in Service**

5.5.1. IF SACS Loop B is NOT in service, **THEN PLACE** in service as follows:

- A. **ENSURE** PMP BP210 XFR AND PMP DP210 XFR Switches in EMER. _____
- B. **START** SAFETY AUXILIARIES COOLING PMP BP210, AND OBSERVE FI-2549B3 SACS PUMP B AND D DISCH FLOW. _____
- C. IF EGHV-2491B, SACS LOOP B HEAT EXCHANGER INLET ISOLATION VALVE, is closed, **THEN OBSERVE** that it auto opens. _____
- D. **START** SAFETY AUXILIARIES COOLING PMP DP210, AND OBSERVE FI-2549B3 SACS PUMP B AND D DISC FLOW. _____
- E. IF EGHV-2494B, SACS LOOP B HEAT EXCHANGER INLET ISOLATION VALVE, is closed, **THEN OBSERVE** that it auto opens. _____
- F. IF required to supply TACS, **THEN PERFORM** the following:
 - 1. **OPEN** HV-2522B/HV-2496B TACS INBD SPLY/RTN _____
 - 2. **OPEN** HV-2522D/HV-2496D TACS OUTBD SPLY/RTN _____
 - 3. **ENSURE** HV-2522E/HV-2522F TACS COMMON SUPPLY ISOL VLVS are open. (Local) _____
 - 4. **CLOSE** EG HV-2662 MN TURB AUX TACS SUP. (Local-10C105) _____

5.6 Place Control Area Chilled Water in Service

- 5.6.1. IF the Control Area Chilled Water System is NOT in service, THEN PLACE in service as follows:
- A. **ENSURE** MOTOR BK400 TRANS Switch in EMER _____
 - B. **PRESS** BP400 START push button CH WATER CIRC PUMP. _____
 - C. **PRESS** BK400 START push button CH WATERCOMPRESSOR AND PERFORM the following:
 - 1. **VERIFY** PROGRAM TIMER ON is ON. _____
 - 2. AFTER ≈ 51 seconds, THEN VERIFY either BK400 CH WATER COMPRESSOR RUN OR LOAD RECYCLE BK400 CH WATER COMPRESSOR is ON. _____
 - D. **ENSURE** BVH407, CONT EQUIP ROOM SUPPLYFAN is operating. (Local) _____

5.7 Place the 1E Panel Room Chilled Water System in Service

- 5.7.1. IF the 1E Panel Room Chilled Water System is NOT in service, THEN PLACE in service as follows:
- A. **ENSURE** MOTOR BK403 TRANS Switch to EMER _____
 - B. **PRESS** BP414 START push button TSC CH WATER CIRC PUMP _____
 - C. **PRESS** BK403 START push button TSC CH WATER COMPRESSOR AND PERFORM the following:
 - 1. **VERIFY** PROGRAM TIMER ON is ON. _____
 - 2. AFTER ≈ 51 seconds, THEN VERIFY either BK403 TSC CH WATER COMPRESSOR RUN OR LOAD RECYCLE BK403TSC CH WATER COMPRESSOR is ON. _____
 - D. **ENSURE** BVH408, DIESEL AREA PANEL ROOM SUPPLY FAN is operating. (Local) _____

5.8 **RHR Suppression Pool Cooling Mode**

NOTE

IF at any time a situation develops whereby HV-F024A (B) and/or HV-F027A (B) are open and the associated RHR pump is not in operation, a potential system drain down will occur. A subsequent start of the RHR pump will cause water hammer. To preclude this occurrence, ensure both valves are closed and perform a system fill & vent prior to starting the RHR pump.

5.8.1. IF necessary, **THEN PLACE** the B RHR loop in the Suppression Pool Cooling mode as follows: **[CD-987X, CD-370X]**

- A. **ENSURE EG-HV-2512B RHR HX SACS RTN ISLN MOV** is OPEN. PB must be held depressed to open. _____
- B. **ENSURE HV-F004B RHR PMP B SUPP POOL SUCT MOV** is OPEN. _____
- C. **ENSURE HV-F007B RHR PMP B MIN FLOW MOV** is OPEN. _____
- D. **START BP202 RHR PUMP.** _____

NOTE

The following two steps should be performed concurrently.

- E. **THROTTLE OPEN HV-F024B RHR LOOP B TEST RET MOV** UNTIL FI-4435 RHR HEAT EXCHANGER FLOW indicates \approx 10,470 gpm. _____
- F. WHEN FI-4435 RHR HEAT EXCHANGER FLOW indicates > 1400 gpm, THEN CLOSE HV-F007B RHR PMP B MIN FLOW MOV. _____
- G. **ENSURE HV-F047B RHR HX INLET VALVE** AND HV-F003B B RHR HX OUTLET MOV are OPEN. _____
- H. **CLOSE HV-F048B RHR HX B SHELL SIDE BYPASS VLV.** _____
- I. **THROTTLE HV-F024B RHR LOOP B TEST RET MOV** as necessary to reestablish loop B flow of approximately 10,470 gpm on FI-4435. _____
- J. **OBSERVE TR-3647J (M)-SUPPRESSION CHAMBER WATER TEMP.** _____

5.8.2. IF B RHR Suppression Pool Cooling Loop is no longer needed,
THEN REMOVE it from operation as follows:

- A. **OPEN** HV-F007B RHR PMP B MIN FLOW MOV. _____
- B. **CLOSE** HV-F024B RHR LOOP B TEST RET MOV. _____
- C. **STOP** BP202 RHR PUMP. _____
- D. **OPEN** HV-F048B RHR HX B SHELL SIDE BYPASS VALVE. _____
- E. **REPOSITION** EG-HV-2512B RHR HX SACS RTN ISLN MOV as necessary. PB must be held depressed. _____

5.9 **Lower Suppression Pool Water Level**

- 5.9.1. As necessary to reduce Suppression Pool level, **DIRECT** the Radwaste Control Room to transfer water from the Suppression Pool via the TWCU Pump & Fuel Pool Filter to the CST. _____

CAUTION

'B' Loop of RHR must be in the Suppression Pool Cooling Mode to perform the following (see Section 5.8). Water should NOT be discharged to Liquid Radwaste if the temperature on TI-4401, Disch to LRW-DISCH TEMP, exceeds 200°F.

- 5.9.2. IF the TWCU Pump is unavailable THEN **ROUTE** RHR flow to Liquid Radwaste as follows:
- A. **PLACE** RHR Loop B in Suppression Pool Cooling IAW Section 5.8 _____
 - B. **ENSURE** TI-4401 Disch to LRW-Disch Temp is < 200°F. _____
 - C. **NOTIFY** Radwaste Operator of impending discharge to Liquid Radwaste System. _____
 - D. **OPEN** HV-F049 RHR LOOP B DISCH TO LIQ RW ISLN MOV. _____
 - E. **ENSURE** HV-4439 RHR LOOP B DISCH TO LIQ RW ISLN MOV is OPEN. _____
 - F. **THROTTLE** OPEN HV-F040 RHR LOOPS B DISCH TO LIQ RW ISLN MOV. _____
 - G. WHEN the desired Suppression Pool Level is reached, THEN **PERFORM** the following:
 - 1. **CLOSE** HV-F040 _____
 - 2. **CLOSE** HV-F049 _____

5.9.3. IF B RHR LOOP is in Shutdown Cooling AND unavailable for use in decreasing Torus Level AND the A Loop of RHR is in service in the Torus Cooling mode, THEN PERFORM the following to utilize Alternate Vessel Letdown flowpath to decrease level:

- A. **NOTIFY** Radwaste Operator of impending discharge to the Liquid Radwaste System. _____

CAUTION

Water at > 200°F should NOT be discharged to the Liquid Radwaste System.

- B. **ENSURE** BC-HV-4439 LIQUID RADWASTE ISOLATION VALVE is OPEN. _____
- C. **UNLOCK AND OPEN** 1-BC-V153 RHR Pump A Dsch Hdr to RW Iso Vlv. _____

CAUTION

Communications should be established AND maintained continuously between the RSP AND the operator controlling the letdown rate locally at the Discharge Header Isolation Valve.

- D. **THROTTLE OPEN** 1-BC-V152 RHR Pump A Dsch Hdr to RW Sup Vlv to initiate AND control the letdown rate: _____
- E. WHEN desired Torus level decrease has been achieved, THEN CLOSE 1-BC-V152 RHR Pump A Dsch Hdr to RW Sup Vlv. _____
- F. **CLOSE AND LOCK** 1-BC-V153 RHR Pump A Dsch Hdr to RW Iso Vlv _____

5.10 **Plant Cooldown**

- 5.10.1. **BEGIN** plotting the Reactor Coolant System cooldown rate IAW Attachment 5, Reactor Coolant System Temperature/ Pressure Data. [T/S 4.4.6.1.1] _____

CAUTION

The Reactor Coolant System temperature and pressure requirements of T/S 3.4.6.1 shall be complied with. During plant Cooldown/Depressurization, similar Rx water level instrumentation should be monitored for significant deviation indicating possible reference line degassing. Also, all maintenance activities which have the potential for draining the Rx Vessel should be terminated.

- 5.10.2. **ESTABLISH AND MAINTAIN** a cooldown rate < 90°F/hr by removing steam using the RCIC System AND the SRVs. _____
- 5.10.3. **MONITOR AND ENSURE** the following while reducing pressure:
- A. SUPPRESSION CHAMBER LEVEL LR-4805-2 (74.5" - 78.5"). [T/S 3.6.2.1] _____
 - B. SACS PUMP B & D SUC TEMP TI-2535B2. The normal temperature band for SACS is 55°F to 87°F. The UFSAR limits are 32°F for minimum AND 95°F for maximum. [CD-397H] _____
- 5.10.4. **ENSURE** the Main Turbine AND Reactor Feed Pump Turbines are on the turning gear. _____
- 5.10.5. BEFORE Reactor Pressure decreases to < 660 psig, THEN VERIFY all Primary AND Secondary Condensate Pumps are secured. (Local) _____

NOTE

IF the A RHR Loop is in Suppression Pool Cooling:

- The A RHR Loop should be maintained in operation while the B RHR Loop is placed in Shutdown Cooling operation.
- IF time AND personnel are available, the B RHR Loop can be drained and filled with CST water (locally) prior to reaching 65 psig to 80 psig.

High Reactor pressure will prevent opening of the shutdown cooling valves but will NOT isolate the valve IF pressure rises above setpoint.

CAUTION

WHEN the RSP Transfer Switch is placed in EMER, RHR S/D Cooling interlocks for overpressure AND low Reactor level are inoperable. RX pressure of 80 psig should NOT be exceeded WITH Suction Valves F008 & F009 open.

5.10.6. At < 80 psig, **PERFORM** the following: [CD-987X, CD-370X]

- A. IF B RHR Loop is operating in Suppression Pool Cooling, THEN REMOVE it from operation per Step 5.8.2. _____
- B. IF a LOP has occurred AND continued cooldown is required **INITIATE** alternate S/D Cooling IAW Att. 10. [PR 981228174] _____
- C. **PLACE** B RHR in Shutdown Cooling Operation IAW Attachment 4. _____
- D. IF DESIRED to place "A" RHR Loop in Shutdown Cooling, **PLACE** A RHR in Shutdown Cooling Operation IAW Attachment 11. _____

5.10.7. **MAINTAIN** a cooldown rate < 90°F/hr by throttling open/closed HV-F048B RHR HX B SHELL SIDE BYP MOV. _____

NOTE

After the RCIC System is shutdown, the CRD System (and the Condensate System, if available) will be the only water supply to the Reactor.

5.10.8. At ≈ 65 psig, **SHUT DOWN** the RCIC System per Step 5.3.1. _____

5.10.9. **CONTINUE** cooldown by throttling HV-F048B RHR HX B SHELL SIDE BYP MOV. _____

NOTE

The unit will be in Cold Shutdown (Operational Condition 4) when Reactor Coolant Temperature is < 200°F.

5.10.10. **CONTINUE** the cooldown to < 200°F **AND RECORD** the time the unit enters Cold Shutdown.

Time: _____

5.10.11. **CONTINUE** the cooldown **UNTIL** the final desired Reactor coolant temperature is reached. (An administrative temperature range of 90°F -110°F should be maintained although other temperature(s) within T/S limits may be used to support specific plant operations, as necessary) _____

5.10.12. **AFTER** ensuring that the temperature readings at the final desired temperature are to the right of the limits in T/S 3.4.6.1, **THEN STOP** plotting the Reactor Coolant Cooldown rate. _____

5.10.13. **MAINTAIN** the following **UNTIL** the Control Room is re-entered:

A. REACTOR VESSEL PRESSURE PR-7853D < 1 psig. _____

B. REACTOR VESSEL LEVEL LR-7854 30" - 39". _____

C. SUPPRESSION CHAMBER WATER TEMP TR-3647J (M) < 95°F **AND** SUPPRESSION CHAMBER LEVEL LR-4805-2 74.5" - 78.5". _____

5.11 Lower Reactor Water Level

NOTE

It may be necessary to reduce Rx level due to CRD System water entering the Rx thru the CRD seals.

CAUTION

Opening HV-F007B to lower Reactor water level is to be done only when absolutely necessary. Opening this valve provides the potential for an uncontrolled drainage path from the Reactor to the Suppression Pool. [CD-847E]

- 5.11.1. IF it is necessary to reduce Reactor level WHEN Reactor pressure is \approx 1 - 80 psig, THEN ROUTE RHR flow to the Torus by opening HV-F007B B RHR PMP MIN FL MOV UNTIL desired level is obtained, THEN CLOSE HV-F007B. _____

- 5.11.2. IF it is necessary to reduce Reactor level WHEN Reactor coolant Temperature is < 200°F, THEN ROUTE RHR flow to Liquid Radwaste as follows:
 - A. **ENSURE** TI-4401 DISCH TO LRW-DISCH TEMP is reading < 200°F. _____
 - B. **NOTIFY** Radwaste Operator of impending discharge to Liquid Radwaste System. _____
 - C. **OPEN** HV-F049 RHR LOOP B DSCH TO LIQ RW ISLN MOV. _____
 - D. **ENSURE** HV-4439 RHR LOOP B DSCH TO LIQ RW ISLN MOV is OPEN. _____
 - E. **THROTTLE** OPEN HV-F040 RHR LOOPS B DSCH TO LIQ RW ISLN MOV. _____
 - F. WHEN the required Reactor Level is reached, THEN CLOSE HV-F040 RHR LOOP B DSCH TO LIQ RW ISLN MOV. _____
 - G. **CLOSE** HV-F049 RHR LOOP B DSCH TO LIQ RW ISLN MOV. _____

5.12 **Control Room Re-entry**

5.12.1. UPON re-entry to the control room,
THEN PERFORM the following:

A. **ESTABLISH** communications between the RSP
AND the Control Room. _____

B. IF Step 5.1.2 was performed,
THEN CLOSE the following circuit breakers:

1. RPS PWR DIST PNL A 10C41

- CB2A _____
- CB3A _____
- CB5A _____
- CB7A _____
- CB8A _____

2. RPS PWR DIST PNL B 10C411

- CB2B _____
- CB3B _____
- CB5B _____
- CB7B _____
- CB8B _____

C. **ENSURE** NSSSS AND PCIS are reset. _____

CAUTION

Failure to reset NSSSS prior to transferring control back to the Main Control Room may result in Shutdown Cooling Isolation.

D. IF RCIC is running from the RSP, **ENSURE** the RCIC flow controller in the MCR is matched WITH actual RCIC flow. _____

(Continued on next page)

5.12.1 (Continued)

E. **PLACE** the following RSP Switches to NORM:

- 1. PMP BP202 XFR - B RHR PUMP _____
- 2. PMP BP502 XFR - B SERV WTR PUMP _____
- 3. PMP DP502 XFR - D SERV WTR PUMP _____
- 4. PMP BP210 XFR - B SACS PUMP _____
- 5. PMP DP210 XFR - D SACS PUMP _____
- 6. MOTOR BK400 TRANS _____
- 7. MOTOR BK403 TRANS _____
- 8. CH "A" TRANSFER _____
- 9. CH "B" TRANSFER _____
- 10. CH "C" TRANSFER _____
- 11. CH "D" TRANSFER _____
- 12. CHANNEL "NON-1E" TRANSFER _____

F. As directed by the SM/CRS, **REFER** to the appropriate system operating/Integrated operating procedures for further instructions. _____

6.0 RECORDS

6.1 **RETAIN** the entire procedure IAW RM-AA-101, Records Management Program.

7.0 REFERENCES

7.1 BLP letter #15653 (Dated 3/26/84) GE letter HCGS-L-86-110

7.2 Gai-tronics drawing 10855 E-48-40(2)1

7.3 Other

- CD-695A, INPO SOER 82-04R05
- CD-387X, FSAR 7.4.2.4.4
- CD-133B, SER 44-83
- CD-812X, FSAR Appendix 9A
- CD-389B, NRB 153
- CD-987X, FSAR 15.9.6.6.3(c)
- CD-904B, GE SIL 326
- CD-462Y, FSAR Appendix 9A.III.L.3
- CD-608D, NRC IN 84-81
- CD-012Z, NRC OPEN 354/85-24-02
- CD-847E, SOER 87-02
- E-1466-0, Rev. 0
- CD-473G, OE 6032
- DCP 80076874, RCIC Speed Modification
- CD-066X, FSAR F05-0065-00
- CD-370X, FSAR 7.4.1.4.5.1

7.4 Corrective Actions

- PR 981228174 - APP R SAFE SHUTDOWN METHOD QUESTIONABLE
- 70041689
- 70044438

**ATTACHMENT 1
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP TRANSFER SWITCH AUTOMATIC ACTION
NOT OBSERVED AT RSP
(Page 1 of 7)**

A. CH "A" TRANSFER AUTOMATIC ACTION:

The following actions will occur but will NOT be observed at the RSP:
[CD-904B, CD-462Y]

1. RHR Valves BC-HV-F021A RHR LOOP A INBD CONT SPRAY MOV
AND BC-HV-F006A A RHR PMP SUCT FROM RECIRC LOOP B ISLN
MOV become inoperative. _____
2. RHR Valves BC-HV-F009 SHUTDOWN COOLING INBD ISLN MOV,
AND BC-HV-F049 RHR LOOP B DSCH TO LIQ RW ISLN MOV become
INOP from the Main Control Room. _____
3. SACS Valves HV-2317A FUEL POOL HX A X-CONN
AND HV-7922A FUEL POOL HX A X-CONN auto-close signals are
disabled and valve control becomes INOP from Main Control Room. _____
4. SACS Valves HV-2314A F/POOL CLG HX SUP ISLN
AND HV-7921A F/POOL CLG HX RTN ISLN become INOP from Main
Control Room. _____
5. The OVERLOAD/POWER FAIL MONITOR (OPF) is disabled for all valves
mentioned in Steps 1 through 4. _____
6. Fuel Pool Cooling Pump AP211 becomes INOP from Main Control Room. _____
7. The RSP/RSS TAKEOVER
AND RHR LOGIC A OUT OF SERVICE
AND the BOP SAFETY SYS OUT OF SVCE alarms annunciate. _____

**ATTACHMENT 1
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP TRANSFER SWITCH AUTOMATIC ACTION
NOT OBSERVED AT RSP
(Page 2 of 7)**

B. CH "B" TRANSFER AUTOMATIC ACTION:

The following actions will occur but will NOT be observed at the RSP:
[CD-904B, CD-462Y]

1. RHR Valves BC-HV-F016B RHR LP B CONT SPRY VLV, BC-HV-F017B LPCI INJECTION VALVE, BC-HV-F021B RHR LP B CONT SPRY VLV, AND BC-HV-F027B RHR LP B SUP POOL SPRY VLV become inoperative. _____
2. RHR Valves BC-HV-F003B RHR HX B OTLT VLV, BC-HV-F004B RHR PMP SUPP POOL MOV, BC-HV-F006B RHR PMP SUCT FROM RECIRC LOOP B ISLN MOV, BC -HV-F007B RHR MIN FLOW MOV, BC-HV-F024B RHR LOOP TEST RET MOV, BC-HV-047B RHR HX B INL VLV, AND BC-HV-F048B RHR HX B SHELL SIDE BYP become INOP from the Main Control Room. _____
3. RCIC Valves BD-HV-F012 RCIC PMP DISCH MOV, FC- HV-F059 RCIC EXH ISLN MOV, FC-HV-F060 RCIC VAC PMP DSCH ISLN MOV, AND FC-HV-F062 RCIC EXH VAC BKR INBD ISLN VLV become INOP from Main Control Room. _____
4. The RCIC Vacuum Pump OP-219 AND RCIC Condenser Pump OP-220 Auto-Start signals are disabled. _____
5. RCIC Turbine alarms are enabled at the RSP (may not be ON). _____
6. RCIC Valves FC-HV-F008 RCIC STEAM SUPPLY OUTBOARD ISOLATION VALVE, FC-HV-F010 CONDENSATE STORAGE TANK TO RCICPUMP SUCTION VALVE, BD- HV-F013 RCIC PUMP DISCHARGE TO FEEDWATER LINE ISOLATION VALVE, BD-SV-F019/SV-4405 RCIC PUMP DISCHARGE MINIMUM FLOW VALVES, FC-HV-4282 RCICTURBINE TRIP/THROTTLE VALVES, FC-HV-F022 TEST RETURN VALVE TO CONDENSATE STORANE TANK, AND FC-HV-F031 SUPPRESSION POOL TO RCIC PUMP SUCTION VALVE become INOP from the Main Control Room. _____
7. RCIC Valves FC-HV-F045, RCIC TURBINE SHUTOFF VALVE AND FC-HV-F046, RCICTURBINE COOLING WATER VALVE, auto open/close signals are disabled AND become INOP from the Main Control Room. _____

(Continued on next page)

**ATTACHMENT 1
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP TRANSFER SWITCH AUTOMATIC ACTION
NOT OBSERVED AT RSP
(Page 3 of 7)**

B. (continued)

- 8. SSWS Valves EA-HV-2197B SSWS STRAINER BF509 MAIN BACKWASH VALVE, EA-HV-2198B SSWS PUMP BP502DISCHARGE VALVE, EA-HV-2204, REACTOR AUXILIARIES COOLING HEAT EXCHANGER SUPPLY VALVE (from SACS loop B), EA-HV-2357B SACS LOOP B TO COOLING TOWER VALVE, AND EA-HV-2371B SACS LOOP B HEAT EXCHANGER B1E201OUTLET VALVE, auto-open signals are disabled AND all valves listed become INOP from the Main Control Room. _____

- 9. Safety Valves PSV-F013F, PSV-F013H AND PSV-F013M become inoperable from the Main Control Room AND the ADS CH OUT OF SERVICE alarm is activated. _____

- 10. SACS Valves EA-HV-2522B/EA-HV-2496B SACS LOOP B TO TURBINE AUXILLARIES COOLING SYSTEM (TACS) INBOARD SUPPLY/RETURN VALVES, EA-HV-2520B RHR PUMP BP202 SEAL AND MOTOR BEARING COOLERS COOLING WATER SUPPLY VALVE, EA-HV-2314B FPCS HEAT EXCHANGER BE202COOLING WATER INLET, EA-HV-2317B FPCS HEAT EXCHANGER COOLING WATER INLET CROSS-CONNECT VALVE, EA-HV-2491B SACS LOOP B HEAT EXCHANGER B1E201INLET VALVE, EA-HV-2512B RHR LOOP B HEAT EXCHANGER TUBE SIDE OUTLET VALVE, EA-HV-7921B FPCS HEAT EXCHANGER BE202COOLING WATER OUTLET VALVE, and EA-HV-7922B FPCS HEAT EXCHANGER COOLING WATER OUTLET CROSS-CONNECT VALVE become INOP from the Main Control Room. _____

- 11. Fuel Pool Cooling Pump BP211 start signals are disabled AND FPCS Valve EC-HV-4689B becomes INOP from the Main Control Room. _____

- 12. The RHR LOGIC B OUT OF SERVICE alarm annunciates AND RHR Pump BP202 becomes INOP from the Main Control Room. _____

(Continued on next page)

**ATTACHMENT 1
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP TRANSFER SWITCH AUTOMATIC ACTION
NOT OBSERVED AT RSP
(Page 4 of 7)**

B. (continued)

- 13. SACS Pump BP210 auto-start signals are disabled
AND pump becomes INOP from Main Control Room
AND Remote Control Panel RCP BP201. _____

- 14. RSP/RSS TAKEOVER, BOP SAFETY SYS OUT OF SERVICE alarms are activated. _____

- 15. SSWS Pump BP502 auto-start signals are disabled
AND pump becomes INOP from Main Control Room
AND Remote Control Panel RCP BP516. _____

- 16. Chiller BK403
AND BP414 auto-start signals are disabled
AND becomes INOP from Main Control Room
AND Remote Control Panel RCP BC487/BC488. _____

**ATTACHMENT 1
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP TRANSFER SWITCH AUTOMATIC ACTION
NOT OBSERVED AT RSP
(Page 5 of 7)**

C. CH "C" TRANSFER AUTOMATIC ACTION:

The following actions will occur but will NOT be observed at the RSP:
[CD-904B, CD-462Y]

1. Reactor Bldg. Ventilation System (RBVS) Supply Damper HD-9370A
AND Exhaust Damper HD-9414A become inoperative from Main Control Room. _____

2. RSP/RSS TAKEOVER AND BOP SAFETY/SYS OUT OF SERVICE alarm is annunciated. _____

3. The OVERLOAD/POWER FAIL MONITOR (OPF) is disabled for RBVS Supply Damper HD-9370A AND Exhaust Damper HD-9414A. _____

**ATTACHMENT 1
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP TRANSFER SWITCH AUTOMATIC ACTION
NOT OBSERVED AT RSP
(Page 6 of 7)**

D. CH "D" TRANSFER AUTOMATIC ACTION:

The following actions will occur but will NOT be observed at the RSP:
[CD-904B, CD-462Y]

1. RHR Valve BC-HV-F004D RHR PUMP D SUPP POOL SUCT MOV AND RCIC Valve FC-HV-F084 RCIC EXH VAC BKR INBD ISLN MOV become INOP from the Main Control Room. _____
2. RHR Valves BC-HV-F008 RECIRC LOOP B TO RHR SUPP OUTBD ISLN MOV, BC-HV- F015B RHR LOOP B RET TO RECIRC LOOP B MOV, BC-HV-F040 RHR LOOP B DISCH TO RW ISLN MOV, BC- HV-4439 RHR TO LRW HDR ISLN MOV AND RCIC Valves FC-HV-F007 RCIC STM INBD ISLN VLV AND FC-HV-F076 RCIC STM LN WARMUP VLV become inoperative from the Main Control Room. _____
3. SACS Pump DP210 AND SSWS Pump DP502 auto-start signals are disabled AND pumps become INOP from Main Control Room. _____
4. Chiller BK400 auto-start input signal is disabled AND becomes INOP from the Main Control Room. _____
5. The RSP/RSS TAKEOVER AND RHR LOGIC D OUT OF SERVICE, AND the BOP SAFETY SYS OUT OF SVCE alarms annunciate. _____
6. SACS Valve HV-2522D TACS OUTBD SUPPLY VLV becomes INOP from the Main Control Room. _____
7. SACS Valves HV-2494B SACS LOOP B HEAT EXCHANGER INLET ISOLATION VALVE, HV-2496D TACS OUTBD RET VLV AND SSWS Valves HV-2197D BACKWASH VALVE D, HV-2198D PUMP D DISCHARGE VLV, AND HV-2355B SACS HX B2 OUTLET VALVE become INOP from the Main Control Room. _____

**ATTACHMENT 1
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP TRANSFER SWITCH AUTOMATIC ACTION
NOT OBSERVED AT RSP
(Page 7 of 7)**

E. CH NON 1E TRANSFER AUTOMATIC ACTION:

1. BB-HV-F031B, Reactor Recirculation Pump BP201 Discharge valve closes
AND BP201 B Reactor Recirculation Pump trips
(only if step C.4 of HC.OP-AB.HVAC-002 was not performed). _____

2. The BOP SAFETY SYS OUT OF SERVICE
AND RSP/RSS TAKEOVER alarms are annunciated. _____

**ATTACHMENT 2
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP REDUNDANT INSTRUMENTATION/CONTROLS
(Page 1 of 6)**

<u>RSP Device</u>	<u>Primary Alternative Device</u>	<u>Alternative Device Description and Location</u>
RCIC	HPCI	HPCI System will automatically cycle on Reactor Vessel level
<u>Nuclear Boiler System</u>		
PR-7853D	PIS-690A,E,J,&N	Indicating trip units Reactor Vessel pressure. El. 102, Relay Room
LR-7854	LIS-N691A&E	Indicating - trip units Reactor Vessel level. El. 102, Relay Room
PSV-F013F	PSV-F013A	Control - Main steam line A. El. 102, Relay Room
PSV-F013H PSV-F013M	PSV-F013E	Safety/relief valve. El. 102, Relay Room
<u>Suppression Pool Monitoring System</u>		
LR-4805-2	LI-4801-1	Indication - suppression pool level. Aux. Bldg., El. 163
TR-3647J	TI-3881A2	Indication - Suppression Pool temperature. Aux. Bldg., El. 163, Room 5605
TR-3647M		
<u>RHR System</u>		
HV-F006B	HV-F006A	Control - RHR Pump AP202 suction from recirc line valve. Rx Bldg., El. 54
HV-F004B	HV-F004A	Control - RHR Pump AP202 suction from Suppression Pool valve. Rx Bldg., El. 54
BP202	AP202	Control - RHR Pump AP202. Aux. Bldg., El. 130 at 10A401

**ATTACHMENT 2
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP REDUNDANT INSTRUMENTATION/CONTROLS
(Page 2 of 6)**

RHR System (continued)

<u>RSP Device</u>	<u>Primary Alternative Device</u>	<u>Alternative Device Description and Location</u>
HV-F048B	HV-F048A	Control - RHR Loop A Hx Bypass Valve. Rx Bldg., El. 77
HV-F015B	HV-F015A	Control - RHR Loop A - SD Cooling Return Valve. Rx Bldg., El. 102
HV-F024B	HV-F024A	Control - RHR Pump AP202 Test Return Valve to Suppression Pool. Rx Bldg., El. 54
HV-F047B	HV-F047A	Control - RHR Loop A Hx shell side inlet valve. Rx Bldg., El. 77
HV-F003B	HV-F003A	Control - RHR Loop A Hx shell side outlet valve. Rx Bldg., El. 54
FI-4435	E11-N652A	Indication - RHR Loop A flow. Aux. Bldg., El. 102, Relay Room
HV-F010B	HV-F010A	Indication - RHR Pump CP202 Test Return Valve to Suppression Pool. Rx Bldg., El. 54
HV-F016B	HV-F016A	Indication - RHR Loop A containment. spray. Rx Bldg., El. 102
HV-F027B	HV-F027A	Indication - RHR Loop A Suppression Pool Spray Line Isolation Valve. Rx Bldg., El. 77
HV-F017B	HV-F017A	Indication - RHR loop A Pressure Coolant Injection Valve. Rx Bldg., El. 102
HV-F004D	HV-F004C	Indication - RHR Pump CP202 Suction from Suppression Pool Valve. Rx Bldg., El. 54
DP-228	CP-228	Indication - ECCS (RHR A) Jockey Pump. Rx Bldg., El. 54

**ATTACHMENT 2
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP REDUNDANT INSTRUMENTATION/CONTROLS
(Page 3 of 6)**

<u>RSP Device</u>	<u>Primary Alternative Device</u>	<u>Alternative Device Description and Location</u>
<u>SACS</u>		
HV-2522B	HV-2522A	Control - SACS Loop A to TACS Inboard Valve. Rx Bldg., El. 102
HV-2522D	HV-2522C	Control - SACS loop A Supply to TACS Outboard Valve. Rx Bldg., El. 102
HV-2496B	HV-2496A	Control - SACS loop A Return from TACS Inboard Valve. Rx Bldg., El. 102
HV-2496D	HV-2496C	Control - SACS Loop A Return from TACS Outboard Valve. Rx Bldg., El. 102
HV-2512B	HV-2512A	Control - RHR loop A Hx Tube Side Outlet Valve. Rx Bldg., El. 77
HV-2520B	HV-2520A	Indication - RHR pump AP202 Seal and Motor Bearing Coolers Cooling Water Supply Valve. Rx Bldg., El. 54
HV-2491B	HV-2491A	Control - SACS loop A Hx A1E201 Inlet Valve. Rx Bldg., El. 102
HV-2494B	HV-2494A	Control - SACS Loop A Hx A2E201 inlet valve. Rx Bldg., El. 102
BP210	AP210	Control - SACS Loop A Pump AP210. Aux. Bldg., El. 130 at 10A401
DP210	CP210	Control - SACS Loop A Pump CP210. Aux. Bldg., El. 130 at 10A403

**ATTACHMENT 2
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP REDUNDANT INSTRUMENTATION/CONTROLS
(Page 4 of 6)**

<u>RSP Device</u>	<u>Primary Alternative Device</u>	<u>Alternative Device Description and Location</u>
<u>SACS</u>		
TI-2535B2	TI-2492A	Indication - SACS Loop A Hx A1E201 inlet temperature. Local, Rx Bldg., El. 102
	TI-2497A	Indication - SACS Loop A Hx A2E201 inlet temperature. Local, Rx Bldg., El. 102
<u>SSWS</u>		
HV-2204	HV-2203	Control - RACS Hx Supply Valve (from SACS Loop A). Rx Bldg., El. 102
HV-2355B	HV-2355A	Control - SACS Loop A Hx A2E201 outlet valve. Rx Bldg., El. 102
HV-2198B	HV-2198A	Control - SSWS Pump AP502 Disc Valve. Intake Structure, El. 80
HV-2371B	HV-2371A	Control - SACS Loop A Hx A1E201 outlet valve. Rx Bldg., El. 102
HV-2198D	HV-2198C	Control - SSWS Pump CP502 disc valve. Intake Structure, El. 80
HV-2197B	HV-2197A	Control - SSWS Strainer AF509 main backwash valve. Intake Structure, El. 93
HV-2197D	HV-2197C	Control - SSWS Strainer CF509 Main Backwash Valve. Intake Structure, El. 93
HV-2357B	HV-2357A	Control - SACS Loop A to Cooling Tower Valve. Rx Bldg., El. 77
BP502	AP502	Control - SSWS Pump AP502. Aux. Bldg., El. 130 at 10A401

**ATTACHMENT 2
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP REDUNDANT INSTRUMENTATION/CONTROLS
(Page 5 of 6)**

<u>RSP Device</u>	<u>Primary Alternative Device</u>	<u>Alternative Device Description and Location</u>
<u>SSWS(Continued)</u>		
DP502	CP502	Control - SSWS Pump CP502. Aux. Bldg., El. 130 at 10A403
<u>RBVS</u>		
HD-9370A	AVH213	Indication - FRVS Recirculation Units. Aux. Bldg., El. 178
HD-9370B	BVH213	Cable Spread Mezz, El. 124
HD-9414A	CVH213	Aux. Bldg., El. 178
HD-9414B	DVH213	Cable Spread Mezz, El. 124
	EVH213	Aux. Bldg., El. 178
	FVH213	Cable Spread Mezz, El. 124
	AVH206	Indication - FRVS Vent Unit. Aux. Bldg., El. 178
	BVH206	Cable Spread Mezz, El. 124

**ATTACHMENT 2
SHUTDOWN FROM OUTSIDE CONTROL ROOM
RSP REDUNDANT INSTRUMENTATION/CONTROLS
(Page 6 of 6)**

<u>RSP Device</u>	<u>Primary Alternative Device</u>	<u>Alternative Device Description and Location</u>
<u>Control Area Chilled Water System</u>		
BK400	AK400	Control - Control Area Chiller AK400. Aux. Bldg., El. 130 at 10A403
BK403	AK403	Control - Safety-Related Panel Room Chiller AK403. Aux. Bldg., El. 130 at 10A401
BP400	AP400	Control - Control Area Chilled Water Circ Pump AP400. Aux. Bldg., El. 130, Sequencer Panel 1CC428, Switch GG
BP414	AP414	Control - Safety-Related Room Chilled Water Circ Pump AP414. Aux Bldg., El. 130, Sequencer Panel 1AC428, Switch EF

**ATTACHMENT 3
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SUPPRESSION POOL COOLING
(Page 1 of 4)**

NOTE

IF time permits AND personnel are available, the A RHR Loop should be placed in the Suppression Pool Cooling mode IAW Attachment 3, and the B Loop left for use during Shutdown Cooling.

1.0 Placing The A RHR Loop In Suppression Pool Cooling

1.1 IF the A SSW pump AP502 is NOT in service, THEN PLACE in service as follows:

1.1.1. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40109 in the EMER position. (Local) _____

1.1.2. **PLACE** BREAKER TEST SWITCH for BRKR 52-40109 in the CLOSE position, **OBSERVING** breaker closure. (Local) _____

1.1.3. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40109 in the NORM position. (Local) _____

1.1.4. **ENSURE** the following: (Local)

A. 1EA-HV-2198A SSWS PMP A DISCH VLV opens. _____

B. 1EA-HV-2371A SACS HX A1 OUT VLV opens. _____

C. 1EA-HV-2197A BACKWASH VLV opens. _____

D. A SSW Pump ammeter indicates 85-110 amps. _____

1.2 IF the C SSW Pump CP502 is NOT in service, THEN PLACE in service as follows:

1.2.1. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40309 in the EMER position. (Local) _____

1.2.2. **PLACE** BREAKER TEST SWITCH for BRKR 52-40309 in the CLOSE position, **OBSERVING** breaker closure. (Local) _____

1.2.3. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40309 in the NORM position. (Local) _____

**ATTACHMENT 3
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SUPPRESSION POOL COOLING
(Page 2 of 4)**

- 1.2.4. **ENSURE** the following: (Local)
 - A. 1EA-HV-2198C SSWS PMP C DISCH VLV opens. _____
 - B. 1EA-HV-2355A SACS HX A2 OUT VLV opens. _____
 - C. 1EA-HV-2197C BACKWASH VLV opens. _____
 - D. C SSW Pump ammeter indicates 85-110 amps. _____

- 1.3 IF the A SACS Pump AP210 is NOT in service,
THEN PLACE in service as follows:
 - 1.3.1. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40104 in the EMER position. (Local) _____
 - 1.3.2. **PLACE** BREAKER TEST SWITCH for BRKR 52-40104 in the CLOSE position, **OBSERVING** breaker closure AND AC AMMETER indicates approx. 50-65 amps. (Local) _____
 - 1.3.3. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40104 in the NORM position. (Local) _____
 - 1.3.4. **ENSURE** 1EG-HV-2491A SACS HX A1E201 INLET is OPEN. _____

- 1.4 IF the C SACS Pump CP210 is NOT in service,
THEN PLACE in service as follows:
 - 1.4.1. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40304 in the EMER position. (Local) _____
 - 1.4.2. **PLACE** BREAKER TEST SWITCH for BRKR 52-40304 in the CLOSE position, **OBSERVING** breaker closure AND AC AMMETER indicates approx. 50-65 amps. (Local) _____
 - 1.4.3. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40304 in the NORM position. (Local) _____
 - 1.4.4. **ENSURE** 1EG-HV-2494A SACS HX A2E201 INLET is OPEN. _____

**ATTACHMENT 3
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SUPPRESSION POOL COOLING
(Page 3 of 4)**

NOTE

Breaker face keylock switches operate in a similar manner to the Remote Shutdown Panel transfer switches. The breaker face keylock switches override certain associated interlocks (e.g., RHR F004A local keylock overrides RHR Suction Valve interlocks associated with F004A and F006A being open simultaneously).

1.5 PLACE A RHR Loop in Suppression Pool Cooling as follows:

1.5.1. **OPEN** 1EG-HV-2512A RHR HX SACS RTN ISLN VLV as follows:

- A. **INSERT** key into keyswitch at breaker 52-212143 RHR HX SACS RTN ISLN VLV BRKR (Local). _____
- B. **TURN** key to the OPEN position
AND LEAVE in the OPEN position with key INSTALLED. _____

1.5.2. **IF closed, THEN OPEN** 1BC-HV-F004A RHR PMP A SUP POOL SUCT VLV as follows:

- A. **INSERT** key into keyswitch at breaker 52-212031, RHR PUMP A SUP POOL SUC BRKR (Local). _____
- B. **TURN** key to the OPEN position
AND LEAVE in the OPEN position with key INSTALLED. _____

NOTE

Radiation Protection should be contacted prior to performing venting and/or draining. The individual(s) performing the venting and/or draining should obtain instructions **AND** approval from the RP Shift Technician or RP Supervisor.

1.5.3. **ENSURE** the A RHR Loop Discharge Header is filled
AND vented by opening 1BC-V353
AND 1BC-V354 Loop A LPCI Inj Hdr Vent Vlvs
UNTIL a solid stream of water is observed,
AND THEN CLOSE 1BC-V353 **AND** 1BC-V354. (Local) _____

**ATTACHMENT 3
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SUPPRESSION POOL COOLING
(Page 4 of 4)**

- 1.5.4. **DIRECT** I/C Technician OR Equipment Operator to proceed to Lower Relay Room Panel 10C617, **AND ESTABLISH** communications via Sound Powered Phones for use during the monitoring of E11-N652A RHR LOOP A FLOW indication in the following step.
(Reference Attachment 7 for Sound Powered Phone Switch S4) _____

- 1.5.5. **START** RHR A Pump AP202 as follows:
 - A. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40106 in the EMER position. (Local) _____
 - B. **PLACE** BREAKER TEST SWITCH for BRKR 52-40106 in the CLOSE position, **OBSERVING** breaker closure **AND** AC AMMETER indicates approx. 130-155 amps. (Local) _____
 - C. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40106 in the NORM position. (Local) _____

- 1.5.6. **ESTABLISH** communications **AND INCR** 1BC-HV-F024A RHR LOOP A TEST RET VLV BRKR 52-212192 (Local) **UNTIL** E11-N652A (Panel 10C617) indicates $\approx 25\%$ ($\approx 10,000$ gpm) as follows:
 - A. **INSERT** key into keyswitch at breaker 52-212192 RHR LOOP A TEST RET BRKR (Local). _____
 - B. **TURN** key to the OPEN position **UNTIL** E11-N652A (Panel 10C617) indicates $\approx 25\%$ ($\approx 10,000$ gpm). _____

- 1.5.7. **CLOSE** 1BC-HV-F048A RHR HX A SHL SIDE BYP VLV as follows:
 - A. **INSERT** key into keyswitch at breaker 52-212092 RHR HX A SHL SIDE BYP BRKR (Local). _____
 - B. **TURN** key to DECREASE for ≈ 40 seconds.
(The normal closing stroke time for this valve is ≈ 40 seconds.) _____
 - C. **THROTTLE** HV-F024A RHR LOOP A TEST RET MOV as necessary to reestablish loop A flow of approx. 10,000 gpm on E11-N652A. _____

- 1.5.8. **MONITOR** TR 3647J (M) SUPPRESSION CHAMBER water temperature. _____

**ATTACHMENT 4
SHUTDOWN FROM OUTSIDE CONTROL ROOM
B RHR LOOP SHUTDOWN COOLING OPERATION
(Page 1 of 4)**

NOTE

IF time permits AND personnel are available, the A RHR Loop should be placed in the Suppression Pool Cooling mode IAW Attachment 3, and the B Loop left for use during Shutdown Cooling.

1.0 Placing The B RHR Loop In Shutdown Cooling Operation

- 1.1 **CLOSE** HV-F004B, B RHR PMP SUPP POOL SUCT MOV. _____
- 1.2 **CLOSE** HV-F007B, B RHR PMP MIN FL MOV. _____
- 1.3 **ENSURE** the following valves are CLOSED:
 - BC-HV-F024B RHR LOOP TEST RET MOV. _____
 - BC-HV-F027B RHR LOOP B SUPP CHAMBER SPRAY HDR ISLN MOV. _____
- 1.4 **CLOSE** 1BC-V262 D ECCS Jockey Pmp to RHR Loop B Isln Vlv (local). _____

NOTE

Interlocks designed to prevent inadvertent draining of the vessel by opening 1BC-HV-F006B are overridden when control is transferred to the Remote Shutdown Panel.

- 1.5 **OPEN** HV-F006B, B RHR PMP SUCT FROM RECIRC LOOP B ISLN MOV. _____

(Continued on next page)

**ATTACHMENT 4
SHUTDOWN FROM OUTSIDE CONTROL ROOM
B RHR LOOP SHUTDOWN COOLING OPERATION
(Page 2 of 4)**

1.6 **FLUSH AND WARM** the B RHR Loop as follows: [CD-066X]

CAUTION

**HV-F004B RHR PMP B SUPP POOL SUCT MOV, HV-F024B RHR LOOP B TEST RET MOV, AND HV-F007B RHR LOOP B MIN FLOW MOV will drain the Reactor Vessel to the Suppression Pool if opened in shutdown cooling.
[CD-389B, CD-608D, CD-847E, CD-695A]**

- 1.6.1. **CLOSE** HV-F003B, B RHR HX OUTLET MOV. _____
- 1.6.2. **PRESS AND HOLD** the OPEN PB for EG-HV-2512B (RHR HX SACS RTN ISLN MOV) until fully open. _____
- 1.6.3. **PERFORM** the following:
 - A. **PLACE** Keylock Switch HS-11495 in the ARMED position (10B242 Breaker 52-242082). _____
 - B. **OPEN** HV-F008 SHUTDOWN COOLING OUTBD ISLN MOV. _____

CAUTION

Opening HV-F009 SHUTDOWN COOLING INBD ISLN MOV may cause a decrease in Reactor water level. [CD-608D]

- 1.6.4. **OPEN** HV-F009 SHUTDOWN COOLING INBD ISLN MOV. _____
- 1.6.5. **NOTIFY** Radwaste Operator of impending discharge of 200°F water to the Liquid Radwaste System. _____
- 1.6.6. **OPEN** HV-F049 RHR LOOP B DSCH TO LIQ RW ISLN MOV. _____
- 1.6.7. **OPEN** HV-4439 RHR LOOP B DSCH TO LIQ RW ISLN MOV. _____
- 1.6.8. **THROTTLE** OPEN HV-F040 RHR LOOP B DSCH TO LIQ RW ISLN MOV to obtain DISCH TO LRW TP TI 4401 TEMPERATURE indication of 200°F. _____

(Continued on next page)

**ATTACHMENT 4
SHUTDOWN FROM OUTSIDE CONTROL ROOM
B RHR LOOP SHUTDOWN COOLING OPERATION
(Page 3 of 4)**

- 1.6.9. WHEN CI-R006 RHR to Radwaste Conductivity indicates < 2 micro-mho's (Local), THEN CLOSE HV-F040 RHR LOOP B DSCH TO LIQ RW ISLN MOV. _____
- 1.6.10. **CLOSE** HV-F049 RHR LOOP B DSCH TO LIQ RW ISLN MOV. _____

CAUTION

HV-F007B RHR PMP B MIN FL MOV will drain the Reactor Vessel to the Suppression Pool IF opened in shutdown cooling operations. [CD-695A, CD-608D, CD-847E]

- 1.6.11. **START** RHR PUMP BP202 AND immediately **THROTTLE OPEN** HV-F015B RHR LOOP B RET TO RECIRC LOOP B ISLN MOV UNTIL RHR HEAT EXCHANGER FI-4435 indicates \approx 3000 gpm. [**CD-133B**] _____
- 1.6.12. **OPERATE** B RHR Loop in Shutdown Cooling at \approx 3000 gpm as indicated on FI-4435 for at least 10 minutes. _____
- 1.7 WHEN conditions of Step 1.6.12 have been satisfied, THEN **THROTTLE OPEN** HV-F015B RHR LOOP B RET TO RECIRC LOOP B ISLN MOV to establish loop flow of \leq 10,000 gpm. _____

**ATTACHMENT 4
SHUTDOWN FROM OUTSIDE CONTROL ROOM
B RHR LOOP SHUTDOWN COOLING OPERATION
(Page 4 of 4)**

CAUTION

The Reactor Coolant System temperature and pressure requirements of T/S 3.4.6.1 shall be complied with.

- 1.8 **OPEN** HV-F003B, B RHR HX OUTLET MOV. _____
- 1.9 **CONTROL** cooldown rate by performing one of the following:
[CD-133B]
 - **THROTTLE** CLOSED HV-F048B B RHR HX SHELL SIDE BYP MOV to increase cooldown rate. _____
 - **THROTTLE** OPEN HV-F048B B RHR HX SHELL SIDE BYP MOV to decrease cooldown rate. _____
 - **THROTTLE** HV-F003B B RHR HX OUTLET MOV as required to increase/decrease cooldown rate. _____
- 1.10 IF Reactor Coolant System temperature and pressure cannot be controlled, **RAISE** Reactor water level to 80 inches to improve natural circulation. [70014100] _____
- 1.11 IF Shutdown Cooling is not able to maintain temperature and pressure AND further cooldown is desired, **IMPLEMENT** Attachment 10. [70014100] _____

**ATTACHMENT 5
SHUTDOWN FROM OUTSIDE CONTROL ROOM
REACTOR COOLANT SYSTEM TEMPERATURE/PRESSURE DATA
(Page 1 of 4)**

1.0 REACTOR COOLANT SYSTEM TEMPERATURE/PRESSURE DATA

1.1 **LOG** the following on page 2 of this attachment every 30 minutes during Reactor cooldown:

1.1.1. Time _____

1.1.2. REACTOR VESSEL - PRESSURE PR-7853D _____

1.1.3. Reactor Vessel Temperature, using the Saturated Steam Tables on Page 4 of this attachment. _____

CAUTION

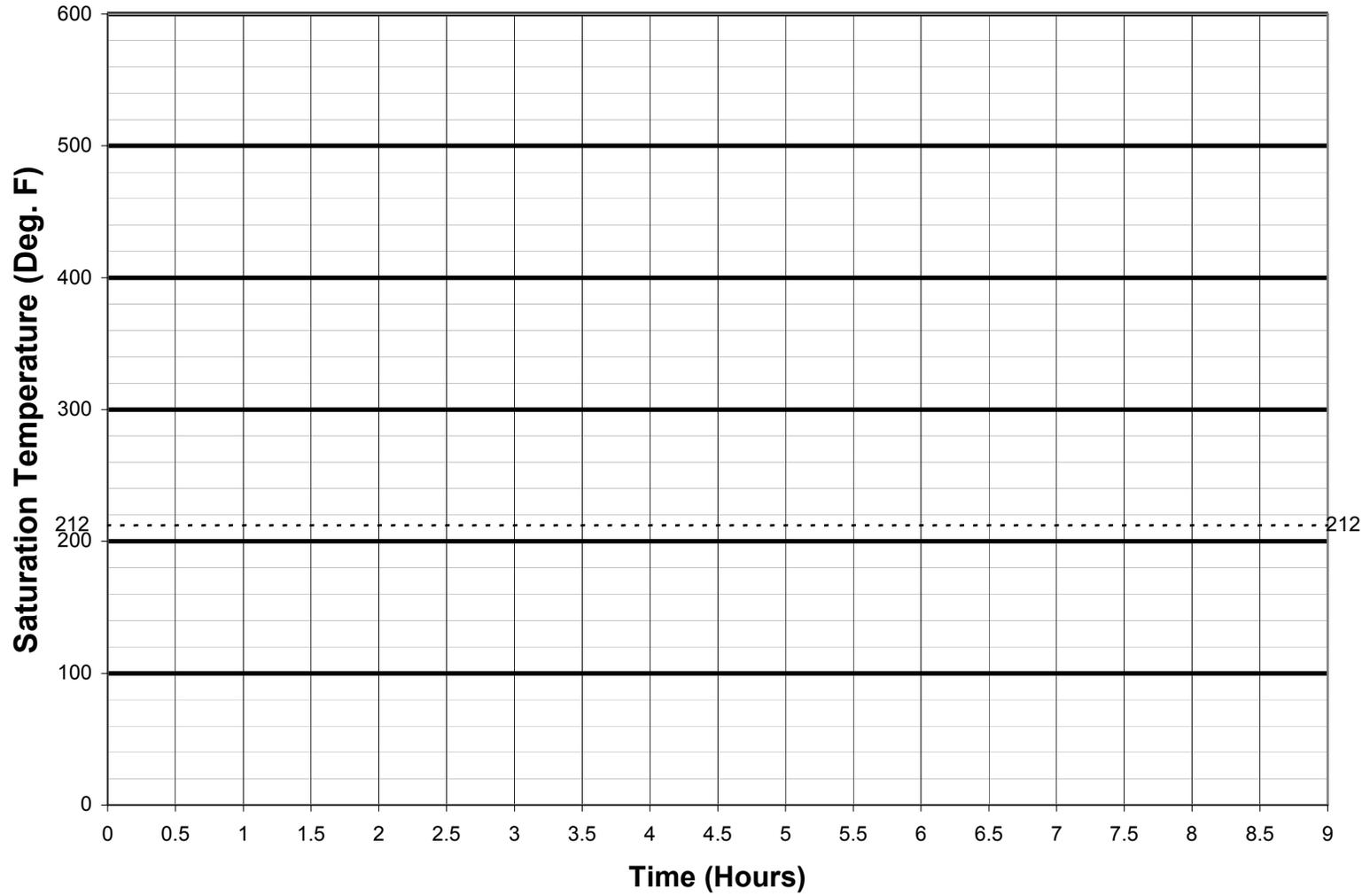
The Reactor Coolant System temperature and pressure requirements of T/S 3.4.6.1 shall be complied with.

1.2 **PLOT** Reactor Vessel temperature versus time on page 3 of this attachment during Reactor cooldown. _____

1.3 **ENSURE** the cooldown rate is less than 90°F/hr. _____

1.4 **DETERMINE** that the RCS temperature and pressure are to the right of limit lines every 30 minutes (**REFER TO** T/S 3.4.6.1). _____

**ATTACHMENT 5
SHUTDOWN FROM OUTSIDE CONTROL ROOM
REACTOR HEATUP COOLDOWN DATA
(Page 3 of 4)**



**ATTACHMENT 5
SHUTDOWN FROM OUTSIDE CONTROL ROOM
REACTOR COOLANT SYSTEM TEMPERATURE/PRESSURE DATA
(Page 4 of 4)**

SATURATED STEAM TABLES

TEMP °F	GAUGE PRESS ≈ (PSIG)
564	1,155
556	1,083
548	1,014
540	948
532	886
524	826
516	770
508	717
500	666
492	618
484	573
476	530
468	490
460	452
452	416
444	383
436	351
428	322
420	294
412	268
404	244
396	221
388	201

TEMP °F	GAUGE PRESS ≈ (PSIG)
380	181
372	163
364	146
356	131
348	116
340	103
332	91
324	80
316	70
308	61
300	52
292	45
284	38
276	31
268	26
260	21
252	16
244	12
236	9
228	5
220	2
212	0.0
200	-3

**ATTACHMENT 6
SHUTDOWN FROM OUTSIDE CONTROL ROOM
COMMUNICATIONS AND EMERGENCY LIGHTING SYSTEMS
FOR SAFE SHUTDOWN AREAS
(Page 1 of 6)**

AUX BUILDING		
AREA	EQUIPMENT	LEGEND
RM 3576, EL. 137	REMOTE S/D PANEL	1, 2, 3, 4
RM 5104, EL. 54	HPCI BATTERIES	2, 4 NOTE 2
RM 5105, EL. 54	RPS MG SET	1, 2, 4, 5
RM 5106, EL. 54	CORRIDOR	2, 4, 1
RM 5107, EL. 54	DIESEL F.O. STORAGE TANKS AND PUMPS	2, 4 NOTE 2
RM 5108, EL. 54	DIESEL F.O. STORAGE TANKS AND PUMPS	2, 4 NOTE 2
RM 3504, EL. 137	CORRIDOR	2, 4, 1
RM 5109, EL. 54	DIESEL F.O. STORAGE TANKS AND PUMPS	2, 4 NOTE 2
RM 5110, EL. 54	DIESEL F.O. STORAGE TANKS AND PUMPS	2, 4 NOTE 2
RM 5111, EL. 54	CORRIDOR	4, 2 NOTE 2
RM 5112, EL. 54	CORRIDOR	1 (IN ADJACENT VESTIBULE), 2, 4
RM 5128, EL. 54	RCIC BATTERIES	2, 4 NOTE 2
RM 5129, EL. 54	HPCI BATTERY CHARGER AND DC SWITCHGEAR	2, 4 NOTE 2
RM 5101, EL. 54	STAIRWAY	2, 4
RM 5130, EL. 54	RCIC BATTERY CHARGER AND DC SWITCHGEAR	2, 4 NOTE 2
RM 5208, EL. 77	D/G RM HVAC COOLER AND RECIRC FAN	2, 4 NOTE 2, 3
RM 5209, EL. 77	D/G RM HVAC COOLER AND RECIRC FAN	2, 4 NOTE 2, 3
RM 5210, EL. 77	D/G RM HVAC COOLER AND RECIRC FAN	2, 4 NOTE 2, 3
RM 5211, EL. 77	D/G RM HVAC COOLER AND RECIRC FAN	2, 4 NOTE 2, 3
RM 5217, EL. 77	CORRIDOR	1 (IN ADJACENT VESTIBULE), 2, 4
RM 5301, EL. 102	CORRIDOR	2, 4, 1
RM 5302, EL. 102	CONTROL PANELS	2, 4, 5 NOTE 2
RM 5304, EL. 102	D/G AND CONTROL PANELS	2, 4 NOTE 2, 3
RM 5305, EL. 102	D/G AND CONTROL PANELS	2, 4 NOTE 2, 3

SEE NOTES ON LAST PAGE OF ATTACHMENT

**ATTACHMENT 6
SHUTDOWN FROM OUTSIDE CONTROL ROOM
COMMUNICATIONS AND EMERGENCY LIGHTING SYSTEMS
FOR SAFE SHUTDOWN AREAS
(Page 2 of 6)**

AUX BUILDING		
AREA	EQUIPMENT	LEGEND
RM 5306, EL. 102	D/G AND CONTROL PANELS	2, 4 NOTE 2, 3
RM 5307, EL. 102	D/G AND CONTROL PANELS	2, 4 NOTE 2, 3
RM 5313, EL. 102	CORRIDOR	1 (IN ADJACENT VESTIBULE), 2, 4
RM 5401, EL. 124	CORRIDOR/ ACCESS AREA	2, 4 NOTE 2
RM 5403, EL. 117-6	CABLE SPREAD RM	1, 2, 4
RM 5404, EL. 124	CORRIDOR	1, 2, 4
RM 5409, EL. 124	CORRIDOR	1, 2, 4
RM 5410, EL. 130	D/G REMOTE CONTROL PANELS AND SEQUENCER	1, 2, 4
RM 5411, EL. 130	SWITCHGEAR, LOAD CENTERS, MCCs AND DIST PANELS	1, 2, 4, 5
RM 5412, EL. 130	D/G REMOTE CONTROL PANELS AND SEQUENCER	1, 2, 4
RM 5413, EL. 130	SWITCHGEAR, LOAD CENTERS, MCCs AND DIST PANELS	1, 2, 4, 5
RM 5414, EL. 130	D/G REMOTE CONTROL PANELS AND SEQUENCER	1, 2, 4, 5
RM 5415, EL. 130	SWITCHGEAR, LOAD CENTERS, MCCs AND DIST PANELS	1, 2, 4, 5
RM 5416, EL. 130	D/G REMOTE CONTROL PANELS AND SEQUENCER	1, 2, 4
RM 5417, EL. 130	SWITCHGEAR, LOAD CENTERS, MCCs AND DIST PANELS	1, 2, 4, 5
RM 5447, EL. 124	FRVS CONTROL PANELS	2, 4 NOTE 2
RM 5448, EL. 124	INVERTERS AND DIST PANELS	1 (IN ADJACENT VESTIBULE), 2, 4
RM 5501, EL. 137	INVERTERS AND DIST PANELS	2, 3 (IN ADJ RM), 4, 5
RM 5502, EL. 137	CORRIDOR	2, 3 (IN ADJ RM), 4, 5

SEE NOTES ON LAST PAGE OF ATTACHMENT

**ATTACHMENT 6
SHUTDOWN FROM OUTSIDE CONTROL ROOM
COMMUNICATIONS AND EMERGENCY LIGHTING SYSTEMS
FOR SAFE SHUTDOWN AREAS
(Page 3 of 6)**

AUX BUILDING		
AREA	EQUIPMENT	LEGEND
RM 5510, EL. 137	CONTROL RM PANELS AND CONSOLES	1, 2, 3, 4
RM 5537, EL. 137	CORRIDOR	1 (IN ADJACENT VESTIBULE), 2, 4
RM 5538, EL. 137	BATTERY CHARGERS, FUSE BOX AND BATTERY MONITOR	4 NOTE 2
RM 5539, EL. 137	BATTERIES	2, 4 NOTE 2
RM 5540, EL. 137	BATTERY CHARGERS, FUSE BOX AND BATTERY MONITOR	4 NOTE 2
RM 5541, EL. 137	BATTERIES	4 NOTE 2
RM 5542, EL. 137	BATTERY CHARGERS, FUSE	2, 4 NOTE 2
RM 5543, EL. 137	BATTERIES	2, 4 NOTE 2
RM 5544, EL. 137	BATTERY CHARGERS, FUSE BOX AND BATTERY ,MONITOR	2, 4 NOTE 2
RM 5545, EL. 137	BATTERIES	4, NOTE 2
RM 5602, EL. 155-3	CONTROL AREA WATER CHILLER, CONTROL ROOM AIR HANDLING UNIT AND RETURN AIR FAN, AND HVAC CONTROL PANEL	1 (LOCATED AWAY FROM LARGEST NOISE SOURCE), 2, 4 NOTE 2, 3
RM 5604, EL. 163-6	CORRIDOR	1, 2, 4
RM 5605, EL. 163-6	CONTROL PANELS	2, 4, 5 NOTE 2
RM 5611, EL. 163-6	CORRIDOR	2, 4, NOTE 2
RM 5606, EL. 163-6	SWITCHGEAR RM COOLERS, D/G BATTERY RM EXH FANS	2, 4 NOTE 2
RM 5607, EL. 163-6	INVERTER, DC SWITCHGEAR, BATTERY CHARGER AND FUSE BOX	4, NOTE 2
RM 5608, EL. 163-6	CORRIDOR	1,2 (IN ADJACENT CORRIDOR)
RM 5609, EL. 163-6	BATTERIES	4 NOTE 2
RM 5610, EL. 163-6	CORRIDOR	4, 1

SEE NOTES ON LAST PAGE OF ATTACHMENT

**ATTACHMENT 6
SHUTDOWN FROM OUTSIDE CONTROL ROOM
COMMUNICATIONS AND EMERGENCY LIGHTING SYSTEMS
FOR SAFE SHUTDOWN AREAS
(Page 4 of 6)**

AUX BUILDING		
AREA	EQUIPMENT	LEGEND
RM 5612, EL. 163-6	CORRIDOR	4, 1
RM 5629, EL. 163-6	SWITCHGEAR RM COOLERS, D/G BATTERY RM EXH FANS	1, 2, 4 NOTE 3
RM 5630, EL. 163-6	CONTROL AREA WATER CHILLER CONTROL RM AIR HANDLING UNIT AND RETURN AIR FAN HVAC CONTROL PANEL	2, 4 NOTE 2, 3
RM 5702, EL. 178	CORRIDOR	1,2 (IN ADJACENT ROOM), 4
RM 5704, EL. 178	CONTROL AND DIESEL AREA HVAC EQUIPMENT	1 (LOCATED AWAY FROM NOISEST EQUIP) 2, 4 NOTE 3
REACTOR BUILDING		
RM 4102, EL. 54	TO 101 VLVS	2, 4 NOTE 5
RM 4104, EL. 54	CORE SPRAY PUMP AND UNIT COOLERS	1 (IN ADJACENT VESTIBULE) 2, 4 NOTE 3
RM 4105, EL. 54	CORE SPRAY PUMP AND UNIT COOLERS	1 (IN ADJACENT VESTIBULE) 2, 4, NOTE 3
RM 4107, EL. 54	RHR PUMP, JOCKEY PUMP UNIT COOLERS AND INSTR RACK	1 (IN ADJACENT ELEC RM) 2, 4NOTE 3
RM 4108, EL. 54	RCIC-MCC AND INSTR RACKS	1, 2, 4
RM 4109, EL. 54	RHR PMP, HX AND UNIT COOLER	1 (IN ADJACENT ELEC RM) 2, 4NOTE 3
RM 4110, EL. 54	RCIC PUMP, TURBINE, AND STEAM CONDENSER VACUUM PUMP, CONDENSATE PUMP JOCKEY PUMP AND UNIT COOLERS	2, 4 NOTE 2, 3
RM 4111, EL. 54	HPCI PUMP, TURBINE GLAND STEAM CONDENSER VACUUM PUMP, JOCKEY PUMP, VALVES AND UNIT COOLERS	2, 4 NOTE 2, 3
RM 4112, EL. 54	HPCI-MCC AND INSTR RACKS	1, 2, 4

SEE NOTES ON LAST PAGE OF ATTACHMENT

**ATTACHMENT 6
SHUTDOWN FROM OUTSIDE CONTROL ROOM
COMMUNICATIONS AND EMERGENCY LIGHTING SYSTEMS
FOR SAFE SHUTDOWN AREAS
(Page 5 of 6)**

REACTOR BUILDING		
AREA	EQUIPMENT	LEGEND
RM 4113, EL. 54	RHR PUMP, HX AND UNIT COOLER	1 (IN ADJACENT ELEC RM) 2, 4 NOTE 3
RM 4114, EL. 54	RHR PUMP, JOCKEY PUMP INSTRUMENT RACK, UNIT COOLERS	1 (IN ADJACENT ELEC RM) 2, 4 NOTE 3
RM 4116, EL. 54	CORE SPRAY PUMP AND UNIT COOLERS	1 (IN ADJACENT VESTIBULE) 2, 4, NOTE 3
RM 4118, EL. 54	CORE SPRAY PUMP AND UNIT COOLERS	1 (IN ADJACENT VESTIBULE) 2, 4, NOTE 3
RM 4201, EL. 77	MCCs	1 (IN ADJ RM),2,4
RM 4202, EL. 77	INSTR RACKS	1, 2, 4 NOTE 3
RM 4203, EL 77	INSTR RACKS	2, 4 NOTE 2
RM 4208, EL. 77	RHR HX AND UNIT COOLER	2, 4 NOTE 2
RM 4209, EL. 77	VLVS AND INSTRUMENTS	1 (IN ADJACENT VESTIBULE) 2, 4, NOTE 3
RM 4210, EL. 77	INSTRUMENTS	2, 4 NOTE 2
RM 4214, EL. 77	RHR HX	2, 4 NOTE 2
RM 4215, EL. 77	INSTR RACK	2, 4 NOTE 2
RM 4216, EL. 77	CORRIDOR	2, 4 NOTE 2
RM 4218, EL. 77	INSTR RACK	1, 2, 4
RM 4219, EL. 77	INSTR	2, 4 NOTE 2
RM 4301, EL. 102	CORRIDOR	1, 2, 4
RM 4303, EL. 102	MCC	1, 2, 4
RM 4307, EL. 102	SACS PUMPS AND HXs CONTROL PANELS, VALVES AND UNIT COOLERS	2, 4 NOTE 2, 3
RM 4309, EL. 102	SACS PUMPS AND HXs CONTROL PANELS, VALVES AND UNIT COOLERS	1 (LOCATED AWAY FROM NOISY EQUIP), 2, 4 NOTE 3

SEE NOTES ON LAST PAGE OF ATTACHMENT

**ATTACHMENT 6
SHUTDOWN FROM OUTSIDE CONTROL ROOM
COMMUNICATIONS AND EMERGENCY LIGHTING SYSTEMS
FOR SAFE SHUTDOWN AREAS
(Page 6 of 6)**

REACTOR BUILDING		
AREA	EQUIPMENT	LEGEND
RM 4315, EL. 102	CORRIDOR	2 (NEARBY) 4, 5
RM 4319, EL. 102	RCIC VLV	2, 4 NOTE 2
RM 4321, EL. 102	RHR VLVS	2, 4 NOTE 2
RM 4327, EL. 102	HPCI VLVS	2, 4 NOTE 2
RM 4329, EL. 102	RHR VLVS	2, 4 NOTE 2
RM 107, EL. 79-8	VLVS	2, 4 NOTE 2
RM 110, EL. 79-8	VLVS	2, 4 NOTE 2
RM 203, EL. 93	MCCs	1 (IN ADJACENT ROOM), 2, 4
RM 204, EL. 93	PUMPS, VALVES AND CONTROL PANELS	1 (IN ADJACENT ROOM), 2, 4 NOTE 3
RM 207, EL. 93	MCCs	1,2 (IN ADJACENT ROOM) 3, 4
RM 208, EL. 93	PUMPS, VALVES AND CONTROL PANELS	1,2 (IN ADJACENT ROOM), 4 NOTE 3
EL. 107	TRAVELING SCREEN CONTROL PANELS	2, 4 NOTE 2
EL. 114	TRAVELING SCREEN MOTOR RM FANS	2, 4 NOTE 2
RM 305, 306, EL. 122	FANS	1, 2, 4 NOTE 3
RM 311, 312, EL. 122	FANS	1, 2, 4 NOTE 3
	STAIRWELLS IN CONTROL, DIESEL, AND REACTOR BUILDINGS	2, NOTE 2

NOTE 1

1 = PA HANDSET 2 = PA SPEAKER 3 = TELEPHONE 4 = RADIO 5 = SND PWRD PHN

NOTE 2

In these rooms the UHF radio sets' sound capability is below the maximum sound level that could be experienced in the room. In these rooms the adjacent hallway can be utilized for communication with the UHF radio set

NOTE 3

These rooms have a pa handset for two-way communication in the adjacent hallway, corridor or room (within ~ 50 ft of these rooms).

**ATTACHMENT 7
SHUTDOWN FROM OUTSIDE CONTROL ROOM
REMOTE SHUTDOWN COMMUNICATION SYSTEM
(SOUND POWERED PHONE)
(Page 1 of 3)**

SWITCH	ROOM	LOC/ JACK	COMPONENTS/CONTROLS
S2	5411 1E SWITCHGEAR 10A404	SOUTH WALL / 10SJ400	D DIESEL GENERATOR OUTPUT BRKR SACS PUMP 1DP210 BRKR SSWS PUMP 1DP502 BRKR CONTROL RM WATER CHILLER 1BK400 BRKR RHR PUMP 1DP202 BRKR RHR SDC RETURN 1BC-HV-F015A BRKR
S2	5413 1E SWITCHGEAR 10A402	SOUTH WALL / 10SJ401	SACS PUMP 1BP210 BRKR SSWS PUMP 1BP502 BRKR SAFETY RELATED PNL RM CHILLER 1BK403 BRKR RHR PUMP 1BP202 BRKR B D/G OUTPUT BRKR
S2	5415 1E SWITCHGEAR 10A403	SOUTH WALL / 10SJ402	SACS PUMP 1CP210 BRKR SSWS PUMP 1CP502 BRKR CONTROL ROOM WATER CHILLER 1AK400 BRKR RHR PUMP 1CP202 BRKR C DIESEL GENERATOR OUTPUT BRKR
S2	5417 1E SWITCHGEAR 10A401	SOUTH WALL / 10SJ403	SACS PUMP 1AP210 BRKR SSWS PUMP 1AP502 BRKR SAFETY RELATED PNL RM CHILLER 1AK403 BRKR RHR PUMP 1AP202 BRKR A DIESEL GENERATOR OUTPUT BRKR
S7	5417 1E SWITCHGEAR 10A401	NORTH WALL/ 10SJ404	D/G LOAD SEQUENCER 1AP414 DIESEL REMOTE ENG CONTROL PNL 1AG400 DIESEL REMOTE GEN CONTROL PNL 1AG400
S7	5415 1E SWITCHGEAR 10A403	NORTH WALL/ 10SJ405	D/G LOAD SEQUENCER 1AP400 DIESEL REMOTE ENG CONTROL PNL 1CG400 DIESEL REMOTE GEN CONTROL PNL 1CG400
S7	5413 1E SWITCHGEAR 10A402	NORTH WALL/ 10SJ406	D/G LOAD SEQUENCER 1BG400 DIESEL REMOTE ENG CONTROL PNL 1BG400 DIESEL REMOTE GEN CONTROL PNL 1BG400

**ATTACHMENT 7
SHUTDOWN FROM OUTSIDE CONTROL ROOM
REMOTE SHUTDOWN COMMUNICATION SYSTEM
(SOUND POWERED PHONE)
(Page 2 of 3)**

SWITCH	ROOM	LOC/ JACK	COMPONENTS/CONTROLS
S7	5411 1E SWITCHGEAR 10A404	NORTH WALL / 10SJ407	D/G LOAD SEQUENCER 1DG400 REMOTE ENG CONTROL PNL 1DG400 REMOTE GEN CONTROL PNL 1DG400
S1	5605 CONTROL EQUIP RM	EAST WALL/ 10SJ408	SUPPRESSION POOL LEVEL 1ATB4507 SUPPRESSION POOL TEMPERATURE 1CTB4508
S4	5302 LOWER CONTROL EQUIP RM	NORTH WALL/ 10SJ409	RPV LEVEL LIS-N691A&E RPV PRESSURE PIS-N690A, E, J, & N RHR LOOP A FLOW E11-N652A
S4	5302 LOWER CONTROL EQUIP RM	NORTH WALL/ 10SJ410	REMOTE CONTROL OF ADS VALVES PSV-F013A &E
S3	5501 ELEC ACCESS AREA (INVERTERS)	SOUTH WALL/ 10SJ411	TACS COOLING LOOP A OUTBOARD SUPPLY EG-HV-2522C
S3	5501 ELEC ACCESS AREA (INVERTERS)	SOUTH WALL/ 10SJ412	TACS COOLING LOOP A INBOARD SUPPLY EG-HV-2522A
S5	5105 RPS MG SET RM	EAST WALL/ 10SJ414	REMOTE SCRAM STATIONS
S6	4310 RX BLDG 102' ENTRANCE AREA	NORTH WALL/ 10SJ200	SACS COOLING LOOP A OUTBOARD SUPPLY EG-HV-2496C
S6	4310 RX BLDG 102' ENTRANCE AREA	NORTH WALL/ 10SJ201	SACS COOLING LOOP A OUTBOARD SUPPLY EG-HV-2496C
S6	4309 A LOOP SACS HX AREA MCC 10B212 NORTH	NORTH WALL/ 10SJ202	RHR A HX TUBE SIDE OUTLET 1BC-HV-2512A SACS LOOP A INBD RETURN 1EG-HV-2496A SSWS TO RACS HX A SUPPLY 1EA-HV-2203 RHR LOOP A TEST RETURN 1BC-HV-F024A TO SUPPRESSION POOL

**ATTACHMENT 7
SHUTDOWN FROM OUTSIDE CONTROL ROOM
REMOTE SHUTDOWN COMMUNICATION SYSTEM
(SOUND POWERED PHONE)
(Page 3 of 3)**

SWITCH	ROOM	LOC/ JACK	COMPONENTS/CONTROLS
S6	4309 A LOOP SACS HX AREA MCC 10B212 SOUTH EAST	SOUTH EAST WALL/ 10SJ203	RHR A HX SHELL SIDE INLET 1BC-HV-F047A RHR A HX SHELL SIDE BYPASS 1BC-HV-F048A RHR A HX SHELL SIDE OUTLET 1BC-HV-F003A RHR A PUMP SUCTION 1BC-HV-F004A RHR LOOP A MIN FLOW 1BC-HV-F007A
S101	3576 REMOTE SHUTDOWN PANEL ROOM 137'	IN COMM PANEL 10-C-684	REMOTE SHUTDOWN COMMUNICATION SYSTEM COMMON JACK

NOTE: ENSURE ALL SWITCHES ARE IN THE S1 POSITION

**ATTACHMENT 8
HPCI SHUTDOWN FROM A DIESEL GENERATOR CONTROL ROOM
(Aux. Bldg. El. 130')**

1.0 HPCI SHUTDOWN FROM A DIESEL GENERATOR CONTROL ROOM

NOTE

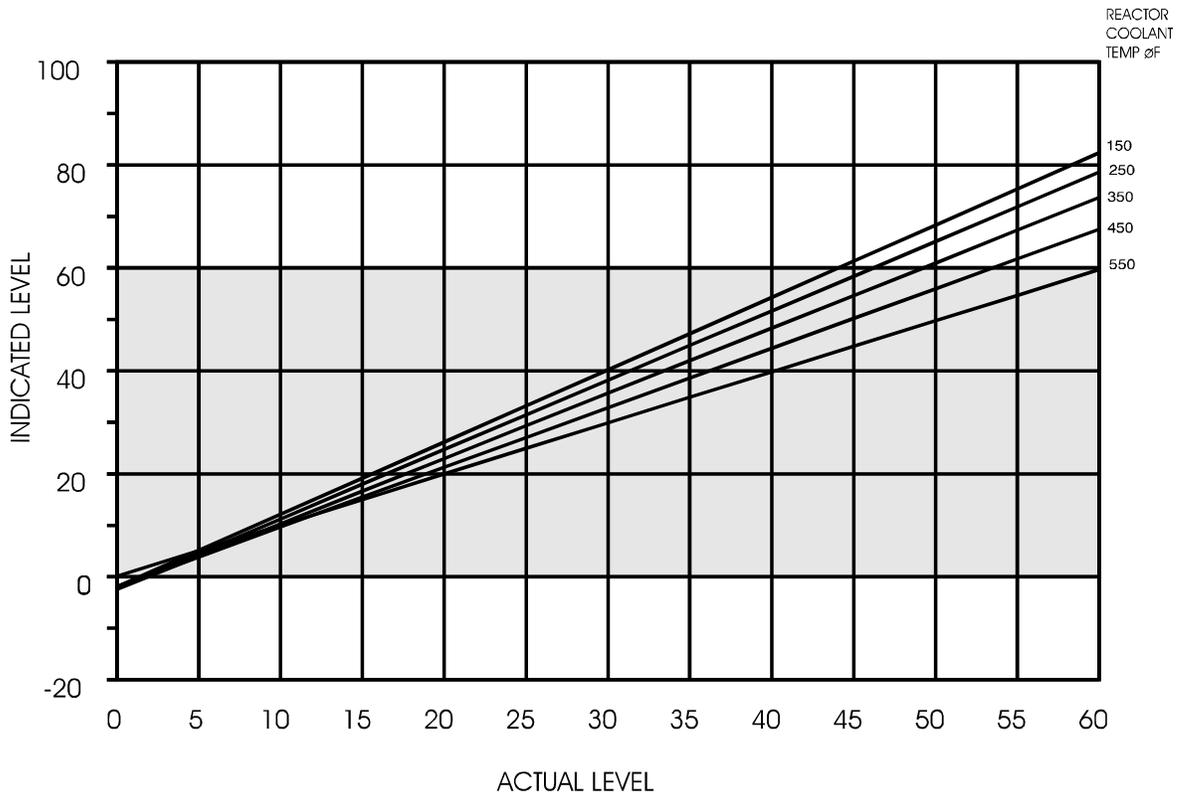
Opening the following circuit breaker will shut down HPCI by closing the Turbine Stop Valve, Governor Valve and HPCI Pump Discharge Valve.

1.1 **OPEN** the following circuit breaker at Class 1E 125VDC Distribution Panel 1AD417:

1.1.1. Circuit Breaker 10, HPCI RELAY VERT BD 10C620. _____

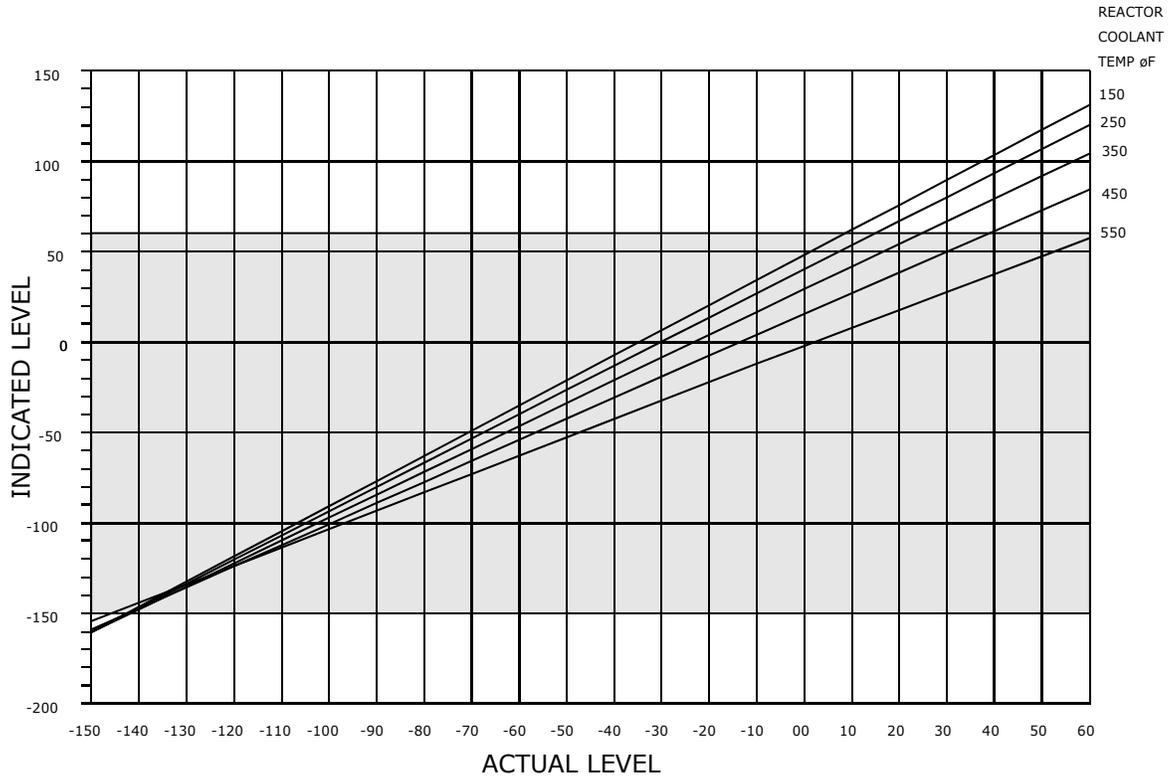
ATTACHMENT 9
VESSEL LEVEL INSTRUMENTATION TEMPERATURE
COMPENSATION CURVES
(Page 1 of 4)

NARROW RANGE LEVEL
TEMPERATURE COMPENSATION
GRAY AREA - INDICATED LEVEL RANGE



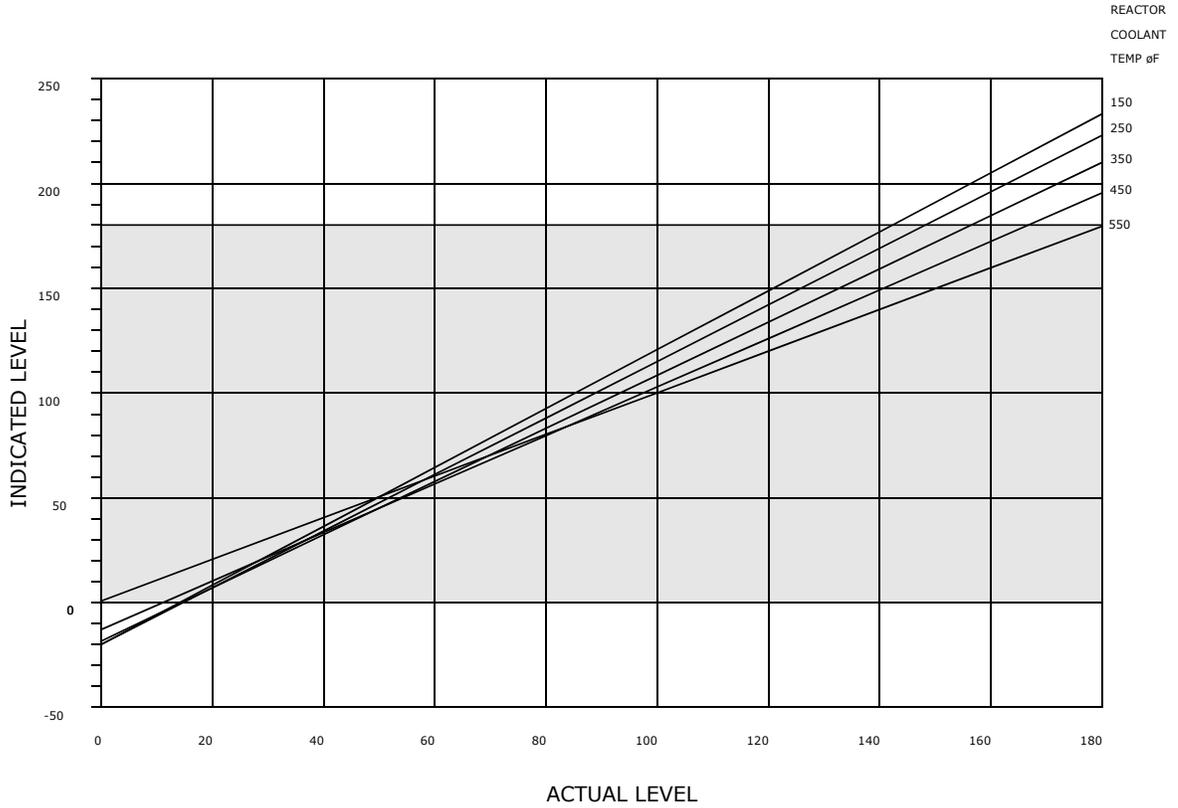
ATTACHMENT 9
VESSEL LEVEL INSTRUMENTATION TEMPERATURE
COMPENSATION CURVES
(Page 2 of 4)

WIDE RANGE LEVEL
TEMPERATURE COMPENSATION
GRAY AREA - INDICATED LEVEL RANGE



**ATTACHMENT 9
VESSEL LEVEL INSTRUMENTATION TEMPERATURE
COMPENSATION CURVES
(Page 3 of 4)**

UPSET RANGE LEVEL
TEMPERATURE COMPENSATION
GRAY AREA - INDICATED LEVEL RANGE

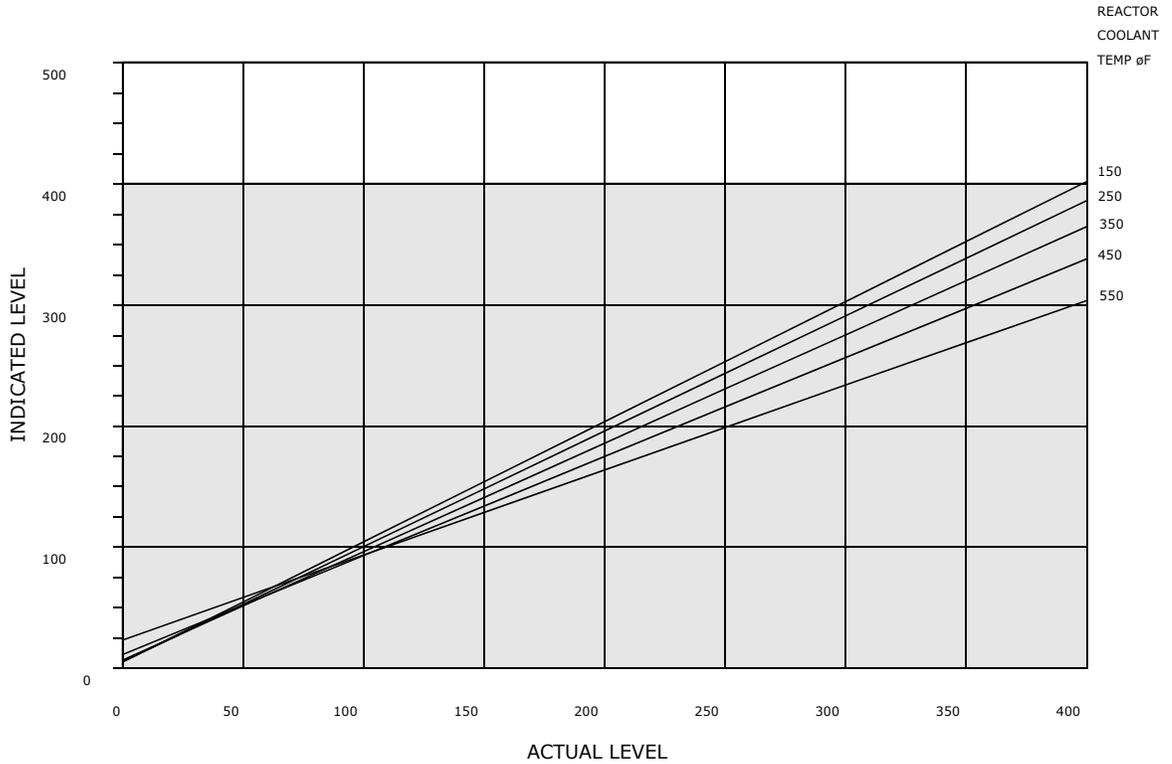


ATTACHMENT 9
VESSEL LEVEL INSTRUMENTATION TEMPERATURE
COMPENSATION CURVES
(Page 4 of 4)

SHUTDOWN RANGE LEVEL

TEMPERATURE COMPENSATION

GRAY AREA - INDICATED LEVEL RANGE



**ATTACHMENT 10
ALTERNATE SHUTDOWN COOLING FROM THE REMOTE SHUTDOWN PANEL ROOM
FOLLOWING A LOSS OF OFFSITE POWER
(Page 1 of 5)**

1.0 ALTERNATE SHUTDOWN COOLING FROM THE REMOTE SHUTDOWN PANEL ROOM FOLLOWING A LOSS OF OFFSITE POWER

NOTE

Suppression Pool temperature should be controlled to maintain RPV water temperature above 79°F.

- 1.1 **PLACE** 'A' RHR Loop in Suppression Pool Cooling IAW Attachment 3. _____
- 1.2 **PLACE** B RHR Loop in service as follows:
 - 1.2.1. **PRESS AND HOLD** the **OPEN** PB for EG-HV-2512B (RHR HX SACS RTN ISLN VLV) until fully open. _____
 - 1.2.2. **ENSURE** BC-HV-F004B RHR PMP B SUP POOL SUCT is OPEN. _____
 - 1.2.3. IF closed, THEN **OPEN** BC-HV-F004B, RHR PMP B SUP POOL SUCT VLV. _____
 - 1.2.4. **ENSURE** the B RHR Loop Discharge Header is filled and vented by opening 1-BC-V324 AND 1-BC-V325 Loop B LPCI Inj Hdr Vent Vlvs UNTIL a solid stream of water is observed, AND THEN **CLOSE** 1-BC-V324 AND 1-BC-V325. (Local, RM 4329) _____
 - 1.2.5. **CLOSE** BC-HV-F048B RHR HX B SHL SIDE BYP VLV _____
 - 1.2.6. **CLOSE** BC-HV-F003B, RHR LOOP B HX OUTLET VLV _____
 - 1.2.7. **OPEN** BC-HV-F017B RHR B LPCI INJ VLV by declutching valve and manually opening (Local Rm 4329). _____
OR
IF BC-HV-F017B CAN NOT be opened, THEN **OPEN** BC-HV-F015B. _____
 - 1.2.8. **START** BP202 RHR B PUMP. _____
 - 1.2.9. **ENSURE** that HPCI and RCIC steam lines, MSIVs, and Main Steam Line Drains are isolated and closed. _____

ATTACHMENT 10
ALTERNATE SHUTDOWN COOLING FROM THE REMOTE SHUTDOWN PANEL ROOM
FOLLOWING A LOSS OF OFFSITE POWER
(Page 2 of 5)

- 1.2.10. From Panel 10-C-399, **PLACE** the control switch for 2 SRVs (F, H, M) in the OPEN position. (A & E SRVs may be operated from Panel 10-C-631 in the Lower Relay Room). _____

NOTE

While the RPV is being filled, suppression pool level will lower. SRV indication is via solenoid and may indicate open when actual valve position is closed. RPV pressure, level, and suppression pool temperature and level should be used to confirm flow through SRV's.

SRV re-opening pressure of 50 psid may be satisfied with RPV pressure < 50 psig due to hydrostatic head.

BC-HV-F003B and BC-HV-F048B may need to be throttled to control vessel fill rate and vessel cooldown.

- 1.2.11. Slowly **OPEN** BC-HV-F003B OR BC-HV-F048B **AND RAISE** RPV level to establish a flowpath through the open SRVs back to the Suppression Pool (HV-F048B will provide greater control over cooldown rate). _____
- 1.2.12. As necessary, **CLOSE** HV-F007B RHR PMP B MIN FLOW MOV. _____
- 1.3 **THROTTLE** BC-HV-F003B RHR LOOP B HX OUTLET VLV and/or BC-HV-F048B RHR HX B SHELL SIDE BYPASS VLV, to increase injection to maximum. _____

ATTACHMENT 10
ALTERNATE SHUTDOWN COOLING FROM THE REMOTE SHUTDOWN PANEL ROOM
FOLLOWING A LOSS OF OFFSITE POWER
(Page 3 of 5)

1.4 IF RPV pressure does not stabilize at least 50 psig above Suppression Chamber pressure, THEN **START** another LPCI Pump as follows:

1.4.1. To start CP202 C RHR PUMP **PERFORM** the following:

- A. **ENSURE** BC-HV-F004C RHR PMP C SUP POOL SUCT VLV is OPEN (Local). _____
- B. IF closed, THEN **OPEN** BC-HV-F004C RHR PMP C SUPP POOL SUCT VLV as follows:

DECLUTCH/MANUALLY open BC-HV-F004C RHR PMP C SUPP POOL SUCT VLV.
(Local, Rm. 4102, 54' Torus, Az 250°) _____
- C. **ENSURE** the C RHR Loop Discharge Header is filled and vented by opening 1-BC-V332 AND 1-BC-V333 Loop C LPCI Inj Hdr Vent Vlvs UNTIL a solid stream of water is observed, AND THEN **CLOSE** 1-BC-V332 AND 1-BC-V333. (Local RM 4329) _____
- D. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40306 C RHR PMP in the EMER position. (Local) _____
- E. **PLACE** BREAKER TEST SWITCH for BRKR 52-40306 in the CLOSE position, **OBSERVING** breaker closure AND AC AMMETER for proper indication. (Local) _____
- F. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40306 in the NORM position. (Local) _____

CAUTION

The possibility of heat stress in room 4329 exists and the practice of stay time should be considered. (Reference Health and Safety Manual)

- G. **OPEN** BC-HV-F017C RHR C LPCI INJ VLV as follows:

DECLUTCH/MANUALLY open BC-HV-F017C RHR C LPCI INJ VLV. (Local, RM. 4329) _____
- H. As necessary, **CLOSE** HV-F007C RHR PMP C MIN FLOW MOV. _____

ATTACHMENT 10
ALTERNATE SHUTDOWN COOLING FROM THE REMOTE SHUTDOWN PANEL ROOM
FOLLOWING A LOSS OF OFFSITE POWER
 (Page 4 of 5)

1.4.2. To START DP202 RHR Pump D **PERFORM** the following:

- A. **ENSURE** BC-HV-F004D RHR PMP D SUP POOL SUCT VLV is OPEN. _____
- B. IF closed, THEN **OPEN** BC-HV-F004D RHR PMP D SUP POOL SUCT VLV as follows:

DECLUTCH/MANUALLY open BC-HV-F004D RHR D LPCI INJ VLV (Local, RM.4102, 54' Torus, Az 110°) _____
- C. **ENSURE** the D RHR Loop Discharge Header is filled and vented by opening 1-BC-V320 AND 1-BC-V321 Loop D LPCI Inj Hdr Vent Vlvs UNTIL a solid stream of water is observed, AND THEN **CLOSE** 1-BC-V320 AND 1-BC-V321. (Local RM 4321) _____
- D. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40406 D RHR PMP in the EMER position. (Local) _____
- E. **PLACE** BREAKER TEST SWITCH for BRKR 52-40406 in the CLOSE position, **OBSERVING** breaker closure AND AC AMMETER for proper indication. (Local) _____
- F. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40406 in the NORM position. (Local) _____

CAUTION

The possibility of heat stress in room 4321 exists and the practice of stay time should be considered. (Reference Health and Safety Manual)

- G. **OPEN** BC-HV-F017D RHR D LPCI INJ VLV as follows:

DECLUTCH/MANUALLY open BC-HV-F017D RHR D LPCI INJ (Local RM.4321) _____
- H. As necessary, **CLOSE** HV-F007D RHR PMP D MIN FLOW MOV. _____

ATTACHMENT 10
ALTERNATE SHUTDOWN COOLING FROM THE REMOTE SHUTDOWN PANEL ROOM
FOLLOWING A LOSS OF OFFSITE POWER
(Page 5 of 5)

- 1.5 IF RPV Pressure does not stabilize below 160 psig above the SUPPRESSION POOL,
THEN OPEN additional SRVs as required. _____

- 1.6 IF cooldown rate exceeds 90°F/hr,
THEN REDUCE LPCI injection into the RPV UNTIL the cooldown decreases below 100°F/hr OR RPV Pressure decreases to within 50 psig of Suppression Chamber Pressure, whichever occurs first. _____

- 1.7 **PROCEED** to cold shutdown IAW applicable remaining steps of Section 5.9. _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 1 of 11)**

1.0 A RHR LOOP SHUTDOWN COOLING OPERATION

NOTE

IF time permits AND personnel are available, the A RHR Loop should be placed in the Suppression Pool Cooling mode IAW Attachment 3, and the B Loop left for use during Shutdown Cooling.

1.1 **LINEUP** A RHR loop for Shutdown Cooling Operation as follows:

NOTE

This step may be performed concurrently with Steps 1.1.2 through 1.1.11

- 1.1.1. IF AVAILABLE, **INSTALL** a thermocouple downstream of the 1-BC-V152 RHR Pump A Dsch Hdr to RW Sup Vlv. _____
- 1.1.2. **CLOSE** HV-F004A A RHR PMP SUPP POOL SUCT MOV as follows:
 - A. **INSERT** key into keyswitch at breaker 52-212031 RHR PUMP A SUP POOL SUC BRKR (Local). _____
 - B. **TURN** key to the CLOSED position AND LEAVE in the CLOSED position with key INSTALLED. _____
- 1.1.3. **CLOSE** HV-F007A, A RHR PMP MIN FL MOV. (Local manual operation required) (Room 4102 – Torus Room, 240° Az., 12' from outer wall) _____
- 1.1.4. **ENSURE** the following valves are CLOSED: (**VERIFY** normal keepfill pressure on N653A on 10C617, OR VERIFY local valve position or other means per CRS)
 - BC-HV-F024A RHR LOOP TEST RET MOV. _____
 - BC-HV-F027A RHR LOOP B SUPP CHAMBER SPRAY HDR ISLN MOV. _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 2 of 11)**

- 1.1.5. **OPEN** Breaker 52-212192 for F024A, RHR LOOP A TEST RET BRKR _____
- 1.1.6. **OPEN** Breaker 52-212041 for F007A, A RHR PMP MIN FL MOV. _____
- 1.1.7. **OPEN** Breaker 52-212083 for F027A, RHR LOOP A TEST RET BRKR. _____

NOTE

Interlocks designed to prevent inadvertent draining of the vessel by opening 1BC-HV-F006A are overridden when control is transferred to the Remote Shutdown Panel.

- 1.1.8. **OPEN** HV-F006A A RHR PMP SUCT FROM RECIRC LOOP B ISLN MOV as follows:
 - A. **INSERT** key into keyswitch at breaker 52-451012 A RHR PMP SUCT FROM RECIRC LOOP B ISLN MOV. _____
 - B. **TURN** key to the OPEN position AND LEAVE in the OPEN position with key INSTALLED. _____
- 1.1.9. **PERFORM** the following to fill and vent the Shutdown Cooling Suction piping: **[CD-891D]**
 - A. **PLACE** BC-HV-F008 SHUTDOWN COOLING OUTBD ISLN MOV Keylock Switch HS-11495 in the ARMED position (10B242 Bkr 242082) _____
 - B. **UNLOCK AND OPEN** 1-AP-V048 Cond Stor & Xfr to RHR B Suct Hdr Fill & Flush Isln Vlv (local). _____
 - C. **OPEN** BC-HV-F008 S/D COOLING OUTBD ISLN MOV. (RSP) _____
 - D. **UNLOCK AND** slowly **OPEN** 1-BC-V191 Cond Stor & Xfr to Recirc Suct. _____

(continued on next page)

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 3 of 11)**

1.1.9 (continued)

- E. **VENT** the Shutdown Cooling Suction piping for a minimum of 5 minutes using the following valves:
 - 1-BC-V284 RHR Suct from Recirc LP B Vnt (Top of Torus - Inboard from 180° Az., 90') _____
 - 1-BC-V285 RHR Suct From Recirc LP B Vnt (Top of Torus - Inboard from 180° Az., 90') _____

- F. **ENSURE** the following vent valves are returned to their required positions:
 - 1-BC-V284 CLOSED _____
 - 1-BC-V285 CLOSED AND LOCKED _____

- G. **VENT** the Shutdown Cooling Suction piping for a minimum of 5 minutes using the following valves:
 - 1-BC-V165 Recirc Loop B to RHR Vnt Isln (North Pipe Chase) _____
 - 1-BC-V166 Recirc Loop B to RHR Vnt (North Pipe Chase) _____

- H. **ENSURE** the following vent valves are returned to their required positions:
 - 1-BC-V165 CLOSED AND LOCKED _____
 - 1-BC-V166 CLOSED _____

- I. **CLOSE AND LOCK** 1-BC-V191 (local). _____

- J. **CLOSE AND LOCK** 1-AP-V048 (local). _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 4 of 11)**

- 1.1.10. **ENSURE** the A RHR Loop Discharge Header is filled/vented as follows:
 - A. **OPEN** 1-AP-V044, CS XFR TO A RHR PMP DSCH ISLN. _____
 - B. **OPEN** the following valves, UNTIL a solid stream of water is observed, AND THEN CLOSE:
 - 1-BC-V353 and 1-BC-V354, RHR LP A LPCI INJ HDR VNT ISLN.(North Pipe Chase Rm 4329) _____
 - 1BC-V334 and 1BC-V335, RHR LP A RET TO RECIR LP A VNT. (North Pipe Chase Rm 4329) _____
 - C. **CLOSE** 1-AP-V044, CS XFR TO A RHR PMP DSCH ISLN. _____
- 1.1.11. **OPEN** BC-HV-F009 SHUTDOWN COOLING INBD ISLN MOV. (RSP) _____
- 1.1.12. **FLUSH AND WARM** the A RHR Loop as follows: **[CD-066X]**
 - A. **CLOSE** 1BC-V212 C ECCS Jockey Pmp to RHR Loop A Isln Vlv (Rm. 4113, A RHR Pump Room) _____
 - B. **ENSURE** BC-HV-4439 LP B DSCH TO LIQ RW is OPEN. (RSP) _____
 - C. **OPEN** 1-BC-V153 RHR Pump A Dsch Hdr to RW Isol. (Rm. 4113, A RHR Pump Room) _____

NOTE

Step 1.1.12.D will allow Reactor Vessel water to flow from the Recirc Shutdown Cooling connection to Radwaste, bypassing the RHR Heat Exchanger.

- D. **THROTTLE OPEN** 1-BC-V152 to ACHIEVE required heatup of the suction portion of the A RHR Loop. (Rm. 4113, A RHR Pump Room) _____

(continued on next page)

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 5 of 11)**

1.1.12 (continued)

CAUTION

**Water > 200°F should NOT be discharged to the Liquid Radwaste system.
Reactor Vessel level should be monitored during the following evolution.**

E. **MONITOR** temporarily installed thermocouple or piping temperature downstream of 1-BC-V152. _____

F. WHEN temperature reaches $\approx 160^\circ$ to 180°F ,
THEN, CLOSE 1-BC-V152. _____

1.1.13. **CLOSE** HV-F003A A RHR HX OUTLET MOV as follows:

A. **INSERT** key into keyswitch at breaker 52-212013,
A RHR HX OUTLET MOV. _____

B. **TURN** key to the DECR position
AND TURN key to DECREASE for ≈ 120 seconds.
(The normal closing time for this valve is ≈ 120 seconds.) _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 6 of 11)**

1.2 **ENSURE** at least one A or C SSW pump is in service as follows:

1.2.1. IF desired to place the A SSW pump AP502 in service,
THEN PERFORM the following:

- A. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40109 in the EMER position. (Local) _____
- B. **PLACE** BREAKER TEST SWITCH for BRKR 52-40109 in the CLOSE position, OBSERVING breaker closure. (Local) _____
- C. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40109 in the NORM position. (Local) _____
- D. **ENSURE** the following: (Local)
 - 1. 1EA-HV-2198A SSWS PMP A DISCH VLV opens. _____
 - 2. 1EA-HV-2371A SACS HX A1 OUT VLV opens. _____
 - 3. 1EA-HV-2197A BACKWASH VLV opens. _____
 - 4. A SSW Pump ammeter indicates 85-110 amps. _____

1.2.2. IF desired to place the C SSW Pump CP502 in service,
THEN PERFORM the following:

- A. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40309 in the EMER position. (Local) _____
- B. **PLACE** BREAKER TEST SWITCH for BRKR 52-40309 in the CLOSE position, OBSERVING breaker closure. (Local) _____
- C. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40309 in the NORM position. (Local) _____
- D. **ENSURE** the following: (Local)
 - 1. 1EA-HV-2198C SSWS PMP C DISCH VLV opens. _____
 - 2. 1EA-HV-2355A SACS HX A2 OUT VLV opens. _____
 - 3. 1EA-HV-2197C BACKWASH VLV opens. _____
 - 4. C SSW Pump ammeter indicates 85-110 amps. _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 7 of 11)**

1.3 **ENSURE** at least one A or C SACS Pump is in service as follows:

1.3.1. **OPEN** 1EG-HV-2512A RHR HX SACS RTN ISLN VLV as follows:

- A. **INSERT** key into keyswitch at breaker 52-212143 RHR HX SACS RTN ISLN VLV BRKR (Local). _____
- B. **TURN** key to the OPEN position **AND LEAVE** in the OPEN position with key INSTALLED. _____

1.3.2. IF desired to place the AP210 SACS pump in service, **THEN PERFORM** the following:

- A. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40104 in the EMER position. (Local) _____
- B. **PLACE** BREAKER TEST SWITCH for BRKR 52-40104 in the CLOSE position, OBSERVING breaker closure, AND AC AMMETER indicates approx. 50-65 amps. (Local) _____
- C. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40104 in the NORM position. (Local) _____
- D. **ENSURE** 1EG-HV-2491A SACS HX A1E201 INLET is OPEN. _____

1.3.3. IF desired to place the C SACS Pump CP210 in service, **THEN PERFORM** the following:

- A. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40304 in the EMER position. (Local) _____
- B. **PLACE** BREAKER TEST SWITCH for BRKR 52-40304 in the CLOSE position, OBSERVING breaker closure, AND AC AMMETER indicates approx. 50-65 amps. (Local) _____
- C. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40304 in the NORM position. (Local) _____
- D. **ENSURE** 1EG-HV-2494A SACS HX A2E201 INLET is OPEN. _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 8 of 11)**

1.4 **PLACE** A RHR Loop in Shutdown Cooling as follows:

1.4.1. **OPEN** 1EG-HV-2512A RHR HX SACS RTN ISLN VLV as follows:

A. **INSERT** key into keyswitch at breaker 52-212143, RHR HX SACS RTN ISLN VLV BRKR (Local). _____

B. **TURN** key to the OPEN position
AND LEAVE in the OPEN position with key INSTALLED. _____

1.4.2. **DIRECT** I/C Technician OR Equipment Operator to proceed to Lower Relay Room Panel 10C617 **AND ESTABLISH** communications via Sound Powered Phones for use during the monitoring of E11-N652A RHR LOOP A FLOW indication in the following step.
(Reference Attachment 7 for Sound Powered Phone switches) _____

1.4.3. **DIRECT** a second Equipment Operator to breaker 52-481062, 1BCHV-F015A, RHR LOOP A RET TO RECIRC LOOP B ISLN MOV located in the D Channel 1E Swgr room, 130 elev Diesel Bldg, and establish communications via sound powered phones or plant page. _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 9 of 11)**

1.4.4. **START** RHR A Pump AP202 as follows:

- A. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40106 in the EMER position. (Local) _____

- B. **PLACE** BREAKER TEST SWITCH for BRKR 52-40106 in the CLOSE position, **OBSERVING** breaker closure AND AC AMMETER indicates approx. 130-155 amps. (Local) _____

- C. **PLACE** NORM/EMER SEL SWITCH for BRKR 52-40106 in the NORM position. (Local) _____

- D. Immediately **THROTTLE** OPEN HV-F015A 52-481062 (Local) UNTIL E11-N652A (Panel 10C617) indicates (\approx 3,000 gpm) as follows:
 - 1. **INSERT** key into keyswitch at breaker 52-481062 1BCHV-F015A, RHR LOOP A RET TO RECIRC LOOP B ISLN MOV (Local). _____

 - 2. **TURN** key to the INCR position UNTIL E11-N652A (Panel 10C617) indicates (\approx 3,000 gpm). _____

 - 3. **OPERATE** A RHR Loop in Shutdown Cooling at \approx 3000 gpm as indicated on E11-N652A for at least 10 minutes. _____

- E. WHEN conditions of Step 1.4.4.D have been satisfied, THEN **THROTTLE OPEN** HV-F015A, RHR LOOP A RET TO RECIRC LOOP B ISLN MOV to establish loop flow of \leq 10,000 gpm as indicated on E11-N652A. _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 10 of 11)**

- 1.4.5. **OPEN** HV-F003A A RHR HX OUTLET MOV as follows:
- A. **INSERT** key into keyswitch at breaker 52-212013 A RHR HX OUTLET MOV. _____
 - B. **TURN** key to INCR for \approx 120 seconds.
(The normal opening time for this valve is \approx 120 seconds.) _____
- 1.4.6. **CONTROL** cooldown rate by performing one of the following:
[CD-133B]
- **THROTTLE** CLOSED HV-F048A, A RHR HX SHELL SIDE BYP MOV to increase cooldown rate.
(Keyswitch at breaker 52-212092) _____
 - **THROTTLE** OPEN HV-F048A A RHR HX SHELL SIDE BYP MOV to decrease cooldown rate.
(Keyswitch at breaker 52-212092) _____
 - **THROTTLE** HV-F003A, A RHR HX OUTLET MOV as required to increase/decrease cooldown rate.
(Keyswitch at breaker 52-212013) _____
- 1.4.7. IF DESIRED, **CLOSE** 1BC-HV-F048A, RHR HX A SHL SIDE BYP VLV as follows:
- A. **INSERT** key into keyswitch at breaker 52-212092 RHR HX A SHL SIDE BYP BRKR (Local). _____
 - B. **TURN** key to DECREASE for \approx 40 seconds.
(The normal closing stroke time for this valve is \approx 40 seconds.) _____
 - C. **THROTTLE** HV-F015A as necessary to reestablish loop A flow of approx. 10,000 gpm on E11-N652A.
(Keyswitch at breaker 52-481062) _____

**ATTACHMENT 11
SHUTDOWN FROM OUTSIDE CONTROL ROOM
A RHR LOOP SHUTDOWN COOLING OPERATION
(Page 11 of 11)**

CAUTION

The Reactor Coolant System temperature and pressure requirements of T/S 3.4.6.1 shall be complied with.

- 1.4.8. IF Reactor Coolant System temperature and pressure can not be controlled, **RAISE** Reactor water level to 80 inches to improve natural circulation. [70014100] _____

- 1.4.9. IF Shutdown Cooling is not able to maintain temperature and pressure, AND further cooldown is desired, **IMPLEMENT** Attachment 10. [70014100] _____

