

**PSEG NUCLEAR L.L.C.  
SALEM/OPERATIONS**

**S1.OP-AB.CR-0001(Q) REV. 17**

**CONTROL ROOM EVACUATION**

- 
- ◆ Biennial Review Performed: Yes \_\_\_ No \_\_\_ NA
  - ◆ DCP Packages and Affected Document Numbers incorporated into this revision: None
  - ◆ The following OTSCs were incorporated into this revision: None
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**REVISION SUMMARY:**

- ◆ Attachment 9 (Page 1 of 12), Item 1 for 1CV243, “Point Of Measurement”, [CRDA 70098833] changed “TP12-7 4-5-C” to read “TP12-2 4-5-C”. Editorial enhancement, aligns with changes previously reviewed and approved in PSBP 218848 Rev. 2.

**IMPLEMENTATION REQUIREMENTS**

**Effective Date:** \_\_\_\_\_

**None**

**CONTROL ROOM EVACUATION****1.0 ENTRY CONDITIONS**

Date: \_\_\_\_\_ Time: \_\_\_\_\_

1.1 Any condition requiring evacuation of the Control Room as a result of one of the following:

- ◆ A Security Event [C0362]
- ◆ Control Room atmosphere becomes uninhabitable.

**2.0 IMMEDIATE ACTIONS****NOTE**

- ◆ The EOPs are not applicable during Control Room Evacuation. They should be used for information only or as directed by the TSC while performing this procedure.
- ◆ The procedure is written for the plant initially in Mode 1, 2, or 3. If the plant is in Mode 4, 5, or 6, only those steps to restore shutdown cooling and stabilize the plant systems after evacuation are necessary.
- ◆ The following keys are located in the Emergency Key Lock Box in the SM Office:
  - Appendix "R" Locker Keys
  - Alternate Shutdown Cabinet Keys
  - Unit 1 Security Key Ring (containing seven Security Keys)
- ◆ The use of radio transmitters and cell phones within Radio Frequency Interference (RFI) and Electromagnetic Interference (EMI) sensitive areas should be minimized during evacuation of the Control Room. Areas that prohibit radio or cellular phone use should be considered EMI "Radio Free Zones" unless otherwise specified by the SM/CRS.

\_\_\_ 2.1 **TRIP** the reactor AND  
**CONFIRM** the Reactor Trip.

\_\_\_ 2.2 **TRIP** the turbine.

\_\_\_ 2.3 **ANNOUNCE** twice on Station PA "Duty Personnel assemble in Hallway immediately outside Control Room Double Doors due to evacuation of Unit One."

- \_\_\_ 2.4 IF conditions permit,  
THEN:
  - \_\_\_ A. **INITIATE** a Main Steam Isolation.
  - \_\_\_ B. **LOWER** 13 AFW Pump speed until:
    - \_\_\_ ◆ Total flow drops to 22E04 LB/HR.
    - OR
    - \_\_\_ ◆ Minimum speed is reached.
- \_\_\_ 2.5 **ENSURE** the Appendix “R”, Alternate Shutdown Cabinet, and Unit 1 Security Keys are obtained from the Emergency Key Lock Box located in the SM Office prior to evacuating the Control Room Area.
- \_\_\_ 2.6 **ENSURE** all Unit 1 Control Room personnel evacuate the Control Room Area.

3.0 SUBSEQUENT ACTIONS**NOTES**

- ◆ Steps 3.1 through 3.7 will be performed concurrently.
- ◆ The following keys are located in the Emergency Key Lock Box in the SM Office:
  - Appendix "R" Locker Keys
  - Alternate Shutdown Cabinet Keys
  - Unit 1 Security Key Ring (containing seven Security Keys)

\_\_\_ 3.1 Shift Manager (SM):

- ◆ **COMPLETE** Attachment 1
- ◆ **COORDINATE** plant operations from TSC.

\_\_\_ 3.2 Shift Technical Advisor (STA), **COMPLETE** Attachment 2.

\_\_\_ 3.3 Control Room Supervisor (CRS), **COMPLETE** Attachment 3.

\_\_\_ 3.4 Reactor Operator (RO), **COMPLETE** Attachment 5.

**NOTE**

The #3 NEO, if available, will perform that part of Attachment 4, to take manual control of Aux Feed-S/G Level Control Valves.

\_\_\_ 3.5 Plant Operator (PO), **COMPLETE** Attachment 6.

\_\_\_ 3.6 No. 1 Nuclear Equipment Operator (#1 NEO), **COMPLETE** Attachment 7.

\_\_\_ 3.7 No. 2 Nuclear Equipment Operator (#2 NEO), **COMPLETE** Attachment 8.

4.0 **COMPLETION AND REVIEW**

\_\_\_ 4.1 **COMPLETE** Attachment 17, Sections 1.0 and 2.0, **AND FORWARD** this procedure to SM/CRS for review and approval.

\_\_\_ 4.2 SM/CRS, **PERFORM** the following:

\_\_\_ A. **REVIEW** this procedure with Attachments 1 through 17 for completeness and accuracy.

\_\_\_ B. **COMPLETE** Attachment 17, Section 3.0.

\_\_\_ C. **FORWARD** completed procedure to Operations Staff.

**END OF PROCEDURE**

**ATTACHMENT 1  
(Page 1 of 1)****SHIFT MANAGER**

- \_\_\_ 1.0 **OBTAIN** the following:
- ◆ One copy of this procedure.
  - ◆ One radio (located in Appendix "R" Cabinet)
  - ◆ The Unit 1 Security Key Ring (located in located in the Emergency Key Lock Box in the SM Office)
- \_\_\_ 2.0 **DISTRIBUTE** the Unit 1 Security Key Ring (containing seven Security Keys) to the Unit 1 CRS.
- \_\_\_ 3.0 **PROCEED** to TSC.
- \_\_\_ 3.1 **NOTIFY** Plant Security that Operators will be utilizing Security keys for accessibility to security zones.
- \_\_\_ 3.2 **NOTIFY** Radiation Protection of Control Room Evacuation and that personnel will be accessing the Control Point and Contaminated Area between the Mech Pen and Elect Pen, Elev 78' unimpeded.
- \_\_\_ 3.3 **NOTIFY** PSEG Dispatcher of the following:
- ◆ Control Room Evacuation
  - ◆ Shutdown of Unit 1
- \_\_\_ 4.0 **PERFORM** Duties of the Emergency Coordinator IAW ECG.
- \_\_\_ 5.0 **DIRECT** plant shutdown/stabilization IAW Attachments 3 through 8.

**ATTACHMENT 2**  
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**SHIFT TECHNICAL ADVISOR**

- \_\_\_ 1.0 **OBTAIN** the following:
- ◆ One copy of this procedure.
  - ◆ One radio (located in Appendix "R" Cabinet)
- \_\_\_ 2.0 **NOTIFY** Primary AND Secondary Communicators to report to the TSC.
- \_\_\_ 3.0 **ENSURE** personnel have the listed attachment of this procedure:
- \_\_\_ 3.1 CRS has Attachment 3
  - \_\_\_ 3.2 RO has Attachment 5
  - \_\_\_ 3.3 PO has Attachments 4 and 6
  - \_\_\_ 3.4 #1 NEO has Attachment 7
  - \_\_\_ 3.5 #2 NEO has Attachment 8.
- \_\_\_ 4.0 **PROCEED** to the TSC.
- \_\_\_ 5.0 **ESTABLISH** communication with the CRS.
- \_\_\_ 6.0 **MONITOR** control of Shutdown System per the following:
- \_\_\_ 6.1 Attachment 5 (RO), Steps 1.0 through 8.0
  - \_\_\_ 6.2 Attachment 6 (PO), Steps 1.0 through 11.0
  - \_\_\_ 6.3 Attachment 7 (#1 NEO), Steps 1.0 through 25.0
  - \_\_\_ 6.4 Attachment 8 (#2 NEO), Steps 1.0 through 14.0.
- \_\_\_ A. IF any 500KV Breaker is to remain OPEN for >1 hour,  
THEN OPEN the associated 500KV Breaker Disconnects  
IAW S1.OP-SO.500-0001(Q), 500KV BUS Operation.
- \_\_\_ 7.0 **NOTIFY** the SM that control of Shutdown Systems is established and the unit is in Hot Standby.

**ATTACHMENT 3  
(Page 1 of 13)****CONTROL ROOM SUPERVISOR**

\_\_\_ 1.0 **OBTAIN** the following:

- ◆ One copy of this procedure.
- ◆ One radio (located in Appendix "R" Cabinet)
- ◆ Key ring set (JA Master, E25 HSD Panel)
- ◆ A Security Master Key from the Unit 1 Security Key Ring [C0363]

\_\_\_ 2.0 **DISTRIBUTE** Security Keys located on the Unit 1 Security Key Ring (containing the six remaining Security Keys) to the following individuals (two extra keys will remain):

- ◆ Reactor Operator (RO) - Attachment 5
- ◆ Plant Operator (PO) - Attachment 6
- ◆ #1 NEO - Attachment 7
- ◆ #2 NEO - Attachment 8

\_\_\_ 3.0 **PROCEED** to Hot Shutdown Panel

**NOTE**

Steps 1.0 through 8.0 of Attachment 5 will be completed prior to initiation of Rapid Boration.

\_\_\_ 4.0 **VERIFY** with the following Operators that they have completed the following:

- \_\_\_ 4.1 Attachment 5 (RO), Steps 1.0 through 8.0
- \_\_\_ 4.2 Attachment 6 (PO), Steps 1.0 through 11.0
- \_\_\_ 4.3 Attachment 7 (#1 NEO), Steps 1.0 through 25.0
- \_\_\_ 4.4 Attachment 8 (#2 NEO), Steps 1.0 through 14.0

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**CONTROL ROOM SUPERVISOR**

\_\_\_ 5.0 **COORDINATE** with other Operators to maintain the following parameters:

- ◆ Steam Generator Levels - 14-33% Narrow Range
  - 11 Steam Generator: LI-517A or LI-1640\*
  - 12 Steam Generator: LI-527A or LI-1641\*
  - 13 Steam Generator: LI-537A or LI-1642\*
  - 14 Steam Generator: LI-547A or LI-1643\*

**CAUTION**

**Steam Generator Differential Pressure Safety Injection will occur at 100 psi differential pressure.**

- ◆ Steam Generator Pressures - 1005 psig (Tave = 547°F)
  - 11 Steam Generator: PI-514B, PI-515B or PI-1644\*
  - 12 Steam Generator: PI-524B, PI-525B or PI-1645\*
  - 13 Steam Generator: PI-534B, PI-535B or PI-1646\*
  - 14 Steam Generator: PI-544B, PI-536B or PI-1647\*
- ◆ Pressurizer Level - 22-77% indicated on LI-459C, LI-460B or LI-1649\*
- ◆ Pressurizer Pressure - 2200-2250 psig indicated on PI-456A, PI-474B or PI-1648\*
- ◆ VCT Level - 24-65% indicated on Local Charging Flow Control Panel 216-1
- ◆ AFST Level - >94% IAW Attachment 14.

\_\_\_ 6.0 **VERIFY** RCP Seal Flows.

\_\_\_ 7.0 **VERIFY** with RO that Attachment 5 is completed.

\_\_\_ 8.0 **NOTIFY** the STA that steps 1 through 15 of Attachment 5 are completed, including Rapid Boration, if performed.

\* APPENDIX R - FOR REFERENCE ONLY

**ATTACHMENT 3  
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**CONTROL ROOM SUPERVISOR**

\_\_\_ 9.0 **MAINTAIN** Hot Standby conditions as directed by SM until one of the following is performed: \_\_\_\_\_ Time

\_\_\_ 9.1 WHEN Control Room access is available,  
THEN GO TO Attachment 16.

OR

\_\_\_ 9.2 WHEN Shutdown to Cold Shutdown is required,  
THEN PROCEED with Step 9.

**NOTE**

- ◆ The following steps will be performed with the assistance from TSC resources.
- ◆ Use of other procedures will be necessary to accomplish various lineups and evolutions throughout the remainder of this procedure. Due to plant conditions, many prerequisites, precautions and limitations required by the procedures may not apply.
- ◆ Handsenders, jumpers and tools are available in the Alternate Shutdown Equipment Storage Cabinet.

\_\_\_ 10.0 **REQUEST** TSC to install hand-senders for the following components IAW Attachment 10:

**NOTE**

11RH18-A/S & 12RH18-A/S, RHR Heat Exchanger Flow Control Valves Local Air Supply Valves are C/T IAW S1.OP-SO.RHR-0002(Q), TERMINATING RHR, when Unit 1 is in Modes 1 & 2.

\_\_\_ 10.1 11RH18, 11 RHR Hx Flow Cont V

\_\_\_ 10.2 12RH18, RHR Hx Flow Cont Valve

\_\_\_ 10.3 1RH20, RHR Hx Byp Valve

\_\_\_ 10.4 1CV8, Letdown Isol for RHR.

**ATTACHMENT 3  
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- \_\_\_ 11.0 **REQUEST** the TSC to bypass 1CV18, Letdown Pressure Control Valve IAW Attachment 10.
- \_\_\_ 12.0 **REQUEST** the TSC to jumper OPEN the following valves IAW Attachment 9:
  - \_\_\_ 12.1 1SS33, Hot Leg Sample, refer to item 18.
  - \_\_\_ 12.2 1SS104, Hot Leg Sample, refer to item 17.
  - \_\_\_ 12.3 1SS49, Pressurizer Liquid Sample, refer to item 16.
  - \_\_\_ 12.4 1SS107, Pressurizer Liquid Sample, refer to item 15.
- \_\_\_ 13.0 When **NOTIFIED** that the sample valves are open, **DIRECT** that the following valves be OPENED at Panel 307-1, Unit 1 Post Acc Smpgl Aux Bldg Sample Room Vlv Panel, El 110', Primary Sample Room:
  - \_\_\_ 13.1 1SS48, Pzr Liquid Space Sample Iso Vlv
  - \_\_\_ 13.2 11SS32, #11 Hot Leg Sample Iso Vlv.
- \_\_\_ 14.0 **REQUEST** the TSC to install Fluke Digital Thermometer at Computer Thermocouple Terminal Cabinet in the Relay Room between TP10-82 and TP10-83 (Regen HX Outlet Temperature).
- \_\_\_ 15.0 **REQUEST** the following from Chemistry:
  - \_\_\_ 15.1 Pressurizer and RCS Boron Concentration sample in preparation for shutdown to Cold Shutdown.
  - \_\_\_ 15.2 RCS Boron sampling hourly.
- \_\_\_ 16.0 **REQUEST** TSC to defeat the following 1RP4 Lockout Switches, IAW Attachment 15.
  - \_\_\_ 16.1 11SJ54-Accumulator Outlet Valve, refer to Step 1.0
  - \_\_\_ 16.2 11SJ49-RHR Discharge to Cold Legs Stop Valve, refer to Step 2.0
  - \_\_\_ 16.3 12SJ54-Accumulator Outlet Valve, refer to Step 3.0
  - \_\_\_ 16.4 14SJ54-Accumulator Outlet Valve, refer to Step 4.0

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**CONTROL ROOM SUPERVISOR**

- \_\_\_ 16.5 13SJ54-Accumulator Outlet Valve, refer to Step 5.0
- \_\_\_ 16.6 12SJ49-RHR Discharge to Cold Legs Stop Valve, refer to Step 6.0
- \_\_\_ 16.7 1SJ69-RWST To RHR Pumps Stop Valve, refer to Step 7.0
- \_\_\_ 17.0 **REQUEST** the TSC to initiate Feedwater Interlock by opening the following breakers:
  - \_\_\_ 17.1 1CDC2AX24, 11BF40 & 12BF40, 11 & 12 SG FW Inlet Control & Bypass Valves; at Cabinet 1CDC2AX in Relay Room Elev 100'.
  - \_\_\_ 17.2 1DDC2AX24, 13BF40 & 14BF40, 13 & 14 SG FW Inlet Control & Bypass Valves; at Cabinet 1DDC2AX in Switchgear Room Elev 84'.

**NOTE**

Necessary procedures, steam table, saturations curves and etc. may be obtained from the TSC.

- \_\_\_ 18.0 **ENSURE** Inner Pen Area is manned.
- \_\_\_ 19.0 **INITIATE** the following:
  - \_\_\_ 19.1 Reactor Coolant System Heatup/Cooldown Log IAW SC.OP-DL.ZZ-0011(Q).
  - \_\_\_ 19.2 Pressurizer Heatup/Cooldown Log IAW SC.OP-DL.ZZ-0012(Q).
- \_\_\_ 20.0 **DIRECT** an Operator to ensure charging suction is aligned to RWST, by performing the following two steps.

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**CONTROL ROOM SUPERVISOR**

**NOTE**

The following 2 steps will be performed at 1C West Valve and Misc. 230V Vital Control Center, Aux Bldg, EI 84'.

- \_\_\_ 21.0 **PROCEED** to 1CY2AX2A, 1SJ1-RWST To Charging Pump Stop Valve, **AND PERFORM** the following:
  - \_\_\_ 21.1 **DEFEAT** door interlock, **AND OPEN** breaker door.
  - \_\_\_ 21.2 **PLACE** key operated NORMAL/EMER switch, 1CY2AX2A-T1, to EMER position.
  - \_\_\_ 21.3 **ENSURE** breaker is CLOSED.
  - \_\_\_ 21.4 **ENSURE** thermal overloads are reset.
  - \_\_\_ 21.5 **PLACE** key operated EMER OPEN/NORM/EMER CLOSE switch, 1CY2AX2A-T2, in EMER Open.
  - \_\_\_ 21.6 **CLOSE** breaker door.
- \_\_\_ 22.0 **PROCEED** to 1CY2AX4A, 1CV40-Volume Control Tank Outlet Isolation Valve, **AND PERFORM** the following:
  - \_\_\_ 22.1 **DEFEAT** door interlock, **AND OPEN** breaker door.
  - \_\_\_ 22.2 **PLACE** key operated NORMAL/EMER switch, 1CY2AX4A-T1, to EMER position.
  - \_\_\_ 22.3 **ENSURE** breaker is CLOSED.
  - \_\_\_ 22.4 **ENSURE** thermal overloads are reset.
  - \_\_\_ 22.5 **PLACE** key operated EMER OPEN/NORM/EMER CLOSE switch, 1CY2AX4A-T2, in EMER CLOSED.
  - \_\_\_ 22.6 **CLOSE** breaker door.
- \_\_\_ 23.0 **DIVERT** 1CV35, VCT 3 Way Inlet V, to HUT IAW Attachment 9, Item 27.

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**CONTROL ROOM SUPERVISOR**

- \_\_\_ 24.0 **DIRECT** Operators to slowly increase steam release to atmosphere through MS10s to establish RCS cooldown rate of 25°F per hour, while maintaining Steam Generator pressures within 50 psig of each other.
- \_\_\_ 25.0 **DIRECT** Operator to cycle pressurizer heaters as required to establish Pressurizer cooldown rate of 25°F per hour IAW Attachment 12.
- \_\_\_ 26.0 **CONTINUE** depressurizing the RCS per the following:
- ◆ **MAINTAIN** VCT level between 24% and 65% by diverting 1CV35, VCT 3 Way Inlet Valve, IAW Attachment 9, Item 27 as necessary.
  - ◆ **MAINTAIN** Steam Generators between 14% and 33% Narrow Range Level.
  - ◆ **OPERATE** MS10s to control Steam Generator pressures within 50 psig of each other while maintaining 25°F per hour cooldown rate.
  - ◆ **MAINTAIN** AFST level greater than 94% IAW Attachment 14.
  - ◆ **DIRECT** an Operator to maintain RCP Seal Injection Flow 6 - 10 gpm by monitoring the following:
    - FI-144, 11 RCP Seal Injection Flow
    - FI-143, 12 RCP Seal Injection Flow
    - FI-116, 13 RCP Seal Injection Flow
    - FI-115, 14 RCP Seal Injection Flow.
  - ◆ **CONTROL** Letdown Flowrate by operating 1CV3 through 1CV5, Letdown Orifices, as required.
    - IF 1CC71, LETDOWN TEMPERATURE CONTROL, is INOPERABLE, THEN Letdown Cooling can be established by overriding 1CC71 OPEN as follows:
      - \_\_\_ A. **CLOSE** 1CA2090, 1CC71 ACTUATOR OPERATING AIR
      - \_\_\_ B. **OPEN** 1CA2089, 1CC71 ACTUATOR BACKUP AIR SUPPLY

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Step 26.0 (Continued)

- ◆ **MAINTAIN** all RCPs in service, if possible, until RCS temperature decreases below 400 °F.
- ◆ **MAINTAIN** Pressurizer level between 22 and 77% by performing one of the following as necessary:
  - ADJUST Letdown
  - MATCH Charging vs Letdown
- ◆ **MAINTAIN** Pressurizer Boron Concentration to within 50 ppm of RCS by performing the following:
  - **MONITOR** Pressurizer temperature IAW Saturation Curve, to ensure Regenerative Heat Exchanger Outlet temperature remains within 320°F of Pressurizer temperature while Borating the Pressurizer.
  - **OPEN** 1CV75, Pressurizer Auxiliary Spray Stop Valve, IAW Item 2 of Attachment 9.
  - **CLOSE** 1CV77, Charging Line Stop Valve, IAW Item 33 of Attachment 9.
- ◆ **MONITOR** Component Cooling Water temperatures using the following:
  - SPDS Computer points U1TE0602AS or U1TE0602BS (TSC)
  - Local temperature indicators 1TI626A or 1TI626B
- ◆ When Pressurizer Boron concentration is within desired ranges, OR pressure reduction is excessive, **PERFORM** the following:
  - **OPEN** 1CV77, Charging Line Stop Valve, IAW Item 33 of Attachment 9
  - **CLOSE** 1CV75, Pressurizer Auxiliary Spray Stop Valve, IAW Item 2 of Attachment 9.

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**CONTROL ROOM SUPERVISOR**

- \_\_\_ 27.0 When RCS pressure decreases below 1000 psig,  
**REQUEST TSC to CLOSE** the following valves IAW Attachment 9:
- ◆ 11SJ54, Item 23
  - ◆ 12SJ54, Item 24
  - ◆ 13SJ54, Item 25
  - ◆ 14SJ54, Item 26.
- \_\_\_ 28.0 When RCS temperature decreases below 400°F,  
**DIRECT** an available Operator to **OPEN** and **RACK DOWN** Breaker 1GD1TB4D, 14  
Reactor Coolant Pump, on 1G 4KV Group Bus.

**NOTE**

Technical Specifications requires that only 1, Centrifugal Charging OR Safety Injection Pump can be OPERABLE when RCS temperature is less than 312°F.

- \_\_\_ 29.0 When RCS temperature is <350°F and >200°F,  
**NOTIFY** the SM that the unit is in Mode 4.
- \_\_\_ 30.0 When RCS temperature is below 350°F and RCS pressure is below 1000 psig,  
**DIRECT** an available Operator to 4KV Vital Switchgear Room  
to **OPEN** and **RACK DOWN** the following breakers:
- \_\_\_ 30.1 1CD1AX5D, 12 Safety Injection Pump on 1C 4KV Bus
- \_\_\_ 30.2 1AD1AX5D, 11 Safety Injection Pump on 1A 4KV Bus.
- \_\_\_ 31.0 **DIRECT** an available Operator to **OPEN** and **RACK DOWN** the non-operating  
Centrifugal Charging Pump:
- \_\_\_ 31.1 1BD1AX9D, 11 Charging Pump on 1B 4KV Bus
- OR
- \_\_\_ 31.2 1CD1AX9D, 12 Charging Pump on 1C 4KV Bus.

Time

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**CONTROL ROOM SUPERVISOR**

- \_\_\_ 32.0 When RCS temperature is less than or equal to 312°F:
- \_\_\_ 32.1 **VERIFY** that RCS pressure is less than 375 psig
- \_\_\_ 32.2 **REQUEST** TSC to arm POPS IAW Attachment 11.
- \_\_\_ 32.3 **DIRECT** an available Operator to **OPEN** and **RACK DOWN** 1ED1TB4D, 12 Reactor Coolant Pump, on 1E 4KV Group Bus.
- \_\_\_ 33.0 When RCS temperature is below 350°F AND RCS pressure is below 340 psig, **REQUEST** the TSC to initiate RHR IAW S1.OP-SO.RHR-0001(Q), Initiating RHR, while operating the following components IAW Attachment 9:
- ◆ 11CC16, RHR Heat Exchanger Component Cooling Outlet Valve, Item 4
  - ◆ 12CC16, RHR Heat Exchanger Component Cooling Outlet Valve, item 5
  - ◆ 1SJ69, RHR Suct From RWST, Item 6
  - ◆ 11RH29, RHR Pump Min Flow MOV, Item 11
  - ◆ 12RH29, RHR Pump Min Flow MOV, Item 12
  - ◆ 11SJ49, RHR Discharge to Cold Legs, Item 7
  - ◆ 12SJ49, RHR Discharge to Cold Legs, Item 8
  - ◆ 1RH1, RHR Common Suct MOV, Item 13
  - ◆ 1RH2, RHR Common Suct MOV, Item 14
  - ◆ 11 RHR Pump, Item 38
  - ◆ 12 RHR Pump, Item 39.
- \_\_\_ 34.0 AFTER RHR is initiated, THEN **DIRECT** personnel to perform the following:
- \_\_\_ 34.1 **MAINTAIN** 1CV3 through 1CV5, Letdown Orifice Isolation Valves, OPEN to provide overpressure protection.
- \_\_\_ 34.2 **NOTIFY** Chemistry department to verify RHR Boron concentration within 50 ppm of RCS Boron concentration.

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**CONTROL ROOM SUPERVISOR**

**NOTE**

Panel 101-1, 11 RHR Instrument Panel; and Panel 102-1, 12 RHR Instrument Pnl are located in the Aux Bldg, El. 45'.

- \_\_\_ 34.3 **ADJUST** RHR flow to maintain 25°F per hour cooldown rate utilizing hand senders in Panels 101-1 and 102-1 for the following valves (increase air pressure to close valves):
- ◆ 11RH18, 11 RHR Hx Flow Cont V
  - ◆ 12RH18, RHR Hx Flow Cont Valve
  - ◆ 1RH20, RHR Hx Byp Valve.

**NOTE**

Panel 202-1, Unit 1 Safety Injection #11 & 12 Pumps Disch Flow & Pressure Panel #202-1, located in the SI Pump Room.

- \_\_\_ 34.4 **MAINTAIN** Pressurizer level between 22 and 77% utilizing the hand sender for 1CV8, Letdown Isol For RHR, on Panel 202-1.
- \_\_\_ 34.5 **MAINTAIN** pressure as necessary by bypassing 1CV18, Letdown Pressure Control Valve, IAW Attachment 10.
- \_\_\_ 35.0 **IF** high RCS flow rates for chemical additions are no longer required, **THEN DIRECT** an available Operator to **OPEN** and **RACK DOWN** Breaker 1HD1TB4D, 11 Reactor Coolant Pump, on 1H 4KV Group Bus.

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**CONTROL ROOM SUPERVISOR**

- \_\_\_ 36.0 When Auxiliary Feedwater is no longer required for secondary heat sink,  
**PERFORM** the following:
- \_\_\_ 36.1 **OPEN** and **RACK DOWN** 1AD1AX1D, 11 Auxiliary Feed Pump  
on 1A 4KV Vital Bus.
- \_\_\_ 36.2 **OPEN** and **RACK DOWN** 1BD1AX1D, 12 Auxiliary Feed Pump  
on 1B 4KV Vital Bus.
- \_\_\_ 37.0 **DIRECT** Operators to fully open all MS10 valves to continue cooldown below 250°F.
- \_\_\_ 38.0 When RCS temperature is less than 200°F,  
Direct an available Operator to **OPEN** and **RACK DOWN** the following breakers:
- \_\_\_\_\_ Time
- \_\_\_ 38.1 Breaker 1AD1AX2D, 11 Containment Spray Pump,  
on 1A Vital 4KV Bus.
- \_\_\_ 38.2 Breaker 1CD1AX2D, 12 Containment Spray Pump, on 1C Vital 4KV Bus.

**ATTACHMENT 3  
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**CONTROL ROOM SUPERVISOR**

\_\_\_ 39.0 **MAINTAIN** the following conditions:

- ◆ RCS temperature - less than 200°F
- ◆ Pressurizer Level - 22 to 77% indicated on LI-459C, LI-460B, or LI-1649\*
- ◆ Pressurizer Pressure - 320 to 350 psig indicated on PI-456A, PI-474B or PT-1648\*
- ◆ One Reactor Coolant Pump in operation, per SM/CRS direction
- ◆ POPS - armed
- ◆ RHR in service with at least one RHR Pump operating

\* APPENDIX R - FOR REFERENCE ONLY

**ATTACHMENT 4  
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**AUXILIARY FEEDWATER**

**NOTE**

- ◆ The following indications are available for local operation:
  - Panel 205-1:
    - 11 AFW Pump REMOTE/LOCAL Switch
    - 11 AFW Pump START/STOP Switch
    - 11 AFW Pump Suction Pressure Indication
    - 11 AFW Pump Discharge Pressure Indication
  - Panel 206-1:
    - 12 AFW Pump REMOTE/LOCAL Switch
    - 12 AFW Pump START/STOP Switch
    - 12 AFW Pump Suction Pressure Indication
    - 12 AFW Pump Discharge Pressure Indication
  - Panel 207-1:
    - 13 AFW Pump REMOTE/LOCAL Switch
    - 13 AFW Pump START/STOP/TRIP Switch
    - 13 AFW Pump Suction Pressure indication
    - 13 AFW Pump Discharge Pressure
    - 13 AFW Pump Steam Pressure
    - 13 AFW Pump INCREASE/OFF/DECREASE Switch

1.0 Is 11 AFW Pump operating?

\_\_\_ NO    \_\_\_ YES ———>  
           |  
           V

**GO TO** Step 3.0

\_\_\_\_\_ Time

**NOTE**

The following step will be performed at 11 Aux Feedwater Panel 205-1.

\_\_\_ 2.0 **PERFORM** the following to start 11 AFW Pump:

\_\_\_ 2.1 **PLACE** 11 AFW Pump Remote-Local switch to LOCAL position

\_\_\_ 2.2 **PLACE** 11 AFW Pump Start-Stop switch to START position.



**ATTACHMENT 4  
(Page 3 of 6)**

**AUXILIARY FEEDWATER**

**NOTE**

- ◆ The following step will be performed at 13 Aux Fdwtr Panel 207-1.
- ◆ Refer to Attachment 13, TURBINE-DRIVEN AFW PUMP RESTORATION; for guidance to RESET 1MS52, OVERSPEED TRIP MECHANISM.

- \_\_\_ 7.0 **REMOVE** 13 Auxiliary Feedwater Pump from service as follows:
- \_\_\_ 7.1 **PLACE** 13 AFW Pump Remote-Local switch to LOCAL position
- \_\_\_ 7.2 **REDUCE** 13 Auxiliary Feedwater Pump speed to minimum by slowly adjusting the 13 AFW Pump INCREASE/OFF/DECREASE Switch, to DECREASE.
- \_\_\_ 7.3 **PLACE** the Start/Stop/Trip switch in TRIP.

**CAUTION**

**Failure to return the 13 AFW Pump START/STOP/TRIP switch to the STOP position will result in the destruction of the actuator solenoids for 1MS52 and 1MS132.**

- \_\_\_ 7.4 **PLACE** 13 AFW Pump Start/Stop/Trip switch in STOP.
- \_\_\_ 7.5 **GO TO** Step 13.0.
- \_\_\_ 8.0 **TRANSFER** 13 Auxiliary Feedwater Pump control to LOCAL as follows:
- \_\_\_ 8.1 **PLACE** 13 AFW Pump Remote-Local switch to LOCAL position.
- \_\_\_ 8.2 **ADJUST** 13 Auxiliary Feedwater Pump speed with the 13 AFW Pump INCREASE/OFF/DECREASE Switch, until discharge pressure indicates 1500 psig as indicated on PL-1686-1 at No. 1 Unit No. 13 Aux Feedwater Pump Panel 207-1.

\_\_\_\_\_ Time

**ATTACHMENT 4**  
**(Page 4 of 6)**

**AUXILIARY FEEDWATER**

- \_\_\_ 9.0 **PERFORM** the following to take MANUAL control of 11AF11, Aux Feed-S/G Level Control Valve:
  - \_\_\_ 9.1 **MANUALLY ADJUST** hand jack for 11AF11 to the valve's present position.
  - \_\_\_ 9.2 **CLOSE** manual isolation valve to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1K.
  - \_\_\_ 9.3 **OPEN** the drain cock of the pressure regulator.
  - \_\_\_ 9.4 **MANUALLY ADJUST** 11AF11 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-517A.
  
- \_\_\_ 10.0 **PERFORM** the following to take MANUAL control of 12AF11, Aux Feed-S/G Level Control Valve:
  - \_\_\_ 10.1 **MANUALLY ADJUST** hand jack for 12AF11 to the valve's present position.
  - \_\_\_ 10.2 **CLOSE** manual isolation valve to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1X.
  - \_\_\_ 10.3 **OPEN** the drain cock of the pressure regulator.
  - \_\_\_ 10.4 **MANUALLY ADJUST** 12AF11 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-527A.
  
- \_\_\_ 11.0 **PERFORM** the following to take MANUAL control of 13AF11, Aux Feed-S/G Level Control Valve:
  - \_\_\_ 11.1 **MANUALLY ADJUST** hand jack for 13AF11 to the valve's present position.
  - \_\_\_ 11.2 **CLOSE** manual isolation valve to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1J.
  - \_\_\_ 11.3 **OPEN** the drain cock of the pressure regulator.
  - \_\_\_ 11.4 **MANUALLY ADJUST** 13AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-537A.

**ATTACHMENT 4**  
**(Page 5 of 6)**

**AUXILIARY FEEDWATER**

- \_\_\_ 12.0 **PERFORM** the following to take MANUAL control of 14AF11, Aux Feed-S/G Level Control Valve:
- \_\_\_ 12.1 **MANUALLY ADJUST** hand jack for 14AF11 to the valve's present position.
- \_\_\_ 12.2 **CLOSE** manual isolation valve to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1L.
- \_\_\_ 12.3 **OPEN** the drain cock of the pressure regulator.
- \_\_\_ 12.4 **MANUALLY ADJUST** 14AF11 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-547A.
- \_\_\_ 12.5 **GO TO** Step 17.0.
- \_\_\_\_\_ Time
- \_\_\_ 13.0 **PERFORM** the following to take MANUAL control of 11AF21, Aux Feed-S/G Level Control Valve:
- \_\_\_ 13.1 **MANUALLY ADJUST** hand jack for 11AF21 to the valve's present position.
- \_\_\_ 13.2 **CLOSE** manual isolation valve 11AF21 A/S to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1M.
- \_\_\_ 13.3 **OPEN** the drain cock of the pressure regulator.
- \_\_\_ 13.4 **MANUALLY ADJUST** 11AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-517A.
- \_\_\_ 14.0 **PERFORM** the following to take MANUAL control of 12AF21, Aux Feed-S/G Level Control Valve:
- \_\_\_ 14.1 **MANUALLY ADJUST** hand jack for 12AF21 to the valve's present position.
- \_\_\_ 14.2 **CLOSE** manual isolation valve 12AF21 A/S to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1Y.
- \_\_\_ 14.3 **OPEN** the drain cock of the pressure regulator.
- \_\_\_ 14.4 **MANUALLY ADJUST** 12AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-527A.

**ATTACHMENT 4  
(Page 6 of 6)****AUXILIARY FEEDWATER**

- \_\_\_ 15.0 **PERFORM** the following to take MANUAL control of 13AF21, Aux Feed-S/G Level Control Valve:
  - \_\_\_ 15.1 **MANUALLY ADJUST** hand jack for 13AF21 to the valve's present position.
  - \_\_\_ 15.2 **CLOSE** manual isolation valve 13AF21 A/S to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1F.
  - \_\_\_ 15.3 **OPEN** the drain cock of the pressure regulator.
  - \_\_\_ 15.4 **MANUALLY ADJUST** 13AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-537A.
  
- \_\_\_ 16.0 **PERFORM** the following to take MANUAL control of 14AF21, Aux Feed-S/G Level Control Valve:
  - \_\_\_ 16.1 **MANUALLY ADJUST** hand jack for 14AF21 to the valve's present position.
  - \_\_\_ 16.2 **CLOSE** manual isolation valve 14AF21 A/S to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1E.
  - \_\_\_ 16.3 **OPEN** the drain cock of the pressure regulator.
  - \_\_\_ 16.4 **MANUALLY ADJUST** 14AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-547A.
  
- \_\_\_ 17.0 **ADJUST** the AF11'S OR AF21 valves as necessary to maintain all Steam Generator levels between 14 and 33% Narrow Range as indicated on LI-517A through LI-547A.
  
- \_\_\_ 18.0 When 13 AFW Pump stops rotating,  
**RESET** 1MS52, OVERSPEED TRIP MECHANISM IAW Attachment 13,  
TURBINE-DRIVEN AFW PUMP RESTORATION.

**ATTACHMENT 5**  
**(Page 1 of 4)**

**REACTOR OPERATOR**

- \_\_\_ 1.0 **OBTAIN** the following:
- ◆ One copy of this procedure.
  - ◆ One radio (located in Appendix "R" Cabinet)
  - ◆ Key ring set and tools (JA Master, Breaker Keyswitch, screwdriver and adjustable wrench).
  - ◆ A Security Master Key from the Unit 1 CRS (located on the Unit 1 Security Key Ring) [C0363]
- \_\_\_ 2.0 **PROCEED** to Rod Drive MG Set Control Panel (460V Vital Bus Room-EI 84'), AND OPEN the following breakers:
- \_\_\_ 2.1 Reactor Trip Breaker A
  - \_\_\_ 2.2 Reactor Trip Breaker B
  - \_\_\_ 2.3 Reactor Trip Bypass Breaker A
  - \_\_\_ 2.4 Reactor Trip Bypass Breaker B.
- \_\_\_ 3.0 **CONFIRM** with the Hot Shutdown Panel Operator (PO) that 11 or 12 Charging Pump is operating.
- \_\_\_ 4.0 **PROCEED** to 1AX1AX7X, #13 Charging Pump breaker AND OPEN the breaker.
- \_\_\_ 5.0 **PROCEED** to 1C West Valve & Misc 230V Control Center-EI 84', AND OPEN Breaker 1CY2AX4I, 1CV175-Rapid Borate Stop Valve.
- \_\_\_ 6.0 **NOTIFY** the CRS of the following:
- \_\_\_ 6.1 The Reactor Trip and Bypass breakers are OPEN
  - \_\_\_ 6.2 #13 Charging Pump Breaker is OPEN.
- \_\_\_ 7.0 **CONFIRM** with NEO #1 that 1CV71, Chr Hdr PCV, is isolated (1CV70) and bypassed (1CV73) and that flow is being maintained to RCP seals at flowrate of 6 to 10 gpm to each seal.



ATTACHMENT 5  
(Page 3 of 4)

## REACTOR OPERATOR

**NOTE**

Step 10.0 through Step 15.0 will only be performed if an Emergency Boration is required for stuck rod.

- \_\_\_ 10.0 **WHEN** directed by the CRS,  
**THEN**:
  - \_\_\_ 10.1 **PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1A, El 122', near the Boric Acid Storage Tanks.
  - \_\_\_ 10.2 **CLOSE** the Air Supply Isolation Valve, 11CV160 A/S, AIR SUPPLY FOR 11CV160.
  - \_\_\_ 10.3 **OPEN** draincock for control air regulator for 11CV160.
  - \_\_\_ 10.4 **PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1B, El 122", near the Boric Acid Storage Tanks.
  - \_\_\_ 10.5 **CLOSE** the Air Supply Isolation Valve, 12CV160 A/S, AIR SUPPLY FOR 12CV160.
  - \_\_\_ 10.6 **OPEN** draincock for control air regulator for 12CV160.
  - \_\_\_ 10.7 **OPEN** 1CV175, Rapid Borate Stop Valve.
  - \_\_\_ 10.8 **PROCEED** to 1CV55 and **ADJUST** the flow for 75 gpm above existing total flow for all RCP seal flows.
- \_\_\_ 11.0 **REQUEST** NEO #1 to adjust 1CV73 to maintain flow to RCP seals between 6 and 10 gpm.
- \_\_\_ 12.0 **NOTIFY** the CRS that Rapid Boration has commenced.
- \_\_\_ 13.0 **REMAIN** in the area of the Charging Pumps.

**ATTACHMENT 5**  
**(Page 4 of 4)**

**REACTOR OPERATOR**

- \_\_\_ 14.0 WHEN directed by CRS to terminate Rapid Boration,  
THEN:
- \_\_\_ 14.1 IF necessary,  
THEN ADJUST 1CV55 to reduce flow to maintain Pressurizer level.
- \_\_\_ 14.2 **REQUEST** the Inner Pen Area Operator (#1 NEO) to adjust 1CV73 to maintain RCP Seal flow between 6 and 10 gpm for each RCP seal.
- \_\_\_ 14.3 **PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1A, El 122', near the Boric Acid Storage Tanks.
- \_\_\_ 14.4 **CLOSE** draincock for control air regulator for 11CV160, BA Xfr Recirc Cont Valve.
- \_\_\_ 14.5 **OPEN** the Air Supply Isolation Valve, 11CV160 A/S, AIR SUPPLY FOR 11CV160.
- \_\_\_ 14.6 **PROCEED** to Unit 1 Cont Air Redundant Air Supply Wall Mntd Pnl 701-1B, El 122", near the Boric Acid Storage Tanks.
- \_\_\_ 14.7 **CLOSE** draincock for control air regulator for 12CV160, BAT Recirc Cont Valve.
- \_\_\_ 14.8 **OPEN** the Air Supply Isolation Valve, 12CV160 A/S, AIR SUPPLY FOR 12CV160.
- \_\_\_ 14.9 **CLOSE** 1CV175, Rapid Borate Stop Valve.
- \_\_\_ 15.0 **NOTIFY** CRS that Rapid Boration is terminated.
- \_\_\_ 16.0 **PROCEED** to Hot Shutdown Panel and assist where necessary.

**ATTACHMENT 6**  
**(Page 1 of 4)**

**PLANT OPERATOR**

\_\_\_ 1.0 **OBTAIN** the following:

- ◆ One copy of this procedure.
- ◆ One radio (located in Appendix "R" Cabinet)
- ◆ Key ring set and tools (JA Master, screwdriver and adjustable wrench).
- ◆ A Security Master Key from the Unit 1 CRS (located on the Unit 1 Security Key Ring)

[C0363]

\_\_\_ 2.0 **PROCEED** to Hot Shutdown Panel AND OPEN the Panel.

\_\_\_ 3.0 **PLACE** all of the following Remote-Local switches to the LOCAL position:

- \_\_\_ ◆ Letdown Orifice Isol Valve, 1CV4
- \_\_\_ ◆ 11 Boric Acid Pump
- \_\_\_ ◆ 11 Component Cooling Pump
- \_\_\_ ◆ Letdown Orifice Isol. Valve 1CV3
- \_\_\_ ◆ 12 Component Cooling Pump
- \_\_\_ ◆ 13 Service Water Pump
- \_\_\_ ◆ 14 Service Water Pump
- \_\_\_ ◆ Letdown Orifice Iso Valve, 1CV5
- \_\_\_ ◆ Emergency Air Compressor.
- \_\_\_ ◆ 12 Boric Acid Pump
- \_\_\_ ◆ 13 Component Cooling Pump
- \_\_\_ ◆ 11 Service Water Pump
- \_\_\_ ◆ 12 Service Water Pump.

**ATTACHMENT 6  
(Page 2 of 4)**

**PLANT OPERATOR**

- \_\_\_ 4.0 **ENSURE** that a minimum of the following equipment is operating:
- \_\_\_ 4.1 One Charging Pump (11 or 12)
- \_\_\_ 4.2 Three Service Water Pumps (11, 12, 13, 14, 15, or 16)
- \_\_\_ 4.3 Two Component Cooling Pumps (11, 12 or 13)
- \_\_\_ 4.4 Four Containment Fans in High Speed (11, 12, 13, 14 or 15)
- \_\_\_ 5.0 **ESTABLISH** AFW IAW Attachment 4.
- \_\_\_ 6.0 **COORDINATE** with other Operators to maintain the following parameters:
- ◆ Steam Generator Levels - 14-33% Narrow Range
    - ◆ 11 Steam Generator: LI-517A or LI-1640\*
    - ◆ 12 Steam Generator: LI-527A or LI-1641\*
    - ◆ 13 Steam Generator: LI-537A or LI-1642\*
    - ◆ 14 Steam Generator: LI-547A or LI-1643\*

**CAUTION**

**Steam Generator Differential Pressure Safety Injection will occur at 100 psi  $\Delta$ P.**

- ◆ Steam Generator Pressures - 1005 psig (Tave = 547°F)
  - ◆ 11 Steam Generator: PI-514B, PI-515B or PI-1644\*
  - ◆ 12 Steam Generator: PI-524B, PI-525B or PI-1645\*
  - ◆ 13 Steam Generator: PI-534B, PI-535B or PI-1646\*
  - ◆ 14 Steam Generator: PI-544B, PI-536B or PI-1647\*

\* APPENDIX R - FOR REFERENCE ONLY

**ATTACHMENT 6  
(Page 3 of 4)**

**PLANT OPERATOR**

Step 6.0 (Continued)

- ◆ Pressurizer Level - 22-77% indicated on LI-459C, LI-460B or LI-1649\*
- ◆ Pressurizer Pressure - 2200-2250 psig indicated on PI-456A, PI-474B or PI-1648\*
- ◆ VCT Level - 24-65% indicated on Local Charging Flow Control Panel 216
- ◆ AFST Level - >94% indicated on Local AFW Pp Control Panel 205-1, 206-1 and 207-1.

**NOTE**

If rapid boration is required, boration should commence as soon as possible to pre-load as much boron as possible and to compensate for initial pressurizer level decrease as a result of a unit trip. Once pressurizer level is increased to a minimum of 70%, the charging rate can be adjusted to compensate for contraction of shrinkage.

7.0 Does Gamma Metric OR SPDS, in the TSC, indicate any stuck rods?

\_\_\_ YES \_\_\_ NO ———>  
 |  
 V

**GO TO** Step 10.0

\_\_\_\_\_ Time

\_\_\_ 8.0 **START** a Boric Acid Pump (11 or 12) in FAST speed.

\* APPENDIX R - FOR REFERENCE ONLY

**ATTACHMENT 6  
(Page 4 of 4)**

**PLANT OPERATOR**

**NOTE**

During Rapid Boration, PZR water level is allowed to increase above the recommended level.

- \_\_\_ 9.0 **COORDINATE** with RO to perform a Rapid Boration for a duration of 35 minutes per each stuck rod, at a rate of at least 36 gpm (singular BAT pump). \_\_\_\_\_ Time
- \_\_\_ 10.0 **MAINTAIN** RCS pressure and Pressurizer Level by one or more of the following:
- ◆ Letdown Orifice Valves
  - ◆ Cycling Pressurizer Heaters
  - ◆ Varying Charging Flow.
- \_\_\_ 11.0 After Boration is completed, **PERFORM** either of the following: \_\_\_\_\_ Time
- \_\_\_ 11.1 **SHUTDOWN** the operating Boric Acid Pump
- OR
- \_\_\_ 11.2 **PLACE** the Boric Acid pump in SLOW speed, recircing the tank.
- \_\_\_ 12.0 **NOTIFY** the STA and CRS that Steps 1.0 through 11.0 of Attachment 6 are completed.

**ATTACHMENT 7  
(Page 1 of 7)**

**#1 NEO**

\_\_\_ 1.0 **OBTAIN** the following:

- ◆ One copy of this procedure.
- ◆ One radio (located in Appendix "R" Cabinet)
- ◆ Key ring set and tools (JA Master, Breaker Keyswitch, screwdriver and adjustable wrench).
- ◆ A Security Master Key from the Unit 1 CRS (located on the Unit 1 Security Key Ring) **[C0363]**

2.0 **DEFEAT** Safety Injection by opening the following breakers:

- \_\_\_ 2.1 Breaker 1AVIB5, Reactor Protection Output Cabinet Train A #103 in 1A 115VAC Vital Instrument Bus for Train "A" in Relay Room Elev 100'.
- \_\_\_ 2.2 Breaker 1AVIB24, 1A Safeguard Emergency Cabinet.
- \_\_\_ 2.3 Breaker 1BVIB8, Reactor Protection Output Cabinet Train B #37 in 1B 115 VAC Vital Instrument Bus for Train "B" in Relay Room Elev 100'.
- \_\_\_ 2.4 Breaker 1BVIB27, 1B Safeguard Emergency Cabinet.
- \_\_\_ 2.5 Breaker 1CVIB9, 1C Safeguard Emergency Cabinet.

3.0 **PERFORM** the following at SW 4KV Switchgear Cabinet:

- \_\_\_ A. **PLACE** 15 SW Pump LOCAL/REMOTE switch on Cabinet 1A3D in LOCAL.
- \_\_\_ B. **PLACE** 16 SW Pump LOCAL/REMOTE switch on Cabinet 1A8D in LOCAL.
- \_\_\_ C. **NOTIFY** HSD Panel Operator (PO) upon completion.

**NOTE**

- ◆ The following steps will be performed in Mech Pen, Elev 78'.
- ◆ The following steps assume the charging system was in a normal operating condition prior to Control Room evacuation.

\_\_\_ 4.0 **REQUEST** Charging flow rate from the RO who is performing Attachment 5.

\_\_\_ 5.0 **PROCEED** to 1CV70, Chg Hdr PCV Inlet Vlv, and 1CV73, Chg Hd PCV Byp Valve, **AND SIMULTANEOUSLY CLOSE** 1CV70 while **OPENING** 1CV73.

**ATTACHMENT 7  
(Page 2 of 7)**

**#1 NEO**

- \_\_\_ 6.0 After 1CV70 is CLOSED, **REQUEST** the charging flowrate from RO, **AND ADJUST** 1CV73 to the flowrate identified in Step 4.0.
- \_\_\_ 7.0 **VERIFY** that a 6-10 gpm flow is maintained for each RCP pump seal as indicated on the following:
- \_\_\_ 7.1 1FI144A, 11 CVC React Cool Pmp Seal Water Flow Ind
- \_\_\_ 7.2 1FI143A, 12 CVC React Cool Pmp Seal Water Flow Ind
- \_\_\_ 7.3 1FI116A, 13 CVC React Cool Pmp Seal Water Flow Ind
- \_\_\_ 7.4 1FI115A, 14 CVC React Cool Pmp Seal Water Flow Ind
- \_\_\_ 8.0 **PROCEED** to the Inner Pen Area.

**CAUTION**

**The following steps, MSIV Isolation, should be coordinated with the CRS.**

- \_\_\_ 9.0 **PROCEED** to No. 11 Steam Gen Press Cont Pnl, 683-1A, **AND CLOSE** 11MS18A/S, A/S to SV587 in Pnl 683-1A.
- \_\_\_ 10.0 **PROCEED** to No. 11 Mn Stm & Trb Bypass Stm Gen Press Cont Pnl, 684-1A, **AND PERFORM** the following for 11MS10 Atmospheric Relief Valve:
- \_\_\_ 10.1 **PLACE** the selector valve in E/P bypass line to LOCAL position.
- \_\_\_ 10.2 **OPERATE** hand sender in E/P line to ensure that PL-8907 indicates zero.
- \_\_\_ 11.0 **PROCEED** to No. 13 Steam Gen Press Cont Pnl, 683-1C, **AND CLOSE** 13MS18A/S, A/S to SV585 in Pnl 683-1C.
- \_\_\_ 12.0 **PROCEED** to 13 Mn Stm & Trb Bypass Stm Gen Press Cont Pnl, 684-1C, **AND PERFORM** the following for 13MS10 Atmospheric Relief Valve:
- \_\_\_ 12.1 **PLACE** the selector valve in E/P bypass line to LOCAL position.
- \_\_\_ 12.2 **OPERATE** hand sender in E/P line to ensure that PL-8909 indicates zero.

**ATTACHMENT 7  
(Page 3 of 7)**

**#1 NEO**

**NOTE**

Each MS18 is equipped with two parallel pressure regulators for valve control. Opening either drain cock on the parallel pressure regulators will ensure the respective MS18 valve is failed to the CLOSED position.

- \_\_\_ 13.0 At 13MS18, **OPEN** at least one drain cock on the pressure regulators.
- \_\_\_ 14.0 At 11MS18, **OPEN** at least one drain cock on the pressure regulators.
- \_\_\_ 15.0 **PERFORM** either of the following to Main Steam Isolate 11MS167, MS ISOL VLV:

**NOTE**

It is only necessary to fail either 11MS171 or 11MS169 to CLOSE 11MS167.

**CAUTION**

**Steam hazard when opening 11MS169 or 11MS171 because of telltale leakoff drain pinholes downstream of valves.**

- \_\_\_ 15.1 **PERFORM** the following to fail open 11MS171, MS ISOL STEAM ASSIST, inside No. 1 Unit Main Stm Vent Vlv Control Panel 688-1A:
- \_\_\_ A. **CLOSE** 11MS171-A/S, AIR SUPPLY TO 11MS171 FOR SV275, PANEL 688-1A.
- \_\_\_ B. **OPEN** draincock of pressure regulator for SV275.
- \_\_\_ OR
- \_\_\_ 15.2 **PERFORM** the following to fail open 11MS169, MS ISOL STEAM ASSIST, inside No. 1 Unit Main Stm Vent Vlv Control Panel 689-1A:
- \_\_\_ A. **CLOSE** 11MS169-A/S, AIR SUPPLY TO 11MS169 FOR SV274, PANEL 689-1A.
- \_\_\_ B. **OPEN** draincock of pressure regulator for SV274.

**ATTACHMENT 7  
(Page 4 of 7)**

**#1 NEO**

\_\_\_ 16.0 **PERFORM** either of the following to Main Steam Isolate 13MS167, MS ISOL VLV:

**NOTE**

It is only necessary to fail either 13MS171 or 13MS169 to CLOSE 13MS167.

**CAUTION**

**Steam hazard when opening 13MS169 or 13MS171 because of telltale leakoff drain pinholes downstream of valves.**

\_\_\_ 16.1 **PERFORM** the following to fail open 13MS171, MS ISOL STEAM ASSIST, inside No. 1 Unit Main Stm Vent Vlv Control Panel 688-1C:

\_\_\_ A. **CLOSE** 13MS171-A/S, AIR SUPPLY TO 13MS171.

\_\_\_ B. **OPEN** draincock of pressure regulator for SV271.

OR

\_\_\_ 16.2 **PERFORM** the following to fail open 13MS169, MS ISOL STEAM ASSIST, inside No. 1 Unit Main Stm Vent Vlv Control Panel 689-1C:

\_\_\_ A. **CLOSE** 13MS169-A/S, AIR SUPPLY TO 13MS169.

\_\_\_ B. **OPEN** draincock of pressure regulator for SV270.

**ATTACHMENT 7  
(Page 5 of 7)**

**#1 NEO**

\_\_\_ 17.0 **PROCEED** to the Outer Pen Area.

**CAUTION**

**The following steps, MSIV Isolation, should be coordinated with the CRS.**

\_\_\_ 18.0 **PROCEED** to 12 Mn Stm & Trb Bypass Stm Gen Press Cont Pnl 684-1B,  
**AND PERFORM** the following for 12MS10, Atmospheric Relief Valve:

\_\_\_ 18.1 **PLACE** the selector valve in E/P bypass line to LOCAL position.

\_\_\_ 18.2 **OPERATE** hand sender in E/P line to ensure that PL-8908 indicates zero.

\_\_\_ 19.0 **PROCEED** to No. 12 Steam Gen Cont Pnl 683-1B,  
**AND CLOSE** 12MS18 A/S, A/S to SV581 in Pnl 683-1B.

\_\_\_ 20.0 **PROCEED** to No. 14 Steam Gen Cont Pnl 683-1D,  
**AND CLOSE** 14MS18 A/S, A/S to SV583 in Pnl 683-1D.

\_\_\_ 21.0 **PROCEED** to 14 Mn Stm & Trb Bypass Stm Gen Press Cont Pnl 684-1D,  
**AND PERFORM** the following for 14MS10, Atmospheric Relief Valve:

\_\_\_ 21.1 **PLACE** the selector valve in E/P bypass line to LOCAL position.

\_\_\_ 21.2 **OPERATE** hand sender in E/P line to ensure that PL-8910 indicates zero.

**NOTE**

Each MS18 is equipped with two parallel pressure regulators for valve control. Opening either drain cock on the parallel pressure regulators will ensure the respective MS18 valve is failed to the CLOSED position.

\_\_\_ 22.0 At 12MS18, **OPEN** at least one drain cock on the pressure regulators.

\_\_\_ 23.0 At 14MS18, **OPEN** at least one drain cock on the pressure regulators.

**ATTACHMENT 7  
(Page 6 of 7)**

**#1 NEO**

\_\_\_ 24.0 **PERFORM** either of the following to Main Steam Isolate 12MS167, MS ISOL VLV:

**NOTE**

It is only necessary to fail either 12MS171 or 12MS169 to CLOSE 12MS167.

**CAUTION**

**Steam hazard when opening 12MS169 or 12MS171 because of telltale leakoff drain pinholes downstream of valves.**

\_\_\_ 24.1 **PERFORM** the following to fail open 12MS171, MS ISOL STEAM ASSIST, inside No. 1 Unit Main Stm Vent Vlv Control Panel 688-1B:

\_\_\_ A. **CLOSE** 12MS171-A/S, SV281 AIR SUPPLY TO 12MS171.

\_\_\_ B. **OPEN** draincock of pressure regulator for SV281.

OR

\_\_\_ 24.2 **PERFORM** the following to fail open 12MS169, MS ISOL STEAM ASSIST, inside No. 1 Unit Main Stm Vent Vlv Control Panel 689-1B:

\_\_\_ A. **CLOSE** 12MS169-A/S, SV280 AIR SUPPLY TO 12MS169.

\_\_\_ B. **OPEN** draincock of pressure regulator for SV280.

**ATTACHMENT 7  
(Page 7 of 7)**

**#1 NEO**

\_\_\_ 25.0 **PERFORM** either of the following to Main Steam Isolate 14MS167, MS ISOL VLV:

**NOTE**

It is only necessary to fail either 14MS171 or 14MS169 to CLOSE 14MS167.

**CAUTION**

**Steam hazard when opening 14MS169 or 14MS171 because of telltale leakoff drain pinholes downstream of valves.**

\_\_\_ 25.1 **PERFORM** the following to fail open 14MS171, MS ISOL STEAM ASSIST, inside No. 1 Unit Main Stm Vent Vlv Control Panel 688-1D:

\_\_\_ A. **CLOSE** 14MS171-A/S, SV285 AIR SUPPLY TO 14MS171.

\_\_\_ B. **OPEN** draincock of pressure regulator for SV285.

**OR**

\_\_\_ 25.2 **PERFORM** the following to fail open 14MS169, MS ISOL STEAM ASSIST, inside No. 1 Unit Main Stm Vent Vlv Control Panel 689-1D:

\_\_\_ A. **CLOSE** 14MS169-A/S, SV284 AIR SUPPLY TO 14MS169.

\_\_\_ B. **OPEN** draincock of pressure regulator for SV284.

\_\_\_ 26.0 **NOTIFY** the CRS and STA that Steps 1 through 25 of Attachment 7 are completed.

\_\_\_ 27.0 **REMAIN** in the Outer Pen Area.

**CAUTION**

**When operating hand sender in E/P bypass line, DO NOT exceed a maximum of 20 psig indicated pressure on PL-8909 & PL-8910.**

\_\_\_ 28.0 When directed by the CRS, **SLOWLY THROTTLE OPEN** 12 & 14 MS10s and **MAINTAIN** Steam Generator Pressures @ 1005 psig (Tave = 547°F), by operating the hand sender in E/P bypass line at No. 1 Unit 12 & 14 Steam Generator Press Control Panels 684-1B and 684-1D respectively.

\_\_\_ 29.0 **VERIFY** opening of the MS10s by observing pressure indication on PL-8908 and PL-8910, respectively.

**ATTACHMENT 8  
(Page 1 of 3)**

**#2 NEO**

\_\_\_ 1.0 **OBTAIN** the following:

- ◆ One copy of this procedure.
- ◆ One radio (located in Appendix "R" Cabinet)
- ◆ Key ring set and tools (Switchyard key, JA Master, Breaker Keyswitch, screwdriver and adjustable wrench).
- ◆ A Security Master Key from the Unit 1 CRS (located on the Unit 1 Security Key Ring) [C0363]

\_\_\_ 2.0 **PROCEED** to Turbine Front Standard,  
AND PLACE the Reset-Normal-Trip lever in the TRIP position.

\_\_\_ 3.0 **PROCEED** to Excitation System Control Cubicle (TB Elev 120')  
AND OPEN Generator Exciter Field Breaker.

\_\_\_ 4.0 Locally, **TRIP** the following:

- \_\_\_ 4.1 11 Steam Generator Feed Pump
- \_\_\_ 4.2 12 Steam Generator Feed Pump

**NOTE**

All breaker operations will be accomplished utilizing the Manual Trip or Close button inside breaker cubicles.

\_\_\_ 5.0 **PROCEED** to No. 1G 4160 Volt Group Bus,  
AND PERFORM the following:

- \_\_\_ 5.1 **ENSURE** that Breaker 1GD1TB1BGGD, 1B Aux Power Transformer Infeed Breaker, is OPEN.
- \_\_\_ 5.2 **ENSURE** that Breaker 1GD1TB12GSD, 12 Station Power Transformer Infeed Breaker, is CLOSED.
- \_\_\_ 5.3 **ENSURE** that Breaker 1GD1TB2D, 13 Heater Drain Pump, is OPEN.

**ATTACHMENT 8**  
**(Page 2 of 3)**

**#2 NEO**

- \_\_\_ 6.0 **PROCEED** to No. 1F 4160 Volt Group Bus,  
AND PERFORM the following:
- \_\_\_ 6.1 **ENSURE** that Breaker 1FD1TB1BFGD, 1B Aux Power Transformer Infeed Breaker, is OPEN.
- \_\_\_ 6.2 **ENSURE** that Breaker 1FD1TB12FSD, 12 Station Power Transformer Infeed Breaker, is CLOSED.
- \_\_\_ 6.3 **ENSURE** that Breaker 1FD1TB2D, 12 Heater Drain Pump, is OPEN.
- \_\_\_ 7.0 **PROCEED** to No. 1E 4160 Volt Group Bus,  
AND PERFORM the following:
- \_\_\_ 7.1 **ENSURE** that Breaker 1ED1TB1AEGD, 1A Aux Power Transformer Infeed Breaker, is OPEN.
- \_\_\_ 7.2 **ENSURE** that Breaker 1ED1TB11ESD, 11 Station Power Transformer Infeed Breaker, is CLOSED.
- \_\_\_ 8.0 **PROCEED** to 1H 4160 Volt Group Bus,  
AND PERFORM the following:
- \_\_\_ 8.1 **ENSURE** that Breaker 1HD1TB1AHGD, 1A Aux Power Transformer Infeed Breaker, is OPEN.
- \_\_\_ 8.2 **ENSURE** that Breaker 1HD1TB11HSD, 11 Station Power Transformer Infeed Breaker, is CLOSED.
- \_\_\_ 8.3 **ENSURE** that Breaker 1HD1TB2D, 11 Heater Drain Pump, is OPEN.
- \_\_\_ 9.0 **TRIP** all BUT ONE of the following Condensate Pumps as directed by the CRS:
- \_\_\_ 9.1 Breaker 1ED1TB1D, 12 Condensate Pump
- \_\_\_ 9.2 Breaker 1FD1TB1D, 13 Condensate Pump
- \_\_\_ 9.3 Breaker 1HD1TB1D, 11 Condensate Pump.
- \_\_\_ 10.0 **PROCEED** to switchyard.

**ATTACHMENT 8**  
**(Page 3 of 3)****#2 NEO**

- \_\_\_ 11.0 **OPEN** 500 KV Bus Section Breakers 1-5, by performing the following at Phase B of Breaker:
  - \_\_\_ 11.1 **OPEN** rear door of cabinet
  - \_\_\_ 11.2 **PLACE** the local switch in OPEN position.
  - \_\_\_ 11.3 **CLOSE** rear door of cabinet.
  
- \_\_\_ 12.0 **OPEN** 500 KV Bus Section Breakers 5-6, by performing the following at Phase B of Breaker:
  - \_\_\_ 12.1 **OPEN** rear door of cabinet
  - \_\_\_ 12.2 **PLACE** the local switch in OPEN position.
  - \_\_\_ 12.3 **CLOSE** rear door of cabinet.

**NOTE**

Copies of operating procedures may be obtained from the TSC.

- \_\_\_ 13.0 **PROCEED** to Steam Generator Feed Pumps, **AND PLACE** both SGFPs on the Turning Gears:
  - \_\_\_ 13.1 11 Steam Generator Feed Pump
  - \_\_\_ 13.2 12 Steam Generator Feed Pump.
  
- \_\_\_ 14.0 **AFTER** the Main Turbine stops rotating, **PLACE** the Turning Gear in operation IAW S1.OP-SO.TRB-0004(Q), Turbine Turning Gear Operation.
  
- \_\_\_ 15.0 **NOTIFY** the STA and CRS that Steps 1 through 14 of Attachment 8 are completed.
  
- \_\_\_ 16.0 **PROCEED** to the Hot Shutdown Panel and provide assistance wherever directed.

**ATTACHMENT 9  
(Page 1 of 12)**

**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
1	1CV243	RC12-7 11-1-11	RC12-7 7-3-13 PIN 23	OPEN	TP12-2 4-5-B	TP12-2 4-5-C	125VDC (OPEN)	218848 211583
			RC12-7 7-3-13 PIN 21	CLOSE			0VDC (CLOSED)	
2	1CV75	RC12-7 11-1-7	RC12-7 7-4-1 PIN 23	OPEN	TP12-2 4-3-B	TP12-2 4-3-C	125VDC	211567
			RC12-7 7-4-1 PIN 21	CLOSE		TP12-2 4-3-D		
3	1CV114	RC14-7 11-1-5	RC14-7 7-3-4 PIN 7	OPEN	TP14-2 4-2-B	TP14-2 4-2-F	125VDC	211562
			RC14-7 7-3-4 PIN 5	CLOSE		TP14-2 4-2-H		
4	11CC16	RC11-3 11-1-19	RC11-3 3-4-10 PIN 7	OPEN	TP11-1 2-4-B	TP11-1 2-4-E	115VAC	211529
			RC11-3 3-4-10 PIN 5	CLOSE		TP11-1 2-4-F		
5	12CC16	RC12-3 11-1-9	RC12-3 3-4-10 PIN 7	OPEN	TP12-1 2-4-B	TP12-1 2-4-E	115VAC	211530
			RC12-3 3-4-10 PIN 5	CLOSE		TP12-1 2-4-F		

**ATTACHMENT 9  
(Page 2 of 12)**

**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
6	1SJ69	RC13-4 11-1-17	RC13-4 4-9-10 PIN 7	OPEN	TP13-2 2-4-R	TP13-1 4-4-E	125VDC	211508 211642
			RC13-4 4-9-10 PIN 5	CLOSE		TP13-1 4-4-F		
7	11SJ49	RC11-4 11-1-15	RC11-4 4-6-1 PIN 7	OPEN	TP11-2 5-3-B	TP11-1 4-2-E	125VDC	211509 211510 217157
			RC11-4 4-6-1 PIN 5	CLOSE		TP11-1 4-2-F		
8	12SJ49	RC12-4 11-1-15	RC12-4 4-6-1 PIN 7	OPEN	TP12-2 2-4-R	TP12-1 4-2-E	125VDC	211511 211512 211666 211652
			RC12-4 4-6-1 PIN 5	CLOSE		TP12-1 4-2-F		
9	11RH19	RC11-4 11-1-15	RC11-4 4-7-13 PIN 7	OPEN	TP11-1 4-2-Z	TP11-1 4-2-X	115VAC	211509 211510
			RC11-4 4-7-13 PIN 5	CLOSE		TP11-1 4-2-Y		
10	12RH19	RC12-4 11-1-15	RC12-4 4-6-7 PIN 7	OPEN	TP12-1 4-2-Z	TP12-1 4-2-X	115VAC	211511 211512
			RC12-4 4-6-7 PIN 5	CLOSE		TP12-1 4-2-Y		

**ATTACHMENT 9  
(Page 3 of 12)**

**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
11	11RH29	RC11-4 11-1-21	RC11-4 4-9-7 PIN 23	OPEN	TP11-1 4-5-B	TP11-1 4-5-E	115VAC	211555
			RC11-4 4-9-8 PIN 7	CLOSE		TP11-1 4-5-F		
			RC11-4 4-9-4 PIN 7	AUTO	RC11-4 11-1-22	RC11-4 4-9-4 PIN 8	28VDC	
			RC11-4 4-9-4 PIN 5	MANUAL		RC11-4 4-9-4 PIN 10		
12	12RH29	RC12-4 11-1-19	RC12-4 4-9-7 PIN 23	OPEN	TP12-1 4-5-B	TP12-1 4-5-E	115VAC	211556
			RC12-4 4-9-8 PIN 7	CLOSE		TP12-1 4-5-F		
			RC12-4 4-9-4 PIN 7	AUTO	RC12-4 11-1-20	RC12-4 4-9-4 PIN 8	28VDC	
			RC12-4 4-9-4 PIN 5	MANUAL		RC12-4 4-9-4 PIN 10		
13	1RH1	RC12-4 11-1-13	RC12-4 4-6-10 PIN 23	OPEN	TP12-1 4-2-BB	TP12-1 4-1-U	125VDC	211506 211507
			RC12-4 4-6-10 PIN 7	CLOSE		TP12-1 4-1-V		

**ATTACHMENT 9  
(Page 4 of 12)**

**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
14	1RH2	RC11-4 11-1-13	RC11-4 4-4-13 PIN 23	OPEN	TP11-1 4-2-BB	TP11-1 4-1-U	125VDC	211504 211505
			RC11-4 4-4-13 PIN 7	CLOSE		TP11-1 4-1-V		
15	1SS107	RC14-7 11-1-3	RC14-7 7-2-4 PIN 7	OPEN	TP14-2 4-1-B	TP14-2 4-1-H	125VDC	220923
			RC14-7 7-2-5 PIN 7	CLOSE		TP14-2 4-1-J		
16	1SS49	RC15-7 11-1-7	RC15-7 7-7-4 PIN 7	OPEN	TP15-2 5-1-B	TP15-2 5-1-H	125VDC	220924
			RC15-7 7-7-5 PIN 7	CLOSE		TP15-2 5-1-J		
17	1SS104	RC14-7 11-1-3	RC14-7 7-2-7 PIN 7	OPEN	TP14-2 4-1-B	TP14-2 4-1-L	125VDC	220923
			RC14-7 7-2-8 PIN 7	CLOSE		TP14-2 4-1-M		
18	1SS33	RC15-7 11-1-7	RC15-7 7-7-7 PIN 7	OPEN	TP15-2 5-1-B	TP15-2 5-1-L	125VDC	220924
			RC15-7 7-7-8 PIN 7	CLOSE		TP15-2 5-1-M		

**ATTACHMENT 9  
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**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
19	1PR1	RC14-6 11-1-15	RC14-6 6-8-1 PIN 7	OPEN	TP14-2 2-3-BB	TP14-2 3-3-D	125VD C	241106 241107
			RC14-6 6-8-2 PIN 7	CLOSE		TP14-2 3-3-E		
			RC14-6 6-8-1 PIN 23	AUTO	RC14-6 11-1-16	RC14-6 6-8-1 PIN 24	28VDC	
			RC14-6 6-8-1 PIN 21	MANUAL		RC14-6 6-8-1 PIN 26		
20	1PR6	RC14-6 11-1-15	RC14-6 3-9-13 PIN 7	OPEN	TP14-2 3-3-X	TP14-2 3-3-V	115VA C	241106 241107
			RC14-6 3-9-13 PIN 23	CLOSE		TP14-2 3-3-W		
21	1PR2	RC15-6 11-1-15	RC15-6 6-8-1 PIN 7	OPEN	TP15-2 2-3-BB	TP15-2 3-3-D	125VD C	242881 242882
			RC15-6 6-8-2 PIN 7	CLOSE		TP15-2 3-3-E		
			RC15-6 6-8-1 PIN 23	AUTO	RC15-6 11-1-16	RC15-6 6-8-1 PIN 24	28VDC	
			RC15-6 6-8-1 PIN 21	MANUAL		RC15-6 6-8-1 PIN 26		

**ATTACHMENT 9  
(Page 6 of 12)**

**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
22	1PR7	RC15-6 11-1-15	RC15-6 3-9-13 PIN 7	OPEN	TP15-2 3-3-X	TP15-2 3-3-V	115VAC	242881 242882
			RC15-6 3-9-13 PIN 23	CLOSE		TP15-2 3-3-W		
23	11SJ54	RC11-6 11-1-2	RC11-6 6-6-1 PIN 7	OPEN	TP11-2 1-5-B	TP11-2 3-1-F	125VDC	211688 211669 217137 217135
			RC11-6 6-6-2 PIN 7	CLOSE		TP11-2 3-1-H		
24	12SJ54	RC12-6 11-1-13	RC12-6 6-6-1 PIN 7	OPEN	TP12-2 3-1-B	TP12-2 3-1-F	125VDC	211672 211673
			RC12-6 6-6-2 PIN 7	CLOSE		TP12-2 3-1-H		
25	13SJ54	RC13-5 11-1-9	RC13-5 5-5-1 PIN 7	OPEN	TP13-1 5-4-N	TP13-1 5-4-F	125VDC	217126 217127
			RC13-5 5-5-2 PIN 7	CLOSE		TP13-1 5-4-H		
26	14SJ54	RC12-5 11-1-11	RC12-5 5-7-1 PIN 7	OPEN	TP12-2 1-1-B	TP12-2 1-1-F	125VDC	217130 217131 211673
			RC12-5 5-7-2 PIN 7	CLOSE		TP12-2 1-1-H		

**ATTACHMENT 9  
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**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
27	1CV35	RC12-7 11-1-15	RC12-7 7-7-1 PIN 7	FLOW TO VCT AUTO	RC12-7 11-1-16	RC12-7 7-7-1 PIN 9	28VDC	211584 211585
			RC12-7 7-7-1 PIN 5	FLOW TO VCT MANUAL	TP12-2 5-2-B	TP12-2 5-2-C	125VDC	
			RC12-7 7-7-4 PIN 23	FLOW TO HUT MANUAL		TP12-2 5-2-D		
28	1CV185	RC11-7 11-1-13	*RC11-7 7-3-1 PIN 23	OPEN	TP11-2 5-2-B	TP11-2 5-2-C	125VDC	211598 211599
			*RC11-7 7-3-1 PIN 21	CLOSE		TP11-2 5-2-D		
			RC11-7 7-3-4 PIN 7	AUTO	RC11-7 11-1-14	RC11-7 7-3-4 PIN 8	28VDC	
			RC11-7 7-3-4 PIN 5	MANUAL		RC11-7 7-3-4 PIN 10		
29	11MS167	RC15-5 11-1-5	RC15-5 5-3-13 PIN 7	HYD OPEN	TP18-1 3-4-B	TP18-1 3-4-F	125VDC	203496 203419 203364 203415
			RC15-5 5-3-14 PIN 7	HYD CLOSE		TP18-1 3-4-H		
30	12MS167	RC15-5 11-1-5	RC15-5 5-2-13 PIN 7	HYD OPEN	TP18-1 3-4-B	TP18-1 3-4-M		
			RC15-5 5-2-14 PIN 7	HYD CLOSE		TP18-1 3-4-N		

\* This jumper by-passes the AUTO/MANUAL mode of operation.

**ATTACHMENT 9  
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**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
31	13MS167	RC18-4 11-1-9	RC18-4 4-7-13 PIN 7	HYD OPEN	TP18-1 3-4-B	TP18-1 3-4-T	125VDC	203497 203365 203419 203416
			RC18-4 4-7-14 PIN 7	HYD CLOSE		TP18-1 3-4-U		
32	14MS167	RC18-4 11-1-9	RC18-4 4-3-7 PIN 7	HYD OPEN	TP18-1 3-4-B	TP18-1 3-4-Y		
			RC18-4 4-3-8 PIN 7	HYD CLOSE		TP18-1 3-4-Z		
33	1CV77	RC14-7 11-1-5	RC14-7 7-3-1 PIN 5	OPEN	TP14-2 4-2-B	TP14-2 4-2-C	125VDC	211562
			RC14-7 7-3-1 PIN 7	CLOSE		TP14-2 4-2-D		
34	1CV2	RC12-7 11-1-9  NOTE 1,2	RC12-7 7-8-1 PIN 7	OPEN	TP12-2 4-5-X	TP12-2 4-4-S	125VDC	211572 211586
			RC12-7 7-8-2 PIN 7	CLOSE		TP12-2 4-4-T		
			RC12-7 7-8-4 PIN 7	AUTO	RC12-7 11-1-10	RC12-7 7-8-4 PIN 11	28VDC	
			RC12-7 7-8-4 PIN 5	MANUAL		RC12-7 7-8-4 PIN 13		

- NOTES: 1. Maintain Jumper until full stroke indicated on meter.  
2. Verify Pressurizer level greater than 17% before opening valve.

**ATTACHMENT 9  
(Page 9 of 12)**

**JUMPERS**

**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve/ Pump	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
35	1CV277	RC12-7 11-1-9  NOTES 1,2	RC12-7 7-5-13 PIN 7	OPEN	TP12-2 4-5-X	TP12-2 5-3-J	125VDC	211572 211586 211587
			RC12-7 7-5-14 PIN 7	CLOSE		TP12-1 5-3-K		
			RC12-7 7-6-13 PIN 7	AUTO	RC12-7 11-1-10	RC12-7 7-6-13 PIN 11	28VDC	
			RC12-7 7-6-13 PIN 5	MANUAL		RC12-7 7-6-13 PIN 13		
36	11 PRIMAR Y WATER MAKEUP PUMP	RC11-7 11-1-9	RC11-7 7-5-1 PIN 7	START	TP11-2 4-4-B	TP11-2 4-4-F	125VDC	211589 211590
			RC11-7 7-5-2 PIN 7	STOP		TP11-2 4-4-H		
			RC11-7 7-5-4 PIN 7	AUTO	RC11-7 11-1-10 SAME	RC11-7 7-5-4 PIN 8	28VDC	
			RC11-7 7-5-4 PIN 5	MANUAL		RC11-7 7-5-4 PIN 10		

NOTES: 1. Maintain Jumper until full stroke indicated on meter.  
2. Verify Pressurizer level greater than 17% before opening valve.

**ATTACHMENT 9  
(Page 10 of 12)**

**JUMPERS**

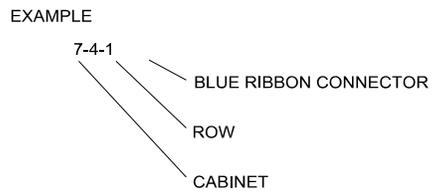
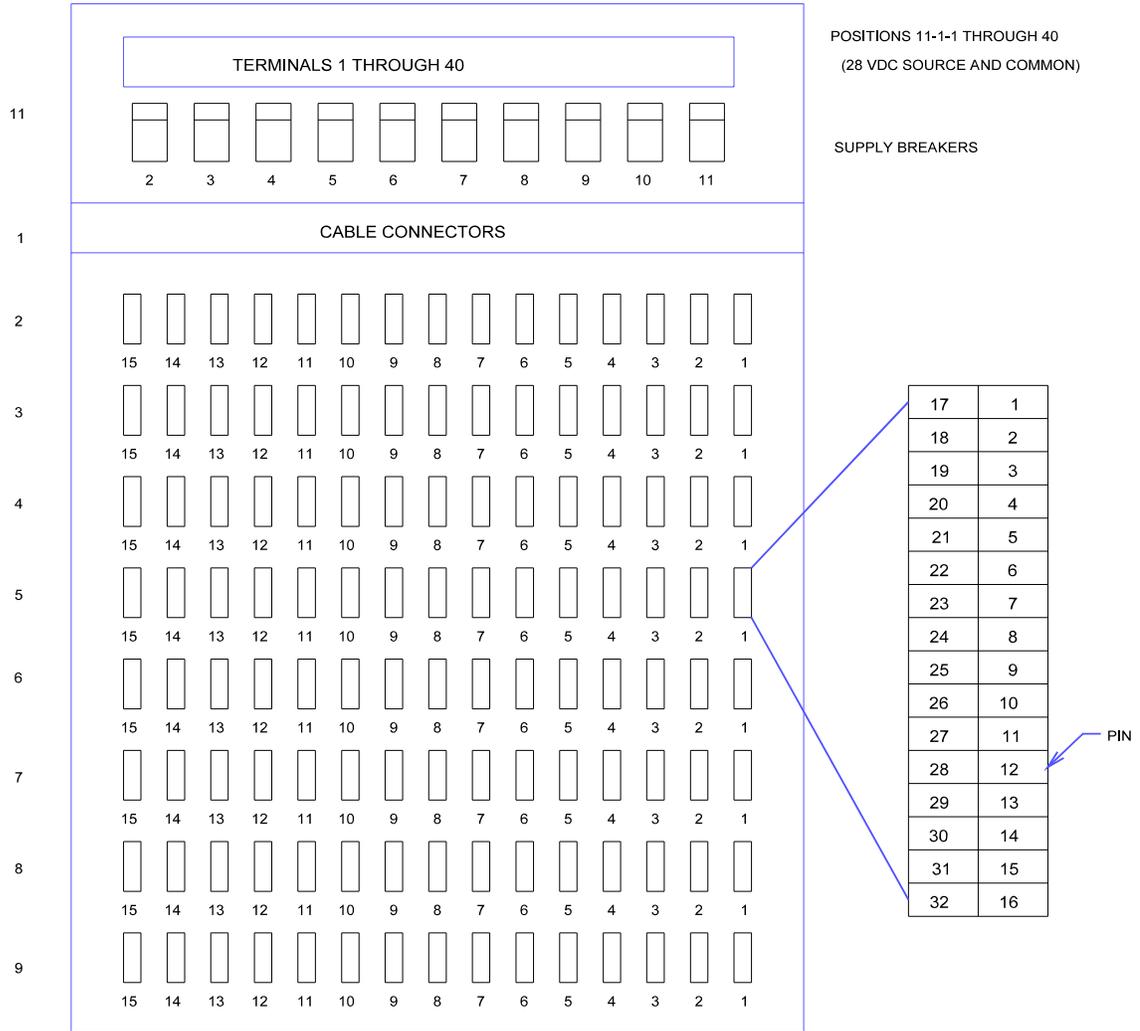
**NOTE**

To operate a particular component, a momentary connection must be made between the + 28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)					STATUS OF COMPONENT(METER)			
Item	Valve/ Pump	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
37	12 PRIMARY WATER MAKEUP PUMP	RC13-7 11-1-9	RC13-7 7-5-1 PIN 7	START	TP13-2 4-4-B	TP13-2 4-4-F	125VDC	211591 211592
			RC13-7 7-5-2 PIN 7	STOP		TP13-2 4-4-H		
			RC13-7 7-5-4 PIN 7	AUTO	RC13-7 11-1-10	RC13-7 7-5-4 PIN 8	28VDC	
			RC13-7 7-5-4 PIN 5	MANUAL		RC13-7 7-5-4 PIN 10		
38	11 RHR PUMP	RC11-4 11-1-11	RC11-4 4-8-1 PIN 7	START	TP11-1 3-5-B	TP11-1 3-5-E	125VDC	211500 211501
			RC11-4 4-8-2 PIN 7	STOP		TP11-1 3-5-F		
39	12 RHR PUMP	RC12-4 11-1-11	RC12-4 4-8-1 PIN 7	START	TP12-1 3-5-B	TP12-1 3-5-E	125VDC	211502 211503
			RC12-4 4-8-2 PIN 7	STOP		TP12-1 3-5-F		

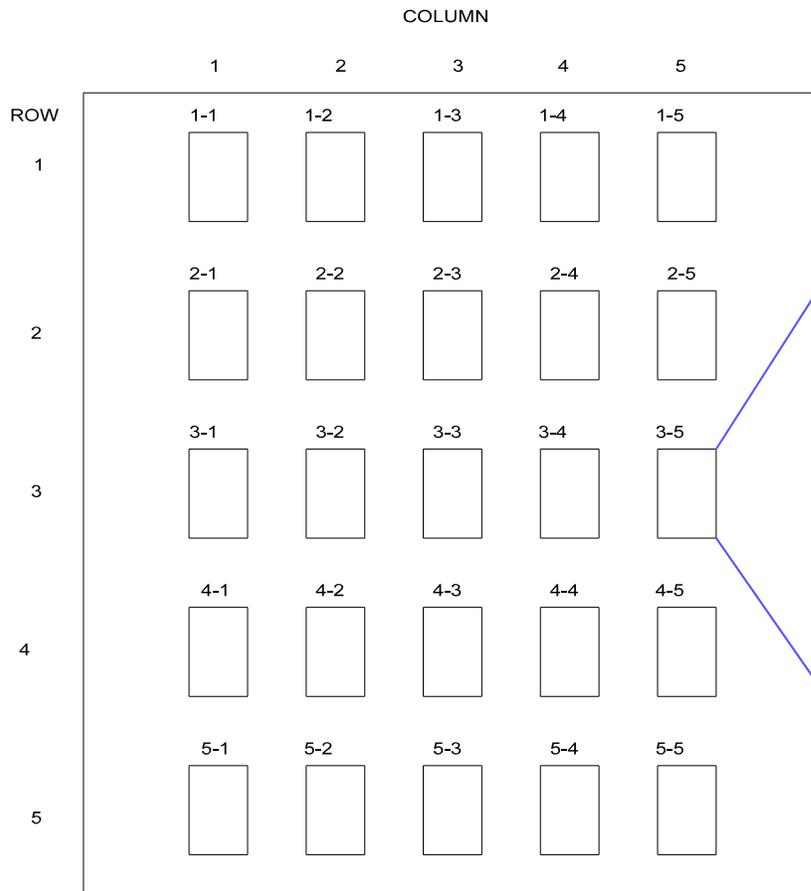
**ATTACHMENT 9  
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**JUMPERS  
Typical Relay Cabinet (RC) Layout**



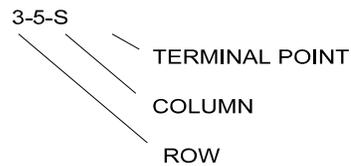
ATTACHMENT 9  
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JUMPERS  
Typical Terminal Cabinet (TP) Layout



A	1
B	2
C	3
D	4
E	5
F	6
H	7
J	8
K	9
L	10
M	11
N	12
P	13
R	14
S	15
T	16
U	17
V	18
W	19
X	20
Y	21
Z	22
AA	23
BB	24

EXAMPLE



NOTE- Letters do NOT appear  
on terminal boards

TERMINAL  
BOARD  
NUMBERING

**ATTACHMENT 10**  
**(Page 1 of 9)**

**LOCAL PANEL TEMPORARY CONTROLS**  
**11RH18, RHR HX FLOW CONT VALVE**

**1.0 ACTION LOCATION**

1.1 Auxiliary Building, Elev. 45' (No. 11 RHR Pump Room)

- ◆ Panel 101-1, 11 RHR Instrument Panel
- ◆ 11RH18, RHR HX FLOW CONT VALVE

**2.0 EQUIPMENT REQUIRED**

- 2.1. Pneumatic jumper with manual pressure regulator (preset at 0 psi outlet pressure).
- 2.2 Tools for installing pneumatic jumper and manual pressure regulator

**3.0 IMPLICATION OF OPERATION**

- ◆ Removes all automatic and manual remote control of valve.

**4.0 OPERATING INSTRUCTIONS**

- \_\_\_ 4.1 At Panel 101-1, 11 RHR Instrument Panel, **PERFORM** the following:
  - \_\_\_ 4.1.1 **OPEN RIGHT** door to Panel 101-1.
  - \_\_\_ 4.1.2 **CLOSE** manual air supply valve in air line 5000-NA to E/P Fisher Type 546.
  - \_\_\_ 4.1.3 **DISCONNECT BOTH** air lines from the E/P.
  - \_\_\_ 4.1.4 **INSTALL** pneumatic jumper and manual pressure regulator in place of the E/P.
  - \_\_\_ 4.1.5 **OPEN** manual air supply valve closed in Step 4.1.2

**ATTACHMENT 10**  
**(Page 2 of 9)**

**LOCAL PANEL TEMPORARY CONTROLS**  
**11RH18, RHR HX FLOW CONT VALVE**

- \_\_\_ 4.1.6 IF 11RH18 needs to be throttled OPEN,  
THEN slowly **LOWER** the manual pressure regulator outlet pressure.
- \_\_\_ A. **CHECK** opening of 11RH18 by observing at least one of the following:
- ◆ Local position of 11RH18
  - ◆ Decreasing RHR Heat Exchanger outlet temperature as indicated on local temperature indicator 1TI-659
  - ◆ Lower # 11 RHR Pump discharge pressure as indicated on local discharge pressure indicator 1PL-414
  - ◆ Lower # 11 RHR Pump suction pressure as indicated on local suction pressure indicator 1PI-631

**CAUTION**

**Do not exceed 20 psig on manual pressure regulator outlet pressure.**

- \_\_\_ 4.1.7 IF 11RH18 needs to be throttled CLOSED,  
THEN slowly **RAISE** the manual pressure regulator outlet pressure.
- \_\_\_ A. **CHECK** closing of 11RH18 by observing at least one of the following:
- ◆ Local position of 11RH18
  - ◆ Increasing RHR Heat Exchanger outlet temperature as indicated on local temperature indicator 1TI-659
  - ◆ Higher # 11 RHR Pump discharge pressure as indicated on local discharge pressure indicator 1PL-414
  - ◆ Higher # 11 RHR Pump suction pressure as indicated on local suction pressure indicator 1PI-631

**ATTACHMENT 10**  
**(Page 3 of 9)**

**LOCAL PANEL TEMPORARY CONTROLS**  
**12RH18, RHR HX FLOW CONT VALVE**

**1.0 ACTION LOCATION**

1.1 Auxiliary Building, Elev. 45' (No. 12 RHR Pump Room)

- ◆ Panel 102-1, 12 RHR Instrument Panel
- ◆ 12RH18, RHR HX FLOW CONT VALVE

**2.0 EQUIPMENT REQUIRED**

2.1 Pneumatic jumper with manual pressure regulator (preset at 0 psig outlet pressure).

2.2 Tools for installing pneumatic jumper and manual pressure regulator

**3.0 IMPLICATION OF OPERATION**

- ◆ Removes all automatic and manual remote control of valve.

**4.0 OPERATING INSTRUCTIONS**

\_\_\_ 4.1 At Panel 102-1, 12 RHR Instrument Panel, **PERFORM** the following:

\_\_\_ 4.1.1 **OPEN RIGHT** door to Panel 102-1.

\_\_\_ 4.1.2 **CLOSE** manual air supply valve in air line 5537-NB to E/P Fisher Type 546.

\_\_\_ 4.1.3 **DISCONNECT BOTH** air lines from the E/P.

\_\_\_ 4.1.4 **INSTALL** pneumatic jumper and manual pressure regulator in place of the E/P.

\_\_\_ 4.1.5 **OPEN** manual air supply valve closed in Step 4.1.2

**ATTACHMENT 10**  
**(Page 4 of 9)**

**LOCAL PANEL TEMPORARY CONTROL**  
**12RH18, RHR HX FLOW CONT VALVE**

- \_\_\_ 4.1.6 IF 12RH18 needs to be throttled OPEN,  
THEN slowly **LOWER** the manual pressure regulator outlet pressure.
- \_\_\_ A. **CHECK** opening of 12RH18 by observing at least one of the following:
- ◆ Local position of 12RH18
  - ◆ Decreasing RHR Heat Exchanger outlet temperature as indicated on local temperature indicator 1TI-660
  - ◆ Lower # 12 RHR Pump discharge pressure as indicated on local discharge pressure indicator 1PL-416
  - ◆ Lower # 12 RHR Pump suction pressure as indicated on local suction pressure indicator 1PI-632

**CAUTION**

**Do not exceed 20 psig on manual pressure regulator outlet pressure.**

- \_\_\_ 4.1.7 IF 12RH18 needs to be throttled CLOSED,  
THEN slowly **RAISE** the manual pressure regulator outlet pressure.
- \_\_\_ A. **CHECK** closing of 12RH18 by observing at least one of the following:
- ◆ Local position of 12RH18
  - ◆ Increasing RHR Heat Exchanger outlet temperature as indicated on local temperature indicator 1TI-660
  - ◆ Higher # 12 RHR Pump discharge pressure as indicated on local discharge pressure indicator 1PL-416
  - ◆ Higher # 12 RHR Pump suction pressure as indicated on local suction pressure indicator 1PI-632

**ATTACHMENT 10  
(Page 5 of 9)**

**LOCAL PANEL TEMPORARY CONTROLS  
1CV18, LETDOWN PRESSURE CONTROL VALVE**

**1.0 ACTION LOCATION**

1.1 Auxiliary Building, Elev. 84'

- ◆ Letdown Heat Exchanger Room (at entrance)
  - 1CV17, LP LTDWN CONT VALVE INLET V
  - 1CV20, LP LTDWN CONT VALVE BYP V
- ◆ No. 11 and 12 AFW Pump Room
  - Panel 213-1, 1 Stm Gen Feed & Cond Hot Shutdown Instrumentation

**2.0 EQUIPMENT REQUIRED**

2.1 Key for Letdown Heat Exchanger Room

**3.0 IMPLICATION OF OPERATION**

3.1 Removes 1CV18 from flow path. All letdown control becomes local-manual.

**4.0 OPERATING INSTRUCTIONS**

- \_\_\_ 4.1 **CLOSE** 1CV17, LP LTDWN CONT VALVE INLET V.
- \_\_\_ 4.2 **THROTTLE** 1CV20, LP LTDWN CONT VALVE BYP V,  
to maintain Pressurizer level as directed by HSD Panel Operator (PO).
- \_\_\_ 4.3 At Panel 213-1, **VERIFY** the following Pressurizer parameters are being maintained:
  - ◆ Pressurizer level - 1LI-1649
  - ◆ Pressurizer pressure - 1PI-1648

**ATTACHMENT 10**  
**(Page 6 of 9)**

**LOCAL PANEL TEMPORARY CONTROLS**  
**1RH20, RHR HX BYP VALVE**

**1.0 ACTION LOCATION**

1.1 Auxiliary Building, Elev. 45' (No. 11 RHR Pump Room)

- ◆ Panel 101-1, 11 RHR Instrument Panel
- ◆ 1RH20, RHR HX BYP VALVE

**2.0 EQUIPMENT REQUIRED**

2.1 Pneumatic jumper with manual pressure regulator (preset at 0 psig outlet pressure).

2.2 Tools for installing pneumatic jumper and manual pressure regulator

**3.0 IMPLICATION OF OPERATION**

- ◆ Removes all automatic and manual remote control of valve.

**4.0 OPERATING INSTRUCTIONS**

\_\_\_ 4.1 At Panel 101-1, 11 RHR Instrument Panel, **PERFORM** the following:

\_\_\_ 4.1.1 **OPEN LEFT** door to Panel 101-1.

\_\_\_ 4.1.2 **CLOSE** manual air supply valve in air line 5000-NA to E/P Fisher Type 546.

\_\_\_ 4.1.3 **DISCONNECT BOTH** air lines from the E/P.

\_\_\_ 4.1.4 **INSTALL** pneumatic jumper and manual pressure regulator in place of the E/P.

\_\_\_ 4.1.5 **OPEN** manual air supply valve closed in Step 4.1.2

**ATTACHMENT 10**  
**(Page 7 of 9)**

**LOCAL PANEL TEMPORARY CONTROLS**  
**1RH20, RHR HX BYP VALVE**

- \_\_\_ 4.1.6 IF 1RH20 needs to be throttled OPEN,  
THEN slowly **LOWER** the manual pressure regulator outlet pressure.
- \_\_\_ A. **CHECK** opening of 1RH20 by observing at least one of the following:
- ◆ Local position of 1RH20
  - ◆ Lower RHR pump discharge pressure as indicated on the associated local discharge pressure indicator:
    - # 11 RHR Pump: 1PL-414
    - # 12 RHR Pump: 1PL-416
  - ◆ Lower RHR pump suction pressure as indicated on the associated local suction pressure indicator:
    - # 11 RHR Pump: 1PI-631
    - # 12 RHR Pump: 1PI-632

**CAUTION**

**Do not exceed 20 psig on manual pressure regulator outlet pressure.**

- \_\_\_ 4.1.7 IF 1RH20 needs to be throttled CLOSED,  
THEN slowly **RAISE** the manual pressure regulator outlet pressure.
- \_\_\_ A. **CHECK** closing of 1RH20 by observing at least one of the following:
- ◆ Local position of 1RH20
  - ◆ Higher RHR pump discharge pressure as indicated on the associated local discharge pressure indicator:
    - # 11 RHR Pump: 1PL-414
    - # 12 RHR Pump: 1PL-416
  - ◆ Higher RHR pump suction pressure as indicated on the associated local suction pressure indicator:
    - # 11 RHR Pump: 1PI-631
    - # 12 RHR Pump: 1PI-632

**ATTACHMENT 10**  
**(Page 8 of 9)**

**LOCAL PANEL TEMPORARY CONTROL**  
**1CV8, LETDOWN ISO FOR RHR**

**1.0 ACTION LOCATION**

1.1 Auxiliary Building, Elev. 84' (Safety Injection Pump Room)

- ◆ Panel 202-1, 1 Safety Inj #11 & 12 Pumps Discharge Flow & Pressure Pnl 202-1
- ◆ 1CV8, LET DOWN ISO FOR RHR

**2.0 EQUIPMENT REQUIRED**

2.1. Pneumatic jumper with manual pressure regulator (preset at 0 psig).

2.2 Tools for installing pneumatic jumper and manual pressure regulator

**3.0 IMPLICATION OF OPERATION**

- ◆ Removes all automatic and manual remote control of valve.

**4.0 OPERATING INSTRUCTIONS**

\_\_\_ 4.1 At Panel 202-1, 1 Safety Inj #11 & 12 Pumps Discharge Flow & Pressure Pnl, (lower left) **PERFORM** the following:

\_\_\_ 4.1.1 **CLOSE** manual air supply valve in air line to E/P Fisher Type 546.

\_\_\_ 4.1.2 **DISCONNECT BOTH** air lines from the E/P.

\_\_\_ 4.1.3 **INSTALL** pneumatic jumper and manual pressure regulator in place of the E/P.

\_\_\_ 4.1.4 **OPEN** manual air supply valve closed in Step 4.1.1.

ATTACHMENT 10  
(Page 9 of 9)LOCAL PANEL TEMPORARY CONTROL  
1CV8, LETDOWN ISO FOR RHR**CAUTION****Do not exceed 20 psig on manual pressure regulator outlet pressure.**

- \_\_\_ 4.1.5 IF 1CV8 needs to be throttled OPEN,  
THEN SLOWLY RAISE the manual pressure regulator outlet pressure.
  - \_\_\_ A. **CHECK** opening of 1CV8 by local observation of valve position.
  
- \_\_\_ 4.1.6 IF 1CV8 needs to be throttled CLOSED,  
THEN SLOWLY LOWER the manual pressure regulator outlet pressure.
  - \_\_\_ A. **CHECK** closing of 1CV8 by local observation of valve position.

**ATTACHMENT 11**  
**(Page 1 of 1)**

**POPS INITIATION**

**NOTE**

To operate a particular component, a momentary connection must be made between the +28VDC source and the designated blue ribbon connector pin in the appropriate relay cabinet. This action performs the same function as depressing a control console pushbutton.

OPERATION OF COMPONENT(JUMPER)				STATUS OF COMPONENT(METER)			
Channel	+28VDC Source	Blue Ribbon Connector	Result	Common (-)	Point of Measurement	Volts	DWG
I	RC14-6 11-1-15	RC14-6 6-8-13 PIN 7	ON (ARMED)	TP14-2 2-3-BB	TP14-2 3-4-Y	125VDC	241106 241107
		RC14-6 6-8-14 PIN 1	OFF		TP14-2 3-4-Y	0VDC	
II	RC15-6 11-1-15	RC15-6 6-8-13 PIN 7	ON (ARMED)	TP15-2 2-3-BB	TP15-2 3-4-Y	125VDC	242881 242882
		RC15-6 6-8-14 PIN 1	OFF		TP15-2 3-4-Y	0VDC	

**ATTACHMENT 12**  
**(Page 1 of 1)**

**LOCAL PRESSURIZER HEATER CONTROL**  
**(Electrical Penetration Area elevation 78', Panels 1GP and 1EP)**

**NOTE**

- ◆ All operations at local control stations are directed by the Hot Shutdown Panel Operator (PO).
- ◆ The following indications and controls are available for local operation:  
Pressurizer Heater Backup Group LOCAL/REMOTE Switch  
Pressurizer Heater Backup Group ON/OFF Switches  
Pressurizer Heater Backup Group power supply breakers
- ◆ Pressurizer Heater AUTO cutout at 17% level is defeated only when the control power is removed from the breaker and the breaker is operated with the Close/Trip buttons located on the breaker.

- \_\_\_ 1.0 **ESTABLISH** communications with the Hot Shutdown Panel Operator (PO).
- \_\_\_ 2.0 Locally **CLOSE** Pressurizer Heater supply breakers.
  - ◆ 1EX1EPX, 1EP 480V PZR HTR BUS MN BKR
  - ◆ 1GX1EP1GP, 1GP 480V PZR HTR BUS B/U SECT MN BKR
- \_\_\_ 3.0 **DETERMINE** if Pressurizer Pressure is controlling pressure at 2235 psig in Automatic by communicating with Hot Shutdown Panel Operator (PO).
  - \_\_\_ 3.1 IF Pressurizer pressure is not controlling in automatic, THEN MANUALLY control Pressurizer pressure at 2200 psig to 2250 psig by taking LOCAL/MANUAL control and operating pressurizer heater breakers as required to stabilize pressure.
  - \_\_\_ 3.2 When directed by Hot Shutdown Panel Operator (PO), **REDUCE** pressure by deenergizing Pressurizer Heaters during RCS cooldown.
- \_\_\_ 4.0 **MAINTAIN** communications with the Hot Shutdown Panel Operator (PO) until access is restored to Control Room.

**ATTACHMENT 13  
(Page 1 of 3)**

**TURBINE-DRIVEN AFW PUMP RESTORATION**

**1.0 RESETTING 1MS52**

[C0356]

- \_\_\_ 1.1 **SEAT** tappet nut by slightly pulling Head Lever away from trip linkage  
AND CHECK that the Emergency Trip Lever is in its RESET position (horizontal).

**NOTE**

The next three steps are interrelated and should occur at about the same time.

- \_\_\_ 1.2 **ROTATE** 1MS52 handwheel in the closed direction (clockwise).  
This will cause the Latch-Up Lever to move up toward the Trip Hook.
- \_\_\_ 1.3 **CHECK** that as the Latch-Up Lever moves up into position, that it moves to and engages the Trip Hook.
- \_\_\_ 1.4 **PULL UP** on the Hand Trip Lever to ensure full engagement of the Trip Hook and Latch-up Lever.

**CAUTION**

**Extra caution is advised while in the Turbine Driven AFW Pump Room when resetting the AFW Pump with AUTO Start signals locked in. In this condition, the pump will start.**

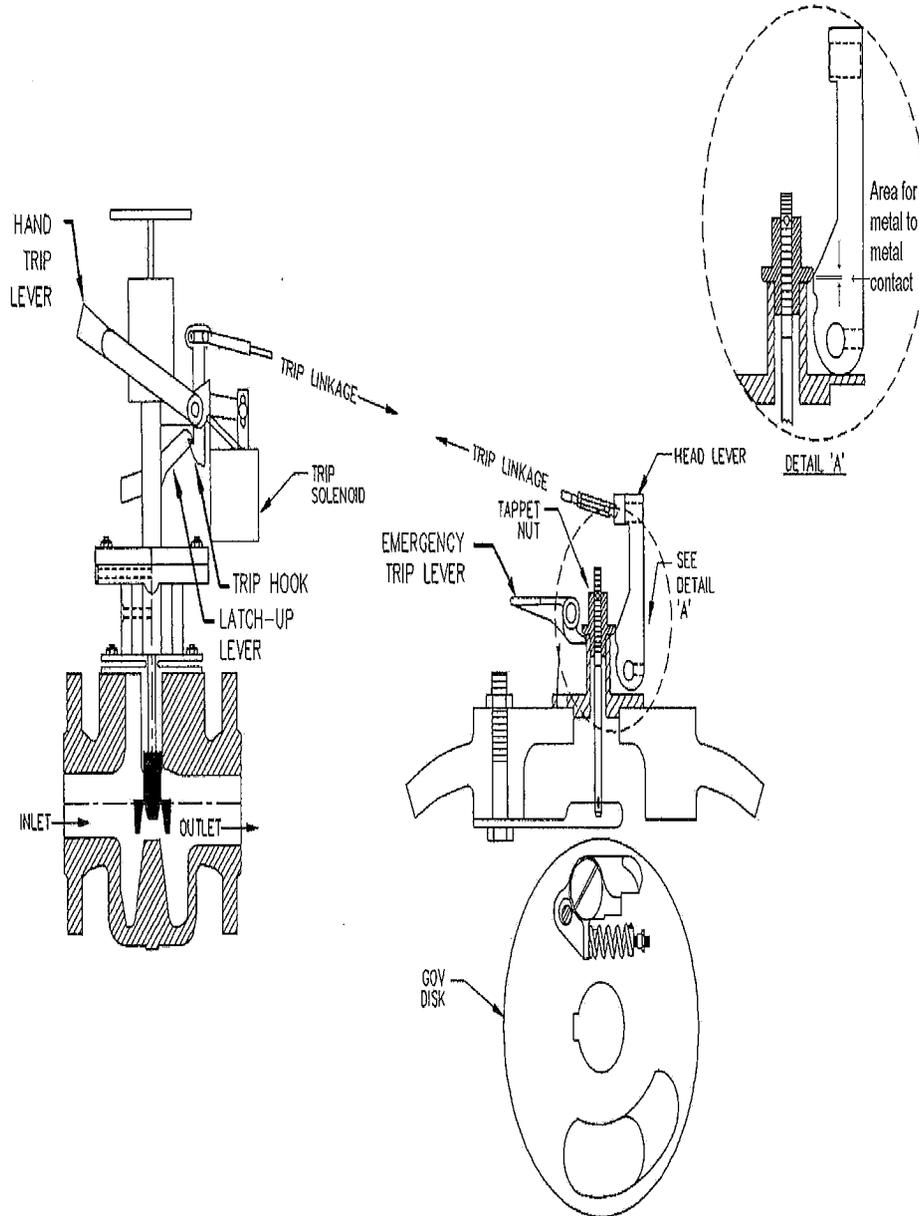
**Leaving 1MS52 backseated may impose more reaction loading on the Trip Hook than the Trip Linkage can overcome, thus rendering the 1MS52 trip function INOPERABLE.**

- \_\_\_ 1.5 Slowly **ROTATE** 1MS52 handwheel in the open direction (counter-clockwise) until the Split Coupling raises and makes contact with the bottom of the Sliding Nut OR the valve comes to rest on the backseat.
- \_\_\_ 1.6 **ROTATE** 1MS52 handwheel clockwise approximately one turn until handwheel moves freely  
AND Latch-up lever is in full contact with Trip Hook. [C0315]
- \_\_\_ 1.7 **ENSURE** turbine stops spinning (indicates 1MS132 is seated).
- \_\_\_ 1.8 **ENSURE** proper engagement of tappet nut and head lever IAW Attachment 13 Page 2, 13 AF Pump Trip/Throttle Valve & Overspeed Trip Mechanism, Overspeed Trip Mechanism/Valve Reset.

ATTACHMENT 13  
(Page 2 of 3)

TURBINE-DRIVEN AFW PUMP RESTORATION

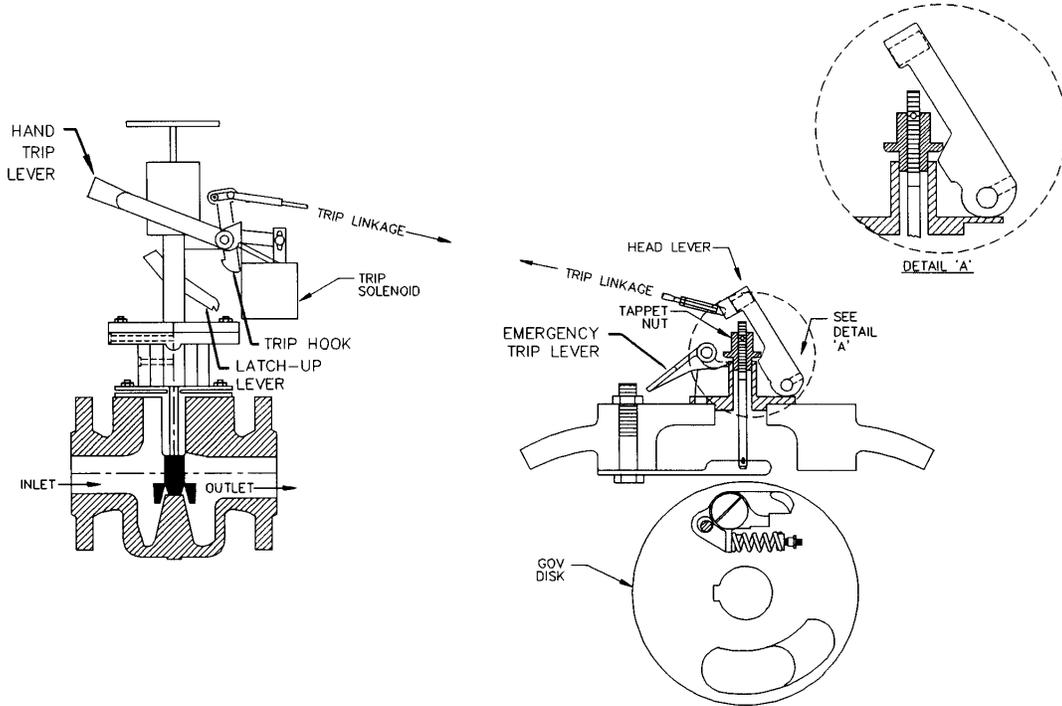
13 AF PUMP TRIP/THROTTLE VALVE & OVERSPEED TRIP MECHANISM  
OVERSPEED TRIP MECHANISM/VALVE RESET



ATTACHMENT 13  
(Page 3 of 3)

TURBINE-DRIVEN AFW PUMP RESTORATION

13 AF PUMP TRIP/THROTTLE VALVE & OVERSPEED TRIP MECHANISM  
OVERSPEED TRIP MECHANISM/VALVE TRIPPED



ATTACHMENT 14  
(Page 1 of 1)

LOCAL AUXILIARY FEEDWATER STORAGE TANK LEVEL CONTROL  
Charging Pump Alley, Auxiliary Building , elevation 84', Panel 229-1A

**NOTE**

- ◆ All operations at local control stations are directed by the CRS.
- ◆ The following indications and controls are available for local operation:
  - AFW Pump Suction Pressure indication.
- ◆ Copies of operating procedures may be obtained from the TSC.

- \_\_\_ 1.0 **ESTABLISH** communications with the CRS.
- \_\_\_ 2.0 **REQUEST** the TSC to establish a hand sender in panel 229-1A, Charging Pump Alley, Auxiliary Building, elevation 84', to allow local operation of 1DR6, AFST Makeup Valve.
- \_\_\_ 3.0 **OPERATE** 1DR6, AFST Makeup Valve, using a HAND SENDER as required, to maintain Auxiliary Feedwater Storage Tank level greater than Technical Specification Minimum Level by maintaining the Off-line Auxiliary Feedwater Pump(s) Suction pressure IAW table:(T/S Min.= 94%) [T/S-4.7.1.3.1]

<b>SUCT PRESS</b>	19.6	20.4	21.3	22.2	23.1	23.9	24.8
<b>LEVEL (%)</b>	70	75	80	85	90	95	100

- \_\_\_ 4.0 **IF** the Auxiliary Feedwater Storage Tank is NOT available as a water source to the Auxiliary Feedwater Pumps, **THEN ALIGN** Auxiliary Feed Pump suction to alternate water source IAW S1.OP-SO.AF-0001(Q), Auxiliary Feedwater System Operation, in the following preferred sequence:
  - ◆ Demineralized Water Storage Tanks
  - ◆ Fresh Water and Fire Protection Water Storage Tank
  - ◆ Service Water System (with EDO concurrence)
- \_\_\_ 5.0 **MAINTAIN** communications with the Hot Shutdown Panel Operator (PO) until access is restored to Control Room.

**ATTACHMENT 15**  
**(Page 1 of 2)**

**DEFEAT 1RP4**

**NOTE**

The following steps will be performed at 1A, 1B and 1C East Valves and Misc. 230V Vital Control Center Elect Pen Area, EI 78'.

- \_\_\_ 1.0 At 1AY2EP2D, 11SJ54-Accumulator Outlet Valve,  
**INSTALL** jumpers between the following terminal points:
  - \_\_\_ 1.1 Terminals 3 and 4
  - \_\_\_ 1.2 Terminals 7 and 8.
  
- \_\_\_ 2.0 At 1AY2EP3D, 11SJ49-RHR Discharge to Cold Legs Stop Valve, **INSTALL** jumpers between the following terminal points:
  - \_\_\_ 2.1 Terminals 29 and 30
  - \_\_\_ 2.2 Terminals 31 and 32.
  
- \_\_\_ 3.0 At 1BY2EP2D, 12SJ54-Accumulator Outlet Valve,  
**INSTALL** jumpers between the following terminal points:
  - \_\_\_ 3.1 Terminals 3 and 4
  - \_\_\_ 3.2 Terminals 7 and 8.
  
- \_\_\_ 4.0 At 1BY2EP3D, 14SJ54-Accumulator Outlet Valve,  
**INSTALL** jumpers between the following terminal points:
  - \_\_\_ 4.1 Terminals 3 and 4
  - \_\_\_ 4.2 Terminals 7 and 8.
  
- \_\_\_ 5.0 At 1CY2EP2D, 13SJ54-Accumulator Outlet Valve,  
**INSTALL** jumpers between the following terminal points:
  - \_\_\_ 5.1 Terminals 3 and 4
  - \_\_\_ 5.2 Terminals 7 and 8.

**ATTACHMENT 15**  
**(Page 2 of 2)**

**DEFEAT 1RP4**

**NOTE**

The following steps will be performed at 1B and 1C West Valves and Misc. 230V Vital Control Center in Aux Bldg, EI 84'.

- \_\_\_ 6.0 At 1BY2AX2D, 12SJ49-RHR Discharge to Cold Legs Stop Valve, **INSTALL** jumpers between the following terminal points:
  - \_\_\_ 6.1 Terminals 29 and 30
  - \_\_\_ 6.2 Terminals 31 and 32.
  
- \_\_\_ 7.0 At 1CY2AX3I, 1SJ69-RWST To RHR Pumps Stop Valve, **INSTALL** jumpers between the following terminal points:
  - \_\_\_ 7.1 Terminals 3 and 4
  - \_\_\_ 7.2 Terminals 7 and 8.

ATTACHMENT 16  
(Page 1 of 9)

## RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR

\_\_\_ 1.0 **OBTAIN** concurrence from the SM of restoration to the Control Room.

**CAUTION**

**If at anytime during the transfer of components from the HSD Panel or SW 4KV Switchgear to Unit #1 Control Area that a component fails to transfer, the component should be returned to operability at the Hot Shutdown Panel and this Attachment terminated until an evaluation and justification are completed.**

\_\_\_ 2.0 **ENSURE** that a full compliment of staff is available in #1 Control Area.

\_\_\_ 3.0 **PERFORM** the following procedures to ensure Control Room and HSD Panel indicators:

\_\_\_ 3.1 S1.OP-ST.HSD-0001, Instrumentation-Remote Shutdown Panel.

\_\_\_ 3.2 S1.OP-PT-HSD-0001, Instrumentation-Remote Shutdown Panel.

\_\_\_ 4.0 **ENSURE** that the following controllers are returned to the REMOTE positions:

\_\_\_ 4.1 1CV55, Charging Flow Control Valve.

\_\_\_ 4.2 1CV71, Chg Hdr PCV.

**ATTACHMENT 16**  
**(Page 2 of 9)**

**RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR**

\_\_\_ 5.0 At HSD Panel, **COMPLETE** the following table:

- ◆ **RECORD** component status as indicated at HSD Panel.
- ◆ For all components NOT In-Service, **PLACE** associated Remote-Local CMC switch at HSD Panel OR SW 4KV Switchgear Cabinet as applicable, in REMOTE position.
- ◆ **RECORD** all components final As-Left Switch position.

<b>Component</b>	<b>In/Service / OFF</b>	<b>Remote/Local Switch</b>	<b>Completed By Init / Date</b>
11 Component Cooling Pump	I/S / OFF	Remote / Local	
15 Service Water Pump (R/L Switch at SW 4KV Swgr Cab 1A3D)	I/S / OFF	Remote / Local	
11 Boric Acid Pump	I/S / OFF	Remote / Local	
16 Service Water Pump (R/L Switch at SW 4KV Swgr Cab 1A8D)	I/S / OFF	Remote / Local	
12 Component Cooling Pump	I/S / OFF	Remote / Local	
13 Service Water Pump	I/S / OFF	Remote / Local	
14 Service Water Pump	I/S / OFF	Remote / Local	
13 Component Cooling Pump	I/S / OFF	Remote / Local	
11 Service Water Pump	I/S / OFF	Remote / Local	
12 Boric Acid Pump	I/S / OFF	Remote / Local	
12 Service Water Pump	I/S / OFF	Remote / Local	
Emergency Air Compressor	I/S / OFF	Remote / Local	

**ATTACHMENT 16**  
**(Page 3 of 9)**

**RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR**

- \_\_\_ 6.0 **PERFORM** the following to return control of Letdown Orifice Isol Valve, 1CV4, to the Control Room:
- \_\_\_ 6.1 **PLACE** the Remote-Local CMC for Letdown Orifice Isol Valve, 1CV4, in REMOTE position.
- \_\_\_ 6.2 **VERIFY** Control Room operability of 1CV4 by the following indications in the Control Room:
- ◆ Valve position
  - ◆ Valve indicating lights.
- \_\_\_ 7.0 **PERFORM** the following to return control of Letdown Orifice Isol Valve, 1CV3, to the Control Room:
- \_\_\_ 7.1 **PLACE** the Remote-Local CMC for Letdown Orifice Isol Valve, 1CV3, in REMOTE position.
- \_\_\_ 7.2 **VERIFY** Control Room operability of 1CV3 by the following indications in the Control Room:
- ◆ Valve position
  - ◆ Valve indicating lights.
- \_\_\_ 8.0 **PERFORM** the following to return control of Letdown Orifice Isol Valve, 1CV5, to the Control Room:
- \_\_\_ 8.1 **PLACE** the Remote-Local CMC for Letdown Orifice Isol Valve, 1CV5, in REMOTE position.
- \_\_\_ 8.2 **VERIFY** Control Room operability of 1CV5 by the following indications in the Control Room:
- ◆ Valve position
  - ◆ Valve indicating lights

ATTACHMENT 16  
(Page 4 of 9)

## RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR

**NOTE**

System configuration should be established after Control Room operability is proven for each component that is operable from Hot Shutdown Panel.

- \_\_\_ 9.0 **PERFORM** the following to establish Containment Fans:
  - \_\_\_ 9.1 **PLACE** the High Speed-Stop-No. 11 Containment Fan Coil Unit switch at the Hot Shutdown Panel in the STOP position.
  - \_\_\_ 9.2 **VERIFY** Control Room operability by starting No. 11 Containment Fan from the Control Room.
  - \_\_\_ 9.3 **PLACE** the High Speed-Stop-No. 12 Containment Fan Coil Unit switch at the Hot Shutdown Panel in the STOP position.
  - \_\_\_ 9.4 **VERIFY** Control Room operability by starting No. 12 Containment Fan from the Control Room.
  - \_\_\_ 9.5 **PLACE** the High Speed-Stop-No. 13 Containment Fan Coil Unit switch at the Hot Shutdown Panel in the STOP position.
  - \_\_\_ 9.6 **VERIFY** Control Room operability by starting No. 13 Containment Fan from the Control Room.
  - \_\_\_ 9.7 **PLACE** the High Speed-Stop-No. 14 Containment Fan Coil Unit switch at the Hot Shutdown Panel in the STOP position.
  - \_\_\_ 9.8 **VERIFY** Control Room operability by starting No. 14 Containment Fan from the Control Room.
  - \_\_\_ 9.9 **PLACE** the High Speed-Stop-No. 15 Containment Fan Coil Unit switch at the Hot Shutdown Panel in the STOP position.
  - \_\_\_ 9.10 **VERIFY** Control Room operability by starting No. 15 Containment Fan from the Control Room.

**ATTACHMENT 16**  
**(Page 5 of 9)**

**RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR**

**NOTE**

The following steps should be repeated for each component that was identified as operating in Step 5.0 and associated Local-Remote switch is still in Local position.

- \_\_\_ 10.0 **PERFORM** the following at the HSD Panel for each component listed in Step 5.0, whose Remote-Local CMC switch is still in Local position:
  - \_\_\_ 10.1 **START** an alternate shutdown component from Control Room IAW respective operating procedure.
  - \_\_\_ 10.2 **AFTER** system stabilization, **SHUTDOWN** component from HSD Panel.
  - \_\_\_ 10.3 **PLACE** associated Local-Remote CMC switch at HSD Panel OR SW 4KV Switchgear Cabinet as applicable, in REMOTE position.
  - \_\_\_ 10.4 **VERIFY** that the components indication lights in the Control Room indicate correct component condition.
- \_\_\_ 11.0 **VERIFY** that the following Local-Remote CMC switches are in REMOTE position:
  - \_\_\_ ◆ No. 11 Component Cooling Pump
  - \_\_\_ ◆ No. 15 Service Water Pump (L/R Switch located at SW 4KV SWGR Cab 1A3D)
  - \_\_\_ ◆ No. 11 Boric Acid Pump
  - \_\_\_ ◆ No. 16 Service Water Pump (L/R Switch located at SW 4KV SWGR Cab 1A8D)
  - \_\_\_ ◆ No. 12 Component Cooling Pump
  - \_\_\_ ◆ No. 13 Service Water Pump
  - \_\_\_ ◆ No. 14 Service Water Pump
  - \_\_\_ ◆ No. 13 Component Cooling Pump
  - \_\_\_ ◆ No. 11 Service Water Pump
  - \_\_\_ ◆ No. 12 Boric Acid Pump
  - \_\_\_ ◆ No. 12 Service Water Pump
  - \_\_\_ ◆ Emergency Air Compressor.

**ATTACHMENT 16**  
**(Page 6 of 9)**

**RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR**

\_\_\_ 12.0 **RESTORE** AFW System to the Control Room in the following sequence:

12.1 Is 13 AFW Pump operating?

\_\_\_ NO    \_\_\_ YES ———>            **GO TO** Step 12.6  
       |  
       V

\_\_\_ 12.2 **ENSURE** 13 AFW Remote/Local switch on Panel 207-1 is in REMOTE.

\_\_\_ 12.3 **START** 13 AFW Pump IAW S1.OP-SO.AF-0001(Q), Auxiliary Feedwater.

\_\_\_ 12.4 **SHUTDOWN** 11 AFW Pump by performing the following:

\_\_\_ A. **ENSURE** 11 Remote/Local switch on Panel 205-1 is in LOCAL position.

\_\_\_ B. **PLACE** 11 AFW Pump Start/Stop switch to the STOP position.

\_\_\_ C. **MANUALLY ADJUST** 14AF21 on hand jack to FULLY OPEN position

\_\_\_ D. **CLOSE** the drain cock of the pressure regulator for 14AF21.

\_\_\_ E. **OPEN** manual isolation valve 14AF21 A/S to pressure regulator  
 in No. 1 Unit Redundant Air Supply Panel 700-1E.

\_\_\_ F. **ADJUST** 14AF21 hand jack to the NEUTRAL position.

\_\_\_ G. **MANUALLY ADJUST** 13AF21 on hand jack to FULLY OPEN position.

\_\_\_ H. **CLOSE** the drain cock of the pressure regulator for 13AF21.

\_\_\_ I. **OPEN** manual isolation valve 13AF21 A/S to pressure regulator  
 in No. 1 Unit Redundant Air Supply Panel 700-1F.

\_\_\_ J. **ADJUST** 13AF21 hand jack to the NEUTRAL position.

\_\_\_ K. **PLACE** 11 AFW Pump Remote/Local switch to the REMOTE position.

\_\_\_ L. **VERIFY** the following indications in the Control Room:

◆ Pump indicating lights

◆ Valve indicating lights

**ATTACHMENT 16**  
**(Page 7 of 9)**

**RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR**

- \_\_\_ 12.5 **SHUTDOWN** 12 AFW Pump by performing the following:
- \_\_\_ A. **ENSURE** 12 Remote/Local switch on Panel 206-1 is in LOCAL.
- \_\_\_ B. **PLACE** 12 AFW Pump Start/Stop switch to the STOP position.
- \_\_\_ C. **MANUALLY ADJUST** 12AF21 on hand jack to FULLY OPEN position.
- \_\_\_ D. **CLOSE** the drain cock of the pressure regulator for 12AF21.
- \_\_\_ E. **OPEN** manual isolation valve 12AF21 A/S to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1Y.
- \_\_\_ F. **ADJUST** 12AF21 hand jack to the NEUTRAL position.
- \_\_\_ G. **MANUALLY ADJUST** 11AF21 on hand jack to FULLY OPEN position.
- \_\_\_ H. **CLOSE** the drain cock of the pressure regulator for 11AF21.
- \_\_\_ I. **OPEN** manual isolation valve 11AF21 A/S to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1M.
- \_\_\_ J. **ADJUST** 11AF21 hand jack to the NEUTRAL position.
- \_\_\_ K. **PLACE** 12 AFW Pump Remote/Local switch to the REMOTE position.
- \_\_\_ L. **VERIFY** the following indications in the Control Room:
- ◆ Pump indicating lights
  - ◆ Valve indicating lights
- \_\_\_ M. **GO TO** Step 13.0

**ATTACHMENT 16**  
**(Page 8 of 9)**

**RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR**

- \_\_\_ 12.6 **SHUTDOWN** 13 AFW Pump by performing the following:
- \_\_\_ A. **START** 11 AND/OR 12 AFW Pump IAW S1.OP-SO.AF-0001(Q), Auxiliary Feedwater.

**NOTE**

Refer to Attachment 13, TURBINE-DRIVEN AFW PUMP RESTORATION; for guidance to RESET 1MS52, OVERSPEED TRIP MECHANISM.

- \_\_\_ B. **ENSURE** that 13 AFW Pump Remote-Local switch on Panel 207-1 to LOCAL position
- \_\_\_ C. **REDUCE** 13 Auxiliary Feedwater Pump speed to minimum by slowly adjusting the 13 AFW Pump INCREASE/OFF/DECREASE Switch, to DECREASE.
- \_\_\_ D. **PLACE** the Start/Stop/Trip switch in TRIP.

**CAUTION**

**Failure to return the 13 AFW Pump START/STOP/TRIP switch to the STOP position will result in the destruction of the actuator solenoids for 1MS52 and 1MS132.**

- \_\_\_ E. **PLACE** 13 AFW Pump Start/Stop/Trip switch in STOP.
- \_\_\_ F. **MANUALLY ADJUST** 11AF11 on the hand jack to the FULLY OPEN position.
- \_\_\_ G. **CLOSE** the drain cock of the pressure regulator for 11AF11.
- \_\_\_ H. **OPEN** manual isolation valve to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1K.
- \_\_\_ I. **ADJUST** 11AF11 hand jack to the NEUTRAL position.
- \_\_\_ J. **MANUALLY ADJUST** 12AF11 on the hand jack to the FULLY OPEN position.

**ATTACHMENT 16**  
**(Page 9 of 9)**

**RESTORATION TO CONTROL ROOM FROM HSD PANEL AND SW 4KV SWGR**

Step 12.6 (Continued)

- \_\_\_ K. **CLOSE** the drain cock of the pressure regulator for 12AF11.
- \_\_\_ L. **OPEN** manual isolation valve to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1X.
- \_\_\_ M. **ADJUST** 12AF11 hand jack to the NEUTRAL position.
- \_\_\_ N. **MANUALLY ADJUST** 13AF11 on the hand jack to the FULLY OPEN position.
- \_\_\_ O. **CLOSE** the drain cock of the pressure regulator for 13AF11.
- \_\_\_ P. **OPEN** manual isolation valve to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1J.
- \_\_\_ Q. **ADJUST** 13AF11 hand jack to the NEUTRAL position.
- \_\_\_ R. **MANUALLY ADJUST** 14AF11 on the hand jack to the FULLY OPEN position.
- \_\_\_ S. **CLOSE** the drain cock of the pressure regulator for 14AF11.
- \_\_\_ T. **OPEN** manual isolation valve to pressure regulator in No. 1 Unit Redundant Air Supply Panel 700-1L.
- \_\_\_ U. **ADJUST** 14AF11 hand jack to the NEUTRAL position.
- \_\_\_ V. **PLACE** 13 AFW Pump Remote/Local switch to the REMOTE position.
- \_\_\_ W. **VERIFY** the following indications in the Control Room:
  - ◆ Pump indicating lights
  - ◆ Valve indicating lights

\_\_\_ 13.0 **RETURN** 11, 12 and 13 AFW Pumps; and valves to operability status per S1.OP-SO.AF-0001(Q), Auxiliary Feedwater System Operation.





## CONTROL ROOM EVACUATION TECHNICAL BASES DOCUMENT

### 1.0 REFERENCES

#### 1.1 Technical Documents

- A. Salem Generating Station Updated Final Safety Analysis Report:
  1. Appendix 3A, Reg Guide 1.68.2, Initial Startup Test Program to Demonstrate Remote Shutdown Capability for Water Cooled Nuclear Power Plants
  2. Section 7.3.2.3, Manual Control of Engineered Safety Features
  3. Section 7.4.1, Hot Shutdown Outside the Control Room
  4. Section 7.4.2, Cold Shutdown Outside the Control Room
  5. Section 7.7.1.2, Operating Control Stations
  6. Section 7.7.3.7.1, Control Room Availability
- B. Salem Generating Station Technical Specifications Unit 1:
  1. 3.3.3.5, Remote Shutdown Instrumentation
  2. 3.4.4, Pressurizer
  3. 6.2.2, Facility Staff
  4. 6.9, Reporting Requirements
- C. Configuration Baseline Documentation:
  1. DE-CB.HSD-0029(Q), Hot Shutdown Panel
- D. Technical/Engineering Letters:
  1. Salem Generating Station Fire Protection Program Safe Shutdown and Interaction Analyses, Volumes 1 and 2, September 1981
  2. S-C-A361-CDS-0125-00, Design Requirements for Safe Shutdown Outside the Control Room
  3. S-C-X500-CDM-0416-00, Cold Shutdown from Outside Control Room
  4. S-C-A900-CFD-0401-01, Cold Shutdown from Outside the Control Room
  5. NRC Inspection Report 50-272/83-37, Remote Shutdown Capability
  6. NLR-N88060, Salem Response to Notice of Violation, Remote Shutdown Capability
  7. NLR-N87196, 10CFR50 Appendix R Safety Evaluation
  8. DEF #DES-92-00002
  9. PSE-94-797, Clarification on Salem RCP Seal Injection
  10. S-C-CVC-MDC-1314, Boration Times For Salem Operating Procedures
- E. Artificial Island Emergency Plan:
  1. Section 2, Assignment of Responsibility
  2. Section 3, Organization
  3. Section 4, Emergency Response Support and Resources
- F. Event Classification Guide:
  1. Section 11, Control Room Evacuation
  2. Section 18, Technical Specification / Plant Status Changes

## 1.2 Procedures

- A. 1-EOP-TRIP-1, Reactor Trip or Safety Injection
- B. ECG, Emergency Classification Guide
- C. SC.OP-DL.ZZ-0011(Q), Reactor Coolant System Heatup/Cooldown Log
- D. SC.OP-DL.ZZ-0012(Q), Pressurizer Heatup/Cooldown Log
- E. S1.OP-AB.CR-0002(Q), Control Room Evacuation Due to a Fire in Control Room or Relay Room
- F. S1.OP-PT.AF-0001(Q), Service Water to Auxiliary Feedwater Spool Piece Installation
- G. S1.OP-PT.HSD-0001(Q), Instrumentation - Remote Shutdown Panel
- H. S1.OP-SO.AF-0001(Q), Auxiliary Feedwater System Operation
- I. S1.OP-SO.RHR-0001(Q), Initiating RHR
- J. S1.OP-SO.RHR-0002(Q), Terminating RHR
- K. S1.OP-SO.TRB-0004(Q), Turbine Turning Gear Operation
- L. S1.OP-SO.500-0001(Q), 500KV BUS Operation
- M. S1.OP-ST.AF-0011(Q), Auxiliary Feedwater
- N. S1.OP-ST.HSD-0001(Q), Instrumentation - Remote Shutdown Panel
- O. S1.RE-RA.ZZ-0012(Q), Reactor Engineering Manual

## 1.3 Drawings

- A. 219456, No. 1 & 2 Units - Auxiliary Building El. 84' Hot Shutdown Station-Arrangement - Panel 213 - Controls
- B. 205236, No. 1 Unit Auxiliary Feedwater P&ID
- C. 2052432, No. 1 Unit Service Water Nuclear Area
- D. 205228, No. 1 Unit Chemical & Volume Control Operation
- E. 205201, No. 1 Unit Reactor Coolant
- F. 205232, No. 1 Unit Residual Heat Removal
- G. 205231, No. 1 Unit Component Cooling
- H. 205244, No. 1 Unit Sampling
- I. 203002, No. 1 Unit 4160V Vital Buses One Line
- J. 601231, No. 1 Unit-Auxiliary Bldg. Control Area 1A-460V. Vital Bus One-Line
- K. 207912, No. 1 Unit-Auxiliary Bldg. 1C West Valves & Misc 230V Vital Contr One-Line
- L. 203000, No. 1 & No. 2 Units Generators & Main Transformer One Line Control

## 1.4 Conformance Documents

- A. C0315, INCI 90-823 Prevents Backseating of MS52
- B. C0356, AR M04-90-0015 Verification of MS132 Position During Surveillance
- C. C0363, Ability to Access Locked Safety Related Areas
- D. C0362, Evacuation of Control Room Due to Security Event.

1.5 **Industry Concerns**

- A. 10CFR50, Appendix A, Criterion 19, Control Room
- B. 10CFR50, Appendix R, Control Room Fire
- C. NRC INFO 86-55, Delayed Access To Safety Related Areas And Equipment During Plant Emergencies
- D. NRC Generic Letter 86-10, Implementation of Fire Protection Requirements
- E. NRC Generic Letter 81-12, Alternative Shutdown Capability
- F. NRC IE INFO 85-09, Isolation Transfer Switches and Post-Fire Shutdown Capability
- G. NUREG 0696, Functional Criteria for Emergency Response Facilities.

1.6 **Other**

- A. DCP 1EC-3662, CCW Letdown Temperature Control Valve (CC71) Modification
- B. DCP 80045583, Service Water And EDG Circuit Changes - Hot Shorts
- C. DCP 80029150 And 80029155, Unit CVCS Cross-Tie
- D. SCI-91-0261, Alternate Shutdown Operating Instructions Emergency Equipment

## 2.0 DISCUSSION

- 2.1 This procedure provides the direction necessary for plant shutdown and cooldown to Cold Shutdown from outside the Control Room. It is the intent of this discussion to provide the reasoning behind the logic and flowpath of the procedure. It is not intended to provide additional direction to the procedure.

The original design of the Hot Shutdown Panel is to provide the means to place the Unit in Hot Standby and maintain the Hot Standby conditions for extended periods, generally defined as up to 7 days. Industry events have also necessitated the requirement to provide the means to remotely place the Unit in Cold Shutdown conditions from controls outside the Control Room. 10CFR50 Appendix A, General Design Criteria 19, Control Room requires the following:

- A. Equipment with a design capability for the prompt Hot Shutdown of the Reactor, including the necessary instrumentation and controls to keep the unit in a safe condition while maintaining Hot Shutdown.
- B. Equipment with the capability to reach cold shutdown conditions of the Reactor through the use of the appropriate procedures.

Salem satisfies these requirements using the Hot Shutdown Panel and numerous local control panels and stations in conjunction with the use of this procedure. Some control features of these panels are as follows:

- ◆ Core Residual Heat Removal
- ◆ Boration of the Reactor Coolant System
- ◆ Pressurizer Level Control
- ◆ Pressurizer Pressure Control
- ◆ Containment Fan Cooler operation

Other panel provide the ability to operate the Auxiliary Feedwater Pumps, Charging Pumps, Boric Acid Transfer Pumps, Service Water Pumps, and Containment Fan Coil Units, as necessary. Instrumentation is available to monitor Pressurizer pressure and level, Steam Generator pressure and level, Component Cooling flow, and Service Water pressure. In addition, the following control and instrumentation is provided at the Hot Shutdown Panel:

- ◆ Controls:
  - ◆ Component Cooling Pumps
  - ◆ Letdown Orifices
  - ◆ Control Area Supply Fans
  - ◆ Emergency Air Compressor
- ◆ Indications:
  - ◆ Component Cooling Surge Tank level
  - ◆ Reactor Coolant Hot Leg and Cold Leg Temperature
  - ◆ Neutron Flux Source Range detectors
  - ◆ CFCU Low Air Flow Alarms

Additional controls for other systems and functions not required in General Design Criteria 19 are provided locally at the components or control panels.

**PROCEDURE PHILOSOPHY**

This procedure was developed with the following philosophy: Trip the reactor, establish control of the primary systems, establish controls of the Steam Generators and then place the Unit in Hot Standby in an expedient manner. No credit is taken for any actions the Operator's may have performed as a result of "skills of the craft" prior to evacuating. Therefore, the procedure addresses the most conservative position, as if no actions were performed prior to the evacuation. This procedure differs from the Control Room evacuation for Appendix R, in that all equipment is available and AC/DC normal power sources are all available. Appendix R related equipment will be operated from the shutdown control panel and other various local panels only after electrical separation from the Control Room is established.

The plan and method of going to Hot Standby is four-fold. First, assemble; second, trip the reactor; third, establish control of operating systems at the Hot Shutdown Panel and fourth, isolate the Steam Generators and initiate AFW. This method is accomplished through the distribution of attachments to each Supervisor/Operator and he/she is to proceed and perform these actions. There are various coordinating points, in the attachments, to maintain plant control.

In order to isolate the Steam Generators, all steam piping must be addressed. Therefore, not only are the MSIVs addressed, but also the MS10s and MS18s. Even though the MS10s will be utilized at a later time frame, the procedure provides directions to obtain initial control and then later utilizes the MS10s in a controlled manner. Also, part of establishing control of the Steam Generators requires establishing the AFW System. Since all AC power sources are available, the AC pumps are utilized to establish and maintain level in the Steam Generators.

The Immediate and Subsequent Actions are self explanatory.

The following provides the reasoning of the action steps in each of the Attachments:

**ATTACHMENT 1 (SM)**

Step 1 is to assemble and obtain the necessary material to perform his/her functions.

Step 2 ensures the Unit 1 Security Key Ring (containing seven Security Keys) is distributed to the Unit 1 CRS.

Step 3:

- ◆ Notifies Security of the situation and that security doors will be breached by operations personnel and requests their assistance.
- ◆ Notifies Radiation Protection of the situation and that operations personnel may be ingressing and egressing potentially contaminated areas without monitoring.
- ◆ Notifies the PSE&G dispatcher of the plant conditions.

Step 4 is obvious but also provides the means to activate personnel which will be necessary for maintaining hot shutdown or proceeding to cold shutdown.

**ATTACHMENT 2 (STA)**

Step 3 ensures all personnel are aware of the situation and have the necessary material.

Step 5 is to ensure that communications are established with the CRS because he is the focal point of all the communications and coordination of plant activities.

Step 6 monitors the work which will place the unit in Hot Standby.

Step 7 informs the SM when Shutdown System control is established, (when he has control of the systems required to shutdown the plant) and Hot Standby conditions are reached.

**ATTACHMENT 3 (CRS)**

Step 2 ensures the Security Keys on the Unit 1 Security Key Ring (containing the remaining six Security Keys) are distributed to the RO, PO, #1 NEO and #2 NEO with two extra keys remaining.

Step 4 is the point where all the Field Operators have finished their immediate tasks and conditions have been established to coordinate the rest of the shutdown.

Steps 5 thru 8 establishes control of critical parameters that maintains the plant in Hot Standby.

Step 9 maintains the plant stable and provides the availability to either return to the Control Room from Hot Standby or proceed with Cold Shutdown.

Note prior to Step 10 is informational in that additional resources of manpower and expertise are now available for the remaining steps of the procedure. Use of other plant procedures is permissible, although certain conditions of the procedure may not be applicable due to the condition of the plant.

Steps 10 and 11 are preparatory for equipment that will be necessary for going to cold shutdown.

Steps 12 and 13 provides a means for chemistry to draw samples to check the boron concentration in the RCS and PZR.

Step 14 installs a temperature indicating device because there isn't one available locally for the regenerative heat exchanger.

Step 15 checks the boron concentration in the RCS and the differential between the RCS and the PZR.

Step 16 provides a means to locally defeat 1RP4 to facilitate operation of the normally locked out valves.

Step 17 provides a means to locally initiate Feedwater Interlock.

Step 19 established the logs for record retention and trending.

**ATTACHMENT 3 (CRS)**

Steps 20 thru 22, aligns charging suction to the RWST.

Steps 23 thru 39 starts the cooldown process. The methods for performing specific equipment operation outside the Control Room are identified and parallels existing procedures on how to go to and maintain cold shutdown.

**ATTACHMENT 4**

Steps 1 through 7 establishes 11 and 12 AFW Pumps operating and 13 AFW Pump shutdown. Assuming the AC Electrical system is in a normal configuration, the motor driven pumps are the preferred pumps.

Steps 8 through 12 establishes control of 13 AFW Pump and the AF11s, Aux Feed S/G Level Control Valves to maintain local control for each S/G.

Steps 13 through 16 establishes control of the AF21s, Aux Feed S/G Level Control Valves to maintain local control for each S/G.

Step 17 provides instructions for maintaining S/G level.

Step 18 restores 13 AFW Pump to operable status to ensure availability if required.

**ATTACHMENT 5 (RO)**

Step 2 ensures the reactor is tripped.

Steps 3 and 4 ensures the 13 Charging Pump is out of service. The PDP pump is not the pump of choice since there is no control for it at the Hot Shutdown Panel (Start/Stop).

Step 5 removes power from the motor-operated valve (1CV175) to prevent inadvertent operation and ensure Operator safety if remote manual operation is required.

Step 6 ensures the CRS knows the status of plant conditions.

Step 7 ensures charging pump flow path is established and maintained to the RCP seals.

Step 8 establishes 1CV55 control in manual and ensures the flowrate is maintained.

Step 9 ensures the CRS knows the status of plant conditions.

Step 10 through 15 provides instructions to Rapid Borate the RCS, if required.

Step 16 moves the RO to assist the CRS at the Hot Shutdown Panel.

**ATTACHMENT 6 (PO)**

Step 3 moves control of certain components from the control room down to the Hot Shutdown Panel to give the Operators control locally.

Step 4 reminds the PO of the minimum operating equipment required to place the unit in Hot Standby from the Hot Shutdown Panel.

Step 5 establishes AFW with Attachment 4. (Attachment 4 was provided as an independent document in case additional personnel are available.)

Step 6 states plant parameters, indicators and values to maintain unit in Hot Standby.

Note prior to Step 7 is a reminder to initiate boration and take advantage of the decrease in Pressurizer level.

Step 7 questions the TSC to determine if the reactor has any stuck rods. If the TSC is not satisfied the reactor is subcritical, the PO is directed to rapid borate. SPDS is available in this scenario per requirements of NUREG-0696. If a rod is stuck, then a rapid boration is required. If the TSC is satisfied, then CRS is directed to the step that informs the STA and SM that the plant is stable in Hot Standby.

Steps 8 and 9 initiates rapid boration for a stuck rod condition.

Step 10 lists different paths that could be used to maintain RCS pressure and level.

Step 11 guidance for Boric Acid Pumps operation after the rapid boration is complete.

Step 12 ensures the CRS and the TSC knows the status of plant conditions.

**ATTACHMENT 7 (#1 NEO)**

Step 2 deenergizes SSPS and SEC to prevent inadvertent Safety Injection.

Steps 4 thru 6 establishes local control of charging flow while maintaining RCP Seal Flow.

Steps 8 thru 25 provides the Operator with specific direction on how to isolate all 4 Steam Generators. He takes manual control of the MS10's and ensures they are closed. He also fails closed the MS167's and the MS18's. This prevents uncontrolled cooldown and provides the Hot Shutdown Panel Operator (PO) with the ability to monitor and control the cooldown rate.

Step 26 ensures the CRS and the TSC knows the status of plant conditions.

Steps 28 & 29 provide direction to operate the MS10s to remove the initial decay heat, establishes the RCS parameters and gives the Operator the indicators to watch as they open the MS10's.

**ATTACHMENT 8 (#2 NEO)**

Steps 2 thru 4 ensure the heat loads are removed from the Steam Generators to allow temperature control of the reactor.

Steps 5 thru 9 verifies the 4KV Group Buses have transferred off the Auxiliary Power Transformer and are loaded on the Station Power Transformers. Step 9 also reduces some unnecessary loads on the Group Buses by taking all but 1 Condensate Pump out of service

Step 15 ensures the CRS and the TSC knows the status of plant conditions.

**ATTACHMENT 9**

This attachment provides the information necessary to jumper some different components that may be required for cold shutdown. These jumpers save the Operators from operating components locally. These jumpers utilizes the blue ribbon connectors in the Relay Room.

**ATTACHMENT 10**

This attachment provides the information necessary on how and where hand senders will be placed while cooling down on RHR.

**ATTACHMENT 11**

This attachment provides the information on where to attach the connectors and how the connection is to be made to provide POPs initiation.

**ATTACHMENT 12**

This attachment provides the information on how to operate Pressurizer Heaters locally.

**ATTACHMENT 13**

This attachment provides the necessary instruction for resetting Turbine-Driven AFW Pump Overspeed Trip Mechanism. The information is specific and graphic illustrations are to assist the Operator.

**ATTACHMENT 14**

This attachment provides the Operator with an alternate method of determining the level in the Auxiliary Feedwater Storage Tank. The local level indication is outside, along side the tank. This keeps the Operator in the immediate vicinity of the Auxiliary Feedwater Pumps and the Hot Shutdown Panel in case he's needed. The attachment also give direction if the alternate water supply is needed.

**ATTACHMENT 15**

The attachment provides a means to locally defeat 1RP4 to facilitate operation of the normally locked out valves.

**ATTACHMENT 16**

The SM provides concurrence to return the restoration to the Control Room using the attachment. The attachment returns the component controls back to the Control Room. This attachment looks at all the components that were transferred to operate remotely from the local panels or from the HSD Panel and SW 4KV Switchgear Cabinet. It lists all the components, the directions how to return the control to the control room and then does operability checks on certain components. A caution in the beginning warns that if a component fails to transfer, the Operator is directed to return control of the individual component to the HSD Panel AND SW 4KV SWGR Cabinet and hold for an evaluation. The attachment also lists the surveillances that check the indications for both the Control Room and HSD Panels and reminds the Operators to establish system configuration after systems are returned. The entire procedure is then reviewed by the SM/CRS to ensure operability concerns are met.

**END OF DOCUMENT**