DRAFT
RO/SROI/SROU
Part B Operating

EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2020050101 / PLOR-007C K/A: 202002A4.07
URO: 3.6 SRO: 3.4

TASK DESCRIPTION: Reset a Recirculation System Upper Flow Limit

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

1. None

C. REFERENCES

1. SO 2.7.A-2 Rev. 7, "Resetting Recirculation System Upper and Lower Flow Limits"

D. TASK STANDARD

1. Satisfactory task completion is indicated when the Recirculation Pump Upper flow limit for the "A" and "B" Recirculation Pump is reset.

2. Estimated time to complete: 9 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform necessary steps to reset the Recirculation System Upper flow limit using appropriate procedures. I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. "A" Condensate Pump has tripped from 100% power.

2. Reactor power is approximately 70%.

3. The cause of the "A" Condensate Pump trip has been determined and corrected, and "A" Condensate Pump has been restarted.

4. The Upper Recirculation Pump flow limit is in effect.

G. INITIATING CUE

The Control Room Supervisor directs you to reset the upper flow limit for the "A" and "B" Recirculation Pumps using SO 2.7.A-2, "Resetting Recirculation System Upper and Lower Flow Limits".

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
1	Obtain a copy of procedure SO 2.7.A-2.	P	A copy of procedure SO 2.7.A-2 is obtained.
	***** NOTE ***** **This JPM is written assuming the "A" Recirculation Pump Upper Flow Limit is reset prior to resetting the "B" Recirculation Pump Upper Flow Limit per the NOTE after step 4.2.1.**		
*2	Slowly lower speed demand using "A" M/A station until "A" generator speed drops slightly. (Cue: Acknowledge M/A station operation; SPI-2-02-184-016A indicates a slight drop.)	P	The "A" Recirc Pump M/A station manual control knob is turned in the counterclockwise direction at the 20C004A panel until "A" generator speed drops slightly.
*3	Depress the "`A' Upper Recirc Flow Limit" reset pushbutton. (Cue: Acknowledge pushbutton operation.)	P	The "`A' Upper Recirc Flow Limit" pushbutton is momentarily DEPRESSED at panel 20C004A.
4	Verify "`A' Upper Flow Limit" red light goes out.	P	"`A' Upper Flow Limit" red light is verified OUT at panel 20C004A.
5	Verify annunciator "A Recirc Flow Limit" (214 B-3) clears.	P	"A Recirc Flow Limit" annunciator verified clear.
*6	Slowly lower speed demand using "B" M/A station until "B" generator speed drops slightly. (Cue: Acknowledge M/A station operation; SPI-2-02-184-016B indicates a slight drop.)	P	The "B" Recirc Pump M/A station manual control knob is turned in the counterclockwise direction at the 20C004A panel until "B" generator speed drops slightly.
*7	Depress the "`B' Upper Recirc Flow Limit" reset pushbutton. (Cue: Acknowledge pushbutton operation.)	P	The "`B' Upper Recirc Flow Limit" pushbutton is momentarily DEPRESSED at panel 20C004A.
8	Verify "`B' Upper Recirc Flow Limit" red light is out.  (Cue: "`B' Upper Recirc Flow Limit" red light is out.)	P	"`B' Upper Recirc Flow Limit" red light is verified OUT at panel 20C004A.

STEP NO	STEP	ACT	STANDARD
9	Verify annunciator "B RECIRC FLOW LIMIT" (214 G-3) clears. (Cue: Annunciators 214 B-3 and 214 G-3 are clear.)	P	'B' "RECIRC FLOW LIMIT" annunciator verified clear.
10	Inform Control Room Supervisor of task completion. (Cue: Control Room Supervisor acknowledges report.)	P	Task completion reported.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When the Recirculation System Upper Flow Limit has been reset for the "A" and "B" Recirculation Pumps, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. "A" Condensate Pump has tripped from 100% power.

2. Reactor power is approximately 70%.

3. The cause of the "A" Condensate Pump trip has been determined and corrected, and "A" Condensate Pump has been restarted.

4. The Upper Recirculation Pump flow limit is in effect.

INITIATING CUE

The Control Room Supervisor directs you to reset the upper flow limit for the "A" and "B" Recirculation Pumps using SO 2.7.A-2, "Resetting Recirculation System Upper and Lower Flow Limits".

PECO Energy Company
Peach Bottom Unit 2

SO 2.7.A-2 RESETTING RECIRCULATION SYSTEM UPPER AND LOWER FLOW LIMITS

1.0 PURPOSE

This procedure provides the instructions necessary to reset a Recirc System flow limit.

2.0 PREREQUISITES

2.1 Recirculation System in operation in accordance with SO 2A.

3.0 PRECAUTIONS

3.1 IF the recirc controller does NOT have control of the recirc pump when the flow limit is reset, THEN the recirc pump will ramp suddenly to the speed demand setting of the controller. **CM-1**

4.0 PERFORMANCE STEPS

4.1 Resetting Recirc System Lower Flow Limit

NOTES

1. The Recirc System Lower Flow Limit is caused by either of the following conditions:
   - o Total feedwater flow less than 20%

     OR

   - o Recirc pump discharge valve NOT full open.
2. WHEN the Recirc Lower Flow Limit is enforcing, THEN annunciator Panel window 214(20C204M) B-3(G-3), "A(B) RECIRC FLOW LIMIT" will alarm AND A(B) LOWER FLOW LIMIT red lights on Panel 20C004A will come on.
3. This circuit is sealed in. The operator can have a demand setting of greater than 30% but MG set speed CANNOT rise above 30%. The operator can lower MG set speed below 30%.

4.1.1 IF the Recirc MG Set is NOT locked up AND conditions allow the reset of the Lower Flow Limit, THEN verify demand signal is set to control MG set at present speed by slowly lowering the speed demand signal using Moore Controller SPIC-2-02-184-016A(B) until generator speed lowers slightly. Otherwise, continue with Step 4.1.2 of this procedure. **CM-2**

NOTE

IF both the "A" AND "B" Lower Flow Limits need to be reset, THEN the "A" Lower Flow Limit should be reset first, followed by the reset of the "B" Lower Flow Limit.

CAUTION

WHEN clearing the Lower Flow Limit, THEN observe recirc pump instrumentation for rpm swings which will cause unexpected reactivity changes.

4.1.2 IF conditions allow the reset of the Lower Flow Limit, THEN push the A(B) LOWER FLOW LIMIT reset pushbutton 2A-S37A(B) on Panel 20C004A. Otherwise, exit this procedure.

4.1.3 Verify A(B) LOWER FLOW LIMIT red light goes out.

4.1.4 IF A(B) UPPER FLOW LIMIT is reset THEN verify annunciator Panel window 214(20C204M) B-3(G-3), "A(B) RECIRC FLOW LIMIT" clears.

4.1.5 IF the Recirc MG Set is NOT locked up, THEN adjust Recirc MG set speeds as directed by Shift Management.

4.2 Resetting Recirc System Upper Flow Limit (45% Runback)

NOTES

1. The Recirc System Upper Flow Limit (45% runback) is caused by either of the following conditions:
   - o Individual feedwater flow less than 20% AND reactor low level +17".

   OR

   - o Condensate Pump breaker trip AND total feed flow greater than 85%.
2. WHEN 45% runback occurs, THEN annunciator Panel window 214(20C204M) B-3(G-3), "A(B) RECIRC FLOW LIMIT" will alarm AND A(B) UPPER FLOW LIMIT red light on Panel 20C004A will come on.
3. This circuit is sealed in. The operator can have a demand setting of greater than 45% but MG set speed CANNOT rise above 45%. The operator can lower MG set speed below 45%.

4.2.1 IF the Recirc MG Set is NOT locked up AND conditions allow the reset of the Upper Flow Limit, THEN verify demand signal is set to control MG set at present speed by slowly lowering the speed demand signal using Moore Controller SPIC-2-02-184-016A(B) until generator speed lowers slightly. Otherwise, continue with Step 4.2.2 of this procedure. **CM-2**

NOTE

IF both the "A" AND "B" Upper Flow Limits need to be reset, THEN the "A" Upper Flow Limit should be reset first, followed by the reset of the "B" Upper Flow Limit.

CAUTION

WHEN clearing the Upper Flow Limit, THEN observe recirc pump instrumentation for rpm swings which will cause unexpected reactivity changes.

4.2.2 IF conditions allow the reset of the Upper Flow Limit, THEN push the A(B) UPPER FLOW LIMIT reset pushbutton 2A-S14A(B) on Panel 20C004A. Otherwise, exit this procedure.

4.2.3 Verify A(B) UPPER FLOW LIMIT red light goes out.

4.2.4 IF A(B) LOWER FLOW LIMIT is reset, THEN verify annunciator Panel window 214(20C204M) B-3(G-3), "A(B) RECIRC FLOW LIMIT" clears.

4.2.5 IF the Recirc MG Set is NOT locked up, THEN adjust Recirc MG set speed as directed by Shift Management.

5.0 CONTROL STATIONS

5.1 20C004A

6.0 REFERENCES

6.1 E-171

6.2 M-1-S-2

6.3 M-1-T-25 Recirc Flow Control System

6.4 M-1-J-55

6.5 CM-1, EIR 2-93-188 "2B Recirc Pump Speed Increase" (T03003)

6.6 CM-2, EIR 2-92-289 "2A Recirc Pump Tipped Due To A Loose Tach-Generator" (T02523)

7.0 TECHNICAL SPECIFICATIONS

7.1 Section 3.4.1, 3.4.2

8.0 INTERFACING PROCEDURES

None

EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2560150101 / PLOR-XXXC K/A: 256000A4.01

URO: 3.3 SRO: 3.3

TASK DESCRIPTION: Start the 'C' Condensate Pump

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

1. None

C. REFERENCES

1. SO 5.1.B-2 Rev. 16, "Placing the Second and Third Condensate Pumps in Service".

D. TASK STANDARD

1. Satisfactory task completion is indicated when the "C" Condensate pump is running, with flow controller FC-2110 set at 3.0 E+6 lbm/hr.

2. Estimated time to complete: 10 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform necessary steps to start the "C" Condensate pump using SO 5.1.B-2, "Placing the Second and Third Condensate Pumps in Service". I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. 13 KV power is available to the "C" Condensate Pump in accordance with SO 53.

2. 480 VAC power is available in accordance with SO 56.

3. Instrument Air is available to the Condensate System in accordance with SO 36B.

4. The 2A and 2B Condensate pumps are operating in accordance with SO 5.1.A-2 and this procedure.

5. Turbine Building Ventilation system is in operation in accordance with SO 40A.1.C-2.

6. An Equipment Operator is standing by in the vicinity to support start of the 2C Condensate Pump. Pre-startup checks (steps 4.1 through 4.6.3) have been completed for the 2C Condensate pump in accordance with SO 5.1.B-2, "Placing the Second and Third Condensate Pumps in Service".

G. INITIATING CUE

The Control Room Supervisor directs you to start the 2C Condensate Pump in accordance with SO 5.1.B-2, "Placing the Second and Third Condensate Pumps in Service".

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
1	Obtain a copy of procedure SO 5.1.B-2.	P	A copy of procedure SO 5.1.B-2 is obtained.
*2	Crack open for 5 to 10 seconds, MO-2098C, "Condensate Pump Discharge Valve" for the 2C Condensate Pump on panel 20C007B. (Cue: Acknowledge control switch operation).	P	MO-2098C control switch is placed in the open position.
3	Verify that MO-2098C is opening. (Cue: MO-2098C red light illuminates".)	P	MO-2098C red indicating light is verified to be illuminated.
*4	Stop the MO-2098C motion after 5 - 10 seconds. (Cue: Acknowledge pushbutton operation.)	P	Depress the red stop pushbutton after the valve opens for 5 - 10 seconds.
*5	Close MO-2098C, Condensate Pump Discharge Valve" for the 2C Condensate Pump on panel 20C007B. (Cue: Acknowledge control switch operation).	P	MO-2098C control switch is placed to the close position.
6	Verify that MO-2098C is closed. (Cue: MO-2098C red light extinguishes.)	P	MO-2098C red indicating light is verified to be off.
*7	Start the 2C Condensate Pump. (Cue: 2C Condensate pump red light illuminates, green light extinguishes. 2C Condensate pump amps peg high, and then lower to 120 amps).	P	2C Condensate Pump Control Switch is taken to start at panel 20C007A.
8	Check that motor amps stabilize at greater than or equal to 115 amps and less than or equal to 125 amps as indicated on panel 20C007A. (Cue: 2C Condensate pump ammeter indicate 120 amps).	P	2C Condensate Pump Amps indicate 120 amps at panel 20C007A.
*9	Open MO-2098C, "Condensate Pump Discharge Valve" on panel 20C007B. (Cue: Acknowledge control switch operation).	P	MO-2098C control switch is placed in the open position. (2 min. limitation for pump running with discharge valve closed.)

STEP NO	STEP	ACT	STANDARD
10	Verify MO-2098C, "Condensate Pump Discharge Valve" on panel 20C007B is open. (Cue: MO-2098C red indicating light illuminates, and MO-2098C green indicating light extinguishes.	P	MO-2098C red indicating light is illuminated, MO-2098C green light is extinguished.
11	Direct the equipment operator to verify that discharge pressure for each operating condensate pump is less than 650 psig, as indicated by PI-2106A(B)(C), "A(B)(C) Condensate Pump Discharge Press" located on panel 2DC159. (Cue: All three condensate pump's discharge pressure are verified to be less than 650 psig).	P	Equipment Operator is directed to verify that discharge pressure for each operating condensate pump is less than 650 psig, as indicated by PI-2106A(B)(C).
12	Direct an Equipment Operator to close the 2C Condensate Pump discharge vent HV-2-5-26027C. (Cue: Equipment operator reports that HV-2-5-26027C is closed.	P	Equipment Operator is directed to close HV-2-5-26027C.
13	Verify Condensate Pump Vibration Monitor readings are at least 1 mil less than alarm setpoint at Data Acquisition System (DAS) display XI-80838 on panel 20C007B AND computer points CA049 through CA057. (Cue: All vibration monitor readings are at least 1 mil less than alarm setpoint).	P	Vibration readings are all verified to be at least 1 mil less than the alarm setpoint.
*14	Set FC-2110, "Condensate Recirc Flow" to 3.0 E+6 lbm/hr (6000 gpm), and verify controller is in auto. (Cue: FC-2110 indicates 3.0 E+6 lbm/hr, with the Flow Controller in auto.	P	FC-2110 is set to 3.0 E+6 lbm/hr is auto.
15	Inform Control Room of task completion. (Cue: Control Room acknowledges report.)	P	Task completion reported.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When the 2C Condensate Pump is running, with FC-2110 set at 3.0 E+6 in auto, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. 13 KV power is available to the "C" Condensate Pump in accordance with SO 53.

2. 480 VAC power is available in accordance with SO 56.

3. Instrument Air is available to the Condensate System in accordance with SO 36B.

4. The 2A and 2B Condensate pumps are operating in accordance with SO 5.1.A-2 and this procedure.

5. Turbine Building Ventilation system is in operation in accordance with SO 40A.1.C-2.

6. An Equipment Operator is standing by in the vicinity to support start of the 2C Condensate Pump. Pre-startup checks (steps 4.1 through 4.6.3) have been completed for the 2C Condensate pump in accordance with SO 5.1.B-2, "Placing the Second and Third Condensate Pumps in Service".

INITIATING CUE

The Control Room Supervisor directs you to start the 2C Condensate Pump in accordance with SO 5.1.B-2, "Placing the Second and Third Condensate Pumps in Service".

PECO Energy Company
Peach Bottom Unit 2

SO 5.1.B-2 PLACING SECOND AND THIRD CONDENSATE PUMPS IN SERVICE

1.0 PURPOSE

This procedure provides the instructions necessary to place the second and third Condensate pumps in service.

2.0 PREREQUISITES

2.1 13 KV power available to the Condensate pumps in accordance with SO 53.

2.2 480 VAC power available to the Condensate system in accordance with SO 56.

2.3 Instrument air available to the Condensate system in accordance with SO 36B.

2.4 One Condensate pump operating in accordance with SO 5.1.A-2, "Condensate System Condensate Pump Start on Short Path Recirc".

2.5 Turbine Building Ventilation system in operation in accordance with SO 40A.1.C-2, "Turbine Building Area Cooling Fans Normal Operation".

3.0 PRECAUTIONS

3.1 The Condensate system shall NOT be operated at greater than 650 psig for extended periods.

4.0 PERFORMANCE STEPS

NOTE

In accordance with GP-2, "Normal Plant Start-up", the second Condensate pump is started before placing the second reactor feedwater pump (RFP) in service at 450 psig reactor pressure, and the third Condensate pump is started before placing the third RFP in service at nominal 35% Reactor Power. **CM-1**

4.1 Perform COL 5.1.B.A-2, COL 5.1.B.B-2, OR COL 5.1.B.C-2, "2A(B)(C) Condensate Pump Start", for the pump to be started as directed by Shift Management.

4.2 Direct the Equipment Operator to verify reset of the lockout relays for the selected Condensate pump, on Panel 20C023 in the cable spreading room.

4.3 For the Condensate pump to be started, direct the Equipment Operator to verify open HV-2-5-26027A(B)(C), "Cond Pump 2A(B)(C) Discharge Vent Valve".

NOTE

Proper oil level is as follows:

Pump thrust bearing: ± 3/8" of bullseye Midpoint

Motor bearings: Between "MIN-RUN" and "FULL IDLE"

- For the 2A(2C) motor bearings, oil level must be within the bullseye.

4.4 Direct the Equipment Operator to check Condensate pump motor oil reservoirs on the selected pump for proper oil level, by observing the three sight glasses on the pump motor.

4.5 Verify cooling water flow to each oil cooler as follows:

4.5.1 Verify fully open the following valves:

- HV-2-34-24326A(B)(C), "TBCW Inlet to Cond Pump A(B)(C) Motor Upper Brg Clr 2AE034(2BE034)(2CE034)"
- HV-2-34-24327A(B)(C), "TBCW Outlet from Cond Pp A(B)(C) Motor Upper Brg Clr 2AE034(2BE034)(2CE034)"
- HV-2-34-24328A(B)(C), "TBCW Inlet to Cond Pump A(B)(C) Motor Lower Brg Clr 2AE125(2BE125)(2CE125)"

- o HV-2-34-24329A(B)(C), "TBCW Outlet from Cond Pp A(B)(C) Motor Lower Brg Clr 2AE125(2BE125)(2CE125)"
- o HV-2-34-24330A(B)(C), "TBCW Inlet to Cond Pump A(B)(C) Thrust Brg Oil Clr 2AE040(2BE040)(2CE040)"
- o HV-2-34-24331A(B)(C), "TBCW Outlet from Cond Pp A(B)(C) Thrust Brg Oil Clr 2AE040(2BE040)(2CE040)"

4.5.2 Observe water flowing through the following:

- o FG-2230A(B)(C), "Cond Pp A(B)(C) Mtr Lower Brg Clg Wtr Out Flow"
- o FG-2358A(B)(C), "Cond Pp A(B)(C) Mtr Upper Brg Clg Wtr Out Flow"
- o FG-2437A(B)(C), "Cond Pp A(B)(C) Thrust Brg Clg Wtr Out Flow"

4.5.3 Check selected Condensate pump bearing cooling water temperatures are greater than or equal to 50° F <u>AND</u> less than or equal to 125° F.

- o TI-2232A(B)(C), "Cond Pp A(B)(C) Pp Thrust Brg Clg Wtr Out Temp"
- o TI-2231A(B)(C), "Cond Pp A(B)(C) Mtr Lower Brg Clg Wtr Out Temp"
- o TI-2359A(B)(C), "Cond Pp A(B)(C) Mtr Upper Brg Clg Wtr Out Temp"

4.6 Establish seal water to the Condensate pumps as follows:

4.6.1 Open HV-2-27A-26022A(B)(C), "Seal Water Supply Valve for 2A(B)(C) Condensate Pump".

4.6.2 Open HV-2-5-26187A(B)(C), "Condensate Pump 2A(B)(C) Seal Water Drain Valve".

4.6.3 <u>WHEN</u> a steady stream of water issues, <u>THEN</u> close HV-2-5-26187A(B)(C).

NOTE

Step 4.7 is to avoid air entrapment between Condensate pump discharge check valve and discharge motor operated valve.

4.7 Crack open for 5 to 10 seconds, and then close MO-2098A(B)(C), "Condensate Pump Valves Discharge A(B)(C)", for the pump to be started, on Panel 20C007B.

CAUTIONS

1. WHEN the Condensate pump motor is hot, (winding temperature > 60° C), THEN do NOT attempt more than one start.
2. WHEN the Condensate pump motor is cold, (winding temperature ≤ 60° C), THEN do NOT attempt more than two starts.
3. Allow the Condensate pump motor to coast to rest between start attempts.
4. IF 1 OR 2 above occurs, THEN prior to attempting a restart, the windings must be cooled by:
   - o Running the motor for 30 minutes

     OR
   - o NOT running the motor for 60 minutes.
5. The Condensate pump shall NOT be operated for more than two minutes with the discharge valve closed.
6. IF a Condensate pump start is attempted with the following lineup:
   - o PCIS/RPS System "A" OR "B" is switched to "ALT SOURCE" on Unit 2 OR Unit 3
   - o The alternate feed is NOT on the inverter
   - o The bypass power source is connected to the same startup transformer as the Condensate pump to be started

   THEN a Half Scram AND Half Group III Isolation may occur. **CM-2**

4.8 Start the selected Condensate pump.

4.9 Check that motor amps stabilize at greater than or equal to 115 amps AND less than or equal to 125 amps as indicated on Panel 20C007A.

CAUTIONS

1. Do NOT operate Condensate system at greater than 650 psig for extended periods to ensure pump discharge check valve open and sufficient flow.
2. Pump discharge pressure shall be less than 650 psig within 5 minutes to ensure sufficient pump flow.

4.10 Open MO-2098A(B)(C) for the pump that was started.

4.11 Direct the Equipment Operator to verify that the discharge pressure for each operating Condensate pump is less than 650 psig, as indicated by PI-2106A(B)(C), "A(B)(C) Condensate Pump Discharge Press", located on Panel 2DC159.

4.12 IF Condensate pump discharge pressure is NOT less than 650 psig within 5 minutes, THEN shutdown the Condensate pump in accordance with SO 5.2.A-2, "Condensate System Condensate Pump Shutdown", AND exit this procedure.

4.13 Direct the Equipment Operator to close selected pump discharge vent HV-2-5-26027A(B)(C).

CAUTION

A Condensate pump shall NOT be operated with vibration monitor indication above 11 mils.

4.14 Verify Condensate Pump vibration monitor readings are at least 1 mil less than alarm setpoint at Data Acquisition System (DAS) display XI-80838 on Panel 20C007B AND PMS computer points CA049 through CA057. IF XI-80838 is unavailable, THEN perform Attachment 1 of SO 5.8.A-2, "Condensate System Routine Inspection", to monitor Condensate pump vibration.

4.15 Set FC-2110, "Condensate Recirc Flow" located on Panel 20C007A to 3.0 X 10^6 lbm/hr (6000 gpm), and verify controller is in "AUTO".

4.16 Perform the applicable section of OM-8.3:2TBN, "Unit 2 Turbine Bldg Night Shift Round Sheet" for the operating Condensate pumps.

5.0 CONTROL STATIONS

5.1 20C007A

5.2 20C007B

5.3 20C023 inside the Cable Spreading Room

5.4 2DC159, Cond Pumps & Fdwtr Htr Inst Rack D

6.0 REFERENCES

6.1 P&ID M-307

6.2 P&ID M-308

6.3 E-8-83

6.4 M-7-A-13

6.5 NE-211-158

6.6 EIR 2-91-345, 2B Condensate Pump Thrust Bearing High Temperature

6.7 CM-1, EIR 2-93-090, Scram on Loss of Condensate Pump (T04238)

6.8 CM-2, EIR 2-91-014, Trip of Unit 2 'B' RPS while starting Unit 3 'B' Recirc M-G set. (T00952)

7.0 TECHNICAL SPECIFICATIONS

None

8.0 INTERFACING PROCEDURES

8.1 COL 5.1.B.A-2, "2A Condensate Pump Start"

8.2 COL 5.1.B.B-2, "2B Condensate Pump Start"

8.3 COL 5.1.B.C-2, "2C Condensate Pump Start"

8.4 SO 5.2.A-2, "Condensate System Condensate Pump Shutdown"

8.5 SO 5.8.A-2, "Condensate System Routine Inspection"

EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2100070201 / PLOR-317CA K/A: 216000A1.01
RO: 3.4 SRO: 3.3

TASK DESCRIPTION: Monitor Reactor Vessel Temperatures During Cooldown

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

Partially completed copy of ST-O-080-500-2, Recording and monitoring Reactor Vessel Temperatures and Pressure.

C. REFERENCES

1. ST-O-080-500-2, Rev. 7, Recording and Monitoring Reactor Vessel Temperatures and Pressure.

2. GP-3, Rev. 86, Normal Plant Shutdown

D. TASK STANDARD

1. Satisfactory task completion is indicated when all required steps have been completed for one set of 15 minute data.

2. Estimated time to complete: 15 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform ST-O-080-500-2, Recording and Monitoring Reactor Vessel Temperatures and Pressure using the appropriate procedures. I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. A reactor cooldown is in progress with a stable cooldown rate established using Bypass valves and pressure set.

2. Cooldown data from PMS is unavailable.

3. Initial data for ST-O-080-500-2, Recording and Monitoring Reactor Vessel Temperatures and Pressure has been recorded on the procedure copy to be provided.

G. INITIATING CUE

The Reactor is shut down and a cooldown is in progress. The Control Room Supervisor directs you to you, to perform the applicable steps of ST-O-080-500-2, Recording and Monitoring Reactor Vessel Temperatures and Pressure using the copy of the procedure provided.

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
	****NOTE****		
	Provide the examinee with a consumable copy of ST-O-080-500-2 with all appropriate signoffs completed on the front cover and page 3 and four lines of temperature data complete on Data Sheet 1.		
*1	Record all the required data using Data Sheet 1. (Cue: Acknowledge the use of Data Sheet 1.)	P	The operator records Vessel Drain Pipe Temperature (column 3), Vessel Metal Temperatures (columns 4 & 5), Reactor Pressure (column 7), Recirc Pump Suction Temperatures (columns 9 & 10).
*2	Determine Steam Dome Saturation Temperature for the reactor pressure in column 7. (Cue: Acknowledge the determination saturation temperature.)	P	The operator uses Table 1 (TSAT) or PMS point SPDS0228 to determine TSAT for reactor pressure and records it in column 8.
*3	Determine which required temperature points are valid for 100°F/hr compliance. (Cue: Acknowledge selection of temperature points.)	P	Determine that Steam Dome Saturation Temperature and both Recirc Pump Suction Temperatures are valid for 100°F/hr compliance.
*4	Calculate the difference between the current valid temperature points and the previous values taken 15 minutes ago. (Cue: Acknowledge calculation.)	P	A calculation of the 15 minute differential temperature for Steam Dome Saturation Temperature and both Recirc Pump Suction Temperatures is made.
*5	Record the value of the largest 15 minute change from the valid temperature points on Data Sheet 1. (Cue: Acknowledge use of Data Sheet 1.)	P	The largest 15 minute differential temperature from the three valid temperature points (usually Steam Dome Saturation Temperature) is recorded in column 11.
	****NOTE****		
	If the candidate reports that the cooldown rate is excessive, acknowledge the report and direct the candidate to take appropriate action and complete the surveillance.		

STEP NO	STEP	ACT	STANDARD
*6	Verify the largest 15 minute temperature change is less than or equal to 20°F and initial "SAT" on Data Sheet 1. Initial "UNSAT" and circle the reading if greater than 20°F. (Cue: Acknowledge the use of Data Sheet 1.)	P	The largest 15 minute temperature change is recognized to be greater than 20°F. Column 12 is initialed "Unsat" and the Unsat temperature reading is circled.
*7	Verify that all required valid temperature points have not changed by more than 100°F. Initial "UNSAT" and take immediate action to reduce cooldown rate. (Cue: Acknowledge use of Data Sheet 1. All BPV green lights "ON", red lights "OFF".)	P	Steam Dome Saturation Temperature and both Recirc Pump Suction Temperatures are recognized to have changed greater than 100°F in the last hour, "UNSAT" is initiated in column 13, pressure set raise pushbutton is depressed until the BPVs go closed.
*8	Determine the appropriate P-T Curve Figure for the current plant conditions. (Cue: Acknowledge choice of table.)	P	Determination is made that Table 4 is the appropriate P-T Curve.
*9	Determine required valid temperature points per the appropriate table. (Cue: Acknowledge choice of valid temperature points.)	P	Using Table 4 determination is made that saturation temperature is the valid point for Curve B, and Recirc Pump Suction Temperature for Curve B_{BH}.
*10	Verify reactor pressure and the required valid temperatures are on the safe side of the required P-T Curve and initial "SAT" on Data Sheet 1. If not on the safe side of the curve initial "UNSAT" and take immediate action to review plant conditions to the safe side of the curve as directed by Shift Management. (Cue: Acknowledge Table 4 and Data Sheet 1 use.)	P	Reactor pressure vs. Steam Dome Saturation Temperature are verified to be on the Right Side of Curve "B" on Table 4, and reactor. Pressure vs. Recirc Pump Suction Temperatures are verified to be on the right side of Curve B_{BH} on Table 4, and initial "SAT" in column 6.
11	Inform the Control Room Supervisor of task completion.	P	The operator informs the Control Room Supervisor of task completion.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When the applicable steps of ST-O-080-500-2 are complete including evaluation of data to determine compliance with applicable limits, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. A reactor cooldown is in progress with a stable cooldown rate established using Bypass valves and pressure set.

2. Cooldown data from PMS is unavailable.

3. Initial data for ST-O-080-500-2, Recording and Monitoring Reactor Vessel Temperatures and Pressure has been recorded on the procedure copy to be provided.

INITIATING CUE

The Reactor is shut down and a cooldown is in progress. The Control Room Supervisor directs you to you, to perform the applicable steps of ST-O-080-500-2, Recording and Monitoring Reactor Vessel Temperatures and Pressure using the copy of the procedure provided.

ST-O-080-500-2 **RECORDING AND MONITORING REACTOR VESSEL TEMPERATURES AND PRESSURE**

TEST FREQUENCY: Unscheduled (See Section 1.0)
TECH SPEC: SR 3.4.9.1, SR 3.4.9.2
APPLICABILITY: At all times

1 **CHECK** why this procedure is being performed:

☐ Scheduled Start-up ☐ Scheduled Shut-down

☐ Other Reason: _____

Approved By SMgt: _____ _____ __/__/__ _____
Printed Name Time Date Initials

2 **INITIAL** one of the following Test Results:

A: All * steps are **SATISFACTORY** _____

B: One or More * steps are **UNSATISFACTORY**
Refer to Section 9.0 for Tech Spec LCO's

Performed By: _____ _____ __/__/__ _____
Printed Name Time Date Initials

RO/PRO Informed of Test Completion: _____ _____ __/__/__ _____

SMgt Informed of Test Results: _____ _____ __/__/__ _____

UNSAT Notification: _____
SMgt Discretion: Plant Mgr or Others

Notified By: _____ _____ __/__/__ _____

3 **IF** other portions of the test did **NOT** function properly, **OR** other discrepancies were noted **THEN COMPLETE** the following:

DESCRIBE discrepancies/actions taken: A/R or ETT #:_____

_____

_____

4 Reviewed/Approved Plant Staff: _____ _____ __/__/__ _____
Printed Name Time Date Initials

1.0 PURPOSE

This test records and monitors reactor vessel temperatures and pressure to prevent exceeding the Tech. Spec. reactor vessel brittle fracture condition, prevent exceeding the Tech. Spec. reactor vessel temperature change rate limit, and maintain bulk coolant temperature less than 212 °F when not in heat-up, cool-down or hot stand-by condition. This test is applicable at all times when Reactor pressure or temperature is undergoing changes and satisfies Tech. Specs. SR 3.4.9.1 and 3.4.9.2. **CM-1**

1.1 APPLICABLE CONDITIONS

This procedure is required to be performed under the following conditions: **CM-2**

1.1.1 **WHEN** reactor heat-up is in progress as described by GP-2, "Normal Plant Start-Up", **UNTIL** 900 psig reactor pressure is attained **AND** the difference between any two temperature readings taken over a 45 minute period is less than 5 °F. The purpose of this monitoring is to ensure and document that the heat-up rate is controlled within the T.S. limit. **CM-9**

1.1.2 **WHEN** reactor depressurization is procedurally directed **OR WHEN** reactor is depressurized with a cooldown in progress, **UNTIL** 165 °F is reached **AND** the difference between any two readings taken over a 45 minute period is less than 5 °F. The purpose of this monitoring is to ensure and document that the cooldown rate is controlled within the T.S. limit. **CM-9**

1.1.3 **WHEN** required by Reactor Vessel Pressure Test Procedures, ST-O-080-675-2 and ST-O-080-680-2. The purpose of this monitoring is to ensure that Tech Spec temperature change rates and P-T limits described by Tech Spec Figure 3.4.9-1 are not violated.

1.1.4 **WHEN** required by GP-12, "Core Cooling Procedure".

1.2 NON-APPLICABLE CONDITIONS.

This procedure is not required under the following conditions:

1.2.1 **WHEN** EHC is regulating pressure above 900 psig Reactor Pressure. This includes steady state (full power) and power changes (reductions or increases).

1.2.2 **AFTER** cooldown has progressed to a point where the RPV is vented AND coolant temperature has met the condition described by Paragraph 1.1.2 (steady state and less than 165 °F).

1.0 **PURPOSE** (Continued)

1.2.3 **WHEN** no fuel is in the RPV.

2.0 TEST EQUIPMENT

None

3.0 PREREQUISITES Initial

3.1 Test Initiation

3.1.1 **COMPLETE** Section 1 of cover page. _____

3.2 Document Review

3.2.1 **ENSURE** procedure is current revision. _____

3.3 Equipment Configuration

None

3.4 Required Redundant Safety Related Equipment

None

3.5 Approval to Start Test

None

4.0 PRECAUTIONS, LIMITATIONS, AND GENERAL INSTRUCTIONS

4.1 Plant Impact Statement

4.1.1 This test could have an impact on plant operations if the data being recorded for this test indicates that operator action is necessary to maintain Tech. Spec. compliance.

4.2 Precautions

4.2.1 This procedure requires a great deal of repetitive, manual logging of data. The repetitive nature of data-logging should not be allowed to decrease the importance of analyzing the data against the requirements and limits given in the procedure.

4.3 Limitations

4.3.1 When in natural circulation, the best available method to measure coolant temperature is, indirectly, using the RPV external skin thermocouples.

4.0 PRECAUTIONS, LIMITATIONS, AND GENERAL INSTRUCTIONS (Continued)

4.3.2 The Reactor Vessel shall **NOT** be pressurized above the pressure allowed in Tech Spec Figures 3.4.9-1, 3.4.9-2 or 3.4.9-3, as appropriate to the plant condition. **IF** the appropriate P-T curve is exceeded, **THEN** action should be taken to bring the plant conditions to the safe side of the curve.

4.3.3 The average rate of reactor coolant temperature change during normal heatup or cooldown should be maintained at a nominal rate of 80 °F in any one hour period. This nominal rate is established to ensure that the Tech Spec limit of 100 °F/hr is not exceeded. **CM-3**

4.4 General Instructions

4.4.1 **IF** any step is initialed UNSAT, **THEN NOTIFY** SMgt.

4.4.2 **IF** procedure is aborted, **THEN NOTIFY** SMgt **AND WRITE "TEST ABORTED"** in Section 3 of Cover Page. This is a logging procedure which has defined entry and exit conditions. It should not be ABORTED unless other equivalent data-taking and analysis is in place.

4.4.3 All applicable * steps are identified immediately in front of the initials.

4.4.4 Free Format Log file name "Heatup", which monitors points monitored and recorded in ST-O-080-500-2, may be used for information. **IF** this procedure is revised, then the Free Format log should also be reviewed and revised if necessary.

4.4.5 If transitioning between PMS and recorder points for the same parameter, the <u>calculated</u> heatup/cooldown rate could exceed 20 degrees in 15 minutes due to differences between the PMS and recorder values. If possible, attempt to make any transitions between PMS and recorder points when actual temperature change is minimal.

4.4.6 This surveillance establishes and maintains operating limits that provide a margin to brittle fracture of the reactor vessel and piping of the reactor coolant pressure boundary.

4.0 PRECAUTIONS, LIMITATIONS, AND GENERAL INSTRUCTIONS (Continued)

4.4.7 This surveillance contains P/T(Pressure / Temperature) limit curves for heatup, cooldown, and inservice leakage and hydrostatic testing, and also limits the maximum rate of change of reactor coolant temperature. The criticality curve provides limits for both heatup or cooldown with the core critical.

4.4.8 Each P/T limit curve defines an acceptable region for normal operation.

4.4.9 Power Transients and reactor trips are not covered by this surveillance

5.0 ACCEPTANCE CRITERIA

5.1 The average rate of reactor coolant temperature change does **NOT** exceed 100 °F in any one hour period, starting when this procedure is entered.

5.2 At all times, reactor vessel temperature and pressure are within the limits of the applicable pressure-temperature curve (Tech Spec Figure 3.4.9-1, 3.4.9-2, 3.4.9-3).

5.3 Bulk reactor coolant temperature is less than 212 °F when not in heat-up, cool-down, or hot stand-by condition.

5.4 Reactor coolant temperature is less than limits described by RPV pressure test procedures during pressurization.

5.5 All required temperature and pressure data has been recorded at least every 30 minutes.

6.0 PERFORMANCE STEPS

NOTES

1. Performance of Steps 6.1.2 through 6.1.15 is required every 15 minutes when the entry conditions to this procedure exist. Performance step signoffs are located on Data Sheets 1 and 2.

2. This procedure requires operators to determine the correct temperature monitoring points using the Data Sheet and Table included, for compliance with P-T curve limitations **AND** 100 °F/hr upper limit for temperature change rate **AND** reactor coolant temperature limits.

3. Additional copies of Data Sheets 1 or 2 may be made for data recording. The total number of pages should be marked on the top of all the Data Sheets.

4. If transitioning between PMS and recorder points for the same parameter, the calculated heatup/cooldown rate could exceed 20 degrees in 15 minutes due to differences between the PMS and recorder values. If possible, attempt to make any transitions between PMS and recorder points when actual temperature change is minimal.

6.1 Recording of RPV Temperature and Pressure

6.1.1 **IF** available **AND** time permits, **THEN INITIATE** from PMS the "Cooldown Rate History" option (from the SPDS Menu or command "cooldn") and/or the Heat-up Log from the Free-Format Display; to display and/or print-out vital temperatures and trends for reactor heatup and cooldown. **CM-4**

6.0 PERFORMANCE STEPS (Continued)

NOTE

Use Data Sheet 2 when required by Reactor Vessel Pressure Test procedures ST-O-080-675-2 and ST-O-080-680-2. Use Data Sheet 1 for all other conditions.

6.1.2 **RECORD** reactor vessel temperature **AND** pressure readings on Data Sheet 1 or 2 from the instruments listed below: **CM-5**

< At Control Room Panel 20C021 >

1. **TR-2-02-3-089, Point 9,** "Reactor Bottom Head Drain Temperature" **OR** Computer point H664. **CM-10**

2. **TR-2-02-3-089, Point 3,** "Reactor Vessel Bottom Head Metal Temperature".

3. **TR-2-02-3-089, Point 2,** "Reactor Vessel Below Head Flange Temperature".

< At Control Room Panel 20C005A >

4. **PR-2-06-096, OR PR-2-06-097,** "Reactor Vessel Pressure" **OR** Computer point SPDS0000. This should be marked "N/A" when the RPV is vented.

5. **Saturation Temperature** that corresponds to reactor pressure recorded in Step 6.1.2.4. See Table 1 for conversion **OR** use Computer point SPDS 0228. This step should be marked N/A if reactor pressure is **less than or equal to** 0 psig **OR** temperature is less than or equal to 212 °F **OR** RPV head is removed.

< At Control Room Panel 20C004A >

6. **TR-2-02-165, (Red Pen),** "Recirculation Loop A Pump Suction Temperature" **OR** Computer point H672. **CM-10**

7. **TR-2-02-165, (Black Pen),** "Recirculation Loop B Pump Suction Temperature" **OR** Computer point H673. **CM-10**

6.0 PERFORMANCE STEPS (Continued)

> **NOTE**
>
> 100 °F/hr heatup and cooldown rate compliance is confirmed in Steps 6.1.3 through 6.1.8.

6.1.3 **DETERMINE** the required temperature monitoring point(s) for 100 °F/hr compliance from the following steps:

1. **IF** reactor vessel pressure is above 0 psig (>212 °F), **THEN USE** steam dome saturation temperature (TSAT) from Step 6.1.2.5 **AND** operating recirc pump suction temperature(s) from Steps 6.1.2.6 and 6.1.2.7.

2. **IF** reactor vessel pressure is equal to 0 psig (≤212 °F), **THEN USE** operating recirc pump suction temperature(s) from Steps 6.1.2.6 and 6.1.2.7.

> **NOTE**
>
> In order for a Recirc pump suction temperature to be VALID, there must be flow through that loop. If the pump is off, the temperature is not valid, but it is recorded.
>
> For example:
>
> 'A' Pump - Loop 'A' ON Suction temp is VALID.
>
> 'B' Pump - Loop 'B' OFF Suction temp is INVALID.

6.1.4 **DETERMINE** which of the required temperature monitoring points of Step 6.1.3 are VALID. **IF** all of the required temperature points of Step 6.1.3 are INVALID, **THEN PROCEED TO** Step 6.1.5, **OTHERWISE, GO** directly to Step 6.1.6.

6.0 PERFORMANCE STEPS (Continued)

NOTE

RHR heat exchanger inlet temperature is an alternate temp. point that can be used for 100 °F/hr compliance. For this temp. point to be VALID, shutdown cooling must be in service **AND** the temperature must be obtained from an operating loop and heat exchanger.

< At Control Room Panel 20C004C >

6.1.5 **RECORD** the operating RHR heat exchanger inlet temperature on Data Sheet 1 or 2 from one of the following points:

1. TRS-2-02-3-10-131,

   Point 4 - 'A' Heat Exchanger Inlet Temp. **OR**

   Point 10 - 'C' Heat Exchanger Inlet Temp. **OR**

   Point 16 - 'B' Heat Exchanger Inlet Temp. **OR**

   Point 22 - 'D' Heat Exchanger Inlet Temp.

NOTES

1. RHR heat exchanger inlet temperature should be compared to previous VALID recirc pump suction temps or TSAT during the initial recording (i.e., first 45 minutes) of temperatures.

2. Computer point SPDS 4225 "MAXIMUM 15-MIN DELTA T" may be used for comparison when determining 15 minute temperature change.

6.1.6 **CALCULATE** the difference between the current valid temperature point(s) of Steps 6.1.4 **OR** 6.1.5 and the previous value(s) taken 15 minutes ago, calculating for the corresponding point - not "worst case to worst case" **AND RECORD** the value of the largest 15 minute change from the point with the largest temperature difference on Data Sheet 1 or 2.

6.0 PERFORMANCE STEPS (Continued)

6.1.7 **IF** the 15 minute temperature change calculated in Step 6.1.6 is greater than 20 °F, **THEN INFORM** SSV **AND EVALUATE** if actions are required to lower the coolant temperature rate of change. Otherwise N/A block provided on Data Sheets 1 and 2. (Section 4.3.3)

6.1.8 **VERIFY** the readings of the required VALID temperature point(s) determined in Step 6.1.4 **OR** 6.1.5 have **NOT** changed by more than 100 °F in the last hour. **INITIAL** SAT provided on Data Sheet 1 or 2. **IF** the 100 °F/hr heatup or cooldown rate has been exceeded, **THEN INITIAL** UNSAT **AND TAKE** IMMEDIATE **ACTION** to decrease the heatup or cooldown rate.

NOTE

Vessel P-T curve compliance is confirmed in Steps 6.1.9 through 6.1.12. Table 2 is provided for guidance.

6.1.9 **DETERMINE** the appropriate P-T curve figure for the current plant conditions:

1. **USE** Tech. Spec. Fig. 3.4.9-1 (Table 3) when invoked by Reactor Pressure Test procedures.

2. **USE** Tech. Spec. Fig. 3.4.9-2 (Table 4) for Non-nuclear heatup or cooldown (Core Not Critical).

3. **USE** Tech. Spec. Fig. 3.4.9-3 (Table 5) for Core-critical operation.

6.0 PERFORMANCE STEPS (Continued)

> **NOTE**
>
> Tech. Spec. Fig. 3.4.9-2 has two curves (B, B_{BH}). Each of these curves require a unique temperature point and therefore must be monitored individually. **ALTERNATE** temperature points for P-T curve compliance are listed in Table 6 and are to be used **IF** the preferred temperature point is unavailable or invalid.

6.1.10 **DETERMINE** the required VALID temperature point(s) for the current plant conditions using Table 3, 4, or 5.

6.1.11 **OBTAIN** reactor pressure value as recorded on Data Sheet 1 or 2.

> **NOTE**
>
> **IF** required VALID temperature point(s) are greater than 275 °F, **THEN** P-T curve compliance will always be maintained regardless of reactor pressure and regardless of plant condition.

6.1.12 **VERIFY** the reactor pressure (Step 6.1.11) and corresponding required VALID temperature(s) (Step 6.1.10) are on the SAFE SIDE (right side) of the required P-T CURVE (Step 6.1.9). **INITIAL** SAT on Data Sheet 1 or 2. **IF** the plant condition is not in the safe region of the curve **INITIAL** UNSAT **AND THEN TAKE** IMMEDIATE **ACTION** to return plant conditions to the safe side of the curve as directed by Shift Management, (i.e. depressurize reactor, open main steam relief valves, increase level, reset scram and reduce or eliminate CRD flow etc.).

6.0 PERFORMANCE STEPS (Continued)

NOTES

1. Step 6.1.13 checks that coolant is less than 212 °F when required.

2. Primary and Secondary containment shall be operable if it is expected that reactor coolant temperature will exceed 212 °F.

6.1.13 **IF** not in a heat-up, cool-down, or hot standby condition, **VERIFY** on Data Sheet 1 that all temperature points are less than 212 °F. **CM-1**

NOTE

It is especially important to review all temperatures in a natural circulation condition because the RPV skin thermocouples are the best indication of RPV coolant temperature and may provide an indication of possible RPV coolant temperature stratification.

1. **IF** the RPV is pressurized in accordance with RPV Pressure Test Procedures ST-O-080-675-2, or ST-O-080-680-2, **THEN PROCEED TO** Step 6.1.14.

NOTE

Upper temperature limits during the pressurization of the RPV for pressure test purposes are described in the RPV test procedures.

2. **IF** Reactor Coolant temperature OR vessel temperature is at 185 °F and rising with the Rx Mode Switch in "SHUTDOWN" OR "REFUEL", **THEN PERFORM** the following:

   a. **NOTIFY** Shift Management.

   b. **CONSIDER** placing Shutdown Cooling in service.

6.0 PERFORMANCE STEPS (Continued)

3. **IF** Reactor Coolant temperature OR vessel temperature is at 190 °F and rising with the Rx Mode Switch in "SHUTDOWN" OR "REFUEL", **THEN PLACE** Shutdown Cooling in service immediately.

6.1.14 **WHEN** each page of Data Sheet 1 or 2 is completed, **REQUEST** Shift Management review. Shift Management shall **INITIAL** on the Data Sheet page when review is complete.**CM-10** Shift Management review is to assure:

1. temperature readings, pressure readings, and verifications are complete,
2. adverse trends are identified,
3. black box initialing is acknowledged,
4. appropriate corrective action is initiated.

6.1.15 **STOP** recording data when the entry conditions to this procedure no longer exist (See Section 1.0 of this procedure).

6.1.16 **REPEAT** Step 6.1.2 through 6.1.15 at least EVERY 15 minutes until the condition described in 6.1.15 is achieved.

7.0 PROCEDURE COMPLETION

Initial

7.1 Independent Verification

None

7.2 Records Completion

7.2.1 **COMPLETE** Section 2 of Cover Page (and Section 3 if applicable). _____

8.0 REFERENCES

8.1 Governing

8.1.1 Tech Spec SR 3.4.9.1

8.1.2 Tech Spec SR 3.4.9.2

8.1.3 CM-1, Provide temperature limits and actions to avoid local boiling (T03620, I0003027E16)

8.0 REFERENCES (Continued)

8.1.4 CM-2, Event Invest RPT 2-92-482 (A0709656, E-1) Entry condition(s)

8.1.5 CM-3, NRC Inspection Report 84-11/11 (T03185)

8.1.6 CM-4, Event Investigation Report 2-91-137, Fail to Log Rx Temps During S/U (T01639)

8.1.7 CM-5, LER 2-86-20 and INPO SER 7-87, Reactor temperature exceeded 212 °F and became pressurized (T03212)

8.1.8 CM-6, Event Investigation Report 3-92-195, Violation of Unit 3 Technical Specification Fig. 3.6.2 (Bottom Head P-T Curve (T02490)

8.1.9 CM-7, Event Investigation Report 3-90-032. Record idle Recirc Loop Temperature(s)

8.1.10 CM-8, LER-3-90-009 and REEIF 3-90-033. Improper Recirc Pump Start. Record both loops, even if not operating (T00763)

8.1.11 CM-9, Letter to NRC from G. A. Hunger, Jr. dated Sept. 29, 1994 transmitting TSCR 93-16 (T03741, A0902903 E95)

8.1.12 CM-10, Letter to NRC from G. A. Hunger, Jr. dated Sept. 29, 1994 transmitting TSCR 93-16 (T03742, T03743, A0902903 E96)

8.1.13 CM-11, Ltr to NRC, Dated 5/16/83 Shift Management to sign off each completed data sheet (T03148)

8.2 Interfacing

8.2.1 GP-2, Normal Plant Startup

8.2.2 GP-3, Normal Plant Shutdown

8.2.3 GP-12, Core Cooling Procedure

8.2.4 T-101, RPV Control

8.2.5 T-102, Primary Containment Control

8.2.6 T-103, Secondary Containment Control

8.0 REFERENCES (Continued)

8.2.7 T-104, Radioactive Release

8.2.8 ST-O-080-940-2, RPV Thermal Cycles

8.2.9 ST-O-080-675-2, Reactor Pressure Vessel (ASME Class I) Leakage Pressure Test

8.2.10 ST-O-080-680-2, Reactor Pressure Vessel (Class I) Hydrostatic Pressure Test

8.3 Developmental

8.3.1 IE Circular 81-11

8.3.2 PORC Minutes BWR 83-046

8.3.3 LER 3-90-003, Bottom Head Drain flow problems. Need for PORC positions.

8.3.4 Licensee Event Report 2-92-94, Rx Pressure Readings Were Not Taken During S/D (T02429). Consistency between procedure requirements and data sheet.

8.3.5 GE SIL 251, BWR Vessel Bottom Head Drain Temperature

8.3.6 GE NEDO-10029

8.3.7 GE SIL 430, Reactor Pressure Vessel Temperature Monitoring

8.3.8 GE SIL 357, Control of Reactor Vessel Temperature/Pressure During Shutdown

8.3.9 PORC Meeting #93-022, A/R A0935071-08 & 09

8.3.10 M-1-S-50 Shts 1 and 2, Electrical Schematic Diagram RV Temperature Monitor

8.3.11 This procedure supersedes ST 9.12, ST-O-02B-500-2

9.0 TECH SPEC LIMITING CONDITIONS FOR OPERATION (LCOs)

Section 3.4.9

10.0 PARTICIPANTS RECORD

Printed Name	Initials

TABLE 1

REACTOR COOLANT SATURATION TEMPERATURES

TEMP °F	PSIG	TEMP °F	PSIG	TEMP °F	PSIG
212	0.0	360	138.314	476	530.414
220	2.49	364	146.207	480	551.454
232	6.871	368	154.417	484	573.114
240	10.272	372	162.952	488	595.404
252	16.187	376	171.821	492	618.334
260	20.731	380	181.033	496	641.914
268	25.804	384	190.598	500	666.164
272	28.553	388	200.524	504	691.084
276	31.451	392	210.82	508	716.704
280	34.504	396	221.497	512	743.024
284	37.718	400	232.563	516	770.064
288	41.099	404	244.029	520	797.834
292	44.654	408	255.904	524	826.344
296	48.388	412	268.198	528	855.614
300	52.309	416	280.921	532	885.644
304	56.423	420	294.084	536	916.474
308	60.737	424	307.695	540	948.094
312	65.257	428	321.767	544	980.524
316	69.992	432	336.304	548	1013.794
320	74.947	436	351.334	552	1047.894
324	80.130	440	366.844	556	1082.854
328	85.549	444	382.864	560	1118.684
332	91.211	448	399.394	564	1155.404
336	97.124	452	416.444	568	1193.024
340	103.296	456	434.034	-----	-----
344	109.734	460	452.174	-----	-----
348	116.446	464	470.864	-----	-----
352	123.442	468	490.134	-----	-----
356	130.728	472	509.974	-----	-----

TABLE 2

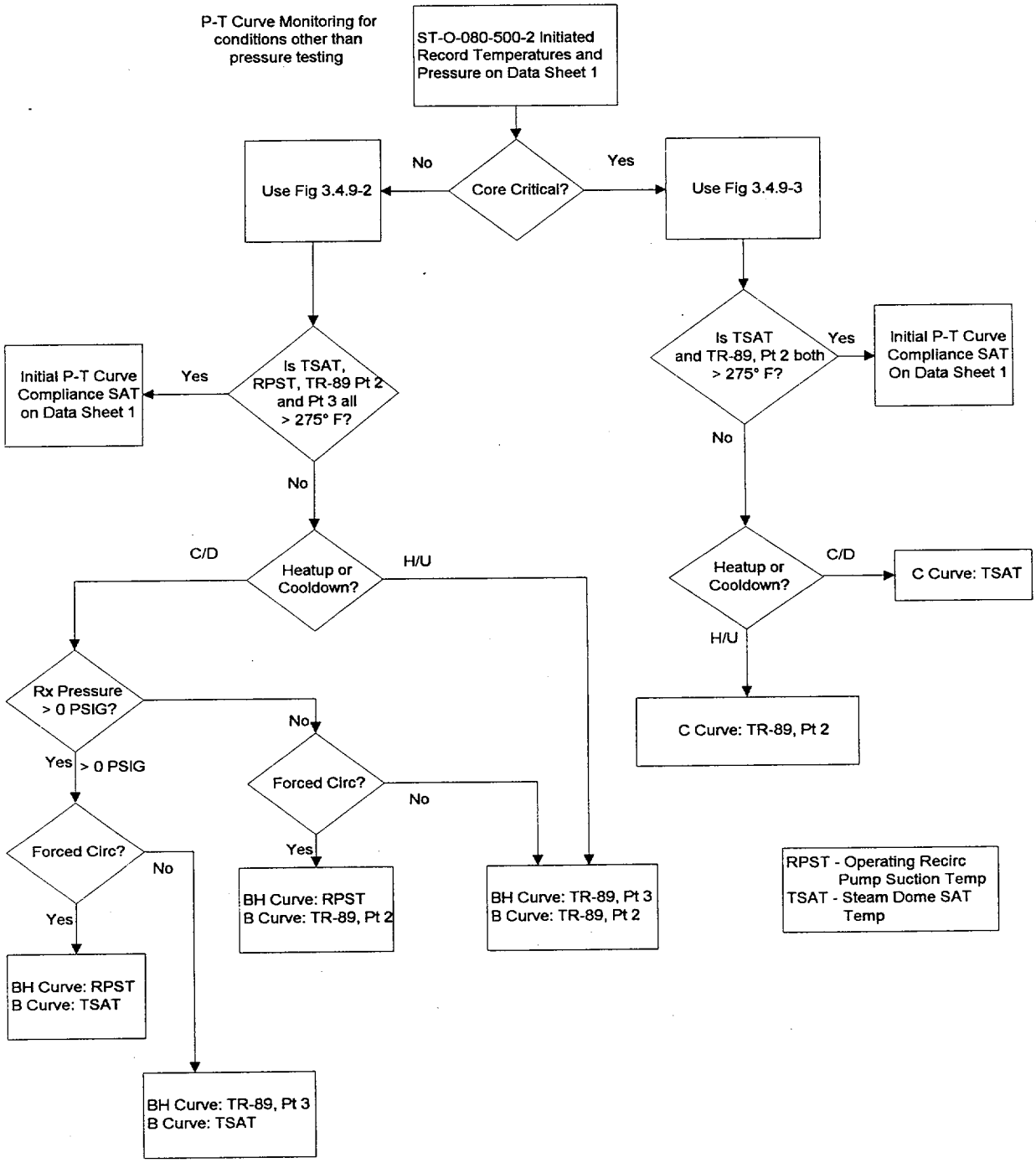

P-T Curve Monitoring for conditions other than pressure testing
ST-O-080-500-2 Initiated Record Temperatures and Pressure on Data Sheet 1
Core Critical?
No
Yes
Use Fig 3.4.9-2
Use Fig 3.4.9-3
Is TSAT, RPST, TR-89 Pt 2 and Pt 3 all > 275° F?
Yes
Initial P-T Curve Compliance SAT on Data Sheet 1
No
Is TSAT and TR-89, Pt 2 both > 275° F?
Yes
Initial P-T Curve Compliance SAT On Data Sheet 1
No
Heatup or Cooldown?
C/D
H/U
Heatup or Cooldown?
C/D
C Curve: TSAT
H/U
C Curve: TR-89, Pt 2
Rx Pressure > 0 PSIG?
Yes > 0 PSIG
No
Forced Circ?
Yes
No
BH Curve: RPST
B Curve: TR-89, Pt 2
BH Curve: TR-89, Pt 3
B Curve: TR-89, Pt 2
Forced Circ?
Yes
No
BH Curve: RPST
B Curve: TSAT
BH Curve: TR-89, Pt 3
B Curve: TSAT
RPST - Operating Recirc Pump Suction Temp
TSAT - Steam Dome SAT Temp

TABLE 3

This table duplicates graphical information from Tech Spec **Figure 3.4.9-1 CM-6**

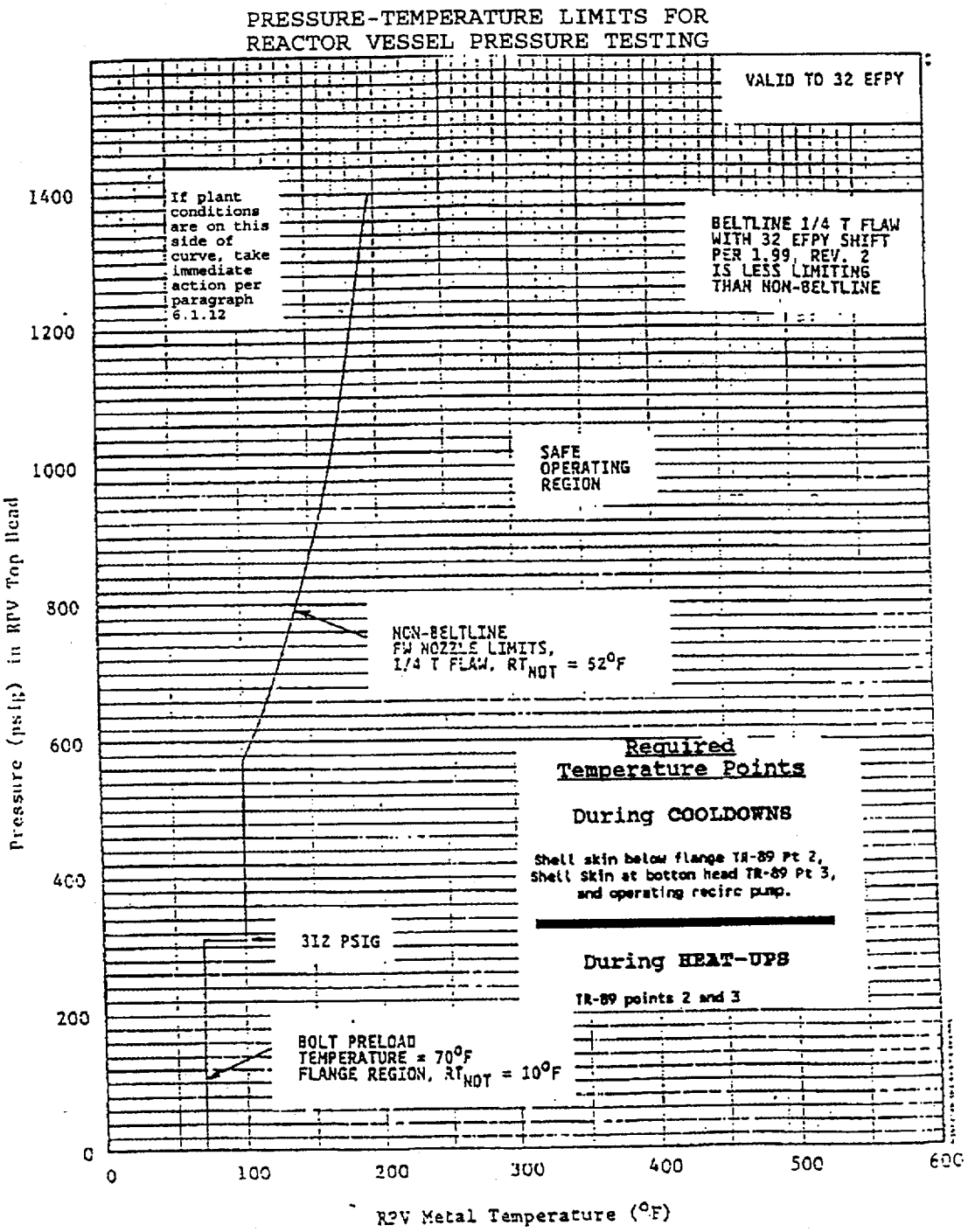


TABLE 4

This table duplicates graphical information from Tech Spec **Figure 3.4.9-2 CM-6**

PRESSURE-TEMPERATURE LIMITS FOR
NON-NUCLEAR HEATUP OR COOLDOWN (Core NOT Critical)

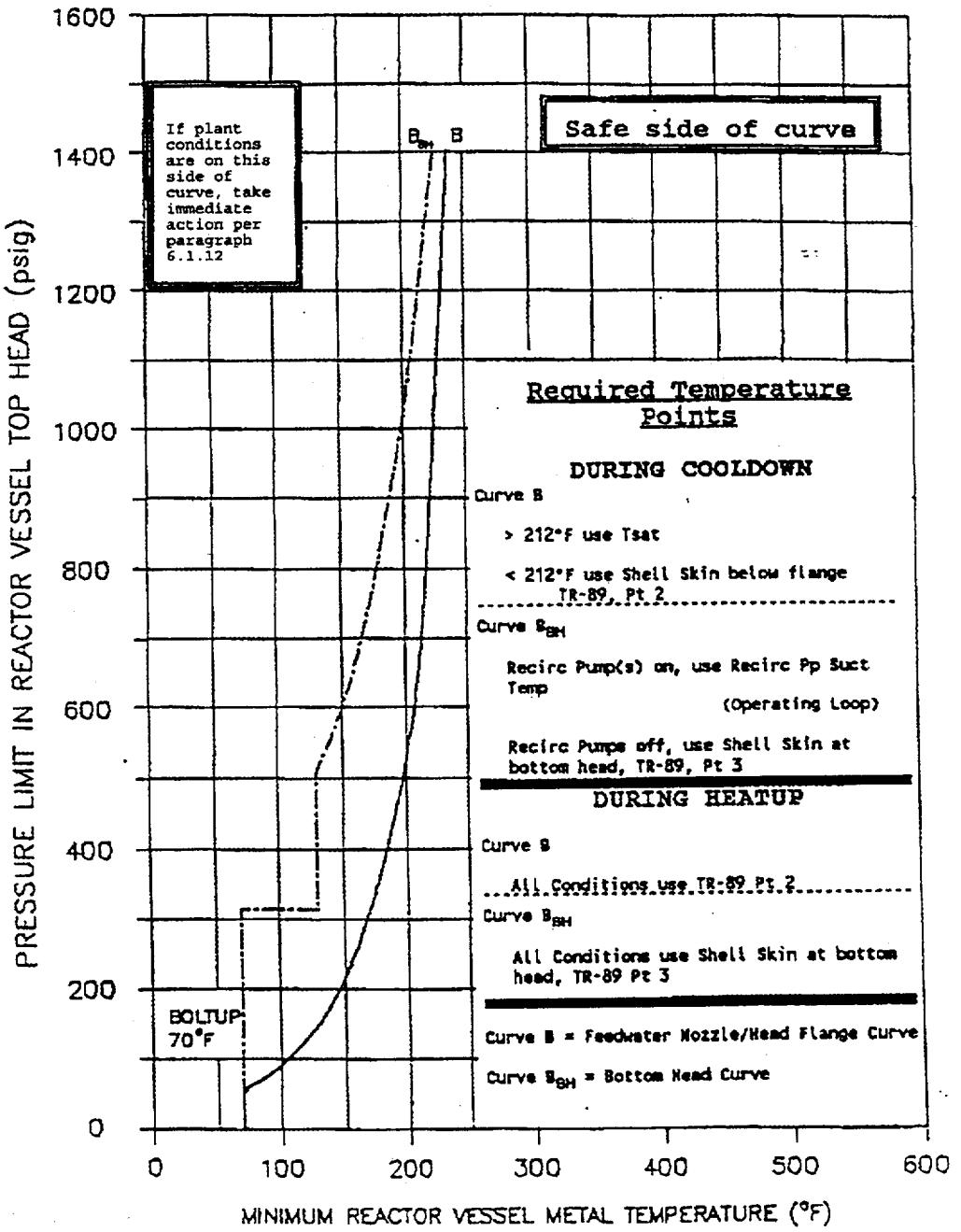


TABLE 5

This table duplicates graphical information from Tech Spec **Figure 3.4.9-3 CM-6**

PRESSURE-TEMPERATURE LIMITS FOR
NUCLEAR HEATUP OR COOLDOWN (Core Critical)

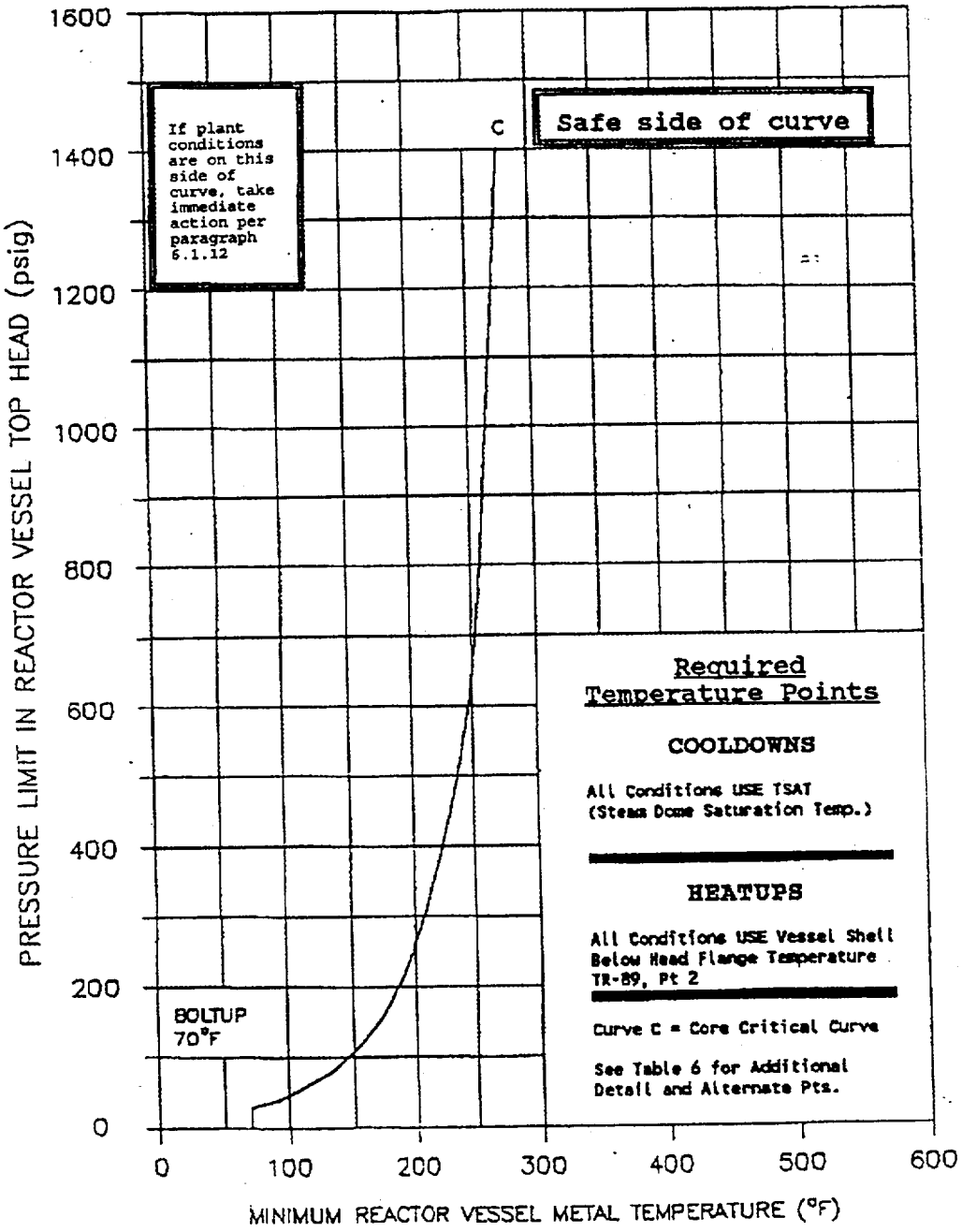


TABLE 6

ALTERNATE TEMPERATURE POINTS FOR P/T CURVE COMPLIANCE

Reactor Vessel Conditions	Non-Nuclear Heatups/Cooldowns (Core NOT Critical) Tech. Spec. Figure 3.4.9-2				Nuclear Heatups/Cooldowns (Core Critical) Tech. Spec. Figure 3.4.9-3	
	Cooldowns		Heatups			
	Bottom Head Drain Curve (B_{BH})	F/W Curve (B)	Bottom Head Drain Curve (B_{BH})	F/W Curve (B)	Cooldowns	Heatups
Vessel Temp: > 212 °F	1) BHD only if high flow confirmed and insulation ok. 2) Recirc Pump Suction Temp (operating loop) 3) Bottom head shell temperatures pt 3,4 TR89	1) Tsat, Steam Dome Saturation Temperature 2) Vessel Shell Below Head Flange Temp TR89, Pt 2	1) Bottom head shell temps Pt 3 or 4 2) Recirc Pump Suction Temp (Operating Loop)	1) TR-89, Point 2 Vessel Shell Below Head Flange Temp 2) Tsat, Steam Dome Saturation Temperature	1) Tsat, Steam Dome Saturation Temperature 2) Recirc Pump Suction Temp (Operating Loop)	1) Vessel Shell Below Head Flange Temp TR-89, Point 2 2) Vessel Bottom Head Metal Temp. TR-89, Point 3 (Note 2)
Vessel Temp: ≤ 212 °F	1) Recirc Pump Suction Temp (operating loop) 2) TR-89, Point 3 Vessel Bottom Head Metal Temp (Note 1, 2)	1) TR-89, Point 2 Vessel Shell Below Head Flange Temp	1) Bottom head shell temp Pts 3 or 4 2) Recirc Pump Suction Temp (Operating Loop)	1) TR-89, Point 2 Vessel Shell Below Head Flange Temp	Plant Condition N/A	1) TR-89, Point 2 Vessel Shell Below Head Flange Temp 2) TR-89, Point 3 Vessel Bottom Head Metal Temp. (Note 2)

2

Page ___ of ___

DATA SHEET 1

REACTOR TEMPERATURE AND PRESSURE DATA TO ASSURE COMPLIANCE WITH 100°F/HR AND P-T CURVE COMPLIANCE

NOT FOR PRESSURE TEST CONDITIONS

** RECORD ALL temperatures WHEN this procedure is in use except as noted.

Date	Time	3 Vessel Drain Pipe	4,5 Vessel Metal Temperatures		6 P-T Curve Compliance All temperatures in shaded areas are on safe side of Tech Spec Fig. 3.4.9-2 or 3.4.9-3 NOTE 1	7 Reactor Pressure PR-2-06-096 or PR-2-06-097 or SPDS0000	8 Steam Dome Sat Temp (TSAT) Table 1 or SPDS 0528 N/A if zero pressure, < 212 °F, or RPV Head removed	9,10 Recirc Pump Suction Temp TR-2-02-165 Circle operating pump(s) CM-7 CM-8 Recirc Pp Suct Temp NOT valid WHEN Pp is OOS		11 Max ΔF/15 minutes for Req'd Valid Temp Point(s) Note 2	12 IF ΔF/15 minutes >20 °F, INFORM SSV Note 2	13 ≤ 100 °F/hr Compliance for Req'd VALID Temp. Points Note 2	Operating RHR Ht Exch Inlet Temp TR-2-10-131 Pt 4, 10, 16 or 22 (Step 6.1.5) N/A when 1 or 2 Recirc Pumps ON. Note 2	All Temperature points less than 212 °F except during Heatup, Cooldown, or HOT STANDBY Note 2
		TR-2-02-3-089			(Step 6.1.12) SAT UNSAT			'A' Loop (Red Pen) or H672	'B' Loop (Black Pen) or H673	(Step 6.1.6) Note 1	(Step 6.1.7)	(Step 6.1.8) SAT UNSAT		(Step 6.1.13) SAT UNSAT
		Pt 9 or Comp Pt H664	Pt 3 Bottom Head	Pt 2 Shell Near Flange										
					*							*		
					*							*		
					*							*		
					*							*		
					*							*		
					*							*		

P/T Curve Compliance - Tech. Spec. 3.4.9

100 °F/hr Compliance - Tech. Spec. 3.4.9

NOTE 1: IF temperature point(s) are UNAVAILABLE or INVALID, THEN see Table 6 for alternates.

NOTE 2:

PLANT CONDITION	TEMPERATURE POINT(S)
> 212 °F (0 psig)	(Tsat) Steam Dome Saturation Temperature and Recirc Pump Suction Temp (Operating Loop(s) Only)
≤ 212 °F (0 psig)	Recirc Pump Suction Temp (Operating Loop(s) Only)
IF above points are UNAVAILABLE or INVALID, THEN use operating RHR Hx Inlet Temp. IF data sheets req'd by GP-12 or 12.1 are in effect and temperature points are unavailable, THEN the data may be marked N/A.	

CM-11_____ _____/_____
INITIAL SMGT DATE TIME

2

Page ___ of ___

DATA SHEET 2

REACTOR TEMPERATURE AND PRESSURE DATA TO ASSURE COMPLIANCE WITH 100°F/HR AND P-T CURVE COMPLIANCE

FOR USE ONLY DURING PRESSURE TESTING

** RECORD ALL temperatures WHEN this procedure is in use (exception-RHR Hx Inlet Temp, See Note 1) CM-7**.

Date	Time	Vessel Drain Pipe	Vessel Metal Temperatures		P-T Curve Compliance All temperatures in shaded areas are on safe side of Tech Spec Fig. 3.4.9-2 or 3.4.9-3 NOTE 1	Reactor Pressure PR-2-06-096 or PR-2-06-097 or SPDS0000		Recirc Pump Suction Temp TR-2-02-165 Circle operating pump(s) CM-7 CM-8 Recirc Pp Suct Temp NOT valid WHEN Pp is OOS		Max ΔF/15 minutes for Req'd Valid Temp Point(s)	IF ΔF/15 minutes >20 °F, INFORM SSV	≤ 100 °F/hr Compliance for Req'd VALID Temp. Points	Operating RHR Ht Exch Inlet Temp TR-2-10-131 Pt 4, 10, 16 or 22 (Step 6.1.5) N/A when 1 or 2 Recirc Pumps ON.
		TR-2-02-3-089											
		Pt 9 or Comp Pt H664	Pt 3 Bottom Head	Pt 2 Shell Near Flange	(Step 6.1.12) SAT UNSAT			'A' Loop (Red Pen) or H672	'B' Loop (Black Pen) or H673	(Step 6.1.6) Note 1	(Step 6.1.7)	(Step 6.1.8) SAT UNSAT	
					*							*	
					*							*	
					*							*	
					*							*	
					*							*	
					*							*	

P/T Curve Compliance - Tech. Spec. 3.4.9

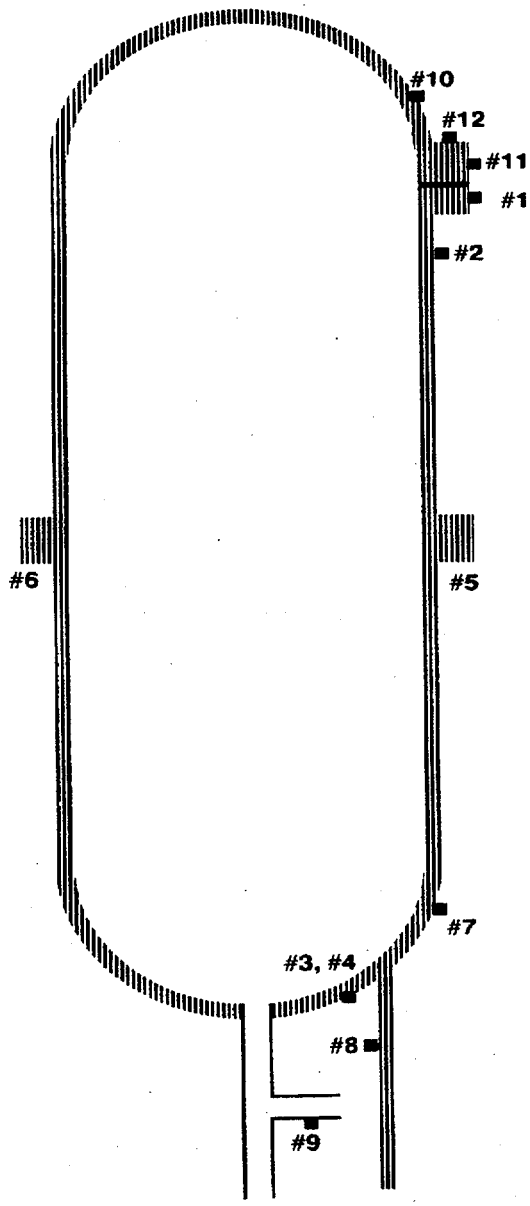
100 °F/hr Compliance - Tech. Spec. 3.4.9

NOTE 1: IF temperature point(s) are UNAVAILABLE or INVALID, THEN see Table 6 for alternates.

CM-11 _____ _____/_____

INITIAL SMGT DATE TIME

FIGURE 1
RPV SKIN TEMPERATURE



TR-2-02-3-089

PT #1 VESSEL FLANGE 207'10" 15°
PT #2 VESSEL STEAM 205'2" 15°
PT #3 BELOW WATER LEVEL 152'5" 15°
PT #4 BELOW WATER LEVEL 152'5" 130°
PT #5 FEEDWATER NOZZLE 189'9.5"210°
PT #6 FEEDWATER NOZZLE 189'9.5" 210°
PT #7 VESSEL ABOVE SKIRT JOINT 153'8" 15°
PT #8 VESSEL SKIRT NEAR BOTTOM JUNCTION 152'1" 15°
PT #9 VESSEL BOTTOM DRAIN
PT #10 VESSEL HEAD ADJACANT TO FLANGE 135°
PT #11 VESSEL HEAD FLANGE 135°
PT #12 VESSEL STUD 270°

Reference: M-1-S-50, Shts 1, 2

EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2050420101 / PLOR-305CA K/A: 203000A4.04
URO: 3.6 SRO: 3.6

TASK DESCRIPTION: High Pressure Service Water System Startup (Alternate Path - High Pump Motor Temperature

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

None

C. REFERENCES

SO 32.1.A-2, Rev. 11, "High Pressure Service Water System Startup and Normal Operations"

D. TASK STANDARD

1. Satisfactory task completion is indicated when the "A" HPSW Pump has been started and then manually tripped due to high motor bearing temperature.

2. Estimated time to complete: 12 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform necessary steps to start the "A" HPSW Pump using appropriate procedures. I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. High Pressure Service Water System is lined up per COL 32.1.A-2.

2. The HPSW Radiation Monitoring System is in operation per SO 63.H.1.A-2.

3. All Diesel Generators are shutdown.

4. Outside air temperature is 45°F.

G. INITIATING CUE

The Control Room Supervisor directs you to place the "A" HPSW Pump in service through the "A" RHR Heat Exchanger in accordance with SO 32.1.A-2, "High Pressure Service Water System Startup and Normal Operations ".

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
1	Obtain a copy of procedure SO 32.1.A-2.	P	A copy of procedure SO 32.1.A-2 is obtained.
2	Direct an Equipment Operator to verify oil level in upper and lower sight glasses on the "A" HPSW Pump is at STANDSTILL. (Cue: Equipment Operator reports that oil level at STANDSTILL.)	P	Equipment Operator is contacted to verify that oil level in the upper and lower sight glasses on the "A" HPSW Pump is at STANDSTILL.
3	Direct an Equipment Operator to verify HPSW and ESW Pump Room fans are aligned. (Cue: Equipment Operator reports that 2BV060 is in "AUTO" and 2AV060 is in "AUTO STBY" and 2AV083 and 2BV083 are in "AUTO".)	P	Equipment Operator is contacted to verify HPSW and ESW pump room fan 2BV060 is in "AUTO", 2AV060 is in "AUTO STBY", 2AV083 is in "AUTO" and 2BV083 is in "AUTO" on panel 20C139.
*4	Open MO-2-10-89A, "HPSW Hx Out". (Cue: Acknowledge control switch operation.)	P	MO-2-10-89A control switch is momentarily placed in the OPEN position at panel 20C003-04.
5	Verify MO-2-10-89A "HPSW Hx Out" is open. (Cue: MO-89A red light is on, green light is out, annunciator E-4 on alarm panel 223 is alarming.)	P	MO-2-10-89A red light is verified ON at panel 20C003-04.
6	Acknowledge the "A RHR HEAT EXCHANGER TUBE TO SHELL LOW PRESS" annunciator. (Cue: Annunciator 223 E-4 is lit solid.)	P	The annunciator "ACKNOWLEDGE" pushbutton is depressed on panel 20C003-04.
*7	Start the "A" HPSW Pump. (Cue: Acknowledge control switch operation.)	P	"A" HPSW Pump control switch is momentarily placed in the START position at panel 20C003-04.

STEP NO	STEP	ACT	STANDARD
8	Verify proper start of the "A" HPSW Pump. (Cue: "A" HPSW Pump red light is on, green light is off, 10A-A2A indicates 120 amps, PI-2330A indicates 300 psig and DPI-2-10-130A indicates 100 psid.)	P	Pump red light ON, amps stable, discharge pressure 260 to 280 psig verified after starting current decays at panel 20C003-04.
9	Verify greater than 20 psid across the "A" RHR heat exchanger on DPI-2-10-130A. (Cue: DPI-2-10-130A indicates 100 psid.)	P	DP across the "A" RHR Hx is verified to be greater than 20 psid on DPI-2-10-130A at panel 20C003-04.
10	Verify "RHR HEAT EXCHANGER TUBE TO SHELL LOW PRESS" annunciator is clear. (Cue: Annunciator 223 E-4 not lit.)	P	"RHR HEAT EXCHANGER TUBE TO SHELL LOW PRESS" annunciator is verified clear on alarm panel 223 E-4.
11	Monitor "A" HPSW motor bearing temperature on computer points W058 - W060. (Cue: W058 indicates 220°F, W059 indicates 205°F, W060 indicates 210°F.)	P	"A" HPSW Pump motor bearing temperature is monitored on computer points W058 - W060.
12	Recognize bearing temperatures indicate a trend above 195°F. (Cue: Computer point W058, W059, and W060 temperatures are rising.)	P	High motor bearing temperature condition is recognized.
*13	Trip the "A" HPSW Pump. (Cue: Acknowledge control switch operation.)	P	"A" HPSW Pump control switch is momentarily placed in the STOP position at panel 20C003-04.
14	Verify the "A" HPSW Pump is secured. (Cue: "A" HPSW green light is on, red light is off, 10A-A2A indicates 0 amps, PI-2330A indicates 0 psig, and DPI-2-10-130A indicates 0 psid.)	P	Pump green light ON is verified at panel 20C003-04.

STEP NO	STEP	ACT	STANDARD
15	CLOSE MO-2-10-89A "HPSW Hx Out" (Cue: Acknowledge control switch operation.)	P	MO-2-10-89A control switch is momentarily placed in CLOSE position at Panel 20C003-04.
16	Verify MO-2-10-89A "HPSW Hx Out" is closed (cue: MO89A Green light is on, red light is out)	P	MO-2-10-89A Green light is verified ON at Panel 20C003-04.
17	Inform Control Room Supervisor of high temperature condition on the "A" HPSW Pump motor and that the pump has been tripped. (Cue: Control Room Supervisor acknowledges report.)	P	High temperature condition on "A" HPSW Pump motor and trip of pump reported to CRS.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When the "A" High Pressure Service Water Pump has been started and then manually tripped due to high motor bearing temperature, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. High Pressure Service Water System is lined up per COL 32.1.A-2.

2. The HPSW Radiation Monitoring System is in operation per SO 63.H.1.A-2.

3. All Diesel Generators are shutdown.

4. Outside air temperature is 45°F.

INITIATING CUE

The Control Room Supervisor directs you to place the "A" HPSW Pump in service through the "A" RHR Heat Exchanger in accordance with SO 32.1.A-2, "High Pressure Service Water System Startup and Normal Operations ".

PECO Energy Company
Peach Bottom Unit 2

SO 32.1.A-2 HIGH PRESSURE SERVICE WATER SYSTEM STARTUP AND NORMAL OPERATIONS

1.0 PURPOSE

This procedure provides the instructions necessary to place the HPSW pumps in service.

2.0 PREREQUISITES

2.1 4KV power available to the HPSW System in accordance with SO 54.

2.2 480 VAC MCC power available to the HPSW System in accordance with SO 56E.

3.0 PRECAUTIONS

3.1 WHEN operating equipment, IF it does NOT perform as expected, THEN place the equipment in a safe condition AND inform Shift Management.

3.2 Always maintain HPSW at a higher pressure than RHR pump discharge pressure so that any leakage will be in-leakage to RHR from HPSW.

3.3 Throttling MO-2-10-089(A or D), "HPSW Hx Outlet" with HPSW inservice in the associated loop, will result in damage to the valves due to high vibration.

3.4 HPSW pump motor bearing damage will occur at 221 °F.

3.5 A Diesel Generator which will be supplying a HPSW pump must be loaded to less than or equal to 2300 KW prior to starting the associated HPSW pump.

4.0 PERFORMANCE STEPS

NOTE

Communications shall be available between the Control Room AND Personnel performing procedures elsewhere in the plant to coordinate the operation of equipment that affects Control Room instrumentation OR alarms.

4.1 Perform COL 32.1.A-2, "High Pressure Service Water System", as directed by Shift Management.

4.2 IF the High Pressure Service Water Radiation Monitoring System CANNOT be placed in service in accordance with SO 63H.1.A-2, High Pressure Service Water Radiation Monitoring System Startup and Normal Operations, THEN notify Chemistry that a grab sample should be taken during the performance of this procedure.

4.3 Verify oil level in the upper AND lower sight glasses on the HPSW pumps are at "STANDSTILL" on all the HPSW pumps to be started.

> NOTE
>
> During the performance of the following step the "FAN 2A-BV60(83) STANDBY FAN" on Panel 20C139 A-1(A-2) annunciator will NOT alarm in this mode of operation.

4.4 IF outside air temperature is greater than 75 °F AND it is expected to run more than two HPSW pumps simultaneously, THEN place the area ventilation fans in "RUN" on Panel 20C139. Proceed to step 4.6 of this procedure.

- HPSW and ESW Pump Room Supply Fan 2AV060
- HPSW and ESW Pump Room Supply Fan 2BV060
- HPSW and ESW Pump Room Exhaust Fan 2AV083
- HPSW and ESW Pump Room Exhaust Fan 2BV083

4.5 Verify Area Ventilation Fans are aligned.

4.5.1 HPSW + ESW Pump Room Supply Fan 2BV060 should be in "AUTO" AND 2AV060 should be in "AUTO STBY" on Panel 20C139.

4.5.2 HPSW + ESW Pump Room Exhaust Fans 2AV083 AND 2BV083 should be in "AUTO" on Panel 20C139.

4.6 Periodically monitor HPSW motor bearing temperature during pump operations on computer points W058 through W069. The subject pump should be shutdown if any bearing temperature indicates a trend above 195 °F.

4.7 Choose the section(s) which lineup HPSW as desired.

- Section 4.8 to operate HPSW in the normal lineup,.
- Section 4.9 to operate HPSW cross tied with 2A OR 2C HPSW pump supplying the B loop of HPSW, use
- Section 4.10 to operate HPSW cross tied with 2B OR 2D HPSW pump supplying the A loop of HPSW, use.

4.8 Operating HPSW in the normal lineup

NOTES

1. A AND D heat exchangers are preferred because there are extra orifices installed downstream of MO-2-10-089A AND D.

2. The following step will cause the associated "RHR HEAT EXCHANGER TUBE TO SHELL LOW PRESS" alarm.

****
* CAUTIONS *
*
* 1. Do NOT throttle MO-2-10-089A OR D, high vibration *
* AND damage will result. *
*
* 2. HPSW pump motor bearing damage will occur at 221°F. *
****

4.8.1 Periodically monitor HPSW motor bearing temperature during pump operations on computer points W058 through W069. The subject pump should be shutdown if any bearing temperature indicates a trend above 195 °F.

4.8.2 Open MO-2-10-089 (A OR C) "HPSW Hx Out" if starting A OR C HPSW pumps. Open MO-2-10-089(B OR D) if starting B OR D HPSW pumps.

4.8.3 Prior to starting a HPSW pump that is to be supplied by a diesel generator, ensure the associated diesel is NOT loaded with more than 2,300 KW OR remove loads as necessary to get below 2,300 KW. **CM-1**

4.8.4 Start the desired HPSW pump.

4.8.5 IF B OR C heat exchangers are being used, throttle MO-2-10-089B OR C to establish 3300 to 5300 gpm flow on FI-2-10-132A OR B on Panel 20C003.

4.8.6 Verify greater than 20 psid across the inservice RHR heat exchanger on DPI-2-10-130A(C,B,D) AND "RHR HEAT EXCHANGER TUBE TO SHELL LOW PRESS" alarm is clear.

4.8.7 IF only one HPSW pump AND heat exchanger is to be placed in service, THEN exit this procedure AND perform SO 32.8.A-2, "High Pressure Service Water System Routine Inspection".

4.8.8 Prior to starting a second HPSW pump in the loop in service, verify HPSW pump is NOT rotating backward.

****
* CAUTIONS *
*
* 1. Starting a HPSW pump which is rotating backward can shear the pumps coupling. *
*
* 2. Throttling MO-2-10-089(A or D), "HPSW Hx Outlet" with HPSW inservice in the associated loop, will result in damage to the valves due to high vibration. *
****

4.8.9 Prior to starting a HPSW pump that is to be supplied by a diesel generator, ensure the associated diesel is NOT loaded with more than 2,300 KW OR remove loads as necessary to get below 2,300 KW. **CM-1**

4.8.10 Place a second HPSW pump in a loop in service by starting the selected pump.

4.7.10.1 IF "A" AND "C" HPSW pumps are running, THEN open OR verify open MO-2-10-089A AND C. MO-2-10-089C must be throttled to establish 6600 to 10600 gpm flow on FI-2-10-132A on Panel 20C003.

4.7.10.2 IF "B" AND "D" HPSW pumps are running, THEN open OR verify open MO-2-10-089B AND D. MO-2-10-089B must be throttled to establish 6600 to 10600 gpm flow on FI-2-10-132B on Panel 20C003.

4.8.11 Perform SO 32.8.A-2, "HPSW System Routine Inspection".

4.9 Operating HPSW cross tied with 2A OR 2C HPSW pump supplying the B loop of HPSW.

4.9.1 Inform Shift Management to review Tech Spec Section 3.7.1, "High Pressure Service Water System" AND enter the Tech Spec action for 1 HPSW Subsystem inoperable, due to loss of single failure protection while the cross tie valve, (MO-2-32-2344) is open.

4.9.2 Periodically monitor HPSW motor bearing temperature during pump operations on computer points W058 through W069. The subject pump should be shutdown if any bearing temperature indicates a trend above 195 °F.

NOTE

MO-2-32-2344(10-186) "A-B HPSW Loop Cross Tie" will NOT open with a high differential pressure across the valve.

4.9.3 Open MO-2-32-2344(10-186).

NOTE

The following step will cause the associated "RHR Heat Exchanger Tube to Shell Low Press" alarm.

4.9.4 Open MO-2-10-089B OR D for the heat exchanger to be placed in service. MO-2-10-089B must be throttled.

4.9.5 Prior to starting a HPSW pump that is to be supplied by a diesel generator, ensure the associated diesel is NOT loaded with more than 2,300 KW OR remove loads as necessary to get below 2,300 KW. **CM-1**

4.9.6 Start HPSW pump A OR C.

4.9.7 Verify greater than 20 psid across the inservice RHR heat exchanger on DPI-2-10-130B OR D AND "RHR HEAT EXCHANGER TUBE TO SHELL LOW PRESS" alarm is clear.

4.9.8 IF a second HPSW pump is required to be operated, THEN verify an adequate flow path will be available to protect the pump.

4.9.8.1 Start the second HPSW pump.

4.9.8.2 Verify HPSW flow is between 6600 gpm to 10600 gpm.

4.9.9 Perform SO 32.8.A-2, "HPSW System Routine Inspection".

4.10 Operating HPSW cross tied with 2B OR 2D HPSW pump supplying the A loop of HPSW.

4.10.1 Inform Shift Management to review Tech Spec Section 3.7.1, "High Pressure Service Water System" AND enter the Tech Spec action for 1 HPSW Subsystem inoperable, due to loss of single failure protection while the cross tie valve, (MO-2-32-2344) is open.

4.10.2 Periodically monitor HPSW motor bearing temperature during pump operations on computer points W058 through W069. The subject pump should be shutdown if any bearing temperature indicates a trend above 195 °F.

> NOTE
>
> MO-2-32-2344(10-186), "A-B HPSW Loop Cross Tie" will NOT open with a high differential pressure across the valve.

4.10.3 Open MO-2-32-2344(10-186).

> NOTE
>
> The following step will cause the associated "RHR HEAT EXCHANGER TUBE TO SHELL LOW PRESS" alarm.

4.10.4 Open MO-2-10-089A OR C for the heat exchanger to be placed in service. MO-2-10-089C must be throttled.

4.10.5 Prior to starting a HPSW pump that is to be supplied by a diesel generator, ensure the associated diesel is NOT loaded with more than 2,300 KW OR remove loads as necessary to get below 2,300 KW. **CM-1**

4.10.6 Start HPSW pump B OR D.

4.10.7 Verify greater than 20 psid across the inservice RHR heat exchanger on DPI-2-10-130A OR C AND "RHR HEAT EXCHANGER TUBE TO SHELL LOW PRESS" alarm is clear.

```
*****************************************************************
*                          CAUTION                              *
*                                                               *
*     Throttling MO-2-10-089(A or D), "HPSW Hx Outlet" with     *
*     HPSW inservice in the associated loop, will result in     *
*     damage to the valves due to high vibration.               *
*****************************************************************
```

4.10.8 IF a second HPSW pump is required to be operated, THEN verify an adequate flow path will be available to protect the pump.

4.10.8.1 Start the second HPSW pump.

4.10.8.2 Verify HPSW flow is between 6600 gpm to 10600 gpm.

4.10.9 Perform SO 32.8.A-2, "HPSW System Routine Inspection".

5.0 CONTROL STATIONS

5.1 20C003, "U/2 CS, RHR Isol & Blowdown Ctrl Board"

5.2 20C139, "HPSW and ESW Pump Room Ventilation Panel"

6.0 REFERENCES

6.1 P&ID M-315

6.2 P&ID M-361

6.3 P&ID M-330

6.4 M-1-S-65

6.5 Safety Evaluation for Mod 2123A (Voltage Study)

6.6 A/R A0815931 Evaluation 01, Acceptable HPSW Pump Operating Range and Vendor Recommendations.

6.7 CM-1, Diesel Generator Load Profiles and System Voltage Regulation Study Safety Evaluation, Sept. 1989.

7.0 TECHNICAL SPECIFICATION

7.1 Section 3.7.1

8.0 INTERFACING PROCEDURES

8.1 SO 32.7.A-2, "Placing Unit 2 HPSW Loops In Service Using Unit 3 HPSW Pumps"

8.2 SO 32.8.A-2, "High Pressure Service Water System Routine Inspection"

8.3 COL 32.1.A-2, "High Pressure Service Water System"

8.4 SO 63H.1.A-2, "High Pressure Service Water Radiation Monitoring System Startup and Normal Operations"

EXLEON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2000330501 / PLOR-319CA K/A: 295006G10
RO: 4.1 SRO: 4.2

TASK DESCRIPTION: Plant Reactor Operator Response to Reactor Scram (Alternate Path – SDV Fails to Isolate)

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

Synchronizing Switch Key

C. REFERENCES

1. RRC 53.1-2, Rev. 0, "Unit 2 House Loads Transfer During a Plant Event"

2. RRC 94.2-2, Rev. 0, "Plant Reactor Operator Scram Actions"

3. RRC 94.2-2:1, Rev. 0, "PRO Scram Reports"

4. RRC 16.1-2, Rev. 0, "Bypass & Restore Instrument N_2 Supply to Drywell"

D. TASK STANDARD

1. Satisfactory task completion is indicated when the trainee has performed all steps required by RRC 53.1-2, "Unit 2 House Loads Transfer During a Plant Event", RRC 94.2-2, "Plant Reactor Operator Scram Actions", and RRC 94.2-2:1, "PRO Scram Reports".

2. Estimated time to complete: 5 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform Plant Reactor Operator scram actions in accordance with the Operations Manual. I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

The plant is in a full power, steady state condition.

G. INITIATING CUE

When reactor scram occurs, the Control Room Supervisor directs you to perform the Plant Reactor Operator scram actions in accordance with the Rapid Response Procedures.

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
*1	Insert handle and place 225-0105, 11 BKR Sync Switch in ON. (Cue: Synchroscope is at approximately 12 o'clock, Sync Lights are off and Incoming and Running Voltmeters indicate approximately 120 VAC.)	P	Sync Switch Handle is inserted into control switch 225-0105 and switch is placed in the ON position at panel 20C009.
2	Verify phase angle difference less than 12 degrees. (Cue: Synchroscope reading is approximately 12 o'clock and Sync Lights are off.)	P	Phase angle difference is verified to be less than 12 degrees on the Synchroscope at panel 20C009.
*3	Close 252-0105, 11 BKR. (Cue: Acknowledge control switch operation.)	P	11 BKR control switch is momentarily placed in the "CLOSE" position at panel 20C009.
4	Verify 252-0105, 11 BKR is closed. (Cue: 252-0105 red light is on, green light is off.)	P	11 BKR red light is verified ON and #1 13.2 KV Aux Bus from SU FDRS ammeter rises on panel 20C009.
5	Verify 252-0101, 1 BKR is tripped. (Cue: 252-0101 green light is on, red light is off.)	P	1 BKR green light is verified ON at panel 20C009.
6	Place 225-0105, 11 BKR Sync switch in OFF and remove handle. (Cue: Incoming and Running Voltmeters indicate 0 VAC.)	P	225-0105 is placed in the "OFF" position and Sync Switch Handle is removed at panel 20C009.
*7	Insert handle and place 225-0202, 22 BKR Sync Switch in ON. (Cue: Synchroscope is at approximately 12 o'clock, Sync Lights are off and Incoming and Running Voltmeters at approximately 120 VAC.)	P	Sync Switch Handle is inserted into Control Switch 225-0202 and switch is placed in the "ON" position at panel 20C009.
8	Verify phase angle difference less than 12 degrees. (Cue: Synchroscope reading is approximately 12 o'clock and Sync Lights are off.)	P	Phase angle difference is verified to be less than 12 degrees on the Synchroscope at panel 20C009.

STEP NO	STEP	ACT	STANDARD
*9	Close 252-0202, 22 BKR. (Cue: Acknowledge control switch operation.)	P	22 BKR Control Switch is momentarily placed in the "CLOSE" position at panel 20C009.
10	Verify 252-0202, 22 BKR is closed. (Cue: 252-0202 red light is on, green light is off.)	P	22 BKR red light is verified ON and #2 13.2 KV Aux Bus from SU FDRS ammeter rises on panel 20C009.
11	Verify 252-0214, 2 BKR tripped. (Cue: 252-0214 green light is on, red light is off.)	P	2 BKR green light is verified ON at panel 20C009.
12	Place 225-0202, 22 BKR Sync Switch in OFF and remove handle. (Cue: Incoming and Running Voltmeters indicate 0 VAC.)	P	225-0202 is placed in the "OFF" position and Sync Switch Handle is removed at panel 20C009.
13	Green flag 252-0101, 1 BKR control switch. (Cue: Acknowledge control switch operation, "1 BKR TRIP" annunciator clears.)	P	1 BKR control switch is momentarily placed in the "TRIP" position at panel 20C009.
14	Green flag 252-0214, 2 BKR Control Switch. (Cue: Acknowledge Control switch operation, #2 BKR TRIP annunciator clears.)	P	2 BKR Control Switch is momentarily placed in the "TRIP" position at panel 20C009.
15	Remove "21 BKR 252-0113" control switch from "Pull to Lock" position and place it in "NORMAL". (Cue: 225-0113 control switch shows a green flag.)	P	21 BKR control switch is removed from "PTL" and placed in the "NORMAL" position at panel 20C009.
16	Remove "12 BKR 252-0210" control switch from "Pull to Lock" and place it in "NORMAL". (Cue: 252-0210 control switch shows a green flag.)	P	12 BKR Control Switch is removed from "PTL" and placed in the "NORMAL" position at panel 20C009.

STEP NO	STEP	ACT	STANDARD
*17	Manually trip the Main Turbine when load drops to approximately 50 MWe. (Cue: Tripped light is on, Reset light is out; Master Trip Solenoid Test Lights A and B are out.)	P	Main Turbine Trip pushbutton is momentarily DEPRESSED at panel 20C008A after generator load drops below 200 MWe on JR-2157 on panel 20C008B and before the Main Generator locks out on reverse power.
18	Verify Main Generator lockout. (Cue: Main Generator output breakers and Alt Exc Fld Bkr green lights are on, red lights are off. Annunciators 220 B-1 and 220 B-2 are lit.)	P	Main Generator output breakers and Alt Exc Fld Bkr green lights are verified ON at Panel 00C009.
19	Verify Group I, II, and III isolations and verify SBGT initiation as appropriate. (Cue: If Reactor level dropped to 1", then all Group II and III isolation valves' green lights are on, red lights are off. SBGT system is running correctly.)	P	PCIS Group II and III isolation status is verified at panel 20C003-01, SBGT system status is verified at panel 20C012.
*20	Verify scram discharge volume vents and drains are closed. (Cue: SDV vent and drain red valve position lights are lit, green valve position lights are NOT lit.)	P	Recognize that SDV vents and drains remain open as indicated on Panel 20C005A or 20C003-01.
*21	Manually close the inboard and outboard SDV vent and drain valves. (Cue: Acknowledge control switch operation for inboard and outboard SDV vents and drain valves.)	P	Control switch for AO-2-03-032A, 023B and 033 and control switch for AO-203-032B, 035B and 036 are rotated counterclockwise to the close position.
22	Verify scram discharge volume vent and drains are closed. (Cue: SDV vent and drain green valve position lights are lit, red valve position lights are NOT lit.)	P	SDV vents and drains are verified closed and indicated on panel 20C005A or 20C003-01.
23	Verify Hydrogen Water Chemistry is isolated. (Cue: FR-8629 flow is 0 scfm.)	P	Hydrogen flow is verified to be at 0 scfm on FR-8629 on panel 20C006A.

STEP NO	STEP	ACT	STANDARD
24	Verify Recirc pump speed has runback to 30%. (Cue: A and B Recirc MG Set generator speed is 30% on SPI-2-02-184-016A and B.)	P	A and B Recirc MG Set generator speed is verified to be 30% on SPI-2-02-184-016A and B on panel 20C004A.
25	Monitor Instrument Air header pressure and Drywell pressure. (Cue: Drywell pressure is .3 psig, instrument air header pressure is 105 psig.)	P	Instrument Air header pressure on PI-2425A(B) on panel 20C012 is verified to be greater than Drywell pressure on PR-2508 on Panel 20C003-03 or computer point M026.

** NOTE **

IF the examinee does NOT report scram actions, THEN inform the examinee that you (the CRS) are ready for his/her scram action report.

26	Report the following to the CRS: • House loads transferred. • Main Turbine is tripped. • Main Generator is locked out. • Group II and III isolations complete and SGTS is initiated. • SDV vent and drain valves did not initially close and had to be manually closed. • Hydrogen Water Chemistry is isolated. • Recirc pump speed is 30%. • Instrument Air header pressure is greater than Drywell pressure. (Cue: CRS is informed.)	P	CRS informed of that: • House loads transferred. • Main Turbine is tripped. • Main Generator is locked out. • Group II and III isolations complete with SGTS in service. • SDV vent and drain valves manually closed. • Hydrogen Water Chemistry is isolated. • Recirc pump speed is 30%. • Instrument Air header pressure is greater than Drywell pressure.

** NOTE **

IF requested by the examinee, THEN grant permission for the examinee to bypass and restore Drywell Instrument Nitrogen.

STEP NO	STEP	ACT	STANDARD
	*** NOTE ***		
It is procedurally permissible for a candidate to perform steps 33-35 prior to steps 27-30.			
*27	Place AO-2969A "Drywell Instrument N_2 Supply Valve" in "CLOSE". (Cue: Acknowledge control switch operation.)	P	AO-2969A control switch is placed in the "CLOSE" position at panel 20C003-03.
28	Verify AO-2969A, "Drywell Instrument N_2 Supply Valve is closed.	P	AO-2969A green light is verified on at panel 20C003-03.
*29	Place AO-2969B "Drywell Instrument N_2 Supply Valve" in "CLOSE". (Cue: Acknowledge control switch operation.)	P	AO-2969B control switch is placed in the "CLOSE" position at panel 20C003-03.
30	Verify AO-2969B, "Drywell Instrument N_2 Supply Valve is closed.	P	AO-2969B green light is verified on at panel 20C003-03.
*33	Place AO-2969A "Drywell Inst N_2 Bypass" Switch in "BYPASS". (Cue: Acknowledge Bypass switch operation.)	P	AO-2969A Bypass switch is placed in the "BYPASS" position at panel 20C005A.
*34	Place AO-2969B "Drywell Inst N_2 Bypass" switch in "BYPASS". (Cue: Acknowledge Bypass switch operation.)	P	AO-2969B Bypass switch is placed in the "BYPASS" position at panel 20C005A.
35	Acknowledge the "DRYWELL INST N_2 VALVES ISOLATION BYPASS" annunciator. (Cue: Annunciator 219 G-1 stops flashing and clears.)	P	The annunciator "ACKNOWLEDGE" pushbutton is depressed at panel 00C024.
*36	Open AO-2969A Drywell Instrument N_2 Supply valve. (Cue: Acknowledge control switch operation.)	P	AO-2969A control switch is placed in the "OPEN" position at panel 20C003-03.
37	Verify AO-2969A Drywell Instrument N_2 supply valve is open. (Cue: AO-2969A red light is ON, green light is OFF.	P	AO-2969A red light is verified ON at panel 20C003-03.

STEP NO	STEP	ACT	STANDARD
*38	Open AO-2969B "Drywell Instrument N_2 Supply" valve. (Cue: Acknowledge control switch operation.)	P	AO-2969B control switch is placed in the "OPEN" position at panel 20C003-03 panel.
39	Verify AO-2969B "Drywell Instrument N_2 Supply" valve is open. (Cue: AO-2969B red light is ON, green light is OFF.)	P	AO-2969B red light is verified ON at panel 20C003-03.
40	Report to the Control Room Supervisor the status of Drywell Instrument Nitrogen. (Cue: Control Room Supervisor acknowledges report.)	P	It is reported that Drywell Instrument Nitrogen is restored.
41	Notify Health Physics of changing plant conditions. (Cue: Health Physics acknowledges report.)	P	Health Physics is notified of the plant scram.
42	Inform Control Room Supervisor of task completion. (Cue: Control Room Supervisor acknowledges report.)	P	Task completion reported.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When all required steps required by RRC 53.1-2, "Unit 2 House Loads Transfer During a Plant Event", RRC 94.2-2, "Plant Reactor Operator Scram Actions", and RRC 94.2-2:1, "PRO Scram Reports" are complete, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

The plant is in a full power, steady state condition.

INITIATING CUE

When reactor scram occurs, the Control Room Supervisor directs you to perform the Plant Reactor Operator scram actions in accordance with the Rapid Response Procedures.

PECO Energy Company
Peach Bottom Unit 2

RRC 53.1-2 UNIT 2 HOUSE LOADS TRANSFER DURING A PLANT EVENT

ENTRY

This RRC provides instructions to transfer house loads during a Plant Event.

PERFORMANCE STEPS

1. INSERT AND place SYNC switch, in "ON" for the selected breaker. [___]
2. VERIFY phase angle difference is < 12 degrees on "Synchroscope". [___]
3. CLOSE the selected breaker. [___]
4. VERIFY the associated generator BKR is tripped. [___]
5. Place "BKR SYNC" switch in "OFF" AND remove. [___]
6. INSERT AND PLACE "BKR SYNC" switch in "ON". [___]
7. VERIFY phase angle difference is < 12 degrees on "Synchroscope". [___]
8. CLOSE selected BKR. [___]
9. VERIFY associated generator BKR is tripped. [___]
10. PLACE "BKR SYNC" switch in "OFF" AND remove. [___]
11. FLAG BKR control switches to correspond to actual position. [___]
12. REMOVE associated bus breakers from "PULL TO LOCK". [___]

AS CONDITIONS PERMIT, REFER TO THE APPROPRIATE SYSTEM OPERATING PROCEDURE.

REFERENCES

Note: When revising this RRC, all changes should coincide with changes made to these referenced procedures.

1. TRIP Procedures
2. SO 53.2.A-2, "Transferring Unit 2 Aux Loads from Unit Auxiliary Transformer to Startup Feed Buses"

PECO Energy Company
Peach Bottom Unit 2

RRC 94.2-2 PLANT REACTOR OPERATOR SCRAM ACTIONS

ENTRY

This RRC provides instructions for plant reactor operator scram actions during a Plant Event as directed by TRIP procedures.

PERFORMANCE STEPS

1. TRANSFER 13KV house loads. [___]
2. TRIP Main Turbine when Generator load drops to approximately 50 MWE. [___]
3. VERIFY Main Generator Lockout. [___]
4. VERIFY Group I, II, III Isolations and SGTS initiation, as applicable. [___]
5. VERIFY scram discharge volume vents and drains are closed. [___]
6. VERIFY Hydrogen Water Chemistry is isolated. [___]
7. VERIFY both Recirc Pumps speed have runback to 30%. [___]
8. MONITOR Instrument Air header pressure and Drywell pressure. [___]
9. WHEN the CRS is ready, THEN REPORT Scram actions. [___]
10. BYPASS AND RESTORE Instrument N_2 to the Drywell when directed by the CRS. [___]
11. REPORT to the CRS, that Drywell Instrument Nitrogen is restored. [___]
12. NOTIFY Health Physics of changing plant conditions. [___]

AS CONDITIONS PERMIT, REFER TO THE APPROPRIATE SYSTEM OPERATING PROCEDURE.

REFERENCES

Note: When revising this RRC, all changes should coincide with changes made to these referenced procedures.

1. TRIP Procedures

PRO SCRAM REPORTS

When the CRS is ready, report the following:

1. "House loads transferred"
2. "Main Turbine is tripped"
3. "Main Generator is locked out"

1. "Group I, II and III isolations are complete and SGTS is initiated"
2. "Scram Discharge Volume vents and drains are closed"
3. "Hydrogen Water Chemistry is isolated"

1. "Recirc pump speed is 30%"
2. "Instrument Air Header pressure is greater than Drywell pressure"

PECO Energy Company
Peach Bottom Unit 2

RRC 16.1-2 Bypass & Restore Instrument N_2 Supply to Drywell.

ENTRY

This RRC provides the instructions to bypass & restore Instrument N_2 Supply to Drywell during a Plant Event as directed by TRIP procedures.

PERFORMANCE STEPS

(The next 2 steps can be performed in either order).

1. PLACE control switch for AO 2969A AND AO 2969B to CLOSED. [___]
2. PLACE D/W Inst. N_2 bypass switches 16A-S100 AND 16A-S99 to BYPASS. [___]
3. VERIFY annunciator "DRYWELL INST. N_2 VALVES ISOLATION BYPASS", 219 (20C09L) G-1, alarms. [___]
4. PLACE the control switch for AO 2969A AND AO 2969B to OPEN. [___]

AS CONDITIONS PERMIT, REFER TO THE APPROPRIATE SYSTEM OPERATING PROCEDURE.

REFERENCES

Note: When revising this RRC, all changes should coincide with changes made to these referenced procedures.

1. TRIP Procedures
2. GP 8.E, "Primary Containment Isolation Bypass"

EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2640020101 / PLOR-001C K/A: 264000A4.04
URO: 3.7 SRO: 3.7

TASK DESCRIPTION: Diesel Generator Fast Start from the Control Room

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

None

C. REFERENCES

Procedure SO 52A.1.B Rev. 21, "Diesel Generator Operations"

D. TASK STANDARD

1. Satisfactory task completion is indicated when:

   a. Diesel Generator Frequency between 58.8 - 61.2 Hz

   b. Diesel Generator Volts 4.16 - 4.4 KV

   c. Diesel Generator is ready for Fast Loading

2. Estimated time to complete: 17 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform necessary steps to Fast Start the E-4 Diesel Generator using appropriate procedures. I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. E-4 Diesel Generator available for operation in accordance with SO 52A.1.A, "Diesel Generator Lineup for Automatic Start"

2. Equipment Operators are standing by in the E-4 D/G Room.

3. GP-23 "Diesel Generator Inoperable", has been reviewed.

G. INITIATING CUE

The Control Room Supervisor directs you to Fast Start the E-4 Diesel Generator in accordance with steps 4.3.1 through 4.3.12 of SO 52A.1.B, "Diesel Generator Operations".

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
1	Obtain a copy of procedure SO 52A.1.B.	P	A copy of procedure SO 52A.1.B is obtained.
2	Direct Equipment Operator to perform pre-start inspection for fast start of E-4 D/G per SO 52A.1.B, steps 4.3.1.1 through 4.3.1.5. (Cue: Report pre-start checks for E-4 D/G are complete per SO 52A.1.B, steps 4.3.1.1 through 4.3.1.5.)	P	Equipment Operator is contacted to perform pre-start inspection for E-4 D/G per SO 52A.1.B, steps 4.3.1.1 through 4.3.1.5.
*3	Start the E-4 diesel generator by turning and holding the "START MODE" switch (143-DG12) to "MAN" and turn the "START-STOP" switch (101-DG12) to "START". (Cue: Release the switches. Acknowledge control switch operation.)	P	Turn and hold "Start Mode" switch (143-DG12) to "MAN" and "Start-Stop" switch (101-DG12) to "START" then release both switches at panel 00C026D.
4	Check the E-4 diesel start after 3 minute prelube. (Cue: 3 minutes for prelube then E-4 D/G volts 4.14 to 4.4 KV, E-4 D/G Frequency 58.8 - 61.2 Hz and annunciator 005 F-4 is alarming.)	P	Wait 3 minutes then verify E-4 Diesel Frequency 58.8 - 61.2 Hz, and E-1 Diesel volts 4.16 - 4.40 KV at panel 00C026D.
5	Acknowledge the "E-4 DIESEL RUNNING" annunciator. (Cue: Annunciator 005 F-4 is lit solid.)	P	The annunciator "ACKNOWLEDGE" pushbutton is depressed on panel 00C026B.
6	Verify `A' ESW pump start.  (Cue: `A' ESW pump red light lit, green light off; discharge pressure is 25 - 64 psig on PI-0236A and motor amps are 22 - 32 amps on `A' pump ammeter.)	P	`A' ESW pump red light lit, discharge pressure is 25 to 64 psig on PI-0236A and motor amps are 22 to 32 amps on the `A' pump ammeter are verified at panel 00C026B.

STEP NO	STEP	ACT	STANDARD
7	Verify `B' ESW pump start.  (Cue: `B' ESW pump red light lit, green light off; discharge pressure is 25 - 64 psig on PI-0236B and motor amps are 22 - 32 amps on `B' pump ammeter.)	P	`B' ESW pump red light lit, discharge pressure is 25 to 64 psig on PI-0236A and motor amps are 22 to 32 amps on the `B' pump ammeter are verified at panel 00C026C.
8	Red flag `A' (B) ESW pump control switch. (Cue: Acknowledge control switch operation.)	P	Turns the `A' (B) ESW pump control switch to "START" and allows the control switch to spring return to normal at panel 00C026B(C).
9	Place control switch for `B' (A) ESW pump to "STOP". (Cue: Acknowledge control switch operation.)	P	Turns the `B' (A) ESW pump control switch to "STOP" and allows the control switch to spring return to "NORMAL" at panel 00C026C(B).
10	Verify `B' (A) ESW pump is secured.  (Cue: `B' (A) ESW pump green light lit, pump control switch is green flagged, pump discharge pressure on PI-0236B(A) and motor amps on `B' (A) pump motor ammeter go to zero.)	P	`B' (A) ESW pump discharge pressure on PI-0236B(A) and amps on `B' (A) pump ammeter are verified going to zero at panel 00C026C(B).
11	Acknowledge the "EMERGENCY SERVICE WATER PUMP AUTO START" annunciator. (Cue: Annunciator 002 A-5 is lit solid when acknowledged and clears when reset.)	P	The annunciator "ACKNOWLEDGE" pushbutton is depressed on panel 00C026B.
12	Verify ECW pump has automatically stopped. (Cue: ECW pump green light lit and motor amps on the EM CLG WTR PP ammeter go to zero.)	P	ECW pump green light lit and ECW pump motor amps on EM CLG WTR PP ammeter are verified going to zero at panel 00C026D.

STEP NO	STEP	ACT	STANDARD
13	Acknowledge the "EMERGENCY COOLING WATER PUMP AUTO START" annunciator. (Cue: Annunciator 212 B-2 clears.)	P	The annunciator "ACKNOWLEDGE" pushbutton is depressed on panel 20C012.
14	Adjust E-4 D/G engine speed with "GOVERNOR" control switch and voltage output with "AUTO VOLTS. REG." control switch, if required. (Cue: Frequency is 60 Hz and voltage is 4.28 KV.)	P	E-4 D/G frequency is 58.8 - 61.2 Hz on the E-4 D/G FREQ METER and voltage is 4.16 - 4.40 KV on the E-4 D/G VOLT METER are verified at panel 00C026D.
15	Direct Equipment Operator to verify ESW flow to the D/G by verifying AO-0-33-0241D is open. (Cue: AO-0-33-0241D is open.)	P	Equipment Operator is contacted to verify ESW flow to the D/G by verifying AO-0-33-0241D is open.
16	Direct Equipment Operator to verify proper generator bearing oil level at LG-7568D. (Cue: Equipment Operator reports that the generator has normal bearing oil level.	P	Equipment Operator is contacted to verify proper generator bearing oil level at LG-7568D.
17	Inform Control Room Supervisor of task completion. (Cue: Control Room Supervisor acknowledges report.)	P	Task completion reported.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

After the E-4 D/G has been fast started in accordance with Steps 4.3.1 through 4.3.12 of SO 52A.1.B, "Diesel Generator Operations" the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. E-4 Diesel Generator available for operation in accordance with SO 52A.1.A, "Diesel Generator Lineup for Automatic Start"

2. Equipment Operators are standing by in the E-4 D/G Room.

3. GP-23 "Diesel Generator Inoperable", has been reviewed.

INITIATING CUE

The Control Room Supervisor directs you to Fast Start the E-4 Diesel Generator in accordance with steps 4.3.1 through 4.3.12 of SO 52A.1.B, "Diesel Generator Operations".

PECO Energy Company
Peach Bottom Units 2 and 3

SO 52A.1.B DIESEL GENERATOR OPERATIONS

1.0 PURPOSE

This procedure provides the instructions necessary to operate the emergency diesel generator in its most commonly used operating modes. It includes slow starting the diesel generator (the preferred method for non-emergency starts), synchronization and loading as for surveillance testing/routine testing, synchronization and transferring of 4KV breakers and shutting down.

This procedure is divided into sections which can be performed separate from the rest of the procedure according to demand and existing conditions.

2.0 PREREQUISITES

2.1 Emergency Diesel Generator System available for operation in accordance with SO 52A.1.A, "Diesel Generator Lineup for Automatic Start". **CM-1**

2.2 Equipment Operator stationed in the diesel generator building to perform operational steps as directed by the control room operators.

2.3 GP-23 "Diesel Generator Inoperable", has been reviewed. Use of this procedure makes the associated diesel generator inoperable.

3.0 PRECAUTIONS

3.1 IF severe engine vibrations OR unusual noises occur, THEN the diesel should be immediately unloaded AND shutdown, until the cause can be determined AND corrected.

3.2 Limit the amount of time the engine is operated at no-load or low load conditions. Excessive operation at no-load or low load will cause oil to build up in the exhaust piping leading to smoke and possibly fire. The engine should be loaded within 10 minutes of EDG start to minimize the accumulation of oil in the manifolds.

3.3 IF an emergency condition exists (MCA or dead bus), THEN the following actions will occur automatically:

3.3.1 Both associated output breakers will trip.

3.3.2 The governor and voltage regulator will convert to isochronous mode (Unit). Speed will increase depending on initial load and the amount of droop in the governing system. Manual control of the governor and voltage regulator is lost when in isochronous mode.

3.3.3 The governor motor operated potentiometer (MOP) and the regulator motor operated controller (MOC) go to their center position.

3.4 IF a Dead Bus condition exists, THEN diesel generator output breaker will anti-pump lockout. To reset the breaker anti-pumping device, the breaker control switch must be placed in "TRIP" and back to "CLOSE" following verification of no over current condition.

3.5 IF an RHR pump breaker trips on anti-pumping, THEN to reset the breaker anti-pumping device, the breaker control switch must be placed in "TRIP" and back to "CLOSE" following verification of no over current condition.

3.6 A modified LPCI Pump start (immediate pump start instead of the pump start after 2 or 8 seconds) may occur following a LOCA signal, with offsite power available and the EDG output breaker closed.

3.7 The Cooling Tower Lift Pumps should NOT be started while an EDG is running. This precaution will eliminate the potential for tripping of the 4KV bus feeder breaker, thus isolating the EDG, leaving it to supply the 4KV bus alone.

3.8 System Operations should be notified prior to EDG runs, since grid operations (such as large load starts) may affect EDG operation. IF system grid problems are anticipated by System Operations, diesel generator testing should not be performed.

3.9 IF electrical transients or grid problems occur with the EDG in Test, diesel generator output current shall be monitored closely. The 4KV bus feeder breaker shall be opened if the current output increases above specified test values.

4.0 PERFORMANCE STEPS

NOTE

The following sections may be performed individually without performing the entire procedure:

- o Section 4.1, Diesel Generator Slow Start
- o Section 4.2, Diesel Generator Synchronization and Loading
- o Section 4.3, Diesel Generator Fast Start
- o Section 4.4, 4KV Switchgear Manual Transfer
- o Section 4.5, Diesel Generator Shutdown

4.1 Diesel Generator Slow Start

4.1.1 Direct the operator to perform the following as a pre-start inspection:

CAUTION

Improper governor oil level may cause erratic engine operation and damage to the governor

4.1.1.1 Verify governor oil level LG-7575A(B)(C)(D) above the black line AND below the top of the sightglass. **CM-7**

4.1.1.2 Check the engine crankcase oil level +3" to -2" on the upper scribe mark on the dipstick.

4.1.1.3 Verify proper generator bearing oil level at LG-7568A(B)(C)(D). **CM-7**

4.1.1.4 Verify coolant expansion tank level LG-0610A(B)(C)(D) between the green and yellow rings on the sightglass. Notify the system manager if coolant is added.

4.1.1.5 Verify control rod pin is engaged with adjuster collar, on each fuel injection pump. (See Figure 1).

CAUTION

The DG will NOT start unless at least 1 minute has passed since the last attempt to start the diesel, OR since the diesel was shutdown, due to the governor shutdown solenoid being energized to stop.

4.1.2 Direct the operator to place the Voltage Shutdown Reset Selector Switch located on the Engine Generator Panel 0A(B,C,D)C097 to "OFF".

4.1.3 Verify "E1(E2)(E3)(E4) DIESEL NOT IN AUTO" alarms.

4.1.4 Direct the operator to verify the AS FOUND setpoint of the governor actuator speed knob as indicated in the window marked "SPEED" combined with the governor actuator speed knob pointer agrees approximately with the values below:

- o E1 21.34
- o E2 21.24
- o E3 20.36
- o E4 20.68

4.1.5 Direct the operator to set the governor actuator speed knob to between 2 and 3 as indicated in the window marked "SPEED".

4.1.6 Start the diesel generator by performing the following:

4.1.6.1 Turn AND hold the "Start Mode" selector switch to "MAN" AND turn the "Start-Stop" switch to "START".

4.1.7 Release the "Start-Stop" AND "Start Mode" switches.

4.1.8 Direct the operator to verify the "E1(E2)(E3)(E4) D/G Lube Oil Pre-Lube Pump" 0AP173 (0BP173) (0CP173)(0DP173) starts.

4.1.9 Check the diesel generator starts approximately 3 minutes after the start of the pre-lube sequence. **CM-2**

NOTE

On a diesel generator start, the A ESW, B ESW AND ECW Pumps receive an auto start signal.

CAUTION

Cooling Water is required for diesel generator operation.

4.1.10 Verify ESW Pumps A AND B started.

4.1.10.1 Check pump discharge pressure PI-0236A AND B, "DISCH PRESS", 25 to 64 psig.

4.1.10.2 Check pump motor current "AMPS" 22 to 32 amps.

4.1.11 Red Flag the ESW Pump selected to remain in service.

4.1.12 Shutdown the remaining ESW Pump.

4.1.13 Verify ECW Pump automatically shuts down.

4.1.14 Direct an operator to slowly raise engine speed by continually rotating the governor actuator speed knob until it is at the AS FOUND setpoint specified in step 4.1.4 of this procedure.

4.1.15 Verify "E1(E2)(E3)(E4) DIESEL RUNNING" alarms.

NOTE

The "GENERATOR LOSS OF FIELD" alarm may come in at the local control panel AND can not be reset until the field is flashed.

4.1.16 Direct the operator to return the Voltage Shutdown Reset Selector Switch to "ON" to cause field flashing.

4.1.17 Verify "E1(E2)(E3)(E4) DIESEL NOT IN AUTO" clears.

4.1.18 Verify diesel generator running at rated frequency (58.8 to 61.2 Hz) and voltage (4.16 to 4.40KV).

4.1.19 Direct an operator to verify ESW flow to the diesel by verifying AO-0-33-0241A(B)(C)(D), "ESW Outlet Block Valve From Diesel Gen E1(2)(3)(4)" OPEN.

4.1.20 Direct an operator to rotate "T" handle on BS-0570A(B)(C)(D), "E1(E2)(E3)(E4) D/G Fuel Oil Pumps Suction Strnr".

4.1.21 Direct an operator to verify proper generator bearing oil level at LG-7568A(B)(C)(D). **CM-7**

4.1.22 Adjust engine speed AND generator output voltage as required, using the applicable control switch(es) below.

- o Engine speed - "GOVERNOR" control switch
- o Generator output voltage - "AUTO VOLT REG" control switch

4.2 Diesel Generator Synchronization and Loading

CAUTION

Limit the amount of time the engine is operated at no-load or low load conditions. The engine should be loaded within 10 minutes of EDG start to minimize the accumulation of oil in the manifolds.

4.2.1 Verify diesel generator is running in accordance with Section 4.1 of this procedure.

4.2.2 Verify diesel generator running at rated frequency (58.8 to 61.2 Hz) and voltage (4.16 to 4.40KV).

NOTES

1. It is good practice to alternate use of the D/G output breakers from test to test.
2. Preferred Off-site Source for 2SUE is 2SU XFMR 00X003 with 3SU XFMR 00X005 as alternate. Preferred Off-site Source for 3SUE is 343SU XFMR 00X011 with 3SU XFMR 00X005 as alternate.

4.2.3 Place the applicable "BKR SYNC" switch in "ON".

o E12	o E22	o E32	o E42
o E13	o E23	o E33	o E43

4.2.4 Verify speed and voltage control of diesel generator as follows:

4.2.4.1 Operate the "GOVERNOR" control switch to:

- o "RAISE" frequency to 0.5 Hz above the initial value.
- o "LOWER" frequency to 0.5 Hz below the initial value.
- o "RAISE" frequency to return to initial value.

4.2.4.2 Operate the "AUTO VOLT REG" control switch to:

- o "RAISE" voltage to 50 volts above the initial value.
- o "LOWER" voltage to 50 volts below the initial value.
- o "RAISE" voltage to return to initial value.

4.2.5 Check both synchronizing lights for proper operation as follows:

- o Both lights "ON" when synchroscope is at "Bottom Dead Center"
- o Both lights "OFF" when synchroscope is at "Top Dead Center"

4.2.6 Adjust diesel generator speed, using the "GOVERNOR" control switch, to make the synchroscope rotate slowly in the "FAST" direction.

CAUTION

Diesel generator voltage should be slightly higher, about 50 volts, but no more than 100 volts higher than bus voltage while synchronizing to avoid damage to the generator.

4.2.7 Adjust diesel generator "INCOMING" voltage so that it is slightly higher than "RUNNING" bus voltage by using the "AUTO VOLT REG" control switch.

4.2.8 Verify the synchroscope is still rotating slowly in the "FAST" direction.

NOTE

The diesel generator is considered synchronized, when the following conditions are met:

- o Diesel generator "INCOMING" voltage slightly higher than "RUNNING" bus voltage. **CM-4**
- o Synchroscope rotating slowly in the "FAST" direction.
- o Synchroscope within 13 degrees of "Top Dead Center".

CAUTION

Perform step 4.2.10 immediately after completing step 4.2.9 to prevent "motoring" the diesel generator.

4.2.9 WHEN the diesel generator is synchronized with the 4KV emergency bus, THEN close breaker E12 (E13) (E22) (E23) (E32) (E33) (E42) (E43).

4.2.10 Pickup 200 to 300 KW of load on the diesel generator by turning the "GOVERNOR" control switch to "RAISE". Pickup 100 KVAR by turning the "AUTO VOLT REG" control switch to "RAISE".

4.2.11 Place the applicable "BKR SYNC" switch in "OFF".

o E12	o E22	o E32	o E42
o E13	o E23	o E33	o E43

NOTE

Loading the diesel generator shall proceed at a rate NOT to exceed 300 KW/min. **CM-3**

4.2.12 Check generator output voltage and generator amperage for all three phases.

4.2.13 Pickup the desired load to be carried by the diesel generator as follows:

4.2.13.1 Turn the "GOVERNOR" control switch to "RAISE".

CAUTION

Do NOT allow the KVAR value to exceed 75% of the KW value, to assure that the generator 0.8 power factor will NOT be exceeded.

4.2.13.2 Maintain the KW/KVAR ratio, by operating the "AUTO VOLT REG" control switch.

NOTES

1. IF the D/G is run above 2600 KW, THEN the Plant Reactor Operator shall log the load and duration of the run.
2. The maximum load to be carried by the diesel generator for continuous operations is 2600 KW. The diesel may be run at loads greater than 2600 KW, but less than 3250 KW in accordance with the following table: **CM-5, CM-6**

o 2600 KW	Continuous
o 2600 KW - 3000 KW	2000 hr/yr
o 3000 KW - 3100 KW	200 hr/yr
o 3100 KW - 3250 KW	30 min/yr

CAUTION

Any operation over 3250 KW will require an engine shutdown, declaration of inoperability AND performance of an internal inspection.

4.2.14 IF the diesel generator is operated at a load greater than 3250 KW, THEN do the following:

4.2.14.1 Immediately reduce the load to under 3000 KW.

4.2.14.2 Shutdown the diesel generator in accordance with Section 4.5 of this procedure.

4.2.14.3 Declare the diesel generator inoperable.

4.2.14.4 Notify Shift Management to have an internal inspection performed on the diesel generator because of the run in excess of 3250 KW.

4.2.15 For shutdown of the diesel generator, proceed to Section 4.5 of this procedure.

4.3 Diesel Generator Fast Start

4.3.1 Direct an operator to perform the following checks as a pre-start inspection:

CAUTION

Improper governor oil level may cause erratic engine operation and damage to the governor

4.3.1.1 Verify governor oil level LG-7575A(B)(C)(D) above the black line AND below the top of the sightglass. **CM-7**

4.3.1.2 Check the engine crankcase oil level +3" to -2" on the upper scribe mark on the dipstick.

4.3.1.3 Verify proper generator bearing oil level at LG-7568A(B)(C)(D). **CM-7**

4.3.1.4 Verify coolant expansion tank level LG-0610A(B)(C)(D) between the green and yellow rings on the sightglass.

4.3.1.5 Verify control rod pin is engaged with adjuster collar, on each fuel injection pump. (See Figure 1).

CAUTION

The DG will NOT start unless at least 1 minute has passed since the last attempt to start the diesel, OR since the diesel was shutdown, due to the governor shutdown solenoid being energized to stop.

4.3.2 Start the diesel generator by performing the following:

4.3.2.1 Turn AND hold the "Start Mode" selector switch to "MAN" AND turn the "Start-Stop" switch to "START".

4.3.3 Release the "Start-Stop" AND "Start Mode" switches.

4.3.4 Check the diesel generator starts after the 3 minute pre-lube sequence, THEN check the following: **CM-2**

o Verify "E1(E2)(E3)(E4) DIESEL RUNNING" alarms.

o Diesel generator running at rated frequency (58.8 to 61.2 Hz) and voltage (4.16 to 4.40KV).

NOTE

On a diesel generator start, the A ESW, B ESW AND ECW Pumps receive an auto start signal.

CAUTION

Cooling Water is required for diesel generator operation.

4.3.5 Verify ESW Pumps A AND B started.

4.3.5.1 Check pump discharge pressure PI-0236A AND B, "DISCH PRESS", 25 to 64 psig.

4.3.5.2 Check pump motor current "AMPS" 22 to 32 amps.

4.3.6 Red Flag the ESW Pump selected to remain in service.

4.3.7 Shutdown the remaining ESW Pump.

4.3.8 Verify ECW Pump automatically shuts down.

4.3.9 Verify diesel generator running at rated frequency (58.8 to 61.2 Hz) and voltage (4.16 to 4.40KV).

4.3.10 Direct an operator to verify ESW flow to the diesel by verifying AO-0-33-0241A(B)(C)(D), "ESW Outlet Block Valve From Diesel Gen E1(E2)(E3)(E4)" open.

4.3.11 Direct an operator to verify proper generator bearing oil level at LG-7568A(B)(C)(D). **CM-7**

4.3.12 Adjust engine speed AND generator output voltage as required, using the applicable control switch(es) below.

o Engine speed - "GOVERNOR"

o Generator output voltage - "AUTO VOLT REG"

NOTES

1. It is good practice to alternate use of the D/G output breakers from test to test.
2. Preferred Off-site Source for 2SUE is 2SU XFMR 00X003 with 3SU XFMR 00X005 as alternate. Preferred Off-site Source for 3SUE is 343SU XFMR 00X011 with 3SU XFMR 00X005 as alternate.

CAUTION

Limit the amount of time the engine is operated no-load or low load conditions. The engine should be loaded within 10 minutes of EDG start to minimize the accumulation of oil in the manifolds.

4.3.13 Place the applicable "BKR SYNC" switch in "ON".

- o E12
- o E22
- o E32
- o E42
- o E13
- o E23
- o E33
- o E43

4.3.14 Verify speed and voltage control of diesel generator as follows:

4.3.14.1 Operate the "GOVERNOR" control switch to:

- o "RAISE" frequency to 0.5 Hz above the initial value.
- o "LOWER" frequency to 0.5 Hz below the initial value.
- o "RAISE" frequency to return to initial value.

4.3.14.2 Operate the "AUTO VOLT REG" control switch to:

- o "RAISE" voltage to 50 volts above the initial value.
- o "LOWER" voltage to 50 volts below the initial value.
- o "RAISE" voltage to return to initial value.

4.3.15 Check both synchronizing lights for proper operation as follows:

- o Both lights "ON" when synchroscope is at "Bottom Dead Center"
- o Both lights "OFF" when synchroscope is at "Top Dead Center"

4.3.16 Adjust diesel generator speed, using the "GOVERNOR" control switch, to make the synchroscope rotate slowly in the "FAST" direction.

CAUTION

Diesel generator voltage should be slightly higher, about 50 volts, but no more than 100 volts higher than bus voltage while synchronizing to avoid damage to the generator.

4.3.17 Adjust diesel generator "INCOMING" voltage so that it is slightly higher than "RUNNING" bus voltage by using the "AUTO VOLT REG" control switch.

4.3.18 Verify the synchroscope is still rotating slowly in the "FAST" direction.

NOTE

The diesel generator is considered synchronized, when the following conditions are met:

- o Diesel generator "INCOMING" voltage slightly higher than "RUNNING" bus voltage. **CM-4**
- o Synchroscope rotating slowly in the "FAST" direction.
- o Synchroscope within 13 degrees of "Top Dead Center".

CAUTION

Perform step 4.3.20 immediately after completing step 4.3.19 to prevent "motoring" the diesel generator.

4.3.19 WHEN the diesel generator is synchronized with the 4KV emergency bus, THEN close breaker E12 (E13) (E22) (E23) (E32) (E33) (E42) (E43).

4.3.20 Pickup 200 to 300 KW of load on the diesel generator by turning the "GOVERNOR" control switch to "RAISE". Pickup 100 KVAR by turning the "AUTO VOLT REG" control switch to "RAISE".

4.3.21 Place the applicable "BKR SYNC" switch in "OFF".

o E12	o E22	o E32	o E42
o E13	o E23	o E33	o E43

NOTE

Loading the diesel generator shall proceed at a rate NOT to exceed 300 KW/min. **CM-3**

4.3.22 Check generator output voltage and generator amperage for all three phases.

4.3.23 Pickup the desired load to be carried by the diesel generator as follows:

4.3.23.1 Turn the "GOVENOR" control switch to "RAISE".

CAUTION

Do NOT allow the KVAR value to exceed 75% of the KW value, to assure that the generator 0.8 power factor will NOT be exceeded.

4.3.23.2 Maintain the KW/KVAR ratio, by operating the "AUTO VOLT REG" control switch.

NOTE

1. IF the D/G is run above 2600 KW, THEN the Plant Reactor Operator shall log the load and duration of the run.
2. The maximum load to be carried by the diesel generator for continuous operations is 2600 KW. The diesel may be run at loads greater than 2600 KW, but less than 3250 KW in accordance with the following table: **CM-5, CM-6**

o 2600 KW	Continuous
o 2600 KW - 3000 KW	2000 hr/yr
o 3000 KW - 3100 KW	200 hr/yr
o 3100 KW - 3250 KW	30 min/yr

CAUTION

Any operation over 3250 KW will require an engine shutdown, declaration of inoperability AND performance of an internal inspection.

4.3.24 IF the diesel generator is operated at a load greater than 3250 KW, THEN do the following:

4.3.24.3 Immediately reduce the load to under 3000 KW.

4.3.24.4 Shutdown the diesel generator in accordance with Section 4.5 of this procedure.

4.3.24.5 Declare the diesel generator inoperable.

4.3.24.6 Notify Shift Management to have an internal inspection performed on the diesel generator because of the run in excess of 3250 KW.

4.3.25 For shutdown of the diesel generator, proceed to Section 4.5 of this procedure.

4.4 4KV Switchgear Manual Transfer

NOTES

1. 2 Emer Aux Xfmr normally supplies:
   - o E12 Emergency Aux Switchgear
   - o E32 Emergency Aux Switchgear
   - o E23 Emergency Aux Switchgear
   - o E43 Emergency Aux Switchgear
2. 3 Emer Aux Xfmr normally supplies:
   - o E22 Emergency Aux Switchgear
   - o E42 Emergency Aux Switchgear
   - o E13 Emergency Aux Switchgear
   - o E33 Emergency Aux Switchgear
3. E212 BKR & E312 BKR are interlocked preventing them from being closed at the same time. The other seven emergency buses are interlocked in a similar manner.
4. Cooling Towers should be the first loads shed during manual load shedding.

CAUTION

Manual load shedding should be initiated to restore 4 KV Bus Voltage to greater than 3.9 KV

4.4.1 Verify the associated diesel for the bus that is to be transferred is running in accordance with Section 4.1 of this procedure.

NOTE

Preferred Off-site Source for 2SUE is 2SU XFMR 00X003 with 3SU XFMR 00X005 as alternate. Preferred Off-site Source for 3SUE is 343SU XFMR 00X011 with 3SU XFMR 00X005 as alternate.

CAUTION

Limit the amount of time the engine is operated at no-load or low load conditions. The engine should be loaded within 10 minutes of EDG start to minimize the accumulation of oil in the manifolds.

4.4.2 Place the applicable "BKR SYNC" switch in "ON".

- o E12
- o E22
- o E32
- o E42
- o E13
- o E23
- o E33
- o E43

4.4.3 Verify speed and voltage control of diesel generator as follows:

4.4.3.1 Operate the "GOVERNOR" control switch to:

- o "RAISE" frequency to 0.5 Hz above the initial value.
- o "LOWER" frequency to 0.5 Hz below the initial value.
- o "RAISE" frequency to return to initial value.

4.4.3.2 Operate the "AUTO VOLT REG" control switch to:

- o "RAISE" voltage to 50 volts above the initial value.
- o "LOWER" voltage to 50 volts below the initial value.
- o "RAISE" voltage to return to initial value.

4.4.4 Check both synchronizing lights for proper operation as follows:

- o Both lights "ON" when synchroscope is at "Bottom Dead Center"
- o Both lights "OFF" when synchroscope is at "Top Dead Center"

4.4.5 Adjust diesel generator speed, using the "GOVERNOR" control switch, to make the synchroscope rotate slowly in the "FAST" direction.

CAUTION

Diesel generator voltage should be slightly higher, about 50 volts, but no more than 100 volts higher than bus voltage while synchronizing to avoid damage to the generator.

4.4.6 Adjust diesel generator "INCOMING" voltage so that it is slightly higher than "RUNNING" bus voltage by using the "AUTO VOLT REG" control switch.

4.4.7 Verify the synchroscope is still rotating slowly in the "FAST" direction.

NOTE

The amount of load being carried on the 4KV emergency bus may be increased by placing equipment on the bus in service. Refer to Table 1 for equipment and associated current values.

4.4.8 Note the amount of load on the 4KV emergency bus, by one of the following methods:

- o Check how many amps are being supplied from "2(3) EM XFMR"
- o Sum load current values as indicated on individual load ammeters for loads being supplied by bus (e.g. RHR Pump, Core Spray Pump, Load Center, etc.)

NOTE

The diesel generator is considered synchronized, when the following conditions are met:

- o Diesel generator "INCOMING" voltage slightly higher than "RUNNING" bus voltage. **CM-4**
- o Synchroscope rotating slowly in the "FAST" direction.
- o Synchroscope within 13 degrees of "Top Dead Center".

CAUTION

Perform step 4.4.10 immediately after completing step 4.4.9 to prevent "motoring" the diesel generator.

4.4.9 WHEN the diesel generator is synchronized with the 4KV emergency bus, THEN close breaker E12 (E13) (E22) (E23) (E32) (E33) (E42) (E43).

4.4.10 Pickup load on the diesel generator by turning the "GOVERNOR" control switch to "RAISE". Pickup KVAR by turning the "AUTO VOLT REG" control switch to "RAISE".

4.4.11 Place the applicable "BKR SYNC" switch in "OFF".

- o E12 o E22 o E32 o E42
- o E13 o E23 o E33 o E43

NOTE

Loading the diesel generator shall proceed at a rate NOT to exceed 300 KW/min. **CM-3**

4.4.12 Check generator output voltage and generator amperage for all three phases.

4.4.13 Pickup all bus loads as follows:

NOTE

Determination of when the D/G has picked up all bus loads can be made by either of the following methods:

- o Diesel generator bus feed ammeter is near the value noted from step 4.4.8 and the emergency transformer bus feed ammeter has lowered to a minimum as close to 0 amps as can be achieved.
- o Using the PMS Computer, access the analog parameters for the bus being transferred via "4KV Emergency Power" in "Operations Graphics" and verify the diesel generator current is near the value noted from step 4.4.8 and the emergency transformer bus feed current has lowered to a minimum as close to 0 amps as can be achieved.

4.4.13.1 Turn the "GOVERNOR" control switch to "RAISE".

4.4.13.2 IF necessary, THEN adjust the "AUTO VOLT REG" control switch.

NOTE

The following step will make the Emergency Bus INOPERABLE and Tech Spec Action 3.8.7 shall be entered with a safety determination made for the supported functions on BOTH Units.

CAUTION

IF an Emergency Start Signal (MCA or Dead Bus) trips the D/G Breaker while the D/G is the sole source of Power to the Bus, THEN the D/G Breaker will have to be closed manually.

4.4.14 Open the applicable startup source bkr.

o E212	o E222	o E232	o E242
o E312	o E322	o E332	o E342
o E213	o E223	o E233	o E243
o E313	o E323	o E333	o E343

4.4.15 Place the applicable "BKR SYNC" switch in "ON", to parallel the diesel generator with the selected startup source.

Bus	Supplying Startup Source		Breaker
E12	Normal Alternate	2SUE 3SUE	E212 E312
E13	Normal Alternate	3SUE 2SUE	E313 E213
E22	Normal Alternate	3SUE 2SUE	E322 E222
E23	Normal Alternate	2SUE 3SUE	E223 E323
E32	Normal Alternate	2SUE 3SUE	E232 E332
E33	Normal Alternate	3SUE 2SUE	E333 E233
E42	Normal Alternate	3SUE 2SUE	E342 E242
E43	Normal Alternate	2SUE 3SUE	E243 E343

4.4.16 Check both synchronizing lights for proper operation as follows:

- Both lights "ON" when synchroscope is at "Bottom Dead Center"
- Both lights "OFF" when synchroscope is at "Top Dead Center"

4.4.17 Adjust diesel generator speed, using the "GOVERNOR" control switch, to make the synchroscope rotate slowly in the "SLOW" direction.

CAUTION

Diesel generator voltage should be slightly higher, about 50 volts, but no more than 100 volts higher than bus voltage while synchronizing to avoid damage to the generator.

4.4.18 Adjust diesel generator "RUNNING" voltage so that it is slightly higher than "INCOMING" bus voltage by using the "AUTO VOLT REG" control switch.

4.4.19 Verify the synchroscope is still rotating slowly in the "SLOW" direction.

NOTE

The diesel generator is considered synchronized, when the following conditions are met:

- o Diesel generator "RUNNING" voltage slightly higher than "INCOMING" bus voltage. **CM-4**
- o Synchroscope rotating slowly in the "SLOW" direction.
- o Synchroscope within 13 degrees of "Top Dead Center".

4.4.20 WHEN the diesel generator is synchronized with the startup source, THEN close the selected breaker.

4.4.21 Place the applicable "BKR SYNC" switch to "OFF".

4.4.22 IF it is desired to manually transfer back to the original S/U source breaker, THEN return to step 4.4.14.

4.4.23 For shut down of the diesel generator, proceed to Section 4.5 of this procedure.

4.5 Diesel Generator Shutdown

CAUTION

Limit the amount of time the engine is operated at no-load or low load conditions.

4.5.1 Reduce diesel generator load as follows:

4.5.1.1 IF the D/G was operating near full load, THEN cool down the D/G by operating at 1500 KW for 5 minutes as follows:

- o Turn the "GOVERNOR" control switch to "LOWER".

CAUTION

Do NOT allow the KVAR value to exceed 75% of the KW value, to assure that the generator 0.8 power factor will NOT be exceeded.

- o Maintain the KW/KVAR ratio by operating the "AUTO VOLT REG" control switch.

4.5.1.2 Reduce D/G load to 100 to 150 KW and VARS to 50 KVAR as follows:

- o Turn the "GOVERNOR" control switch to "LOWER".
- o Maintain the KW/KVAR ratio by operating the "AUTO VOLT REG" control switch until VARS are reduced to 50 KVAR.

4.5.2 WHEN D/G load is reduced to 100 to 150 KW and VARS are 50 KVAR, THEN trip the applicable diesel generator output breaker.

o E12	o E22	o E32	o E42
o E13	o E23	o E33	o E43

CAUTION

IF the diesel generator breaker does NOT indicate open, THEN do NOT proceed with diesel generator shutdown, until the breaker is verified open.

4.5.3 Verify the diesel generator output breaker opened as follows:

4.5.3.1 Check the breaker "GREEN" open light lit.

4.5.3.2 Check D/G "WATTS" at 0.

4.5.3.3 Check D/G "VAR" at 0.

4.5.4 IF it is required to operate the opposite output breaker, THEN perform step 4.5.8 and the applicable steps in Section 4.2 or 4.4 of this procedure.

4.5.5 Shutdown the diesel generator by turning its control switch to "STOP".

4.5.6 IF the Emergency Service Water (ESW) was used AND is NOT required for any other evolution, THEN shutdown the running ESW pump in accordance with SO 33.2.A, "Emergency Service Water System Shutdown", AND return to step 4.5.7 of this procedure.

4.5.7 IF the Emergency Cooling Water (ECW) System was used AND is NOT required for any other evolution, THEN it may be shutdown in accordance with SO 48.2.A, "Emergency Cooling Water System Shutdown". Return to step 4.5.8 of this procedure.

4.5.8 IF equipment that was started for the sole purpose of loading the diesel generator is no longer required, THEN they may be shutdown in accordance with their system procedures.

4.5.9 IF the diesel generator was run for one hour OR more, THEN direct an operator to perform the following steps for the diesel generator that has just been shut down. Return to step 4.5.10 of this procedure. **CM-9**

4.5.9.1 Remove cap from HV-0-52D-10007A (B)(C)(D), "D/G Fuel Oil Day Tank 0AT040 (0BT040)(0CT040)(0DT040) Drain Valve".

4.5.9.2 Crack open HV-0-52D-10007A(B)(C)(D) AND collect a 1 liter sample of fuel oil in a sample bottle.

4.5.9.3 Close HV-0-52D-10007A (B)(C)(D).

4.5.9.4 Allow the sample to settle for 15 minutes.

NOTE

IF water is present, THEN the water may settle to the bottom of the bottle or the sample may be all water.

4.5.9.5 Visually examine the sample for accumulated water.

4.5.9.6 IF water is observed, THEN repeat steps 4.5.9.2 through 4.5.9.5 until no water settles to the bottom of the sample bottle.

4.5.9.7 IF accumulator water was removed from the day tank, THEN verify the total amount of water removed was less than 2 liters.

4.5.9.8 Verify all accumulated water has been removed from the day tank.

4.5.9.9 Verify HV-0-52D-10007A(B)(C)(D) is closed.

4.5.9.10 Install cap on HV-0-52D-10007A (B)(C)(D).

NOTE

Step 4.5.10 may be omitted if Shift Management decides that it is undesirable to "air roll" the engine.

4.5.10 Direct an operator to perform the following steps 20 to 30 minutes after shutting down the diesel generator AND return to step 4.5.11 of this procedure:

NOTE

Steps 4.5.10.1 and 4.5.10.2 will bring up the following alarms on the Local Diesel Panel: "ENGINE OVERSPEED" and "CONTROL AT ENGINE" AND the Control Room alarms: "DIESEL GENERATOR TROUBLE", "DIESEL NOT IN AUTO" and "DIESEL GENERATOR NOT RESET".

4.5.10.1 Manually trip the fuel racks for the engine to be rolled, by pushing the large emergency stop button located on the engine control side.

4.5.10.2 Place the Diesel Generator Control Selector Switch RS4 located on the E1(E2)(E3)(E4) Diesel Gage Panel (DGP) to "AT ENGINE".

4.5.10.3 Unlock AND close HV-0-52C-10154A(B)(C)(D), "E1(E2)(E3)(E4) D/G Lube Oil Booster Block Valve".

4.5.10.4 Listen for abnormal noises during air roll. **CM-8**

4.5.10.5 Depress the manual start pushbutton located on the DGP for 2 to 3 seconds, allowing several revolutions of the crankshafts.

NOTE

Independent Verification of the following 3 steps is accomplished by A-C-8 "Control of Locked Valves and Devices" for the Locked Valve and by the absence of Control Room alarms for the fuel racks and RS4.

4.5.10.6 Open AND lock open HV-0-52C-10154A(B)(C)(D).

4.5.10.7 Reset the fuel racks.

4.5.10.8 Place the Diesel Generator Control Selector Switch RS4 located on the E1(E2)(E3)(E4) Diesel Gage Panel (DGP) to "NORMAL".

4.5.10.9 Verify all alarms are reset.

4.5.11 Perform SO 52A.1.A, "Diesel Generator Lineup for Automatic Start" to prepare the diesel generator for automatic operation.

4.5.12 IF outside air temperature is in excess of 70 degrees fahrenheit, place the 0AV091 (0BV091) (0CV091) (0DV091) in service until compartment air temperatures stabilize; THEN return the running fan to the "AUTO" position.

5.0 CONTROL STATIONS

5.1 Main Control Room Panel 00C029A(B)(C)(D)

5.2 Main Control Room Panel 00C026A(B)(C)(D)

5.3 Main Control Room Panel 00C024

5.4 E1(E2)(E3)(E4) D/G Local Control Panel 0AC097(0BC097)(0CC097)(0DC097)

5.5 E1(E2)(E3)(E4) Diesel Gauge Panel

6.0 REFERENCES

6.1 E-1, Single Line Diagram Station

6.2 E-8, Standby Diesel Gens. & 4160 Volt Emer. Power System, Unit No. 2

6.3 E-12, Standby Diesel Gens. & 4160 Volt Emer. Power System, Unit No. 3

6.4 E-5-166, Fairbanks-Morse Vendor Manual

6.5 E-5-7, Standby Diesel Engine Generators

6.6 M-377, Diesel Generator Auxiliary Systems

6.7 TRMS 3.14

6.8 Peach Bottom Improved Tech Specs Open Items A/R A0828140 Eval 23

6.9 CM-1, EIR 2-91-197 (T01669)

6.10 CM-2, INPO Significant Operating Experience Report 83-1 (T00658)

6.11 CM-3, PBAPS TSCR 88-08 (T02425)

6.12 CM-4, PBAPS LER 3-87-06 (T00279)

6.13 CM-5, INPO Significant Event Report 44-80 (T00422)

6.14 CM-6, PBAPS Diesel Generator Load Profiles and System Voltage Regulation Study

6.15 CM-7, Response to Report No. 86-25 dated 4-24-87 (T00293)

6.16 CM-8, NRC Inspection Report 91-13 (T01067)

6.17 CM-9, Letter to NRC from G.A.Hunger, Jr. dated Sept. 29, 1994 transmitting TSCR 93-16 (T03778, A0905549 E61)

7.0 TECHNICAL SPECIFICATION

7.1 3.8.1

7.2 3.8.2

8.0 INTERFACING PROCEDURES

8.1 SO 52A.1.A, "Diesel Generator Lineup for Automatic Startup"

8.2 SO 33.2.A, "Emergency Service Water System Shutdown"

8.3 SO 48.2.A, "Emergency Cooling Water System Shutdown"

8.4 ST-O-52D-601(2)(3)(4)-2, "E1(2)(3)(4) Diesel Generator Fuel Oil Day Tank Water Removal"

8.5 A-C-8, "Control of Locked Valves and Devices"

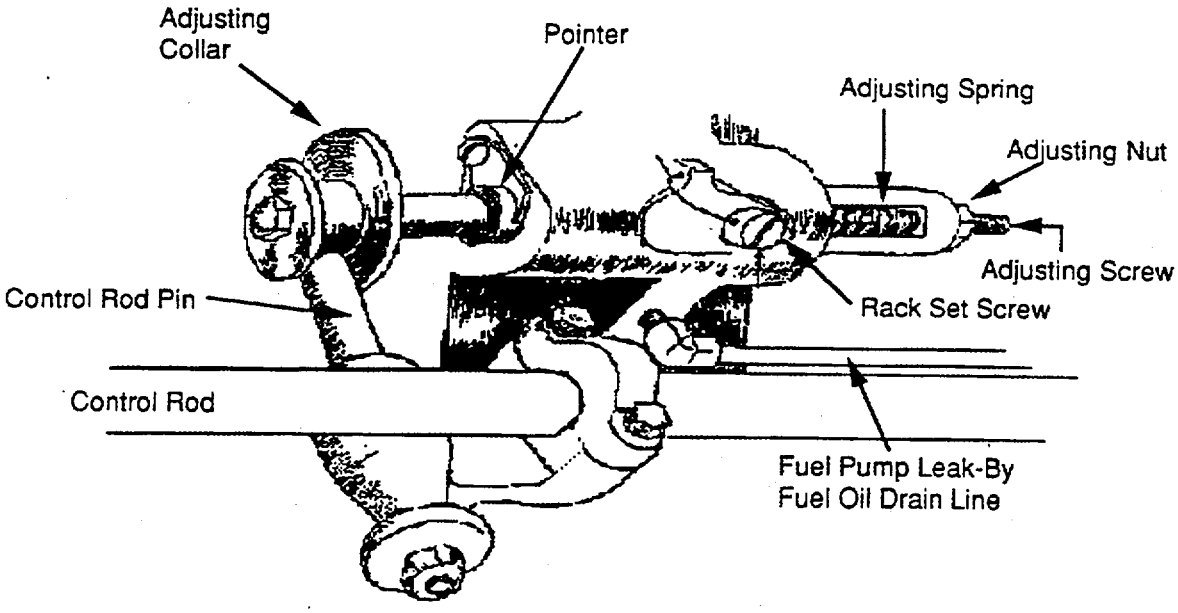
TABLE 1

AVAILABLE LOADS FOR THE DIESEL GENERATOR

Diesel	Bus	Equipment (In Preferred Loading Sequence)	Operating Mode	Approximate Current Draw in the Given Mode of Operation
E1	E12	2A RHR Pump 2A HPSW Pump 2A Core Spray Pump 2A CRD Pump	RHR Full Flow Test Normal System Operation Core Spray Full Flow Test Normal System Operation	188 Amps 115 Amps 65 Amps 24 Amps
	E13	3A RHR Pump 3A HPSW Pump 3A Core Spray Pump	RHR Full Flow Test Normal System Operation Core Spray Full Flow Test	188 Amps 115 Amps 65 Amps
E2	E22	2B RHR Pump 2B HPSW Pump 2B Core Spray Pump A ESW Pump A ESW Booster Pump	RHR Full Flow Test Normal System Operation Core Spray Full Flow Test Normal System Operation Normal System Operation	188 Amps 115 Amps 65 Amps 24 Amps 24 Amps
	E23	3B RHR Pump 3B HPSW Pump 3B Core Spray Pump 3B CRD Pump	RHR Full Flow Test Normal System Operation Core Spray Full Flow Test Normal System Operation	188 Amps 115 Amps 65 Amps 24 Amps
E3	E32	2C RHR Pump 2C HPSW Pump 2C Core Spray Pump B ESW Pump B ESW Booster Pump	RHR Full Flow Test Normal System Operation Core Spray Full Flow Test Normal System Operation Normal System Operation	188 Amps 115 Amps 65 Amps 24 Amps 24 Amps
	E33	3C RHR Pump 3C HPSW Pump 3C Core Spray Pump 3B CRD Pump	RHR Full Flow Test Normal System Operation Core Spray Full Flow Test Normal System Operation	188 Amps 115 Amps 65 Amps 24 Amps
E4	E42	2D RHR Pump 2D HPSW Pump 2D Core Spray Pump 2B CRD Pump	RHR Full Flow Test Normal System Operation Core Spray Full Flow Test Normal System Operation	188 Amps 115 Amps 65 Amps 24 Amps
	E43	3D RHR Pump 3D HPSW Pump 3D Core Spray Pump ECW Pump	RHR Full Flow Test Normal System Operation Core Spray Full Flow Test Normal System Operation	188 Amps 115 Amps 65 Amps 21 Amps

FIGURE 1

CONTROL ASSEMBLY



EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2120090101 / PLOR-XXXC K/A: 212000A4.14
URO: 3.8 SRO: 3.8

TASK DESCRIPTION: Half-Scram Reset

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

Key for Scram Discharge Volume High Level Bypass Switch.

C. REFERENCES

GP-11E, Rev. 19, "Reactor Protection System - Scram and ARI Reset"

D. TASK STANDARD

1. Satisfactory task completion is indicated when the Reactor Protection System is reset and the Scram Discharge Volume Vent and Drain valves are open.

2. Estimated time to complete: 19 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform necessary steps to reset a scram and begin draining the Scram Discharge Volume using appropriate procedures. I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. Reactor power is 100%.

2. Plant conditions are stable.

3. The "B" RPS bus has been transferred to the normal source after maintenance.

4. The "B" Half-Scram is not reset.

5. Both RPS buses are energized.

6. ARI was NOT initiated.

G. INITIATING CUE

The Control Room Supervisor directs you to reset the half scram in accordance with GP-11.E "Reactor Protection System - Scram and ARI Reset".

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
1	Obtain a copy of GP-11E, "Reactor Protection System - Scram and ARI Reset".	P	A copy of GP-11E, "Reactor Protection System - Scram and ARI Reset" is obtained.
2	Verify scram initiating signal clear or bypassed. (Cue: No scram signal annunciators are lit.)	P	No scram signal annunciator lit.
*3	Place Scram Reset switch in Group 1 & 4 position and then the Group 2 & 3 position. (Cue: Acknowledge reset switch operation.)	P	Scram Reset switch 5A-S9 is taken to the "GROUP 1 & 4", and then "GROUP 2 & 3" positions at panel 20C005A.
4	Verify the four scram group white lights are lit on both the RPS cabinets. (Cue: All of the scram group white lights are lit on both 20C015 and 20C017.)	P	All scram group white lights verified LIT on panels 20C015 and 20C017.
5	Verify "A CHANNEL AUTO SCRAM" and "B CHANNEL AUTO SCRAM" annunciators are clear. (Cue: Annunciators 211 B-1 and 211 C-1 are not lit.)	P	"A CHANNEL REACTOR AUTO SCRAM" and "B CHANNEL REACTOR AUTO SCRAM" annunciators are verified clear on alarm panels 211 B-1 and 211 C-1.
*6	Place SDV Outboard Vent and Drain Valves Switch, 5A-S14B, in "OPEN". (Cue: Acknowledge control switch operation.)	P	The SDV Outboard Vent and Drain Valve control switch 5A-S14B is momentarily placed in the "OPEN" position and then released at panel 20C005A.
7	Verify the SDV Outboard Vent and Drain Valves indicate open. (Cue: SDV Outboard Vent and Drain Valves red lights are on, green lights are off.)	P	SDV Outboard Vent and Drain Valves red lights are verified ON at panel 20C005A.

STEP NO	STEP	ACT	STANDARD
8	Inform Control Room Supervisor of task completion. (Cue: Control Room Supervisor acknowledges report.)	P	Task completion reported.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When the scram is reset and the Scram Discharge Volume Vents and Drains are open, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. Reactor power is 100%.

2. Plant conditions are stable.

3. The "B" RPS bus has been transferred to the normal source after maintenance.

4. The "B" Half-Scram is not reset.

5. Both RPS buses are energized.

6. ARI was NOT initiated.

INITIATING CUE

The Control Room Supervisor directs you to reset the half scram in accordance with GP-11.E "Reactor Protection System - Scram and ARI Reset".

Unit_____

Scram Reset_____/_____
Date Time
(Required for full scram only)

PECO Energy Company
Peach Bottom Units 2 and 3

GP-11.E REACTOR PROTECTION SYSTEM - SCRAM AND ARI RESET

1.0 PURPOSE

This procedure provides instructions for fully resetting the RPS trip circuitry following a half OR full reactor scram. It also provides instructions for resetting the Alternate Rod Insertion (ARI) logic following a half OR full initiation.

2.0 PREREQUISITES

2.1 IF a full scram is to be reset, THEN the reactor mode switch must be in the SHUTDOWN OR REFUEL position.

2.2 RPS Buses A AND B Energized.

3.0 PERFORMANCE STEPS

> NOTE
>
> Steps 3.1 to 3.5 are only required to be performed if ARI was initiated.

3.1 Verify that the "A" AND "B" ARI manual initiate pushbutton's collars are in the "DISARMED" position, AND the associated alarms are clear, on Panel 20(30)C236L; 207(307)D-2 AND E-2.

3.2 Verify that any automatic ARI initiation signal is clear (greater than OR equal to -48" RPV level OR less than OR equal to 1106 psig reactor pressure).

> NOTE
>
> The ARI signal CANNOT be reset for 40 seconds following automatic OR manual initiation.

3.3 Depress the "A" AND "B" ARI "RESET" pushbuttons.

3.4 Verify that the ARI solenoid valves close:

- o SV-2(3)-3-141A
- o SV-2(3)-3-142A
- o SV-2(3)-3-141B
- o SV-2(3)-3-142B

3.5 Verify the ARI annunciators can be reset:

- o "A CHANNEL ARI TRIP" 20(30)C236L; 207(307)D-1
- o "B CHANNEL ARI TRIP" 20(30)C236L; 207(307)E-1

> NOTE
> Only steps marked with a + sign are to be performed during reset of a half-scram condition.

+3.6 Verify the scram initiating signal is cleared OR bypassed.

> NOTE
>
> Shift Management permission is required to bypass the Scram Discharge Volume High Level signals.

3.7 Place the Scram Discharge Volume High Water Level Bypass switch, 5A-S8, on Panel 20(30)C005A in the "BYPASS" position.

3.8 Verify the "SCRAM DISCH VOLUME HI WATER LEVEL SCRAM BYPASS", annunciator is up on Panel 20(30)C205L; 210(310) C-2 .

+3.9 Reset the Reactor Protection System by placing the Scram Reset switch in the Group 1 and 4 position AND then in the Group 2 and 3 position (switch is spring returned to normal.)

+3.10 Verify the four scram group white lights are lit on both the RPS cabinets 20(30)C015 AND 20(30)C017.

+3.11 Verify "A CHANNEL REACTOR AUTO SCRAM" AND "B CHANNEL REACTOR AUTO SCRAM" annunciators (or the "A CHANNEL REACTOR MANUAL SCRAM" AND "B CHANNEL REACTOR MANUAL SCRAM" annunciators) clear on Panel 20(30)C205R; 211(311).

3.12 WHEN the scram air header pressure is approximately 70 psig (indicated by PI-2(3)-3-312 on Panel 20(30)C124), THEN verify "SCRAM VALVE PILOT AIR HEADER PRESS HI-LOW" annunciator clear (Panel 20(30)C205R; 211(311)D-2).

3.13 Verify HCU's return to normal by checking the following:

3.13.1 Check blue scram lights are off, located on full core display panel.

NOTES

1. The HCU accumulator trouble lights may NOT clear for 20-30 minutes after the scram is reset.

2. Steps 3.12.2, through 3.12.4 are based on normal CRD AND HCU operation AND may NOT be applicable during all plant conditions.

3.13.2 Verify the "ACCUMULATOR TROUBLE" lights are clear, located on full core display panel.

3.13.3 Verify the "CRD ACCUMULATOR LO PRESS HI LEVEL", annunciator is clear on Panel 20(30)C205R; 211(311)E-2.

NOTES

1. Restoring charging water pressure may take several minutes.

2. It is very important that cooling water flow be restored to the CRD mechanisms to protect the seals from heat damage.

3.13.4 WHEN the charging water flow is restored to normal, THEN ensure that CRD System Cooling Water Flow (FI-2(3)-03-306 on Panel 20(30)C005A) indicates 45 to 65 gpm.

3.13.5 Place the Rod Drift alarm reset switch to the reset position, 3A-S7 on Panel 20(30)C005A, AND verify the rod drift alarm lights AND the "ROD DRIFT" annunciator are clear, on Panel 20(30)C205R; 211(311)D-4.

NOTE

Indications of fuel damage include, but are NOT limited to, "HIGH OFF GAS RADIATION" OR "MAIN STEAMLINE RADIATION" alarms.

3.14 If fuel damage is suspected, THEN direct Health Physics to perform a radiation survey of the Scram Discharge Volume.

****
* CAUTION *
*
* If scram discharge volume is > 1000 mr/hr, then draining *
* must be coordinated with HP Supervision. *
****

NOTES

1. IF fuel damage is NOT suspected, THEN the scram discharge volume may be drained.

2. Steps 3.15 AND 3.16 apply if a half scram was caused by the manual scram channel OR loss of power to the RPS bus.

+3.15 Place the SDV Inboard Vent and Drain Valves Switch, 5A-S14A, in the "OPEN" position (spring return to auto) on Panel 20(30)C005A, AND verify the SDV Inboard Vent AND Drain Valves indicate open.

+3.16 Place the SDV Outboard Vent and Drain Valves switch, 5A-S14B, in the "OPEN" position (spring return in auto) on Panel 20(30)C005A, AND verify the SDV Outboard Vent and Drain valves indicate open.

NOTES

1. Annunciators in Step 3.16 may take 15 to 25 minutes to clear.

2. The following annunciators may be up on a half scram due to the SDV being isolated AND inleakage.

+3.17 Verify the following annunciators are clear:

- "SCRAM DISCH VOLUME HI WATER LEVEL TRIP on Panel 20(30)C205L; 210(310)C-1.

- "SCRAM DISCH VOLUME NOT DRAINED" on Panel 20(30)C205L; 210(310)B-2.

3.18 Place the Scram Discharge Volume High Water Level Bypass switch, 5A-S8, in the "NORMAL" position on Panel 20(30)C005A.

3.19 Verify the "SCRAM DISCH VOLUME HI WATER LEVEL SCRAM BYPASS", annunciator is clear on Panel 20(30)C205L; 210(310)C-2.

4.0 REFERENCES

4.1 BWR Discussion 5.2, RPS Scram Circuitry

4.2 M-1-S-54, RPS Elementary Diagram

4.3 E-3030, ARI Schematic

4.4 TRMS 3.1

EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2003810599 / PLOR-074P K/A: 295037EA1.05
RO: 4.2 SRO: 4.1

TASK DESCRIPTION: Isolating and Venting Scram Air Header - Unit 3 (T-214-3)

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

1. EOP Locker Key

2. T-214-3 Tool Package

C. REFERENCES

Procedure T-214-3, Rev. 6, "Isolating and Venting the Scram Air Header"

D. TASK STANDARD

1. Satisfactory task completion is indicated when the Unit 3 scram air header has been isolated and vented.

2. Estimated time to complete: 8 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform necessary steps to isolate and vent the Unit 3 scram air header using appropriate procedures. I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. A partial loss of feed flow on Unit 3 results in RPV level dropping below the scram setpoint.

2. Control Rods did NOT insert.

3. Blue scram lights on the Full Core Display are NOT lit.

4. Scram air header PI-3-03-312 on panel 30C124 reads 70 psig.

5. TRIP procedures have directed that the scram air header be depressurized.

G. INITIATING CUE

The Control Room Supervisor directs you, the Equipment Operator to perform T-214-3, "Isolating and Venting the Scram Air Header" on Unit 3.

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
*1	Obtain the key for the Emergency Operating Procedure Tool Locker. (Cue: When examinee requests EOP Tool Locker key from WCS OR examinee identifies the location of the WCS keybox and its associated key then evaluator should provide the EOP Tool Locker key.)	S	Emergency Operating Procedure Tool Locker Key requested from WCS OR examinee identifies the location of the WCS keybox and its associated key.
*2	Open Emergency Operating Procedure Tool Locker and obtain T-214 Tool Kit. (Cue: Equipment obtained.)	P	Tool Locker located on Radwaste Building El. 165' is unlocked, opened and T-214 Tool Kit located.
	****NOTE**** **When examinee locates tool kit, inform him that he now has the tools to perform the procedure. Provide the examinee with a copy of the T-200 procedure which corresponds to the tool kit that has been chosen. DO NOT allow tools to be removed from the locker. Relock the locker before leaving the area.**		
*3	Close HV-3-3-123, Instr Air Header Block Vlv to Scram Pilot Valve Header. (Cue: Valve handwheel is turned [CLOCKWISE] until stem length above valve yoke lowers 1 inch then handwheel will not turn.)	S	HV-3-3-123 handwheel is turned CLOCKWISE until resistance of valve seat is felt. (Located on RB Unit 3 135', CRD Valve Nest.)
4	Verify closed IDV-3-3-312, PS-3-03-230 + PS-3-03-229 Instrument Drain Valve. (Cue: [CLOCKWISE] Valve handwheel did not move and stem length above valve yoke did not move.)	S	IDV-3-3-312 handwheel movement is attempted in the CLOCKWISE direction.
*5	Remove the cap from IDV-3-3-312. (Cue: Pipe cap is turned [COUNTERCLOCKWISE] until cap is removed.)	S	Pipewrench from Tool Kit is placed on IDV-3-3-312 pipe cap and is turned COUNTERCLOCKWISE until pipe cap is removed from pipe.
*6	Open IDV-3-3-312. (Cue: Valve is turned [COUNTER-CLOCKWISE] until stem length above valve yoke raises ¼ inch then will not turn, flow noise can be heard as valve is opened.	S	IDV-3-3-312 is turned COUNTER-CLOCKWISE until resistance of valve backseat is felt.

STEP NO	STEP	ACT	STANDARD
7	Inform Control Room Supervisor of task completion. (Cue: Control Room Supervisor acknowledges report.)	S	Task completion reported using telephone, hand held radio, or GAI-TRONICS page system.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When the Unit 3 scram air header has been isolated and vented, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. **A partial loss of feed flow on Unit 3 results in RPV level dropping below the scram setpoint.**

2. **Control Rods did NOT insert.**

3. **Blue scram lights on the Full Core Display are NOT lit.**

4. **Scram air header PI-3-03-312 on panel 30C124 reads 70 psig.**

5. **TRIP procedures have directed that the scram air header be depressurized.**

INITIATING CUE

The Control Room Supervisor directs you, the Equipment Operator to perform T-214-3, "Isolating and Venting the Scram Air Header" on Unit 3.

Final

PECO Energy Company
Peach Bottom Unit 2

T-214-2 ISOLATING AND VENTING THE SCRAM AIR HEADER

1.0 PURPOSE

This procedure provides the instructions necessary to isolate the Instrument Air Supply to the scram air header and manually vent the air header as an alternate means of inserting control rods when a failure to scram has occurred.

2.0 PREREQUISITES

2.1 Use of this procedure has been directed by the TRIP or SAMP procedures.

2.2 One or more scram valves closed as indicated by the blue scram lights NOT lit on the full core display.

2.3 Positive pressure indication on PI-2-03-312 at 20C124 panel.

2.4 Emergency Operating Tool Locker key obtained from Shift Management.

2.5 The T-214 Tool Package from the Emergency Operating Tool Locker located in Radwaste Building 165' (near the Unit 2 Remote Shutdown Panel), which contains the following equipment:

- o One copy of T-214-2
- o Two 8 inch adjustable wrenches

3.0 AREA ACCESS/PERSONNEL REQUIREMENTS

3.1 Area Access

3.1.1 Main Control Room

3.1.2 Reactor Building 135'

3.1.3 Radwaste Building 165', EOP Tool Locker

3.2 Personnel Requirements

3.2.1 Required: 1 Equipment Operator

3.2.2 Preferred: 1 MCR Operator, 1 Equipment Operator

4.0 PERFORMANCE STEPS

> **NOTE**
>
> Draining the Scram Discharge Volume may be required to insert control rods.

4.1 Isolate the scram air header by closing HV-2-3-123, "Instr Air Header Block Vlv to Scram Pilot Valve Header," located on Reactor Building 135' elevation at CRD valve nest, against wall, and approximately 9 ft above the floor.

4.2 Verify closed IDV-2-3-312, "PS-2-03-230 + PI-2-03-229 Instrument Drain Valve," located on Reactor Building 135' elevation to the right of the CRD exhaust filters.

4.3 Remove the cap from IDV-2-3-312.

4.4 Open IDV-2-3-312.

4.5 Inform the MCR when the scram air header has been vented.

4.6 In the MCR, verify the blue scram lights lit on the full core display AND all rods fully inserted.

5.0 RETURN TO NORMAL

5.1 Close IDV-2-3-312, "PS-2-03-230 + PI-2-03-229 Instrument Drain Valve," located on Reactor Building 135' to the right of the CRD exhaust filters.

_____ _____
Performer Initials/Date I.V. Initials/Date

5.2 Install cap for IDV-2-3-312.

_____ _____
Performer Initials/Date I.V. Initials/Date

5.3 Open HV-2-3-123, "Instr Air Header Block Vlv to Scram Pilot Valve Header," located near CRD valve nest.

_____ _____
Performer Initials/Date I.V. Initials/Date

5.4 Return all keys and inform Shift Management upon completion of this procedure.

_____
Shift Management Signature/Date

6.0 REFERENCES

6.1 P&ID M-356, "Control Rod Drive Hydraulic System - Part A"

6.2 P&ID M-357, "Control Rod Drive Hydraulic System - Part B"

6.3 M-1-S-54, "Reactor Protection System"

6.4 T-101, "RPV Control"

6.5 SAMP-1, "RPV and Primary Containment Flooding"

PECO Energy Company
Peach Bottom Unit 3

T-214-3 ISOLATING AND VENTING THE SCRAM AIR HEADER

1.0 PURPOSE

This procedure provides the instructions necessary to isolate the Instrument Air Supply to the scram air header and manually vent the air header as an alternate means of inserting control rods when a failure to scram has occurred.

2.0 PREREQUISITES

2.1 Use of this procedure has been directed by the TRIP or SAMP procedures.

2.2 One or more scram valves closed as indicated by the blue scram lights NOT lit on the full core display.

2.3 Positive pressure indication on PI-3-03-312 at 30C124 panel.

2.4 Emergency Operating Tool Locker key obtained from Shift Management.

2.5 The T-214 Tool Package from the Emergency Operating Tool Locker located in Radwaste Building 165' (near the Unit 2 Remote Shutdown Panel), which contains the following equipment:

- o One copy of T-214-3
- o Two 8 inch adjustable wrenches

3.0 AREA ACCESS/PERSONNEL REQUIREMENTS

3.1 Area Access

3.1.1 Main Control Room

3.1.2 Reactor Building 135'

3.1.3 Radwaste Building 165', EOP Tool Locker

3.2 Personnel Requirements

3.2.1 Required: 1 Equipment Operator

3.2.2 Preferred: 1 MCR Operator, 1 Equipment Operator

4.0 PERFORMANCE STEPS

> **NOTE**
>
> Draining the Scram Discharge Volume may be required to insert control rods.

4.1 Isolate the scram air header by closing HV-3-3-123, "Instr Air Header Block Vlv to Scram Pilot Valve Header," located on Reactor Building 135' elevation at CRD valve nest, on wall near swing bus N310025A.

4.2 Verify closed IDV-3-3-312, "PS-3-03-230 + PI-3-03-229 Instrument Drain Valve," located on Reactor Building 135' elevation near the left corner of swing bus N310025A.

4.3 Remove the cap from IDV-3-3-312.

4.4 Open IDV-3-3-312.

4.5 Inform the MCR when the scram air header has been vented.

4.6 In the MCR, verify the blue scram lights lit on the full core display AND all rods fully inserted.

5.0 RETURN TO NORMAL

5.1 Close IDV-3-3-312, "PS-3-03-230 + PI-3-03-229 Instrument Drain Valve," located on Reactor Building 135' near the left corner of swing bus N310025A.

_____ _____
Performer Initials/Date I.V. Initials/Date

5.2 Install cap for IDV-3-3-312.

_____ _____
Performer Initials/Date I.V. Initials/Date

5.3 Open HV-3-3-123, "Instr Air Header Block Vlv to Scram Pilot Valve Header," located near CRD valve nest.

_____ _____
Performer Initials/Date I.V. Initials/Date

5.4 Return all keys and inform Shift Management upon completion of this procedure.

_____
Shift Management Signature/Date

6.0 REFERENCES

6.1 P&ID M-356, "Control Rod Drive Hydraulic System - Part A"

6.2 P&ID M-357, "Control Rod Drive Hydraulic System - Part B"

6.3 M-1-S-54, "Reactor Protection System"

6.4 T-101, "RPV Control"

6.5 SAMP-1, "RPV and Primary Containment Flooding"

EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 0201710040/ PLOR-054P K/A: 218000A2.03
URO: 3.4 SRO: 3.6

TASK DESCRIPTION: Backup Instrument Nitrogen to ADS System Startup and Operation

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

None

C. REFERENCES

Procedure SO 16A.1.A-2 Rev. 4, "Backup Instrument Nitrogen to ADS Startup and Operation".

D. TASK STANDARD

1. Satisfactory task completion is indicated when backup Instrument Nitrogen to ADS has been lined up locally.

2. Estimated time to complete: 23 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform necessary steps to line up Backup Instrument Nitrogen to the ADS relief valves using SO 16A.1.A-2, "Backup Instrument Nitrogen to ADS Startup and Operation". I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. The Prerequisites listed in SO 16A.1.A-2, "Backup Instrument Nitrogen to ADS Startup and Operation" are met.

2. COL 16A.1.A-2, "Backup Instrument Nitrogen to ADS System" has been performed.

G. INITIATING CUE

The Control Room Supervisor directs you, the Equipment Operator, to perform SO 16A.1.A-2, "Backup Instrument Nitrogen to ADS Startup and Operation" in order to lineup Backup Instrument Nitrogen to the Unit 2 ADS relief valves.

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
1	Obtain a copy of procedure SO 16A.1.A-2.	P	A copy of procedure SO 16A.1.A-2 is obtained.
	******NOTE****** **Inform the examinee the individual bottle PCV outlet pressure indicators and header pressure indicator (PI-8130) read zero psig. Individual bottle pressures indicate 2200 psig.**		
*2	Slowly open the nitrogen bottle isolation valves for 2AS377, 2BS377 and 2CS377. (Cue: Acknowledge isolation valve operation.)	S	Nitrogen bottle isolation valves 16A-23331A, 16A-23331B and 16A-23331C are slowly turned in the counterclockwise direction.
*3	Adjust nitrogen bottle 2AS377 pressure control valve to obtain ≥ 85 psig. (Cue: Acknowledge PCV operation, pressure indicator for bottle 2AS377 indicates 85 psig.)	S	PCV-2-16A-8917A handle is turned clockwise until ≥ 85 psig is obtained on bottle 2AS377 pressure indicator.
*4	Adjust nitrogen bottle 2BS377 pressure control valve to obtain ≥ 85 psig. (Cue: Acknowledge PCV operation, pressure indicator for bottle 2BS377 indicates 85 psig.)	S	PCV-2-16A-8917B handle is turned clockwise until ≥ 85 psig is obtained on bottle 2BS377 pressure indicator.
*5	Adjust nitrogen bottle 2CS377 pressure control valve to obtain ≥ 85 psig. (Cue: Acknowledge PCV operation, pressure indicator for bottle 2CS377 indicates 85 psig.)	S	PCV-2-16A-8917 C handle is turned clockwise until ≥ 85 psig is obtained on bottle 2CS377 pressure indicator.
6	Request URO to verify Backup Nitrogen is ≥ 85 psig on PI-8142. (Cue: Unit Reactor Operator acknowledges request and reports that PI-8142 indicates 85 psig.)	S	Control Room is requested via telephone, radio, or GAI-TRONICS page system to verify that backup nitrogen pressure is ≥ 85 psig on PI-8142.

STEP NO	STEP	ACT	STANDARD
7	Inform Control Room Supervisor of task completion. (Cue: Control Room Supervisor acknowledges report.)	S	Task completion reported using telephone, hand held radio, or GAI-TRONICS page system.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When the Backup Instrument Nitrogen to ADS System has been lined up locally and the URO verifies ≥ 85 psig Backup Instrument Nitrogen pressure indication, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. The Prerequisites listed in SO 16A.1.A-2, "Backup Instrument Nitrogen to ADS Startup and Operation" are met.

2. COL 16A.1.A-2, "Backup Instrument Nitrogen to ADS System" has been performed.

INITIATING CUE

The Control Room Supervisor directs you, the Equipment Operator, to perform SO 16A.1.A-2, "Backup Instrument Nitrogen to ADS Startup and Operation" in order to lineup Backup Instrument Nitrogen to the Unit 2 ADS relief valves.

Final

PECO Energy Company
Peach Bottom Unit 3

SO 16A.1.A-3 BACKUP INSTRUMENT NITROGEN TO ADS STARTUP AND OPERATION

1.0 PURPOSE

This procedure provides the instructions necessary to align the Backup Instrument Nitrogen To ADS System to provide a backup supply of nitrogen for operation of the ADS relief valves.

2.0 PREREQUISITES

2.1 Vital 120 VAC System available in accordance with SO 8A.1.A-3, "Vital 120 VAC System Normal Operation".

3.0 PRECAUTIONS

3.1 WHEN operating equipment, IF it does NOT perform as expected, THEN place the equipment in a safe condition AND inform Shift Management.

3.2 Nitrogen bottle pressure shall be maintained greater than 1300 psig.

3.3 Opening a nitrogen bottle valve without its respective pressure control valve fully counterclockwise, could result in pressure control valve failure.

4.0 PERFORMANCE STEPS

> NOTE
>
> Communications shall be available between the Control Room AND Personnel performing procedures elsewhere in the plant to coordinate the operation of equipment that affects Control Room instrumentation OR alarms.

4.1 Perform COL 16A.1.A-3, "Backup Instrument Nitrogen to ADS System", as directed by Shift Management.

4.2 Slowly open the applicable nitrogen bottle 3A(B,C)S377 isolation valve.

4.3 Adjust the following nitrogen bottle pressure control valves to obtain ≥ 85 psig on the individual nitrogen bottle pressure indicators:

N2 Bottle	Pressure Control Valve
3AS377	PCV-3-16A-9917A, "Nitrogen Pressure Control Valve for Backup Supply to ADS"

3BS377	PCV-3-16A-9917B, "Nitrogen Pressure Control Valve for Backup Supply to ADS"
3CS377	PCV-3-16A-9917C, "Nitrogen Pressure Control Valve for Backup Supply to ADS"

4.4 Request the RO to verify ≥ 85 psig as indicated on PI-9142, "Backup N2", at Panel 30C003-03, "Containment Atmosphere".

> NOTE
>
> IF piping downstream of SV-9130A & B is depressurized, THEN SV-9130A & B will close on a high nitrogen flow isolation upon opening.

4.5 Place SV-9130A, "A Supply", AND SV-9130B, "B Supply", control switches on Panel 30C003-03 in "OPEN" AND verify the valves remain open.

4.6 IF SV-9130A & B do NOT remain open, THEN place SV-9130A & B control switches in "CLOSE" AND proceed to AO 16A.1-3, "Post Maintenance Filling of the Backup Instrument Nitrogen to ADS System".

4.7 Place SV-9130A & B control switches in "CLOSE".

5.0 CONTROL STATIONS

5.1 MCR 30C003-03, Containment Atmosphere panel

6.0 REFERENCES

6.1 P&ID M-333, Instrument Nitrogen

6.2 E-2357, Post Accident Monitoring System

6.3 M-1-S-23, Primary Containment Isolation System

6.4 E-28, Instrumentation & Uninterruptible AC System Unit 2 & Common

6.5 SO 58A.1.A-3, "Vital 120 VAC System Normal Operation"

7.0 TECHNICAL SPECIFICATIONS

7.1 Section 3.5.1

8.0 INTERFACING PROCEDURES

8.1 COL 16A.1.A-3, "Backup Instrument Nitrogen to ADS System"

8.2 AO 16A.1-3, "Post Maintenance Filling of the Backup Instrument Nitrogen to ADS System"

PECO Energy Company
Peach Bottom Unit 2

SO 16A.1.A-2 BACKUP INSTRUMENT NITROGEN TO ADS STARTUP AND OPERATION

1.0 PURPOSE

This procedure provides the instructions necessary to align the Backup Instrument Nitrogen To ADS System to provide a backup supply of nitrogen for operation of the ADS relief valves.

2.0 PREREQUISITES

2.1 Vital 120 VAC System available in accordance with SO 58A.1.A-2, "Vital 120 VAC System Normal Operation".

3.0 PRECAUTIONS

3.1 WHEN operating equipment, IF it does NOT perform as expected, THEN place the equipment in a safe condition AND inform Shift Management.

3.2 Nitrogen bottle pressure shall be maintained greater than 1300 psig.

3.3 Opening a nitrogen bottle valve without its respective pressure control valve fully counterclockwise, could result in pressure control valve failure.

4.0 PERFORMANCE STEPS

> NOTE
>
> Communications shall be available between the Control Room AND Personnel performing procedures elsewhere in the plant to coordinate the operation of equipment that affects Control Room instrumentation OR alarms.

4.1 Perform COL 16A.1.A-2, "Backup Instrument Nitrogen to ADS System", as directed by Shift Management.

4.2 Slowly open the applicable nitrogen bottle 2A(B,C)S377 isolation valve.

4.3 Adjust the following nitrogen bottle pressure control valves to obtain ≥ 85 psig on the individual nitrogen bottle pressure indicators:

N2 Bottle	Pressure Control Valve
2AS377	PCV 2-16A-8917A, "Nitrogen Pressure Control Valve for Backup Supply to ADS"

2BS377 PCV 2-16A-8917B, "Nitrogen Pressure Control Valve for Backup Supply to ADS"

2CS377 PCV 2-16A-8917C, "Nitrogen Pressure Control Valve for Backup Supply to ADS"

4.4 Request the RO to verify ≥ 85 psig as indicated on PI-8142, "Backup N2", at Panel 20C003-03, "Containment Atmosphere".

> NOTE
>
> IF piping downstream of SV-8130A & B is depressurized, THEN SV-8130A & B will close on a high nitrogen flow isolation upon opening.

4.5 Place SV-8130A, "A Supply", AND SV-8130B, "B Supply", control switches on Panel 20C003-03 in "OPEN", AND verify the valves remain open.

4.6 IF SV-8130A & B do NOT remain open, THEN place SV-8130A & B control switches in "CLOSE" AND proceed to AO 16A.1-2, "Post Maintenance Filling of the Backup Instrument Nitrogen to ADS System".

4.7 Place SV-8130A & B control switches in "CLOSE".

5.0 CONTROL STATIONS

5.1 MCR 20C003-03, Containment Atmosphere panel

6.0 REFERENCES

6.1 P&ID M-333, Instrument Nitrogen

6.2 E-2357, Post Accident Monitoring System

6.3 M-1-S-23, Primary Containment Isolation System

6.4 E-28, Instrumentation & Uninterruptible AC System Unit 2 & Common

6.5 SO 58A.1.A-2, "Vital 120 VAC System Normal Operation"

7.0 TECHNICAL SPECIFICATIONS

7.1 Section 3.5.1

8.0 INTERFACING PROCEDURES

8.1 COL 16A.1.A-2, "Backup Instrument Nitrogen to ADS System"

8.2 AO 16A.1-2, "Post Maintenance Filling of the Backup Instrument Nitrogen to ADS System"

EXELON NUCLEAR
PEACH BOTTOM ATOMIC POWER STATION
JOB PERFORMANCE MEASURE

POSITION TITLE: Unit Reactor Operator/Senior Reactor Operator

TASK-JPM DESIGNATOR: 2390110401 / PLOR-312PA K/A: 2.1.20

URO: 4.3 SRO: 4.2

TASK DESCRIPTION: Closing a Stuck Open MSIV - Alternate Path (Unit 2)

A. NOTES TO EVALUATOR:

1. An asterisk (*) before the step number denotes a CRITICAL STEP. CRITICAL STEPS are those steps which when not performed correctly will prevent the system from functioning properly or prevent successful task completion.

2. System cues included in the performance checklist are to be provided to the examinee when no system response is available.

3. JPM Performance

   a. "Control Room" JPMs are designed to be performed in the simulator. If a "Control Room" JPM is to be performed in the Control Room all perform steps (P) shall be simulated (S).

   b. When performing "In-Plant" JPMs, no equipment will be operated without Shift Management approval.

4. Satisfactory performance of this JPM is accomplished if:

   a. The task standard is met.

   b. JPM completion time requirement is met.

      1) For non-time critical JPMs, completion within double the estimated time (listed in paragraph D.2) is acceptable provided the evaluator determines that the progress to completion is acceptable.

      2) For time critical JPMs, completion within the estimated time (listed in paragraph D.2) is required.

5. The estimated time to complete this JPM, though listed in the task standard, is not to be given to the examinee.

B. TOOLS AND EQUIPMENT

Fuse Pullers

C. REFERENCES

AO 1A.2-2, Rev. 5, "Closing a Stuck Open Outboard Main Steam Isolation Valve"

D. TASK STANDARD

1. Satisfactory task completion is indicated when the Unit 2 Reactor Building 135' Elevation Instrument Air header has been vented.

2. Estimated time to complete: 22 minutes Non-Time Critical

E. DIRECTIONS TO EXAMINEE

When given the initiating cue, perform necessary steps to close the stuck open outboard MSIVs using AO 1A.2-3, "Closing a Stuck Open Outboard MSIV". I will describe initial plant conditions and provide you access to the materials required to complete this task.

F. TASK CONDITIONS/PREREQUISITES

1. Unit 2 has just been manually scrammed.

2. RPV level is -175 inches.

3. All outboard MSIVs failed to isolate.

4. Radiological conditions do NOT allow entry into the Outboard MSIV Room.

5. Proper operation of SGIG system has been verified in accordance with SO 16B.8.A-3, "Backup Seismic Instrument Nitrogen Routine Inspection".

G. INITIATING CUE

The Control Room Supervisor directs you to close the Unit 2 outboard MSIVs in accordance with AO 1A.2-2, "Closing a Stuck Open Outboard MSIV", beginning with step 4.1.

H. PERFORMANCE CHECKLIST

STEP NO	STEP	ACT	STANDARD
1	Obtain a copy of procedure AO 1A.2-2.	P	A copy of procedure AO 1A.2-2 is obtained.
	**** NOTE **** Examinee should utilize sections 4.1 AND 4.3 of AO 1A.2-2.		
2	Open panel 20C042 front panel doors. (Cue: Panel 20C042 doors are open.)	P	Door handle turned, doors pulled outward to gain access to the outboard MSIV AC and DC solenoid valve fuses at the front of panel 20C042 in the Cable Spreading Room.
3	Pull the outboard MSIV AC solenoid valve fuse 16A-F12B. (Cue: Fuse is removed.)	S	Fuse puller is attached to outboard MSIV AC solenoid valve fuse 16A-F12B fuse if pulled outward until fuse is free of fuse holder.
4	Request the Unit Reactor Operator to monitor outboard MSIV position indication. (Cue: Outboard MSIVs are open.)	S	Unit Reactor Operator is contacted to monitor outboard MSIV position indication.
5	Pull the outboard MSIV DC solenoid valve fuse 16A-F11B. (Cue: Fuse is removed.)	S	Fuse puller is attached to outboard MSIV DC solenoid valve fuse 16A-F11B. Fuse is pulled outward until fuse is free of fuse holder.
6	Request the Unit Reactor Operator to monitor Main Steam line flow using FI-2-06-088A,B,C,D on panel 20C008A. (Cue: Main Steam line FI-2-06-088A,B,C,D are NOT reading downscale. Position indication for all outboard MSIVs has been lost.)	S	Unit Reactor Operator is contacted to monitor Main Steam line flow on FI-2-06-088A,B,C,D at panel 20C008A.
7	Install fuse 16A-F11B. (Cue: Fuse is installed.)	S	Fuse puller is attached to outboard MSIV DC solenoid valve fuse 16A-F11B. Fuse is inserted until fuse is installed in fuse holder.
8	Close panel 20C042 front panel doors. (Cue: Panel 20C042 doors are closed.)	P	Door closed and relatched using handle.

STEP NO	STEP	ACT	STANDARD
9	Request the Unit Reactor Operator to verify RWCU isolation. (Cue: RWCU is isolated.)	S	Unit Reactor Operator is contacted to verify RWCU isolation.
10	Direct the Unit Reactor Operator to open Backup N_2 to ADS valves SV-8130A(B) in accordance with SO 16A.7.A-2. (Cue: SV-8130A(B) are open.)	S	Unit Reactor Operator is contacted to verify Backup N_2 to ADS valves SV-8130A(B) in accordance with SO 16A.7.A-2.
*11	Close Instrument Air A(B) Header Isolation valves HV-2-36B-46981A AND HV-2-36B-46981B. (Cue: The valve handwheels have been turned clockwise until they will turn no further.)	S	HV-2-36B-46981A and HV-2-36-46981B handwheels turned clockwise until the resistance of the valve seats are felt at the 2A Recirc MG Set area.
12	Verify open Instrument Air Supply to DT-4695 Inlet Block valves HV-2-36B-44642 and HV-2-36B-44643. (Cue: The valve handwheels are turned slightly in the clockwise direction and then turned counterclockwise to their original position.	S	HV-2-36B-44642 and HV-2-36B-44643 handwheels are turned slightly in the clockwise direction and then turned counterclockwise to their original position at the 2B Recirc MG Set area.
13	Notify MCR that venting is commencing AND to perform more frequent monitoring of MSIV position.	S	URO contacted to monitor MSIV position.
*14	Simultaneously press and hold Drain Trap Bypass switches HS-2-36B-4695 AND HS-2-36B-4696. (Cue: HS-2-36B-4695 AND HS-2-36B-4696 are simultaneously depressed and held.)	S	Drain Trap Bypass pushbuttons HS-2-36B-4695 AND HS-2-36B-4696 are simultaneously depressed and held at the 2B Recirc MG Set area.

STEP NO	STEP	ACT	STANDARD
15	When contacted by the Unit Reactor Operator that the MSIVs are closed, the switches are released. (Cue: All outboard MSIVs indicated closed. Main Steam line flow indicators are downscale. The drain trap pushbuttons are released.)	S	Upon receiving report that the outboard MSIVs are closed, the drain trap pushbuttons are released.
16	Inform Control Room of task completion. (Cue: Control Room acknowledges report. Outboard MSIVs are closed.)	S	Task completion reported using telephone, hand held radio or GAI-TRONICS page system.

Under "ACT" P - must perform
S - must simulate

I. TERMINATING CUE

When the Unit 2 outboard MSIVs are closed, the Control Room Supervisor should be informed. The evaluator will then terminate the exercise.

TASK CONDITIONS/PREREQUISITES

1. Unit 2 has just been manually scrammed.

2. RPV level is -175 inches.

3. All outboard MSIVs failed to isolate.

4. Radiological conditions do NOT allow entry into the Outboard MSIV Room.

5. Proper operation of SGIG system has been verified in accordance with SO 16B.8.A-3, "Backup Seismic Instrument Nitrogen Routine Inspection".

INITIATING CUE

The Control Room Supervisor directs you to close the Unit 2 outboard MSIVs in accordance with AO 1A.2-2, "Closing a Stuck Open Outboard MSIV", beginning with step 4.1.

PECO Energy Company
Peach Bottom Unit 2

AO 1A.2-2 CLOSING A STUCK OPEN OUTBOARD MAIN STEAM ISOLATION VALVE

1.0 PURPOSE

This procedure provides the instructions necessary for closing a stuck open outboard Main Steam Isolation Valve (MSIV) following a Group I isolation.

2.0 PREREQUISITES

2.1 Shift Management's permission to perform this procedure.

2.2 Group I isolation signal OR plant conditions warranting isolation of the main steam lines present.

2.3 Mode switch in shutdown.

3.0 PRECAUTIONS

3.1 During performance of this procedure, the Instrument Air Header for Unit 2 Reactor Building elevation 135' may be vented. Attachment 1 provides a list of equipment that will be effected. Reference ON-119, "Loss of Instrument Air", for effect on plant and operator response.

3.2 IF stuck open MSIV CLOSES during performance of this procedure, THEN place equipment in a safe condition AND inform Shift Management.

4.0 PERFORMANCE STEPS

NOTES

1. Communication should be established between the Control Room AND personnel performing procedures elsewhere in the plant to coordinate the operation of equipment that affects Control Room instrumentation OR alarms.

2. Section 4.1: Attempts to close the stuck open MSIV by removing power to the control logic. This section is preferred to section 4.2 or 4.3.

3. Section 4.2: Attempts to close the stuck open MSIV by removing air to the Outboard MSIV header. This section is only used as radiological conditions permit.

4. Section 4.3: Attempts to close the stuck open MSIV by removing air to the 135' Rx Bldg header.

4.1 Perform steps 4.1.1 through 4.1.5 to remove power to the outboard MSIV (AO-2-01A-086A(B,C,D) AC and DC solenoid valves.

4.1.1 Direct an operator to remove power to the outboard MSIV AC solenoid valves by removing fuse 16A-F12B in panel 20C042.

4.1.2 Monitor outboard MSIV position indication to determine if stuck open MSIV has closed.

NOTE

Removing DC power from the MSIV control logic will result in loss of position indication for all outboard MSIVs. MSIV closure shall be verified by observing main steam line flow.

4.1.3 Direct an operator to remove power to the outboard MSIV DC solenoid valves by removing fuse 16A-F11B in panel 20C042.

4.1.4 Monitor main steam line flow using FI-2-06-088A(B,C,D) on 20C008A to determine if stuck open MSIV has closed.

4.1.5 IF MSIV does not indicate closed THEN direct an operator to resore power to the outboard MSIV DC solenoid valves and valve indication lights by installing fuse 16A-F11B in panel 20C042.

NOTE

Section 4.2 shall only be used if radiological conditions permit access to the Unit 2 OBMSIV room.

4.2 IF radiological conditions permit access to the Unit 2 OBMSIV room, THEN perform steps 4.2.1 through 4.2.4 to remove instrument air to the Outboard MSIV header, otherwise go to section 4.3.

<AT R2-30, OUTBOARD MSIV ROOM>

4.2.1 Close HV-2-36B-46913A, "Instr Air A Hdr Isol Valve for Outboard MSIV Room".

4.2.2 Close HV-2-36B-46913B, "Instr Air B Hdr Isol Valve for Outboard MSIV Room".

4.2.3 Uncap and Open HV-2-36B-46919A, "Instr Air A Hdr Isol Valve for Future Header Extension".

4.2.4 Uncap and Open HV-2-36B-46919B, "Instr Air B Hdr Isol Valve for Future Header Extension".

****
* CAUTION *
*
* Venting the MSIV headers will impact the ability to *
* reset the Scram per T-216-2. *
****

4.3 Perform steps 4.3.1 through 4.3.6 to remove instrument air to the Unit 2 Reactor Building elevation 135' header.

NOTE

The following major equipment will be lost due to isolation and venting of the Instrument Air Header for Unit 2 Reactor Building elevation 135':

- Instrument Air Backup to Instrument Nitrogen
- Drywell Instrument Nitrogen supply header
- RBCCW to RWCU Non-Regen Hx and Pump Seal Coolers
- Instrument Air supply to the large Primary Containment Ventilation Isolation Valves
- Control Rod Drive Hydraulic System Flow

Attachment 1 contains more detail on effected equipment

4.3.1 Isolate/Verify Isolation of Reactor Water Cleanup System.

4.3.2 Open SV-2-16A-8130A(B), "Backup Nitrogen to ADS A(B) Supply" in accordance with SO 16A.7.A-2, "Backup Instrument Nitrogen to ADS System Manual Actuation".

4.3.3 Verify proper operation of SGIG system in accordance with SO 16B.8.A-2, "Backup Seismic Instrument Nitrogen System Routine Inspection".

4.3.4 Direct an operator to vent the Instrument Air Header to Unit 2 Reactor Building elevation 135.

<AT T2-68, B RECIRC PUMP MG SET>

4.3.4.1 Close HV-2-36B-46981A, "Instr Air A Hdr Isol Valve for U/2 Rx Bldg El 135".

4.3.4.2 Close HV-2-36B-46981B, "Instr Air B Hdr Isol Valve for U/2 Rx Bldg El 135".

4.3.4.3 Verify open HV-2-36B-44642, "I/A Supply to Rx Bldg 135 DT-4695 Inlet Block Valve".

4.3.4.4 Verify open HV-2-36B-44643, "I/A Supply to Rx Bldg 135 DT-4696 Inlet Block Valve".

4.3.4.5 Notify Control Room that venting is commencing AND to perform more frequent monitoring of MSIV position.

```
*************************************************************
*                        CAUTION                            *
*                                                           *
*     Venting the MSIV headers will take a considerable amount *
*     of time due to check valves downstream of the vent path  *
*     being used.                                           *
*************************************************************
```

4.3.4.6 Simultaneously Press and Hold HS-2-36B-4695, "By-Pass Hand Switch for Drain Trap DT-4695" and HS-2-36B-4696, "By-Pass Hand Switch for Drain Trap DT-4696".

4.3.5 Monitor outboard MSIV position indication and Main Steam Line Flow to determine if stuck open MSIV has closed.

4.3.6 WHEN all outboard MSIVs indicate closed, THEN direct operator to release HS-2-36B-4695 and HS-2-36B-4696.

NOTE
All restoration steps require Double/Independent Verification. Signoffs for restoration steps are in Attachment 2.

4.4 WHEN restoration is desired, THEN perform the following in conjunction with Attachment 2:

4.4.1 Obtain Shift Management permission to perform restoration.

4.4.2 Obtain Unit 2 Reactor Operator permission to perform restoration.

4.4.3 IF Section 4.3 was performed, THEN perform steps 4.4.3.1 through 4.4.3.4 to restore instrument air to the Unit 2 Reactor Building elevation 135' header, OTHERWISE proceed to step 4.4.4.

<AT T2-68, B RECIRC PUMP MG SET>

4.4.3.1 Open HV-2-36B-46981A, "Inst Air A Hdr Isol Valve for U/2 Rx Bldg El 135".

4.4.3.2 Open HV-2-36B-46981B, "Inst Air B Hdr Isol Valve for U/2 Rx Bldg El 135".

4.4.3.3 Restore the Instrument Nitrogen system in accordance with SO 16.7.A-2 as directed by Shift Management.

4.4.3.4 Place Reactor Water Cleanup System in service in accordance with SO 12.1.A-2 as directed by Shift Management.

4.4.4 IF Section 4.2 was performed, THEN perform steps 4.4.4.1 through 4.4.4.4 to restore instrument air to the Outboard MSIV header, OTHERWISE proceed to step 4.4.5.

<AT R2-30, OUTBOARD MSIV ROOM>

4.4.4.1 Close AND Cap HV-2-36B-46919A, "Instr Air A Hdr Isol Valve for Future Header Extension".

4.4.4.2 Close AND Cap HV-2-36B-46919B, "Instr Air B Hdr Isol Valve for Future Header Extension".

4.4.4.3 Open HV-2-36B-46913A, "Instr Air A Hdr Isol Valve for Outboard MSIV Room".

4.4.4.4 Open HV-2-36B-46913B, "Instr Air B Hdr Isol Valve for Outboard MSIV Room ".

4.4.5 IF Section 4.1 was performed, THEN perform steps 4.4.5.1 AND 4.4.5.2 to restore power to the Outboard MSIV (AO-2-01A-086A(B,C,D) AC and DC solenoid valves.

4.4.5.1 Install (OR Verify installed) fuse 16A-F11B in panel 20C042.

4.4.5.2 Install fuse 16A-F12B in panel 20C042.

5.0 CONTROL STATIONS

5.1 20C003-01

5.2 20C005A

5.3 20C008

6.0 REFERENCES

6.1 M-351, Sheet 1 and 2

6.2 M-320, Sheet 15

6.3 M-1-S-23, Sheet 11

7.0 TECHNICAL SPECIFICATION

7.1 Section 3.6.1.3, 3.6.1.5, 3.6.3.1

8.0 INTERFACING PROCEDURES

8.1 ON-119, "Loss of Instrument Air"

8.2 SO 12.1.A-2, "Reactor Water Cleanup System Startup For Normal Operations Or Reactor Vessel Level Control"

8.3 SO 16.7.A-2, "Instrument Nitrogen System Restoration Following Primary Containment Isolation"

8.4 SO 16A.7.A-2, "Backup Instrument Nitrogen to ADS System Manual Actuation"

8.5 SO 16B.8.A-2, "Backup Seismic Instrument Nitrogen System Routine Inspection"

ATTACHMENT 1

EQUIPMENT EFFECTED BY LOSS OF INSTRUMENT AIR HEADER 135 RX BLDG

VALVE	DESCRIPTION	NORMAL POSITION	FAILURE MODE
AO-2-01A-086A	A Main Steam Line Outboard Isolation Valve	OPEN	CLOSED
AO-2-01A-086B	B Main Steam Line Outboard Isolation Valve	OPEN	CLOSED
AO-2-01A-086C	C Main Steam Line Outboard Isolation Valve	OPEN	CLOSED
AO-2-01A-086D	D Main Steam Line Outboard Isolation Valve	OPEN	CLOSED
TIC-2535A(B)	M/G Lube Oil Cooler Outlet Temp	THROTTLED	OPEN
AO-2-03-019A	Control Rod Hydraulic System Flow Control A	OPEN	CLOSED
AO-2-03-019B	Control Rod Hydraulic System Flow Control B	OPEN	CLOSED
CV-2-07B-2515	N2 Purge to Drywell and Torus	CLOSED	CLOSED
AO-2-07B-2519	Drywell and Torus Inlet N2 Purge Isol Valve	CLOSED	CLOSED
AO-2-07B-2523	Drywell + Torus N2 Make-up Inlet Isol Valve	CLOSED	CLOSED
AO-2-07B-2521A	Torus Air Purge Outboard Isolation Valve	CLOSED	CLOSED
AO-2-07B-2521B	Torus Air and N2 Purge Outboard Isol Valve	CLOSED	CLOSED
AO-2-07B-2520	Drywell Air and Nitrogen Purge Isol Valve	CLOSED	CLOSED
AO-2-07B-2505	Drywell Air Purge Inlet Isolation Valve	CLOSED	CLOSED
AO-2-13-022	RCIC Discharge Check Valve	N/A	N/A
AO-2-16-2969A(B)	A(B) DW Inst N2 Hdr Isol Valve to A(B) Hdr	OPEN	CLOSED
AO-2-23-018	HPCI Discharge Check Valve	N/A	N/A
AO-2-23C-480707	HPCI Turbine Heatup Bypass Valve	CLOSED	CLOSED
AO-2-35-8154A	RBCW Backup to DWCW Clrs Inlet Vv B Loop	CLOSED	OPEN
AO-2-35-8154B	RBCW Backup from DWCW Clrs Outlet Vv B Loop	CLOSED	OPEN
AO-2-35-8155A	RBCW Backup to DWCW Clrs Inlet Vv A Loop	CLOSED	OPEN
AO-2-35-8155B	RBCW Backup from DWCW Clrs Outlet Vv A Loop	CLOSED	OPEN
AO-2-35-2253	RBCW Isol to Non Regen Hx + Pp Seal Clrs	OPEN	CLOSED
AO-2-36B-4230A(B)	Instrument Air Backup to A(B) Inst N2 Hdr	CLOSED	CLOSED
	Backup Inst Air to DW Inst N2 Hdr A(B)	N/A	N/A
	TIP Drive Mechanisms	N/A	N/A

ATTACHMENT 2

RESTORATION VERIFICATION

This attachment provides signoffs of procedure steps AND shall be forwarded to Nuclear Records Management System at the completion of this procedure.

4.4.1 Shift Management permission to perform restoration.

_____
Shift Management/Date/Time

4.4.2 Unit 2 Reactor Operator permission to perform restoration.

_____
Unit 2 Reactor Operator/Date/Time

4.4.3.1 Open HV-2-36B-46981A. _____

_____
IV

4.4.3.2 Open HV-2-36B-46981B. _____

_____
IV

4.4.3.3 Instrument Nitrogen system restored in accordance with SO 16.7.A-2 as directed by Shift Management (N/A if NOT performed). _____

_____
IV

4.4.3.4 Reactor Water Cleanup system restored in accordance with SO 12.1.A-2 as directed by Shift Management (N/A if NOT performed). _____

_____
IV

4.4.4.1 Close AND Cap HV-2-36B-46919A. _____

_____
IV

4.4.4.2 Close AND Cap HV-2-36B-46919B. _____

_____
IV

4.4.4.3 Open HV-2-36B-46913A. _____

_____
IV

ATTACHMENT 2 (Continued)

4.4.4.4 Open HV-2-36B-46913B. _____

_____ IV

4.4.5.1 Install (OR Verify installed) fuse 16A-F11B in panel 20C042. _____

_____ IV

4.4.5.2 Install fuse 16A-F12B in panel 20C042. _____

_____ IV