

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 64.OP.004.103 0 11/18/02 202002 A2.05 3.8/4.0
Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Reset Recirculation Pump Limiter #2 Runback IAW ON-164-002

Completed By:

Reviews:

Rich Chin
Writer

11/18/02
Date

Rich C. Chin 11-19-02
Instructor/Writer Date

Approval:

[Signature]
Requesting Supv./C.A. Head

11-19-02
Date

[Signature] 11-19-02
Nuclear Training Supv. Date

Date of Performance:

_____ 20 Min _____
Allowed Time (Min) Time Taken (Min)

JPM Performed By:

_____ _____ _____ _____
Last First M.I. Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

_____ _____
Signature Typed or Printed

Comments:

**REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 64.OP.004.103**

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.
- B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection safety shoes, hardhats, etc; is required and/or posted as being necessary.
- C. If in the judgement of the evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved

II. REFERENCES

ON-164-002, Loss Of Reactor Recirculation Flow

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

36 Reset recirc pump runback

IV. TASK CONDITIONS

- A. The plant is in Mode 1.
- B. Rods 18-23, 18-39, 42-23, and 42-39, are fully inserted to support HCU maintenance on Rod 18-23
- B. A trip of CWP 1D has caused a Reactor Recirculation runback to occur.
- C. NO Operator actions have been taken.

V. INITIATING CUE

Reset recirculation pump runback in accordance with appropriate Off Normal procedure.

PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 64.OP.004.103

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p>Evaluator:</p> <ul style="list-style-type: none"> The FAULTED step in this JPM is preceded by a fault statement in BOLD TYPE WITH ALL CAPITAL LETTERS. This JPM must be performed in the simulator. Select IC 20 Both Units at 100%. FULLY INSERT THE FOLLOWING RODS: Rods 18-23, 18-39, 42-23, and 42-39 Allow plant to stabilize Insert the following preference file: RESTOREPREF YPP.JPM95-3 DEPRESS PB-1 TRG E1 RRE.1S12BRST PB-2 TRG E1 = IMF CN03:SYB311R621B 100 When ready, place simulator in RUN. Trip (electrical fault) 1D circ water pump. IMF CW142002D 500 0 100 Ensure Reactor Recirc Pump B Limiter #2 runback has occurred prior to start of the JPM, Silence all alarms and allow plant to stabilize. <p>(DO NOT PERFORM ANY OPERATOR ACTIONS)</p>			

*Critical Step

#Critical Sequence

STCP-QA-125B

Rev. 2 (9/93)

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 64.OP.004.103

Student Name: _____

Step	Action	Standard	Eval	Comments
1	Obtain a controlled copy of ON-164-002, Loss Of Reactor Recirculation Flow	Controlled copy obtained.		
1a.	Record date and time of event.	Records date and time of event		
2	Selects the correct section to perform	Selects section 3.4		
3	Plot position on Power/Flow Map, Form NDAP-QA-0338-10.	Plots Power to flow and determines NOT to be in Region 1 or 2		
4	Perform appropriate action specified on Power/Flow Map.	Determines NO action required for current region		
5	Determine which limiter initiated runback:	<p>Verifies:</p> <p>RX RECIRC LIMITER 1 RUNBK RESET HS-B31-1S15A(B) pushbutton Green light NOT LIT</p> <p>Limiter (#2) LOSS OF FW PP RUNBK RESET HS-B31-1S12A(B) pushbutton Green lights LIT</p>		

*Critical Step

#Critical Sequence

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Appl. To/JPM No.: S/RO 64.OP.004.103

Student Name: _____

Step	Action	Standard	Eval	Comments
6	Ensure both pumps have run back to value associated with controlling limiter.	Verifies: Reactor Recirc Pump A SY-B31-1R621A controller AND Reactor Recirc Pump B SY-B31-1R621B controller approximately 45%		
7	Monitor neutron instrumentation for indication of core instability. IF required, Perform ON-178-002, Core Flux Oscillations.	Select a Control Rod and monitors for LPRM/APRM oscillations and determines they are stable and ON-178-002 is NOT required.		
8	On 1C600, Monitor the following: Main Steam Line Radiation Monitor, RR-D12-1R603. Offgas Pretreatment Log Radiation Monitor, RR-D12-1R601. <u>Evaluator:</u> If questioned about Rad Monitor readings, inform student that the radiation level were at their 100% reactor power values and have now lowered and stabilized at the values indicated.	Checks: Main Steam Line Radiation Monitor, RR-D12-1R603. AND Offgas Pretreatment Log Radiation Monitor, RR-D12-1R601.		

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Student Name: _____

Step	Action	Standard	Eval	Comments
9	IF Main Steam Line Radiation Monitor or Offgas Pretreatment Log Radiation Monitor increases, Direct Chemistry to sample per CH-ON-003.	Determines Radiation Monitor, RR-D12-1R603. AND Offgas Pretreatment Log Radiation Monitor, RR-D12-1R601. NORMAL for this power level.		
10	Observe following plant parameters WITHIN LIMITS corresponding to new power level: a. Power to flow limits b. Condenser vacuum c. Feedwater flow/steam flow d. RPV water level	Checks: Power to flow limits Condenser vacuum Feedwater flow/steam flow RPV water level And determines WITHIN LIMITS for the new power level		
11	Determine signal that initiated runback <u>Evaluator:</u> CWP 1D trip was given in initial conditions	Determines: Limiter #2 (45%) runback initiated by Circulating Water Pump 1D protective trip		
12	Ensure REACTOR RECIRC PUMP A(B) SPEEDS SY-B31-1R621A(B) IN MANUAL.	Checks: the amber M (manual) lights on both of the following are LIT Reactor Recirc Pump A SY-B31-1R621A Reactor Recirc Pump B SY-B31-1R621B		

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 64.OP.004.103

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p><u>Evaluator:</u> If necessary provide student with INITIAL recirc pump RPM: (available from monitored parameters) A: 756 RPM \pm 2 RPM B: 756 RPM \pm 2 RPM</p>			
*13	<p>Ensure GEN 1A(1B) DEMAND adjusted such that GEN 1A(1B) SPEED decreases when controller DEMAND is decreased.</p> <p><u>Evaluator:</u> If necessary provide student with recirc pump RPM: (available from monitored parameters) A: 750 RPM and slowly dropping B: 750 RPM and slowly dropping</p> <p>Student may observe loop flow to confirm control</p>	Depresses the DEC pushbuttons on Reactor Recirc Pump A(B) SY-B31-1R621A(B) controller until Gen 1A(B) Demand XI-14032A(B) and Gen 1A(B) Speed SI-14032A(B) start to decrease.		
*14	Depress RECIRC A LOSS OF FW PP RUNBK RESET HS-B31-1S12A pushbutton.	Depresses the Recirc A Loss of FW PP Runback Reset HS-B31-1S12A pushbutton.		
15	Monitor GEN 1A SPEED SI-14032A.	Checks Gen 1A Speed SI-14032A. and determines speed is stable		
16	Observe Green light above RECIRC A LOSS OF FW PP RUNBK RESET HS-B31-1S12A pushbutton EXTINGUISHED.	Verifies: RECIRC A LOSS OF FW PP RUNBK RESET HS-B31-1S12A Pushbutton green light NOT LIT		

*Critical Step

#Critical Sequence

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Appl. To/JPM No.: S/RO 64.OP.004.103

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p><u>Evaluator</u> If minor speed oscillations occur, acknowledge student concerns and direct student to continue with FW PP Runback Resets. Speed oscillations will be addressed subsequent to the reset.</p> <p><u>FAULT STATEMENT: RRP B WILL EXPERIENCE AN UNCONTROLLED SPEED INCREASE AFTER THE STUDENT HAS RESET THE RUNBACK.</u></p>			
*17	Depress RECIRC B LOSS OF FW PP RUNBK RESET HS-B31-1S12B pushbutton.	Depresses the Recirc B Loss of FW PP Runback Reset HS-B31-1S12B pushbutton.		
18	Monitor GEN 1B SPEED SI-14032B.	Checks Gen 1B Speed SI-14032B and Determines RRP B speed is increasing .		
*19	Trip scoop tube on affected generator by depressing SCOOP TUBE B LOCK OR RESET HS-B31-1S03B TRIP pushbutton.	Depresses the SCOOP TUBE B LOCK OR RESET HS-B31-1S03B Trip pushbutton.		
20	Observe Green light above RECIRC B LOSS OF FW PP RUNBK RESET HS-B31-1S12B pushbutton EXTINGUISHED.	Verifies: RECIRC B LOSS OF FW PP RUNBK RESET HS-B31-1S12B Pushbutton green light NOT LIT		

*Critical Step

#Critical Sequence

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Student Name: _____

Step	Action	Standard	Eval	Comments
21	Check RECIRC A(B) FLOW LIMIT RUNBACK annunciator CLEARED.	Verifies: RECIRC A(B) FLOW LIMIT RUNBACK annunciator SLOW FLASHES		
22	Notify Reactor Engineering. <u>Evaluator:</u> Acknowledge notification	States requirement to Notify Reactor Engineering		

*Critical Step

#Critical Sequence

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TASK CONDITIONS:

- A. The plant is in Mode 1.
- B. Rods 18-23, 18-39, 42-23, and 42-39, are fully inserted to support HCU maintenance on Rod 18-23
- C. A trip of CWP 1D has caused a Reactor Recirculation runback to occur.
- D. NO Operator actions have been taken.

INITIATING CUE:

Reset recirculation pump runback in accordance with appropriate Off Normal procedure.

TASK CONDITIONS:

- A. The plant is in Mode 1.
- B. Rods 18-23, 18-39, 42-23, and 42-39, are fully inserted to support HCU maintenance on Rod 18-23
- C. A trip of CWP 1D has caused a Reactor Recirculation runback to occur.
- D. NO Operator actions have been taken.

INITIATING CUE:

Reset recirculation pump runback in accordance with appropriate Off Normal procedure.

PROCEDURE COVER SHEET

PPL SUSQUEHANNA, LLC		NUCLEAR DEPARTMENT PROCEDURE		
LOSS OF REACTOR RECIRCULATION FLOW				7/10/2002 ON-164-002 Revision 20 Page 1 of 10
<u>QUALITY CLASSIFICATION:</u> <input checked="" type="checkbox"/> QA Program <input type="checkbox"/> Non-QA Program		<u>APPROVAL CLASSIFICATION:</u> <input checked="" type="checkbox"/> Plant <input type="checkbox"/> Non-Plant <input type="checkbox"/> Instruction		
EFFECTIVE DATE: _____ PERIODIC REVIEW FREQUENCY: _____ N/A PERIODIC REVIEW DUE DATE: _____ N/A				
<u>RECOMMENDED REVIEWS:</u> 				
Procedure Owner: _____ Shift Technical Advisor-A Shift Responsible Supervisor: _____ Shift Manager-A Shift Responsible FUM: _____ Manager-Nuclear Operations Responsible Approver: _____ Manager-Nuclear Operations				

1. SYMPTOMS AND OBSERVATIONS

- 1.1 Reactor power begins to decrease immediately.
- 1.2 Reactor vessel water level increases.
- 1.3 Any following indication on Standby Information Panel 1C652:
 - 1.3.1 Recirculation loop flow(s) decreases in affected loop(s).
 - 1.3.2 Jet pump flow(s) for affected loop(s) and total jet pump flow decreases.
- 1.4 Any following annunciator on Operating Unit Benchboard 1C651:
 - 1.4.1 RECIRC M-G GEN A(B) LOCKOUT TRIP.
 - 1.4.2 RECIRC M-G A(B) DRIVE MTR TRIP.
 - 1.4.3 RECIRC PUMP A(B) HI PRESS/LO LEVEL TRIP.
 - 1.4.4 RPT SYS LOOP A(B) TRIP.
 - 1.4.5 RECIRC A(B) FLOW LIMIT RUNBACK.

2. AUTOMATIC ACTIONS

- 2.1 Possible main turbine trip and reactor scram because of RPV level swell caused by the trip of both Reactor Recirculation Pumps, depending on plant operating conditions.
- 2.2 Reduction in Reactor power, core flow, steam flow, feedwater flow, and generator output corresponding to recirc runback flow decrease.

3. OPERATOR ACTIONS

- ☐ 3.1 **Record** Date and Time of event.

_____ / _____ / _____
Shift Supervision Date Time

- ☐ 3.2 **IF both** Recirculation Pumps trip, **Immediately Scram** reactor.

3.3 **IF** one Reactor Recirculation Pump trips:

NOTE: **WHEN** operating recirculation pump speed is <75% rated speed (1260 rpm), Core Pressure Drop (i.e., Core Plate DP) is used to determine actual core flow due to inaccuracies associated with indicated core flow.

3.3.1 **IF** operating recirculation pump speed is <75% rated speed (1260 rpm), **Determine** actual core flow by (else N/A):

- ☐ a. **Display** Core Pressure Drop via PICSY computer point NJP51 - Core PL Press **OR** if PICSY unavailable via XR-B21-1R613, Blue Pen: Core Plate DP.
- ☐ b. **Determine** actual core flow using Form GO-100-009-2 "Core Flow vs. Core Pressure Drop" curve.
- ☐ 3.3.2 **Plot** position on Power/Flow Map, Form NDAP-QA-0338-10.
- ☐ 3.3.3 **Perform** appropriate action as specified on Power/Flow Map.
- ☐ 3.3.4 **IF** Power/Flow Map indicates operation in Region 1 **OR** Core Flow is < the Natural Recirculation Line or operations in any region not bounded by Power/Flow map, **Place** MODE SWITCH to **SHUTDOWN**.
- ☐ 3.3.5 **Ensure** thermal power REDUCED to < 70% rod line.
- ☐ 3.3.6 **Reduce** operating pump speed to 80% rated pump speed (80% = 1344 rpm) in accordance with OP-164-001.
- ☐ 3.3.7 **Comply** with COLR Section 8.0 Limits in TRM.
- ☐ 3.3.8 **Comply** with Tech Spec LCOs 3.4.1.

CAUTION

Thermal binding and/or pressure locking of recirculation isolation valves might occur if closed for more than approximately 5 minutes.

- ☐ 3.3.9 For stopped pump, **Place** RECIRC A(B) MOV OL BYPS HV-143-F031A(B)/F032A(B) key switch to **TEST** position.

- ☐ 3.3.10 **Ensure** RECIRC PUMP A(B) DSCH BYPS HV-143-F032A(B) **OPEN**.
- ☐ 3.3.11 **Close** RECIRC PUMP A(B) DSCH HV-143-F031A(B).
- ☐ 3.3.12 Within 5 minutes, **Open** RECIRC PUMP A(B) DSCH HV-143-F031A(B).
- ☐ 3.3.13 **AFTER** 2 minutes, **Place** RECIRC A(B) MOV OL BYPS HV-143-F031A(B)/F032A(B) key switch to **NORM** position.
- ☐ 3.3.14 Prior to restart of pump, **Notify** Duty Reactor Engineer to perform an evaluation of core thermal limits and preconditioning.

CAUTION

Do not attempt to restart recirc pump if operating above 70% rod line or if any flux oscillations are observed.

- ☐ 3.3.15 **WHEN** cause of trip corrected, **Restart** Reactor Recirculation Pump in accordance with OP-164-001 Reactor Recirculation System.
- ☐ 3.3.16 **IF** pump will be out of service > 1 hour, **Comply** with GO-100-009 Single Recirculation Loop Operation.
- 3.4 In the event of Reactor Recirculation Pump runback:
 - ☐ 3.4.1 **Plot** position on Power/Flow Map, Form NDAP-QA-0338-10.
 - ☐ 3.4.2 **Perform** appropriate action specified on Power/Flow Map.
 - ☐ 3.4.3 **IF** Power/Flow Map indicates operation in Region 1 or Core Flow is < the Natural Recirculation Line **OR** operation in any region not bounded by Power/Flow map, **Place** MODE SWITCH to **SHUTDOWN**.
 - 3.4.4 **Determine** which limiter initiated runback:
 - ☐ a. Limiter #1 (30%) limiting by Green light **ILLUMINATED** above RX RECIRC LIMITER 1 RUNBK RESET HS-B31-1S15A(B) pushbutton.

- ☐ b. Limiter #2 (45%) limiting by Green light **ILLUMINATED** above LOSS OF FW PP RUNBK RESET HS-B31-1S12A(B) pushbutton.
- ☐ 3.4.5 **Ensure** both pumps run back to value associated with controlling limiter.

CAUTION

As core flow decreases, core flux instabilities are more likely to occur.

- 3.4.6 **Monitor** neutron instrumentation for indication of core instability.

- ☐ a. **IF** required, **Perform** ON-178-002, Core Flux Oscillations.

CAUTION

Power reduction will further reduce amount of feedwater heating which will cause reactor power to increase.

- ☐ b. **Continue Monitoring** position on Power/Flow map.
- 3.4.7 On 1C600, **Monitor** the following:
 - ☐ a. Main Stream Line Radiation Monitor, RR-D12-1R603.
 - ☐ b. Offgas Pretreatment Log Radiation Monitor, RR-D12-1R601.
- ☐ 3.4.8 **IF** Main Steam Line Radiation Monitor or Offgas Pretreatment Log Radiation Monitor increases, **Direct** Chemistry to sample per CH-ON-003.
- 3.4.9 **Observe** following plant parameters WITHIN LIMITS corresponding to new power level:
 - ☐ a. Power to flow limits
 - ☐ b. Condenser vacuum
 - ☐ c. Feedwater flow/steam flow
 - ☐ d. RPV water level

3.4.10 **Determine** signal that initiated runback from following:

a. Limiter #1 (30%) runback initiated by any following condition:

- ☐ (1) Total feedwater flow $\leq 20\%$ for > 15 seconds.
- ☐ (2) RECIRC PUMP A(B) DSCH HV-143-F031A(B) not fully open.
- ☐ (3) RPV water level $<$ level 3.

b. Limiter #2 (45%) runback initiated by:

- ☐ (1) Any Circulating Water Pump protective trip.
- ☐ (2) RPV low water level (+ 30") and any of following:
 - ☐ (a) Feedwater flow A, B, or C decrease to $\leq 20\%$.
 - ☐ (b) Any Condensate Pump discharge pressure ≤ 100 psig.
 - ☐ (c) Auto isolation of Feedwater Heaters String A, B or C due to high level in Feedwater Heaters 1 or 2.

☐ 3.4.11 **Ensure** REACTOR RECIRC PUMP A(B) SPEEDS SY-B31-1R621A(B) IN **MANUAL**.

☐ 3.4.12 For Limiter #1 runback **Perform** following for one or both pumps as required:

CAUTION (1)

When establishing control with the recirc pump speed controllers, minimize lowering core flow to avoid inadvertent entry into Regions I or II of the power/flow map.

CAUTION (2)

When establishing control with the recirc pump speed controllers, pump speed should be maintained at appx. 500 rpm. Speed oscillations are possible when the pump is operated between 460 and 485 rpm.

- ☐ a. To prevent pump speed from changing when Limiter #1 reset, **Ensure** GEN 1A(1B) DEMAND adjusted such that GEN 1A(1B) SPEED decreases when controller DEMAND is decreased.
- ☐ b. **Depress** RX RECIRC LIMITER 1 RUNBK RESET HS-B31-1S15A(B) pushbutton.
- ☐ c. **Monitor** GEN 1A(1B) SPEED SI-14032A(B).
- ☐ d. **IF** speed increases rapidly, **Trip** scoop tube on affected generator by depressing SCOOP TUBE A(B) LOCK OR RESET HS-B31-1S03A(B) **TRIP** pushbutton.
- ☐ e. **IF** previously illuminated, **Observe** Green light above RX RECIRC LIMITER 1 RUNBK RESET HS-B31-1S15A(B) pushbutton **EXTINGUISHED**.

3.4.13 For Limiter #2 runback **Perform** following for one or both pumps as required:

CAUTION

When establishing control with the recirc pump speed controllers, minimize lowering core flow to avoid inadvertent entry into Regions I or II of the power/flow map.

- ☐ a. To prevent pump speed from changing when Limiter #2 reset, **Ensure** GEN 1A(1B) DEMAND adjusted such that GEN 1A(1B) SPEED decreases when controller DEMAND is decreased.
- ☐ b. **Depress** RECIRC A(B) LOSS OF FW PP RUNBK RESET HS-B31-1S12A(B) pushbutton.
- ☐ c. **Monitor** GEN 1A(1B) SPEED SI-14032A(B).

- ☐ d. **IF** speed increases rapidly, **Trip** scoop tube on affected generator by depressing SCOOP TUBE A(B) LOCK OR RESET HS-B31-1S03A(B) **TRIP** pushbutton.
- ☐ e. **Observe** Green light above RECIRC A(B) LOSS OF FW PP RUNBK RESET HS-B31-1S12A(B) pushbutton **EXTINGUISHED**.
- ☐ 3.4.14 **Check** RECIRC A(B) FLOW LIMIT RUNBACK annunciator **CLEARED**.
- ☐ 3.4.15 **Notify** Reactor Engineering.

3.5 **Forward** completed copy of this procedure to following for review and retention:

3.5.1	Shift Manager	_____ / _____
		Signature Date
3.5.2	Assistant Operations Mgr.-Shift Operations	_____ / _____
		Signature Date
3.5.3	Manager-Nuclear Operations	_____ / _____
		Signature Date
3.5.4	DCS Supervisor	

4. REFERENCES

- 4.1 FSAR Section 5.4.1 Reactor Recirculation Pumps
- 4.2 FSAR Section 15.3 Decrease in Reactor Coolant Flowrate
- 4.3 GE SIL No. 380
- 4.4 M-143 Reactor Recirculation
- 4.5 Memo PLI-42281, S.A. Somma to A.M. Price, "Indicated Core Flow Anomaly," October 1, 1985
- 4.6 NRC Bulletin 88-07 Supplement 1
- 4.7 OP-164-001, Reactor Recirculation System

5. DISCUSSION

Loss of Reactor recirculation flow can be caused by the unexpected tripping of one or both Reactor Recirculation Pumps. Tripping of both pumps has the greatest impact on plant operation. At high power levels, the Main Turbine may trip automatically because of RPV water level swell and result in a Reactor scram. If the Reactor does not scram automatically following trip of both Reactor Recirculation Pumps, the reactor is immediately scrammed manually to avoid potential for core flux oscillations.

The Reactor may be operated at reduced power with one Reactor Recirculation Pump out of service and the other driving half of the jet pumps. The idle Reactor Recirculation Pump is kept hot by reverse flow through the loop and is not started unless the idle loop temperature is within 50°F of the operating loop temperature, and the Reactor is operating below the 70% rod line.

Loss of one Reactor Recirculation Pump during Reactor operation does not initiate any Reactor Protection System or safeguards systems actuation because fuel thermal margins are maintained. Flow in the idle jet pumps reverses in approximately 6 seconds, and flow in the operating jet pumps increases to about 143% of its normal flow if the operating pump is at 84% pump speed.

In single loop operation, core flow indication is not accurate when recirculation pump speeds are less than 75% of rated pump speed (1260 rpm). There are two reasons for this inaccuracy:

1. When core flow is below about 38 Mlb/hr, forward flow takes place through both loops of jet pumps, in single loop operation, however, the Reverse Flow Summer instrumentation will subtract off the measured flow in the idle loop.
2. When the flow through a jet pump loop is too low to accurately measure the flow i.e., below about 8 Mlb/hr), the individual jet pump low flow cut-off instrumentation provides a zero reading. The low forward or reverse flow through the jet pumps in the idle loop will not be accounted for.

When the recirculation pump speed is 75% of rated or higher, the indicated core flow can be accurately determined from control room instrumentation or PICSY. If recirculation pump speed is less than 75% of rated, core flow should be determined by using the Core Flow vs. Core Pressure Drop Curve provided.

If total core flow decreases into Region I of Power/Flow Map, the Reactor is manually scrammed to avoid potential for core flux oscillations. The operator reduces flow in the operating loop to single pump flow criteria. Single pump flow criteria is based on reducing the operating pump speed to less than 80% rated pump speed (80% = 1344 rpm), in accordance with OP-164-001.

Automatic trips of Reactor Recirculation Pumps can come from EOC-RPT trip (CV fast closure, ≥ 500 psig; SV closure, $\leq 5.5\%$ closed) or ATWS (RPV low level 2, Reactor high pressure). The ATWS and EOC RPT trips open the RPT breakers which in turn cause the MG set drive motor to trip. A LPCI Initiation signal with low Reactor pressure (< 236 psig) trips the Reactor Recirculation Pumps by closing the discharge and discharge bypass valves.

Two speed limiters limit recirc flow by limiting generator speed on the Reactor Recirc MG sets. Limiter #1 limits speed to 30% and provides NPSH protection for the recirc pumps. Limiter #2 limits speed to 45% and prevents spurious scrams due to transients on the Condensate/Feedwater System and Circulating Water System.

**PENNSYLVANIA POWER LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 52.OP.010.151 0 11/15/02 206000 A2.17 3.9/4.3
Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Override An Inadvertent Start Of The HPCI System In Accordance With OP-152-001

Completed By:

Richard E. Chin
Writer

11/15/02
Date

Reviews:

Rich E. Chin
Instructor/Writer

11-19-02
Date

Approval:

[Signature]
Requesting Supv./C.A. Head

11-15-02
Date

[Signature]
Nuclear Training Supv.

11-19-02
Date

Date of Performance:

8 min
~~-15 Min~~ REC 12-3-02
Allowed Time (Min)

Time Taken (Min)

JPM Performed By:

Last

First

M.I.

Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

Signature

Typed or Printed

Comments:

**REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 52.OP.010.151**

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.
- B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection safety shoes, hardhats, etc; is required and/or posted as being necessary.
- C. If in the judgement of the evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved

II. REFERENCES

OP-152-001, High Pressure Coolant Injection (HPCI) System

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

IV. TASK CONDITIONS

- A. The plant is in Mode 1 at approximately 90 percent reactor power.
- B. You are the PCOP.
- C. An event will occur on panel 1C601.

V. INITIATING CUE

Respond to the event as required.

PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 52.OP.010.151

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p>Note</p> <ul style="list-style-type: none"> The IC is to be set up at 90% power. Override the HPCI Flow Controller to prevent manual override of HPCI injection, requiring the operator to isolate HPCI. IMF CN02:FCE411R600 100 0 100 IMF CN03:FCE411R600 100 0 100 Give the Task Conditions/Initiating Cue Sheet to the student. When the student indicates that he/she is prepared to respond to the plant conditions, the simulator should be placed in RUN. Insert HPCI Inadvertent Initiation IMF HP152004 <p>Evaluator</p> <ul style="list-style-type: none"> The FAULTED step in this JPM is preceded by a fault statement in BOLD TYPE WITH ALL CAPITAL LETTERS. 			

*Critical Step

#Critical Sequence

STCP-QA-125B

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 52.OP.010.151

Student Name: _____

Step	Action	Standard	Eval	Comments
1.	<p>Respond to Alarm HPCI Flow -Low (AR114 window E02)</p> <p><u>Evaluator</u> Student may immediately Place HPCI TURBINE FLOW CONTROL FC-E41-1R600 in MANUAL <u>AND</u> Reduce demand to zero (0). This is acceptable.</p> <p><u>Evaluator</u> If necessary Role play the SRO and Acknowledge receipt of the alarm, and direct overriding HPCI injection.</p>	<p>Acknowledges alarm HPCI Flow – Low (AR114 window E02) and Informs SRO of the Alarm</p> <p>Determines HPCI flow initiation is inadvertent by verifying Drywell Pressure and Reactor water level normal.</p>		
2.	<p>Obtains correct hard card for overriding HPCI</p> <p><u>Evaluator</u> Student may refer to OP-152-001 section 2.15 to address the alarm. This is acceptable.</p>	<p>Obtains hard card for overriding HPCI OP-151-001 Attachment C.</p>		
3.	<p>(HC) Place or Check Placed HPCI Aux Oil Pump 1P213 to START</p> <p><u>Evaluator:</u> The Auxiliary Oil Pump will not start until HPCI speed decreases to less than 2,200 rpm.</p>	<p>Places the control switch for HPCI Aux Oil Pump 1P213 in the START position.</p>		

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 52.OP.010.151

Student Name: _____

Step	Action	Standard	Eval	Comments
	<u>FAULT STATEMENT</u> HPCI INJECTION FLOW WILL NOT DECREASE TO ZERO WHEN PRESSURE IS REDUCED TO LESS THAN REACTOR PRESSURE.			
4.	(HC) Place HPCI Flow Controller to Manual	Places the Manual/Auto switch on HPCI Turbine Flow Control FC-E41-1R600 in the M position.		
5.	(HC) Adjusts Controller to reduce HPCI discharge pressure to less than Reactor pressure.	Depresses the Close pushbutton on HPCI Turbine Flow Control FC-E41-1R600. Checks that HPCI flow does NOT decrease to zero.		
6.	(HC) Ensure that HPCI minimum flow valve HV-155-F012 opens when conditions are met.	Notes that the Min Flow valve HV-155-F012 remains closed.		
7.	(HC) Ensure injection has been stopped.	Notes Injection to vessel continues		
	<u>Evaluator</u> If SRO is informed that the flow indication has NOT decreased to zero, instruct the student to continue performing the procedure.			

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 52.OP.010.151

Student Name: _____

Step	Action	Standard	Eval	Comments
8.	(HC) Attempt to reset the HPCI initiation signal. Evaluator: The initiation signal will not reset. The green indicator lamp above the HPCI Int Sig Reset HS-E41-1S17.	Depresses the HPCI Int Sig Reset HS-E41-1S17 Reset pushbutton. Notes that the initiation signal will NOT reset by observing that the green indicator lamp above the HPCI Sig Reset HS-E41-1S17 Reset pushbutton remains LIT.		
9.	(HC) Reduce HPCI turbine speed to stop flow. Evaluator This may have been done initially.	Depresses the decrease pushbutton on HPCI Turbine Flow Control FC-E41-1R600.		
10.	(HC) Ensure injection has been stopped. Evaluator If SRO is informed that the flow indication has NOT decreased to zero, instruct the student to continue performing the procedure.	Checks that HPCI flow indication does NOT decrease to zero.		
11.	Notes no oscillations and requirement to isolate HPCI Evaluator Student should determine that HPCI isolation should be attempted through steam supply line isolation in the subsequent steps.	Checks HPCI speed and determines that it is stable		

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 52.OP.010.151

Student Name: _____

Step	Action	Standard	Eval	Comments
*12.	(HC) Isolate HPCI.	Depresses the HPCI Steam Supply Manual Isolation HS-E41-1S32 pushbutton.		
13.	(HC) Ensure Stm Supply OB Iso valve CLOSES.	Checks HPCI Steam Supply OB Iso HV-155-F003 amber light LIT		
14.	(HC) Ensure Pump Suction from Supp Pool CLOSES	Checks HPCI Pump Suction from Supp Pool HV-155-F042 amber light LIT		
15.	(HC) Ensure Injection valve CLOSES	Checks HPCI Injection HV-155-F006 amber light LIT		
16.	(HC) Ensures Auxiliary Oil Pump STARTS	Checks HPCI Auxiliary Oil Pump 1P213 red light LIT		
17.	(HC) Places IB Stm supply valve to close	Places the HPCI Steam Supply IB Iso HV-155-F002 Keylock Switch in the CLOSE position		
18.	(HC) Places OB Stm supply valve to close	Places the HPCI Steam Supply OB Iso HV-155-F003 Keylock Switch in the CLOSE position.		
	<u>Evaluator:</u> Instruct the student to stop.			

*Critical Step

#Critical Sequence

STCP-QA-125B

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TASK CONDITIONS

- A. The plant is in Mode 1 at approximately 90 percent reactor power.
- B. You are the PCOP.
- C. An event will occur on panel 1C601.

INITIATING CUE

Respond to the event as required.

TASK CONDITIONS

- A. The plant is in Mode 1 at approximately 90 percent reactor power.
- B. You are the PCOP.
- C. An event will occur on panel 1C601.

INITIATING CUE

Respond to the event as required.

OVERRIDING HPCI INJECTION

(Ref. Section 2.15)

- ☐ 1. To prevent auto injection if HPCI not initiated.
 - ☐ a. **Place** HPCI TURBINE FLOW CONTROL FC-E41-1R600 in **MANUAL AND Reduce** demand to zero (0).
 - ☐ b. **IF** HPCI turbine auto starts shutdown HPCI in accordance with step 3.

- ☐ 2. To stop injection place HPCI pump on minimum flow as follows:
 - ☐ a. **Place** or **CHECK PLACED** HPCI AUXILIARY OIL PUMP 1P213 switch to **START**.
 - ☐ b. **Place** HPCI TURBINE FLOW CONTROL FC-E41-1R600 in **MANUAL**.
 - ☐ c. **Adjust** HPCI TURBINE FLOW CONTROL FC-E41-1R600 to reduce HPCI discharge pressure less than Reactor pressure.
 - ☐ d. **Ensure** HPCI MIN FLOW TO SUPP POOL HV-155-F012 opens when HPCI flow < 500 gpm and discharge pressure > 125 psig.
 - ☐ e. **IF** HPCI flow indication does not decrease to zero gpm with HPCI pump discharge pressure less than reactor pressure, **Shut Down** HPCI per following step.

- ☐ 3. To stop injection/shutdown HPCI:
 - ☐ a. **Ensure** HPCI AUXILIARY PUMP 1P213 switch placed to **START**.
 - ☐ b. **Depress** HPCI INT SIG RESET HS-E41-1S17 RESET pushbutton.
 - ☐ c. **IF** HPCI initiation resets, **Shut Down** HPCI in accordance with section 2.9 of OP-152-001.
 - ☐ d. **IF** HPCI initiation does not reset, stop injection/shut down using following sections (1) preferred, or (2):
 - ☐ (1) **Reduce** HPCI turbine speed to stop injection:
 - ☐ (a) **Place** HPCI TURBINE FLOW CONTROL FC-E41-1R600 in **MANUAL**.
 - ☐ (b) **Reduce** demand to stop HPCI flow.
 - ☐ (c) **Ensure** HPCI Auxiliary Oil Pump 1P213 does not cycle on and off.
 - ☐ (d) **Monitor** frequently HPCI speed for oscillations.
 - ☐ (e) **IF** turbine speed oscillations occur **Increase** HPCI turbine speed.
 - ☐ (f) **IF** HPCI flow indication does not decrease to zero gpm with HPCI pump discharge pressure < Reactor pressure or turbine speed oscillations continue, **Isolate** HPCI in accordance with following section:
 - ☐ (2) To isolate HPCI:
 - ☐ (a) **Depress** HPCI STM SUPPLY MAN ISO HS-E41-1S32 pushbutton.
 - ☐ (b) **Ensure** HPCI STM SUPPLY OB ISO HV-155-F003 **CLOSES**.



- (c) **Ensure** HPCI PUMP SUCT FROM SUPP POOL HV-155-F042 **CLOSES**.
- (d) **Ensure** HPCI INJECTION HV-155-F006 **CLOSES**.
- (e) **Ensure** HPCI AUX OIL PUMP 1P213 starts as HPCI turbine coasts down.
- (f) **Close** HPCI STM SUPPLY IB ISO HV-155-F002.
- (g) **Place** HPCI STM SUPPLY OB ISO HV-155-F003 KEYSWITCH to **CLOSE**.

**PENNSYLVANIA POWER LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 00.ON.015.105 3 11/15/02 295016 AA 1.06 4.0/4.1
Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Immediate Operator Action For Control Room Evacuation

Completed By:

Reviews:

R. E. Chin
Writer

11/15/02
Date

R. E. Chin
Instructor/Writer

11-15-02
Date

Approval:

[Signature]
Requesting Supv./C.A. Head

11-15-02
Date

[Signature]
Nuclear Training Supv.

11-15-02
Date

Date of Performance:

10 Min
Allowed Time (Min)

Time Taken (Min)

JPM Performed By:

Last First M.I.

Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

Signature

Typed or Printed

Comments:

**REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 00.ON.015.105**

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.
- B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection safety shoes, hardhats, etc; is required and/or posted as being necessary.
- C. If in the judgement of the evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved

II. REFERENCES

ON-100-009, Control Room Evacuation

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

02 Plant Shutdown Outside the Control Room in Conjunction with JPM 00.ON.015.101

IV. TASK CONDITIONS

- A. A condition has occurred requiring abandonment of the Control Room.
- B. You are the Unit Supervisor in the Control Room.
- C. The Control Room will be non-inhabitable in five to eight minutes.

V. INITIATING CUE

Perform the Immediate Operator Actions of Control Room evacuation.

PERFORMANCE CHECKLIST

Page 3 of 5

Appl. To/JPM No.: S/RO 00.ON.015.105

Student Name: _____

Step	Action	Standard	Eval	Comments
1.	<p><u>Evaluator:</u> If performed in the simulator, any power level IC may be selected. IC-18 preferred.</p> <p>The student is allowed to reference ON-100-009.</p> <p>Record date and time of event.</p>	<p>States requirement to record date and time of event.</p> <p>Pick up PA and announce that the Control Room is being evacuated.</p> <p>Place HS-C72A-1S01 to SHUTDOWN.</p> <p>Check any of the following: a. Full Core Display b. RSCS c. OD-7</p>		
	<p><u>Evaluator Note:</u> If Security is notified, acknowledge Security notification has been completed.</p> <p>Announce twice over PA system "Control Room evacuation in progress."</p>			
	<p>*2. Place the reactor MODE SWITCH to SHUTDOWN.</p>			
3.	ENSURE all control rods INSERTED.			

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Student Name: _____

Step	Action	Standard	Eval	Comments
4.	INSERT SRMs and IRMs.	Select IRMs and SRMs. Drive power on. Depress DRIVE IN.		
*5.	Close the MSIVs and MSL Drains.	Takes HS for F022A-D to close. Takes HS for F028A-D to close. Takes HS for F016 and F019 to close.		
*6.	Close RFP A, B, and C discharge valves.	Takes HS for HV-10603 A, B, and C to close.		
*7.	Trip RFPT A, B, and C.	Depresses TRIP pushbutton for all three RFPTs.		
*8.	Place FW Low Load Valve in AUTO.	Places LIC-C32-1R602 in AUTO.		
*9.	Opens HPCI Test Line isolation valve F011.	Places the HV-155-F011 to OPEN.		

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 00.ON.015.105

Student Name: _____

Step	Action	Standard	Eval	Comments
10.	Take two (2) security controlled keys from Shift Supervisor key cabinet to gain entrance into Reactor Building. (Unit Supervisor only)	States requirement to get keys from Shift Supervisor.		
11.	Take PICSY laptop computer. (Unit Supervisor only) <u>Evaluator:</u> Inform student that the keys and the laptop have been obtained.	Obtains laptop computer from Shift Supervisor's Office.		
12.	Evacuate the Control Room.	Leaves the Control Room to go to the RSDP.		

*Critical Step

#Critical Sequence

STCP-QA-125B

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TASK CONDITIONS:

- A. A condition has occurred requiring abandonment of the Control Room.
- B. You are the Unit Supervisor in the Control Room.
- C. The Control Room will be non-inhabitable in five to eight minutes.

INITIATING CUE:

Perform the Immediate Operator Actions of Control Room Evacuation.

TASK CONDITIONS:

- A. A condition has occurred requiring abandonment of the Control Room.
- B. You are the Unit Supervisor in the Control Room.
- C. The Control Room will be non-inhabitable in five to eight minutes.

INITIATING CUE:

Perform the Immediate Operator Actions of Control Room Evacuation.

PROCEDURE COVER SHEET

PPL SUSQUEHANNA, LLC		NUCLEAR DEPARTMENT PROCEDURE		
CONTROL ROOM EVACUATION				8-13-02 ON-100-009 Revision 6 Page 1 of 31
<u>QUALITY CLASSIFICATION:</u> (X) QA Program () Non-QA Program		<u>APPROVAL CLASSIFICATION:</u> (X) Plant () Non-Plant () Instruction		
EFFECTIVE DATE: _____ PERIODIC REVIEW FREQUENCY: _____ N/A PERIODIC REVIEW DUE DATE: _____ N/A				
<u>RECOMMENDED REVIEWS:</u> 				
Procedure Owner: _____ Shift Technical Advisor-B Shift Responsible Supervisor: _____ Shift Manager-B Shift Responsible FUM: _____ Manager-Nuclear Operations Responsible Approver: _____ Manager-Nuclear Operations				

1. SYMPTOMS AND OBSERVATIONS

Conditions exist which require Control Room EVACUATION:

- 1.1 Dense SMOKE
- 1.2 Extreme HEAT
- 1.3 Hazardous GAS which induces difficulty in breathing
- 1.4 Direction from Shift Supervision

2. AUTOMATIC ACTIONS

None

3. IMMEDIATE OPERATOR ACTIONS

- 3.1 **Record** date and time of event.

Shift Supervision

_____/_____
Date Time

NOTE:	If Control Room evacuation is anticipated, Notify Security to provide access to BOTH Units' Remote Shutdown Panels.
-------	--

- 3.2 As time permits, **Perform** following prior to Control Room evacuation:

- ☐ 3.2.1 **Announce** twice over Plant PA System "Control Room evacuation in progress."
- ☐ 3.2.2 **Place** MODE SWITCH HS-C72A-1S01 to **SHUTDOWN**.⁽⁵⁾
- ☐ 3.2.3 **Ensure** all Control Rods **INSERTED**.
- ☐ 3.2.4 **Insert** SRM's and IRM's.
- ☐ 3.2.5 **Close** MSIV's and MSL drains HV-141-F022A,B,C,& D, HV-141-F028A,B,C & D, HV-141-F016 and HV-141-F019.⁽⁵⁾
- ☐ 3.2.6 **Close** RFP A,B & C DSCH ISO HV-0603A,B & C.⁽⁵⁾
- ☐ 3.2.7 **Trip** RFPT A,B & C, RFPT A, B & C TRIP RESET HS-12745A, B & C.⁽⁵⁾
- ☐ 3.2.8 **Place** FW LOW LOAD DEMAND LIC-C32-1R602 in **AUTO**.

- ☐ 3.2.9 **Open** HPCI TEST LINE TO CST ISO HV-155-F011.
- ☐ 3.2.10 **Take** two (2) sets of security keys from Shift Supervisor key cabinet to gain entrance into Reactor Building. (Unit Supervisor only)
- ☐ 3.2.11 **Take** PICSY laptop computer from under the Shift Supervisor's desk. (Unit Supervisor only)
- ☐ 3.3 **Evacuate** Main Control Room.

4. SUBSEQUENT OPERATOR ACTIONS

NOTE: All indications and controls are from 1C201 unless otherwise indicated.

- ☐ 4.1 **IF** required to establish communication between Remote Shutdown Panel and locations in the plant, **Refer** to Attachment C for sound powered phone location.

NOTE: Unit Two Remote Shutdown Panel Room phone extension is 3823.

- 4.2 **IF** Control Room evacuated prior to completing immediate operator actions, **Perform** locally:

- 4.2.1 **Open** the following breakers to Scram Reactor and isolate Inboard and Outboard MSIV's and Main Steam Line Drains:⁽⁵⁾

NOTE: A screwdriver has been stored in JP1203 Sound Powered Phone Headset Storage Box (by A RPS Panel) if needed to open RPS panels.

- ☐ a. 1Y201A Bkr CB2A in RPS power distribution panel (27-749')
- ☐ b. 2Y201B Bkr CB8B in RPS power distribution panel (27-749')

- 4.2.2 Manually **Close** following valves (11-729'):

- ☐ a. HV-10603A RFP A Dsch Iso
- ☐ b. HV-10603B RFP B Dsch Iso
- ☐ c. HV-10603C RFP C Dsch Iso

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 55.OP.007.001 1 11/14/02 201001 A2.07 3.2/3.1
Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Shift The CRD Flow Stations From A To B In Accordance With OP-255-001

Completed By:

Reviews:

Richard Chin
Writer

11/14/02
Date

Richard E. Chi 12/3/02
Instructor/Writer Date

Approval:

[Signature]
Requesting Supv./C.A. Head

12/3/02
Date

[Signature] 12/3/02
Nuclear Training Supv. Date

Date of Performance:

_____ 20
Allowed Time (Min)

_____ Time Taken (Min)

JPM Performed By:

_____ _____ _____
Last First M.I.

_____ Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

_____ Signature

_____ Typed or Printed

Comments:

**REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 55.OP.007.001**

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.
- C. If in the judgement of the evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved

II. REFERENCES

OP-255-001, Control Rod Drive Hydraulic System

III. REACTIVITY MANIPULATIONS

This JPM satisfies the following reactivity manipulations:

None

IV. TASK CONDITIONS

- A. Unit 2 is at 80 percent reactor power.
- B. While adjusting Control Rods per Reactor Engineering Instructions, it is noted that the "A" CRD Flow Control station is not responding properly.
- C. The "B" CRD Flow Control Station needs to be placed in service so that I&C can investigate.

V. INITIATING CUE

Change CRD flow control stations from FV-2F002A to FV-2F002B.

Appl. To/JPM No.: S/RO 55.OP.007.001

Student Name: _____

Step	Action	Standard	Eval	Comments
	<u>Evaluator</u> With the A flow control station in service the following conditions exist: <ul style="list-style-type: none"> • M/A-2D009A is in auto. • Closed and Open position indicator lights for FCV are illuminated. • M/A-2D009B is in MAN. • FCV B closed light is ILLUMINATED and the open light is EXTINGUISHED. 			
1.	Obtain a controlled copy of OP-255-001.	Controlled copy obtained.		
2.	Select the correct section to perform.	Selects Section 3.4.		
3.	Review the prerequisites.	Ensures that all prerequisites have been met.		
	<u>Evaluator</u> Inform the student that all prerequisites have been met.			
4.	Review the precautions.	Follows all precautions as applicable.		

*Critical Step

#Critical Sequence

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Appl. To/JPM No.: S/RO 55.OP.007.001

Student Name: _____

Step	Action	Standard	Eval	Comments
5.	Ensure that the master CRD flow controller is in automatic. <u>Evaluator</u> FIC-C12-2R600 is located on Panel 2C601 in the Control Room. Inform the student that the controller is in automatic.	Calls the Control Room and confirms that CRD Flow Controller FIC-C12-2R600 is in automatic.		
6.	Ensure that the FCV B controller is in manual at minimum.	Ensures that the following conditions exist for M/A-2D009B Man/Auto Station Control Valve B controller: <ul style="list-style-type: none"> • Man/Auto control switch is in the MAN position. • The red pen is at 0. • Amber light is ILLUMINATED and the red light is EXTINGUISHED 		
7.	Check that the inlet isolation valve for flow control valve B is open. <u>Evaluator</u> Inform the student that the valve is open.	Checks that the Flow Control Valve B Iso 246F046B is open.		

*Critical Step

#Critical Sequence

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Appl. To/JPM No.: S/RO 55.OP.007.001

Student Name: _____

Step	Action	Standard	Eval	Comments
*8.	Open the outlet isolation valve for FCV B. <u>Evaluator</u> <ul style="list-style-type: none"> Flow will change dramatically (20-25 gpm) if this valve is more than cracked open initially. For training, ensure that the student understands the necessity for waiting for the flow to stabilize. Audible sound change has stopped and flow has stabilized 	Very slowly cracks open Flow Control Valve B Iso 246F047B. Waits for flow to stabilize as indicated by any of the following: <ul style="list-style-type: none"> Audible sound change has stopped. M/A-2D009A Man/Auto Station Control Valve A Black pen STABLE. Flow Control Station Total Water Flow FI-2R019 ~ 63 gpm. Completes opening Flow Control Valve B Iso 246F047B.		
*9.	Open Flow Control Valve FV-2F002B. <u>Evaluator</u> <ul style="list-style-type: none"> The red Open light will illuminate as the valve opens. Both the Closed and Open lights will remain illuminated. Flow Control Valve A will go in the closed direction as Flow Control Valve B is opened. Red and Black pens are matched. 	Slowly rotates the manual adjust knob on M/A-2D009B Man/Auto Station Control Valve B until the red and black pens are matched.		

*Critical Step

#Critical Sequence

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Appl. To/JPM No.: S/RO 55.OP.007.001

Student Name: _____

Step	Action	Standard	Eval	Comments
10.	Wait for flow to stabilize. <u>Evaluator</u> If necessary, inform student that the Audible sound change has stopped.	Waits for flow to stabilize as indicated by any of the following: • Audible sound change has stopped. • M/A-2D009A Man/Auto Station Control Valve A Black pen DECREASES and STABILIZES. • Flow Control Station Total Water Flow on FI-2R019 ~ 63 gpm.		
11.	Adjust the inservice flow control station manual position indication. <u>Evaluator</u> Nothing will occur when this is performed. The student should match these needles as closely as possible. The closer the match the smaller the change when the controller is placed in manual later.	Slowly rotates the manual adjust knob on M/A-2D009A Man/Auto Station Control Valve A until the red and black pens are matched.		
12.	Check total water flow.	Notes that Flow Control Station Total Water Flow FI-2R019 indicates approximately 63 gpm.		

*Critical Step

#Critical Sequence

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Appl. To/JPM No.: S/RO 55.OP.007.001

Student Name: _____

Step	Action	Standard	Eval	Comments
13.	Place Flow Control Station A in manual.	Places the Man/Auto switch on M/A-2D009A Man/Auto Station Control Valve A in the MAN position.		
*14.	Place Flow Control Station B in automatic.	Rotates the Man/Auto control switch on M/A-2D009B Man/Auto Station Control Valve B to the AUTO position.		
*15.	Close Flow Control Valve A. <u>Evaluator</u> <ul style="list-style-type: none"> FCV FV-2F002A will go closed and valve FV-2F002B will open farther to compensate. The open indicator for FV-2F002A will extinguish. 	Slowly rotates the manual adjust knob on M/A-2D009A Man/Auto Station Control Valve A in the counterclockwise direction until the red pen indicates 0.		
16.	Check total water flow.	Notes that Flow Control Station Total Water Flow FI-2R019 indicates approximately 63 gpm.		

*Critical Step

#Critical Sequence

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Appl. To/JPM No.: S/RO 55.OP.007.001

Student Name: _____

Step	Action	Standard	Eval	Comments
17.	Close Flow Control Valve A Iso 246F047A.	Slowly closes Flow Control Valve A Iso 246F047A.		
18.	Check CRD System parameters.	Notes the following parameters: <ul style="list-style-type: none">• Flow Control Station Total Water Flow FI-2R019 ~ 63 gpm.• Downstream P-C/Rea Differential Pressure PDI-2R005 < 50 psid.• Upstream P-C/Rea Differential Pressure PDI-2R009 is ~ 250 psig.		

*Critical Step

#Critical Sequence

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TASK CONDITIONS:

- A. Unit 2 is at 80 percent reactor power.
- B. While adjusting Control Rods per Reactor Engineering Instructions, it is noted that the "A" CRD Flow Control station is not responding properly.
- C. The "B" CRD Flow Control Station needs to be placed in service so that I&C can investigate.

INITIATING CUE:

Change CRD flow control stations from FV-2F002A to FV-2F002B.

TASK CONDITIONS:

- A. Unit 2 is at 80 percent reactor power.
- B. While adjusting Control Rods per Reactor Engineering Instructions, it is noted that the "A" CRD Flow Control station is not responding properly.
- C. The "B" CRD Flow Control Station needs to be placed in service so that I&C can investigate.

INITIATING CUE:

Change CRD flow control stations from FV-2F002A to FV-2F002B.

3.4 SWAPPING FLOW CONTROL STATIONS

3.4.1 Prerequisites

CRD Hydraulic System operation in accordance with section 3.1 of this procedure.

3.4.2 Precautions

None

NOTE: Following steps change from Flow Control Valve FV-2F002A to FV-2F002B. To change from valve B to A, use valves in parentheses.

3.4.3 ENSURE CRD FLOW CONTROLLER FC-C12-2R600 in AUTO.

3.4.4 ENSURE M/A-2D009B(A) Man/Auto Station Control Valve B(A) in MAN with Red pen indicating 0. Red pen displays MANUAL demand on the local controller.

3.4.5 ENSURE Position Indicator Flow Control Valve B(A) Amber light ILLUMINATED and Red light EXTINGUISHED indicating FV-2F002B(A) CLOSED.

3.4.6 CHECK OPEN Flow Control Valve B(A) Iso 246F046B(A).

NOTE: To prevent large (20 to 25 gpm) flow changes, following step should be performed very slowly.

3.4.7 SLOWLY CRACK OPEN Flow Control Valve B(A) Iso 246F047B(A).

3.4.8 OBSERVE following indicating flow stabilized:

a. Audible sound change STOPPED.

- b. M/A-2D009A(B) Man/Auto Station Control Valve A(B)
Black pen STABLE. The black pen displays control room demand.
 - c. Flow Control Station Total Water Flow FI-2R019 ~ 63 gpm.
- 3.4.9 When stable flow indicated, FULLY OPEN Flow Control Valve B(A) Iso 246F047B(A).
- 3.4.10 SLOWLY ROTATE manual adjust knob on M/A-2D009B(A) Man/Auto Station Control Valve until Black and Red pens closely matched as possible.
- 3.4.11 OBSERVE following indicating flow stabilized:
 - a. Audible sound change STOPPED.
 - b. M/A-2D009A(B) Man/Auto Station Control Valve A(B)
Black pen DECREASES and STABILIZES.
 - c. Flow Control Station Total Water Flow FI-2R019 ~ 63 gpm.
- 3.4.12 SLOWLY ROTATE manual adjust knob on M/A-2D009A(B) Man/Auto Station Control Valve until Black and Red pens closely matched as possible.
- 3.4.13 ENSURE Flow Control Station Total Water Flow FI-2R019 ~ 63 gpm and stable.
- 3.4.14 PLACE M/A-2D009A(B) Man/Auto Station Control Valve A(B) control switch to MAN.
- 3.4.15 PLACE M/A-2D009B(A) Man/Auto Station Control Valve B(A) control switch to AUTO.
- 3.4.16 SLOWLY ROTATE manual adjust knob on M/A-2D009A(B) Man/Auto Station Flow Control Valve A(B) until Red pen indicates 0.
- 3.4.17 ENSURE Flow Control Station Total Water Flow FI-2R019 ~ 63 gpm and stable.

NOTE: To prevent large (20 to 25 gpm) flow changes, following step should be performed very slowly.

3.4.18 SLOWLY CLOSE Flow Control Valve A(B) Iso 246F047A(B).

3.4.19 CHECK following for normal CRD System parameters:

- a. Flow Control Station Total Water Flow FI-2R019 ~ 63 gpm.
- b. Downstream P-C/Rea Differential Pressure PDI-2R005 < 50 psid.
- c. Upstream P-C/Rea Differential Pressure PDI-2R009 ~ 250 psid.

PENNSYLVANIA POWER & LIGHT COMPANY

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

S/RO	24.OP.001.007	0	11/14/02	264000	A2.09	3.7/ 4.1
Appl. To	JPM Number	Rev. No.	Date	NUREG 1123 Sys. No.		K/A

Task Title: Transfer of DG "E" for DG "C"

Completed By:

Reviews:

Richard Chin	11/14/02	<u>Rich E Chin</u>	11-19-02
Writer	Date	Instructor/Writer	Date

Approval

<u>[Signature]</u>	11/19/02	<u>[Signature]</u>	11-19-02
Requesting Supv./C.A. Head	Date	Nuclear Trng. Supv.	Date

	20	
Date of Performance:	Allowed Time (Min.)	Time Taken (Min.)

JPM Performed By:

Student Name: _____

Last	First	M.I.	Employee #/S.S. #
------	-------	------	-------------------

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name: _____

Signature	Typed or Printed
-----------	------------------

Comments:

**REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 24.OP.001.007**

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.
- B. All applicable safety precautions shall be taken in accordance with established PPL safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.
- C. If in the judgement of the evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved

II. REFERENCES

- A. OP-024-004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E
Attachment C (Revision 23) **[Steps 1 and 2 signed as being completed]**

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

IV. TASK CONDITIONS

- A. Both Units were at 100% Steady State Power
- B. A Station Blackout occurred
- C. The "A" Diesel generator was started LOCALLY
- D. The control room crew is performing Unit 1(2) Response to Station Blackout EO-100(200)-030,
- E. To facilitate two diesels in same division operating, the control room is attempting to energize the "C" bus using the "E" DIESEL GENERATOR.
- F. Another operator is at the "E" DG and has already performed steps 1 and 2 of OP-024-004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E
Attachment C (Revision 23)

V. INITIATING CUE

Prepare the "C" DG for Transfer by performing steps 3 through 11 of OP-024-004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E Attachment C (Revision 23)

PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO O24.OP.001.007

Student Name: _____

Step	Action	Standard	Eval	Comments
	Obtain a controlled copy of OP-024-004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E Attachment C (Revision 23)	Controlled copy obtained from evaluator.		
*1.	3. At 0C521C Diesel Generator C Engine Control Panel, PLACE DG C Control Mode Select Switch 43CM to LOCAL.	PLACES DG C Control Mode Select Switch 43CM to LOCAL		
2.	4. OBSERVE following:			
	4.1 Control Switches Not Proper for Remote Auto Oper. ALARM.	Verifies: "Control Switches Not Proper for Remote Auto Oper" ALARM (Window E08) LIT		
	4.2 Remote white light EXTINGUISHES.	Verifies: REMOTE white light NOT LIT		
	4.3 Local white light ILLUMINATED.	Verifies: LOCAL white light LIT		
	4.4 DG C Available for Emergency white light EXTINGUISHES.	Verifies: DG C Available for Emergency white light NOT LIT		
3.	5. ENSURE Control Room received DG Panel ALARM.	Calls the Control Room to verify DG Panel ALARM has been received.		
	<u>Evaluator</u> Role play the control room and inform the candidate that DG Panel ALARM has been received			

*Critical Step

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PERFORMANCE CHECKLIST

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Student Name: _____

Step	Action	Standard	Eval	Comments
*4.	6. At 0C521C CLOSE ESW Loop A Valves for DG C by momentarily placing switch to CLOSE for ESW Supply/Return HV-01112C/HV-01122C.	PLACES ESW Supply/Return HV-01112C/HV-01122C switch to CLOSE		
*5.	7. At 0C521C CLOSE ESW Loop B Valves for DG C by momentarily placing switch to CLOSE for ESW Supply/Return HV-01110C/HV-01120C. NOTE: Switching protective equipment required at switchgear. <u>Evaluator</u> This JPM will not proceed to the point of racking the breakers, therefore Switching protective equipment will not be required.	PLACES ESW Supply/Return HV-01110C/HV-01120C switch to CLOSE		
6.	8. At 0C512C DG E for DG C Transfer Panel PLACE DG C Bldg Ventil Supply Fan 0V512C to STOP.	PLACES DG C Bldg Ventil Supply Fan 0V512C switch to STOP		
*7.	9. At 0C512C PLACE HS-00057C, DG C Auto Start Control, to DISABLE to prevent inadvertent start while transferring logic.	PLACES HS-00057C, DG C Auto Start Control switch to DISABLE		
8.	10. At 0C512C OBSERVE DG C Aligned white light EXTINGUISHED.	Verifies DG C Aligned white light NOT LIT		

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Student Name: _____

Step	Action	Standard	Eval	Comments
*#9.	11. At 0C512C SEQUENTIALLY PLACE following switches to D/G E position:			
	11.1 HS-00058C Generator Metering & Computer Monitoring	PLACES HS-00058C Generator Metering & Computer Monitoring switch to D/G E position		
	11.2 HS-00059C Generator Field Current Computer Monitoring	PLACES HS-00059C Generator Field Current Computer Monitoring switch to D/G E position		
	11.3 HS-00060C Diesel Alarms to Control Room Annunciator	PLACES HS-00060C Diesel Alarms to Control Room Annunciator switch to D/G E position		
	11.4 HS-00061C ESW Temp Monitoring & HVAC Alarms	PLACES HS-00061C ESW Temp Monitoring & HVAC Alarms switch to D/G E position		
	11.5 HS-00062C ESW Loop A Supply Valve Control & Indication	PLACES HS-00062C ESW Loop A Supply Valve Control & Indication switch to D/G E position		
	11.6 HS-00063C ESW Loop A Return Valve Control & Indication	PLACES HS-00063C ESW Loop A Return Valve Control & Indication switch to D/G E position		
	11.7 HS-00064C ESW Loop B Supply Valve Control & Indication	PLACES HS-00064C ESW Loop B Supply Valve Control & Indication switch to D/G E position		

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO O24.OP.001.007

Student Name: _____

Step	Action	Standard	Eval	Comments
	11.8 HS-00065C DG Bypass Indication Unit 1	PLACES HS-00065C DG Bypass Indication Unit 1 switch to D/G E position		
	11.9 HS-00066C DG Bypass Indication Unit 2	PLACES HS-00066C DG Bypass Indication Unit 2 switch to D/G E position		
	11.10 HS-00067C Alignment Alarm & Indication Only	PLACES HS-00067C Alignment Alarm & Indication Only switch to D/G E position		
	11.11 HS-00068C ESW Loop B Return Valve Control & Indication	PLACES HS-00068C ESW Loop B Return Valve Control & Indication switch to D/G E position		
	11.12 HS-00069C ESW Bypass Indication and Auto Loop Transfer	PLACES HS-00069C ESW Bypass Indication and Auto Loop Transfer switch to D/G E position		
	11.13 HS-00070C Ventilation Supply Fans Control	PLACES HS-00070C Ventilation Supply Fans Control switch to D/G E position		
	11.14 HS-00071C DG Ctl, Indication, Metering & Breaker Trip Interlock	PLACES HS-00071C DG Ctl, Indication, Metering & Breaker Trip Interlock switch to D/G E position		
	11.15 HS-00072C Generator Relaying & Breaker Trip Interlock	PLACES HS-00072C Generator Relaying & Breaker Trip Interlock switch to D/G E position		

*Critical Step

#Critical Sequence

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PERFORMANCE CHECKLIST

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Appl. To/JPM No.: S/RO 024.OP.001.007

Student Name: _____

Step	Action	Standard	Eval	Comments
	11.16 HS-00073C Generator Metering & Breaker Trip Interlock	PLACES HS-00073C Generator Metering & Breaker Trip Interlock switch to D/G E position		
	11.17 HS-00074C Engine Control & Indication	PLACES HS-00074C Engine Control & Indication switch to D/G E position		
	11.18 HS-00075C Engine, Generator & ESW Pump Control	PLACES HS-00075C Engine, Generator & ESW Pump Control switch to D/G E position		
	11.19 HS-00076C Generator Breaker Control	PLACES HS-00076C Generator Breaker Control switch to D/G E position		

*Critical Step

#Critical Sequence

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TASK CONDITIONS

- A. Both Units were at 100% Steady State Power
- B. A Station Blackout Occurred
- C. The "A" Diesel generator was started LOCALLY
- D. The control room crew is performing Unit 1(2) Response to Station Blackout EO-100(200)-030,
- E. To facilitate two diesels in same division operating, the control room is attempting to energize the "C" bus using the "E" Diesel generator.
- F. Another operator is at the "E" DG and has already performed steps 1 and 2 of OP-024-004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E Attachment C (Revision 23)

INITIATING CUE

Prepare the "C" DG for Transfer by performing steps 3 through 11 of OP-024-004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E Attachment C (Revision 23)

TASK CONDITIONS

- A. Both Units were at 100% Steady State Power
- B. A Station Blackout Occurred
- C. The "A" Diesel generator was started LOCALLY
- D. The control room crew is performing Unit 1(2) Response to Station Blackout EO-100(200)-030,
- E. To facilitate two diesels in same division operating, the control room is attempting to energize the "C" bus using the "E" Diesel generator.
- F. Another operator is at the "E" DG and has already performed steps 1 and 2 of OP-024-004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E Attachment C (Revision 23)

INITIATING CUE

Prepare the "C" DG for Transfer by performing steps 3 through 11 of OP-024-004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E Attachment C (Revision 23)

TRANSFER OF DG E FOR DG C

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DATE: TODAY

CONFIRM

VERIFY

1. CHECK DG E available for substitution determined by following at 0C521E Diesel Generator E Engine Control Panel:

1.1 Master Trip Ckt Reset light ILLUMINATED.

NPO

NPO2

1.2 DC Power Avail Circuit #1 & #2 lights ILLUMINATED.

NPO

NPO2

1.3 All annunciators clear or evaluated as not affecting DG E operability.

NPO

NPO2

2. LOG transfer start time in PCO log.

NOW

NOTE: Next step produces Control Room & Local Alarm.

3. At 0C521C Diesel Generator C Engine Control Panel, PLACE DG C Control Mode Select Switch 43CM to LOCAL.

4. OBSERVE following:

4.1 Control Switches Not Proper for Remote Auto Oper. ALARM.

4.2 Remote white light EXTINGUISHES.

4.3 Local white light ILLUMINATED.

4.4 DG C Available for Emergency white light EXTINGUISHES.

5. ENSURE Control Room received DG Panel ALARM.

6. At 0C521C CLOSE ESW Loop A Valves for DG C by momentarily placing switch to CLOSE for ESW Supply/Return HV-01112C/HV-01122C.

7. At 0C521C CLOSE ESW Loop B Valves for DG C by momentarily placing switch to CLOSE for ESW Supply/Return HV-01110C/HV-01120C.

Form to be forwarded to DCS by Ops Clerk.

TRANSFER OF DG E FOR DG C

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		<u>CONFIRM</u>	<u>VERIFY</u>
NOTE:	Switching protective equipment required at switchgear.		
8.	At 0C512C DG E for DG C Transfer Panel PLACE DG C Bldg Ventil Supply Fan 0V512C to STOP.	_____	_____
9.	At 0C512C PLACE HS-00057C, DG C Auto Start Control, to DISABLE to prevent inadvertent start while transferring logic.	_____	_____
10.	At 0C512C OBSERVE DG C Aligned white light EXTINGUISHED.	_____	_____
11.	At 0C512C SEQUENTIALLY PLACE following switches to D/G E position:		
11.1	HS-00058C Generator Metering & Computer Monitoring	_____	_____
11.2	HS-00059C Generator Field Current Computer Monitoring	_____	_____
11.3	HS-00060C Diesel Alarms to Control Room Annunciator	_____	_____
11.4	HS-00061C ESW Temp Monitoring & HVAC Alarms	_____	_____
11.5	HS-00062C ESW Loop A Supply Valve Control & Indication	_____	_____
11.6	HS-00063C ESW Loop A Return Valve Control & Indication	_____	_____
11.7	HS-00064C ESW Loop B Supply Valve Control & Indication	_____	_____
11.8	HS-00065C DG Bypass Indication Unit 1	_____	_____
11.9	HS-00066C DG Bypass Indication Unit 2	_____	_____
11.10	HS-00067C Alignment Alarm & Indication Only	_____	_____
11.11	HS-00068C ESW Loop B Return Valve Control & Indication	_____	_____
11.12	HS-00069C ESW Bypass Indication and Auto Loop Transfer	_____	_____
11.13	HS-00070C Ventilation Supply Fans Control	_____	_____

TRANSFER OF DG E FOR DG C

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	<u>CONFIRM</u>	<u>VERIFY</u>
11.14 HS-00071C DG Ctl, Indication, Metering & Breaker Trip Interlock	_____	_____
11.15 HS-00072C Generator Relaying & Breaker Trip Interlock	_____	_____
11.16 HS-00073C Generator Metering & Breaker Trip Interlock	_____	_____
11.17 HS-00074C Engine Control & Indication	_____	_____
11.18 HS-00075C Engine, Generator & ESW Pump Control	_____	_____
11.19 HS-00076C Generator Breaker Control	_____	_____
12. At DG C-C 4.16KV Swgr, OPEN Diesel Gen. Bkr 0A510C01.	_____	_____
13. OPEN Transfer Breaker 0A510C01 Control & Trip DC Power Knife Switch.	_____	_____
14. RACK OUT 0A510C01.	_____	_____
15. REMOVE transfer breaker from 0A510C01 and PLACE in 0A510C02 DG E - C 4.16KV Swgr, Diesel Gen. Bkr Alternate Pos.	_____	_____
16. RACK IN 0A510C02.	_____	_____
17. CLOSE Transfer Breaker 0A510C02 Control & Trip DC Power Knife Switch.	_____	_____
18. CLOSE 0A510C02.	_____	_____
19. At 0C512C PLACE DG C Bldg Ventil Supply Fan 0V512C to AUTO.	_____	_____
20. At 0C512C OBSERVE DG E Aligned white light ILLUMINATED.	_____	_____
NOTE: Breaker will not close in following step.		
21. At 0A510, Diesel Generator E 4.16KV Switchgear:		
21.1 PLACE Feeder Breaker to MCC 0B565 0A51005 control switch to CLOSE position and RELEASE to reset breaker logic for automatic closure on undervoltage at 0B565.	_____	_____

TRANSFER OF DG E FOR DG C

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	<u>CONFIRM</u>	<u>VERIFY</u>
21.2 CONFIRM Bkr OA51005 Aligned for Auto white light ILLUMINATED.	_____	_____
22. At 0C512E-C DG E for DG C Transfer Panel CHECK DG C Auto Start Control HS-00057E-C in DISABLE.	_____	_____
23. At 0C512E-C SEQUENTIALLY PLACE following switches to D/G E position:		
23.1 HS-00076E-C Generator Breaker Control	_____	_____
23.2 HS-00075E-C Engine, Generator & ESW Pump Control	_____	_____
23.3 HS-00074E-C Engine, Control & Indication	_____	_____
23.4 HS-00073E-C Generator Metering & Breaker Trip Interlock	_____	_____
23.5 HS-00072E-C Generator Relaying & Breaker Trip Interlock	_____	_____
23.6 HS-00071E-C DG Ctl, Indication, Metering & Breaker Trip Interlock	_____	_____
23.7 HS-00070E-C Ventilation Supply Fans Control	_____	_____
23.8 HS-00069E-C ESW Bypass Indication & Auto Loop Transfer	_____	_____
23.9 HS-00068E-C ESW Loop B Return Valve Control & Indication	_____	_____
23.10 HS-00067E-C Alignment Alarm & Indication Only	_____	_____
23.11 HS-00066E-C DG Bypass Indication Unit 2	_____	_____
23.12 HS-00065E-C DG Bypass Indication Unit 1	_____	_____
23.13 HS-00064E-C ESW Loop B Supply Valve Control & Indication	_____	_____
23.14 HS-00063E-C ESW Loop A Return Valve Control & Indication	_____	_____
23.15 HS-00062E-C ESW Loop A Supply Valve Control & Indication	_____	_____

TRANSFER OF DG E FOR DG C

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		<u>CONFIRM</u>	<u>VERIFY</u>
23.16	HS-00061E-C ESW Temp Monitoring & HVAC Alarms	_____	_____
23.17	HS-00060E-C Diesel Alarms to Control Room Annunciator	_____	_____
23.18	HS-00059E-C Generator Field Current Computer Monitoring	_____	_____
23.19	HS-00058E-C Generator Metering & Computer Monitoring	_____	_____
NOTE:	Following steps refer to one transfer breaker used in five different locations. Normally it is located at 0A510, DG E 4.16KV Switchgear, Feeder Breaker to Test Facility Xfmr 0A51006. There is an associated label "Transfer Breaker Location" that is moved with the transfer breaker to each of the five locations.		
(³) 24.	At 0A510, PERFORM following:		
24.1	REMOVE transfer breaker 0A51006, and	_____	_____
24.2	PLACE in DG E for DG C Breaker 0A51003 in accordance with OP-000-001, Racking Breakers, and	_____	_____
24.3	PLACE "Transfer Breaker Location" label on the DG E for DG C Breaker cubicle door.	_____	_____
25.	RACK IN 0A51003 in accordance with OP-000-001.	_____	_____
26.	CLOSE Transfer Breaker 0A51003 Control & Trip DC Power Knife Switch.	_____	_____
27.	CLOSE 0A51003.	_____	_____
28.	At 0C512E-C PLACE DG C Auto Start Control HS-00057E-C to ENABLE position.	_____	_____
29.	At 0C512E-C OBSERVE DG E Aligned white light ILLUMINATED.	_____	_____

TRANSFER OF DG E FOR DG C

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CONFIRM VERIFY

NOTE: Flow should not be directed through the "E" diesel while ESW supply and return valves (HV-01110E/HV-01120E/HV-01112E/HV-01122E) are being stroked.

- | | | | |
|-----|--|-------|-------|
| 30. | At 0C577E DG E Bldg Auxiliary Systems Control Panel, OPEN ESW Loop A Valves for DG E by placing handswitch to OPEN for ESW Loop A Supply/Return HV-01112E/HV-01122E. | _____ | _____ |
| 31. | At 0C577E OPEN ESW Loop B Valves for DG E by placing handswitch to OPEN for ESW Loop B Supply/Return HV-01110E/HV-01120E. | _____ | _____ |
| 32. | At 0C521E PLACE Control Mode Select Switch to REMOTE. | _____ | _____ |
| 33. | ENSURE Control Room DG Panel Alarm EXTINGUISHED. | _____ | _____ |
| 34. | At 0C521E OBSERVE: | | |
| | 34.1 Control Switches Not Proper for Remote Auto Oper. Alarm EXTINGUISHED. | _____ | _____ |
| | 34.2 DG Bypassed or Inoperable alarm EXTINGUISHED. | _____ | _____ |
| | 34.3 Local white light EXTINGUISHED. | _____ | _____ |
| | 34.4 Remote white light ILLUMINATED. | _____ | _____ |
| | 34.5 DG Available for Emerg white light ILLUMINATED. | _____ | _____ |
| 35. | ALIGN Diesel Generator E for Standby Automatic operation in accordance with OP-024-001. | _____ | _____ |
| 36. | NOTIFY Control Room DG E has been substituted for DG C. | _____ | _____ |
| 37. | AFFIX E DG placards on C Diesel Controls on Panel 0C653. | _____ | _____ |
| 38. | LOG time of transfer completion in PCO Log. | _____ | _____ |
| 39. | PERFORM SO-024-001 to maintain DG E operability. System Test Verification is performed in lieu of Independent Verification. | _____ | _____ |