DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC In-Plant JPM P-1

TITLE: PERFORM REQUIRED ACTIONS FOR RPV INJECTION WITH THE SBLC TEST TANK

SITE: DAEC

JPM TITLE: PERFORM REQUIRED ACTIONS FOR RPV INJECTION WITH THE SBLC TEST TANK

JPM NUMBER: NRC In-Plant P-1 **REV.** 1

RELATED PRA INFO: None

TASK NUMBER(S) / TASK TITLE(S): RO 95.43 / Inject into the RPV with SBLC from the Test Tank.

K/A NUMBERS AND VALUES: E/APE 295031 Reactor Low Water Level
EA 1.08, Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL : Alternate injection systems:
IMPORTANCE 3.8 / 3.9

Justification (FOR K/A VALUES <3.0): N/A

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [X] Perform: [ ]

EVALUATION LOCATION:

In-Plant:	X	Control Room:	
Simulator:		Other:	
Lab:			

Time for Completion: 15 Minutes Time Critical: NO

Alternate Path / Faulted: NO

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago	01/03/12
	WTS JPM Developer	Date
Validated by:		
	Validation Instructor	Date
Reviewed by:		
	Plant Reviewer	Date
Approved by:		
	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

____________________________ ____________________________
Validation Personnel /Date Validation Personnel/Date

____________________________ ____________________________
Validation Personnel /Date Validation Personnel/Date

SIMULATOR SET UP: N/A

Required Materials: 1. AIP 406, Injection with SBLC

General References: 1. AIP 406, Rev. 8

Task Standards:

1. Simulates unlocking and closing of V-26-01.
2. Simulates opening V-09-60.
3. Simulates unlocking and opening V-26-18.
4. Simulates unlocking and throttling open V-26-14.
5. Simulates starting the A and B SBLC pumps.

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- You are the SANSOE.
- EOP 1 has been entered due to a LOCA.
- RPV level is +100 inches and lowering at ≈1" every 15 minutes.
- RPV pressure is 800 psig and lowering ≈1 psig every 5 minutes.
- Two Demin Water Pumps are running.
- The SBLC system WAS used for injection via the SBLC TANK.
- The SBLC TANK is now empty.

INITIATING CUES (IF APPLICABLE):

Coordinate with the NSOE and perform RPV injection with the Standby Liquid Control system test tank IAW AIP 406, INJECTION WITH SBLC, beginning at step (2).

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: **When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).**

NOTE: **Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.**

Performance Step: 1 **Critical N**	Obtains Procedure
Standard:	States that the procedure would be handed out from the Control Room in this case, but he/she could obtain it from WCCS or approved printer.
Evaluator Cue:	**When the Candidate states how to obtain procedure, hand him/her the copy provided.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 2 **Critical N**	Verify that the SBLC pumps are secured.
Standard:	Checks SBLC Pumps secured.
Evaluator Cue:	**If candidate checks any of the following:** • **Pumps are quiet** • **No piston movement visible** • **Discharge pressure is zero** • **No flow noise / indication**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 3 **Critical _Y_**	Unlock and close V-26-1, SBLC STORAGE TANK 1T-218 OUTLET ISOLATION.
Standard:	Simulates using a 2081 key, unlocks and closes V-26-1.
Evaluator Note:	• **Key is on SANSOE's ("Second Assistant's") key ring.** • **Candidate should indicate that he/she will turn the valve handwheel in the clockwise direction, and the stem of the valve will lower until it disappears.**
Evaluator Cue:	**After candidate simulates turning handwheel, V-26-1 is closed.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 4 **Critical _Y_**	Open V-09-60, 1T-218 DEMIN WATER SUPPLY ISOLATION.
Standard:	Simulates opening V-09-60.
Evaluator Cue:	• **After candidate simulates turning handwheel, V-09-60 is open.** • **If candidate listens for flow as pipe pressurizes, flow noise is heard.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 5 **Critical _Y_**	Open V-26-18, SBLC TEST TANK 1T-217 OUTLET ISOLATION.
Standard:	Simulates unlocking and opening V-26-18.
Evaluator Cue:	**After candidate simulates turning handwheel, V-26-18 is open.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 6 **Critical _Y_**	Unlock and throttle open V-26-14, DEMIN WATER SUPPLY ISOLATION as necessary to maintain test tank level above ¼ full on local sight glass LG2604.
Standard:	Simulates unlocking and throttling open V-26-14.
Evaluator Cue:	• **After candidate simulates turning handwheel, V-26-14 is open.** • **If candidate listens for flow, flow noise is heard.** • **If candidate asks sightglass tank level, it is ¾ and rising slowly.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 7 **Critical _N_**	If the Squib Valves were NOT previously opened, perform the following at 1C05: 1. Unlock and place STANDBY LIQUID CONTROL Switch HS-2613 in the "PUMPS A AND B RUN" position. 2. Verify both Squib Valve Ready lights turn OFF and SBLC SQUIB VALVE CONTINUITY LOSS (1C05A, F-3) annunciator is activated. 3. Return and lock STANDBY LIQUID CONTROL Switch HS-2613 in the "STOP" position.
Standard:	Recognizes that the Squib Valves were previously opened and marks these steps "N/A."
Evaluator Note:	**The turnover stated that SBLC was already injected into the RPV; therefore, the squibs have already been fired.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Evaluator Note: The following procedure Note is prior to the next step.

NOTE

Local operation of the SBLC pumps is authorized in the following steps to minimize the impact on control room resources.

Performance Step: 8 **Critical _Y_**	Commence injecting into the RPV by locally starting SBLC pumps using handswitches HS-2608 and HS-2610.
Standard:	Simulates starting SBLC pumps via HS-2608 and HS-2610.
Evaluator Cue:	**If the candidate checks for pump operation or flow noise,** • **Pump Noise is heard** • **Piston operation is visible** • **If the candidate informs the control room, role play as the control room and acknowledge that he is injecting into the RPV with Demin water via the SBLC test tank.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 9 **Critical <u>N</u>**	Verify system operation using any of the following local and/or remote indications: 1C05 • SBLC Flow, FI-2620 • SBLC Pressure, PI-2605 Local • SBLC Flow, FIT-2620 • SBLC Pressure, PI-2606 • SBLC TEST Tank Level, LG-2604
Standard:	Either calls the control room or verifies locally that SBLC is operating.
Evaluator Cue:	**If the Candidate calls the control room, role play as the control room and give him/her the following SBLC parameters:** • **SBLC Flow ≈ 60 gpm (FI-2620)** • **SBLC Pressure ≈ 850 psig (PI-2605)** **If the Candidate checks the local parameters, he/she will point out the local flow and pressure indicators; give appropriate values.** • **SBLC Flow, FIT-2620 ≈ 60 gpm** • **SBLC Pressure, PI-2606 ≈ 850 psig** • **SBLC TEST Tank Level, LG-2604 ≈1/2 full and stable** **After the parameters are given, inform the Candidate that another operator will control the SBLC Test Tank level.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Terminating Cues: **SBLC pumps started and test tank injection verified (simulated).**

Stop Time: ___________

NRC In-Plant JPM P-1, PERFORM REQUIRED ACTIONS FOR RPV INJECTION WITH THE SBLC TEST TANK

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ____________________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- You are the SANSOE.
- EOP 1 has been entered due to a LOCA.
- RPV level is +100 inches and lowering at ≈1" every 15 minutes.
- RPV pressure is 800 psig and lowering ≈1 psig every 5 minutes.
- Two Demin Water Pumps are running.
- The SBLC system WAS used for injection via the SBLC TANK.
- The SBLC TANK is now empty.

INITIATING CUES (IF APPLICABLE):

Coordinate with the NSOE and perform RPV injection with the Standby Liquid Control system test tank IAW AIP 406, INJECTION WITH SBLC, beginning at step (2).

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

AIP 406
INJECTION WITH SBLC

Purpose: To use the SBLC System as an alternate means of injecting water into the RPV when normal injection systems are inadequate or unavailable. **{C001}**

Location: Control Room Panel 1C05, RB 833', RB 812', RB 786', TB Basement

Equipment Required: (1) GE #75 Key, (1) #2081 Key

Instructions:

CAUTION
Alternate Injection from the SBLC Tank is NOT authorized during an ATWS since it is reserved for boron injection.

(1) **To inject from the SBLC TANK**, perform the following (actions taken at 1C05 unless specified otherwise):

(a) Unlock STANDBY LIQUID CONTROL Switch HS-2613 and place the switch in the "PUMPS A AND B RUN" position. __________

(b) Verify system operation using any of the following indications: __________

- SBLC Pumps A/B Red Running Lights ON
- SBLC Squib White Lights OFF
- SBLC Flow, FI-2620
- SBLC Pressure, PI-2605
- SBLC Tank Level, LI-2600A

(c) If not previously performed, deenergize SBLC tank heaters when SBLC tank level reaches about 30% by placing the following breakers in the OFF position. __________

Breaker	Location
1B3446	RB, 786' Level, F5
1B1426	RB, 812' Level, E10

(d) Secure SBLC Pumps as tank level approaches 0%. ___________

(e) As directed by the CRS, refill the SBLC tank as follows:

1. To refill with sodium boron solution, return the system to the Standby Readiness condition per OI 153. ___________

2. To refill 1T-218 with Demin Service Water perform the following:

   a. Open V-09-60, 1T-218 Demin Water Supply Isolation. ___________

   b. On the RB 833' Level, Unlock V-26-13, Demin Water Supply to 1T-218, and operate as necessary to provide makeup water to the SBLC tank. ___________

NOTE

Fire Water is a lower quality water system and consideration should be given to the availability of Demin Service Water and the flow rates required for makeup.

3. To refill with Fire Water, perform the following otherwise N/A:

   a. Unlock and open the SBLC Storage Tank cover. ___________

   b. Use local fire hose station(s) to provide makeup water to the SBLC tank. ___________

(f) As directed by the CRS, continue injection into the RPV by repeating Steps (1)(a) through (1)(e). ___________

(2) **To inject from the TEST TANK**, perform the following (actions taken on the RB 833' level unless specified otherwise):

(a) Verify SBLC Pumps secured. ___________

(b) Unlock and close V-26-1, SBLC Storage Tank 1T-218 Outlet Isolation. ___________

(c) Open V-09-60, 1T-218 Demin Water Supply Isolation. ___________

(d) Unlock and open V-26-18, SBLC Test Tank 1T-217 Outlet Isolation. ___________

(e) Unlock and throttle open V-26-14, Demin Water Supply Isolation, as necessary to maintain test tank level above 1/4 full on local sight glass LG-2604. ___________

(f) If the Squib Valves were NOT previously opened, perform the following at 1C05:

1. Unlock and place STANDBY LIQUID CONTROL Switch HS-2613 in the “PUMPS A AND B RUN” position. ___________

2. Verify both Squib Valve Ready lights turn OFF and SBLC SQUIB VALVE CONTINUITY LOSS (1C05A, F-3) annunciator is activated. ___________

3. Return and lock STANDBY LIQUID CONTROL Switch HS-2613 in the “STOP” position. ___________

NOTE

Local operation of the SBLC pumps is authorized in the following steps to minimize the impact on control room resources.

(g) Commence injection into the RPV by locally starting SBLC Pumps using handswitches HS-2608 and HS-2610. ___________

(h) Verify system operation using any of the following local and/or remote indications:

1C05

- SBLC Flow, FI-2620
- SBLC Pressure, PI-2605

Local

- SBLC Flow, FIT-2620
- SBLC Pressure, PI-2606
- SBLC TEST Tank Level, LG-2604

CAUTION
SBLC pump(s) should be secured if test tank level drops below 1/4 full to prevent pump damage.

(i) Continue performing actions in Step (2)(j) until directed by the control room to secure injection.

(j) Control SBLC Test Tank Level between 1/4 full and full as indicated on local gage LG-2604 by performing the following actions, as necessary:

1. Throttle V-26-14, DEMIN WATER SUPPLY ISOLATION.
2. Locally start/stop SBLC Pumps using handswitches HS-2608 and HS-2610.

(k) If necessary, start an additional Demin Water Pump using local handswitches in the TB Basement.

Restoration:

(1) When no longer required for RPV injection, secure the SBLC pumps and return the system to the Standby Readiness Condition per OI 153.

AIP 406
INJECTION WITH SBLC

References:

(1) OI 153, Standby Liquid Control System

(2) P&ID M-109, Condensate & Demineralized Water System

(3) P&ID M-126, Standby Liquid Control System

(4) **{C001}** COM021867, FPL letter L-2007-007 to NRC dated Feb. 9, 2007, and License Amendment dated August 9, 2007.

AIP 406
INJECTION WITH SBLC

Usage Level

Continuous Use

Effective Date:

Approved for **'Point-of-Use'** printing **IF NO DCFs** are in effect for this procedure.
(on designated printers)

Record the following: Date / Time: ____________________ / ________________

Printer ID: **DA -** ______________________ Initials: _________

NOTE: *Per ACP 106.1, a DCF/REV check shall be performed and documented every 24 hours if active document use exceeds a 24 hour period as determined from the date and time recorded above.*

Document approval signatures on file

Prepared By: Ron Potts / ______________________ Date: __________
Print Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)
Reviewed By: ______________ / ______________ Date: ________ Print Signature
Reviewed By: ______________ / ______________ Date: ________ Print Signature

PROCEDURE APPROVAL BY QUALIFIED REVIEWER
Approved By ______________ / ______________ Date: ________ Print Signature

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC In-Plant JPM P-2

TITLE: Shift CRD Flow Control Valves

SITE:	DAEC
JPM TITLE:	Shift CRD Flow Control Valves
JPM NUMBER:	NRC In-Plant P-2 **REV.** 1
RELATED PRA INFO:	None
TASK NUMBER(S) / TASK TITLE(S):	30.06 / Perform Required Actions for Switching Flow Control Valves
K/A NUMBERS AND VALUES:	SYSTEM: 201001 Control Rod Drive Hydraulic System. A2.07 Ability to (a) predict the impacts of the following on the CONTROL ROD DRIVE HYDRAULIC SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Flow control valve failure. IMPORTANCE: 3.2 / 3.1
Justification (FOR K/A VALUES <3.0):	N/A

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [X] Perform: [ ]

EVALUATION LOCATION:				
	In-Plant:	X	Control Room:	
	Simulator:		Other:	
	Lab:			

Time for Completion: 15 Minutes Time Critical: NO

Alternate Path / Faulted: NO

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago	01/03/13
	WTS JPM Developer	Date
Validated by:		
	Validation Instructor	Date
Reviewed by:		
	Plant Reviewer	Date
Approved by:		
	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

________________________ ________________________

Validation Personnel /Date Validation Personnel/Date

________________________ ________________________

Validation Personnel /Date Validation Personnel/Date

SIMULATOR SET UP: N/A

Required Materials:

1. OI 255, Control Rod Drive Hydraulic System

General References:

1. OI 255, Control Rod Drive Hydraulic System, Section 6.2, Rev. 82

Task Standards:

1. Slowly close V-17-29 Outlet Isolation Valve while throttling open V-17-28 Outlet Isolation to maintain CRD System flow at 40 gpm on FI-1815.
2. Place the AUTO/MANUAL transfer switch HIC-1834A in the AUTO position.
3. Place the AUTO/MANUAL transfer switch HIC-1834B to the MANUAL position.

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- The plant is at rated conditions.
- CRD Flow Control Valve CV-1822 is currently in service.
- An air leak has been reported on CV-1822.
- CV-1822 must be removed from service in order to repair the air leak.

INITIATING CUES:

- Coordinate with the control room and Shift CRD Flow Control Valves IAW OI 255, Control Rod Drive Hydraulic System, Section 6.2.
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: 1 **Critical N**	Establish communications between the Control Room and the local CRD flow control station.
Standard:	Communication is simulated established via the telephone, sound powered phone, or plant page.
Evaluator Cue:	**You are in contact with the control room.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 2 **Critical N**	Verify Outlet Isolation Valve V-17-29 [28] for Standby Flow Control Valve CV-1822 [1821] closed.
Standard:	Verifies V-17-28 is closed.
Evaluator Cue:	**The Outlet Isolation Valve will not move when the handwheel is turned in the close direction.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 3 **Critical <u>N</u>**	Verify Inlet Isolation Valve V-17-27 [26] for Standby Flow Control Valve CV-1822 [1821] open.
Standard:	Verifies V-17-26 is open.
Evaluator Cue:	**Inlet isolation valve is open.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 4 **Critical <u>N</u>**	At 1C05, place FC-1814 CRD SYSTEM FLOW CONTROL in MANUAL.
Standard:	Simulates contacting the Control Room to have FC-1814 placed in MANUAL.
Evaluator Cue:	**Role Play as the Reactor Operator and Cue that FC-1814 is in MANUAL**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 5 **Critical <u>N</u>**	Verify local AUTO/MAN transfer switch HIC-1834B [A] for CV-1822 [1821] selected to MAN.
Standard:	Verifies HIC 1834A is in MAN.
Evaluator Cue:	**HIC 1834A is in MAN.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 6 **Critical** __N__	Raise and lower the air signal to CV-1822 [1821] with the manual control knob, and verify that the valve strokes normally.
Standard:	Simulates observing the valve position indicator as air signal is raised and lowered, observing for proper operation.
Evaluator Cue:	**Standby flow control valve CV-1821 opens smoothly when the controller knob is rotated in the increase direction. When the knob is rotated in the counterclockwise direction, the valve closes smoothly.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 7 **Critical** __N__	Match manual and automatic air signals for CV-1822 [1821].
Standard:	Simulates matching automatic and manual air signals for CV-1821 by adjusting so that both red pointers are aligned.
Evaluator Cue:	**Manual and automatic air signals are matched**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 8 **Critical** __Y__	Slowly close V-17-28 [29] Outlet Isolation Valve for CV-1821 [1822] while throttling open V-17-29 [28] Outlet Isolation for CV-1822 [1821] to maintain CRD System flow at 40 gpm on FI-1815.
Standard:	Simulates closing V-17-29 Outlet Isolation Valve for CV-1822 while throttling open V-17-28 Outlet Isolation for CV-1821 to maintain CRD System flow at 40 gpm on FI-1815.
Evaluator Cue:	**When demonstrated, state that V-17-29 is closed and V-17-28 is open. CRD flow is 40 gpm.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 9 **Critical _N_**	Verify that the manual and automatic air signals on HIC-1834B [A] for CV-1822 [1821] are balanced.
Standard:	Verifies the manual and automatic air signals on HIC-1834A for CV-1821 are balanced.
Evaluator Cue:	**Manual and automatic air signals are matched.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 10 **Critical _Y_**	Place the AUTO/MANUAL transfer switch HIC-1834B [A] for CV-1822 [1821] in the AUTO position.
Standard:	Simulates placing the AUTO/MANUAL transfer switch HIC-1834A for CV-1821 in the AUTO position.
Evaluator Cue:	**HIC-1834A is in AUTO.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 11 **Critical _N_**	Verify that the manual and automatic air signals on HIC-1834A [B] for CV-1821 [1822] are balanced.
Standard:	Verifies that the manual and automatic air signals on HIC-1834B for CV-1822 are balanced.
Evaluator Cue:	**The manual and automatic air signals on HIC-1834B are matched.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 12 **Critical _Y_**	Place the AUTO/MANUAL transfer switch HIC-1834A [B] for CV-1821 [1822] to the MANUAL position.
Standard:	Places the AUTO/MANUAL transfer switch HIC-1834B for CV-1822 to the MANUAL position
Evaluator Cue:	**Transfer switch HIC-1834B for CV-1822 is in the MANUAL position.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 13 **Critical _N_**	Reduce the manual air signal to CV-1821 [1822] to minimum.
Standard:	Simulates reducing air signal to CV-1822 to minimum.
Evaluator Cue:	**Air signal to CV-1822 is at minimum.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 14 **Critical _N_**	Verify Outlet Isolation Valve V-17-28 [29] for CV-1821 [1822] closed.
Standard:	Verifies that Outlet Isolation Valve V-17-29 for CV-1822 is closed.
Evaluator Cue:	**Valve V-17-29 for CV-1822 is closed**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 15 **Critical _N_**	Notify the Control Room that flow control valve CV-1822 [1821] is on line with CV-1821 [1822] in standby.
Standard:	Calls the Control Room and informs them that flow control valve CV-1821 is on line with CV-1822 in standby.
Evaluator Cue:	**Role Play as the Control Room Operator and acknowledge the report.** **Following the report, Cue the operator that the JPM is complete.**
Evaluator Note:	**The remaining steps in the procedure are control room actions.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Terminating Cues: **The standby flow control valve has been placed in service locally.**

Stop Time: ___________

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ____________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ______________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- The plant is at rated conditions.
- CRD Flow Control Valve CV-1822 is currently in service.
- An air leak has been reported on CV-1822.
- CV-1822 must be removed from service in order to repair the air leak.

INITIATING CUES:

- Coordinate with the control room and Shift CRD Flow Control Valves IAW OI 255, Control Rod Drive Hydraulic System, Section 6.2.
- This Task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

OPERATING INSTRUCTION
OI 255
CONTROL ROD DRIVE HYDRAULIC SYSTEM

Usage Level
Multiple Use

Approved for **'Point-of-Use'** printing **IF NO Temporary Changes** are in effect for this procedure.
(on designated printers)

Record the following: Date / Time: ____________ / _________ Initials: ____

NOTE: *A check to ensure current revision and no temporary changes shall be performed and documented every 24 hours if active document use exceeds a 24 hour period as determined from the date and time recorded above.*

Prepared By: ____________________ / ____________________________ Date: __________
Print / Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)
Reviewed By: ____________________ / ____________________ Date: __________   Print / Signature
Reviewed By: ____________________ / ____________________ Date: __________   Print / Signature

PROCEDURE APPROVAL BY QUALIFIED REVIEWER
Approved By ____________________ / ____________________ Date: __________   Print / Signature

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1.0 PURPOSE

To provide detailed instructions to the system operating personnel for proper operation of the Control Rod Drive (CRD) Hydraulic System.

2.0 PRECAUTIONS AND LIMITATIONS

(1) Do not exceed a charging water pressure of 1510 psig. Accumulator pressure in excess of 1510 psig may cause control rod drive (CRD) mechanism damage during a Scram.

(2) The CRD mechanism could be seriously damaged if a scram occurs with Insert Isolation V-18-1008 (**-**) open and either Withdraw Isolation V-18-1275 (**-**) or Scram Discharge Isolation V-18-1542 (**-**) closed.

(3) CRD Pump 1P-209A[B] Minimum Flow Isolation V-17-9[11] shall be locked open prior to operation of the pump to prevent pump damage during low system flow conditions.

(4) Only one CRD Pump should normally be in operation unless two are required by Emergency Operating Procedures.

(5) During hot shutdown periods (reactor water temperature >212°F), one CRD pump should run continuously to supply cooling water to the CRD mechanisms to maintain temperatures below 250°F to preclude CRD mechanism seal damage.

(6) The CRD System contains potentially contaminated water. Comply with ACP 1411.29 and use appropriate radiological precautions during venting and draining activities.

(7) The continuous modes of control rod operation should only be used for the purpose of reactor startup, timing the CRD insert and withdraw speeds, power suppression testing, single rod continuous insertion, and rod insertion and withdrawal during sequence exchange steps.

(8) HCU valves are identified by the lead valve number in the series on P&ID M-118 and control rod core positions such as V-18-29 (22-23) for the charging water isolation valve on the central control rod HCU.

(9) Do not use the Scram Time Testing Equipment for anything other than Scram Time Testing, maintenance activities for "FULL IN" control rods, or as directed by Emergency Operating Procedures.

(10) Any Control Rod that is withdrawn from a defueled cell with cooling water valved in, is capable of drifting into the core, especially if a scram signal is received. In general it is preferred to completely isolate the HCU of a defueled cell. Cooling water should only be valved in if adequate support exists for the blade or the CRD system is secured.

(11) Isolation of multiple HCUs with the CRD pump(s) in operation can cause higher-than-normal cooling and exhaust water header pressures that, in turn, may be a precursor to inadvertent rod motion (insert OR withdrawal) if a sufficient number of HCUs are not in service or if alternate system flow paths are not established. Ensure that the cooling water DP is less than 35 psid, or the number of HCUs isolated is less than 50%, or as in the case of a full core offload when all HCUs are isolated, rotate the spectacle flange to assist in cooling and exhaust water header pressure control.
(Reference GE 10 CFR Part 21 SC07-08 and INPO SEN 264).

(12) Per CRD BWROG and Vendor (GE) guidance, timing of the CRD travel time for insert and withdrawal shall be performed by the "Light-to-Light" method. Timing from light OUT to light OUT (for CRD insert) and light ON to light ON (for CRD withdrawal) accounts for hysterisis in the PIP reed switches. The PIP reed switches close just before a notch position is reached and open just after a notch position is passed. See specific direction below:

(a) For CRD Insert: CRD travel shall be timed from the 4-Rod Display light going OUT at the initial position to the light going OUT at the final position.

(b) For CRD Withdrawal: As a short insert signal is given to unlatch the collet fingers, the initial position light will go out momentarily and then come back on once the CRD actually begins to withdraw. Therefore CRD travel shall be timed from the 4-Rod Display light going <u>back</u> ON at the initial position to the light going ON at the final position.

(13) While fuel channel distortion is not expected for the DAEC core, it is possible, particularly in the peripheral control cells. If while moving control rods, a rod fails to settle or is abnormally slow in settling and/or the control rod speeds vary significantly from the norm, fuel channel distortion may be suspected. Contact the Reactor Engineer for assistance.

(14) **IF** combined Mini-Purge flow (both loops) is raised above 5 gpm, **THEN** the 8 hour average thermal power shall be limited to ≤ 1911.5 MWth, sufficient margin shall be maintained to MELLLA load line, and Reactor Engineering shall be contacted **{C001}**

3.0 STARTUP OF THE CRD SYSTEM

Usage Level
Continuous Use

3.1 PREPARATIONS FOR STARTUP OF THE CRD SYSTEM FROM SHUTDOWN CONDITIONS

(1) Verify that the Control Rod Drive System Electrical Lineup OI 255A1 (Attachment 1) has been completed. ____________

(2) Verify that the Control Rod Drive System Valve Lineup and Checklist OI 255A2 (Attachment 2 & 4) has been completed. ____________

(3) Verify that Hydraulic Control Unit Valve Lineup and Checklist OI 255A3 (Attachment 3 & 5) has been completed. ____________

(4) Verify all Hydraulic Control Units are pre-charged with Nitrogen per Section 8.4. ____________

(5) Verify that the Reactor Building Closed Cooling Water System is in service. ____________

(6) Verify that the Instrument and Service Air System is in service and supplying CRD Air Filters 1F-1A, B, C, and D, per OI 518.1. ____________

(7) Verify that the CST 1T-5A[B] LO LEVEL (1C06A, B-8[9]) annunciators are reset. ____________

(8) Verify the instrument air pressure to the CRD flow control station is approximately 30 psig as indicated on Pressure Indicator PI-1819. ____________

(9) At the local CRD master flow control station, select Flow Control Valve CV-1821[22] for operation as follows:

(a) Place CV-1821[22] manual/auto switch in AUTO. ____________

(b) Place CV-1822[21] manual/auto switch in MANUAL. ____________

(c) Adjust standby flow control valve CV-1822[21] to zero. ____________

(d) Verify Flow Control Outlet Isolation Valve V-17-28[29] is open. ____________

(e) Close Flow Control Outlet Isolation Valve V-17-29[28]. ____________

(10) Vent CRD Pump Suction Filters 1F-15A and 1F-15B through the following Vent Valves:

Valve	Description	
V-17-97	CRD Pump Suction Filter 1F-15A Vent	____________
V-17-110	CRD Pump Suction Filter 1F-15B Vent	____________
V-17-112	CRD Pump Suction Filter 1F-15B Outlet Vent	____________

(11) Vent the Condensate Supply to CRD through V-09-102 near the SW Torus Area Catwalk (requires 2 Operators due to location of valve on Torus Catwalk and drain in Torus basement). ____________

(12) Verify adequate suction pressure (5 to 15 psig) as indicated by local Pressure Gauges PI-1803A and PI-1803B. ____________

(13) Vent both CRD pumps 1P-209A and B through pump casing Vent Valves V-17-04 and V-17-6, respectively. ____________

Usage Level

Reference Use

CAUTION
To prevent inadvertent control rod withdrawal, the cooling water DP has to stay less than 35 psid, or the number of HCUs isolated less than 50%, or the spectacle flange rotated to assist in cooling and exhaust water header pressure control.

3.2 STARTUP OF A CRD PUMP

(1) Prepare to start CRD Pump 1P-209A[B] as follows:

(a) Verify adequate oil level in CRD Pump 1P-209A[B] motor and speed changer. ____________

(b) Close 1P-209A[B] Pump Discharge Isolation V-17-8[10] to approximately 1/2 turn open. ____________

(c) Adjust CRD SYSTEM FLOW CONTROL FC-1814 to 0 gpm in MANUAL. ____________

CONTINUOUS RECHECK STATEMENT
(Applicable to the remainder of this section)

IF	CRD Pump 1P-209A[B] becomes airbound (indicated by motor current dropping to approximately 9 amps,	**THEN**	immediately stop the pump to prevent damage and vent CRD suction piping, suction filters and pump casing.

(2) At 1C05, verify MO-1833, INLET TO CRD RETURN LINE, is fully open. ____________

(3) Start CRD PUMP 1P-209A[B] by momentarily placing handswitch HS-1807A[B] on 1C05 in the START position. ____________

NOTE
Do not exceed 33 amps motor current when opening Discharge Valve V-17-8[10] in the next step. The CRD pump will trip on low suction pressure of 18 in HG abs after a 15 second time delay.

(4) Slowly open Discharge Isolation V-17-8[10] to pressurize downstream piping and to prevent CRD pump from tripping on low suction pressure. ____________

(5) Vent both CRD Discharge Filters 1F-201A and B, using the following Vent Valves:

Filter	Valve	Description	
1F-201A	V-17-15	CRD Pump Disch Filter 1F-201A Vent	____________
	V-17-17	1F-201A Combined Vent/ Drain Line Isolation	____________
1F-201B.	V-17-18	CRD Pump Disch Filter 1F-201B Vent	____________
	V-17-20	1F-201B Combined Vent/ Drain Line Isolation	____________

NOTE
As the HCU accumulators charge, the individual alarm lights on the FULL CORE DISPLAY on 1C05 should extinguish.

(6) At 1C05, verify charging header pressurized >1200 psig on PI-1816A CHARGING WATER PRESSURE. ____________

(7) Slowly adjust CRD SYSTEM FLOW CONTROL FC-1814 to obtain approximately 40 gpm on FI-1814 CRD SYSTEM FLOW. ____________

(8) When FC-1814 is properly controlling flow, then shift to AUTO. ____________

(9) Slowly adjust DRIVE WATER ΔP CONTROL MO-1830 to obtain approximately 260 psid on PDI-1825A DRIVE WATER ΔP. ____________

(10) Start up the GEMAC Reactor Vessel Level Instruments Reference Legs Backfill System per OI 880, Section J-1. ____________

Usage Level
Information Use

4.0 NORMAL OPERATION OF THE CRD SYSTEM

CONTINUOUS RECHECK STATEMENT (Applicable to the remainder of this section)	
IF combined Mini-Purge flow (both loops) is raised above 5 gpm,	**THEN** the 8 hour average thermal power shall be limited to ≤ 1911.5 MWth, sufficient margin shall be maintained to MELLLA load line, and Reactor Engineering shall be contacted **{C001}**

(1) During normal plant operation, the CRD Hydraulic System shall be maintained in operation. The following system parameters shall be periodically monitored and logged: ____________

Component	Location	Low	Norm	High
CRD FILTERS 1F-201A/B INLET PRESSURE	Local			1510
CRD SUCTION FILTER dP (PDI-1800)	Local	-	-	1
CRD PUMP SUCTION PRESSURE (PI-1803A[B])	Local	5[0]	-	16
STABILIZING FLOW (FI-1826)	Local	5.0	6	-
CRD DISCHARGE FILTER dP (PDIS-1812)	Local	-	-	10
TOTAL SYSTEM FLOW (FI-1815)	Local	-	40	-
MINI PURGE FLOW (FI-1804A[B])	Local	2	-	4
CRD PUMP OIL PRESSURE	Local	20	-	30
CRD PUMP OIL TEMPERATURE	Local	80	100	120
SCRAM AIR PILOT AIR HEADER PRESSURE (PI-1841)	Local	70	72	75

(2) Periodically monitor the following on 1C05: ____________

Component	Location	Low	Norm	High
CHARGING WATER PRESSURE	PI-1816A	-	-	1510
DRIVE WATER ΔP	PDI-1825A	200	260	300
COOLING WATER ΔP	PDI-1832A	15	20	25

5.0 SHUTDOWN OF THE CRD SYSTEM

Usage Level

Continuous Use

5.1 INITIAL SHUTDOWN

NOTE

Periods of extended, no-flow conditions may result in excessive corrosion of CRD components. Whenever plant conditions permit, cooling water flow should be maintained and the drives cycled weekly.

(1) Shut down the GEMAC Reactor Level Instruments Reference Legs Backfill System per OI-880, Section J-1. ____________

(2) At 1C05, balance the deviation on FC-1814 CRD SYSTEM FLOW CONTROL and transfer to MANUAL. ____________

(3) Adjust FC-1814 CRD SYSTEM FLOW CONTROL to minimum signal. ____________

(4) Stop CRD PUMP 1P-209A[B] with handswitches HS-1807A and HS-1807B. ____________

Usage Level

Continuous Use

CAUTION
To prevent inadvertent control rod withdrawal, the cooling water DP has to stay less than 35 psid, or the number of HCUs isolated less than 50%, or the spectacle flange rotated to assist in cooling and exhaust water header pressure control.

5.2 SUPPLYING FLUSH WATER TO THE CONTROL ROD ASSEMBLIES

(1) Verify the CRD System is shutdown per Section 5.1 and that both CRD Pumps 1P-209A and B are tagged out. ____________

(2) Connect a 1 inch Chicago hose between condensate service from either V-36-126 or V-36-127 (located behind 1C126B) to V-17-188 CRD Refueling Outage Low Flow Flush Connection Isolation, or V-17-99 MO-1833 flush connection. ____________

(3) When hose has been hooked up, OPEN Condensate Service Supply, either V-36-126 or V-36-127, and check for leaks. ____________

(4) Open V-17-188 or V-17-99 to supply flushing water to the control rod drive assemblies. ____________

(5) To secure close V-17-188 or V-17-99 and either V-36-126 or V-36-127, disconnect and drain hose. ____________

6.0 ALTERNATING CRD SYSTEM COMPONENTS

Usage Level

Continuous Use

6.1 SWITCHING CRD PUMPS

(1) Prepare to start standby CRD Pump 1P-209A[B] as follows:

(a) Verify adequate oil level in standby CRD Pump 1P-209A[B]. ____________

(b) Verify standby CRD Pump 1P-209A[B] Discharge Isolation V-17-8 [10] full open. ____________

CONTINUOUS RECHECK STATEMENT
(Applicable to the remainder of this section) _________

IF CRD Pump 1P-209A[B] becomes airbound (indicated by motor current dropping to approximately 9 amps,	**THEN** immediately stop the pump to prevent damage and vent CRD suction piping, suction filters and pump casing.

(2) At 1C05, start Standby CRD PUMP 1P-209A[B] by momentarily placing handswitch HS-1807A[B] on 1C05 in the START position. ____________

(3) Stop Running CRD PUMP 1P-209B[A] by momentarily placing handswitch HS-1807B[A] on 1C05 in the STOP position. ____________

Usage Level
Continuous Use

6.2 SWITCHING TO THE STANDBY FLOW CONTROL VALVE CV-1822[CV-1821]

(1) Establish communications between the Control Room and the local CRD flow control station. ____________

(2) Verify Outlet Isolation Valve V-17-29[28] for Standby Flow Control Valve CV-1822[21] closed. ____________

(3) Verify Inlet Isolation Valve V-17-27[26] for Standby Flow Control Valve CV-1822[21] open. ____________

(4) At 1C05, place FC-1814 CRD SYSTEM FLOW CONTROL in MANUAL. ____________

(5) Verify local AUTO/MAN transfer switch HIC-1834B[A] for CV-1822[21] selected to MAN. ____________

(6) Raise and lower the air signal to CV-1822[21] with the manual control knob, and verify that the valve strokes normally. ____________

(7) Match manual and automatic air signals for CV-1822[21]. ____________

(8) Slowly close V-17-28[29] Outlet Isolation Valve for CV-1821[22] while throttling open V-17-29[28] Outlet Isolation for CV-1822[21] to maintain CRD System flow at 40 gpm on FI-1815. ____________

(9) Verify that the manual and automatic air signals on HIC-1834B[A] for CV-1822 [CV-1821] are balanced. ____________

(10) Place the AUTO/MANUAL transfer switch HIC-1834B[A] for CV-1822[21] in the AUTO position. ____________

(11) Verify that the manual and automatic air signals on HIC-1834A[B] for CV-1821 [CV-1822] are balanced. ____________

(12) Place the AUTO/MANUAL transfer switch HIC-1834A[B] for CV-1821[22] to the MANUAL position. ____________

(13) Reduce the manual air signal to CV-1821[22] to minimum. ____________

(14) Verify Outlet Isolation Valve V-17-28[29] for CV-1821[22] closed. ____________

(15) Notify the Control Room that flow control valve CV-1822[21] is on line with CV-1821[22] in standby. ____________

(16) At 1C05, observe that CV-1822[21] indicates intermediate or open, and that CV- 1821[22] indicates closed. ____________

(17) Place CRD SYSTEM FLOW CONTROL FC-1814 to AUTO. ____________

(18) Verify that CRD System flow indicates 40 gpm on FI-1814 CRD SYSTEM FLOW. ____________

(19) Verify that drive water pressure is approximately 260 psid as indicated on PDI-1825A (CRD PRESSURE) DRIVE WATER ΔP. ____________

6.3 SWITCHING CRD PUMP DISCHARGE FILTERS

Usage Level

Continuous Use

6.3.1 PLACING STANDBY DISCHARGE FILTER 1F-201B[A] IN SERVICE

CAUTION

Since the CRD Pump Discharge Filters are normally pressurized to 1500 psig, valve operations should be performed carefully. __________

(1) Verify the following valve positions for standby CRD Pump Discharge Filter 1F-201B[A]:

Inlet Isolation Valve V-17-14[13]	OPEN	__________
Outlet Isolation Valve V-17-22[21]	CLOSED	__________

(2) Vent Filter 1F-201B[A] as follows:

(a) Open Combined Vent/Drain Line Isolation V-17-20[17]. __________

(b) Crack open CRD Pump Discharge Filter 1F-201B[A] Vent Valve V-17-18[15] and vent as necessary. __________

(c) Close V-17-18[15]. __________

(d) Close V-17-20[17]. __________

♻ CONTINUOUS RECHECK STATEMENT ♻

(Applicable to the remainder of this section) __________

IF PDIS-1812 CRD Pump Discharge Filter High Diff Pressure rises while transferring to the standby filter,	**THEN** stop the evolution, and inform the CRS.

(3) Slowly open Outlet Isolation Valve V-17-22[21]. __________

(4) Slowly close Outlet Isolation Valve V-17-21[22]. __________

(5) At 1C05, verify that CRD System flow is 40 gpm and drive water pressure is approximately 260 psid as indicated on FI-1814 CRD SYSTEM FLOW and PDI-1825A (CRD PRESSURE) DRIVE WATER ΔP, respectively. __________

Usage Level

Continuous Use

6.3.2 ISOLATING AND DRAINING DISCHARGE FILTER 1F-201A[B]

CAUTION
Since the CRD Pump discharge Filters are normally pressurizes to 1500 psig, valve operations should be performed carefully for operator safety.

(1) Verify closed Outlet Isolation Valve V-17-21[22]. ____________

(2) Close Inlet Isolation Valve V-17-13[14]. ____________

(3) Slowly open the following valves to depressurize and drain the Discharge Filter 1F-201A[B]:

(a) Slowly open Combined Vent/Drain Line isolation V-17-17[20]. ____________

(b) Slowly open CRD Pump Discharge Filter 1F-201A[B] Vent Valve V-17-15[18]. ____________

(c) Slowly open CRD Pump Disch Filter 1F-201A[B] Drain Valve V-17-16[19]. ____________

Usage Level

Continuous Use

6.3.3 RETURNING DISCHARGE FILTER 1F-201A[B] TO A STANDBY CONDITION

CAUTION

Since the CRD Pump discharge Filters are normally pressurizes to 1500 psig, valve operations should be performed carefully for operator safety.

(1) Close Filter Drain Valve V-17-16[19]. ____________

(2) Verify Combined Vent/Drain Line isolation V-17-17[20] is open. ____________

(3) Throttle Filter Vent Valve V-17-15[18] to one turn open. ____________

(4) Crack open Filter 1F-201A[B] Inlet Isolation Valve V-17-13[14] to flush air from the filter housing. ____________

(5) When venting is complete, close Vent Valves V-17-15[18]. ____________

(6) Close Combined Vent/Drain Line isolation V-17-17[20]. ____________

(7) Fully open Filter Inlet Isolation Valve V-17-13[14]. ____________

6.4 SWITCHING CRD PUMP SUCTION FILTERS

Usage Level
Continuous Use

6.4.1 PLACING STANDBY SUCTION FILTER 1F-15B[A] IN SERVICE

CONTINUOUS RECHECK STATEMENT
(Applicable to the remainder of this section)

IF CRD Pump 1P-209A[B] becomes airbound (indicated by motor current dropping to approximately 9 amps),	**THEN** immediately stop the pump to prevent damage and vent CRD suction piping, suction filters and pump casing.

____

(1) Verify the following valve positions for standby CRD Pump Suction Filter 1F-15B[A]:

Inlet Isolation Valve V-17-108[118]	OPEN	_____________
Outlet Isolation Valve V-17-109[95]	CLOSED	_____________

(2) Attach a hose at filter vent V-17-110[97] and direct flow to the floor drain. _____________

(3) Vent Filter 1F-15B[A] through V-17-110[97]. _____________

(4) For standby filter 1F-15B only:

(a) Attach a hose at line vent V-17-112 and direct flow to floor drain. _____________

(b) Slowly vent Filter 1F-15B outlet piping by opening and then closing V-17-112 until a solid stream of water is observed. _____________

(c) Continue checking for air throughout the following steps via V-17-112. _____________

(5) Slowly open Outlet Isolation Valve V-17-109[95]. _____________

(6) Slowly close Outlet Isolation Valve V-17-95[109]. _____________

(7) Vent Filter 1F-15B[A] through V-17-110[97]. _____________

(8) Verify CRD Pump Suction Filter 1F-15B Outlet Vent V-17-112 closed. _____________

(9) At 1C05, verify that CRD System flow is 40 gpm and drive water pressure is approximately 260 psid. _____________

Usage Level

Continuous Use

6.4.2 ISOLATION AND DRAINING SUCTION FILTER 1F-15A[B]

(1) Close Inlet Isolation Valve V-17-118[108]. ____________

(2) Attach hoses at Vent Valve V-17-97[110] and at Drain Valve V-17-98[111] and direct to floor drain. ____________

(3) Open Vent Valve V-17-97[110] to depressurize Suction Filter 1F-15A[B]. ____________

(4) Open Drain Valve V-17-98[111] to drain Suction Filter 1F-15A[B]. ____________

(5) Verify drain flow stops to ensure filter is isolated. ____________

Usage Level

Continuous Use

6.4.3 RETURNING SUCTION FILTER 1F-15A[B] TO A STANDBY CONDITION

(1) Close Filter Drain Valve V-17-98[111]. ____________

(2) Throttle Filter Vent Valve V-17-97[110] to one turn open. ____________

(3) Slowly open Filter 1F-15A[B] Inlet Isolation Valve V-17-118[108] to flush air from the filter housing. ____________

(4) When air is no longer present, close vent V-17-97[110]. ____________

(5) For Filter 1F-15B:

  (a) Attach a hose line to vent V-17-112 and direct flow to floor drain. ____________

  (b) Vent Filter 1F-15B outlet piping through V-17-112, then close vent V-17-112. ____________

(6) Verify V-17-118[108] Filter Inlet Isolation Valve is full open. ____________

Usage Level

Continuous Use

6.5 SWITCHING STABILIZING VALVE SETS

(1) Verify that Inlet Isolation Valve V-17-36[35] is open for the SV-1844A/B[1843A/B] Standby Stabilizing Valve Set. ____________

NOTE

Stabilizing valve flow should not change when performing the next step.

(2) Open Outlet Isolation Valve V-17-42[41] for standby stabilizing valve set. ____________

(3) On 1C05, place STAB VALVE SELECT Switch HS-1831 in the B[A] position. ____________

(4) Verify that the B[A] white light above the STAB VALVE SELECT switch HS-1831 illuminates. ____________

(5) Close Outlet Isolation Valve V-17-41[42]. ____________

(6) Observe flow of 6 gpm on Flow Indicator FI-1826 with no control rod movement. ____________

Usage Level

Continuous Use

6.6 SWITCHING CRD AIR FILTERS

(1) Place 30 psig Instrument Air Supply filter 1F-1B[A] in service as follows:

(a) Slowly open Outlet Isolation Valve V-17-66[65] for Standby Air Filter 1F-1B[A]. ____________

(b) Slowly open Inlet Isolation Valve V-17-64[63] for Air Filter 1F-1B[A]. ____________

(c) Close Inlet Isolation Valve V-17-63[64] for Air Filter 1F-1A[B]. ____________

(d) Close Outlet Isolation Valve V-17-65[66] for Air Filter 1F-1A[B]. ____________

(2) Place 70-75 psig Instrument Air Filter 1F-1D[C] in service as follows:

(a) Slowly open Outlet Isolation Valve V-17-60[59] for Standby CRD Air Filter 1F-1D[C]. ____________

(b) Slowly open Inlet Isolation Valve V-17-58[57] for CRD Air Filter 1F-1D[C]. ____________

(c) Close Inlet Isolation Valve V-17-57[58] for CRD Air Filter 1F-1C[D]. ____________

(d) Close Outlet Isolation Valve V-17-59[60] for CRD Air Filter 1F-1C[D]. ____________

7.0 CRD SYSTEM ADJUSTMENTS

Usage Level

Continuous Use

7.1 ADJUSTMENT OF STABILIZING VALVE SET SV-1843[1844]A AND B

NOTE

Normal flow rate through a stabilizing valve set (with 40 gpm system flow, 260 psid drive water pressure and no control rod movement) is 6 gpm. A flow decrease could be caused by a clogged filter or other obstruction to flow.

CONTINUOUS RECHECK STATEMENT
(Applicable to the remainder of this section)

IF a clogged filter is suspected,	**THEN** isolate the stab valve set per Section 6.5 and initiate a WRC to replace the filter.

(1) At 1C05, verify system flow of 40 gpm and drive water pressure of 260 psid as indicated on FI-1814 CRD SYSTEM FLOW and PDI-1825A (CRD PRESSURE) DRIVE WATER ΔP, respectively. __________

(2) Electrically isolate Withdraw Solenoid Valve SV-1843[1844]B by disconnecting the electrical connector from the valve solenoid housing. __________

(3) Verify that flow through Insert Solenoid Valve SV-1843[1844]A is 4 gpm as indicated on Flow Indicator FI-1826. __________

(a) If flow is not 4 gpm, adjust the insert solenoid needle valve to obtain 4 gpm. __________

(4) Reconnect the electrical connector to valve SV-1843[1844]B. __________

(5) Observe that Stabilizing Valve flow is 6 gpm at Flow Indicator FI-1826 with no control rod movement. __________

(a) If flow is not 6 gpm, adjust the withdraw solenoid needle valve to obtain 6 gpm. __________

(6) Electrically isolate Insert Solenoid Valve SV-1843[1844]A by disconnecting the electrical connector from the valve solenoid housing. ____________

(7) Verify that flow through withdraw Solenoid Valve SV-1843[1844]B is about 2 gpm as indicated on Flow Indicator FI-1826. ____________

(a) If flow is not 2 gpm, adjust the withdraw solenoid needle valve to obtain 2 gpm. ____________

(8) Reconnect the electrical connector to valve SV-1843[1844]A. ____________

(9) Observe that Stabilizing Valve flow is 6 gpm at Flow Indicator FI-1826 with no control rod movement. ____________

7.2 CONTROL ROD (**-**) TIMING AND DRIVE SPEED ADJUSTMENT

Usage Level
Continuous Use

7.2.1 PREREQUISITES

(1) Ensure other "in vessel" work is not adversely affected by the performance of this testing. Evaluate applicable work schedules and work controls. ____________

(2) Any CRD that is to be tested shall be coupled with its control rod. ____________

(3) Verify the Rod Position Indicating System is operating and indicating properly. ____________

(4) Verify cell to be tested is in its desired configuration. ____________

(5) All rods inserted or as specified by Reactor Engineering. ____________

(6) At 1C05, bypass the Rod Worth Minimizer. ____________

(7) Second licensed operator in place to perform peer checking of rod movement. ____________

(8) 2 additional Operators available to time drive movement. ____________

(9) To prevent delays, obtain a quanity of O-rings for the caps on V-18-563 / V-18-652 from the Warehouse. May need to replace the O-ring under the cap to prevent leakage. ____________

(10) Review Precaution and Limitation concerning the Light-to Light method to be used when timing drive movement. ____________

(11) Obtain 2 in-calibration stopwatches to be used during Section 7.2.2 testing in the control room log. ____________

Usage Level

Continuous Use

7.2.2 ROD WITHDRAWAL/INSERTION TEST

(1) Verify CRD drive water differential pressure (250-280 psid). ____________

(2) At 1C05, perform the following (substeps may be performed concurrently as required): ____________

(a) Fully withdraw the control rod being tested (using notch override). ____________

NOTE

As a short insert signal is given to unlatch the collet fingers, the initial position light will go out momentarily and then come back on once the CRD actually begins to withdraw. Therefore CRD travel shall be timed from the 4-Rod Display light going back ON at the initial position to the light going ON at the final position. ____________

(b) Using 2 calibrated stopwatches, time CRD travel and record withdraw times below:

First stopwatch time: ___________ seconds

Second stopwatch time: ___________ seconds ____________

(c) Record the average of the CRD Withdraw times

Average withdraw time: ___________ seconds ____________

(d) Confirm Average Withdraw Time is within the required band of 48 $\pm$ 8 seconds. ____________

(3) If the average withdraw time is not within the preferred band of 48 $\pm$ 4 seconds, then adjust the withdraw speed using needle valve V-18-652(**-**) at SV-1853 Withdraw Exhaust, as follows:

(a) Unthread the cap from the flow control device. ____________

(b) Loosen the flow control locknut. ____________

(c) Turn flow control clockwise to lower flow and speed, or turn flow control counterclockwise to raise flow and speed. ____________

(d) When proper setting is obtained, tighten the flow control locknut to hold the flow control in position. ____________

(e) Replace the cap on the flow control device. ____________

(4) At 1C05, perform the following (substeps may be performed concurrently as required):

(a) Fully insert the control rod being tested (in a continuous stroke). ____________

(b) Using 2 calibrated stopwatches, time CRD insert travel and record times below:
First stopwatch time: ___________ seconds
Second stopwatch time: ___________ seconds ____________

(c) Record the average of the CRD insert times:
Average insert time: ___________ seconds ____________

(d) Confirm Average Insert Time is within the required band of 48 $\pm$ 8 seconds. ____________

(5) If the average insert time is not within the preferred band of 48 ± 4 seconds, then adjust the insert speed using needle valve V-18-563 (**-**) at SV-1851 Insert Drive Solenoid, as follows:

(a) Unthread the cap from the flow control device. ____________

(b) Loosen the flow control locknut. ____________

(c) Turn flow control clockwise to lower flow and speed, or turn the flow control counterclockwise to raise flow and speed. ____________

(d) When proper setting is obtained, tighten the flow control locknut to hold the flow control in position. ____________

(e) Replace the cap on the flow control device. ____________

(6) If withdraw or insert speed adjustments were made repeat steps (2) through (5) to establish desired insert/withdraw rod speed. ____________

(7) For each Control Rod timed, enter in E-log the as found and as left insert and withdraw times and M&TE used, and CRD Drive Water Differential Pressure. ____________

(8) When testing is complete, at 1C05, place the Rod Worth Minimizer in operate. ____________

Usage Level

Continuous Use

7.3 ADJUSTMENT OF CRD CHARGING WATER HEADER THROTTLE VALVE V-17-24

NOTE

This procedure is performed in order to prevent spurious CRD pump trip coincident with reactor scram.

(1) Initial conditions:

(a) CRD Suction Filter 1F-15A[B] dP <.6 psid.

(b) All HCUs valved in.

(c) All Control Rods fully inserted.

(d) One condensate pump in operation.

(2) Verify CRD Pump 1P-209A[B] in operation per Section 3.0 and 4.0.

(3) Close CRD Charging Water Header Throttle Valve V-17-24.

(4) At 1C05, verify CRD Pump 1P-209A[B] running current of 23 to 25 amps.

(5) Station operators at V-17-24 and PI-1803A[B].

(6) 

At 1C05, insert a manual scram.

NOTE

Nominal CRD low suction pressure trip setting is 18" Hg (-6 psig). CRD Filter Differential Suction Pressure PDI-1800 may exceed upscale value (>5.0 psid) during the following steps.

(7) Throttle open Charging Water Header Throttle Valve V-17-24 until CRD Pump 1P-209A[B] current reaches 30 amps OR pump suction pressure drops to 0 psig.

(8) Record maximum pump current and minimum suction pressure in operator log.

(9) Reset reactor scram.

(10) Verify HCU accumulators recharge.

(11) Verify CRD Pump 1P-209A[B] discharge pressure less than 1500 psig at PI-1816A (CRD PRESSURE) CHARGING WATER PRESS (1C05) or PI-1816B (local).

(12) Close V-17-24. Count number of turns to full close and log in operators' log.

(13) Throttle open V-17-24 to the position recorded above.

(14) While monitoring CRD Pump 1P-209A[B] current and suction pressure:

(a) 

Insert a manual scram.

(b) Verify suction pressure remains >11" Hg.

(c) Verify pump current does not exceed 32 amps.

(15) Reset reactor scram.

8.0 HCU OPERATIONS

Usage Level

Continuous Use

8.1 CRD (**-**) HCU ISOLATION DURING REACTOR OPERATION

CAUTION

See Section 8.2 for HCU isolation for maintenance.

Supplying high pressure to the CRD insert line when the withdraw line is isolated can damage CRD internal components. This is avoided by operating riser valves in the order shown.

(1) Close the following valves on CRD (**-**) HCU in this order:

(a) Insert Isolation V-18-1008 (**-**)

(b) Withdraw Isolation V-18-1275 (**-**)

(c) Charging Water Isolation V-18-29 (**-**)

CAUTION

The water is the CRD System is potentially contaminated.

(2) Attach a drain hose to Accum Water Side Vent V-18-207 (**-**).

(3) Slowly open Accum Water Side Vent V-18-207 (**-**) and drain to Reactor Building floor drain.

(4) When the accumulator is fully drained, as indicated by a constant reading on PI-1847 (**-**), close Accum Water Side Vent V-18-207 (**-**) to 1/2 turn open.

(5) Close Accum Inst Cartridge valve V-18-296 (**-**).

(6) Carefully loosen the Nitrogen Charging Connection Cap on the accumulator instrument block to bleed off instrument block pressure. Then remove the cap.

(7) Slowly bleed off the nitrogen side of HCU accumulator for CRD (**-**) through the charging connection by opening V-18-296 (**-**).

(8) Close the Drive Water Isolation V-18-385 (**-**). ____________

(9) Open the Insert Isolation V-18-1008 (**-**). ____________

NOTE

The following step provides optional electrical disarming of a selected CRD.

____

(10) If desired to electrically disarm the selected CRD, then remove RMCS input to CRD (**-**) by disconnecting and tagging the amphenol connectors from the associated Directional Control Valves SV-1851, SV-1852, SV-1853, and SV-1854, otherwise N/A. ____________

(11) Verify that Scram Valve CV-1849 (**-**) is not leaking by observing that the water flow from the hose attached to the Accum Water Side Vent V-18-207 has stopped. ____________

Usage Level

Continuous Use

8.2 CRD (**-**) HCU ISOLATION FOR MAINTENANCE

(1) If isolating a HCU because of In-Core Activities to Prevent Rod Motion, Then exit this section and perform OI 255A6, Removing a De-Fueled Cells Control Rod From Service, otherwise N/A. ____________

____

CAUTION

The following procedure isolates cooling water to the CRD mechanism.

Sustained loss of cooling water when the Reactor is at operating temperature and pressure will shorten the operating life of the CRD mechanism's internal seals.

Supplying high pressure to the CRD insert line when the withdraw line is isolated can damage CRD internal components. This is avoided by operating riser valves in the order shown below.

Isolating cooling water to too many CRDs will cause excessive cooling water dP and control rod drift.

____

CAUTION

Isolation of multiple HCUs with the CRD pump(s) in operation can cause higher-than-normal cooling and exhaust water header pressures that, in turn, may be a precursor to inadvertent rod motion (insert OR withdrawal) if a sufficient number of HCUs are not in service or if alternate system flow paths are not established.

To prevent inadvertent control rod withdrawal, the cooling water DP has to stay less than 35 psid, or the number of HCUs isolated less than 50%, or in the case of a full core offload when all HCUs are isolated, rotate the spectacle flange to assist in cooling and exhaust water header pressure control.
(Reference GE 10 CFR Part 21 SC07-08 and INPO SEN 264).

(2) Close the following valves on the CRD (**-**) HCU in the following order: ____________

(a)	Insert Isolation	V-18-1008(**-**)	____________
(b)	Withdraw Isolation	V-18-1275(**-**)	____________
(c)	Charging Water Isolation	V-18-29(**-**)	____________
(d)	Scram Discharge Isolation	V-18-1542(**-**)	____________
(e)	Cooling Water Isolation	V-18-830(**-**)	____________
(f)	Drive Water Isolation	V-18-385(**-**)	____________
(g)	Exhaust Water Isolation	V-18-741(**-**)	____________

(3) Bleed pressure from CRD (**-**) HCU accumulator per Section 8.5. __________

(4) If it is desired to disarm the control rod drive electrically (remove RMCS signals to the HCU), disconnect and tag the amphenol connectors to Directional Control Valves SV-1851, SV-1852, SV-1853, and SV-1854. __________

Usage Level

Continuous Use

8.3 RETURNING AN ISOLATED HCU TO SERVICE

(1) If returning a isolated HCU to service because of In-Core Activities to Prevent Rod Motion, Then exit this section and perform OI 255A7, Returning a De-Fueled Cells Control Rod To Service, otherwise N/A. __________

(2) Verify V-18-1186 (**-**) SCRAM PILOT AIR SUPPLY is open. __________

(3) Verify the following valves closed: __________

Cooling Water Isolation	V-18-830 (**-**)	__________
Insert Isolation	V-18-1008 (**-**)	__________

____

CAUTION

Supplying high pressure to the CRD insert line when the withdraw line is isolated can damage CRD internal components. This is avoided by operating riser valves in the order shown below.

Unisolating charging water will pressurize the insert header.

Isolating cooling water to too many CRDs will cause excessive cooling water dP and control rod drift.

(4) Precharge N_2 side of accumulator per Section 8.4, leaving Charging Water Isolation V-18-29 (**-**) close. __________

(5) Verify Scram Discharge Isolation V-18-1542 (**-**) open. __________

(6) Verify Withdraw Isolation V-18-1275 (**-**) open. __________

(7) Slowly pressurize HCU (**-**) accumulator by opening Charging Water Isolation V-18-29 (**-**). __________

NOTE
The piston in the water accumulator should compress the gas charge to approximately twice precharge pressure determined in Section 8.4 as indicated on Pressure Indicator PI-1847 (**-**).

(8) Verify the following valves open in the following order:

(a)	Insert Isolation	V-18-1008 (**-**)	______
(b)	Cooling Water Isolation	V-18-830 (**-**)	______
(c)	Exhaust Water Isolation	V-18-741 (**-**)	______
(d)	Drive Water Isolation	V-18-385 (**-**)	______

(9) If necessary, reconnect the amphenol connectors to Directional Control Valves SV-1851, SV-1852, SV-1853, and SV-1854. ______

(10) Approximately 30 minutes after precharging an accumulator, verify constant pressure on Pressure Indicator PI-1847 (**-**). ______

(11) If pressure exceeds 1200 pounds, perform the following to bleed off excess pressure:

(a) Close Accum Gas Side Isolation V-18-296 (**-**). ______

(b) loosen the cap on the N_2 charging connector to bleed off excess pressure. ______

(c) Carefully throttle open Accum Gas Side Isolation V-18-296(**-**) to slowly lower pressure, as read on N2 Pressure Indicator PI-1847, to the desired value below 1200 pounds. ______

(d) Close Accum Gas Side Isolation V-18-296(**-**). ______

(e) Reinstall the cap on the N_2 charging connector. ______

(f) Open Accum Gas Side Isolation V-18-296 (**-**). ______

NOTE
If the CRD is driven to position 00, withdrawal from this position will be difficult if air remains in the piping.

(12) If plant conditions permit, apply a series of notch-in and notch-out signals at 1C05 to CRD (**-**) to purge air from the HCU risers. Stroke between position 06 and position 48, as permitted by plant conditions. ______

(13) Observe that there is no evidence of water leakage at the manifold, shut off valves or other areas of the HCU. ____________

Usage Level

Reference Use

8.4 PRECHARGING CRD (**-**) HCU ACCUMULATOR WITH NITROGEN

NOTE

All accumulators should be precharged before startup so that no recharging will be required until reactor pressure is above 600 psig. __________

(1) Obtain the N_2 Cart. ____________

(2) Verify compliance with TS 3.1.5. ____________

(3) Close Charging Water Isolation V-18-29 (**-**). ____________

NOTE

The accumulator is fully drained when the gas pressure indicated on Pressure Indicator PI-1847 (**-**) remains constant.

This indicates that the piston in the water accumulator has reached its mechanical stop. __________

CAUTION

The water in the CRD System is potentially contaminated. __________

(4) Attach a drain hose to Accum Water Side Vent V-18-207 (**-**), and slowly open the valve to discharge accumulator water to the floor drain. ____________

(5) Close V-18-207 (**-**) to 1/2 turn open. ____________

(6) Close Accum Gas Side Isolation V-18-296 (**-**). ____________

(7) Carefully loosen the Nitrogen Charging Connection Cap on the accumulator instrument block to bleed off instrument block pressure. Then remove the cap. ____________

(8) Verify the following valves are CLOSED on the nitrogen cart:

Nitrogen Cart Pressure Gauge Vent valve ____________

Nitrogen Cart Charging Header Vent valve ____________

(9) Connect the nitrogen charging line to the instrument block. ____________

(10) Verify the following valves are OPEN on the nitrogen cart:

Nitrogen Cart Pressure Gauge Isolation valve ____________

Nitrogen Cart Charging Header Isolation valve ____________

Nitrogen Cart Charging Line Isolation valve ____________

(11) Slowly pressurize the charging header by opening the nitrogen bottle isolation valve. ____________

(12) The accumulator water side should be fully drained before final adjustment of Nitrogen pressure. ____________

NOTE

To raise nitrogen regulator pressure, the regulator adjust needs to be turned clockwise.

To lower nitrogen regulator pressure, the regulator adjust needs to be turned counter-clockwise.

____

CAUTION

If accumulator nitrogen pressure was initially 0 psig, the following step may force water out Accum Water Side Vent V-18-207 (**-**).

____

(13) Slowly open Accum Gas Side Isolation V-18-296 (**-**) and adjust the Nitrogen Regulator to obtain precharge pressure per Appendix 1, as indicated on HCU pressure indicator PI-1847 (**-**). ____________

(14) Close Accum Gas Side Isolation V-18-296 (**-**). ____________

(15) Close the nitrogen bottle isolation valve. ____________

(16) Slowly open one of the nitrogen cart vent valves. ____________

(17) When the nitrogen charging line has been fully vented, remove the charging hose from the instrument block and replace the cap. ____________

(18) Open Accum Gas Side Isolation V-18-296 (**-**), and observe precharge pressure on Pressure Indicator PI-1847. ____________

(19) Close Accum Water Side Vent V-18-207 (**-**). ____________

(20) If it is desired to maintain the HCU isolated, or returning an HCU to service per section 8.3, omit the next step. ____________

> **NOTE**
>
> The piston in the water accumulator should compress the gas charge to approximately twice the precharge determined in step (13).

____

(21) Slowly throttle open Charging Water Isolation V-18-29 (**-**) to pressurize the accumulator. When flow through the valve ceases, open it fully. ____________

(22) Approximately 30 minutes after precharging an accumulator, verify constant pressure on Pressure Indicator PI-1847. ____________

(23) If pressure exceeds 1200 pounds, perform the following to bleed off excess pressure:

- (a) Close Accum Gas Side Isolation V-18-296 (**-**). ____________
- (b) Loosen the cap on the N_2 charging connector to bleed off excess pressure. ____________
- (c) Carefully throttle open Accum Gas Side Isolation V-18-296(**-**) to slowly lower pressure, as read on N2 Pressure Indicator PI-1847, to the desired value below 1200 pounds. ____________
- (d) Close Accum Gas Side Isolation V-18-296(**-**). ____________
- (e) Reinstall the cap on the N_2 charging connector. ____________
- (f) Open Accum Gas Side Isolation V-18-296 (**-**). ____________

Usage Level

Reference Use

8.5 DEPRESSURIZING CRD (**-**) HCU ACCUMULATOR

♻ **CONTINUOUS RECHECK STATEMENT** (Applicable to the remainder of this section) ♻	
IF maintenance or replacement is going to be performed on the HCU,	**THEN** the HCU accumulator gas side should be depressurized.

(1) Verify compliance with TS 3.1.5. ____________

(2) Close Charging Water Isolation V-18-29 (**-**). ____________

NOTE

The accumulator is fully drained when the gas pressure indicated on Pressure Indicator PI-1847 (**-**) remains constant.

CAUTION

The water in the CRD System is potentially contaminated.

(3) Attach a drain hose to Accum Water Side Vent V-18-207 (**-**), and slowly open the valve to discharge accumulator water to the floor drain. ____________

(4) Close Accum Gas Side Isolation V-18-296 (**-**) on the accumulator instrumentation block. ____________

(5) Carefully unthread the cap from the N_2 charging connector on the instrumentation block. A small amount of N_2 gas will escape from the instrument block. ____________

(6) Carefully throttle open Accum Gas Side Isolation V-18-296 (**-**) and permit N_2 gas to slowly discharge through the charging connector. ____________

(7) As N_2 pressure drops, gradually open Accum Gas Side Isolation V-18-296 (**-**). ____________

(8) Observe that accumulator N_2 Pressure Indicator PI-1847 (**-**) indicates 0 psig and no pressure exists in the accumulator. ____________

(9) Replace the cap on the Nitrogen Charging Connection. ____________

(10) Close Accum Water Side Vent V-18-207 (**-**) to between 1/2 and 1 turn open to minimize drainage to the RB Floor drains in case of scram. ____________

Usage Level

Reference Use

8.6 DRAINING CRD (**-**) HCU INSTRUMENT BLOCK

NOTE

The HCU liquid detector switch alarms when approximately 37 cc of water accumulates in the instrument block.

(1) If necessary, determine the cause of the CRD ACCUMULATOR LO PRESSURE OR HI LEVEL (1C05A, F-7) annunciator by depressing the associated pushbutton at 1C54[72]. ____________

(a) If the pushbutton light does not go out, see Section 8.4 for accumulator precharging. ____________

(b) If the light goes out and CRD ACCUMULATOR LO PRESSURE OR HI LEVEL (1C05A, F-7) resets, continue with this section. ____________

(2) Close Accum Gas Side Isolation V-18-296 (**-**). ____________

CAUTION

CRD System water is potentially contaminated.

(3) Carefully unthread the cap on the nitrogen charging connection block to relieve N_2 pressure trapped inside the instrument block. ____________

(4) When nitrogen pressure is 0 psig, as indicated on PI-1847 (**-**), remove the cap and allow the instrument block to drain. Momentarily crack open Accum Gas Side Isolation V-18-296 (**-**) to blow out remaining water, then shut V-18-296 (**-**). ____________

(a) If water is found, note time and accumulator in the NSOE log to determine the accumulator piston seal leak rate. ____________

(5) Replace the cap and tighten. ____________

(6) Open Accum Gas Side Isolation V-18-296 (**-**). ____________

(7) If the CRS/OSM desires to attempt to reseat the piston seals on an HCU that is repeatedly receiving multiple water alarms, perform the following (otherwise N/A):

(a) Verify compliance with TS 3.1.5. ____________

(b) Close Charging Water Isolation V-18-29 (**-**). ____________

(c) Attach a drain hose to Accum Water Side Vent V-18-207 (**-**). ____________

♻ CONTINUOUS RECHECK STATEMENT ♻	
IF a reactor scram occurs,	**THEN** immediately close Accum Water Side Vent V-18-207 (**-**).

____

(d) Slowly open Accum Water Side Vent V-18-207 (**-**) to discharge the accumulator to the floor drain. ____________

(e) When the piston has moved to the top of accumulator, as evidenced by a stable accumulator pressure (approximately 500 –600 psig), close the Accum Water Side Vent V-18-207 (**-**). ____________

(f) Open Charging Water Isolation V-18-29 (**-**). ____________

(g) Repeat steps (7)(b) thru (7)(f) two to three more times as directed by the CRS/OSM, or N/A this step. ____________

9.0 CRD MECHANISM COUPLING AND VENTING

Usage Level
Reference Use

9.1 CRD MECHANISM COUPLING AND VENTING AFTER CRD MAINTENANCE

NOTE

The following section is used to couple a CRD mechanism to its associated control rod and vent the CRD and its associated hydraulic lines. ____________

(1) The following steps shall be completed prior to performing this section:

(a) The CRD mechanism installed in the CRD housing flange. ____________

(b) The position indicator probe installed in the CRD and connected. ____________

(c) The control rod associated with the CRD is installed. ____________

(d) The CRD Hydraulic System operating normally. ____________

(e) The fuel assemblies associated with the control rod installed, or the blade guide in place to guide the control rod. ____________

(2) If there is fuel in the cell, unisolate the HCU for CRD (**-**) per Section 8.3. ____________

(3) Verify the following valves are closed: ____________

COOLING WATER ISOLATION	V-18-830(**-**)	____________
INSERT ISOLATION	V-18-1008(**-**)	____________

(4) If the cell is defueled, unisolate the HCU for CRD (**-**) per the following:

CAUTION

Supplying high pressure to the CRD insert line when the withdraw line is isolated can damage CRD internal components. This is avoided by operating riser valves in the order shown below. Isolating cooling water to too many CRDs will cause excessive cooling water dP and control rod drift.

(a) Open the following valves:

SCRAM DISCHARGE ISOLATION	V-18-1542(**-**)	______
WITHDRAW ISOLATION	V-18-1275(**-**)	______
INSERT ISOLATION	V-18-1008(**-**)	______
COOLING WATER ISOLATION	V-18-830(**-**)	______
EXHAUST WATER ISOLATION	V-18-741(**-**)	______
DRIVE WATER ISOLATION	V-18-385 (**-**)	______

(b) Reconnect amphenol connectors to Directional Control Valves SV-1851, SV-1852, SV-1853 and SV-1854. ______

(c) Precharge N_2 side of accumulator per Section 8.4, including opening Charging Water Isolation V-18-29 (**-**). ______

CAUTION

The CRD should not be fully inserted during the following steps due to difficulty may be encountered in moving a CRD out of position "00" prior to complete venting.

♻ CONTINUOUS RECHECK STATEMENT ♻

(Applicable to the remainder of this section)

IF blade guides are used to support the control rod in the cell being coupled,	**THEN** station an observer on the refuel floor to verify drive movement does not lift the blade guide out of position.

(5) Permit cooling water to purge the lines and CRD for several minutes before proceeding. ______

(6) At 1C05, with CRD (**-**) at position 48, apply and hold a notch-out override signal to vent the CRD and associated piping. Observe drive water flow at 1C05 Indicator FI-1829A (CRD FLOW) DRIVE WATER FLOW. Drive flow will diminish as air is pushed out of the drive. Repeat this step several times before attempting to drive the control rod in. ____________

(7) Apply a notch-in signal to CRD (**-**) to couple the CRD to the control rod. Do not insert beyond position 46 unless necessary to achieve coupling. ____________

(8) Attempt to withdraw the control rod to the full-out position. If unable to withdraw to position 48, proceed to Section 9.2, CRD Riser Venting. ____________

(9) With the CRD at position 48, apply a notch-out override signal, and observe the rod position display. Verify proper coupling by observing that the full core display has "full out" back lighted in red, and the four rod display shows position 48 with the ROD OVERTRAVEL OUT (1C05A, D-7) annunciator reset. ____________

CAUTION

Normal drive pressure should be sufficient for rod insertion. Possible causes of difficulty with rod insertion are improper blade guide, fuel, or fuel support piece placement. ____________

♻ **CONTINUOUS RECHECK STATEMENT** ♻

(Applicable to the remainder of this section) ____________

IF unusual difficulty with rod insertion is encountered,	**THEN** discontinue rod movement and investigate.

(10) Drive CRD (**-**) in two or three notches at a time (do not insert beyond position 06), then attempt to fully withdraw it. "Double clutching" and slightly elevated drive pressure (50-100 psig above normal) may be necessary until air is worked out of the drive. When CRD withdrawal begins to work consistently, proceed with the next Step. If the CRD does not work smooth at this point, the CRS may direct to vent the CRD risers per section 9.2. ____________

(11) At 1C05, stroke the CRD several times between position 48 and position 06, using continuous-in and continuous-out modes. ____________

(12) When the drive strokes smoothly and consistently works in single notch-out mode, withdraw the rod to position 48 and perform Step (9) coupling check, with normal drive pressure. ____________

(13) Fully insert CRD (**-**). ____________

Usage Level

Reference Use

9.2 CRD RISER VENTING

CAUTION
This venting should only be done when reactor water temperature is less than 212°F to prevent injury to personnel.

(1) If limited travel is in force, move the rod only that amount allowed by the pull sheet. ____________

(2) If any CRD reacts sluggishly, or riser venting is needed for a rod that will not move, or venting is deemed necessary by the CRS, vent the insert and withdraw risers as follows:

(a) Make preparations at Drive Water Insert Vent Dragon Valve V-18-1097 (**-**) and Drive Water Withdraw Vent Dragon Valve V-18-1364 (**-**) to vent the desired CRD. ____________

1. Remove the side plug to access the valve stem. ____________
2. Confirm the valve closed with the valve operating tool. ____________
3. Remove the bottom plug from the valve. ____________
4. Connect the vent rig hose to the bottom port on the valve. ____________
5. Remove the pipe cap from one of four red RBED stub tubes on the floor. ____________
6. Connect the discharge end of the vent rig hose to the RBED stub tube. ____________

(b) At 1C05, select and apply a notch-out override signal to CRD (**-**). ____________

(c) Vent the system at Drive Water Withdraw Vent Dragon Valve V-18-1364 (**-**) until a continuous stream of water issues. Shut the vent valve. ____________

(3) Attempt to withdraw the control rod to the full out position if not already there. If unable to withdraw to position 48, repeat the venting at Drive Water Withdraw Vent Dragon Valve V-18-1364 (**-**), steps (2)(b) and (c). ____________

(4) While applying a continuous insert signal to CRD (**-**) (do not insert beyond position 06), vent the system at Drive Water Insert Vent Dragon Valve V-18-1097 (**-**) until a continuous stream of water issues. Shut the vent valve. ____________

(5) Repeat the venting of the insert and withdraw risers as needed until the control rod moves smoothly with normal drive pressure. ____________

(6) Return the control rod to the desired position. ____________

(7) Disconnect vent rig hose from affected dragon valve bottom ports. ____________

(8) Install plugs at bottom and side ports of affected dragon valves. ____________

(9) Disconnect vent rig hose at RBED stub tubes and install pipe caps. ____________

(10) Independently verify all RBED stub tube pipe caps are installed. ____________

(11) At the insert dragon valve, independently verify the side and bottom plugs are installed. ____________

(12) At the withdraw dragon valve, independently verify the side and bottom plugs are installed. ____________

Usage Level
Reference Use

9.3 CRD MECHANISM RECOUPLING

(1) Local and total core power should be monitored during this procedure to determine actual control rod position during CRD insertion. ____________

(2) Attempt to recouple CRD (**-**) by inserting the CRD to position 46 or as directed by the CRS and Reactor Engineer. ____________

(3) Withdraw CRD (**-**) to position 48. ____________

(4) Give CRD (**-**) a continuous withdraw signal. ____________

(5) Verify that CRD (**-**) remains at position 48 and does not overtravel. ____________

NOTE
When the control rod is recoupled, rod position will go blank momentarily, then indicate position 48.

____

(6) If the rod still overtravels, repeat Steps (2) through (5) at least two more times, or as directed by the CRS and Reactor Engineer. ____________

(7) If CRD (**-**) cannot be recoupled to its control rod, proceed as follows:

(a) Fully insert CRD (**-**). ____________

(b) Electrically disarm CRD (**-**) by disconnecting and tagging the amphenol connectors from Directional Control Valves SV-1851, SV-1852, SV-1853, and SV-1854. ____________

Usage Level
Reference Use

9.4 USE OF INDIVIDUAL SCRAM SWITCHES

CAUTION
Scram Time Testing Equipment is not to be used for anything other than Scram Time Testing, maintenance activities for "FULL IN" control rods, or as directed by Emergency Operating Procedures.

(1) At 1C16, place the scram solenoid test toggle switch for the desired rod to the lower position. ____________

(2) At 1C05, ensure FULL IN green light is on for the rod scrammed. ____________

(3) At 1C16, return the test toggle switch to the upper position approximately 10 to 20 seconds after rod has been fully inserted. ____________

Usage Level

Reference Use

10.0 CONTROL ROD DOUBLE NOTCH RESTORATION

10.1 RESTORATION FROM A WITHDRAW DOUBLE NOTCH

(1) Verify thermal limits on an official or a predicted 3D case. ____________

(2) Use the CONTROL ROD MOVEMENT SWITCH C11A-S2 at 1C05 to INSERT the rod one notch to its intended position. NA if the double notch is anticipated as part of a planned reactivity manipulation and thermal limits are not adversely affected. ____________

(3) Notify Reactor Engineering. ____________

Usage Level

Reference Use

10.2 RESTORATION FROM AN INSERT DOUBLE NOTCH

(1) Verify thermal limits on the official or predicted 3D case. ____________

(2) Use the CONTROL ROD MOVEMENT SWITCH C11A-S2 at 1C05 to WITHDRAW the rod one notch to its intended position. NA if the double notch is anticipated as part of a planned reactivity manipulation and thermal limits are not adversely affected. ____________

(3) Notify Reactor Engineering. ____________

11.0 REFERENCES

(1) Updated Final Safety Analysis Report, Duane Arnold Energy Center, Section 7.7.3

(2) Technical Specifications, Duane Arnold Energy Center, Reactivity Control Systems.

(3) Control Rod Drive System, Operation and Maintenance Instructions, GEK-16642

(4) Hydraulic Control Unit, Operation and Maintenance Instructions, GEK-9582-A

(5) P and ID Nos. M-117/118, Control Rod Drive Hydraulic System

(6) Elementary Diagram, Control Rod Drive Hydraulic System, Bechtel VPCR No. 7884-APED-C11-25-9

(7) Functional Control Diagram, Control Rod Drive Hydraulic System, Bechtel VPCR No. 7884-APED-C11-4(1)-5, -4 (2 through 7) -4

(8) CRD Feed Pump Connection Diagram, Bechtel Drawing No. E-120, Sheet 15

(9) CRD Pump Vibration Monitor Scheme, Bechtel Drawing No. E-112, Sheet 10

(10) CRD Hydraulic System PDT Conn. Diagram, Bechtel Drawing No. E-120, Sheet 17

(11) MM-134, MM-135, DCRDR

(12) DCPs 1421, 1451, 1543

(13) DDC 1137

(14) OI 518.1, OI-880

(15) AR 950434.01, AR 98 1113.01, AR 23595

(16) EMA A40701, A40702, A40703, A40704

(17) AR CA041307

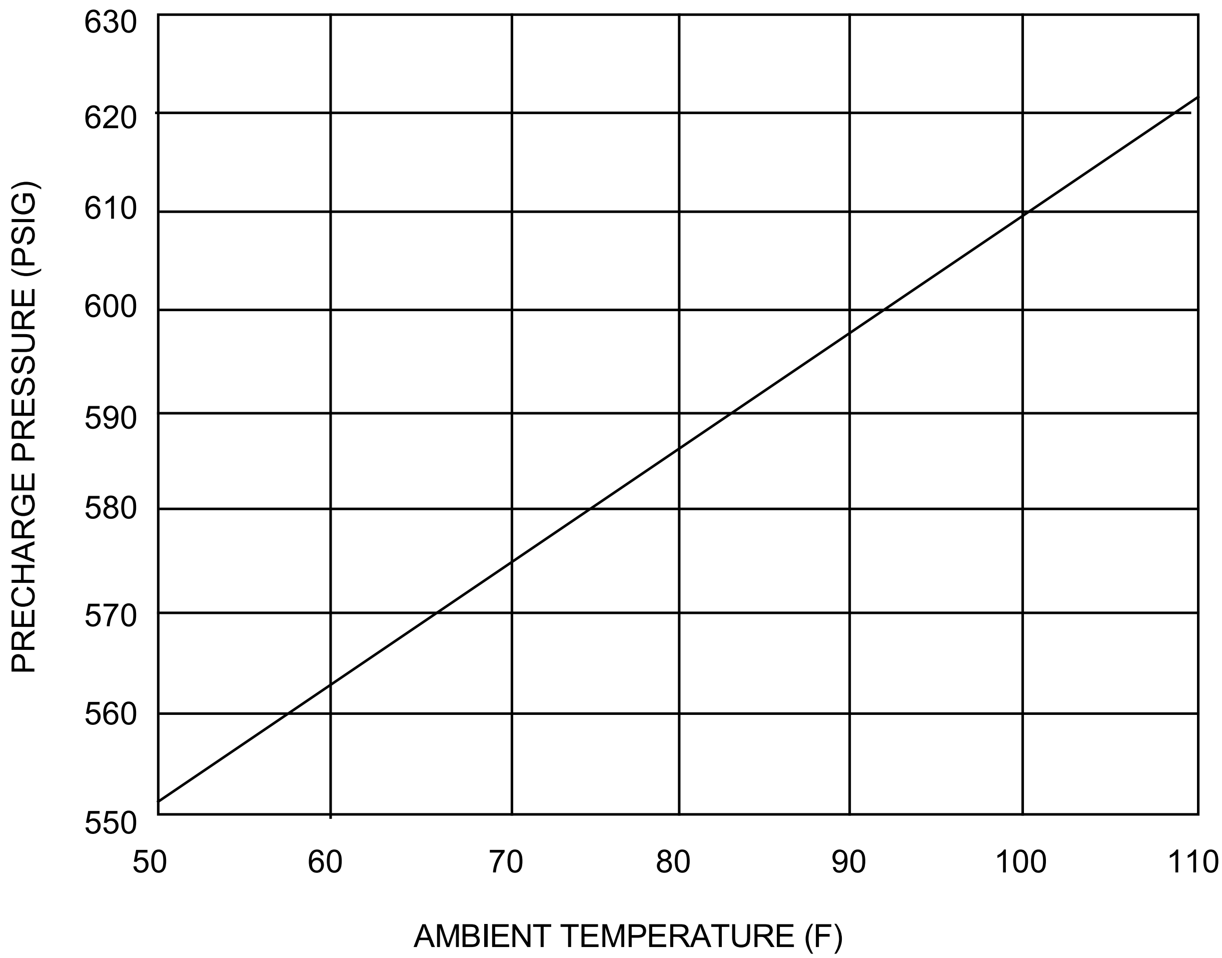
(18) NEC Information Notice 2010-06 Inadvertent Control Rod Withdrawal Event While Shutdown

(19) Commitment Items:

  (a) {C001} - RIS 2007-21, rev. 1, and NEI Position Statement on the Licensed Power Limit, dated June 23, 2008.

APPENDIX 1

HCU ACCUMULATOR PRECHARGE NITROGEN PRESSURE VERSUS AMBIENT TEMPERATURE



APPENDIX 2

HCU ACCUMULATOR MODULE LOCATION

43					N	S	S				
39			N	N	N	N	S	S	S		
35		N	N	N	N	S	S	S	S	S	
31		N	N	N	N	N	S	S	S	S	
27	N	N	N	N	N	S	S	S	S	S	S
23	N	N	N	N	N	N	S	S	S	S	S
19	N	N	N	N	N	S	S	S	S	S	S
15		N	N	N	N	N	S	S	S	S	
11		N	N	N	N	S	S	S	S	S	
7			N	N	N	N	S	S	S		
3					N	S	S				
	2	**6**	**10**	**14**	**18**	**22**	**26**	**30**	**34**	**38**	**42**

N = North End
S = South End

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC In-Plant JPM P-3

TITLE: Establish Alternative Power to 125 VDC and 250 VDC Chargers

SITE:	DAEC
JPM TITLE:	Establish Alternative Power to 125 VDC and 250 VDC Chargers
JPM NUMBER:	NRC In-Plant P-3 **REV.** 1
RELATED PRA INFO:	None
TASK NUMBER(S) / TASK TITLE(S):	304.2-07.02 / Perform Required Actions During a Station Blackout
K/A NUMBERS AND VALUES:	E/APE 295003, Partial or Complete Loss of A.C. Power AA1.04 Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: D.C. electrical distribution system. IMPORTANCE 3.6 / 3.7
Justification (FOR K/A VALUES <3.0):	N/A

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [X] Perform: [ ]

EVALUATION LOCATION:				
	In-Plant:	X	Control Room:	
	Simulator:		Other:	
	Lab:			

Time for Completion: 20 Minutes Time Critical: NO

Alternate Path / Faulted: NO

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago	01/24/13
	WTS JPM Developer	Date
Validated by:		
	Validation Instructor	Date
Reviewed by:		
	Plant Reviewer	Date
Approved by:		
	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

______________________________ ______________________________
Validation Personnel /Date Validation Personnel/Date

______________________________ ______________________________
Validation Personnel /Date Validation Personnel/Date

SIMULATOR SET UP: N/A

Required Materials:
1. AOP 301.1, Station Blackout, Attachment 10, Current Revision
2. Power Cable Reel Cart

General References:
1. AOP 301.1, Station Blackout, Attachment 10, Revision 53

Task Standards:
1. Places 1D22-01, AC Power to the OFF position.
2. Places 1D22-02, DC Output to the OFF position.
3. Places 1D44-01, AC Power to the OFF position.
4. Places 1D44-02, DC Output to the OFF position.
5. Plugs one end of a cable into receptacle 1N12, 1D12 AC Supply Receptacle.
6. Plugs one end of a cable into receptacle 1N120, 1D120 AC Supply Receptacle.
7. Connects cable to 1NSBOA, “A” Receptacle on 1BSBO-1.
8. Plugs one end of a cable into receptacle 1N43, 1D43 AC Supply Receptacle.
9. Connects cable to 1NSBOA, “A” Receptacle on 1BSBO-1.
10. Connects cable to 1NSBOB, “B” Receptacle on 1BSBO-1.
11. Connects cable to 1NSBOC, “C” Receptacle on 1BSBO-1.
12. Closes 1BSBO-1 TSC DG Disconnect Switch to energize temporary cables.

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- The plant has experienced a Station Blackout.
- The Station Blackout occurred 3 hours ago.
- All immediate operator actions have been directed and performed.
- The operators are implementing the follow-up actions to mitigate the consequences of the transient.
- Doors 402 and 405 have been blocked open in accordance with Attachment 1, Essential Switchgear Rooms Ventilation Instruction.

INITIATING CUES:

- Perform AOP 301.1, Attachment 10, Alternate AC Power to 125 VDC and 250 VDC Chargers.
- Electricians are not available to support the task.
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: 1 **Critical _N**	Send an Operator or Station Electrician to 1BSBO-1 TSC Disconnect Switch located near Door 402, in the Battery Room Hallway of the Control Building.
Standard:	Operator proceeds to the 1BSBO-1 TSC Disconnect Switch located near Door 402, in the Battery Room Hallway of the Control Building.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	______________________________

Performance Step: 2 **Critical _N**	Confirm 1BSBO-1 TSC Disconnect Switch white "Power Available" light is on.
Standard:	Verifies that 1BSB0-1 TSC Disconnect Switch white "Power Available" light is ON.
Evaluator Cue	**The Power Available light is on.**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	______________________________

Performance Step: 3 **Critical <u>Y</u>**	At 1D22 125V Division II Battery Charger, verify the following: 1D22-01 AC POWER is OFF.
Standard:	Places 1D22-01, AC Power to the OFF position.
Evaluator Cue:	**If asked the position of 1D22-01, AC Power, inform the candidate that 1D22-01, AC Power, is ON.** **When the candidate places 1D22-01, AC Power, to the OFF position, inform the candidate that normal resistance was felt and the breaker snapped into the OFF position.**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 4 **Critical <u>Y</u>**	At 1D22 125V Division II Battery Charger, verify the following: 1D22-02 DC OUTPUT is OFF.
Standard:	Places 1D22-02, DC Output, to the OFF position.
Evaluator Cue:	**If asked the position of 1D22-02, DC Output, inform the candidate that 1D22-02, DC Output, is ON.** **When the candidate places 1D22-02, DC Output, to the OFF position, inform the candidate that normal resistance was felt and the breaker snapped into the OFF position.**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 5 **Critical _Y_**	At 1D44 250V Division II Battery Charger, verify the following: 1D44-01 AC POWER is OFF.
Standard:	Places 1D44-01, AC Power, to the OFF position.
Evaluator Cue:	**If asked the position of 1D44-01, AC Power, inform the candidate that 1D44-01, AC Power, is ON.** **When the candidate places 1D44-01, AC Power, to the OFF position, inform the candidate that normal resistance was felt and the breaker snapped into the OFF position.**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 6 **Critical _Y_**	At 1D44 250V Division II Battery Charger, verify the following: 1D44-02 DC OUTPUT is OFF.
Standard:	Places 1D44-02, DC Output, to the OFF position.
Evaluator Cue:	**If asked the position of 1D44-02, DC Output, inform the candidate that 1D44-02, DC Output is ON.** **When the candidate places 1D44-02, DC Output, to the OFF position, inform the candidate that normal resistance was felt and the breaker snapped into the OFF position.**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 7 **Critical _N_**	Verify Doors 402 and 405 are blocked open.
Standard:	Verifies Doors 402 and 405 are blocked open.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 8 **Critical _N_**	Move power cable reel cart from Admin building hall to battery room corridor.
Standard:	Moves power cable reel cart to the battery room corridor.
Evaluator Note:	**Do NOT have the candidate actually move the power reel cart. Have the candidate locate the power reel cart and inform you how the cart will be relocated to the battery room corridor.**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 9 **Critical _Y_**	In 1A3 Switchgear Room, plug one end of each cable into the following receptacles: 1N12, 1D12 AC Supply Receptacle.
Standard:	Locates 1N12, 1D12 AC Supply Receptacle. Plugs one end of a cable into receptacle 1N12, 1D12 AC Supply Receptacle.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 10 **Critical _Y_**	In 1A3 Switchgear Room, plug one end of each cable into the following receptacles: 1N120, 1D120 AC Supply Receptacle.
Standard:	Locates 1N120, 1D120 AC Supply Receptacle. Plugs one end of a cable into receptacle 1N12, 1D12 AC Supply Receptacle.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 11 **Critical** <u>Y</u>	In 1A3 Switchgear Room, plug one end of each cable into the following receptacles: 1N43, 1D43 AC Supply Receptacle.
Standard:	Locates 1N43, 1D43 AC Supply Receptacle. Plugs one end of a cable into receptacle 1N12, 1D12 AC Supply Receptacle.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 12 **Critical** <u>Y</u>	In Battery Room Hallway, connect cables into the following receptacles: 1NSBOA, “A” Receptacle on 1BSBO-1.
Standard:	Locates 1NSBOA, “A” Receptacle on 1BSBO-1. Plugs one end of a cable into receptacle 1N12, 1D12 AC Supply Receptacle.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 13 **Critical** <u>Y</u>	In Battery Room Hallway, connect cables into the following receptacles: 1NSBOB, “B” Receptacle on 1BSBO-1
Standard:	Locates 1NSBOB, “B” Receptacle on 1BSBO-1. Plugs one end of a cable into receptacle 1N12, 1D12 AC Supply Receptacle.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 14 **Critical _Y_**	In Battery Room Hallway, connect cables into the following receptacles: 1NSBOC, "C" Receptacle on 1BSBO-1.
Standard:	Locates 1NSBOC, "C" Receptacle on 1BSBO-1. Plugs one end of a cable into receptacle 1N12, 1D12 AC Supply Receptacle.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Performance Step: 15 **Critical _Y_**	Close 1BSBO-1 TSC DG Disconnect Switch to energize temporary cables. Immediately open if arcing occurs or abnormal noises are present (notify TSC).
Standard:	Closes 1BSBO-1 TSC DG Disconnect Switch to energize temporary cables.
Evaluator Cue:	**When the candidate simulates closing 1BSBO-1 TSC DG Disconnect Switch, Cue that the JPM is complete.**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	____

Terminating Cues: **When the candidate has energized the temporary cables by closing 1BSBO-1 TSC DG Disconnect Switch.**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: ___________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ____________________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- The plant has experienced a Station Blackout.
- The Station Blackout occurred 3 hours ago.
- All immediate operator actions have been directed and performed.
- The operators are implementing the follow-up actions to mitigate the consequences of the transient.

INITIATING CUES:

- Perform AOP 301.1, Attachment 10, Alternate AC Power to 125 VDC and 250 VDC Chargers.
- Electricians are not available to support the task.
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

ABNORMAL OPERATING PROCEDURE

AOP 304.1

LOSS OF 4160V NON-ESSENTIAL ELECTRICAL POWER

Usage Level

Reference Use

Approved for **'Point-of-Use'** printing **IF NO Temporary Changes** are in effect for this procedure.

Record the following: Date / Time: ____________ / _________ Initials: ____

NOTE: *A check to ensure current revision and no temporary changes shall be performed and documented every 24 hours if active document use exceeds a 24 hour period as determined from the date and time recorded above.*

Enter the following as applicable:

THIS PAGE

WAS INTENTIONALLY

LEFT BLANK

IMMEDIATE ACTIONS

1. Suspend all evolutions in progress associated with electrical switchgear and switching operations. ________

2. Establish critical parameter monitoring of RPV Water Level and Main Condenser backpressure, as priorities allow. ________

3.  If unable to control and maintain RPV level, then manually scram the reactor and perform IPOI 5. ________

4. If necessary, perform Fast Power Reduction per IPOI 4 to reduce reactor power within:
   a. The capacity of one Reactor Feedwater Pump (<960 amps). ________
   b. The capacity of one Circulating Water Pump. ________

5.  If unable to control main condenser backpressure less than 7.5” Hg absolute with reactor power > 26%, then manually scram the reactor and enter IPOI 5. ________

6. Send an operator to 1A1[1A2] switchgear to investigate the cause of loss of power. ________

<u>AUTOMATIC ACTIONS</u>

- Load Shedding of the following 4160V Bus 1A1[1A2] loads:
  - Reactor Feedwater Pump 1P-1A[B]
  - Reactor Recirculation M-G Set 1G-201A[B]
  - Circulating Water Pump 1P-4A[B]
  - Condensate Pump 1P-8A[B]
  - General Service Water Pump 1P-89C (Loss of 1A2 only)

- Loss of Well Pump 1P-58D (Loss of 1A2 only)

- Operating Reactor Recirculation MG Set 1G-201B[A] 45% runback at 186” reactor water level

- Loss of Offgas Closed Loop Cooling Pumps 1P-105A and B (Loss of 1A1 only)

- Loss of Electric Fire Pump 1P-48 (Loss of 1A1 only)

FOLLOW-UP ACTIONS

CAUTION
Do not attempt to reset 4160V Non-Essential Bus 1A1[1A2] Lockout Relay 186-1 [186-2] or Startup Transformer 1X3 Lockout Relay 386/ST if found to be tripped. A thorough evaluation of the cause of the trip is required to prevent equipment damage before reenergizing Bus 1A1[1A2] or Startup Transformer 1X3.

7. For **LOSS of 1A1 ONLY**, perform the following:
   a. Crosstie 1B1 and 1B2 by performing the following:
      - Momentarily place control switch FEEDER BREAKER 1B101 XFMR 1X11 to LC 1B1 to the TRIP position. ________
      - Momentarily place control switch TIE BREAKER 1B107 LC 1B1/1B2 in the CLOSE position. ________
   b. Crosstie 1B5 and 1B6 by performing the following:
      - Momentarily place control switch FEEDER BREAKER 1B501 XFMR 1X51 to LC 1B5 to the TRIP position. ________
      - Momentarily place control switch TIE BREAKER 1B505 LC 1B5/1B6 in the CLOSE position. ________
   c. Place BUS 1A1 TRANSFER switch in MANUAL. ________
   d. Verify Offgas Closed Cooling Water Pump 1P-105A[B] in service. ________
   e. Start Offgas Glycol Pump 1P-243A[B]. ________
   f. Concurrently perform ARP 1C04A, A-4 (“A” RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD) as directed by CRS. ________
   g. Verify Circ Water Pump 1P-4A Discharge Valve HO-4201 closed. ________
   h. Isolate one Cooling Tower as necessary by manually closing its riser valves and sparging valve to maintain the Circ Water pump discharge pressure (local PI-4203 or computer point F015) 21 to 35 psig. ________

MO-4249	1E-69A West Riser Valve
MO-4250	1E-69A East Riser Valve
V-42-43	1E-69A Tower Sparging Bypass

   i. Continue with RESTORATION OF POWER TO NON-ESSENTIAL 4160V BUSES. ________

FOLLOW-UP ACTIONS (continued)

CAUTION

Do not attempt to reset 4160V Non-Essential Bus 1A1[1A2] Lockout Relay 186-1 [186-2] or Startup Transformer 1X3 Lockout Relay 386/ST if found to be tripped. A thorough evaluation of the cause of the trip is required to prevent equipment damage before reenergizing Bus 1A1[1A2] or Startup Transformer 1X3.

8. For **LOSS of 1A2 ONLY**, perform the following:
   a. Crosstie 1B2 and 1B1 by performing the following:
      - Momentarily place control switch FEEDER BREAKER 1B201 XFMR 1X21 to LC 1B2 to the TRIP position. ________
      - Momentarily place control switch TIE BREAKER 1B107 LC 1B1/1B2 in the CLOSE position. ________
   b. Crosstie 1B6 and 1B5 by performing the following:
      - Momentarily place control switch FEEDER BREAKER 1B601 XFMR 1X61 to LC 1B6 to the TRIP position. ________
      - Momentarily place control switch TIE BREAKER 1B505 LC 1B5/1B6 in the CLOSE position. ________
   c. Place BUS 1A2 TRANSFER switch in MANUAL. ________
   d. Verify two Well Water Pumps are in service. ________
   e. Verify Well Water Pump 1P-58D secured. In AUTO, verify FC-4414D demand is zero. In HAND, verify speed adjust at 1C373 is zero. ________
   f. Verify GSW Pumps 1P-89A and B in service. ________
   g. Concurrently perform ARP 1C04B, A-1 ("B" RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD) as directed by CRS. ________
   h. Verify Circ Water Pump 1P-4B Discharge Valve HO-4202 closed. ________
   i. Isolate one Cooling Tower as necessary by manually closing its riser valves and sparging valve to maintain the Circ Water pump discharge pressure (local PI-4203 or computer point F015) 21 to 35 psig. ________

MO-4251	1E-69B West Riser Valve
MO-4252	1E-69B East Riser Valve
V-42-42	1E-69B Tower Sparging Bypass

   j. Continue with RESTORATION OF POWER TO NON-ESSENTIAL 4160V BUSES. ________

PROBABLE ANNUNCIATORS

1C08A, A-1 AUX XFMR TO 1A1 BKR 1A101 TRIP
A-2 BUS 1A1 LOCKOUT TRIP OR LOSS OF VOLTAGE
A-3 S/U XFMR TO 1A1 BREAKER 1A102 TRIP

1C08B, A-8 S/U XFMR TO 1A2 BREAKER 1A202 TRIP
A-9 BUS 1A2 LOCKOUT TRIP OR LOSS OF VOLTAGE
A-10 AUX XFMR TO 1A2 BREAKER 1A201 TRIP

1C06A, A-10 “A” CIRC WATER PUMP 1P-4A TRIP OR MOTOR OVERLOAD
A-11 “B” CIRC WATER PUMP 1P-4B TRIP OR MOTOR OVERLOAD
A-12 “A” CONDENSATE PUMP 1P-8A TRIP OR MOTOR OVERLOAD
A-13 “B” CONDENSATE PUMP 1P-8B TRIP OR MOTOR OVERLOAD
C-5 “C” GSW PUMP 1P-89C TRIP OR MOTOR OVERLOAD

1C06B, C-3 “A” RX FEED PUMP 1P-1A TRIP OR MOTOR OVERLOAD
C-4 “B” RX FEED PUMP 1P-1B TRIP OR MOTOR OVERLOAD

1C04A, A-1 “A” RECIRC GENERATOR LOCKOUT
A-4 “A” RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD
A-7 “B” RECIRC GENERATOR LOCKOUT
C-1 “A” RECIRC GENERATOR AUX LOCKOUT RELAY TRIP
C-7 “B” RECIRC GENERATOR AUX LOCKOUT RELAY TRIP

1C04B, A-1 “B” RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD

1C05A, E-4 “A” RPS BACK-UP HALF – SCRAM

1C05B, E-4 “B” RPS BACK-UP HALF – SCRAM

PROBABLE INDICATIONS

1C08 - Loss of 4160V Non-Essential Bus 1A1[1A2]:

- Phase Indicating Lights for 1A1[1A2] are OFF
- BUS 1A1[1A2] AUX XFMR AMPERES meter indicates 0 amps
- BUS 1A1[1A2] VOLTS meter indicates 0 volts
- BUS 1A1[1A2] STARTUP XFMR AMPERES indicates 0 amps
- AUX XFMR TO BUS 1A1[1A2] 4KV SW 1A101[1A201] indicates OPEN
- STARTUP XFMR TO BUS 1A1[1A2] 4KV SW 1A102[1A202] indicates OPEN

IMMEDIATE ACTIONS

NOTE

The main condenser will not be available as a long term heat sink. Reactor pressure has to be controlled using HPCI, RCIC, and/or SRVs. ________

1.  If the Reactor Mode Switch in STARTUP or RUN, THEN manually scram the reactor and enter IPOI 5. ________

2. Suspend all evolutions in progress associated with electrical switchgear and switching operations. ________

3. Establish critical parameter monitoring of RPV Water Level and Drywell Pressure, as priorities allow. ________

AUTOMATIC ACTIONS

- Load Shedding of the following 4160V Bus 1A1 and 1A2 loads:

  - Reactor Feedwater Pump 1P-1A and B
  - Reactor Recirculation M-G Sets 1G-201A and B
  - Circulating Water Pump 1P-4A and B
  - Condensate Pump 1P-8A and B
  - General Service Water Pump 1P-89C

- Loss of Well Pump 1P-58D

- Loss of Electric Fire Pump 1P-48 and Jockey Fire Pump 1P-47

FOLLOW-UP ACTIONS

4. Verify two Well Water Pumps are in service. ________

5. Verify Well Water Pump 1P-58D secured. In AUTO, verify FC-4414D demand is zero. In HAND, verify speed adjust at 1C373 is zero. ________

6. Verify GSW Pumps 1P-89A and B in service. ________

7. Place BUS 1A1 TRANSFER switch in MANUAL. ________

8. Place BUS 1A2 TRANSFER switch in MANUAL. ________

9. Continue with RESTORATION OF POWER TO NON-ESSENTIAL 4160V BUSES. ________

PROBABLE ANNUNCIATORS

1C08A, A-1 AUX XFMR TO 1A1 BKR 1A101 TRIP
A-2 BUS 1A1 LOCKOUT TRIP OR LOSS OF VOLTAGE
A-3 S/U XFMR TO 1A1 BREAKER 1A102 TRIP
C-7 STARTUP XFMR LOCKOUT TRIP

1C08B, A-8 S/U XFMR TO 1A2 BREAKER 1A202 TRIP
A-9 BUS 1A2 LOCKOUT TRIP OR LOSS OF VOLTAGE
A-10 AUX XFMR TO 1A2 BREAKER 1A201 TRIP

1C06A, A-10 "A" CIRC WATER PUMP 1P-4A TRIP OR MOTOR OVERLOAD
A-11 "B" CIRC WATER PUMP 1P-4B TRIP OR MOTOR OVERLOAD
A-12 "A" CONDENSATE PUMP 1P-8A TRIP OR MOTOR OVERLOAD
A-13 "B" CONDENSATE PUMP 1P-8B TRIP OR MOTOR OVERLOAD
C-5 "C" GSW PUMP 1P-89C TRIP OR MOTOR OVERLOAD

1C06B, C-3 "A" RX FEED PUMP 1P-1A TRIP OR MOTOR OVERLOAD
C-4 "B" RX FEED PUMP 1P-1B TRIP OR MOTOR OVERLOAD

1C04A, A-1 "A" RECIRC GENERATOR LOCKOUT
A-4 "A" RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD
A-7 "B" RECIRC GENERATOR LOCKOUT
C-1 "A" RECIRC GENERATOR AUX LOCKOUT RELAY TRIP
C-7 "B" RECIRC GENERATOR AUX LOCKOUT RELAY TRIP

1C04B, A-1 "B" RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD

1C05A, E-4 "A" RPS BACK-UP HALF – SCRAM

1C05B, E-4 "B" RPS BACK-UP HALF – SCRAM

PROBABLE INDICATIONS

1C08 - Loss of 4160V Non-Essential Bus 1A1 and 1A2:

- Phase Indicating Lights for 1A1[1A2] are OFF
- BUS 1A1 and 1A2 AUX XFMR AMPERES meter indicates 0 amps
- BUS 1A1 and 1A2 VOLTS meter indicates 0 volts
- BUS 1A1 and 1A2 STARTUP XFMR AMPERES indicates 0 amps
- AUX XFMR TO BUS 1A1[1A2] 4KV SW 1A101[1A201] indicates OPEN
- STARTUP XFMR TO BUS 1A1[1A2] 4KV SW 1A102[1A202] indicates OPEN

OPERATOR ACTIONS

CAUTION
Do not attempt to reset 4160V Non-Essential Bus 1A1[1A2] Lockout Relay 186-1 [186-2] or Startup Transformer 1X3 Lockout Relay 386/ST if found to be tripped. A thorough evaluation of the cause of the trip is required to prevent equipment damage before reenergizing Bus 1A1[1A2] or Startup Transformer 1X3.

1. IF **Startup Transformer 1X3** is desired source and is **deenergized**, then perform the following:

   a. Confirm Startup Transformer 1X3 Lockout Relay 386/ST reset at 1C31 or annunciator 1C08A, C-7 STARTUP XFMR LOCKOUT TRIP reset. ________

   b. Place the STARTUP TRANSFORMER J BREAKER [STARTUP TRANSFORMER K BREAKER] SYNCHRONIZE switch in the ON position. ________

NOTE
Bus 1A1[1A2] load shed will occur if grid voltage is less than 65% rated. This corresponds to 78 volts on the INCOMING VOLTS SYNCHRONIZE meter.

   c. Confirm INCOMING VOLTS SYNCHRONIZE greater than 78 volts. ________

   d. Momentarily place STARTUP TRANSFORMER J BREAKER (OCB 5550) [STARTUP TRANSFORMER K BREAKER (OCB 5560)] in the CLOSE position. ________

   e. Place the STARTUP TRANSFORMER J BREAKER [STARTUP TRANSFORMER K BREAKER] SYNCHRONIZE switch in the OFF position. ________

   f. Notify ITC Midwest that the Startup Transformer is in service. **{C001}** ________

   g. Record the time ITC Midwest was notified that the Startup Transformer was placed in service in the Operating Log. **{C001}** ________

   h. Continue at Step 2. ________

CAUTION

Do not attempt to reset 4160V Non-Essential Bus 1A1[1A2] Lockout Relay 186-1 [186-2] or Startup Transformer 1X3 Lockout Relay 386/ST if found to be tripped. A thorough evaluation of the cause of the trip is required to prevent equipment damage before reenergizing Bus 1A1[1A2] or Startup Transformer 1X3.

______

2. IF **Startup Transformer 1X3** is desired source and is **energized**, then perform the following:

   a. Confirm Bus 1A1[2] Lockout Relay 186-1[186-2] reset locally or via computer point D592[D593]. ______

   b. Verify Load Shed of the following:

      - Reactor Feedwater Pump 1P-1A[B] ______
      - Circulating Water Pump 1P-4A[B] ______
      - Condensate Pump 1P-8A[B] ______
      - Reactor Recirculation MG Set 1G-201A[B] ______

   c. Verify 1E-69A[B] Cooling Tower fans are OFF. ______

   d. Reenergize Bus 1A1[1A2] by placing control switch 4KV BREAKER 1A102[1A202] STARTUP XFMR TO BUS 1A1[1A2] in the CLOSE position and confirm the breaker closed. ______

   e. Verify bus voltage indicates approximately 4160V on all three phases by observing the BUS 1A1[1A2] VOLTS meters. ______

   f. Observe that all three white (phase energized) indicating lights above the BUS 1A1[1A2] VOLTS meter are on. ______

   g. Place BUS 1A1[1A2] TRANSFER Switch in AUTO. ______

   h. Continue at Step 4. ______

CAUTION
Only perform Main Transformer Backfeed if Bus 1A1[1A2] was previously being backfed in accordance with GMP-ELEC-20.

3. IF **Main Transformer 1X1 Backfeed** is desired source, then perform the following:

   a. Confirm Bus 1A1[2] Lockout Relay 186-1[186-2] reset locally or via computer point D592[D593]. ________

   b. Verify BUS 1A1 TRANSFER switch in MANUAL. ________

   c. Verify 4KV BREAKER 1A101 AUX XFMR TO BUS 1A1 open. ________

   d. Verify BUS 1A2 TRANSFER switch in MANUAL. ________

   e. Verify 4KV BREAKER 1A201 AUX XFMR TO BUS 1A2 open. ________

   f. Verify GENERATOR MO-DISC SW 4292 [GENERATOR MO-DISC SW 0236] closed. ________

   g. In 1C08, jumper terminals #1 and #2 on relay 25-2. ________

   ________ CV

   h. Notify ITC Midwest that DAEC is reenergizing the Main Transformers from the grid. **{C001}** ________

   i. Record the time ITC Midwest was notified that the Main Transformers were reenergized from the grid in the Operating Log. **{C001}** ________

   j. Place the GENERATOR OUTPUT I BREAKER [GENERATOR OUTPUT H BREAKER] SYNCHRONIZE switch in the ON position. ________

   k. Place the GENERATOR OUTPUT I BREAKER control switch OCB-4290) [GENERATOR OUTPUT H BREAKER control switch (OCB-0220)] in the CLOSE position. ________

   l. Place the GENERATOR OUTPUT I BREAKER [GENERATOR OUTPUT H BREAKER] SYNCHRONIZE switch in the OFF position. ________

   m. In 1C08, remove the jumper from terminals #1 and #2 of relay 25-2. ________

   ________ CV

n. Verify Load Shed of the following:
   - Reactor Feedwater Pump 1P-1A[B] ________
   - Circulating Water Pump 1P-4A[B] ________
   - Condensate Pump 1P-8A[B] ________
   - Reactor Recirculation MG Set 1G-201A[B] ________

o. Verify 1E-69A[B] Cooling Tower fans are OFF. ________

p. Place BUS 1A1[1A2] SYNCHRONIZE switch in the ON position. ________

NOTE

Bus 1A1[1A2] load shed will occur if bus voltage is less than 65% rated. This corresponds to 78 volts on the INCOMING VOLTS SYNCHRONIZE meter.

q. Confirm INCOMING VOLTS SYNCHRONIZE greater than 78 volts. ________

r. Reenergize Bus 1A1[1A2] by placing control switch 4KV BREAKER 1A101[1A201] AUX XFMR TO BUS 1A1[1A2] in the CLOSE position and confirm the breaker closed. ________

s. Verify bus voltage indicates approximately 4160V on all three phases by observing the BUS 1A1[1A2] VOLTS meters. ________

t. Observe that all three white (phase energized) indicating lights above the BUS 1A1[1A2] VOLTS meter are on. ________

u. Place BUS 1A1[1A2] SYNCHRONIZE switch in the OFF position. ________

4. Restore the following systems to normal lineups as directed by the CRS/OSM:
   - Offgas System ________
   - Condensate and Feedwater System ________
   - Circulating Water System ________
   - Reactor Recirculation System ________
   - General Service Water System ________
   - Well Water System ________
   - Isolated Phase Bus Duct Cooling System ________

5. Restore 480V Load Centers as directed by the CRS/OSM. ________

6. Consult with Electrical Maintenance and thoroughly investigate and evaluate the cause of the malfunction. ________

INFORMATION

- Non-Essential 4160V Bus 1A1 loads:

1A103 Reactor Feed Pump 1P-1A
1A104 Reactor Recirculation MG Set 1G-201A
1A105 Circulation Water Pump 1P-4A
1A106 Condensate Pump 1P-8A
1A107 480V Load Center 1B1
1B102 480V MCC **1B12**
1B1205 Reactor Feed Pump 1P-1A Aux Lube Oil Pump 1P-2A
1B1206 Turbine Lube Oil Tank Vapor Extractor 1K-7
1B1207 Turbine Lube Oil Transfer Pump 1P-39
1B1208 Turbine Hydraulic Fluid Pump 1P-97A
1B1210 Condenser Area HVAC Unit 1V-AC-21
1B1212 Turbine Building Crane 1H-3 Feeder
1B1213 Steam Drain Valve before Bypass Valve MO-1042
1B1214 1L12 Temporary Power Panel
1B1216 Steam Seal Unloading Valve MO-1171
1B1217 Aux. Steam Feed to Steam Seal Valve MO-1172
1B1218 Lube Oil Conditioner Heat Exchanger Pump 1V-HP-25
1B1219 Aux. Transformer Cooling Feeder B (1X2)
1B1220 480/277V Lighting Panel **1L01**
1B1221 Startup Transformer Cooling Feeder B (1X3)
1B1222 Main Transformer Cooling Feeder B1 (1X1A)
1B1223 Main Transformer Cooling Feeder B2 (1X1B)
1B1224 Main Transformer Cooling Feeder B3 (1X1C)
1B1225 Main Transformer Cooling Feeder B4 (1X1D)
1B1228 LP Heater 1A, 2A Inlet Block Valve MO-1485
1B1229 LP Heater 3A, 4A, 5A Inlet Block Valve MO-1550
1B1230 LP Heater 3A, 4A, 5A Outlet Block Valve MO-1548
1B1231 LP Heater 3, 4, 5 Bypass Valve MO-1546
1B1232 Main Stop Valves Before Seat Drain Valve MO-1098
1B1233 MSR 18A 1st Stage Stop Check Valve MO-1025
1B1234 MSR 18A 2nd Stage Stop Check Valve MO-9147
1B1235 Turbine Building Clean Water Sump Pump 1P-108A
1B1236 Turbine Extraction to Heater 4A Drain MO-1184
1B1237 Turbine Extraction to Heater 3A Drain MO-1185
1B1238 Turbine Extraction to Heater 4B Drain MO-1336
1B1239 Turbine Extraction to Heater 3B Drain MO-1396
1B1240 480V Power Receptacles
1B1241 Turbine Building Roll Up Door No. 124
1B1242 CO_2 System Vaporizer Electric Heater
1B1243 Feedwater Startup Isolation Valve MO-1631

INFORMATION

- Non-Essential 4160V Bus 1A1 loads (continued):

  480V Load Center 1B1 (continued)

  - 1B103 480V MCC **1B13**
    - 1B1301 Circulating Water System Electrohydraulic Power Unit 1S-92A (HO-4201)
    - 1B1302 480V Lighting Panel **1L05**
    - 1B1303 through 1B1307 Unit Heaters 1V-UH-54D, B, C, F, and K
    - 1B1309 Circulating Water Pump Room Supply Fan 1V-SF-54
    - 1B1310 Circulating Water Acid Feed System 1C417, 1P120A,B
    - 1B1311 Jockey Pump 1P-47 Control Panel 1C114
    - 1B1312 General Service Water Auto Strainer 1S-24
    - 1B1313 Fire Pump Room Electric Heater 1V-EC-50
    - 1B1314 Unit Heater 1V-UH-54M
    - 1B1315 Pumphouse Sump Pump 1P132A
    - 1B1316 Circulating Water System Blowdown Valve MO-4253
    - 1B1317 Unit Heater 1V-UH-54N
  - 1B104 480V MCC **1B14**
    - 1B1401 RB Refueling Platform Alternate Power Supply
    - 1B1405 Reactor Building Shaft Exhaust Fan 1V-EF-11B
    - 1B1407 Main Plant Exhaust Fan 1V-EF-02
    - 1B1410 Reactor Building Heat Exchanger Area Cooling Unit 1V-AC-10
    - 1B1412 Reactor Building Hot Water Secondary Loop Pump 1V-HP-10B
    - 1B1413 Main Air Hot Water Secondary Loop Pump 1V-HP-12A
    - 1B1415 Main Air Hot Water Injection Pump 1V-HP-13A
    - 1B1416 Chiller Well Water Bypass Valve MO-2039C
    - 1B1420 Turbine Building SJAE Area Exhaust Fan 1V-EF-13B
    - 1B1421 Reactor Building Main Air Supply Fan 1V-SF-10B
    - 1B1422 Turbine Building Main Air Supply Fan 1V-SF-22B
    - 1B1425 Condensate Sludge Discharge Mixing Pump 1P-110
    - 1B1426 Standby Liquid Control Tank Heater B
    - 1B1427 Reactor Building Crane 1H-1 Feeder
    - 1B1431 Backwash Pump 1V-BWP-11 (For Main Plant Air Supply)
    - 1B1432 Waste Filter Holding Pump 1P-239
    - 1B1433 Floor Drain Filter Holding Pump 1P-212
    - 1B1434 Reactor Building Elevator Machinery Room Exhaust Fan 1V-EF-14
    - 1B1435 Reactor Building Decontamination Equipment Lighting Transformer 1XL175
  - 1B105 480V MCC **1B15**
    - 1B1501 Control Building Humidifier 1V-H-31
    - 1B1502 Control Building Preheater Pump 1V-HP-32
    - 1B1503 Administration Building Feeder A (1st Floor Lighting Panel L03)
    - 1B1504 Administration Building Feeder B (2nd Floor Lighting Panel L04)
    - 1B1505 Administration Building Feeder C (3rd Floor Lighting Panel L05)
    - 1B1506 480 VAC Power Receptacle
    - 1B1507 480V Power Receptacles
    - 1B1509 Security Building Alternate 480 V Power
    - 1B1510 Inverter Power Transformer 1LUPSA- SBO/Appendix R Lighting
    - 1B1513 Computer Room HVAC Panel **1LB-1513**, HVAC Units 1V-AC-56, 57, and 58
  - 1B106 Fire Pump 1P-48
  - 1B107 480V Load Center 1B1-1B2 Tie

INFORMATION

– Non-Essential 4160V Bus 1A1 loads (continued):

1A108 480V Load Center 1B7
1B701 through 1B712 Cooling Tower Fans 1K-11A through 1K-11L, 1K-11Z
1B713 480V MCC **1B71**
1B7101 Cooling Tower 1E-69A Circulating Water West Inlet Valve MO-4249
1B7102 Cooling Tower 1E-69A Circulating Water East Inlet Valve MO-4250
1B7103 CT 1E-69A Lighting Panel **1L71** (Via XFMR 1XL71)
1B7104 Temporary Power Receptacle, 1N7104
1B7105 CT 1E-69A Control BLDG Unit Heater 1V-UH-58W
1B7106 Deluge 16 Valve House Unit Heater 1V-UH-58U/V

1A109 480V Load Center 1B5
1B502 480V MCC **1B52**
1B5205 Steam Packing Exhaust Blower 1K-6A
1B5206 Steam Packing Exhauster Blower Discharge Valve MO-1178
1B5207 Stator Winding Liquid Cooling Pump 1P-91A
1B5208 Reactor Feed Water Flow Block Valve MO-1592
1B5209 Turbine Building Hot Water Secondary Loop Pump 1V-HP-20A
1B5210 Turbine Building Hot Water Injection Pump 1V-HP-21
1B5211 Evaporator Boiler Transfer Pump 1P-42A
1B5212 Turbine Building Hot Water Door Heater Booster Pump 1V-HP-22
1B5213 Isolated Phase Bus Cooling Unit 1E-64A
1B5215 480V Power Receptacles
1B5216 Demineralized Water Transfer Pump 1P-13A
1B5218 Heating Boiler Feed Pump 1P-54A
1B5219 Condensate Demineralizer Bypass Valve MO-1708
1B5222 480/277V Lighting Panel **1L02**
1B5223 Main Transformer Phase A Cooling Feeder A1 (1X1A)
1B5224 Main Transformer Phase B Cooling Feeder A2 (1X1B)
1B5225 Main Transformer Phase C Cooling Feeder A3 (1X1C)
1B5226 Main Transformer Phase D Cooling Feeder A4 (1X1D)
1B5227 Turbine Railroad Entrance Door Heater Fan 1V-DH-20A
1B5228 Condensate Service Pump 1P-12B, SV-5229A/B
1B5229 LP Heater 1A, 2A Outlet Block Valve MO-1474
1B5230 LP Heater 1, 2 Bypass Valve MO-1473
1B5231 Turbine Building Floor Drain Sump Pump 1P-87A
1B5232 Turbine Building Equipment Drain Sump Pump 1P-88A
1B5233 Turbine Building Chemical Waste Sump Pump 1P-103A
1B5234 Demineralizer Makeup Pump 1P-107A
1B5235 MSR Shell Pocket Drain Valve MO-1087A
1B5236 MSR Shell Pocket Drain Valve MO-1087B
1B5240 MSR Shell Pocket Drain Valve MO-1087C
1B5241 MSR Shell Pocket Drain Valve MO-1087D
1B5242 Turbine Cross Under Drain Valve MO-1024B
1B5243 Hotwell Transfer Pump 1P-258
1B5244 SJAE Condensate Return Pump 1P-133A

INFORMATION

– Non-Essential 4160V Bus 1A1 loads (continued):

1A109 480V Load Center 1B5
- 1B503 480V MCC **1B53**
  - 1B5301 Waste Sludge Discharge Mixing Pump 1P-71A
  - 1B5302 Radwaste Building Pump Room No. 336 Supply Fan 1V-SF-46
  - 1B5303 Radwaste Building Floor Drain Sump Pump 1P-60A
  - 1B5304 Waste Collector Pump 1P-65
  - 1B5305 Detergent Holding Tank Transfer Pump 1P-55
  - 1B5306 Waste Sample Pump 1P-68A
  - 1B5307 Detergent Drain Pump 1P-56A
  - 1B5308 Reactor Cleanup Sludge Discharge Mixing Pump 1P-06
  - 1B5309 Reactor Building Drywell Personnel Lock Hoist 1H-13
  - 1B5310 Chemical Waste Pump 1P-73
  - 1B5311 Spent Resin Discharge Pump 1P-85
  - 1B5313 Radwaste Building Multizone HVAC Unit 1V-AC-40A
  - 1B5314 Radwaste Building Exhaust Fan 1V-EF-42A
  - 1B5316 480V Power Receptacles
  - 1B5317 Torus and Drywell Purge Fan 1V-EF-17
  - 1B5318 Chemical Waste Sample Pump 1P-72
  - 1B5319 Drywell Backwash Pump 1P-59, SV-5701
  - 1B5320 Reagent Addition Pump 1P-74
  - 1B5322 Floor Drain Collector Pump 1P-45
  - 1B5323 480V MCC **1B56** (Offgas Retention Building)
    - 1B5601 Glycol Cooler Refrigeration Machine 1S-274A
    - 1B5602 Glycol Cooler Refrigeration Machine 1S-274B
    - 1B5603 Glycol Tank Agitator 1S-273
    - 1B5604 Glycol Pump 1P-243A
    - 1B5605 Glycol Pump 1P-243B
    - 1B5606 Domestic Water Control Panel 1C221
    - 1B5607 Offgas Retention Building Equipment Drain Sump Pump 1P-79A
    - 1B5608 Offgas Retention Building Equipment Drain Sump Pump 1P-79B
    - 1B5609 Offgas Retention Building Floor Drain Sump Pump 1P-80A
    - 1B5610 Offgas Retention Building Floor Drain Sump Pump 1P-80B
    - 1B5611 Roll Up Door No. 710
    - 1B5613 480V/277V Lighting Panel **1L102**
    - 1B5614 Reactor Building Railroad Door Heater Fan 1V-DH-10A
    - 1B5615 Reactor Building Railroad Door Heater Fan 1V-DH-10B
    - 1B5616 Machine Shop Chilled Water Pump 1V-CP-50
    - 1B5617 Machine Shop Exhaust Fan 1V-EF-54
    - 1B5618 Offgas Retention Building HVAC Unit 1V-AC-52
    - 1B5619 Machine Shop Door Heater Booster Pump 1V-HP-54
    - 1B5622 Machine Shop Hot Water Pump 1V-HP-52A

INFORMATION

– Non-Essential 4160V Bus 1A1 loads (continued):

1A109 480V Load Center 1B5 (Continued)

480V MCC **1B56** (continued)

1B5623 Machine Shop Hot Water Pump 1V-HP-52B
1B5624 Machine Shop Hot Water Injection Pump 1V-HP-53
1B5625 Machine Shop HVAC Unit 1V-AC-53
1B5626 480V/277V Lighting Panel **1L104**
1B5627 Machine Shop Entrance Door Heater 1V-DH-50
1B5628 Machine Shop Entrance Door Heater 1V-DH-51
1B5629 Carbon Adsorber Vault HVAC Unit 1V-AC-54
1B5630 Carbon Adsorber Vault HVAC Unit 1V-AC-55
1B5631 Water Treatment Lab Electrical Unit Heater 1V-UH-59
1B5632 Offgas Retention Building Exhaust Fan 1V-EF-58
1B5633 Machine Shop Bridge Crane 1H-14
1B5634 Offgas Stack Sump Pump 1P-3A
1B5635 Offgas Stack Sump Pump 1P-3B
1B5636 480V-208Y/120V Lighting Transformer **1XL179**

1B5324 480V/277V Lighting Panel **1L06** and **1L60**
1B5325 Radwaste Building Hot Water Secondary Loop Pump 1V-HP-40A
1B5326 Recombiner Heat Exchanger Closed Cooling Water Pump 1P-105B
1B5327 Radwaste Conveyor Floor Drain Sump Pump 1P-62A
1B5328 Radwaste Building Equipment Drain Sump Pump 1P-61A
1B5329 Reactor Building Sample Sink Exhaust Fan 1V-EF-12
1B5330 Radwaste Building Sample Rack 1C207 Exhaust Fan 1V-EF-43
1B5331 Floc Eductor 1S-36 Exhaust Valves Actuator 1N5331
1B5332 Radwaste Evaporator 1N5332
1B5334 Radwaste Solidification Process Recirculation Pump 1P-137
1B5335A Radwaste Solidification Process Level Control Panel 1N5335A
1B5335B Radwaste Solidification Process Hydraulic Mixer Panel 1N5335B

INFORMATION

– Non-Essential 4160V Bus 1A1 loads (continued):

1A109 480V Load Center 1B5 (Continued)
- 1B504 480V MCC **1B54**
  - 1B5402A Steam Tunnel 480VAC Power Receptacle 1N5402A
  - 1B5402B Steam Tunnel 480VAC Power Receptacle 1N5402B
  - 1B5403 Reactor Building Fuel Rod Assembly Hoist 1H-15A
  - 1B5404 Reactor Building Fuel Rod Assembly Hoist 1H-15B
  - 1B5406 480V MCC **1B55** (Recombiner Building)
    - 1B5501 Offgas Recombiner Inlet Valve MO-4150A
    - 1B5502 Offgas Recombiner Inlet Valve MO-4150B
    - 1B5503 Offgas Jet Compressor Inlet Valve MO-4151
    - 1B5504 Offgas Condenser Cooling Valve MO-4159A
    - 1B5505 Offgas Condenser Cooling Valve MO-4160B
    - 1B5506 Offgas Condenser Cooling Valve MO-4160A
    - 1B5507 Offgas Condenser Cooling Valve MO-4159B
    - 1B5508 Recombiner Heat Exchanger Closed Cooling Water Pump 1P-105A
    - 1B5510 Offgas Jet Compressor Steam Control Valve MO-4156
    - 1B5511 480-208Y/120V Lighting Transformer **1XL130**
    - 1B5512 Nitrogen Purge System Valve MO-4369A
    - 1B5513 Nitrogen Purge System Valve MO-4369B
    - 1B5514 Nitrogen Purge System Valve MO-4369C
    - 1B5515 Recombiner Room Cooling Unit 1V-AC-16
    - 1B5516 Recombiner Building Exhaust Fan 1V-EF-16
    - 1B5518 Nitrogen Vaporizer Power Receptacle (outside) 1N5518
    - 1B5519 Drywell/Torus Differential Pressure Air Compressor 1K-18A
    - 1B5520 Drywell/Torus Differential Pressure Standby Air Compressor 1K-18B
  - 1B5407 A Recirc MG Set Lube Oil Pump (A1) 1P-202A
  - 1B5408 B Recirc MG Set Lube Oil Pump (B1) 1P-203A
  - 1B5409 480V-208Y/120V Lighting Transformer **1XL160**
  - 1B5410 CRD Repair Room HEPA Unit Exhaust Fan 1V-EF-103A
  - 1B5411 Reactor Recirculation MG Room Supply Fan 1V-SF-11
  - 1B5412 CRD Repair Room HEPA Unit Exhaust Fan 1V-EF-103B
  - 1B5414 480VAC Power Receptacles
  - 1B5418 480/227V Lighting Panel **1L07**
  - 1B5419 A Recirc MG Set Lube Oil Pump (A3) 1P-202C
  - 1B5420 Torus Exhaust Throttle Valve M0-4309A
- 1B505 480V Load Center 1B5-1B6 Tie

1A110 Switchyard Load Center

INFORMATION

– Non-Essential 4160V Bus 1A2 loads:

1A203 Reactor Feed Pump 1P-1B
1A204 Reactor Recirculation MG Set 1G-201B
1A205 Circulation Water Pump 1P-4B
1A206 Condensate Pump 1P-8B
1A207 480V Load Center 1B2
  1B202 480V MCC **1B22**
    1B2201 Reactor Feed Pump 1P-1B Aux Lube Oil Pump 1P-2B
    1B2202 Turbine Hydraulic Fluid Pump 1P-97B
    1B2203 Turbine EHC Fluid Filtering Pump 1P-95
    1B2205 Switchgear Room HVAC Unit 1V-AC-20
    1B2206 Condenser Area Cooling Unit 1V-AC-22
    1B2207 480V Power Receptacles 1N2207A/B/C/D
    1B2210 Combined Control Valve Before Seat Drain MO-1028
    1B2211 Control Valve No. 1 Steam Lead Drain MO-1034
    1B2212 Control Valve No. 2 Steam Lead Drain MO-1035
    1B2213 Stop Valve No. 1 Before Seat Drain MO-1038
    1B2214 Stop Valve No. 2 Before Seat Drain MO-1039
    1B2215 Stop Valve No. 3 Before Seat Drain MO-1040
    1B2216 Stop Valve No. 4 Before Seat Drain MO-1041
    1B2217 Reactor Feedwater Flow Block Valve MO-1636
    1B2218 CO_2 System Refrigerator Motor
    1B2220 1st Stage Extraction Steam Drain Valve MO-1099
    1B2221 LP Heater 3B, 4B, 5B Outlet Block Valve MO-1547
    1B2222 Turbine Building Clean Water Sump Pump 1P-108B
    1B2223 MSR 18B 1st Stage Stop Check Valve MO-1027
    1B2224 MSR 18B 2nd Stage Stop Check Valve MO-9148
    1B2225 Turbine Hydraulic Fluid Power Unit Heaters 1HF1 and 1HF2
    1B2226 Startup Transformer Cooling Feeder A (1X3)
    1B2227 Turbine Building Oil Sump Pump 1P-106
    1B2228 Auxiliary Transformer Cooling Feeder A (1X2)
    1B2229 Backwash Pump 1V-BWP-20 (For 1V-AC-21 and 1V-AC-22)
    1B2231 Hot Water Circulating Pump 1P-52A
    1B2232 Turbine Building Decontamination Equipment Room Lighting Panels **1L176** and **1L177**

INFORMATION

Non-Essential 4160V Bus 1A2 loads(continued):

1A207 480V Load Center 1B2 (continued)
- 1B203 480V MCC **1B23**
  - 1B2301 Circulating Water System Electrohydraulic Power Unit 1S-92B (HO-4202)
  - 1B2302 through 1B2307 Unit Heaters 1V-UH-54A, E, G, H, J, and L
  - 1B2309 Circulating Water Pump Room Main Supply Fan 1V-SF-55
  - 1B2310 Fire Pump Room Roof Exhaust Fan 1V-REF-54
  - 1B2311 480V Power Receptacle
  - 1B2312 Chlorination System Control Panel 1C103
  - 1B2313 Chlorination Drum Hoist 1H-12
  - 1B2314 Fire Pump Room Air Handling Unit 1V-AH-52
  - 1B2315 Roll Up Doors No. 501, 508, and 509
  - 1B2316 480V Power Receptacle Pumphouse
  - 1B2318 Chemical Treatment Control Panel 1C278
  - 1B2319 Pump House Sump Pump 1P-132B
  - 1B2320 480V Power Receptacles
- 1B204 480V MCC **1B24**
  - 1B2401 Reactor Building Main Supply Fan 1V-SF-10A
  - 1B2402 Reactor Building Main Supply Fan 1V-SF-10C
  - 1B2403 Turbine Building Main Supply Fan 1V-SF-22A
  - 1B2404 Turbine Building Main Supply Fan 1V-SF-22C
  - 1B2405 Plant Main Exhaust Fan 1V-EF-01
  - 1B2406 Plant Main Exhaust Fan 1V-EF-03
  - 1B2407 Reactor Pool Exhaust Fan 1V-EF-10
  - 1B2408 Reactor Building Shaft Exhaust Fan 1V-EF-11A
  - 1B2409 Turbine Building Air Ejector Area Exhaust Fan 1V-EF-13A
  - 1B2412 Main Air Hot Water Injection Pump 1V-HP-11
  - 1B2413 480V Power Receptacles
  - 1B2415 Reactor Building Hot Water Secondary Loop Pump 1V-HP-10A
  - 1B2416 Main Air Hot Water Secondary Loop Pump 1V-HP-12B
  - 1B2420 Main Air Hot Water Injection Pump 1V-HP-13B
  - 1B2421 Standby Gas Treatment System Outside Air Supply Fan 1V-SF-13
  - 1B2422 Turbine Building Exhaust Fan 1V-EF-21C
- 1B205 Condenser Vacuum Pump 1P-32

INFORMATION

Non-Essential 4160V Bus 1A2 loads(continued):

1A209 480V Load Center 1B6
- 1B602 480V MCC **1B62**
  - 1B6201 Steam Packing Exhaust Blower 1K-6B
  - 1B6202 Steam Packing Exhaust Blower Discharge Valve MO-1180
  - 1B6203 Stator Winding Liquid Cooling Pump 1P-91B
  - 1B6204 Exhaust Hood Water Spray Bypass Valve MO-1484
  - 1B6205 Demineralized Water Storage Tank Hot Water Pump 1V-HP-23
  - 1B6206 MO-4257 Outer Loop LP Condenser Inlet Isolation
  - 1B6207 Turbine Building Floor Drain Sump Pump 1P-87B
  - 1B6208 Turbine Building Equipment Drain Sump Pump 1P-88B
  - 1B6210 Turbine Building Railroad Entrance Door Heater Fan 1V-DH-20B
  - 1B6211 Condensate Backwash Transfer Pump 1P-14
  - 1B6212 Makeup Demineralizer Control Panel 1C-81
  - 1B6213 Heating Boiler Panel 1C85
  - 1B6214 480-208Y/120V Lighting Transformer 1XL150 (1L-150 and 1L-151)
  - 1B6215 Turbine Building Hot Water Secondary Loop Pump 1V-HP-20B
  - 1B6216 Demineralized Water Transfer Pump 1P-13B
  - 1B6217 Condensate Storage Tank Heat Exchanger Pump 1V-HP-24
  - 1B6218 Heating Boiler Feed Pump 1P-54B
  - 1B6219 Isolated Phase Bus Cooling Unit 1E-64B
  - 1B6220 MO-4258 Inner Loop LP Condenser Inlet Isolation
  - 1B6221 Condenser Circulating Water Outlet Valve MO-4208
  - 1B6222 Condenser Circulating Water Outlet Valve MO-4209
  - 1B6223 Condensate Service Water Pump 1P-12A, SV-5228A/B
  - 1B6224 LP Heater 1B, 2B Inlet Block Valve MO-1494
  - 1B6225 LP Heater 1B, 2B Outlet Block Valve MO-1470
  - 1B6226 LP Heater 3B, 4B, 5B Inlet Block Valve MO-1549
  - 1B6227 Condensate Service Jockey Pump 1P-11
  - 1B6228 Turbine Building Chemical Waste Sump Pump 1P-103B
  - 1B6229 Turbine Building Acid-Caustic Waste Sump Pump 1P-104
  - 1B6230 Demineralizer Make-up Pump 1P-107B
  - 1B6231 Evaporator Boiler Transfer Pump 1P-42B
  - 1B6232 SJAE Condensate Transfer Pump 1P-133B
  - 1B6233 Turbine Cross Under Pipe Drain Valve MO-1024D
  - 1B6234 Condensate Return Unit 1V-S-20

INFORMATION

Non-Essential 4160V Bus 1A2 loads(continued):

- 1A209 480V Load Center 1B6 (continued)
  - 1B604 480V MCC **1B64**
    - 1B6401 B Recirculation MG Set Lube Oil Pump (B3) 1P-203C
    - 1B6402 A Recirculation MG Set Lube Oil Pump (A2) 1P-202B
    - 1B6403 B Recirculation MG Set Lube Oil Pump (B2) 1P-203B
    - 1B6404 Reactor Building Service Platform
    - 1B6405 Reactor Building Refueling Platform
    - 1B6406 Reactor Recirculation MG Set Room Supply Fan 1V-SF-12
    - 1B6407 Lighting Transformer 1XL170/Lighting Panel 1L170
    - 1B6408 480V Power Receptacles
    - 1B6409 Steam Tunnel Cooling Unit 1V-AC-17B
    - 1B6410 Turbine Building Exhaust Fan 1V-EF-21A
    - 1B6411 Turbine Building Exhaust Fan 1V-EF-21B
  - 1B605 480V **1L61** (Data Acquisition Center)
    - CKT 01 Xfmr. 1XL61, Panels **1L162, 1L163**
    - CKT 07 1BR101A Throwover Switch, **1L64**/Plant Process Computer
    - CKT 08 DAC HVAC Circulating Pump DAC-P001B
    - CKT 13 DAC HVAC Boiler DAC-EC002
- 1A208 480V Load Center **1B8**
  - 1B801 through 1B812 Cooling Tower Fans 1K-11M through 1K-11Y
  - 1B813 480V MCC **1B81**
    - 1B8101 Cooling Tower 1E-69B Circulating Water West Inlet Valve MO-4251
    - 1B8102 Cooling Tower 1E-69B Circulating Water East Inlet Valve MO-4252
    - 1B8103 480-208Y/120V Lighting Transformer 1XL81
    - 1B8104 Temporary Power Receptacle 1N8104
    - 1B8105 Unit Heater 1V-UH-58X
    - 1B8106 Valve House Unit Heater 1V-UH-58Z
- 1A210 General Service Water Pump 1P-89C
- 1A211 Wellwater Pump 1P-58D, Power Panel 1C-374
- 1BR725 480V MCC **1B63**
    - 1B6301 Radwaste Building Hoist 1H010-M
    - 1B6303 Radwaste Filter Aid Tank Agitator 1S206-M
    - 1B6304 Radwaste Precoat Tank Agitator 1S207-M
    - 1B6305 Radwaste Building Control Room Chilled Water Pump 1VCP040M
    - 1B6306 Radwaste Building Equipment Drain Sump Pump 1P0618-M
    - 1B6307 Waste Sample Pump 1P068B-M
    - 1B6308 Waste Surge Pump 1P069-M
    - 1B6309 Waste Precoat Pump 1P232-M
    - 1B6310 Floor Drain Filter Aid Pump 1P213-M
    - 1B6311 Waste Filter Aid Pump 1P238-M
    - 1B6312 Floor Drain Sample Pump 1P046-M
    - 1B6313 Floor Drain Discharge Mixing Pump 1P071B-M
    - 1B6314 Radwaste Building Heater Coil 1VEC001 (1C-474) 1VEC001
    - 1B6315 Radwaste Building Wet Filter Exhaust Fan 1VEF040-M
    - 1B6316 Radwaste Building Exhaust Fan 1VEF042B-M
    - 1B6317 Radwaste Building Multizone HVAC Unit 1VAC041-M

1BR725 480V MCC **1B63 (continued)**

1B6318 Radwaste Building Multizone HVAC Unit 1VAC040B-M
1B6319 1T088 Discharge Pump 1P292
1B6320 1T466 Discharge Pump 1P295
1B6321 Radwaste Hydraulic Press 1S059-M
1B6322 Detergent Drain Pump 1P056B-M
1B6323 480VAC Power Receptacles
1B6324 Radwaste Building Wet Filter Exhaust Fan 1VEF041-M
1B6326 Evaporator Boiler Service Box 1C192
1B6327 Machine Shop Distribution Panel 1L09
1B6328 Radwaste Building Hot Water Secondary Loop Pump 1VHP040B-M
1B6329 Radwaste Building Hot Water Injection Pump 1VHP041-M
1B6330 480V/277V Lighting Panel 1L04
1B6331 Radwaste Conveyor Floor Drain Sump Pump 1P062B-M
1B6332 Radwaste Building Floor Drain Sump Pump 1P060B-M
1B6333 Fuel Pool Filter Demin Precoat Tank Agitator 1S246-M
1B6334 Fuel Pool Filter Demin Resin Feed Tank Agitator 1S247-M
1B6335 Reactor Water Cleanup Filter Demin Precoat Tank Agitator 1S205-M
1B6336 Reactor Water Cleanup Filter Resin Feed Tank Agitator 1S243-M
1B6337 Fuel Pool Filter Demin Precoat Pump 1P241-M
1B6338 Reactor Water Filter Demin Precoat Pump 1P208-M
1B6341 Radwaste Building Boiler Room Exhaust Fan 1VSF044-M
1B6342 Radwaste Building Boiler Room Hot Water Circ Pump 1VHP044-M
1B6343 Radwaste Building Evaporator Room Cooling Unit 1VAC042-M
1B6344 Radwaste Building Boiler Room Unit Heater

References

7. Single Line Diagram Station Connections, Bechtel Drawing No. 7884-E-1
8. Single Line Meter and Relay Diagram Generator and 4160V System, Bechtel Drawing No. 7884-E-4
9. Single Line Meter and Relay Diagram 480V System, Bechtel Drawing No. 7884-E-6
10. Schematic Meter and Relay Diagram 4.16KV Bus 1A1 and Auxiliary Transformer, Bechtel Drawing No. 7884-E-21
11. Schematic Meter and Relay Diagram 4.16KV Bus 1A2 and Startup Transformer, Bechtel Drawing No. 7884-E-22
12. Schematic Meter and Relay Diagram, 480V Load Center System, Bechtel Drawing No. 7884-E-24
13. Single Line Diagram Station Connections, Bechtel Drawing No. 7884-E-1
14. 4160V and 480V System Control and Protection, Bechtel Drawing No. E-104, Sheets 2, 3, 4, 10, 11, 12, 13, 25, 25A, 26, and 26A
15. DCPs 1330, 1341, 1403, 1554
16. MM-133, 214
17. AR 95-2070.11
18. ECP 1560, ECP 1631
19. EMA A34709, EMA A43422
20. DDC 4720
21. ECP 1715
22. **{C001}** – COM029620, NUC-001 Implementation

ABNORMAL OPERATING PROCEDURE

AOP 304.1

LOSS OF 4160V NON-ESSENTIAL ELECTRICAL POWER

Approved for **'Point-of-Use'** printing **IF NO Temporary Changes** are in effect for this procedure.

Record the following: Date / Time: ______________ / __________ Initials: ____

NOTE: *A check to ensure current revision and no temporary changes shall be performed and documented every 24 hours if active document use exceeds a 24 hour period as determined from the date and time recorded above.*

Prepared By: ____________________ / ____________________________ Date: __________
Print Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)

Reviewed By: ____________________ / ____________________________ Date: __________
Print Signature

Reviewed By: ____________________ / ____________________________ Date: __________
Print Signature

PROCEDURE APPROVAL BY QUALIFIED REVIEWER

Approved By ____________________ / ____________________________ Date: __________
Print Signature

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC SIM JPM S-1

TITLE: Start a Recirc MG Set

SITE:	DAEC		
JPM TITLE:	Start a Recirc MG Set		
JPM NUMBER:	NRC S-1	**REV.**	2
RELATED PRA INFORMATION:	None		
TASK NUMBER(S) / TASK TITLE(S):	12.01/ Start Recirc MG set		
K/A NUMBERS AND VALUES:	202001 Recirculation System A4.02, Ability to manually operate and/or monitor in the control room: System Valves IMPORTANCE: 3.5 /3.4		
Justification (FOR K/A VALUES <3.0):	N/A		

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:				
	In-Plant:	[ ]	Control Room:	[ ]
	Simulator:	[X]	Other:	[ ]
	Lab:	[ ]		

Time for Completion: 20 Minutes Time Critical: NO

Alternate Path / Faulted: NO

TASK APPLICABILITY: SRO/RO

Developed by:	**Mark Santiago** WTS JPM Developer	**03/14/13** Date
Validated by:	Validation Instructor	Date
Reviewed by:	Plant Reviewer	Date
Approved by:	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

Validation Personnel /Date	Validation Personnel/Date
Validation Personnel /Date	Validation Personnel/Date

SIMULATOR SET UP:

1. Mark up the Simulator copy of OI 264, Reactor Recirculation System, with Section 6.3 Steps (1) thru (6) complete and annotated _______
2. Verify a blank copy of STP 3.4.9-03, Recirc Pump Start Temperature Recording, is available to the applicant _______
3. Verify an unmarked copy of the Steam Tables is available to the applicant _______
4. **RESET** to the saved IC (IC 110) _______
5. If the saved IC is not available, then reset to an at power IC and set the following conditions:
   a. The “B” Recirc pump is secured with its discharge valve open and discharge bypass open _______
   b. Single loop Admin limits are met per OI 264, Precaution (30) _______
   c. “A” Recirc pump speed is < 50% per OI 264, Precaution (16) _______
   d. Temperature limits of STP 3.4.9-03, Recirc Pump Start Temperature Recording, are met _______
   e. RWCU is in service _______
   f. Verify that only one Reactor Feedwater Pump is in service _______
   g. Raise RPV water level to the upper portion of the green band on 1C05 _______
   h. Place the simulator in **FREEZE** _______
   i. If re-using this JPM, save setup to an available IC or snapshot _______
6. Place the simulator in **RUN** _______

TRIGGERS: None

SIMULATOR MALFUNCTIONS: None

SIMULATOR OVERRIDES: None

SIMULATOR REMOTE FUNCTIONS: None

Required Materials:

1. OI 264, Reactor Recirculation System with Section 6.3, Steps (1) thru (6) complete and annotated
2. STP 3.4.9-03, Recirc Pump Start Temperature Recording (A blank copy can be found in the JPM folder)
3. Copy of 3.4.2-01 Daily Jet Pump Operability Test rev checked and perf date filled in. (A blank copy can be found in the JPM folder)
4. Steam Tables

General References:

1. OI 264, Rev. 129

Task Standards:

1. Close "B" Recirc. Pump discharge valve MO-4628
2. Obtain pre-start temperatures and determine that start limitations are met (2 separate limitations)
3. Start "B" MG Set
4. Open "B" Recirc. Pump discharge valve MO-4628
5. Recirc loop flows are balanced

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- The plant entered single loop 24 hours ago when the “B” Recirc Pump tripped.
- The cause of the trip has been identified and corrected.
- The plant is at [**evaluator to provide current reactor power**].
- Preparations are in progress for restarting the “B” Recirc Pump.
- 3D Monicore has just been shutdown in anticipation of the Recirc Pump start.
- Steps (1) through (6) of OI 264, section 6.3, STARTUP OF A[B] MG SET AND RECIRC PUMP, have been completed.
- Another operator will monitor and control RPV water level during the pump start.

INITIATING CUES:

- Start 1P-201B Recirc Pump IAW OI 264, Section 6.3, beginning at Step (7).
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: 1 **Critical N**	Verify B MG SET SPEED CONTROL SIC-9245B is set at startup speed demand.
Standard:	Candidate verifies that "B" MG set speed control is set at ~ 36% (startup demand).
Performance:	**SATISFACTORY ________UNSATISFACTORY ________**
Comments:	____

Performance Step: 2 **Critical N**	Verify the following annunciators reset: • "A"["B"] RECIRC GENERATOR LOCKOUT (1C04A, A-1[A-7]) • "A"["B"] RECIRC MG CONTROL POWER TRANSFER INITIATED (1C04A, B-1[B-7]) • "A"["B"] RECIRC GENERATOR AUX LOCKOUT RELAY TRIP (1C04A, C-1[C-7]) • "A"["B"] RECIRC MG FLUID DRIVE OIL LO TEMP (1C04A, C-3[C-9]) • "A"["B"] RECIRC PUMP MOTOR OIL HI/LO LEVEL (1C04A, C-4[B, C-1]) • "A"["B"] RECIRC MG SCOOP TUBE LOCK (1C04A, C-5[B, C-2]) • "A"["B"] RECIRC MG SPEED CONTROLLER FAILURE (1C04A, D-1[D-7])
Standard:	Candidate verifies that the above annunciators are reset.
Performance:	**SATISFACTORY ________UNSATISFACTORY ________**
Comments:	____

Performance Step: 3 **Critical _N_**	Verify that MO-4601[4602] A[B] RECIRC PUMP SUCTION and MO-4629[4630] A[B] RECIRC PUMP DISCH BYP are OPEN.
Standard:	The candidate verifies that MO-4602 and MO-4630 are open by observing valve indicating lights.
Performance:	**SATISFACTORY ________UNSATISFACTORY ________**
Comments:	____

Performance Step: 4 **Critical _N_**	Determine the ∆T between the Recirc Pump suction temperatures per STP 3.4.9-03, Recirc Pump Start Temperature Recording.
Standard:	The candidate obtains a copy of STP 3.4.9-03, Recirc Pump Start Temperature Recording. • Determines operating Recirc Pump Suction Temperature using TR-4603, Red Channel • Determines idle Recirc Pump Suction Temperature using TR-4603, Black Channel • Determines ∆T between the Recirc Pump suction temperatures
Performance:	**SATISFACTORY ________UNSATISFACTORY ________**
Comments:	____

Performance Step: 5 **Critical _N_**	If loop temperatures are not within 50ºF, then: (a) Place running loop speed at approximately 50%. (b) Verify open MO-4627[4628] A[B] RECIRC PUMP DISCHARGE (for the non-running pump). (c) Raise speed of running pump slowly to raise idle loop temperature to within 50ºF of operating loop temperature.
Standard:	The candidate concludes that loop temperatures are within 50ºF and proceeds to the next step.
Performance:	**SATISFACTORY ________UNSATISFACTORY ________**
Comments:	____

Evaluator Note: The following procedure Note is prior to the next step.

NOTE

As core flow is reduced, idle Recirc. Loop Drive flows may become negative. If this occurs, 3D Monicore may stop. 3D Monicore may be restarted once the idle Recirc. Pump is placed back in service. Ref. CAP044439.

Performance Step: 6 **Critical _N_**	Shutdown 3D Monicore per OI 831.4
Standard:	The candidate determines that this step has already been completed based on the initial conditions and proceeds to the next step.
Performance:	**SATISFACTORY ________ UNSATISFACTORY ________**
Comments:	____

Performance Step: 7 **Critical _N_**	Adjust LC-4577 on 1C05 to raise reactor water level to the upper portion of the green band on available 1C05 indications.
Standard:	The candidate verifies that reactor water level is already in the upper portions of the green band and proceeds to the next step.
Performance:	**SATISFACTORY ________ UNSATISFACTORY ________**
Comments:	____

Evaluator Note: The following procedure Notes and Cautions are prior to the next step

NOTE

As recirc speed approaches 50%, flow in the idle loop may be insufficient to keep the loop warm. Therefore, the amount of time spent at less than 50% speed should be minimized.

NOTE

Reactor Engineering will provide a plan to the OSM/CRS which provides required power maneuvering prior to reducing recirc flow on the operating loop. Operating experience indicates that core plate dP inaccuracies at low flows and non-linear flow changes for speed changes of the operating pump may result in a small power rise while lowering pump speed. Thus this plan shall provide ample margin to account for this change in order to preclude entering the buffer region on the power/flow map while reducing recirc pump speed on the operating loop.

CAUTION

To prevent a 20% runback, it must be ensured that total feedwater flow is maintained greater than approximately 1.4Mlb/hr when the inservice recirc pump speeds are adjusted.

CAUTION

When speed of the operating Recirc Pump is lowered to <50%, the power to flow map must be closely monitored to avoid entering the buffer region.

Performance Step: 8 **Critical <u>N</u>**	Reduce speed of operating A[B] Recirc Pump to below 50% with A[B] MG SET SPEED CONTROL SIC-9245A[B] at 1C04.
Standard:	The candidate concludes that the “A” MG set is already below 50% speed and progresses to the next step.
Performance:	**SATISFACTORY__________UNSATISFACTORY ________**
Comments:	____

Evaluator Note: The following procedure Note is prior to the next step

<u>NOTE</u>
Prior to taking RPV Bottom Head Drain Temperatures per STP 3.4.9-03, it must be verified that RWCU is in service.

Performance Step: 9 **Critical <u>N</u>**	Verify LCO for “Reactor Coolant System – Recirculation Loops Operating” has been entered.
Standard:	The candidate verifies with the CRS that the LCO has been entered.
Evaluator Cue:	**Role Play as the CRS and Cue that the LCO has been entered.**
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

Evaluator Note: The following steps are contained within STP 3.4.9-03, Recirc Pump Start Temperature Recording.

Performance Step: 10 **Critical _N_**	Record temperatures at the following points per STP 3.4.9-03, Recirc Pump Start Temperature Recording: Recirc Pump Suction Temperature Reactor Vessel Dome Saturation Temperature Reactor Vessel Bottom Head Drain Temperature
Standard:	The candidate either obtains a clean copy of STP 3.4.9-03, Recirc Pump Start Temperature Recording, or uses the previously obtained copy used in Step 4 of the JPM.
Evaluator Note:	**If the "B" Recirc Pump is NOT started within 15 minutes of taking the temperature data, the candidate should retake the temperature data. If the Recirc Pump is started after the 15 minute time period, the candidate fails this step. In that case, this step should be marked critical and evaluated as Unsat.** **Time temperatures were recorded ____________________.** **Time Pump Started at Step 15 _________________.**
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

Performance Step: 11 **Critical _Y_**	Within 15 minutes prior to Recirc Pump start, record RPV Coolant and Recirc Pump Suction Temperatures for the Recirc Pump being started.
Standard:	• Determines operating Recirc Pump Suction Temperature using TR-4603, Red Channel • Records Operating Recirc Pump Suction Temperature as the RPV Coolant Temperature in Step 7.1 • Determines Recirc Pump Suction Temperature using TR-4603, Black Channel. • Records Idle Recirc Pump Suction Temperature in Step 7.1 • Determines that the Recirc Pump Suction temperature is within 50 degrees of RPV Coolant temperature.
Evaluator Note:	**Per section 2.0 Briefing Information, discussion item 2.1.2, the RPV Coolant Temperature is the operating recirc pump suction temperature or, if the vessel is "hot", the saturation temperature corresponding to the RPV steam dome pressure.** **Therefore, the candidate may also use the saturation temperature corresponding to the RPV steam dome pressure as the RPV Coolant Temperature when determining whether the loop ΔT requirement is met.** **The temperature of the vessel wall adjacent to the flange, TR-4569 Green pen, can only be used if the vessel is cold.**
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

Performance Step: 12 **Critical _Y_**	Within 15 minutes prior to Recirc Pump start, record RPV Coolant and RPV Bottom Head Coolant temperatures for the Recirc Pump being started.
Standard:	• Determines RPV pressure • Determines Saturation temperature for current reactor pressure using Appendix A (or Steam Tables) • Records Saturation Temperature as RPV Coolant Temperature in Step 7.2 • Determines RPV Bottom Head Coolant Temperature using TI-2713, Point 5. • Records RPV Bottom Head Coolant Temperature in Step 7.2 • Determines that the vessel ΔT requirement is met (<145°F ΔT).
Evaluator Note:	**Per section 2.0 Briefing Information, discussion item 2.1.3, the temperature of the vessel wall adjacent to the flange, TR-4569, Green pen, can only be used if the vessel is cold.**
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

Performance Step: 13 **Critical _N_**	Completes STP 3.4.9-03
Standard:	Documents in Step 7.3 that both temperature requirements are met.
Evaluator Cue:	**If the candidate states that STP 3.4.2-01 needs to be completed after the pump start, inform him/her that the STP will be completed by another individual.**
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

EVALUATOR NOTE: The remaining steps are derived from OI 264, Reactor Recirculation System.

Evaluator Note: The following procedure Notes and Caution are prior to the next step.

NOTE

In order to minimize changes in the pump start temperatures, be prepared to start the MG set immediately after the associated RECIRC PUMP DISCHARGE valve reaches full closed.

Indicated reactor level will lower upon the start of a recirc pump due to the suction on the Downcomer Annulus region. If operating with only one feedwater pump, a 45% recirc pump runback will be initiated if reactor level drops to 186".

During an MG Set start sequence, the generator will ramp to about 80% speed immediately as shown on A[B] MG set speed controller SIC-9245A[B] X-% PERCENT SPEED indicator. The A[B] MG Set Field Breaker will automatically close 6 seconds after the MG Set start. When the field breaker closes, the generator speed will drop rapidly to approximately 40% speed and settle out at 20% speed.

NOTE

For low core flow AND single loop operation conditions (i.e., <27 Mlbm/hr), Core Plate dP can be obtained from PDR/FR-4528. The Core Flow vs Core Plate dP graph under Appendix 2 can be used to determine core flow in Mlbm/hr.

CAUTION

MO-4627[4628] A[B] RECIRC PUMP DISCHARGE valve is not equipped with bonnet overpressure protection. Ensure MO-4627[4628] does not remain closed during plant heatup.

Performance Step: 14 **Critical _Y_**	Close MO-4628, B RECIRC PUMP DISCHARGE with the handswitch at Panel 1C04.
Standard:	The candidate closes MO-4628. Valve red indicating light off; green light on.
Performance:	**SATISFACTORY ________UNSATISFACTORY ________**
Comments:	____

Performance Step: 15 **Critical _Y_**	Start up idle A[B] MG Set and A[B] Recirc Pump momentarily by placing A[B] RECIRC MG SET MOTOR BREAKER 1A104[1A204] handswitch in the START position.
Standard:	The candidate starts the "B" recirc MG set by placing the "B" MG set handswitch on 1C04 to the START position.
Evaluator Note:	**IF asked, respond as field operator that you are standing by for start of "B" MG and will inspect MG after start.** **Record Time Pump Started at Step 10 __________.**
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

Performance Step: 16 **Critical _Y_**	Open MO-4627[4628] A[B] RECIRC PUMP DISCHARGE valve with HS-4627[4628] at 1C04.
Standard:	The candidate opens MO-4628. Valve red indicating light on; green light off.
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

Performance Step: 17 **Critical _N_**	After reactor level stabilizes, adjust LC-4577 on 1C05 as necessary to restore level to the middle of the green band using available 1C05 indications.
Standard:	Candidate directs the operator controlling RPV water level to adjust LC-4577 as necessary to restore level to the middle of the green band.
Evaluator Cue:	**Role Play as the RO controlling RPV level and Cue that RPV level has been restored to the middle of the green band.**
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

Evaluator Cue: **If the candidate asks the CRS if they should balance flows, respond that they should continue in the procedure.**

Evaluator Note: **The following procedure Caution is prior to the next step**

CAUTION
Total core flow should be maintained constant while balancing recirc loop flows to prevent abnormal core power distributions.

Performance Step: 18 **Critical _Y_**	Balance recirc loop flow by slowly and simultaneously lowering speed of the operating pump and raising speed on the on-coming pump using the respective A[B] MG SET SPEED CONTROL SIC-9245A[B].
Standard:	Candidate adjusts "A" and "B" speed controllers as required to balance Recirc Loop flows. Total Core flow remains relatively constant while balancing loop flows. Recirc loop flows are balanced.
Evaluator Note:	**Total Core flow can be monitored using Total Core Flow / Core Plate ΔP recorder FR-4528 (located below the Rod Worth Minimizer display on 1C05).** **Recirc Loop flows can be read on Recirc Pump Discharge Flow recorder FR-4635 or individual loop flow indicators FI-4634A ("A" loop) and FI-4634B ("B" loop).**
Evaluator Cue:	**When Recirc Loop flows are balanced, Cue the candidate that the JPM is completed.**
Performance:	**SATISFACTORY _________UNSATISFACTORY ________**
Comments:	____

Terminating Cues: The "B" Recirc pump is running and loop flows are balanced.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: ___________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ____________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ______________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- The plant entered single loop 24 hours ago when the "B" Recirc Pump tripped.
- The cause of the trip has been identified and corrected.
- The plant is at [**evaluator to provide current reactor power**].
- Preparations are in progress for restarting the "B" Recirc Pump.
- 3D Monicore has just been shutdown in anticipation of the Recirc Pump start.
- Steps (1) through (6) of OI 264, section 6.3 STARTUP OF A[B] MG SET AND RECIRC PUMP have been completed.
- Another operator will monitor and control RPV water level during the pump start.

INITIATING CUES:

- Start 1P-201B Recirc Pump IAW OI 264, Section 6.3 beginning at Step (7)
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Usage Level
CONTINUOUS

Approved for **'Point-of-Use'** printing **IF NO Temporary Changes** are in effect for this procedure.

Record the following: Date / Time: ____________ / __________ Initials: ____

NOTE: *A check to ensure current revision and no temporary changes shall be performed and documented every 24 hours if active document use exceeds a 24 hour period as determined from the date and time recorded above.*

Prepared By: ____________________ / ____________________________ Date: __________
Print Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)

Reviewed By: ____________________ / ____________________________ Date: __________
Print Signature

Reviewed By: ____________________ / ____________________________ Date: __________
Print Signature

PROCEDURE APPROVAL BY QUALIFIED REVIEWER

Approved By ____________________ / ____________________________ Date: __________
Print Signature

1.0 PURPOSE

1.1 The purpose of this STP is to log Recirc Pump speeds daily to ensure Recirc Pumps are not operating at a significant speed mismatch and to verify Jet Pump operability. Verification of Jet Pump operability shall be made daily, following startup of a Recirculation Pump, and after any unexplained changes in core flow, Jet Pump Loop flow, Recirc Loop flow, or core plate differential pressure.

1.2 When this procedure is performed in its entirety it FULLY SATISFIES Recirculation Loop Operations Recirc Pump speed mismatch surveillance requirements.

1.3 When this procedure is performed in its entirety it FULLY SATISFIES Jet Pumps surveillance requirements.

2.0 BRIEFING INFORMATION

2.1 PERFORMANCE INFORMATION

2.1.1 This STP is organized as follows:

STP Sections	Evolution
7.1	Recirc Pump Speed Mismatch Check
7.2	Jet Pumps 9-16 Operability Check
7.3	Jet Pumps 1-8 Operability Check

All steps within a section are to be performed in sequence and the STP steps carried through to completion, unless otherwise indicated. The sections may be performed concurrently for ease of recording data.

Sections 7.2 and 7.3 are not required to be performed when reactor power is less than or equal to (≤) 21.7% RTP. If this procedure is being performed when reactor power is less than or equal to (≤) 21.7% RTP, Prerequisite 6.2 and Sections 7.2 and 7.3 are to be marked "N/A".

2.1.2 Personnel recommended to perform this procedure:

1 Operations

2.1.3 Special Test Equipment required:

None

2.1.4 If Recirculation Pump speed is less than 60% of rated, an Engineering evaluation may be performed to determine Jet Pump OPERABILITY.

2.1.5 Collect Jet Pump DP values using the "2 MIN AVE" screen on FR-4501 and FR-4502 in Sections 7.2 and 7.3. Any display screen can be used at other times.

2.2 GENERAL CAUTIONS

2.2.1 None

2.3 SPECIAL PRECAUTIONS

2.3.1 None

3.0 REFERENCES

3.1 None

4.0 GENERAL INSTRUCTIONS

4.1 Steps marked with a "TS" immediately to the right of the step sign-off line are required by Technical Specifications. If these steps do not meet their acceptance criteria or cannot be performed, a NRC reportable condition may exist and shall be reported to the Control Room Supervisor (CRS) immediately.

4.2 The CRS shall be immediately notified and the appropriate Limiting Condition for Operations section of Technical Specifications referred to whenever problems are encountered during the performance of this STP.

4.3 An Action Request (AR) should be completed for any problems encountered with “TS” marked steps during the performance of this test.

5.0 APPENDICES

5.1 Appendix A – JETS Program Instructions

1. If at a workstation desktop, log onto SSE as follows:
   a. Click: Start : Programs: PDA APPS: IBM Personal Communications PC3270: PPC
   b. At Username Prompt, type SSE <Enter>.
   c. Enter the appropriate password and press <Enter>.
   d. At the $ prompt, type JETS and press <Enter>.
      The Jet Pump Program main menu should come up on the screen.

2. If at a VAX/PPC terminal, log onto SSE as follows:
   a. Log onto the SSE account.
   b. At the PPC1_SSE prompt, type JETS and press <Enter>. The Jet Pump program main menu should come up on the screen.

3. Type 1 to access combined Loop A and Loop B Jet Pump tables. Type 2 to access only the Loop A Jet Pump table (Jet Pumps 9-16). Type 3 to access only the Loop B Jet Pump table (Jet Pumps 1-8).

NOTE

All ΔPs must be a positive value between 0 and 30, but not including 0 ($0<\Delta P\leq 30$). The program will automatically tab forward as each Jet Pump's ΔP is entered. The <Tab> key may be used to move forward to the next Jet Pump, if desired. The <Control> and <H> keys pressed simultaneously may be used to move backward to the previous Jet Pump, if desired. If desired to change a ΔP, use the <Backspace> key to erase all numerals to the left of the decimal point before entering the new numbers.

4. Type in each Jet Pump's ΔP.

NOTE

If all fields are not filled with a positive number between 0 and 30, but not including 0 ($0<\Delta P\leq 30$) when Step 5.0 is performed, the program will not calculate the % deviations and will return to the Jet Pump main menu.

5. Press the <Enter> key to calculate the % deviations. The printout will automatically print on laser printer LTA14 and the program will automatically terminate.

6.0 PREREQUISITES

6.1 The reactor is in two-loop operation. (If the reactor is in single loop operation, perform STP 3.4.2-03 instead.) _________ (OPS)

6.2 For sections 7.2 and 7.3, reactor power is greater than (>) 21.7% RTP. (See Performance Information Step 2.1.1.) _________ (OPS)

7.0 PROCEDURE

7.1 RECIRC PUMP SPEED MISMATCH CHECK

7.1.1 At 1C04, using the "D" button on SIC-9245A, A MG SET SPEED CONTROL, select "X" - PERCENT SPEED mode of indication. ________

a. Record the percent speed indication. ________ TS

A MG SET PERCENT SPEED (SIC-9245A.X) __________ %

b. Record the percent speed indication in Step 7.2.1. (Mark this step N/A if Section 7.2 is not required.) ________

c. Using the "D" button on SIC-9245A, select "S" - SETPOINT mode of indication. ________

7.1.2 At 1C04, using the "D" button on SIC-9245B, B MG SET SPEED CONTROL, select "X" - PERCENT SPEED mode of indication. ________

a. Record the percent speed indication. ________ TS

B MG SET PERCENT SPEED (SIC-9245B.X) ___________%

b. Record the percent speed indication in Step 7.3.1. (Mark this step N/A if Section 7.3 is not required.) ________

c. Using the "D" button on SIC-9245B, select "S" – SETPOINT mode of indication. ________

7.1.3 On Attachment 1, plot the intersection of the Recirc Pump speed values using the data recorded in Steps 7.1.1.a and 7.1.2.a. ________

7.1.4 Confirm that the point plotted on Attachment 1 is within the appropriate limit for the current core power. If the point is outside the limit, immediately notify the CRS. ________ TS

Performed by:	Date:	Time:	
______________________	________	________	________
______________________	________	________	________
______________________	________	________	________

7.2 JET PUMPS 9-16 OPERABILITY CHECK

7.2.1 At 1C04, record the following data for the "A" Recirc Pump: ________

A MG SET PERCENT SPEED (SIC-9245A.X) ______%

DISCHARGE FLOW (FI-4634A) _________ KGPM

LOOP A FLOW (FR-4503, Ch 1) ______________ Mlbm/hr

7.2.2 Using the data recorded in Step 7.2.1, plot "A" Recirc MG Set speed vs. "A" Recirc Pump discharge flow on Attachment 2. ________ TS

7.2.3 Using the data recorded in Step 7.2.1, plot "A" Recirc MG Set speed vs. Loop "A" Jet Pump flow on Attachment 3. ________ TS

NOTE

If Step 7.2.4.a is answered NO, Acceptance Criteria Step 8.2.2 should be answered YES if either Step 7.2.13.a or Step 7.2.13.e is answered YES. ________

7.2.4 Perform the following evaluation:

a. Are all of the points that were plotted on Attachment 2 and Attachment 3 between or on the sloped lines? ________ TS

(YES/NO) ___________

b. If the answer to Step 7.2.4.a was YES, Jet Pumps 9-16 are OPERABLE. "N/A" Step 7.2.4.c, Steps 7.2.7 through 7.2.13.e, and Attachment 4. Then continue with Step 7.2.5. ________

c. If the answer to Step 7.2.4.a was NO, immediately notify the CRS. Then, "N/A" Step 7.2.4.b and perform the remainder of Section 7.2. ________

7.2.5 At 1C38, record jet pump total developed head as read on FR-4502, Channel 9 (PDT-4567), Jet Pump Total Head: ________

FR-4502, Channel 9 (PDT-4567): __________ psid

7.2.6 At 1C38 recorder FR-4501 Jet Pump Flow – Loop A, using the "2 MIN AVE" screen record the indicated RECIRC LOOP A Jet Pump differential pressure value for each Jet Pump in column "A" of Table A (contained in Step 7.2.11). ________

7.2.7 If the JETS program is available, "N/A" Steps 7.2.9 through 7.2.11 and then perform the remainder of Section 7.2. If the JETS program is not available, "N/A" Steps 7.2.8 and 7.2.8.a and then perform the remainder of Section 7.2. ________

7.2.8 Using the instructions provided in Appendix "A", obtain a printout of "A" Recirc Loop ΔPs. ________

a. Attach the printout to the STP. ________

7.2.9 Calculate the sum of the individual Jet Pump ΔPs and the average Jet Pump ΔP and record those values in the appropriate spaces at the bottom of Table A. ________

7.2.10 Calculate the difference between each individual Jet Pump ΔP and the average ΔP and record the results in column "B" of Table A. ________

7.2.11 Using the following equation, calculate the percent deviation of each individual Jet Pump ΔP from the average ΔP, and record the result in column "C" of Table A. ________

$$\%\ \text{Deviation} = 100 \times \frac{\text{Ind. } \Delta P - \text{Avg. } \Delta P}{\text{Avg. } \Delta P}$$

TABLE A

JET PUMP	A (ΔP)	B (Ind.ΔP - Avg.ΔP)	C (% Deviation)
JP-9	________	________	________
JP-10	________	________	________
JP-11	________	________	________
JP-12	________	________	________
JP-13	________	________	________
JP-14	________	________	________
JP-15	________	________	________
JP-16	________	________	________

________ ÷ 8 = ________
(Sum of ΔPs) (Avg. ΔP)

7.2.12 Plot each individual Recirc Loop "A" Jet Pump % deviation value (from column "C" of Table A or JETS program calculation) on Attachment 4. ________

NOTE

If Step 7.2.13.a is answered NO, Acceptance Criteria Step 8.2.2 shall be answered NO also, unless Recirc Pump speed is less than 60% of rated and an Engineering evaluation determines that the Jet Pumps are OPERABLE.

____

7.2.13 Perform the following evaluation:

a. Are all of the points plotted on Attachment 4 on or between the lines of the allowable band? ________ TS

(YES/NO) __________

b. If the answer to Step 7.2.13.a is YES, Jet Pumps 9-16 are OPERABLE. "N/A" Steps 7.2.13.c, 7.2.13.d, and 7.2.13.e. ________

c. If the answer to Step 7.2.13.a is NO and Recirc Pump speed is greater than or equal to (≥) 60% of rated, immediately notify the CRS. Then, "N/A" Steps 7.2.13.b, 7.2.13.d, and 7.2.13.e. ________

d. If the answer to Step 7.2.13.a is NO and Recirc Pump speed is less than (<) 60% of rated, immediately inform the CRS and then contact Engineering to perform an evaluation of Jet Pump operability. Then, "N/A" Steps 7.2.13.b and 7.2.13.c. ________

e. If an Engineering evaluation was performed, are Jet Pumps 9-16 OPERABLE? ("N/A" if an Engineering evaluation is not required to be performed.) ________ Engineering TS

(YES/NO) __________

7.3 JET PUMPS 1-8 OPERABILITY CHECK

7.3.1 At 1C04, record the following data for the "B" Recirc Pump: ________

B MG SET PERCENT SPEED (SIC-9245B.X) ______%

DISCHARGE FLOW (FI-4634B) __________ KGPM

LOOP B FLOW (FR-4504, Ch 1) ___________ Mlbm/hr

7.3.2 Using the data recorded in Step 7.3.1, plot "B" Recirc MG Set speed vs. "B" Recirc Pump discharge flow on Attachment 5. ________ TS

7.3.3 Using the data recorded in Step 7.3.1, plot "B" Recirc MG Set speed vs. Loop "B" Jet Pump flow on Attachment 6. ________ TS

NOTE

If Step 7.3.4.a is answered NO, Acceptance Criteria Step 8.2.3 should be answered YES if either Step 7.3.12.a or Step 7.3.12.e is answered YES. ________

7.3.4 Perform the following evaluation:

a. Are all of the points that were plotted on Attachment 5 and Attachment 6 between or on the sloped lines? ________ TS

(YES/NO) ______________

b. If the answer to Step 7.3.4.a was YES, Jet Pumps 1-8 are OPERABLE. "N/A" Step 7.3.4.c, Steps 7.3.6 through 7.3.12.e, and Attachment 7. Then, perform Step 7.3.5. ________

c. If the answer to Step 7.3.4.a was NO, immediately notify the CRS. Then, "N/A" Step 7.3.4.b and perform the remainder of Section 7.3. ________

7.3.5 At 1C38 recorder FR-4502 Jet Pump Flow – Loop B, using the "2 MIN AVE" screen record the indicated RECIRC LOOP B Jet Pump differential pressure value for each Jet Pump in column "A" of Table B (contained in Step 7.3.10). ________

7.3.6 If the JETS program is available, "N/A" Steps 7.3.8 through 7.3.10 and then perform the remainder of Section 7.3. If the JETS program is not available, "N/A" Steps 7.3.7 and 7.3.7.a, then perform the remainder of Section 7.3. ________

7.3.7 Using the instructions provided in Appendix "A", obtain a printout of "B" Recirc Loop ΔPs. ________

a. Attach the printout to the STP. ________

7.3.8 Calculate the sum of the individual Jet Pump ΔPs and the average Jet Pump ΔP and record the results in the appropriate spaces at the bottom of Table B. ________

7.3.9 Calculate the difference between each individual Jet Pump ΔP and the average ΔP and record the result in column "B" of Table B. ________

7.3.10 Using the following equation, calculate the percent deviation of each individual Jet Pump ΔP from the average ΔP and then record the result in column "C" of Table B. ________

$$\%\ \text{Deviation} = 100 \times \frac{\text{Ind. } \Delta P - \text{Avg. } \Delta P}{\text{Avg. } \Delta P}$$

TABLE B

JET PUMP	A (ΔP)	B (Ind.ΔP - Avg.ΔP)	C (% Deviation)
JP-1			
JP-2			
JP-3			
JP-4			
JP-5			
JP-6			
JP-7			
JP-8			

________ ÷ 8 = ________
(Sum of ΔPs) (Avg. ΔP)

7.3.11 Plot each individual Recirc Loop "B" Jet Pump % deviation value (from column "C" of Table B or JETS program calculation) on Attachment 7. ________

NOTE

If Step 7.3.12.a is answered NO, Acceptance Criteria Step 8.2.3 shall be answered NO also, unless Recirc Pump speed is less than 60% of rated and an Engineering evaluation determines that Jet Pumps are OPERABLE.

____

7.3.12 Perform the following evaluation:

a. Are all of the points plotted on Attachment 7 on or between the lines of the allowable band? ________ TS

(YES/NO) __________

b. If the answer to Step 7.3.12.a is YES, Jet Pumps 1-8 are OPERABLE. "N/A" Steps 7.3.12.c, 7.3.12.d, and 7.3.12.e. ________

c. If the answer to Step 7.3.12.a is NO and Recirc Pump speed is greater than or equal to (≥) 60% of rated, immediately notify the CRS. Then, "N/A" Steps 7.3.12.b, 7.3.12.d, and 7.3.12.e. ________

d. If the answer to Step 7.3.12.a is NO and Recirc Pump speed is less than (<) 60% of rated, immediately inform the CRS and then contact Engineering to perform an evaluation of Jet Pump operability. Then, "N/A" Steps 7.3.12.b and 7.3.12.c. ________

e. If an Engineering evaluation was performed, are Jet Pumps 1-8 OPERABLE? ("N/A" if an Engineering evaluation is not required to be performed.) ________ Engineering TS

(YES/NO) __________

8.0 ACCEPTANCE CRITERIA

8.1 Check below the reason for performing this STP. If this STP is performed for any reason other than for satisfying the PURPOSE as stated in Section 1.0, indicate below (otherwise mark this step "N/A"):

[ ] Daily Requirement

[ ] Pump Start

[ ] Unexplained changes

[ ] Other

____

____

____

8.2 All Technical-Specification-required items, as indicated by "TS", have been performed satisfactorily.

8.2.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified ________

8.2.2 Section 7.2 ( ) YES ( ) NO ⇒ CRS notified ________

8.2.3 Section 7.3 ( ) YES ( ) NO ⇒ CRS notified ________

8.3 All other items checked in this test have been performed satisfactorily.

8.3.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified ________

8.3.2 Section 7.2 ( ) YES ( ) NO ⇒ CRS notified ________

8.3.3 Section 7.3 ( ) YES ( ) NO ⇒ CRS notified ________

8.4 Indicate any relevant test comments below, otherwise mark this step "N/A":

____

____

____

____

____

____

____ ______________

Operations Date

____ ______________

Surveillance Coordinator Date

9.0 ATTACHMENTS

9.1 Attachment 1 – Speed of Pump "A" vs. Speed of Pump "B"

9.2 Attachment 2 – "A" MG Set Speed vs. "A" Recirc Pump Discharge Flow

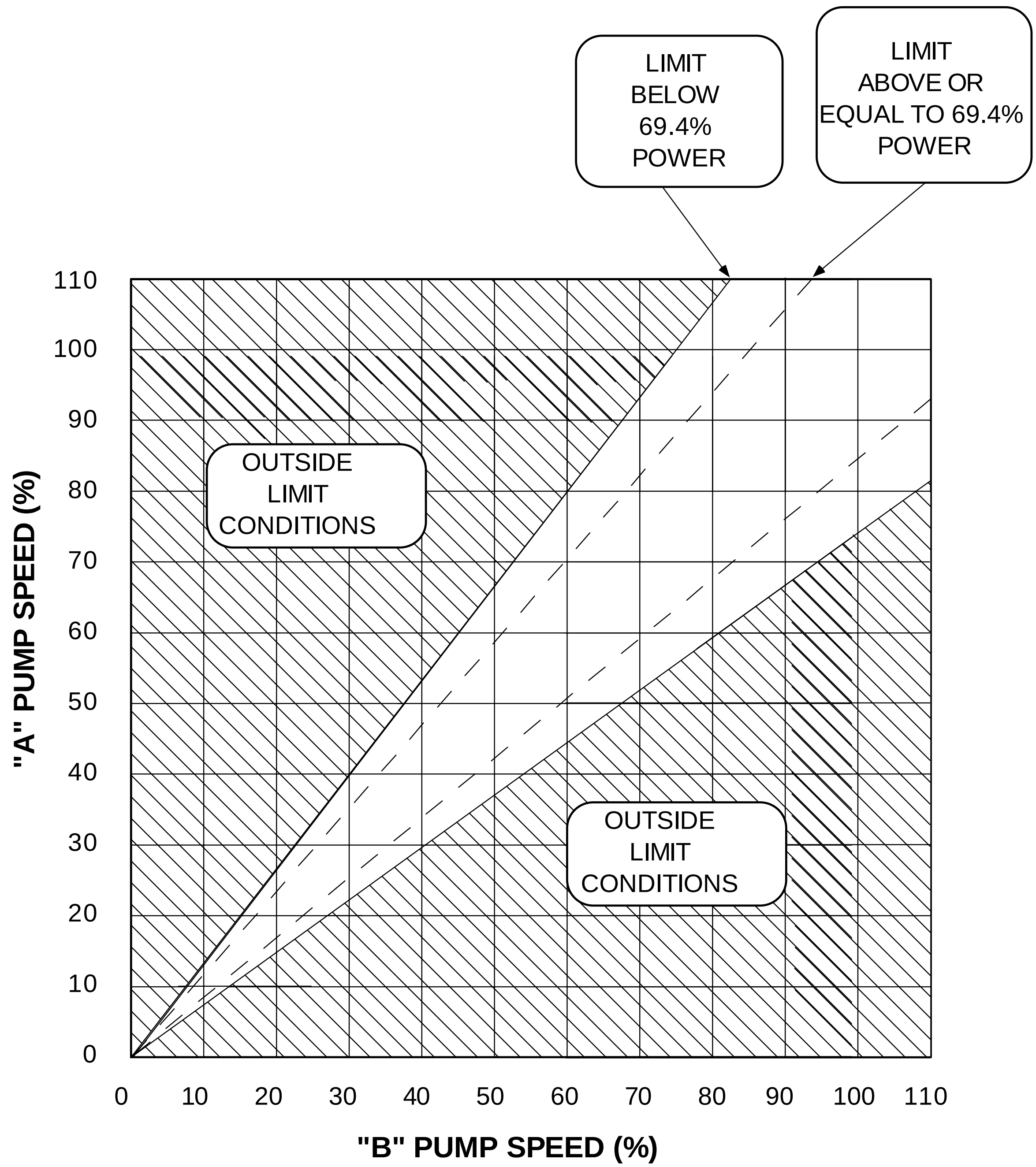
9.3 Attachment 3 – "A" MG Set Speed vs. Loop "A" Jet Pump Flow

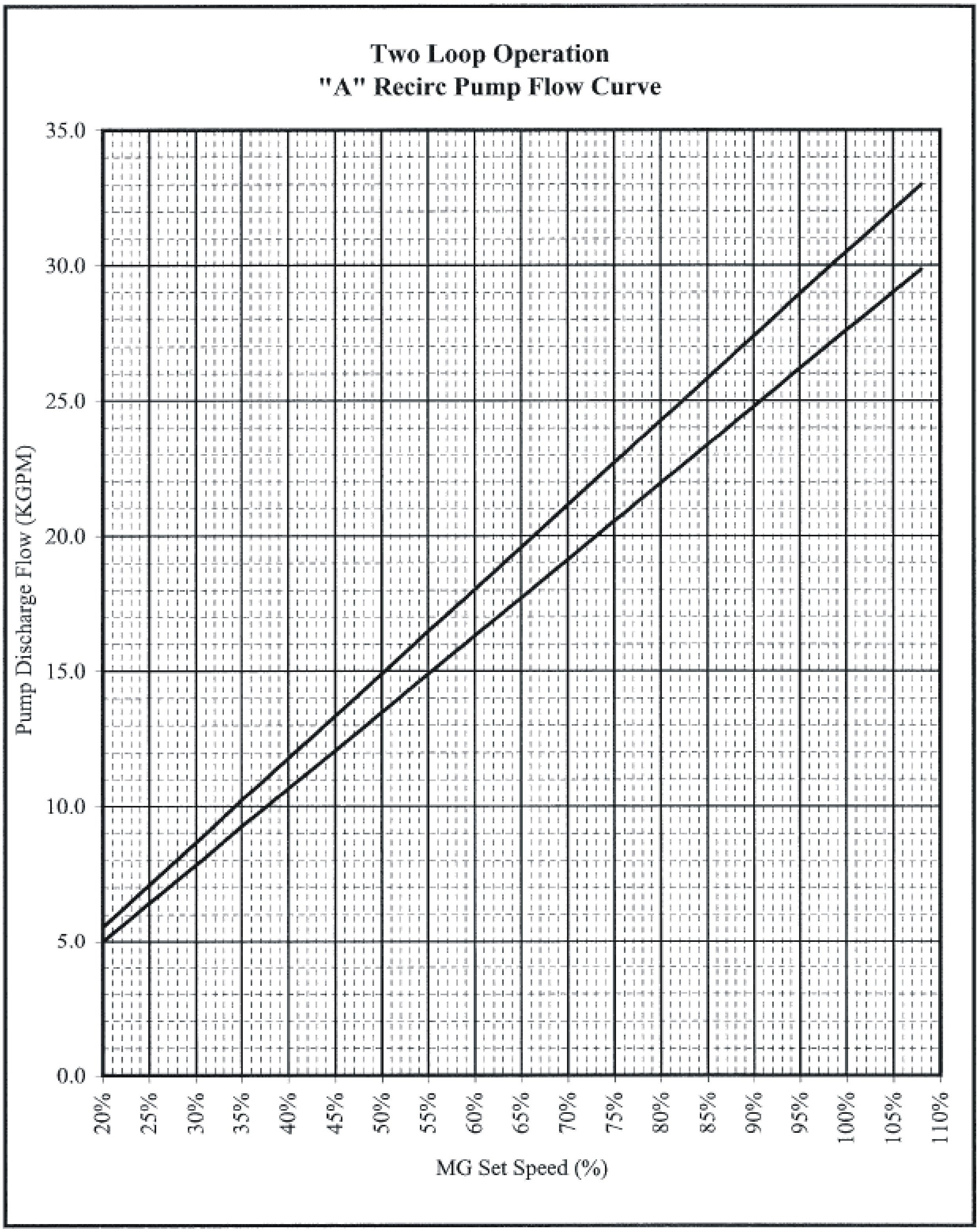
9.4 Attachment 4 – Loop "A" Jet Pump % Deviation vs. Jet Pump Number

9.5 Attachment 5 – "B" MG Set Speed vs. "B" Recirc Pump Discharge Flow

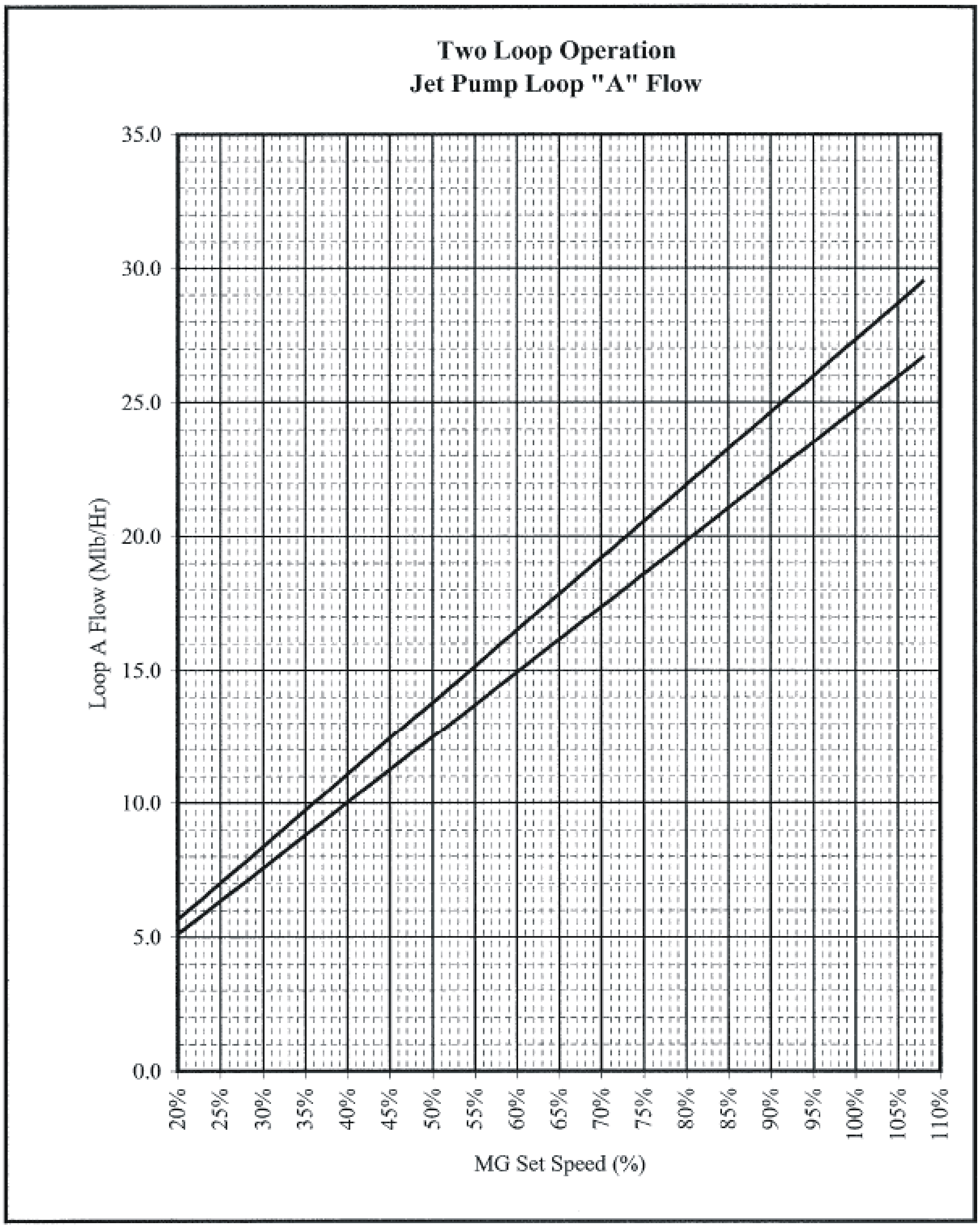
9.6 Attachment 6 – "B" MG Set Speed vs. Loop "B" Jet Pump Flow

9.7 Attachment 7 – Loop "B" Jet Pump % Deviation vs. Jet Pump Number

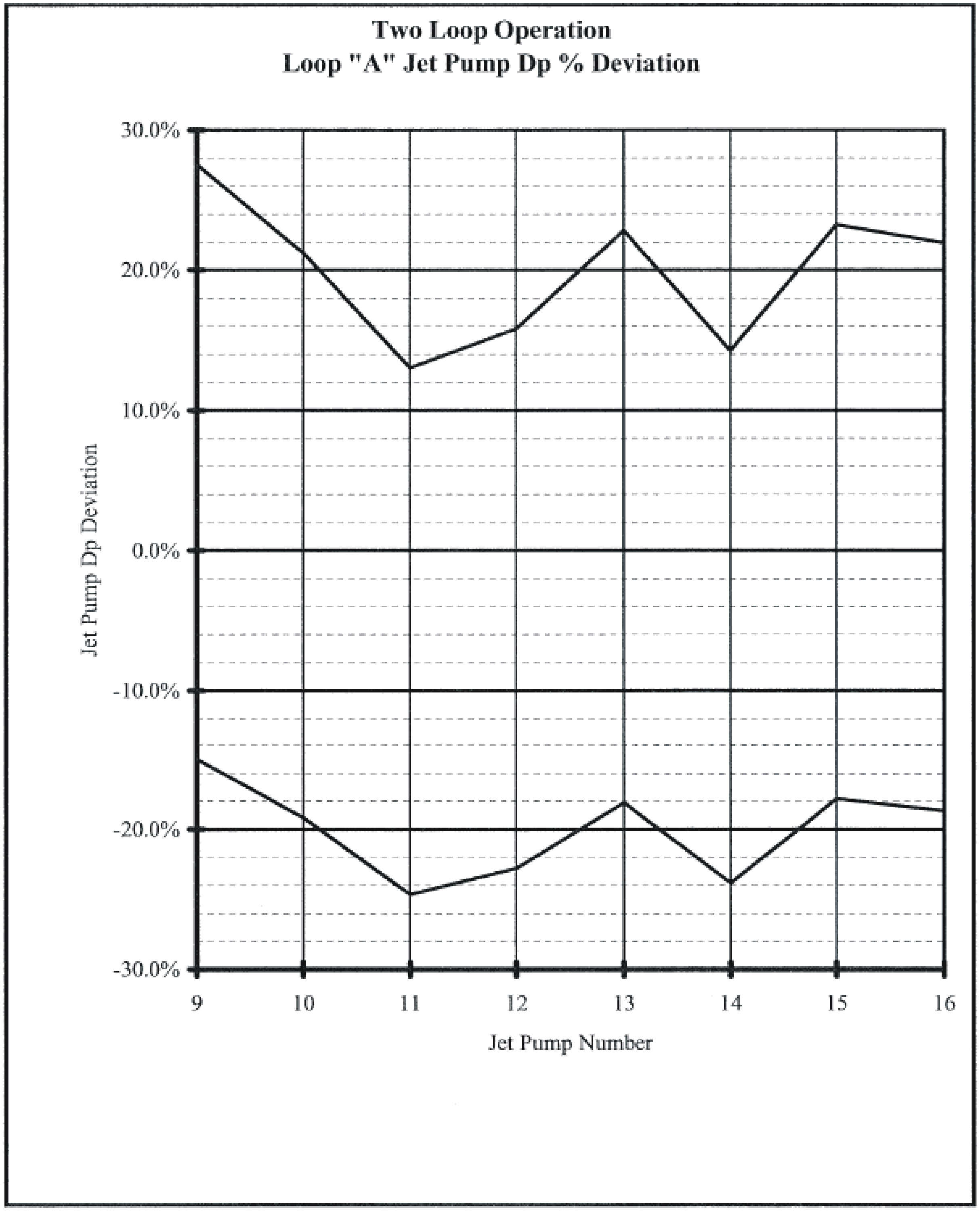

LIMIT BELOW 69.4% POWER
LIMIT ABOVE OR EQUAL TO 69.4% POWER
OUTSIDE LIMIT CONDITIONS
OUTSIDE LIMIT CONDITIONS
"A" PUMP SPEED (%)
"B" PUMP SPEED (%)
0 10 20 30 40 50 60 70 80 90 100 110



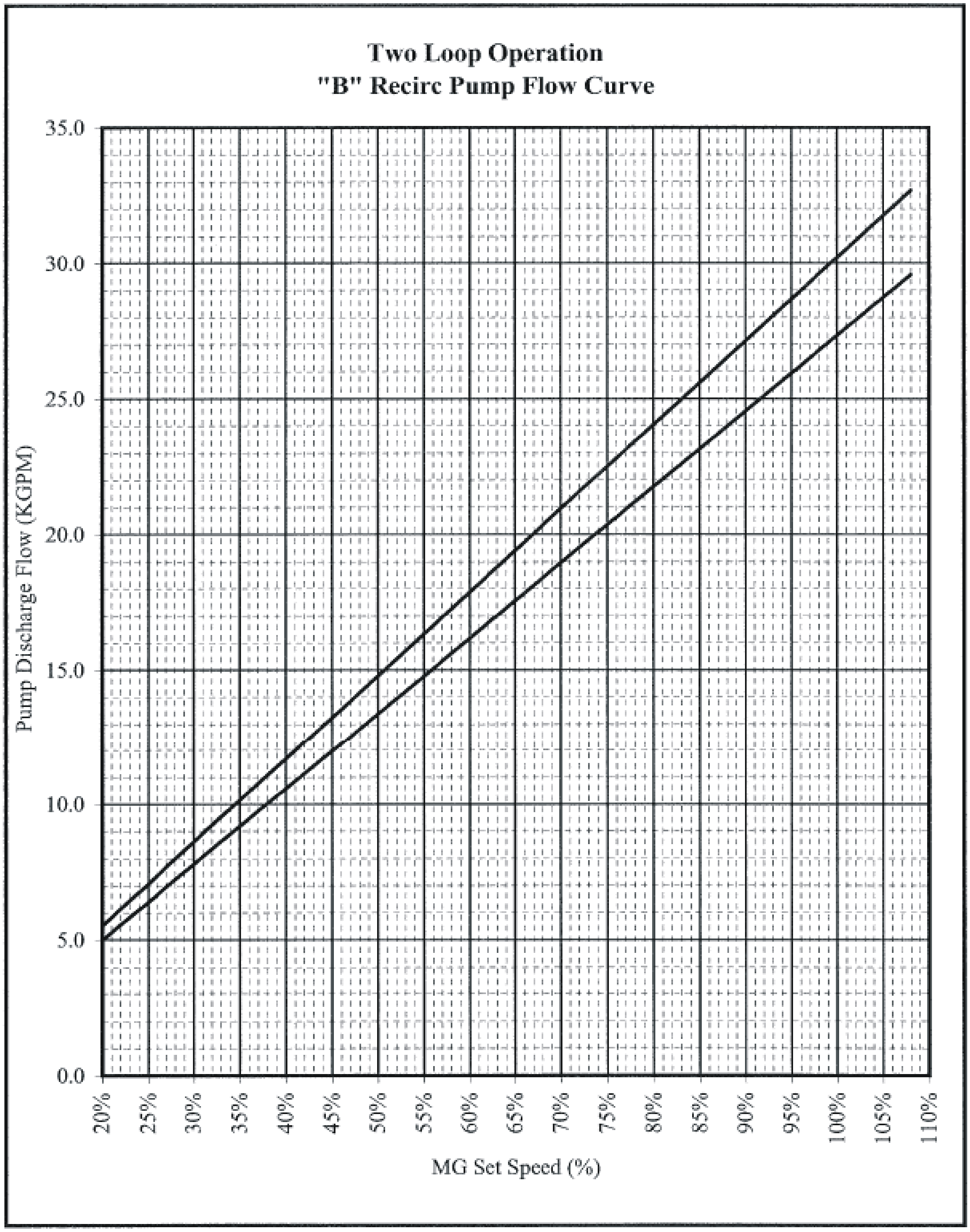
Last updated from data acquired on December 11, 2010.



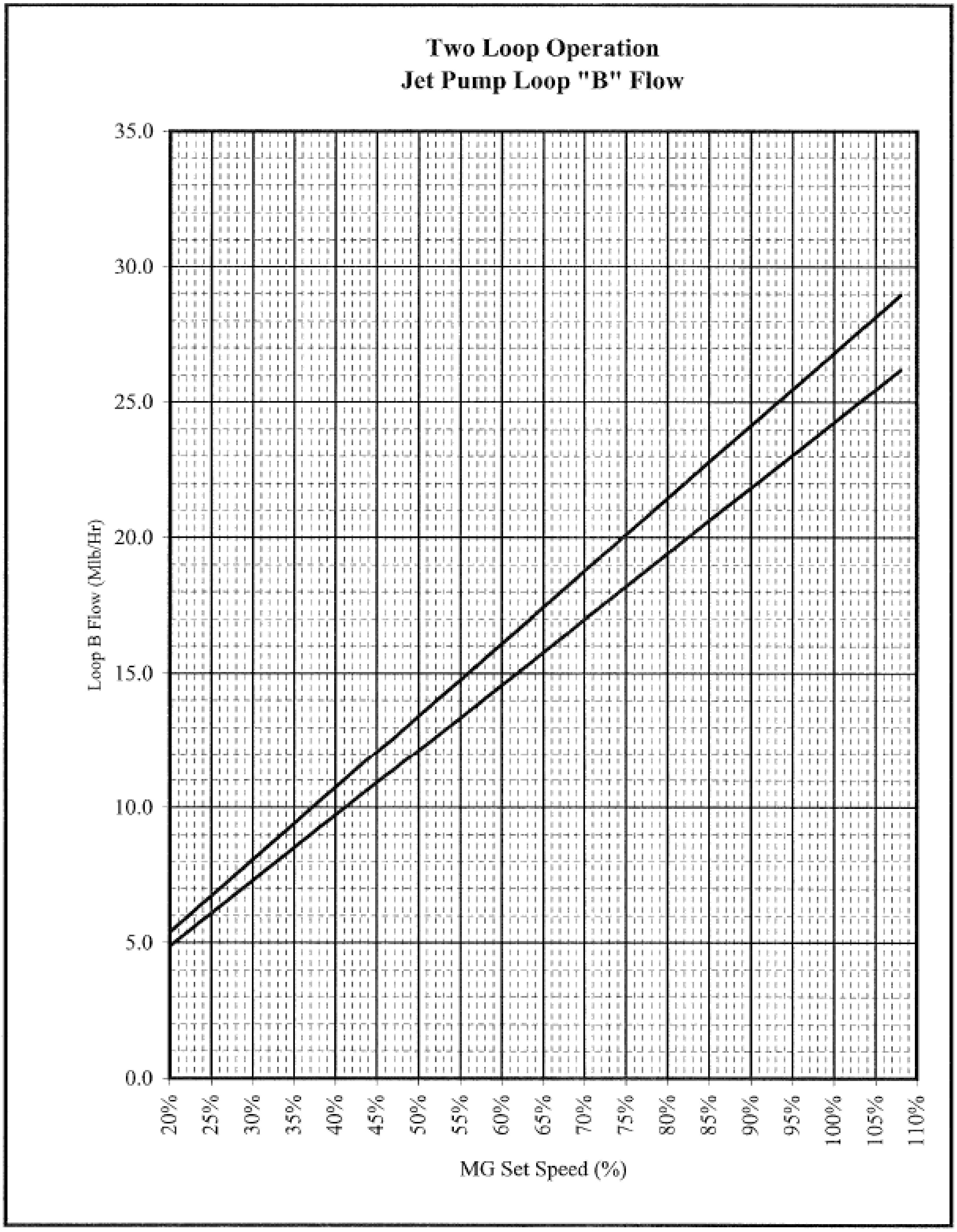
Last updated from data acquired on December 11, 2010.



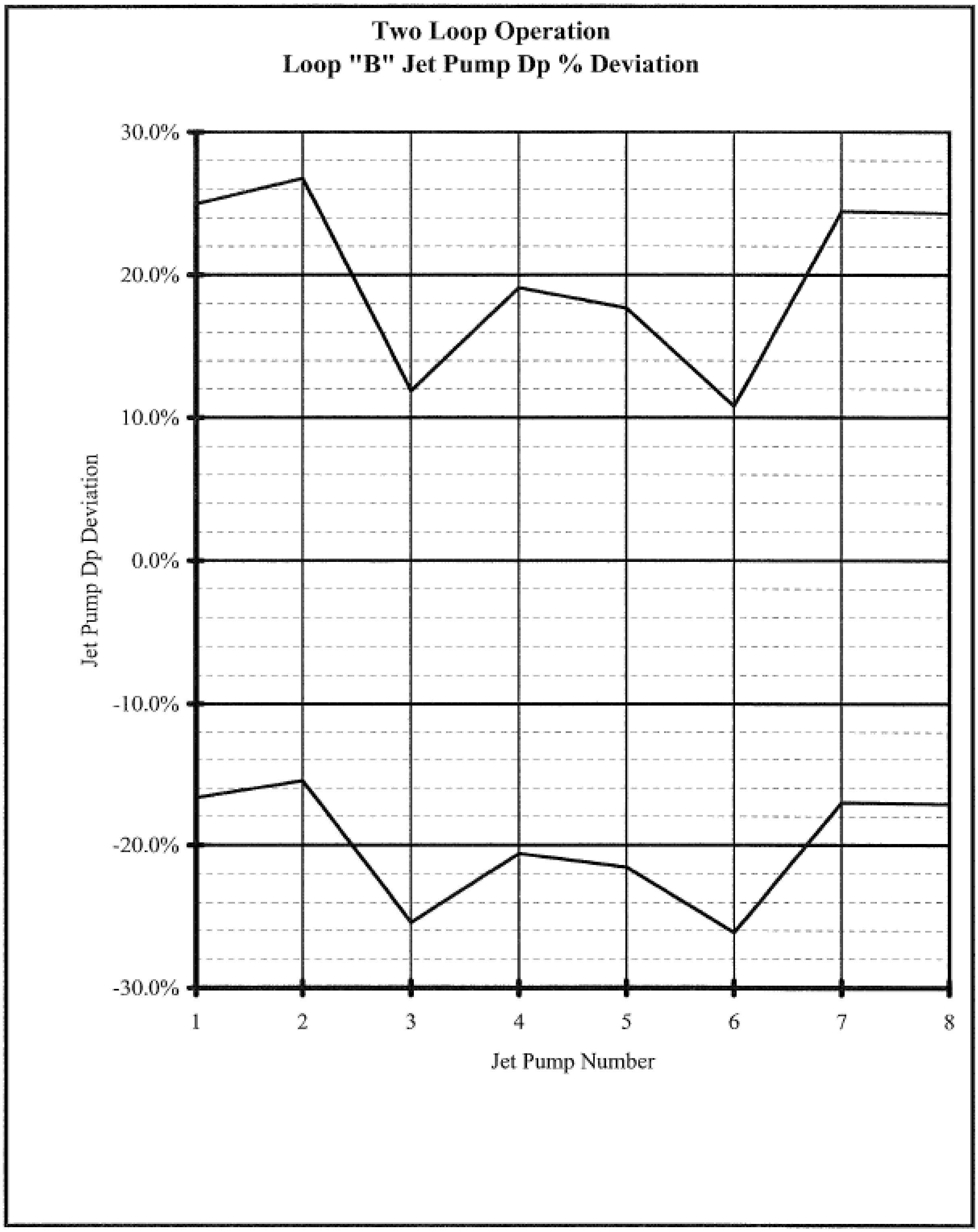
Last updated from data acquired on December 11, 2010.



Last updated from data acquired on December 11, 2010.



Last updated from data acquired on December 11, 2010.



Last updated from data acquired on December 11, 2010.

Usage Level
CONTINUOUS

Effective Date: ___________________

Approved for **'Point-of-Use'** printing **IF NO DCFs** are in effect for this procedure.
(on designated printers)

Record the following: Date / Time: ___________________ / _______________

Printer ID: **DA -** _____________________ Initials: _________

NOTE: *Per ACP 106.1, a DCF/REV check shall be performed and documented every 24 hours if active document use exceeds a 24 hour period as determined from the date and time recorded above.*

Document approval signatures on file

Prepared By: Michael Winchester / ______________________________ Date: ___________
Print / Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)

Reviewed By: ______________________ / ______________________________ Date: ___________
Print / Signature

Reviewed By: ______________________ / ______________________________ Date: ___________
Print / Signature

Reviewed By: ______________________ / ______________________________ Date: ___________
Print / Signature

PROCEDURE APPROVAL BY QUALIFIED REVIEWER

Approved By Dave Davidson / ______________________________ Date: ___________
Print / Signature

1.0 PURPOSE

1.1 The purpose of this STP is to record recirculation loop temperatures as well as dome and bottom head drain temperatures within 15 minutes prior to starting each of the Recirc Pumps.

1.2 When this procedure is performed in its entirety it FULLY SATISFIES the RCS Pressure and Temperature (P/T) Limits surveillance requirement to verify the difference between the bottom head coolant temperature and the Reactor Pressure Vessel coolant temperature is ≤ 145°F.

1.3 When this procedure is performed in its entirety it FULLY SATISFIES the RCS Pressure and Temperature (P/T) Limits surveillance requirement to verify the difference between the reactor coolant temperature in the recirculation loop to be started and the Reactor Pressure Vessel coolant temperature is ≤ 50°F.

2.0 BRIEFING INFORMATION

2.1 PERFORMANCE INFORMATION

2.1.1 Personnel recommended to perform this procedure:

1 Operations

2.1.2 When verifying **Loop ΔT ≤ 50°F:**
RPV Coolant temperature is the operating Recirc pump suction temperature, OR if hot, the saturation temperature corresponding to RPV steam dome pressure (see Appendix A), OR the temperature of the vessel wall adjacent to the flange (if cold).
Recirc Pump Suction temperatures are typically read from TR-4603. If TE-4603A, TE-4604A, or TR-4603 are inoperable or degraded, then computer points B034 or B035 from TE-4603* [or B038] and B036 or B037 from TE-4604* [or B039] may be used. A degraded instrument sticker should be placed on TR-4603.

2.1.3 When verifying **Vessel ΔT ≤ 145°F:**
If hot, RPV Coolant temperature is the saturation temperature corresponding to RPV steam dome pressure (see Appendix A), or the temperature of the vessel wall adjacent to the flange (if cold).
RPV Bottom Head Coolant (i.e., RPV bottom drain) temperature measurement requires RWCU to be in-service.

2.2 GENERAL CAUTIONS

2.2.1 None

2.3 SPECIAL PRECAUTIONS

2.3.1 None

3.0 REFERENCES

3.1 None

4.0 GENERAL INSTRUCTIONS

4.1 Steps marked with a "TS" immediately to the right of the step signoff line are required by Technical Specifications. If these steps do not meet their acceptance criteria or cannot be performed, a NRC reportable condition may exist and shall be reported to the Control Room Supervisor (CRS) immediately.

4.2 The CRS shall be notified immediately and the appropriate Limiting Condition for Operation section of Technical Specifications referred to whenever problems are encountered during the performance of this STP.

4.3 An Action Request (AR) should be completed for problems encountered with "TS" marked steps during the performance of this test.

5.0 APPENDICES

5.1 Appendix A (table) - Pressure (Psig) vs. Temp (°F) (T-SAT)

Pressure Psig	Temp °F	Pressure Psig	Temp °F	Pressure Psig	Temp °F	Pressure Psig	Temp °F
1100	558	560	481	160	370	42	289
1080	555	540	478	150	366	40	287
1060	553	520	474	140	361	38	284
1040	551	500	470	130	355	36	282
1020	548	480	466	120	350	34	279
1000	546	460	461	110	344	32	277
980	544	440	457	100	338	30	274
960	541	420	452	98	336	28	271
940	539	400	448	95	334	26	268
920	536	380	443	92	332	24	265
900	534	360	438	89	330	22	262
880	531	340	433	86	328	20	259
860	528	320	427	83	326	18	255
840	526	300	421	80	324	16	252
820	523	290	418	77	321	14	248
800	520	280	415	74	319	12	244
780	517	270	412	71	317	10	240
760	514	260	409	68	314	9	237
740	511	250	406	65	312	8	234
720	508	240	402	62	309	7	232
700	505	230	399	59	306	6	229
680	502	220	395	56	303	5	227
660	499	210	391	53	300	4	224
640	495	200	387	50	298	3	221
620	492	190	383	48	295	2	217
600	488	180	379	46	293	1	215
580	485	170	375	44	291	0	212

6.0 PREREQUISITES

6.1 None

7.0 PROCEDURE

7.1 Within 15 minutes prior to Recirc Pump start, record RPV Coolant and Recirc Pump Suction temperatures* for the Recirc Pump being started. ________

1P-201A START				
RPV Coolant Operating Recirc Loop TR-4603 Black Pen OR Saturation Temp OR TR-4569 Green Pen	°F	°F	°F	°F
Recirc Pump Suction Idle Recirc Loop TR-4603 Red Pen	°F	°F	°F	°F
Loop ΔT ≤ 50°F	ΔT	ΔT	ΔT	ΔT
Time and Initial				

1P-201B START				
RPV Coolant Operating Recirc Loop TR-4603 Red Pen OR Saturation Temp OR TR-4569 Green Pen	°F	°F	°F	°F
Recirc Pump Suction Idle Recirc Loop TR-4603 Black Pen	°F	°F	°F	°F
Loop ΔT ≤ 50°F	ΔT	ΔT	ΔT	ΔT
Time and Initial				

* Reference Performance Information paragraph 2.1.2

7.2 Within 15 minutes prior to Recirc Pump start, record RPV Coolant and RPV Bottom Head Coolant temperatures* for the Recirc Pump being started. ________

1P201A START				
RPV Coolant Saturation Temp OR TR-4569 Green Pen	°F	°F	°F	°F
RPV Bot Head Coolant Bottom Head Drain TI-2713 Pt.5	°F	°F	°F	°F
Vessel ΔT ≤145°F	ΔT	ΔT	ΔT	ΔT
Time and Initial				

1P201B START				
RPV Coolant Saturation Temp OR TR-4569 Green Pen	°F	°F	°F	°F
RPV Bot Head Coolant Bottom Head Drain TI-2713 Pt.5	°F	°F	°F	°F
Vessel ΔT ≤145°F	ΔT	ΔT	ΔT	ΔT
Time and Initial				

** Reference Performance Information paragraph 2.1.3

7.3 Perform the following:

7.3.1 Confirm Loop ΔT is less than or equal to (≤) 50°F within 15 minutes of Recirc Pump startup. ________ TS

7.3.2 Confirm Vessel ΔT is less than or equal to (≤) 145°F within 15 minutes of Recirc Pump startup. ________ TS

7.3.3 Record applicable Recirc Pump start time below: ________

1P-201A Time: __________

1P-201B Time: __________

7.3.4 If in Mode 1 or Mode 2, log in and start STP 3.4.2-01 upon completion of Recirc Pump start. If not in Mode 1 or Mode 2, mark this step N/A. ________

______________________________	_________	________	________
______________________________	_________	________	________
______________________________	_________	________	________
Performed by:	Date:	Time:	

8.0 ACCEPTANCE CRITERIA

8.1 If this STP is performed for any reason other than for satisfying the PURPOSE as stated in Section 1.0, indicate below (otherwise mark this step "N/A"):

____

____

____

8.2 If a DCF, Procedure Work Request (PWR), or Action Request (AR) was written due to problems encountered with the performance of this procedure, list the applicable number(s) below. ("N/A" blocks as appropriate.)

DCF No. ________ PWR No. _________ AR No. _________

DCF No. ________ PWR No. _________ AR No. _________

8.3 All Technical-Specification-required items, as indicated by "TS", have been performed satisfactorily: ________

( ) YES ( ) NO ⇒ CRS notified

8.4 All other items checked in this test have been performed satisfactorily: ________

( ) YES ( ) NO ⇒ CRS notified

8.5 Indicate any relevant test comments below, otherwise mark this step "N/A":

____

____

____

____

____

________________________________ ______________

Operations Date

________________________________ ______________

Surveillance Coordinator Date

9.0 ATTACHMENTS

9.1 None

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC JPM S-2

TITLE: <u>**LPCI Initiation while in Shutdown Cooling.**</u>

JPM TITLE: LPCI Initiation while in Shutdown Cooling

JPM NUMBER: NRC S-2 **REV.** 1

TASK NUMBER(S) / TASK TITLE(S): 2.17 / Perform LPCI initiation while in SDC

K/A NUMBERS: SYSTEM: 203000 RHR/LPCI: Injection Mode
A4.02, Ability to manually operate and/or monitor in the control room: System Valves. IMPORTANCE: 4.1 /4.1

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:

In-Plant:	[ ]	Control Room:	[ ]
Simulator:	[X]	Other:	[ ]
Lab:	[ ]		

Time for Completion: 15 Minutes Time Critical: ☐ Yes ☒ No

Alternate Path [NRC]: ☐ Yes ☒ No
Alternate Path [INPO]: ☐ Yes ☒ No

Developed by:	**Mark Santiago**	**11/28/12**
	WTS Exam Developer	Date
Validated by:		
	Validation Instructor	Date
Reviewed by:		
	Plant Reviewer	Date
Approved by:		
	Training Supervisor	Date

Commitments: {C001} ACE 001729, Review recommendation 4 of OE 001501.
{C002} CA046394, Improvements needed for Operations Simulator JPMs.

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS		YES	NO	N/A
1.	Are all items on the signature page filled in correctly?	☐	☐	☐
2.	Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3.	Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4.	Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5.	Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6.	Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7.	If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8.	Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9.	Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10.	Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11.	Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12.	Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13.	Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14.	Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15.	Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. {C001}	☐	☐	☐
16.	If the JPM is to be administered to an ILT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. {C001}	☐	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

RE-VALIDATION SIGNATURE

JPMs must be re-validated prior to use. Verify the above Review Statements are "YES" or "N/A". When it is determined that the JPM is still valid and can be performed as written, sign and date the form below.

Re-Validation Personnel Date   Re-Validation Personnel Date

Re-Validation Personnel Date   Re-Validation Personnel Date

SIMULATOR SET UP:

1. Reset to the saved IC (IC 115) for this JPM _______
2. If the saved IC is not available, then reset to IC 16 and set up as follows:
   a. Insert malfunctions per the table below _______
   b. Place the simulator in **RUN** _______
   c. Clear recorders using the pushbutton behind 1C05 or the schedule file. _______
   d. Activate **Event Trigger 1** _______
   e. Allow level to lower just below the LO-LO-LO (64") actuations _______
   f. Place the simulator in **FREEZE** _______
   g. If re-using this JPM, save setup to an available IC or snapshot _______
3. Hang "B" loop SDC Tags IAW OI 149A1 (Attachment 7), RHR SYSTEM SHUTDOWN COOLING TAG CHECKLIST _______
4. Place the simulator in **RUN** when the candidate begins the JPM _______

EVENT TRIGGERS: None

SIMULATOR MALFUNCTIONS:

TIME	MAL. #	MALFUNCTION TITLE	ET	DELAY	F. SEV.	RAMP	I. SEV.
Setup	rr15a	Recirc Loop A Rupture	1	00:00:00	97%	00:00:00	97%
Setup	cs01a	Core Spray Pump "A" trip	1	00:00:00	NA	NA	Active
Setup	cs01b	Core Spray Pump "B" trip	1	00:00:00	NA	NA	Active

SIMULATOR OVERRIDES: None

SIMULATOR REMOTE FUNCTIONS: None

Required Materials:

1. Keys for keylocked switches
2. OI 149, RHR System

General References:

1. OI 149 Section 5.2, Rev. 137

Task Standards:

1. Reset the Group 4 isolation signal.
2. Close “B” and “D” RHR pumps’ SDC suction valves, MO-1912 and MO-1920.
3. Open “B” and “D” RHR pumps’ Torus suction valves, MO-1913 and MO-1921.
4. Open cross tie valve MO-2010.
5. Start “B” and “D” RHR pumps.

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- Shutdown cooling (SDC) was in operation using “B” RHR loop.
- A loss of coolant accident has occurred.
- Both Core Spray pumps and the Condensate system are NOT available.

INITIATING CUES (IF APPLICABLE):

- IAW OI 149, Section 5.2, LPCI Initiation while in Shutdown Cooling, inject into the RPV using all four RHR pumps. Inject into the selected loop.
- Inform the CRS when all four pumps are injecting.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Evaluator Note: All controls and indications are located on panel 1C03 unless otherwise noted.

Evaluator Note: If the candidate questions the CRS as to whether he or she can lift the SDC Tags, Cue the candidate that they have permission to lift the tags as required and that another operator will track their removal.

Performance Step: 1 **Critical N**	Verify MO-1908 and 1909, inboard and outboard shutdown cooling valves on 1CO3 are closed.
Standard:	Candidate verifies MO-1908 and 1909 are closed by observing open and closed indicating lights.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 2 **Critical Y**	When MO-1908 and MO-1909 are fully closed, reset MO-1905 and 2003 isolation signal by depressing MO-1905 and 2003 GROUP 4 ISOL SEALED-IN reset pushbuttons HS-1905B and HS-2003B on 1C03.
Standard:	Candidate depresses HS-1905B and HS-2003B GROUP 4 ISOL SEALED-IN reset pushbuttons. Amber light associated with each pushbutton extinguishes.
Evaluator Note:	**Depressing HS-2003 is not a critical element of this step because LPCI has selected the "B" Loop for injection.** **MO-1905 will auto open as soon as the "B" loop pushbutton is depressed via LPCI Loop selection logic.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 3 **Critical _Y_**	Close RHR Pump Shutdown Cooling Suction Valves on 1C03: <u>Valve</u> <u>Description</u> <u>Position</u> **Loop A:** MO 2011 A PUMP SHUTDOWN CLG SUCTION CLOSE MO 2016 C PUMP SHUTDOWN CLG SUCTION CLOSE **Loop B:** MO 1912 B PUMP SHUTDOWN CLG SUCTION CLOSE MO 1920 D PUMP SHUTDOWN CLG SUCTION CLOSE
Standard:	• Candidate closes MO 1912, B PUMP SHUTDOWN CLG SUCTION valve, by placing the control switch to close. • Candidate closes MO 1920, D PUMP SHUTDOWN CLG SUCTION valve, by placing the control switch to close.
Evaluator Note:	**Candidates may close these valves one at a time or concurrently.** **Verifying MO 2011 and MO 2016 closed are not critical elements of this critical step in that they were already closed.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 4 **Critical _Y_**	Open the RHR Pump Torus suction valves on 1C03 for the loop that was in Shutdown Cooling: Valve Description Position **Loop A:** MO 2012 A PUMP TORUS SUCTION OPEN MO 2015 C PUMP TORUS SUCTION OPEN **Loop B:** MO 1913 B PUMP TORUS SUCTION OPEN MO 1921 D PUMP TORUS SUCTION OPEN
Standard:	• Candidate verifies that MO 2012, A PUMP TORUS SUCTION, is already open by observing valve indicating lights. • Candidate verifies that MO 2015, C PUMP TORUS SUCTION, is already open by observing valve indicating lights. • Candidate opens MO 1913, B PUMP TORUS SUCTION, by placing the keylock control switch to open. • Candidate opens MO 1921, D PUMP TORUS SUCTION, by placing the keylock control switch to open.
Evaluator Note:	**Candidates may open these valves one at a time or concurrently.** **Verifying valves MO 2012 and MO 2015 are open are not critical elements of this critical step in that they were already opened.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Evaluator Note: The following procedure Caution is prior to the next step

CAUTION
V-19-48 RHR LOOP CROSSTIE may be difficult to open during LOCA conditions due to environmental and radiological hazards. It should only be opened to ensure adequate core cooling.

Performance Step: 5 **Critical Y**	If necessary to align available RHR pumps with an available injection path, then open the applicable RHR Cross-Tie valve: Valve / Description / Position V-19-48 / RHR LOOP CROSSTIE / OPEN MO-2010 / RHR CROSSTIE / OPEN
Standard:	• Candidate verifies V-19-48, RHR LOOP CROSSTIE valve, is open by observing valve indicating lights. • Candidate opens MO-2010, RHR CROSSTIE valve, by placing the keylock control switch to open.
Evaluator Note:	**LPCI injection will commence as soon as MO-2010 begins to open due to the already running "A" and "C" RHR pumps and the "B" loop injection valves being open.** **Verifying that manual valve V-19-48 is open is not a critical element of this critical step in that the valve is already open.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 6 **Critical N**	Align an injection path to the RPV as follows: (a) If LPCI Loop Select has selected a loop, confirm injection valves have automatically opened.
Standard:	• Candidate determines that the "B" loop has been selected. • Candidate verifies that MO-1904, INBD INJECT ISOL valve, is open by observing valve indicating lights. • Candidate verifies that MO-1905, OUTBD INJECT valve, is open by observing valve indicating lights.
Evaluator Note:	**Candidate can determine that a loop has been selected by observing the amber loop selected lights or by examining the position of the loop injection valves.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 7 **Critical N**	(b) If LPCI Loop Select has NOT selected a loop, manually aligns the LPCI inject path by opening MO-2003[1905].
Standard:	Candidate determines LPCI has selected the "B" loop and that this step is not applicable.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 8 **Critical Y**	Start A and C [B and D] RHR PUMP 1P-229A and C [B and D] by placing the associated handswitch on 1C03 in STOP and then to the START position: Handswitch — Description HS-2014 [1915] — A[B] RHR PUMP 1P-229A[B] HS-2018 [1923] — C[D] RHR PUMP 1P-229C[D]

Standard:	• Candidate verifies that A RHR PUMP 1P-229A is already running.
	• Candidate verifies that C RHR PUMP 1P-229C is already running.
	• Candidate starts B RHR PUMP 1P-229B by:
	  o First placing the pump control switch to STOP
	  o Then by placing the pump control switch to START
	• Candidate starts D RHR PUMP 1P-229D by:
	  o First placing the pump control switch to STOP
	  o Then by placing the pump control switch to START

Evaluator Note:	**"A" and "C" pumps are already running due to the LPCI initiation logic.** **Although the "B" loop pumps also received an initiation signal, they tripped when the SDC suction isolation valves closed. In order to reset the pump breaker "anti-pumping" feature, the control switch must first be taken to the stop position.** **Verifying that the "A" and "C" RHR pumps are already running are not critical elements of this critical step.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 9 **Critical <u>N</u>**	Throttle MO-2004[1904] as needed to control RPV level. Place HS-2004C[1904C] LPCI Open Interlock Override to OVERRIDE as needed.
Standard:	Candidate observes level response and determines that RPV level is slowly rising. Candidate informs the CRS that all four pumps are injecting.
Evaluator Cue:	**When the candidate has informed the CRS that all four pumps are injecting, Cue that the JPM is complete.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	____

Terminating Cues: **All four RHR pumps are injecting.**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: __________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ____________________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Shutdown cooling (SDC) was in operation using “B” RHR loop.
- A loss of coolant accident has occurred.
- Both Core Spray pumps and the Condensate system are NOT available.

INITIATING CUES (IF APPLICABLE):

- IAW OI 149, Section 5.2, LPCI Initiation while in Shutdown Cooling, inject into the RPV using all four RHR pumps. Inject into the selected loop.
- Inform the CRS when all four pumps are injecting.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC SIM JPM S-3

TITLE: Manual Arming of LLS

SITE:	DAEC		
JPM TITLE:	Manual Arming of LLS		
JPM NUMBER:	NRC S-3	**REV.**	2
RELATED PRA INFO:	None		
TASK NUMBER(S) / TASK TITLE(S):	8.05/ Perform Manual Operation of LLS		
K/A NUMBERS AND VALUES:	SYSTEM: 239002 Relief/Safety Valves A1.04, Ability to predict and/or monitor changes in parameters associated with operating the RELIEF/SAFETY VALVES controls including: Reactor Pressure. IMPORTANCE: 3.8 / 3.8		
Justification (FOR K/A VALUES <3.0):	N/A		

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:

In-Plant:	[ ]	Control Room:	[ ]
Simulator:	[X]	Other:	[ ]
Lab:	[ ]		

Time for Completion: 8 Minutes Time Critical: NO

Alternate Path / Faulted: YES

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago	01/25/13
	WTS JPM Developer	Date
Validated by:		
	Validation Instructor	Date
Reviewed by:		
	Plant Reviewer	Date
Approved by:		
	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

_____________________________ _____________________________

Validation Personnel /Date   Validation Personnel/Date

_____________________________ _____________________________

Validation Personnel /Date   Validation Personnel/Date

SIMULATOR SET UP:

1. Reset to the saved IC (IC 111) for this JPM _______
2. If the saved IC is not available, then reset to IC 31 and set up as follows:
    a. Insert malfunctions per the table below _______
    b. Place the simulator in **RUN** _______
    c. Clear recorders using the pushbutton behind 1C05 or the schedule file. _______
    d. Scram the reactor _______
    e. Close the MSIVs _______
    f. Maintain RPV Level in the Green band _______
    g. Allow LLS to cycle twice _______
    h. Disarm LLS _______
    i. Allow the RPV to re-pressurize until alarm REACTOR VESSEL HIGH PRESSURE TRIP (1C05B, C-4) activates _______
    j. Activate **Event Trigger 1** _______
    k. Acknowledge and reset all alarms _______
    l. Place the simulator in **FREEZE** _______
    m. If re-using this JPM, save setup to an available IC or snapshot _______
3. Place the simulator in **RUN** when the candidate begins the JPM _______

TRIGGERS: None

SIMULATOR MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	ET	Delay	F. Sev.	Ramp	I. Sev.
Setup	ad10A	Low Low Pressure Switch Fails low –logic A	1	00:00:00	NA	NA	Active
Setup	ad10B	Low Low Pressure Switch Fails low –logic B	1	00:00:00	NA	NA	Active

SIMULATOR OVERRIDES: None

SIMULATOR REMOTE FUNCTIONS: None

Required Materials: 1. OI 183.1 QRC1, Manual Arming of LLS.

General References: 1. OI 183.1 QRC1, Manual Arming of LLS, Rev. 0

Task Standards:
1. Cycles an LLS valve to arm LLS.
2. Determines that the LLS valves have failed to reclose as RPV Pressure lowers.
3. Disarms the “A” LLS logic.
4. Disarms the “B” LLS logic.

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- The plant was at rated conditions when a plant scram occurred.
- The MSIVs were manually closed when a main turbine bypass valve failed open.
- HPCI and RCIC are not available for pressure control.
- EOP 1, RPV Control, execution is in progress.

INITIATING CUES:

- Manually arm the Low-Low Set Logic IAW OI 183.1 QRC 1, Manual Arming of LLS.
- This task is not time critical
- Inform the evaluator when you have completed the task

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: 1 **Critical: N**	At 1C05, confirm annunciator REACTOR VESSEL HIGH PRESSURE TRIP (1C05B, C-4) activated.
Standard:	Operator verifies that annunciator 1CO5B, C-4 has activated.
Evaluator Note:	**The LLS logic will not arm until the High RPV Pressure Trip (1055 psig) has been exceeded.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Evaluator Note: The following Continuous Recheck Statement is prior to the next step

♻ CONTINUOUS RECHECK STATEMENT ♻

IF containment pressure response is abnormal or LLS does not function properly,	**THEN** disarm LLS logic by depressing pushbuttons PB-4401 and PB-4407 (at 1C03) and use manual operation of ADS valves.

Performance Step: 2 **Critical: <u>Y</u>**	At 1C03, cycle PSV-4401 [**OR** PSV-4407] by taking handswitch HS-4401 [**OR** HS-4407] to OPEN, then return to AUTO.
Standard:	• Candidate opens either PSV-4401 **OR** PSV-4407 by taking the associated handswitch to OPEN. • Candidate closes the relief valve just opened by taking the associated handswitch to AUTO. • Annunciator LLS ”A” or ”B” ARMED (1C03A, D-5) alarms. • The PSV manually opened via this step remains open. • The PSV Valve not manually opened via this step opens.
Evaluator Note:	**The high SRV tailpipe pressure switches picked up when the PSV was manually opened. The pressure switches in conjunction with the high RPV pressure scram trip signal (previous step) causes LLS to initiate.** **Since RPV pressure is currently above the opening pressures for LLS, both valves will open.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 3 **Critical: <u>N</u>**	At 1C03, confirm the following: (a) Annunciator LLS A or B ARMED (1C03A, D-5) activated. (b) LLS valves PSV-4401 AND PSV-4407 open.
Standard:	Candidate verifies that: • Annunciator LLS ”A” or ”B” ARMED (1C03A, D-5) alarms. • LLS valves PSV-4401 AND PSV-4407 open.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Evaluator Note: Once armed, the LLS set logic will fail to reclose the LLS valves as pressure lowers due to a failure within the logic. The candidate is expected to respond IAW the Continuous Recheck Statement.

Performance Step: 4 **Critical: N**	Confirm LLS Valves cycle automatically to maintain RPV pressure within the following respective operating bands: **Valve** / **Opens** / **Closes** PSV-4401 / 1030 psig / 910 psig PSV-4407 / 1035 psig / 915 psig
Standard:	Candidate determines that the both LLS valves fail to close as pressure lowers below the closure setpoint. Candidate refers to the Continuous Recheck Statement.
Evaluator Cue:	**Candidate may report the failure to the CRS. If so, Role Play as CRS and direct the candidate to take all appropriate actions.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 5 **Critical: Y**	Disarm "A" Logic Lo-Lo Set
Standard:	Depresses A LOGIC LO-LO SET ARMING RESET pushbutton PB-4401 at panel 1C03.
Evaluator Note:	**Both Channels of LO-LO set logic must be reset prior to the Tech Spec Cooldown Rate being exceeded in order for this step to be marked Satisfactory. The cooldown rate will be exceeded when RPV pressure lowers to ~ 450 psig.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 6 **Critical: Y**	Disarm “B” Logic Lo-Lo Set
Standard:	Depresses B LOGIC LO-LO SET ARMING RESET pushbutton PB-4407 at panel 1C03.
Evaluator Note:	**Both Channels of LO-LO set logic must be reset prior to the Tech Spec Cooldown Rate being exceeded in order for this step to be marked Satisfactory. The cooldown rate will be exceeded when RPV pressure lowers to ~ 450 psig.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 7 **Critical: N**	Determines that LLS valves have closed.
Standard:	Candidate verifies that the LLS valves have closed by observing close indicating lights for PSV-4401 and PSV-4407 and/or by verifying that RPV pressure has stopped lowering. Informs CRS that LLS has been disarmed.
Evaluator Cue:	**Role Play as CRS as required and acknowledge report.** **After LLS has been disarmed and the candidate has verified that the LLS valves are closed, Cue the candidate that the JPM is complete.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Terminating Cues: **LLS disarmed.**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: ___________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ____________________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- The plant was at rated conditions when a plant scram occurred.
- The MSIVs were manually closed when a main turbine bypass valve failed open.
- HPCI and RCIC are not available for pressure control.
- EOP 1, RPV Control, execution is in progress.

INITIATING CUES:

- Manually arm the Low-Low Set Logic IAW OI 183.1 QRC 1, Manual Arming of LLS.
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC SIM JPM S-4

TITLE: HPCI PUMP DISCHARGE TRANSFER FROM THE CST TO THE REACTOR VESSEL

	JOB PERFORMANCE MEASURE (JPM)

SITE: DAEC

JPM TITLE: HPCI PUMP DISCHARGE TRANSFER FROM THE CST TO THE REACTOR VESSEL

JPM NUMBER: NRC S-4 **REV.** 1

RELATED PRA INFORMATION: None

TASK NUMBER(S) / TASK TITLE(S): 5.12/ Transfer Discharge from CST to Vessel

K/A NUMBERS AND VALUES: SYSTEM: 206000 High Pressure Coolant Injection System. A4.04, Ability to manually operate and/or monitor in the control room: Major system valves. IMPORTANCE: 3.7/3.7

Justification (FOR K/A VALUES <3.0): N/A

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:

In-Plant:		Control Room:	
Simulator:	X	Other:	
Lab:			

Time for Completion: 8 Minutes Time Critical: NO

Alternate Path / Faulted: NO

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago	10/31/12
	WTS JPM Developer	Date
Validated by:		
	Validation Instructor	Date
Reviewed by:		
	Plant Reviewer	Date
Approved by:		
	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered “YES” or the JPM is not valid for use. If all questions/statements are answered “YES” then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

Validation Personnel /Date   Validation Personnel/Date

Validation Personnel /Date   Validation Personnel/Date

SIMULATOR SET UP:

1. Reset to the saved IC (IC 112) for this JPM ______
2. If the saved IC is not available, then reset to IC 20 and set up as follows:
   a. Place the simulator in **RUN** ______
   b. Clear recorders using the pushbutton behind 1C05 or the schedule file. ______
   c. Scram the reactor ______
   d. Close the MSIVs ______
   e. Place HPCI in pressure control (CST to CST) ______
   f. Lower RPV level to between 170 and 120 inches ______
   g. Secure RPV injection as required to stabilize level or be slowly lowering. *Level must not be lowering so fast as to result in an HPCI auto initiation signal within the next 10 minutes*. ______
   h. Verify that HPCI Pump Discharge pressure is **LESS THAN REACTOR PRESSURE** ______
   i. Acknowledge and reset all alarms ______
   j. Place the simulator in **FREEZE** ______
   k. If re-using this JPM, save setup to an available IC or snapshot ______
3. Place the simulator in **RUN** when the candidate begins the JPM ______

TRIGGERS: None

SIMULATOR MALFUNCTIONS: None

SIMULATOR OVERRIDES: None

SIMULATOR REMOTE FUNCTIONS: None

Required Materials: 1. OI 152, High Pressure Coolant Injection System

General References: 1. OI 152, High Pressure Coolant Injection System, Rev.103

Task Standards:
1. Throttle closed CV-2315 TEST BYPASS valve and raise pump discharge pressure to > 100 psig above RPV pressure.
2. Open MO-2312 HPCI INJECT valve.
3. Close CV-2315 TEST BYPASS valve.

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- The reactor has scrammed.
- The MSIVs are closed and HPCI was placed in CST to CST mode to control RPV pressure.
- RPV level is lowering slowly due to HPCI operation.
- No other sources of high pressure injection are available.

INITIATING CUES:

- Transfer HPCI pump discharge from the CST to the Reactor Vessel and inject into the vessel IAW OI 152, section 9.2, HPCI Pump Discharge Transfer from the CST to the Reactor Vessel.
- Restore RPV level to between 170 and 211 inches.
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Evaluator Note: All controls and indications are located on panel 1C03 unless otherwise noted.

Performance Step: 1 **Critical: Y**	Throttle closed CV-2315 TEST BYPASS valve, allowing FIC-2309 HPCI FLOW CONTROL time to respond to flow/pressure changes until HPCI discharge pressure as indicated on PI-2306 (HPCI) PUMP DISCHARGE PRESSURE on 1C03 is approximately 100 psig above reactor pressure.
Standard:	• Operator determines that HPCI pump discharge pressure is below RPV pressure. • Throttles CV-2315 TEST BYPASS valve in the closed direction as required and allows pump discharge pressure to stabilize at a value ~ 100 psig above reactor pressure.
Evaluator Note:	**RPV pressure indication can be determined from multiple sources. The most likely sources are 1C05 panel pressure indications or HPCI Steam Line pressure indication on 1C03.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 2 **Critical: Y**	Open MO-2312 HPCI INJECT valve by placing handswitch HS-2312 on 1C03 in the OPEN position and allowing it to spring return to the AUTO position.
Standard:	Operator opens MO-2312 HPCI INJECT valve by momentarily placing handswitch HS-2312 in the OPEN position.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 3 **Critical: <u>Y</u>**	Close CV-2315 TEST BYPASS valve by placing handswitch HS-2315 on 1C03 in the CLOSE position and allowing it to spring return to the AUTO position and observing proper valve position indication.
Standard:	Operator closes CV-2315 TEST BYPASS valve by holding handswitch HS-2315 in the CLOSE position until the valve indicates full closed and then allows the switch to spring return to the auto position.
Evaluator Note:	**As CV-2315 TEST BYPASS valve is closed in this step, HPCI pump discharge pressure will rise and injection will commence when discharge pressure is greater than RPV pressure.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 4 **Critical: <u>N</u>**	Verify on 1C03 that MO-2318 MIN FLOW BYPASS valve is closed with HPCI flow above 600 gpm.
Standard:	• Operator observes flow indication FIC-2309 HPCI FLOW CONTROL and determines that HPCI flow is currently > 600 gpm. • Operator verifies that MO-2318 MIN FLOW BYPASS valve is closed by observing valve indicating lights.
Evaluator Cue:	
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 5 **Critical: <u>N</u>**	Close MO-2316 REDUNDANT SHUTOFF by placing handswitch HS-2316 on 1C03 in the CLOSE position and observing proper valve position indication.
Standard:	Operator closes MO-2316 REDUNDANT SHUTOFF by momentarily placing handswitch HS-2316 in the CLOSE position.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 6 **Critical: <u>N</u>**	Restore RPV level.
Standard:	Operator monitors RPV level response and determines that RPV level is rising.
Evaluator Note:	**RPV level indication can be determined from multiple sources. The most likely source is via 1C05 panel level indications. Operator may allow HPCI to trip on high RPV level.**
Evaluator CUE:	**When the operator determines that RPV level is rising, CUE the operator that the JPM is complete.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Terminating Cues: **HPCI is aligned for injection and applicant is controlling RPV level or HPCI has tripped on high reactor water level.**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: ___________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ______________________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- The reactor has scrammed.
- The MSIVs are closed and HPCI was placed in CST to CST mode to control RPV pressure.
- RPV level is lowering slowly due to HPCI operation.
- No other sources of high pressure injection are available.

INITIATING CUES:

- Transfer HPCI pump discharge from the CST to the Reactor Vessel and inject into the vessel IAW OI 152, section 9.2, HPCI Pump Discharge Transfer from the CST to the Reactor Vessel.
- Restore RPV level to between 170 and 211 inches.
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC SIM JPM S-5

TITLE: AIR PURGE COOLING OF THE DRYWELL

SITE:	DAEC
JPM TITLE:	AIR PURGE COOLING OF THE DRYWELL
JPM NUMBER:	NRC S-5 **REV.** 1
RELATED PRA INFO:	None
TASK NUMBER(S) / TASK TITLE(S):	94.14 / Respond to Well Water System Abnormal Operation Condition
K/A NUMBERS AND VALUES:	SYSTEM: 223001 Primary Containment System and Auxiliaries A2.10, Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High Drywell temperature IMPORTANCE: 3.6 / 3.8
Justification (FOR K/A VALUES <3.0):	N/A

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:

In-Plant:		Control Room:	
Simulator:	X	Other:	
Lab:			

Time for Completion: 15 Minutes Time Critical: NO

Alternate Path / Faulted: NO

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago WTS JPM Developer	12/31/12 Date
Validated by:	Validation Instructor	Date
Reviewed by:	Plant Reviewer	Date
Approved by:	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

____________________________ ____________________________

Validation Personnel /Date Validation Personnel/Date

____________________________ ____________________________

Validation Personnel /Date Validation Personnel/Date

SIMULATOR SET UP:

1. Reset to the saved IC (IC 114) for this JPM ______
2. If the saved IC is not available, then reset to IC 20 and set up as follows:
   a. Place the simulator in **RUN** ______
   b. Clear recorders using the pushbutton behind 1C05 or the schedule file. ______
   c. Scram the reactor ______
   d. Verify that a Group 3 isolation and SBGT start has occurred ______
   e. Restore RPV level to > 170 inches and stabilize (to allow resetting the Group 3 isolation signal) ______
   f. Be prepared to maintain RPV level >170 inches throughout the duration of the JPM ______
   g. Do not actually secure well water as part of the setup. ______
   h. Acknowledge and reset all alarms ______
   i. Place the simulator in **FREEZE** ______
   j. If re-using this JPM, save setup to an available IC or snapshot ______
3. Place the simulator in **RUN** when the candidate begins the JPM ______

TRIGGERS: None

SIMULATOR MALFUNCTIONS: None

SIMULATOR OVERRIDES: None

SIMULATOR REMOTE FUNCTIONS: None

Required Materials:
1. AOP 408, Well Water System Abnormal Operation
2. Keys for various keylocked containment atmospheric control valves

General References:
1. AOP 408, Well Water System Abnormal Operation, Rev. 29

Task Standards:
1. Reset the Group 3 Isolation signals
2. Open Inbd Drywell Vent Isol CV-4302
3. Open Outbd Drywell Vent Isol CV-4303
4. Open Inbd DW Vent Bypass Isol CV-4310
5. Direct that Open Air Purge Isolation CV-4317 be opened locally
6. Open Outbd Cont Purge Supply Isol CV-4306
7. Open Inbd DW Purge Inlet Isol CV-4307
8. Open Inbd Torus Purge Inlet Isol CV-4308
9. Start DW/Torus Purge Fan 1V-EF-17

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- The plant was at full power when a loss of Well Water Supply to the Drywell occurred.
- AOP 408, Well Water System Abnormal Operation, has been entered.
- The plant was scrammed when Drywell temperature could not be maintained.
- RPV level lowered to ~ 155 inches but has now recovered to the normal range.
- Drywell pressure is 1.3 psig and rising slowly.

INITIATING CUES:

- Initiate Air Purge Cooling of the Drywell IAW with AOP 408, Attachment 1.
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

EVALUATOR NOTE: The following procedure Note is prior to the next step

NOTE
A Group 3 Isolation will preclude an Air Purge of the Drywell.

Performance Step: 1 **Critical _N_**	Verify at least one train of Standby Gas Treatment is in operation.
Standard:	Determines that both SBGT trains are in service by observing indications on panel 1C24 (such as the Red fan running indications, annunciators, system flow, etc).
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 2 **Critical Y**	If all Group 3 signals are clear, at 1C05 depress DIV 1 and DIV 2 PCIS Reset pushbuttons to clear the isolation signals.
Standard:	• Determines that Group 3 isolation signals are all clear • Depresses PCIS Group 1-5 Reset pushbutton for Div 2 AND • Depresses PCIS Group 1-5 Reset pushbutton for Div 1
Evaluator Note:	**Group 3 isolation signals are:** • **RPV level ≤ 170 inches** • **Drywell pressure ≥ 2.0 psig** • **Rx Bldg Vent Shaft Rad ≥ 8 mr/hr** • **Fuel Pool Exhaust Rad ≥ 8 mr/hr** • **Offgas Vent Rad ≥ 6.0 X E^5 CPS** **Annunciator 1C05B, C-8, PCIS GROUP 3 ISOLATION INITIATED, will not clear after the Group 3 isolation is reset. This is because the alarm will not clear until the SBGT lockout relays are reset. Evidence that the logic has been properly reset will be when Group 3 isolation valves can be opened in the following steps.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 3 **Critical N**	Position the following handswitch at 1C35: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4378A / Suction Inboard Isol CV-4378A / CLOSE
Standard:	Momentarily rotates control switch/or verifies HS-4378A for Suction Inboard Isol CV-4378A to the CLOSE position.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 4 **Critical _N_**	Position the following handswitch at 1C35:

SWITCH	DESCRIPTION	POSITION
HS-4378B	Suction Outboard Isol CV-4378B	CLOSE

Standard: Momentarily rotates control switch/or verifies HS-4378B for Suction Inboard Isol CV-4378A to the CLOSE position.

Performance: **SATISFACTORY ______UNSATISFACTORY ______**

Comments: ____

Performance Step: 5 **Critical _Y_**	Position the following handswitch at 1C03:

SWITCH	DESCRIPTION	POSITION
HS-4302	Inbd Drywell Vent Isol CV-4302	AUTO OPEN

Standard: Rotates control switch HS-4302 for Inbd Drywell Vent Isol CV-4302 to the AUTO OPEN position.
Red valve open light illuminates; green light remains ON.

Evaluators Note See Note 17 and reference Prints M143(1) and M143(2). These valves are set to a throttled position and will show dual indication.

Performance: **SATISFACTORY ______UNSATISFACTORY ______**

Comments: ____

Performance Step: 6 **Critical _Y_**	Position the following handswitch at 1C03:

SWITCH	DESCRIPTION	POSITION
HS-4303	Outbd Drywell Vent Isol CV-4303	AUTO OPEN

Standard: Inserts key into control switch for Outbd Drywell Vent Isol CV-4303 and rotates switch to the AUTO OPEN position.
Red valve open light illuminates; green light remains ON.

Evaluators Note See Note 17 and reference Prints M143(1) and M143(2). These valves are set to a throttled position and will show dual indication.

Performance: **SATISFACTORY ______UNSATISFACTORY ______**

Comments: ____

Performance Step: 7 **Critical Y**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4310 / Inbd DW Vent Bypass Isol CV-4310 / AUTO OPEN
Standard:	Inserts key into control switch for Inbd DW Vent Bypass Isol CV-4310 and rotates switch to the AUTO OPEN position. Red valve open light illuminates; green light extinguishes.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 8 **Critical N**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4300 / Inbd Torus Vent Isol CV-4300 / CLOSE
Standard:	Determines that Inbd Torus Vent Isol CV-4300 handswitch is already in the CLOSE position and moves on to the next step.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 9 **Critical N**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4301 / Outbd Torus Vent Isol CV-4301 / CLOSE
Standard:	Determines that Outbd Torus Vent Isol CV-4301 keylocked handswitch is already in the CLOSE position and moves on to the next step.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 10 **Critical N**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4309 / Inbd Torus Vent Bypass Isol CV-4309 / CLOSE
Standard:	Determines that Inbd Torus Vent Bypass Isol CV-4309 keylocked handswitch is already in the CLOSE position and moves on to the next step.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 11 **Critical N**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4311 / Cont N_2 Make-up Supply Isol CV-4311 / CLOSE
Standard:	Rotates control switch for Cont N2 Make-Up Supply Isol CV-4311 valve to CLOSE.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 12 **Critical N**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4312 / DW N_2 Make-up Inlet Isol CV-4312 / CLOSE
Standard:	Rotates control switch for DW N_2 Make-Up Inlet Isol CV-4312 valve to CLOSE.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 13 **Critical N**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4313 / Torus N_2 Make-up Inlet Isol CV4313 / CLOSE
Standard:	Rotates control switch for Torus N_2 Make-Up Inlet Isol CV4313 valve to CLOSE.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 14 **Critical _Y_**	When Drywell pressure is approximately 0 psig: Open Air Purge Isolation CV-4317 using handswitch HS-4317 (above Drywell entrance).
Standard:	When Drywell pressure is ~ 0 psig, contacts local operator to open Air Purge Isolation CV-4317 using handswitch HS-4317.
Evaluator Note:	**Multiple indications of Drywell pressure exist. Most convenient to IC03 operations is NR Pressure Indicators on IC03 vertical section.**
Evaluator Cue:	**When the candidate contacts the local operator to open CV-4317, Role Play as the local operator and report that you have opened CV-4317.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 15 **Critical _Y_**	Position the following handswitch at 1C03**:** **SWITCH** / **DESCRIPTION** / **POSITION** HS-4306 / Outbd Cont Purge Supply Isol CV-4306 / AUTO OPEN
Standard:	Rotates control switch for Outbd Cont Purge Supply Isol CV-4306 to the AUTO OPEN position. Red valve open light illuminates; green light remains ON.
Evaluators Note	See Note 17 and reference Prints M143(1) and M143(2). These valves are set to a throttled position and will show dual indication.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 16 **Critical Y**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4307 / Inbd DW Purge Inlet Isol CV-4307 / AUTO OPEN
Standard:	Rotates control switch for Inbd DW Purge Inlet Isol CV-4307 to the AUTO OPEN position. Red valve open light illuminates; green light remains ON.
Evaluators Note	See Note 17 and reference Prints M143(1) and M143(2). These valves are set to a throttled position and will show dual indication.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 17 **Critical Y**	Position the following handswitch at 1C03: **SWITCH** / **DESCRIPTION** / **POSITION** HS-4308 / Inbd Torus Purge Inlet Isol CV-4308 / AUTO OPEN
Standard:	Rotates control switch for Inbd Torus Purge Inlet Isol CV-4308 to the AUTO OPEN position. Red valve open light illuminates; green light remains ON.
Evaluators Note	See Note 17 and reference Prints M143(1) and M143(2). These valves are set to a throttled position and will show dual indication.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 18 **Critical Y**	Start DW/Torus Purge Fan 1V-EF-17 using HS-7418 at 1C23.
Standard:	Places control switch for DW/Torus Purge Fan 1V-EF-17 to start position on IC23. Red Purge Fan indicating light illuminates.
Evaluator Note:	**Drywell pressure may increase slightly when purge fan is started.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 19 **Critical _N_**	At 1K-14, place HS-4374 (Drywell N2 Compressor 1K-14 local handswitch) to OFF.
Standard:	Contacts local operator to place the Drywell N2 Compressor 1K-14 local handswitch to OFF. When report received that the N2 Compressor 1K-14 has been secured, informs the CRS that Air Purge Cooling of the Drywell is in progress.
Evaluator Cue:	**Role Play as local operator and CUE that the Drywell N2 Compressor 1K-14 local handswitch has been placed in off.** **As required, CUE that the JPM has been completed.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Terminating Cues: **Air Purge Cooling of the Drywell is in progress.**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: __________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ____________________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- The plant was at full power when a loss of Well Water Supply to the Drywell occurred.
- AOP 408, Well Water System Abnormal Operation, has been entered.
- The plant was scrammed when Drywell temperature could not be maintained.
- RPV level lowered to ~ 155 inches but has now recovered to the normal range.
- Drywell pressure is 1.3 psig and rising slowly.

INITIATING CUES:

- Initiate Air Purge Cooling of the Drywell IAW with AOP 408, Attachment 1.
- This Task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC SIM JPM S-6

TITLE: "B" STANDBY DIESEL GENERATOR OPERABILITY TEST

SITE:	DAEC
JPM TITLE:	“B” STANDBY DIESEL GENERATOR OPERABILITY TEST
JPM NUMBER:	NRC S-6 **REV.** 1
RELATED PRA INFO:	None
TASK NUMBER(S) / TASK TITLE(S):	19.04 / Parallel the SBDG System to Essential Bus
K/A NUMBERS AND VALUES:	264000 Emergency Generators, Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Synchronization of the emergency generator with other electrical supplies. IMPORTANCE: 3.6/3.6
Justification (FOR K/A VALUES <3.0):	N/A

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:				
	In-Plant:	[ ]	Control Room:	[ ]
	Simulator:	[X]	Other:	[ ]
	Lab:	[ ]		

Time for Completion: 30 Minutes Time Critical: NO

Alternate Path / Faulted: YES

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago	11/27/12
	WTS JPM Developer	Date
Validated by:		
	Validation Instructor	Date
Reviewed by:		
	Plant Reviewer	Date
Approved by:		
	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

____________________________ Validation Personnel /Date

____________________________ Validation Personnel/Date

____________________________ Validation Personnel /Date

____________________________ Validation Personnel/Date

SIMULATOR SET UP:

1. Reset to the saved IC (IC 110) for this JPM _______
2. If the saved IC is not available, then reset to IC 20 and set up as follows:
   a. Place the simulator in **RUN** _______
   b. Clear recorders using the pushbutton behind 1C05 or the schedule file. _______
   c. Start the “B” SBDG _______
   d. Acknowledge the SBDG Trouble Alarm locally using the Remote Function AN05 _______
   e. Place Test Maintenance Alarm borders around the following annunciators: _______
      1) 1C08B (A-3) _______
      2) 1C08B(C-1) _______
      3) 1C08B (C-2) _______
      4) 1C08A (D-7) _______
   f. Acknowledge and reset all alarms _______
   g. Place the simulator in **FREEZE** _______
   h. If re-using this JPM, save setup to an available IC or snapshot _______
3. Be prepared to place the GOVERNOR MODE SWITCH (DROOP) in PARALLEL when directed using Remote Function DG11 _______
4. Place the simulator in **RUN** _______

TRIGGERS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
ET1	ZAODGWDG2 >= 0.45	“B” DG KW meter is > 1800 KW
ET2	ZDIDGDG2(2)==1	HS-3231B, “B” DIESEL GENERATOR 1G-21 CONTROL in STOP

SIMULATOR MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	ET	Delay	F. Sev.	Ramp	I. Sev.
Setup	AN1C08B(14)	1C08B (B-2) B DIESEL GEN 1G 21 PHASE OVERCURRENT OR GROUND FAULT	1	00:00:00	NA	NA	On
Setup	AN1C08B(14)	1C08B (B-2) B DIESEL GEN 1G 21 PHASE OVERCURRENT OR GROUND FAULT	2	00:00:00	NA	NA	Off

SIMULATOR OVERRIDES: None

SIMULATOR REMOTE FUNCTIONS:

TIME	REMOTE FUNCTION #	REMOTE FUNCTION TITLE	VALUE	RAMP
As Directed	dg11	“B” DG 1G21 Droop Switch	PARALLEL	NA

Required Materials:

1. STP 3.8.1-05B "B" STANDBY DIESEL GENERATOR OPERABILITY TEST (SLOW START FROM EMER START AIR) completed up through Step 7.12 (File can be found in the JPM Folder)

General References:

1. STP 3.8.1-05B "B" STANDBY DIESEL GENERATOR OPERABILITY TEST (SLOW START FROM EMER START AIR)
2. ARP 1C08B B-2, B DIESEL GENERATOR 1G-21 PHASE OVERCURRENT OR GROUND FAULT

Task Standards:

1. Place GOVERNOR MODE SWITCH (DROOP) in PARALLEL.
2. Place handswitch BUS 1A4 TRANSFER selector switch in MANUAL in preparation for paralleling.
3. Synchronize the diesel generator with Bus 1A4 (multiple critical steps are included in this evolution).
4. Return handswitch BUS 1A4 TRANSFER selector switch to AUTO after paralleling.
5. Load the diesel IAW the STP.
6. When annunciator 1C08B B-2, B DIESEL GENERATOR 1G-21 PHASE OVERCURRENT OR GROUND FAULT alarms responds per the ARP as follows:
   a. Unloads the diesel
   b. Trips the diesel output breaker
   c. Trips the diesel via the Diesel Generator Control Switch
   d. Places the Diesel Generator Control Switch in Pull-to-Lock

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- STP 3.8.1-05B “B” STANDBY DIESEL GENERATOR OPERABILITY TEST (SLOW START FROM EMER START AIR) is in progress.
- The “B” SBDG has just been started.
- STP 3.8.1-05B is complete though step 7.12.
- An operator is standing by locally to assist as required.

INITIATING CUES:

- Continue STP 3.8.1-05B “B” STANDBY DIESEL GENERATOR OPERABILITY TEST (SLOW START FROM EMER START AIR) commencing at step 7.13.
- This task is not time critical
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: 1 **Critical: N**	At 1C08, perform the following: a. Confirm 1G-21 generator steady state frequency, as indicated on B DIESEL GENERATOR 1G-21 FREQUENCY meter, is greater than or equal to (≥) 59.5 Hz and less than or equal to (≤) 60.5 Hz.
Standard:	Candidate verifies that "B" Diesel Generator frequency is ≥ 59.5 Hz and ≤ 60.5 Hz.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 2 **Critical: N**	b. Confirm 1G-21 generator steady state voltage, as indicated on B DIESEL GENERATOR 1G-21 VOLTS meter, is greater than or equal to (≥) 3744 VAC and less than or equal to (≤) 4576 VAC.
Standard:	Candidate verifies that "B" Diesel Generator voltage is ≥ 3744 volts and ≤ 4576 volts.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 3 **Critical: N**	c. Adjust 1G-21 generator frequency to 60 ± 0.2 Hz (59.8 to 60.2 Hz) using B DIESEL GENERATOR 1G-21 SPEED ADJUST handswitch.
Standard:	If required, candidate adjusts diesel speed using the B DIESEL GENERATOR 1G-21 SPEED ADJUST handswitch until frequency is between 59.8 to 60.2 Hz.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 4 **Critical: _N_**	d. Adjust 1G-21 generator voltage 4160 ± 50 VAC (4110 to 4210 VAC) using B DIESEL GENERATOR 1G-21 VOLTAGE ADJUST handswitch.
Standard:	If required, candidate adjusts Diesel Generator voltage using B DIESEL GENERATOR 1G-21 VOLTAGE ADJUST handswitch until voltage is 4160 ± 50.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 5 **Critical: _Y_**	At 1C94, place HS-3234B, GOVERNOR MODE SWITCH (DROOP), in PARALLEL.
Standard:	Candidate contacts local operator and directs that the GOVERNOR MODE SWITCH (DROOP) be placed in PARALLEL.
Evaluator Note:	**Annunciator 1C08B-C2 will alarm during this step.**
Simulator Operator:	**When directed, place the GOVERNOR MODE SWITCH (DROOP) in PARALLEL using remote function.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 6 **Critical: _N_**	Performance of Step 7.1.16: a. Makes the 1G-21 B SBDG inoperable. Ensure Steps 7.1.16 through 7.1.53 are completed within the time allowed by Prerequisite 6.10. Record the date and time below and inform the CRS of the start of the inoperability condition.
Standard:	• Candidate informs the CRS that the performance of steps 7.1.16 through 7.1.53 will inop the “B” SBDG. • Candidate records the current date and time.
Evaluator Cue:	**Role Play as CRS and Cue that the appropriate LCO has been entered.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 7 **Critical: N**	b. Makes the Standby Transformer Offsite Circuit inoperable. Record the date and time below and inform the CRS of the start of the inoperability condition.
Standard:	• Candidate informs the CRS that the performance of step 7.1.16 will inop the Standby Transformer Offsite Power Circuit. • Candidate records the current date and time.
Evaluator Cue:	**Role Play as CRS and Cue that the appropriate LCO has been entered.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 8 **Critical: Y**	At 1C08, perform the following: a. Place handswitch BUS 1A4 TRANSFER in MANUAL.
Standard:	• Candidate places Bus 1A4 TRANSFER switch in MANUAL. • Annunciator 1C08A-D7 alarms.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 9 **Critical: N**	b. Confirm annunciator 4KV BUS AUTO TRANSFER INOP (1C08A, D-7) is activated.
Standard:	Candidate determines that annunciator 1C08A, D-7 has alarmed.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Evaluator Note: **The following procedure Note is prior to the next step.**

NOTE

Past history has shown synch check tolerances are very tight; and, if NOT met, the Diesel Output Breaker will NOT close.

Performance Step: 10 **Critical:** <u>Y</u>	At 1C08, synchronize 1G-21 to the bus as follows: a. Place the SYNCHRONIZE switch for 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 to ON.
Standard:	Candidate places SYNCHRONIZE switch for 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 to ON.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 11 **Critical:** <u>Y</u>	b. Using handswitch B DIESEL GENERATOR 1G-21 VOLTAGE ADJUST, raise INCOMING VOLTS SYNCHRONIZE to slightly more than RUNNING VOLTS SYNCHRONIZE.
Standard:	Candidate adjusts diesel generator output voltage until INCOMING VOLTS is slightly more than RUNNING VOLTS.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 12 **Critical:** <u>Y</u>	c. Using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST, adjust Diesel Generator speed to obtain a slow, clockwise synchroscope rotation.
Standard:	Candidate adjusts diesel speed until the synchroscope is rotating slowly in the clockwise direction.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 13 **Critical: <u>Y</u>**	d. When the synchroscope is at the 12 o'clock position, momentarily place the 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 control switch in CLOSE.
Standard:	• When the synchroscope is at the 12 o'clock position, candidate momentarily places 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 control switch to CLOSE. • Breaker remains closed.
Evaluator Note:	**It is not necessary for the breaker to remain closed on the 1st attempt to pass this step (see the following step). However, at some point, the candidate must successfully synchronize the diesel generator to the bus.** **Candidate may make a plant page announcement prior to closing the output breaker.** **Candidate may contact security to verify that all personnel are clear of the area.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 14 **Critical: <u>N</u>**	e. If 1A411 fails to close due to NOT satisfying the sync check, perform the following (otherwise mark N/A): 1. Perform applicable ARP 1C08B, A-2 steps. 2. As directed by the CRS, reperform applicable substeps of Step 7.1.17 to close 1A411.
Standard:	If required, notifies CRS of breaker failing to close. If required, refers to ARP 1C08B, A-2 steps.
Evaluator Cue:	**If required, Role Play as CRS; and Cue the operator to make another attempt at closing the 1A411 breaker.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 15 **Critical: N**	f. Confirm the red (breaker closed) and white (closing spring charged) indicating lights are ON.
Standard:	Candidate confirms that the breaker is closed and has recharged by observing indicating lights.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 16 **Critical: Y**	At 1C08, load Diesel Generator to 250 - 300 KW as indicated on the B DIESEL GENERATOR 1G-21 KILOWATTS meter using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST.
Standard:	Candidate, using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST, raises diesel loading to 250 - 300 KW.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 17 **Critical: N**	At 1C08, place the SYNCHRONIZE switch for 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 to OFF.
Standard:	Candidate places SYNCHRONIZE switch for 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 to OFF.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 18 **Critical: Y**	At 1C08, place handswitch BUS 1A4 TRANSFER in AUTO.
Standard:	• Candidate returns BUS 1A4 TRANSFER handswitch to AUTO position.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 19 **Critical: N**	Record date and time below and inform CRS of return to service of the Standby Transformer Offsite Circuit.
Standard:	• Informs CRS of the return to service of the Standby Transformer Offsite Circuit. • Records date and time.
Evaluators Cue:	**When the CRS is informed that the Standby Transformer has been returned to service, Cue the applicant that the LCO for offsite sources has been exited.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 20 **Critical: Y**	At 1C08, using speed and voltage adjust, raise generator load as follows: a. Raise load to approximately 1500 kW at 260 amps. b. Maintain engine load at 1500 KW for greater than or equal to (≥) 30 minutes.
Standard:	• Candidate, using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST, raises diesel loading to ~1500 KW. • Candidate, using B DIESEL GENERATOR 1G-21 VOLTAGE ADJUST, adjusts voltage as required until the diesel is carrying ~ 260 amps.
Evaluator Cue:	**After the diesel load is to ~ 1500 kW at 260 amps, Cue the candidate that 30 minutes have elapsed.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Evaluator Note: Alarm 1C08B B-2, B DIESEL GENERATOR 1G-21 PHASE OVERCURRENT OR GROUND FAULT will annunciate in the next step when diesel loading exceeds ~ 1800 kW.

Performance Step: 21 **Critical: Y**	c. Raise load to approx. 2000 kW at 348 amps.
Standard:	Candidate, using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST, begins to raise diesel loading.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 22 **Critical: N**	Respond to unexpected alarm.
Standard:	• Candidate acknowledges alarm and refers to ARP. • Notifies CRS of alarm.
Simulator Operator:	**If asked, Role Play as local operator and report that Relay 159N/DG2 is tripped.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Evaluator Note: The following steps are derived from ARP 1C08B, B-2

Performance Step: 23 **Critical: Y**	If the "B" SBDG is operating in parallel with offsite sources: a. Verify BUS 1A4 TRANSFER breaker mode selector switch is in MANUAL.
Standard:	• Candidate places Bus 1A4 TRANSFER switch in MANUAL. • Annunciator 1C08A-D7 alarms.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 24 **Critical: Y**	b. Reduce load on "B" SBDG 1G-21 to approximately 50 KW using the Diesel Generator 1G-21 Speed Adjust Control.
Standard:	Candidate, using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST, reduces diesel loading to ~ 50 kW.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 25 **Critical: Y**	c. Place the control switch for 4KV BREAKER 1A411 "B" DIESEL GENERATOR 1G-21 in the TRIP position, Observe that the green (breaker tripped) and the white(closing Spring charged) indicating lights are ON.
Standard:	• Candidate places the control switch for 4KV BREAKER 1A411 "B" DIESEL GENERATOR 1G-21 to the TRIP position. • Candidate verifies breaker 1A411 breaker has tripped by observing light indication.
Evaluator Note:	**Verifying light indication is not a critical element of this step.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 26 **Critical: Y**	d. Place BUS 1A4 TRANSFER breaker mode selector switch in AUTO.
Standard:	• Candidate places Bus 1A4 TRANSFER switch in AUTO. • Annunciator 1C08A-D7 clears.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 27 **Critical: Y**	e. Hold HS-3231B, "B" DIESEL GENERATOR 1G-21 CONTROL handswitch, in STOP for 5 to 10 seconds to stop the diesel, then place HS-3231B in Pull-to-Lock.
Standard:	• Candidate places and holds HS-3231B, "B" DIESEL GENERATOR 1G-21 CONTROL handswitch, in the STOP position. • After 5 to 10 seconds, candidate places HS-3231B in the Pull-to-Lock position.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 28 **Critical: N**	f.	Comply with Tech. Specs. For placing the transfer mode selector switch to Manual, and the Diesel Generator in Pull-to-Lock.
Standard:	Candidate informs the CRS of the need to refer to Tech Specs.	
Evaluator Cue:	**Cue the candidate that the JPM is complete.**	
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**	
Comments:	____	

Terminating Cues: **Diesel is shutdown and HS-3231B, "B" DIESEL GENERATOR 1G-21 CONTROL, handswitch is in Pull-to-Lock.**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: ___________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ______________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- STP 3.8.1-05B “B” STANDBY DIESEL GENERATOR OPERABILITY TEST (SLOW START FROM EMER START AIR) is in progress.
- The “B” SBDG has just been started.
- STP 3.8.1-05B is complete though step 7.12.
- An operator is standing by locally to assist as required.

INITIATING CUES:

- Continue STP 3.8.1-05B “B” STANDBY DIESEL GENERATOR OPERABILITY TEST (SLOW START FROM EMER START AIR) commencing at step 7.13.
- This task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Usage Level:
CONTINUOUS

Approved for **'Point-of-Use'** printing **IF NO Temporary Changes** are in effect for this procedure.

Record the following: Date / Time: _____________ / _________ Initials: ____

NOTE: *A check to ensure current revision and no temporary changes shall be performed and documented every 24 hours if active document use exceeds a 24 hour period as determined from the date and time recorded above.*

1.0 PURPOSE

1.1 The purpose of this test is to demonstrate the operability of the B Standby Diesel Generator and the B Diesel Generator Fuel Oil Transfer System.

1.2 This procedure, when performed in its entirety, PARTIALLY SATISFIES the AC Sources-Operating requirements for the following functions:

1.2.1 Verifying each DG starts from standby conditions and achieves steady state voltage ≥ 3744 Volts and ≤ 4576 Volts and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

1.2.2 Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load greater than or equal to (≥) 2750 kW and less than or equal to (≤) 2950 KW.

1.2.3 Verify each day tank contains ≥ 220 gallons of fuel oil.

1.2.4 Verify the fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.

1.3 This procedure, when performed in its entirety, PARTIALLY SATISFIES the Diesel Fuel Oil, Lube Oil, and Starting Air requirements for the following functions:

1.3.1 Verify fuel oil storage tank contains ≥ 36,317 gallons of fuel.

1.3.2 Verify lube oil inventory is ≥ 257 gallons for each DG.

1.3.3 Verify required air start receiver pressure is ≥ 150 psig.

1.4 The purpose of this test is to demonstrate the capability of the B Standby Diesel Generator to be started by either of its Air Start Solenoids by direction of the Operations Committee on April 13, 1974. This STP PARTIALLY SATISFIES this requirement.

1.4.1 Starting "B" EDG, 1G-21 with SV-3262B isolated confirms proper operation of Air Start Solenoid SV-3262A and Vent Solenoid SV-3262C.

1.5 The purpose of this test is to meet the requirements of the DAEC Inservice Testing Program. This STP satisfies these requirements:

1.5.1 Starting "B" EDG, 1G-21 satisfies check valve V-32-19 closed exercise requirements (if the check valve is not closed, the prime will be lost on the fuel system and the diesel will not start).

1.5.2 Operation of "B" EDG, 1G-21 at rated load satisfies check valve V-32-19 open exercise requirements.

1.6 This STP FULLY SATISFIES the Technical Specification surveillance requirements of STP 3.8.1-04B and may be performed in its place if accomplished within the proper time frame.

1.7 This STP obtains vibration data for the B EDG Generators (1G-21/Gen). This is a non-Technical Specification related collection of vibration data. Refer to PERFORMANCE INFORMATION paragraph 2.1.11 for additional details.

2.0 BRIEFING INFORMATION

2.1 PERFORMANCE INFORMATION

2.1.1 Testing is organized as follows:

Section	System / Subcomponent
7.1	B / EDG 1G-21

All STP steps are to be performed in sequence and carried through to completion, unless stated otherwise.

2.1.2 Personnel recommended to perform this procedure:

3 Operations

2.1.3 Test Equipment required:

Calculator

Keys for locked valves

1 Portable Machinery Analyzer for collection of EDG Generator vibration data (see PERFORMANCE INFORMATION paragraph 2.1.11)

2.1.4 Use the 0.8 pf nomograph for the performance of this STP.

2.1.5 Set Lube Oil Pre-lube Timer at two minutes. Start the Diesel Generator after Pre-lube Pump has been running for greater than one minute. The Pre-lube Pump will stop after engine start.

2.1.6 This test will consist of a slow manual start of the Diesel Generator.

2.1.7 Diesel generator availability is being maintained during portions of this STP by taking credit for operator actions. These actions are called out in Continuous Recheck Statements within the STP. During performance of steps when the Continuous Recheck Statements are applicable, an operator in continuous communication with the Control Room shall remain in the Diesel Generator room to perform recheck actions if necessary. This ensures that the diesel generator can be restored rapidly if an emergency start signal is received.

2.1.8 The Mechanical Maintenance Supervisor should be advised at the start of the test to allow for proper maintenance interface coordination.

2.1.9 A locked valve shall be secured by a padlocked chain or cable passed around a pipe or other substantial stationary object, or special locking device, and passed through or around the valve handwheel in such a way as to preclude unintentional valve operation.

2.1.10 Two different instrumentation loops (local and 1C08) monitor Diesel Generator power (KW) indication. Due to individual loop tolerances, deviations between these indications can occur. In order to provide consistency for data recording, the KW meter at 1C08 is to be used for all references to Diesel Generator power in this STP. Local indication should be used for gross KW indication only.

2.1.11 This STP obtains generator vibration data for the B Emergency Diesel (1G-21) generator. Vibration data collected herein is <u>NOT</u> intended to satisfy Section XI collection criteria. Furthermore, this data is <u>NOT</u> required to be recorded or documented within the body of this STP. Therefore, completion/closure of this STP is not dependent upon successful collection or evaluation of Emergency Diesel generator vibration data.

2.1.12 If a fire extinguisher is discharged during the EDG test run, the extinguisher should be replaced at the earliest opportunity with a fully charged like-for-like extinguisher.

2.2 GENERAL CAUTIONS

2.2.1 Performance of this STP renders 1G21 (B SBDG) inoperable. This STP controls the time that the SBDG is inoperable and no other documentation besides that contained in this STP is required unless the SBDG cannot be returned to its standby readiness condition as directed by this STP or there is an extended delay in completing the STP.

2.2.2 Performance of this STP renders B ESW inoperable. This STP controls the time that the B ESW System is inoperable and no other documentation besides that contained in the STP is required unless the B ESW cannot be returned to its standby readiness condition as directed by the STP or there is an extended delay in completing the STP.

2.2.3 Performance of this STP renders the Standby Transformer Offsite Circuit inoperable. This STP controls the time that the Standby Transformer Offsite Circuit is inoperable and no other documentation besides that contained in this STP is required unless the Standby Transformer Offsite Circuit cannot be returned to its standby readiness condition as directed by this STP within one hour of being declared inoperable.

2.2.4 STP 3.8.1-01, Offsite Power Sources, is performed within the body of this STP and may have to be performed again if there is an extended delay (every 12 hours) in completing this STP.

2.3 SPECIAL PRECAUTIONS

2.3.1 Higher than normal bus voltages will reduce the amount of current needed to establish the recommended load (490 amps is based on a bus voltage of 4200 VAC).

2.3.2 The Diesel Generator output breaker shall be tripped prior to tripping the diesel engine to prevent motorizing the diesel if paralleled with another source.

2.3.3 To reduce the likelihood of exhaust fires, the SBDG should be started and loaded to at least 1500 KW within 20 minutes or less whenever possible. Exhaust Fires are caused by extended unloaded operation. Unloaded operation should be reduced as much as possible during engine operation.

2.3.4 When the SBDG is first started there is a high dP across the SBDG room door which makes it difficult to open the door until the dP across the door has equalized. Personnel may encounter difficulties opening the door to a SBDG room when the diesel is first started. Personnel shall be clear of the SBDG room any time a planned start of the engine is being performed unless otherwise approved by the CRS.

3.0 REFERENCES

3.1 Applicable Drawings:

3.1.1 BECH M-132

3.2 Associated Documents:

3.2.1 Operating Instruction OI 324

3.2.2 CAL-IELP-M81-09

3.2.3 NG-92-2216

3.2.4 NG-89-3623, “Diesel Fuel Oil Transfer Pumps (1P-44A&B)”

3.2.5 NG-90-0089, “Emergency Diesel Generator (EDG) Air Receiver Pressure Decay Rate”

3.3 Commitment Items:

3.3.1 C001 – LER 93-004

3.3.2 C002 – NG-99-0112, TS Bases SR 3.8.1.7

4.0 GENERAL INSTRUCTIONS

4.1 Steps marked with a “TS” immediately to the right of the step sign-off line are required by Technical Specifications. If these steps do not meet their acceptance criteria or cannot be performed, a NRC reportable condition may exist and shall be reported to the Control Room Supervisor (CRS) immediately.

4.2 If any equipment or components are observed to be in a state of disrepair during the performance of this STP, appropriate corrective maintenance shall be initiated.

4.3 An Action Request (AR) should be completed for any problems encountered with “TS” marked steps during the performance of this test/inspection.

4.4 The CRS shall be notified immediately and the appropriate Limiting Conditions for Operation section of Technical Specifications referred to whenever problems are encountered during the performance of this STP.

4.5 An independent verification (IV) of valves repositioned during the performance of this test will be conducted, when directed by the CRS, using the POST-STP COMPLETION CHECKLIST attached to this procedure.

4.6 Steps marked with “(ASME)” following the step are used to meet ASME requirements. If the component does not meet the acceptance criteria of ASME, that component shall be considered inoperable.

4.7 This STP provides for independent verification of calculation steps. Independently verified calculations shall comply with the following standards:

- Independent calculation verifications shall be performed by a person or persons other than the person or persons that performed the original (initial) calculation.
- The independent calculation shall include a review of the appropriateness of assumptions, input data, and calculation methods used.
- Independent calculations need not exactly check the original calculation, but must provide results consistent with the original calculation. Where differences exist, the conclusion that these differences are not significant shall be justified in the comments section (Step 8.6 of this procedure).

By signing and/or initialing the designated steps (“IV” or “Independently Verified by”) within this procedure, the Independent Verifier confirms that the aforementioned standards have been satisfied.

5.0 APPENDICES

5.1 Appendix A – 1T-37A/B Tank Level (Inches to Gallons)

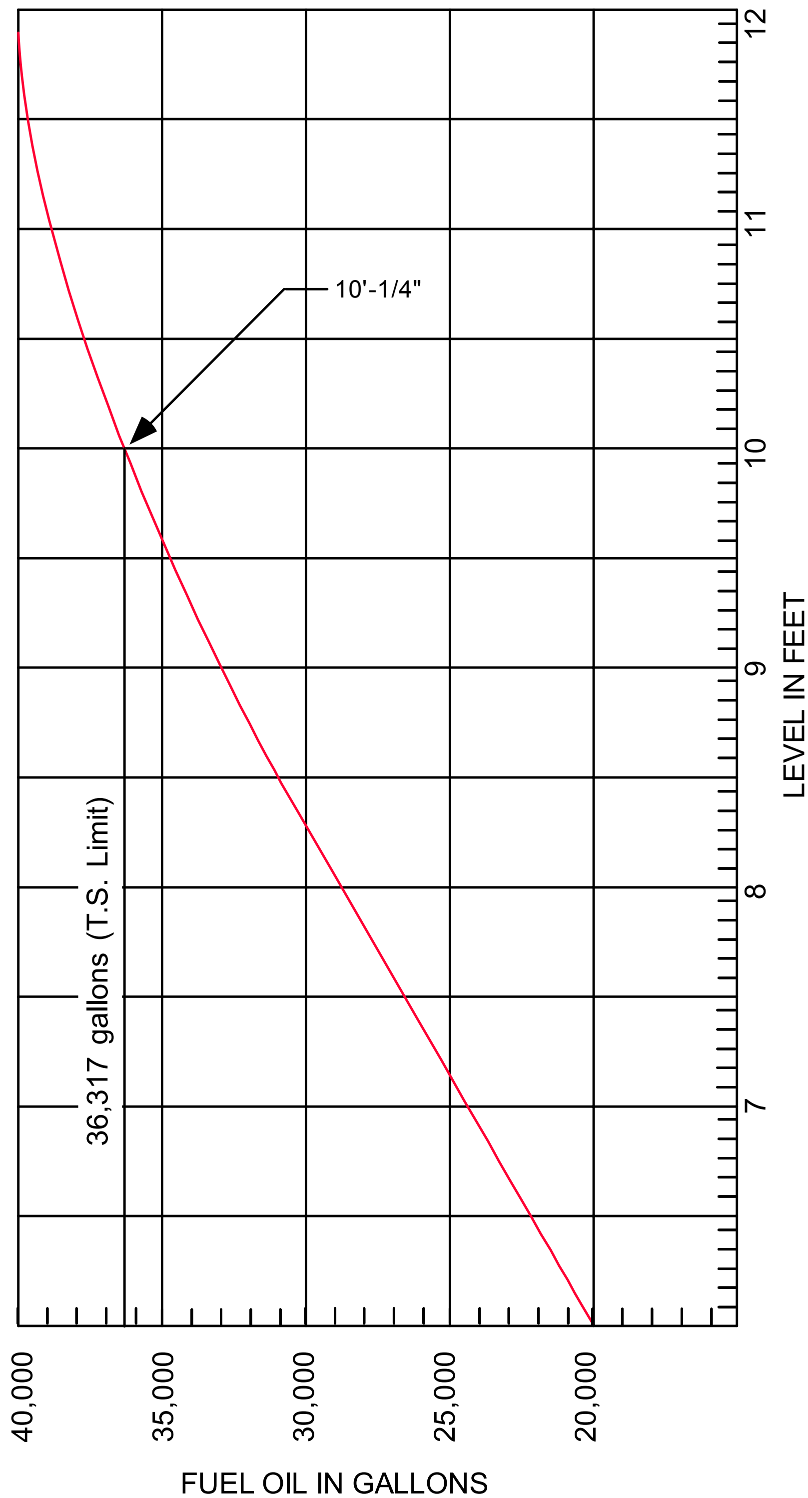
5.2 Appendix B – 1T-35 Fuel Oil Storage Tank Level (Level to Gallons)

5.3 Appendix C – Generator Vibration Data Collection Points

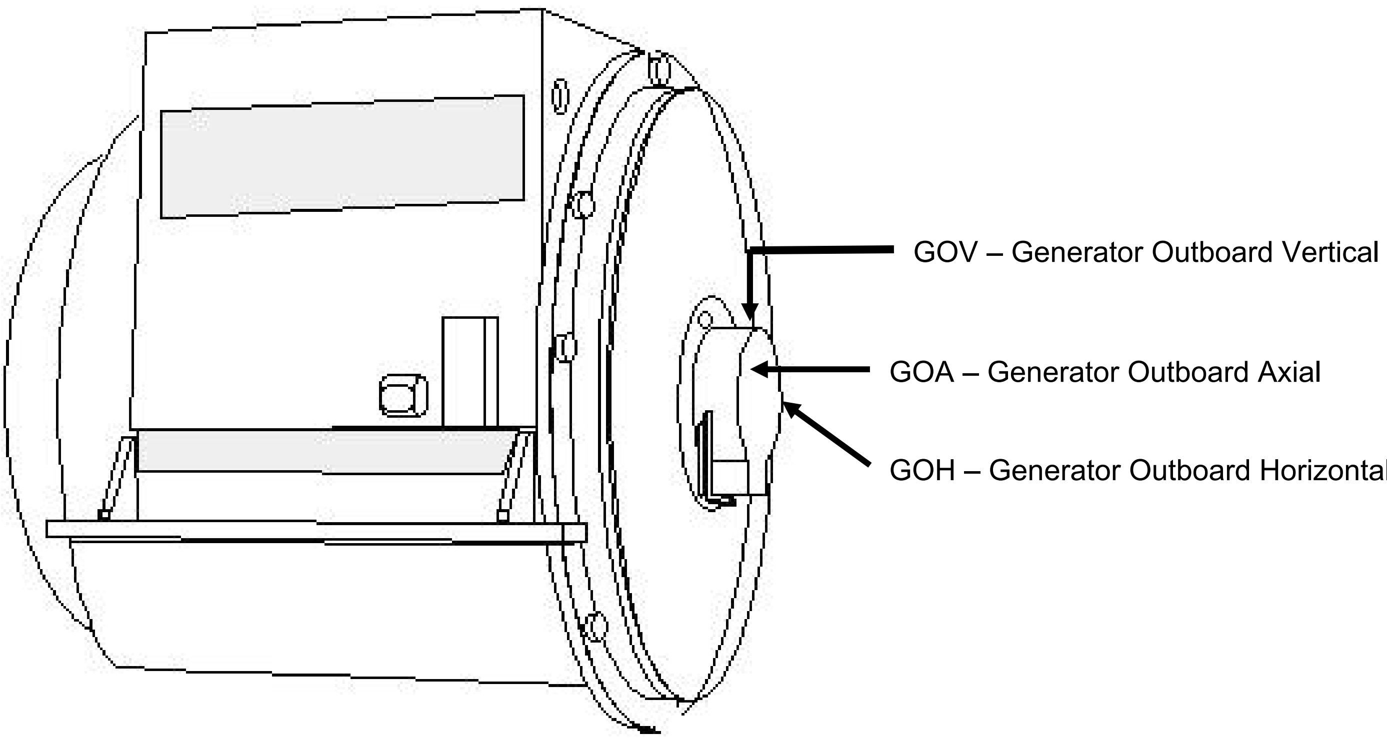
Level (Inches)	Capacity (Gallons)	Level (Inches)	Capacity (Gallons)
*2	0	33	511
3	5	34	531
4	12	35	551
5	21	36	571
6	31	37	591
7	43	38	612
8	55	39	633
9	68	40	654
10	80	41	675
11	92	42	696
12	107	43	717
13	124	44	738
14	141	45	759
15	158	46	778
16	184	47	796
17	191	48	814
18	208	49	831
19	226	50	848
20	244	51	865
21	263	52	882
22	284	53	899
23	305	54	916
24	326	55	931
25	347	56	943
26	368	57	955
27	389	58	968
28	410	59	980
29	431	60	992
30	451	61	1002
31	471	**62	1011
32	491		

* The suction from the day tanks is 2” above the tank bottom. This 2” has an unusable volume of 8.81 gallons.

** The day tank overflow is located at 62” above the tank bottom.



10'-1/4"
36,317 gallons (T.S. Limit)
LEVEL IN FEET
12
11
10
9
8
7
40,000
35,000
30,000
25,000
20,000
FUEL OIL IN GALLONS



Emergency Diesel Generator – 1G031/Gen and 1G021/Gen

6.0 PREREQUISITES

6.1 Performance of this STP renders B SBDG (1G-21) inoperable. Using the Safety Function Determination Program (SFDP), confirm that a loss of safety function will not exist during the performance of this STP. ________ (CRS)

6.2 Performance of this STP does NOT result in a common cause failure of the Standby Diesel Generator that is not under test. ________ (CRS)

6.3 Performance of this STP renders B ESW inoperable. Using the Safety Function Determination Program (SFDP), confirm that a loss of safety function will not exist during the performance of this STP. ________ (CRS)

6.4 Using the Technical Specifications, determine the maximum allowed time to perform the portions of the STP that make the B ESW Subsystem inoperable. Record this time below: ________ (CRS)

Maximum allowed inoperable time: ___________________

6.5 Ensure Mode 2 will not be entered from Mode 3 or Mode 4 during performance of this test. ________ (CRS)

6.6 Verify Standby Diesel Generator 1G-31 is operable. ________ (CRS)

6.7 Contact the grid operator (ITC Midwest) and verify grid stability. ________ (CRS)

6.8 Complete OI 324A10, SBDG STANDBY/READINESS CONDITION CHECKLIST for Diesel Generator 1G-21. ________ (CRS)

6.9 Verify that bromination has NOT occurred within the past 12 hours. ________ (CRS)

6.10 CRS verify Prerequisites 6.1 through 6.9 have been satisfied and that the maximum allowed inoperable time for B SBDG (1G-21) is seven (7) days. ________ (CRS)

7.0 PROCEDURE

7.1 1G-21 OPERABILITY

> **NOTE**
>
> Steps 7.1.1 through 7.1.3 may be performed concurrently.

____

7.1.1 Perform the applicable portions of STP 3.8.1-01, Offsite Power Sources. ________

7.1.2 At 1C94, check annunciator LUBE OIL MAKE UP TANK LEVEL LOW (1C94, B-2) is reset. ________ TS

7.1.3 At 1G-21, check crankcase oil level is between ADD and 4” above full mark. ________ TS

> **NOTE**
>
> Operator should monitor SBDG exhaust pipe lagging until the DG is loaded, DG operating temperatures are stabilized, and DG exhaust pipe lagging is not excessively smoking.

____

7.1.4 Verify Operator has a portable mist extinguisher available in SBDG Room. ________

7.1.5 At west side of skid, unlock and close V-32-147 DIESEL AIR START ISOL FROM ELECTRIC COMPRESSOR. ________

> **NOTE**
>
> Placing the IDLE-RATED SWITCH HS-3281B in IDLE enables the slow start logic. If a LOOP emergency signal is received while in IDLE the slow start logic will be overridden and the engine will rapidly accelerate to rated speed and be ready to pick up loads.
>
> During a slow start the engine will turn over and increase RPM automatically. After a 120 second hold at 500 RPM the engine will then accelerate to 900 RPM. The operator will not have speed control at 1C08 for about 15 seconds after the engine reaches synchronous speed.

____

7.1.6 At 1C94, place the IDLE-RATED SWITCH, HS-3281B, in IDLE. ________

a. Confirm SLOW START MODE annunciator (1C94, C-7) activates. ________

NOTE

Pre-lube Pump will stop after engine start. The SBDG should be started after Pre-lube Pump has been running for greater than one minute per Step 7.1.8. ________

CAUTION ________

To reduce the likelihood of exhaust fires, the SBDG should be started and loaded to at least 1500 KW within 20 minutes or less whenever possible. Exhaust Fires are caused by extended unloaded operation. Unloaded operation should be reduced as much as possible during engine operation.

7.1.7 At 1C08, pre-lube 1G-21 by setting KS-3238B (Pre-lube Timer) for 2 minutes and pressing B DIESEL GENERATOR 1G-21 PRELUBE pushbutton. Record Start Time: ________

Time: ________________

7.1.8 At 1C08, after Pre-lube Pump has been running for greater than one minute, place handswitch B DIESEL GENERATOR 1G-21 CONTROL HS-3231B in START and back to AUTO. ________

NOTE ________

The ESW pump should auto start if not already running.

7.1.9 At 1C06, verify B ESW PUMP 1P-99B indicates on. ________

7.1.10 At 1C23, verify B DIESEL GEN 1G-21 RM SUPPLY FAN 1V-SF-21 is operating. ________

7.1.11 At 1C94, confirm SLOW START MODE annunciator (1C94, C-7) is reset. ________

7.1.12 At 1C08, confirm annunciator "B" DIESEL GEN 1G-21 RUNNING (1C08B, A-3) is activated. ________

7.1.13 At 1C08, perform the following:

a. Confirm 1G-21 generator steady state frequency, as indicated on B DIESEL GENERATOR 1G-21 FREQUENCY meter, is greater than or equal to (≥) 59.5 Hz and less than or equal to (≤) 60.5 Hz. ________ TS

b. Confirm 1G-21 generator steady state voltage, as indicated on B DIESEL GENERATOR 1G-21 VOLTS meter, is greater than or equal to (≥) 3744 VAC and less than or equal to (≤) 4576 VAC. **{C002}** ________ TS

Record VAC: _____________

c. Adjust 1G-21 generator frequency to 60 ± 0.2 Hz (59.8 to 60.2 Hz) using B DIESEL GENERATOR 1G-21 SPEED ADJUST handswitch. ________

d. Adjust 1G-21 generator voltage 4160 ± 50 VAC (4110 to 4210 VAC) using B DIESEL GENERATOR 1G-21 VOLTAGE ADJUST handswitch. ________

☆ ************ CRITICAL STEP ************ ________

7.1.14 At 1C94, place HS-3234B, GOVERNOR MODE SWITCH (DROOP), in PARALLEL. ________

7.1.15 Performance of Step 7.1.16:

a. Makes the 1G-21 B SBDG inoperable. Ensure Steps 7.1.16 through 7.1.53 are completed within the time allowed by Prerequisite 6.10. Record the date and time below and inform the CRS of the start of the inoperability condition. ________

Date / Time: ____________ / ____________

b. Makes the Standby Transformer Offsite Circuit inoperable. Record the date and time below and inform the CRS of the start of the inoperability condition. ________

Date / Time: ____________ / ____________

7.1.16 At 1C08, perform the following:

a. Place handswitch BUS 1A4 TRANSFER in MANUAL. ________

b. Confirm annunciator 4KV BUS AUTO TRANSFER INOP (1C08A, D-7) is activated. ________

NOTE

Past history has shown synch check tolerances are very tight and if NOT met, the Diesel Output Breaker will NOT close. ________

7.1.17 At 1C08, synchronize 1G-21 to the bus as follows:

a. Place the SYNCHRONIZE switch for 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 to ON. ________

b. Using handswitch B DIESEL GENERATOR 1G-21 VOLTAGE ADJUST, raise INCOMING VOLTS SYNCHRONIZE to slightly more than RUNNING VOLTS SYNCHRONIZE. ________

c. Using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST, adjust Diesel Generator speed to obtain a slow, clockwise synchroscope rotation. ________

d. When the synchroscope is at the 12 o'clock position, momentarily place the 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 control switch in CLOSE. ________

e. If 1A411 fails to close due to NOT satisfying the sync check, perform the following (otherwise mark N/A):

1. Perform applicable ARP 1C08B, A-2 steps. ________

2. As directed by the CRS, reperform applicable substeps of Step 7.1.17 to close 1A411. ________

f. Confirm the red (breaker closed) and white (closing spring charged) indicating lights are ON. ________

7.1.18 At 1C08, load Diesel Generator to 250 - 300 KW as indicated on the B DIESEL GENERATOR 1G-21 KILOWATTS meter using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST. ________

7.1.19 At 1C08, place the SYNCHRONIZE switch for 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 to OFF. ________

7.1.20 At 1C08, place handswitch BUS 1A4 TRANSFER in AUTO. ________

7.1.21 Record date and time below and inform CRS of return to service of the Standby Transformer Offsite Circuit. ________

Date / Time: ____________ / ____________

7.1.22 At 1C08, using speed and voltage adjust, raise generator load as follows:

a. Raise load to approximately 1500 kW at 260 amps. ________

b. Maintain engine load at 1500 KW for greater than or equal to (≥) 30 minutes. ________

Start Time: ____________

End Time: _____________

c. Raise load to approx. 2000 kW at 348 amps. ________

____

CAUTION
Higher than normal bus voltages will reduce the amount of current needed to establish the recommended load. (490 amps is based on a bus voltage of 4200 VAC.)

d. Record 1A4 Bus Voltage (as read at 1C08) in the following space: ________

____________ volts

e. Perform the following calculation to determine the required current: ________

____
(IV)

$$\text{Current} = \frac{2850 \times 10^3 \text{ W}}{(\sqrt{3})\ (\text{Power Factor})\ (\text{Bus Voltage})}$$

$$\text{Current} = \frac{2850 \times 10^3 \text{ W}}{(1.732)\ (0.8)\ (\underset{(7.1.22.d)}{\underline{\qquad\qquad}})}$$

Current = ____________ amps

f. Raise load to approximately 2850 KW at calculated current. ________

____
(7.1.22.e)

g. Record the time. ________

Time ________________________

7.1.23 Using magnetic mounts, obtain Diesel Generator 1G-21 generator (1G-21/Gen) vibration data at locations designated in Appendix C. ________

TEST EQUIPMENT	DAEC ID	CAL DUE DATE
Portable Machinery Analyzer	_______	_____________
Transducer	_______	_____________

NOTE

Technical Specifications require that the Diesel Generator operates for greater than or equal to (≥) 60 minutes at a load of greater than or equal to (≥) 2750 KW and less than or equal to (≤) 2950 KW. Momentary transients, due to changing grid conditions, outside of this range are acceptable.

Steps 7.1.24 and 7.1.25 may be performed concurrently.

____

7.1.24 Verify the following time and load requirements:

a. Verify that Diesel 1G-21 has operated loaded to greater than or equal to (≥) 2750 KW and less than or equal to (≤) 2950 KW for at least one hour. ________ TS

b. Verify that Diesel 1G-21 has operated loaded to greater than or equal to (≥) 2750 KW and less than or equal to (≤) 2950 KW for at least two hours. (ASME) ________

NOTE

OI 324A9, SBDG OPERATING CHECKLIST, may be started after Diesel 1G-21 has operated at full load for at least 1.5 hours. Stator winding temperatures must still be taken after Diesel 1G-21 has operated at full load for at least two hours.

____

7.1.25 Perform the following:

a. Verify that Diesel 1G-21 has operated loaded greater than or equal to (≥) 2750 KW and less than or equal to (≤) 2950 KW for at least 1.5 hours. ________

b. Complete OI 324A9, SBDG OPERATING CHECKLIST, for Diesel Generator 1G-21. ________

NOTE

The time from Step 7.1.26 to 7.1.35 should not exceed 15 minutes to prevent extended unloaded operation during shutdown of the engine. ________

7.1.26 At 1C08, using speed and voltage adjust, lower generator load to approximately 1500 KW at 260 amps and hold for 5 minutes. ________

Time Reached: ______________

End Time: ______________

7.1.27 Performance of Step 7.1.28 makes the Standby Transformer Offsite Circuit inoperable. Record the date and time below and inform the CRS of the start of the inoperability condition. ________

Date / Time: ____________ / ____________

7.1.28 At 1C08, place BUS 1A4 TRANSFER handswitch in MANUAL. ________

CAUTION

The Diesel Generator output breaker shall be tripped prior to tripping the diesel engine to prevent motorizing the diesel if paralleled with another source. ________

7.1.29 At 1C08, perform the following:

a. Using speed and voltage adjust, lower generator load to approximately 50 KW while maintaining a 0.8 power factor. ________

b. Place 4KV BREAKER 1A411 B DIESEL GENERATOR 1G-21 control switch in TRIP. ________

7.1.30 At 1C08, perform the following:

a. Place BUS 1A4 TRANSFER handswitch in AUTO. ________

b. Confirm 4KV BUS AUTO TRANSFER INOP annunciator (1C08A, D-7) reset. ________

7.1.31 Record date and time below and inform CRS of return to service of the Standby Transformer Offsite Circuit. ________

Date / Time: ____________ / ____________

7.1.32 At 1C94, place HS-3234B, GOVERNOR MODE SWITCH (DROOP), in UNIT. ________

7.1.33 At 1C94, place the IDLE-RATED SWITCH, HS-3281B, in RATED. ________

7.1.34 At 1C08, perform the following:

a. Set 1G-21 generator frequency to 60 ± 0.2 Hz (59.8 to 60.2 Hz) using handswitch B DIESEL GENERATOR 1G-21 SPEED ADJUST. ________

b. Set 1G-21 generator voltage to 4160 ± 50 VAC (4110 to 4210 VAC) using handswitch B DIESEL GENERATOR 1G-21 VOLTAGE ADJUST. ________

7.1.35 At 1C08, place handswitch B DIESEL GENERATOR 1G-21 CONTROL HS-3231B in STOP, hold for 5 to 10 seconds, then place to AUTO. ________

7.1.36 At 1C08, confirm annunciator "B" DIESEL GEN 1G-21 RUNNING (1C08B, A-3) is reset. ________

7.1.37 At 1C08, confirm the following:

a. B DIESEL GENERATOR 1G-21 VOLTS meter at 0 ________

b. B DIESEL GENERATOR 1G-21 FREQUENCY meter at mechanical zero ________

7.1.38 At 1C06, stop 1P-99B B ESW PUMP using handswitch B ESW PUMP 1P-99B HS-4928B. (Mark this step N/A if pump is required by other plant conditions). ________

7.1.39 If directed by CRS, perform Steps 7.1.58 through 7.1.68 prior to Steps 7.1.40 through 7.1.57 to facilitate completion of this STP. Otherwise, mark this step N/A. ________

7.1.40 Confirm that the Diesel Generator has been shutdown for greater than (>) 30 minutes and less than (<) 4 hours prior to performing Steps 7.1.42 through 7.1.57. ________

7.1.41 Performance of step 7.1.42 makes B ESW inoperable. Ensure steps 7.1.42 through 7.1.53 are completed within the time allowed by Prerequisite 6.4. Record date and time below and inform the CRS of start of inoperability condition.

Date/Time:____________/________________

CONTINUOUS RECHECK STATEMENT _________

IF during the performance of Steps 7.1.42 through 7.1.50 1G-21 gets an emergency start signal	**THEN** rapidly perform Steps 7.1.49.a and 7.1.50. Mark other steps N/A as needed.

7.1.42 Depress Emergency STOP Pushbutton (over speed trip). _________

7.1.43 At 1C94, confirm annunciator ENGINE OVER SPEED (1C94, A-1) is activated. _________

7.1.44 Near inspection cover 13, close V-32-109, AIR ISOLATION TO OIL BOOSTER TANKS. _________

NOTE _________

If the Diesel engine turns over more than necessary, the oil pump will pump oil back to the areas that are being blown down.

7.1.45 Using manual override of SV-3262A, SBDG 1G-21 EMERG START AIR SUPPLY ISOLATION, admit starting air to 1G-21 for 1 to 3 seconds (sufficient to cause one full revolution of the engine crankshaft). _________

7.1.46 Open and lock open V-32-147 DIESEL AIR START ISOL FROM ELECTRIC COMPRESSOR. _________

7.1.47 Near inspection cover 13, perform the following:

a. Open V-32-110 to vent air on the line to bearing oil booster. _________

b. Close V-32-110. _________

7.1.48 Open V-32-109. _________

★ ********** **CRITICAL STEP** ********** _________

7.1.49 Reset the overspeed trip using the reset lever (located near the Emergency Trip pushbutton) as follows:
{C001}

a. Take the reset lever to the reset position (e.g., feel the latch drop in place, hear a click), then release the reset lever. _________

b. Slowly take the reset lever to the reset position to verify that the latch is holding the plunger (e.g., the reset lever moves freely, significant force increase near the end of movement), then release the reset lever. _________

7.1.50 At 1C92, depress HS-3253B, ALARM RESET, pushbutton. _________

7.1.51 At 1C94, confirm annunciator ENGINE OVER SPEED (1C94, A-1) is reset. _________

7.1.52 At 1C94, reset all annunciators. _________

7.1.53 At 1C08, confirm B DIESEL GENERATOR 1G-21 STOP RELAY RESET light is lit. _________

7.1.54 Complete the following:

a. Record the date and time below and inform the CRS of the return to service of Standby Diesel Generator 1G-21 and B ESW. _________

Date / Time: _____________ / _____________

b. Determine the elapsed time since date and time was recorded in Step 7.1.15.a, record elapsed time below: _________

Elapsed time for Step 7.1.15.a: _____________

c. Confirm elapsed time recorded in Step 7.1.54.b is less than or equal to (≤) the allowable time shown in Prerequisite 6.10 (1G-21). If elapsed time is greater than (>) allowable time, inform CRS immediately. _________

d. Determine the elapsed time since date and time was recorded in Step 7.1.41, record elapsed time below: ________

Elapsed time for Step 7.1.41: ____________

e. Confirm elapsed time recorded in Step 7.1.54.d is less than or equal to (≤) the allowable time shown in Prerequisite 6.4 (B ESW). If either elapsed time is greater than (>) allowable time, inform CRS immediately. ________

7.1.55 Confirm air receiver pressure, as indicated on PI-3221B, SBDG 1G-21 AIR RECEIVER TANK 1T-115B PRESSURE, is greater than or equal to (≥) 150 psig. If value is outside this range, notify the CRS immediately. ________ TS

7.1.56 Confirm air receiver pressure, as indicated on PI-3222B, SBDG 1G-21 AIR RECEIVER TANK 1T-116B PRESSURE, is greater than or equal to (≥) 150 psig. If value is outside this range, notify the CRS immediately. ________ TS

7.1.57 Confirm air receiver pressure, as indicated on PI-3223B, SBDG 1G-21 AIR RECEIVER TANK 1T-117B PRESSURE, is greater than or equal to (≥) 150 psig. If value is outside this range, notify the CRS immediately. ________ TS

7.1.58 Record 1T-37B, SBDG 1G-21 FUEL OIL DAY TANK level as indicated on LIS-3210, FO TRANSFER PUMP 1P-44B AUTO START/STOP SWITCH. ________

1T-37B LEVEL ______ inches

7.1.59 Convert 1T-37B level to gallons using Appendix A. Record the level. ________

1T-37B LEVEL _____________ gallons

7.1.60 Confirm 1T-37B level is greater than or equal to (≥) 220 gallons. If value is outside this range, notify the CRS immediately. ________ TS

7.1.61 At 1C08, verify that B DIESEL OIL TRANSFER PUMP 1P-44B handswitch HS-3202 is selected to AUTO. ________

7.1.62 At 1C92, perform the following:

> **NOTE**
>
> If Diesel Generator run is extended, 1P-44B may auto-start and refill 1T-37B on a low level condition. If 1P-44B was observed to start, refill 1T-37B, and secure automatically during the diesel run, credit may be taken for Steps 7.1.62.a through 7.1.62.e as long as 1T-37B AS LEFT level is greater than or equal to (≥) 50 inches. (It may be necessary to refill 1T-37B per OI 324 Section 9.2.)

____

a. Start FUEL OIL TRANSFER PUMP 1P-44B, by placing HS-3204 DIESEL OIL TRAN PUMP handswitch to START. ________

> **NOTE**
>
> The following verifications can be made by verifying the status of indicating lights for B DIESEL OIL TRANSFER PUMP 1P-44B at 1C08.

____

b. Confirm that FUEL OIL TRANSFER PUMP 1P-44B is running. ________

c. Place HS-3204 to STOP. ________

d. Confirm that FUEL OIL TRANSFER PUMP 1P-44B continues to run. ________

> **NOTE**
>
> The intent of the following step is to prove the Tech Spec-required logic operability of FUEL OIL TRANSFER PUMP 1P-44B. The fuel oil day tank level at which this logic verification takes place is not relevant to satisfying the Tech Spec requirement.

____

e. Verify that FUEL OIL TRANSFER PUMP 1P-44B automatically stops. ________ TS

f. Record 1T-37B level indicated on LIS-3210: ________

1T-37B LEVEL ________ in. = ________ gal.

g. Confirm AS LEFT 1T-37B level is greater than or equal to (≥) 50 inches. ________

7.1.63 At 1C92, depress HS-3253B, ALARM RESET pushbutton. ________

7.1.64 At 1C94, verify all annunciators are reset. List any abnormal alarms in Step 8.6. ________

NOTE

1G021/LOP, SBDG 1G-21 Standby Lube Oil Pump, will get a start signal 10 minutes after SBDG shutdown. ________

7.1.65 Verify 1G021/LOP, SBDG 1G-21 Standby Lube Oil Pump, is running. ________

NOTE

If level indicating switch LIS-3201 is inoperable, the following step can be satisfied by determining tank level using the storage tank's dipstick. ________

7.1.66 At 1T-35 DIESEL FUEL OIL STORAGE TANK, record level as indicated on LIS-3201, DIESEL OIL STORAGE TANK LO-LO LEVEL. ________

1T-35 LEVEL ______ ft. ______ in.

7.1.67 Convert 1T-35 level to gallons using Appendix B. Record level in gallons. ________

1T-35 LEVEL _____________ gallons

7.1.68 Confirm 1T-35 level is greater than or equal to (≥) 36,317 gallons (≥ 10'-1/4"). If value is outside this range, notify the CRS immediately. ________ TS

______________________________	__________	_________	_________
______________________________	__________	_________	_________
______________________________	__________	_________	_________
Performed by:	Date:	Time:	

8.0 ACCEPTANCE CRITERIA

8.1 If this STP is performed for any reason other than for satisfying the PURPOSE as stated in Section 1.0, indicate below (otherwise mark this step "N/A"):

____

____

____

8.2 **IF** test was performed to establish pump reference values, **THEN** review and IST Engineer approval of test data (per ACP 1407.3) is required prior to declaration of component operability (N/A if test was not performed to establish reference values). ________ (IST Engineer)

8.3 All Technical Specification required items, as indicated by "TS", have been performed satisfactorily:

8.3.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified ________

8.4 All ASME required items, as indicated by (ASME), have been performed satisfactorily:

8.4.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified ________

8.5 All other items checked in this test performed satisfactorily.

8.5.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified ________

8.6 Indicate any relevant test comments below, otherwise mark this step "N/A":

____

____

____

____

____ ________________
Operations Date

____ ________________
Surveillance Coordinator Date

9.0 ATTACHMENTS

9.1 Attachment 1 - Post-STP Completion Checklist

DEVICE NUMBER	DEVICE LOCATION	DEVICE DESCRIPTION	DEVICE POSITION	INITIALS (IV)
V-32-110	Skid West Side	"B" SBDG Air Start Header Vent	CL	
V-32-109	Skid West Side	Air Isolation To Oil Booster Tanks	OP	
V-32-147	Skid West Side	Diesel Air Start Isol From Electric Compressor	LOP*	
V-32-186	Skid LOF	PI-3268B Filter Outlet Low Pressure Root Isol	CL	
V-32-187	Skid LOF	PI-3268B Filter Inlet High Pressure Root Isol	CL	
V-32-185	Skid LOS	PI-3269B Strainer Outlet Low Pressure Root Isol	CL	
V-32-184	Skid LOS	PI-3269B Strainer Inlet High Pressure Root Isol	CL	
SPEED	Woodward Governor	Droop Control	0 (zero)	
LOAD	Woodward Governor	Fuel Control	MAX	
Speed Control	Woodward Governor	Speed Control	21.38	
HS-3234B	1C94	Governor Mode Switch (Droop)	UNIT	
HS-3281B	1C94	Idle-Rated Switch	RATED	

* A locked valve shall be secured by a padlocked chain or cable passed around a pipe or other substantial stationary object, and passed through or around the valve handwheel in such a way as to preclude unintentional valve operation.

______________________________ ____________ /__________
Performed By Date Time

______________________________ ____________ /__________
Approved by CRS Date Time

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC SIM JPM S-7

TITLE: Withdraw Control Rods during Reactor Startup

SITE: DAEC

JPM TITLE: Withdraw Control Rods during Reactor Startup

JPM NUMBER: AUDIT S-7 **REV.** 2

RELATED PRA INFO: None

TASK NUMBER(S) / TASK TITLE(S): 84.02 /Substitute Rod Position

K/A NUMBERS AND VALUES: SYSTEM: 201006 Rod Worth Minimizer System (RWM)
A4.06, Ability to manually operate and/or monitor in the control room: Selected rod position indication.
IMPORTANCE: 3.2 / 3.2

Justification (FOR K/A VALUES <3.0): N/A

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:

In-Plant:	[ ]	Control Room:	[ ]
Simulator:	[X]	Other:	[ ]
Lab:	[ ]		

Time for Completion: 15 Minutes Time Critical: NO

Alternate Path / Faulted: YES

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago	01/25/13
	WTS JPM Developer	Date
Validated by:		
	Validation Instructor	Date
Reviewed by:		
	Plant Reviewer	Date
Approved by:		
	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

________________________ ________________________

Validation Personnel /Date Validation Personnel/Date

________________________ ________________________

Validation Personnel /Date Validation Personnel/Date

SIMULATOR SET UP:

1. Reset to the saved IC (IC 113) for this JPM ______
2. If the saved IC is not available, then reset to IC 18 and set up as follows:
   a. Insert the malfunction per the table below
   b. Place the simulator in **RUN** ______
   c. Clear recorders using the pushbutton behind 1C05 or the schedule file. ______
   d. Verify that the existing rod pattern is IAW the beginning of Step 26 of the pull sequence with rod 10-35 the next rod to be withdrawn from position 44 to 46 ______
   e. Select or verify selected, rod 10-35. Rod 34-11 is the 3rd rod to be withdrawn. ______
   f. Acknowledge and reset all alarms ______
   g. Place the simulator in **FREEZE** ______
   h. If re-using this JPM, save setup to an available IC or snapshot ______
3. Place the simulator in **RUN** when the candidate begins the JPM ______

TRIGGERS: None

SIMULATOR MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	ET	Delay	F. Sev.	Ramp	I. Sev.
Setup	rd04a3411	CR RPIS REED SW FAILURE OPEN- ROD 34-11		00:00:00	46	NA	46

SIMULATOR OVERRIDES: None

SIMULATOR REMOTE FUNCTIONS: None

Required Materials:
1. AOP 255.1, Control Rod Movement / Indication Abnormal
2. OI 878.8, NUMAC Rod Worth Minimizer System
3. Control rod sequence package

General References:
1. ARP 1C05A, D-6, Rod Drift, Rev. 70
2. AOP 255.1, Control Rod Movement / Indication Abnormal
3. OI 878.8, NUMAC Rod Worth Minimizer System, Rev. 22

Task Standards:
1. Withdraw rods 10-35, 34-35 and 34-11 to position 46.
2. Determine that a loss of position indication has occurred for rod 34-11.
3. Determine that entering a substitute rod position into the RWM is required.
4. Substitute position of 46 is entered for control rod 34-11 IAW OI 878.8.

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- A reactor plant startup is in progress IAW IPOI 2, Startup.
- Reactor power is ~ 20%.
- Power ascension via control rod withdraw is continuing.
- Rod withdraw status: Step 26 control rods are at position 44 and control rod 10-35 is the next rod to be withdrawn.
- The reactivity brief has been completed.
- Assume a second operator is peer checking any required control rod movement.

INITIATING CUES:

- Raise power to ~ 25% via control rod withdraw.
- This Task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: 1 **Critical: N**	Verify that the next rod to be withdrawn is rod 10-35.
Standard:	• Verifies that rod 10-35 is the next rod to be withdrawn by reviewing the rod sequence sheets. • Determines that the rod is to be withdrawn from position 44 to position 46. • Verifies rod is selected and at position 44.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 2 **Critical: Y**	Withdraw rod 10-35 to position 46.
Standard:	• Momentarily places the ROD MOVEMENT CONTROL Switch C11A-S2 in the OUT-NOTCH position. • Rod 10-35 withdraws one notch and settles at position 46.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 3 Select next rod to be withdrawn.
Critical: Y

Standard:

- Determines that rod 34-35 is the next rod to be withdrawn by reviewing the rod sequence sheets.
- Determines that the rod is to be withdrawn from position 44 to position 46.
- Selects rod 34-35.
- Verifies rod is selected and at position 44.

Performance: **SATISFACTORY ______UNSATISFACTORY ______**

Comments: ____

Performance Step: 4 Withdraw rod 34-35 to position 46.
Critical: Y

Standard:

- Momentarily places the ROD MOVEMENT CONTROL Switch C11A-S2 in the OUT-NOTCH position.
- Rod 34-35 withdraws one notch and settles at position 46.

Performance: **SATISFACTORY ______UNSATISFACTORY ______**

Comments: ____

Performance Step: 5 Select next rod to be withdrawn.
Critical: Y

Standard:

- Determines that rod 34-11 is the next rod to be withdrawn by reviewing the rod sequence sheets.
- Determines that the rod is to be withdrawn from position 44 to position 46.
- Selects rod 34-11.
- Verifies rod is selected and at position 44.

Performance: **SATISFACTORY ______UNSATISFACTORY ______**

Comments: ____

Evaluator Note: The reed switch for position 46 is stuck open for rod 34-11. When the rod is withdrawn to position 46, position indication will be lost. After the Reactor Manual Control sequence timer times out, a Rod Drift alarm will occur. The Rod Worth Minimizer (RWM) will apply both insert and withdraw blocks. The RWM will display "FF" for the rod's position indicating an unknown position for rod 34-11.

Performance Step: 6 **Critical: Y**	Withdraw rod 34-11 to position 46.
Standard:	• Momentarily places the ROD MOVEMENT CONTROL Switch C11A-S2 in the OUT-NOTCH position. • Notes loss of position indication on the Four Rod Display for rod 34-11. • Notes Rod Drift and RWM alarms.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 7 **Critical: N**	Respond to unexpected alarm 1C05A, D-6, Rod Drift, and loss of position indication
Standard:	• Informs CRS of alarm. • Refers to ARP.
Evaluator Cue:	**Role Play as CRS as required and acknowledge report.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	______________________________

Evaluator Note: The following steps are derived from ARP1C05A, D-6, Rod Drift.

Evaluator Note: The candidate may determine at anytime that the problem is associated with a loss of rod position indication and not a drifting rod. If so, the candidate may recommend entering AOP 255.1, Control Rod Movement / Indication Abnormal, without referring to all the following ARP steps.

Evaluator Cue: If, at any time, the operator recommends entering AOP 255.1, Role Play as CRS and Cue the operator to enter and execute AOP 255.1.

Performance Step: 8 **Critical: <u>N</u>**	At 1C05, select affected Control Rod, monitor 4 rod display to determine if a control rod is drifting, and, if so, in what direction.
Standard:	• Determines that drift alarm is associated with rod 34-11 by observing which rod has the Red Drift Alarm illuminated. • Determines that this is the currently selected rod. • Determines that the rod is not drifting by observing position indication on the 4 rod display and moves on to the next step.
Evaluator Note:	**The Drift annunciator will alarm when a rod is not being moved via the Reactor Manual Control system and there are no even numbered reed switches closed for a given rod. Since the reed switch has failed open for position 46, there are no even number reed switches closed for this rod.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 9 **Critical: <u>N</u>**	IF any control rod is drifting OUT, perform the following:
Standard:	Determines that this step is not applicable and moves on to the next step.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 10 **Critical: <u>N</u>**	IF any control rod is drifting IN, perform the following:
Standard:	Determines that this step is not applicable and moves on to the next step.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 11 **Critical: <u>N</u>**	If any control rod has scrammed, perform the following:
Standard:	• Determines that the rod has not scrammed by observing that the Blue Scram light on the Full Core display is not illuminated for rod 34-11. • Candidate moves on to the next step.
Evaluator Cue:	**Candidate may also make this determination by observing other indications such as Full In indication on the Full Core Display or reactor power indications.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 12 **Critical: <u>N</u>**	If no control rods are drifting and rod position indication is lost at one notch, then enter AOP 255.1
Standard:	• Operator determines that a loss of position indication for this notch has occurred. • Recommends to the CRS that AOP 255.1 be entered.
Evaluator Cue:	**Role Play as CRS and Cue the operator to enter and execute AOP 255.1.**
Evaluator Note:	**This step is to be marked SAT as long as the candidate determines that a loss of position indication for this notch has occurred. This may be determined via use of the ARP, observing the RWM display, or other indications.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Evaluator Note: The following steps are derived from AOP 255.1, Control Rod Movement / Indication Abnormal.

Performance Step: 13 **Critical: N**	Obtain AOP 255.1 and determine appropriate section.
Standard:	Determines that Section ABNORMAL ROD CONTROL AND POSITION INDICATIONS is appropriate.
Evaluator Note:	**There are three sections of this AOP. The 1st two sections are not applicable.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 14 **Critical: N**	If necessary or desirable for reactor safety, manually scram the reactor.
Standard:	Determines that a reactor scram is not warranted and moves on to the FOLLOW-UP ACTIONS.
Evaluator Note:	**This is the only Immediate Action of this section.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	______________________________

Evaluator Note: The following Note is prior to the first FOLLOW-UP Action. This note is not applicable to any anticipated action in the JPM.

NOTE

When attempting to move a rod, the following indications should be observed on 1C05:

a. White Rod Selected light on the four-rod display.
b. White Rod Number light on the full-core display.
c. Green ROD IN light, Red ROD OUT light, Amber ROD SETTLE light and White ROD PERMISSIVE light at the Rod Movement Control Switch.
d. CRD Drive Water Flow indicated at FI-1829A, (CRD Flow) Drive Water Flow.
e. LPRM indication, especially the LPRM string nearest the selected rod.

All indicating lights are considered operable for this procedure.

Performance Step: 15 **Critical: N**	**IF** a Rod Block exists, **THEN** concurrently perform ARP 1C05B (A-6) Rod Out Block.
Standard:	Determines that annunciator 1C05B (A-6) Rod Out Block has not alarmed and moves on to the next step.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 16 **Critical: N**	**IF** the White Rod Selected and/or White Rod Number light does not operate, **THEN a**ttempt to select different rod(s) to verify if the rod select matrix works.
Standard:	• Determines that the select matrix is working by observing the select matrix indications (White Rod Selection and/or White Rod Number lights function). • Moves on to the next step.
Evaluator Cue:	**Candidate may select a different rod to verify this function.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 17 **Critical: N**	**IF** a rod cannot be selected, **THEN** notify the Reactor Engineer and the Operation's Manager.
Standard:	Determines that a rod CANNOT be selected, notifies the Reactor Engineer and the Operation's Manager and moves on to the next step.
Evaluator Cue:	**Acknowledge that a rod cannot be selected and direct the operator to move on to the next step.**
Evaluator Note:	**Candidate may select a different rod to verify this function.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 18 **Critical: N**	IF selected rod does not indicate movement AND drift alarm occurs on a different control rod, THEN RPIS probes in the undervessel area may be misconnected (selected rod is actually moving but position changes indicate at another rod's coordinates) and a Work Request and an AR should be issued.
Standard:	Determines that this step is not applicable.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 19 **Critical: Y**	IF rod position indication is lost at one notch, THEN consult with CRS/OSM and Reactor Engineer to enter Substitute Rod Position, as necessary, AND attempt to move the affected rod, as allowed by rod sequence, to an adjacent notch to check for reed switch failure AND consult with CRS/OSM and Reactor Engineer to modify rod pattern if necessary to avoid leaving the control rod at the notch(es) with no position indication AND issue a Work Request to repair RPIS.
Standard:	Determines that entering a substitute rod position is necessary.
Evaluator Note:	Indications that the position indication is lost for notch 46 include: • "FF" displayed on the RWM (position unknown) • Loss of position indication on the 1C05 Four-Rod display when rod 34-11 is selected • "99" displayed on the process computer for the position of rod 34-11
Evaluator Cue:	**When consulted, Role Play as CRS/OSM and direct the operator to enter a substitute rod position for control rod 34-11.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 20	Determine the appropriate procedure.
Critical: N	
Standard:	Determines that OI 878.8, NUMAC Rod Worth Minimizer System, Section 8.2, ROD POSITION SUBSTITUTION is applicable.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	______________________________

Evaluator Note: The following steps are derived from OI 878.8, NUMAC Rod Worth Minimizer System, Section, 8.2 ROD POSITION SUBSTITUTION.

Evaluator Note: The following Note and Caution are before the first step of Section 8.2.

NOTE

This feature is not available in the INOP mode. A substitute position may be entered only if the rod position is unknown to the RWM AND there are no critical Self-Test failures. No more than eight substitute rod positions are allowed.

CAUTION

A rod with a substituted position must be moved prior to substituting another position.

Performance Step: 21	Verify the Rod Worth Minimizer (RWM-CC) keylock MODE switch in the OPER position.
Critical: N	
Standard:	Determines that the Rod Worth Minimizer computer chassis MODE switch is in OPER and moves on to the next step.
Evaluator Cue:	The Rod Worth Minimizer computer chassis is on a back panel.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 22	At Panel 1C05, verify the Rod Worth Minimizer operator's display (RWM-OD) keylock mode switch is in the OPERATE position.
Critical: N	
Standard:	Determines that the RWM-OD keylock mode switch is in the OPERATE position and moves on to the next step.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 23 **Critical: Y**	Press the ETC softkey until the SUBSTITUTE OPTIONS menu choice becomes available.
Standard:	ETC softkey pressed until SUBSTITUTE OPTIONS becomes available.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 24 **Critical: Y**	Press the appropriate softkey. The screen will display all rods which have been substituted (eight maximum) and their corresponding substitute positions.
Standard:	SUBSTITUTE OPTIONS softkey pressed.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Evaluator Note: The following Note is before the next step of the procedure.

NOTE

If the selected rod has faulty position data and there are less than eight rods on the substitute rod list, the Rod Worth Minimizer-Operator Display (RWM-OD) display will prompt: NEW POSITION TO SUBSTITUTE:, followed by a position value.

Performance Step: 25 **Critical: Y**	Press the INCREMENT POSITION or DECREMENT POSITION softkey as required to select the desired position.
Standard:	Appropriate softkey pressed until position 46 is selected.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 26 **Critical: _N_**	Independently verify the desired position is indicated on the RWM Operator's Display.
Standard:	Requests independent verification of the position selected in the previous step.
Evaluator Cue:	**Role Play as an Independent Verifier; and, regardless of what position is selected, Cue that the correct position has been selected. Initial step (6) of the procedure.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 27 **Critical: _Y_**	Press the ENTER SUBSTITUTE softkey.
Standard:	ENTER SUBSTITUTE softkey pressed.
Evaluator Cue:	The screen will display the change to the substitute rod list and the selected rod position will indicate SUB'D
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 28 **Critical: _N_**	Verify the screen displays the change to the substitute rod list and the proper substituted position.
Standard:	Determines that screen correctly displays the change to the list and the correct rod position.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 29 **Critical: _N_**	Press the EXIT softkey to return to the main menu.
Standard:	EXIT softkey pressed.
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Performance Step: 30 **Critical: _N_**	Determine that a substitute position of 46 has been entered into the RWM and that rod withdraw can continue.
Standard:	Notes that the RWM ROD BLOCK alarm clears and that the RWM displays the position for rod 34-11 as 46.
Evaluator Cue:	**When the candidate has determined that rod withdraw can be continued, Cue that the JPM has been completed.**
Performance:	**SATISFACTORY ______UNSATISFACTORY ______**
Comments:	____

Terminating Cues: **Substitute value of 46 has been entered for rod 34-11.**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: ___________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ____________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ______________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- A reactor plant startup is in progress IAW IPOI 2, Startup.
- Reactor power is ~ 20%.
- Power ascension via control rod withdraw is continuing.
- Rod withdraw status: Step 26 control rods are at position 44 and control rod 10-35 is the next rod to be withdrawn.
- The reactivity brief has been completed.
- Assume a second operator is peer checking any required control rod movement.

INITIATING CUES:

- Raise power to ~ 25% via control rod withdraw.
- This Task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

DUANE ARNOLD ENERGY CENTER

JOB PERFORMANCE MEASURE

2013 NRC SIM JPM S-8

TITLE: <u>Perform Required Actions for SBGT Overheating</u>

SITE:	DAEC
JPM TITLE:	Perform Required Actions for SBGT Overheating
JPM NUMBER:	NRC S-8 **REV.** 2
RELATED PRA INFO:	None
TASK NUMBER(S) / TASK TITLE(S):	7.11 /Perform emergency overheating actions
K/A NUMBERS AND VALUES:	SYSTEM: 261000 Standby Gas Treatment System A2.03, Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High train temperature IMPORTANCE: 2.9 /3.2
Justification (FOR K/A VALUES <3.0):	N/A

APPLICABLE METHOD OF TESTING: ☒ **RO** ☒ **SRO** ☐ **STA** ☐ **NSPEO** ☒ **SRO CERT**

Simulate/walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:				
	In-Plant:	[ ]	Control Room:	[ ]
	Simulator:	[X]	Other:	[ ]
	Lab:	[ ]		

Time for Completion: 20 Minutes Time Critical: NO

Alternate Path / Faulted: YES

TASK APPLICABILITY: SRO/RO

Developed by:	Mark Santiago WTS JPM Developer	01/25/13 Date
Validated by:	Validation Instructor	Date
Reviewed by:	Plant Reviewer	Date
Approved by:	Training Supervisor	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☐	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☐	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☐	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☐	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☐	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☐
8. Is the Licensee level appropriate for the task being evaluated if required?	☐	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☐	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☐
11. Have the performance steps been identified and typed (Critical / Sequence / Time Critical) appropriately?	☐	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☐	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☐	☐	☐
15. Are all critical steps clearly identified by procedural guidance? If licensing, EP or other groups were needed to determine correct actions, then the answer should be NO. (ACE 1729)	☐	☐	☐
16. If the JPM is to be administered for initial qualification, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge. (ACE 1729)	☐	☐	☐

All questions/statements must be answered "YES" or the JPM is not valid for use. If all questions/statements are answered "YES" then the JPM is considered valid and can be performed as written. The individual(s) performing the validation shall sign and date this form.

____________________ Validation Personnel /Date

____________________ Validation Personnel/Date

____________________ Validation Personnel /Date

____________________ Validation Personnel/Date

SIMULATOR SET UP:

1. Reset to the saved IC (IC 112) for this JPM _______
2. If the saved IC is not available, then reset to IC 20 and set up as follows:
   a. Clear recorders using the pushbutton behind 1C05 or the schedule file. _______
   b. Create and validate Event Trigger 2 per the table below _______
   c. Insert malfunctions per the table below _______
   d. If re-using this JPM, save setup to an available IC or snapshot _______
3. Place the simulator in **RUN** _______
4. Be prepared to activate Event Trigger 3 when requested to open V-33-88, SBGT DELUGE SYSTEM 19 & 20 SHUTOFF valve. _______

TRIGGERS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
2	zdipchs5814a==1	True when HS 5814A, "A" SBGT Mode Select Switch is taken to the MAN position

SIMULATOR MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	ET	Delay	F. Sev.	Ramp	I. Sev.
Setup	pc12A	SBGT CHARCOAL HIGH TEMPERATURE- A SGBT		00:00:00	45	00:00:00	As is
	pc12A	SBGT CHARCOAL HIGH TEMPERATURE- A SGBT	2	00:00:00	72	00:00:07	45
Step 12	pc12A	SBGT CHARCOAL HIGH TEMPERATURE- A SGBT	3	00:00:00	15	00:00:20	72

SIMULATOR OVERRIDES: None
SIMULATOR REMOTE FUNCTIONS: None

Required Materials:
1. OI 170, SBGT System
2. Keys for Keylock Switches

General References:
1. OI 170, SBGT System, Rev. 60

Task Standards:
1. "A" SBGT MODE SELECT Switch HS-5814A is placed in the MAN position.
2. Depresses CARBON BED DELUGE pushbutton PB-5838A.
3. Calls an in-plant operator to manually open V-33-88, SBGT DELUGE SYSTEM 19 & 20 SHUTOFF valve.
4. When bed temperature is below 150°F, then depresses the "A" train CARBON BED DELUGE RESET Pushbutton.

EVALUATOR TURNOVER SHEET (Read to Applicant)

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- SBGT started on a Group 3 isolation
- “A” SBGT system started as expected; however, it is now overheating.

INITIATING CUES:

- Perform a Manual Cooldown of the SBGT train IAW section 9.1 of OI 170, Standby Gas Treatment System.
- This Task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e. the examinee looks or asks for the indication).

NOTE: Critical steps are shaded GREY and marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Evaluator Note: All controls and indications are located on panel 1C24A unless otherwise noted.

Evaluator Note: The following procedure Note is immediately before Section 9.1, Manual Cooldown of SBGT Train.

NOTE

These sections may be required at any time after any SBGT train has been used but will most likely be required immediately after a train is transferred from the operating mode to the standby mode or in shutting down a train from the operating mode to the Standby/Readiness condition.

Performance Step: 1 **Critical N**	At 1C24A[B] confirm carbon bed temperature on TI-5838A[B] CARBON BED TEMP is greater than 150°F.
Standard:	Determines that carbon bed temperature is ~ 180°F and continues on in the procedure.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Evaluator Note: The following Note and Continuous Recheck Statements are prior to the next step.

NOTE

The following steps will activate the "A"["B"] SBGT IN MANUAL MODE (1C24A[B], C-4) and SBGT PANEL 1C-24 TROUBLE (1C07A, B-11) annunciators.

CONTINUOUS RECHECK STATEMENT

(applicable to section 9.1)

IF bed temperatures are above 255°F and rising	**THEN** IMMEDIATELY proceed to Section 9.2.

♻ CONTINUOUS RECHECK STATEMENT (applicable to section 9.1 steps (3) thru the remainder of the section) ♻	
IF the SBGT Mode Select Switch is out of the AUTO position,	**THEN** the SBGT Train shall be considered inoperable.

Performance Step: 2 **Critical _N_**	If a LOCA is in progress, have the CRS consider swapping to the off-service SBGT bed. After the bed swap, continue on with this section, as resources become available.
Standard:	Determines that a LOCA is not in progress based on initial conditions and continues on to next step.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 3 **Critical _N_**	Verify SBGT LCO has been entered, if applicable.
Standard:	Questions CRS as to whether a LCO for the “A” SBGT have been entered.
Evaluator Cue:	Role Play as CRS, and Cue that the appropriate LCO for the SBGT System has been entered.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 4 **Critical <u>Y</u>**	Place A[B] SBGT MODE SELECT Switch HS-5814A[B] in the MAN position on Panel 1C24A[B].
Standard:	Places "A" SBGT MODE SELECT Switch HS-5814A in the MAN position.
Booth Instructor:	**Verify EVENT TRIGGER 2 activates to modify PC12A to 72 on a 7 second ramp.**
Evaluator Note:	**When this switch is placed in the MAN position, the Carbon Bed Temperature will begin to increase to a value of ~ 290°F.** **Annunciator 1C24A, B-3, "A" STANDBY GAS TREATMENT CARBON BED HIGH TEMP DELUGE PERMISSIVE will alarm when temperature is > 255°F.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Evaluator Note: At any time following receipt of the high temperature alarm, the candidate may determine that carbon bed temperature is > 255°F. If so, then the candidate may proceed directly to Section 9.2 of OI 170 IAW the previous Continuous Recheck Statement. If so, steps 5, 6 and 7 of this JPM may not be performed prior to the end of the JPM.

Performance Step: 5 **Critical <u>N</u>**	Respond to unexpected alarm 1C24A, B-3, "A" STANDBY GAS TREATMENT CARBON BED HIGH TEMP DELUGE PERMISSIVE.
Standard:	Notifies CRS. Refers to ARP.
Evaluator Cue:	**Role Play as CRS as required, and Cue the candidate to respond as appropriate to the unexpected alarm.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Evaluator Note: The next 2 steps of the JPM are derived from ARP 1C24A, B-3.

Evaluator Note: The following Note is prior to the first Operator Action Step of the ARP.

NOTE

At any temperature in the Carbon Bed above 255°F, the Operator as directed by the Control Room Supervisor, may initiate the Fire Protection System by opening V-33-88 (located Rx Bldg. 792, NE Corner by MG room door) and depressing CARBON BED DELUGE Pushbutton PB-5838A.

Performance Step: 6 **Critical N**	At Panel 1C-24A, confirm the Train "A" Carbon Bed temperature greater than 255°F on TI-5838A.
Standard:	Determines that Carbon Bed Temperature is > 255°F.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 7 **Critical N**	If greater than 255°F, perform Filter Unit Overheat actions of OI 170 (Standby Gas Treatment System).
Standard:	Determines that entry into section 9.2, FILTER UNIT OVERHEATING / EMERGENCY OVERHEATING is now required.
Evaluator Note:	**The decision to enter section 9.2 could also be based on the Continuous Recheck Statement of section 9.1.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Evaluator Note: The remaining steps in this JPM are derived from Section 9.2, of OI 170.

Evaluator Note: The following procedure Note, Caution and Continuous Recheck Statement are contained in Section 9.2, prior to the first step.

NOTE

At carbon adsorber temperatures of 255°F or more, the operator has the option of manually starting the fire deluge sprays to prevent excessive temperatures and possible hot spots which could cause combustion of the activated charcoal. V-33-88 has to be manually opened to initiate deluge flow.

CAUTION

Do not manually initiate the Charcoal Filter Bed Fire Protection Deluge System unless absolutely necessary because the SBGT train will be inoperable and it will be necessary to replace the activated charcoal in the unit.

♻ CONTINUOUS RECHECK STATEMENT (applicable to section 9.2) ♻	
IF fire deluge sprays are automatically activated at 310°F,	**THEN THEN** proceed to Step (4) immediately.

Performance Step: 8
Critical N

Confirm the "A"["B"] SBGT CARBON BED HI TEMP DELUGE PERMISSIVE (1C24A[B], B-3) annunciator.

Standard: Confirms that Annunciator 1C24A, B-3 is in alarm.

Performance: **SATISFACTORY ______ UNSATISFACTORY _____**

Comments: ____

Performance Step: 9
Critical N

On Panel 1C24A[B], perform the following:

(a) Verify CARBON BED TEMP TI-5838A[B] indicates above 255°F; otherwise, attempt to cool the affected bed per Section 9.1.

Standard: Determines that the temperature on TI 5838A indicates ~ 290°F.

Evaluator Note: **This step is flagged as a "Critical Step" within the procedure and the candidate should request a peer check.**

Evaluator Cue: **If asked to provide a peer check, Role Play as a Peer Checker and Cue that you concur that the temperature is above 255°F.**

Initial in the space provided in the procedure.

Performance: **SATISFACTORY ______ UNSATISFACTORY _____**

Comments: ____

Performance Step: 10 **Critical Y**	(b) As directed by the CRS, depress CARBON BED DELUGE pushbutton PB-5838A[B] for the affected SBGT Train.
Standard:	Questions CRS as to whether deluge should be initiated. Depresses CARBON BED DELUGE pushbutton PB-5838A.
Evaluator Cue	**If / when questioned, Role Play as CRS and ask the operator what he or she recommends. Then, Cue the operator to proceed with his or her recommendation.**
Evaluator Note:	**Annunciator 1C24A, C-3 STANDBY GAS TREATMENT SYSTEM CARBON BED HI-HI TEMP DELUGE INITIATION (TRAIN A), will alarm when the pushbutton is depressed.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 11 **Critical N**	If a LOCA is in progress, have the CRS consider swapping to the off-service SBGT bed. After the bed swap, continue on with this section as resources become available.
Standard:	Determines that a LOCA is not in progress and continues on to next step.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 12 **Critical <u>Y</u>**	If the Fire Protection System is initiated, perform the following: (a) Near North Recirc MG air lock door, OPEN V-33-88 SBGT DELUGE SYSTEM 19 & 20 SHUTOFF.
Standard:	Calls an in-plant operator to manually open V-33-88, SBGT DELUGE SYSTEM 19 & 20 SHUTOFF.
Booth Instructor Cue	**Role Play as plant operator and Cue that you will manually open V-33-88, SBGT DELUGE SYSTEM 19 & 20 SHUTOFF, valve.** **Then, activate *EVENT TRIGGER 3*. This will lower Carbon Bed Temperatures.**
Evaluator Cue:	**If the candidate informs you that he/she would contact an in-plant operator to open V-33-88, Cue the candidate to call the instructor station to get in touch with the in-plant operator.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 13 **Critical <u>N</u>**	(b) Verify that Deluge Valves CV-5837A[B] open as indicated by lower bed temperatures on Panel 1C24A[B].
Standard:	Verifies that temperature on the overheated bed lowers.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 14 **Critical N**	(c) Verify that the emergency stop signal sent to the controls of A[B] SBGT TRAIN has performed the following on Panel 1C24A[B]: 1. Closed COOLDOWN/OUTSIDE AIR VLV AV-5801A[B] 2. Opened INTAKE VALVE AV-5825A[B] 3. Shut down CONSTANT HEATER EC-5805A[B] 4. Shut down VARIABLE HEATER ∆T CONTROLLER TDIC-5805A[B] 5. Closed FAN INLET VALVE AV-5815A[B] 6. Stopped EXHAUST FAN 1V-EF-15A[B]
Standard:	Verifies the following on 1C24A: 1. COOLDOWN/OUTSIDE AIR VLV AV-5801A is closed 2. INTAKE VALVE AV-5825A is open 3. CONSTANT HEATER EC-5805A is off 4. VARIABLE HEATER ΔT CONTROLLER TDIC-5805A is off 5. FAN INLET VALVE AV-5815A is closed 6. EXHAUST FAN 1V-EF-15A is stopped
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 15 **Critical N**	Verify SBGT LCO has been entered, if applicable.
Standard:	Recalls that the LCO was entered via the previous section and progresses on to the next step.
Evaluator Cue:	**If asked as to whether the LCO was entered, Role Play as CRS and Cue that the appropriate LCO has been entered.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 16 **Critical N**	Verify A[B] SBGT MODE SELECT HS-5814A[B] in MAN position on Panel 1C24A[B].
Standard:	Determines that the “A” Mode Selector Switch is already in the MAN position.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 17 **Critical N**	Place HS-5801A[B] COOLDOWN/OUTSIDE AIR VLV AV-5801A[B] to CLOSE.
Standard:	Places COOLDOWN/OUTSIDE AIR VLV AV-5801A handswitch to close.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 18 **Critical N**	Momentarily place HS-5816A[B] EXHAUST FAN 1V-EF-15 A[B] to STOP.
Standard:	Momentarily places HS-5816A EXHAUST FAN 1V-EF-15 A to STOP.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Performance Step: 19 **Critical N**	Place Fan Inlet valve AV-5815A[B] handswitch, HS-5815A[B], in CLOSE.
Standard:	Places Fan Inlet valve AV-5815A[B] handswitch, HS-5815A[B], in CLOSE.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	______________________________

Evaluator Note: The following procedure Caution is prior to the next step.

CAUTION
Care should be taken not to run high contaminated water into the small sump any longer than necessary.

Performance Step: 20 **Critical Y**	When the deluge water is no longer required, as bed temperatures drop below 150°F, depress the CARBON BED DELUGE RESET Pushbutton, PB-5837A[B] on Panel 1C24A[B].
Standard:	When bed temperature is below 150°F, then depresses the “A” train CARBON BED DELUGE RESET Pushbutton, PB-5837A.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Performance Step: 21 **Critical N**	Close V-33-88.
Standard:	Calls the in-plant operator to close V-33-88.
Booth Instructor Cue	**Role Play as in-plant operator and inform the candidate that you will manually close V-33-88, SBGT DELUGE SYSTEM 19 & 20 SHUTOFF, valve.**
Evaluator Cue	**After the candidate has requested that V-33-88 be closed, Cue that the JPM is complete.**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	____

Terminating Cue: **Deluge secured.**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}

Stop Time: ___________

Examinee: **Evaluator:**

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **NSPEO** ☐ **SRO CERT** **Date:** ______________

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO:** ☐ **YES:** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

The initial conditions that I read may not **exactly** match the simulator setup, assume that the conditions that I read you are **the correct** plant conditions.

- SBGT started on a Group 3 isolation
- “A” SBGT system started as expected; however, it is now overheating.

INITIATING CUES:

- Perform a Manual Cooldown of the SBGT train IAW section 9.1 of OI 170, Standby Gas Treatment System.
- This Task is not time critical.
- Inform the evaluator when you have completed the task.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator. {C002}