

Facility: Seabrook Station Exam Level (circle one): RO / SRO(I) / SRO(U)	Date of Examination: 6/02/03-6/06/03 Operating Test No.:
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B.1 Control Room Systems		
System / JPM Title	Type Code*	Safety Function
a. 001 Control Rod Drive / 1/M Plot performance. Identify that the reactor goes critical below -500 pcm value.	N, A, S, L	1
b. 006 ECCS / Transfer SI to Cold Leg Recirculation (CBS-V14 fails) (SRO-U)	D, A, S	2
c. 010 Primary Pressure Control System / Depressurize the RCS during a natural circulation cooldown with letdown unavailable IAW ES-0.2. (SRO-U)	N, A, S	3
d. 062 AC Electrical distribution / Loss of All AC Power; failure of EDG output breaker and charging pump auto start.	N, A, S	6
e. 028 Hydrogen Recombiners / Start hydrogen recombiners. (SRO-U)	D, S	5
f. 012 RPS Power Range NI Failure	D, S	7
g. 076 Service Water System / Transfer Service Water to the Cooling Tower	D, S	4(sec)
B.2 Facility Walk-Through		
a. 005 RHR / Manual Operation of RHR TCV for mid-loop operations. (SRO-U)	D, R	4(pri)
b. 064 EDG / Local EDG Normal Start and Load (SRO-U)	D	6
c. 061 EFW / Reset the TDEFW pump turbine trip throttle valve.	D	4(sec)

\* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: <u>Seabrook Station</u>		Date of Examination: _____
Examination Level: <b>SRO</b>		Operating Test Number: _____
<b>Administrative Topic/Subject Description</b>		<b>Describe method of evaluation:</b> 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Loss of RHR Cooling	2.1.25 Ability to obtain and interpret station reference materials such as as graphs, monographs, and tables which contain performance data. SRO: 3.1.  JPM: Evaluate loss of cooling conditions and determine time to boiling from chart.
	SDM Calculation Review	2.1.25 Ability to obtain and interpret station reference materials such as as graphs, monographs, and tables which contain performance data. SRO: 3.1.  JPM: Review a SDM calculation for Natural Circulation Cooldown.
A.2	Tagouts	2.2.13 Knowledge of tagging and clearance procedures. SRO: 3.8.  JPM: Review a tagout request.
A.3	Radiation control	2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. SRO: 3.1  JPM: Contaminated injured man actions.
A.4	Emergency Classification, Notifications, and PAR. JPM	2.4.38 Ability to take actions called for in the facility emergency plan, including (if required) supporting or acting as emergency coordinator. SRO: 4.0  JPM: Given a set of conditions, the applicant will make an EAL determination, PAR, and make required notifications.

Facility: <u>Seabrook Station</u>		Date of Examination: _____
Examination Level (circle one): <b>RO</b>		Operating Test Number: _____
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	QPTR Calculation JPM	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. RO: 3.9.  JPM: Perform required QPTR due to PRNI failure.
	SDM Calculation JPM	2.1.25 Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. RO: 2.8.  JPM: Perform a SDM calculation for Natural Circulation Cooldown.
A.2	Tagout JPM	2.2.13 Knowledge of tagging and clearance procedures. RO: 3.6.  JPM: Generate a danger tagout.
A.3	High Radiation Area Question	2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. RO: 2.5.  Question: Given the plant is in a Site Area Emergency, what is the highest dose a worker is allowed to receive in a non-emergency operation.
	Contamination Control Question	2.3.1 Knowledge of 10CFR20 and related facility radiation control requirements. RO: 2.6.  Question: Requirements for a Locked High Rad Area.
A.4	RO's Responsibilities During Emergency Plan Implementation	2.4.39 Knowledge of the RO's responsibilities in emergency plan implementation. RO: 3.3.  Question: E Plan reporting requirements during training (off watch).
		2.4.39 Knowledge of the RO's responsibilities in emergency plan implementation. RO: 3.3.  Question: Operator responsibilities during SGTR event.

JOB PERFORMANCE MEASURE WORKSHEET

JPM #1: 1/M PLOT DURING APPROACH TO CRITICALITY

ALTERNATE PATH

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 001K5.75 Definition, uses, and calculation of 1/M plot

# JOB PERFORMANCE MEASURE WORKSHEET

## VERIFICATION OF COMPLETION

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

# JOB PERFORMANCE MEASURE WORKSHEET

## 1.0 Task Number and Description:

Task number is N/A.

Applicant is to perform a 1/M plot during a normal approach to criticality. Shut down banks have been withdrawn. Staff will act as the primary RO and bring the reactor critical. Reactor will achieve criticality before reaching the -500 pcm rod height. The applicant should determine from the 1/M plot that the ECP is incorrect and recommend to the US/SM to stop the startup.

## 2.0 Conditions:

- Plant is in mode 3.
- All shutdown banks are withdrawn.
- All steps of OS1000.07 are complete up to and including 4.3.
- Procedure is currently in step 4.4 (WITHDRAW control banks to criticality)

## 3.0 Standards:

Perform 1/M plot in accordance with Form A: Manual Inverse Count Rate Ratio Plot (1/M) of OS1000.07, "Approach to Criticality". Notify US/SM that reactor will achieve criticality before -500 pcm. Applicant must locate actions for criticality for outside of 500 pcm band but above Rod Insertion Limit.

## 4.0 Student Materials:

- Copy of the Tear-Off Sheet.
- ECP paperwork.
- Procedure OS1000.07, "Approach to Criticality".
- Form A of OS1000.07, "Approach to Criticality".
- 1/M plotting paper.
- Calculator

## 5.0 Limitations on performance:

None.

## 6.0 References:

- OS1000.07, "Approach to Criticality".
- Form A of OS1000.07, "Approach to Criticality".

## 7.0 Setting

Simulator

## 8.0 Safety Considerations:

None

## JOB PERFORMANCE MEASURE WORKSHEET

### 9.0 Approximate Completion Time:

30 Minutes.

### 10.0 Initial Cue

A. You are tasked by the SM to perform Form A of OS1000.07, the 1/M plot.

B. You will have the following references: ECP, OS1000.07, "Approach to Criticality", Form A of OS1000.07, and a 1/M plotting sheet.

C. Plant conditions:

- The plant is in mode 3.
- All shutdown banks are withdrawn.
- Reactor startup is in progress per OS1000.07.
- All pre-job briefs are complete.

### 11.0 Attachments

- 1/M validation plot.
- Form A of RS1735, "Estimated Critical Position Data & Analysis Form"
- Form A of OS1000.07, "Manual Inverse Count Rate Ration Plot (1/M)"



**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical	SAT UNSAT	
S=Simulate	critical step	standard		

**CUE:** When applicant informs shift supervision that criticality was achieved outside +/-500 pcm, and explains actions above **inform them: "The JPM is complete"**

## Tear-Off Sheet for Applicant

A. Initial conditions:

- The plant is in mode 3.
- All shutdown banks are withdrawn.
- Reactor startup is in progress per OS1000.07.
- All pre-job briefs are complete.

B. You will have the following references: ECP, OS1000.07, "Approach to Criticality", Form A of OS1000.07, and a 1/M plotting sheet.

C. You are tasked by the SM to perform Form A of OS1000.07, the 1/M plot.

## Simulator Operator Instructions

Reset simulator to IC 186.

Set RCS boron concentration to 1650 ppm.

JOB PERFORMANCE MEASURE WORKSHEET

JPM #2: TRANSFER SI TO COLD LEG RECIRCULATION (CBS-V14 FAILS)

ALTERNATE PATH

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 006A4.05 Ability to manually operate and monitor in the control room:  
Transfer of ECCS flowpaths prior to recirculation.

JOB PERFORMANCE MEASURE WORKSHEET

VERIFICATION OF COMPLETION

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

# JOB PERFORMANCE MEASURE WORKSHEET

## 1.0 Task Number and Description:

Position: RO

0050500601 Align RH For SI Recirculation, Cold Leg  
0060500301 Transfer SI To Cold Leg Recirculation

## 2.0 Conditions:

- A. A reactor trip with SI occurred from 100% power.
- B. The US has transitioned through E-0 to E-1, and is ready to transition to ES-1.3.
- C. RWST level is decreasing toward the RWST LEVEL LO-LO setpoint.

## 3.0 Standards:

- A. Align ECCS equipment to the Cold Leg Recirculation Mode within the time limits specified in the body of this JPM. The time limits were determined in DCR 00-0013, "Manual Transfer to Cold Leg Recirculation Timing".

B.

## 4.0 Student Materials:

Copy of the Tear-Off Sheet.  
Copy of ES-1.3, "Transfer To Cold Leg Recirculation", Rev. 19

## 5.0 Limitations On Performance:

Simulate/Perform all steps. Verbalize all actions to the evaluator.

## 6.0 References:

CR 01-07468-01 [DCR 00-0013, Manual Transfer to Cold Leg Recirculation Timing (Entire JPM)]

Procedures:

- ES-1.3, Transfer To Cold Leg Recirculation
- OGP-1, Control Switch Operation

Sys	KA	Description	Value RO/SRO
013	A1.06	Predict/monitor changes in RWST levels.	3.6/3.9
013	A1.08	Predict/monitor changes in Ctmt sump level.	3.7/3.8
013	A3.02	Monitor operation of actuated equipment.	4.1/4.2
013	A4.03	Manually operate ESFAS initiation.	4.5/4.7

## JOB PERFORMANCE MEASURE WORKSHEET

### 7.0 Setting:

Simulator:

- A. The simulator can be initialized to any mode 1 IC, or to a snapshot IC for the JPM.
- B. Insert the following overrides to simulate inability to open CBS-V14.
  1. ON (CBS-V14 S signal reset lamp for RWST lo-lo, pg. PBF11)
  2. RESET (CBS-V14 S signal reset switch, pg. PBF11)
  3. CLOSE (CBS-V-14 control switch, pg. PBF12)
- C. Insert the double-ended RCS Cold Leg malfunction.
- D. Run the simulator while performing the following per E-0 and E-1:
  1. Trip RCPs.
  2. Reset SI.
  3. Throttle EFW.
  4. Shutdown both EDGs by stopping both, shutting SW-V16, and 18, resetting both diesels.
  5. Place the simulator in freeze when the RWST is approximately 130,000 gallons to ensure the automatic swap-over signal has not actuated.

### 8.0 Safety Considerations:

None

### 9.0 Approximate Completion Time:

20 minutes

### 10.0 Initiating Cue

A. Initial Conditions:

- A reactor trip with SI occurred from 100% power.
- The US has transitioned through E-0 to E-1, and is ready to transition to ES-1.3.
- RWST level has decreased to approximately 130,000 gallons.

B. You are the Primary Operator. You are going to transfer ECCS to the cold leg recirculation mode when we receive the RWST LEVEL LO-LO alarm.

C. Perform the task using ES-1.3, Transfer to Cold Leg Recirculation.

**US to Primary Operator, "Primary Operator (or student's name), let me know when we receive the RWST LEVEL LO-LO alarm, then you will transfer the Emergency Core Cooling System to Cold Leg Recirculation per ES-1.3."**

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT    UNSAT	

**This JPM is faulted - CBS-V14 fails to open. The student must use the RNO Column in Step 2 of ES-1.3. Under this condition, certain ES-1.3 actions have time limits that must be met to pass the JPM. The actions and time limits are:**

1. RH-P-8B & CBS-P-9B in PTL: ≤ 3 min. from “RWST LEVEL LO-LO” alarm actuation;
2. CBS-V2 & CBS-V5 CLOSED: ≤ 5 min. 48 sec. from “RWST LEVEL LO-LO” alarm actuation;
3. All CCPs and SIPs STOPPED: ≤ 11 min. from “RWST EMPTY” alarm actuation.

**NOTE: VERIFY THAT THE CONTROL SWITCH FOR CBS-V14 IS IN THE “AUTO” POSITION!**

**NOTE:** Ensure that the person reading the procedure reads the caution prior to step 1 of ES 1.3 to the student.

1.    P    Start time: \_\_\_\_\_                      Initiating cue read.                      \_\_\_\_\_

**CUE:** If the student requests a Peer Check at any time during the JPM, respond: “No one is available to peer check your actions. Please continue with the task”.

“RWST LEVEL LO-LO” alarm actuation:    Record time: \_\_\_\_\_

- |     |   |   |  |                 |
|-----|---|---|--|-----------------|
| *2. | P | Reset SI.   | *Verifies SI reset.                      |                 |
| *3. | P | Verify Containment sump recirc. valves - <u>FULL OPEN</u> :                             |  |                 |
|     |   | • TRAIN A – CBS-V8  | *• Verifies CBS-V-8 is open.             |                 |
|     |   | • TRAIN B – CBS-V14   | *• Verifies CBS-V-14 is <u>NOT</u> open. |                 |
|     |   | a. Perform RNO – manually open valves.  | *a. Attempts to open CBS-V14.            |                 |
|     |   | b. If a valve cannot be fully opened then place corresponding RHR and CBS pumps in PTL. | *b. Places CBS-P-9B and RH-P-8B in PTL.  |                 |
|     |   | <b>P-8B &amp; P-9B in PTL</b>   | <b>* Time</b>                            |                 |
|     |   |   | <b>* Δ Time</b>                          | <b>≤ 3 min.</b> |

\*4.    P    Simultaneously close RWST



**PERFORMANCE CHECKLIST**

D=Discuss P=Perform S=Simulate	<b>ELEMENT/STEP</b> *denotes a critical step	<b>STANDARD</b> *denotes critical standard	<b>EVALUATION</b> SAT    UNSAT	<b>INITIALS/DATE</b>
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- |   |  |
|---|--|
| e. Close RH-V14, RHR discharge to cold legs 1 and 2.                              | *e. Closes RH-V-14.  |
| f. Open SI and CCP suction cross-connects:<br>• CS-V460<br>• CS-V461<br>• CS-V475 | *f. Opens/ checks open:<br><br>• CS-V460<br>• CS-V461<br>• CS-V475             |
| g. Open RHR supplies to SI and CCP suction:<br>• RH-V35<br>• RH-V36               | *g. Opens:<br><br>* • RH-V35<br>• RH-V36 interlock with CBS-V14 keeps it shut. |
| h. Start any pump that was stopped due to RWST empty alarm.                       | *h. No action required since the empty alarm should not come in.               |

- |  |   |
|--|---|
| *6.    P    Isolate RWST feed to CCPs and SI pumps.            | Isolates RWST feed to CCPs and SI pumps.      |
| a. Close SI pump suction valves:<br>• CBS-V47<br>• CBS-V51     | *a. Closes:<br><br>• CBS-V47<br>• CBS-V51     |
| b. Close CCP suction valves:<br>• CS-LCV-112D<br>• CS-LCV-112E | *b. Closes:<br>• CS-LCV-112D<br>• CS-LCV-112E |

**CUE: "The JPM is complete."**

- |  |  |       |
|--|--|-------|
| 7.            Stop time<br><br>Evaluator calculates time to complete task. | Time to complete the task<br>≤ 20 minutes. | _____ |
|--|--|-------|

## Tear-Off Sheet for Applicant

### A. Initial Conditions:

- A reactor trip with SI occurred from 100% power.
- The US has transitioned through E-0 to E-1, and is ready to transition to ES-1.3.
- RWST level has decreased to approximately 130,000 gallons.

B. You are the Primary Operator. You are going to transfer ECCS to the cold leg recirculation mode when we receive the RWST LEVEL LO-LO alarm.

C. Perform the task using ES-1.3, Transfer to Cold Leg Recirculation.

## Simulator Operator Instructions

- A. The simulator can be initialized to any mode 1 IC, or to a snapshot IC for the JPM.
- B. Insert the following overrides to simulate inability to open CBS-V14.
- ON (CBS-V14 S signal reset lamp for RWST lo-lo, pg. PBF11)
  - RESET (CBS-V14 S signal reset switch, pg. PBF11)
  - CLOSE (CBS-V-14 control switch, pg. PBF12)
- C. Insert the double-ended RCS Cold Leg malfunction.
- D. Run the simulator while performing the following per E-0 and E-1:
- Trip RCPs.
  - Reset SI.
  - Throttle EFW.
  - Shutdown both EDGs by stopping both, shutting SW-V16, and 18, resetting both diesels.
  - Place the simulator in freeze when the RWST is approximately 130,000 gallons to ensure the automatic swap-over signal has not actuated.

JOB PERFORMANCE MEASURE WORKSHEET

JPM #3: DEPRESSURIZE THE RCS DURING A NATURAL CIRCULATION  
COOLDOWN

ALTERNATE PATH

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 004A4.09 Ability to manually operate and monitor in the control room:  
PZR spray and heater controls.

JOB PERFORMANCE MEASURE WORKSHEET

VERIFICATION OF COMPLETION

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

## JOB PERFORMANCE MEASURE WORKSHEET

### 1.0 Task Number and Description:

Task number is N/A.

Applicant is to depressurize the RCS during a natural circulation cooldown in accordance with ES-0.2, "Natural Circulation Cooldown". The letdown system will fail/isolate forcing an alternate method of depressurization in the procedure. The JPM is complete when the applicant depressurizes the RCS to 1900 psig in accordance with step 8 of ES-0.2.

### 2.0 Conditions:

- A. The crew is performing ES-0.2, "Natural Circulation Cooldown".
- B. Steps 1-7 are complete or are in progress.
- C. The reactor is tripped. RCPs are secured.
- D. RCS pressure is 2300 psig.

### 3.0 Standards:

The applicant is to reduce RCS pressure to 1900 psig using both the auxiliary spray followed by using the PZR PORVs when the letdown system fails.

### 4.0 Student Materials:

- ES-0.2, "Natural Circulation Cooldown"
- OS1202.01, "Loss of Letdown"

### 5.0 Limitations on performance:

Peer checks will be performed by the examiner. A Peer check will only consist of an acknowledgement or concurrence of the action peer checked.

### 6.0 References:

Procedures

- ES-0.2, "Natural Circulation Cooldown"
- OS1202.01, "Loss of Letdown"

Detailed Systems

- CS
- PPLC

### 7.0 Setting

Simulator

## JOB PERFORMANCE MEASURE WORKSHEET

### 8.0 Safety Considerations:

None

### 9.0 Approximate Completion Time:

15 minutes

### 10.0 Initial Cue

Initial Conditions:

- The crew is performing ES-0.2, "Natural Circulation Cooldown".
- Steps 1-7 are complete or are in progress.
- The reactor is tripped. RCPs are secured.
- RCS pressure is 2300 psig.

You are the primary reactor operator. The crew is cooling down and depressurizing the plant in accordance with ES-0.2, "Natural Circulation Cooldown". Steps 1-7 are complete. Your task is to complete step 8 of ES-0.2, "Depressurize RCS to 1900 PSIG".

**PERFORMANCE CHECKLIST**

	D=Discuss P=Perform S=Simulate	ELEMENT/STEP *denotes a critical step	STANDARD *denotes critical standard	EVALUATION		INITIALS/DATE
				SAT	UNSAT	
1.	P	Start time	_____ Initiating cue read.	_____		_____
2.	P	Step 8.b. Turn PZR heaters OFF.	Turns all PZR heaters OFF.			
*3.	P	Step 8.c. Use auxiliary spray per ATTACHMENT A.	Lines up auxiliary spray IAW attachment A. Uses auxiliary spray to reduce RCS pressure.  Place normal PZR spray valves controller(s) in manual and open normal PZR spray valves  OPEN CS-V142, CHG TO REGEN ISO  OPEN CS-V143, CHG TO REGEN ISO  OPEN CS-V185, PZR AUX SPRAY  Close normal charging loop isolation valves: CLOSE CS-V177  CLOSE CS-V180  Place CS-FK-121 in manual and charge at desired rate  Control RCS pressure as follows: Throttle normal PZR spray valves, as necessary.  Adjust charging flow, as necessary.  Adjust seal injection			

## PERFORMANCE CHECKLIST

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT    UNSAT	

flow as necessary using  
CS-HCV-182.

**Note:** When applicant completes spray lineup and initiates spray, letdown will be isolated and remains unavailable.

**CUE:** After applicant informs US of letdown isolation, inform applicant that letdown will remain unavailable for the remainder of the procedure.

5.	P	Blocks SI actuation before 1950 psig.	If pressure drops below 1950 psig then rises above 1950 psig, the SI PZR pressure block will have to be reset.
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**Note:** the above step may be not applicable if PZR pressure does not rise above 1950 psig during the performance of this procedure.

*6.	P	WHEN auxiliary spray is no longer required, then perform the following:	OPEN desired normal charging loop isolation valve:  OPEN CS-V177 OR OPEN CS-v180  CLOSE CS-V185, PZR AUX SPRAY  Place CS-FK-121 in AUTO  Close normal PZR spray valves as necessary.
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**CUE:** the operator may not execute the RNO without instruction from the US. If required, allow the RO to inform you that letdown is isolated. If necessary, order the RO to reduce pressure to 1900 psig using the PZR PORV in accordance with the step 8 RNO column.

*7.	P	Step RNO 8.a. IF letdown can NOT be established, THEN use one PZR PORV.	Use one PZR PORV to reduce pressure to 1900 psig.
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**CUE:** When pressure is reduced to 1900 psig using PZR PORVs, inform the applicant: **"The JPM is complete."**

## **Tear-Off Sheet for Applicant**

### **Initial Conditions:**

- The crew is performing ES-0.2, "Natural Circulation Cooldown".
- Steps 1-7 are complete or are in progress.
- The reactor is tripped. RCPs are secured.
- RCS pressure is 2300 psig.

You are the primary reactor operator. The crew is cooling down and depressurizing the plant in accordance with ES-0.2, "Natural Circulation Cooldown". Steps 1-7 are complete. Your task is to complete step 8 of ES-0.2, "Depressurize RCS to 1900 PSIG".

## Simulator Operator Instructions

Establish plant conditions for the cooldown (post-trip). Snap the IC the first day of exam week for exam security reasons. Save the IC and password protect it.

IC: \_\_\_\_\_

When the applicant complete the auxiliary spray line-up and initiates spray, fail letdown isolation valve CS-V150.

Sim Diagram CS1

cpCSV150    AOV Fails Closed

JOB PERFORMANCE MEASURE WORKSHEET

JPM #4: MANUAL START AND LOAD OF EDG AFTER LOSS OF ALL AC  
POWER

ALTERNATE PATH

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 064A4.01 Ability to manually operate and monitor in the control room:  
local and remote operation of the EDG.

# JOB PERFORMANCE MEASURE WORKSHEET

## VERIFICATION OF COMPLETION

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

## JOB PERFORMANCE MEASURE WORKSHEET

### 1.0 Task Number and Description:

Task number is N/A.

Applicant is to restore power to at least one AC bus by restoring the 'A' EDG in accordance with ECA-0.0 step 5. Both EDGs will fail to start automatically. EDG 1B will not start under any circumstance. EDG 1A's output breaker will fail to close automatically upon manual start. EDG 1A will not be able to start via the emergency start pushbutton but will start with the normal start pushbutton. Charging pump CS-P-2A will fail to start automatically on restoration of bus E5.

### 2.0 Conditions:

- A loss of all AC power has occurred from 100% power.
- The reactor is tripped.
- Both EDGs have failed to automatically start.
- Steps 1-5.b of ECA-0.0 are complete.

### 3.0 Standards:

The applicant must get EDG 'A' started, shut it's output breaker, and restore all loads prescribed by ECA-0.0 step 5.

### 4.0 Student Materials:

- ECA-0.0, "Loss of All AC Power"

### 5.0 Limitations on performance:

Peer checks will be performed by the examiner. The only response given by the examiner in a peer check will be a simple acknowledgement or concurrence.

### 6.0 References:

- ECA-0.0, "Loss of All AC Power"

### 7.0 Setting

Simulator

### 8.0 Safety Considerations:

None

## JOB PERFORMANCE MEASURE WORKSHEET

### 9.0 Approximate Completion Time:

20 minutes.

### 10.0 Initial Cue

Initial conditions:

- The plant was operating at 100% power.
- A loss of offsite power resulted in a plant trip.
- Both EDGs failed to start automatically.
- The crew is in ECA-0.0, "Loss of All AC Power".
- Steps 1 through 5.b have been completed.

Your task is to restore power to at least one emergency AC bus and restore vital loads in accordance with ECA-0.0 step 5.c-f.

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical	SAT UNSAT	
S=Simulate	critical step	standard		

1. P Start time: \_\_\_\_\_ Initiating cue read. \_\_\_\_\_

Note: The applicant will begin by verifying at least one EDG is running. Neither EDG is running. The operator should enter the RNO column for step 5.c. EDG 'B' will not start under any circumstance.

2. P Start EDG 1B using the emergency start pushbutton. Presses the emergency start pushbutton for EDG 1B. EDG 1B does NOT start.

3. P Start EDG 1B using the normal start pushbutton. Presses the normal start pushbutton for EDG 1B. EDG 1B does NOT start.

4. S Calls NSO to attempt EDG 1B start using slave relay K603 using test switch S909 at SSPS. Simulator operator simulates a FAILED attempt to start EDG 1B using relays.

NOTE: the applicant may attempt to start EDG 1A before attempting the manual starts below, if so, skip to step 11.

CUE: Simulator operator to control room: **'EDG 1B did not start using test switch S909 at SSPS'**

5. S Calls diesel operator to start EDG 1B locally. Simulator operator simulates a FAILED attempt to start EDG 1B using local control.

6. P RO orders EDG operator to place EDG 1B generator breaker control selector switch in LOCAL. CUE: simulator operator: Report when EDG 1B generator breaker control selector switch is in LOCAL.

7. P RO orders EDG operator to depress EDG 1B ENGINE RESET PUSHBUTTON. CUE: simulator operator: Report when EDG 1B ENGINE RESET PUSHBUTTON has been depressed.

8. P RO orders EDG operator to CUE: simulator

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical	SAT	UNSAT
S=Simulate	critical step	standard		

depress EDG 1B  
EMERGENCY START  
PUSHBUTTON

operator: Report when  
EDG 1B EMERGENCY  
START PUSHBUTTON  
has been depressed  
and that the diesel has  
NOT started.

9. P RO orders EDG operator to  
depress the TEST START  
pushbutton.

CUE: simulator  
operator: Report when  
the TEST START  
pushbutton has been  
depressed and inform  
control room that the  
diesel has not started.

10. P RO orders EDG operator to  
manually override main air start  
valve(s).

CUE: simulator  
operator: Report that  
the diesel did not start  
when the main air start  
valve(s) were opened.

NOTE: At this point, all attempts to start EDG 1B have failed, applicant will try to start EDG 1A.

11. P Start EDG 1A using the  
emergency start pushbutton.

Presses the emergency  
start pushbutton for  
EDG 1A. EDG 1A does  
NOT start.

\*12. P Start the 'A' EDG using  
NORMAL start.

Applicant starts 'A' EDG  
using normal start  
pushbutton.

Note: EDG 'A' starts but the output breaker does not shut.

\*13. P Step 5.e.2 Diesel generator  
breaker – CLOSED - NO

Manually closes the 'A'  
EDG output breaker.

Note: the operator should verify that the EPS is sequencing properly by observing the EPS status lights progress sequentially.

**Simulator Operator: delete override for CS-P-2A when the applicant attempts to start pump manually.**

\*14. P Step 5.e.3 Verify the following  
equipment loaded. The 'A'  
CCP failed to start  
automatically.

Start CS-P-2A  
manually.

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT    UNSAT	

**CUE:** When emergency bus E5 is energized and step 5.f has been completed, inform the applicant **“The JPM is complete”**

## **Tear-Off Sheet for Applicant**

Initial conditions:

- The plant was operating at 100% power.
- A loss of offsite power resulted in a plant trip.
- Both EDGs failed to start automatically.
- The crew is in ECA-0.0, "Loss of All AC Power".
- Steps 1 through 5.b have been completed.

Your task is to restore power to at least one emergency AC bus and restore vital loads in accordance with ECA-0.0 step 5.c-f.

## Simulator Operator Instructions

Reset simulator to IC 100.

### **Failure of 'A' EDG to start automatically.**

MFED031 DG1A AUTO START FAILURE
OVERRIDE DG1A EMERGENCY START PB TO RELEASE

### **Failure of 'B' EDG to start manually or automatically**

MFED033 DG1B AUTO START FAILURE
OVERRIDE DG1B EMERGENCY START PB TO RELEASE
OVERRIDE DG1B NORMAL START SWITCH TO NORMAL

### **Failure of CS-P-2A to start automatically**

MFCS001 CS-P-2A FAILS TO AUTO START
MFEPS001 EPS TRAIN A PR1 DOES NOT ENERGIZE
NFEPS002 EPS TRAIN A PR1X DOES NOT ENERGIZE

Simulator operator is to act as NSO when locally starting the EDGs as written in the Performance Checklist.

Delete OVERRIDE on CS-P-2A when operator attempts to start pump manually.

JOB PERFORMANCE MEASURE WORKSHEET

JPM #5: START HYDROGEN RECOMBINERS

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 028A4.01 Ability to operate and monitor in the control room: HRPS controls.

JOB PERFORMANCE MEASURE WORKSHEET

VERIFICATION OF COMPLETION

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

## JOB PERFORMANCE MEASURE WORKSHEET

### 1.0 Task Number and Description:

Position: RO

0280500201 Start 'A' H<sub>2</sub> Recombiner From The Main Control Room.

### 2.0 Conditions:

This JPM can be implemented with any plant conditions such that the electric plant can support operation of the recombiners.

### 3.0 Standards:

Place a hydrogen recombiner in service.

### 4.0 Student Materials:

Copy of the Tear-Off Sheet.

Copy of OS1023.40, Hydrogen Recombiner Operation, Rev. 7, Chg. 1.  
Calculator.

### 5.0 Limitations On Performance:

Simulate/Perform all steps. Verbalize all actions to the evaluator.  
Even if requested, no Peer Checks will be provided during the JPM.

### 6.0 References:

Procedures:

- FR-C.1, Response To Inadequate Core Cooling.
- OS1023.40, Hydrogen Recombiner Operation.
- OGP-1, Control Switch Operation.

Technical Specifications:

- 3.6.4.2, Combustible Gas Control - Electric Hydrogen Recombiners

## JOB PERFORMANCE MEASURE WORKSHEET

Sys	KA	Description	Value RO/SRO
2.1	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of operation.	3.9/4.0
2.1	2.1.21	Ability to obtain and verify controlled procedure copy.	3.1/3.2
2.1	2.1.20	Ability to execute procedure steps.	4.3/4.2
2.1	2.1.31	Ability to locate control room switches, controls, and indications, and determine that they are correctly reflecting the desired plant lineup.	4.2/3.9

### 7.0 Setting:

Simulator: Any IC may be used. **Perform this JPM on the back of the MCB at the recombiner control panel. The simulator must be in RUN to allow the PWR OUT meter to respond to the potentiometer.**

**Verify the "PWR OUT" potentiometer is at MINIMUM prior to beginning the JPM.**

### 8.0 Safety Considerations:

None

### 9.0 Approximate Completion Time:

20 minutes

### 10.0 Initial Cue:

**US to Secondary Operator, "Secondary Operator (or student's name), we are in FR-C.1, and containment hydrogen concentration is presently 3.4%. Place Hydrogen Recombiner 'A' in service per OS1023.40, Hydrogen Recombiner Operation. Report to me when the recombiner is in service.**

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT UNSAT	

1. P Start time: \_\_\_\_\_ Initiating cue read. \_\_\_\_\_

**CUE:** If the student request a Peer Check at any time during the JPM, respond: "No one is available to peer check your actions. Please continue with the task".

**NOTE:** Place the Simulator in RUN.

**NOTE:** If asked by the student, "The electrical lineup has been completed".

**CUE:** When student checks light, evaluator to student, "The light is energized."

2. S Verify the white PWR. IN AVAIL. light is energized. Verifies the PWR. IN AVAIL. light is energized. \_\_\_\_\_

3. P Set the PWR. ADJ. potentiometer to zero. Turns PWR ADJ pot to 000. \_\_\_\_\_

\*4. P Place the PWR. OUT SW. switch to the ON position and VERIFY that the red light on the switch plate comes on. \* • Moves switch to ON position. \_\_\_\_\_

• Verifies the red light is on. \_\_\_\_\_

**CUE:** AT EACH POWER LEVEL, INFORM THE OPERATOR THE STATED TIME HAS ELAPSED

\*5. Energize the Hydrogen Recombiner heater by PERFORMING the following: Energizes the recombiner: \_\_\_\_\_

P a. TURN the PWR. ADJ. Potentiometer clockwise until 5 kW is indicated on the PWR. OUT meter. MAINTAIN the 5 kW value for at least 10 minutes. \*a. Turns the PWR ADJ pot clockwise until 5 kW is indicated. Maintain 5 kW for 10 minutes. \_\_\_\_\_

P b. TURN the PWR. ADJ. Potentiometer clockwise until 10 kW is indicated on the PWR. OUT meter. MAINTAIN the 10 kW value for at least 10 minutes. \*b. Turns the PWR ADJ pot clockwise until 10 kW is indicated. Maintain 10 kW for 10 minutes. \_\_\_\_\_

**PERFORMANCE CHECKLIST**

D=Discuss P=Perform S=Simulate	ELEMENT/STEP *denotes a critical step	STANDARD *denotes critical standard	EVALUATION		INITIALS/DATE
			SAT	UNSAT	
P	c. TURN the PWR. ADJ. Potentiometer clockwise until 20 kW is indicated on the PWR. OUT meter. MAINTAIN the 20 kW value for at least 5 minutes.	*c. Turns the PWR ADJ pot clockwise until 20 kW is indicated. Maintain 20 kW for 5 minutes.	_____	_____	
P	d. DETERMINE the recombiner power setting per Form A, Power Out Setpoint Calculation.	d. Refers to Form A.	_____	_____	
P	e. Calculate the H <sub>2</sub> recombiner power setpoint by performing the following:	e. Determines power setting:			

**CUE:** When the student locates any of the required pressure instruments, cue the student: **“Containment pressure is 4 psig.”**

- |   |   |       |       |
|---|---|-------|-------|
| <ul style="list-style-type: none"> <li>• DETERMINE the current containment pressure from SI-PI-934 or SI-PI-935, MCB containment pressure indicators.</li> </ul>  | <ul style="list-style-type: none"> <li>• Determines the current cntmnt pressure from SI-PI-934 or 935.</li> </ul>   | _____ | _____ |
| <ul style="list-style-type: none"> <li>• Current Containment Pressure + 14.7 psi = psia</li> </ul>  | <ul style="list-style-type: none"> <li>• Converts cntmnt pressure to psia and records on data sheet (= 18.7 psia).</li> </ul>   | _____ | _____ |
| <ul style="list-style-type: none"> <li>• Pre-accident Containment Average Temperature is 120°F.</li> </ul>  | <ul style="list-style-type: none"> <li>• No action required.</li> </ul>   |       |       |
| <ul style="list-style-type: none"> <li>• Using containment absolute pressure, pre-accident containment average temperature and Figure 2, Recombiner Power Correction Factor Curve determine the Pressure Factor (C<sub>p</sub>).</li> </ul> | <ul style="list-style-type: none"> <li>* • Determines C<sub>p</sub> and Records on data sheet - (C<sub>p</sub> = 1.17 - 1.20).</li> </ul> <p>Enter student C<sub>p</sub> value:<br/>C<sub>p</sub> = _____</p> | _____ | _____ |

**PERFORMANCE CHECKLIST**

D=Discuss P=Perform S=Simulate	<b>ELEMENT/STEP</b> *denotes a critical step	<b>STANDARD</b> *denotes critical standard	<b>EVALUATION</b>  SAT    UNSAT	<b>INITIALS/DATE</b>
--------------------------------------	--	--	---------------------------------------	----------------------

- MULTIPLY the Pressure Factor ( $C_p$ ) by Reference Power (45.24 kW).  
  
 $(C_p) \times 45.24 = \text{Power Setting kW}$

- Multiplies  $C_p$  by the reference power. Records on data sheet - (52.9 – 54.3 kW).  
  
 Enter student kW value:  
 KW = \_\_\_\_\_

\_\_\_\_\_

**CUE:** If the student requests a second person verification, respond: **“For the purpose of this evaluation, a second verification will not be performed. Please continue with the procedure.”**

- Have a second person VERIFY the power setting calculation.

- Requests second person verification.

\_\_\_\_\_

- P    f. Turn the PWR. ADJ. potentiometer clockwise until the power setpoint, as calculated in Step 4.2.4.4, is indicated on the PWR OUT meter.

- \*f. Turns the PWR ADJ pot clockwise until the power setpoint is indicated on the PWR OUT meter.

\_\_\_\_\_

**CUE:** When student mentions that conference with the TSC is necessary to determine recombiner effectiveness, inform the student, **“The STED is aware of this and in contact with the TSC on this matter.”**

- P    g. CONFER with the TSC to determine recombiner effectiveness and the need to make adjustments to recombiner power.

- g. Attempts to confer with the TSC.

\_\_\_\_\_

**CUE:** **“The JPM is complete.”**

6.            Stop time  
  
               Evaluator calculates time to complete task.

Time to complete the task  
 $\leq 20$  minutes.

\_\_\_\_\_

## **Tear-Off Sheet for Applicant**

**US to Secondary Operator, "Secondary Operator (or student's name), we are in FR-C.1, and containment hydrogen concentration is presently 3.4%. Place Hydrogen Recombiner 'A' in service per OS1023.40, Hydrogen Recombiner Operation. Report to me when the recombinder is in service.**

## Simulator Operator Instructions

Reset the simulator to any convenient IC.

JOB PERFORMANCE MEASURE WORKSHEET

JPM #6: POWER RANGE NI FAILURE

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 015A2.01 Ability to predict the impacts of the following malfunctions on the NIS and use procedures to mitigate, control, or correct the consequences of those malfunctions: power supply loss or erratic operation.

# JOB PERFORMANCE MEASURE WORKSHEET

## VERIFICATION OF COMPLETION

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

## JOB PERFORMANCE MEASURE WORKSHEET

### 1.0 Task Number and Description:

Position: RO

0150402101 Electronically Remove A Failed NI Detector

### 2.0 Conditions:

- A. Plant is in mode 1 at 100% power.
- B. The US entered OS1211.04, Power Range NI Instrument Failure, in response to channel N42 failing high.

### 3.0 Standards:

Remove NI channel N42 from service per OS1211.04.

### 4.0 Student Materials:

- A. Copy of the Tear-Off sheet.
- B. Copy of OS1211.04, Power Range NI Instrument Failure, Rev. 9, Chg. 1.

### 5.0 Limitations on performance:

Simulate/Perform all steps. Verbalize all actions to the evaluator.  
Even if requested, no Peer Checks will be provided during the JPM.

### 6.0 References:

Procedures:

OS1211.04, Power Range NI Instrument Failure  
OGP-1, Control Switch Operation

Technical Specifications:

3.3.1 RX Trip System Instrumentation  
3.2.4 QPTR

Drawings:

1-NHY-509043, 509044 NI Functional Diagrams

## JOB PERFORMANCE MEASURE WORKSHEET

Sys	KA	Description	Value RO/SRO
015	A1.04	Quadrant power tilt ratio.	3.5/3.7
015	A2.02	Faulty operation.	3.1/3.5
015	A4.01	Selection of controlling NIS channel.	3.6/3.6
015	A2.01	Power supply loss or erratic operation.	3.5/3.9

### 7.0 Setting:

Simulator

A. Initialize the simulator to a 100% power IC. Place the simulator in RUN.

### 8.0 Safety Considerations:

None

### 9.0 Approximate Completion Time:

15 minutes

### 10.0 Initiating Cue:

Initial conditions:

- The plant is at 100% power.
- Power range channel, NI-42, has failed.
- The US entered OS1211.04, "Power Range NI Instrument Failure", in response to channel N42 failing high.

US to applicant: "Reactor operator, remove power range channel N42 from service in accordance with OS1211.04, "Power Range NI Instrument Failure".

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT UNSAT	

1. P Start time \_\_\_\_\_ Initiating cue read. \_\_\_\_\_

**CUE:** If the student requests a Peer Check at any time during the JPM, respond: **"No one is available to peer check your actions. Please continue with the task".**

**CUE:** If the student asks if electrical load is decreasing, the US should respond that it is not.

\*2. P Check Power Range Channel - FAILED HIGH. Reports NI-42 failed high. \_\_\_\_\_

a. Place rod control in Manual. a. Verifies rods in Manual. \_\_\_\_\_

b. Select Rod Stop Bypass switch - TO FAILED CHANNEL \*b. Selects N42 on the rod stop bypass switch. \_\_\_\_\_

c. Check  $T_{avg}$  - within 1°F Of  $T_{ref}$ . c. Checks/Controls  $T_{avg}$  within 1°F of  $T_{ref}$ . \_\_\_\_\_  
 • If  $T_{avg} > T_{ref}$  by more than 1°F, manually control rod motion or turbine load to restore temperature.

\*3. P Bypass The Failed Power Range Channel: Bypasses the failed channel: \_\_\_\_\_

a. Select the following NI cabinet switches to the failed channel (N42): a. Positions switches as follows: \_\_\_\_\_

• Upper Section Detector Current Comparator switch. \* • Selects N42 on the upper section detector current comparator switch. \_\_\_\_\_

• Lower Section Detector Current Comparator switch. \* • Selects N42 on the lower section detector current comparator switch. \_\_\_\_\_

• Power Mismatch Bypass switch. \* • Selects N42 on the power mismatch bypass switch. \_\_\_\_\_

• IF NOT selected • Verifies N42 \_\_\_\_\_

**PERFORMANCE CHECKLIST**

D=Discuss  
P=Perform  
S=Simulate

ELEMENT/STEP  
\*denotes a  
critical step

STANDARD  
\*denotes critical  
standard

EVALUATION  
SAT UNSAT

INITIALS/DATE

previously, Rod Stop  
Bypass switch.

selected on the rod  
stop bypass switch.

- Comparator Channel  
Defeat switch to N42.

\*

- Selects N42 on  
the comparator  
channel defeat  
switch.

\_\_\_\_\_

b. Trip affected channel  
bistables

- 1) Verify redundant channel  
bistables - NOT  
TRIPPED.

\*

- 1) Verifies and reports  
redundant channel  
bistables - NOT  
TRIPPED for N41,  
N43, N44

\_\_\_\_\_

UL-6 - RCS Loop OTΔT  
PR High TRIP  
PR HIGH RATE TRIP  
If power is less than P-10:  
POWER RANGE LOW  
TRIP

- RCS Loop OTΔT
- PR High Trip
- PR High Rate  
Trip

- 2) Remove control power  
fuses for affected power  
range channel.

\*

- 2) Removes N42 control  
power fuses.

\_\_\_\_\_

**CUE: "The JPM is complete."**

4. Stop time

Time to complete the task ≤  
15 minutes.

\_\_\_\_\_

Evaluator calculates the time to  
complete the task.

## **Tear-Off Sheet for Applicant**

**Initial conditions:**

- The plant is at 100% power.
- Power range channel, NI-42, has failed.
- The US entered OS1211.04, "Power Range NI Instrument Failure", in response to channel N42 failing high.

**US to applicant: "Reactor operator, remove power range channel N42 from service in accordance with OS1211.04, "Power Range NI Instrument Failure".**

## Simulator Operator Instructions

**Reset the simulator to a 100% power IC.**

**Fail the power range channel NI-42 to 120%**

**MFNI002 value: 120**





JOB PERFORMANCE MEASURE WORKSHEET

**JPM #7: TRANSFER SERVICE WATER TO THE COOLING TOWER**

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 076A4.01 Ability to manually operate and monitor in the control room:  
SWS pumps (076A4.02) SWS Valves.

# JOB PERFORMANCE MEASURE WORKSHEET

## VERIFICATION OF COMPLETION

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

# JOB PERFORMANCE MEASURE WORKSHEET

## 1.0 Task Number and Description:

Position: RO

0760103401 Switch From SW To Cooling Tower Operation

## 2.0 Conditions:

- A. The plant is operating at 100%.
- B. On line maintenance needs to be done on the Service Water System Train A.
- C. The SM requested that Service Water Train A be transferred to the Cooling Tower, until the job is complete in approximately 12 hours.
- D. Pre-starts are complete on the "A" Cooling Tower Pump.

## 3.0 Standards:

Place the Cooling Tower in operation per OS1016.05, Service Water Cooling Tower Operation.

## 4.0 Student Materials:

Copy of the Tear-Off Sheet.

Copy of OS1016.05, Service Water Cooling Tower Operation, Rev. 7, Chg. 26

## 5.0 Limitations On Performance:

Simulate/Perform all steps. Verbalize all actions to the evaluator.  
Even if requested, no Peer Checks will be provided during the JPM.

## 6.0 References:

Procedures:

- OS1016.05, Service Water Cooling Tower Operation
- OGP-1, Control Switch Operation

Sys	KA	Description	Value RO/SRO
076	A2.01	Ability to predict the impact of and use procedures to control a loss of SW.	3.5/3.7
076	K3.01	Knowledge of the effect that a loss of malfunction of SW on closed cooling water system.	3.4/3.6

## JOB PERFORMANCE MEASURE WORKSHEET

### 7.0 Setting:

Simulator  
Reset the simulator to any 100% IC.

### 8.0 Safety Considerations:

None

### 9.0 Approximate Completion Time:

20 minutes

### 10.0 Initial Cue:

Initial Conditions:

1. The plant is operating at 100%.
2. On line maintenance needs to be done on the Service Water System Train A.
3. The SM requested that Service Water Train A be transferred to the Cooling Tower, until the job is complete in approximately 12 hours.
4. Local pre-starts are complete on the 'A' Cooling Tower Pump.

Perform the task using OS1016.05, "Service Water Cooling Tower Operation".

US to Secondary Operator, "**Secondary Operator (or student's name), using OS1016.05 section 4.3, transfer Service Water train A from the ocean to the Cooling Tower. All prerequisites, precautions/limitations are complete.**"

## PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP *denotes a critical step	STANDARD *denotes critical standard	EVALUATION  SAT    UNSAT	INITIALS/DATE
--------------------------------------	---	---	--------------------------------	---------------

1.	P    Start time	Initiating cue read.		_____
----	-----------------	----------------------	--	-------

**CUE:**    If the student requests a Peer Check at any time during the JPM, respond **“No one is available to peer check your actions. Please continue with the task”.**

**NOTE:**    Student may verify prerequisites, precautions & limitations.

**NOTE:**    Student may put the color graphic on the MPCS for Service Water.

2.	P    RECORD cooling tower level in the Unit Journal, as read on either SW-LI-6139, Cooling Tower Basin Level, or A1537.	Records cooling tower level.		_____
----	---	------------------------------	--	-------

**CUE:**    If the student attempts to perform pump pre-start checks, provide the cue: **“Local pump pre-starts checks are complete.”**

3.	PERFORM pump pre-starts for SW-P-110A, cooling tower pump A, as determined by the US.	Performs control room pre-start checks.		_____
----	---	---	--	-------

4.	P    Verify SW-V-5, SW isolation to secondary loads is OPEN.	Verifies SW-V-5 open.		_____
----	--	-----------------------	--	-------

5.	P    VERIFY SW-V-139, SW cooling tower train A spray bypass recirculation, is OPEN.	Verifies SW-V-139 open.		_____
----	---	-------------------------	--	-------

*6.	P    CLOSE SW-V-4, SW isolation to secondary loads.	Closes SW-V4.		_____
-----	---	---------------	--	-------

7.	P    CHECK CLOSED/CLOSE SW-V-74, turbine building SW cross-connect to PAB.	Checks SW-V74 closed.		_____
----	--	-----------------------	--	-------

*8.	P    START SW-P-110A, cooling tower pump A.	Starts SW-P-110A.		_____
-----	---	-------------------	--	-------

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical	SAT    UNSAT	
S=Simulate	critical step	standard		

- |      |   |   |                                    |       |       |
|------|---|---|------------------------------------|-------|-------|
| *9.  | P | PLACE the train A standby SW pump control switch in PULL-TO-LOCK.                   | Places SW-P-41C (A) in PTL.        | _____ | _____ |
| *10. | P | SHUTDOWN the running train A SW pump, and PLACE its control switch in PULL-TO-LOCK. | Stops P-41A (C) and places in PTL. | _____ | _____ |

**NOTE: Using a stopwatch, start timing the flush when student starts opening SW-V54,**

OR

Record current time \_\_\_\_\_ .

- |      |   |  |   |       |       |
|------|---|--|---|-------|-------|
| *11. | P | OPEN SW-V54, Cooling Tower Pump A discharge isolation.   | Opens SW-V54.                                   | _____ | _____ |
| *12. | P | When SW-V-54 indicates full OPEN, PLACE SW-V-54 control switch in AUTO.                          | When SW-V54 is full open, place switch in AUTO. | _____ | _____ |
| *13. | P | VERIFY SW-V-56, cooling tower train A spray header test, auto closed.                            | Verify SW-V56 auto-closed.                      | _____ | _____ |
| 14   |   | If required, manually control PCCW heat exchanger outlet temperature using CC-TK-2171 (Train A). | No action should be required.                   |       |       |

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION		INITIALS/DATE
P=Perform	*denotes a	*denotes critical	SAT	UNSAT	
S=Simulate	critical step	standard			

*15.	P	FLUSH the train A SW system to discharge transition structure for at least 103 seconds, then CONTINUE with step 4.3.15.	Flushes to ocean for at least 103 seconds prior to proceeding to next step.	_____	_____
------	---	---	---	-------	-------

**NOTE:** Record current time \_\_\_\_\_ or observe stop watch reading \_\_\_\_\_ .

**\*Elapsed time for flush \_\_\_\_\_ (≥ 103 seconds).**

*16.	P	OPEN SW-V34, SW Train A return to cooling tower.	Opens SW-V34.	_____	_____
------	---	--	---------------	-------	-------

*17.	P	CLOSE SW-V20, SW Train A to discharge structure.	Closes SW-V20.	_____	_____
------	---	--	----------------	-------	-------

*18.	P	ADJUST SW-V-15, PCCW heat exchanger A SW isolation, as required to limit cooling tower pump A flow to less than 16,000 gpm.	If necessary, adjusts SW-V15 to establish <16,000 gpm.	_____	_____
------	---	---	--	-------	-------

**CUE: "The JPM is complete."**

19.	Stop time	Evaluator calculates time to complete task.	Time to complete the task ≤ 20 minutes.	_____	
-----	-----------	---	---	-------	--

## **Tear-Off Sheet for Applicant**

### **Initial Conditions:**

- The plant is operating at 100%.
- On line maintenance needs to be done on the Service Water System Train A.
- The SM requested that Service Water Train A be transferred to the Cooling Tower, until the job is complete in approximately 12 hours.
- Local pre-starts are complete on the "A" Cooling Tower Pump.

Perform the task using OS1016.05, "Service Water Cooling Tower Operation".

**US to Secondary Operator, "Secondary Operator (or student's name), using OS1016.05 section 4.3, transfer Service Water train A from the ocean to the Cooling Tower. All prerequisites, precautions/limitations are complete."**

## Simulator Operator Instructions

Reset the simulator to a 100% power IC.

JOB PERFORMANCE MEASURE WORKSHEET

**JPM #8: MANUAL OPERATION OF RHR TCV FOR MID-LOOP OPERATIONS**

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

**Method of Testing**

Simulated Performance: \_\_\_\_\_ Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_ Simulator: \_\_\_\_\_ Plant: \_\_\_\_\_

**K/A reference: 005K4.02, K4.03 Knowledge of RHRS design features and/or interlocks which provide for modes of operation, RHR heat exchanger bypass flow control.**

**JOB PERFORMANCE MEASURE WORKSHEET**

**VERIFICATION OF COMPLETION**

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

## JOB PERFORMANCE MEASURE WORKSHEET

**1.0 Task Number and Description:**

Position: NSO

1150101004 Position Any Valve

**2.0 Conditions:**

- A. The Plant is in mode 6 with fuel in the vessel.
- B. In preparation for installing SG nozzle dams, Complex Procedure OS1000.12, "Operation With The RCS At Reduced Inventory/Midloop Conditions", is being used to drain the RCS to mid-loop.
- C. All Prerequisites of OS1000.12 are complete, and RHR train A is in service.
- D. OS1000.12 is completed through step 6.1.11.2.

**3.0 Standards:**

Simulate manually blocking RH-HCV-606 per OS1000.12.

**4.0 Student Materials:**

Copy of the Tear-Off sheet  
 Copy of OS1000.12, "Operation with The RCS At Reduced Inventory/Midloop Conditions", Revision 3, Change 11, pages 18 through 21.  
 Wrench to operate the 1 ¼-inch jam nut. (Simulate obtaining from the Tool Crib.)  
 Flashlight

**5.0 Limitations on performance:**

Simulate all steps. Verbalize all actions to the evaluator.  
 Even if requested, no Peer Checks will be provided during the JPM.

**6.0 References:**

OS1000.12, "Operation With The RCS At Reduced Inventory/Midloop Conditions", Rev.3, Chg.9.

Sys	KA	Description	Value RO/SRO
2.1	2.1.20	Ability to execute procedure steps.	4.3/4.2
078	K3.02	Loss of IAS on systems having pneumatic valves and controls.	3.4/3.6
2.1	2.1.30	Ability to locate and operate components, including local controls.	3.9/3.4
005	K3.01	RCS.	3.9/4.0

## JOB PERFORMANCE MEASURE WORKSHEET

### 7.0 Setting:

In plant: -25 ft elevation, A RHR vault stairwell (B RHR vault stairwell).

### 8.0 Safety Considerations:

JPM is in RCA.

Review HP radiological maps/postings prior to entry. NRC examiners should enter RCA under RWP 4 task 1.

There is a posted area in the RHR Vault stairway with radiation levels near 25mrem/hr.

### 9.0 Approximate Completion Time:

15 minutes

### 10.0 Directions to the Student:

Initial Conditions:

- The Plant is in mode 6 with fuel in the vessel.
- In preparation for installing SG nozzle dams, Complex Procedure OS1000.12, Operation With The RCS At Reduced Inventory/Midloop Conditions, is being used to drain the RCS to mid-loop.
- All Prerequisites of OS1000.12 are complete, and RHR train A is in service.
- OS1000.12 is completed through step 6.1.11.2.

You are the Primary NSO. You are going to manually gag RH-HCV-606, Train A temperature control to limit fail open flow rate to 3500 gpm.

**US to Primary Operator, "Primary Operator (or students name), train A RHR flow has been stabilized at 3500 gpm in accordance with OS1000.12, step 6.1.11.2. Complete section 6.1.11 and report when the required actions are complete."**

## PERFORMANCE CHECKLIST

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT UNSAT	

1. P Start time \_\_\_\_\_ Initiating cue read. \_\_\_\_\_

**CUE:** If the student request valve location from the control room, **"RH-HCV-606 is located on the (-)25 ft elevation, A vault, northwest corner by stairs. "**

**CUE:** If the student requests a Peer Check at any time during the JPM, respond: **"No one is available to peer check your actions. Please continue with the task".**

\*2. S Prepare RH-HCV-606 handjack for operation. Simulates preparing handjack for operation. \_\_\_\_\_

**CUE:** If the student contacts the control room for permission to unlock the handjack, **"You have permission to unlock RH-HCV-606."**

**CUE:** When student simulates unlocking the lock, **"The lock unlocks."**

a. Unlock handjack	a. Using Best key from NSO key ring, simulates unlocking the handjack for RH-HCV-606. _____
--------------------	---

**CUE:** When student simulates turning the jam nut in the counter clockwise direction, **"The nut backs off."**

**NOTE:** The jam nut may be finger tight which would eliminate the requirement for using a wrench in the next step.

b. Back off jam nut	*b. Simulates turning the jam nut counter-clockwise. _____
---------------------	--

**CUE:** When the student request the control room to perform step 6.1.11.4 (6.1.12.4), **"RH-FCV-618 (619) is full closed and flow indicates 3500 gpm."**

**CUE:** After the student has simulated rotating the handwheel a few turns in the closed direction, **"You start to feel resistance."**

**PERFORMANCE CHECKLIST**

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical	SAT    UNSAT	
S=Simulate	critical step	standard		

*3.	S	Engage handjack.	Simulates rotating RH-HCV-606 (607) in the closed direction until resistance is felt.	_____	_____
-----	---	------------------	---	-------	-------

**CUE:** When the student simulates turning the jam nut in the clockwise direction, "The nut rotates several turns and then tightens."

*4.	S	Tighten jam nut.	Simulates rotating the jam nut in the clockwise direction until snug tight.	_____	_____
-----	---	------------------	---	-------	-------

5.	S	Inform the control room that the handjack is set per procedure.	Informs the control room that the handjack for RH-HCV-606 (607) is set.	_____	_____
----	---	---	---	-------	-------

**CUE:** "The JPM is complete."

6.		Stop Time _____			
		Evaluator calculates the time to complete the task.			Time to complete the task ≤ 15 minutes.

Initial Conditions:

- The Plant is in mode 6 with fuel in the vessel.
- In preparation for installing SG nozzle dams, Complex Procedure OS1000.12, Operation With The RCS At Reduced Inventory/Midloop Conditions, is being used to drain the RCS to mid-loop.
- All Prerequisites of OS1000.12 are complete, and RHR train A is in service.
- OS1000.12 is completed through step 6.1.11.2.

You are the Primary NSO. You are going to manually gag RH-HCV-606, Train A temperature control valve to limit fail open flow rate to 3500 gpm.

US to Primary Operator, **"Primary Operator (or students name), train A RHR flow has been stabilized at 3500 gpm in accordance with OS1000.12, step 6.1.11.2. Complete section 6.1.11 and report when the required actions are complete."**

JOB PERFORMANCE MEASURE WORKSHEET

JPM #9: LOCAL EDG NORMAL START AND LOAD

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 2.4.35 Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.

JOB PERFORMANCE MEASURE WORKSHEET

VERIFICATION OF COMPLETION

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

# JOB PERFORMANCE MEASURE WORKSHEET

## 1.0 Task Number and Description:

Position: NSO

0640400204 Locally Start And Load An EDG.

## 2.0 Conditions:

- A. The plant is in mode 5.
- B. DG 1B is being locally started and loaded for post-maintenance testing.
- C. Precautions 3.1 - 3.3, 3.7, 3.8, 3.12, 3.20 and 3.21 of OS1026.09 are satisfied.
- D. All prerequisites of OS1026.09 are satisfied.
- E. The pre-start logs were completed 15 minutes ago by another NSO.

## 3.0 Standards:

Simulate a local start of DG 1B and parallel it to bus E-6.

## 4.0 Student Materials:

Copy of the Tear-Off Sheet.

Copy of OS1026.09, Operation Of DG 1B, Rev. 8, Chg. 22.

## 5.0 Limitations On Performance:

Simulate all steps, and verbalize all actions to the evaluator.  
Even if requested, no Peer Checks will be provided during the JPM.

## 6.0 References:

Procedures / Good practices:

- OS1026.09, Operation Of DG 1B.
- OGP-1, Control Switch Operation

Detailed Systems:

- EDM
- EDE

Technical Specifications:

- 3.8.1.1, AC Sources Operating
- 3.8.1.2, AC Sources Shutdown

## JOB PERFORMANCE MEASURE WORKSHEET

Drawings:

- EDE: 1-NHY-310102
- DG: 1-NHY-310857

Sys	KA	Description	Value RO/SRO
2.4	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including.	3.3/3.5

### 7.0 Setting:

"B" EDG Room.

### 8.0 Safety Considerations:

High noise area.

**DO NOT OPERATE** any controls since the potential for an inadvertent ESF actuation exists.

### 9.0 Approximate Completion Time:

20 minutes

### 10.0 Directions To The Student(s):

Initial Conditions:

1. The plant is in mode 5.
2. DG 1B is being locally started and loaded for post-maintenance testing.
3. All applicable Precautions of OS1026.09 are satisfied.
4. All prerequisites of OS1026.09 are satisfied.
5. The pre-start logs were completed 15 minutes ago by another NSO.

You are a spare NSO. You are going to simulate the local NSO actions required to start and parallel DG 1B to bus E-6.

**US to Spare NSO, "Spare NSO (or student's name), simulate local starting and paralleling of DG 1B IAW OS1026.09 starting at step 4.2.2. Operate the EDG in AUTO voltage control. Desired load is 5500 kW ± 500 kW. The ROVER has completed step 4.2.1. The DG 1B pre-start logs are complete and satisfactory."**

## PERFORMANCE CHECKLIST

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT UNSAT	

1. P Start time Initiating cue read. \_\_\_\_\_

**CUE:** If the student requests a Peer Check at any time during the JPM, respond: **"No one is available to peer check your actions. Please continue with the task."**

**CUE:** Evaluator to NSO, **"The DG breaker control switch is in REMOTE."**

**NOTE:** NSOs carry keys. Student may simulate having and placing a key in the switch.

\*2. S Place DG breaker control selector switch to LOCAL. Simulates placing the breaker control SS to local:

\*a. Place key in breaker switch.

\*b. Rotate SS to local.

**CUE:** Control Room to NSO, **"We show that DG 1B is in LOCAL."**

**CUE:** Evaluator to NSO, **"The voltage regulator mode selector switch is in AUTO."**

3. S Place the voltage regulator mode selector switch in AUTO. Verifies the voltage regulator mode SS in AUTO.

**CUE:** Evaluator to NSO, **"The manual voltage regulator switch is pulled out in the TRACK position."**

4. S Check the manual voltage regulator switch pulled out in the TRACK position. Verifies the manual voltage regulator switch pulled out in TRACK.

\*5. S Press both EMERGENCY STOP push-buttons at the same time to prevent an uncontrolled diesel start after reset. Simulates pushing both EMERGENCY STOP push-buttons.

6. S Notify local personnel of loud noise due to venting high-pressure air. Notifies local personnel of venting high-pressure air.

## PERFORMANCE CHECKLIST

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT UNSAT	

**CUE:** When the engine reset button is pressed, the air shutdown relay resets and produces a "whoosh."

- |     |   |   |  |
|-----|---|---|--|
| *7. | S | Press the ENGINE RESET push-button.           | Simulates resetting the diesel engine.   |
| 8.  | S | Check DG-P-227B off prior to starting the DG. | Checks the rocker arm pre-lube pump off. |

**NOTE:** If ENGINE RESET is not pushed, the DG will not start.

- |     |   |                                   |                                       |
|-----|---|-----------------------------------|---------------------------------------|
| *9. | S | Press the TEST START push-button. | Simulates starting the diesel engine. |
|-----|---|-----------------------------------|---------------------------------------|

**CUE:** Evaluator to NSO, "The engine starts. Output is 59.5 Hz and 4,190 AC volts."

- |     |   |  |  |
|-----|---|--|--|
| 10. | S | Check DG 1B comes up to rated frequency and voltage, 60 Hz (58.8 to 61.2 Hz) and 4,160 volts (3,740 to 4,580 volts). | Checks DG 1B at rated frequency and voltage. |
|-----|---|--|--|

**CUE:** The student should not ask, about manually flashing the field since both voltage and frequency are indicated and normal. If asked, restate that "frequency is 59.5 Hz & voltage is 4,190 VAC."

**CUE:** Control room to NSO, "SW-V18 is open and FI-6191 indicates 1840 gpm."

- |     |   |  |   |
|-----|---|--|---|
| 11. | S | At the MCB, check SW-V-18 – OPEN.  | Contacts the control room and asks them to verify SW-V-18 open. |
| 12. | S | At the MCB, check SW flow to DG 1B greater than: <ul style="list-style-type: none"> <li>• 900 gpm – on ocean</li> <li>• 1800 gpm – on cooling tower</li> </ul> | Checks SW flow > 1,800 gpm.                                     |

**CUE:** When asked, evaluator to NSO, "The bus E-6 synchronizing switch is in OFF."

## PERFORMANCE CHECKLIST

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT UNSAT	

*13.	S	Place the bus E-6 synchronizing switch to - DG TO BUS.	Simulates placing the SNS to DG TO BUS.
------	---	--	---

**CUE:** After SNS is positioned to DG TO BUS, evaluator to NSO, **“Bus E-6 incoming volts is 130 volts; bus E-6 running volts is 120 volts. The synchroscope is rotating CCW slowly; the lights go out at 12 o'clock and are bright at 6 o'clock.”**

**NOTE:** The DG is read on the incoming meter, and the bus is read on the running meter. Therefore, the incoming meter rises when the student RAISES on the voltage regulator, and conversely, the incoming meter lowers when student LOWERS on voltage regulator.

*14.	S	Adjust DG 1B voltage so that bus E-6 INCOMING VOLTS and RUNNING VOLTS match.	Simulates matching INCOMING VOLTS to RUNNING VOLTS.
------	---	--	---

**CUE:** If speed is raised, evaluator to NSO, **“The synchroscope needle slows, stops and begins to rotate clockwise.”**

If speed is lowered, evaluator to NSO, **“The synchroscope needle speeds up in the CCW direction.”**

*15.	S	Adjust engine speed until the SYNCH meter rotates slowly in the fast direction.	Simulates adjusting speed until the SYNCH meter rotates CW slowly.
------	---	---	--

*16	S	When BUS E6 synchronizing meter pointer is between eleven and twelve o'clock and synchroscope lights are off, place generator breaker control switch to CLOSE.	Places generator breaker control switch to CLOSE when synchroscope needle is between eleven and twelve o'clock and the synchroscope lights are out.
-----	---	--	---

**NOTE:** if the applicant raises speed, real load (KW) will increase, likewise, if they lower speed, KW will decrease.

*17	S	RAISE DG 1B speed to pick up slightly over 500 KW.	Uses 1B DG speed changer to RAISE speed of DG.
-----	---	--	--

**CUE:** VARs first lowers, comes to an inflection point, then raises when the voltage is increased via the voltage regulator. VARs decrease when voltage is lowered.

## PERFORMANCE CHECKLIST

	D=Discuss P=Perform S=Simulate	ELEMENT/STEP *denotes a critical step	STANDARD *denotes critical standard	EVALUATION		INITIALS/DATE
				SAT	UNSAT	
*18.	S	RAISE generator voltage to increase lagging VARs to slightly over 200 KVAR.	RAISES generator voltage to increase lagging VARs to slightly over 200 KVAR using voltage regulator in automatic mode.			
19.	S	Place BUS E6 SYNCHRONIZING switch to OFF.	Places BUS E6 SYNCHRONIZING switch to OFF.			
<b>NOTE: loading of the DG should take place slowly over a 30 minute period. The preferred KVAR loading is 2/3 of KW loading (power factor of approximately 0.85) and MAXIMUM KVAR loading is ¾ of KW loading.</b>						
20.	S	RAISE generator KW load to desired load and maintain appropriate VARs loading.	Applicant explains loading the diesel in increments over the next 30 minutes and maintains KVARs at 2/3 of KW loading.			

**CUE: "The JPM is complete"**

## Tear-Off Sheet for Applicant

### Initial Conditions:

- The plant is in mode 5.
- DG 1B is being locally started and loaded for post-maintenance testing.
- All applicable Precautions of OS1026.09 are satisfied.
- All prerequisites of OS1026.09 are satisfied.
- The pre-start logs were completed 15 minutes ago by another NSO.

You are a spare NSO. You are going to simulate the local NSO actions required to start and parallel DG 1B to bus E-6.

**US to Spare NSO, "Spare NSO (or student's name), simulate local starting and paralleling of DG 1B IAW OS1026.09 starting at step 4.2.2. Operate the EDG in AUTO voltage control. Desired load is 5500 kW  $\pm$  500 kW. The ROVER has completed step 4.2.1. The DG 1B pre-start logs are complete and satisfactory."**

# JOB PERFORMANCE MEASURE WORKSHEET

## JPM #10: RESET THE TDEFW PUMP TURBINE TRIP THROTTLE VALVE

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

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

### Method of Testing

Simulated Performance: \_\_\_\_\_

Actual Performance: \_\_\_\_\_

Classroom: \_\_\_\_\_

Simulator: \_\_\_\_\_

Plant: \_\_\_\_\_

K/A reference: 2.4.35 Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.

**JOB PERFORMANCE MEASURE WORKSHEET**

**VERIFICATION OF COMPLETION**

Examinee's Name: \_\_\_\_\_

Examiner's Name: \_\_\_\_\_

Date Performed: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Number of attempts: \_\_\_\_\_

Time to complete: \_\_\_\_\_

Question documentation

Responses to questions

Result: SAT or UNSAT (circle one)

Examiner's signature and date: \_\_\_\_\_

## JOB PERFORMANCE MEASURE WORKSHEET

### 1.0 Task Number and Description:

Position: NSO

0610401204 Reset The Turbine Driven EFW Pump Trip Valve.

### 2.0 Conditions:

- A. The plant is in Mode 3 following a trip from 100% power.
- B. All station AC electrical power has been lost.
- C. The Turbine Driven EFW Pump started and then tripped.

### 3.0 Standards:

Reset the turbine driven EFW pump trip valve and start FW-P-37A per OS1036.03, "Resetting The Steam Driven EFW Pump Trip Valve".

### 4.0 Student Materials:

- Copy of the Tear-Off Sheet.
- Copy of OS1036.03, Resetting The Steam Driven EFW Pump Trip Valve, Rev. 2, Chg. 3.
- Copy of OS1090.01, "Manual Operation Of Remote Operated Valves", Rev. 5, Chg. 11, page 1 through 6 and 18 & 19.

### 5.0 Limitations On Performance:

Simulate/Perform all steps. Verbalize all actions to the evaluator. Even if requested, no Peer Checks will be provided during the JPM.

### 6.0 References:

Procedures:

- OS1036.03, "Resetting The Steam Driven EFW Pump Trip Valve"
- OS1090.01, Manual Operation Of Remote Operated Valves

Technical Specifications:

- 3.7.1.2, AFW System
- 3.7.1.3, CST
- 3.7.10, Area Temperature Monitoring

Drawings:

- 1-NHY-503584
- 1-NHY-503585

**JOB PERFORMANCE MEASURE WORKSHEET**

Sys	KA	Description	Value RO/SRO
061	A2.04	Ability to predict impact and use procedure to correct, control, mitigate AFW pump failure.	3.4/3.8
2.4	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations.	3.3/3.5

**7.0 Setting:**

Plant, EFW Pump house.

**8.0 Safety Considerations:**

- Hot steam piping.
- Possible automatic pump start.
- Rotating equipment hazard.
- Hearing protection as posted.
- Stand clear of drain valves located on the east side of the turbine.

**9.0 Approximate Completion Time:**

10 minutes

**10.0 Initial Cue:**

Initial Conditions:

- The plant is in Mode 3 following a trip from 100% power.
- All station AC electrical power has been lost.
- The Turbine Driven EFW Pump started and then tripped.

You are the Roving NSO. You are going to reset the Turbine Driven EFW pump trip valve and restart the pump.

**US to Roving NSO, "Roving NSO (or student's name), simulate resetting MS-V-129, the trip valve for emergency feed pump turbine using OS1036.03, Resetting The Steam Driven EFW Pump Trip Valve, then restart the steam driven EFW pump."**



## PERFORMANCE CHECKLIST

D=Discuss	ELEMENT/STEP	STANDARD	EVALUATION	INITIALS/DATE
P=Perform	*denotes a	*denotes critical		
S=Simulate	critical step	standard	SAT    UNSAT	

**CUE:** If the control room is contacted regarding step 3.2.4 of OS1090.01 in reference to the de-clutch lever limitations on FW-V-346, US to NSO, **“This is an emergency. Locally open FW-V-346.”**

- |   |   |
|---|---|
| <p>b. Check open/open FW-V-346, EFW pump A mini-flow.</p> | <p>*b. Simulates opening FW-V-346 locally by depressing the de-clutch lever and rotating the handwheel CCW.</p> |
|---|---|

**CUE:** As MS-V-129 is opened, evaluator to student, **“Speed is increasing to 3600 rpm.”**

- |   |  |
|---|--|
| <p>c. Slowly open MS-V-129 to increase speed to 3600 rpm (3500 – 3700 rpm).</p> | <p>*c. Simulates slowly opening MS-V-129 by turning the handwheel CCW.</p> |
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**CUE:** When the student verifies EFW pump speed remains below 3750 rpm, evaluator to student, **“Speed is steady at 3675 rpm.”**

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|---|--|
| <p>d. Verify the EFW pump governor is operating properly:</p> <ul style="list-style-type: none"> <li>• Verify pump speed remains below 3750 rpm.</li> <li>• Fully open MS-V-129.</li> <li>• Remove MS-V-129 from its backseat by closing ¼ turn.</li> </ul> | <p>d. Verifies the EFW pump governor is operating properly:</p> <ul style="list-style-type: none"> <li>• Verifies pump speed remains below 3750 rpm.</li> <li>• Simulates fully opening MS-V-129.</li> <li>• Simulates closing MS-V-129 ¼ turn.</li> </ul> |
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**CUE:** **“The JPM is complete.”**

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| 4. | <p>Stop time</p> <p>Evaluator calculates time to complete task.</p> | <p>Time to complete the task ≤ 10 minutes.</p> <hr style="width: 100%;"/> |
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## Tear-Off Sheet for Applicant

### Initial Conditions:

- The plant is in Mode 3 following a trip from 100% power.
- All station AC electrical power has been lost.
- The Turbine Driven EFW Pump started and then tripped.

You are the Roving NSO. You are going to reset the Turbine Driven EFW pump trip valve and restart the pump.

**US to Roving NSO, "Roving NSO (or student's name), simulate resetting MS-V-129, the trip valve for emergency feed pump turbine using OS1036.03, Resetting The Steam Driven EFW Pump Trip Valve, then restart the steam driven EFW pump."**