

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-RO Admin1

Facility: Calvert Cliffs 1 & 2**JPM Number:** RO Admin1**Alternate Path:** No**Task Number:** 055.005**Task Title:** Take the Reactor Critical**Task Standard:**

This JPM is complete when the 1/M plot has been completed/recorded for the Source Range NI data given, the plot is evaluated and a determination is made that predicted criticality will occur above the CEA Upper Bound, and required OP-2 actions are identified for predicted criticality occurring above the CEA Upper Bound.

K/A Reference: 2.1.37 (4.3/4.6)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 20 minutes**References and Tools Required:**

1. OP-2-1
2. OP-2-1 Appendix 2
3. Calculator

JPM Setup Instructions:

1. OP-2-1 placekeeping marks for steps 6.5 and 6.6 completed.
2. OP-2-1 placekeeping marks for steps 6.7 completed up to step 6.7.F, with step 6.7.F in progress.
3. Appendix 2 placekeeping marks for steps B.1 and B.2 completed.
4. Appendix 2 completed with the following values
 - WRNI Channel-A/C
 - Initial Countate-25/25

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.

Initial Conditions:

1. You are performing the duties of an extra RO.
2. Unit-1 Reactor tripped 4 days ago.
3. 1/M is the only available reactivity monitoring method due to PPC 1/M Application and SUR Monitor issues.
4. RCS boron sample is within 1 PPM of ECC boron concentration.
5. ECC is Group 4 at 90".
6. ECC CEA Lower Bound is Group 4 at 16".
7. ECC CEA Upper Bound is Group 5 at 59.25".
8. Reactor Startup is in progress per OP-2.
9. Base countrate, CR_I, was 25 CPS.

Initiating Cue:

1. The Unit Supervisor assigns you three tasks:

Task 1

Complete the 1/M plot, given the following data table, for each CEA position as the CEAs were/are being withdrawn.

CEA Position	WRNI-A (CPS)	WRNI-C (CPS)
Reg Group 1- 0"	25	25
Reg Group 1 – 95.25"	31	31
Reg Group 2 – 108.75"	42	42
Reg Group 3 – 122.5"	63	63
Reg Group 4 – 81.5"	80	80
Reg Group 5 – 54.5"	125	125

Task 2:

Predict where criticality is expected based on the 1/M data and circle when criticality is predicted below:

- Below CEA Lower Bound
- Between CEA Lower and Upper Bound
- Above CEA Upper Bound

Task 3

What OP-2 actions, if any, would be required based on this prediction and record any required actions, if any, below.

2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide a calculator, the partially completed OP-2-1, and the partially completed OP-2-1 Appendix 2.			
Examiner NOTE The following addresses Task 1 from the Cue Sheet.				
APP 2	1/M METHOD OF REACTIVITY MONITORING	Identifies next step to complete is Appendix 2 based on Examinee Cue Sheet.	—	—
Comment				
Examiner NOTE If a data point is not calculated and/or plotted, the Critical Step can be considered met if a trend line drawn through the 1/M plot would have intersected the data point(s) not specifically calculated by the Examinee.				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* APP 2 B.5-6	DIVIDE CR _i by CR to obtain the 1/M value. PLOT the 1/M value against the Regulating Group position on the CEA WITHDRAWAL 1/M PLT.	<u>CRITICAL STEP*</u> * Reg Group 1 – 95.25”, calculates and records/plots 1/M value of ~0.8. * Reg Group 2 – 108.75”, calculates and records/plots 1/M value of ~0.6. * Reg Group 3 – 122.5”, calculates and records/plots 1/M value of ~0.4. * Reg Group 4 – 81.5”, calculates and records/plots 1/M value of ~0.31. * Reg Group 5 – 54.5”, calculates and records/plots 1/M value of ~0.2.	—	—
Comment				
Examiner NOTE The following addresses Task 2 from the Cue Sheet.				
* Task 2	Predict where criticality is expected based on the 1/M data and circle when criticality is predicted below: <ul style="list-style-type: none"> • Before CEA Lower Bound • Between CEA Lower and Upper Bound • After CEA Upper Bound 	<u>CRITICAL STEP*</u> Evaluates 1/M plot trend and determines 1/M will not reach 0 until Group 5 is fully withdrawn. * Circles Above CEA Upper Bound.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
<p>Examiner NOTE</p> <p>The following addresses Task 3 from the Cue Sheet.</p>				
OP-2 6.7 F.6	IF the WRNIs and SUR Meters indicate that criticality is going to happen above the ECC Upper Bound CEA Position THEN PERFORM the following:	<p>Evaluates OP-2 for actions with criticality expected above the ECC Upper Bound CEA Position.</p> <p>Determines step 6.7.F.6 applies.</p>	—	—
Comment				
* OP-2 6.7 F.6 a	INSERT the Regulating CEAs to the Zero Power PDIL CEA Position using manual sequential.	<p><u>CRITICAL STEP*</u></p> <p>* Records insert the Regulating CEAS to the Zero Power PDIL CEA Position using manual sequential, or similar wording.</p>	—	—
Comment				
OP-2 6.7 F.6 b	NOTIFY the Reactor Engineering Work Group (REWG) that the Regulating CEAs are being inserted to the Zero Power PDIL CEA Position.	Records Notify Reactor Engineering Work Group that the Regulating CEAs are being inserted to the Zero power PDIL CEA Position, or similar wording.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
OP-2 6.7 F.6 c	INITIATE and Issue Report to document any ECC discrepancy.	Records Initiate an Issue Report, or similar wording.	—	—
Comment				
* OP-2 6.7 F.6 d	OBTAIN an adjusted ECC from REWG PER NEOP-302.	<u>CRITICAL STEP*</u> *Records obtain an adjusted ECC from REWG per NEOP-302, or similar wording.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
OP-2 6.7 F.6 e	<p>ENSURE the following prior to recommencing the reactor startup:</p> <p>(1) The error in the ECC process has been determined AND understood.</p> <p>(2) CONCURRENCE for reactor startup is received from the Manager Operations or his alternate, based on evaluation of core power distributions for reactivity anomalies.</p>	<p>Records Ensure the error in the ECC process has been determined and understood prior to recommencing the reactor startup, or similar wording.</p> <p>Records Concurrence for reactor startup is received from the Manager Operations or his alternate, or similar wording.</p>	—	—
<p>Comment</p>				
<p>TERMINATING CUE:</p> <p>This JPM is complete when the 1/M plot has been completed/recorded for the Source Range NI data given, the plot is evaluated and a determination is made that predicted criticality will occur above the CEA Upper Bound, and required OP-2 actions are identified for predicted criticality occurring above the CEA Upper Bound.</p> <p>The Examinee is expected to end the JPM.</p>				
<p>TIME STOP: _____</p>				

Verification of Completion**Job Performance Measure Number:** RO Admin1**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of an extra RO.
2. Unit-1 Reactor tripped 4 days ago.
3. 1/M is the only available reactivity monitoring method due to PPC 1/M Application and SUR Monitor issues.
4. RCS boron sample is within 1 PPM of ECC boron concentration.
5. ECC is Group 4 at 90".
6. ECC CEA Lower Bound is Group 4 at 16".
7. ECC CEA Upper Bound is Group 5 at 59.25".
8. Reactor Startup is in progress per OP-2.
9. Base countrate, CR_I, was 25 CPS.

Initiating Cue:

1. The Unit Supervisor assigns you three tasks:

Task 1

Complete the 1/M plot, given the following data table, for each CEA position as the CEAs were/are being withdrawn.

CEA Position	WRNI-A (CPS)	WRNI-C (CPS)
Reg Group 1- 0"	25	25
Reg Group 1 – 95.25"	31	31
Reg Group 2 – 108.75"	42	42
Reg Group 3 – 122.5"	63	63
Reg Group 4 – 81.5"	80	80
Reg Group 5 – 54.5"	125	125

Cue continued on next page

Task 2:

Predict where criticality is expected based on the 1/M data and circle when criticality is predicted below:

- Below CEA Lower Bound
- Between CEA Lower and Upper Bound
- Above CEA Upper Bound

Task 3

What OP-2 actions, if any, would be required based on this prediction and record any required actions, if any, below.

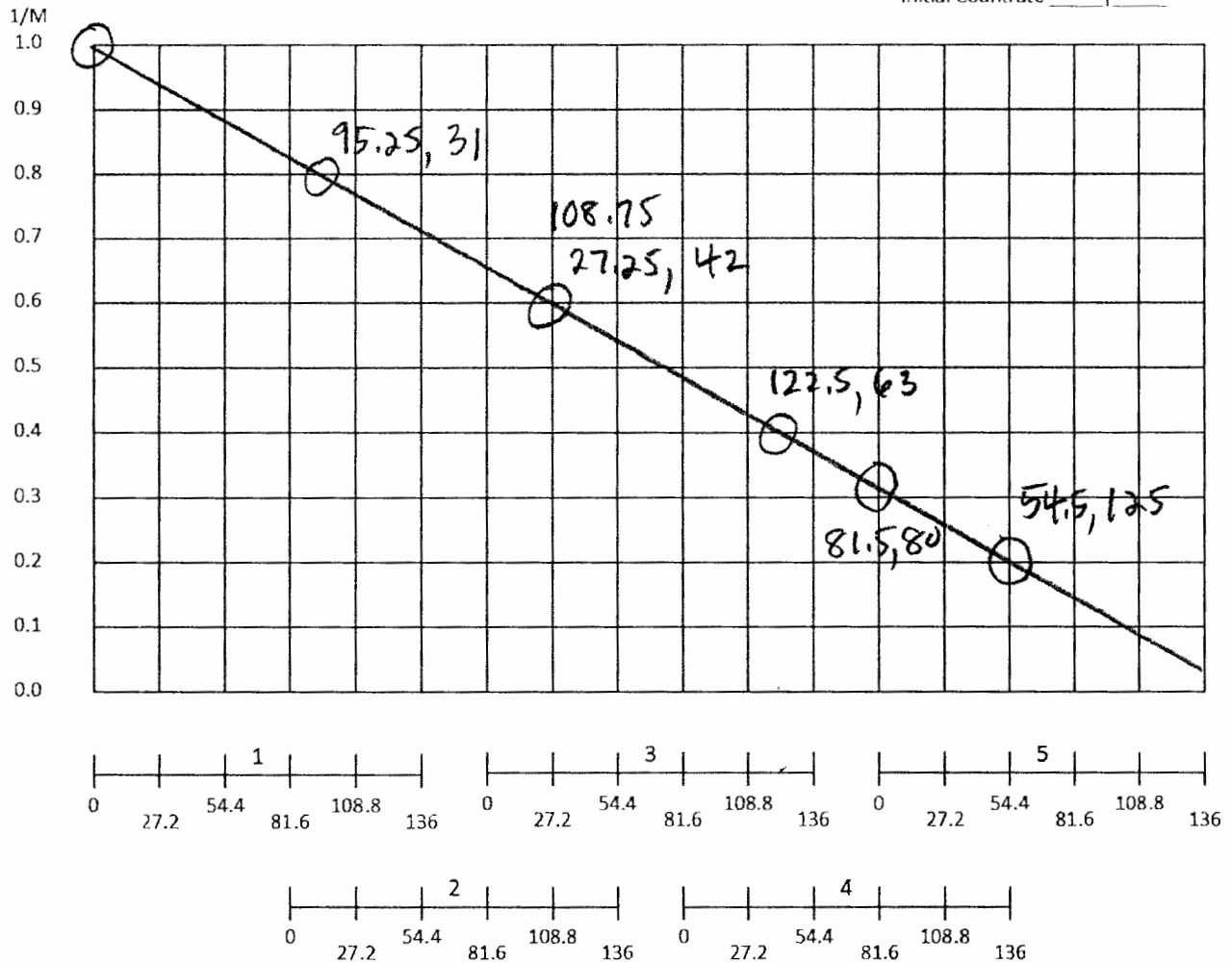
PLANT STARTUP FROM HOT STANDBY TO
MINIMUM LOAD

OP-2
APPENDIX 2
Rev. 05000/Unit 1
Page 4 of 4

1/M METHOD OF REACTIVITY MONITORING [B0032]

CEA WITHDRAWAL 1/M PLOT

WRNI Channel A C
Initial Count rate 25 25



KEY

Task 2:

Predict where criticality is expected based on the 1/M data and circle when criticality is predicted below:

- Below CEA Lower Bound
- Between CEA Lower and Upper Bound
- Above CEA Upper Bound

Task 3

What OP-2 actions, if any, would be required based on this prediction and record any required actions, if any, below.

INSERT REG GROUP CEAS TO ZERO POWER
PDIL *

NOTIFY REACTOR ENGINEERING *

INITIATE AN ISSUE REPORT *

OBTAIN AN ADJUSTED ECC *

ENSURE ERROR HAS BEEN DETERMINED *

CONCURRENCE FROM MANAGER OPERATIONS FOR STARTUP *

* OR SIMILAR WORDING

CRITICAL

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-RO Admin2

Facility: Calvert Cliffs 1 & 2**JPM Number:** RO Admin2**Alternate Path:** No**Task Number:** 201.005**Task Title:** Evaluate the need for plant cooldown**Task Standard:**

This JPM is complete when available condensate inventory is evaluated using EOP Attachment (9), and it is determined there is insufficient water to cooldown to $< 300^{\circ}\text{F}$ and the plant could be maintained in hot standby conditions for 3 days from the trip.

K/A Reference: 2.1.25 (3.9/4.2)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 7 minutes**References and Tools Required:**

1. EOP Attachment (9)
2. Calculator

JPM Setup Instructions:

1. N/A

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-2 CRO.
2. Unit-2 is operating at 100% power when a Station Blackout occurs.
3. EOP-7-2, Station Blackout, is implemented.
4. The need for a Unit-2 plant cooldown is being evaluated with the following current conditions:
 - Unit-1 is in Mode 6
 - Unit-2 tripped 2 hours ago.
 - Unit-2 is in Hot Standby
 - The TBVs are not available
 - 21 CST level is 30'
 - 12 CST level is 24.5'
 - 11 CST is empty for maintenance

Initiating Cue:

1. The Unit Supervisor is evaluating the need for a plant cooldown per EOP-7 and assigns you two tasks.

Task 1

Determine if adequate inventory exists to perform a cooldown to 300°F, with current CST levels and no additional makeup, by completing EOP Attachment (9) Steps 1-2. Circle your determination below.

Circle YES, adequate inventory exists to cooldown to 300°F

NO, adequate inventory does not exist to cooldown to 300°F

Task 2

Determine if adequate inventory exists to maintain Unit-2 in Hot Standby conditions, with current CST levels and no additional makeup, for 72 hours from the trip, using EOP Attachment (9). Circle your determination below.

YES, adequate inventory exists to maintain Hot Standby for 72 hours

NO, adequate inventory does not exist to maintain Hot Standby for 72 hours

2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the operator with a calculator and Unit-2 EOP-Attachment (9).			
EOP ATT 9	UNIT-2 EOP ATTACHMENTS, Attachment (9), Makeup Water Required For RCS Cooldown.	Identifies next step to complete is EOP-Attachment (9).	—	—
Comment				
EOP ATT 9 1	Determine the amount of makeup water required to perform an ADV cooldown and a TBV cooldown, based on the time after shutdown:			
* EOP ATT 9 1.a	ADV cooldown and time after shutdown	<u>CRITICAL STEP*</u> Refers to Figure or Table "INVENTORY REQUIRED TO COOL DOWN TO 300° F". Notes Unit-2 has been shut down for 2 hours and determines ~614,531 gallons are required to cool Unit-2 to 300° F with the ADVs. *Marks/records 600,000-630,000.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
EOP ATT 9 1.b	TBV cooldown and time after shutdown	Refers to Figure or Table "INVENTORY REQUIRED TO COOL DOWN TO 300° F". Notes Unit-2 has been shut down for 2 hours and determines ~88,490 gallons are required to cool Unit-2 to 300° F with the TBVs. Marks/records 83,000-93,000 or N/A.	—	—
Comment				
EOP ATT 9 2	Determine the amount of makeup water available in the CSTs:			
* EOP ATT 9 2.a	Record the level in 21 CST.	<u>CRITICAL STEP*</u> *Records 21 CST level as 30 ft.	—	—
Comment				
* EOP ATT 9 2.b	Record the level in 12 CST.	<u>CRITICAL STEP*</u> *Records 12 CST level as 24.5 ft.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* EOP ATT 9 2.c	Record the level in 11 CST.	<u>CRITICAL STEP*</u> *Records 11 CST level as 0 ft.	—	—
Comment				
EOP ATT 9 2.d	Determine the status of Unit-1 (check one):			
EOP ATT 9 2.d (1)	Mode 1, 2 or 3 and does NOT require AFW operation.	Evaluates Unit-1 condition from Examinee Cue Sheet. Determines Unit-1 is not in Mode 1-3.	—	—
Comment				
EOP ATT 9 2.d (2)	Mode 1, 2 or 3 and does require AFW operation.	Evaluates Unit-1 condition from Examinee Cue Sheet. Determines Unit-1 is not in Mode 1-3.	—	—
Comment				
* EOP ATT 9 2.d (3)	Mode 4, 5, 6 or defueled.	<u>CRITICAL STEP*</u> Evaluates Unit-1 condition from Examinee Cue Sheet. *Determines condition is applicable and checks/marks 2.d.(3) as Unit-1 current condition.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
EOP ATT 9 2.e NOTE	Calculated negative values should be entered as zero.			
EOP ATT 9 2.e	Determine the amount of makeup water available to Unit 2 using one of the following formulas, based on the status checked in step 2.d above:			
EOP ATT 9 2.e (1)	IF step d.(1) is checked, THEN correct CST levels for usable volume:	Determines step is N/A since step d.(3) is checked.	—	—
Comment				
EOP ATT 9 2.e (2)	IF step d.(2) is checked, THEN correct CST levels for usable volume:	Determines step is N/A since step d.(3) is checked.	—	—
Comment				
EOP ATT 9 2.e (3)	IF step d.(3) is checked, THEN correct CST levels for usable volume:	Determines step is applicable since step d.(3) is checked.	—	—
Comment				
* EOP ATT 9 2.e (3) (a)	step 2.a _____ ft - 2.75 ft =	<u>CRITICAL STEP*</u> *Calculates and records (a) usable volume as 27.25 ft.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* EOP ATT 9 2.e (3) (b)	step 2.b _____ ft - 2.5 ft =	<u>CRITICAL STEP*</u> *Calculates and records (b) usable volume as 22 ft.	—	—
Comment				
* EOP ATT 9 2.e (3) (c)	step 2.c _____ ft - 2.75 ft =	<u>CRITICAL STEP*</u> * Calculates and records (b) usable volume as 0 ft.	—	—
Comment				
* EOP ATT 9 2.e (3) (d)	step(a) _____ ft + step(b) _____ ft + step(c) _____ ft =	<u>CRITICAL STEP*</u> * Calculates and records e.(3) usable volume as 49.25 ft.	—	—
Comment				
* EOP ATT 9 2.e (3) (f)	Convert the amount of CST level into gallons. (ft available) _____ ft x 9636.78 gal/ft =	<u>CRITICAL STEP*</u> * Calculates and records 2.f gallons available between 474,573-474,622 gals.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
Examiner NOTE The following addresses Task 1.				
* EOP ATT 9 3	IF adequate inventory exists to perform cooldown, THEN determine if an adequate makeup source exists to maintain hot standby.	<u>CRITICAL STEP*</u> Refers to step 1.a for amount of makeup water required to perform a cooldown with the ADVs. Determines there is not adequate inventory to perform a cooldown to 300°F based on current CST inventory. *Circles/identifies NO, adequate inventory does not exist to cooldown to 300°F.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
<p>Examiner NOTE</p> <p>The following addresses Task 2.</p>				
<p>* EOP ATT 9 4</p>	<p>IF adequate inventory does NOT exist to perform cooldown, THEN evaluate the following:</p> <ul style="list-style-type: none"> Maintaining hot standby conditions 	<p><u>CRITICAL STEP*</u></p> <p>Refers to Figure or Table "MAKEUP WATER REQUIRED TO MAINTAIN HOT STANDBY".</p> <p>Determines ~ 450,000 gallons are required to maintain Unit-2 in Hot Standby for 3 days (72 hours).</p> <p>*Circles/identifies YES, adequate inventory exists to maintain Hot Standby for 72 hours.</p>	—	—
<p>Comment</p>				
<p>TERMINATING CUE:</p> <p>This JPM is complete when available condensate inventory is evaluated using EOP Attachment (9), and it is determined there is insufficient water to cooldown to < 300° F and the plant could be maintained in hot standby conditions for 3 days from the trip.</p> <p>The Examinee is expected to end the JPM.</p>				
<p>TIME STOP: _____</p>				

Verification of Completion**Job Performance Measure Number:** RO Admin2**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-2 CRO.
2. Unit-2 is operating at 100% power when a Station Blackout occurs.
3. EOP-7-2, Station Blackout, is implemented.
4. The need for a Unit-2 plant cooldown is being evaluated with the following current conditions:
 - Unit-1 is in Mode 6
 - Unit-2 tripped 2 hours ago.
 - Unit-2 is in Hot Standby
 - The TBVs are not available
 - 21 CST level is 30'
 - 12 CST level is 24.5'
 - 11 CST is empty for maintenance

Initiating Cue:

1. The Unit Supervisor is evaluating the need for a plant cooldown per EOP-7 and assigns you two tasks.

Task 1

Determine if adequate inventory exists to perform a cooldown to 300°F, with current CST levels and no additional makeup, by completing EOP Attachment (9) Steps 1-2. Circle your determination below.

Circle YES, adequate inventory exists to cooldown to 300°F

NO, adequate inventory does not exist to cooldown to 300°F

Task 2

Determine if adequate inventory exists to maintain Unit-2 in Hot Standby conditions, with current CST levels and no additional makeup, for 72 hours from the trip, using EOP Attachment (9). Circle your determination below.

YES, adequate inventory exists to maintain Hot Standby for 72 hours

NO, adequate inventory does not exist to maintain Hot Standby for 72 hours

ATTACHMENT (9)
Page 1 of 5

MAKEUP WATER REQUIRED FOR RCS COOLDOWN

1. Determine the amount of makeup water required to perform an ADV cooldown and a TBV cooldown, based on the time after shutdown:
* 600,000 - 630,000
a. ADV cooldown and time after shutdown 1.a * gals
b. TBV cooldown and time after shutdown 1.b # gals
83,000 - 93,000 OR N/A
2. Determine the amount of makeup water available in the CSTs:
a. Record the level in 21 CST. 2.a 30 ft
b. Record the level in 12 CST. 2.b 24.5 ft
c. Record the level in 11 CST. 2.c 0 ft
d. Determine the status of Unit 1 (check one):
(1) ___ Mode 1, 2 or 3 and does **NOT** require AFW operation.
(2) ___ Mode 1, 2 or 3 and does require AFW operation.
(3) ☒ Mode 4, 5, 6 or defueled.

NOTE

Calculated negative values should be entered as zero.

- e. Determine the amount of makeup water available to Unit 2 using one of the following formulas, based on the status checked in step 2.d above:

- (1) **IF** step d.(1) is checked,
THEN correct CST levels for usable volume:

- | | |
|---|----------------|
| (a) step 2.a _____ ft - 2.75 ft = | (a) _____ ft |
| (b) step 2.b _____ ft - 16 ft = | (b) _____ ft |
| (c) step(a) _____ ft + step(b) _____ ft = | e.(1) _____ ft |

KEY

ATTACHMENT (9)
Page 2 of 5

MAKEUP WATER REQUIRED FOR RCS COOLDOWN

- (2) **IF** step d.(2) is checked,
THEN correct CST levels for usable volume:

(a) step 2.a _____ ft - 2.75 ft = (a) _____ ft

(b) $\frac{\text{step 2.b _____ ft} - 2.5 \text{ ft}}{2} =$ (b) _____ ft

(c) step(a) _____ ft + step(b) _____ ft = e.(2) _____ ft

- (3) **IF** step d.(3) is checked,
THEN correct CST levels for usable volume:

(a) step 2.a 30 ft - 2.75 ft = (a) 27.25 ft

(b) step 2.b 24.5 ft - 2.5 ft = (b) 22 ft

(c) step 2.c 0 ft - 2.75 ft = (c) 0 ft

(d) step(a) 27.25 ft + step(b) 22 ft + step(c) 0 ft = e.(3) 49.25 ft

- f. Convert the amount of CST level into gallons.

(ft available) 49.25 ft x 9636.78 gal/ft =

2.f * gals
474,573 - 474,622

NOTE

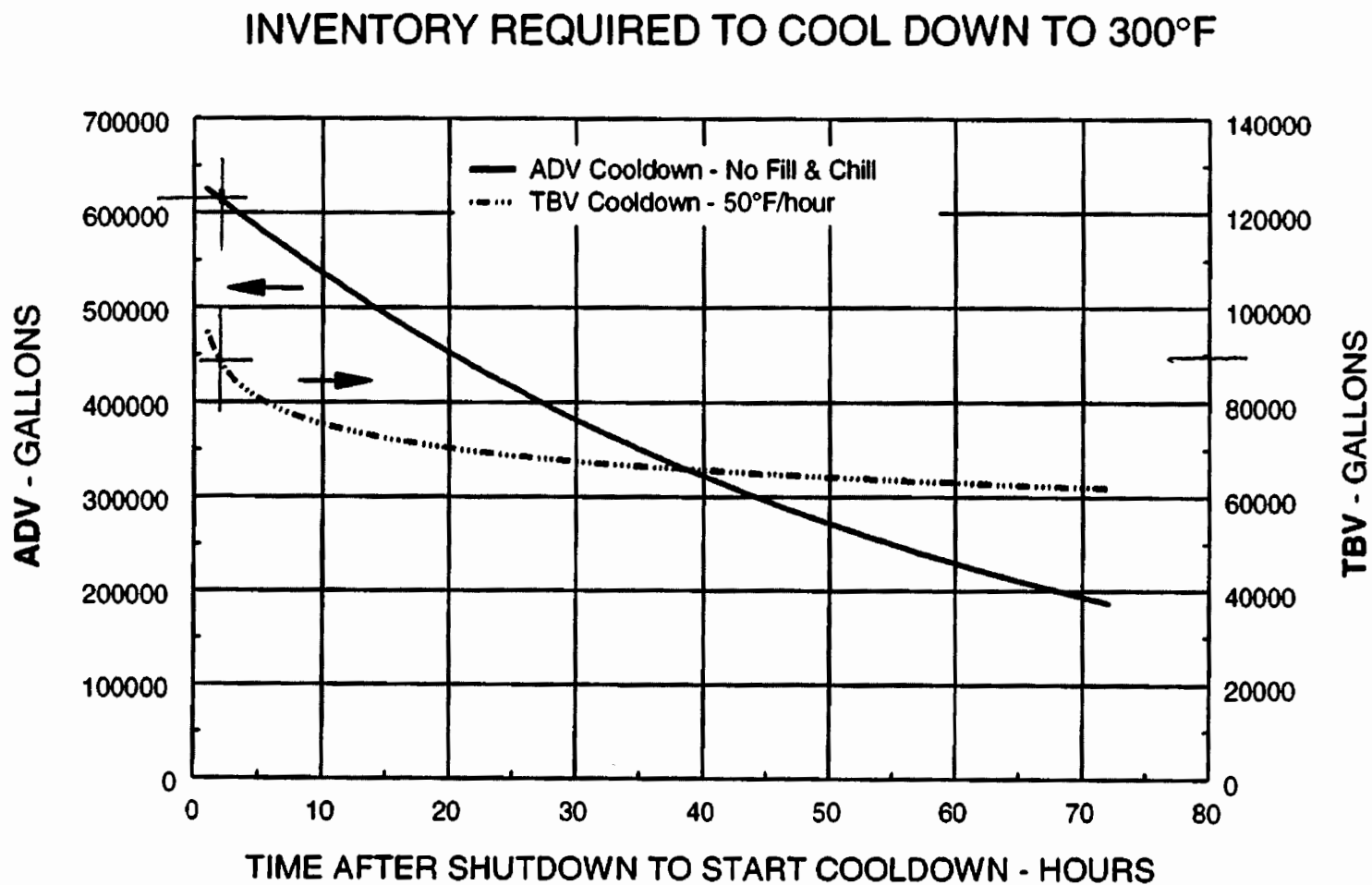
The nominal capacity of a Well Water pump is 300 GPM.
The nominal capacity of a Demineralized Water Transfer pump is 300 GPM.
The Fire System can fill the CST via fire hoses at greater than 500 GPM.

CAUTION

The status of both units should be considered when evaluating a makeup source.

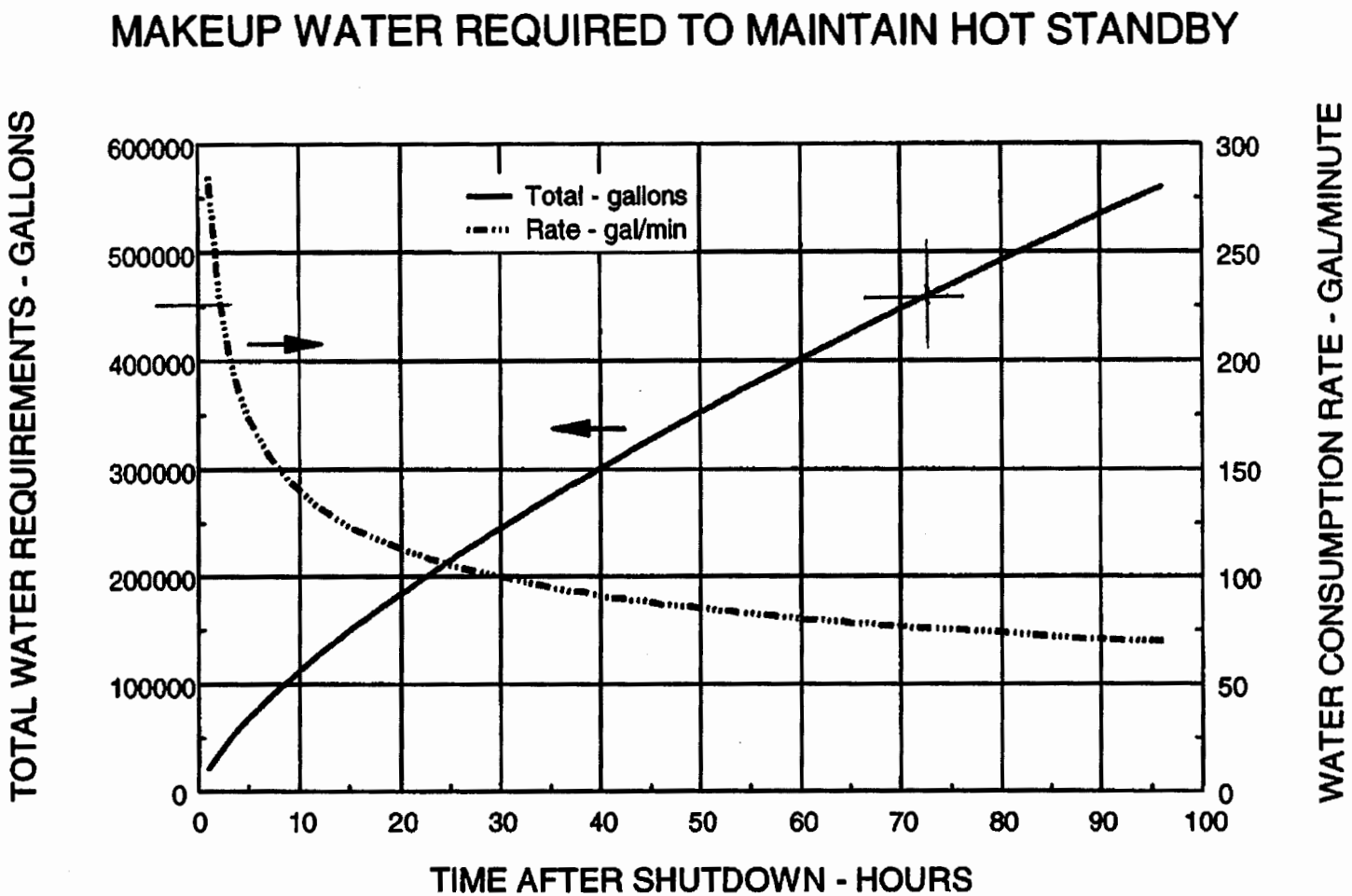
3. **IF** adequate inventory exists to perform cooldown,
THEN determine if an adequate makeup source exists to maintain hot standby.
4. **IF** adequate inventory does **NOT** exist to perform cooldown,
THEN evaluate the following:
 - Maintaining hot standby conditions
 - Time to restore an adequate makeup source
 - Restoration of other plant systems (TBVs, main feedwater system, etc.)
 - Performing partial cooldown while restoring plant systems

MAKEUP WATER REQUIRED FOR RCS COOLDOWN



ATTACHMENT (9)
Page 4 of 5

MAKEUP WATER REQUIRED FOR RCS COOLDOWN



ATTACHMENT (9)
Page 5 of 5

MAKEUP WATER REQUIRED FOR RCS COOLDOWN

INVENTORY REQUIRED TO COOL DOWN TO 300 F

TIME AFTER SHUTDOWN - HOURS	(ADV) COOLDOWN - GALLONS	TBV COOLDOWN - GALLONS
1	625,067	94,828
(2)	(614,531)	88,490
4	593,988	82,575
6	574,132	79,301
8	554,939	77,056
10	536,389	75,359
12	518,458	74,000
24	422,783	69,054
36	344,764	66,316
48	281,142	64,439
72	186,953	61,883

MAKEUP WATER REQUIRED TO MAINTAIN HOT STANDBY

TIME AFTER SHUTDOWN - HOURS	TOTAL WATER REQUIREMENT - GALLONS	WATER CONSUMPTION RATE - GAL/MINUTE
1	21,964	285
2	35,919	230
4	58,740	186
6	78,323	164
8	96,060	150
10	112,541	140
12	128,085	132
24	209,464	107
36	279,295	94
48	342,547	86
(72)	(456,746)	76
96	560,185	70

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-2 CRO.
2. Unit-2 is operating at 100% power when a Station Blackout occurs.
3. EOP-7-2, Station Blackout, is implemented.
4. The need for a Unit-2 plant cooldown is being evaluated with the following current conditions:
 - Unit-1 is in Mode 6
 - Unit-2 tripped 2 hours ago.
 - Unit-2 is in Hot Standby
 - The TBVs are not available
 - 21 CST level is 30'
 - 12 CST level is 24.5'
 - 11 CST is empty for maintenance

Initiating Cue:

1. The Unit Supervisor is evaluating the need for a plant cooldown per EOP-7 and assigns you two tasks.

Task 1

Determine if adequate inventory exists to perform a cooldown to 300°F, with current CST levels and no additional makeup, by completing EOP Attachment (9) Steps 1-2. Circle your determination below.

Circle YES, adequate inventory exists to cooldown to 300°F

☒ NO, adequate inventory does not exist to cooldown to 300°F

Task 2

Determine if adequate inventory exists to maintain Unit-2 in Hot Standby conditions, with current CST levels and no additional makeup, for 72 hours from the trip, using EOP Attachment (9). Circle your determination below.

☒ YES, adequate inventory exists to maintain Hot Standby for 72 hours

NO. adequate inventory does not exist to maintain Hot Standby for 72 hours

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-RO Admin3

Facility: Calvert Cliffs 1 & 2**JPM Number:** RO Admin3**Alternate Path:** No**Task Number:** 036.009**Task Title:** AFW Pump Large Flow Test**Task Standard:**

This JPM is complete when 11 AFW Pump Curve Test data for Step 6.3.P is calculated and pump data for Step 6.3.Q is independently verified.

K/A Reference: 2.2.12 (3.7/4.1)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 8 minutes**References and Tools Required:**

1. STP O-73H-1 (Rev 11)
2. Calculator

JPM Setup Instructions:

1. STP O-73H-1 placekeeping marks for steps 6.3.P.1-4 completed.
2. Table in 6.3.P.4 completed with the following values
 - Pump/Turbine Speed-3996 RPM
 - Suction pressure-23.5 PSIG
 - Discharge Pressure-1270 PSIG
 - Suction Pipe Temperature-53.5°F
 - Suction Flowrate-311 GPM
 - FIC-4511A output-65%
 - FIC-4512A output-68%
 - 11 SG Pressure-880 PSIA
 - 12 SG Pressure-880 PSA
 - Recirc Flowrate-88.93 GPM
3. STP O-73H-1 placekeeping marks for steps 6.3.Q.1-7 completed.

4. Table in 6.3.Q.3 completed with the following values
 - Pump/Turbine Speed-3993 RPM
 - Suction pressure-26.0 PSIG
 - Discharge Pressure-1280 PSIG
 - Suction Pipe Temperature-57.8°F
 - Suction Flowrate-253 GPM
 - FIC-4511A output-73%
 - FIC-4512A output-76%
 - 11 SG Pressure-880 PSIA
 - 12 SG Pressure-880 PSA
 - Recirc Flowrate-89.5 GPM
5. Step 6.3.Q.4 completed with 1280 and 1280.64 PSID as recorded values.
6. Step 6.3.Q.5 completed with 1280.64, 26.0, and 1254.64 PSID as recorded values.
7. Step 6.3.Q.6 completed with 2.309 as recorded value.
8. Step 6.3.Q.47 completed with 1254.64, 2.309, and 2896.96 FT as recorded values.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. STP O-73H-1 is in progress.
3. 11 AFW Pump Curve Test is currently being performed.

Initiating Cue:

1. The Unit Supervisor directs you to first complete Steps 6.3.P.5 through 6.3.P.8.
2. Once Steps 6.3.P.5-8 are completed, the Unit Supervisor directs you to perform an independent verification for 6.3.Q.8. If any errors are identified during the independent verification, circle the errors in the STP.
3. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide a calculator and the partially completed STP O-73H-1.			
STP	STP O-73H-1, Step 6.3.P, 11 AFW Pump Curve Test.	Identifies next step to complete is Step 6.3.P.5.	—	—
Comment				
* STP 6.3 P.5	CALCULATE 11 AFW Pump corrected discharge pressure: $\frac{\text{—————}}{(1\text{-PI-4501}) \text{ (Step P.4)}} + 0.64 = \frac{\text{—————}}{\text{(Corrected Press)}} \text{ PSID}$	<u>CRITICAL STEP*</u> Refers to Step 6.3.P.4 for data. *Records 1270 for 1-PI-4501/Step P.4. *Calculates and records value between 1270-1271 for Corrected Press.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* STP 6.3 P.6	CALCULATE pump ΔP by subtracting pump suction pressure from corrected pump discharge pressure: $\Delta P = \frac{\text{_____}}{\text{(Corr Disch Press) (Step P.5)}} - \frac{\text{_____}}{\text{(Suct Press) (Step P.4)}}$ $= \text{_____ PSID}$	<u>CRITICAL STEP*</u> Refers to Step 6.3.P.4 for data. *Records value between 1270-1271 for Corrected Disch Press/Step P.5. *Records 23.5 for Suct Press/Step P.4. *Calculates and records value between 1246-1248 for Pump ΔP	—	—
Comment				
* STP 6.3 P.7	DETERMINE the ΔP Multiplication factor from ATTACHMENT 1, D/P TO HEAD CONVERSION TABLE, using the suction temperature taken in step P.4. Multiplication Factor: _____	<u>CRITICAL STEP*</u> Refers to Step 6.3.P.4 for data and Attachment 1. *Records 2.307 for Multiplication Factor.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* STP 6.3 P.8	CALCULATE 11 AFW Pump Total Developed Head Below: $\frac{\text{_____} (\Delta P)}{(\text{Step P.6})} \times \frac{\text{_____} (\text{mult factor})}{(\text{Step P.7})}$ $= \text{_____} \text{ FT (TDH)}$	<u>CRITICAL STEP*</u> Refers to Step 6.3.P.4 for data. *Records value between 1246-1248 for Step P.6. *Records 2.307 for Step P.7. *Calculates and records value between 2874-2879 for Total Developed Head.	—	—
Comment				
STP	STP O-73H-1, Step 6.3.Q, 11 AFW Pump Curve Test.	Identifies next step to complete is Step 6.3.Q.8 based on Examinee Cue Sheet.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* STP 6.3 Q.8	Independently CHECK calculations and Multiplication Factor determination in steps Q.4, Q.5, Q.6, and Q.7.	<p><u>CRITICAL STEP*</u></p> <p>Refers to Step 6.3.Q.4 for data and evaluates calculations in steps Q.4, Q.5, Q.6, and Q.7.</p> <p>Determines Multiplication Factor from Attachment 1 in Step Q.6 is incorrect.</p> <p>*Circles/identifies that Multiplication Factor from Attachment 1 in Step Q.6 is incorrect.</p> <p>Determines Calculation for Total Developed Head in Step Q.7 is incorrect.</p> <p>*Circles/identifies that calculation for Total Developed Head in Step Q.7 is incorrect.</p>	—	—
Comment				
<p>TERMINATING CUE:</p> <p>This JPM is complete when 11 AFW Pump Curve Test data for Step 6.3.P is calculated and pump data for Step 6.3.Q is independently verified.</p> <p>The Examinee is expected to end the JPM.</p>				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** RO Admin3**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. STP O-73H-1 is in progress.
3. 11 AFW Pump Curve Test is currently being performed.

Initiating Cue:

1. The Unit Supervisor directs you to first complete Steps 6.3.P.5 through 6.3.P.8.
2. Once Steps 6.3.P.5-8 are completed, the Unit Supervisor directs you to perform an independent verification for 6.3.Q.8. If any errors are identified during the independent verification, circle the errors in the STP.

AFW PUMP LARGE FLOW TEST

STP O-73H-1
Rev. 11/Unit 1
Page 68 of 125

6.3.P 11 AFW PUMP CURVE TEST [B2117] (Continued)

INITIALS

5. CALCULATE 11 AFW Pump corrected discharge pressure:

$$\frac{1270}{(1-PI-4501) \text{ (Step P.4)}} + 0.64 = \frac{*}{*} \text{ PSID } * \quad 1270-1271$$

6. CALCULATE pump ΔP by subtracting pump suction pressure from pump corrected discharge pressure:

$$* \quad 1270-1271 \quad \Delta P = \frac{*}{*} \text{ (Corr Disch Press) (Step P.5)} - \frac{23.5}{*} \text{ (Suct Press) (Step P.4)} = \frac{*}{*} \text{ PSID } * \quad 1246-1248$$

7. DETERMINE the ΔP multiplication factor from ATTACHMENT 1, D/P TO HEAD CONVERSION TABLE, using the suction temperature taken in step P.4.

Multiplication Factor: 2.307

8. CALCULATE 11 AFW Pump Total Developed Head Below:

$$\# \quad 1246-1248 \quad \# \quad \frac{*}{*} \text{ (Step P.6)} \times \frac{2.307}{*} \text{ (mult factor) (Step P.7)} = \frac{*}{*} \text{ FT (TDH) } * \quad 2874-2879$$

9. Independently CHECK calculations AND Multiplication Factor determination in steps P.5 through P.8.

UNIT SUPERVISOR
HAS GIVEN STEP 9
TO ANOTHER RO.
PROCEED TO TASK 2

KEY

AFW PUMP LARGE FLOW TEST

STP O-73H-1
Rev. 11/Unit 1
Page 71 of 125

6.3.Q 11 AFW PUMP CURVE TEST [B2117] (Continued)

INITIALS

6. **DETERMINE** the ΔP multiplication factor from ATTACHMENT 1, D/P TO HEAD CONVERSION TABLE, using the suction temperature taken in step Q.3.

Multiplication Factor:

2.309

7. **CALCULATE** 11 AFW Pump Total Developed Head Below:

$$\frac{1254.64}{(\text{Step Q.5})} (\Delta P) \times \frac{2.309}{(\text{Step Q.6})} (\text{mult factor}) = 2896.96 \text{ FT (TDH)}$$

8. Independently **CHECK** calculations **AND** Multiplication Factor determination in steps Q.4, Q.5, Q.6 and Q.7.

R. **ESTABLISH** a test flow rate of 190-215 GPM as follows:

NOTE

Flows should be balanced between controllers to feed equal amounts of AFW to the Steam Generators.

- ADJUST BOTH** 11 S/G Flow Controller 1-FIC-4511A **AND** 12 S/G Flow Controller 1-FIC-4512A to obtain an average suction flowrate of 190-215 GPM for 5 minutes at 3980 to 4000 RPM.
(5 minute average read on Ultrasonic Flowmeter.)
- CHECK** S/G levels are being properly maintained between ± 10 inches.

KEY

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-RO Admin4

Facility: Calvert Cliffs 1 & 2**JPM Number:** RO Admin4**Alternate Path:** No**Task Number:** 204.111**Task Title:** Perform duties as Emergency Communicator**Task Standard:**

This JPM is complete when the ERO is activated using the primary method via the Training Everbridge account. (Time Critical)

K/A Reference: 2.4.39 (3.9/3.8)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 7 minutes**References and Tools Required:**

1. Shift Communicator Binder
2. EP-AA-112-100-F-57 (ERONS Notification Details)

JPM Setup Instructions:

1. Shift Communicator binder is available.
2. Place keep the Shift Communicator Checklist (EP-AA-112-100-F-51) to indicate that Initial Actions 1.1 is completed and Initial Actions 1.2 and 1.3 are in progress.
3. Create a completed Training Version of EP-AA-112-100-F-57 (ERONS Notification Details) with the following information completed:
 - 1.1 "Calvert Cliffs" is circled
 - 1.2 "Simulator Actual Event Respond to Facility" is circled
 - Write time of 1315 at bottom of first page.
4. An internet assessable computer with Everbridge shortcut is available.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Shift Communicator.
2. An Alert declaration was made at time 1305.
3. A plant page was made for the Shift Communicator to come to the Control Room.
4. You report to the Control Room.
5. You have informed the Shift Manager of your arrival per Initial Action Step 1.1 in the Shift Communicator Checklist.

Initiating Cue:

1. The Shift Manager is completing the ERONS Notification Details form.
2. You are to standby in preparation to activate the ERO.
3. This is a time critical task. The JPM will not begin until you are ready. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
<p>Examiner NOTE</p> <p>The intent of this JPM is to activate the Training Everbridge account. The Examinee will not actually activate the ERO when performing this task. It is important to verify that the Training ERONS Notification Details Form is used as this form contains passwords that ensure only the Training Everbridge account is accessed during this JPM.</p> <p>The time critical part of the JPM starts when the ERONS Notification Details Form is handed to the Operator.</p>				
CUE	After Examinee reviews Cue Sheet, provide the operator with the Shift Communicator binder.			
SCC	Locates Shift Communicator binder.	Identifies next step to complete in Shift Communicator Checklist is EP-AA-112-100-F-51 Steps 1.2 and 1.3.	—	—
Comment				
CUE	Provide a copy of the Training ERONS Notification Details Form, EP-AA-112-110-F-57. Activate the ERO per the ERONS Notification Details Form. Note ERONS Start Time _____			
SCC 1.3	If directed by the Shift Manager, then INITIATE ERO Activation (call out) using an ERO Notification form.	Determines step is applicable based on Cue. Proceeds to EP-AA-112-110-F-57, ERONS Notification Details (CNG).	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
ERONS	Locates ERONS Notification Details.	Identifies next step to complete is EP-AA-112-110-F-57 Step 1.3.	—	—
Comment				
ERONS 1.3 NOTE	The user name and password are case sensitive. Four (4) failed attempts to log in will lock the system.			
* ERONS 1.3	OPEN Everbridge using the shortcut icon on your desktop computer. If shortcut icon is not available or not functioning, OPEN a web browser, then TYPE: https://manager.everbridge.net/login in the address bar.	<u>CRITICAL STEP*</u> *Accesses Everbridge sign in page.	—	—
Comment				
ERONS 1.3 A	If the internet is not available, then GO to Section 2, Initiate Activation / Termination of Notification System using live Everbridge Agent.	Determines step is N/A.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* ERONs 1.4	ENTER the appropriate station specific Username and Password from Step 1.1 and SELECT "Sign in".	<u>CRITICAL STEP*</u> *Enters username of ccnppsim and password of Exelon15, then selects Sign-in.	—	—
Comment				
<p>Examiner NOTE</p> <p>When using the Training activation passwords, the next screen will prompt the user to ensure they have used the appropriate login. The Examinee may need to be directed to proceed when this warning screen is encountered. The warning screen will not display the Station Name, but rather Calvert Cliffs Ops/Forced Outage/Training Platform.</p>				
CUE	If Calvert Cliffs Ops/Forced Outage/Training Platform is displayed: The appropriate Login has been used.			
ERONs	VERIFY the appropriate Station Name is displayed, CLICK "Proceed".	Clicks Proceed based on Cue and accesses Everbridge Incidents page.	—	—
Comment				
* ERONs 1.6	CLICK on +Launch Incident button.	<u>CRITICAL STEP*</u> *Clicks +Launch Incident button and accesses Everbridge Launch Incident page.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* ERONs 1.7	CLICK on the appropriate incident from step 1.2.	<u>CRITICAL STEP*</u> *Clicks on Simulator Actual Event Respond to Facility.	—	—
Comment				
ERONs 1.8	VERIFY the appropriate incident is displayed.	Verifies Simulator Actual Event Respond to Facility displays on page.	—	—
Comment				
ERONs 1.9	If the incident displayed is not correct, then CLICK correct incident from list and RETURN to Step 1.8.	Determines step is N/A.	—	—
Comment				
* ERONs 1.10	If the incident displayed is correct, then CLICK on "NEXT".	<u>CRITICAL STEP*</u> *Determines information displayed is correct and clicks on Next.	—	—
Comment				
ERONs 1.10 A	CLICK check box to "Close Incident after successful send".	Clicks box to get a check in Close Incident after successful send box.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* ERONS 1.10 B	CLICK on "SEND".	<u>CRITICAL STEP*</u> *Clicks Send in < 10 minutes of starting ERONS initiation. Current Time _____ ERONS Start Time _____ *Current – ERONS < 10 mins	—	—
Comment				
Examiner NOTE When using the Training activation passwords, a confirm message box will not appear.				
CUE	A confirm message box did not appear.			
ERONS 1.10 C	If confirm message box appears, then CLICK "Yes".	Determines step is N/A based on Cue.	—	—
Comment				
ERONS 1.11	On the next screen validate there is a date and time in Sent On column. Record Time _____	Validates that date and time information populated under the Sent On column. Records time.	—	—
Comment				
ERONS 1.12	SELECT "Log Out" to exit the Everbridge Notification program.	Clicks Logout to exit Everbridge program.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
Examiner NOTE When using the Training Everbridge account, the remaining activities associated with activating the ERO will not occur and must be simulated. The Examiner should ask what actions are required when the ERO is activated and what actions would be taken if the ERO was not activated.				
CUE	Ask the Examinee: What are the expected responses and any further actions required once logging out of Everbridge?			
ERONS 1.13 1.15	Additional actions required.	Determines that a call to the Control Room from the ERO notification system should be received within 10 minutes after initiating the system. Determines the Shift Emergency Director/Shift Manager should be notified of ERONS initiation.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Ask the Examinee: What actions would be required if a call was not received in the Control Room from the ERO notification system?			
ERONs 1.14	Actions if a confirmation call was not received in the Control Room.	Alternate activation method of calling an Everbridge Live Agent via the telephone would need to be initiated.	—	—
Comment				
TERMINATING CUE: This JPM is complete when the ERO is activated using the primary method via the Training Everbridge account. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** RO Admin4**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Shift Communicator.
2. An Alert declaration was made at time 1305.
3. A plant page was made for the Shift Communicator to come to the Control Room.
4. You report to the Control Room.
5. You have informed the Shift Manager of your arrival per Initial Action Step 1.1 in the Shift Communicator Checklist.

Initiating Cue:

1. The Shift Manager is completing the ERONS Notification Details form.
2. You are to standby in preparation to activate the ERO.

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-SRO Admin1

Facility: Calvert Cliffs 1 & 2**JPM Number:** SRO Admin1**Alternate Path:** No**Task Number:** 203.013**Task Title:** Verify Core Alteration preparations are complete**Task Standard:**

This JPM is complete when the OP-7 Core Alteration Checklist has been reviewed and steps signed off for conditions met and entries made on the Core Alteration Checklist Issue Tracking for conditions not currently met.

K/A Reference: 2.1.36 (3.0/4.1)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 18 minutes**References and Tools Required:**

1. OP-7 Core Alteration Checklist for Fuel Movement
2. OP-CA-114, Containment Closure
3. Refueling Tech Specs (3.9)
4. Refueling Machine TRM (15.9.3)
5. OI-22D, Fuel Handling Area Ventilation System
6. NEOP-13 Figure 1.II.A.6.
7. COLR for Tech Spec 3.9.1
8. eSOMS logs search for Core Alteration related entries (STP O-59, STP O-60, STP O-55A, Containment Closure Tags, etc.)
9. Two pages of Core Alteration Checklist Issue Tracking Sheet.

JPM Setup Instructions:

1. OP-7-1 placekeeping marks for Steps 6.9.B.2 d, f, g h, i , j, k (except for Operations), l, m, n, and o completed.
2. OP-7-1 placekeeping marks for Steps, 6.9.B.3.a, d, e, and f completed.
3. OP-7-1 placekeeping marks for Steps 6.9.B.4.c, d, f, and g completed.
4. eSOMS log search completed per the attached.
5. Two page Core Alteration Checklist Issue Tracking Sheet created per the attached.
6. Row 1 completed on Core Alteration Checklist Issue Tracking Sheet with Step 2.k and Operations Surveillance Requirements.
7. Picture of 1C10 with 11 IRU available and 12/13 IRU OOS.
8. Picture of 1C34 with SFP ventilation fans all secured and Charcoal Filters bypassed.
9. Picture of TR-351 with RCS temperatures of 110°F.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of an extra SRO.
2. Unit-1 is in Mode 6 preparing to perform a full core off-load.
3. This will be the first movement of fuel this outage on Unit-1.
4. 11 LPSI Pump is in service with Shutdown Cooling Flow at 3000 GPM.
5. Required Refueling Boron Concentration per NEOP-13 and COLR is ≥ 2560 PPM.
6. Today's date is 8/5/18 and time is 1200
7. Fuel offload is scheduled to begin at 1800 today.
8. OP-7 Step 6.9.B, Core Alteration Checklist for Fuel Movement, has been partially completed.

Initiating Cue:

1. The Shift Manager has directed you to complete the Core Alteration Checklist for Fuel Movement, per OP-7 Step 6.9.B.
2. An administrative aid, a Core Alteration Checklist Issue Tracking Sheet, has been created to communicate issues with the Outage Control Center.
3. Document any issues/deviations (i.e. steps that currently cannot be signed off) that prevent moving fuel on the Core Alteration Checklist Issue Tracking Sheet.
4. Are there any questions? You may begin.

eSOMS Log Search (Refueling Related Entries)

Unit	Date	Entry	User	Position
1	07/26/2018 22:00:00	Reactor shutdown per OP-4, Rapid CEA Insertion method. Unit-1 is in Mode 3.	RO1	RO1
1	07/31/2018 20:00:00	Commenced CEA Uncoupling.	CRS1	CRS1
1	08/01/2018 04:00:00	CEA Uncoupling completed.	CRS1	CRS1
1	08/01/2018 08:00:00	CEA Uncoupling verification completed.	CRS1	CRS1
1	08/01/2018 12:00:00	Commenced filling RFP per OI-3B-1, Section 6.5.	MISC	MISC
1	08/01/2018 16:00:00	Secured filling RFP per OI-3B-1, Section 6.5. Final RFP level 67.05 feet by lowest indication. Final RWT level 50 inches.	MISC	MISC
1	08/02/2018 05:00:00	Shifted Containment Purge to Normal Purge per STP O-60-1 to facilitate testing. Chemistry and RadCon informed.	CRO1	CRO1
1	08/02/2018 07:00:00	Restored U-1 Modified Containment Purge per OI-36 Section 6.2, Exhaust Fan only, following testing per STP O-60-1. Chemistry and RadCon informed.	CRO1	CRO1
1	08/02/2018 09:00:00	STP O-60-1, Containment Purge Isolation System Functional Test, completed sat for scheduled surveillance.	CRO1	CRO1
	08/02/2018 10:00:00	Shifted to 11 LPSI Pump in service at 3000 GPM flow per OI-3A, Section 6.8.1.	CRO1	CRO1
1	08/03/2018 01:00:00	STP O-59-1, Refueling Machine Hoist Functional Test, completed sat for scheduled surveillance.	RO1	RO1
	08/04/2018 23:00:00	Commenced hanging yellow tags for STP O-55A-1 in preparation for Restricted Containment Closure, core off load.	MISC	MISC
1	08/05/2018 04:00:00	Chemistry reports the following boron sample results: SFP-2605 PPM RFP-2590 PPM RCS/SDC-2589 PPM	MISC	MISC

Core Alteration Checklist Issue Tracking Sheet

6.9.B Step	Issue	Corrected

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
Examiner NOTE Multiple steps in the OP-7 Core Alteration Checklist are marked as complete when the Examinee starts the JPM. Only steps needing evaluation by the Examinee are included in the JPM.				
CUE	After Examinee reviews Cue Sheet, provide: <ul style="list-style-type: none"> • Partially completed OP-7, Core Alteration Checklist for Fuel Movement • OP-CA-114, Containment Closure • Refueling Tech Specs (3.9) • Refueling Machine TRM (15.9.3) • OI-22D, Fuel Handling Area Ventilation System • NEOP-13 Figure 1.II.A.6 and COLR for Tech Spec 3.9.1 • eSOMS logs search for Core Alteration related entries (STP O-59, STP O-60, STP O-55A, Containment Closure Tags, etc.) • Partially completed Core Alteration Checklist Issue Tracking Sheet. • Picture of TR-351 with RCS temperatures • Picture of IRUs on 1C10 • Picture of SFP Ventilation on 1C34 			
OP-7	OP-7, Core Alteration Checklist for Fuel Movement.	Identifies next step to complete is Step 6.9.B.1.	—	—
Comment				
6.9.B 1	IF onloading an empty core, THEN verify the Core Support Plate cleanliness is acceptable for fuel onload. (N/A if NOT onloading an empty core.)	Determines Step is N/A based on Cue Sheet. Marks step N/A.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.9.B 2 NOTE	Steps in this section may be performed concurrently and in any order.			
6.9.B 2	IF performing core alterations MORE THAN 72 HOURS since the last core alteration, THEN PERFORM THE following:	Determines step is applicable based on Cue Sheet.	—	—
Comment				
* 6.9.B 2 a	ENSURE STP O-59-1, REFUELING MACHINE HOSIT FUNCTIONAL TEST, is completed satisfactorily within 72 hours prior to the initial start of movement of fuel assemblies within the reactor vessel for a refueling operation consisting of either a fuel offload and onload OR a fuel shuffle, to consider the Refueling Machine Main Hoist operable. (TRM TVR 15.9.3.1) (N/A if not required at this time OR if the requirement of TRM TVR 15.9.3.1 have already been satisfied for the current refueling operation.)	<p><u>CRITICAL STEP*</u></p> <p>Evaluates eSOMS logs.</p> <p>Determines STP O-59-1 was completed within 72 hours of planned start of fuel offload.</p> <p>*Marks/records Step B.2.a as complete.</p>	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.9.B 2 b	<p>ENSURE STP O-60-1, CONTAINMENT PURGE ISOLATION SYSTEM FUNCTIONAL TEST, is completed prior to movement of irradiated fuel within Containment. (Tech Spec SR 3.9.3.2)</p> <p>N/A step if already performed within the last 92 days OR the action requirements of Tech Specs 3.3.7.B and 3.9.3 are met.</p>	<p><u>CRITICAL STEP*</u></p> <p>Evaluates eSOMS logs.</p> <p>Determines STP O-60-1 was completed within 72 hours of planned start of fuel offload.</p> <p>*Marks/records Step B.2.b as complete.</p>	—	—
Comment				
* 6.9.B 2 c	<p>ENSURE STP O-55A-1, CONTAINMENT CLOSURE VERIFICATION, is complete PER the requirements of OP-CA-114, Containment Closure. (Tech Spec SR 3.9.3.1)</p>	<p><u>CRITICAL STEP*</u></p> <p>Evaluates eSOMS logs.</p> <p>Determines STP O-55A-1 has not been completed.</p> <p>*Marks/records STP O-55A-1, or similar wording, as Fuel Offload Requirement.</p>	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.9.B 2 e	ENSURE the Containment Closure tags are controlled by STP O-55A-1 and OP-CA-114, CONTAINMENT CLOSURE during movement of irradiated fuel assemblies within containment.	<p><u>CRITICAL STEP*</u></p> <p>Evaluates eSOMS logs.</p> <p>Determines Containment Closure tags have not been all hung per STP O-55A-1 and OP-CA-114.</p> <p>*Marks/records Containment Closure tags, or similar wording, as Fuel Offload Requirement.</p>	—	—
Comment				
6.9.B 2 k	REQUEST the responsible discipline VERIFY Surveillance Requirements under their responsibility are current to allow core alterations AND are established on the schedule to remain current:	<p>Determines Operations has not verified Surveillance requirements are current yet.</p> <p>Marks/records Operations Surveillance Requirements, or similar wording, as Fuel Offload Requirement</p> <p>OR</p> <p>Determines condition is already listed on Fuel Offload Requirement.</p>	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.9.B 3 b	ENSURE the Reactor has been subcritical for at least 100 hours (TRM TVR 15.9.1.1) prior to movement of irradiated fuel assemblies in the reactor vessel. (N/A if couple CEAs after fuel movement)	<u>CRITICAL STEP*</u> Evaluates eSOMS logs. Determines Reactor has been subcritical for > 100 hours. *Marks/records Step B.3.b as complete.	—	—
Comment				
* 6.9.B 3 c	The RCS (SDC), RFP, and SFP boron concentrations are greater than the Refueling Boron Concentration PER NEOP-13.	<u>CRITICAL STEP*</u> Evaluates eSOMS logs. Determines RCS (SDC), RFP, and SFP are all greater than NEOP-13/COLR value of > 2560 PPM. *Marks/records Step B.3.c as complete.	—	—
Comment				
6.9.B 4 NOTE	Steps in this section may be performed concurrently and in any order.			
6.9.B 4	IF performing core alterations MORE THAN ONE HOUR since the last core alteration, THEN PERFORM the following:	Determines step is applicable based on Cue Sheet.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.9.B 4 a	IF any recently irradiated fuel assemblies will be moved in the Auxiliary Building, THEN ENSURE SFP Ventilation is in service PER OI-22D, FUEL HANDLING AREA VENTILATION SYSTEM.	<u>CRITICAL STEP*</u> Evaluates 1C34 indications. Determines SFP Ventilation is not in service per OI-22D, to support core alterations. *Marks/records SFP Ventilation, or similar wording, as Fuel Offload Requirement.	—	—
Comment				
* 6.9.B 4 a(1)	IF available ENSURE Charcoal Filters in service, PER OI-22D, FUEL HANDLING AREA VENTILATION SYSTEM, Section titled, CHARCOAL FILTER OPERATION.	<u>CRITICAL STEP*</u> Evaluates 1C34 indications. Determines SFP Charcoal Filters are available and not in service per OI-22D, to support core alterations. *Marks/records SFP Charcoal Filters, or similar wording, as Fuel Offload Requirement.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.9.B 4 b	ESTABLISH direct communications between the Control Room and personnel at the refueling station(s), within 1 hour prior to the start of core alterations (TRM 15.9.2)	<p>Determines current time is > 1 hour before start of core alterations.</p> <p>Marks/records Direct Communications, or similar wording, as Fuel Offload Requirement.</p> <p>OR</p> <p>Leaves step unmarked since not applicable until within 1 hour prior to start of core alterations.</p>	—	—
Comment				
* 6.9.B 4 e	ENSURE at least one Containment Iodine Filter is available for service.	<p><u>CRITICAL STEP*</u></p> <p>Evaluates 1C10 indications.</p> <p>Determines 11 IRU is available.</p> <p>*Marks/records Step B.4.e as complete.</p>	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.9.B 4 h	The RCS temperature is greater than 70°F and less than or equal to 140°F (SR 3.9.1.1)	<u>CRITICAL STEP*</u> Evaluates RCS temperature on TR-351 indications. Determines RCS temperature is > 70°F and < 140°F. *Marks/records Step B.4.h as complete.	—	—
Comment				
* 6.9.B 4 i	If moving fuel assemblies within containment, THEN SDC loop in operation circulating reactor coolant at a flow rate of ≥ 1500 gpm OR meeting the requirements of LCO 3.9.4 note 1. (SR 3.9.4.1, 3.9.5.2)	<u>CRITICAL STEP*</u> Determines 11 LPSI Pump is in operation and SDC flow rate is 3000 gpm based on Cue Sheet or eSOMS logs. *Marks/records Step B.4.i as complete.	—	—
Comment				
6.9.B 4 j	If coupling CEA's, THEN SDC loop in operation circulating reactor coolant at a flow rate of ≥ 1500 gpm OR meeting the requirements of LCO 3.9.4 note 2. (SR 3.9.4.1, 3.9.5.2)	Determines Step is N/A based on Cue Sheet. Marks step N/A.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
6.9.B 5	Core alteration check list complete with all issues that will affect the refueling operation resolved.	<p>Determines check list is not complete based on multiple steps awaiting completion.</p> <p>Marks/records Checklist complete, or similar wording, as Fuel Offload Requirement</p> <p>OR</p> <p>Leaves step unmarked</p>	—	—
<p>Comment</p>				
<p>TERMINATING CUE:</p> <p>This JPM is complete when the OP-7 Core Alteration Checklist has been reviewed and steps signed off for conditions met and entries made on the Core Alteration Checklist Issue Tracking for conditions not currently met.</p> <p>The Examinee is expected to end the JPM.</p>				
<p>TIME STOP: _____</p>				

Verification of Completion**Job Performance Measure Number:** SRO Admin1**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of an extra SRO.
2. Unit-1 is in Mode 6 preparing to perform a full core off-load.
3. This will be the first movement of fuel this outage on Unit-1.
4. 11 LPSI Pump is in service with Shutdown Cooling Flow at 3000 GPM.
5. Required Refueling Boron Concentration per NEOP-13 and COLR is ≥ 2560 PPM.
6. Today's date is 8/5/18 and time is 1200
7. Fuel offload is scheduled to begin at 1800 today.
8. OP-7 Step 6.9.B, Core Alteration Checklist for Fuel Movement, has been partially completed.

Initiating Cue:

1. The Shift Manager has directed you to complete the Core Alteration Checklist for Fuel Movement, per OP-7 Step 6.9.B.
2. An administrative aid, a Core Alteration Checklist Issue Tracking Sheet, has been created to communicate issues with the Outage Control Center.
3. Document any issues/deviations (i.e. steps that currently cannot be signed off) that prevent moving fuel on the Core Alteration Checklist Issue Tracking Sheet.

CALVERT CLIFFS NUCLEAR POWER PLANT

UNIT ONE

OP-7

SHUTDOWN OPERATIONS

REVISION 05600

Safety Related

REFERENCE USE

SFAM:

Director Site Operations

N/A - STEP MARKED AS N/A
COMPLETE - STEP MARKED AS COMPLETE
STILL REQUIRED - STEP NOT MARKED AS COMPLETE
AND ACTIONS NEEDED RECORDED
ON CORE ALTERATION CHECKLIST
ISSUE TRACKING SHEET

KEY

TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
1.0 PURPOSE	6
2.0 APPLICABILITY/SCOPE	6
3.0 REFERENCES AND DEFINITIONS	7
4.0 PREREQUISITES	10
5.0 PRECAUTIONS	11
6.0 PROCEDURE	18
6.1 COLLAPSE THE PRESSURIZER BUBBLE	18
6.2 RCS DRAINING BETWEEN 100 INCHES PZR LEVEL AND 41 FT ELEVATION	42
6.3 ENTERING REDUCED INVENTORY CONDITION [B0073]	59
6.4 REDUCED INVENTORY OPERATIONS[B0073]	85
6.5 EXITING REDUCED INVENTORY OPERATIONS	95
6.6 RCS FILLING OPERATIONS WITH LEVEL GREATER THAN 41 FT ELEVATION	97
6.7 MODE 6 PREPARATIONS	99
6.8 MODE 6 ENTRY	109
6.9 CORE ALTERATIONS PREPARATIONS[B0408]	110
A. CHECKLIST FOR CORE ALTERATIONS OTHER THAN FUEL MOVES	110
B. CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT	115
C. CORE ALTERATION CHECKLIST FOR CEA COUPLING AFTER FUEL MOVEMENT	125
6.10 MODE 5 PREPARATIONS	127
6.11 MODE 5 ENTRY	135
6.12 PREPARE RCS FOR DRAWING PRESSURIZER BUBBLE	136
6.13 FILL THE RCS AND GO SOLID	147
6.14 DRAW PRESSURIZER BUBBLE	157

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 115 of 240

B. CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT

1. **IF** unloading an empty core,
THEN verify the Core Support Plate cleanliness is acceptable for fuel onload.
(N/A if **NOT** unloading an empty core.)

	RE INITIALS	DATE
COMPLETED		

NA

~~NOTE~~

Steps in this section may be performed concurrently and in any order.

2. **IF** performing core alterations **MORE THAN 72 HOURS** since the last core alteration,
THEN PERFORM the following: [B0408]
 - a. **ENSURE** STP O-59-1, REFUELING MACHINE HOIST FUNCTIONAL TEST, is completed satisfactorily within 72 hours prior to the initial start of movement of fuel assemblies within the reactor vessel for a refueling operation consisting of either a fuel offload and onload **OR** a fuel shuffle, to consider the Refueling Machine Main Hoist operable. (TRM TVR 15.9.3.1)
(N/A if not required at this time **OR** if the requirements of TRM TVR 15.9.3.1 have already been satisfied for the current refueling operation.)

	INITIALS	DATE	TIME
START			
COMPLETED			

COMPLETE

- b. **ENSURE** STP O-60-1, CONTAINMENT PURGE ISOLATION SYSTEM FUNCTIONAL TEST, is completed prior to movement of irradiated fuel within Containment. (Tech Spec SR 3.9.3.2)

	INITIALS	DATE
COMPLETED		

COMPLETE

N/A step if already performed within the last 92 days **OR** the action requirements of Tech Specs 3.3.7.B and 3.9.3 are met.

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 116 of 240

6.9.B.2 CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

- c. **ENSURE** STP O-55A-1, CONTAINMENT CLOSURE VERIFICATION, is complete **PER** the requirements of OP-CA-114, Containment Closure. (Tech Spec SR 3.9.3.1) [B0089]

	INITIALS	DATE
START		
COMPLETED		

STILL
REQUIRED

- ~~d.~~ **NOTIFY** the Operations FSTC to ensure that STP O-55A-1 is scheduled to be performed on a weekly basis during movement of irradiated fuel assemblies within containment. (May be carried as a turn-over item until the FSTC is on site.)

	INITIALS	DATE
COMPLETED	XX	8/5/18

- e. **ENSURE** the Containment Closure tags are controlled by STP-O-55A-1 and OP-CA-114, CONTAINMENT CLOSURE during movement of irradiated fuel assemblies within containment. [B0089]

	INITIALS	DATE
COMPLETED		

STILL
REQUIRED

- ~~f.~~ **REVIEW** the Temporary Alteration Log for operability impact of equipment required for core alterations. (Ref MD-1-100)

	INITIALS	DATE
SM	DG	8/5/18

- ~~g.~~ **REVIEW AND EVALUATE ALL** procedure controlled temporary plant configuration changes **PER** MN-1-110, Appendix PC, for operability impact of equipment required for core alterations.

	INITIALS	DATE
SM	DG	8/5/18

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 117 of 240

6.9.B.2 CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

- ☒ **h. VERIFY** post-Maintenance testing on completed maintenance orders (status W8, W9, T1, T2, and T3) and in any working status (W1, W2, and W3) identified as core alterations restraints are complete or will **NOT** impact core alterations.

	INITIALS	DATE
WEC - SRO	TV	8/4/18

- ☒ **i. VERIFY** there are no tag outs which affect equipment required for core alterations.

	INITIALS	DATE
WEC - SRO	TV	8/4/18

- ☒ **j. ENSURE** access to the Fuel Transfer Tube access hatch walkway (45' Cntmt) has been restricted. **[B1243]**
(N/A if coupling CEAs after fuel movement)

	INITIALS	DATE
Rad-Con Ops	3H	8/4/18

- ☒ **k. REQUEST** the responsible discipline **VERIFY** Surveillance Requirements under their responsibility are current to allow core alterations **AND** are established on the the schedule to remain current:

DISCIPLINE	INITIALS	DATE
Operations		
Fire Protection	KM	8/5/18
E&C	GH	8/5/18
Mechanical Maint	TT	8/4/18
Snubbers	TP	8/4/18
Programs Engineering	KB	8/4/18

AWAITING
COMPLETION OF
OPS STPS.

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 118 of 240

6.9.B.2 CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

- ☒ **1. REQUEST** the responsible Engineering Supervisors to certify and initial that no project **OR** modifications are currently outstanding which could impact core alterations.

	INITIALS	DATE
ENGINEERING MANAGER-BOP	PC	8/4/18
ENGINEERING MANAGER-PRIMARY	ML	8/5/18
ENGINEERING MANAGER-E&C	DB	8/4/18
MANAGER-REACTOR ENGINEERING	BB	8/4/18

- ☒ **2. REQUEST** the responsible maintenance supervisors certify and initial that **ALL** maintenance activities, associated post-maintenance tests and supporting surveillance tests have been completed satisfactorily on components that are required for performing core alterations.

	INITIALS	DATE
MANAGER- MMD	LL	8/4/18
MANAGER-SITE PROJECT MANAGEMENT	DP	8/4/18
MANAGER- EMD	GH	8/4/18
MANAGER- IMD	PT	8/4/18

- ☒ **3. REQUEST** the PORC Chairman certify and initial that any PORC Open Items that prohibit core alterations are appropriately closed.

RESPONSIBILITY	INITIALS	DATE
PORC Chairman	PC	8/4/18

- ☒ **4. REQUEST** the responsible supervisors certify and initial that there are no open CRs **OR** RHOs that restrain core alterations.

RESPONSIBILITY	INITIALS	DATE
Supervisor-Calvert Cliffs Warehouse Unit (RHOs)	JM	8/4/18
Outage Manager (CRs)	DD	8/5/18

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 119 of 240

6.9.B CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

NOTE

Steps in this section may be performed concurrently and in any order.

8

IF performing core alterations **MORE THAN 24 HOURS** since the last core alteration,
THEN PERFORM the following: [B0408]

a

Approval for the movement of fuel has been received from the Manager-Site Operations.
(N/A if coupling CEAs after fuel movement)

	INITIALS	DATE
COMPLETED	JX	8/5/18

b. **ENSURE** the Reactor has been subcritical for at least 100 hours (TRM TVR 15.9.1.1) prior to movement of irradiated fuel assemblies in the reactor vessel.
(N/A if coupling CEAs after fuel movement)

RX S/D DATE / TIME	INITIALS

COMPLETE

	INITIALS	DATE	TIME
COMPLETED			

c. The RCS (SDC), RFP, and SFP boron concentrations are greater than the Refueling Boron Concentration **PER** NEOP-13.

	INITIALS	DATE
COMPLETED		

COMPLETE

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 120 of 240

6.9.B.3 CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

NOTE

An evaluation to ensure compliance with the FSAR, is required for instances when these radiation monitors are all out of service.

- d. ☒ **VERIFY** ONE of the following is in service.
(N/A if coupling CEAs after fuel movement)

- ☒ Fuel Handling Area Vent Radiation Monitor, 0-RI-5420
- ☒ 0-RE-7025, AUX. BLDG SPENT FUEL POOL SERVICE PLATFORM
- ☒ 0-RE-7024A, "SFP AREA DETECTOR - NORMAL RANGE"
- ☒ 0-RE-7024B, SFP AREA DETECTOR - HIGH RANGE

	INITIALS	DATE
COMPLETED	NY	8/5/18

- e. ☒ **ENSURE** Required Train of CREVS operable **PER** Tech Spec 3.7.8.
(N/A if coupling CEAs after fuel movement)

	INITIALS	DATE
COMPLETED	NY	8/5/18

- f. ☒ **ENSURE** Required Train of CRETS operable **PER** Tech Spec 3.7.9.
(N/A if coupling CEAs after fuel movement)

	INITIALS	DATE
COMPLETED	NY	8/5/18

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 121 of 240

6.9.B CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

NOTE

Steps in this section may be performed concurrently and in any order.

4. **IF** performing core alterations **MORE THAN ONE HOUR** since the last core alteration,
THEN PERFORM the following: [B0408]

- a. **IF** any recently irradiated fuel assemblies will be moved in the Auxiliary Building,
THEN ENSURE SFP Ventilation is in service **PER** OI-22D, FUEL HANDLING AREA VENTILATION SYSTEM.

	INITIALS	DATE	TIME
COMPLETED			

STILL
REQUIRED

- (1) **IF** available **ENSURE** Charcoal Filters in service, **PER** OI-22D, FUEL HANDLING AREA VENTILATION SYSTEM, Section titled, CHARCOAL FILTER OPERATION.

	INITIALS	DATE	TIME
COMPLETED			

STILL
REQUIRED

NOTE

Communications shall be established for all core alterations.

- b. **ESTABLISH** direct communication between the Control Room and personnel at the refueling station(s), within 1 hour prior to the start of core alterations (TRM 15.9.2)

	INITIALS	DATE	TIME
COMPLETED			

UNMARKED
OR

STILL
REQUIRED

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 122 of 240

6.9.B.4 CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

NOTE

Communications shall be Verified for all core alterations.

- ☒ **ADD** note to the Shift Turnover Sheet under non-routine surveillance requirements, to verify communications at a frequency not to exceed **once every 12 hours** during core alterations. (TRM TVR 15.9.2.1)

	INITIALS	DATE	TIME
COMPLETED	IX	8/5/18	1100

- ☒ **VERIFY** RFP level, per the lowest indication, is greater than the 65 foot elevation (normally 67 feet) within 24 hours prior to movement of irradiated fuel assemblies within Containment and every 24 hours thereafter. (Tech Spec 3.9.6.1) **[B0407]**
(N/A if coupling CEAs after fuel movement)

	INITIALS	DATE	TIME
COMPLETED	IX	8/5/18	1100

- ☒ The RFP level alarm band is set to plus or minus 0.2 ft.
- e. **ENSURE** at least one Containment Iodine Filter is available for service. **[B0014]**

	INITIALS	DATE
COMPLETED		

COMPLETE

- ☒ **ENSURE** no containment closure deviations, other than allowed by Tech Spec 3.9.3, exist during movement of irradiated fuel assemblies within Containment.

	INITIALS	DATE
COMPLETED	IX	8/5/18

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 123 of 240

6.9.B.4 CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

- g. **ENSURE** the operable WRNIs to be used for refueling meet the requirements of the Fuel Handling procedures to be used for core alterations (i.e. Two operable channels should be in the vicinity of the last fuel assemblies removed during a core offload, and the first fuel assemblies inserted during a core onload).

	SE/NFM INITIALS	DATE
COMPLETED	BB	8/5/18

- h. The RCS temperature is greater than 70°F and less than or equal to 140°F. (SR 3.9.1.1) [B0477]

	INITIALS	DATE
COMPLETED		

COMPLETE

- i. **IF** moving fuel assemblies within containment,
THEN SDC loop in operation circulating reactor coolant at a flow rate of ≥ 1500 gpm **OR** meeting the requirements of L.C.O. 3.9.4 note 1. (SR 3.9.4.1, 3.9.5.2)

	INITIALS	DATE
COMPLETED		

COMPLETE

- j. **IF** coupling CEA's,
THEN SDC loop in operation circulating reactor coolant at a flow rate of ≥ 1500 gpm **OR** meeting the requirements of L.C.O. 3.9.4 note 2. (SR 3.9.4.1, 3.9.5.2)

	INITIALS	DATE
COMPLETED		

N/A

SHUTDOWN OPERATIONS

OP-7
Rev. 05600/Unit 1
Page 124 of 240

6.9.B.4 CORE ALTERATION CHECKLIST FOR FUEL MOVEMENT (Continued)

NOTE

An evaluation to ensure compliance with the FSAR, is required for instances where one or more of the radiation monitors are out of service.

☒ **VERIFY** the following radiation monitors are in service:

☒ **IF** Cntmt Purge is in service,
THEN 69' Elevation Containment Area Radiation Monitors, 1-RI-5316A thru D, are operable with fuses installed **PER** Tech Spec 3.3.7. This includes a check of the CRS Sensor Modules, ESFAS "A" Logic Module, ESFAS "A" Manual Actuation Channel **AND** bypass keys on ESFAS.
[B0630]

☒ **IF** Cntmt Purge is secured,
THEN at least one of the 69' Elevation Containment Area Radiation Monitors, 1-RI-5316A thru D.

	INITIALS	DATE
COMPLETED	<i>JS</i>	8/4/18

5. Core alteration check list complete with all issues that will affect the refueling operation resolved. [B0408]

	SIGNATURE	DATE
SM		

**** END ****

UNMARKED
OR
STILL REQUIRED

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-SRO Admin2

Facility: Calvert Cliffs 1 & 2**JPM Number:** SRO Admin2**Alternate Path:** No**Task Number:** 202.247**Task Title:** Verify an Estimated Critical Condition Calculation**Task Standard:**

This JPM is complete when several Estimated Critical Conditions have been reviewed, errors identified, and correct data entered on a blank line in Section 4 of NEOP-302 Attachment 2.

K/A Reference: 2.1.25 (4.2)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 25 minutes**References and Tools Required:**

1. NEOP-302, Estimated Critical Condition
2. NEOP-13, Technical Data Book (Unit-1-Rev 39)
3. Calculator

JPM Setup Instructions:

1. NEOP-302 placekeeping marks for steps 4.6, 6.1, 6.2, and 6.3 completed up to Step 6.3.2.
2. NEOP-302 Attachment 1, and Attachment 2 completed per attached.
3. Xenon Worth Calculator provided per attached.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of an extra SRO.
2. Unit-1 tripped from 100% power on 8/4/18 at 0200.
3. It is now 0800 on 8/5/18.
4. Preparations are underway for a quick trip recovery startup.
5. RCS boron has been diluted to 1188 PPM, which is within 1 PPM of target RCS boron concentration.
6. Reactor Engineering has provided a Xenon Worth Calculation Report.
7. The B-10 Correction Factor per the B-10 report is 0.96.
8. Estimated Critical Condition (ECC) calculations have been prepared by Reactor Engineering for 0900, 1000, and 1100 with the following condition:
 - Burnup is 13,500 MWD/MTU

Initiating Cue:

1. Reactor Engineering has completed the ECC Calculations per NEOP-302.
2. Sections 1, 2, and 3 of NEOP-302 Attachment 2 have been completed and verified as correct.
3. The Shift Manager has directed you to perform the licensed SRO review of the ECC calculations in Section 4 of Attachment 2 from 0900-1100.
4. You are to perform the review per NEOP-302, Step 6.3.2.
5. If any errors are found in the ECC data and calculations, document any corrections required on a blank line in Section 4 of Attachment 2 (ECC form.) Notification of the preparer is not required. Complete the entire row of Section 4 of Attachment 2, with the exception of the Preparer and Reviewer initials, for any time period found in error.
6. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide a calculator, NEOP-13 (Rev 39), the partially completed NEOP-302, and the Xenon Worth Calculation.			
NEOP	NEOP-302, Step 6.3, Estimated Critical Conditions.	Identifies next step to complete is Step 6.3.2.	—	—
Comment				
NEOP 6.3.2	SUBMIT Section 4 to a licensed SRO for review. Prior to performing the review, the SRO shall review Step 4.5.2	Determines Step 4.5.2 needs to be reviewed.	—	—
Comment				
NEOP 4.5.2	Some calculations performed in this procedure are originated by Reactor Engineering (RE) and then reviewed by a Senior Reactor Operator (SRO). If data required as an input for a certain calculation has been previously approved (i.e. previously signed off by an SRO), then it is not necessary to re-validate that data. When reviewing calculations, the SRO shall:			
NEOP 4.5.2 1	Verify that the previous critical condition is correct if not previously reviewed.	Determines that Input Data in Section 1 for previous critical condition was previously reviewed by an SRO as shown by SRO signature on Attachment 2 Section 1.	—	—

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
Comment				
NEOP 4.5.2 2	INDEPENDENTLY VERIFY that all recorded data and calculations in the section being reviewed are accurate.	Reviews data and calculations in Section 4 of Attachment 2. Determines the following: 0900 Xenon Worth value used is incorrect. 0900 CEA Worth is incorrect based on both Xenon Worth and math error. 0900 ECC CEA, Lower, and Upper Bound errors exist due to CEA Worth being incorrect. 1000 ECC data and calculations are correct. 1100 ECC data and calculations are correct.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
NEOP 4.5.2 3	VERIFY that the ECC Upper and Lower Bounds are calculated correctly AND the established bounds are between 135 inches withdrawn on Reg Group 5 and Zero Power PDIL, if reviewing an estimated critical condition.	<p>Reviews data and calculations in Section 4 of Attachment 2. Determines the following:</p> <p>0900 ECC Gp 5/Gp 4 are incorrect</p> <p>0900 Lower CEA Bound pcm is incorrect</p> <p>0900 Lower CEA Bound Gp 4/Gp 3 are incorrect</p> <p>0900 Upper CEA Bound pcm is incorrect</p> <p>0900 Upper CEA Bound Gp 5 is incorrect</p> <p>1000 Data and calculations are correct</p> <p>1100 ECC data and calculations are correct.</p>	—	—
Comment				
CUE	<p>If notified of an error:</p> <p>Document any corrections required on a blank line on the Section 4 of Attachment 2 (ECC form.)</p> <p>Complete the entire row of Section 4 of Attachment 2, with the exception of the Preparer and Reviewer initials, for any time period found in error.</p>			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 Xenon Worth as 126.6	—	—
Comment				
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 CEA Worth as 631±1	—	—
Comment				
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 ECC Gp 5 as 2.25±0.75	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 ECC Gp 4 as 92.25±0.75	—	—
Comment				
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 Lower CEA Bound pcm as 1131±1	—	—
Comment				
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 Lower CEA Bound Gp 4 as 21.75±0.75	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 Lower CEA Bound Gp 3 as 111.75±0.75	—	—
Comment				
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 Upper CEA Bound pcm as 131±1	—	—
Comment				
* NEOP 4.5.2 4	IF an error is found, THEN INSTRUCT the preparer to make the necessary corrections, AND REPEAT the review.	<u>CRITICAL STEP*</u> Documents following on blank line in Section 4 of Attachment 2. *Marks/records corrected 0900 Upper CEA Bound Gp 5 as 99.75±0.75	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TERMINATING CUE: This JPM is complete when several Estimated Critical Conditions have been reviewed, errors identified, and correct data entered on a blank line in Section 4 of NEOP-302 Attachment 2. The Examinee is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** SRO Admin2**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of an extra SRO.
2. Unit-1 tripped from 100% power on 8/4/18 at 0200.
3. It is now 0800 on 8/5/18.
4. Preparations are underway for a quick trip recovery startup.
5. RCS boron has been diluted to 1188 PPM, which is within 1 PPM of target RCS boron concentration.
6. Reactor Engineering has provided a Xenon Worth Calculation Report.
7. The B-10 Correction Factor per the B-10 report is 0.96.
8. Estimated Critical Condition (ECC) calculations have been prepared by Reactor Engineering for 0900, 1000, and 1100 with the following condition:
 - Burnup is 13,500 MWD/MTU

Initiating Cue:

1. Reactor Engineering has completed the ECC Calculations per NEOP-302.
2. Sections 1, 2, and 3 of NEOP-302 Attachment 2 have been completed and verified as correct.
3. The Shift Manager has directed you to perform the licensed SRO review of the ECC calculations in Section 4 of Attachment 2 from 0900-1100.
4. You are to perform the review per NEOP-302, Step 6.3.2.
5. If any errors are found in the ECC data and calculations, document any corrections required on a blank line in Section 4 of Attachment 2 (ECC form.) Notification of the preparer is not required. Complete the entire row of Section 4 of Attachment 2, with the exception of the Preparer and Reviewer initials, for any time period found in error.

[illegible]
$$\pm 0.75$$

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-SRO Admin3

Facility: Calvert Cliffs 1 & 2**JPM Number:** SRO Admin3**Alternate Path:** No**Task Number:** 210.003**Task Title:** Perform the initial review of a completed STP**Task Standard:**

This JPM is complete when STP O-73H-2 Acceptance Criteria for Step 6.2 is completed and any required actions are identified.

K/A Reference: 2.2.12 (3.7/4.1)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 14 minutes**References and Tools Required:**

1. STP O-73H-2 (Rev 13)
1. Tech Spec 3.7.3

JPM Setup Instructions:

1. STP O-73H-2 placekeeping marks for Steps 4.0 and 5.0 completed.
2. Tables and data in Step 6.2 completed per the attached.
3. STP O-73H-2 placekeeping marks for Step 6.2 completed up to 6.2.BC.
4. WC-AA-111 requirements in Step 6.2.BC removed.
5. Attachment 1 of STP O-73H-2 included.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-2 Unit Supervisor.
2. 21 AFW Pump is currently aligned for Automatic Operation and 22 AFW Pump is currently aligned for Standby Operation.
3. STP O-73H-2 is in progress. Only Section 6.2, 23 and 13 AFW Pump Flow Verification, is being performed.
4. Section 6.2 of STP O-73H-2 has been completed with exception of Acceptance Criteria review.

Initiating Cue:

1. You are to perform the Supervisory Review by completing Step 6.2.BC, Acceptance Criteria.
1. Document any further actions required, if any, as a result of the Supervisory Review below. Notifications, if required, are not to be made verbally. Notifications, if required, should be documented below as well.
2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the partially completed STP O-73H-2 and a calculator.			
STP	STP O-73H-2, Step 6.2.BC, Acceptance Criteria.	Identifies next step to complete is Step 6.2.BC.	—	—
Comment				
6.2 BC 1 NOTE	Performance of this step constitutes a supervisor review. Actual observation of equipment response by the SRO performing this review is not required. Answering YES to a step below signifies that the referenced step has been completed and signed off by a qualified operator other than the SRO reviewer and that the actual equipment response is acceptable and valid.			
* 6.2 BC 1	Were 23 AFW PP INBD AND OUTBD bearing vibration accelerometer readings less than ACTION RANGE limit as recorded in Step 6.2.R? (N/A if NOT tested in step 6.2.R)	<u>CRITICAL STEP*</u> Reviews vibration accelerometer readings in Step 6.2.R. Determines all readings were less than ACTION RANGE. *Circles YES	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.2 BC 2	Did 23 AFW Pump develop a Total Developed Head (TDH) of at least 2468.3 Feet in Step 6.2.U? (Reference Value: 2730.3 Feet)	<u>CRITICAL STEP*</u> Reviews value calculated in Step 6.2.U. Determines TDH developed was 2448 Feet. *Circles NO	—	—
Comment				
* 6.2 BC 3	Did 23 AFW Pump feed 21 SG at \geq 300 GPM in Step 6.2.Y?	<u>CRITICAL STEP*</u> Reviews value recorded in Step 6.2.Y. Determines 23 AFW Pump feed rate to 21 SG was 300 GPM. *Circles YES	—	—
Comment				
* 6.2 BC 4	Did 23 AFW Pump feed 22 SG at \geq 300 GPM in Step 6.2.AA	<u>CRITICAL STEP*</u> Reviews value recorded in Step 6.2.AA. Determines 23 AFW Pump feed rate to 22 SG was 100 GPM. *Circles NO	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
* 6.2 BC 5	Did 13 AFW Pump feed a combined flowrate of ≥ 300 GPM in Step 6.2.AQ?	<u>CRITICAL STEP*</u> Reviews value recorded in Step 6.2.AQ. Determines 13 AFW Pump combined feed rate was 300 GPM. *Circles YES	—	—
Comment				
* 6.2 BC 6	Was closure of 2-AFW-190 verified in Step 6.2.AY? (N/A if closure was verified PER Step 6.2.AZ or test equipment not installed.)	<u>CRITICAL STEP*</u> Reviews indications received in Step 6.2.AY. Determines 2-AFW-190 closed. *Circles YES	—	—
Comment				
* 6.2 BC 7	Was leakrate LESS THAN OR EQUAL TO 3 GPM in step 6.2.AZ verifying closure of 2-AFW-190? (N/A if closure was verified PER Step 6.2.AY or not required.)	<u>CRITICAL STEP*</u> Reviews indications received in Step 6.2.AZ. Determines Step AZ was not performed since Step AY was performed. *Circles N/A	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.2 BC 8	This test is considered satisfactory if YES OR N/A was answered in the steps above.	<u>CRITICAL STEP*</u> Reviews answers in 6.2.BC.1-7. Determines Steps 6.2.BC.2 and 6.2.BC.4 were answered NO. *Circles UNSAT	—	—
Comment				
6.2 BC 8a	IF unsat, THEN:	Determines step is applicable.	—	—
Comment				
CUE	If Examinee is attempting to notify the Shift Manager (SM), record any further actions required on Cue Sheet.			
* 6.2 BC 8a 1st Bullet	NOTIFY SM.	<u>CRITICAL STEP*</u> *Marks/records action of notifying the Shift Manager, or similar wording.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.2 BC 8a 2nd Bullet	DECLARE affected equipment inoperable.	<u>CRITICAL STEP*</u> * Marks/records action of declaring the 23 AFW Pump, the motor-driven pump, inoperable, or similar wording.	—	—
Comment				
CUE	After Examinee determines Tech Spec actions are required, provide Tech Spec 3.7.3.			
* 6.2 BC 8a 3rd Bullet	TAKE action as required by Technical Specifications.	<u>CRITICAL STEP*</u> Determines TS 3.7.3 Condition B applies. * Marks/records action of aligning the 22 AFW Pump, the standby steam-driven pump, for Automatic Operation within 72 hours, or similar wording. *Marks/records action of returning 23 AFW Pump, the motor-driven pump, to OPERABLE status within 7 days, or similar wording.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.2 BC 8b	INITIATE an Issue Report for all equipment deficiencies.	<u>CRITICAL STEP*</u> * Marks/records action of initiating an Issue Report, or similar wording.	—	—
Comment				
6.2 BC 8c	INITIATE an Issue Report for components tested in this section that exceeded ALERT RANGE to evaluate pump condition and include need to be placed in Supplemental Program for increased testing frequency. (N/A if NO component test in this section exceeded the Alert Range)	Reviews vibration accelerometer readings in Step 6.2.R. Determines all readings were in NORMAL RANGE and no action required. Determines step is N/A.	—	—
Comment				
TERMINATING CUE: This JPM is complete when STP O-73H-2 Acceptance Criteria for Step 6.2 is completed and any required actions are identified. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** SRO Admin3**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-2 Unit Supervisor.
2. 21 AFW Pump is currently aligned for Automatic Operation and 22 AFW Pump is currently aligned for Standby Operation.
3. STP O-73H-2 is in progress. Only Section 6.2, 23 and 13 AFW Pump Flow Verification, is being performed.
4. Section 6.2 of STP O-73H-2 has been completed with exception of Acceptance Criteria review.

Initiating Cue:

1. You are to perform the Supervisory Review by completing Step 6.2.BC, Acceptance Criteria.
3. Document any further actions required, if any, as a result of the Supervisory Review below. Notifications, if required, are not to be made verbally. Notifications, if required, should be documented below as well.

6.2 23 AND 13 AFW PUMP FLOW VERIFICATION [B2117] (Continued)

INITIALS

BC. ACCEPTANCE CRITERIA:

NOTE

Performance of this step constitutes a supervisory review. Actual observation of equipment response by the SRO performing this review is not required. Answering YES to a step below signifies that the referenced step has been completed and signed off by a qualified operator **other than the SRO reviewer** and that the actual equipment response is acceptable and valid.

1. Were 23 AFW PP INBD **AND** OUTBD bearing vibration accelerometer readings less than ACTION RANGE limit as recorded in Step 6.2.R?
(N/A if **NOT** tested in step 6.2.R)

YES / NO / N/A
(circle one) SRO

2. Did 23 AFW Pump develop a Total Developed Head (TDH) of at least 2468.3 Feet and no greater than 2812.2 Feet in Step 6.2.U?
(Reference Value: 2730.3 Feet)

YES / NO
(circle one) SRO

3. Did 23 AFW PP feed 21 SG at ≥ 300 GPM in Step 6.2.Y?

YES / NO
(circle one) SRO

4. Did 23 AFW PP feed 22 SG at ≥ 300 GPM in Step 6.2.AA?

YES / NO
(circle one) SRO

5. Did 13 AFW PP feed a combined flowrate of ≥ 300 GPM in Step 6.2.AQ.

YES / NO
(circle one) SRO

6. Was closure of 2-AFW-190 verified in Step 6.2.AY ?
(N/A if closure was verified **PER** Step 6.2.AZ or test equipment not installed.)

YES / NO / N/A
(circle one) SRO

KEY

AFW PUMP LARGE FLOW TEST

STP O-73H-2
Rev. 13/Unit 2
Page 60 of 120

6.2.BC 23 AND 13 AFW PUMP FLOW VERIFICATION [B2117] (Continued)

INITIALS

7. Was leakrate LESS THAN OR EQUAL TO 3 GPM in step 6.2.AZ verifying closure of 2-AFW-190?
(N/A if closure was verified PER Step 6.2.AY or not required.)

YES / NO / N/A
(circle one) SR0

8. This test is considered satisfactory if YES OR N/A was answered in the steps above.

SAT / UNSAT
(circle one) SR0

- a. IF unsat,
THEN:

- NOTIFY SM.
- DECLARE affected equipment inoperable.
- TAKE action as required by Technical Specifications.

SR0

SR0

SR0

- b. INITIATE an Issue Report for all equipment deficiencies.

- c. INITIATE an Issue Report for components tested in this section that exceeded ALERT RANGE to evaluate pump conditions and include need to be placed in Supplemental Program for increased testing frequency.
(N/A if NO components tested in this section exceeded the Alert Range)

- (1) INFORM IST Engineer of any components that exceed Alert Range.
(Voice Mail is acceptable.)
(N/A if NO components in this section exceed the Alert Range)

EXAMINEE'S CUE SHEET

Initial Conditions:

1. You are performing the duties of the Unit-2 Unit Supervisor.
2. 21 AFW Pump is currently aligned for Automatic Operation and 22 AFW Pump is currently aligned for Standby Operation.
3. STP O-73H-2 is in progress. Only Section 6.2, 23 and 13 AFW Pump Flow Verification, is being performed.
4. Section 6.2 of STP O-73H-2 has been completed with exception of Acceptance Criteria review.

Initiating Cue:

1. You are to perform the Supervisory Review by completing Step 6.2.BC, Acceptance Criteria.
3. Document any further actions required, if any, as a result of the Supervisory Review below. Notifications, if required, are not to be made verbally. Notifications, if required, should be documented below as well.

NOTIFY SHIFT MANAGER *

DECLARE 23 AFW PUMP INOPERABLE *

ALIGN 22 AFW PUMP WITHIN 72 HOURS FOR AUTO *

RETURN 23 AFW PUMP WITHIN 7 DAYS *

INITIATE ISSUE REPORT *

* OR SIMILAR WORDING

AFW PUMP LARGE FLOW TEST

STP O-73H-2
Rev. 13/Unit 2
Page 48 of 120

6.2 23 AND 13 AFW PUMP FLOW VERIFICATION [B2117] (Continued)

INITIALS

NOTE

Throttling of gauge isolation valves to dampen gauge needle oscillations is permissible.

WHEN 23 AFW Pump has been running for at least 5 minutes with an average flowrate of 420 (410-425) GPM (5 minute average as read on the Ultrasonic Flowmeter),
THEN RECORD the following data:

Handwritten mark

PARAMETER	ACCEPTABLE RANGE	READING
Suction Pressure (2-PI-4542)	N/A	21.75 PSIG
Discharge Pressure (2-PI-4544)	N/A	1081.9 PSIG
Pump Suction Pipe Temperature	N/A	60.5 °F
Pump Suct Flowrate (5 minute average)	420 GPM (410-425)	419.9 GPM
21 S/G Flow Controller output signal (2-FIC-4525A)	N/A	70 %
22 S/G Flow Controller output signal (2-FIC-4535A)	N/A	67.5 %
21 Steam Generator Pressure (2-PI-1013A)	N/A	880 PSIA
22 Steam Generator Pressure (2-PI-1023A)	N/A	880 PSIA
23 AFW PP Recirc flowrate (5 minute average)	N/A	129.3 GPM

419.9

129.28

AFW PUMP LARGE FLOW TEST

STP O-73H-2
Rev. 13/Unit 2
Page 49 of 120

6.2.R 23 AND 13 AFW PUMP FLOW VERIFICATION [B2117] (Continued)

INITIALS

NOTE

Vibration readings shall be taken in in/sec peak.

RECORD vibration accelerometer readings.

PARAMETER	ACTION RANGE	ALERT RANGE	NORMAL RANGE	READING
Pump inboard horizontal vibration (PIH) REF VALUE 0.04	>0.240	>0.100 and ≤0.240	≤0.100	.045 IPS
Pump inboard vertical vibration (PIV) REF VALUE 0.04	>0.240	>0.100 and ≤0.240	≤0.100	.039 IPS
Pump outboard horizontal vibration (POH) REF VALUE 0.04	>0.240	>0.100 and ≤0.240	≤0.100	.041 IPS
Pump outboard vertical vibration (POV) REF VALUE 0.05	>0.300	>0.125 and ≤0.300	≤0.125	.044 IPS
Pump outboard axial vibration (POA) REF VALUE 0.045	>0.270	>0.110 and ≤0.270	≤0.110	.028 IPS

IF thermography is required,
THEN DIRECT Component Specialist to perform thermography.

CALCULATE pump ΔP by subtracting pump suction pressure from pump discharge pressure:

$$\Delta P = \frac{1081.9}{\text{(Disch Press)}} - \frac{21.75}{\text{(Suct Press)}} = \frac{1060.2}{\text{(D/P)}} \text{ PSID}$$

DETERMINE the ΔP multiplication factor from ATTACHMENT 1, D/P TO HEAD CONVERSION TABLE, using the suction temperature taken in step R.

Multiplication Factor: 2.309

CALCULATE 23 AFW Pump Total Developed Head Below:

$$\frac{1060.2}{\text{(Step S)}} \times \frac{2.309}{\text{(Step T)}} = \frac{2448}{\text{(Between } \geq 2468.3 \text{ and } \leq 2812.2 \text{ Feet)}}$$

(Alert range ≥2468.3 and ≤2539.2 Feet)

Independently CHECK calculations AND Multiplication Factor determination in steps S through U.

AFW PUMP LARGE FLOW TEST

STP O-73H-2
Rev. 13/Unit 2
Page 50 of 120

6.2 23 AND 13 AFW PUMP FLOW VERIFICATION [B2117] (Continued)

INITIALS

~~W~~ IF Section 6.5, 23 AFW PUMP CURVE TEST, is to be performed,
THEN PROCEED to Step 6.5.N.
(N/A if not performing Section 6.5, 23 AFW PUMP CURVE TEST)

NA

~~X~~ **ADJUST** 22 S/G Flow Controller 2-FIC-4535A to 100 GPM.

NY

CAUTION

Motor driven pump is limited to 575 GPM.

~~Y~~ **ADJUST** 21 SG Flow Control Valve, 2-FIC-4525A as necessary to ≥ 300 GPM **AND RECORD** Flow Rate indicated on 2-FIC-4525A:

305
GPM
2-FIC-4525A
(Min ≥ 300 GPM)

NY

~~Z~~ **ADJUST** 21 S/G Flow Controller 2-FIC-4525A to 100 GPM.

NY

CAUTION

Motor driven pump is limited to 575 GPM.

~~AA~~ **ADJUST** 22 SG Flow Controller, 2-FIC-4535A as necessary to ≥ 300 GPM **AND RECORD** Flow Rate indicated on 2-FIC-4535A:

105
GPM
2-FIC-4535A
(Min ≥ 300 GPM)

NY

~~AB~~ **ADJUST** 22 S/G Flow Controller 2-FIC-4535A to 100 GPM.

NY

~~AC~~ **LOCK OPEN** 23 AFW PP RECIRC TO PP SUCT, 2-AFW-185.

NY

CAUTION

Lowering of AFW flow to the S/G's will affect Core reactivity and Q power should be monitored closely.

~~AD~~ **STOP** 23 AFW Pump by momentarily placing handswitch 2-HS-4540 to STOP.

NY

~~AE~~ **ENSURE** Technical Specification 3.7.3 requirements are met for 13 AFW Pump being Out of Service to Unit One.

MB

SRO

AFW PUMP LARGE FLOW TEST

STP O-73H-2
Rev. 13/Unit 2
Page 52 of 120

6.2 23 AND 13 AFW PUMP FLOW VERIFICATION [B2117] (Continued)

INITIALS

CAUTION

13 AFW Pump must have at least 160 GPM flow to the Steam Generators prior to isolating 13 AFW PP RECIRC TO PP SUCT ISOL, 1-AFW-185.

AP. [PC] **ENSURE** 13 AFW Pump flow to Steam Generators is greater than or equal to 160 GPM,
THEN UNLOCK AND SHUT 13 AFW PP RECIRC TO PP SUCT ISOL, 1-AFW-185.

NY

NOTE

Flows should be balanced between controllers to feed equal amounts of AFW to the Steam Generators.

CAUTION

Motor driven pump is limited to 575 GPM.

AQ. **ADJUST BOTH** 21 S/G Flow Controller 2-FIC-4525A **AND** 22 S/G Flow Controller 2-FIC-4535A to obtain a total flowrate of ≥ 300 GPM **AND RECORD** Flow rates:

$$\frac{150}{2-FIC-4535A} \text{ GPM} + \frac{150}{2-FIC-4525A} \text{ GPM} = \frac{300}{\text{MIN}} \geq 300 \text{ GPM}$$

NY

AP. **CHECK** S/G levels are being properly maintained between ± 10 inches.

NY

AS. **RECORD** 13 AFW Pump dynamic suction pressure:

1-PI-4542: 25.5 PSIG
(20 PSIG MIN)

NY

NA. **IF** pressure is < 20 PSIG
THEN notify Control Room Supervisor.
(N/A **IF** pressure is > 20 PSIG)

NA

AT. **LOCK OPEN** 13 AFW PP RECIRC TO PP SUCT ISOL, 1-AFW-185.

NY

AU. **IF** thermography is required,
THEN DIRECT Component Specialist to perform thermography.

NY

AFW PUMP LARGE FLOW TEST

STP O-73H-2
Rev. 13/Unit 2
Page 54 of 120

6.2 23 AND 13 AFW PUMP FLOW VERIFICATION [B2117] (Continued)

INITIALS

NOTE

Step AY can be completed after the performance steps of other sections are complete. Acceptance Criteria referencing these steps shall be delayed until CE completes step AY.

~~AY~~ **DIRECT** CE personnel to analyze recorded traces and **CHECK**
(✓) all indication received:
(N/A if no test equipment installed.)

☒ 2-AFW-190 FULL SHUT

☒ 2-AFW-190 FULL OPEN

☐ 2-AFW-190 INCONCLUSIVE

CE Signature Today Date

~~AY~~ **VERIFY** 13 AFW PP U-2 AFW HDR CKV, 2-AFW-190 closure as follows:

(N/A if 2-AFW-190 verified shut in step AY or not required.)

~~AY~~ **ENSURE SHUT** U1 TO U2 AFW X-CONN VLV,
1-AFW-4550-CV.

CAUTION

The following steps may place Unit 2 in Tech Spec Action statement 3.7.3 due to Motor driven AFW Pump being removed from service.

~~AY~~ **SHUT** Unit 2 Motor Train Block Valves:

- 21 SG AFW BLOCK VLV, 2-AFW-4522-CV
- 21 SG AFW BLOCK VLV, 2-AFW-4523-CV
- 22 SG AFW BLOCK VLV, 2-AFW-4532-CV
- 22 SG AFW BLOCK VLV, 2-AFW-4533-CV

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-SRO Admin4

Facility: Calvert Cliffs 1 & 2**JPM Number:** SRO Admin4**Alternate Path:** No**Task Number:** 093.080**Task Title:** Startup Steam Generator Blowdown to the Condenser/Circ Water**Task Standard:**

This JPM is complete when a SG Blowdown Liquid Radioactive Waste Continuous Release Permit is reviewed, conditions are evaluated for continued release, and ODCM actions are identified if RMS and Flow Instruments are taken OOS.

K/A Reference: 2.3.6 (2.0/3.8)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 17 minutes**References and Tools Required:**

1. CP-0601 Attachment (3), Steam Generator Blowdown Liquid Radioactive Waste Release Permit
2. ODCM Part 3.0/4.0.
3. OI-35, Radiation Monitoring System, Section 6.10 and Table 1.

JPM Setup Instructions:

1. CP-0601 Attachment (3), Steam Generator Blowdown Liquid Radioactive Waste Release Permit completed with following values
 - Unit: 1
 - Permit Number: L-20180401-1002-C
 - Pre-Release Gamma Scan Number: 5Aug18 200002
 - Release Source Volume: 3.679E+07 Liters
 - Discharge Point: Unit-2 Checked
 - Minimum Number Circulating Water Pumps Required: 5
 - Dilution Flow Rate Pre-Release: 1.000E+06
 - Maximum Release Flow Rate: 225
 - 1(2)-RE-4014 Background: 8.300E+01
 - 1(2)-RE-4095 Background: 1.800E+02
 - Expected Response 1(2)-RE-4014: 8.300E+01
 - Expected Response 1(2)-RE-4095: 1.800E+02
 - Adjustable/Max Setpoint 1(2)-RE-4014: 2.075E+02
 - Adjustable/Max Setpoint 1(2)-RE-4095: 4.500E+02
 - Signatures for Independent Verification for Calculations, Prepared By, and SCO Approval with date of 8/5/18.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-1 Unit Supervisor.
2. Unit-1 is at 100% power with all Waterboxes are in service.
3. Unit-2 is in Mode 6 with all Waterboxes secured.
4. Current secondary coolant specific activity and Dose Equivalent I-131 is less than MDA (Minimum Detectable Activity).
5. Steam Generator Blowdown is currently aligned to the Condenser but will be shifted to Circ Water next shift.
6. Current reading on 1-RE-4014 is 83 CPM and steady.
7. Current reading on 1-RE-4095 is 180 CPM and steady.
8. Chemistry has prepared a continuous Steam Generator Blowdown Liquid Radioactive Waste Release Permit in preparation of the realignment to Circ Water.
9. It is 8/5/18.
10. The Shift Chemistry Technician has delivered the release permit to the Control Room.
11. The Permit Number, Gamma Scan Number, and Release Source Volume are all correct.

Initiating Cue:

1. The Shift Manager assigns you the following three tasks::

Task 1

Review the Unit-1 Steam Generator Blowdown Liquid Radioactive Waste Release Permit and determine if the permit can be approved. Circle your determination below.

YES, the permit can approved

NO, the permit cannot be approved because there is an error on the permit.

If there is an error, circle/identify the error on the permit.

Task 2

Maintenance planned on 8/6/18, will remove both 1-RE-4014 and 1-RE-4095 from service, but power will be maintained to both RMS during the maintenance. In addition to a permit change, determine if Steam Generator blowdown to Circ Water can continue with both 1-RE-4014 and 1-RE-4095 OOS. Circle your determination below.

YES, blowdown can continue during the maintenance on both RMSs

NO, blowdown will have to be secured during the maintenance

If YES, document any required actions per the ODCM below.

Task 3

Maintenance planned on 8/13/18, will remove 1-FI-4089, Steam Generator Blowdown Flow, from service. Determine if Steam Generator blowdown to Circ Water can continue with 1-FI-4089 OOS. Circle your determination below.

YES, blowdown can continue during the maintenance on 1-FI-4089

NO, blowdown will have to be secured during the maintenance

If YES, document any required actions per the ODCM below.

2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the partially completed Steam Generator Blowdown Liquid Radioactive Waste Release Permit, the ODCM Part 3.0/4.0, and OI-35 Section 6.10 and Table 1.			
Examiner NOTE The following addresses Task 1.				
* CP-0601	Release Criteria is understood, Plant Systems are in operation, and required plant configuration for conducting release has been established. Chemistry Tech discussed permit with SRO/SM.	<u>CRITICAL STEP*</u> Evaluates Release Criteria entries and determines Unit 2 is checked in error. *Circles/identifies NO, the permit cannot be approved because there is an error on the permit. *Marks/records Unit-2, or similar wording, as error. Determines 6 Circulating Water Pumps are running, which is > minimum number of 5 required. Determines 1.000 E+06 gpm is dilution flow rate with 5 Circulating Water Pumps running. Determines the Adjustable/Max Setpoint is higher than the Expected Response.	—	—
Comment 				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
<p>Examiner NOTE</p> <p>The following addresses Task 2.</p>				
<p>*</p> <p>OI-35</p> <p>Table 1</p>	<p>IF RI-4014 and RI-4095 are out of service, Then ENSURE ODCM Controls Requirements 3.3.3.10 Action 29 is met. Blowdown may shift to MWS when loss of power occurs. Reference 1C22-ALM.</p>	<p><u>CRITICAL STEP*</u></p> <p>Evaluates OI-35 for RMS inoperability and determines ODCM 3.3.3.10 applies.</p> <p>Reviews ODCM 3.3.3.10 and determines Action B.29 applies if both 1-RE-4014 and 1-RE-4095 are removed from service.</p> <p>*Circles/identifies YES, blowdown can continue during the maintenance on both RMSs</p> <p>*Marks/records grab samples are taken at least once per 48 hours and analyzed, or similar wording.</p>	—	—
<p>Comment</p>				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
Examiner NOTE The following addresses Task 3.				
* OI-35 Table 1	IF FI-4089 is out of service, Then ENSURE ODCM Controls Requirements 3.3.3.10 Action 30 is met. During release, ESTIMATE flow rate every four hours.	<u>CRITICAL STEP*</u> Reviews ODCM 3.3.3.10 and determines Action B.30 applies if 1-FI-4089 is removed from service. *Circles/identifies YES, blowdown can continue during the maintenance on 1-FI-4089 *Marks/records flow rate is estimated at least once per 4 hours, or similar wording.	—	—
Comment				
TERMINATING CUE: This JPM is complete when a SG Blowdown Liquid Radioactive Waste Continuous Release Permit is reviewed, conditions are evaluated for continued release, and ODCM actions are identified if RMS and Flow Instruments are taken OOS. The Examinee is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** SRO Admin4**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 Unit Supervisor.
2. Unit-1 is at 100% power with all Waterboxes are in service.
3. Unit-2 is in Mode 6 with all Waterboxes secured.
4. Current secondary coolant specific activity and Dose Equivalent I-131 is less than MDA (Minimum Detectable Activity).
5. Steam Generator Blowdown is currently aligned to the Condenser but will be shifted to Circ Water next shift.
6. Current reading on 1-RE-4014 is 83 CPM and steady.
7. Current reading on 1-RE-4095 is 180 CPM and steady.
8. Chemistry has prepared a continuous Steam Generator Blowdown Liquid Radioactive Waste Release Permit in preparation of the realignment to Circ Water.
9. It is 8/5/18.
10. The Shift Chemistry Technician has delivered the release permit to the Control Room.
11. The Permit Number, Gamma Scan Number, and Release Source Volume are all correct.

Initiating Cue:

1. The Shift Manager assigns you the following three tasks::

Task 1

Review the Unit-1 Steam Generator Blowdown Liquid Radioactive Waste Release Permit and determine if the permit can be approved. Circle your determination below.

YES, the permit can approved

NO, the permit cannot be approved because there is an error on the permit.

If there is an error, circle/identify the error on the permit.

Continued on next page

Task 2

Maintenance planned on 8/6/18, will remove both 1-RE-4014 and 1-RE-4095 from service, but power will be maintained to both RMS during the maintenance. In addition to a permit change, determine if Steam Generator blowdown to Circ Water can continue with both 1-RE-4014 and 1-RE-4095 OOS. Circle your determination below.

YES, blowdown can continue during the maintenance on both RMSs

NO, blowdown will have to be secured during the maintenance

If YES, document any required actions per the ODCM below.

Task 3

Maintenance planned on 8/13/18, will remove 1-FI-4089, Steam Generator Blowdown Flow, from service. Determine if Steam Generator blowdown to Circ Water can continue with 1-FI-4089 OOS. Circle your determination below.

YES, blowdown can continue during the maintenance on 1-FI-4089

NO, blowdown will have to be secured during the maintenance

If YES, document any required actions per the ODCM below.

OPENEMS LIQUID RADIOACTIVE WASTE RELEASE PERMITS

CP-0601
Revision 02100
Page 50 of 57

Page 1 of 1

Attachment 3, Unit 1 Steam Generator Blowdown Liquid Radioactive Waste Release PermitPermit Number: L-20180401-1002-CPre-Release Gamma Scan Number: 5 AUG 18 200002Release Source Volume: 3.679 E+07 LITERS

RELEASE CRITERIA

Discharge Point: <input type="checkbox"/> Unit 1 <input checked="" type="checkbox"/> Unit 2	Minimum Number Circulating Water Pumps Required: <u>5</u>
Dilution Flow Rate Pre-Release: <u>1.000 E+06</u> gpm	Maximum Release Flow Rate: <u>225</u> gpm
1(2)-RE-4014 Background: <u>8.300 E+01</u> cpm	1(2)-RE-4095 Background: <u>1.800 E+02</u> cpm
Expected Response 1(2)-RE-4014: <u>8.300 E+01</u> cpm	Expected Response 1(2)-RE-4095: <u>1.800 E+02</u> cpm
Adjustable/Max Setpoint 1(2)-RE-4014: <u>2.075 E+02</u> cpm	Adjustable/Max Setpoint 1(2)-RE-4095: <u>4.500 E+02</u> cpm
Independent Verification for Calculations: <u>[Signature]</u>	

Approval (Release Criteria is within ODCM Requirements)

Prepared By: <u>AUSTIN SMITH</u>	<u>[Signature]</u>	<u>8/5/18</u>	<u>1000</u>
SCO Approval: <u>JOHN TESLA</u>	<u>[Signature]</u>	<u>8/5/18</u>	<u>1020</u>
Release Criteria is understood, Plant Systems are in operation, and required plant configuration for conducting release has been established. Chemistry Tech discussed permit with SRO/SM.			
SM/CRS: _____	_____	_____	_____
RMS Pre-Op checks have been completed and release criteria reviewed. Correct setpoints entered in computer and Peer Checked. Flow Rate Meter Channel Check Satisfactory.			
CRO: _____	_____	_____	_____
Independent Verification of Alarm Setpoints.			
CRO: _____	_____	_____	_____

Release Data

Release Start Date: _____	Release Start Time: _____
Release End Date: _____	Release End Date: _____
Number Circulating Water Pumps Operating During Release: _____	Number Saltwater Pumps Operating During Release: _____

Post-Release Data and Review

Post-Release Gamma Scan Number: _____	KEY		
Post-Release Volume: _____ Liters			
Post-Release Dilution Flow Rate: _____ gpm			
Independent Verification for Calculations: _____			
Permit Closed Out: _____	_____	_____	_____
SCO Approval: (Required)	_____	_____	_____
_____	_____	_____	_____

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 Unit Supervisor.
2. Unit-1 is at 100% power with all Waterboxes are in service.
3. Unit-2 is in Mode 6 with all Waterboxes secured.
4. Current secondary coolant specific activity and Dose Equivalent I-131 is less than MDA (Minimum Detectable Activity).
5. Steam Generator Blowdown is currently aligned to the Condenser but will be shifted to Circ Water next shift.
6. Current reading on 1-RE-4014 is 83 CPM and steady.
7. Current reading on 1-RE-4095 is 180 CPM and steady.
8. Chemistry has prepared a continuous Steam Generator Blowdown Liquid Radioactive Waste Release Permit in preparation of the realignment to Circ Water.
9. It is 8/5/18.
10. The Shift Chemistry Technician has delivered the release permit to the Control Room.
11. The Permit Number, Gamma Scan Number, and Release Source Volume are all correct.

Initiating Cue:

1. The Shift Manager assigns you the following three tasks::

Task 1

Review the Unit-1 Steam Generator Blowdown Liquid Radioactive Waste Release Permit and determine if the permit can be approved. Circle your determination below.

YES, the permit can approved

☒ NO, the permit cannot be approved because there is an error on the permit.

If there is an error, circle/identify the error on the permit.

Continued on next page

Task 2

Maintenance planned on 8/6/18, will remove both 1-RE-4014 and 1-RE-4095 from service, but power will be maintained to both RMS during the maintenance. In addition to a permit change, determine if Steam Generator blowdown to Circ Water can continue with both 1-RE-4014 and 1-RE-4095 OOS. Circle your determination below.

☒ YES, blowdown can continue during the maintenance on both RMSs

☐ NO, blowdown will have to be secured during the maintenance

If YES, document any required actions per the ODCM below.

GRAB SAMPLES TAKEN AT LEAST EVERY 48
HOURS AND ANALYZED *

Task 3

Maintenance planned on 8/13/18, will remove 1-FI-4089, Steam Generator Blowdown Flow, from service. Determine if Steam Generator blowdown to Circ Water can continue with 1-FI-4089 OOS. Circle your determination below.

☒ YES, blowdown can continue during the maintenance on 1-FI-4089

☐ NO, blowdown will have to be secured during the maintenance

If YES, document any required actions per the ODCM below.

FLOW RATE IS ESTIMATED AT LEAST ONCE
PER 4 HOURS *

* OR SIMILAR WORDING

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-SRO Admin5

Facility: Calvert Cliffs 1 & 2**JPM Number:** SRO Admin5**Alternate Path:** No**Task Number:** 204.025**Task Title:** Determine whether a Reportable Occurrence has occurred**Task Standard:**

This JPM is complete when seismic event data is evaluated to determine a Unit shutdown is required and the Operations Decision Tree #1 evaluated and Safety (SAF) Reportability events identified.

K/A Reference: 2.4.29 (3.1/4.4)**Method of Testing:** Actual Performance-Classroom**Validation Time:** 30 minutes**References and Tools Required:**

1. OI-46, Seismic Measurement Equipment
2. ERPIP-3.0, Immediate Actions, Attachment (14), Seismic Event
3. Seismic Event Report Page 1
4. LS-AA-1020, Reportability Tables and Decision Trees
5. LS-AA-1010 Safety (SAF) Reportable Events

JPM Setup Instructions:

1. OI-46 placekeeping marks completed up to Step 6.3.B.2.
2. ERPIP-3.0 Attachment (14) placekeeping marks completed with the following information:
 - Implementation Time: 1200
 - Implementation Date: 8/5/18
 - Steps 1.0, 1.1, and 1.2 marked as completed
3. Seismic Event Report Page 1 created with data per the attached.
4. Blank Operations Decision Tree #1 with LS-AA-1020 Pages 95-98.

KMI Condor Event Summary

Automatic Processing Date: 08/05/2018 12:00:00 (Local)

Recorder Event	Date	Time	Run Time	Abs Max Peaks (g) Ch. 1	Ch. 2	Ch. 3	OBE- Exc'd
(R001) R001_BQ003.EVT OYE001	08/05/2018	11:57:00	01:81	0.0801	0.0531	0.0811	YES
(R002) R002_BM003.EVT OYE002	08/05/2018	11:57:00	01:81	0.0801	0.0531	0.0811	YES
(R003) R003_BH003.EVT OYE003	08/05/2018	11:57:00	01:81	0.0801	0.0531	0.0811	YES
(R004) R004_BJ003.EVT OYE004	08/05/2018	11:57:00	01:81	0.0802	0.0532	0.0831	YES
(R005) R005_BF003.EVT OYE005	08/05/2018	11:57:00	01:81	0.1410	0.0950	0.0131	YES

Footnotes: When assembling output, be sure to use event time as your collating basis because Recorder/Event numbers may not be concurrent.

Copies of record/Event files for this event, if generated, will be found in the C:\AssociatedEvents\20131219_152106\directory, with file extension .EVT.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-2 Unit Supervisor.
2. Both Units were initially at 100% power.
3. Annunciator SEISMIC EVENT alarms on 1C26.
4. An earthquake is felt by personnel on site.
5. Unit-1 automatically tripped due to a loose wire in the Main Generator Exciter ground circuit.
6. Unit-2 remained at 100%
7. EOP-1 was implemented on Unit-1.
8. The Shift Manager has implemented ERPIP-3.0 Attachment 14 for a Seismic Event.
9. Page 1 of the Seismic Event Report has been obtained per OI-46.
10. The Shift Manager has declared an Alert and is in the process of completing the Initial Notification Form.

Initiating Cue:

1. The Shift Manager has assigned you two tasks while he is completing and initiating the communication of the Initial Notification Form:

Task 1

Evaluate ERPIP-3.0 Attachment 14 and determine if a Unit-2 Shutdown is required. Circle your determination below.

YES, Unit-2 must be shutdown

NO, Unit-2 can remain at 100% power.

If YES, document the reason below:

Task 2

Determine if a Reportable Event has occurred per Operations Decision Tree #1 in LS-AA-1020. Evaluate only the Safety (SAF) Reportability Events for both units using the Operations Decision Tree #1. Operations Decision Trees #2-4, the Radiological (RAD), Security (SEC), and Environmental (ENV) Reportability Events will all be evaluated by the Shift Manager after the Initial Notification Form is communicated.

Document the Safety (SAF) evaluation by using LS-AA-1020 Operations Decision Tree #1. Circle all Yes/No answers and circle all applicable SAF Reportability Events on the Operations Decision Tree. SAF 3.2 and 3.3 do not apply to Calvert Cliffs.

The following information is known:

- The plant is not in an unanalyzed condition based on the Seismic Event Report data
- All systems are responding as expected
- A walkdown by the Equipment Operators has determined no system degradation
- All communications systems are available
- The grid is stable

2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide partially completed OI-46, Seismic Event Report Page 1, partially completed ERPIP-3.0 Attachment 14, LS-AA-1020, LS-AA-1110, and a blank Operations Decision Tree #1 from LS-AA-1020.			
Examiner NOTE The following addresses Task 1.				
Task 1	Determine if a Unit-2 shutdown is required.	Determines ERPIP-3.0 Attachment 14 guidance must be evaluated to determine if Unit-2 shutdown is required.	—	—
Comment				
3.0 Att 14 2.0	If peak acceleration values are greater than: 0.15g Horizontal OR 0.10 g Vertical (Design Basis Earthquake), THEN: 2.1 COMMENCE a controlled shutdown PER OP-3, AND PLACE both Units in Mode 5 as expeditiously as possible.	Evaluates Seismic Event Report data. Determines max Horizontal reading from Ch.1 is 0.141. Determines max Vertical reading from Ch. 2 is 0.0950. Determines step is N/A since max Horizontal reading is < 0.15g and max Vertical reading is < 0.10g.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
* 3.0 Att 14 3.0	If peak acceleration values are within the following ranges: GREATER than 0.08g and LESS than 0.15g Horizontal (Operating Bases Earthquake) GREATER than 0.053g and LESS than 0.10g Vertical (Operating Bases Earthquake) THEN 3.2 COMMENCE a controlled shutdown PER OP-3.	<u>CRITICAL STEP*</u> Evaluates Seismic Event Report data. Determines max Horizontal reading from Ch.1 is 0.141. Determines max Vertical reading from Ch. 2 is 0.0950. Determines step is applicable since max Horizontal reading is >0.08g and < 0.15g and max Vertical reading is >0.053g and < 0.10g. *Circles/indicates YES, Unit-2 must be shutdown *Marks/records: > 0.08g Horizontal, or similar wording AND/OR > 0.053g Vertical, or similar wording	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
Examiner NOTE The following addresses Task 2.				
Task 2	Determine Safety (SAF) Reportability Events per LS-AA-1020 using Operations Decision Tree	Determines LS-AA-1020 and LS-AA-1110 must be evaluated to determine what Safety related Reportability Events apply. Proceeds to LS-AA-1020 Operations Decision Tree #1.	—	—
Comment				
Examiner NOTE Examinee may also select SAF 1.12 when evaluating the Operations Decision Tree if earthquake is interpreted as posing an actual threat to the safety of the plant.				
* 1020 Tree #1	Emergency Plan Activated	<u>CRITICAL STEP*</u> Determines Emergency Plan activated based on Cue Sheet. *Circles YES for Decision Diamond. Evaluates SAF 1.1, 1.2, 1.3, 1.4, 1.5, 1.7, 1.8, 1.10, 1.12, 1.13, and 1.16 against event using LS-AA-1110. Determines SAF 1.1 applies. *Circles/indicates SAF 1.1 Reportable Events on the Operations Decision Tree #1.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
* 1020 Tree #1	ESF, RPS or ECCS Actuation	<p><u>CRITICAL STEP*</u></p> <p>Determines Unit-1 RPS actuated based on Cue Sheet.</p> <p>*Circles YES for Decision Diamond.</p> <p>Evaluates SAF 1.5, 1.6, and 1.7 against event using LS-AA-1110.</p> <p>Determines SAF 1.6 applies.</p> <p>*Circles/indicates SAF 1.6 Reportable Events on the Operations Decision Tree #1.</p>	—	—
Comment				
1020 Tree #1	Degraded Plant Condition; Safety System Malfunction	<p>Determines no degraded plant condition exists based on Cue Sheet.</p> <p>Circles NO for Decision Diamond.</p>	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
1020 Tree #1	Shutdown Required by TS	<p>Determines no Tech Spec conditions exist requiring plant shutdown based on Cue Sheet.</p> <p>Circles NO for Decision Diamond.</p> <p>Proceeds to Operations Tree #2.</p>	—	—
<p>Comment</p>				
<p>TERMINATING CUE:</p> <p>This JPM is complete when seismic event data is evaluated to determine a Unit shutdown is required and the Operations Decision Tree #1 evaluated and Safety (SAF) Reportability events identified.</p> <p>The Examinee is expected to end the JPM.</p>				
<p>TIME STOP: _____</p>				

Verification of Completion**Job Performance Measure Number:** SRO Admin5**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-2 Unit Supervisor.
2. Both Units were initially at 100% power.
3. Annunciator SEISMIC EVENT alarms on 1C26.
4. An earthquake is felt by personnel on site.
5. Unit-1 automatically tripped due to a loose wire in the Main Generator Exciter ground circuit.
6. Unit-2 remained at 100%
7. EOP-1 was implemented on Unit-1.
8. The Shift Manager has implemented ERPIP-3.0 Attachment 14 for a Seismic Event.
9. Page 1 of the Seismic Event Report has been obtained per OI-46.
10. The Shift Manager has declared an Alert and is in the process of completing the Initial Notification Form.

Initiating Cue:

1. The Shift Manager has assigned you two tasks while he is completing and initiating the communication of the Initial Notification Form:

Task 1

Evaluate ERPIP-3.0 Attachment 14 and determine if a Unit-2 Shutdown is required. Circle your determination below.

YES, Unit-2 must be shutdown

NO, Unit-2 can remain at 100% power.

If YES, document the reason below:

Cue continued on next page

Task 2

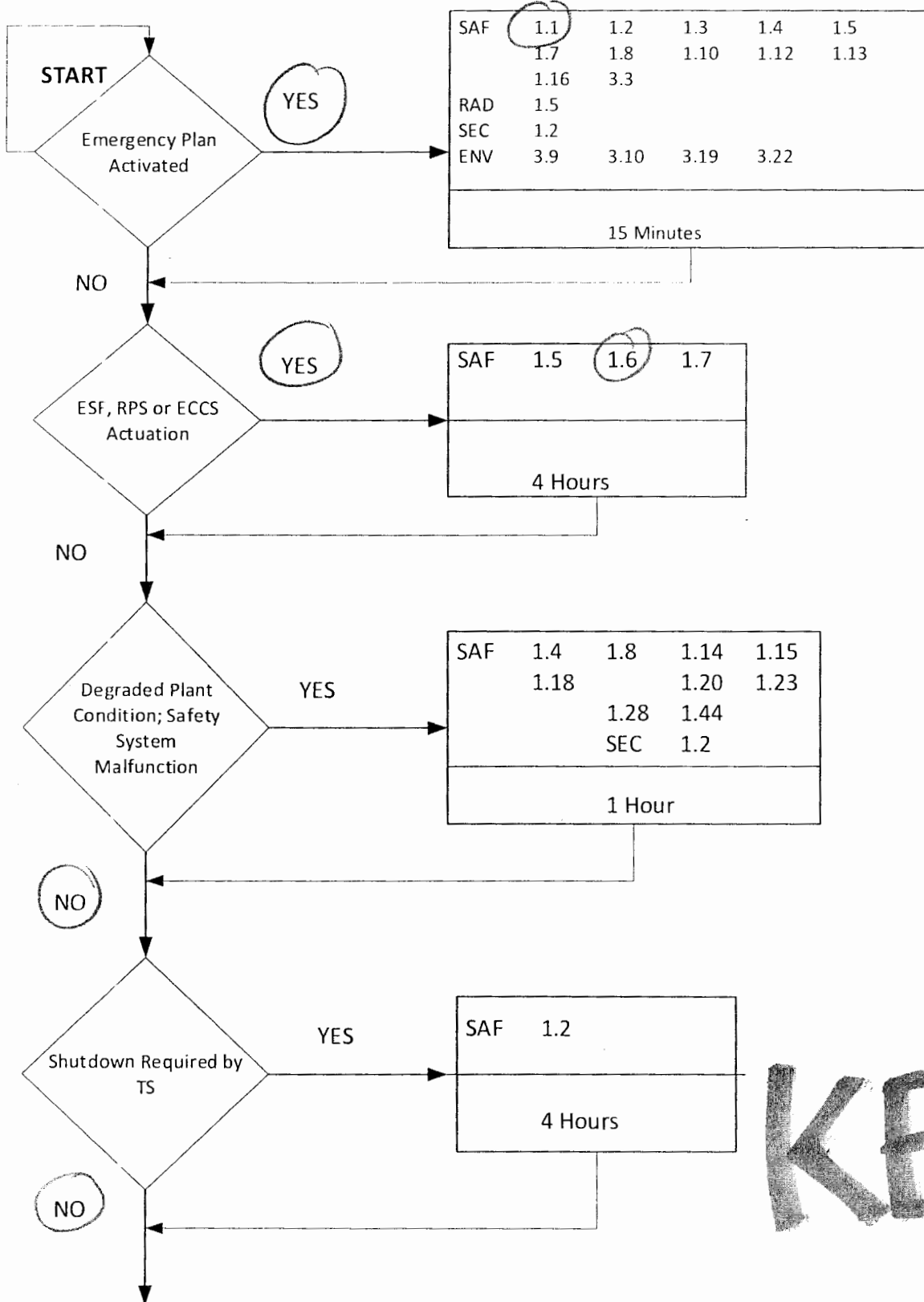
Determine if a Reportable Event has occurred per Operations Decision Tree #1 in LS-AA-1020. Evaluate only the Safety (SAF) Reportability Events for both units using the Operations Decision Tree #1. Operations Decision Trees #2-4, the Radiological (RAD), Security (SEC), and Environmental (ENV) Reportability Events will all be evaluated by the Shift Manager after the Initial Notification Form is communicated.

Document the Safety (SAF) evaluation by using LS-AA-1020 Operations Decision Tree #1. Circle all Yes/No answers and circle all applicable SAF Reportability Events on the Operations Decision Tree. SAF 3.2 and 3.3 do not apply to Calvert Cliffs.

The following information is known:

- The plant is not in an unanalyzed condition based on the Seismic Event Report data
- All systems are responding as expected
- A walkdown by the Equipment Operators has determined no system degradation
- All communications systems are available
- The grid is stable

OPERATIONS DECISION TREE #1



Go to Operations Tree # 2

SHIFT MANAGER
WILL PERFORM REMINDER
OF OPERATIONS DECISION TREES

KEY

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-2 Unit Supervisor.
2. Both Units were initially at 100% power.
3. Annunciator SEISMIC EVENT alarms on 1C26.
4. An earthquake is felt by personnel on site.
5. Unit-1 automatically tripped due to a loose wire in the Main Generator Exciter ground circuit.
6. Unit-2 remained at 100%
7. EOP-1 was implemented on Unit-1.
8. The Shift Manager has implemented ERPIP-3.0 Attachment 14 for a Seismic Event.
9. Page 1 of the Seismic Event Report has been obtained per OI-46.
10. The Shift Manager has declared an Alert and is in the process of completing the Initial Notification Form.

Initiating Cue:

1. The Shift Manager has assigned you two tasks while he is completing and initiating the communication of the Initial Notification Form:

Task 1

Evaluate ERPIP-3.0 Attachment 14 and determine if a Unit-2 Shutdown is required. Circle your determination below.

☒ YES, Unit-2 must be shutdown

☐ NO, Unit-2 can remain at 100% power.

If YES, document the reason below:

> 0.08g HORIZONTAL AND/OR > 0.053g VERTICAL *

* OR SIMILAR WORDING

Cue continued on next page

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Simulator1

Facility: Calvert Cliffs 1 & 2**JPM Number:** Simulator1**Alternate Path:** Yes**Task Number:** 041.007**Task Title:** Dilute the RCS via CVCS**Task Standard:**

This JPM is complete when a 30 gallon DI is makeup to the VCT is completed, the unexpected loss of 1Y10 has been identified, and immediate actions are taken per AOP-7J-1 for a loss of 1Y10.

Time Critical Task: No**K/A Reference:** 004A2.06 (4.2/4.3)**Method of Testing:** Actual Performance-Simulator**Validation Time:** 10 minutes**References and Tools Required:**

1. OI-2B, CVCS Boration, Dilution And Makeup Operations
2. Immediate Actions from 100% Power
3. AOP-7I, Loss of 4KV, 480Volt, Or 208/120 Volt Instrument Bus Power

JPM Setup Instructions:

1. Reset to IC-34 (Both Units 100%, MOC).
2. Ensure 1-FQIS-210X on 1C07 is set to 0 gallons (i.e. reads 0 while pushing red button.)
3. Ensure 1-FQIS-210Y on 1C07 reading 0.
4. Malfunctions:
 - a. 120v002_02 on Event 1

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.

Initial Conditions:

1. You are performing the duties of the Unit-1 RO.
2. Unit-1 is at 100%.
3. A 30 gallon DI addition to the VCT is now required to maintain normal power level.

Initiating Cue:

1. You are to complete the 30 gallon dilution per OI-2B, Step 6.18, Page 74.
2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of OI-2B.			
	Locates OI-2B, Step 6.18	Determines that next step to be performed is OI-22B Step 6.18 on Page 74.	—	—
6.18 A	Initial Conditions			
6.5 A.1	Unit is in Mode 1.	Determines Unit-1 is in Mode 1 based on Cue Sheet OR Evaluates Reactor Power and determines Unit-1 is in Mode 1	—	—
Comment				
6.18 B	Procedure			
6.18 B.1	DETERMINE the volume of dilution needed to achieve the desired RCS boron concentration of the desired Reactor power.	Determines 30 gallons DI is required based on Cue Sheet.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
CUE	If asked, 100 GPM is the desired flow rate setpoint.			
6.18 B.2	ADJUST MAKEUP WTR FLOW CONTR, FIC-210X, to desired flow rate setpoint.	Determines that flow rate setpoint on 1-FIC-210X on 1C07 is at the desired setpoint.	—	—
Comment				
* 6.18 B.3	SET RC M/U BATCHING handswitch, FQIS-210X, for the volume determined in Step 1.	<u>CRITICAL STEP*</u> *Pushes red button on 1-FQIS-210X and adjusts FQIS reading to 3 using black buttons for a volume of 30 gallons	—	—
Comment				
* 6.18 B.4	OPEN VCT M/U, CVC-512-CV.	<u>CRITICAL STEP*</u> *Places 1-HS-2512 on 1C07 to OPEN	—	—
Comment				
* 6.18 B.5	PLACE MAKEUP WTR FLOW CONTR, FIC-210X, in AUTO.	<u>CRITICAL STEP*</u> *Depresses A/M button on 1-FIC-210X on 1C07 and shifts controller to AUTO	—	—
Comment				
6.18 B.6 NOTE	Flow can be stopped at any time by shutting RC M/U FLOW CONTR, CVC-210X-CV, via manual control of FIC-210X.			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.18 B.6	WHEN CVC-210X-CV indicates intermediate, THEN PLACE M/U MODE SEL SW, HS-210, in DILUTE.	<u>CRITICAL STEP*</u> Observes 1-RCS-210X-CV indication on 1C07 *After RCS-210X-CV indicates intermediate or in the open position, places 1-HS-210 on 1C07 to DILUTE	—	—
Comment				
6.18 B.7	WHEN desired to secure dilution OR the RC M/U BATCHING handswitch, FQIS-210X counts down to zero, THEN:	Observes 1-FQIS-210X on 1C07 and determines FQIS is counting down. After 1-FQIS-210X has counted down to zero, determines step is now applicable.	—	—
Comment				
Examiner NOTE				
Examinee can perform 6.18.B.7 bulleted steps in any order.				
* 6.18 B.7 1st Bullet	PLACE VCT M/U handswitch, HS-2512, to CLOSE.	<u>CRITICAL STEP*</u> *Places 1-HS-2512 on 1C07 to CLOSE	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.18 B.7 2nd Bullet NOTE	Due to circuit design the selected RCMU Pump may continue to run after taking M/U MODE SEL SW, HS-210 to MANUAL. The RCMU Pump can be stopped by taking the selected pump handswitch to STOP.			
6.18 B.7 2nd Bullet	PLACE M/U MODE SEL SW, HS-210, to MANUAL	Places 1-HS-210 on 1C07 to MANUAL	—	—
Comment				
6.18 B.7 3rd Bullet	PLACE MAKEUP WTR FLOW CONTR, FIC-210X, in MANUAL with a 0% output signal.	Depresses A/M button on 1-FIC-210X on 1C07 and shifts controller to MANUAL. Lowers controller output of 1-FIC-210X on 1C07 to 0%.	—	—
Comment				
Examiner NOTE Direct Simulator Driver to insert Event 1. This will cause loss of 1Y10. Alternate Path Starts Here				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	After Examinee notes unexpected alarms: Monitor the Primary. Once the monitoring report is provided: CRO reports RPS is not calling for a trip. Evaluate for a potential bus loss based on indications at 1C05 only.			
	Determines multiple unexpected alarms received and monitors the Primary.	Notes unexpected alarms and announces multiple alarms. Monitors the primary using monitoring plaque on 1C05 and determines primary is not stable based on PZR level trends on 1C06. Reports to the Unit Supervisor the Primary is not stable.	—	—
Comment				
	Evaluates indications at 1C05 for electrical power malfunction.	Determines that 1Y10 as a minimum is lost based on indications at 1C05.	—	—
CUE	After the Examinee has evaluated for and reported the potential bus loss based on 1C05 indications: The STA will evaluate the Preliminary section of AOP-7I-1. Perform the Immediate Actions for a loss of 1Y10. Hand Immediate Actions From 100% Power to Examinee.			
Examiner NOTE Examinee may first perform Charging Pump actions (4 th bullet) before Opening MOV-501 and before evaluating Tcold for trends.				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
	Locates Immediate Actions From 100% Power steps for loss of 1Y10.	Locates Immediate Actions From 100% Power steps for loss of 1Y10.	—	—
* IA 1Y10 1st Bullet	Open VCT outlet CV-501.	<u>CRITICAL STEP*</u> *Places 1-HS-2501 on 1C07 to OPEN	—	—
Comment				
* IA 1Y10 2nd Bullet	Shut RWT to CHG CV-504.	<u>CRITICAL STEP*</u> *Places 1-HS-2504 on 1C07 to CLOSE	—	—
Comment				
<p>Examiner NOTE</p> <p>Examinee may first perform Charging Pump actions (4th bullet) while evaluating Tcold for trends.</p> <p>Examinee must ensure Tcold is within 2°F of program and may choose to raise Tcold by lowering Turbine load once Tcold is < 2°F of program.</p>				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* IA 1Y10 3rd Bullet	Adjust Turbine to maintain Tc on program.	<u>CRITICAL STEP*</u> Monitors Tcold on either 1-TI-124 on 1C05 or 1-TI-112C/122C on 1C06. Determines if Tcold is within 2°F of program. *If Tc > 2°F off program, lowers Turbine load by placing 1-CS-80 on 1C02 to LOWER until Tcold is < 2°F off program. OR *If Tc > 2°F off program, lowers Turbine load by selecting LOWER on MK6 Load Set Manual Adj until Tcold is < 2°F off program.	—	—
Comment				
Examiner NOTE Examinee may place all three Charging Pump handswitches in PULL TO LOCK based on PZR level.				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	If Examinee recommends placing all three Charging Pumps in PULL TO LOCK: Place all three Charging Pumps in PULL TO LOCK. If Examinee reports PZR level is > 225": Ensure all three Charging Pumps in PULL TO LOCK.			
* IA 1Y10 4th Bullet	Place 2 Charging Pumps in PTL.	<u>CRITICAL STEP*</u> *Places at least two of the following three handswitches in PULL TO LOCK: <ul style="list-style-type: none"> • 1-HS-224X on 1C07 • 1-HS-224Y on 1C07 • 1-HS-224Z on 1C07 	—	—
Comment				
TERMINATING CUE: This JPM is complete when a 30 gallon DI makeup to the VCT is completed, the unexpected loss of 1Y10 has been identified, and immediate actions are taken per AOP-7J-1 for a loss of 1Y10. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Simulator1**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 RO.
2. Unit-1 is at 100%.
3. A 30 gallon DI addition to the VCT is now required to maintain normal power level.

Initiating Cue:

1. You are to complete the 30 gallon dilution per OI-2B, Step 6.18, Page 74.

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Simulator2

Facility: Calvert Cliffs 1 & 2**JPM Number:** Simulator2**Alternate Path:** No**Task Number:** 201.057**Task Title:** Monitor ESFAS Actuation**Task Standard:** This JPM is complete when SIAS has been reset.**K/A Reference:** 013A4.02 (4.3/4.4)**Method of Testing:** Actual Performance-Simulator**Validation Time:** 13 minutes**References and Tools Required:**

1. EOP-6, Steam Generator Tube Rupture
2. EOP-Attachments

JPM Setup Instructions:

1. Placekeep EOP-Attachment (2) SIAS Verification Checklist with steps 1C08/1C09/1C10 a-i, all 1C13, all 1C18A/1C18B, all 1C34, all 1C90, and all 1C101 steps marked as complete.
2. Annotate on EOP-Attachment (2) SIAS Verification Checklist steps 1C08/1C09/1C10 a-b that HSPI and LPSI are in PTL for HPSI Throttling.
3. Reset to IC-34.
4. Ensure keys are inserted in 1-HS-5 and 1-HS-6 on 1C10.
5. Place 1-HS-5464 in OPEN on 1C10.
6. Insert Override P1C07_F07_LTON to Off.
7. Insert a 10 GPM SG tube leak on 11 SG using malfunction ms001_01.
8. Once Condenser Off-Gas RMS alarms, manually trip the Reactor.
9. Initiate SIAS manually by depressing 1-HS-1 on 1C09 and 1-HS-2 on 1C10.
10. Perform the following EOP-0 actions:
 - Manually trip 11A and 12B RCPs on 1C06.
 - Start 13 AFW Pump at 1C03.
 - Trip both 11 and 12 SGFPs at 1C03.
 - Place 1-HS-4011 and 1-HS-4013 in CLOSE on 1C03.
 - Place 1-HS-4516 and 1-HS-4517 in CLOSE on 1C03.
 - Place 1-HS-2515 and 1-HS-2516 in CLOSE on 1C07.

11. Commence a cooldown/depressurization to establish the following conditions:

- RCS pressure < 1500 PSIA
- RCS temperature < 500°F
- Lower cooldown rate once < 500°F
- Plant cooldown in progress with limited Annunciators coming in alarm

12. While cooling down, perform the following EOP-6 actions:

- Place 1-HS-2501 in CLOSE on 1C07
- Place 1-HS-2504 in CLOSE on 1C07
- Block SGIS
- Isolate 11 SG per EOP-6
- Establish 11 SG between (-)10 and 0"
- PZR level > 120"
- Place 11/13 HPSI Pumps in PULL TO LOCK
- Place 11/12 LPSI Pumps in PULL TO LOCK
- Place 11/12/13 Condensate Booster Pumps in PULL TO LOCK
- Place 13 Condensate Pump in PULL TO LOCK
- Place 11/12 Heater Drain Pumps in PULL TO LOCK
- Place all PZR heaters in OFF on 1C06

13. Match the following handswitch flags to running conditions:

- 11/12/13 Charging Pumps on 1C07
- 11/12 Boric Acid Pumps on 1C07
- 11 and 12 Containment Spray on 1C08/1C09

14. Match handswitches as appropriate per SIAS Verification Checklist on 1C13.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.

Initial Conditions:

1. You are performing the duties of the Unit-1 CRO.
2. A Steam Generator Tube Rupture has occurred in 11 SG.
3. A SIAS occurred during EOP-0, Post-Trip Immediate Actions.
4. EOP-6, Steam Generator Tube Rupture, has been implemented.
5. 11 SG has been isolated.
6. An RCS cooldown and depressurization are in progress.
7. HPSI and LPSI have been throttled by placing the pumps in PULL TO LOCK.
8. Recovery actions are in progress.

Initiating Cue:

1. The RO has alarm control on all panels except for 1C08, 1C09, and 1C10.
2. You are to prevent an uncontrolled system restoration by matching handswitches in their required checklist position and reset SIAS per EOP-6 Step IV.S on Page 64.
3. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
	TIME START: _____			
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of EOP-6.			
Examiner NOTE Direct Simulator Driver to acknowledge and reset all alarms that occur except for those on 1C08, 1C09, and 1C10.				
EOP-6	Locates EOP-6, Step IV.S.	Determines that next step to be performed is EOP-6, Step IV.S on Page 64.	—	—
IV.S 1	IF SIAS has actuated, THEN reset SIAS as follows:	Determines SIAS has actuated based on Cue Sheet and step is applicable.	—	—
Comment 				
IV.S 1.a NOTE	Performance of procedure steps and present plant conditions may create acceptable exceptions to the checklist.			
IV.S 1.a CAUTION	To prevent uncontrolled system restoration, handswitches should be matched to the checklist positions unless specified otherwise.			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	After Examinee determines ATTACHMENT (2) SIAS VERIFICATION CHECKLIST is required: An extra RO has completed a portion of the SIAS Verification Checklist already. You are to complete the rest. Provide marked up copy of Unit-1 EOP SIAS Verification Checklist (Attachment (2)).			
IV.S 1.a	Verify ESFAS equipment is aligned correctly AND handswitches are matched PER ATTACHMENT (2) SIAS VERIFICATION CHECKLIST.	Proceeds to Unit-1 EOP-Attachments.	—	—
Comment				
EOP	Locates ATTACHMENT (2) SIAS VERIFICATION CHECKLIST.	Determines that next step to be performed is EOP-Attachment (2), SIAS Verification Checklist.	—	—
EOP 1C08/9/10 j	11, 12, 13, and 14 CNTMT AIR CLR's...Running in Low(1)	Verifies the following handswitches Amber lights are on and does not match HS: <ul style="list-style-type: none"> • 1-HS-5299 on 1C10 • 1-HS-5300 on 1C10 • 1-HS-5301 on 1C10 • 1-HS-5302 on 1C10 	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
EOP 1C08/9/10 k	CNTMT CLR EMER OUT valves: <ul style="list-style-type: none"> • 1-SRW-1582-CV... Open • 1-SRW-1585-CV... Open • 1-SRW-1590-CV... Open • 1-SRW-1593-CV... Open 	Places the following handswitches in OPEN: <ul style="list-style-type: none"> • 1-HS-1582 on 1C10 • 1-HS-1585 on 1C10 • 1-HS-1590 on 1C10 • 1-HS-1593 on 1C10 	—	—
Comment				
EOP 1C08/9/10 l	11, 12, and 13 IODINE FILT FANs...Running	Verifies the following handswitches all have running indications and matches HS flag: <ul style="list-style-type: none"> • 1-HS-5293 on 1C10 • 1-HS-5295 on 1C10 • 1-HS-5297 on 1C10 	—	—
Comment				
EOP 1C08/9/10 m	RCDT PP CONTMT ISOL valve, 1-RCW-4260-CV... Shut	Verifies 1-HS-4260 on 1C10 is in CLOSE position.	—	—
Comment				
EOP 1C08/9/10 n	WGS CNTMT ISOL valves: <ul style="list-style-type: none"> • 1-WGS-2180-CV... Shut • 1-WGS-2180-CV... Shut 	Verifies the following handswitches are in the CLOSE position: <ul style="list-style-type: none"> • 1-HS-2180 on 1C10 • 1-HS-2181 on 1C10 	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* EOP 1C08/9/10 o	CNTMT RMS ISOL valves: • 1-CRM-5291-CV...Shut* • 1-CRM-5292-CV...Shut*	<u>CRITICAL STEP*</u> *Places the following handswitches in CLOSE: • 1-HS-5291 on 1C10 • 1-HS-5292 on 1C10	—	—
Comment				
EOP 1C08/9/10 p	CNTMT NORMAL SUMP DRN valves: • 1-EAD-5462-MOV...Shut • 1-EAD-5463-MOV...Shut	Verifies the following valves are in the CLOSE position: • 1-EAD-5462-MOV on 1C10 • 1-EAD-5463-MOV on 1C10	—	—
Comment				
CUE	If asked, RCS was being sampled prior to the Tube Rupture.			
* EOP 1C08/9/10 q	RCS SAMPLE ISOL valve, 1-PS-5464-CV...Shut*	<u>CRITICAL STEP*</u> *Places 1-HS-5464 in CLOSE on 1C10	—	—
Comment				
EOP 1C08/9/10 r	H2 PURGE ISOL valves: • 1-HP-6900-MOV...Shut • 1-HP-6901-MOV...Shut	Verifies the following handswitches are in the CLOSE position: • 1-HS-6900 on 1C10 • 1-HS-6901 on 1C10	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
EOP 1C07 a	L/D CNTMT ISOL valves: <ul style="list-style-type: none"> • 1-CVC-515-CV... Shut • 1-CVC-515-CV... Shut 	Verifies the following handswitches are in the CLOSE position: <ul style="list-style-type: none"> • 1-HS-2515 on 1C07 • 1-HS-2516 on 1C07 	—	—
Comment				
EOP 1C07 b	11, 12, and 13 CHG PPs...Running	Verifies the following handswitches all have running indications. <ul style="list-style-type: none"> • 1-HS-224X on 1C07 • 1-HS-224Y on 1C07 • 1-HS-224Z on 1C07 	—	—
Comment				
EOP 1C07 c	VCT OUT valve, 1-CVC-501- MOV...Shut	Verifies 1-HS-2501 on 1C07 is in CLOSE.	—	—
Comment				
EOP 1C07 d	VCT M/U valve, 1-CVC-512- CV...Shut	Verifies 1-HS-2512 on 1C07 is in CLOSE.	—	—
Comment				
EOP 1C07 e	BA DIRECT M/U valve, 1-CVC- 514-MOV...Open	Verifies 1-HS-2514 on 1C07 indicates OPEN.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
EOP 1C07 f	11 and 12 BA PPs...Running	Verifies the following handswitches both have running indications. <ul style="list-style-type: none"> • 1-HS-226X on 1C07 • 1-HS-2226 on 1C07 	—	—
Comment				
EOP 1C07 g	BAST GRAVITY FD valves: <ul style="list-style-type: none"> • 1-CVC-508-MOV...Open • 1-CVC-509-MOV...Open 	Verifies the following handswitches both indicate OPEN: <ul style="list-style-type: none"> • 1-HS-2508 on 1C07 • 1-HS-2509 on 1C07 	—	—
Comment				
EOP 1C07 h	BAST RECIRC valves: <ul style="list-style-type: none"> • 1-CVC-510-CV...Shut • 1-CVC-511-CV...Shut 	Places the following handswitches in CLOSE: <ul style="list-style-type: none"> • 1-HS-2510 on 1C07 • 1-HS-2511 on 1C07 	—	—
Comment				
* EOP 1C07 i	RCP BLEED-OFF ISOL valves: <ul style="list-style-type: none"> • 1-CVC-505-CV...Shut* • 1-CVC-506-CV...Shut* 	<u>CRITICAL STEP*</u> *Places the following handswitches in CLOSE: <ul style="list-style-type: none"> • 1-HS-2505 on 1C07 • 1-HS-2506 on 1C07 	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
EOP-6	Locates EOP-6, Step IV.S.	Determines that next step to be performed is EOP-6, Step IV.S.b on Page 64.	—	—
* IV.S 1.b	Block the pressurizer pressure signals.	<u>CRITICAL STEP*</u> *Momentarily places 1-HS-5 to BLOCK until 1C08 Annunciator G-25 alarms *Momentarily places 1-HS-6 to BLOCK until 1C08 Annunciator G-26 alarms	—	—
Comment				
IV.S 1.c NOTE	1B Diesel Generator non-essential trips are enabled when SIAS is reset			
* IV.S 1.c	Reset the SIAS signals.	<u>CRITICAL STEP*</u> *Momentarily depresses 1-HS-3 on 1C10 *Momentarily depresses 1-HS-4 on 1C10 Verifies SIAS reset by noting 1C08 Annunciator G-5 clears	—	—
Comment				
TERMINATING CUE: This JPM is complete when SIAS has been reset. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Simulator2**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. A Steam Generator Tube Rupture has occurred in 11 SG.
3. A SIAS occurred during EOP-0, Post-Trip Immediate Actions.
4. EOP-6, Steam Generator Tube Rupture, has been implemented.
5. 11 SG has been isolated.
6. An RCS cooldown and depressurization are in progress.
7. HPSI and LPSI have been throttled by placing the pumps in PULL TO LOCK.
8. Recovery actions are in progress.

Initiating Cue:

1. The RO has alarm control on all panels except for 1C08, 1C09, and 1C10.
2. You are to prevent an uncontrolled system restoration by matching handswitches in their required checklist position and reset SIAS per EOP-6 Step IV.S on Page 64.

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Simulator3

Facility: Calvert Cliffs 1 & 2**JPM Number:** Simulator3**Alternate Path:** Yes**Task Number:** 052/061.016**Task Title:** Fill SITs using various flowpaths**Task Standard:**

This JPM is complete when 11A SIT level has been returned to normal and 11A SIT pressure has been restored to normal following the vent line leak.

Time Critical Task: No**K/A Reference:** 006A1.13 (3.5/3.7)**Method of Testing:** Actual Performance-Simulator**Validation Time:** 18 minutes**References and Tools Required:**

1. OI-3A. Safety Injection and Containment Spray
2. 1C09-ALM, ESFAS 12 Alarm Manual

JPM Setup Instructions:

1. IC with startup in progress and power ~1E-4%.
2. OI-3A, Safety Injection and Containment Spray, is completed with placekeeping indicating that Steps 6.3.A and B.1-12 are completed and identifies all of the associated 11A SIT valves operated (617-MOV, etc)
3. CCV tag on 1-HS-3618 on 1C08.
4. CCV tag on 1-HIC-3618 on 1C08.
5. CCV tag on 1-HS-3617 on 1C08.
6. Establish PPC screen with following trends:
 - RWT Level (L4142)
 - QT Pressure (P116)
 - QT Level (L116)
7. Establish level of ~188" in 11A SIT by performing OI-3A, Step 6.7.
8. Ensure pressure is ~213 PSIG in 11A SIT. If pressure needs to be adjusted, raise pressure by performing OI-3A, Step 6.1.
9. Verify the 11A SIT PRESS alarm on 1C09 is not in.
10. Pump 11 RCDT per OI-17C-2, Step 6.14.
11. Start 11 HPSI Pump.

12. Verify 1-HIC-3618 controller output on 1C08 is <0%.
13. Place 1-HS-3618 on 1C08 to OPEN. The valve indication should indicate closed due to HIC-3618 output.
14. Using dry erase marker, mark current SIT level indications on 1C08 and 1C09.
15. Overrides:
 - a. P1C08_1CV613_LTGREEN to On
 - b. P1C08_1CV613_LTRED to On
 - c. P1C08_1HS3613 to OPEN on event 1
 - d. P1C08_1HS3613 to CLOSE on event 2
 - e. P1C08_1PI311A_MT to 221.0 on event 3
 - f. P1C08_1PIA311_MT to 222.0 on event 3
 - g. P1C09_H01_LTON to Off on event 3
 - h. P1C08_1PI311A_MT to 220.0 on event 4
 - i. P1C08_1PIA311_MT to 221.0 on event 4
16. Insight Table open to fast fill 11A SIT to ~192" (Cell 1026 to 0.547.)

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. Unit-1 is in Mode 2 and continuing with a startup following a Forced Outage.
3. 11A Safety Injection Tank (SIT) level is low at 188" and needs to be filled.
4. Instrument Maintenance is preparing a Troubleshooting Plan to evaluate 1C09 intermediate indication for 11A SIT VENT CV, 1-HS-3613.
5. OI-3A, Safety Injection and Containment Spray, was implemented to fill 11A SIT.
6. Plant Computer trends have been established to monitor RWT level, Quench Tank pressure, and Quench Tank level.
7. 11 HPSI Pump was started and the Aux HPSI Header flushed per OI-3A, Safety Injection and Containment Spray. OI-3A Steps 6.3.B.1-12 have been completed.
8. 11A SIT Checkvalve Leakage CV, 1-SI-618-CV, is currently shut with 1-HIC-3618 output at 0% and valve handswitch, 1-HS-3618, in OPEN.
9. Chemistry reports that HPSI header boron concentration is 2505 PPM.

Initiating Cue:

1. You are to continue with OI-3A, Safety Injection and Containment Spray, Step 6.3.B.13 on page 17 and fill 11A SIT to ~193".
2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of OI-3A-1 with appropriate placekeeping marks.			
OI-3A	Locates AOP-OI-3A, Step 6.3.B.13	Determines that next step to be performed is 6.3.B.13 on Page 17.	—	—
6.3 B.13	CHECK HPSI header boron concentration meets the following: (TS SR 3.5.1.4) <ul style="list-style-type: none"> HPSI header boron concentration is between 2450 and 2700 PPM 	Evaluates Chemistry HPSI header sample results. Determines 2505 PPM is within limits based on Cue Sheet.	—	—
Comment				
CUE	Chemistry has recorded the HPSI Header boron concentration in eSOMS.			
6.3 B.14	RECORD the boron concentration is the CRO Daily Log	Determines that step has been completed by the Chemistry based on the Cue.	—	—
Comment				
6.3 B.15 CAUTION	The HPSI header isolation must be the same to ensure the sample is representative of the boron concentration to the fill the SIT(s).			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.3 B.15	OPEN the HPSI header isolation opened in Step 3 or 4 above: <ul style="list-style-type: none"> 11A AUX HPSI HDR, 1-SI-617-MOV (11A SIT) 	<u>CRITICAL STEP*</u> *Momentarily places 1-HS-3617 in OPEN until 1-617-MOV indicates full open	—	—
Comment				
* 6.3 B.16	OPEN the fill isolation valve for the desired SIT: <ul style="list-style-type: none"> 11A SIT FILL, 1-SI-611-CV 	<u>CRITICAL STEP*</u> *Places 1-HS-3611 in OPEN	—	—
Comment				
6.3 B.17 NOTE	The SIT pressure will rise approximate 2 PSI PER 1 inch of level filled. This may require venting PER Section 6.2, VENTING SAFETY INJECTION TANK(s)			
6.3 B.17	IF the SIT pressure rises due to filling and requires venting of the SIT, THEN REFER to Section 6.3, VENTING SAFTY INJECTION TANK(s)	Evaluates 11A SIT pressure during fill. Determines that SIT will not require venting.	—	—
Comment				
6.3 B.17 CAUTION	<ul style="list-style-type: none"> Quench Tank level shall be observed while filling SIT. Opening the Check Valve Leakage CV too far may cause the relief valve on the SIT LEAK-off Return Header to lift. In Mode 1-3, SIT pressure should be maintained greater than 200 PSIG AND less than 225 PSIG. TS 3.5.1 limit is between 200 and 250 PSIG. In Modes 1-3, the SIT should NOT be filled greater than 197 inches. TS 3.5.1 limit is 199 inches. 			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
Examiner NOTE The Examinee is expected to control the fill rate to the 11A SIT such that the relief valve on the SIT LEAK-off Return Header does not lift. If the relief valve does lift, it is not intended that the Examinee address the abnormal Quench Tank conditions.				
CUE	If Quench Tank parameters start to rise, the RO will address Quench Tank alarms/abnormal trends.			
* 6.3 B.18	THROTTLE OPEN the check valve leakage CV for the selected HPSI header to establish flow: <ul style="list-style-type: none"> 11A SIT CKV LKG CV, 1-SI-618-CV 	<u>CRITICAL STEP*</u> *Raises output on 1-HIC-3618 > 0% to throttle open 1-SI-618-CV Maintains flow rate low enough that relief valve on the SIT LEAK-off Return Header does not lift and Quench Tank parameters on 1C06 are maintained: <ul style="list-style-type: none"> QT pressure on 1-PI-116 2-4 PSIG. QT level on 1-LIA-116 27-30". 	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Once 11A SIT level is rising: Simulator will be forwarded in time. Direct Simulator Driver to fast fill the 11A SIT to 192" using Insight Table. Direct Simulator Driver to initiate Event 4. This will raise 11A SIT pressure. 11A SIT level is now 192" and rising.			
* 6.3 B.19	WHEN at the desired level or SIT pressure approaches 225 PSIG, THEN SHUT the check valve leakage CV opened.	<u>CRITICAL STEP*</u> Monitors SIT level on 1-LI- 311A . Raises 11A SIT level to 192- 194". *Once at required level, shuts 1-SI-618-CV by: Lowering output on 1-HIC- 3618 to \leq 0% AND/OR Places 1-HS-3618 to CLOSE	—	—
Comment				
* 6.3 B.20	SHUT the SIT fill isolation valve opened.	<u>CRITICAL STEP*</u> *Places 1-HS-3611 to CLOSE	—	—
Comment				
6.3 B.21	IF additional SIT(s) are to be filled, THEN REPEAT Steps 16- 20 to fill each additional SIT.	Determines step is N/A	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.3 B.22	SHUT the MAIN or AUX HPSI HDR isolation opened.	<u>CRITICAL STEP*</u> *Momentarily places 1-HS-3617 to CLOSE until 1-SI-617-MOV indicates closed	—	—
Comment				
* 6.3 B.23	STOP running HPSI Pump. • 11 HPSI Pump, 1-HS-301X	<u>CRITICAL STEP*</u> *Momentarily places 1-HS-301X in STOP	—	—
Comment				
6.3 B.24	IF ANY SI Check Valve Leak Indicators, 1-PIA-319, 329, 339, or 349 indicate > 300 PISG THEN PERFORM the following to lower pressure to < 300 PSIG:	Evaluates pressure indicators and determines 1-PIA-319, is reading > 300 PSIG. Determines step is applicable.	—	—
Comment				
* 6.3 B.24 a	OPEN LEAKOFF TO RCDT, 1-SI-661-CV.	<u>CRITICAL STEP*</u> *Places 1-HS-3661 to OPEN	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.3 B.24 b	CYCLE the selected check valve leakage CV one at a time to drain the header(s): <ul style="list-style-type: none"> 11A SIT CKV LKG CV, 1-SI-618-CV 	<u>CRITICAL STEP*</u> Throttles/Opens 1-SI-618-CV by performing the following: *IF 1-HS-3618 is in CLOSE, then places 1-HS-3618 to OPEN *Adjusts/verifies output on 1-HIC-3618 is > 0% Shuts 1-SI-618-CV by performing the following: Adjusts/verifies output on 1-HIC-3618 is 0% AND/OR Places 1-HS-3618 in CLOSE	—	—
Comment				
* 6.3 B.24 c	WHEN the selected headers have been drained, THEN SHUT LEAKOFF TO RCDT, 1-SI-661-CV.	<u>CRITICAL STEP*</u> Verifies pressure on 1-PIA-319 is < 300 PSIG. *Places 1-HS-3661 to CLOSE	—	—
Comment				
6.3 B.24 d	REPEAT steps a through c as required.	Evaluates pressure indicators PIA-329, 339, and 349. Determines no additional SI Check Valves need drained.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
<p>Examiner NOTE</p> <p>Direct Simulator Driver to remove overrides on 1PI311A_MT and PIA311_MT.</p> <p>Director Simulator Driver to insert Event 1. This will lower 11A SIT N2 pressure until 11A SIT PRESS alarms on low pressure.</p> <p>When 11A SIT PRESS alarms on 1C08, direct Simulator Driver to insert Event 2. This will stop the SIT depressurization.</p> <p>Alternate Path Starts Here</p>				
	Determines unexpected alarm received.	Notes 11A SIT PRESS low pressure alarm on 1C09. Refers to 1C09 Alarm Manual.	—	—
Comment				
CUE	An Equipment Operator in containment reported a leak downstream of the 11A SIT Vent Valve CV. The pipe cap was tightened and the leak has stopped.			
1C09 ALM	Evaluates possible causes	Determines alarm is valid and due to low pressure	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	The Unit Supervisor will evaluate Tech Spec 3.5.1. Restore 11A SIT pressure to ~220 PSIG per OI-3A.			
1C09 ALM 1	RAISE 11A SIT pressure by raising N2 pressure or raising SIT level (whichever is more practical), PER OI-3A, Safety Injection and Containment Spray.	Refers to OI-3A and determines Step 6.1 will be used to restore pressure in 11A SIT.	—	—
Comment				
6.1 A.1	Initial Conditions SIT pressure is less than 225 PSIG.	Evaluates 11A SIT pressure on 1-PI-311A and determines pressure is <225 PSIG	—	—
Comment				
6.1 A.2	IF in Cold Shutdown, THEN SIT pressure is less than 215 PSIG.	Determines step is N/A	—	—
Comment				
CUE	After the direction is given to the ABO, 0-N2-236 is open.			
* 6.1 B.1	Procedure OPEN U-1 SAFETY INJ TKS N ₂ SUPP VLV, 0-N2-236	<u>CRITICAL STEP*</u> *Directs ABO to open 0-N2-236	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	If asked, the Unit Supervisor has assigned an Extra RO as the dedicated operator and the Extra RO is stationed.			
6.1 B.2	STATION a dedicated operator in the Control Room to isolate the penetration by closing the N ₂ supply control valve, if Containment isolation is required.	Determines that Unit Supervisor has assigned and stationed a dedicated operator based on Cue OR Designates themselves as the dedicated operator.	—	—
Comment				
6.1 B.3 NOTE	To avoid excessive SIT pressure during plant heatup, maximum SIT pressure in Cold Shutdown should be limited to 215 PSIG.			
6.1 B.3 CAUTION	In Modes 1, 2, and 3, SIT pressure should be maintained greater than 200 PSIG and less than 225 PSIG.			
* 6.1 B.3	OPEN the N ₂ Supply control valve for the SIT to be pressurized: <ul style="list-style-type: none"> 11A SIT N₂ SUPP, 1-SI-612-CV 	<u>CRITICAL STEP*</u> *Places 1-HS-3612 to OPEN	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
<p>Examiner NOTE</p> <p>SIT pressure rises very slowly when raising pressure with N₂.</p>				
CUE	<p>After 1-SI-612-CV is open and the Examinee has determined 11A SIT pressure is rising:</p> <p>Simulator will be forwarded in time.</p> <p>Direct Simulator Driver to insert Event 3, which will fast pressurize 11A SIT to 220 PSIG.</p> <p>11A SIT pressure is now 220 PSIG.</p>			
* 6.1 B.4	<p>WHEN the SIT being pressurized is at the desired pressure, THEN SHUT the SIT N₂ supply control valve opened</p>	<p><u>CRITICAL STEP*</u></p> <p>Determines 11A SIT pressure is restored to desired pressure based on Cue.</p> <p>*Places 1-HS-3612 to CLOSE</p>	—	—
<p>Comment</p>				
<p>TERMINATING CUE: This JPM is complete when 11A SIT level has been returned to normal and 11A SIT pressure has been restored to normal following the vent line leak.</p> <p>The Examiner is expected to end the JPM.</p>				
<p>TIME STOP: _____</p>				

Verification of Completion**Job Performance Measure Number:** Simulator3**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. Unit-1 is in Mode 2 and continuing with a startup following a Forced Outage.
3. 11A Safety Injection Tank (SIT) level is low at 188" and needs to be filled.
4. Instrument Maintenance is preparing a Troubleshooting Plan to evaluate 1C09 intermediate indication for 11A SIT VENT CV, 1-HS-3613.
5. OI-3A, Safety Injection and Containment Spray, was implemented to fill 11A SIT.
6. Plant Computer trends have been established to monitor RWT level, Quench Tank pressure, and Quench Tank level.
7. 11 HPSI Pump was started and the Aux HPSI Header flushed per OI-3A, Safety Injection and Containment Spray. OI-3A Steps 6.3.B.1-12 have been completed.
8. 11A SIT Checkvalve Leakage CV, 1-SI-618-CV, is currently shut with 1-HIC-3618 output at 0% and valve handswitch, 1-HS-3618, in OPEN.
9. Chemistry reports that HPSI header boron concentration is 2505 PPM.

Initiating Cue:

1. You are to continue with OI-3A, Safety Injection and Containment Spray, Step 6.3.B.13 on page 17 and fill 11A SIT to ~193".

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Simulator4

Facility: Calvert Cliffs 1 & 2**JPM Number:** Simulator4**Alternate Path:** Yes**Task Number:** 093.015**Task Title:** Verify Automatic Turbine trip on Unit-2**Task Standard:** This JPM is complete when 500 KV Line voltage is initially raised to ~530 KV and Turbine Trip is performed in EOP-0.**K/A Reference:** 045A3.11 (2.6/2.9)**Method of Testing:** Actual Performance-Simulator**Validation Time:** 15 minutes**References and Tools Required:**

1. OI-43A, Main Turbine and Generator/Exciter Operation
2. EOP-0, Post-Trip Immediate Actions

JPM Setup Instructions:

1. Reset to IC-34 (Both Units 100%, MOC).
2. Bottom Turbine Ovation Screen on 2C02 on Control display.
3. Top Turbine Ovation Screen on 2C02 on Control display with 9.9% ramp rate.
4. Lower 500KV Sensitive Volts (0-EI-1001) on 1C01 to 526 KV by lowering MVARs on both Units.
5. Verify both Unit-1 and Unit-2 MVARs are ~ matched in the LAG after the 500 KV Sensitive Volt adjustment.
6. Two mimics available to the Simulator Driver to indicate 2-MS-4019-CV valve position on Turbine Ovation screens is open (red).
7. Events
 - a. P1C01_11GEVRAUTO_SWRAISE (U-1 Voltage Regulator Raised) on event 1
 - b. P1C01_21GENEXCBK_SWTRIP (U-2 Generator Field Stopped) on event 4

8. Overrides:

- a. P2C17_22BA_MT to 500.00000 on event 1
- b. P2C17_22AA_MT to 500.00000 on event 1
- c. P1C20_21BZA_MT to 490.00000 on event 1
- d. P1C20_21AZA_MT to 490.00000 on event 1
- e. P1C19_24BZB_MT to 600.00000 on event 1
- f. P2C17_23B_MT to 4.20000 on event 1
- g. set ISEXT_GRID_V=510 on event 2
- h. P1C01_A09_LTON to On on event 2
- i. P1C01_A02_LTON to On on event 2 delete in 2
- j. P1C01_A02_LTON after 6 to On on event 2 delete in 10
- k. P1C01_A10_LTON after 10 to On on event 2
- l. P2C02_2HS8250 after 15 to TRIP on event 2
- m. P1C01_MGS2TERMV_MT to 21.00000 on event 2
- n. P1C07_1RR202 to 75.00000 on event 2
- o. P1C01_MGS2K41M_LTGRE to Off on event 2
- p. P1C01_MGS2K41M_LTRED to On on event 2
- q. P1C01_MGS2K41M_LTGRE to On event 4
- r. P1C01_MGS2K41M_LTRED to Off on event 4
- s. P1C07_1RR202 to 0 on event 4
- t. P1C01_MGS2TERMV_MT to 0 on event 4

9. Verify Schedule is in RUN

10. Verify Events is Open.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-2 CRO.
2. Both Units are at 100% power.
3. Both Units Main Generator Voltage Regulators are in Auto.
4. 500KV Line Sensitive Volts are currently ~526 KV.
5. All 4 KV and 480 Volt bus voltages are within limits.
6. The electrical grid is stable.
7. The Transmission System Operator (SO-TSO) is making preparations for planned maintenance at Waugh Chapel.
8. The SO-TSO has requested that 500KV Line Voltage be raised to 530 KV as read on 500KV Buses Sensitive Volts (0-EI-1001) on 1C01.

Initiating Cue:

1. You are to raise 500KV Line Voltage, as read on 500 KV Buses Sensitive Volts (0-EI-1001) on 1C01, to 530 KV per OI-43A Step 6.7 on Page 55.
2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of OI-43A-2.			
	Locates OI-43A Step 6.7.	Determines that next step to be performed is OI-43A Step 6.7 on Page 55.	—	—
6.7 A	Initial Conditions			
6.7 A.1	Initial Conditions Anyone of the following occurs:			
6.7 A.1 1st bullet	System Operator-Transmission System Operator (SO-TSO) has requested line voltage be adjusted.	Determines initial condition is met based on Examinee Cue Sheet.	—	—
Comment				
6.7 A.1 2nd bullet	It is desired to adjust 13 KV or 4 KV bus voltage by adjusting 500 KV line voltage.	Determines initial condition is N/A.	—	—
Comment				
6.7 B	Procedure			
6.7 B.1 NOTE	Steps 1.c and 1.d can be performed in any order and as many times as needed to obtain proper line voltage.			
6.7 B.1 CAUTION	Line voltage should be maintained between 514.5-535.5 KV (525±2%) to assure PJM voltage and stability operating guidelines.			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
6.7 B.1	IF both Main Generators are paralleled to the grid AND it is desired to raise or lower 500 KV line voltage, THEN:	Determines step is applicable based on Examinee Cue Sheet OR Evaluates Unit-1 and Unit-2 Main Generator loading on 1C01 and determines step is applicable.	—	—
Comment				
CUE	If asked, the Transmission System Operator is aware of pending changes to 500 KV line voltage.			
6.7 B.1 a	ENSURE SO-TSO has been notified.	Determines SO-TSO is notified based on Examinee Cue Sheet. OR Contacts SO-TSO by calling on telephone and communicates planned 500 KV line voltage changes.	—	—
Comment				
6.7 B.1 a bullet NOTE	Adjustments to support grid stability should be performed as soon as practical.			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
6.7 B.1 a bullet	IF notified to make adjustment to support grid stability, AND the adjustment can NOT be performed with 30 minutes, THEN NOTIFY the SO-TSO why the adjustment is NOT achievable.	Determines step is N/A.	—	—
Comment				
6.7 B.1 b	IF line Voltage is outside 514.5-535.5 KV (525 \pm 2%), THEN PERFORM the following: (1) CONTACT SO-TSO for direction. (2) ENSURE a log entry made in Control Room logs noting Line Voltage outside band.	Evaluates 500 KV Buses Sensitive Line Volts on 0-EI-1001 on 1C01 and determines voltage is within limits and step is N/A OR Determines 500 KV line voltage is within limits based on Examinee Cue Sheet. Determines step is N/A.	—	—
Comment				
6.7 B.1 c NOTE	Reactive load should be maintained in the lag direction when the Voltage Regulator is in Manual.			
6.7 B.1 c	ADJUST U-1 Voltage Regulator as follows:			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
<p>Examiner NOTE</p> <p>Examinee is allowed to adjust either Units Voltage Regulator in either order (i.e. Unit-1 first or Unit-2 first). Examinee is allowed to adjust either Units Voltage Regulator multiple times to achieve the desired 500KV line voltage. The Critical Tasks are met when Voltage Regulator adjustments are completed and the 500 KV Buses Sensitive Line Volts on 0-EI-1001 at 1C01 reads 529-531 KV.</p>				
<p>* 6.7 B.1 c 1st bullet</p>	<p>IF U-1 Voltage Reg is in AUTO, THEN ADJUST 11 GEN AUTO VOLT CONTR, 1-CS-90, to achieve approximately one-half of the required change in line voltage.</p>	<p><u>CRITICAL STEP*</u></p> <p>Determines U-1 Voltage Regulator is in Auto based on Examinee Cue Sheet or 1-CS-43 position on 1C01.</p> <p>*Momentarily places 1-CS-90 in RAISE to raise 500KV line voltage</p> <p>If U-1 Voltage Regulator is first to be adjusted, then first 500 KV line voltage change is from 526 KV to ~527-529 KV.</p> <p>*If Unit-1 Voltage Regulator is the last one adjusted:</p> <p>500 KV Buses Sensitive Line Volts on 0-EI-1001 at 1C01 read 529-531 KV</p>	—	—
<p>Comment</p>				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.7 B.1 c 2nd bullet	IF U-1 Voltage Reg is in MANUAL, THEN ADJUST 11 GEN MANUAL VOLT CONTRO, 1-CS-70, to achieve approximately one-half of the required change in line voltage.	Determines step is N/A.	—	—
Comment				
6.7 B.1 d NOTE	Reactive load should be maintained in the lag direction when the Voltage Regulator is in Manual.			
6.7 B.1 d	ADJUST U-2 Voltage Regulator as follows:			
* 6.7 B.1 d 1st bullet	ADJUST 21 GEN VOLT REG ADJUST, 2-CS-90V, to achieve approximately one-half of the required change in line voltage.	<u>CRITICAL STEP*</u> *Momentarily places 2-CS-90V in RAISE to raise 500KV line voltage. If U-2 Voltage Regulator is first to be adjusted, then first 500 KV line voltage change is from 526 KV to ~527-529 KV. *If Unit-2 Voltage Regulator is the last one adjusted: 500 KV Buses Sensitive Line Volts on 0-EI-1001 at 1C01 read 529-531 KV	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
Examiner NOTE Only the Unit-2 buses are intended to be evaluated.				
CUE	<p>All Unit-1 4KV and 480 Volt buses are within their limits and only Unit-2 4KV and 480 Volt buses need to be evaluated.</p> <p>If Examinee is evaluating voltages on all three phases: Voltages on all 3 phases are identical.</p> <p>After Examinee notes high voltage on 24B 480V bus: There is an Issue Report for the failed high 24B 480V bus voltage indication on 1C19. Compensatory bus reading from fluke behind the panel indicates 24B 480V bus is 505 Volts.</p>			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
6.7 B.1 e	ENSURE BOTH Units 4 KV and 480 Volt buses are within their limits.	<p>Determines spec for 4 KV buses us 4.1-4.35 KV.</p> <p>Determines spec for 480V buses is 445-510 V.</p> <p>Evaluates following Unit-2 indications and determines that all 4 KV buses are within 4.1-4.35 KV limits:</p> <ul style="list-style-type: none"> • 21 (2-EI-421) on 1C20 • 22 (2-EI-404) on 2C17 • 23 (2-EI-405) on 2C17 • 24 (2-EI-424) on 1C20 • 25 (2-EI-401) on 2C17 • 26 (2-EI-400) on 2C17 <p>Evaluates following Unit-2 indications and determines that all 480 Volt buses are within 445-510V limits except for 24B 480V bus, which is reading high on 1C19.</p> <p>Determines actual 24B bus voltage reading given from Cue is within 445-510V limits:</p> <ul style="list-style-type: none"> • 21A (2-EI-521A) on 1C20 • 21B (2-EI-521B) on 1C20 • 22A (2-EI-504) on 2C17 • 22B (2-EI-505) on 2C17 • 23A (2-EI-506) on 2C17 • 23B (2-EI-507) on 2C17 • 24A (2-EI-524A) on 1C19 • 24B (2-EI-524B) on 1C19 • 25 (2-EI-508) on 2C17 	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
Examiner NOTE Direct Simulator Driver to insert Event 2. This will cause loss a large electrical grid disturbance and result in trip of Unit-2 Reactor/Turbine. Alternate Path Starts Here				
CUE	After TURB TRIP alarms on 2C02: RO reports Unit-2 Reactor Trip. Implement EOP-0.			
	Determines multiple unexpected alarms received.	Notes unexpected alarms on 1C01.	—	—
EOP-0	Locates EOP-0 Step IV.B	Determines that next step to be performed is EOP-0 Step IV.B on 2C02 plaque.	—	—
Examiner NOTE Unit-2 Reactor status is not available on the simulator.				
CUE	Unit-2 Reactor is tripped.			
IV.B 1	Check the Reactor has tripped.	Determines Reactor is tripped based on Cue.	—	—
Comment				
IV.B 2	Ensure the Turbine has tripped by performing the following actions:			
IV.B 2 a	Depress the U-2 MAIN TURB TRIP button.	Momentarily depresses 2-HS-8250 on 2C02.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
IV.B 2 b	Check the TURBINE THROTTLE valves shut.	Evaluates either Turbine Ovation screen and determines Turbine Throttle Valves are shut based on TV1, TV2, TV3, and TV4 valves indicating closed/green or ~0.	—	—
Comment				
IV.B 2 c	Check Turbine speed drops.	Evaluates either Turbine Ovation screen and determines Turbine speed is < 1800 RPM and lowering.	—	—
Comment				
IV.B 2 d	IF the Turbine was paralleled to the grid, THEN check the Turbine Generator Output breakers open: <ul style="list-style-type: none"> • 21 GEN BUS BKR, 0-CS-552-61 • 21 GEN TIE BKR, 0-CS-552-63 	Evaluates Turbine Generator Output breakers and determines 0-552-61 and 0-552-63 are open on 1C01.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
* IV.B 2 e	Verify 21 GEN EXITATION, 2-CS-90SS, is stopped.	<u>CRITICAL STEP*</u> Notes that 2-CS-90SS indicates closed on 1C01. Momentarily places 2-CS-90SS on 1C01 in STOP until 2-CS-90SS indicates open*	—	—
Comment				
CUE	If Examinee does not note identify 2-MSR-4019-CV as open due to issues with mimic: 2-MSR-4019-CV valve color icon is red on Turbine Ovation screens.			
CUE	After Turbine Trip alternate action report is made, acknowledge report.			
IV.B 3	Ensure the Main Steam to MSR Second Stage Control Valves shut: <ul style="list-style-type: none"> • 2-MS-4018-CV (21 MSR) • 2-MS-4019-CV (22 MSR) • 2-MS-4017-CV (23 MSR) • 2-MS-4020-CV (24 MSR) 	Evaluates either Turbine Ovation screen and determines 2-MSR-4018/4017/4020-CVs are shut and 2-MSR-4019-CV is open. Determines alternate actions are required and reports to the Unit Supervisor "Taking Alternate Actions for MSR Second Stage Control Vales remaining open" or similar wording.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	When directed to shut 2-MS-343, acknowledge order.			
* IV.B 3.1	IF ANY Main Steam to MSR Second Stage Control Valve fails to shut, THEN dispatch an operator to shut the MAIN STEAM SUPPLY to MSR 2 ND STAGE ISOLATION VALVE: <ul style="list-style-type: none"> • (2-MS-4018-CV) 2-MS-341 • (2-MS-4019-CV) 2-MS-343 • (2-MS-4017-CV) 2-MS-346 • (2-MS-4020-CV) 2-MS-348 	<u>CRITICAL STEP*</u> *Dispatches an Equipment Operator to shut 2-MS-343	—	—
Comment				
CUE	After Turbine Trip report is made, acknowledge report.			
IV.B	Turbine Trip Assessment	Reports either "Turbine Trip is complete" or "Monitoring Turbine Trip for MSR Second Stage Control Valve isolation" or similar wording.	—	—
Comment				
TERMINATING CUE: This JPM is complete when 500 KV Line voltage is initially raised to ~530 KV and Turbine Trip is performed in EOP-0. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Simulator4**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-2 CRO.
2. Both Units are at 100% power.
3. Both Units Main Generator Voltage Regulators are in Auto.
4. 500KV Line Sensitive Volts are currently ~526 KV.
5. All 4 KV and 480 Volt bus voltages are within limits.
6. The electrical grid is stable.
7. The Transmission System Operator (SO-TSO) is making preparations for planned maintenance at Waugh Chapel.
8. The SO-TSO has requested that 500KV Line Voltage be raised to 530 KV as read on 500KV Buses Sensitive Volts (0-EI-1001) on 1C01.

Initiating Cue:

1. You are to raise 500KV Line Voltage, as read on 500 KV Buses Sensitive Volts (0-EI-1001) on 1C01, to 530 KV per OI-43A Step 6.7 on Page 55.

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Simulator5

Facility: Calvert Cliffs 1 & 2**JPM Number:** Simulator5**Alternate Path:** No**Task Number:** 048.028**Task Title:** Notes failure of Containment Spray and manually initiates**Task Standard:**

This JPM is complete when CSAS flow has been established on 12 CS Header and actions are taken for an idle 12 SRW Header when CAC voiding conditions exist.

K/A Reference: 026A1.01 (3.9/4.2)**Method of Testing:** Actual Performance-Simulator**Validation Time:** 9 minutes**References and Tools Required:**

1. EOP-5, Loss of Coolant Accident
2. 1C08-ALM, ESFAS 11 Alarm Manual

JPM Setup Instructions:

1. Reset to IC-34.
2. Place EOP-5 Procedure PPC screen on monitor above 1C04.
3. Place 11 CS Pump, 1-HS-4516, on 1C08 in PULL TO LOCK.
4. Place INFO tag on 1-HS-4516 on 1C08.
5. Malfunctions:
 - a. si004_01
 - b. esfa004_02
 - c. dg001_02 on event 2
6. Remotes:
 - a. 152-1109_A to RACKED_OUT
 - b. 152-1109_A after 0.2 to RACKED_IN on event 1

7. Overrides:

- a. P1C07_F07_LTON to off
- b. P1C13_1H1570_LTGREE to On
- c. P1C13_1H1571_LTGREE to On
- d. P1C13_1H1571 to STOP
- e. P1C18_M04_LTON to Off
- f. P1C18B_1BDGFREQ_MT to 60.0
- g. P1C18B_1BDGVOLT_MT to 4.0
- h. P1C18_M10_LTON to Off
- i. P1C18B_AB1_LTON to Off
- j. P1C18B_AB2_LTON to Off
- k. P1C18B_AB5_LTON to Off
- l. P1C13_1HS1570_LTGREE to Off on event 1
- m. P1C18B_AB1_LTON to On on event 2
- n. P1C18B_AB2_LTON to On on event 2
- o. P1C18B_AB5_LTON to On on event 2
- p. P1C18_M10_LTON to On on event 2
- q. P1C18B_1BDGFREQ_MT to 59.2 on event 2
- r. P1C18B_1BDGVOLT_MT to 0 on event 2

8. Events:

- a. P1C13_1HS1570_SWSTART assigned to event 1

9. Place Schedule in RUN.

10. Place Simulator in RUN.

11. Insert a 10000 GPM leak with rcs002.

12. Allow the Reactor to trip automatically.

13. Secure all 4 RCPs on 1C06.

14. Start 13 AFW Pump on 1C04.

15. Place 13 SRW Pump in PULL TO LOCK on 1C13.

16. Place an INFO tag on 13 SRW Pump, 1-HS-1572, on 1C13.

17. Run until Containment Pressure is 15 PSIG.

18. Ensure Events File is open.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.

Initial Conditions:

1. You are performing the duties of the Unit-1 CRO.
2. 13 SRW Pump is OOS.
3. A Large Break LOCA has occurred.
4. EOP-5, Loss of Coolant Accident, has been implemented.

Initiating Cue:

1. You are to Maintain the Containment Environment per EOP-5 Step H on Page 19.
2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of EOP-5-1. Direct Simulator Driver to acknowledge all alarms on all panels.			
EOP-5	Locates EOP-5, Step H.	Determines that next step to be performed is EOP-5 Step H on Page 19.	—	—
H 1	IF SIAS has NOT actuated, THEN perform the following: a. Start ALL available CNTMT AIR CLR's in HIGH. b. Open the CNTMT CLR EMER OUT valves for the operating CNTMT AIR CLR's.	Checks if ACTUATION SYS SIAS TRIP alarm on 1C08 has actuated. Determines step is N/A.	—	—
Comment				
H 2	IF containment pressure rises to 2.8 PSIG, THEN verify ESFAS actuation of the following:	Checks Containment pressure using indications on 1C09 or the PCC: • 1-PI-5310 and/or • 1-PI-5307 and/or • 1-PI-5308 Determines that containment pressure is > 2.8 PSIG and step is applicable.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
H 2 1st bullet	SIAS	<p>Verifies SIAS by:</p> <p>Checks that ACTUATION SYS SIAS TRIP alarm on 1C08 has actuated.</p> <p>Verifies 11 HPSI Pump is running by checking 1-HS-301X on 1C08.</p> <p>Verifies 13 HPSI Pump is running by checking 1-HS-301Z on 1C09.</p> <p>Verifies all Main HPSI Header MOVs are open by checking 1-HS-3616/3626/3636/3646 on 1C08/1C09.</p> <p>Verifies all Aux HPSI Header MOVs are open by checking 1-HS-3617/3627/3637/3647 on 1C08/1C09.</p> <p>Determines SIAS has actuated and is verified.</p>	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
H 2 2nd bullet	CIS	<p>Verifies CIS by:</p> <p>Checks that ACTUATION SYS CIS TRIP alarm on 1C08 has actuated.</p> <p>Verifies CCW valves to Containment are closed using 1-HS-3832 and 1-HS-3833 on 1C10.</p> <p>Determines CIS has actuated and is verified.</p>	—	—
Comment				
H 3	IF CIS has actuated, THEN trip ALL RCPs.	<p>Determines step is applicable.</p> <p>Checks RCP status using following handswitches on 1C06 and determines all RCPs are secured:</p> <ul style="list-style-type: none"> • 1-HS-151 • 1-HS-161 • 1-HS-171 • 1-HS-181 	—	—
Comment				
CUE	After Examinee dispatches Equipment Operator, acknowledge request.			
H 4	Verify the SRW Pump Room Ventilation is in service PER SRW Pump Room Ventilation section of OI-15.	Dispatches Equipment Operator to verify SRW Pump Room Ventilation is in service PER OI-15.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* H 5	<p>IF containment pressure rises to 4.25 PSIG, THEN verify CSAS has actuated and spray flow is approximately 1350 GPM per pump by flow indicators:</p> <ul style="list-style-type: none"> • (11 CS HDR FLOW) 1-FI-4148 • (12 CS HDR FLOW) 1-FI-4149 	<p><u>CRITICAL STEP*</u></p> <p>Checks Containment pressure using indications on 1C09 or the PCC:</p> <ul style="list-style-type: none"> • 1-PI-5310 and/or • 1-PI-5307 and/or • 1-PI-5308 <p>Determines that containment pressure is > 4.25 PSIG and step is applicable.</p> <p>Evaluates 11 CS flow using 1-FI-4148 on 1C08 and determines flow is 0 due to 11 CS Pump OOS.</p> <p>Evaluates 12 CS flow using 1-FI-4149 on 1C09 and determines flow is 0 due to 1-SI-4151-CV not open.</p> <p>*Places 1-HS-4151 in OPEN OR momentarily depresses 1-HS-11 on 1C10.</p> <p>Evaluates 12 CS flow using 1-FI-4149 on 1C09 after opening SI-4151-CV and determines 12 CS flow is acceptable.</p> <p>Checks that ACTUATION SYS CSAS TRIP alarm on 1C08 has actuated.</p> <p>Evaluates 1-HS-4453, 1-HS-4460, and 1-HS-4467 on 1C03 and determines all CBPs have tripped.</p>	—	—
<p>Comment</p>				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
H 6 CAUTION	The following step provides actions to prevent waterhammer damage from CAC voiding.			
H 6 CAUTION	SRW Pumps start when power is restored to the associated 4KV Bus.			
CUE	If asked, there are no known discrepancies with 11 or 12 Service Water Pump.			
H 6	IF CSAS has actuated, AND EITHER SRW Header is NOT in operation, THEN perform the following actions:	Evaluates 1-HS-1570 and 1-HS-1571 on 1C13 and determines a SRW Header is idle and the step is applicable.	—	—
Comment				
H 6 a	IF 11 SRW Header is idle, THEN restart 11 SRW Header as follows:	Determines step is applicable.	—	—
Comment				
H 6 a(1)	Check that Containment Pressure has remained less than 25 PSIG with 11 SRW Header idle.	Checks Containment pressure using indications on 1C09 or the PCC: <ul style="list-style-type: none"> • 1-PI-5310 and/or • 1-PI-5307 and/or • 1-PI-5308 Determines that containment pressure has remained < 25 PSIG.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* H 6 a(2)	Attempt to start the desired SRW PP on 11 SRW Header.	<u>CRITICAL STEP*</u> *Momentarily places 1-HS-1570 in START until 11 SRW Pump starts.	—	—
Comment				
H 6 b	IF 12 SRW Header is idle, THEN restart 12 SRW Header as follows:	Determines step is applicable.	—	—
Comment				
H 6 b (1)	Check that Containment Pressure has remained less than 10 PSIG with 12 SRW Header idle.	Checks Containment pressure using indications on 1C09 or the PCC: <ul style="list-style-type: none">• 1-PI-5310 and/or• 1-PI-5307 and/or• 1-PI-5308 Determines that containment pressure has not remained < 10 PSIG.	—	—
Comment				
H 6 b.1 CAUTION	1B DG SRW flow is less than SRW PP minimum flow requirements. This step permits restoration of SRW to supply 1B DG.			
H 6 b.1 WARNING	High radiation levels may exist in the Auxiliary Building. RAS may significantly raise existing radiation levels.			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
H 6 b.1	IF Containment Pressure exceeded 10 PSIG, THEN perform the following actions:	Determines that step is applicable.	—	—
Comment				
H 6 b.1 (1)	Restart 12 SRW Header:			
CUE	After Examinee dispatches Equipment Operator, report that 1-SRW-149 is shut.			
* H 6 b.1 (1)(a)	Shut 13 CNTM CLG U MAN SUPP FR 12 SRW SUBSYS, 1-SRW-149, located 27 ft East Pen Room south of Containment Purge Supply.	<u>CRITICAL STEP*</u> *Dispatches Equipment Operator to shut 1-SRW-149.	—	—
Comment				
CUE	After Examinee dispatches Equipment Operator, report that 1-SRW-156 is shut.			
* H 6 b.1 (1)(b)	Shut 14 CNTM CLG SUPP FR 12 SRW SUBSYS, 1-SRW-156, located 5 ft West Pen Room along west wall.	<u>CRITICAL STEP*</u> *Dispatches Equipment Operator to shut 1-SRW-156.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
H 6 b.1 (1)(c)	Attempt to start the desired SRW PP on 12 SRW Header.	Momentarily places 1-HS-1571 to START and determines 12 SRW Pump does not start.	—	—
Comment				
CUE	If Examinee determines communication with the Technical Support Center is required: The Unit Supervisor is informing the Technical Support that the 11 SRW system was restored but the 12 SRW system has not yet been restored.			
H 6 b.1 (1)(d)	Consult with the Plant Technical Support Center for guidance on system restoration.	May inform Unit Supervisor that consultation with the Technical Support Center is required OR May move directly to Step H.6.b.1.(2).	—	—
Comment				
H 6 b.1 (2)	IF 12 SRW Header can NOT be restarted, THEN perform the following actions:	Determines step is applicable.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
H 6 b.1 (2)(a)	Place the SRW PP(s) aligned to 12 SRW Header in PULL TO LOCK.	Places 1-HS-1571 on 1C13 in PULL TO LOCK.	—	—
Comment				
* H 6 b.1 (2)(b)	Place 1B DG OUT BKR, 152-1403, in PULL TO LOCK.	<u>CRITICAL STEP*</u> *Places 1-CS-152-1403 on 1C18B in PULL TO LOCK.	—	—
Comment				
CUE	After Examinee dispatches Equipment Operator: Acknowledge request Direct Simulator Driver to initiate Event 2, which will trip the 1B DG When 1B DG CONTR BOARD 1C18B alarms on 1C18: The 1B DG fuel racks have been tripped locally.			
* H 6 b.1 (2)(c)	Locally trip the 1B DG fuel racks by pushing the EMERGENCY STOP PUSH TO STOP ENGINE trip device.	<u>CRITICAL STEP*</u> *Directs Equipment Operator to locally trip the 1B DG fuel racks by pushing the EMERGENCY STOP PUSH TO STOP ENGINE trip device.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	After Examinee determines communication with the Technical Support Center is required, acknowledge the report.			
H 6 b.1 (2)(d)	Consult with the Plant Technical Support Center for guidance on system restoration.	Informs the Unit Supervisor or determines consultation with the Technical Support Center is required	—	—
Comment				
TERMINATING CUE: This JPM is complete when CSAS flow has been established on 12 CS Header and actions are taken for an idle 12 SRW Header when CAC voiding conditions exist. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Simulator5**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. 13 SRW Pump is OOS.
3. A Large Break LOCA has occurred.
4. EOP-5, Loss of Coolant Accident, has been implemented.

Initiating Cue:

1. You are to Maintain the Containment Environment per EOP-5 Step H on Page 19.

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Simulator6

Facility: Calvert Cliffs 1 & 2**JPM Number:** Simulator6**Alternate Path:** No**Task Number:** 004.007**Task Title:** Transfer ESF Buses from SMECO to BG&E Grid**Task Standard:**

This JPM is complete when 11 4KV Bus is transferred from SMECO to the BGE Grid.

Time Critical Task: No**K/A Reference:** 062A4.01 (3.3/3.1)**Method of Testing:** Actual Performance-Simulator**Validation Time:** 10 minutes**References and Tools Required:**

1. OI-27E, SMECO Offsite Power System
2. OI-21B, 1B Diesel Generator

JPM Setup Instructions:

1. Reset to IC-34.
2. Trip Unit-1 Reactor.
3. Disable 1A DG by inserting malfunction dg002_02.
4. Disable 0C DG by inserting malfunction dg002_01.
5. Initiate Steam Driven AFW on 1C04.
6. Ensure MSR 2nd Stage Source MOVs indicate shut at 1-HS-4025 on 1C02.
7. Initiate LOOP by opening 1-252-1104 on 1C18.
8. Open 1-252-1201 on 1C18.
9. Open 2-252-2201 on 1C19.
10. Open 2-252-2104 on 1C19.
11. Tie 1Y09 to 1Y10 using Remote 1SY09 to 1Y10.
12. Shut SMECO Tie Breaker Shut using Remote 252-2301 to CLOSED.
13. Power 11 13KV Bus from SMECO by shutting 1-252-1105 on 1C18.
14. Reset all lockouts by using Remote RESET_86_PLANT to RESET.
15. Match HS flags (to green) on all open breakers on 11 13KV Bus.
16. Match HS flags (to green) on all open breakers on Unit-1 4KV Buses.
17. Close 1-252-1102 on 1C18.
18. Place 1-HS-25 on 1C18 to ON.
19. Close 1-152-1115 on 1C18 using sync stick.
20. Place 1-HS-25 on 1C18 to NORM.
21. Return sync stick to HOME BASE on 1C19.
22. Shut 2-CS-252-2104 on 1C19.
23. Reset all lockouts by using Remote RESET_86_PLANT to RESET.
24. Place 1A DG Output Breaker, 1-152-1703, in Pull To Lock on 1C18A.
25. Place Abnormal Component tag on 1A DG Output Breaker, 1-152-1703.
26. Place 0C DG Breaker, 0-152-0703, in Pull To Lock on 1C19C.
27. Hang info tags on 0C DG:
 - 0-152-0703 on 1C19C
 - 0-HS-0707 on 1C19C
 - 0-HS-0708 on 1C19C
28. Place 11 and 12 Charging Pumps in Pull to Lock on 1C07.

-
29. Start 12 CCW Pump on 1C13.
 30. Ensure SMECO mimic indicates 252-2301 shut on 1C19.
 31. ADV position established to maintain RCS temperatures constant.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. 0C DG was tagged out.
3. A Loss of Offsite Power occurred.
4. 1A DG did not start and is still not available.
5. 1B DG started and is powering 14 4KV Bus.
6. 1Y09 was tied to 1Y10 with 1Y10 supplying power.
7. 11 13KV Bus was powered by SMECO per OI-27E.
8. 11 4KV Bus was powered by SMECO per OI-27E.
9. Offsite Power has been restored and is powering 21 13KV Bus.

Initiating Cue:

1. Initial conditions for Step 6.5 have been verified by the Unit Supervisor.
2. You are to restore 11 4KV Bus to the BG&E Grid on 21 13KV Bus per OI-27E, Step 6.5.F, starting on Page 39.
3. No other Operators are available to assist.
4. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
	TIME START: _____			
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of OI-27E.			
	Locates OI-27E, Step 6.5.F	Determines that next step to be performed is OI-27E Step 6.5.F on Page 39.	—	—
6.5 F.1	ENSURE 21 13KV Service Bus energized from BG&E grid.	Determines 21 13KV bus is powered from the BG&E Grid based on Cue Sheet OR Evaluates electrical mimic on 1C19 and 1C20 and determines 21 13KV bus is powered from P-13000-2.	—	—
Comment				
CUE	If asked, the 1A DG is still not available.			
6.5 F.2	IF 1A Diesel Generator available, THEN PERFORM the following: a. START 1A Diesel Generator PER OI-21A, 1A DIESEL GENERATOR.	Determines that step is N/A based on Cue Sheet or Cue.	—	—
Comment				
6.5 F.3	IF 1A Diesel Generator is not available, THEN PERFORM the following:	Determines step is applicable based on Cue Sheet or Cue.	—	—

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
Comment				
6.5 F.3 a	IF NOT already done, THEN PLACE 1A DG OUT BKR, 1-CS-152-1703 in PULL TO LOCK.	Evaluates 1A HS position and determines 1-CS-152-1703 is already in PULL TO LOCK.	—	—
Comment				
* 6.5 F.3 b	INSERT sync stick into sync jack at 11 4KV BUS ALT FDR, 1-CS-152-1101.	<u>CRITICAL STEP*</u> Removes sync stick from HOME BASE on 1C19. *Inserts sync stick into sync jack just to the left of 1-CS-152-1101 on 1C18.	—	—
Comment				
6.5 F.3 c NOTE	This will start LOCI/SD sequencer to load bus in an orderly fashion when 11 4KV BUS ALT FDR, 152-1101, is closed. "SEQUENCER INITIATED" alarm will alarm on 1C08 to verify this.			
6.5 F.3 c	INSERT key for 11 4KV BUS LOCI/SD SEQUENCER MANUAL INITATE, 1-HS-25.	Determines key is already inserted in 1-HS-25.	—	—
Comment				
* 6.5 F.3 c (1)	PLACE 11 4KV BUS LOCI/SD SEQUENCER MANUAL INITATE, 1-HS-25, in ON.	<u>CRITICAL STEP*</u> *Rotates keyswitch for 1-HS-25 to ON position.	—	—

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
Comment				
6.5 F.3 d NOTE	The following steps will be a "dead bus" transfer.			
Examiner NOTE Direct Simulator Driver to acknowledge all annunciators during remainder of JPM.				
CUE	If informed of pending temporary loss of 11 4KV Bus, acknowledge report.			
* 6.5 F.3 d	OPEN 11 4KV BUS NORMAL FDR, 1-CS-152-1115	<u>CRITICAL STEP*</u> *Momentarily places 1-CS-152-1115 to TRIP until breaker 1-152-1115 is open.	—	—
Comment				
* 6.5 F.3 e	CLOSE U-4000-21 13KV FDR, 2-CS-252-2102.	<u>CRITICAL STEP*</u> *Momentarily places 2-CS-252-2102 to CLOSE until breaker 2-252-2102 is shut.	—	—
Comment				
* 6.5 F.3 f	CLOSE 11 4KV BUS ALT FDR, 1-CS-152-1101.	<u>CRITICAL STEP*</u> *Momentarily places 1-CS-152-1101 to CLOSE until breaker 1-152-1101 is shut.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
6.5 F.3 g	ENSURE loads listed on APPENDIX A, have sequenced on.	Refers to OI-27E, Appendix A.	—	—
Comment				
CUE	Evaluate loads associated with Breaker 152-1703 shutting (1A DG paralleled with 11/17 4KV Bus).			
APP A	The following table lists loads which will receive a start signal from selected Shutdown Sequencers (SDS)	Determines appropriate loads to evaluate are associated with Breaker 152-1703 shutting (1A DG paralleled with 11/17 4KV Bus) or evaluates same loads based on Cue.	—	—
Comment				
APP A	11 Salt Water Pump	Evaluates 11 Saltwater Pump status using 1-HS-5199 on 1C13. Determines 11 SW Pump is running.	—	—
Comment				
APP A	11 Service Water Pump	Evaluates 11 SRW Pump status using 1-HS-1570 on 1C13. Determines 11 SRW Pump is running.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
APP A	11 Control Room A/C Compressor	Evaluates 11 CR HVAC status using 0-HS-5340 on 1C34. Determines 11 CR HVAC is running.	—	—
Comment				
CUE	After dispatching Equipment Operator: 11 Switchgear Room Ventilation is in service and running per OI-22H.			
APP A	11 Swgr A/C Compressor	Directs Equipment Operator to evaluate status of 11 SWGR. Determines 11 SWGR HVAC is running based on Cue.	—	—
Comment				
APP A	11 Instrument Air Compressor	Evaluates 11 IA COMPR indications at 1C13 and determines 11 IAC is running.	—	—
Comment				
6.5 F.3 g	ENSURE loads listed on APPENDIX A, have sequenced on.	Determines all loads listed on APPENDIX A have sequenced on.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
6.5 F.3 h	RETURN 11 4KV BUS LOCI/SD SEQUENCER MANUAL INITATE, 1-HS-25, to NORM.	Rotates keyswitch for 1-HS-25 to NORM position.	—	—
Comment				
CUE	Leave key inserted in 1-HS-25.			
6.5 F.3 i	IF desired, THEN REMOVE key from keyswitch.	Determines step is N/A.	—	—
Comment				
6.5 F.3 j	RETURN sync stick to HOME BASE.	Removes sync stick from sync jack just to the left of 1-CS-152-1101 and inserts sync stick into HOME BASE on 1C19.	—	—
Comment				
TERMINATING CUE: This JPM is complete when 11 4KV Bus is transferred from SMECO to the BGE Grid. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Simulator6**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. 0C DG was tagged out.
3. A Loss of Offsite Power occurred.
4. 1A DG did not start and is still not available.
5. 1B DG started and is powering 14 4KV Bus.
6. 1Y09 was tied to 1Y10 with 1Y10 supplying power.
7. 11 13KV Bus was powered by SMECO per OI-27E.
8. 11 4KV Bus was powered by SMECO per OI-27E.
9. Offsite Power has been restored and is powering 21 13KV Bus.

Initiating Cue:

1. Initial conditions for Step 6.5 have been verified by the Unit Supervisor.
2. You are to restore 11 4KV Bus to the BG&E Grid on 21 13KV Bus per OI-27E, Step 6.5.F, starting on Page 39.
3. No other Operators are available to assist.

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Simulator7

Facility: Calvert Cliffs 1 & 2**JPM Number:** Simulator7**Alternate Path:** No**Task Number:** 078.010**Task Title:** Nulling NI Pots to ΔT Pots**Task Standard:**

This JPM is complete when the Examinee nulls RPS Channel "A" NI Pot to the ΔT Pot and clears the "NUCLEAR ΔT CH DEVIATION" alarm and it is determined no other channels require being nulled. .

K/A Reference: 015A3.03 (3.9/3.9)**Method of Testing:** Actual Performance-Simulator**Validation Time:** 12 minutes**References and Tools Required:**

1. OP-2, Plant Startup From Hot Standby To Minimum Load
2. OI-30, Nuclear Instrumentation

JPM Setup Instructions:

1. Reset IC-14 (11% power)
2. Insert override 1P05_D43_LTON to on.
3. Place all 4 RPS RPSCIP Meter Inputs to Nuclear Pwr.
4. Adjust NUCLEAR PWR CALIBRATE pots to achieve the following NI readings:
 - Channel A: 8.4 - 8.8%
 - Channel B: Null to match ΔT power
 - Channel C: Null to match ΔT power
 - Channel D: Null to match ΔT power
5. OP-2 placekeeping marks completed with Step 6.9.F.1 complete. Record NI power indications with values after simulator setup complete. All ΔT Power and RR Power should be recorded as 11% (variety of values reading between 11.1-11.5%).
6. Verify all 4 RPS Channel NUCLEAR PWR CALIBRATE pots are locked (full clockwise/down)
7. Verify all 4 RPS RPSCIP drawer Meter Input switches are in ΔT power.
8. Verify RPS Bypass keys 1, 2, 7, 8, and 10 stored in the key locker.
9. RPS Chains are available and stored in Unit Supervisor desk drawers.
10. Stage Procedure Cart by RPS channels.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.

Initial Conditions:

1. You are performing the duties of the Unit-1 CRO.
2. A Unit-1 startup is in progress.
3. Power is approximately 11% and holding.
4. 1C05 Annunciator Window D-43, "NUCLEAR ΔT CH DEVIATION" is in.

Initiating Cue:

1. You are to Null the NI Pots per OP-2, Step 6.9.F.2 on Page 54.
2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of OP-2-1.			
OP-2	Locates OP-2, Step 6.9.F.2.	Determines that next step to be performed is OP-2 Step 6.9.F.2 on Page 54.	—	—
6.9 F.2 NOTE	<ul style="list-style-type: none"> When nulling NI pots, the possibility exists that the pot may reach its hard stop before the NUCLEAR POWER-ΔT POWER deviation meter reaches zero. Tech Spec 3.3.1 requires the Axial Power Distribution Trip and the Loss of Load Trip to be active when NUCLEAR INSTRUMENT POWER is > 15% RTP. 			
6.9 F.2	WHEN Reactor power is between 10 and 12%, THEN NULL the NI pot for each channel that NI power is reading less than Delta-T power PER OI-30, section titled, NULLING NI POTS TO DELTA T POTS.	Determines power is between 10-12% based on Examinee Cue Sheet and determines OI-30 must be implemented OR Evaluates Δ T power indications on 1C15 and determines power is between 10-12% and OI-30 must be implemented.	—	—
Comment				
OI-30	Locates OI-30 Step 6.10.	Determines that next step to be performed is OI-30 Step 10 on Page 45.	—	—
6.10 A	Initial Conditions			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.10 A.1	NI Power is indication less than Delta-T Power for the channels being adjusted.	Evaluates Nuclear PWR- ΔT PWR(%) on RPS Calibration & Indication Panels on 1C15. Determines RPS Channel A NI Power is less than Delta-T Power and initial condition is met.	—	—
Comment				
6.10 A.2	Rated thermal power is less than or equal to 30%.	Determines power is between 10-12% based on Examinee Cue Sheet and determines initial condition is met OR Evaluates Delta-T power indications on 1C15 and determines power is between 10-12% and initial condition is met.	—	—
Comment				
6.10 B	Procedure			
6.10 B.1 NOTE	<ul style="list-style-type: none"> Tech Spec 3.3.1 requires the Axial Power Distribution Trip and the Loss of Load Trip to be active when NUCLEAR INSTRUMENT POWER is > 15% RTP. Excore NI Power Range Safety Channels are adjusted one entire channel at a time, with the channels selected in any order. 			
6.7 B.1 CAUTION	Adjustment of an Excore NI Power Range Safety Channel renders the channel inoperable AND requires entry into Technical Specification Action Statement 3.3.1.			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT												
CUE	After Examinee determines Tech Spec 3.3.1 must be entered when adjusting NI pots: The Unit Supervisor and the RO have evaluated and implemented all actions required by Tech Spec 3.3.1.															
6.10 B.1	NULL the NI pot for each channel that NI power is reading less than Delta-T power, by performing Steps a. through i. for a specific channel.	Determines that only Channel A NI power is reading less than Delta-T power.	—	—												
Comment																
* 6.10 B.1 a	BYPASS the following RPS trips for the channel to be adjusted: <table border="0"> <tr> <td>TRIP UNIT</td> <td>BYPASS KEY</td> </tr> <tr> <td>HI POWER</td> <td>1</td> </tr> <tr> <td>HI RATE</td> <td>2</td> </tr> <tr> <td>TM/LO PRES</td> <td>7</td> </tr> <tr> <td>LOSS LOAD</td> <td>8</td> </tr> <tr> <td>AXIAL PWR</td> <td>10</td> </tr> </table>	TRIP UNIT	BYPASS KEY	HI POWER	1	HI RATE	2	TM/LO PRES	7	LOSS LOAD	8	AXIAL PWR	10	<u>CRITICAL STEP*</u> Obtains RPS Bypass keys 1, 2, 7, 8, and 10 from key cabinet. At RPS Channel A on 1C15, inserts bypass key and then rotates key until bypass light illuminates for the following Trip Units: Trip Unit 1 Trip Unit 2 Trip Unit 7 Trip Unit 8 Trip Unit 10	—	—
TRIP UNIT	BYPASS KEY															
HI POWER	1															
HI RATE	2															
TM/LO PRES	7															
LOSS LOAD	8															
AXIAL PWR	10															
Comment																

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	After Examinee requests an independent verification that correct RPS Channel "A" Trip Units 1, 2, 7, 8 & 10 are bypassed: The independent verification has been completed Step 6.10.B.1.b is complete			
6.10 B.1 b	INDEPENDENTLY VERIFY that RPS Trip Units 1, 2, 7, 8 & 10 are bypassed.	Requests an independent verification that the correct RPS Trip Units have been bypassed.	—	—
Comment				
* 6.10 B.1 c	PLACE the DVM METER INPUT switch in NUCLEAR PWR.	<u>CRITICAL STEP*</u> *Places METER INPUT switch on 1C15 RPS Channel A Calibration & Indication Panel to NUCLEAR PWR.	—	—
Comment				
6.10 B.1 d NOTE	<ul style="list-style-type: none"> Counterclockwise rotation raises the reading. When nulling NI pots, the possibility exists that the pot may reach its hard stop before the NUCLEAR POWER-ΔT POWER deviation meter reaches zero. During a plant startup, this is acceptable as long as the NUCLEAR ΔT CH DEVIATION alarm is clear. 			
6.10 B.1 d CAUTION	Potentiometer adjustments must be stopped immediately if 1(2)C05 annunciator "POWER LEVEL HIGH CHANNEL PRE-TRIP" alarms while adjusting a potentiometer.			
Examiner NOTE Direct Simulator Driver to remove 1C05 D-43 Override when the NUCLEAR PWR CALIBRATE potentiometer is adjusted and Nuclear PWR-ΔT PWR(%) on Channel A RPS Calibration & Indication Panel on 1C15 is ~(-)2%.				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* 6.10 B.1 d	UNLOCK AND slowly ADJUST the NUCLEAR PWR CALIBRATE potentiometer (FIGURE 1 – Item D) to zero the NUCLEAR POWER DELTA-T POWER deviation meter.	<u>CRITICAL STEP*</u> *Unlocks NUCLEAR PWR CALIBRATE potentiometer and adjusts NUCLEAR PWR CALIBRATE potentiometer until Nuclear PWR-ΔT PWR(%) on Channel A RPS Calibration & Indication Panel on 1C15 reads ~ 0.	—	—
Comment				
6.10 B.1 d (1)	IF 1(2)C05 annunciator "POWER LEVEL HIGH CHANNEL PRE-TRIP" alarms while potentiometer is being adjusted, THEN STOP adjustment AND ENSURE test switch alignment is correct.	Evaluates annunciator POWER LEVEL HIGH CHANNEL PRE-TRIP alarm on 1C05 and determines step is N/A.	—	—
Comment				
6.10 B.1 d (2)	IF 1(2)C05 annunciator "POWER LEVEL HIGH CHANNEL PRE-TRIP" alarmed AND test switch alignment is correct, THEN REQUEST IM to check HIGH POWER Trip Unit pre-trip AND trip setpoints on that channel.	Evaluates annunciator POWER LEVEL HIGH CHANNEL PRE-TRIP alarm on 1C05 and determines step is N/A.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.10 B.1 e	LOCK the locking device on the NUCLEAR PWR CALIBRATE potentiometer.	Locks the NUCLEAR PWR CALIBRATE potentiometer by rotating lock full clockwise/down.	—	—
Comment				
6.10 B.1 f	IF tripped, THEN RESET VOPT AND RPS Trip Units 1, 7 and 10 AND associated Control Room annunciators.	Evaluates RPS Trip Unit status on Channel A on 1C15 and determines step is N/A as no trip units are in a tripped condition.	—	—
Comment				
* 6.10 B.1 g	REMOVE the Trip Bypass Keys from RPS Trip Units 1, 2, 7, 8 & 10.	<u>CRITICAL STEP</u> * At RPS Channel A on 1C15, rotates bypass key, verifies the bypass light goes out, and then removes key for the following Trip Units: Trip Unit 1 Trip Unit 2 Trip Unit 7 Trip Unit 8 Trip Unit 10	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	After Examinee requests an independent verification that the bypass keys have been correctly removed from RPS Channel "A" Trip Units 1, 2, 7, 8 & 10: The independent verification has been completed Step 6.10.B.1.h is complete			
6.10 B.1 h	INDEPENDENTLY VERIFY that Trip Bypass Keys are removed from Trip Units 1, 2, 7, 8 & 10.	Requests an independent verification that bypass keys have been correctly removed from RPS Channel "A" Trip Units 1, 2, 7, 8 & 10.	—	—
Comment				
6.10 B.1 i	PLACE the DVM METER INPUT switch in ΔT PWR.	Places METER INPUT switch on 1C15 RPS Channel A Calibration & Indication Panel to ΔT PWR.	—	—
Comment				
6.10 B.1 j	REPEAT Steps a. through i. for the next NI channel until all desired channels are nulled.	Evaluates Nuclear PWR- ΔT PWR(%) on Channel B, C, and D RPS Calibration & Indication Panels on 1C15. Determines process is NOT required for RPS Channels B, C, or D.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
6.10 B.2	CHECK the POWER ON LED is illuminated for ALL four channels.	Evaluates green POWER light for RPS Channels A, B, C, and D. Determines that POWER ON LED is lit for all four channels.	—	—
Comment				
6.10 B.2 1st bullet	IF POWER ON LED is NOT illuminated, THEN INITIATE an IR to investigate and repair.	Determines step is N/A.	—	—
Comment				
TERMINATING CUE: This JPM is complete when the Examinee nulls RPS Channel "A" NI Pot to the ΔT Pot and clears the "NUCLEAR ΔT CH DEVIATION" alarm and it is determined no other channels require being nulled. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Simulator7**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. A Unit-1 startup is in progress.
3. Power is approximately 11% and holding.
4. 1C05 Annunciator Window D-43, "NUCLEAR ΔT CH DEVIATION" is in.

Initiating Cue:

1. You are to Null the NI Pots per OP-2, Step 6.9.F.2 on Page 54.

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Simulator8

Facility: Calvert Cliffs 1 & 2**JPM Number:** Simulator8**Alternate Path:** Yes**Task Number:** 202.055**Task Title:** Respond to loss of Refueling Pool level**Task Standard:**

This JPM is complete when SDC flow has been lowered, a lowering RFP level is identified, the SFP is isolated from the RFP, and actions to contain airborne activity are completed from the Control Room.

K/A Reference: 029A1.02 (3.4/3.4)**Method of Testing:** Actual Performance-Simulator**Validation Time:** 14 minutes**References and Tools Required:**

1. OI-3B, Shutdown Cooling
2. AOP-6E, Loss of Unit-1 Refueling Pool Level

JPM Setup Instructions:

1. Reset to IC-4.
2. Verify the following keys are inserted: 25-28, 25, 35, 37-39, 47 and 48.
3. Fill RFP to 67' using Insight Table Refueling Pool Level and cells 701, 707, and 708.
4. Verify SDC in service with 11 LPSI Pump running at 3000 GPM.
5. Verify that SI-657-CV position will allow SDC flow to be lowered < 1500 GPM (i.e. adjusted such that with SI-306-CV full shut, SDC flow is < 1500 GPM.)
6. Verify tags on 1C07 indicate SDC purification is secured (1-SI-464/465/475-Shut).
7. Verify 1-HS-2520 in BYPASS on 1C07.
8. Verify 11 Main Exhaust Fan (1-HS-5412) is running on Unit-1 on 1C34.
9. Verify 21 Main Exhaust Fan (2-HS-5412) is running on Unit-2 on 1C34.
10. Verify 11 AUX BLDG & WP EXH FAN (1-HS-5410) is running on Unit-1 on 1C34.
11. Verify 21 AUX BLDG & WP EXH FAN (2-HS-5410) is running on Unit-2 on 1C34.
12. Verify 11 SFP EXH FAN (0-HS-5419) is running on 1C34.
13. Verify 11 AUX BLDG & WP SUPP FAN (1-HS-5422) is running on 1C34.
14. Start 12 AUX BLDG & WP SUPP FAN (1-HS-5423) on 1C34.
15. Open AUX BLDG & WP XCONN 2-HVAC-5440 (2-HS-5440) on 1C34.
16. Stop 21 AUX BLDG & WP SUPP FAN (2-HS-5422) on 1C34.

17. Verify SFP EXH FILT handswitch, 0-HS-5416, in the FILTER position at 1C34.
18. Cover 1C05 and 1C06 PAMS screens with paper stating Reactor Vessel Head removed.
19. Malfunctions:
 - a. rcs002 to 10000.0 on Event 1
20. Overrides:
 - a. P1C10_J21_LTON to On on Event 1
 - b. P1C08_1LIA4144_MT from 0 to 2.00000 in 600 on event 1
 - c. P1C09_1LIA4145_MT from 0 to 2.00000 in 600 on event 1
21. Ensure Schedule in RUN.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. SRW is running in a normal lineup for testing support.
3. Unit-1 is in Mode 6 with refueling activities in progress.
4. Shutdown Cooling (SDC) is in service per OI-3B Section 6.1.1 with 11 LPSI Pump in service
5. SDC purification is not in service.
6. RCS boron is 2529 PPM and steady.
7. RCS temperature band is 100-120°F.
8. The Fuel Handling Supervisor has requested that SDC flow be lowered to 2000 GPM due to fuel moves near the 12 Hot Leg.

Initiating Cue:

1. You are to lower SDC flow from 3000 to between 1500-1525 GPM per OI-3B Step 6.8.4 on Page 109.
2. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of OI-3B-1.			
OI-3B	Locates OI-3B, Step 6.8.4.	Determines that next step to be performed is OI-3B, Step 6.8.4.	—	—
6.8.4 A	Initial Conditions			
6.8.4 A.1	SDC in operation PER Section 6.1.1, Normal Initiation of SDC.	Determines that Initial condition is met per Examinee Cue Sheet.	—	—
Comment				
CUE	If asked, there are no dilution activities in progress.			
6.8.4 A.2	NO reduction in RCS boron concentration is in progress.	Determines that Initial condition is met per Examinee Cue Sheet.	—	—
Comment				
6.8.4 B	Procedure			
6.8.4 B.1	IF desired THEN LOWER SDC FLOW to 1500 GPM as follows:	Determines step is applicable based on Examinee Cue Sheet.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.8.4 B.1 a	IF CVCS Purification is on SDC AND IF DESIRED, THEN SHUT SDC SUPP CVCS B/U, 1-SI-464.	<p>Determines step is N/A based on Examinee Cue Sheet</p> <p>OR</p> <p>Evaluates CVCS mimic on 1C07 and notes that 1-SI-464 indicates shut.</p> <p>Determines step is N/A.</p>	—	—
Comment				
* 6.8.4 B.1 b	REDUCE SDC flow to approximately 1500 GPM by adjusting SDC FLOW CONTR, 1-FIC-306, and SDC TEMP CONTR, 1-HIC-3657	<p><u>CRITICAL STEP*</u></p> <p>*Lowers setpoint on 1-FIC-306 on 1C09 to 1500-1525.</p> <p>OR</p> <p>*Shifts 1-FIC-306 to Manual and adjusts output and/or adjusts output on 1-HIC-3657 until PV on 1-FIC-306 is 1490-1540.</p>	—	—
Comment				
<p>Examiner NOTE</p> <p>Direct Simulator Driver to insert Event 1. This will cause lowering RFP level.</p> <p>Alternate Path Starts Here</p>				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	<p>After Examinee notes unexpected alarms, direct the Examinee to monitor the Refueling Cart.</p> <p>Once the Examinee notes that RFP level is lowering:</p> <ul style="list-style-type: none"> • A large leak from the North Refueling Cavity has been identified by the Containment Coordinator • The RO and an extra RO will implement AOP-3B. • Isolate the Spent Fuel Pool from the Refueling Pool per AOP-6E, Step IV. B • Provide Examinee with copy of AOP-6E. 			
	Determines unexpected alarm received.	<p>Notes unexpected CNTMT NORMAL SUMP LVL HI alarm on 1C10.</p> <p>Monitors the parameters on the Refueling Cart and determines that RFP level is lowering.</p> <p>Determines that AOP-6E must be implemented based on the Cue.</p>	—	—
Comment				
AOP-6E	Locates AOP-6E, Step IV.B.	Determines that next step to be performed is AOP-6E, Step IV.B on Page 9.	—	—
B	ISOLATE THE SFP FROM THE RFP.			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	After Examinee requests Transfer Carriage status: The RCRO reports that the Fuel Transfer Carriage is in the Spent Fuel Pool and the carriage is currently in the Horizontal position.			
B.1	IF the Transfer Carriage is in the RFP, THEN transfer it to the SFP PER OI-25E, FUEL TRANSFER SYSTEM.	Determines step is N/A based on Cue.	—	—
Comment				
B 2 NOTE	Shutting the Transfer Tube Gate Valve, 0-SFP-1, may be delayed if additional time is needed to place a Fuel Assembly in a safe location.			
B 2	WHEN the Transfer Carriage is in the SFP, THEN perform the following actions:	Determines following steps can be performed based on Cue.	—	—
Comment				
B 2.a	Ensure that it is in the horizontal position.	Determines that Transfer Carriage is in the horizontal position based on Cue.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* B 2.b	Stop 11 and 12 SFP CLG PPS: <ul style="list-style-type: none"> • 0-HS-1994 • 0-HS-1995 	<u>CRITICAL STEP*</u> *Places the following handswitches momentarily to TRIP or to PULL TO LOCK on 1C13: <ul style="list-style-type: none"> • 0-HS-1994 • 0-HS-1995 	—	—
Comment				
CUE	After Examinee dispatches Equipment Operator: 0-SFP-1 is shut.			
* B 2.c	Shut the transfer Tube Gate Valve, 0-SFP-1.	<u>CRITICAL STEP*</u> *Directs an Equipment Operator to shut 0-SFP-1.	—	—
Comment				
CUE	After Examinee dispatches Equipment Operator: 0-SFP-103 and 0-SFP-107 are shut.			
* B 2.d	Shut the SPF Pump Discharge Valves: <ul style="list-style-type: none"> • (11 SFP Pump) 0-SFP-103 • (12 SFP Pump) 0-SFP-107 	<u>CRITICAL STEP*</u> *Directs an Equipment Operator to shut 0-SFP-103 and 0-SFP-107.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Inform Examinee that AOP-6E Step IV. C is being performed by the Unit-2 Unit Supervisor. Perform AOP-6E Step IV. D, Contain the Airborne Activity.			
AOP-6E	Locates AOP-6E, Step IV.D.	Determines that next step to be performed is AOP-6E, Step IV.D on Page 11.	—	—
D 1	Isolate Containment Purge:			
* D 1.a	Stop 11 CNTMT PURGE SUPP and EXH FANs.	<u>CRITICAL STEP*</u> *Places the following handswitches in STOP on 1C34: <ul style="list-style-type: none"> • 1-HS-5290 • 1-HS-5289 	—	—
Comment				
* D 1.b	Close 11 CNTMT PURGE SUPP and EXH valves: <ul style="list-style-type: none"> • 1(2)-HS-1410 • 1(2)-HS-1412 	<u>CRITICAL STEP*</u> *Places the following handswitches in CLOSE on 1C10: <ul style="list-style-type: none"> • 1-HS-1410 • 1-HS-1412 	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* D 2	Start all available IODINE FILT FANS: <ul style="list-style-type: none"> • 11 FAN 1(2)-HS-5293 • 12 FAN 1(2)-HS-5295 • 13 FAN 1(2)-HS-5297 	<u>CRITICAL STEP*</u> *Momentarily places following handswitches in START on 1C10: <ul style="list-style-type: none"> • 1-HS-5293 • 1-HS-5295 • 1-HS-5297 	—	—
Comment				
D 3	Log the start time of the Iodine Filter Fans.	Logs start time for each fan in AOP-6E.	—	—
Comment				
D 4 CAUTION	Ensure the minimum flow requirement (1700 GPM) for the SRW pumps is maintained.			
CUE	If asked, SRW is not in a reduced load lineup.			
D 4	IF the SRW system is aligned for reduced load operation, THEN start a second SRW pump.	Evaluates SRW Pump indications on 1C13 or Cue. Determines 2 SRW Pumps are running and step is N/A.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
* D 5	Open the CNTMT CLR EMER OUT valves on ALL available Containment Air Coolers (CACs): <ul style="list-style-type: none"> • (11 CAC) 1-HS-1582 • (12 CAC) 1-HS-1585 • (13 CAC) 1-HS-1590 • (14 CAC) 1-HS-1593 	<u>CRITICAL STEP*</u> * Places following handswitches in OPEN on 1C09: <ul style="list-style-type: none"> • 1-HS-1582 • 1-HS-1585 • 1-HS-1590 • 1-HS-1593 	—	—
Comment				
D 6	Verify SRW flow through the available Containment Air Coolers.	Verifies SRW flow is greater than zero on flow indications on 1C09 below or using the Plant Computer: <ul style="list-style-type: none"> • 1-FI-1581 • 1-FI-1584 • 1-FI-1589 • 1-FI-1592 	—	—
Comment				
* D 7	Start ALL available CNTMT AIR CLRs in HIGH speed: <ul style="list-style-type: none"> • (11 CAC) 1-HS-5299 • (12 CAC) 1-HS-5300 • (13 CAC) 1-HS-5301 • (14 CAC) 1-HS-5302 	<u>CRITICAL STEP*</u> *Momentarily places following handswitches in HIGH on 1C09: <ul style="list-style-type: none"> • 1-HS-5299 • 1-HS-5300 • 1-HS-5301 • 1-HS-5302 	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
D 8	Maintain a negative pressure in the Aux Building:			
D 8.a	Check that ONE of the MAIN EXH FANS is running on EACH unit: <ul style="list-style-type: none"> • 11(21) Fan 1(2)-HS-5412 • 12(22) Fan 1(2)-HS-5413 	Evaluates Main Exhaust Fans at 1C34. Determines that 11 Main Exhaust Fan is running on Unit-1 and 21 Main Exhaust Fan is running on Unit-2.	—	—
Comment				
D 8.b	Check that ONE of the AUX BLDG & WP EXH FANS is running on EACH unit: <ul style="list-style-type: none"> • 11(21) Fan 1(2)-HS-5410 • 12(22) Fan 1(2)-HS-5411 	Evaluates Aux Building Ventilation Fans at 1C34. Determines that 11 AUX BLDG & WP EXH FAN (1-HS-5410) is running on Unit-1. Determines that 21 AUX BLDG & WP EXH FAN (2-HS-5410) is running on Unit-2.	—	—
Comment				
CUE	After Examinee dispatches Equipment Operator: The 69 foot to 45 foot rolling door is shut.			
D 9	Verify shut the Cask Unloading Hatch (69 foot to 45 foot rolling door).	Directs Equipment Operator to verify the Cask Unloading Hatch (69 foot to 45 foot rolling door) is shut.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
D 10	Maintain a negative pressure in the Fuel Handling Area by performing the following:			
D 10.a	Check that ONE of the SFP EXH FANs is running: <ul style="list-style-type: none"> • 11 SFP EXH FAN 0-HS-5419 • 12 SFP EXH FAN 0-HS-5420 	Evaluates SFP Ventilation Fans at 1C34. Determines that 11 SFP EXH FAN (0-HS-5419) is running.	—	—
Comment				
D 10.b	Check that TWO AUX BLDG & WP SUPPLY FANs are running: <ul style="list-style-type: none"> • 11(21) AUX BLDG & WP SUPP FAN 1-HS-5422 (2-HS-5422) • 12 AUX BLDG & WP SUPP FAN 1-HS-5423 	Evaluates Aux Building Ventilation Fans at 1C34. Determines that 11 AUX BLDG & WP SUPP FAN (1-HS-5422) is running. Determines 12 AUX BLDG & WP SUPP FAN (1-HS-5423) is running.	—	—
Comment				
D 11	Verify the SFP EXH FILT handswitch, 0-HS-5416, in the FILTER position.	Evaluates SFP Ventilation on 1C34. Determines SFP EXH FILT handswitch (0-HS-5416) is in the FILTER position.	—	—
Comment				

TERMINATING CUE:

This JPM is complete when SDC flow has been lowered, a lowering RFP level is identified, the SFP is isolated from the RFP, and actions to contain airborne activity are completed from the Control Room.

The Examiner is expected to end the JPM.

TIME STOP: _____

Verification of Completion**Job Performance Measure Number:** Simulator8**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 CRO.
2. SRW is running in a normal lineup for testing support.
3. Unit-1 is in Mode 6 with refueling activities in progress.
4. Shutdown Cooling (SDC) is in service per OI-3B Section 6.1.1 with 11 LPSI Pump in service
5. SDC purification is not in service.
6. RCS boron is 2529 PPM and steady.
7. RCS temperature band is 100-120°F.
8. The Fuel Handling Supervisor has requested that SDC flow be lowered to 1500 GPM due to fuel moves near the 12 Hot Leg.

Initiating Cue:

1. You are to lower SDC flow from 3000 to between 1500-1525 GPM per OI-3B Step 6.8.4 on Page 109.

Examinee: _____

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Plant1

Facility: Calvert Cliffs 1 & 2**JPM Number:** Plant1**Alternate Path:** No**Task Number:** 202.123**Task Title:** Secure the MG Sets**Task Standard:**

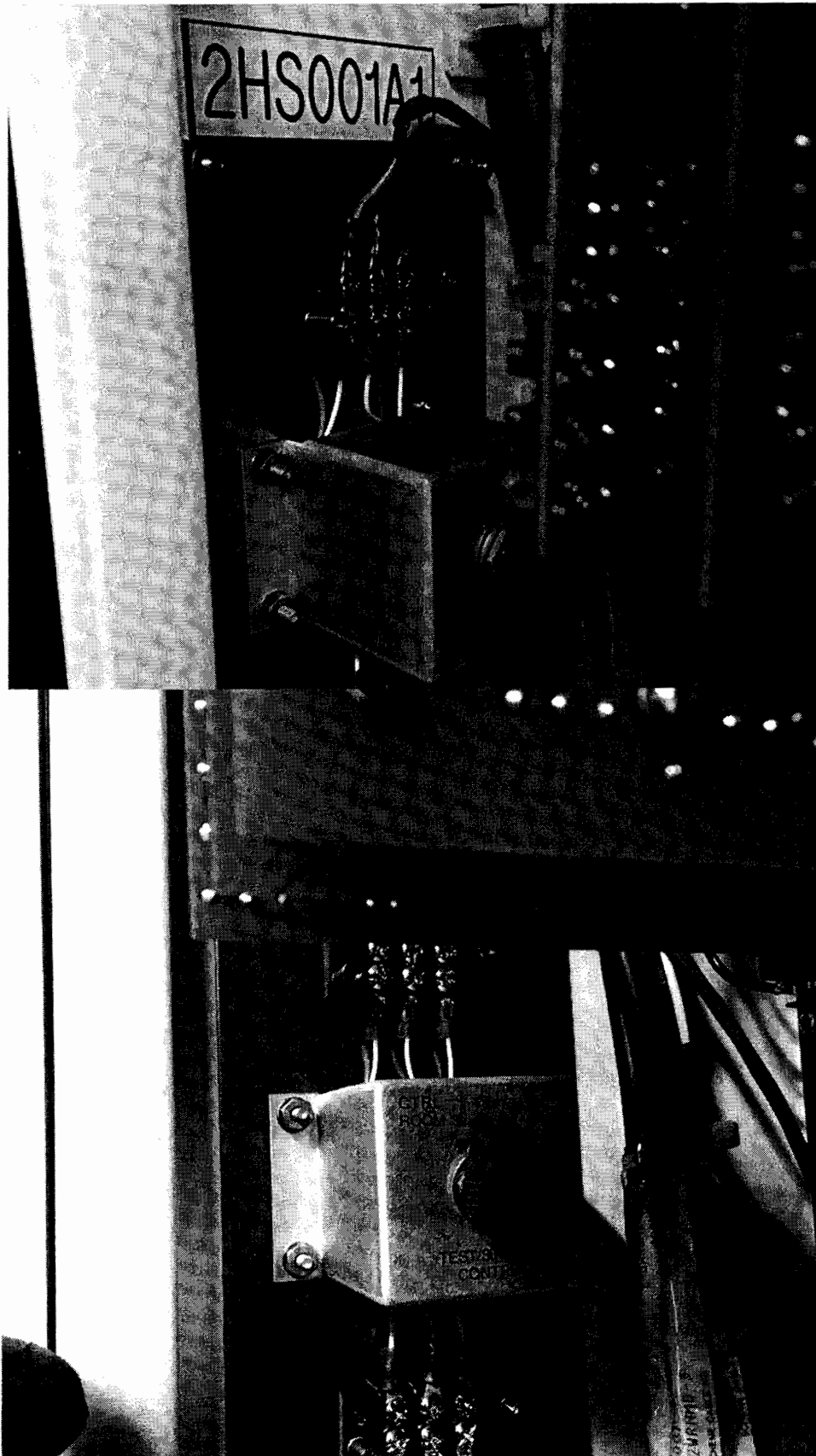
This JPM is complete when the MG sets have been shutdown locally, the Reactor is verified shutdown, and SG Blowdown/RCP Bleedoff/Letdown/RCS Sampling are all isolated to conserve SG and RCS inventory.

Time Critical Task: No**K/A Reference:** 001A1.06 (4.1/4.4)**Method of Testing:** Simulated-Plant**Validation Time:** 12 minutes**References and Tools Required:**

1. AOP-9B-2, Safe Shutdown Due to a Severe Cable Spreading Room Fire
2. Pictures of cabinet 2-NX-001A1 internals

JPM Setup Instructions:

1. AOP-9B-2, Safe Shutdown Due to a Severe Cable Spreading Room Fire, printed single sided, in a procedure binder.
2. Pictures available for examinee of cabinet 2-NX-001A1 internals, per attached.



Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-2 CRO.
2. A severe fire has started in the Unit-2 Cable Spreading Room.
3. AOP-9B-2, Safe Shutdown Due to a Severe Cable Spreading Room Fire, has been implemented.
4. All actions in the Unit-2 Control Room have been attempted.
5. Unit-2 personnel have evacuated the Control Room.
6. You have obtained your necessary key ring and equipment at the Safe Shutdown Panel in the Unit-2 45' SWGR Room per Step IV.H.

Initiating Cue:

1. The Unit Supervisor directs you to respond to the Unit-2 Cable Spreading Room fire using AOP-9B-2, Safe Shutdown Due to a Severe Cable Spreading Room Fire.
2. Starting in the Unit-2 45' SWGR Room, you are to commence with Step IV.I, Shutdown 21 and 22 CEDM MG Sets, on page 10.
3. You are to perform all CRO position-specific steps.
4. No other Operators are available to assist.
5. All component actions will be simulated.
6. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of AOP-9B-2.			
	Locates AOP-9B-2, Step IV.I- SHUTDOWN 21 AND 22 CEDM MG SETS	Determines that next step to be performed is IV.I, to shutdown 21 and 22 MG Sets	—	—
IV.I 1	On CEDM MG Set Control Panel:	Locates panel 2C87 in U-2 45' Switchgear Room	—	—
Comment				
CUE	Initially, the Local LOAD ON light is lit. After Local LOAD OFF Pushbutton is depressed: Local LOAD ON light goes out Local/22 MG Generator Amps read zero.			
* IV.I 1.a	Depress Local LOAD OFF Pushbutton.	<u>CRITICAL STEP*</u> *Depresses Local LOAD OFF button on 2C87	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Initially, the Remote LOAD ON light is lit. After Remote LOAD OFF Pushbutton is depressed: Remote LOAD ON light goes out. Remote/21 MG Generator Amps read zero.			
* IV.I 1.b	Depress Remote LOAD OFF Pushbutton.	<u>CRITICAL STEP*</u> *Depresses Remote LOAD OFF button on 2C87	—	—
Comment				
CUE	Initially, the Local MOTOR ON light is lit. After Local MOTOR OFF Pushbutton is depressed for several seconds: Local MOTOR ON light goes out Local/22 MG Generator Volts and Exciter Field Amps ramp to zero Noise level from 22 MG starts to lower.			
* IV.I 1.c	Depress and hold Local MOTOR OFF Pushbutton until MOTOR ON light deenergizes.	<u>CRITICAL STEP*</u> *Depresses and holds Local MOTOR OFF button on 2C87 until Local MOTOR ON light goes out	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Initially, the Remote MOTOR ON light is lit. After Remote MOTOR OFF Pushbutton is depressed for several seconds: Remote MOTOR ON light goes out Remote/21 MG Generator Volts and Exciter Field Amps ramp to zero			
* IV.I 1.d	Depress and hold Remote MOTOR OFF Pushbutton until MOTOR ON light deenergizes.	<u>CRITICAL STEP*</u> *Depresses and holds Remote MOTOR OFF button on 2C87 until Remote MOTOR ON light goes out	—	—
Comment				
CUE	The Unit Supervisor directs you to perform all CRO specific steps in AOP-9B-2.			
IV.I 2	Perform Step J.	Determines that next step to be performed is IV.J, to verify the Reactor is shutdown	—	—
Comment				
IV.J 1	Isolate Channel A WRNI from the Control Room:	N/A		

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	After locating and simulating how to open cabinet 2-NX-001A1: The cabinet is open. Provide pictures of cabinet 2-NX-001A1 internals. Voltage in the cabinet is < 50 volts and no electrical PPE is required.			
IV.J 1.a	Open OPT. ISOL, 2-NX-001A1 (behind 2C43).	Locates cabinet 2-NX-001A1 and opens the cabinet by loosening screws on the right and moving the holding brackets	—	—
Comment				
CUE	Initially, 2HS001A1 is in the fully counter-clockwise/CTRL ROOM position. After the HS is manipulated: 2HS001A1 is in the fully clockwise/OFF position.			
* IV.J 1.b	Place 2-HS-001A1 in OFF.	<u>CRITICAL STEP*</u> *Rotates 2HS001A1 fully clockwise to the OFF position	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Initially, 2-HS-015B is in the fully clockwise/C position. After HS is manipulated: 2-HS-015B is in the fully counter-clockwise/A position.			
* IV.J 1.c	On 2C43, verify 2-HS-015B selected to A.	<u>CRITICAL STEP*</u> Locates 2-HS-015B on panel 2C43 *Rotates 2-HS-015B to the fully counter-clockwise/A position	—	—
Comment				
IV.J NOTE	Reactivity Control is satisfactory when Reactor Power is less than $10^{-4}\%$ power and constant or lowering.			
CUE	After locating indications: Power on 2-NI-016 is $10^{-2}\%$ and continuing to slowly lower Power on 2-NI-015 is reading pegged high.			
IV.J 2	Verify Reactor Power is trending to, or is less than $10^{-4}\%$ power and lowering.	Locates % Power indication on 2-NI-016 and determines power is trending towards $10^{-4}\%$ and power is lowering	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
IV.J 3	Perform Step M.	Determines that next step to be performed is IV.M, to isolate SG Blowdown and conserve RCS inventory	—	—
Comment				
CUE	After demonstrating inserting the key, key is fully inserted.			
IV.M 1	Insert key for 21 S/G SURF and BOT B/D, 2-BD-4010-CV / 2-BD-4011-CV.	Fully inserts key into 2-HS-4010A	—	—
Comment				
CUE	Initially, 2-HS-4010A is in the fully counter-clockwise/OPEN position.\nAfter HS is manipulated: 2-HS-4010A is in the fully clockwise/CLOSE position.			
* IV.M 2	Rotate key to CLOSE.	<u>CRITICAL STEP*</u> *Rotates 2-HS-4010A to the fully clockwise/CLOSE position	—	—
Comment				
CUE	After demonstrating inserting the key, key is fully inserted.			
IV.M 3	Insert key for 22 S/G SURF and BOT B/D, 2-BD-4012-CV / 2-BD-4013-CV.	Fully inserts key into 2-HS-4012A	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Initially, 2-HS-4012A is in the fully counter-clockwise/OPEN position. After HS is manipulated: 2-HS-4012A is in the fully clockwise/CLOSE position.			
* IV.M 4	Rotate key to CLOSE.	<u>CRITICAL STEP*</u> *Rotates 2-HS-4012A to the fully clockwise/CLOSE position	—	—
Comment				
CUE	After demonstrating inserting the key, key is fully inserted.			
IV.M 5	Insert key for RCP CBO ISOL, 2-CVC-505-CV.	Fully inserts key into 2-HS-2505A	—	—
Comment				
CUE	Initially, 2-HS-2505A is in the fully clockwise/NORMAL position. After HS is manipulated: 2-HS-2505A is in the fully counter-clockwise/CLOSE position.			
* IV.M 6	Rotate key to CLOSE.	<u>CRITICAL STEP*</u> *Rotates 2-HS-2505A to the fully counter-clockwise/CLOSE position	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	After demonstrating inserting the key, key is fully inserted.			
IV.M 7	Insert key for L/D CNTMT ISOL, 2-CVC-516-CV.	Fully inserts key into 2-HS- 2516A	—	—
Comment				
CUE	Initially, 2-HS-2516A is in the fully clockwise/NORMAL position. After HS is manipulated: 2-HS-2516A is in the fully counter-clockwise/CLOSE position.			
* IV.M 8	Rotate key to CLOSE.	<u>CRITICAL STEP*</u> *Rotates 2-HS-2516A to the fully counter- clockwise/CLOSE position	—	—
Comment				
CUE	After demonstrating inserting the key, key is fully inserted.			
IV.M 9	Insert key for RC SAMPLE ISOL, 2-PS-5464-SV.	Fully inserts key into 2-HS- 5464B	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Initially, 2-HS-5464B is in the fully clockwise/NORMAL position. After HS is manipulated: 2-HS-5464B is in the fully counter-clockwise/CLOSE position.			
* IV.M 10	Rotate key to CLOSE.	<u>CRITICAL STEP*</u> *Rotates 2-HS-5464B to the fully counter-clockwise/CLOSE position	—	—
Comment				
TERMINATING CUE: This JPM is complete when the MG sets have been shutdown locally, the Reactor is verified shutdown, and SG Blowdown/RCP Bleedoff/Letdown/RCS Sampling are all isolated to conserve SG and RCS inventory. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Plant1**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-2 CRO.
2. A severe fire has started in the Unit-2 Cable Spreading Room.
3. AOP-9B-2, Safe Shutdown Due to a Severe Cable Spreading Room Fire, has been implemented.
4. All actions in the Unit-2 Control Room have been attempted.
5. Unit-2 personnel have evacuated the Control Room.
6. You have obtained your necessary key ring and equipment at the Safe Shutdown Panel in the Unit-2 45' SWGR Room per Step IV.H.

Initiating Cue:

1. The Unit Supervisor directs you to respond to the Unit-2 Cable Spreading Room fire using AOP-9B-2, Safe Shutdown Due to a Severe Cable Spreading Room Fire.
2. Starting in the Unit-2 45' SWGR Room, you are to commence with Step IV.I, Shutdown 21 and 22 CEDM MG Sets, on page 10.
3. You are to perform all CRO position-specific steps.
4. No other Operators are available to assist.
5. All component actions will be simulated.

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Plant2

Facility: Calvert Cliffs 1 & 2**JPM Number:** Plant2**Alternate Path:** No**Task Number:** 204.137**Task Title:**

Apply the watchstander's role as part of the Control Room Team in Normal, Abnormal, Emergency, and ERPIP situations

Task Standard:

This JPM is complete when local control has been established for 11 SWAC and 11 SWAC has been started, after 11 Cavity Cooling Fan Damper has been isolated for fire effects, and 11 SWGR HVAC is started.

Time Critical Task: No**K/A Reference:** 068AA1.21 (3.9/4.1)**Method of Testing:** Simulated-Plant**Validation Time:** 12 minutes**References and Tools Required:**

1. AOP-9A-1, Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire

JPM Setup Instructions:

1. AOP-9A-1, Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire, printed single sided, in a procedure binder

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.**Initial Conditions:**

1. You are performing the duties of the Unit-1 ABO.
2. A severe fire has started in the Control Room.
3. AOP-9A-1, Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire, has been implemented.
4. You have obtained your necessary key ring and equipment at the Safe Shutdown Panel in the Unit-1 45' SWGR Room.
5. You are currently performing steps in the Unit-1 69' West Electrical Penetration Room.
6. You have just notified 1C43 that Channel D WRNI has been isolated from the Control Room per Step IV.BS.

Initiating Cue:

1. You are to commence with AOP-9A-1, Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire, Step IV.BT, Start 11 Saltwater Air Compressor, on page 80.
2. You are to perform all remaining ABO position-specific steps.
3. No other Operators are available to assist.
4. All component actions will be simulated.
5. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of AOP-9A-1.			
	Locates AOP-9A-1, Step IV.BT-START 11 SALTWATER AIR COMPRESSOR	Determines that next step to be performed is IV.BT, to start 11 Saltwater Air Compressor	—	—
CUE	Any attempt to use the Radio is not effective. After Examinee contacts 1C43 on the phone: Load Center 11B is energized per Step BO.			
IV.BT 1	Contact 1C43 to verify Load Center 11B is energized PER Step BO.	Contacts 1C43 by dialing either 3501, 5625, or 3511 on the telephone and verifies that Step BO has been completed	—	—
Comment				
CUE	After demonstrating inserting the key, key is fully inserted.			
IV.BT 2	On north end of MCC 114R, insert key into 11 Saltwater Air Compressor Local/Remote Handswitch, 1-HS-5204A1.	Locates 11 SWAC controls in U-1 69' West Electrical Penetration Room and fully inserts key into 1-HS-5204A1	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Initially, 1-HS-5204A1 is in the fully counter-clockwise/REMOTE position. After HS is manipulated: 1-HS-5204A1 is in the fully clockwise/LOCAL position.			
* IV.BT 3	Place into 11 Saltwater Air Compressor Local/Remote Handswitch to LOCAL.	<u>CRITICAL STEP*</u> *Rotates 1-HS-5204A1 to the fully clockwise/LOCAL position*	—	—
Comment				
CUE	Initially, 1-HS-5204A is in the spring return to center position with the Green light on and the Red light off. While the HS is manipulated: 1-HS-5204A is in the fully clockwise/START position with the Green light off and the Red light on. Once the HS is released: 1-HS-5204A is in the spring return to center position.			
* IV.BT 4	Place 11 Saltwater Air Compressor Local Control Handswitch, 1-HS-5204A to START.	<u>CRITICAL STEP*</u> *Rotates 1-HS-5204A to the fully clockwise/START position and then releases HS*	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
CUE	Any attempt to use the Radio is not effective. After Examinee contacts 1C43 on the phone, acknowledge report.			
IV.BT 5	Notify 1C43 that 11 Saltwater Air Compressor is operating.	Contacts 1C43 by dialing either 3501, 5625, or 3511 on the telephone and informs 1C43 that 11 Saltwater Air Compressor is operating.	—	—
Comment				
CUE	The Unit Supervisor directs you to perform all ABO specific steps in AOP-9A-1.			
IV.BT 6	Perform Step BU.	Determines that next step to be performed is BU, Isolate Fire Effects for 11 Cavity Cooling Fan Damper	—	—
Comment				
IV.BU NOTE	11 Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A is located on breaker 52-11454			
CUE	After demonstrating inserting the key, key is fully inserted.			
IV.BU 1	Insert Key into 11 Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A.	Locates breaker 52-11454 and fully inserts key into 1-HS-5303A	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
CUE	Initially, 1-HS-5303A is in the fully counter-clockwise/CR position.\nAfter HS is manipulated:\n1-HS-5303A is in the fully clockwise/CR ISOL position.			
* IV.BU 2	Place 11 Cavity Cooling Fan Damper Isolation Switch, 1-HS-5303A, to CR ISOL.	<u>CRITICAL STEP*</u> *Rotates 1-HS-5303A to the fully clockwise/CR ISOL position*	—	—
Comment				
CUE	Any attempt to use the Radio is not effective. After Examinee contacts 1C43 on the phone, acknowledge report.			
IV.BU 3	Notify 1C43 to have the RO start 11 Cavity Cooling Fan PER Step CF.	Contacts 1C43 by dialing either 3501, 5625, or 3511 on the telephone and informs 1C43 that the RO can now start the 11 Cavity Cooling Fan PER Step CF	—	—
Comment				
IV.BU 4	GO TO 69' Unit-1 Fan Room to perform Step BV.	Determines that next step to be performed is BV, Restore Switchgear Room Ventilation and proceeds to the 69' Unit-1 Fan Room	—	—
Comment				
Examiner NOTE Steps 1-4 in BV are not required to be demonstrated by the Examinee.				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Once Examinee enters the 69' Unit-1 Fan Room: Steps BV 1-3 have been completed by an extra Equipment Operator. Perform remainder of ABO actions starting at Step IV.BV.5.			
IV.BV NOTE	Equipment to tie the damper is located at 11 SWGR HVAC			
IV.BV 1	Tie open ATMOS DISCH GRAVITY DMPR, 1-HVAC-230	Determines steps 1-3 have been completed by another Equipment Operator based on Cue. Proceeds to step 5.	—	—
Comment				
CUE	Any attempt to use the Radio is not effective. After Examinee contacts 1C43 on the phone: Load Center 11A is energized per Step BN.			
IV.BV 5	Contact 1C43 to verify Load Center 11A is energized PER Step BN.	Contacts 1C43 by dialing either 3501, 5625, or 3511 on the telephone and verifies that Step BN has been completed	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	Initially, 1-HS-5426 is in the fully counter-clockwise/STOP position with the Green light on and the Red light off. After the HS is manipulated: 1-HS-5426 is in the fully clockwise/START position with the Green light off and the Red light on.			
* IV.BV 6	Place 11 Switchgear Room HVAC Unit handswitch, 1-HS-5426, to START	<u>CRITICAL STEP*</u> *Rotates 1-HS-5426 to the fully clockwise/START position*	—	—
Comment				
CUE	Any attempt to use the Radio is not effective. After Examinee contacts 1C43 on the phone, acknowledge report.			
IV.BV 7	Notify 1C43 that 11 Switchgear Room HVAC has been started.	Contacts 1C43 by dialing either 3501, 5625, or 3511 on the telephone and informs 1C43 that 11 Switchgear Room HVAC has been started.	—	—
Comment				
TERMINATING CUE: This JPM is complete when local control has been established for 11 SWAC and 11 SWAC has been started, after 11 Cavity Cooling Fan Damper has been isolated for fire effects, and 11 SWGR HVAC is started. The Examiner is expected to end the JPM.				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Plant2**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-1 ABO.
2. A severe fire has started in the Control Room.
3. AOP-9A-1, Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire, has been implemented.
4. You have obtained your necessary key ring and equipment at the Safe Shutdown Panel in the Unit-1 45' SWGR Room.
5. You are performing steps in the Unit-1 69' West Electrical Penetration Room.
6. You have just notified 1C43 that Channel D WRNI has been isolated from the Control Room per Step IV.BS.

Initiating Cue:

1. You are to commence with AOP-9A-1, Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire, Step IV.BT, Start 11 Saltwater Air Compressor, on page 80.
2. You are to perform all remaining ABO position-specific steps.
3. No other Operators are available to assist.
4. All component actions will be simulated.

Calvert Cliffs Nuclear Power Plant

2018 NRC
Initial Licensed
Operator Exam

JPM-Plant3

Facility: Calvert Cliffs 1 & 2**JPM Number:** Plant3**Alternate Path:** No**Task Number:** 002.018**Task Title:** Place/Remove a 125VDC Battery Charger in/from service**Task Standard:**

This JPM is complete when 21 Battery Charger is started and sharing load on 21 DC Bus with 13 Battery Charger.

Time Critical Task: No**K/A Reference:** 063A3.01 (2.7/3.1)**Method of Testing:** Simulated-Plant**Validation Time:** 11 minutes**References and Tools Required:**

1. OI-26A, 125 Volt Vital DC
2. SA-CA-129-1001, Electrical Safety Task Matrices/PPE Requirements

JPM Setup Instructions:

1. OI-26A, 125 Volt Vital DC, printed single sided.
2. SA-CA-129-1001, Electrical Safety Task Matrices/PPE Requirements, Attachment 1, printed single sided.

Directions to the Examinee:

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

Hand Examinee's Cue Sheet to Examinee at this time.

Initial Conditions:

1. You are performing the duties of the Unit-2 CRO.
2. 21 Battery Charger was removed from service for emergent maintenance.
3. 21 DC Bus has remain energized with 13 Battery Charger in service during the 21 Battery Charger maintenance window. 13 Battery Charger DC OUTPUT amps are currently 110 Amps and steady.
4. All repairs to the 21 Battery Charger have been completed.
5. The Clearance was removed with the following conditions:
 - 480V load center breaker for the 21 Battery Charger, 52-2407, left in the CLOSED position
 - 21 Battery Charger AC INPUT breaker left in the OFF position
 - 21 Battery Charger DC OUTPUT breaker left in the OFF position.
 - 21 BATT CHGR FUSED DISC SW, 95-2102, left in the OFF position
6. PPE requirements were identified at the brief as 100% cotton long-sleeve shirt and pants and safety glasses.
7. You are wearing a 100% cotton long-sleeve shirt and pants.

Initiating Cue:

1. The Unit Supervisor directs you to place 21 Battery Charger in service OI-26A, 125 Volt Vital DC.
2. All component actions will be simulated.
3. Are there any questions? You may begin.

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
TIME START: _____				
CUE	After Examinee reviews Cue Sheet, provide the examinee with a copy of OI-26A.			
	Locates OI-26A Step 6.4, Placing a Battery Charge in Service	Determines that OI section to return 21 Battery Charger to service is OI-26A Step 6.4	—	—
Comment				
6.4 A	Initial Conditions	N/A		
Examiner NOTE It is not intended for the Examinee to locally evaluate 21 DC Bus and 13 Battery Charger status.				
CUE	If the Examinee is evaluating 21 DC Bus and 13 Battery Charger status: 21 DC bus has remain energized with 13 Battery Charger in service during the entire maintenance window.			
6.4 A.1	The DC bus is energized from the Battery and/or the other Battery Charger.	Based on the Cue Sheet, determines that 21 DC bus has remain energized with 13 Battery Charger in service	—	—
Comment				
Examiner NOTE It is not intended for the Examinee to locally verify that the 480V load center feeder breaker for 21 Battery Charger is closed.				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	If the Examinee is evaluating 480V load center feeder breaker status: Power is available to the 21 Battery Charger with 480V load center breaker 52-2407 in the CLOSED position.			
6.4 A.2	The associated 480V load center breaker is closed.	Based on the Cue Sheet, determines that power is available to the 21 Battery Charger with 480V load center breaker 52-2407 in the CLOSED position	—	—
Comment				
CUE	AC INPUT volts, DC OUTPUT amps, and DC OUTPUT volts on Panel 2D05 all read zero.			
6.4 A.3	Indication is available for Battery Charger output voltage and current.	Locates 21 Battery Charger in the U-2 Cable Spreading Room. Evaluates voltage and output indications on Panel 2D05 and determines indications are available for 21 Battery Charger output voltage and current	—	—
Comment				
6.4 B	Procedure	N/A		

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	DC OUTPUT breaker on Panel 2D05 is in the full down/OFF position.			
6.4 B.1	CHECK the Battery Charger DC OUTPUT BREAKER is OFF.	Verifies position of DC OUTPUT breaker on Panel 2D05 is in the full down/OFF position.	—	—
Comment				
CUE	AC INPUT breaker on Panel 2D05 is in the full down/OFF position.			
6.4 B.2	CHECK the Battery Charger AC INPUT CIRCUIT BREAKER is OFF.	Verifies position of AC INPUT breaker on Panel 2D05 is in the full down/OFF position.	—	—
Comment				
CUE	Initially, 95-2102 is in the fully clockwise/down/OFF position. After BATT CHGR FUSED DIS SW is manipulated: 95-2102 is in the fully counter-clockwise/up/ON position.			
* 6.4 B.3	Check the BATT CHGR FUSED DIS SW for the battery charger being placed in service is ON:	<u>CRITICAL STEP*</u> Determines BATT CHGR FUSED DIS SW to be operated is 95-2102. *While wearing Safety Glasses, rotates BATT CHGR FUSED DIS SW 95-2102 on 2D01 counter-clockwise to the fully counter-clockwise/up/ON position*	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	2D01 bus amps read 0 amps and bus voltmeter reads 133 volts.			
6.4 B.4	Check the associated DC bus voltmeter on 1(2)D01 OR 1(2)D02 indicates 125 to 137.5 VDC.	Locates bus voltmeter on 2D01 and determines DC bus volts are within desired range	—	—
Comment				
CUE	Initially, DC OUTPUT breaker on Panel 2D05 is in the full down/OFF position. After the breaker is manipulated: 21 Battery Charger DC OUTPUT breaker on Panel 2D05 is in the full up/ON position.			
* 6.4 B.5	Place the Battery Charger DC OUTPUT BREAKER to ON.	<u>CRITICAL STEP*</u> *While wearing Safety Glasses, places 21 Battery Charger DC OUTPUT breaker on Panel 2D05 to full up/ON position*	—	—
Comment				
CUE	Red light for "REVERSE POLARITY" on Panel 2D05 is dark/not lit.			
6.4 B.6	Check the "REVERSE POLARITY" lamp is NOT lit.	Locates red "REVERSE POLARITY" lamp on Panel 2D05 and determines lamp is not on.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.4 B.7 NOTE	Trouble lights will cycle on and off until the Charger has stabilized on the bus.			
CUE	<p>Initially, AC INPUT breaker on Panel 2D05 is in the full down/OFF position, AC INPUT volts, DC OUTPUT amps, and DC OUTPUT volts on Panel 2D05 all read zero.</p> <p>After the breaker is manipulated:</p> <p>21 Battery Charger AC INPUT breaker on Panel 2D05 is in the full up/ON position</p> <p>DC OUTPUT volts on Panel 2D05 rise to 134 VDC and steadies</p> <p>DC OUPUT amps on Panel 2D05 rise to 10 amps and steadies</p> <p>All red trouble light blink once and then go out/are dark.</p>			
* 6.4 B.7	Place the Battery Charger AC INPUT BREAKER to ON.	<u>CRITICAL STEP*</u> *While wearing Safety Glasses, places 21 Battery Charger AC INPUT breaker on Panel 2D05 to full up/ON position*	—	—
Comment				
6.4 B.8 NOTE	As battery charge assumes load, the amperage indication will rise to some value and stabilize.			
CUE	DC OUTPUT volts on Panel 2D05 rises to 134 VDC and steadies.			
6.4 B.8	Check the Battery Charger voltage is indicating between 125 and 137.5 VDC.	Evaluates DC OUTPUT volts on Panel 2D05 and determines DC OUTPUT volts are within desired range	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
6.4 B.9 NOTE	When the chargers set voltage is reached, the Charger Ammeter will indicate a composite of required bus current and battery float current. This composite current will always be above 0 amps.			
Examiner NOTE When 21 Battery Charger initially assumes load, 13 Battery Charger DC OUTPUT amps will lower from initial 150 amps to 140 amps. The Battery Chargers will not be sharing load properly until the SHARING LOAD RESET is depressed. After the SHARING LOAD RESET is depressed, 13 Battery Charger DC OUTPUT amps will lower from 140 amps to 80 amps while 21 Battery Charger DC OUTPUT amps rise from 10 amps to 70 amps.				
CUE	DC OUTPUT amps on Panel 2D05 read 10 amps and steady. If evaluated, DC OUTPUT amps on Panel 1D07 read 140 amps and steady.			
6.4 B.9	Check the Battery Charger DC Ammeter is indicating greater than 0 amps.	Evaluates DC OUTPUT amps on Panel 2D05 and determines DC OUTPUT amps are within desired range	—	—
Comment				
CUE	No red TROUBLE lights are lit/on.			
6.4 B.10	Check that NO TROUBLE lights are lit.	Evaluates red TROUBLE lights on Panel 2D05 and determines that no TROUBLE lights are on.	—	—
Comment				
6.4 B.11 NOTE	Master and Slave load currents should begin to slowly converge until they are within 50 amps of each other.			

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>
6.4 B.11	IF load sharing with similar style Charger, THEN CHECK the Load Sharing operation:	Determines step is applicable since 13 and 21 Battery Chargers are similar style Chargers.	—	—
Comment				
CUE	21 Battery Charger EQUALIZE TIMER on Panel 2D05 reads zero and 13 Battery Charger EQUALIZE TIMER on Panel 1D07 reads zero.			
6.4 B.11.a	VERIFY that both equalize timers are in the timed out position.	Checks 21 Battery Charger EQUALIZE TIMER on Panel 2D05 and 13 Battery Charger EQUALIZE TIMER on Panel 1D07. Determines both equalize timers are timed out based on both EQUALIZE TIMERS reading zero.	—	—
Comment				

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT
CUE	<p>Initially, yellow UNABLE TO SHARE light is on/lit, 21 Battery Charger DC OUTPUT amps are 10 amps, and 13 Battery Charger DC OUTPUT amps are 140 amps.</p> <p>After depressing the SHARING RESET pushbutton:</p> <p>Yellow UNABLE TO SHARE light is off/not lit.</p> <p>21 Battery Charging DC OUTPUT amps start to rise from 10 to 70 Amps.</p> <p>13 Battery Charger DC OUTPUT amps start to lower from 140 to 80 Amps.</p>			
* 6.4 B.11.b	IF the UNABLE TO SHARE light is lit, THEN PRESS the SHARING RESET pushbutton.	<u>CRITICAL STEP*</u> *Depresses SHARING RESET pushbutton on Panel 2D05*	—	—
Comment				
CUE	Yellow UNABLE TO SHARE light is off/not lit.			
6.4 B.11.c	IF the UABLE TO SHARE light comes on again, THEN CONTACT the Electrical Shop to adjust the Slave Potentiometer so that the Master is carrying approximately 60% of the load current.	Determines step is N/A since UNABLE TO SHARE light does not come on again	—	—
Comment				
<p>TERMINATING CUE: This JPM is complete when 21 Battery Charger is started and sharing load on 21 DC Bus with 13 Battery Charger.</p> <p>The Examinee is expected to end the JPM.</p>				
TIME STOP: _____				

Verification of Completion**Job Performance Measure Number:** Plant3**Examinee:** _____**NRC Examiner:** _____**Date Performed:** _____**Facility Evaluator:** _____**Number of Attempts:** _____**Time to Complete:** _____**Follow up Question(s):**

Examinee Response:

Result: SATISFACTORY _____ UNSATISFACTORY _____**Examiner's Signature and Date:**

EXAMINEE'S CUE SHEET**Initial Conditions:**

1. You are performing the duties of the Unit-2 CRO.
2. 21 Battery Charger was removed from service for emergent maintenance.
3. 21 DC Bus has remain energized with 13 Battery Charger in service during the 21 Battery Charger maintenance window. 13 Battery Charger DC OUTPUT amps are currently 110 Amps and steady.
4. All repairs to the 21 Battery Charger have been completed.
5. The Clearance was removed with the following conditions:
 - 480V load center breaker for the 21 Battery Charger, 52-2407, left in the CLOSED position
 - 21 Battery Charger AC INPUT breaker left in the OFF position
 - 21 Battery Charger DC OUTPUT breaker left in the OFF position.
 - 21 BATT CHGR FUSED DISC SW, 95-2102, left in the OFF position
6. PPE requirements were identified at the brief as 100% cotton long-sleeve shirt and pants and safety glasses.
7. You are wearing a 100% cotton long-sleeve shirt and pants.

Initiating Cue:

1. The Unit Supervisor directs you to place 21 Battery Charger in service OI-26A, 125 Volt Vital DC.
2. All component actions will be simulated.

Appendix D	Scenario Outline	Form ES-D-1	
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Examiners: _____</p> <p>_____</p> <p>_____</p> </div> <div style="width: 45%;"> <p>Operators: _____</p> <p>_____</p> <p>_____</p> </div> </div> <p>Initial Conditions: Unit-1 is at 100% power, MOC. Unit-2 is at 100% power.</p> <p>Turnover: 11 AFW Pump, RRS-Y, and 0C DG OOS. The crew is instructed to prepare to shift EHC Pumps per OI-9C.</p> <p>Critical Tasks</p> <ol style="list-style-type: none"> 1. Deenergize CEDM bus to trip the reactor within 1 minute of PROT CH TRIP alarm. 2. Restores power to 11 4KV Bus prior to 11 and 22 DC bus voltages going below 106V. 			
Event #	Malfunction #	Event Type*	Event Description
1		N-BOP/SRO	Shift EHC Pumps
2	P1C07_F-16	C-ATC/SRO	IX D/P High/Lower Charging and Letdown
3	P1C03_C-09	C-BOP/SRO	11C FWH Level High
4	tg024_01	C-BOP/SRO R-ATC T-SRO	MTCV-1 Partially Shuts/AOP-7F/AOP-7E
5	tg024_01 rps005	C-ATC/SRO T-SRO	EHC Leak/Loss of Load/ATWS/EOP-0
6	rcs027_01	C-ATC	PORV-402 Leakage
7	swyd002 dg002_02 4KV001_04	M-ALL	LOOP/SBO/EOP-7
8	152-1703	C-BOP	1A DG Output Breaker Failure to Auto Close
<p>* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (T)ech Spec</p>			

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

Scenario Overview

Initial Conditions:

Unit-1 at 100% power, MOC

Unit-2 at 100% power

Equipment OOS: 11 AFW Pump, RRS-Y and 0C DG OOS

Abnormal Conditions: Maximizing purification due to high sulfates

Instructions for shift: Shift EHC Pumps due to high vibrations on 11 EHC Pump

Event 1

The crew will start 12 EHC Pump and then secure 11 EHC pump per OI-9C due to high vibrations identified by Condition Monitoring.

Event 2

The crew will receive a CVCS Purification IX D/P high alarm on 1C07. The IX's will be immediately bypassed. Chemistry will request that Charging and letdown be lowered and the IX be placed back in service until another Purification IX can be loaded. The crew will lower Charging and Letdown to one Charging Pump and restore purification flow per OI-2A.

Event 3

11C FWH Level will drift high due to a faulty Level Controller and level will challenge Turbine Trip values. The crew will respond using the 1C03 Alarm Manual and manually open the High Level Dump CV to prevent a Turbine Trip and isolate air to the control valve.

Event 4

A Main Turbine Control Valve (MTCV) will partially fail shut, causing a loss of load. Temperature will rise and exceed DNB Tech Spec 3.4.1 limits. The crew will take immediate actions and lower power per AOP-7F to restore RCS temperature to program. The crew will also implement AOP-7E for the Turbine Valve malfunction and adjust the TBV controller to minimize further transients caused by the partially open MTCV going further shut.

Event 5

A large EHC leak will develop causing two of the MTCVs to rapidly shut. RCS temperature will exceed DNB Tech Spec 3.4.1 limits and PZR level will exceed Tech Spec 3.4.9 limits. The loss of load will result in a high RCS Pressure condition reaching trip criteria. RPS will not automatically trip the reactor. The crew will need to recognize manual trip failure and implement EOP-0. The crew will perform the Critical Task of deenergizing the CEDMs in order to trip the reactor

Event 6

A PORV that lifts due to the high RCS pressure condition will remain partially open, resulting in a RCS leak. The crew will note the lowering RCS pressure trend in EOP-0 and manually isolate the leaking PORV by shutting the PORV Block MOV. RCS temperature will also be controlling lower than normal due to the TBV Controller setting established in AOP-7E, requiring the Controller setpoint to be restored to normal to restore temperature.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

Event 7

Once RCS temperature and pressure are restoring, a Loss of Offsite power will occur. The 1A DG will fail to start and the 14 4Kv Bus will fault, resulting in a Station Blackout. The crew will establish RCS heat removal by initiating AFW and directing local control of the ADVs. The crew will implement EOP-7 and verify the MSIVs are shut to protect the condenser. RCP bleedoff will be isolated to minimize RCS inventory loss. The Main Feedwater System will be secured. The electrical system will be aligned for restoration and the 1A DG will be returned to service. The crew will direct local restart of the DG.

Event 8

When the 1A DG is started, the output breaker will not auto close. The crew will need to manually close the breaker to complete the Critical Task of restoring power to the 11 4KV bus.

If plant conditions degrade or the crew is unsure of the diagnosis it is acceptable for them to enter EOP-8 instead of EOP-7. If EOP-8 is entered, all critical tasks still apply unless individual tasks are invalidated by the exam team.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

Scenario Setup Instructions

1. Reset to IC-34.
2. Place simulator in RUN and advance charts.
3. Place simulator in FREEZE.
4. Enter Triggers:
 - a. CEA_ROD_POSITION(1) < 5 (CEA 01 on bottom (1Y10 required)) on event 6
 - b. P1C03_1HS1451_SWOPEN (11C FWH Dump Opened) on event 18
 - c. P1C07_1HS2520_SWBYPASS (CVCS IX Bypassed) on event 19
5. Enter Malfunctions:
 - a. afv001_01
 - b. dg002_01
 - c. tg024_01 to 40.0 on event 4
 - d. rps005 on event 5
 - e. rps006 on event 5
 - f. esfa008_01 on event 5
 - g. esfa008_02 on event 5
 - h. tg024_01 to 0 on event 5
 - i. tg004_02 after 15 on event 5
 - j. rcs027_01 after 120 to 10.0 on event 6
 - k. swyd002 on event 7
 - l. dg002_02 on event 7
 - m. 4kv001_04 on event 7
 - n. dg001_02 on event 16
6. Enter Remote Functions:
 - a. 1-MS-3988 after 5 to 1.0

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

7. Enter Panel Overrides:
 - a. P1C04_1STP3986_LTRED to off
 - b. P1C04_1STP3986_LTWHIT to off
 - c. P1C04_1HS3986_LTWHIT to off
 - d. P1C07_F16_LTON to On on event 2
 - e. P1C07_F16_LTON after 20 to Off on event 19
 - f. P1C03_1LI1450_MT to 5.50000 on event 3
 - g. P1C03_C09_LTON to On on event 3
 - h. P1C03_11CFWHTR_LTBRI to On on event 3
 - i. P1C03_1LI1450_MT from 5.50000 to -5 in 60 on event 18
 - j. P1C03_C09_LTON to Off on event 18
 - k. P1C03_11CFWHTR_LTBRI to Off on event 18
 - l. P1C18A_KF1703 to TRIP on event 7
8. Administrative:
 - a. Upper Right Mk 6 screen set to lube-hyd oil on 1C02 (with EHC pressures visible)
 - b. Place an "INFO" tag on 11 AFW Pump indication.
 - c. Place Protected Equipment tags on 12 and 13 AFW Pumps.
 - d. Place an off normal tag on RRS-Y.
 - e. Raise Charging and Letdown with 11 and 12 Charging Pumps in service per OI-2A, Step 6.3.
 - f. Start 12 CR HVAC.
 - g. Secure 11 CR HVAC.
 - h. Place 0C DG Output breaker in Pull To Lock.
 - i. Place "INFO" tags on 0C DG Output Breaker, 0C Emergency Start, and 0C Slow Start pushbuttons.
 - j. Ensure correct magnetic plaques are in place.
9. Independently verify correct completion of the following:
 - a. Event Triggers correctly entered
 - b. Malfunctions correctly entered
 - c. Remote Functions correctly entered
 - d. Panel Overrides correctly entered
 - e. Administrative actions correctly performed

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

10. Place simulator in RUN.
11. Ensure schedule files are in RUN.
12. Ensure Trigger files are in RUN.
13. Reset/Acknowledge panel and PPC alarms.
14. Ensure all PPC screens selected to Main Menu, Alarms, or SPDS Operating Summary page.
15. Select "Clock" and ensure "Horn On" for annunciators.
16. Brief the Crew:

1. Present plant conditions:	Both Units are at 100% power Unit-1 is in MOC
2. Power history:	Unit-1 has been at 100% for last 3 months
3. Equipment out of service:	RRS-Y 0C DG 11 AFW Pump
4. Abnormal conditions:	2 Charging Pumps in service due to high RCS sulfates 12 Charging Pump has developed a 0.03 GPM packing leak. When charging can be shifted/lowered, secure 12 Charging Pump.
5. Surveillances due:	None
6. Instructions for shift:	Shift to 12 EHC Pump due to higher vibrations on 11 EHC Pump and through Filter 1

17. Allow crew 3-5 minutes to acclimate themselves with their positions.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

18. Instructions for the Booth Operator:

- a. Event 1: When directed by Lead Examiner, call into Control Room as TBO and report "I'm on station and ready for shift of EHC pumps."
- b. Event 2: Activate IX D/P High/Lower Charging and Letdown when directed by Lead Examiner.
- c. Event 3: Activate 11C FWH Level High when directed by Lead Examiner.
- d. Event 4: Activate MTCV-1 Partially Shuts/AOP-7F/AOP-7E when directed by Lead Examiner.
- e. Event 5: Activate EHC Leak/Loss of Load/ATWS/EOP-0 when directed by Lead Examiner
- f. Event 6: No actions in booth necessary to activate PORV-402 Leakage.
- g. Event 7: Activate EHC Leak/Loss of Load/ATWS/EOP-0 when directed by Lead Examiner.
- h. Event 8: When directed by Lead Examiner, call into Control Room as WEC and report "1A DG issues have been repaired. The 1A DG is available.

Responses to Crew Requests

If a request and response is not listed, delay the response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

Allow 2-3 minutes to perform requests from or to give reports to the Control Room unless otherwise specified.

REQUEST	RESPONSE
Event 1- Shift EHC Pumps	
1. Place Filter 1 in service.	Acknowledge request. <ul style="list-style-type: none"> After 2 minutes, report Filter 1 is in service.
2. WEC informed of EHC pump shift.	Acknowledge request. No further actions are required.
Event 2- IX D/P High/Lower Charging and Letdown.	
1. WEC informed of high IX D/P.	Acknowledge request. No further actions are required.
2. Investigate high IX D/P.	Acknowledge request. <ul style="list-style-type: none"> Immediately report "Local D/P is 50 PSID. I had a note on my turnover that IX D/P was approaching the high limit and Chemistry may ask for lower purification flow if that happens."
3. Chemistry informed of high IX D/P.	Acknowledge information. <ul style="list-style-type: none"> Immediately report "RCS chemistry is still elevated due to sulfates. We need to minimize the time without purification. We would like you to lower Charging and Letdown and then place the IXs back in service until another IX bed can be prepared for purification."
4. Rad Con Shift Supervisor informed of change in CVCS lineup.	Acknowledge request. No further actions are required.
5. Chemistry informed of change in CVCS lineup.	Acknowledge request. No further actions are required.
6. Flowrate on Process Rad Monitor.	Acknowledge request. <ul style="list-style-type: none"> After 1 minute report "Process Rad Monitor flow rate is 1 GPM."

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

REQUEST	RESPONSE
Event 3-11C FWH Level High	
1. WEC informed of 11C FWH level issue.	Acknowledge request. No further actions are required.
2. Investigate 11C FWH level and control systems.	Acknowledge request. <ul style="list-style-type: none"> After 2 minutes, report "I hear a small air leak inside LC-1450 controller." If the High Level dump valve is open, report "The NLCV, HDV-1450-CV, is shut."
3. Isolate NLCV Air Isolation and bleed off the air.	Acknowledge request. <ul style="list-style-type: none"> After 3 minutes, report "The air isolation is shut and air has been bled off the 11C FWH NLCV."
4. Place 11C FWH in service.	Acknowledge request. No further actions are required.
Event 4- MTCV-1 Partially Shuts/AOP-7F/AOP-7E	
1. WEC informed of MTCV issue.	Acknowledge request. No further actions are required.
2. Notify Main Turbine System Engineer and support.	Acknowledge request. No further actions are required.
3. Local indications at MTCV-1.	Acknowledge request. <ul style="list-style-type: none"> After 2 minutes, report "MTCV-1 is open ~ 40% locally. There is a small EHC leak on the actuator and we have adequate spill prevention controls to capture the EHC fluid."

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

REQUEST	RESPONSE
Event 5- EHC Leak/Loss of Load/ATWS/EOP-0	
1. Local status of MTCVs.	<p>Acknowledge request.</p> <ul style="list-style-type: none"> After 2 minutes report "All MTCVs and MTSVs are shut. EHC leakage has stopped, but it looks like the leak on MTCV-1 got larger and a leak started on MTCV-2 as well. All EHC fluid is being adequately contained."
Event 6- PORV-402 Leakage	
1. WEC informed of PORV issue.	Acknowledge request. No further actions are required.
Event 7- LOOP/SBO/EOP-7	
1. Manually operate ADVs.	<p>Acknowledge request.</p> <ul style="list-style-type: none"> After 1 minutes, position ADV (1-MS-3938-CV and 1-MS-3939-CV using Remotes with a 1 minute ramp. After an additional minute, report ADVs are positioned as requested.
2. Verify SWGR ventilation in service per OI-22H.	<p>Acknowledge request.</p> <ul style="list-style-type: none"> After 2 minutes report "Neither 11 or 12 SWGR HVAC are in service due to loss of power effects."
3. Status of 4KV Buses.	<p>Acknowledge request.</p> <ul style="list-style-type: none"> After 2 minutes report "14 4KV bus flags indicate 14 4KV bus is faulted. 11 4KV bus is not faulted."
4. Status of 1B DG.	<p>Acknowledge request.</p> <ul style="list-style-type: none"> After 2 minutes report "1B DG is running without auxiliaries."
5. Status of 1A DG.	<p>Acknowledge request.</p> <ul style="list-style-type: none"> After 2 minutes report "1A DG has multiple alarms. Generator Lockout Relay is one of them. I'll call the WEC and inform him of the condition so the Electricians can evaluate the indications. After an additional minute report "The 1A DG output breaker is open with no abnormal indications at the breaker locally and no faults on 11 4KV bus."

Appendix D		Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant		Scenario #1	OP-Test # 2018
REQUEST		RESPONSE	
6. Locally trip the 1B DG.		Acknowledge request. <ul style="list-style-type: none"> After 2 minutes, initiate Director Event 16 and report "1B DG has been tripped locally and is secured." 	
7. Status of 0C DG maintenance.		Acknowledge request. <ul style="list-style-type: none"> Immediately report "0C DG will be OOS until at least the next shift." 	
8. Status of electrical grid/Offsite power.		Acknowledge request. <ul style="list-style-type: none"> After 2 minutes report "Large scale grid issue. BGE and SMECO are all unavailable." 	
9. Shut MS Upstream Drain MOVs locally.		Acknowledge request. No further actions are required.	
10. Shut FW-4516 and FW-4517-MOVs locally.		Acknowledge request. No further actions are required.	
11. Control AFW flow locally.		Acknowledge request. No further actions are required.	
12. Shut CD-410 and CD-411.		Acknowledge request. No further actions are required.	
13. Locally open SITE POWER FDR BREAKER 252-1106.		Acknowledge request. <ul style="list-style-type: none"> Immediately initiate Director Event 15. After another 2 minutes report "Site Power breaker 252-1106 is open." 	

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #1	OP-Test # 2018

REQUEST	RESPONSE
Event 8- 1A DG Output Breaker Failure to Auto Close	
1. 1A DG Prelube status.	<p>Acknowledge request.</p> <ul style="list-style-type: none"> • Immediately report “The SM has evaluated time since loss of power and determined prelube can be waived due to emergency condition.”
2. Start the 1A DG locally per OI-21A.	<p>Acknowledge request.</p> <ul style="list-style-type: none"> • Remove malfunction dg002_02. • Place a camera on 1A DG Output breaker on 1C18B. • After another 2 minutes, initiate Director Event 8 and report “1A DG start indications are normal. The output breaker is not shut, but there are no abnormal indications at the breaker and 17/11 4KV bus is not faulted.” • When the 1A DG output breaker is taken to close, immediately remove override P1C18A_KF1703.

[illegible]

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #1	OP-Test # 2018
Event #2		IX D/P High Lower Charging and Letdown.	C-ATC/SRO
Time	Position	Applicant's Actions or Behavior	
	ATC	Notes PURIF IX DIFF PRESS HI alarms on 1C07. Informs the SRO.	
	ATC	Refers to 1C07 Alarm Manual and determines CVCS IX must be bypassed.	
	ATC	Places IX BYPASS, CVC-520-CV, in BYP.	
	ATC/BOP SRO	Notifies Chemistry of condition.	
	SRO	Directs ATC to lower Charging and Letdown to 1 Charging Pump in service to restore purification.	
	ATC	Refers to OI-2A Step 6.4 to lower Charging and Letdown.	
	ATC/BOP SRO	Notifies RadCon and Chemistry that Charging and Letdown will be lowered to one pump in service.	
	ATC	Places 13 Charging Pump HS in PULL TO LOCK.	
	ATC	Places BACKUP CHARGING PUMP SELECT switch to 12&13.	
	ATC	Stops 12 Charging Pump.	
	ATC	Lowers BIAS on LETDOWN THROTTLE VL CONTROLER, HIC-110, to approximately (-)11	
	ATC	Places 13 Charging Pump HS in AUTO	
	ATC	Places IX BYPASS, CVC-520-CV, in AUTO.	
Examiner notes:			
Event concludes when FW LVL HI alarms on 1C03.			
NOTE TO EXAMINER			
Cue Booth Operator to insert next malfunction, 11C FWH Level High, when desired.			

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #1	OP-Test # 2018
Event #3		11C FWH Level High	C-BOP/SRO
Time	Position	Applicant's Actions or Behavior	
	BOP	Notes FW LVL HI alarm on 1C03. Informs the SRO.	
	BOP	Refers to 1C03 Alarm Manual and determines 11C FWH level is high.	
	BOP	Opens 11C HW HI LVL Dump HS-1451	
	BOP	Directs TBO to investigate 11C FWH level and control systems.	
	SRO	Notifies the WEC of plant conditions. Requests support.	
	BOP	Determines 11C FWH level has lowered with high level dump open and FWH does not need to be isolated.	
	BOP	Directs TBO to isolate and bleed off air to the 11C FWH NLCV.	
	BOP	Determines 11C FWH level has lowered with high level dump open and FWH does not need to be isolated.	
Examiner notes:			
Event concludes when MTCV-1 Partially Shuts.			
NOTE TO EXAMINER			
Cue Booth Operator to insert next malfunction, MTCV-1 Partially Shuts/AOP-7F/AOP-7E, when desired			

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #1	OP-Test # 2018
Event #4		MTCV-1 Partially Shuts AOP-7F/AOP-7E	C-BOP/SRO R-ATC T-SRO
Time	Position	Applicant's Actions or Behavior	
	ATC	Notes rising RCS temperature. Informs the SRO.	
	BOP	Determines MTCV-1 has shut to ~40%. Informs the SRO.	
	SRO	Implements AOP-7F, Loss of Load and distributes Trip Criteria.	
	SRO	Directs the ATC to take the Immediate Action to Insert CEAs or borate to control power.	
	ATC	Notes that RCS temperature has exceeded 548 ⁰ F. Informs the SRO.	
	SRO	Evaluates TS 3.4.1 RCS Tcold exceeded 548 ⁰ F. Determines TS 3.4.1 Condition A applies while RCS is > 548 ⁰ F.	
	ATC	Lowers Reactor power until RCS Tcold is < 548 ⁰ F: <ul style="list-style-type: none"> • Inserts CEAs as necessary while maintaining the CEAs above the Transient Insertion Limit (> 102" withdrawn). • Borates as necessary <ul style="list-style-type: none"> ○ Opens CVC-514-MOV. ○ Runs a Boric Acid Pump for desired amount ○ Shuts CVC-514-MOV. 	
		Event #5 continues on next page.	
Examiner notes:			

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #1	OP-Test # 2018

Event #4		MTCV-1 Partially Shuts AOP-7F/AOP-7E	C-BOP/SRO R-ATC T-SRO
Time	Position	Applicant's Actions or Behavior	
	ATC	Verifies RCS pressure is returning to 2250 PSIA and PZR level is returning to 216".	
	SRO	Implements AOP-7E, Main Turbine Malfunction Step XIV for Turbine Valve Failures.	
	SRO	Notifies the WEC of plant conditions. Requests notification of the Main Turbine System Engineer and support.	
	BOP	Adjusts TURBINE BYPASS VLV CONTR, PIC-4056, setpoint just above Main Steam header pressure but not lower than 830 PSIA.	
Examiner notes:			
Event concludes when MTCV-1 Fully Shuts. If SRO's understanding of the Technical Specification applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.			
NOTE TO EXAMINER			
Cue Booth Operator to insert next malfunction, EHC Leak/Loss of Load/ATWS/EOP-0, when desired.			

[illegible]

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #1	OP-Test # 2018
Event #5		EHC Leak/Loss of Load/ATWS/EOP-0	C-ATC/SRO T-SRO
Time	Position	Applicant's Actions or Behavior	
	ATC	Critical Task Deenergizes CEDMs within a minute of PROT CH TRIP alarm: <ul style="list-style-type: none"> • Opens 12A 480V BUS FDR, 52-1201 • Opens 13A 480V BUS FDR, 52-1301 	
	BOP/ATC	Determines that Reactor is tripped.	
	ATC	Reenergizes 12A and 13A 480V Buses: <ul style="list-style-type: none"> • Shuts 12A 480V BUS FDR, 52-1201. • Shuts 13A 480V BUS FDR, 52-1301. 	
	ATC	Determines Reactivity Safety Function is met. Informs the SRO that Reactivity is complete.	
	BOP	Determines MSR Source MOVs, MS-4025/MS-4026, are going shut. Reports to the SRO monitoring Turbine Trip for MSR 2 nd Stage Source MOVs going shut.	
Examiner notes:			
Event concludes when ATC begins Pressure and Inventory Control Safety Function. If SRO's understanding of the Technical Specification applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.			
NOTE TO EXAMINER Event #6, PORV-402 Leakage, is automatically inserted when the Reactor is tripped. The Booth Operator is not required to initiate the malfunction.			

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #1	OP-Test # 2018
Event #6		PORV-402 Leakage	C-ATC
Time	Position	Applicant's Actions or Behavior	
	BOP	Initially determines Vital Auxiliaries is met. Informs the SRO that Vital Auxiliaries is complete.	
	BOP	Informs SRO that Turbine Trip is complete after MSR Source MOVs, MS-4025-MOV and MS-4026-MOV, are shut.	
	BOP	Returns TURBINE BYPASS VLV CONTR, PIC-4056, setpoint to 900 PSIA or shuts MSIVs if SG pressure determined to be < 800 PSIA.	
	ATC	Determines RCS pressure is lowering or Quench Tank parameters are rising. Informs the SRO taking alternate actions for lowering pressure.	
	ATC	Notes elevated PRESSURIZER RV FLOW MONITOR indications for both PORV-402 and RV-200.	
	ATC	Shuts PORV 402 BLOCK, RC-403-MOV.	
	ATC	Determines: <ul style="list-style-type: none"> • RCS pressure is rising • Quench Tank parameters are no longer rising • PRESSURIZER RV FLOW MONITOR indications return to zero 	
	ATC	Determines Pressure and Inventory Control Safety Function is met. Informs the SRO that Pressure and Inventory Control is complete.	
Examiner notes:			
Event concludes when Control Room lighting on Unit-1 is lost.			
NOTE TO EXAMINER			
Cue Booth Operator to insert next malfunction, LOOP/SBO/EOP-7, when desired.			

[illegible]

[illegible]

SHIFT TURNOVER INFORMATION SHEET [B0459]

DATE: Today

ON-COMING SHIFT: DAYS

UNIT STATUS

PARAMETER	UNIT 1		UNIT 2	
MODE OF OPERATION	1		1	
REACTOR POWER (%)	100		100	
GENERATION NET (MWe)	885		912	
Net RCS LEAKAGE (gpm)	0.03		0.0	
RCS BORON (ppm)	756		1609	
UNIT RISK (HIGHEST FOR DAY)	CDF: LOW	LERF: LOW	CDF: LOW	LERF: LOW
UNIT RISK COLOR	GREEN		GREEN	
BULK POWER NOTIFICATIONS	Normal			

NON-ROUTINE SURVEILLANCE REQUIREMENTS and ACTION STATEMENTS [B0125]

List action statements expiring during the oncoming shift, non-routine, conditional, & mode dependent surveillances (e.g. chemistry samples, operability verifications, ETPs, <7 day STPs)

OD's/RECO's/FA's and REF's requested by OPS

Unit	Description	Date Requested	Type	Resp.	ECD

Surveillances coming Due (Info Only-Follow the Schedule)

Unit 1		Unit 2	
DATE	STP	DATE	STP

OOS SR EQUIPMENT

OOS NSR EQUIPMENT

UNIT 1 & COMMON	UNIT 2	UNIT 1 & COMMON	UNIT 2
11 AFW Pump		RRS-Y	
		0C DG	

SHIFT TURNOVER INFORMATION SHEET (00450)

GENERAL INFORMATION					
UNIT 1					
				11 HEADER	12 HEADER
Max Header Pressure 7/11/12 21:04M	SW PUMP	11		33 psig (yesterday)	
		12			32 psig (yesterday)
		13		32.5 psig (yesterday)	30 psig (yesterday)

LONG TERM NOTES

1. None

SHORT TERM NOTES

1. Vibrations on 11 EHC Pump are elevated. Component Monitoring requests shift to 12 EHC Pump immediately after taking the watch. When shifting, place Filter 1 in service on 12 EHC Pump.
2. RCS sulfates are elevated and Chemistry requests maximum purification. Chemistry evaluating IX D/P trend and plans to reload another IX as a purification bed.
3. 12 Charging Pump packing leakage developed on last shift and is primary source of net RCS leakage. If Charging Pumps need swapped, ensure 12 Charging Pump is secured.

Appendix D**Scenario Outline****Form ES-D-1****Calvert Cliffs Nuclear Power Plant****Scenario #2****OP-Test # 2018**

Examiners:

Operators:

Initial Conditions: U-1 is at 100% power, MOC. U-2 is at 100%.

Turnover: Condensate Demin Bypass MOV, RRS-Y, and 0C DG OOS. The crew is instructed to complete STP O-70-1 on 11 Pene Room Ventilation Fan.

Critical Tasks

1. Establishes AFW flow to at least one S/G at ≥ 150 GPM prior to S/G levels going below (-) 350 inches.
2. Initiates an RCS Cooldown without exceeding 100°F in one hour. (Applicable only if OTCC is not initiated)
3. Commences OTCC when both S/G levels are below (-) 350 inches or TCOLD rises uncontrollably 5 °F or greater. (Applicable only if SG levels lower below (-)350 inches)

Event #	Malfunction #	Event Type*	Event Description
1		N-BOP/SRO	11 Pene Room Fan Test/STP O-70-1
2	P1C18_F12	C-ATC	VCT Pressure High
3	cd009_02 cd001	C-BOP/SRO R-ATC	Condenser Tube leak/AOP-10
4	cd009_02	C-ALL	2 nd Condenser Tube Leak/EOP-0/EOP-1
5	rcs026_02	I-ATC T-SRO	LT-100Y Fails High
6	afw005 afw001_01	C-BOP/SRO T-SRO	13 AFW Pump Trip/Steam Driven AFW Steam Leak
7	afw005 afw001_01	M-ALL	Loss of All Feedwater/EOP-3

* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (T)ech Spec

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #2	OP-Test # 2018

Scenario Overview

Initial Conditions:

Unit-1 at 100% power, MOC

Unit-2 at 100% power

Equipment OOS: Condensate Demin Bypass MOV, RRS-Y, and 0C DG OOS

Abnormal Conditions: Summer conditions

Instructions for shift: Complete surveillance testing on 11 Penetration Ventilation Fan

Event 1

The crew will commence monthly surveillance testing on 11 Penetration Room Ventilation Fan by completing STP O-70. During the test, 23 AFW Pump will be taken OOS due to an emergent issue.

Event 2

VCT pressure will go high due to a leaking H2 fill valve and the crew will receive an alarm on 1C07. The crew will direct that the leaking valve be isolated and vent the VCT to the Waste Gas System to its normal control band per OI-2A.

Event 3

A condenser tube leak will occur in the 11A Waterbox. The crew will note rising secondary chemistry parameters and implement AOP-10. Due to the Demin Bypass MOV being OOS, the 11A Waterbox will need to be removed from service. This will cause a lowering condenser vacuum due to the summer conditions and the crew will need to reduce power in parallel to stabilize vacuum.

Event 4

Prior to the crew completing the 11A Waterbox shutdown, a second, larger condenser tube in 11A Waterbox will begin to leak, causing secondary chemistry parameters to exceed AOP-10 Reactor trip criteria. The crew will manually trip the Reactor and then secure the Main Feed system to limit impact on SG chemistry. The crew will exit EOP-0 and implement EOP-1 with all Safety Functions met.

Event 5

As Pressurizer level returns to normal in EOP-1, LT-110Y will fail high. The crew will respond using the 1C06 Alarm Manual and shift level controllers. Post-Accident instrumentation Tech Spec 3.3.10 will be evaluated for applicability.

Event 6

AFW will be lost sequentially depending on the AFW pump in service when EOP-1 is implemented. The motor driven AFW train will be disabled by a motor overload. The steam driven train will be disabled by a steam leak in the AFW Pump Room. The LCO for Tech Spec 3.7.3 will no longer be met. The crew will restore AFW initially with the backup AFW system when the first AFW Pump is lost.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #2	OP-Test # 2018

Event 7

The last remaining Unit-1 AFW Pump will be lost and the crew will identify the loss of all feedwater. EOP-1 Safety Functions will no longer be met and the crew will exit EOP-1 and implement EOP-3. The crew will trip all RCPs and commence RCS boration. A rapid cooldown will be started and the crew will demonstrate the Critical Task of maintaining the cooldown less than 100⁰F in one hour. Once the cooldown is started, 23 AFW Pump will become available. The crew will restore SG levels by using the Unit-2 motor driven AFW Pump to restore feedwater on Unit-1. Once AFW is restored, the crew will slow the cooldown rate and stabilize the plant in Mode 3 to satisfy the Critical Task of maintaining RCS cooldown rates within Tech Spec limits. If SG levels lower < -350", then the crew will perform the potential critical task of initiating OTCC.

If plant conditions degrade or the crew is unsure of the diagnosis it is acceptable for them to enter EOP-8 instead of EOP-3. If EOP-8 is entered, all critical tasks still apply unless individual tasks are invalidated by the exam team.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #2	OP-Test # 2018

Scenario Setup Instructions

1. Reset to IC-34.
2. Place simulator in RUN and advance charts.
3. Place simulator in FREEZE.
4. Enter Triggers:
 - a. CEA on bottom (1Y10 required) to Event 6
 - b. CEA on bottom (1Y10 required) to Event 8
5. Enter Malfunctions:
 - a. dg002_01
 - b. afw004_01
 - c. afw004_02
 - d. cd001 from 2.0 to 0.10000 in 300 on event 19
 - e. rcs026_02 to 1_HIGH on event 5
 - f. afw005 on event 17
6. Enter Remote Functions:
 - a. EP001 to 90.0
 - b. EP002 to 70.0
 - c. 0-N2-250 to 0.1 on event 2
 - d. 0-N2-250 to 0.02 on event 16
 - e. 0-N2-250 to 0.0 on event 15
 - f. 1-MS-3986 after 10 to 0 in 30 on event 18
 - g. 1-MS-3988 after 10 to 0 in 30 on event 18

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #2	OP-Test # 2018

7. Enter Panel Overrides:

- a. P1C03_1HS4439 to OPEN
- b. P1C03_1MOV4439_LTRED to Off
- c. P1C03_1HS4439_LTWHT to Off
- d. P1C17_L14_LTON to Off on event 2
- e. P1C33_T13_LTON to Off on event 2
- f. P1C03_C52_LTON to On on event 3
- g. P1C03_C21_LTON after 30 to On on event 3
- h. P1C17_L11_LTON after 120 to On on event 3
- i. P1C10_J20_LTON to On on event 18
- j. P1C04_1PI3987_MT from 1100.0 to 0 in 60 on event 18
- k. P1C04_1PI3989_MT from 1100.0 to 0 in 60 on event 18
- l. P1C04_W05_LTON to Off on event 18
- m. P1C04_1STP3986_LTRED to Off on event 18
- n. P1C04_1STP3986_LTWHT to On on event 18
- o. P1C04_1HS4550 to OPEN on event 14
- p. 2-HS-4540 to START on event 13

8. Administrative:

- a. Place an "INFO" tag on Condensate Demin Bypass MOV.
- b. Place an off normal tag on RRS-Y.
- c. Verify PRZR LVL CH SEL switch, 1-HS-110, is selected to 110Y.
- d. Think Reactivity tag moved to 1-HS-110.
- e. Raise VCT pressure to ~40 PSIG per OI-2A, using remote N2-250.
- f. Place 0C DG Output breaker in Pull To Lock.
- g. Place "INFO" tags on 0C DG Output Breaker, 0C Emergency Start, and 0C Slow Start pushbuttons.
- h. STP O-70-1 marked with Step 6.4.1 complete and SM/SRO approval signatures.
- i. Reset/Acknowledge panel and PPC alarms.
- j. Cycle 11 Pene Room Filter Damper HS-5285 shut and then open to get alarms on PPC.
- k. Verify adequate copies of AOP-10.
- l. Ensure correct magnetic plaques are in place.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #2	OP-Test # 2018

9. Independently verify correct completion of the following:
 - a. Event Triggers correctly entered
 - b. Malfunctions correctly entered
 - c. Remote Functions correctly entered
 - d. Panel Overrides correctly entered
 - e. Administrative actions correctly performed
10. Place simulator in RUN.
11. Ensure schedule files are in RUN.
12. Ensure Trigger files are in RUN.
13. Ensure all PPC screens selected to Main Menu, Alarms, or SPDS Operating Summary page.
14. Select "Clock" and ensure "Horn On" for annunciators.
15. Brief the Crew:

1. Present plant conditions:	Both Units are at 100% power Unit-1 is in MOC
2. Power history:	Unit-1 has been at 100% for last 3 months
3. Equipment out of service:	RRS-Y 0C DG Condensate Demin Bypass MOV
4. Abnormal conditions:	Summer conditions
5. Surveillances due:	STP O-70-1 due today.
6. Instructions for shift:	Complete STP O-70-1. First step to perform is 6.4, which will test the 11 Penetration Room Vent Fan.

16. Allow crew 3-5 minutes to acclimate themselves with their positions.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #2	OP-Test # 2018

17. Instructions for the Booth Operator:

- a. Event 1: When directed by Lead Examiner, call into Control Room as ABO and report "I'm on station and ready for STP O-70."
- b. Event 2: Activate VCT Pressure High when directed by the Lead Examiner. When VCT pressure alarms, immediately initiate Director Event 16.
- c. Event 3: Activate Condenser Tube leak/AOP-10 when directed by the Lead Examiner.
- d. Event 4: When directed by Lead Examiner, call into Control Room as Chemistry and report "Both Condensate and Feedwater Sodium are 220 PPB and stable."
- e. Event 5: Activate LT-100Y Fails High when directed by Lead Examiner.
- f. Event 6: When directed by Lead Examiner, activate trip of running AFW Pump:
 - 1) If 13 AFW Pump is running, initiate Director Event 17.
 - 2) If 12 AFW Pump is running, initiate Director Event 18 Trip/Steam Driven AFW Steam Leak
- g. Event 7: When directed by Lead Examiner, activate trip of remaining AFW Pump:
 - 1) If 13 AFW Pump is running, initiate Director Event 17.
 - 2) If 12 AFW Pump is running, initiate Director Event 18 Trip/Steam Driven AFW Steam Leak.
 - 3) Call into the Control Room with the following reports once EOP-3 is implemented and the RCPs are secured:
 - a. If SG level is $> (-)170$ " report "23 AFW Pump return to service is imminent."
 - b. If SG level is $< (-) 170$ " report "23 AFW Pump has been returned to service and is available."

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario #2	OP-Test # 2018

Responses to Crew Requests

If a request and response is not listed, delay the response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

Allow 2-3 minutes to perform requests from or to give reports to the Control Room unless otherwise specified.

REQUEST	RESPONSE
Event 1-11 Pene Room Fan Test/STP O-70-1	
1. WEC informed of issue/status.	Acknowledge request. No further actions required.
2. Locally verify that 11 Ventilation Fan discharge damper opens.	Acknowledge request. <ul style="list-style-type: none"> After 1 minute report "1-HVAC-5283 is open locally."
3. 11 Penetration Room HEPA and Charcoal Filter D/Ps.	Acknowledge request. <ul style="list-style-type: none"> After 1 minute report "1-PDI-5285 D/P is 0.2 inches water and 1-PDIS-5285 D/P is 0.4 inches water." After 1 more minute, call the Unit Supervisor and report "23 AFW Pump has been taken OOS due to an emergent breaker issue."
4. Secure Zinc Addition Skid.	Acknowledge request. No further actions required.
Event 2- VCT Pressure High	
1. WEC informed of issue/status.	Acknowledge request. No further actions required.
2. Investigate VCT conditions locally.	Acknowledge request. After 1 minute, report "There's a Condition report that 1-CVC-190 leaks by when shut and I found 1-CVC-189, which should be shut, cracked open. I can hear H2 gas flow right now. Want me to shut 1-CVC-189, which should be shut right now?"
3. Shut 1-CVC-189.	Acknowledge request and immediately modify After 1 minute, report "1-CVC-189 is shut and I do not hear any additional gas flow."

Appendix D		Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018
REQUEST		RESPONSE	
4. Chemistry informed/VCT pressure band.		Acknowledge request and immediately report “35-45 PSIG is current VCT pressure band.”	
Event 3- Condenser Tube leak/AOP-10			
1. WEC informed of issue/status.		Acknowledge request. No further actions required.	
2. Evaluate 1T21 alarm.		Acknowledge request. <ul style="list-style-type: none">After 1 minute remove P1C03_C52_LTON override and report “1T21 alarm due to high Feedwater sodium. Feedwater sodium is 5 ppb and rising.	
3. Evaluate 1C57 alarm/Condensate and Feedwater Sodium values.		Acknowledge request. <ul style="list-style-type: none">After 1 minute remove P1C03_C21_LTON override and report “1C57 alarm due to multiple alarms. Most critical alarm is Condensate Sodium high, which is now reading 11 PPB and rising.”After 2 more minutes, report “Condensate Sodium is now 20 PPB and rising. The leak is in 11A waterbox.”After 5 more minutes report “Condensate and Feedwater sodium is 140 PPB and rising.”	
4. Action Level status.		Acknowledge request. Immediately report “We are in Action Level 1.”	
5. Evaluate 1C90 alarm.		Acknowledge request. No further actions required.	
6. Evaluate 1T22 alarm.		Acknowledge request. <ul style="list-style-type: none">After 1 minute reset alarm using remote 1T22-Alarm Reset and report “1T22 alarm due to start of standby CAR.”	
7. Shut 1-CD-233.		Acknowledge request. After 2 minutes shut 1-CD-233 using remote and report “1-CD-233 is shut.”	
8. Shut 1-CAR-101.		Acknowledge request. <ul style="list-style-type: none">After 2 minutes shut 1-CAR-101 using remote and report “1-CAR-101 is shut.”	

Appendix D		Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018
9. Shut 11A Waterbox Inlet MOV.	Acknowledge request. <ul style="list-style-type: none">• After 2 minutes, place 1-CW-5225-HS in CLOSED using remote.• After 1 more minute report “11A Inlet Waterbox MOV-5225 is shut.”		
10. Secure Chem Add injection.	Acknowledge request. No further actions required.		
11. Status of Condensate Demin Bypass MOV.	Acknowledge request. Immediately report “The Condensate Demins cannot be placed in service at this time and it may be at least another 30 minutes before the maintenance is completed on the Demin Bypass MOV.”		
12. Place Condensate Demins in service.	Acknowledge request. No further actions required.		
13. Maximize SG Blowdown.	Acknowledge request. No further actions required.		
Event 4-2 nd Condenser Tube Leak/EOP-0/EOP-1			
1. Condensate and Feedwater Sodium values.	Acknowledge request. Immediately report Condensate and Feedwater sodium are 220 PPB and steady. Leak has stopped now that 11A waterbox is secured.”		
Event 5- LT-100Y Fails High			
1. WEC informed of issue/status.	Acknowledge request. No further actions required.		
Event 6-13 AFW Pump Trip/Steam Driven AFW Steam Leak			
1. Evaluate 13 AFW Pump status.	Acknowledge request. <ul style="list-style-type: none">• If originally running in EOP-1, wait 1 minute and then report “13 AFW Pump breaker has tripped on overload.”		
2. Evaluate 11 AFW Pump status.	Acknowledge request. <ul style="list-style-type: none">• If originally running in EOP-1, wait 1 minute and then report “AFW Room Watertight door is hot to the touch and it sounds like I hear steam flow in the room.”		
3. AFW Pump Room Steam Leak status.	Acknowledge request. <ul style="list-style-type: none">• If MS-4070/4071 are shut, wait 1 minute ad report “AFW Room Watertight door is still hot to the touch		

Appendix D		Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018
		but I don't hear any steam flow anymore."	
4. WEC informed of issue/status.		Acknowledge request. No further actions required.	
Event 7- Loss of All Feedwater/EOP-3			
1. WEC informed of issue/status.		Acknowledge request. No further actions required.	
2. Shut U-2 Motor Train AFW Block valves.		Acknowledge request. <ul style="list-style-type: none">After 1 minute, report "Unit-2 Motor Train AFW Block valves are shut."	
3. Open 2-AFW-4550-CV		Acknowledge request. <ul style="list-style-type: none">After 1 minute, initiate Director Event 14 and after valve indicates full open on 1C04 report "2-AFW-4550 is open."	
4. 23 AFW Pump.		Acknowledge request. <ul style="list-style-type: none">If SG level is > (-)170" report "23 AFW Pump return to service is imminent."If SG level is < (-) 170" report "23 AFW Pump has been returned to service and is available."	
5. Start 23 AFW Pump.		Acknowledge request. <ul style="list-style-type: none">After 1 minute, initiate Director Event 14 and after valve indicates full open on 1C04 report "2-AFW-4550 is open."	
6. Maintain 12 CST inventory.		Acknowledge request. No further actions required.	

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018
Event #1		11 Pene Room Fan Test/STP O-70-1	N-BOP
Time	Position	Applicant's Actions or Behavior	
	BOP	Refers to STP O-70 Step 6.4 to perform 11 PENT RM VENT FAN Test.	
	BOP	Places 12 FILT ISOL DMPRS handswitch, HS-5287, in CLOSE.	
	BOP	Verifies HVAC-5287-PO and HVAC-5288-PO indicate SHUT on the PPC.	
	BOP	Starts 11 PENET RM VENT FAN by placing HS-5283 to START.	
	BOP	Direct Equipment Operator to verify 11 VENT FAN DISCH DAMPER is open locally.	
	BOP	Direct Equipment Operator to obtain D/P across 11 PENET RM HEPA and Charcoal Filters. <ul style="list-style-type: none"> • Documents 1-PDI-5285 as 0.2" H2O in STP • Documents 1-PDIS-5285 as 0.4" H2O in STP 	
Examiner notes:			
Event concludes when VCT PRESS alarms on 1C07.			
NOTE TO EXAMINER			
Cue Booth Operator to insert next malfunction, VCT Pressure High, when desired.			

[illegible]

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018
Event #3		Condenser Tube leak/AOP-10	C-BOP/SRO, R-ATC
Time	Position	Applicant's Actions or Behavior	
	BOP	Notes 11 TURB PLANT SMPL SYS 1T21 alarm on 1C03. Informs the SRO.	
	BOP	Directs Equipment Operator to evaluate 1T21 alarm status locally.	
	BOP	Notes COND DEMIN SYS 1C57 alarm on 1C03. Informs the SRO.	
	BOP	Directs Chemistry to evaluate 1C57 alarm status locally.	
	SRO	Implements AOP-10, Abnormal Secondary Chemistry Conditions, for high Condensate and Feedwater sodium. Distributes trip criteria associated with Condensate and Feedwater sodium.	
	BOP	Directs Equipment Operator to shut COND HI LVL DUMP DISCH valve, 1-CD-233.	
	ATC	Performs a rapid downpower per OP-3: <ul style="list-style-type: none"> • Opens CVC-514-MOV. • Starts a second Charging Pump. • Runs a Boric Acid Pump for 30 seconds. • Shuts CVC-514-MOV. • Opens CVC-504-MOV. • Shuts CVC-501-MOV. • Inserts CEAs as necessary while maintaining the CEAs above the Transient Insertion Limit (87.75".) • Lowers Turbine Load to maintain Tcold within 2°F of program. • Energizes all Pressurizer Backup Heaters. • Adjusts the setpoint on the selected Pressurizer Pressure Controllers to maintain Pressurizer pressure at 2250 PSIA. 	
		Event #3 continues on next page	
Examiner notes:			

[illegible]

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018
Event #4		2nd Condenser Tube Leak/EOP-0/EOP-1	C-ALL
Time	Position	Applicant's Actions or Behavior	
	BOP/SRO	Determines trip criteria has been exceeded for Condensate and Feedwater sodium.	
	SRO	Directs ATC to trip Unit-1.	
	ATC	Trips Unit-1 Reactor.	
	SRO	Implements EOP-0.	
	ATC	Determines Reactivity Safety Function is met. Informs the SRO that Reactivity is complete.	
	ATC	May secure from the rapid downpower per OP-3: <ul style="list-style-type: none"> • Opens CVC-501-MOV • Shuts CVC-504-MOV 	
	SRO	After Reactivity is reported or the Reactor is tripped, directs BOP to take following actions per AOP-10: <ul style="list-style-type: none"> • Initiate AFW • Trip both SGFPs 	
	BOP	Starts AFW by either: <ul style="list-style-type: none"> • Starts 13 AFW Pump or • Starts 11 AFW Pump by opening MS-4070/4070A-CV and MS-4071/4071A-CV 	
	BOP	Trips 11 and 12 SGFPs.	
		Event #4 continues on next page	
Examiner notes:			

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018
Event #4		2nd Condenser Tube Leak/EOP-0/EOP-1	C-ALL
Time	Position	Applicant's Actions or Behavior	
	BOP	Determines MSR Source MOVs, MS-4025/MS-4026, are going shut. Reports to the SRO monitoring Turbine Trip for MSR 2 nd Stage Source MOVs going shut.	
	BOP	Initially determines Vital Auxiliaries is met. Informs the SRO that Vital Auxiliaries is complete.	
	ATC	Determines Pressure and Inventory Control Safety Function is met. Informs the SRO that Pressure and Inventory Control is complete.	
	BOP	Informs SRO that Turbine Trip is complete after MSR Source MOVs, MS-4025-MOV and MS-4026-MOV, are shut.	
	BOP	May monitor Core and RCS Heat Removal Safety Function for SG level trends.	
	BOP	Determines Core and RCS Heat Removal Safety Function is met. Informs the SRO that Core and RCS Heat Removal is complete.	
	ATC/BOP	Determines Containment Environment Safety Function is met. Informs the SRO that Containment Environment is complete.	
	ATC/BOP	Determines Radiation Levels External to Containment Safety Function is met. Informs the SRO that Radiation Levels External to Containment is complete.	
	SRO	Evaluates the EOP-0 flowchart and recommends the implementation of EOP-1.	
	SRO	Directs implementation of EOP-1.	
Examiner notes:			
Event concludes when Restore Normal Pressurizer Level is assigned in EOP-1.			
NOTE TO EXAMINER			
Cue Booth Operator to insert next malfunction, LT-100Y Fails High, when desired.			

Event #5		LT-100Y Fails High	I-ATC, T-SRO
Time	Position	Applicant's Actions or Behavior	
	ATC	Notes PZR CH Y LVL alarm on 1C06.	
	ATC	Determines LT-110Y or LIC-110Y has failed high. Informs the SRO.	
	ATC	Shifts PZR LVL CH SEL switch, HS-110, to 110X.	
	ATC	Shifts PZR HTR LO LVL CUT-OFF SEL switch, HS-100-3, to X.	
	ATC	Determines PZR level is trending to 160".	
	SRO	Evaluates Tech Spec 3.3.10. Determines 3.3.10 Condition A applies.	
	BOP	Secures the Main Feedwater system: <ul style="list-style-type: none">• Places all Condensate Booster Pumps in PULL TO LOCK.• Places one Condensate Pump in PULL TO LOCK.• Places both Heater Drain Pumps in PULL TO LOCK.• Shuts FW-4516-MOV and FW-4517-MOV.	
Examiner notes:			
Event concludes when first AFW Pump trips.			
NOTE TO EXAMINER Cue Booth Operator to insert next malfunction, 13 AFW Pump Trip/Steam Driven AFW Steam Leak, when desired.			

Examiner notes:

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018
Event #6		13 AFW Pump Trip Steam Driven AFW Steam Leak	C-BOP, T-SRO
Time	Position	Applicant's Actions or Behavior	
	BOP	Starts an AFW pump: <ul style="list-style-type: none"> Starts 13 AFW Pump or Starts 11 AFW Pump by opening MS-4070/4070A-CV and MS-4071/4071A-CV 	
	BOP	Critical Task Establishes AFW flow to at least one S/G at ≥ 150 GPM prior to S/G levels going below (-) 350 inches.	
	BOP/SRO	May isolate steam leak in AFW Pump Room: <ul style="list-style-type: none"> Shuts MS-4070/4070A-CV and MS-4071/4071A-CV 	
	SRO	Evaluates Tech Spec 3.7.3. <ul style="list-style-type: none"> Determines 3.7.3 Condition A applies if 11 AFW tripped Determines 3.7.3 Condition B applies if 13 AFW tripped May determine 3.7.3 Condition C applies if steam is isolated to the Steam Driven AFW Pumps 	
Examiner notes:			
Event concludes when remaining AFW pump trips. If SRO's understanding of the Technical Specification applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.			
NOTE TO EXAMINER Cue Booth Operator to insert next malfunction, Loss of All Feedwater/EOP-3, when desired.			

[illegible]

[illegible]

[illegible]

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario #2	OP-Test # 2018

Event #7		Loss of All Feedwater/EOP-3	M-ALL
Time	Position	Applicant's Actions or Behavior	
	ATC	Critical Task (N/A if SG levels both remain > -350") Commences OTCC when both S/G levels are below (-) 350 inches or Tcold rises uncontrollably 5 °F or greater. (Must be initiated prior to CET temperature reaching 560°F.)	
	ATC	When PZR PRESS BLOCK PERMITTED alarms are received on 1C09, blocks SIAS using HS-5 and HS-6. (N/A if SG level does not lower to < (-)350")	
	ATC	When PZR pressure is <1270 PSIA, verifies HPSI flow meets requirements of EOP Attachment 10. (N/A if SG level does not lower to < (-)350")	
	ATC	Determines EOP Attachment 17 minimum equipment is available to ensure successful OTCC. (N/A if SG level does not lower to < (-)350")	
The scenario will terminate when the AFW is restored with 23 AFW Pump with flow at ~150 GPM.			
<p>After scenario ends ask SRO for ERPIP call. The correct Emergency Action Level declaration for this scenario is:</p> <ol style="list-style-type: none"> 1. UNUSUAL EVENT, per HU3.1, in Event 6/7, due to asphyxiant in amounts that have or could adversely affect NORMAL PLANT OPERATION. 2. ALERT, per FA1.1, in Event 7, due to OTCC flow established. (N/A if OTCC not initiated) 			

SHIFT TURNOVER INFORMATION SHEET [B0459]

DATE: **Today**

ON-COMING SHIFT: **DAYS**

UNIT STATUS

PARAMETER	UNIT 1		UNIT 2	
MODE OF OPERATION	1		1	
REACTOR POWER (%)	100		100	
GENERATION NET (MWe)	885		912	
Net RCS LEAKAGE (gpm)	0.01		0.0	
RCS BORON (ppm)	756		1609	
UNIT RISK (HIGHEST FOR DAY)	CDF: LOW	LERF: LOW	CDF: LOW	LERF: LOW
UNIT RISK COLOR	GREEN		GREEN	
BULK POWER NOTIFICATIONS	Normal			

NON-ROUTINE SURVEILLANCE REQUIREMENTS and ACTION STATEMENTS [B0125]

List action statements expiring during the oncoming shift, non-routine, conditional, & mode dependent surveillances (e.g. chemistry samples, operability verifications, ETPs, <7 day STPs)

--	--	--

OD's/RECO's/FA's and REF's requested by OPS

Unit	Description	Date Requested	Type	Resp.	ECD

Surveillances coming Due (Info Only-Follow the Schedule)

Unit 1		Unit 2	
DATE	STP	DATE	STP
Today	STP O-70-1		

OOS SR EQUIPMENT

OOS NSR EQUIPMENT

UNIT 1 & COMMON	UNIT 2	UNIT 1 & COMMON	UNIT 2
		RRS-Y	
		0C DG	
		Cond Demin Bypass MOV	

SHIFT TURNOVER INFORMATION SHEET IR04501

GENERAL INFORMATION					
UNIT 1					
				11 HEADER	12 HEADER
Max Header Pressure P11-12-21-0-M	SW PUMP	11		33 psig (yesterday)	
		12			32 psig (yesterday)
		13		32.5 psig (yesterday)	30 psig (yesterday)

LONG TERM NOTES

1. None

SHORT TERM NOTES

1. Component Monitoring is staying over to monitor 11 Penetration Room Fan performance. Perform Step 6.4 first in STP O-70-1 and preferably immediately after taking the watch.
2. Chemistry changed VCT pressure band to 35-45 PSIG.

Examiners:

Operators:

Initial Conditions: U-1 is at 93% power, EOC. U-2 s at 100%.

Turnover: Condensate Demin Bypass MOV, RRS-Y, and 0C DG OOS. Outage preparations in progress, including MSSV testing. The crew is instructed to start the IRUs per OI-5B.

Critical Tasks

1. Shuts 11 and 12 MSIVs due to SGIS failure
2. Trips 11A & 12B or 11B & 12A RCPs when RCS pressure decreases to <1725 PSIA prior to RCS pressure reaching 1300 PSIA
3. Identifies 11 S/G as the faulted S/G and isolates 11 S/G

Event #	Malfunction #	Event Type*	Event Description
1		N-BOP/SRO	Start IRUs/OI-5B
2	rcs016	C-ATC T-SRO	PZR Spray CV-100E Fails Open
3	ms016_05	C-BOP/SRO T-SRO	SG MSSV Lifts/AOP-7K
4	ms016_05	C-SRO R-ATC	SG MSSV Reseats/AOP-7F
5	cvcs007	C-ALL	RCS Leak into Letdown Heat Exchanger/AOP-2A
6	1HS4025	C-BOP/SRO	Turbine Trip/MSR Source MOVs Fail to Close/
7	rcs002	C-ATC/SRO	LOCA
8	esfa012 ms016_05	M-ALL	SG MSSV Lifts/EOP-0/EOP-8
9	1HS3636/3637	C-ATC	HPSI MOV Fails Open
* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (T)ech Spec			

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario # 3	OP-Test # 2018

Scenario Overview

Initial Conditions:

Unit-1 at 93% power, EOC

Unit-2 at 100% power

Equipment OOS: Condensate Demin Bypass MOV, RRS-Y, and 0C DG OOS

Abnormal Conditions: MSSV testing in progress

Instructions for shift: Start all 3 IRUs for outage preparations

Event 1

The crew will be requested to start the IRUs to support the Outage schedule. The crew will start all 3 IRUs using OI-5B.

Event 2

PZR Spray CV-100E fails open causing pressure to lower below DNB. LCO for Tech Spec 3.4.1 will no longer be met. The crew will respond using the 1C06 Alarm Manual. The crew will shift PZR Spray controller output to only CV-100F and return RCS pressure to normal.

Event 3

A MSSV on 11 SG will fully lift during testing. The crew will implement AOP-7K and lower Turbine load to restore Tcold to program. Tech Spec 3.7.1 for the inoperable MSSV will be evaluated.

Event 4

The MSSV will reseal abruptly reseal, resulting in a Loss of Load. The crew will implement AOP-7F and lower power to restore Tcold to program.

Event 5

An RCS leak will start in the Letdown Heat Exchanger which will exceed the capacity of a charging pump. The crew will implement AOP-2A and isolate the leak by securing letdown. Charging Pumps will need to be manually cycled after letdown is secured to prevent reaching PZR level TS limit.

Event 6

The Main Turbine will trip due to a Generator fault and EOP-0 will be implemented. The MSR 2nd Stage Source MOVs won't automatically close and the crew will need to manually close the Panel Loader CVs to prevent an uncontrolled cooldown.

Event 7

A 300 GPM LOCA into containment will start one minute after the trip. The crew will restart all Charging Pumps due to lowering PZR level. Due to rising Containment pressure and temperature, the crew will start the standby Containment Air Cooler and align Emergency Outlet SRW to all of the Containment Air Coolers.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario # 3	OP-Test # 2018

Event 8

The inoperable MSSV will again lift, resulting in an uncontrolled RCS cooldown and rapid lowering of RCS pressure. The crew will need to perform the Critical Task to shut the MSIVs due to a SGIS failure. Once the MSIVs are shut, the PRA Significant Task to align long-term AFW will be performed by starting either the motor or steam-driven AFW system. The crew will perform the Critical Task of securing 2 RCPs due to lowering RCS pressure. EOP-8 will be implemented due to two events occurring, the excess steam demand event and the LOCA. The crew will verify Safety Injection flow and lower RCS pressure to reduce the RCS leakrate and lower subcooling using PIC-4. HR-2 will be used to perform the Critical Task to isolate 11 SG. Once the 11 SG level empties, the crew will need to establish 12 SG as the heat sink to prevent the RCS from heating up.

Event 9

As Pressurizer Level returns, the crew will throttle HPSI flow. One of the HPSI MOVs will fail open and the crew will need to alter the Safety Injection lineup to control Pressurizer Level.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario # 3	OP-Test # 2018

Scenario Setup Instructions

1. Reset to IC-36.
2. Place simulator in RUN and advance charts.
3. Place simulator in FREEZE.
4. Enter Triggers:
 - a. CEA_ROD_POSITION(1) < 5 (CEA 01 on bottom (1Y10 required)) on Event 7
 - b. CEA_ROD_POSITION(1) < 5 (CEA 01 on bottom (1Y10 required)) on Event 8
 - c. PRES_J1_P < 1725 (PZR Press goes below 1725 PSIA) on Event 9
5. Enter Malfunctions:
 - a. esfa012
 - b. dg002_01
 - c. rcs016 on event 2
 - d. ms016_05 on event 3
 - e. cvcs007 to 45.0 on event 5
 - f. tg001 after 10 on event 6
 - g. rcs002 after 60 to 300.0 on event 7
 - h. ms016_05 after 300 on event 8
6. Enter Remote Functions:
 - a. 1-MS-4025-MOV to OPEN on event 6
 - b. 1-MS-4026-MOV to OPEN on event 6
 - c. 1-MS-4021_PO to 0 on event 19
 - d. 1-MS-4024_PO to 0 on event 19
 - e. 1-CC-166 to 0 on event 20

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario # 3	OP-Test # 2018

7. Enter Panel Overrides:

- a. P1C03_1HS4439 to OPEN
- b. P1C03_1MOV4439_LTRED to Off
- c. P1C03_1HS4439_LTWHIT to Off
- d. P1C05_D44_LTON to Off
- e. P1C02_1MOV4025_LTGRE to Off on event 6
- f. P1C02_1MOV4025_LTRED to On on event 6
- g. P1C02_1MOV4026_LTGRE to Off on event 6
- h. P1C02_1MOV4026_LTRED to On on event 6
- i. P1C01_A54_LTON after 5 to On on event 6
- j. P1C07_X58_LTON to Off on event 9
- k. P1C07_X59_LTON to Off on event 9
- l. P1C08_G03_LTON to Off on event 9
- m. P1C09_1HS3636 after 30 to PLTORD on event 9
- n. P1C09_1HS3637 after 30 to PLTORD on event 9

8. Administrative:

- a. Raise Charging and Letdown with 11 and 12 Charging Pumps in service per OI-2A, Step 6.3.
- b. Equalize PZR boron per OP-3.
- c. Lower power to 93% using CEAs and boration. Group 5 CEAs should be ~115" when stable.
- d. Adjust Turbine Load to ensure Tcold on program.
- e. Place an off normal tag on RRS-Y.
- f. Place an "INFO" tag on Condensate Demin Bypass Valve.
- g. Place 0C DG Output breaker in Pull To Lock.
- h. Place "INFO" tags on 0C DG Output Breaker, 0C Emergency Start, and 0C Slow Start pushbuttons.
- i. Prepare a sticky to indicate U-1 MAIN STM PIPING RM 315 is in alarm on 1C24. Do not initially place the sticky on the panel.
- j. Ensure Simulator speaker volume is adjusted correctly.
- k. Ensure correct magnetic plaques are in place.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario # 3	OP-Test # 2018

9. Independently verify correct completion of the following:
 - a. Event Triggers correctly entered
 - b. Malfunctions correctly entered
 - c. Remote Functions correctly entered
 - d. Panel Overrides correctly entered
 - e. Administrative actions correctly performed
10. Place simulator in RUN.
11. Ensure schedule files are in RUN.
12. Ensure Trigger files are in RUN.
13. Ensure all PPC screens selected to Main Menu, Alarms, or SPDS Operating Summary page.
14. Select "Clock" and ensure "Horn On" for annunciators.
15. Brief the Crew:

1. Present plant conditions:	Both Units are at 100% power Unit-1 is at EOC
2. Power history:	Unit-1 was lowered to 93% to perform MSSV testing
3. Equipment out of service:	RRS-Y 0C DG Condensate Demin Bypass MOV
4. Abnormal conditions:	MSSV testing in progress
5. Surveillances due:	None
6. Instructions for shift:	Maintain power at 93% for MSSV testing Start all 3 IRUs for outage preparations

16. Allow crew 3-5 minutes to acclimate themselves with their positions.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario # 3	OP-Test # 2018

17. Instructions for the Booth Operator:

- a. Event 1: When directed by Lead Examiner, call into Control Room as WEC and state "Outage schedule has us starting the 11-13 IRUs as soon as we take the shift."
- b. Event 2: Activate PZR Spray CV-100E Fails Open when directed by the Lead Examiner. Remove malfunction rcs016 when the ATC has shifted PRZR SPRAY VLV SEL HS-100-8 to 100F and only after RCS pressure is < 2200 PSIA. Place a sticky note on the Fire Panel indicating U-1 MAIN STM PIPING RM 315.
- c. Event 3: Activate SG MSSV Lifts/AOP-7K when directed by the Lead Examiner.
- d. Event 4: Remove malfunction ms016_05 to activate SG MSSV Reseats/AOP-7F when directed by the Lead Examiner.
- e. Event 5: Activate RCS Leak into Letdown Heat Exchanger/AOP-2A when directed by the Lead Examiner.
- f. Event 6: Activate Turbine Trip/MSR Source MOVs Fail to Close when directed by the Lead Examiner.
- g. Event 7: LOCA is automatically inserted one minute after the trip. No Booth Operator actions are required.
- h. Event 8: SG MSSV Lifts/EOP-0/EOP-8 is automatically inserted five minutes after the trip. After MSIVs are closed and 11 SG pressure is < 670 PSIA, remove malfunction esfa012.
- i. Event 9: HPSI MOV Fails Open Failure is automatically inserted after RCS pressure lowers below 1725 PSIA. The intent of the malfunction is for only one HPSI Header MOV to fail open. However, the failure is inserted on both SI-636 and SI-637-MOVs since the Operator plans to throttle HPSI are initially unknown. Once the Operator has determined one of the MOVs is failed open, the override on the opposite MOV should be removed.
 - 1) If 11 HPSI is secured and then SI-636-MOV is discovered failed open, the Booth Operator should remove the override on SI-637-MOV.
 - 2) If 13 HPSI is secured and then SI-637-MOV is discovered failed open, the Booth Operator should remove the override on SI-636-MOV. This will allow the Operator to successfully throttle HPSI.

Appendix D	Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant	Scenario # 3	OP-Test # 2018

RESPONSES TO CREW REQUESTS

If a request and response is not listed, delay the response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

Allow 2-3 minutes to perform requests from or to give reports to the Control Room unless otherwise specified.

REQUEST	RESPONSE
Event 1-Start IRUS/OI-5B	
1. WEC informed of issue/status.	Acknowledge request. No further actions required.
2. Painting status in containment.	<ul style="list-style-type: none"> Acknowledge request and immediately report "There have been no Containment entries yet in support of the pre-outage work."
Event 2- PZR Spray CV-100E Fails Open	
1. WEC informed of issue/status.	Acknowledge request. No further actions required.
Event 3- SG MSSV Lifts/AOP-7K	
1. WEC informed of issue/status.	Acknowledge request. No further actions required.
2. Status of MSSV testing.	Acknowledge request. <ul style="list-style-type: none"> After 2 minutes, report "The MSSV being tested on 11 SG has gone full open. We are determining how to gag the Safety shut."
3. Suspend all MSSV testing.	Acknowledge request. No further actions required.
4. Unit-1 Main Steam Pene Room Fire Alarm.	Acknowledge request. <ul style="list-style-type: none"> After 2 minutes, report "There is no fire in the MSIV room. It appears that the MSSV lifting has caused the humidity in the room to rise and activate the alarm."

Appendix D		Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant		Scenario # 3	OP-Test # 2018
REQUEST		RESPONSE	
Event 4- SG MSSV Reseats/AOP-7F			
1. WEC informed of issue/status.		Acknowledge request. No further actions required.	
2. Status of MSSV.		Acknowledge request and immediately report “The 11 SG MSSV went shut on its own. We were not attempting to gag the valve.”	
3. Any leaking SG safeties on the Aux Building Roof.		Acknowledge request. • After 2 minutes, report “There are no leaking SG Safeties on the Aux Building Roof.”	
4. Suspend all MSSV testing.		Acknowledge request. No further actions required.	
Event 5- RCS Leak into Letdown Heat Exchanger/AOP-2A			
1. WEC informed of issue/status.		Acknowledge request. No further actions required.	
2. RadCon or Chemistry informed of leak.		Acknowledge request. No further actions required.	
3. Sample SGs per CP-436.		Acknowledge request. • After 10 minutes, report “There is no activity in either SG.”	
4. Indication of leak in Aux Building.		Acknowledge request. • After 5 minutes, report “There is no indication of an active RCS leak anywhere in the Aux Building.”	
5. Shut 1-CC-166.		Acknowledge request. • After 2 minutes, initiate Director Event 20 and report “1-CC-166 is shut.”	

Appendix D		Scenario Outline		Form ES-D-1	
Calvert Cliffs Nuclear Power Plant		Scenario # 3		OP-Test # 2018	
REQUEST		RESPONSE			
Event 6- Turbine Trip/MSR Source MOVs Fail to Close					
1. WEC informed of issue/status.		Acknowledge request. No further actions required.			
2. Verify MSR 2 nd Stage Bypass Control Valve panel loaders in manual with a 0% output.		<ul style="list-style-type: none">Acknowledge request.After 2 minutes, initiate Director Event 19 and report "The panel loaders are in manual with a 0% output."			
Event 8-SG MSSV Lifts/EOP-0/EOP-8					
1. Status of MSSV.		Acknowledge request and immediately report "The 11 SG MSSV went open again."			
2. Any leaking SG safeties on the Aux Building Roof.		<ul style="list-style-type: none">Acknowledge request.After 2 minutes, report "There is one 11 SG Safety lifting on the Aux Building Roof."			
1. Override annunciators.		<ul style="list-style-type: none">Acknowledge request.After 1 minutes, override desired annunciator to OFF using OVERRIDES and report desired annunciator card has been pulled.			
2. Sample SGs per CP-436.		<ul style="list-style-type: none">Acknowledge request.After 10 minutes, report "There is no activity in either SG."			
3. Place H2 monitors in service.		Acknowledge request. No further actions required.			
4. Align 11 ADV control to 1C43, in manual, with a 0% output.		<ul style="list-style-type: none">Acknowledge request.After 2 minutes, initiate Director Event 18 and report "11 ADV control has been shifted to 1C43, in manual, with a 0% output."			
5. Evaluate Safety Valves on Aux Building roof.		<ul style="list-style-type: none">Acknowledge request.After 2 minutes:If 11 SG pressure is < 50 PSIA, then report "There are no leaking Safety Valves on the roof."IF 11 SG pressure is > 50 PSIA, then report "There is one 11 SG Safety leaking on the Aux Building Roof."			

Appendix D		Scenario Outline	Form ES-D-1
Calvert Cliffs Nuclear Power Plant		Scenario # 3	OP-Test # 2018
REQUEST		RESPONSE	
6. Evaluate Safety Valves on Aux Building roof.		Acknowledge request. <ul style="list-style-type: none">• After 4 minutes, report there are no leaking Safety Valves on the roof.	
Event 9- SG MSSV Lifts/SGIS Failure/EOP-0/EOP-8			
1. HPSI MOV-636/637 local indications.		Acknowledge request. <ul style="list-style-type: none">• After 2 minutes, report “The breaker for the MOV is closed and is indicating the MOV is open.”• After 2 more minutes, report “RadCon says it will be another 15 minutes before they will support entry into the Penetration Rooms to evaluate local MOV indications.”	

Examiner notes:

Event concludes when MSSV lifts. If SRO's understanding of the Technical Specification applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.

NOTE TO EXAMINER

Cue Booth Operator to insert next malfunction. SG MSSV Lifts/AOP-7K, when desired

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario # 3	OP-Test # 2018
Event #3		SG MSSV Lifts/AOP-7K	C-BOP/SRO, T-SRO
Time	Position	Applicant's Actions or Behavior	
	ATC/BOP	Notes increased sound associated with MSSV lifting. Informs the SRO.	
	ATC	Notes RCS temperature lowering. Informs the SRO.	
	SRO	Implements AOP-7K. Distributes trip criteria associated with lowering temperature.	
	SRO	Directs BOP to adjust Turbine Load to restore Tcold to program.	
	ATC	Monitors reactor power. <ul style="list-style-type: none"> • Inserts CEAs as necessary to control power while maintaining CEAs above the Transient Insertion Limit (87.75".) • Borates as necessary to control power by opening CVC-514-MOV and starting a Boric Acid Pump. 	
	BOP	Lowers Turbine Load to restore Tcold to program.	
	SRO	Notifies the WEC of plant conditions. Requests support.	
	ATC/BOP	Notes U-1 MAIN STM PIPING RM 315 fire alarm on 1C24B.	
	ATC/BOP	Dispatches Equipment Operator to evaluate U-1 MAIN STM PIPING RM 315 fire alarm.	
	SRO	Evaluates Tech Spec 3.7.1. Determines LCO 3.7.1 Condition A applies.	
Examiner notes:			
Event concludes when MSSV reseats. If SRO's understanding of the Technical Specification applicability is not clearly observable, follow-up questioning may be required upon completion of the scenario.			
NOTE TO EXAMINER			
Cue Booth Operator to insert next malfunction, SG MSSV Reseats/AOP-7F, when desired.			

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario # 3	OP-Test # 2018

Event #4		SG MSSV Reseats/AOP-7F	C-SRO, R-ATC
Time	Position	Applicant's Actions or Behavior	
	ATC/BOP	Notes reduced sound associated with MSSV reseating. Informs the SRO.	
	ATC	Notes RCS temperature rising. Informs the SRO.	
	SRO	Implements AOP-7F.	
	SRO	Directs ATC to lower Reactor Power to restore Tcold to program.	
	ATC	Lowers Reactor Power to restore Tcold to program. <ul style="list-style-type: none"> • Inserts CEAs as necessary while maintaining CEAs above the Transient Insertion Limit (87.75".) • Borates as necessary by opening CVC-514-MOV and starting a Boric Acid Pump. 	
	BOP	May adjust TURBINE BYPASS VLV CONTR, PIC-4056, setpoint just above Main Steam header pressure but not lower than 830 PSIA.	
	SRO	Notifies the WEC of plant conditions. Requests support.	
Examiner notes:			
Event concludes when L/D PRESS alarms on 1C07.			
NOTE TO EXAMINER			
Cue Booth Operator to insert next malfunction, RCS Leak into Letdown Heat Exchanger/AOP-2A, when desired.			

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario # 3	OP-Test # 2018

Event #5		RCS Leak into Letdown Heat Exchanger/AOP-2A	C-ALL
Time	Position	Applicant's Actions or Behavior	
	ATC	Controls PZR level < 225" by securing 11 and 12 Charging Pumps.	
	ATC/BOP	Determines the leak is not on the Charging Header.	
	BOP	Determines leak is not occurring inside Containment.	
	BOP	Starts 11 Penetration Room Ventilation Fan using HS-5283 and 12 Penetration Room Ventilation Fan using HS-5284.	
	BOP/SRO	Determines RCS leak is into the Component Cooling Water system.	
	BOP/SRO	Evaluates Component Cooling system indications with letdown isolated: <ul style="list-style-type: none"> • Determines Head Tank level is steady/no longer rising • Determines RMS indications are no longer rising 	
	ATC/BOP	Shifts CVC-500-CV to WPS.	
	ATC/BOP	Shifts TIC-223 to manual with a 100% output signal.	
	BOP	Directs Equipment Operator to shut 1-CC-166.	
Examiner notes:			
Event concludes when UNIT XFMR HI SIDE LEADS DIFF alarms on 1C01.			
NOTE TO EXAMINER Cue Booth Operator to insert next malfunction, Turbine Trip/MSR Source MOVs Fail to Close/SG MSSV Lifts/SGIS Failure/EOP-0, when desired.			

[illegible]

Appendix D		Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant		Scenario # 3	OP-Test # 2018

Event #7		LOCA	C-ATC
Time	Position	Applicant's Actions or Behavior	
	ATC	Starts all Charging Pumps due to lowering PZR level.	
	ATC	Determines Pressure and Inventory Safety Function is not met. Informs the SRO that Pressure and Inventory Safety Function is not met due to low pressure and low level.	
	BOP	Determines Vital Auxiliaries Safety Function is met. Informs the SRO that Vital Auxiliaries is complete.	
	BOP	If adjusted, returns TURBINE BYPASS VLV CONTR, PIC-4056, setpoint to 900 PSIA.	
	ATC/BOP	Notes Containment Normal Sump level high alarm on 1C10. Informs the SRO.	
	ATC/BOP	Starts 13 Containment Air Cooler in High Speed.	
	ATC/BOP	Opens Emergency Outlet SRW Valves on all Containment Air Coolers.	
	ATC/BOP	Determines Containment Environment Safety Function is not met. Informs the SRO that Containment Environment is not met due to high pressure and temperature.	
Examiner notes:			
Event concludes when MSSV lifts.			
<p>NOTE TO EXAMINER</p> <p>Event #8, SG MSSV Lifts/EOP-0/EOP-8, is automatically inserted five minutes after the trip. The Booth Operator is not required to initiate the malfunction. The Booth Operator will need to remove the SGIS malfunction after the MSIVs are shut.</p>			

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Appendix D	Scenario Outline	Form ES-D-2
Calvert Cliffs Nuclear Power Plant	Scenario # 3	OP-Test # 2018

Event #9		HPSI MOV Fails Open	C-ATC
Time	Position	Applicant's Actions or Behavior	
	ATC	Determines PZR level is > 101" and HPSI flow can be throttled.	
	ATC	Verifies HPSI Throttling criteria are met by: <ul style="list-style-type: none"> • Verifying SCM is >25°F • PZR level is >101" • 11 S/G is available for heat removal 	
	ATC	Lowers HPSI flow by: <ul style="list-style-type: none"> • Securing either 11 or 13 HPSI pump • Throttling shut on the running pumps HPSI header MOVs. 	
	ATC	Notes that SI-636-MOV or SI-637-MOV fails to throttle shut. Informs the SRO.	
	ATC	Lowers HPSI flow by either: <ul style="list-style-type: none"> • Securing the running HPSI pump OR <ul style="list-style-type: none"> • Starting the secured HPSI pump • Securing the HPSI pump with the open header MOV • Throttling shut on the running pumps HPSI header MOVs 	
	ATC	Maintains PZR level 101-180".	

Examiner notes:

The scenario will terminate when the Critical Tasks for Shutting the MSIVs, Securing 2 RCPs and Isolating 11 SG have been completed.

After scenario ends ask SRO for ERPIP call. The correct Emergency Action Level declaration for this scenario is:

1. ALERT, per FA1.1, in Event 7, due to RCS leakrate exceeding 50 GPM with L/D isolated.

SHIFT TURNOVER INFORMATION SHEET [B0459]

DATE: **Today**

ON-COMING SHIFT: **DAYS**

UNIT 1: PWR Day

UNIT STATUS				
PARAMETER	UNIT 1		UNIT 2	
MODE OF OPERATION	1		1	
REACTOR POWER (%)	93		100	
GENERATION NET (MWe)	821		912	
Net RCS LEAKAGE (gpm)	0.01		0.0	
RCS BORON (ppm)	205		1609	
UNIT RISK (HIGHEST FOR DAY)	CDF: LOW	LERF: LOW	CDF: LOW	LERF: LOW
UNIT RISK COLOR	GREEN		GREEN	
BULK POWER NOTIFICATIONS	Normal			

NON-ROUTINE SURVEILLANCE REQUIREMENTS and ACTION STATEMENTS [B0125]		
<i>List action statements expiring during the oncoming shift, non-routine, conditional, & mode dependent surveillances (e.g. chemistry samples, operability verifications, ETPs, <7 day STPs)</i>		

OD's/RECO's/FA's and REF's requested by OPS					
Unit	Description	Date Requested	Type	Resp.	ECD

Surveillances coming Due (Info Only-Follow the Schedule)			
Unit 1		Unit 2	
DATE	STP	DATE	STP
Today			

OOS SR EQUIPMENT		OOS NSR EQUIPMENT	
UNIT 1 & COMMON	UNIT 2	UNIT 1 & COMMON	UNIT 2
		RRS-Y	
		0C DG	
		Cond Demin Bypass MOV	

SHIFT TURNOVER INFORMATION SHEET |B0459|

GENERAL INFORMATION					
UNIT 1					
				11 HEADER	12 HEADER
Max Header Pressure PU1-12-21-0-M	SW PUMP	11		33 psig (yesterday)	
		12			32 psig (yesterday)
		13		32.5 psig (yesterday)	30 psig (yesterday)

LONG TERM NOTES

1. None

SHORT TERM NOTES

1. Need to start 11, 12, and 13 IRUs after taking the watch per the Outage schedule.