NEXTera ENERGY SEABROOK

RO ADMIN JOB PERFORMANCE MEASURE '1'

PERFORM STEADY STATE LEAK RATE CALCULATION

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

0020200201 Perform RC Steady State Leak Rate Calculation

2. Conditions:

A. The plant is in Mode 1, 100% steady state power.

B. Your shift started the manual RCS leak rate 72 hour surveillance at 0030 with the main plant computer out of service.

C. Chemistry reports that SG "B" tube leakage is 9.90 gpd.

3. Standards:

Calculate the manual steady state leak rate.

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of OX1401.02, RCS Steady State Leak Rate Calculation
- Copy of PRT capacity vs. level curve TK-006.
- Copy of RCDT capacity vs. level curve (0-50%) TK-007A.
- Copy of RCDT capacity vs. level curve (50-100%) TK-007B.
- Calculator

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- OX1401.02, RCS Steady State Leak Rate Calculation, Rev. 08

Sys	KA	Description	Value RO/SRO
002	K4.05	Detection of RCS leakage.	3.8/4.2
002	A3.01	Reactor coolant leak detection system.	3.7/3.9

7. Setting:

Simulator or Classroom

8. Safety Considerations:

None

9. Approximate Completion Time:

30 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to perform a manual RCS steady state leak rate calculation.

B. The following information is provided to you:

1. The plant is in Mode 1, 100% steady state power.
2. Your shift started the manual RCS leak rate 72 hour surveillance at 0030 with the main plant computer out of service.
3. Chemistry reports that SG "B" tube leakage is 9.90 gpd.
4. Perform the task using OX1401.02, RCS Steady State Leak Rate Calculation.

C. We will begin after the Initiating Cue is read. Do you have any questions?

11. Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), the time is 0630. Complete the manual steady state leak rate calculation using OX1401.02 and the following collected data. Discuss the results with me."**

"Start" Data @ 0030		"Finish" Data @ 0630	
Tavg	587.6°F	Tavg	587.5°F
PZR Level – LT-459	60%	PZR Level – LT-459	60%
VCT Level	50%	VCT Level	53%
Integrated Makeup	15 gal	Integrated Makeup	205 gal
PRT Level	81%	PRT Level	81%
RCDT Level	46%	RCDT Level	65%

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
1. P	Start time _____	Initiating cue read		

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

NOTE: Student should begin at step 4.1.3 of OX1401.02. Main plant computer is not available.

2.	P	Verify that prerequisites are complete	Reviews prerequisites and verifies all requirements are complete.	_____	_____

CUE: If student inquiries about chemistry notification, provide the cue, **"All prerequisites of section 2 were met at 0030 this morning."**

*3.	P	Calculate and record data as shown on Form A PM Number LEAK-OT002-000 Test Data Sheet (Manual RCS Leak Rate).	Student calculates and records data as shown on Form A PM Number LEAK-OT002-000 Test Data Sheet (Manual RCS Leak Rate) as follows:		
		TIME (1)	TIME (1)	_____	_____
		TAVG (2)	TAVG (2)	_____	_____
		PZR LEVEL (3)	PZR LEVEL (3)	_____	_____
		VCT LEVEL (4)	VCT LEVEL (4)	_____	_____
		INTEGRATED MAKEUP (5)	INTEGRATED MAKEUP (5)	_____	_____
		PRT LEVEL (6)	PRT LEVEL (6)	_____	_____
		RCDT LEVEL (7)	RCDT LEVEL (7)	_____	_____

NOTE: In accordance with Note 1 on Form A, enter SG tube leakage in the next section.

NOTE: Student must convert given SG "B" tube leakage from gpd to gpm.

*4.	P	Record any known sources of additional leakage (8) on Form A.	Student records any known sources of additional leakage (8) on Form A: SG "B" tube leakage.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*5. P	Calculate Identified Leakage (9) and record on Form A.	Student calculates Identified Leakage (9) and records on Form A.	_____	_____
*6. P	Calculate Unidentified Leakage and record on Form A.	Student calculates Unidentified Leakage and record on Form A.	_____	_____

NOTE: If the student reports leak rate values but does not report that the values are SAT, then cue, **"Are the leakage results within allowed Tech Spec limits?"**

CUE: "The JPM is complete."

7.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 10 minutes
8.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.	_____ _____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TURNOVER SHEET FOR RO ADMIN JPM '1'

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to perform a manual RCS steady state leak rate calculation.

B. The following information is provided to you:

1. The plant is in Mode 1, 100% steady state power.
2. Your shift started the manual RCS leak rate 72 hour surveillance at 0030 with the main plant computer out of service.
3. Chemistry reports that SG "B" tube leakage is 9.90 gpd.
4. Perform the task using OX1401.02, RCS Steady State Leak Rate Calculation.

C. We will begin after the Initiating Cue is read. Do you have any questions?

Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), the time is 0630. Complete the manual steady state leak rate calculation using OX1401.02 and the following collected data. Discuss the results with me."**

"Start" Data @ 0030		"Finish" Data @ 0630	
Tavg	587.6°F	Tavg	587.5°F
PZR Level – LT-459	60%	PZR Level – LT-459	60%
VCT Level	50%	VCT Level	53%
Integrated Makeup	15 gal	Integrated Makeup	205 gal
PRT Level	81%	PRT Level	81%
RCDT Level	46%	RCDT Level	65%

KEY RO / SRO ADMIN JPM '1'

Form A: PM Number LEAK-OT002

Test Data Sheet

(Sheet 2 of 4)

MANUAL RCS LEAK RATE						
PARAMETER	INSTRUMENT USED	FINISH	START	CHANGE FINISH-START	CONVERSION	GALLONS OR MINUTES
TIME	MCB CLOCK	0630	0030	6	60 min/hr	360 min (1)
OBTAIN DATA FROM THE MAIN CONTROL BOARD AND CP-38A						
TAVG	DIGITAL	587.5 °F	587.6 °F	-0.1 °F	83.96 gal/°F **(Note 2)**	-8.396 gal (2)
PZR LEVEL	**(Note 4)** LT-459	60 %	60 %	0 %	61.31 gal/% **(Note 2)**	0 gal (3)
VCT LEVEL	LI-185	53 %	50 %	3 %	31.14 gal/%	93.42 gal (4)
INTEGRATED MAKEUP	CS-FIQ-111 **(Note 5)**	205 gal	15 gal	190 gal	N/A	190 gal (5)
PRT LEVEL	LI-470	11250 gal **(Note 3)**	11250 gal **(Note 3)**	0 gal	N/A	0 gal (6)
RCDT LEVEL	LI-1403 **(at CP-38A)**	230 gal **(Note 3)**	160 gal **(Note 3)**	70 gal	N/A	70 gal (7)
OBTAIN THIS DATA FROM ANY KNOWN SOURCE AND RECORD GALLONS **(Note 1)**						
						2.475 gal (8)
						gal (8)

IDENTIFIED LEAKAGE

* acceptable range 0.181 to 0.221

$$\frac{(8:\ 2.475) + (7:\ 70) + (6:\ 0) = (0.201\ ^{*})\ \text{gpm}^{(9)}}{(360)/1}$$

Identified Leakage Acceptance Criteria ≤ 10 gpm

UNIDENTIFIED LEAKAGE

** acceptable range 0.024 to 0.064

$$\left[\frac{(5:\ 190) + (2:\ -8.396) - (3:\ 0) - (4:\ 93.42)}{(360)/1}\right] - (9:\ 0.201)\ \text{gpm} = 0.044\ ^{**}\ \text{gpm}$$

Unidentified Leakage Acceptance Criteria ≤ 1 gpm

Note 1: This is for sampling losses, accumulator leaks, steam generator tube leakage, etc.
Note 2: These conversion factors are only valid for normal operating temperature and pressure. If the plant is stable at a reduced pressure and temp and the computer is **not** available, use the conversion factors from Figure 2.
Note 3: Obtain tank volume from the Primary Technical Data Book and record gallons for calculation. Do **not** use % due to nonlinearity of the tank volume.
Note 4: Record the instrument number and use the same hot calibrated level indicator for both start and finish.
Note 5: Any RWST, BWST, or SF Pool makeups must be subtracted from the integrated makeup total.

Calculations checked by: _____

SG 'B' Tube leakage

$$\frac{9.9\ \text{gal}}{\text{day}} \left| \frac{1\ \text{day}}{24\ \text{hr}} \right| \frac{6\ \text{hr}}{} = 2.475\ \text{gal}$$

NEXTera ENERGY SEABROOK

RO ADMIN JOB PERFORMANCE MEASURE '2'

ECP CALCULATION

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

0010100201 Perform Estimated Critical Position (ECP) Calculations

2. Conditions:

A. The plant is preparing for a startup after a 2 day outage following an inadvertent reactor trip.

B. Plant condition/history is as follows:

a. Shift turnover has been completed and no surveillance's are planned or in progress.

b. MODE 3 with RCS at 557°F and 2235 psig.

c. The plant has been shutdown for two days as of 0000 today. It is now 0100.

d. Criticality planned for today at 0500

e. Desired Rod Position for criticality is Control Bank D at 100 steps.

f. RCS boron concentration (C_B), 1459 ppm. Sample time 0030 today.

g. Full Out Position is presently CBD @ 228 steps.

h. Core Burnup is 16,000 MWD/MTU.

i. Net Poison worth will be 500 pcm at 0500 today.

j. There is no boron depletion.

3. Standards:

A. Determine the critical boron concentration within ± 30 ppm using RS-1735 Form A, Block 6.

B. Determine the zero power rod insertion limit per RS1735 Form A, Block 9, item "A".

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of RS1735, Reactivity Calculations. Rev 8.
- Figures from the Primary Tech Data Book:
  - RE-01, Critical Boron Concentration, Rev. 01-17-00
  - RE-03, Differential Boron Worth, Rev. 01-17-00
  - RE-5, Overlap Integral Rod Worth vs Rod Position, Rev. 01-17-00
  - RE-16, Control Bank D Operating Band, Rev. 01-17-00
  - Core Operating Limits Report (SSTR Rev.140)
- Calculator

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- OS1000.07, Approach to Criticality
- RS1735, Reactivity Calculations, Rev 8

Sys	KA	Description	Value RO/SRO
192008	K1.07	Calculate ECP using procedures and given plant procedures.	3.5/3.6

7. Setting:

Simulator or Classroom

8. Safety Considerations:

None

9. Approximate Completion Time:

20 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to perform an Estimated Critical Position (ECP) calculation.

B. The following information is provided to you:

1. Shift turnover has been completed and no surveillance's are planned or in progress.
2. MODE 3 with RCS at 557°F and 2235 psig.
3. The plant has been shutdown for two days as of 0000 today. It is now 0100.
4. Criticality planned for today at 0500.
5. Desired Rod Position for criticality is Control Bank D at 100 steps.
6. RCS boron concentration (C_B), 1459 ppm. Sample time 0030 today.
7. Full Out Position is presently CBD @ 228 steps.
8. Core Burnup is 16,000 MWD/MTU.
9. Net Poison worth will be 500 pcm at 0500 today.
10. There is no boron depletion.
11. Perform the task using RS1735, Reactivity Calculations.

11. Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), calculate an Estimated Critical Position (ECP) using RS1735, Reactivity Calculations. Discuss the results with me."**

PERFORMANCE CHECKLIST

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

1. P Start time _____ Initiating cue read

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

NOTE: Student will perform section 4.1, ECP Procedure (ECP Data & Analysis Form A) of RS1735.

NOTE: Student reviews prerequisites and precautions of RS1735.

2. P ENTER in Section 1 the date, time, burnup and desired rod position for the ECP.
   Student enters in Section 1:
   - Date
   - Time
   - Burnup
   - Desired CB D rod position

   _____ _____

NOTE: Student reviews following NOTE prior to step 4.1.2:
The value of C_0 may be alternately supplied by Reactor Engineering to take advantage of critical boron data measured at the present burnup.

CUE : If the student asks RE for alternative data as mentioned in NOTE prior to step 4.1.2, respond **"RE has no alternative data available. Use Figure RE-1 for Critical Boron Concentration."**

*3. P RECORD in Section 2 the Hot Zero Power (HZP), **no** xenon, critical boron concentration (C_0) from TDB Figure RE-01 for the burnup listed in Section 1.
Student records critical boron concentration (C_0) from Figure RE-01. _____ _____

4. P RECORD in Section 3 the Net Poison Worth (NPW) at the expected time of criticality (ρ_I) as determined by Reactor Engineering **or** computer prediction.
Student records Net Poison Worth (NPW) at the expected time of criticality (ρ_I). _____ _____

*5. P RECORD in Section 4 the inserted rod worth (ρ_R), from TDB Figure RE-05, "Overlap Integral Rod Worth vs. Rod Position (HZP)" for the desired rod position listed in Section 1.
Student records the inserted rod worth (ρ_R), from Figure RE-05. _____ _____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*6. P	RECORD in Section 5 the Differential Boron Worth (DBW) at HZP from TDB Figure RE-03 "Differential Boron Worth vs. Burnup (HZP, HFP)" for the burnup listed in Section 1.	Student records the Differential Boron Worth (DBW) at HZP from Figure RE-03.	_____	_____
*7. P	COMPLETE the calculation in Section 6 to determine the estimated Critical Boron Concentration (C_B).	Student calculates the estimated Critical Boron Concentration (C_B).	_____	_____
*8. P	In Section 7, DETERMINE the Estimated Corrected Critical Boron Concentration (CCB) as follows:	Student determines the Estimated Corrected Critical Boron Concentration (CCB) as follows:		
	1. RECORD the critical boron concentration from Form A, Section 6, in Form A, Section 7, block A.	1. Student records the critical boron concentration from Form A, Section 6, in Form A, Section 7, block A.	_____	_____
NOTE: Student reviews NOTE prior to step 4.1.7.2 regarding ^{10}B depletion.				
	2. If ^{10}B depletion is **not** to be accounted for, then record a 0 in block B and Go To Step 4.1.7.5.	2. Student recalls no boron depletion from the turnover information and goes to step 4.1.7.5.	_____	_____
	3. RECORD in block C the critical boron from block A and the delta critical boron concentration from block B.	3. Student records in block C the critical boron from block A and the delta critical boron concentration from block B.	_____	_____
	4. PERFORM the calculation in block C and RECORD the result in block D.	4. Student performs the calculation in block C and records the result in block D.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
*9. P	In Section 8, determine the ECP administrative control rod insertion limit as follows:	Student determines the ECP administrative control rod insertion limit as follows:	
	1. RECORD in block A the HZP Rod Insertion Limit (RIL) for control bank C from the COLR, "Core Operating Limits Report."	1. Student records in block A the HZP Rod Insertion Limit (RIL) for control bank C from the COLR.	_____ _____
	2. RECORD in block B the rod worth from Section 4, PERFORM the calculation and RECORD the results of the calculation in block B.	2. Student record in block B the rod worth from Section 4, performs the calculation and records the results of the calculation in block B.	_____ _____
	3. RECORD in block C the control bank and steps using TDB Figure RE-05, "Overlap Integral Rod Worth vs. Rod Position (HZP)" corresponding to the rod worth calculated in block B	3. Student records in block C the control bank and steps using TDB Figure RE-05 corresponding to the rod worth calculated in block B.	_____ _____
	4. RECORD in block D the ECP administrative insertion limit by choosing the higher of the bank and steps recorded in blocks A and C.	4. Student records in block D the ECP administrative insertion limit by choosing the higher of the bank and steps recorded in blocks A and C.	_____ _____
*10. P	In Section 9, determine the ECP administrative control rod withdrawal limit as follows:	Student determines the ECP administrative control rod withdrawal limit as follows:	
NOTE: Student reviews NOTE prior to step 4.1.9.1 regarding HZP Moderator Temperature Coefficient (MTC) control rod withdrawal limits for the current cycle.			
	1. RECORD in block A the HZP Moderator Temperature Coefficient (MTC) rod withdrawal limit for control bank D using TDB Figure RE-16, "Control Bank D Operating Band."	1. Student records N/A in block A the HZP Moderator Temperature Coefficient (MTC) rod withdrawal limit for control bank D from Figure RE-16 per the NOTE prior to the step.	_____ _____

PERFORMANCE CHECKLIST

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

NOTE: Student reviews NOTE prior to step 4.1.9.2 regarding a negative result.

2.	RECORD in block B the rod worth from Section 4, PERFORM the calculation and RECORD the results of the calculation in block B.	2. Student records in block B the rod worth from Section 4, performs the calculation and records the results of the calculation in block B.	_____ _____
3.	RECORD in block C the control bank and steps using TDB Figure RE-05, "Overlap Integral Rod Worth vs. Rod Position (HZP)" corresponding to the rod worth calculated in block B.	3. Student records in block C the control bank and steps using Figure RE-05 corresponding to the rod worth calculated in block B.	_____ _____
4.	RECORD in block D the ECP administrative withdrawal limit by choosing the lower of the bank and steps recorded in blocks A and C.	4. Student records in block D the ECP administrative withdrawal limit by choosing the lower of the bank and steps recorded in blocks A and C.	_____ _____

CUE: "The JPM is complete."

11.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 20 minutes	
12.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____ _____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TURNOVER SHEET FOR RO ADMIN JPM '2'

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to perform an Estimated Critical Position (ECP) calculation.

B. The following information is provided to you:

1. Shift turnover has been completed and no surveillance's are planned or in progress.
2. MODE 3 with RCS at 557°F and 2235 psig.
3. The plant has been shutdown for two days as of 0000 today. It is now 0100.
4. Criticality planned for today at 0500.
5. Desired Rod Position for criticality is Control Bank D at 100 steps.
6. RCS boron concentration (C_B), 1459 ppm. Sample time 0030 today.
7. Full Out Position is presently CBD @ 228 steps.
8. Core Burnup is 16,000 MWD/MTU.
9. Net Poison worth will be 500 pcm at 0500 today.
10. There is no boron depletion.
11. Perform the task using RS1735, Reactivity Calculations.

C. We will begin after the Initiating Cue is read. Do you have any questions?

Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), calculate an Estimated Critical Position (ECP) using RS1735, Reactivity Calculations. Discuss the results with me."**

KEY RO/SRO ADMIN JPM 2

Form A: Estimated Critical Position Data & Analysis Form

(Sheet 1 of 3)

NOTE: Enter all input data as positive values.

1) Estimated Condition for Criticality

Date: Today Time: 0500 Burnup: 16,000 MWD/MTU

Desired Rod Position: CB D (Bank) @ 100 (Steps)

2) Design Critical Boron Concentration @ Current Burnup (HZP, ARO, No Xenon)

C_0 = 1200 ppm from TDB Figure RE-01

3) Net Poison Worth @ Expected Time of Criticality

ρ_I = 500 pcm from computer prediction or Reactor Engineering

4) Inserted Rod Worth @ Criticality

ρ_R = 425 pcm from TDB Figure RE-05

5) Differential Boron Worth @ Current Burnup (HZP)

DBW = 7.02 pcm/ppm from TDB Figure RE-03

6) Estimated Critical Boron Concentration

$$C_B = C_0 - \left(\frac{\rho_I + \rho_R}{DBW}\right)$$

$$C_B = 1200 \text{ ppm} - \left(\frac{500 \text{ pcm} + 425 \text{ pcm}}{7.02 \text{ pcm/ppm}}\right)$$

C_B = 1068 ppm

KEY RO/SRO ADMIN JPM 2

Form A: Estimated Critical Position Data & Analysis Form

(Sheet 2 of 3)

7) Corrected Critical Boron Concentration

A) C_B = 1068 ppm From Form A Section 6

B) ΔC_B = 0 ppm Use 0 if no ^{10}B depletion **OR** enter calculated amount from Form B Section 4 **OR** from an RE Calculation **OR** from an RCS isotopic analysis

C_{CB} = $C_B + \Delta C_B$ ppm

C) C_{CB} = 1068 ppm + 0 ppm

D) C_{CB} = 1068 ppm

8) ECP Administrative Control Rod Insertion Limit (AIL)

A) Rod Insertion Limit (RIL) = Bank: CB C @ 71 steps From COLR *CB C @ 150 also Acceptable

B) ρ_{AIL} = 425 pcm + 500 pcm = 925 pcm From Form A Section 4
ρ_R

C) Rod Position at ρ_{AIL} = Bank: CB D @ 35* steps From TDB Figure RE-05

D) ECP Administrative Insertion Limit = Bank: CB D @ 35* steps Higher bank/step of A and C

9) ECP Administrative Control Rod Withdrawal Limit (AWL)

A) Rod Withdrawal Limit = Bank N/A @ N/A steps From TDB Figure RE-16

B) ρ_{AWL} = 425 pcm – 500 pcm = 0 pcm From Form A Section 4
ρ_R

C) Rod Position at ρ_{AWL} = Bank: D @ 225 steps From TDB Figure RE-05

D) ECP Administrative Withdrawal Limit = Bank: D @ 225 steps Lower bank/steps of A and C

Completed By: PSO Date/Time: Today

Independently Verified By: BOP Date/Time: Today

Approved By SM: SM Date/Time Today

NEXTera ENERGY SEABROOK

RO ADMIN JOB PERFORMANCE MEASURE '3'

SHUTDOWN MARGIN SURVEILLANCE IN RESPONSE TO A DROPPED ROD

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

0010100401 Perform Shutdown Margin Calculation

2. Conditions:

A. The plant is in Mode 2, at 3% RTP.

B. Plant condition/history is as follows:

1. Core age is 12000 MWD/MTU
2. RCS boron concentration is 1300 ppm.
3. During a power adjustment, rod H-2 dropped to the bottom of the core.
4. OS1210.05, Dropped Rod actions are being performed.
5. Rod H-2 cannot be moved.

3. Standards:

Determine the shutdown margin within ±0.035%ΔK/K.

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of RX1707, Shutdown Margin Surveillance Rev 7 Chg.7.
- Figures from the Primary Tech Data Book:
  - RE-08 Total Power Defect vs. Power And Boron Concentration, Rev. 01-17-00.
  - RE-18 Shutdown Margin Values, Rev. 01-17-00.
  - RE-19 Control Bank Worth At RIL vs. Power Rev. 01-17-00.
  - Core Operating Limits Report (SSTR Rev.140)
- Calculator

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- OS1210.05, Dropped Rod
- RX1707, Shutdown Margin Surveillance Rev 7 Chg.7.

Sys	KA	Description	Value RO/SRO
Generic	2.2.12	Knowledge of Surveillance Procedures.	3.7/4.1

7. Setting:

Simulator or Classroom.

8. Safety Considerations:

None.

9. Approximate Completion Time:

15 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to perform a shutdown margin verification.

B. The following information is provided to you:

1. The plant is in Mode 2, at 3% RTP.
2. Core age is 12000 MWD/MTU
3. RCS boron concentration is 1300 ppm.
4. During a power adjustment, rod H-2 dropped to the bottom of the core.
5. OS1210.05, Dropped Rod actions are being performed.
6. Rod H-2 cannot be moved.

C. We will begin after the Initiating Cue is read. Do you have any questions?

11. Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), "perform a shutdown margin calculation per RX1707, Shutdown Margin Surveillance. Discuss the results with me."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1.	P Start time _____	Initiating cue read	

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

NOTE: Student reviews prerequisites and precautions of RX1707.

NOTE: Student will perform Form C: Shutdown Margin Determination Immovable, Untrippable Or Dropped Rod(s) in accordance with RX1707, section 4.4.

2.	P	Form C: Shutdown Margin Determination Immovable, Untrippable Or Dropped Rod(s), PART 1	Student completes Form C, Part 1 as follows:		
		(a) Number of Immovable, Untrippable and Dropped Rod(s)	(a) Student enters number of Immovable, Untrippable and Dropped Rod(s)	_____	_____
		(b) Maximum Worth Individual of Immovable, Untrippable **or** Dropped Rod (Primary Technical Data Book Figure RE-18).	(b) Student enters maximum Worth Individual of Immovable, Untrippable **or** Dropped Rod (Primary Technical Data Book Figure RE-18)	_____	_____
		*(c) Total Unavailable Rod Worth	*(c) Student calculates Total Unavailable Rod Worth (a) X (b)	_____	_____
		*(d) Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	*(d) Student determines and enters the Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	_____	_____
		(e) Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	(e) Student determines and enters the Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
	(f) Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	(f) Student determines and enters the Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	_____	_____
	*(g) Shutdown Margin [f - (c + d + e)] / 1,000	*(g) Student calculates and enters the Shutdown Margin [f - (c + d + e)] / 1,000	_____	_____
3. P	Notify the SM/US if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report.	Student notifies the SM/US if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report.		
CUE:	**"The JPM is complete."**			
4.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 20 minutes		
5.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to perform a shutdown margin verification.

B. The following information is provided to you:
   1. The plant is in Mode 2, at 3% RTP.
   2. Core age is 12000 MWD/MTU
   3. RCS boron concentration is 1300 ppm.
   4. During a power adjustment, rod H-2 dropped to the bottom of the core.
   5. OS1210.05, Dropped Rod actions are being performed.
   6. Rod H-2 cannot be moved.

C. We will begin after the Initiating Cue is read. Do you have any questions?

Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), "perform a shutdown margin calculation per RX1707, Shutdown Margin Surveillance. Discuss the results with me."**

KEY RO/SRO ADMIN JPM3

Form C: Shutdown Margin Determination Immovable, Untrippable Or Dropped Rod(s)

(Sheet 1 of 2)

PART I

Shutdown Margin Determination - MODEs 1 and 2 (Step 4.4.1.1)	
Number of Immovable, Untrippable and Dropped Rod(s)	1 (a)
Maximum Worth Individual of Immovable, Untrippable **or** Dropped Rod (Primary Technical Data Book Figure RE-18)	1128 (b) pcm
Total Unavailable Rod Worth = (a) 1 x (b) 1128 pcm = (c) 1128 pcm	
Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	80 (d) pcm
Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	2000 (e) pcm
Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	5373 (f) pcm
Shutdown Margin [f - (c + d + e)] / 1,000	2.165 ** %ΔK/K
Notify the SM/US if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report. *	

Completed By _____ Date _____

Independently Verified By _____ Date _____

US Review _____ Date _____

SM Review _____ Date _____

* SDM is greater than the limit in the COLR.

** acceptable range 2.130 to 2.200

NEXTera ENERGY SEABROOK

RO ADMIN JOB PERFORMANCE MEASURE '4'

COP EXHAUST RAD MONITOR SETPOINTS

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position	RO
0290100201	Start-Up the COP System
0290100501	Adjust Containment Pressure Using the COP System

2. Conditions:

A. The plant is in Mode 1, 100% steady state power.

B. The previous shift has made preparations to place COP in service per OS1023.69 section 4.2.

3. Standards:

Calculate COP Exhaust Radiation Monitors Alert and Alarm setpoints prior to gaseous effluent release per OS1023.69 section 4.2.

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of OS1023.69, Containment On-Line Purge System Operation
- Copy of CS0917.02 Form C, GEW Containment Purge Release Permit
- Calculator

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- OS1023.69, Containment On-Line Purge System Operation, Rev. 12
- CS0917.02, Gaseous Effluent Releases, Rev. 10, Chg. 12.
- CP-4.1 Effluent Surveillance Program

Sys	KA	Description	Value RO/SRO
Generic	2.3.11	Ability to Control Radiation Releases	3.8/4.3

7. Setting:

Simulator or Classroom

8. Safety Considerations:

None

9. Approximate Completion Time:

20 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to verify the alert and alarm setpoints of the COP Exhaust Radiation Monitors prior to placing COP in service.

B. The following information is provided to you:

1. The plant is in Mode 1, 100% steady state power.
2. The previous shift has made preparations to place COP in service per OS1023.69, section 4.2.
3. Perform the task per OS1023.69 Containment On-Line Purge Operation, section 4.2.
4. Prerequisites for performance of OS1023.69 section 4.2 have been completed.
5. CS0917.02 Form C, release permit, has already been approved.

C. We will begin after the Initiating Cue is read. Do you have any questions?

11. Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), after reviewing the Gaseous Effluent Waste Containment Purge Release Permit, continue with preparations to place COP in service per OS1023.69 step 4.2 and the following collected data. Discuss your results with me after you complete step 4.2.5."**

Monitor ID	Current Background Value (CPM)	Alert Value (CPM)	High Value (CPM)
1-RM-6527A-1	23.5	33.3	43.2
1-RM-6527A-2	18.1	24.0	31.2
1-RM-6527B-1	25.7	36.0	48.0
1-RM-6527B-2	16.4	23.5	30.5

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

*2.	P	RECORD the alert and high alarm setpoint values from CP-295 for the COP rad monitors:	Student records the alert and high alarm setpoint values from CP-295 for the COP rad monitors:		
		1-RM-6527A-1	1-RM-6527A-1	____	____
		1-RM-6527A-2	1-RM-6527A-2	____	____
		1-RM-6527B-1	1-RM-6527B-1	____	____
		1-RM-6527B-2	1-RM-6527B-2	____	____
*3.	P	RECORD the current background readings from CP-295 for the COP rad monitors:	Student records the current background readings from CP-295 for the COP rad monitors:		
		1-RM-6527A-1	1-RM-6527A-1	____	____
		1-RM-6527A-2	1-RM-6527A-2	____	____
		1-RM-6527B-1	1-RM-6527B-1	____	____
		1-RM-6527B-2	1-RM-6527B-2	____	____
*4.	P	RECORD the expected radiation monitor response from the Gaseous Effluent Waste (GEW) Containment Purge Release Permit, CH-L524, obtained from Chemistry.	Student records the expected radiation monitor response from the Gaseous Effluent Waste (GEW) Containment Purge Release Permit, CH-L524, obtained from Chemistry.	____	____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*5. P	ADD the Expected Radiation Monitor Response value to the current COP rad monitor background levels recorded in step 4.2.2. These become the new COP rad monitor "in service" background levels:	Student adds the Expected Radiation Monitor Response value to the current COP rad monitor background levels recorded in step 4.2.2. These become the new COP rad monitor "in service" background levels:		
	1-RM-6527A-1	1-RM-6527A-1	_____	_____
	1-RM-6527A-2	1-RM-6527A-2	_____	_____
	1-RM-6527B-1	1-RM-6527B-1	_____	_____
	1-RM-6527B-2	1-RM-6527B-2	_____	_____

NOTE: Student reviews CAUTION and NOTE prior to step 4.2.5.

*6. P	COMPARE the **new** COP Monitor Background Levels to the alert and high alarm values recorded in step 4.2.1. DETERMINE the need to make RDMS data base changes by checking the following: If the high alarm value remains within 2X background as prescribed in Tech. spec 3.3.2, table 3.3-4, Item 3.c.4), **AND** The alert alarm value remains sufficiently higher than the **new** COP monitor in-service background levels to avoid an inadvertent alert alarm, **THEN** **No** RDMS data base changes are required. CONTINUE with step 4.2.7.	Student compares the new COP Monitor background levels to the alert and high alarm values recorded in step 4.2.1 and determines the need to make RDMS data base changes.	_____	_____

NOTE: If the student determines that it is **not** necessary to perform step 4.2.6, then the JPM is complete and the JPM is a **FAILURE**.

PERFORMANCE CHECKLIST

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

CUE: After the student determines that it is necessary to make RDMS data base changes, respond **"Step 4.2.6.1 will be performed by the BOP operator and is in progress. Continue with step 4.2.6.2"**

*7.	P	CALCULATE the **new** alert alarm setpoint by multiplying the **new** COP monitor background level recorded in step 4.2.4 by 1.5 for each monitor to be changed:	Student calculates the new alert alarm setpoint by multiplying the new COP monitor background level recorded in step 4.2.4 by 1.5 for each monitor to be changed:	
		1-RM-6527A-1	1-RM-6527A-1	____ ____
		1-RM-6527A-2	1-RM-6527A-2	____ ____
		1-RM-6527B-1	1-RM-6527B-1	____ ____
		1-RM-6527B-2	1-RM-6527B-2	____ ____
*8.	P	CALCULATE the **new** high alarm setpoint by multiplying the **new** COP monitor background level recorded in step 4.2.4 by 1.95 for each monitor to be changed:	Student calculates the new high alarm setpoint by multiplying the new COP monitor background level recorded in step 4.2.4 by 1.95 for each monitor to be changed:	
		1-RM-6527A-1	1-RM-6527A-1	____ ____
		1-RM-6527A-2	1-RM-6527A-2	____ ____
		1-RM-6527B-1	1-RM-6527B-1	____ ____
		1-RM-6527B-2	1-RM-6527B-2	____ ____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
CUE:	**"The JPM is complete."**		
9.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 10 minutes	
10.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____ _____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to verify the alert and alarm setpoints of the COP Exhaust Radiation Monitors prior to placing COP in service.

B. The following information is provided to you:

1. The plant is in Mode 1, 100% steady state power.
2. The previous shift has made preparations to place COP in service per OS1023.69, section 4.2.
3. Perform the task per OS1023.69 Containment On-Line Purge Operation, section 4.2.
4. Prerequisites for performance of OS1023.69 section 4.2 have been completed.
5. CS0917.02 Form C, release permit, has already been approved.

C. We will begin after the Initiating Cue is read. Do you have any questions?

Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), after reviewing the Gaseous Effluent Waste Containment Purge Release Permit, continue with preparations to place COP in service per OS1023.69 step 4.2 and the following collected data. Discuss your results with me after you complete step 4.2.5."**

Monitor ID	Current Background Value (CPM)	Alert Value (CPM)	High Value (CPM)
1-RM-6527A-1	23.5	33.3	43.2
1-RM-6527A-2	18.1	24.0	31.2
1-RM-6527B-1	25.7	36.0	48.0
1-RM-6527B-2	16.4	23.5	30.5

4. INSTRUCTIONS

4.1 System Lineup

- 4.1.1 PERFORM applicable sections of system lineup, Form B, as directed by US.

4.2 Placing The Containment On-Line Purge System In Service

- 4.2.1 RECORD the alert and high alarm setpoint values from CP-295 for the COP rad monitors:

Monitor ID	Alert Value (CPM)	High Value (CPM)
1-RM-6527A-1	33.3	43.2
1-RM-6527A-2	24.0	31.2
1-RM-6527B-1	36.0	48.0
1-RM-6527B-2	23.5	30.5

- 4.2.2 RECORD the **CURRENT** background readings from CP-295 for the COP rad monitors:

Monitor ID	Current Background Value (CPM)
1-RM-6527A-1	23.5
1-RM-6527A-2	18.1
1-RM-6527B-1	25.7
1-RM-6527B-2	16.4

- 4.2.3 RECORD the expected radiation monitor response from the Gaseous Effluent Waste (GEW) Containment Purge Release Permit, CH-L524, obtained from Chemistry.

Expected Radiation Monitor Response (CPM): 6.5

KEY RO/SRO ADMIN JPM 4

- 4.2.4 ADD the Expected Radiation Monitor Response value to the **CURRENT** COP rad monitor background levels recorded in step 4.2.2. These become the **new** COP rad monitor "in service" background levels:

Monitor ID	Current Background Level Indication (CPM)		Expected Radiation Monitor Response (CPM)		New COP Monitor Background Level CPM)
1-RM-6527A-1	23.5	+	6.5	=	30.0
1-RM-6527A-2	18.1	+	6.5	=	24.6
1-RM-6527B-1	25.7	+	6.5	=	32.2
1-RM-6527B-2	16.4	+	6.5	=	22.9

CAUTION

Changing conditions in the PAB can effect COP monitor background levels. Consideration should be given to evolutions in process that could increase COP monitor background levels when determining the need for making RDMS data base changes prior to placing COP in service.

NOTE

Normally, the expected radiation monitor response from containment does **not** add a significant contribution to the in-service COP monitor background levels, making changes to the alert and high alarm setpoints unnecessary.

- 4.2.5 COMPARE the **new** COP Monitor Background Levels to the alert and high alarm values recorded in step 4.2.1. DETERMINE the need to make RDMS data base changes by checking the following:

RDMS changes required. Go to Step 4.2.6.

- If the high alarm value remains within 2X background as prescribed in Tech. spec 3.3.2, table 3.3-4, Item 3.c.4),

AND

- The alert alarm value remains sufficiently higher than the **new** COP monitor in-service background levels to avoid an inadvertent alert alarm,

THEN

No RDMS data base changes are required. CONTINUE with step 4.2.7.

KEY RO/SRO ADMIN JPM 4

4.2.6 If COP rad monitor RDMS setpoint change requests are required, then PERFORM the following:

☐ 4.2.6.1 INITIATE MA4.6A, RDMS Data Base Item Change Request, (one form per monitor) for each of the following COP rad monitors as required:

1-RM-6527A-1

1-RM-6527A-2

1-RM-6527B-1

1-RM-6527B-2

☐ 4.2.6.2 CALCULATE the **new** alert alarm setpoint by multiplying the **new** COP monitor background level recorded in step 4.2.4 by 1.5 for each monitor to be changed:

Monitor ID	New COP Monitor Background Level (step 4.2.4)			New Alert Alarm Setpoint
1-RM-6527A-1	30.0	X 1.5	=	45.0
1-RM-6527A-2	24.6	X 1.5	=	36.9
1-RM-6527B-1	32.2	X 1.5	=	48.3
1-RM-6527B-2	22.9	X 1.5	=	34.4

☐ 4.2.6.3 CALCULATE the **new** high alarm setpoint by multiplying the **new** COP monitor background level recorded in step 4.2.4 by 1.95 for each monitor to be changed:

Monitor ID	New COP Monitor Background Level (step 4.2.4)			New High Alarm Setpoint
1-RM-6527A-1	30.0	X 1.95	=	58.5
1-RM-6527A-2	24.6	X 1.95	=	48.0
1-RM-6527B-1	32.2	X 1.95	=	62.8
1-RM-6527B-2	22.9	X 1.95	=	44.7

NEXTera ENERGY SEABROOK

SRO ADMIN JOB PERFORMANCE MEASURE '1'

VERIFY STEADY STATE LEAK RATE CALCULATION

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

0020200201 Perform RC Steady State Leak Rate Calculation

2. Conditions:

A. The plant is in Mode 1, 100% steady state power.

B. Your shift started the manual RCS leak rate 72 hour surveillance at 0030 with the main plant computer out of service.

C. Chemistry reports that SG "B" tube leakage is 9.90 gpd.

3. Standards:

Verify the manual steady state leak rate.

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of completed OX1401.02, RCS Steady State Leak Rate Calculation
- Copy of PRT capacity vs. level curve TK-006.
- Copy of RCDT capacity vs. level curve (0-50%) TK-007A.
- Copy of RCDT capacity vs. level curve (50-100%) TK-007B.
- Calculator

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- OX1401.02, RCS Steady State Leak Rate Calculation, Rev. 08

Sys	KA	Description	Value RO/SRO
002	K4.05	Detection of RCS leakage.	3.8/4.2
002	A3.01	Reactor coolant leak detection system.	3.7/3.9

7. Setting:

Simulator or Classroom

8. Safety Considerations:

None

9. Approximate Completion Time:

30 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Work Control Supervisor. You are going to verify a manual RCS steady state leak rate calculation.

B. The following information is provided to you:

1. The plant is in Mode 1, 100% steady state power.
2. Your shift started the manual RCS leak rate 72 hour surveillance at 0030 with the main plant computer out of service.
3. Chemistry reports that SG "B" tube leakage is 9.90 gpd.
4. The Primary Operator completed OX1401.02, RCS Steady State Leak Rate Calculation.

C. We will begin after the Initiating Cue is read. Do you have any questions?

11. Initiating Cue:

SM to Work Control Supervisor, **"Work Control Supervisor (or student's name), verify the manual steady state leak rate calculation using OX1401.02 and the following collected data. Record any issues that you find on the Turnover Sheet. Correct any issues that you find. Discuss the results with me."**

"Start" Data @ 0030		"Finish" Data @ 0630	
Tavg	587.6°F	Tavg	587.5°F
PZR Level – LT-459	60%	PZR Level – LT-459	60%
VCT Level	50%	VCT Level	53%
Integrated Makeup	15 gal	Integrated Makeup	205 gal
PRT Level	81%	PRT Level	81%
RCDT Level	46%	RCDT Level	65%

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: Student should begin at step 4.1.3 of OX1401.02. Main plant computer is not available.

2.	P	Verify that prerequisites are complete	Reviews prerequisites and verifies all requirements are complete.	_____ _____

CUE: If student inquiries about chemistry notification, provide the cue, **"All prerequisites of section 2 were met at 0030 this morning."**

*3.	P	Calculate and record data as shown on Form A PM Number LEAK-OT002-000 Test Data Sheet (Manual RCS Leak Rate).	Student verifies calculations as shown on Form A PM Number LEAK-OT002-000 Test Data Sheet (Manual RCS Leak Rate) as follows:	
		TIME (1)	TIME (1)	_____ _____
		TAVG (2)	TAVG (2)	_____ _____
		PZR LEVEL (3)	PZR LEVEL (3)	_____ _____
		VCT LEVEL (4)	VCT LEVEL (4)	_____ _____
		INTEGRATED MAKEUP (5)	INTEGRATED MAKEUP (5)	_____ _____
		PRT LEVEL (6)	PRT LEVEL (6)	_____ _____
		RCDT LEVEL (7)	RCDT LEVEL (7)	_____ _____

NOTE: In accordance with Note 1 on Form A, enter SG tube leakage in the next section.

NOTE: Student must convert given SG "B" tube leakage from gpd to gpm.

*4.	P	Record any known sources of additional leakage (8) on Form A.	Student verifies any known sources of additional leakage (8) on Form A: SG "B" tube leakage.	_____ _____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
*5. P	Calculate Identified Leakage (9) and record on Form A.	Student verifies calculation for Identified Leakage (9) on Form A.	_____ _____
*6. P	Calculate Unidentified Leakage and record on Form A.	Student verifies calculation for Unidentified Leakage and record on Form A.	_____ _____

NOTE: If the student reports leak rate values but does not report that the values are SAT, then cue, **"Are the leakage results within allowed Tech Spec limits?"**

CUE: "The JPM is complete."

7.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 10 minutes
8.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.	_____ _____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Work Control Supervisor. You are going to verify a manual RCS steady state leak rate calculation.

B. The following information is provided to you:

1. The plant is in Mode 1, 100% steady state power.
2. Your shift started the manual RCS leak rate 72 hour surveillance at 0030 with the main plant computer out of service.
3. Chemistry reports that SG "B" tube leakage is 9.90 gpd.
4. The Primary Operator completed OX1401.02, RCS Steady State Leak Rate Calculation.

C. We will begin after the Initiating Cue is read. Do you have any questions?

Initiating Cue:

US to Work Control Supervisor, **"Work Control Supervisor (or student's name), verify the manual steady state leak rate calculation using OX1401.02 and the following collected data. Record any issues that you find on the Turnover Sheet. Correct any issues that you find. Discuss the results with me."**

"Start" Data @ 0030		"Finish" Data @ 0630	
Tavg	587.6°F	Tavg	587.5°F
PZR Level – LT-459	60%	PZR Level – LT-459	60%
VCT Level	50%	VCT Level	53%
Integrated Makeup	15 gal	Integrated Makeup	205 gal
PRT Level	81%	PRT Level	81%
RCDT Level	46%	RCDT Level	65%

KEY RO / SRO ADMIN JPM '1'

Form A: PM Number LEAK-OT002
Test Data Sheet
(Sheet 2 of 4)

MANUAL RCS LEAK RATE						
PARAMETER	INSTRUMENT USED	FINISH	START	CHANGE FINISH-START	CONVERSION	GALLONS OR MINUTES
TIME	MCB CLOCK	0630	0030	6	60 min/hr	360 min (1)
OBTAIN DATA FROM THE MAIN CONTROL BOARD AND CP-38A						
TAVG	DIGITAL	587.5 °F	587.6 °F	-0.1 °F	83.96 gal/°F **(Note 2)**	-8.396 gal (2)
PZR LEVEL	**(Note 4)** LT-459	60 %	60 %	0 %	61.31 gal/% **(Note 2)**	0 gal (3)
VCT LEVEL	LI-185	53 %	50 %	3 %	31.14 gal/%	93.42 gal (4)
INTEGRATED MAKEUP	CS-FIQ-111 **(Note 5)**	205 gal	15 gal	190 gal	N/A	190 gal (5)
PRT LEVEL	LI-470	11250 gal **(Note 3)**	11250 gal **(Note 3)**	0 gal	N/A	0 gal (6)
RCDT LEVEL	LI-1403 **(at CP-38A)**	230 gal **(Note 3)**	160 gal **(Note 3)**	70 gal	N/A	70 gal (7)
OBTAIN THIS DATA FROM ANY KNOWN SOURCE AND RECORD GALLONS **(Note 1)**						
						2.475 gal (8)
						gal (8)

IDENTIFIED LEAKAGE

* acceptable range 0.181 to 0.221

$$\frac{(8: 2.475) + (7: 70) + (6: 0) = (0.201\ *)\ \text{gpm}^{(9)}}{(360)/1}$$

Identified Leakage Acceptance Criteria ≤ 10 gpm

UNIDENTIFIED LEAKAGE

** acceptable range 0.024 to 0.064

$$\frac{(5: 190) + (2: -8.396) - (3: 0) - (4: 93.42)}{(360)/1} - (9: 0.201)\ \text{gpm} = 0.044\ **\ \text{gpm}$$

Unidentified Leakage Acceptance Criteria ≤ 1 gpm

Note 1: This is for sampling losses, accumulator leaks, steam generator tube leakage, etc.
Note 2: These conversion factors are only valid for normal operating temperature and pressure. If the plant is stable at a reduced pressure and temp and the computer is **not** available, use the conversion factors from Figure 2.
Note 3: Obtain tank volume from the Primary Technical Data Book and record gallons for calculation. Do **not** use % due to nonlinearity of the tank volume.
Note 4: Record the instrument number and use the same hot calibrated level indicator for both start and finish.
Note 5: Any RWST, BWST, or SF Pool makeups must be subtracted from the integrated makeup total.

Calculations checked by: _____

SG 'B' Tube leakage

$$\frac{9.9\ \text{gal}}{\text{day}} \left| \frac{1\ \text{day}}{24\ \text{hr}} \right| \frac{6\ \text{hr}}{} = 2.475\ \text{gal}$$

NEXTera ENERGY SEABROOK

SRO ADMIN JOB PERFORMANCE MEASURE '2'

APPROVE ECP CALCULATION

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

0010100201 Perform Estimated Critical Position (ECP) Calculations

2. Conditions:

A. The plant is preparing for a startup after a 2 day outage following an inadvertent reactor trip.

B. Plant condition/history is as follows:

a. Shift turnover has been completed and no surveillance's are planned or in progress.

b. MODE 3 with RCS at 557°F and 2235 psig.

c. The plant has been shutdown for two days as of 0000 today. It is now 0100.

d. Criticality planned for today at 0500

e. Desired Rod Position for criticality is Control Bank D at 100 steps.

f. RCS boron concentration (C_B), 1459 ppm. Sample time 0030 today.

g. Full Out Position is presently CBD @ 228 steps.

h. Core Burnup is 16,000 MWD/MTU.

i. Net Poison worth will be 500 pcm at 0500 today.

j. There is no boron depletion.

3. Standards:

A. Determine the critical boron concentration within ± 30 ppm using RS-1735 Form A, Block 6.

B. Determine the zero power rod insertion limit per RS1735 Form A, Block 9, item "A".

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of completed RS1735, Reactivity Calculations. Rev 8.
- Figures from the Primary Tech Data Book:
  - RE-01, Critical Boron Concentration, Rev. 01-17-00
  - RE-03, Differential Boron Worth, Rev. 01-17-00
  - RE-5, Overlap Integral Rod Worth vs Rod Position, Rev. 01-17-00
  - RE-16, Control Bank D Operating Band, Rev. 01-17-00
  - Core Operating Limits Report (SSTR Rev.140)
- Calculator

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- OS1000.07, Approach to Criticality
- RS1735, Reactivity Calculations, Rev 8

Sys	KA	Description	Value RO/SRO
192008	K1.07	Calculate ECP using procedures and given plant procedures.	3.5/3.6

7. Setting:

Simulator or Classroom

8. Safety Considerations:

None

9. Approximate Completion Time:

20 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Shift Manager. You are going to approve an Estimated Critical Position (ECP) calculation.

B. The following information is provided to you:

1. Shift turnover has been completed and no surveillance's are planned or in progress.
2. MODE 3 with RCS at 557°F and 2235 psig.
3. The plant has been shutdown for two days as of 0000 today. It is now 0100.
4. Criticality planned for today at 0500.
5. Desired Rod Position for criticality is Control Bank D at 100 steps.
6. RCS boron concentration (C_B), 1459 ppm. Sample time 0030 today.
7. Full Out Position is presently CBD @ 228 steps.
8. Core Burnup is 16,000 MWD/MTU.
9. Net Poison worth will be 500 pcm at 0500 today.
10. There is no boron depletion.
11. The Primary Operator completed the ECP and it has been verified by the Secondary Operator.
12. Perform the task using RS1735, Reactivity Calculations.

11. Initiating Cue:

Evaluator to Shift Manager, **"Shift Manager (or student's name), approve the Estimated Critical Position (ECP) using RS1735, Reactivity Calculations. Record any issues that you find on the Turnover Sheet. Correct any issues that you find. Discuss the results with me."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: Student will perform section 4.1, ECP Procedure (ECP Data & Analysis Form A) of RS1735.

NOTE: Student reviews prerequisites and precautions of RS1735.

2.	P	ENTER in Section 1 the date, time, burnup and desired rod position for the ECP.	Student verifies Section 1 data: • Date • Time • Burnup • Desired CB D rod position	_____	_____

NOTE: Student reviews following NOTE prior to step 4.1.2:
The value of C_0 may be alternately supplied by Reactor Engineering to take advantage of critical boron data measured at the present burnup.

CUE : If the student asks RE for alternative data as mentioned in NOTE prior to step 4.1.2, respond **"RE has no alternative data available. Use Figure RE-1 for Critical Boron Concentration."**

*3.	P	RECORD in Section 2 the Hot Zero Power (HZP), **no** xenon, critical boron concentration (C_0) from TDB Figure RE-01 for the burnup listed in Section 1.	Student verifies critical boron concentration (C_0) from Figure RE-01.	_____	_____
4.	P	RECORD in Section 3 the Net Poison Worth (NPW) at the expected time of criticality (ρ_I) as determined by Reactor Engineering **or** computer prediction.	Student verifies Net Poison Worth (NPW) at the expected time of criticality (ρ_I).	_____	_____
*5.	P	RECORD in Section 4 the inserted rod worth (ρ_R), from TDB Figure RE-05, "Overlap Integral Rod Worth vs. Rod Position (HZP)" for the desired rod position listed in Section 1.	Student verifies the inserted rod worth (ρ_R), from Figure RE-05.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*6. P	RECORD in Section 5 the Differential Boron Worth (DBW) at HZP from TDB Figure RE-03 "Differential Boron Worth vs. Burnup (HZP, HFP)" for the burnup listed in Section 1.	Student verifies the Differential Boron Worth (DBW) at HZP from Figure RE-03.	_____	_____
*7. P	COMPLETE the calculation in Section 6 to determine the estimated Critical Boron Concentration (C_B).	Student verifies the estimated Critical Boron Concentration (C_B).	_____	_____
*8. P	In Section 7, DETERMINE the Estimated Corrected Critical Boron Concentration (CCB) as follows:	Student verifies the Estimated Corrected Critical Boron Concentration (CCB) as follows:		
	1. RECORD the critical boron concentration from Form A, Section 6, in Form A, Section 7, block A.	1. Student verifies the critical boron concentration from Form A, Section 6, in Form A, Section 7, block A.	_____	_____
NOTE: Student reviews NOTE prior to step 4.1.7.2 regarding ^{10}B depletion.				
	2. If ^{10}B depletion is **not** to be accounted for, then record a 0 in block B and Go To Step 4.1.7.5.	2. Student recalls no boron depletion from the turnover information and goes to step 4.1.7.5.	_____	_____
	3. RECORD in block C the critical boron from block A and the delta critical boron concentration from block B.	3. Student verifies in block C the critical boron from block A and the delta critical boron concentration from block B.	_____	_____
	4. PERFORM the calculation in block C and RECORD the result in block D.	4. Student verifies the calculation in block C and records the result in block D.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
*9. P	In Section 8, determine the ECP administrative control rod insertion limit as follows:	Student verifies the ECP administrative control rod insertion limit as follows:	
	1. RECORD in block A the HZP Rod Insertion Limit (RIL) for control bank C from the COLR, "Core Operating Limits Report."	1. Student verifies in block A the HZP Rod Insertion Limit (RIL) for control bank C from the COLR.	_____ _____
	2. RECORD in block B the rod worth from Section 4, PERFORM the calculation and RECORD the results of the calculation in block B.	2. Student verifies in block B the rod worth from Section 4 and the results of the calculation in block B.	_____ _____
	3. RECORD in block C the control bank and steps using TDB Figure RE-05, "Overlap Integral Rod Worth vs. Rod Position (HZP)" corresponding to the rod worth calculated in block B	3. Student verifies in block C the control bank and steps using TDB Figure RE-05 corresponding to the rod worth calculated in block B.	_____ _____
	4. RECORD in block D the ECP administrative insertion limit by choosing the higher of the bank and steps recorded in blocks A and C.	4. Student verifies in block D the ECP administrative insertion limit from the higher of the bank and steps recorded in blocks A and C.	_____ _____
*10. P	In Section 9, determine the ECP administrative control rod withdrawal limit as follows:	Student verifies the ECP administrative control rod withdrawal limit as follows:	
NOTE: Student reviews NOTE prior to step 4.1.9.1 regarding HZP Moderator Temperature Coefficient (MTC) control rod withdrawal limits for the current cycle.			
	1. RECORD in block A the HZP Moderator Temperature Coefficient (MTC) rod withdrawal limit for control bank D using TDB Figure RE-16, "Control Bank D Operating Band."	1. Student verifies N/A in block A the HZP Moderator Temperature Coefficient (MTC) rod withdrawal limit for control bank D from Figure RE-16 per the NOTE prior to the step.	_____ _____

PERFORMANCE CHECKLIST

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

NOTE: Student reviews NOTE prior to step 4.1.9.2 regarding a negative result.

	2. RECORD in block B the rod worth from Section 4, PERFORM the calculation and RECORD the results of the calculation in block B.	2. Student verifies in block B the rod worth from Section 4 and the results of the calculation in block B.	_____	_____
	3. RECORD in block C the control bank and steps using TDB Figure RE-05, "Overlap Integral Rod Worth vs. Rod Position (HZP)" corresponding to the rod worth calculated in block B.	3. Student verifies in block C the control bank and steps using Figure RE-05 corresponding to the rod worth calculated in block B.	_____	_____
	4. RECORD in block D the ECP administrative withdrawal limit by choosing the lower of the bank and steps recorded in blocks A and C.	4. Student verifies in block D the ECP administrative withdrawal limit from the bank and steps recorded in blocks A and C.	_____	_____

CUE: "The JPM is complete."

11.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 20 minutes		
12.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the the Shift Manager. You are going to approve an Estimated Critical Position (ECP) calculation.

B. The following information is provided to you:

1. Shift turnover has been completed and no surveillance's are planned or in progress.
2. MODE 3 with RCS at 557°F and 2235 psig.
3. The plant has been shutdown for two days as of 0000 today. It is now 0100.
4. Criticality planned for today at 0500.
5. Desired Rod Position for criticality is Control Bank D at 100 steps.
6. RCS boron concentration (C_B), 1459 ppm. Sample time 0030 today.
7. Full Out Position is presently CBD @ 228 steps.
8. Core Burnup is 16,000 MWD/MTU.
9. Net Poison worth will be 500 pcm at 0500 today.
10. There is no boron depletion.
11. The Primary Operator completed the ECP and it has been verified by the Secondary Operator.
12. Perform the task using RS1735, Reactivity Calculations.

C. We will begin after the Initiating Cue is read. Do you have any questions?

Initiating Cue:

Evaluator to Shift Manager, **"Shift Manager (or student's name), approve the Estimated Critical Position (ECP) using RS1735, Reactivity Calculations. Record any issues that you find on the Turnover Sheet. Correct any issues that you find. Discuss the results with me."**

KEY RO/SRO ADMIN JPM 2

Form A: Estimated Critical Position Data & Analysis Form

(Sheet 1 of 3)

NOTE: Enter all input data as positive values.

1) Estimated Condition for Criticality

Date: Today Time: 0500 Burnup: 16,000 MWD/MTU

Desired Rod Position: CB D (Bank) @ 100 (Steps)

2) Design Critical Boron Concentration @ Current Burnup (HZP, ARO, No Xenon)

C_0 = 1200 ppm from TDB Figure RE-01

3) Net Poison Worth @ Expected Time of Criticality

ρ_I = 500 pcm from computer prediction or Reactor Engineering

4) Inserted Rod Worth @ Criticality

ρ_R = 425 pcm from TDB Figure RE-05

5) Differential Boron Worth @ Current Burnup (HZP)

DBW = 7.02 pcm/ppm from TDB Figure RE-03

6) Estimated Critical Boron Concentration

$$C_B = C_0 - \left(\frac{\rho_I + \rho_R}{DBW} \right)$$

$$C_B = 1200 \text{ ppm} - \left(\frac{500 \text{ pcm} + 425 \text{ pcm}}{7.02 \text{ pcm/ppm}} \right)$$

C_B = 1068 ppm

KEY RO/SRO ADMIN JPM 2

Form A: Estimated Critical Position Data & Analysis Form

(Sheet 2 of 3)

7) Corrected Critical Boron Concentration

A) C_B = 1068 ppm From Form A Section 6

B) ΔC_B = 0 ppm Use 0 if no ^{10}B depletion **OR** enter calculated amount from Form B Section 4 **OR** from an RE Calculation **OR** from an RCS isotopic analysis

C_{CB} = $C_B + \Delta C_B$ ppm

C) C_{CB} = 1068 ppm + 0 ppm

D) C_{CB} = 1068 ppm

8) ECP Administrative Control Rod Insertion Limit (AIL)

A) Rod Insertion Limit (RIL) = Bank: CB C @ 71 steps From COLR * CB C @ 150 also Acceptable

B) ρ_{AIL} = 425 ρ_R pcm + 500 pcm = 925 pcm From Form A Section 4

C) Rod Position at ρ_{AIL} = Bank: CB D @ 35 * steps From TDB Figure RE-05

D) ECP Administrative Insertion Limit = Bank: CB D @ 35 * steps Higher bank/step of A and C

9) ECP Administrative Control Rod Withdrawal Limit (AWL)

A) Rod Withdrawal Limit = Bank N/A @ N/A steps From TDB Figure RE-16

B) ρ_{AWL} = 425 ρ_R pcm – 500 pcm = 0 pcm From Form A Section 4

C) Rod Position at ρ_{AWL} = Bank: D @ 225 steps From TDB Figure RE-05

D) ECP Administrative Withdrawal Limit = Bank: D @ 225 steps Lower bank/steps of A and C

Completed By: PSO Date/Time: Today

Independently Verified By: BOP Date/Time: Today

Approved By SM: SM Date/Time Today

NEXTera ENERGY SEABROOK

SRO ADMIN JOB PERFORMANCE MEASURE '3'

REVIEW SHUTDOWN MARGIN SURVEILLANCE IN RESPONSE TO A DROPPED ROD

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

JOB PERFORMANCE WORKSHEET

1. Task Number and Description

Position RO

0010100401 Perform Shutdown Margin Calculation

2. Conditions:

A. The plant is in Mode 2, at 3% RTP.

B. Plant condition/history is as follows:

1. Core age is 12000 MWD/MTU
2. RCS boron concentration is 1300 ppm.
3. During a power adjustment, rod H-2 dropped to the bottom of the core.
4. OS1210.05, Dropped Rod actions are being performed.
5. Rod H-2 cannot be moved.

3. Standards:

Determine the shutdown margin within ±0.035%ΔK/K.

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of completed RX1707, Shutdown Margin Surveillance Rev 7 Chg.7.
- Figures from the Primary Tech Data Book:
  - RE-08 Total Power Defect vs. Power And Boron Concentration, Rev. 01-17-00.
  - RE-18 Shutdown Margin Values, Rev. 01-17-00.
  - RE-19 Control Bank Worth At RIL vs. Power Rev. 01-17-00.
  - Core Operating Limits Report (SSTR Rev.140)
- Calculator

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- OS1210.05, Dropped Rod
- RX1707, Shutdown Margin Surveillance Rev 7 Chg.7.

Sys	KA	Description	Value RO/SRO
Generic	2.2.12	Knowledge of Surveillance Procedures.	3.7/4.1

7. Setting:

Simulator or Classroom.

8. Safety Considerations:

None.

9. Approximate Completion Time:

15 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Unit Supervisor. The Primary Operator has performed shutdown margin verification. You are to review the shutdown margin verification.

B. The following information is provided to you:
   1. The plant is in Mode 2, at 3% RTP.
   2. Core age is 12000 MWD/MTU
   3. RCS boron concentration is 1300 ppm.
   4. During a power adjustment, rod H-2 dropped to the bottom of the core.
   5. OS1210.05, Dropped Rod actions are being performed.
   6. Rod H-2 cannot be moved.

C. We will begin after the Initiating Cue is read. Do you have any questions?

11. Initiating Cue:

SM to Unit Supervisor, **"Unit Supervisor (or student's name), "review the shutdown margin calculation per RX1707, Shutdown Margin Surveillance. Record any issues that you find on the Turnover Sheet. Correct any issues that you find. Discuss the results with me."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: Student reviews prerequisites and precautions of RX1707.

NOTE: Student will review the completed Form C: Shutdown Margin Determination Immovable, Untrippable Or Dropped Rod(s) in accordance with RX1707, section 4.4.

2.	P	Form C: Shutdown Margin Determination Immovable, Untrippable Or Dropped Rod(s), PART 1	Student reviews Form C, Part 1 as follows:		
		(a) Number of Immovable, Untrippable and Dropped Rod(s)	(a) Student reviews number of Immovable, Untrippable and Dropped Rod(s)	_____	_____
		(b) Maximum Worth Individual of Immovable, Untrippable **or** Dropped Rod (Primary Technical Data Book Figure RE-18).	(b) Student reviews maximum Worth Individual of Immovable, Untrippable **or** Dropped Rod (Primary Technical Data Book Figure RE-18)	_____	_____
		*(c) Total Unavailable Rod Worth	*(c) Student reviews calculation for Total Unavailable Rod Worth (a) X (b)	_____	_____
		*(d) Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	*(d) Student reviews the Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	_____	_____
		(e) Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	(e) Student reviews Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
	(f) Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	(f) Student reviews the Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	_____	_____
	*(g) Shutdown Margin [f - (c + d + e)] / 1,000	*(g) Student reviews calculation for the Shutdown Margin [f - (c + d + e)] / 1,000	_____	_____
3. P	Notify the SM/US if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report.	Student notifies the SM if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report.		
CUE:	**"The JPM is complete."**			
4.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 20 minutes		
5.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Unit Supervisor. The Primary Operator has performed shutdown margin verification. You are to review the shutdown margin verification. The following information is provided to you:
   1. The plant is in Mode 2, at 3% RTP.
   2. Core age is 12000 MWD/MTU
   3. RCS boron concentration is 1300 ppm.
   4. During a power adjustment, rod H-2 dropped to the bottom of the core.
   5. OS1210.05, Dropped Rod actions are being performed.
   6. Rod H-2 cannot be moved.

B. We will begin after the Initiating Cue is read. Do you have any questions?

Initiating Cue:

SM to Unit Supervisor, **"Unit Supervisor (or student's name), "review the shutdown margin calculation per RX1707, Shutdown Margin Surveillance. Record any issues that you find on the Turnover Sheet. Correct any issues that you find. Discuss the results with me."**

KEY RO/SRO ADMIN JPM3

Form C: Shutdown Margin Determination Immovable, Untrippable Or Dropped Rod(s)

(Sheet 1 of 2)

PART I

Shutdown Margin Determination - MODEs 1 and 2 (Step 4.4.1.1)	
Number of Immovable, Untrippable and Dropped Rod(s)	1 (a)
Maximum Worth Individual of Immovable, Untrippable **or** Dropped Rod (Primary Technical Data Book Figure RE-18)	1128 (b) pcm
Total Unavailable Rod Worth = 1 (a) x 1128 (b) pcm = 1128 (c) pcm	
Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	80 (d) pcm
Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	2000 (e) pcm
Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	5373 (f) pcm
Shutdown Margin [f - (c + d + e)] / 1,000	2.165 ** %ΔK/K
Notify the SM/US if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report. *	

Completed By _____ Date _____

Independently Verified By _____ Date _____

US Review _____ Date _____

SM Review _____ Date _____

* SDM is greater than the limit in the COLR.

** acceptable range 2.130 to 2.200

NEXTera ENERGY SEABROOK

SRO ADMIN JOB PERFORMANCE MEASURE '4'

VERIFY COP EXHAUST RAD MONITOR SETPOINTS

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position	RO/SRO
0290100201	Start-Up the COP System
0290100501	Adjust Containment Pressure Using the COP System
0710101302	Authorize Release of Gaseous Waste.

2. Conditions:

A. The plant is in Mode 1, 100% steady state power.

B. The previous shift has made preparations to place COP in service per OS1023.69 section 4.2.

3. Standards:

Verify correct COP Exhaust Radiation Monitors Alert and Alarm setpoints prior to gaseous effluent release per OS1023.69 section 4.2.

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of OS1023.69, Containment On-Line Purge System Operation
- Copy of CS0917.02 Form C, GEW Containment Purge Release Permit
- Calculator

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- OS1023.69, Containment On-Line Purge System Operation, Rev. 12
- CS0917.02, Gaseous Effluent Releases, Rev. 10, Chg. 12.
- CP-4.1 Effluent Surveillance Program

Sys	KA	Description	Value RO/SRO
Generic	2.3.11	Ability to Control Radiation Releases	3.8/4.3

7. Setting:

Simulator or Classroom

8. Safety Considerations:

None

9. Approximate Completion Time:

20 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Unit Supervisor. You are going to verify the COP Exhaust Radiation Monitors alarm setpoints prior to placing COP in service.

B. The following information is provided to you:

1. The plant is in Mode 1, 100% steady state power.
2. The Primary Operator has completed OS1023.69, section 4.2 for placing COP in service.
3. Perform the task per OS1023.69 Containment On-Line Purge Operation, section 4.2.
4. CS0917.02 Form C, release permit, has already been approved.

C. We will begin after the Initiating Cue is read. Do you have any questions?

11. Initiating Cue:

Shift Manager to Unit Supervisor, **"Unit Supervisor (or student's name), verify the COP Exhaust Radiation Monitors alarm setpoints per OS1023.69 step 4.2 and the following collected data. Record any issues that you find on the Turnover Sheet. Correct any issues that you find. Discuss the results with me."**

Monitor ID	Current Background Value (CPM)	Alert Value (CPM)	High Value (CPM)
1-RM-6527A-1	23.5	33.3	43.2
1-RM-6527A-2	18.1	24.0	31.2
1-RM-6527B-1	25.7	36.0	48.0
1-RM-6527B-2	16.4	23.5	30.5

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
1. P	Start time _____	Initiating cue read		
CUE:	If the student requests a Peer Check at any time during the JPM respond, **"No one is available to Peer Check your actions. Please continue with the task."**			
*2. P	RECORD the alert and high alarm setpoint values from CP-295 for the COP rad monitors:	Student verifies the alert and high alarm setpoint values from CP-295 for the COP rad monitors:		
	1-RM-6527A-1	1-RM-6527A-1	____	____
	1-RM-6527A-2	1-RM-6527A-2	____	____
	1-RM-6527B-1	1-RM-6527B-1	____	____
	1-RM-6527B-2	1-RM-6527B-2	____	____
*3. P	RECORD the current background readings from CP-295 for the COP rad monitors:	Student verifies the current background readings from CP-295 for the COP rad monitors:		
	1-RM-6527A-1	1-RM-6527A-1	____	____
	1-RM-6527A-2	1-RM-6527A-2	____	____
	1-RM-6527B-1	1-RM-6527B-1	____	____
	1-RM-6527B-2	1-RM-6527B-2	____	____
*4. P	RECORD the expected radiation monitor response from the Gaseous Effluent Waste (GEW) Containment Purge Release Permit, CH-L524, obtained from Chemistry.	Student verifies the expected radiation monitor response from the Gaseous Effluent Waste (GEW) Containment Purge Release Permit, CH-L524, obtained from Chemistry.	____	____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*5. P	ADD the Expected Radiation Monitor Response value to the current COP rad monitor background levels recorded in step 4.2.2. These become the new COP rad monitor "in service" background levels:	Student verifies the calculation to add the Expected Radiation Monitor Response value to the current COP rad monitor background levels recorded in step 4.2.2. These become the new COP rad monitor "in service" background levels:		
	1-RM-6527A-1	1-RM-6527A-1	_____	_____
	1-RM-6527A-2	1-RM-6527A-2	_____	_____
	1-RM-6527B-1	1-RM-6527B-1	_____	_____
	1-RM-6527B-2	1-RM-6527B-2	_____	_____

NOTE: Student reviews CAUTION and NOTE prior to step 4.2.5.

*6. P	COMPARE the **new** COP Monitor Background Levels to the alert and high alarm values recorded in step 4.2.1. DETERMINE the need to make RDMS data base changes by checking the following: If the high alarm value remains within 2X background as prescribed in Tech. spec 3.3.2, table 3.3-4, Item 3.c.4), **AND** The alert alarm value remains sufficiently higher than the **new** COP monitor in-service background levels to avoid an inadvertent alert alarm, **THEN** **No** RDMS data base changes are required. CONTINUE with step 4.2.7.	Student compares the new COP Monitor background levels to the alert and high alarm values recorded in step 4.2.1 and verifies the correct determination for the need to make RDMS data base changes.	_____	_____

NOTE: If the student determines that it is **not** necessary to perform step 4.2.6, then the JPM is complete and the JPM is a **FAILURE**.

PERFORMANCE CHECKLIST

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

CUE: After the student determines that it is necessary to make RDMS data base changes, respond **"Step 4.2.6.1 will be performed by the BOP operator and is in progress. Continue with step 4.2.6.2"**

*7.	P	CALCULATE the **new** alert alarm setpoint by multiplying the **new** COP monitor background level recorded in step 4.2.4 by 1.5 for each monitor to be changed:	Student verifies the calculation for the new alert alarm setpoint by multiplying the new COP monitor background level recorded in step 4.2.4 by 1.5 for each monitor to be changed:	
		1-RM-6527A-1	1-RM-6527A-1	____ ____
		1-RM-6527A-2	1-RM-6527A-2	____ ____
		1-RM-6527B-1	1-RM-6527B-1	____ ____
		1-RM-6527B-2	1-RM-6527B-2	____ ____
*8.	P	CALCULATE the **new** high alarm setpoint by multiplying the **new** COP monitor background level recorded in step 4.2.4 by 1.95 for each monitor to be changed:	Student verifies the calculation for the new high alarm setpoint by multiplying the new COP monitor background level recorded in step 4.2.4 by 1.95 for each monitor to be changed:	
		1-RM-6527A-1	1-RM-6527A-1	____ ____
		1-RM-6527A-2	1-RM-6527A-2	____ ____
		1-RM-6527B-1	1-RM-6527B-1	____ ____
		1-RM-6527B-2	1-RM-6527B-2	____ ____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
CUE:	**"The JPM is complete."**		
9.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 10 minutes	
10.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		____ ____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Unit Supervisor. You are going to verify the COP Exhaust Radiation Monitors alarm setpoints prior to placing COP in service.

B. The following information is provided to you:

1. The plant is in Mode 1, 100% steady state power.
2. The Primary Operator has completed OS1023.69, section 4.2 for placing COP in service.
3. Perform the task per OS1023.69 Containment On-Line Purge Operation, section 4.2.
4. CS0917.02 Form C, release permit, has already been approved.

C. We will begin after the Initiating Cue is read. Do you have any questions?

Initiating Cue:

Shift Manager to Unit Supervisor, **"Unit Supervisor (or student's name), verify the COP Exhaust Radiation Monitors alarm setpoints per OS1023.69 step 4.2 and the following collected data. Record any issues that you find on the Turnover Sheet. Correct any issues that you find. Discuss the results with me."**

Monitor ID	Current Background Value (CPM)	Alert Value (CPM)	High Value (CPM)
1-RM-6527A-1	23.5	33.3	43.2
1-RM-6527A-2	18.1	24.0	31.2
1-RM-6527B-1	25.7	36.0	48.0
1-RM-6527B-2	16.4	23.5	30.5

KEY RO / SRO ADMIN JPM 4

4. INSTRUCTIONS

4.1 System Lineup

- 4.1.1 PERFORM applicable sections of system lineup, Form B, as directed by US.

4.2 Placing The Containment On-Line Purge System In Service

- 4.2.1 RECORD the alert and high alarm setpoint values from CP-295 for the COP rad monitors:

Monitor ID	Alert Value (CPM)	High Value (CPM)
1-RM-6527A-1	33.3	43.2
1-RM-6527A-2	24.0	31.2
1-RM-6527B-1	36.0	48.0
1-RM-6527B-2	23.5	30.5

- 4.2.2 RECORD the **CURRENT** background readings from CP-295 for the COP rad monitors:

Monitor ID	Current Background Value (CPM)
1-RM-6527A-1	23.5
1-RM-6527A-2	18.1
1-RM-6527B-1	25.7
1-RM-6527B-2	16.4

- 4.2.3 RECORD the expected radiation monitor response from the Gaseous Effluent Waste (GEW) Containment Purge Release Permit, CH-L524, obtained from Chemistry.

Expected Radiation Monitor Response (CPM): 6.5

KEY RO/SRO ADMIN JPM 4

• 4.2.4 ADD the Expected Radiation Monitor Response value to the **CURRENT** COP rad monitor background levels recorded in step 4.2.2. These become the **new** COP rad monitor "in service" background levels:

Monitor ID	Current Background Level Indication (CPM)		Expected Radiation Monitor Response (CPM)		New COP Monitor Background Level CPM)
1-RM-6527A-1	23.5	+	6.5	=	30.0
1-RM-6527A-2	18.1	+	6.5	=	24.6
1-RM-6527B-1	25.7	+	6.5	=	32.2
1-RM-6527B-2	16.4	+	6.5	=	22.9

CAUTION

Changing conditions in the PAB can effect COP monitor background levels. Consideration should be given to evolutions in process that could increase COP monitor background levels when determining the need for making RDMS data base changes prior to placing COP in service.

NOTE

Normally, the expected radiation monitor response from containment does **not** add a significant contribution to the in-service COP monitor background levels, making changes to the alert and high alarm setpoints unnecessary.

• 4.2.5 COMPARE the **new** COP Monitor Background Levels to the alert and high alarm values recorded in step 4.2.1. DETERMINE the need to make RDMS data base changes by checking the following:

RDMS changes required. Go to Step 4.2.6.

- If the high alarm value remains within 2X background as prescribed in Tech. spec 3.3.2, table 3.3-4, Item 3.c.4),

AND

- The alert alarm value remains sufficiently higher than the **new** COP monitor in-service background levels to avoid an inadvertent alert alarm,

THEN

No RDMS data base changes are required. CONTINUE with step 4.2.7.

KEY RO/SRO Admin JPM 4

4.2.6 If COP rad monitor RDMS setpoint change requests are required, then PERFORM the following:

☐ 4.2.6.1 INITIATE MA4.6A, RDMS Data Base Item Change Request, (one form per monitor) for each of the following COP rad monitors as required:

1-RM-6527A-1

1-RM-6527A-2

1-RM-6527B-1

1-RM-6527B-2

☐ 4.2.6.2 CALCULATE the **new** alert alarm setpoint by multiplying the **new** COP monitor background level recorded in step 4.2.4 by 1.5 for each monitor to be changed:

Monitor ID	New COP Monitor Background Level (step 4.2.4)			New Alert Alarm Setpoint
1-RM-6527A-1	30.0	X 1.5	=	45.0
1-RM-6527A-2	24.6	X 1.5	=	36.9
1-RM-6527B-1	32.2	X 1.5	=	48.3
1-RM-6527B-2	22.9	X 1.5	=	34.4

☐ 4.2.6.3 CALCULATE the **new** high alarm setpoint by multiplying the **new** COP monitor background level recorded in step 4.2.4 by 1.95 for each monitor to be changed:

Monitor ID	New COP Monitor Background Level (step 4.2.4)			New High Alarm Setpoint
1-RM-6527A-1	30.0	X 1.95	=	58.5
1-RM-6527A-2	24.6	X 1.95	=	48.0
1-RM-6527B-1	32.2	X 1.95	=	62.8
1-RM-6527B-2	22.9	X 1.95	=	44.7

SRO ADMIN JOB PERFORMANCE MEASURE '5'

POST SCENARIO EMERGENCY PLAN CLASSIFICATION AND NOTIFICATION

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position SRO

1190402003 Perform required notifications of on-site and off-site personnel for emergency events.

2. Conditions:

A. As applicable to associated simulator scenario.

B. No code yellow security event in progress.

3. Standards:

Classify the emergency condition and complete the State Notification Fact Sheet.

4. Student Materials:

- Copy of Turnover Sheet.
- Copy of ER-1.1, Classification of Emergencies
- Copy of ER-1.2, Emergency Plan Activation

5. Limitations On Performance:

Perform all steps. Even if requested, no Peer Checks will be provided during the JPM.

6. References:

Procedures:

- ER-1.1, Classification of Emergencies
- ER-1.2, Emergency Plan Activation

Sys	KA	Description	Value RO/SRO
Generic	2.3.40	Knowledge of SRO responsibilities in emergency plan implementation.	2.7/4.5
Generic	2.3.41	Knowledge of the emergency action level thresholds and classifications.	2.9/4.6
Generic	2.3.43	Knowledge of emergency communications systems and techniques.	3.2/3.8

7. Setting:

Simulator, post scenario in FREEZE.

Note to Evaluator:
Because this JPM is done with the simulator in freeze the Control Board clock cannot be used to track time. The digital clock on the Communications Console or a wristwatch must be used. There is a reminder cue in the body of the JPM.

8. Safety Considerations:

None

9. Approximate Completion Time:

30 minutes

10. Directions To The Student:

Evaluator gives Turnover sheet and required materials to the student.

Evaluator reads the following to student:

A. You are the Work Control Supervisor. You will classify the Emergency Condition based on the most severe condition experienced during the scenario and complete the State Notification Fact Sheet.

B. The following information is provided to you:

   1. The plant condition is as applicable to associated simulator scenario.
   2. Perform the task using ER-1.1, Classification of Emergencies.
   3. No code yellow security event in progress.

C. We will begin after the Initiating Cue is read.

D. This task is time critical.

E. The evaluator will act as the Shift Manager and provide the cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

Shift Manager to Work Control Supervisor, **"Work Control Supervisor (or student's name), classify the Emergency Condition based on the most severe condition experienced during the scenario. Complete the State Notification Fact Sheet and notify the states."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: Student enters ER 1.1, Classification of Emergencies (blue binder).

*2.	P	Depending upon the plant mode in effect when the potential emergency initiating condition occurs, review the following forms:	Depending upon the plant mode in effect when the potential emergency initiating condition occurs, student reviews the following forms:	
		ER 1.1 A, Emergency Initiating Condition Matrix Modes 1, 2, 3 and 4	ER 1.1 A, Emergency Initiating Condition Matrix Modes 1, 2, 3 and 4	_____ _____
		ER 1.1C, Fission Product Barrier Degradation Matrix Modes 1, 2, 3 and 4	ER 1.1C, Fission Product Barrier Degradation Matrix Modes 1, 2, 3 and 4	_____ _____
		ER 1.1B, Emergency Initiating Condition Matrix Modes 5, 6 and Defueled	ER 1.1B, Emergency Initiating Condition Matrix Modes 5, 6 and Defueled	_____ _____

CUE: If the student is considering an emergency classification under a radiological effluent EAL which requires a dose projection (AS1 or AG1), cue the following, **"No dose projection will be performed. Please continue with the next step."**

*3.	P	If an emergency classification is being considered under a radiological effluent EAL which requires a dose projection (AS1 or AG1), implement offsite dose assessment using procedure ER 5.7, Initial Offsite Dose Projection.	Student goes to step 3 of ER 1.1.	_____ _____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*4. P	Circle the potential emergency initiating condition(s) on each Form. This assessment must be performed promptly to support the goal of making an emergency declaration within 15 minutes of initial EAL indications becoming available in the Control Room.	Student circles the potential emergency initiating condition(s) on each Form.	_____	_____
*5. P	For Category A, E, H, S and C events, refer to the initiating condition EAL(s) in Figure 1 and verify that either the EAL(s) is met or the intent is met. All Category F EALs are presented on Form ER 1.1C (i.e., not in Figure 1).	Student verifies that the EAL is met or the intent of the initiating condition is met.	_____	_____
*6. P	Identify the most severe (highest) emergency classification for which the EAL(s) is met or the intent of the initiating condition is met.	Student identifies the most severe (highest) emergency classification for which the EAL(s) is met or the intent of the initiating condition is met.	_____	_____

NOTE: Student reviews NOTE prior to step 6.

*7. P	If an emergency declaration is warranted, immediately implement Station Emergency Response Procedure ER 1.2, Emergency Plan Activation.	Student determines an emergency declaration is warranted and immediately implements Station Emergency Response Procedure ER 1.2, Emergency Plan Activation.	_____	_____

NOTE: Student enters ER 1.2, Emergency Plan Activation and obtains the appropriate binder.

- Unusual Event (Green binder)
- Alert (Yellow binder)
- Site Area Emergency (Orange binder)
- General Emergency (Red binder)

PERFORMANCE CHECKLIST

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

CUE: When the student gets to the step to assume the role of the STED, if asked, the Evaluator responds **"I am the STED."**

8.	P	Assume the role of STED.	Student verifies Shift Manager is the STED.	____	____
*9.	P	Implement one of the following forms based on the emergency classification:	Student implements **ONE** of the following forms based on the emergency classification:		
		Form ER 1.2A, Unusual Event Checklist - Short Term Emergency Director.	Form ER 1.2A, Unusual Event Checklist - Short Term Emergency Director.	____	____
		Form ER 1.2B, Alert Checklist - Short Term Emergency Director.	Form ER 1.2B, Alert Checklist - Short Term Emergency Director.	____	____
		Form ER 1.2C, Site Area Emergency Checklist - Short Term Emergency Director.	Form ER 1.2C, Site Area Emergency Checklist - Short Term Emergency Director.	____	____
		Form ER 1.2D, General Emergency Checklist - Short Term Emergency Director.	Form ER 1.2D, General Emergency Checklist - Short Term Emergency Director.	____	____
*10.	P	If entering this checklist during a code yellow security event, implement ER1.2 actions in parallel with the code yellow actions directed by OS1290.03. Make **both** the security **and** the emergency classification related plant announcements per OS1290.03 and ER 1.2.	Student recalls from the Turnover Sheet no code yellow security event in progress.	____	____

NOTE: Student reviews CAUTION prior to step 2.

PERFORMANCE CHECKLIST

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

NOTE: The time recorded for the UPDATE starts the 15 minute clock to to notify the states. This task is time critical.

*11.	P	Declare the emergency via a crew UPDATE by announcing the emergency classification. Enter the time of the UPDATE _____. This is the time of the emergency declaration.	STED declares the emergency via a crew UPDATE by announcing the emergency classification and records the time of the UPDATE.	_____ _____
*12.	P	Enter the emergency initiating condition designation (e.g., AU1, etc.) _____.	Student enters the emergency initiating condition designation.	_____ _____

NOTE: Depending on the type of declaration, the student may have to perform the next step. If not, then N/A the next step.

*13.	P	DETERMINE REMOTE MONITORING AREA (RMA) ACTIVATION	Student determines remote monitoring area (RMA) activation.	_____ _____
*14.	P	NOTIFY GUARD ISLAND SECURITY	Student notifies guard island security as follows:	
		a. Contact Guard Island Security at x4006 or x4008.	a. Contact Guard Island Security at x4006 or x4008.	_____ _____
		b. Direct implementation of procedure GN1332.00, Security Response to a Declared Radiological Emergency.	b. Direct implementation of procedure GN1332.00, Security Response to a Declared Radiological Emergency.	_____ _____
		c. Provide the following information: • A _____ has been declared. • Time of declaration per step 2 • The emergency initiating condition per step 3 • The remote monitoring area is/is not being activated	c. Provide the following information: • A _____ has been declared. • Time of declaration per step 2 • The emergency initiating condition per step 3 • The remote monitoring area is/is not being activated	_____ _____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*15. P	NOTIFY STATION PERSONNEL	Student notifies station personnel as follows:		
	a. Ensure Gaitronics night muting is off.	a. Ensure Gaitronics night muting is off.	_____	_____
	b. Sound the plant emergency alarm.	b. Sound the plant emergency alarm.	_____	_____
	c. Using the Gaitronics override, make the proper announcement.	c. Using the Gaitronics override, make the proper announcement.	_____	_____
	d. Repeat the plant emergency alarm.	d. Repeat the plant emergency alarm.	_____	_____
	e. Using the Gaitronics override, repeat the proper announcement.	e. Using the Gaitronics override, repeat the proper announcement.	_____	_____
*16. P	COMPLETE FORM ER 2.0B, STATE NOTIFICATION FACT SHEET	Student completes form ER 2.0B, State Notification Fact Sheet as follows:		
	a. Block 1 - Leave blank	a. Block 1 - Leave blank	_____	_____
	b. Block 2 – Enter time declared from step 2 and check the proper event.	b. Block 2 – Enter time declared from step 2 and check the proper event.	_____	_____
	c. Block 3 – Enter the emergency initiating condition designation	c. Block 3 – Enter the emergency initiating condition designation	_____	_____

NOTE: Depending on the type of declaration, the student may have to determine appropriate protective action recommendations.

	d. Block 4 - Check the proper block(s).	d. Block 4 - Check the proper block(s).	_____	_____
	e. Block 5 - Use the procedure "release" guidance when completing this block.	e. Block 5 - Use the procedure "release" guidance when completing this block.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
NOTE:	When student presents form for authorization: **Make no comments of any sort on the information recorded. Evaluator should sign form as STED**			
	f. Block 6 – Requires authorization signature of the STED or SED	d. Block 6 – Requires authorization signature of the STED or SED	_____	_____
	g. Block 7 – Leave blank	e. Block 7 – Leave blank	_____	_____
*17.	P NOTIFY THE STATES	Student notifies the states as follows:		
	a. Give the completed copy of form ER 2.0B to the Work Control Supervisor.	a. Give the completed copy of form ER 2.0B to the Work Control Supervisor.	_____	_____
	b. Direct the Work Control Supervisor to implement form ER 1.2E.	b. Student implements form ER 1.2E.	_____	_____
NOTE:	Student reviews CAUTION prior to step 1.			
*18.	P Obtain the completed form ER 2.0B, State Notification Fact Sheet, from the STED.	Student obtains the completed form ER 2.0B, State Notification Fact Sheet, from the STED.	_____	_____
*19.	P Enter your name and title in Block 1.	Student enters their name and title in Block 1.	_____	_____
*20.	P Contact the NH State Police and MA Emergency Management Agency using the Nuclear Alert System (NAS or orange phone), as follows:	Student contacts the NH State Police and MA Emergency Management Agency using the Nuclear Alert System (NAS or orange phone), as follows:		
	a. Pick up the handset and press Group Call Number **A1**.	a. Student picks up the handset and press Group Call Number **A1**.	_____	_____
	b. Verify that both NH and MA dispatcher(s) are on the line.	b. Student verifies that both NH and MA dispatcher(s) are on the line.	_____	_____
	c. **IF** neither state responds, go immediately to step 4.	c. Student goes to step 3d.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
	d. Ensure that the dispatcher(s) answering has (have) a copy of the State Notification Fact Sheet.	d. Student ensures that the dispatcher(s) answering has (have) a copy of the State Notification Fact Sheet.	_____	_____

NOTE: Time Notification Initiated must be within 15 minutes of the time when the UPDATE was made in Step 11 of this JPM.

	e. Enter the Time Notification Initiated to NH and MA on the first line of form ER 2.0B.	e. Student enters the Time Notification Initiated to NH and MA on the first line of form ER 2.0B.	_____	_____
	f. Read all information slowly and clearly.	f. Student reads all information slowly and clearly.	_____	_____
	g. Verify that the dispatcher(s) has (have) received the correct information by asking one to read back the information.	g. Student verifies that the dispatcher(s) has (have) received the correct information by asking one to read back the information.	_____	_____
	h. Obtain the name(s) of the dispatcher(s) and enter in Block 7.	h. Student obtains the name(s) of the dispatcher(s) and enters in Block 7.	_____	_____
	i. Press **A#** to end the group call, and then hang-up the handset.	i. Student presses **A#** to end the group call, and then hangs-up the handset.	_____	_____

CUE: "The JPM is complete."

21.	Stop time _____ Evaluator calculates time difference from JPM Step 11 to Step 20e. This time must be ≤15 minutes for SAT JPM.	Time to complete task ≤ 30 minutes	_____	_____
22.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Work Control Supervisor. You will classify the Emergency Condition based on the most severe condition experienced during the scenario and complete the State Notification Fact Sheet.

B. The following information is provided to you:

   1. The plant condition is as applicable to associated simulator scenario.
   2. Perform the task using ER-1.1, Classification of Emergencies.
   3. No code yellow security event in progress.

C. We will begin after the Initiating Cue is read.

D. The evaluator will act as the Shift Manager and provide the cues and communications for this JPM. Do you have any questions?

Initiating Cue:

Shift Manager to Work Control Supervisor, **"Work Control Supervisor (or student's name), classify the Emergency Condition based on the most severe condition experienced during the scenario. Complete the State Notification Fact Sheet and notify the states."**

NEXTera ENERGY SEABROOK

CONTROL ROOM JOB PERFORMANCE MEASURE 'a'

PERFORM A BLENDED MAKEUP

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

JOB PERFORMANCE WORKSHEET

1. Task Number and Description

Position RO

0040102501 Manually Makeup to the VCT (blended makeup)

2. Conditions:

A. A manual blended makeup to the VCT is required due to normal system losses.

B. After makeup is initiated, CS-FCV-110A, Boric Acid Flow to the Blender, will fail closed stopping boric acid flow while the RMW flow continues.

3. Standards:

Perform a 500 gallon manual blended makeup to the VCT.

4. Student Materials:

- Copy of Tear-Off Sheet.
- Copy of completed RS1735, Reactivity Calculations, Rev. 8
- Copy of OS1008.01, Chemical and Volume Control System Makeup Operations, Rev. 34, Section 4.6

5. Limitations On Performance:

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

6. References:

Procedures:

- RS1735, Reactivity Calculations
- OS1008.01, Chemical and Volume Control System Makeup Operations, Rev. 34

Sys	KA	Description	Value RO/SRO
004	A4.07	Ability to manually operate and/or monitor boration/dilution in the control room.	3.9/3.7

7. Setting:

Simulator: Reset the simulator to a preset IC or perform the following.

A. Initialize the simulator to a 100% power IC.

B. Verify or adjust the VCT level to approximately 40%.

8. Safety Considerations:

None.

9. Approximate Completion Time:

15 minutes

10. Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You will perform a manual blended makeup to the VCT due to normal system losses.

B. The following information is provided to you:

1. The plant is at 100%.
2. Perform the task using OS1008.01, Chemical and Volume Control System Makeup Operations.

C. We will begin after the Initiating Cue is read.

D. The US will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), perform a 500 gallon manual blended makeup to the top of the VCT through CS-FCV-111B at 70 gpm, Step Back ON and 20 gallon flush. The manual blended makeup has been calculated and verified."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

CUE: Give the student the completed RS1735 for the 500 gallon blended makeup.

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

NOTE: Student reads Note prior to step 4.6.1 of OS1008.01.

CUE: If the student asks for Section 4.1 of OS1008.01 to verify CVCS Makeup System is aligned for AUTO respond, **"CVCS Makeup System is aligned for AUTO."**

2.	P	If the CVCS Makeup System is not aligned for AUTO, PERFORM Section 4.1 prior to performing this section.	Student verifies CVCS Makeup System is aligned for AUTO.	____	____
3.	P	DETERMINE desired total makeup and boric acid quantities and flow rates.	Student uses reviews values from completed RS1735.	____	____

CUE: If questioned about CS-F-5 DP respond, **"No NSO is available to check CS-F-5 DP."**

4.	P	If possible, locally OBTAIN CS-F-5, Boric Acid Filter, DP during the makeup. If DP is approaching 10 psid, INITIATE PM CS-F-5-C1.	Student contacts primary NSO about CS-F-5 DP.	____	____
*5.	P	PLACE the BLENDER MODE START SWITCH to STOP.	Student places the BLENDER MODE START SWITCH to STOP	____	____
*6.	P	PLACE the BORIC ACID BLENDER MODE SELECTOR SWITCH to MANUAL.	Student places the BORIC ACID BLENDER MODE SELECTOR SWITCH to MANUAL.	____	____
*7.	P	Using 1-CS-FIQ-111, SET "MAKEUP TARGET" to the desired quantity.	Student uses 1-CS-FIQ-111 and SETs "MAKEUP TARGET" to the desired quantity.	____	____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*8. P	Using 1-CS-FIQ-111, SET "BORIC ACID TARGET" to the desired quantity.	Student uses 1-CS-FIQ-111 and SETs "BORIC ACID TARGET" to the desired quantity.	____	____
NOTE: Student reads Note prior to step 4.6.8 of OS1008.01.				
*9. P	Using 1-CS-FIQ-111, SET "MAKEUP FLOW RATE" to the desired flow rate.	Student uses 1-CS-FIQ-111 and SETs "MAKEUP FLOW RATE" to the desired flow rate.	____	____
*10. P	Using 1-CS-FIQ-111, SET "BORIC ACID FLOW RATE" to the desired flow rate.	Student uses 1-CS-FIQ-111 and SETs "BORIC ACID FLOW RATE" to the desired flow rate.	____	____
NOTE: Student reads Note prior to step 4.6.10 of OS1008.01.				
11. P	If step back is not desired, using 1-CS-FIQ-111, TURN "STEP BACK" OFF.	Student leaves STEP BACK ON.	____	____
NOTE: Student reads Note prior to step 4.6.11 of OS1008.01.				
12. P	Using 1-CS-FIQ-111, SET "FLUSH" to the desired quantity.	Student verifies 1-CS-FIQ-111 "FLUSH" at 20 gallons.	____	____
*13. P	If makeup to the top of the VCT is desired, PLACE the control switch for CS-FCV-111B, BORIC ACID BLENDER TO VCT, to OPEN.	Student places the control switch for CS-FCV-111B, BORIC ACID BLENDER TO VCT, to OPEN.	____	____
14. P	If makeup to the charging pumps is desired, PLACE the control switch for CS-FCV-110B, BORIC ACID BLENDER TO CHG PUMPS, to OPEN.	Student leaves the control switch for CS-FCV-110B, BORIC ACID BLENDER TO CHG PUMPS, in AUTO.	____	____

PERFORMANCE CHECKLIST

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

NOTE: Student reads Note prior to step 4.6.14 of OS1008.01.

- Student **shall** remain at the makeup controls during the makeup to ensure proper system response and to verify the desired volumes are added.
- Student will closely monitore the following indications during and after the boration/dilution until steady state operation is achieved:
  - Nuclear Instrumentation
  - Tavg
  - Loop ΔT
  - C0006, THERMAL POWER 4 MIN AVG

*15.	P	TURN the BLENDER MODE START SWITCH to START **and** HOLD for approximately **one** second.	Student turns the BLENDER MODE START SWITCH to START and HOLDs for approximately one second.	_____	_____

NOTE: There are two potential paths for the student to identify the following failure. The student may note the loss of boric acid flow while monitoring OR VAS alarm F8142, Boric Acid Blend Deviation HI-LO actuation. If the student notes the loss of boric acid flow while monitoring, then go to JPM Step 16. If the student receives VAS alarm F8142, Boric Acid Blend Deviation HI-LO, then go to JPM Step 17.

******BEGIN ALTERNATE PATH******

CUE: CS-FCV-110A fails closed stopping the boric acid flow:

- SELECT: MF LIST
- SELECT: CHEMICAL VOLUME CONTROL SYSTEM (Component)
- SELECT: mdCSV110A
- SELECT: GO TO POS
- SELECT: Value = 0
- SELECT: Ramp Time = 15
- SELECT: Insert

CUE: When student informs US that CS-FCV-110A, BORIC ACID FLOW TO BLENDER has failed closed and recommends using 'Skill of the Operator' to stop the blended makeup, respond **"I concur."**

*16.	P	Stop the blended makeup.	Student turns the BLENDER MODE START SWITCH to STOP.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
CUE:	When student reviews VAS alarm F8142, Boric Acid Blend Deviation HI-LO and recommends stopping the blended makeup, respond **"I concur."**			
*17. P	Stop the blended makeup.	Student turns the BLENDER MODE START SWITCH to STOP.	_____	_____
CUE:	**"The JPM is complete."**			
18.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 15 minutes		
19.	Obtain from student: Tear Off sheets and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TEAR OFF SHEET FOR CONTROL ROOM 'a' JPM

Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator.
B. The following information is provided to you:
   1. A manual blended makeup to the VCT is required due to normal system losses.
   2. Perform the task using OS1008.01, Chemical and Volume Control System Makeup Operations.
C. We will begin after the Initiating Cue is read.
D. The US will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), perform a 500 gallon manual blended makeup to the top of the VCT through CS-FCV-111B at 70 gpm, Step Back ON and 20 gallon flush. The manual blended makeup has been calculated and verified."**

NEXTera ENERGY SEABROOK

CONTROL ROOM JOB PERFORMANCE MEASURE 'b'

TRIP ALL RCPS

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

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PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

0030401501 Monitor RCP Trip Criteria
0030400401 Perform An Emergency RCP Shutdown

2. Conditions:

A. An Automatic Reactor trip and safety injection occurred from 100% power.
B. All required actions of E-0, Reactor Trip Or Safety Injection, are complete.
C. The crew determined that SI is not required and has transitioned to ES-1.1, step 7.

3. Standards:

Manually operate ECCS and reactor coolant pumps per EOPs.

4. Student Materials:

- Copy of Tear-Off Sheet.
- Copy of ES-1.1, SI Termination, Rev. 36.
- Copy of E-1, Loss Of Reactor Or Secondary Coolant, Rev. 41.

5. Limitations On Performance:

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

6. References:

Procedures:

- E-0, Reactor Trip Or Safety Injection
- ES-1.1, SI Termination
- E-1, Loss Of Reactor Or Secondary Coolant

Sys	KA	Description	Value RO/SRO
006	A4.01	Ability to manually operate ECCS pumps.	4.1/3.9
003	A2.02	Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown.	3.7/3.9

7. Setting:

Simulator: Reset the simulator to IC 328 or perform the following:

A. Initialize the simulator to a 100% power IC.
B. Trip PZR pressure bistables from Panel Overview.
   - Select Trip CP-1 Trip bistable PB-455D
   - Select Trip CP-2 Trip bistable PB-456D
C. Allow automatic Reactor Trip and Safety Injection.
D. Complete all actions of E-0 through step 16.
E. Open EFW mini-flow valves and throttle EFW flow.
F. Activate Event Trigger L0083J Last Try after SI has actuated. Event trigger L0083J Last Try will increase the RCS leak when the second SI pump is stopped.
G. Transition to ES-1.1, step 7.
H. Ensure all alarms are acknowledged.
I. Place the simulator in freeze.

8. Safety Considerations:

None.

9. Approximate Completion Time:

10 minutes

10. Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to terminate Safety Injection per ES-1.1, SI Termination.

B. The following information is provided to you:

   1. The plant sustained an automatic Reactor Trip and Safety Injection from 100% power.
   2. All required actions of E-0, Reactor Trip or Safety Injection, are complete.
   3. The crew has transitioned to ES-1.1, step 7.

C. Perform the task using ES-1.1, SI Termination.

D. We will begin after the Initiating Cue is read.

E. The US will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), we have transitioned to ES-1.1, SI Termination, step 7. Determine if conditions are satisfied for stopping SI pumps."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: Student reads Note prior to step 7 of ES-1.1: "E-0 continuous action step 13 remains applicable if this procedure was entered from E-0." E-0, step 13 is "Check if all charging pumps should be stopped." This action would be required if Pressurizer level is greater than 95%. **US should provide this information if requested.**

2.	P	Check If SI Pumps Should Be Stopped:		
		a. Check RCS pressure: • Pressure greater than 1700 psig -AND- • Pressure stable or increasing by pressure recorder	a. Verifies pressure greater than 1700 psig and stable or increasing by pressure recorder	_____ _____
		*b. Stop SI pumps and place in standby	*b. Stops both SI pumps and places control switches in standby	_____ _____
3.	P	Check If RHR Pumps Should Be Stopped:		
		a. RHR pumps – any running with RWST suction aligned to RWST	a. Determines that RHR pumps are running with suction aligned to RWST.	_____ _____
		*b. Stop RHR pumps and place in standby	*b. Stops both RHR pumps and places control switches in standby	_____ _____

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

******BEGIN ALTERNATE PATH******

NOTE: If student asks US to read ECCS Re-initiation Criteria and step 8 is completed, do so. Student may manually align valves and start ECCS pumps and go to E-1 in accordance with ECCS Re-initiation Criteria from OAS page. Step 4 of this JPM would be not applicable if this occurs.

NOTE: For ES-1.1 Step 9a (JPM Step 4a) student should either:
Evaluate RCS subcooling due to a decreasing trend and determine that RCS subcooling is <40°F.
-OR-
Determine that PZR level cannot be maintained greater than 7% [28% ADVERSE CONTAINMENT] and manually align valves and start ECCS pumps as necessary in accordance with step 9a or 9b RNO.

NOTE: It is expected that PZR level will be trending to 7% rapidly but value reported for PZR level is time dependent. PZR level cannot be maintained by controlling charging and letdown flow.

4.	P	Verify ECCS Flow Not Required:			
		a. RCS subcooling - GREATER THAN 40°F	a. Student verifies and reports that RCS subcooling is >40°F. (It is expected that RCS subcooling will be >40°F and decreasing at the time the step is implemented.)	_____	_____
		b. PZR Level - GREATER THAN 7% [28% FOR ADVERSE CONTAINMENT]	b. Student verifies and reports PZR Level value and trend.	_____	_____
		*c. RNO step 9a or 9b: Manually align valves and start ECCS pumps as necessary. Go to E-1 Loss of Reactor or Secondary Coolant step 1	*c. RNO step 9a or 9b: Manually align valves and start ECCS pumps as necessary. (Student should align CCPs to RCS cold legs and isolate normal charging path. CCP and SI pumps should be started. Cold Leg Injection status lights may be used to ensure proper line up.)	_____	_____

PERFORMANCE CHECKLIST

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

CUE: If required, US provide the following cue, **"Transitioning to E-1 Loss of Reactor or Secondary Coolant step 1."**

NOTE: US should review note prior to step 1 of E-1. RCS subcooling should be <40°F by this time.

5. P Check If RCPs Should Be Stopped:

a. ECCS pumps - AT LEAST ONE RUNNING • CCP OR • SI Pump	a. Student reports at least one CCP or SI Pump running.	_____	_____
b. RCS subcooling - LESS THAN 40°F	b. Student reports RCS subcooling is less than 40°F.	_____	_____
*c. Stop all RCPs	*c. Student stops all RCPs.	_____	_____

CUE: "The JPM is complete."

6. Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 10 minutes		
7. Obtain from student: Tear Off sheets and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TEAR OFF SHEET FOR CONTROL ROOM 'b' JPM

Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to terminate Safety Injection per ES-1.1, SI Termination.

B. The following information is provided to you.

   1. The plant sustained an automatic Reactor Trip and Safety Injection from 100% power.
   2. All required actions of E-0, Reactor Trip or Safety Injection, are complete.
   3. The crew has transitioned to ES-1.1, step 7.

C. Perform the task using ES-1.1, SI Termination.

D. We will begin after the Initiating Cue is read.

E. The US will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), we have transitioned to ES-1.1, SI Termination, step 7. Determine if conditions are satisfied for stopping SI pumps."**

NEXTera ENERGY SEABROOK

CONTROL ROOM JOB PERFORMANCE MEASURE 'c'

PERFORM SI TERMINATION/REDUCTION

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

SBK 0060403801 Perform Abnormal Safety Injection System Operations
SBK 0060500101 Perform SI Termination/Reduction

2. Conditions:

A. The reactor tripped and SI was initiated.

B. The crew completed all LOCA actions and determined that post LOCA cooldown and depressurization was required.

C. The crew initiated post LOCA cooldown and depressurization actions.

D. An RCS cooldown to cold shutdown remains in progress with all but one SI pump stopped.

E. Temperature and subcooling originally prevented stopping the remaining SI pump.

F. The US continued the cooldown and wants to again attempt to stop the remaining SI pump.

3. Standards:

Last SI pump is stopped.

4. Student Materials:

- Copy of Tear-Off Sheet.
- Copy of ES-1.2, Post LOCA Cooldown and Depressurization, Rev. 38

5. Limitations On Performance:

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

6. References:

Procedures:

- ES-1.2, Post LOCA Cooldown and Depressurization, Rev. 38

Sys	KA	Description	Value RO/SRO
09	EA1.09	Ability to operate RCPs	3.6/3.6
09	EA1.16	Ability to monitor subcooling monitors	4.2/4.2
09	EA2.01	Ability to determine actions to be taken based on RCS pressure, temperature saturated	4.2/4.8
09	EA2.04	Ability to determine or interpret pressurizer level	3.8/4.0
09	EA2.29	Ability to monitor CVCS pump indicating lights	3.2/3.4
09	EA2.34	Ability to monitor conditions for throttling HPI	3.6/4.2

7. Setting:

Simulator: Reset the simulator to a IC 323 or perform the following:

A. Initialize the simulator to a 100% power IC.
B. Insert malfunction RCS Cold Leg 4 leak at 1200 gpm.
   - SELECT: MF List
   - SELECT: REACTOR COOLANT
   - SELECT: mfRCS049D
   - SELECT: Final Value = 1200
   - SELECT: Ramp Time = 30
   - SELECT: Insert
C. Place the simulator in RUN and allow the reactor to trip and SI to actuate.
D. Complete E-0 and E-1 through step 12 for ES-1.2 transition.
E. Open EFW mini-flow valves and throttle EFW flow.
F. Reset SI.
G. Shut down and reset EDGs. Isolate SW to EDGs
H. Trip all RCPs.
I. Transition to ES-1.2 and perform steps once, stopping one CCP and all but one SI pump.

J. Establish the following conditions:
   - One SI pump in operation.
   - Cooldown rate less than 100°F per hour.
   - RCP C in operation (PZR spray).
   - RHR pumps stopped.

K. Modify malfunction RCS Cold Leg 4 leak to 450 gpm to restore subcooling.
   - SELECT: MF List
   - SELECT: REACTOR COOLANT
   - SELECT: mfRCS049D
   - SELECT: Final Value = 450
   - SELECT: Ramp Time = 30
   - SELECT: Modify

L. Place the simulator in FREEZE when RCS subcooling is greater than 135°F.

M. The intent is to have conditions that will allow stopping the last SI pump in ES-1.2.

8. Safety Considerations:

None.

9. Approximate Completion Time:

10 minutes

10. Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. If conditions are satisfied, you are going to stop the remaining SI pump.

B. The following information is provided to you:

1. The reactor tripped and SI was initiated.
2. The crew completed all LOCA actions and determined that post LOCA cooldown and depressurization was required.
3. The crew initiated post LOCA cooldown and depressurization actions.
4. RCS pressure was not stable or increasing during step for checking if RHR pumps should be stopped.
5. An RCS cooldown to cold shutdown remains in progress with all but one SI pump stopped.
6. Temperature and subcooling originally prevented stopping the remaining SI pump.
7. The US continued the cooldown and wants to again attempt to stop the remaining SI pump.

C. Perform the task using ES-1.2, Post LOCA Cooldown and Depressurization.

D. We will begin after the Initiating Cue is read.

E. The US will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), if conditions are satisfied, stop the running SI pump per ES-1.2 step 14."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: US (Instructor) begin at step 14 of ES-1.2.

2. P	Check If One SI Pump Should Be Stopped:		
	a. Any SI pump - RUNNING	a. Student verifies one SI Pump running.	_____ _____
	b. Determine required RCS subcooling from table:	b. Student determines required RCS subcooling from the table as follows:	_____ _____

NOTE: When the student is ready to begin, evaluator to Primary Operator, **"Using the table at step 14 of ES-1.2, determine the required RCS subcooling independent of the Unit Supervisor. When you have determined the required subcooling report your result to the Unit Supervisor."**

	b1. Determine Any RCPs Running.	b1. Determines and reports correct RCP status (ONE).	_____ _____
	b2. Determine SI Pump Status.	b2. Determines and reports correct CCP status (ONE).	_____ _____
	*b3. Determine required RCS subcooling.	*b3. Determines that required RCS subcooling is 135°F.	_____ _____

PERFORMANCE CHECKLIST

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

NOTE: When the student determines the required subcooling and reports the result to the Unit Supervisor respond, **"The required subcooling is (value reported). We are continuing to step 14c of ES-1.2."**

	c. RCS subcooling - GREATER THAN REQUIRED SUBCOOLING	c. Student verifies and reports that RCS subcooling is >135°F.	_____	_____
	d. PZR level - GREATER THAN 30% [44% FOR ADVERSE CONTAINMENT]	d. Student reports PZR level is greater than 30% [44% for Adverse Containment]	_____	_____
	*e. Stop one additional SI pump.	*e. Student places the last SI pump switch to stop or PTL.	_____	_____

CUE: "The JPM is complete."

3.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 10 minutes		
4.	Obtain from student: Tear Off sheets and any other training materials used in performance of this JPM.		_____	_____

Control Room 'c'

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TEAR OFF SHEET FOR CONTROL ROOM 'c' JPM

Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. If conditions are satisfied, you are going to stop the remaining SI pump.

B. The following information is provided to you:

1. The reactor tripped and SI was initiated.
2. The crew completed all LOCA actions and determined that post LOCA cooldown and depressurization was required.
3. The crew initiated post LOCA cooldown and depressurization actions.
4. RCS pressure was not stable or increasing during step for checking if RHR pumps should be stopped.
5. An RCS cooldown to cold shutdown remains in progress with all but one SI pump stopped.
6. Temperature and subcooling originally prevented stopping the remaining SI pump.
7. The US continued the cooldown and wants to again attempt to stop the remaining SI pump.

C. Perform the task using ES-1.2, Post LOCA Cooldown and Depressurization.

D. We will begin after the Initiating Cue is read.

E. The US will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), if conditions are satisfied, stop the running SI pump per ES-1.2 step 14."**

NEXTera ENERGY SEABROOK

CONTROL ROOM JOB PERFORMANCE MEASURE 'd'

STEAM HEADER PRESSURE PT-507 FAILS HIGH

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

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PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

JOB PERFORMANCE WORKSHEET

1. Task Number and Description

Position RO

SBK 0390400401 Identify Main Steam PT507 Instrument Failure

2. Conditions:

A. The plant is at 75% power and all systems are normal.

3. Standards:

Identify failure of MS-PT-507, steam header pressure instrument and restore the system per ON1230.01, MS-PT-507 or FW-PT-508 Pressure Instrument Failure.

4. Student Materials:

- Copy of Tear Off Sheet.
- Copy of ON1230.01, MS-PT-507 or FW-PT-508 Pressure Instrument Failure, Rev.12.

5. Limitations On Performance:

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

6. References:

Procedures:

- ON1230.01, MS-PT-507 or FW-PT-508 Pressure Instrument Failure.

Sys	KA	Description	Value RO/SRO
035	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	3.7/4.4

7. Setting:

Simulator: Reset the simulator to a preset IC or perform the following.

A. Initialize the simulator to a 75% power IC.
B. Place the simulator in RUN.
C. Place the simulator in FREEZE.

8. Safety Considerations:

None.

9. Approximate Completion Time:

10 minutes

10. Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary Operator. An event will occur. You are expected to identify the event and recommend actions and/or procedures to implement.

B. The following information is provided to you:

1. The plant is at 75% power and all systems are normal.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Secondary Operator, **"You are the Secondary Operator; respond to any condition that arises."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

CUE: Insert MS-PT-507 fail low as follows:

- SELECT: MF List
- SELECT: MAIN STEAM (Component)
- SELECT: ptMSPT507
- SELECT: FAIL TO SPECIFIED VALUE
- SELECT: Value = 0
- SELECT: Ramp Time = 30
- SELECT: Insert

NOTE: This malfunction reduces feed flow to all steam generators simultaneously. The student may take manual control of the Main Feed Pump master speed controller to stabilize the plant prior to diagnosing the failed instrument and entering the Abnormal procedure. This action is allowed as a 'skill of the operator task'.

CUE: If student recommends using 'Skill of the Operator' to take manual control of the Main Feed Pump master speed controller, US respond, **"I concur."**

2.	P	Recognize and report that MS-PT-507 is failed low.	Recognizes and reports that MS-PT-507 is failed low.	_____	_____

CUE: If student recommends entering ON1230.01, MS-PT-507 or FW-PT-508 Pressure Instrument Failure, US respond. **"I concur."**

NOTE: Give the student a copy of ON1230.01, MS-PT-507 or FW-PT-508 Pressure Instrument Failure.

PERFORMANCE CHECKLIST

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

NOTE: Student reads Note prior to step 2 of ON1230.01.

3.	P	Check Condenser Steam Dump System:			
		a. Steam dumps in - TAVG MODE	a. Student verifies Steam dumps in - TAVG MODE.	_____	_____
		b. Verify steam dump controller MS-PK-507 in – MANUAL AND MINUMUM OUTPUT	b. Student verifies steam dump controller MS-PK-507 in – MANUAL AND MINUMUM OUTPUT.	_____	_____

NOTE: Step 4 is a critical step. The actions for Step 4 may be met earlier with the 'Skill of the Operator' actions.

NOTE: Student reads Note prior to Step 2 of ON1230.01.

*4.	P	Restore Main Feed Pump Speed Control:			
		*a. Place Master Speed Controller to MANUAL	*a. Student verifies/transfers Master Speed Controller to MANUAL.	_____	_____
		*b. Control feed header/steam header ΔP at PROGRAM ΔP	*b. Student controls feed header/steam header ΔP at PROGRAM ΔP to return all SG NR levels to 50%.	_____	_____
5.	P	Check Secondary Plant Conditions - STABLE	Student checks Secondary Plant Conditions stable.	_____	_____
6.	P	Check Third Condensate Pump - NOT RUNNING	Student checks third Condensate Pump is not running.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
CUE:	**"The JPM is complete."**			
7.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 20 minutes	_____	_____
8.	Obtain from student: Tear Off sheets and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TEAR OFF SHEET FOR CONTROL ROOM 'd' JPM

Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary Operator. An event will occur. You are expected to identify the event and recommend actions and/or procedures to implement.

B. The following information is provided to you:

   1. The plant is at 100% power and all systems are normal.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Secondary Operator, **"You are the Secondary Operator, respond to any condition that arises."**

NEXTera ENERGY SEABROOK

CONTROL ROOM JOB PERFORMANCE MEASURE 'e'

START HYDROGEN RECOMBINERS

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

JOB PERFORMANCE WORKSHEET

1. Task Number and Description

Position RO

0280500201 Start 'A' H_2 Recombiner From The Main Control Room.

2. Conditions:

A. A reactor trip with SI occurred from 100% power due to a large break LOCA.
B. The US transitioned through E-0, E-1, ES-1.3, and back to E-1 and is now at step 18.
C. Hydrogen concentration in containment is 1.25%

3. Standards:

Place a hydrogen recombiner in service.

4. Student Materials:

- Copy of Tear-Off Sheet.
- Copy of OS1023.40, Hydrogen Recombiner Operation, Rev. 8

5. Limitations On Performance:

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

6. References:

Procedures:

- E-1, Loss of Reactor or Secondary Coolant
- OS1023.40, Hydrogen Recombiner Operation, Rev. 8

Sys	KA	Description	Value RO/SRO
028	A2.02	LOCA condition and concern over hydrogen.	3.5/3.9
028	A2.03	The hydrogen/air concentration in excess of limit flame propagation or detonation with resulting equipment damage in containment.	3.4/4.0
2.1	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of operation.	4.3/4.4
2.1	2.1.8	Ability to coordinate personnel activities outside the control room.	3.4/4.1
2.1	2.1.31	Ability to locate control room switches, controls, and indications, and determine that they are correctly reflecting the desired plant lineup.	4.6/4.3

7. Setting:

NOTE: If this JPM is paired with another, use the setup of the other JPM.

Simulator: Reset the simulator to IC 326 or perform the following:

A. Initialize the simulator to a 100% power IC.

B. Place the simulator in RUN and allow the reactor to trip and SI to actuate.

C. Insert malfunction RCS Cold Leg 12 LOCA (double ended shear).
   - SELECT: MF List
   - SELECT: REACTOR COOLANT
   - SELECT: mfRC024A
   - SELECT: Final Value = 50000
   - SELECT: Ramp TIme = 10
   - SELECT: Insert

D. Complete required steps in E-0, E-1, ES-1.3, back to E-1 and go through to Step 18.

E. Using panel graphics display sections PGR06A and PGR06B insert overrides on Hydrogen Analyzer 'A' meter AND Hydrogen Analyzer 'B' meter. Override to 1.25% for both meters.

F. Insert the following overrides Safety Injection Analog outputs for Containment pressure:

- IOOZMAOSIPI2576 Final Value=4
- IOOZMAOSIPI2577 Final Value=4
- IOOZMAOSIPR934B Final Value=4
- IOOZMAOSIPR934R Final Value=4
- IOOZMAOSIPR935B Final Value=4
- IOOZMAOSIPR935R Final Value=4
- IOOZMAOSIPI934 Final Value=4
- IOOZMAOSIPI935 Final Value=4
- IOOZMAOSIPI936 Final Value=4
- IOOZMAOSIPI937 Final Value=4

G. Place the Simulator in FREEZE.

H. The simulator must be in RUN to allow the PWR OUT meter to respond to the potentiometer.

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

8. Safety Considerations:

None.

9. Approximate Completion Time:

20 minutes

10. Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary Operator. You are going to place Hydrogen Recombiner 'A' in service.

B. The following information is provided to you:

1. A reactor trip with SI occurred from 100% power due to a large break LOCA.
2. The US transitioned through E-0, E-1, ES-1.3, and back to E-1.
3. The crew is presently at Step 18 of E-1 Loss of Reactor or Secondary Coolant and they have checked containment H_2 concentration, which is 1.25%.
4. Perform the task using OS1023.40, Hydrogen Recombiner Operation.

C. We will begin after the Initiating Cue is read.

D. The US will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Secondary Operator, **"Secondary Operator (or student's name), we are in E-1, and containment hydrogen concentration is presently 1.25%. Place Hydrogen Recombiner 'A' in service per OS1023.40, Hydrogen Recombiner Operation. Report to me when the recombiner is in service."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
1. P	Start time _____	Initiating cue read		

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

CUE: If the student asks about section 4.1, Electrical Lineup respond, **"The electrical lineup has been completed."**

2.	P	VERIFY that the white PWR. IN AVAIL. light is energized.	Student verifies that the white PWR. IN AVAIL. light is energized.	_____	_____
*3.	P	SET the PWR. ADJ. potentiometer to zero.	Student sets the PWR. ADJ. potentiometer to zero.	_____	_____
*4.	P	PLACE the PWR. OUT SW. switch to the ON position and VERIFY that the red light on the switch plate comes on.	Student places the PWR. OUT SW. switch to the ON position and VERIFY that the red light on the switch plate comes on.	_____	_____

NOTE: Student reads note prior to OS1023.40, Step 4.2.4.

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

*5.	P	ENERGIZE the hydrogen recombiner heater by performing the following:			
		a. TURN the PWR. ADJ. potentiometer clockwise until 5 kilowatts are indicated on the PWR. OUT meter. MAINTAIN the 5 kilowatt value for at least 10 minutes.	a. Student turns the PWR. ADJ. potentiometer clockwise until 5 kilowatts are indicated on the PWR. OUT meter.	_____	_____
		b. TURN the PWR. ADJ. potentiometer clockwise until 10 kilowatts are indicated on the PWR. OUT meter. MAINTAIN the 10 kilowatt value for at least 10 minutes.	b. Student turns the PWR. ADJ. potentiometer clockwise until 10 kilowatts are indicated on the PWR. OUT meter.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
	c. TURN the PWR. ADJ. potentiometer clockwise until 20 kilowatts are indicated on the PWR. OUT meter. MAINTAIN the 20 kilowatt value for at least 5 minutes.	c. Student turns the PWR. ADJ. potentiometer clockwise until 20 kilowatts are indicated on the PWR. OUT meter.	_____	_____
	d. DETERMINE the recombiner power setting per Form A, Power Out Setpoint Calculation.	d. Student refers to and completes Form A as follows:		

CUE: When the student locates any of the required pressure instruments, if necessary, cue the student: **"Containment pressure is 4 psig."**

	d1. DETERMINE the current containment pressure from SI-PI-934 or SI-PI-935, MCB containment pressure indicators.	d1. Student determines the current containment pressure from SI-PI-934 or SI-PI-935 and converts the value from psig to psia.	_____	_____
	d2. Pre-accident Containment Average Temperature is 120 °F.	d2. Student will use this value on Figure 2.		
	d3. Using containment absolute pressure, pre-accident containment average temperature and Figure 2, Recombiner Power Correction Factor Curve, DETERMINE the Pressure Factor (Cp).	d3. Student determines Cp and records on data sheet – (Cp = 1.17 to 1.19).	_____	_____
	d4. MULTIPLY the Pressure Factor (Cp) by Reference Power (45.24 kw).	d4. Student multiplies Cp by the reference power and records on data sheet – (52.9 to 53.8 kW).	_____	_____

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

	d5. HAVE a second person independently verify the Power Setting calculation.	d5. Student requests second person independently verify the Power Setting calculation.	_____	_____

PERFORMANCE CHECKLIST

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

NOTE: Student will return to the body of the procedure to complete step 4.2.4.5.

	e.	TURN the PWR. ADJ. potentiometer clockwise until the power setpoint as calculated in step 4.2.4.4 is indicated on the PWR. OUT meter.	e. Student turns the PWR. ADJ. potentiometer clockwise until the power setpoint is indicated on the PWR. OUT meter.	_____ _____

NOTE: If the student reports that Hydrogen Recombiner 'A' is in service respond, **"Hydrogen Recombiner 'A' is in service"** and go to JPM step 7.

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

6.	P	CONFER with the TSC to determine recombiner effectiveness and the need to make adjustments to recombiner power.	Student attempts to confer with the TSC.	_____ _____

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

7.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 20 minutes	
8.	Obtain from student: Tear Off sheets and any other training materials used in performance of this JPM.		_____ _____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary Operator. You are going to place Hydrogen Recombiner 'A' in service.
B. The following information is provided to you:
    1. A reactor trip with SI occurred from 100% power due to a large break LOCA.
    2. The US transitioned through E-0, E-1, ES-1.3, and back to E-1.
    3. The crew is presently at Step 18 of E-1 Loss of Reactor or Secondary Coolant and they have checked containment H_2 concentration, which is 1.25%.
    4. Perform the task using OS1023.40, Hydrogen Recombiner Operation.
C. We will begin after the Initiating Cue is read.
D. The US will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Secondary Operator, **"Secondary Operator (or student's name), we are in E-1, and containment hydrogen concentration is presently 1.25%. Place Hydrogen Recombiner 'A' in service per OS1023.40, Hydrogen Recombiner Operation. Report to me when the recombiner is in service."**

NEXTera ENERGY SEABROOK

CONTROL ROOM JOB PERFORMANCE MEASURE 'f'

EMERGENCY TRIP OF EMERGENCY DIESEL 1B

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

0640402501 Restore off-site power to Bus E5/E6

2. Conditions:

A. Bus E6 was being supplied by the RAT (Reserve Auxiliary Transformer) to support a scheduled UAT (Unit Auxiliary Transformer) breaker inspection.

B. The tagging clearance for the UAT breaker has not been started.

C. A failure on the Bus 6 RAT breaker caused the breaker to trip open.

D. Emergency Diesel 1B started and restored power to bus E6.

E. The crew entered OS1246.02, DEGRADED VITAL AC POWER (PLANT OPERATING).

F. Plant conditions are stable.

G. The Shift Manager has directed the Unit Supervisor to transfer bus E6 to the UAT and shutdown Emergency Diesel 1B.

H. The US is ready to restore off-site power to bus E6 using Attachment U of OS1246.02, DEGRADED VITAL AC POWER (PLANT OPERATING).

3. Standards:

The intention of the JPM is for the student to identify and recommend/perform an emergency shutdown of Emergency Diesel 1B. The student will restore off-site power to Bus E6 and respond to degraded Emergency Diesel 1B condition as necessary.

4. Student Materials:

- Copy of Tear-Off Sheet.
- Copy of Attachment U of OS1246.02, DEGRADED VITAL AC POWER (PLANT OPERATING), Rev. 15

5. Limitations On Performance:

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

6. References:

Procedures:

- Attachment U of OS1246.02, DEGRADED VITAL AC POWER (PLANT OPERATING), Rev. 15

Sys	KA	Description	Value RO/SRO
064	A4.07	Ability to manually operate and/or monitor in the control room: Transfer EDG with load to grid.	3.4/3.4

7. Setting:

Simulator: Reset the simulator to a preset IC or perform the following.

A. Initialize the simulator to a 100% power IC.

B. Place the simulator in RUN.

C. Transfer Bus E6 to the RAT. Place the UAT breaker in Normal After Stop.

D. Remove CS-P-2B from service by placing Caution Tags and racking out the breaker. CS-P-2B is removed from service so it does not interfere with the JPM. The CCP's start on a LOP.

- SELECT: RF List
- SELECT: CHEMICAL VOLUME CONTROL SYSTEM (Component)
- SELECT: bkCS1P2B_52
- SELECT: RACKOUT
- SELECT: Insert

E. Insert 4160V Bus E6 A72 trip.

- SELECT: MF List
- SELECT: ELECTRICAL DISTRIBUTION (Component)
- SELECT: bkEDE6RAT
- SELECT: TRIP
- SELECT: Insert

F. Check for the following:

- EPS sequenced loads start, as applicable with the plant remaining at power.
- SGBD isolated.
- SW-V-5 closed.

G. Clear RAT amber light and PLACE RAT breaker in PTL

H. Establish a 4-Point trend for the following Analog Points:

- A2732 DG 1B Vlts
- A2734 DG 1B Gen Field Amps
- A2735 DGB Watts
- A2736 DG1B Vars

8. Safety Considerations:

None.

9. Approximate Completion Time:

20 minutes

10. Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary Operator.

B. The following information is provided to you:

1. While supplying Bus 6 for maintenance activities, a failure on the Bus 6 RAT breaker caused the breaker to trip open.
2. Emergency Diesel 1B started and restored power to bus E6.
3. The US is ready to restore off-site power to bus E6 using Attachment U of OS1246.02, DEGRADED VITAL AC POWER (PLANT OPERATING).

C. We will begin after the Initiating Cue is read.

D. The US will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Secondary Operator, **"Secondary Operator (or student's name), restore offsite power to bus E6, via the UAT, using Attachment U of OS1246.02, LOSS OF OFFSITE POWER-PLANT SHUTDOWN."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
1. P	Start time _____	Initiating cue read		

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

NOTE: Student reads CAUTION prior to step 1 of OS1246.02 Attachment U.

CUE: If the student asks if the grid is stable, respond: **"The grid is stable."**

2.	P	IF AC emergency bus is deenergized, THEN restore offsite power as follows:	Student recognizes that Bus 6 is energized by Emergency Diesel 1B and continues with step 2a.	_____	_____
*3.	P	Raise EDG frequency to 60.2 to 60.4 HZ.	Student raises Emergency Diesel 1B frequency to 60.2 to 60.4 Hz.	_____	_____
*4.	P	Place EDG sync. selector switch in the RAT or UAT position.	Student places the Bus 6 sync. selector switch in the UAT position.	_____	_____
*5.	P	Reset RMO.	Student resets 'B' Train RMO.	_____	_____
*6.	P	Adjust EDG voltage to match INCOMING VOLTS with RUNNING VOLTS.	Student adjusts Emergency Diesel 1B voltage to within ±10 KV.	_____	_____
*7.	P	Adjust EDG frequency so that the sync. meter is going slowly in the fast direction.	Student adjusts Emergency Diesel 1B speed as required.	_____	_____
*8.	P	Close the RAT or UAT breaker when synchronized.	Student closes the Bus 6 UAT breaker when synchronized.	_____	_____
*9.	P	Place the sync. selector switch in OFF.	Student places the Bus 6 sync. selector switch in OFF.	_____	_____

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

******BEGIN ALTERNATE PATH******

NOTE: On a low lube oil condition the emergency diesel engines should automatically trip. This scenario simulates failure of the automatic trip. Based on the VAS (Video Alarm System) alarm and report from the field, it is expected that the candidate will perform a manual emergency shutdown of the diesel generator.

NOTE: The Emergency Diesel 1B Lube Oil Pressure Low and Aux. Lube Oil Pump Running alarms should be initiated before the Emergency Diesel 1B can be unloaded. Initiate the alarms as follows:

- SELECT: MF List
- SELECT: ELECTRICAL DISTRIBUTION
- SELECT: svo6608DGB
- SELECT: Final Value = 1
- SELECT: Insert
- SELECT: svo6611DGB
- SELECT: Final Value = 1
- SELECT: Insert

NOTE: Wait for the associated low lube oil pressure alarms to go into alarm prior to providing the following CUE.

CUE: The Roving NSO makes an urgent report to the Control Room on the radio: **"Control this is the Roving NSO. There is a large amount of lube oil spraying from the Bravo diesel engine."**

CUE: If the student recommends stopping the Emergency Diesel 1B, say: **"I Concur."**

*10.	P	Perform emergency shutdown of DG-1B by simultaneously pressing BOTH Emergency Stop pushbuttons.	Student performs an emergency shutdown of Emergency Diesel 1B by simultaneously pressing <u>BOTH</u> Emergency Stop pushbuttons.	____	____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP	STANDARD	EVALUATION
	* denotes a critical step	* denotes a critical step	SAT UNSAT
CUE:	**"The JPM is complete."**		
11.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 20 minutes	
12.	Obtain from student: Tear Off sheets and any other training materials used in performance of this JPM.		____ ____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TEAR OFF SHEET FOR CONTROL ROOM 'f' JPM

Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary Operator.

B. The following information is provided to you:

1. While supplying Bus 6 for maintenance activities, a failure on the Bus 6 RAT breaker caused the breaker to trip open.
2. Emergency Diesel 1B started and restored power to bus E6.
3. The US is ready to restore off-site power to bus E6 using Attachment U of OS1246.02, DEGRADED VITAL AC POWER (PLANT OPERATING).

C. We will begin after the Initiating Cue is read.

D. The US will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Secondary Operator, **"Secondary Operator (or student's name), restore offsite power to bus E6, via the UAT, using Attachment U of OS1246.02, DEGRADED VITAL AC POWER (PLANT OPERATING)."**

NEXTera ENERGY SEABROOK

CONTROL ROOM JOB PERFORMANCE MEASURE 'g'

FR-H.1 BLEED AND FEED

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

JOB PERFORMANCE WORKSHEET

1. Task Number and Description

Position RO

0060401501 Monitor The Safety Injection System When Activated

0060501201 Feed And Bleed The RCS During Inadequate Core Cooling

2. Conditions:

A. A reactor trip has occurred.
B. A loss of all feedwater capability has forced a transition to FR-H.1, Response to Loss of Secondary Heat Sink.

3. Standards:

Initiate bleed and feed per FR-H.1, Response to Loss of Secondary Heat Sink.

4. Student Materials:

- Copy of Tear Off Sheet.
- Copy of FR-H.1, Response to Loss of Secondary Heat Sink, Rev. 35.

5. Limitations On Performance:

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

6. References:

Procedures:

- FR-H.1, Response to Loss of Secondary Heat Sink, Rev. 35.

Sys	KA	Description	Value RO/SRO
EPE 074	EK3.04	Tripping RCPs.	3.9/4.2
EPE 074	EK3.05	Activating HPI system.	4.2/4.5
EPE 074	EK3.11	Guidance contained in EOP for inadequate core cooling	4.0/4.4

7. Setting:

Simulator: Reset the simulator to IC 335 or perform the following:

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

B. Place FW-P37B control switch in PTL.

C. Insert override for RC-PCV-456B control switch to AUTO.

- SELECT: Simulator Panels
- SELECT: CF
- SELECT: Insert Override
- SELECT: RC-PCV-456B control switch
- SELECT: AUTO
- SELECT: Insert

D. Insert remote function for MS-V129 to remain closed.

- SELECT: RF List
- SELECT: MAIN STEAM (Component)
- SELECT: rmvMSV129
- SELECT: Final Value = 0
- SELECT: Insert

E. Insert component remote function to remove FW-P-37B from service.

- SELECT: RF List
- SELECT: FEEDWATER (Component)
- SELECT: bkFW37B
- SELECT: Rack-out
- SELECT: Insert
- SELECT: mvFW347
- SELECT: Open Breaker
- SELECT: Insert

F. Place CAUTION tags on the motor-driven EFW pump and mini-flow valve control switches.

G. Place simulator in FREEZE.

H. Insert malfunctions for failure of automatic reactor trip Train A & B.
   - SELECT: MF List
   - SELECT: REACTOR PROTECTION SYSTEM
   - SELECT: mfRPS001
   - SELECT: Insert
   - SELECT: mfRPS002
   - SELECT: Insert

I. Insert malfunctions for FW-P113 trip (faulty 86 device) Bus 4 & 5.
   - SELECT: MF List
   - SELECT: FEEDWATER
   - SELECT: mfFW039
   - SELECT: Insert
   - SELECT: mfFW041
   - SELECT: Insert

J. Insert malfunctions mfFW038 and mfFW054 Delay 10 seconds to trip both MFPs on low LO pressure.
   - SELECT: MF List
   - SELECT: FEEDWATER
   - SELECT: mfFW038
   - SELECT: Delay = 10
   - SELECT: Insert
   - SELECT: mfFW054
   - SELECT: Delay = 10
   - SELECT: Insert

K. To simulate an ATWS event, do not trip the reactor during step 1 of E-0.

L. Place simulator in RUN.

M. Manually trip the reactor when SG wide range levels reach approximately 30%.
   - SELECT: Scenario
   - SELECT: NSO Locally Trip the Reactor
   - SELECT: Run

N. Complete all actions of FR-S.1.

O. Place the simulator in FREEZE.

P. Ensure 3 S/G WR levels <30%, conditions for immediate Bleed and Feed exist.

8. Safety Considerations:

None.

9. Approximate Completion Time:

15 minutes

10. Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary Operator. You are going to evaluate the need for RCS bleed and feed, and perform the appropriate actions.

B. The following information is provided to you:

1. An ATWS and loss of both main feed pumps has occurred.
2. FR-S.1 has been completed.
3. The motor driven EFW pump is tagged out.
4. A transition from FR-S.1 to FR-H.1, Response To Loss Of Secondary Heat Sink has occurred and steps 1 & 2 of FR-H.1 have been completed.
5. You are the only operator in the control room. You must perform all control board operations.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Secondary Operator, **"Secondary Operator (or student's name), continue performing FR-H.1 beginning with step 3."**

PERFORMANCE CHECKLIST

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

NOTE: Provide the student with a copy of FR-H.1, Response to Loss of Secondary Heat Sink and place the simulator in RUN once the Student responds to the Initiating Cue.

1. P Start time _____ Initiating cue read

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

NOTE: Student reviews the CAUTIONS and NOTE prior to step 1. If asked if total feed flow is less than 500 GPM due to operator action, respond: **"No Operator Action was taken."**

NOTE: Student reviews the CAUTION prior to step 3. CAUTION states the following:
If wide range level in any 3 SGs is less than 30% [51% for adverse containment] OR PZR pressure is greater than or equal to 2385 PSIG due to loss of secondary heat sink, Steps 10 through 14 should be immediately initiated for bleed and feed.

*2.	P	Per the CAUTION prior to step 3, check SG wide range levels.	Student identifies 3 SG wide range levels <30% and immediately goes to step 10.	_____	_____

NOTE: Student reviews the CAUTION prior to step 10. CAUTION states the following:
Steps 10 through 14 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.

*3.	P	Check RCP Status: All RCPs - STOPPED	Student checks all RCPs running and stops all RCPs.	_____	_____
*4.	P	Actuate SI	Student actuates SI.	_____	_____
5.	P	Verify RCS Feed Path:			
		a. Check pump status • CCPs - AT LEAST ONE RUNNING - OR - • SI pumps - AT LEAST ONE RUNNING	a. Student verifies both charging pumps and/or both SI Pumps running.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
	b. Check valve alignment for operating pumps - PROPER ALIGNMENT ON STATUS PANEL • TRAIN A - COLD LEG INJECTION • TRAIN B - COLD LEG INJECTION	b. Student verifies proper valve alignment for operating pumps Train A & B Cold Leg Injection status panels.	_____	_____

NOTE: Student reviews the NOTE prior to step 13.

******BEGIN ALTERNATE PATH******

6.	P	Verify RCS Bleed Path:			
		a. Verify power to PZR PORV block valves - AVAILABLE	a. Student verifies power to both PZR PORV block valves.	_____	_____
		b. Verify PZR PORV block valves - BOTH OPEN	b. Student verifies both PZR PORV block valves are open.	_____	_____

NOTE: Opening the A PORV is the critical step.

		*c. Open both PZR PORVs	*c. Student positions both PZR PORVs control switches to open and reports the following: • A PORV is open • B PORV did not open	_____	_____

CUE: When student reports B PORV did not open respond, **"I concur. Continue with your procedure."**

7.	P	Verify Adequate RCS Bleed Path: • PZR PORVs - BOTH OPEN • PZR PORV block valves - BOTH OPEN	Student reports B PORV did not open.	_____	_____
*8.	P	Open reactor head vent isolations: • RC-FV-2881 • RC-V323	Student opens reactor head vent isolations: • RC-FV-2881 • RC-V323	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	 UNSAT
CUE:	**"The JPM is complete."**			
9.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 15 minutes	_____	_____
10.	Obtain from student: Tear Off sheets and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary Operator. You are going to evaluate the need for RCS bleed and feed, and perform the appropriate actions.

B. The following information is provided to you:

1. An ATWS and loss of both main feed pumps has occurred.
2. FR-S.1 has been completed.
3. The motor driven EFW pump is tagged out.
4. A transition from FR-S.1 to FR-H.1, Response To Loss Of Secondary Heat Sink has occurred and steps 1 & 2 of FR-H.1 have been completed.
5. You are the only operator in the control room. You must perform all control board operations.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Secondary Operator, **"Secondary Operator (or student's name), continue performing FR-H.1 beginning with step 3."**

NEXTera ENERGY SEABROOK

CONTROL ROOM JOB PERFORMANCE MEASURE 'h'

PLACING THE CONTAINMENT ON-LINE PURGE (COP) SYSTEM IN SERVICE

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

JOB PERFORMANCE WORKSHEET

1. Task Number and Description

Position RO

0290100201 Startup the COP System

2. Conditions:

A. The plant is at 75% power and all systems are normal.

B. Maintenance is preparing for a long duration job in containment and has requested the COP system be placed in service to improve air quality.

3. Standards:

Place the COP System in service per OS1023.69, Containment On-Line Purge System Operation, Section 4.2, starting at step 4.2.8.

4. Student Materials:

- Copy of Tear Off Sheet.
- Copy of OS1023.69, Containment On-Line Purge System Operation, Rev.12.

5. Limitations On Performance:

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

6. References:

Procedures:

- OS1023.69, Containment On-Line Purge System Operation.

Sys	KA	Description	Value RO/SRO
029	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.	4.2/3.9

7. Setting:

Simulator: Reset the simulator to a preset IC or perform the following.

A. Initialize the simulator to a 75% power IC.

B. Rack In the breakers for COP-V1 and V4 and COP-V2 and V3.

- SELECT: RF List
- SELECT: CONTAINMENT ONLINE PURGE
- SELECT: rfCOP01
- SELECT: Final Value = IN
- SELECT: Insert
- SELECT: rfCOP02
- SELECT: Final Value = IN
- SELECT: Insert

8. Safety Considerations:

None.

9. Approximate Completion Time:

15 minutes

10. Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to place the COP System in service per OS1023.69, Containment On-Line Purge System Operation.

B. The following information is provided to you:

1. The plant is at 75% power and all systems are normal.
2. Maintenance is preparing for a long duration job in containment and has requested the COP system be placed in service to improve air quality.
3. All procedure prerequisites of OS1023.69 are complete and section 4.2 has been completed through step 4.2.7.
4. Precaution 3.2 states that during operations that change Containment pressure, A Point A3250 CONTM PURGE PRESS should be trended on the MPCS.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), continue placing COP in service per OS1023.69, Containment On-Line Purge System Operation, at step 4.2.8. Control containment pressure at 15.2 psia."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: Student reviews CAUTION prior to step 4.2.8 which states the following:
If alarm point D7251, CONTAINMENT PURGE PRESS HIGH (setpoint at 15.35 psia) activates while placing COP system in service, COP-FN-73, containment on-line purge supply fan, should be manually stopped and containment pressure bled down as necessary through COP-V-3 and COP-V-4, COP system exhaust isolation valves.

CUE: When the student checks containment pressure via COP-PI-1787 or VAS point A3250 respond, **"Containment pressure is 15.32 psia."**

*2.	P	START COP-FN-73, containment on-line purge supply fan.	Student starts COP-FN-73, containment on-line purge supply fan and observes status lights change state.	_____	_____

NOTE: Student reviews NOTE prior to step 4.2.9 which states the following:
Steps 4.2.9.1 through 4.2.9.4 **must** be performed in order specified.

*3.	P	At MCB-CR, OPEN the following valves:			
		1. COP-V-1, on-line purge supply ORC isolation	1. Student opens COP-V-1 and observes proper response.	_____	_____
		2. COP-V-4, on-line purge exhaust ORC isolation	2. Student opens COP-V-4 and observes proper response.	_____	_____
		3. COP-V-2, on-line purge supply IRC isolation	3. Student opens COP-V-2 and observes proper response.	_____	_____
		4. COP-V-3, on-line purge exhaust IRC isolation	4. Student opens COP-V-3 and observes proper response.	_____	_____

PERFORMANCE CHECKLIST

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

CUE: When the student checks containment pressure via COP-PI-1787 or VAS point A3250 respond, **"Containment pressure is 15.32 psia and stable."**

*4.	P	Throttle OPEN COP-V-8, COP exhaust throttle valve (coarse control), to obtain a containment pressure between 15.2 and 15.3 psia, or as directed by the US, as read on COP-PI-1787, containment pressure.	Student throttles open COP-V-8 to a containment pressure between 15.2 and 15.3 psia.	_____	_____

CUE: When the student checks containment pressure via COP-PI-1787 or VAS point A3250 respond, **"Containment pressure is 15.25 psia and stable."**

5.	P	Throttle OPEN COP-V-7, COP exhaust throttle valve (fine control) to establish and maintain a containment pressure of 15.2 psia, or as directed by the US.	Student throttles open COP-V-7 to a containment pressure of 15.2 psia.	_____	_____

CUE: When the student checks containment pressure via COP-PI-1787 or VAS point A3250 respond, **"Containment pressure is 15.2 psia and stable."**

NOTE: Student reviews NOTE prior to step 4.2.12 which states the following:
If the WRGM is out of service, the COP system will need to be monitored at the RDMS console and promptly shutdown should any of the following radiation monitors reach their alert setpoint:
RM-6527A-1, RM-6527A-2, RM-6527B-1, RM-6527B-2

CUE: When the student reviews the WRGM status respond, **"The WRGM is in service."**

6.	P	If the WRGM is out of service, the US has reviewed the preceding NOTE with an assigned operator.	Student checks if the WRGM is out of service.	_____	_____
7.	P	NOTIFY Chemistry that the COP system is in operation.	Student notifies Chemistry that the COP system is in operation.	_____	_____

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
CUE:	**"The JPM is complete."**			
8.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 20 minutes	_____	_____
9.	Obtain from student: Tear Off sheets and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TEAR OFF SHEET FOR CONTROL ROOM 'h' JPM

Directions To The Student:

Evaluator gives Tear Off sheet to the student.

Evaluator reads the following to student:

A. You are the Primary Operator. You are going to place the COP System in service per OS1023.69, Containment On-Line Purge System Operation.

B. The following information is provided to you:
   1. The plant is at 75% power and all systems are normal.
   2. Maintenance is preparing for a long duration job in containment and has requested the COP system be placed in service to improve air quality.
   3. All procedure prerequisites of OS1023.69 are complete and section 4.2 has been completed through step 4.2.7.
   4. Precaution 3.2 states that during operations that change Containment pressure, A Point A3250 CONTM PURGE PRESS should be trended on the MPCS.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Primary Operator, **"Primary Operator (or student's name), continue placing COP in service per OS1023.69, Containment On-Line Purge System Operation, at step 4.2.8. Control containment pressure at 15.2 psia."**

NEXTera ENERGY SEABROOK

IN-PLANT JOB PERFORMANCE MEASURE 'i'

ASDV LOCAL OPERATION

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

JOB PERFORMANCE WORKSHEET

1. Task Number and Description

Position RO

0410150104 Locally Operate The ASDVs To Cool Down The RCS

2. Conditions:

A. The reactor tripped due to a loss of offsite power.

B. The US is in ECA-0.0 step 7 Depressurize intact SGs and one ASDV will not open from the MCB.

3. Standards:

Simulate local ASDV operation per ECA-0.0 Attachment J.

4. Student Materials:

- Copy of Turnover Sheet
- Copy of ECA-0.0 Attachment J Rev.44

5. Limitations On Performance:

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

6. References:

Procedures:

- ECA-0.0 Loss of All AC Power.
- OS1430.05 ASDV 18 Month Local Valve Stroke

Sys	KA	Description	Value RO/SRO
2.4	2.4.35	Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	3.8/4.0
035	K6.02	Knowledge of the effect of a loss or malfunction on the following will have on the S/GS: Secondary PORV.	3.1/3.5

7. Setting:

West Pipe Chase

8. Safety Considerations:

During the JPM, ensure proper safety precautions, FME, and/or radiological concerns as applicable are followed.

9. Approximate Completion Time:

15 minutes

10. Directions To The Student:

Evaluator gives Turnover Sheet to the student.

Evaluator reads the following to student:

A. You are the Primary NSO. You are going to simulate local operation of an ASDV.

B. The following information is provided to you:
   1. The reactor tripped due to a loss of offsite power.
   2. The US is in ECA-0.0 step 7 Depressurize intact SGs and one ASDV will not open from the MCB.
   3. Perform the task using ECA-0.0 Attachment J.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Primary NSO, **"Primary NSO (or student's name), obtain a controlled copy of ECA-0.0 Attachment J. Take local control of MS-PV-3001 (3004) the A (D) SG ASDV. Coordinate with the control room to depressurize the A (D) Steam Generator."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: When student demonstrates the ability to obtain a controlled copy of ECA-0.0 Loss Of All AC Power, provide the student with ECA-0.0 Loss Of All AC Power Attachment J.

NOTE: Do not permit climbing on railings or plant equipment for safety concerns.

2.	S	Use ladder staged in pipe chase for ASDV operation.	Simulates getting ladder staged in pipe chase for ASDV operation.	_____	_____

CUE: When student simulates getting ladder staged in pipe chase, evaluator to student, **"Ladder has been obtained and placed in position for local ASDV operation."**

*3.	S	Unscrew clevis from manual override shaft at the top of the actuator.	Simulates unscrewing clevis from manual override shaft at the top of the actuator.	_____	_____

CUE: When student simulates unscrewing clevis from manual override shaft at the top of the actuator (turning CCW), evaluator to student, **"The clevis has been unscrewed."**

*4.	S	Turn the handwheel in the ENGAGED direction to expose the actuator shaft above the manual override shaft.	Simulates turning the handwheel in the ENGAGED direction to expose the actuator shaft above the manual override shaft.	_____	_____

CUE: When student simulates turning the handwheel in the ENGAGED direction to expose the actuator shaft above the manual override shaft, evaluator to student," **The actuator shaft is exposed above the manual shaft override."**

*5.	S	Slide the clevis onto the actuator shaft notch.	Simulates sliding the clevis onto the actuator shaft notch.	_____	_____

CUE: When student simulates sliding the clevis onto the actuator shaft notch, evaluator to student, **"The clevis is on the actuator shaft notch."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
6. S	Request the control room to place the selector switch for the A (D) ASDV to modulate.	Requests the control room to place the selector switch for the A (D) ASDV to modulate.	_____	_____

CUE: US to Primary NSO, **"The selector switch for the A (D) ASDV has been placed in the MODULATE position."**

*7.	S	Place the bypass valve on the Bailey Positioner in MAN (press to turn).	Simulates placing the bypass valve on the Bailey Positioner in MAN.	_____ _____

CUE: When student simulates pressing and turning the bypass valve to MAN, evaluator to student, **"The Bailey Positioner is in manual."**

8.	S	Inform control room that the A (D) ASDV is in local manual control.	Informs control room that the A (D) ASDV is in local manual control.	_____ _____

CUE: US to Primary NSO, **"I copy, you have manual control of the A (D) ASDV. Slowly open the A (D) ASDV to approximately 10% open."**

*9.	S	Throttle the ASDV to the desired position using the handwheel.	Throttles the ASDV to the desired position by turning the handwheel in the OPEN direction until ASDV is 10% (+/-5%) as shown on valve stem position indication.	_____ _____

CUE: When student identifies 10% (+/-5%) on valve stem position indication and simulates turning the handwheel in the OPEN direction, evaluator to student, **"The ASDV is approximately 10% open."**

10.	S	Inform the control room that the A (D) ASDV is 10% open.	Informs the control room that the A (D) ASDV is 10% open.	_____ _____

CUE: US to Primary NSO,**"I copy, the A (D) ASDV is 10% open."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	 UNSAT
CUE:	**"The JPM is complete."**			
11.	Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 15 minutes	_____	_____
12.	Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TURNOVER SHEET FOR IN-PLANT 'i' JPM

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Primary NSO. You are going to simulate local operation of an ASDV.

B. The following information is provided to you:
   1. The reactor tripped due to a loss of offsite power.
   2. The US is in ECA-0.0 step 7 Depressurize intact SGs and one ASDV will not open from the MCB.
   3. Perform the task using ECA-0.0 Attachment J.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Primary NSO, **"Primary NSO (or student's name), obtain a controlled copy of ECA-0.0 Attachment J. Take local control of MS-PV-3001 (3004) the A (D) SG ASDV. Coordinate with the control room to depressurize the A (D) Steam Generator."**

NEXTera ENERGY SEABROOK

IN-PLANT JOB PERFORMANCE MEASURE 'j'

RESET STEAM DRIVEN EFW PUMP TRIP VALVE

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

1. Task Number and Description

Position RO

0610401204 Reset the Turbine Driven EFW Pump Trip Valve

2. Conditions:

A. The Plant is in Mode 3 following a trip from 100% power.

B. All station AC electrical power has been lost.

C. The turbine driven EFW pump started and then tripped.

3. Standards:

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

4. Student Materials:

- Copy of Turnover Sheet
- Copy of OS1036.03, Resetting Then Steam Driven EFW Pump Trip Valve, Rev. 03
- Copy of OS1090.01, Manual Operation Of Remote Operated Valves Rev.17 (pages 5-9 and 18-19)

5. Limitations On Performance:

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

6. References:

Procedures:

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

Sys	KA	Description	Value RO/SRO
061	A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: pump failure or improper operation.	3.4/3.8
2.4	2.4.35	Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	3.8/4.0

7. Setting:

EFW Pump House

8. Safety Considerations:

During the JPM, ensure proper safety precautions, FME, and/or radiological concerns as applicable are followed.

9. Approximate Completion Time:

15 minutes

10. Directions To The Student:

Evaluator gives Turnover Sheet to the student.

Evaluator reads the following to student:

A. You are the Roving NSO. You are going to simulate resetting the turbine driven EFW pump trip valve and restart the pump.

B. The following information is provided to you:
   1. The Plant is in Mode 3 following a trip from 100% power.
   2. All station AC electrical power has been lost.
   3. The turbine driven EFW pump started and then tripped.
   4. Perform the task using OS1036.03, Resetting Then Steam Driven EFW Pump Trip Valve.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

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

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: When student demonstrates the ability to obtain a controlled copy of OS1036.03, Resetting The Steam Driven EFW Pump Trip Valve, provide the student with OS1036.03, Resetting The Steam Driven EFW Pump Trip Valve.

NOTE: Student should review the note prior to step 4.1.1.

*2.	S	Pull and hold trip rod towards MS-V-129.	Simulates pulling and holding the trip rod toward MS-V-129.	_____	_____

CUE: When student simulates pulling and holding the trip rod toward MS-V-129, evaluator to student, **"The trip rod is being held towards MS-V-129."**

*3.	S	Check/place the flat of the washer against the trip rod	Simulates checking/placing the flat of the washer against the trip rod.	_____	_____

CUE: When student simulates checking/placing the flat of the washer against the trip rod, evaluator to student, "The flat of the washer is against the trip rod."

4.	S	Verify the trip plunger drops into place.	Simulates verifying the trip plunger drops into place.	_____	_____

CUE: When student simulates verifying the trip plunger drops into place, evaluator to student, **"The trip plunger is in place."**

5.	S	Release the trip rod.	Simulates releasing the trip rod.	_____	_____

CUE: When student simulates releasing the trip rod, evaluator to student, **"The trip rod is released."**

6.	S	Refer to Figure 2 and verify the flat side of the washer is engaged with the flat side of the head lever and is not tilted or bound.	Refers to Figure 2 and verifies the flat side of the washer is engaged with the flat side of the head lever and is not tilted or bound.	_____	_____

CUE: When student refers to Figure 2, evaluator to student, **"The flat side of the washer is engaged with the flat side of the head lever and is not tilted or bound."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate		ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*7.	S	Reset MS-V-129 by turning the handwheel clockwise until the latch snaps into place.	Resets MS-V-129 – simulates turning the handwheel clockwise until the latch snaps into place.	_____	_____

CUE: When student simulates turning MS-V-129 handwheel, evaluator to student,**"MS-V-129 is reset."**

CUE: If the control room is contacted, acknowledge US to NSO, **"Restart the steam driven EFW pump locally."**

8.	S	Verify MS-V-129 is reset.	Simulates verifying MS-V-129 is reset	_____	_____

CUE: When student simulates verifying MS-V-129 is reset or states MS-V-129 previously reset, evaluator to student,**"MS-V-129 is reset."**

9.	S	Check open/open FW-V-346 EFW pump A mini-flow.	Simulates checking open/opening FW-V-346 EFW pump A mini-flow.	_____	_____

CUE: When student simulates checking open/opening FW-V-346 EFW pump A mini-flow, evaluator to student, **"The valve is shut"**

CUE: If the control room is contacted regarding status of FW-V-346, US to NSO, **"No power is available to remotely open FW-V-346. Open FW-V-346 locally."**

NOTE: If requested, provide student with the required portions of OS1090.01, Manual Operation of Remote Operated valves.

CUE: If required, provide the following cue, US to NSO (or evaluator to student if control room not contacted), **"FW-V-346 has been deenergized at MCC-515 node C3S."**
If control room is contacted regarding step 3.2.4 of OS1090.01 in reference to declutch lever limitations for FW-V-346, US to NSO, **"This is an emergency. Locally open FW-V-346."**

*10.	S	Press the declutch lever to engage the manual handwheel.	Simulates pressing the declutch lever to engage the manual handwheel.	_____	_____

CUE: When student simulates pressing the declutch lever, evaluator to student, **"The declutch lever has been pressed."**

*11.	S	Operate the valve manually by use of the manual handwheel.	Simulates opening the valve by counter clockwise rotation of the manual handwheel.	_____	_____

CUE: When student simulates opening the valve, evaluator to student, **"The valve is open."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate		ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	UNSAT
*12.	S	Slowly open MS-V-129 to increase speed to 3600 RPM as read on FW-ST-TM-1.	Simulates slowly opening MS-V-129 to increase speed to 3600 RPM.	_____	_____

CUE: When student simulates checking local rpm indicator FW-ST-TM-1 after simulating turning MS-V-129 handwheel CCW, evaluator to student, **"Speed is increasing to 3600 RPM."**

******BEGIN ALTERNATE PATH******

13.	S	Verify speed remains less than 3750 RPM while slowly opening MS-V-129 full open.	Simulates verifying speed remains less than 3750 RPM while opening MS-V-129 full open.	_____	_____

CUE: When student verifies that speed remains less than 3750 RPM while opening MS-V-129 fully, evaluator to student, **"Speed is 3900 RPM and rising."**

*14.	S	If pump speed increases to greater than 3750 RPM, REDUCE pump speed with MS-V-129 to maintain pump speed between 3500 and 3750 RPM.	Simulates closing MS-V-129 to control pump speed.	_____	_____

CUE: When student simulates closing MS-V-129 to control pump speed, evaluator to student, **"Speed is 3650 RPM and stable."**

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

15.		Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 15 minutes	_____	_____
16.		Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Roving NSO. You are going to simulate resetting the turbine driven EFW pump trip valve and restart the pump.

B. The following information is provided to you:
   1. The Plant is in Mode 3 following a trip from 100% power.
   2. All station AC electrical power has been lost.
   3. The turbine driven EFW pump started and then tripped.
   4. Perform the task using OS1036.03, Resetting Then Steam Driven EFW Pump Trip Valve.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

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

NEXTera ENERGY SEABROOK

IN-PLANT JOB PERFORMANCE MEASURE 'k'

TRANSFER VITAL INSTRUMENT BUS

Student Name: _____ LMS #: _____

Evaluator Name: _____

SAT UNSAT

OFFICIAL NRC EXAMINATION MATERIAL

ACCESS IS LIMITED TO NRC EXAMINERS AND PERSONNEL THAT FULLY UNDERSTAND AND HAVE SIGNED ON TO THE 2015 NRC INITIAL EXAM SECURITY AGREEMENT.

PREPARED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

TRAINING SUPERVISOR

JOB PERFORMANCE WORKSHEET

1. Task Number and Description

Position RO

0620201504 Transfer a Vital (120VAC) Instrument Bus Power Supply

2. Conditions:

A. The Plant is in Mode 5.

B. UPS EDE-I-1A (B) is being removed from service for inspection.

3. Standards:

Simulate energizing a vital power panel from its maintenance supply per OS1047.02, Transferring Power Supplies To 120V AC Vital Instrument Buses.

4. Student Materials:

- Copy of Turnover Sheet
- Copy of OS1047.02, Transferring Power Supplies To 120V AC Vital Instrument Buses, Rev. 09, Pages 1-9.

5. Limitations On Performance:

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

6. References:

Procedures:

- OS1047.02, Transferring Power Supplies To 120V AC Vital Instrument Buses, Rev. 09

Sys	KA	Description	Value RO/SRO
062	A2.10	Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Effects of switching power supplies on instruments and controls.	3.0/3.3

7. Setting:

A (B) Esssential Switchgear Room

8. Safety Considerations:

During the JPM, ensure proper safety precautions, FME, and/or radiological concerns as applicable are followed.

9. Approximate Completion Time:

10 minutes

10. Directions To The Student:

Evaluator gives Turnover Sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary NSO. You are going to simulate transferring an instrument power panel to its maintenance supply.

B. The following information is provided to you:
   1. The Plant is in Mode 5.
   2. UPS EDE-I-1A (B) is being removed from service for inspection.
   3. Perform the task using OS1047.02, Transferring Power Supplies To 120V AC Vital Instrument Buses.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

11. Initiating Cue:

US to Secondary NSO, **"Secondary NSO (or student's name), simulate transferring PP-1A (B) to its maintenance supply per OS1047.02. All of the procedure prerequisites are complete."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate	ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT UNSAT
1. P	Start time _____	Initiating cue read	

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

NOTE: When student demonstrates the ability to obtain a controlled copy of OS1047.02, Transferring Power Supplies To 120V AC Vital Instrument Buses, provide the student with the required portions of OS1047.02, Transferring Power Supplies To 120V AC Vital Instrument Buses.

CUE: If the student contacts the control room regarding the caution prior to step 4.1.1 (4.2.1), US to NSO, **"Applicable Figures (1, 2, and 3) have been reviewed for specific vital instruments and loads. You may continue."** If student reviews remainder of caution respond, **"I understand."**

When student asks about LTOP, US to NSO, **"LTOP is armed. We have entered TS 3.4.9.3 and placed the control switch for RC-PCV-456A (B) in CLOSE."**

CUE: If the student contacts the control room regarding Tech Specs, US to NSO, **"I understand that PP-1A (B) will be momentarily de-energized. We have entered TS 3.8.3.2. You may continue."**

2.	S	Check closed/close the MCC 531 (631) node D29 (D25) maintenance supply feeder breaker to PP-1A (B).	Simulates checking closed/closing the MCC 531 (631) maintenance supply feeder breaker to PP-1A (B).	_____	_____

CUE: When student simulates checking closed the maintenance supply feeder breaker, evaluator to student, **"The breaker at node D29 (D25) is in the ON position."**

*3.	S	Loosens the nuts on PP-1A (B) mechanical interlock device.	Simulates loosening the nuts on PP-1A (B) mechanical interlock device.	_____	_____

CUE: When student simulates loosening the nuts on PP-1A (B) mechanical interlock device, evaluator to student, **"The nuts loosen."**

CUE: When student reads the step about making a Gaitronics announcement, evaluator to student, **"The announcement has been made by the US."**

*4.	S	Open circuit 15, PP-1A (B) normal supply breaker.	Simulates opening circuit 15, PP-1A (B) normal supply breaker.	_____	_____

CUE: When student simulates opening the normal supply breaker, evaluator to student, **"The breaker opens."**

PERFORMANCE CHECKLIST

D=Discuss P=Perform S=Simulate		ELEMENT/STEP * denotes a critical step	STANDARD * denotes a critical step	EVALUATION SAT	 UNSAT
*5.	S	Close circuit 16, PP-1A (B) maintenance supply breaker.	Simulates closing circuit 16, PP-1A (B) maintenance supply breaker.	_____	_____

CUE: When student simulates closing the maintenance supply breaker, evaluator to student, **"The breaker closes."**

6.	S	Tighten the nuts on the PP-1A (B) mechanical interlock device.	Simulates tightening the nuts on the PP-1A (B) mechanical interlock device.	_____	_____

CUE: When student simulates tightening the nuts, evaluator to student, **"The nuts tighten."**

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

7.		Stop time _____ Evaluator calculates time to complete task	Time to complete task ≤ 10 minutes	_____	_____
8.		Obtain from student: Turnover sheet and any other training materials used in performance of this JPM.		_____	_____

PERFORMANCE SUMMARY

Provide comments on unsatisfactory performance of an element/step or for any deviation from performance as stated. Record interruptions in performance such as retraining, shift change, and processing of procedure changes. Recommend remedial training, if necessary.

TURNOVER SHEET FOR IN-PLANT 'k' JPM

Directions To The Student:

Evaluator gives Turnover sheet to the student.

Evaluator reads the following to student:

A. You are the Secondary NSO. You are going to simulate transferring an instrument power panel to its maintenance supply.

B. The following information is provided to you:
   1. The The Plant is in Mode 5.
   2. UPS EDE-I-1A (B) is being removed from service for inspection.
   3. Perform the task using OS1047.02, Transferring Power Supplies To 120V AC Vital Instrument Buses.

C. We will begin after the Initiating Cue is read.

D. I will provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

US to Secondary NSO, **"Secondary NSO (or student's name), simulate transferring PP-1A (B) to its maintenance supply per OS1047.02. All of the procedure prerequisites are complete."**

NEXTera ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG

SITE: **Seabrook** **Revision #:** **DRAFT**

LMS ID: **LMS Rev. Date:**

SEG TITLE: **2015 LOIT NRC SIM Exam A**

SEG TYPE: ☐ **Training** ☒ **Evaluation**

PROGRAM: ☐ **LOCT** ☒ **LOIT** ☐ **Other:**

DURATION: **90 minutes**

Developed by: _____ _____
Instructor/Developer Date

Reviewed by: _____ _____
Instructor (Instructional Review) Date

Validated by: _____ _____
SME (Technical Review) Date

Approved by: _____ _____
Training Supervision Date

Approved by: _____ _____
Training Program Owner (Line) Date

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER REVIEWER	DATE DATE

OVERVIEW / SEQUENCE OF EVENTS

OVERVIEW

The crew will take the watch at MOL 100% power with stable Xenon, Boron Concentration at 1058 ppm, CB D at 230 steps. 'B' Emergency Diesel Generator is out of service with SEPS available. ISO New England will call and require a downpower to 800 MW electric in 30 minutes due to grid instabilities. The controlling channel for pressurizer level, RC-LT-459 will fail low, isolating letdown. The PSO will have to reduce charging flow to the RCP seals only. FW-PT-508 will fail high causing the MFPs to slow down, reducing feedwater flow to the steam generators and lowering all steam generator levels. The BOP will have to take manual control of the MFP Master Speed Controller and restore the DP to program. Due to the grid instability the station will suffer a loss of offsite power. 'A' EDG will trip due to a loss of lube oil and cannot be recovered. With 'B' EDG also out of service the crew will be required to go to ECA-0.0 where they will restore power to Bus 6 with SEPS. After the power restoration the 'B' Train of SW fails to auto start and must be started manually by the BOP. After the power restoration the 'B' Train of PCCW fails to auto start and must be started manually by the PSO.

SEQUENCE OF EVENTS

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
1.	Rapid down power to 800 MW electric in 30 minutes.
2.	PZR Level Instrument, RC-LT-459 fails low.
3.	Combined Feed Header Pressure Instrument, FW-PT-508 fails high.
4.	Loss of offsite power with no EDG response.
5.	'B' Train of PCCW fails to auto start
6.	'B' Train of SW fails to auto start

SIMULATOR SET UP INSTRUCTIONS

Perform simulator set up per the Simulator Setup Checklist.

General Instructions

a. Provide extra copies of procedures to Examiners
b. Reset to preset IC 121.
c. Place simulator in Run
d. Verify the following have been inserted OR reset to MOL 100% IC and insert the following:
    1. A Train is Protected, SV C0755, '1'
    2. 'B' EDG out of service for maintenance:
        - SELECT: RF List
        - SELECT: ELECTRICAL DISTRIBUTION (Component)
        - SELECT: bkEDE6DG
        - SELECT: RACK-OUT
        - SELECT: Insert
        - SELECT: LOCAL PANELS
        - SELECT: DG SYSTEM
        - SELECT: DG B
        - SELECT: SS9710, LOCAL/REMOTE/MAINTENANCE
        - SELECT: Final Value = MAINTENANCE
    3. Place 'B' EDG breaker control switch in PTL.
    4. Put INFO tag on the 'B' EDG breaker control switch.
    5. 'B' Train PCCW fail to start from EPS:
        - SELECT: MF List
        - SELECT: PRIMARY COMPONENT COOLING
        - SELECT: mfCC013
        - SELECT: Insert
        - SELECT: mfCC015
        - SELECT: Insert

6. 'B' Train SW fail to start from EPS:
   - SELECT: MF List
   - SELECT: SERVICE WATER
   - SELECT: mfSW013
   - SELECT: Insert
   - SELECT: mfSW015
   - SELECT: Insert
7. DG-1A Low Lube Oil Trip
   - SELECT: MF List
   - SELECT: ELECTRICAL DISTRIBUTION
   - SELECT: mfed032
   - SELECT: Insert
8. Advance logger and tear off any sheets with print.

SHIFT TURNOVER INFORMATION

- See Turnover Sheet

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 1	ISO New England calls Seabrook Station and states the following: **"Due to grid instabilities Seabrook must downpower to 800 MW electric in 30 minutes."** When the US calls the SM to perform the ODI.61 notifications, then respond **"I will perform the ODI.61 notifications."**	**PSO(R), BOP(N), US(N)** ISO New England calls Seabrook Station. Due to grid instabilities Seabrook must downpower to 800 MW electric in 30 minutes. US enters OS1231.04, Rapid Down Power and directs the following actions: **Step 1:** US will call SM to Perform Notifications per ODI.61, Redeclaration/Joint Owner Notification Guidelines. **Step 2:** Perform Down Power Briefing per ATTACHMENT A: • Power decrease priorities: o Load schedule should be maintained. o Tavg/Tref control band should be maintained: ▪ Between ZERO and +3°F to insert control rods in auto ▪ Between -3°F and +3°F with control rods in manual o AFD should be maintained near the administrative control band during the transient. • Reactivity control guidance: o Boration control: ▪ Use ODI.56 or reactivity balance calculation to determine boron quantity. ▪ Boration rate should be controlled to maintain Tavg/Tref control band. ▪ If rapid boration method is selected, it is preferable to add the boron quantity in several batches to maintain a smooth load schedule. ▪ Boration should be established to avoid rod insertion limits.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Rapid downpower (continued)		○ Rod control: ▪ The preferred method is to have control rods in auto to expedite power reduction. ▪ If auto rod withdrawal occurs, control rods may be placed in manual to control AFD. ○ As described in power decrease priorities above, control rods should be used to control AFD near the administrative band. After the transient, AFD should be returned to within the administrative band. ○ Turbine control: ▪ Turbine load should be reduced to maintain load schedule. ▪ Turbine load may be adjusted to help maintain Tavg/Tref within control band. • Human factor protocol guidance ○ The US may direct the operators to perform reactivity changes rather than direct each discrete reactivity manipulation. The operators must announce the intention to perform each manipulation. ○ Peer checks may be waived during transients. • Recovery actions must be taken to remain within the following limits: ○ Tavg/Tref control band (Auto or Manual Rods) ○ Tech Spec 3.2.1, AFD limit **US will read CAUTION prior to Step 3 to PSO:** Control Rods in Auto may initially insert rapidly and must be monitored to prevent exceeding Rod Insertion Limits. **Step 3:** Align Rod Control System: • PSO will verify/place rod control in auto.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Rapid downpower (continued)		**Step 4:** Determine Boration Value For Desired Power Level: • PSO will obtain boration value per ODI.56 (694 gallons of boric acid). • US will verify boration value per ODI.56. • The crew will borate per Attachment B or may chose to rapid borate in batches per Attachment D. NOTE: The US will give Attachment B or D to the PSO to perform at Step 5. He will then proceed to Step 6 to give direction to the BOP for turbine control. **Step 5:** Perform Boration: 1. PSO performs Attachment B or D as follows: **PSO will read NOTE prior to Attachment B, step 1:** NOTE: The maximum boration flow rate in normal mode is 40 GPM. 1. PSO will place the BLENDER MODE START SWITCH to STOP. 2. PSO will place the BORIC ACID BLENDER MODE SELECTOR SWITCH to BORATE. 3. PSO will perform the following using CS-FIQ-111 controller: a. Set the desired BORIC ACID quantity (694 gallons). b. Set the desired BORIC ACID flow rate (35 gpm). c. Turn off the STEP BACK feature. 4. PSO will turn the BLENDER MODE START SWITCH to START and HOLD for approximately one second. 5. PSO will verify the plant responds as expected. NOTE: Attachment B will remain in progress for the duration of the makeup.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Rapid downpower (continued)		**PSO will read NOTE prior to Attachment D, step 1:** NOTES: It is preferable to add boron quantity in several batches to maintain a smooth load reduction schedule. It is preferable to use a timer to track boration time. 1. PSO will stop CVCS manual makeup operation, as necessary. 2. PSO will open CS-V-426. 3. PSO will start at least one boric acid pump. IF VCT auto makeup in progress, THEN start second boric acid pump by placing control switch in normal after start position. 4. PSO will verify boration flow greater than 50 GPM as indicated on CS-FI-183A, Emergency Boration Flow. 5. PSO will maintain charging flow greater than rapid boration flow. 6. PSO will stop the rapid boration when the desired quantity has been added NOTE: Attachment D will remain in progress for the duration of the makeup.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Rapid downpower (continued)	.	**US will read NOTE prior to Step 6 to BOP:** Turbine load decrease should be less than or equal to 50 MWe/min (225%/hr) to avoid opening condenser steam dump valves. **Step 6:** Reduce Turbine Load to the Desired Power Limit: • BOP will setup to reduce turbine load (MWE) as necessary to maintain load reduction schedule by selecting desired Load Ramp Rate (120%/hr) and the desired Load Setpoint (60%). **Step 7:** Initiate PZR Forced Spray • PSO will turn on C & D (or A & B) backup heaters and monitor that the spray valves respond as expected. NOTE: Once the US identifies the temperature change due to the boration, he will give the order to commence unloading the turbine. NOTE: The Rapid Down Power procedure will remain in progress for the duration of the down power. **Step 8:** Monitor Rod Position: • PSO will check control rod insertion limit LO LO alarms - RESET **Step 9:** Check Steam Dump Operation: • BOP will check steam dumps – CLOSED **Step 10:** Perform Equipment Shut Down Actions per ATTACHMENT E

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 2	RC-LT-459 Fail Low: • SELECT: MF List • SELECT: REACTOR COOLANT (Component) • SELECT: ltRCLT459 • SELECT: Fail Low • SELECT: Insert	**PSO(I), US (I, TS)** PZR Level Instrument, RC-LT-459 Fails Low. RC-LCV-459 and CS-V-145 will go closed and isolate letdown flow. **Alarms:** D4435, Pressurizer Level Deviation Low D4461, PZR LVL Low & HTR Interlock Actuated F4323, PZR Control Heaters Tripped F4324, PZR Group C Backup Heaters Tripped F4325, PZR Group D Backup Heaters Tripped B8186, PZR STM/CHG Line ΔT Approach Limit US may direct the PSO to reduce charging flow to the RCP seals only. BOP will take over monitoring reactivity changes for the rapid down power. The crew enters OS1201.07, PZR Level Instrument Failure: **Step 1:** PSO identifies that the controlling pressurizer level channel is failed low. **Step 2:** Realign Pressurizer Level Instruments: a. PSO manually controls pressurizer level by reducing charging flow to the RCP seals only. b. PSO selects an alternate level channel for CONTROL/BACKUP (461/460). c. PSO selects an alternate level channel for RECORDER (461). **Step 3:** PSO will reset or manually control pressurizer heaters as necessary. **Step 4:** PSO will check letdown isolated with RC-LCV-459 closed.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
RC-LT-459 Fail Low (continued)	If the US calls I&C for support, then respond **"I&C personnel will arrive in the control room shortly."** If the US calls WCS for support, then respond **"The OCC is putting together a support team now."**	**Step 5:** Check If Normal Letdown Can Be Established: a. PSO adjusts charging to greater than 50 gpm. b. PSO reports Pressurizer level greater than 17%. c. PSO establishes normal letdown as follows: 1) PSO verifies CC-V341 is open and CS-TK-130 is in Auto. 2) PSO closes CS-HCV-189 and 190. 3) PSO opens RC-LCV-459 and then opens CS-V145. 4) PSO places CS-PK-131 in manual and sets the output to approximately 20% and then opens CS-HCV-189 OR 190 to establish letdown flow. Note: While raising letdown flow, PSO will make adjustments to charging and monitor Regen Heat Exchanger temperature. 5) US will go to Step 7. **Step 7:** PSO will align Pressurizer level control for automatic operation when desired. **Step 8:** PSO will verify Redundant Channel Bistables for PRESSURIZER LEVEL HI at UL-6 are not tripped. **Step 9:** US Verify Technical Specification Compliance: • T.S. 3.3.1, Reactor Trip System Instrumentation; Table 3.3-1, Item 11 • T.S. 3.3.3.6, Accident Monitoring Instrumentation; Table 3.3.10, Item 5 • T.S. 3.3.3.5, Remote Shutdown Systems; Table 3.3-9, Item 5 • US will coordinate with I&C for placing the affected channel in bypass for troubleshooting or in trip within 6 hours.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 3	FW-PT-508 Fail High: • SELECT: MF List • SELECT: FEEDWATER (Component) • SELECT: ptFWPT508 • SELECT: FAIL TO SPECIFIED VALUE • SELECT: Value = 1500 • SELECT: Ramp = 30 • SELECT: Insert If the US calls WCS for support, then respond **"The OCC is putting together a support team now."**	**BOP(I), US(I)** Combined Feed Header Pressure Instrument, FW-PT-508 Fails High. The speed of the main feed pumps will decrease due to the higher than program DP. SG levels will decrease requiring manual operator actions. **Alarms:** D4704, SG D STM Flow/Feed Flow Mismatch D4706, SG A STM Flow/Feed Flow Mismatch D4708, SG B STM Flow/Feed Flow Mismatch D4710, SG C STM Flow/Feed Flow Mismatch US will direct the BOP to take manual control of the Main Feed Pump Master Speed controller and return all steam generator NR levels to 45% to 55%. The crew enters ON1230.01, MS-PT-507 or FW-PT-508 Pressure Instrument Failure: **Step 1:** BOP checks Steam Dumps In Tavg Mode and steam dump controller MS-PK-507 in manual and minimum output. **US reads Note prior to Step 2:** Setpoint value on the feedpump master speed controller will provide programmed ΔP based on steam flow indication. **Step 2:** BOP take manual control of the Main Feed Pump Master Speed controller and control feed header/steam header ΔP at program ΔP. **Step 3:** BOP will check Secondary Plant Conditions stable. **Step 4:** BOP checks third condensate pump not running. **Step 5:** US may contact Work Control or I&C to start repair effort.

Event 4 E-0, Reactor Trip or Safety Injection ECA-0.0, Loss of All AC Power	Loss of offsite power: • SELECT: MF List • SELECT: ELECTRICAL DISTRIBUTION • SELECT: mfED038 • SELECT: Insert	**PSO(M), BOP(M), US(M)** Loss of offsite power and reactor trip with no EDG response. On Reactor Trip and Loss of Offsite Power, the US announces Reactor Trip, entering E-0 and directs crew to perform their Immediate Actions. US enters E-0, Reactor Trip or Safety Injection **Step 1:** Verify Reactor Trip: • PSO will check Rod bottom lights lit, reactor trip and bypass breakers open and neutron flux decreasing. **Step 2:** Verify Turbine Trip: • BOP will check all stop valves or all control valves closed and the generator breaker open. **Step 3:** Verify Power To AC Emergency Busses: • BOP will check both AC emergency busses energized. • BOP will attempt to emergency start the 'A' EDG. • BOP will report NO AC emergency busses energized. • US will go to ECA-0.0, LOSS OF ALL AC POWER, Step 1.

ECA-0.0, Loss of All AC Power (continued)	If BOP calls NSO to check DG-1A status, then respond **"I am at DG-1A and there is oil all over the floor."** BOP calls NSO to locally open EFW pump mini flow valves, respond **"Locally open EFW pump mini flow valves."** Locally open EFW pump mini flow valves • SELECT: Sim Diagrams • SELECT: FW 3 • SELECT: FW-V-346 • SELECT: RF:MANUAL ADJUST • SELECT: Value = 1 • SELECT: Ramp Time = 30 • SELECT: Insert • SELECT: FW-V-347 • SELECT: RF:MANUAL ADJUST • SELECT: Value = 1 • SELECT: Ramp Time = 30 • SELECT: Insert When EFW pump mini flow valves are open, report to Control Room **"EFW pump mini flow valves are open."**	US announces entering ECA-0.0 and directs crew to perform their Immediate Actions. US enters ECA-0.0, Loss of All AC Power **Step 1:** Verify Reactor Trip: • PSO verifies reactor trip and bypass breakers open. • PSO verifies neutron flux decreasing. **Step 2:** Verify Turbine Trip: • BOP verifies all stop valves or all control valves closed. • BOP verifies generator breaker open. Note: After immediate actions are complete, BOP may request SG Level Control Criteria from the ECA-0.0 OAS page. US instructs BOP that WHEN SG level is adequate based on 65% WR in at least two SGs OR 6% NR in at least one SG, THEN perform the following: a. Place EFW pump mini-flow valve control switches to the open position. b. Locally open EFW pump mini-flow valves. c. Locally throttle EFW flow control valves to maintain narrow range level between 6% and 50% [15% and 50% FOR ADVERSE CONTAINMENT] d. WHEN power is restored to EFW flow control valves, THEN throttle flow using MCB switches. **Step 3:** Check If RCS Is Isolated: a. PSO checks PZR PORVs closed. b. PSO checks Letdown isolation valve CS-V-145 closed. c. PSO checks Excess letdown isolation valves, CS-V-175 & 176 closed. d. PSO checks RCS sample valves closed by phase a status panels.

ECA-0.0, Loss of All AC Power (continued)		**Step 4:** BOP verifies EFW Flow greater than 500 gpm total flow. **Step 5:** Try To Restore Power To Any AC Emergency Bus: a. BOP places UAT and RAT supply breaker control switches for the emergency busses in PULL TO LOCK position. Note: BOP or US will verify SEPS running from MPCS Color Graphics or D-Points D8288 and D8289. b. BOP identifies that NO EDGs are available. US verifies that SEPS feeder breaker is aligned to Bus 6 then directs the following per the RNO: 1) BOP places the following control switches in Pull to Lock: • DG 1B output breaker • CBS-P-9B • SI-P-6B 2) BOP closes SEPS Bus 6 breaker. 3) US go to Step 5f. f. BOP verifies EPS actuated and sequencing • BOP may request to reset RMO per "Skill of the Operator". g. Check equipment loaded: • PSO checks Charging Pump. • PSO checks Thermal barrier cooling pump
Event 5 **Critical Task**	'B' Train of PCCW fails to auto start	**PSO(C), US(C)** • PSO Checks PCCW pump – NOT RUNNING 1) PSO/BOP Resets RMO **2) PSO manually starts a 'B' Train PCCW pump.** • BOP checks EFW pump
Event 6 **Critical Task**	'B' Train of SW fails to auto start	**BOP(C), US(C)** • BOP checks SW pump 1) PSO/BOP Resets RMO **2) BOP manually starts a 'B' Train SW pump.** Check AC emergency busses – AT LEAST ONE ENERGIZED

	Terminate the scenario when the crew Restores power and starts 'B' Train PCCW and SW pumps or at Lead Examiner's direction.	

*** END OF SCENARIO ***

	WORLD CLASS PERFORMANCE .....*expect it!*	**For Simulator Use Only** OPERATIONS DEPARTMENT TURNOVER

Plant Status

Plant is in Mode **1** At **100**% Power.

The Security Threat Level is **Yellow**

Protected Train

A

Current PRA Risk is **Green**

Aggregate risk is **6 LOW**

Reactivity

RCS Boron concentration is **1058** ppm

Performing A **30** Gal **Dilution** Every 5 hours

Rod control is in **Auto** With Control Bank "D" at **230** Steps

RCS Tave Band (Deg. F) **589- 589.3**

Dilution Amount Required To Raise Tave by 1 Deg. F (Gal): **218**

Boration Amount Required To Lower Tave by 1 Deg. F (Gal): **38**

SG Blowdown Lineup: **Hotwells** At **60** GPM/SG

Cation Run (Minutes):Mids - **6** Days - **6** Cation Flowrate: **Full Flow**

Turbine Controls: Make adjustments as required to maintain 8 Hour thermal power between 3646.0 MW and 3647.9 MW. The 1 Hour thermal power average will be maintained below 3648 MW.

Control Rods will be manipulated per Reactor Engineering recommendations and will normally be left in automatic control. Utilize OS1000.10 Fig. 11, Rod Motion Checklist.

ODI 56 Values for NEPEX Contingency Downpower

Amount of Boration Needed To reduce Output to 1200 Mwe Net (C6123) Is **124** Gal.

Amount of Boration Needed To reduce Output to 800 Mwe Net (C6123) Is **694** Gal.

Reactivity	Activities that may affect reactivity.

General Plant Status	General Plant Info (Non Watchstation Specific)

'B' Emergency Diesel Generator is out of service for maintenance with SEPS available. TS 3.8.1.1, Actions b, c and d are met.

Evolutions	List non-tagging evolutions and surveillances in progress or planned

Work Control	Name:	RSS

Primary NSO	Name:	FB RSS MED

Secondary NSO	Name:	FB RSS MED

Rover NSO	Name:	FB RSS MED

'B' Emergency Diesel Generator is out of service for maintenance with SEPS available. TS 3.8.1.1, Actions b, c and d are met.

Waste NSO	Name:	FB RSS MED

Field Support NSO	Name:	FB RSS MED

Fire Brigade Leader	Name:

Unit Supervisor	Name:

Shift Manager	Name:

NEXTera ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG

SITE: Seabrook **Revision #:** FINAL

LMS ID: **LMS Rev. Date:**

SEG TITLE: 2015 LOIT NRC SIM Exam B

SEG TYPE: ☐ Training ☒ Evaluation

PROGRAM: ☐ LOCT ☒ LOIT ☐ Other:

DURATION: 90 minutes

Developed by: _____ _____
Instructor/Developer Date

Reviewed by: _____ _____
Instructor (Instructional Review) Date

Validated by: _____ _____
SME (Technical Review) Date

Approved by: _____ _____
Training Supervision Date

Approved by: _____ _____
Training Program Owner (Line) Date

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER REVIEWER	DATE DATE

OVERVIEW / SEQUENCE OF EVENTS

OVERVIEW

The crew will take the watch at MOL 8% power. Boron Concentration is 1631 ppm with CB D at 90 steps and 'A' MFP in service. SEPS and CC-P-11D are out of service for maintenance. The crew will begin a power increase to 15% power to roll the turbine. No fuel preconditioning guidelines are in effect. 'D' SG Level controlling channel FW-LT-549 fails low requiring manual control of the 'D' SG FRV. Pressurizer pressure controlling channel RC-PT-455 fails low requiring manual control of the master pressure controller. The crew will then respond to a 45 gpm reactor vessel flange leak requiring reactor vessel flange isolation. After isolation is complete the crew will address a 20 gpm RCS leak. MS-PT-507 fails high and all steam dumps open. The crew will respond with P-12 switch operation or take manual control of the Steam Dump controller. The crew will then respond to 2 dropped rods which will require a reactor trip. Simultaneously the RCS leak will grow to 50,000 gpm requiring and SI actuation. RHR pumps will not automatically start. However, the crew will be able to start one RHR pump.

SEQUENCE OF EVENTS

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
1.	Crew begins power increase to 15% power ready to roll the turbine.
2.	'D' SG Level controlling channel FW-LT-549 fails low.
3.	Pressurizer pressure controlling channel RC-PT-455 fails low.
4.	45 gpm reactor vessel flange leak. After reactor vessel flange isolation, 20 gpm RCS leak.
5.	MS-PT-507 fails high. All steam dumps open.
6.	2 rods drop. On rod drop RCS leak grows to 50,000 gpm. Reactor trip and SI required.
7.	RHR pumps will not automatically start. PSO starts 'B' RHR pump.

Critical Task	Description
1.	The PSO reports RCS subcooling <40°F. Per the OAS page the US will direct PSO to check at least one running ECCS pump and stop all RCPs.
2.	PSO starts RHR pumps in E-0. Only the 'B' RHR pump starts.

SIMULATOR SET UP INSTRUCTIONS

Perform simulator set up per the Simulator Setup Checklist.

General Instructions

a. Provide extra copies of procedures to Examiners
b. Reset to IC 122.
c. Place simulator in Run
d. Verify the following have been inserted OR reset to MOL 8% IC and insert the following:
   1. A Train is Protected, SV C0755, '1'
   2. Both RHR pumps fail to auto start and 'B' RHR pump can be started:
      - SELECT: MF List
      - SELECT: RESIDUAL HEAT REMOVAL (Component)
      - SELECT: RH (Breaker)
      - SELECT: bkRHP8A
      - SELECT: FAIL TO CLOSE (CAN NOT CLOSE)
      - SELECT: Insert
      - SELECT: RESIDUAL HEAT REMOVAL
      - SELECT: mfRH005
      - SELECT: Insert
      - SELECT: mfRH006
      - SELECT: Insert
   3. SEPS out of service for maintenance:
      - SELECT: RF List
      - SELECT: SUPPLEMENTAL EMERGENCY POWER SYSTEM
      - SELECT: rfSEP001
      - SELECT: Final Value = OFF
      - SELECT: Insert
      - SELECT: rfSEP002
      - SELECT: Final Value = OFF
      - SELECT: Insert
      - SELECT: SUPPLEMENTAL EMERGENCY POWER SYSTEM (Component)
      - SELECT: bkSEPSA5A
      - SELECT: RACK-OUT
      - SELECT: Insert
      - SELECT: bkSEPSA7A
      - SELECT: RACK-OUT
      - SELECT: Insert

4. Place SEPS Bus 5 breaker control switch in PTL.
5. Put INFO tag on the SEPS Bus 5 breaker control switch.
6. Place SEPS Bus 6 breaker control switch in PTL.
7. Put INFO tag on the SEPS Bus 6 breaker control switch.
8. CC-P-11D out of service for maintenance:
   - SELECT: RF List
   - SELECT: PRIMARY COMPONENT COOLING (Component)
   - SELECT: cCCP11D
   - SELECT: RF:RACK-OUT
   - SELECT: Insert
9. Place CC-P-11D control switch in PTL.
10. Put INFO tag on the CC-P-11D control switch.
11. Ensure Boron Concentration in the Blender pipes = 0
    - SELECT: Sim Diagrams
    - SELECT: CS 5
    - SELECT: rfCS028
    - SELECT: Final Value = 0
    - SELECT: Ramp Time = 10
    - SELECT: Insert

e. Advance logger and tear off any sheets with print.

SHIFT TURNOVER INFORMATION

- See Turnover Sheet

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 1 Start at Lead Examiners discretion.	**NOTE: The Power Increase may be pre-briefed prior to the crew taking the watch.** Allow the students to increase plant power to the extent that a significant reactivity manipulation is demonstrated. **NOTE: If the crew desires to operate the SG Feed Reg Bypass Valves in MAN for the power increase, then perform Event 2 FW-LT-549 failure prior to the crew going to manual control.**	**PSO(R), BOP(N), US(N)** Crew Begins the Power increase IAW MPE Procedure OS1000.02, Plant Startup From Hot Standby to Minimum Load. The crew should prepare for and initiate a power increase to 15%. **Unit Supervisor:** A brief reactivity review will take place discussing the temperature limits for Tavg to be used in the power increase. The temperature band will normally be ±3°F with rods in manual. At 8% reactor power, the steam dumps are in the Steam Pressure Mode with MS-PK-507 in AUTO maintaining RCS temperature at 557°F. Control rods will be used to control reactor power. **Reactor Power change**: The crew will use control rods to raise reactor power. When control rods are used in manual, the operator will verify rod speed, place the Rod Motion Selector (In-Hold-Out) switch to the OUT direction and withdraw the rods a maximum of three steps. The PSO will monitor temperature and power as confirmation of actions.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 2 Start at Lead Examiners discretion.	FW-LT-549 fail low: • SELECT: MF List • SELECT: FEEDWATER (Component) • SELECT: ItFWLT549 • SELECT: FAIL TO SPECIFIED VALUE • SELECT: Value = 0 • SELECT: Insert	**BOP(I), US(I, TS)** FW-LT-549 for 'D' SG bypass FRV fails low. The 'D' SG bypass FRV will go full open. **Alarms:** D4773 SG D LVL REF DEVIATION D4879 SG D LEVEL LOW F4850 SG D LEVEL LO-LO Once BOP identifies the 'D' SG bypass FRV full open, US may direct BOP to take manual control of the 'D' SG bypass FRV and maintain 'D' SG at 45% to 55%. US enters OS1235.03, SG Level Instrument Failure. **US reads CAUTION prior to Step 1:** Failure of channels 519, 529, 539 or 549 will require manual feedwater regulating bypass valve control since a redundant level channel is not provided. **Step 1:** Check Steam Generator Water Level Control: a. BOP identifies failed instrument is the controlling channel. b. BOP places 'D' steam generator bypass feed control valve in MANUAL. c. BOP controls feed flow to maintain narrow range level 45% to 55%.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
FW-LT-549 Failure (continued)	The crew calls the WCS/WWM for the FW-LT-549 failure, respond **"Understand that FW-LT-549 has failed low. I&C is on their way to the control room and a troubleshooting team is being formed."**	NOTE: US may realign Steam Generator Level Instruments on 'D' SG to clear hardwire alarm and for eventual automatic control when the plant is on the Main Feed Regulating valves.. **Step 2:** Realign Steam Generator Level Instruments: • BOP states no alternate channel for 'D' SG bypass FRV. • US may direct BOP to swap 'D' SG controlling channels for future use.. **Step 3:** Align Steam Generator Water Level Control: • BOP states 'D' SG bypass FRV will remain in MANUAL. **Step 4:** Verify Redundant Channels Bistables - NOT TRIPPED • PSO verifies at UL-1 - SG LVL HI HI FW ISO TURB TRIP - NOT TRIPPED. • PSO verifies at UL-6 - SG LVL LO LO - NOT TRIPPED. • BOP verifies at UL-12 - SG LVL HI HI FW ISO TURB TRIP - NOT TRIPPED. **Step 5:** US verifies Technical Specification Compliance: • T.S. 3.3.1, Reactor Trip System Instrumentation; Table 3.3-1, Item 13 • T.S. 3.3.2, Engineered Safety Features Actuation System Instrumentation; Table 3.3-3, Items 5.b, 6.a, 7.c, 10.c • T.S. 3.3.3.6, Accident Monitoring Instrumentation; Table 3.3-10, Item 7 US will coordinate with I&C to place bistables to bypass for up to 6 hours or trip within 6 hours. **Step 6:** Verify ATWS Mitigation Input Status: • BOP reports that no ATWS mitigation channels are failed and the US return to procedure in effect.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 3 Start at Lead Examiners discretion.	RC-PT-455 Failed Low: • SELECT: MF List • SELECT: Reactor Coolant (component) • SELECT: ptRCPT455 • SELECT: FAIL LOW • SELECT: INSERT	**PSO(I), US(I, TS)** RC-PT-455, controlling pressurizer pressure instrument fails low. **Initial Alarms:** F5298 OTDT CHAN TRIP F7434 PZR PRESSURE LOW CHANNEL LOW (RX) F7435 PZR PRESSURE LOW CHANNEL TRIP (SI) UL1-F10 PZR PRESS LO SI UL6-A3 RCS LOOP OTΔT UL6-A5 PRESSURIZER PRESS LO Once PSO identifies the controlling pressurizer pressure channel failure, US may direct PSO to take manual control of the master pressure controller and control RCS pressure 2225 to 2250 psig (approximate band). US enters OS1201.06, PZR Pressure Instrument / Component Failure and directs the following actions: **US will read NOTE prior to Step 1 to PSO:** A reactor trip may occur on OTΔT setpoint if RCS pressure significantly decreases below normal operating pressure. **Step 1:** Check PORVs closed: • PSO will report both PORVs closed. **Step 2:** Check Normal PZR Spray Valves closed: • PSO will report both Normal PZR Spray valves are Open. • PSO will report both Normal PZR Spray valves responding correctly.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
RC-PT-455 Failure Low (continued)		**US will read NOTE prior to Step 3 to PSO:** Channel P-455/P-456 is normally selected for pressure control because a failed LOW – RC-PT-458 (selected for backup) or RC-PT-457 (selected for control), will prevent automatic operation of both pressurizer PORVs. **Step 3:** Check PZR Pressure Channels: Controlling/Backup/Recorder channel failed: • PSO reports no Controlling/Backup/Recorder channel failed, but that RC-PT-455 has failed low. **US will read CAUTION prior to Step 4 to PSO:** Channel Selection of alternate pressurizer pressure control channel OR recorder channel uses a "make before break" circuit that can result in control system transient if a significant deviation exists between the channels. **Step 4:** Realign Pressurizer Pressure Instruments: • PSO reports that 457/456 or 458/456 for is selected for control/backup. • PSO reports that 456, 457 or 458 is selected for the pressure channel recorder. • PSO reports that an alternate ΔT, OT, OP channel is selected for the recorder. **Step 5:** Align Pressurizer Pressure control: • PSO reports that RCS pressure is trending to 2235 psig and the master pressure controller, RC-PK-455A is in auto. **Step 6:** Verify redundant channels bistables not tripped: • PSO will report redundant channels bistables not tripped on UL-1 and UL-6 bistables.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
RC-PT-455 Failure Low (continued)	The crew calls the WCS/WWM for the RC-PT-455, respond **"Understand that RC-PT-455 has failed low. I&C is on their way to the control room and a troubleshooting team is being formed."**	**Step 7:** Verify Technical Specification Compliance: • T.S. 3.3.1, Reactor Trip System Instrumentation; Table 3.3 1, Items 7, 9 and 10. Enter action 6. • T.S. 3.3.2, Engineered Safety Features Actuation System Instrumentation; Table 3.3-3, Items 1.d. Enter action 18. US will coordinate with I&C to place bistables to bypass for up to 6 hours or trip within 6 hours.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 Start at Lead Examiners discretion.	Reactor Vessel Flange Leak at 45 gpm. • SELECT: MF List • SELECT: REACTOR COOLANT • SELECT: mfRC019 • SELECT: Final Value = 45 • SELECT: Ramp Time = 30 • SELECT: Insert When PSO closes RC-V147 modify mfRC019 to 0 gpm. • SELECT: MF List • SELECT: REACTOR COOLANT • SELECT: mfRC019 • SELECT: Final Value = 0 • SELECT: Ramp Time = 10 • SELECT: Modify	**PSO(C), US(C, TS)** Reactor Vessel Flange Leak at 45 gpm followed by 20 gpm RCS leak **Initial Alarms:** D4320 RX Vessel Flange Leakoff Temp High PSO identifies Reactor Vessel Flange Leakoff Temp High and US enters OS1201.05, Loss of Reactor Vessel Flange Seal. **US reads NOTES prior to Step 1:** • High temperature for the reactor vessel flange leakoff alarms at 200°F. • Reactor vessel flange leakoff is classified as identified leakage. **Step 1:** Check Reactor Vessel Flange Leakoff Temperature leakage indicated: • PSO identifies D4320 RX Vessel Flange Leakoff Temp High in Alarm AND • PSO identifies RC-TI-401, reactor vessel flange leakoff temperature greater than 200°F. **Step 2:** Realign Reactor Vessel Flange Leakoff: a. PSO closes RC-V147, reactor vessel flange leakoff isolation. b. US refers to 0N1090.04 CONTAINMENT ENTRY to enter containment and proceeds to Step 3. **Step 3:** Verify Reactor Vessel Flange Seal Integrity: a. PSO verifies Reactor vessel flange leakoff temperature decreasing. b. PSO identifies that Containment activity is NORMAL. c. PSO identifies that Containment temperature is NORMAL. **Step 4:** Verify Technical Specification Compliance: • T.S. 3.4.6.2 RCS Leakage

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
RCS Leak at 20 gpm. (continued)	After RCS Leakage T.S. review, insert RCS Leak at 20 gpm. • SELECT: MF List • SELECT: REACTOR COOLANT • SELECT: mfRC050A • SELECT: Final Value = 20 • SELECT: Ramp Time = 30 • SELECT: Insert	PSO identifies PZR level and pressure lowering. US directs PSO to take manual control of charging and letdown and stabilize PZR level. US enters OS1201.02, RCS Leak. **US reads CAUTION prior to Step 1 to PSO:** IF Plant in mode 1,2, or 3 with SI Accumulators aligned for injection AND PZR level can NOT be maintained greater than 7% using normal charging lineup, THEN perform the following: 1) Trip reactor 2) WHEN reactor trip is verified, THEN actuate SI 3) Go to E-0, REACTOR TRIP OR SAFETY INJECTION. **Step 1:** Check If Pressurizer Level Can Be Maintained: • PSO places charging in manual and reduces letdown to stabilize PZR level. • PSO will estimate RCS leakage using a Flow Balance. • BOP should commence a Mass Balance for RCS leakage determination. **Step 2:** US will call the Shift Manager to refer to ER 1.1, Classification of Emergencies. **Step 3:** US will Determine Appropriate Procedure Step Transition with PSO that RCS leak is suspected and go to Step 4. **Step 4:** Isolate Potential RCS Leakage Sources: a. PSO checks PORV tailpipe temperatures and acoustic monitor alarms are normal. b. PSO verifies RC-FV-2881 and RC-V323 are both closed. c. PSO verifies CS-V175 and 176 are both closed.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
RCS Leak (continued)		**Step 4:** CONTINUED d. PSO checks RCS sample lines are closed by Phase A status panels. NOTE: In the following step RC-TI-401 is high from the previous reactor vessel flange leak. The Crew will recognize this and will not transition back to OS1201.05 but continue in OS1201.02. e. PSO verifies reactor vessel flange leakoff temperature RC-TI-401 RX vessel flange leakoff temp is high. f. PSO checks valve stem leakoff header temperature D7804 and D7805 are reset. g. BOP checks steam generator tubes intact as follows: • Main steamline radiation – NORMAL • Steam generator blowdown radiation – NORMAL • Condenser air evacuation radiation – NORMAL • Steam generator sample - NORMAL h. PSO checks SI discharge header pressure less than 800 psig. i. US evaluates that RCS leakage is not isolated and goes to step 16. **Step 16:** Crew continues efforts to locate and identify source of leakage via plant walkdowns and possible containment entry while continuing with this procedure. **Step 17:** Estimate the RCS leak rate as follows: a. Crew maintains Tavg – STABLE b. PSO maintains pressurizer level – STABLE c. PSO will use VCT level trend and BOP will PZR/VCT mass balance. **Step 18:** Verify Technical Specification Compliance: • US reviews T.S. 3.4.6.2, Reactor Coolant System Leakage and determines Action b applies to reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
RCS Leak (continued)	**NOTE: After completing Step 20, insert Event 5 MS-PT-507 failure high on next page.**	**Step 19:** Check VCT Makeup Control System: • PSO will set VCT makeup controls to the desired boron concentration. • PSO will verify makeup set for automatic control. **Step 20:** Evaluate Continued Plant Operation: • Crew will state that RCS leakage is not isolated and US will proceed to Step 21. **US reads NOTE prior to Step 21:** • The following steps will direct a plant shutdown based on RCS leakage exceeding technical specification limits. • OS1231.04 RAPID DOWN POWER is performed if desired rate of power decrease is greater than or equal to 10%/hr. **Step 21:** Commence Plant Shutdown While Continuing With This Procedure: US will commence plant shutdown IAW OS1000.03, Plant Shutdown from Minimum Load to Hot Standby while continuing with this procedure.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 5 Start at Lead Examiners discretion.	After completing Step 20, insert MS-PT-507 failure high. • SELECT: MF List • SELECT: MAIN STEAM (Component) • SELECT: ptMSPT507 • SELECT: FAIL TO SPECIFIED VALUE • SELECT: Value = 1300 • SELECT: Ramp Time = 10 • SELECT: Insert	**BOP(C), US(C)** MS-PT-507 fail high. All steam dumps go full open. **Alarms:** D4704 SG D STM FLOW/FEED FLOW MISMATCH D4706 SG A STM FLOW/FEED FLOW MISMATCH D4708 SG B STM FLOW/FEED FLOW MISMATCH D4710 SG C STM FLOW/FEED FLOW MISMATCH D4770 SG A LVL REF DEVIATION D4771 SG B LVL REF DEVIATION D4772 SG C LVL REF DEVIATION D4773 SG D LVL REF DEVIATION The BOP may close the steam dumps by using the P-12 interlock switches or by taking MS-PK-507 to MANUAL and reducing the output to Minimum by the "Skill of the Operator" prior to entering the abnormal procedure. Depending on the duration of these actions the ASDVs may open to control RCS temperature. US enters OS1230.01, MS-PT-507 or FW-PT-508 Pressure Instrument Failure.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
MS-PT-507 fail high (continued)		**Step 1:** Check Condenser Steam Dump System: a. With steam dumps in steam press mode and PT-507 failed high the US directs the following: 1) BOP closes steam dumps by placing either steam dump interlock control switch to OFF position. 2) BOP places steam dump controller MS-PK-507 in MANUAL with minimum output. 3) BOP places steam dump interlock control switch to NA RESET NA BYPASS INTERLOCK position. 4) BOP manually controls steam dumps as required. 5) US goes to Step 2. **US reads NOTE prior to Step 2:** Setpoint value on the feedpump master speed controller will provide programmed ΔP based on steam flow indication. **Step 2:** Restore Main Feed Pump Speed Control: • BOP controls Master Speed Controller to control programed ΔP. **Step 3:** Check Secondary Plant Conditions STABLE • BOP reports secondary plant is stable. **Step 4:** Check Third Condensate Pump NOT RUNNING • BOP reports Third Condensate Pump NOT RUNNING. **Step 5:** Initiate Instrument Repairs

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 6 Start at Lead Examiners discretion.	2 Rods drop: • SELECT: MF List • SELECT: ROD CONTROL AND POSITION • SELECT: mfCP011 • SELECT: Insert RCS leak to 50,000 gpm on reactor trip. • SELECT: MF List • SELECT: REACTOR COOLANT • SELECT: mfRC050A • SELECT: Final Value = 50000 • SELECT: Ramp Time = 10 • SELECT: MODIFY	**PSO(M), BOP(M), US(M)** 2 rods drop requiring a manual reactor trip. The PSO identifies to US 2 dropped rods. **Alarms:** D7749 TWO OR MORE RODS ON BOTTOM D4421 TAVG-TREF DEVIATION US enters OS1210.05, Dropped Rod, and directs the following actions: **Step 1:** Stabilize Plant Conditions: • PSO will check ONLY one rod dropped and report 2 dropped rods. • US will direct manual reactor trip. US will direct crew to enter E-0, Reactor Trip or Safety Injection and to perform their immediate actions.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-0, Reactor Trip or Safety Injection (continued) **Critical Task 1**		E-0, Reactor Trip or Safety Injection **Step 1:** Verify Reactor Trip: • PSO will check Rod bottom lights lit, reactor trip and bypass breakers open and neutron flux decreasing. **Step 2:** Verify Turbine Trip: • BOP will check all stop valves or all control valves closed and the generator breaker open. **Step 3:** Verify Power To AC Emergency Busses: • BOP will check both AC emergency busses energized. **Step 4:** Check If SI Is Actuated: • PSO will check both SI annunciators lit. US will direct PSO and BOP to bring up their alarms and notify him of any immediate plant concerns and share any pertinent plant information. At this time the PSO may report no RHR pumps running. US may direct PSO to start RHR pumps or to perform the action per E-0, Attachment A. **The PSO may report RCS subcooling <40°F. Per the OAS page the US will direct PSO to check at least one running ECCS pump and stop all RCPs.** **Step 5:** Perform ESF actuation verification per Attachment A: • PSO will perform Attachment A.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-0, Reactor Trip or Safety Injection (continued) **Event 7** **Critical Task 2**		PSO performing Attachment A while US and BOP process E-0. 1. PSO will verify Containment Isolation Phase A Actuation by checking all status panel lights lit for both trains. 2. PSO will verify Safeguard Equipment Alignment by checking proper alignment by status panel for both trains. **PSO(C), US(C)** **PSO starts RHR pumps. Only the 'B' RHR pump starts.** 3. PSO will verify Feedwater Isolation by checking proper alignment by status panel. 4. PSO will verify a PCCW Pump running in both loops. 5. PSO will verify ECCS Flow by checking: • CCP indicated flow to RCS cold legs. • RCS pressure <1700 psig, SI pump indicated flow to both trains. • RCS pressure <300 psig, No RHR flow indication. PSO checks valve alignment and attempts to start pumps without success. 6. PSO will verify MS-V-129 is open. 7. PSO will verify a SW Pump running in both trains. 8. PSO will verify SW flow to Train A and Train B Diesels >900 gpm. 9. PSO will verify main steamlines are isolated. 10. PSO will verify Containment Pressure >18 psig: • PSO verifies Containment Spray actuation. • PSO stops all RCPs. 11. PSO will verify Total EFW flow >500 gpm. 12. PSO will not need to reset RMO. 13. PSO will notify US of actuation verification status. Attachment A is complete.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-0, Reactor Trip or Safety Injection (continued)		**Step 6:** Monitor RCS Temperature stable at or trending to 557°F. • IF BOP reports temperature >557°F, THEN US will direct the following actions: o Dump steam to condenser OR o Dump steam using SG ASDVs. • IF BOP reports temperature <557°F and decreasing, THEN US will direct the following actions: o Stop dumping steam to condenser and atmosphere. o Check MS to MSRs isolated. NOTE: The following 2 steps may have been performed per the E-0 OAS page. o IF cooldown continues, THEN open EFW pump mini flow valves AND throttle total feed flow to maintain greater than 500 GPM. o WHEN SG level is adequate based on 15% NR (Adverse Containment) in at least one SG, THEN throttle feed flow to maintain SG narrow range level between 15% and 50%. o IF cooldown continues, THEN close MSIVs, MSIV bypass valves and upstream drains.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-0, Reactor Trip or Safety Injection (continued) **Critical Task 1 (if not performed earlier)**		**Step 7:** Check RCS Isolated: • BOP will check CS-V-145, both PORVs and both normal PZR spray valves closed. NOTE: The following step may have been performed per the OAS page at the Step 4 pause. **Step 8:** Check If RCPs Should Be Stopped: • BOP will check at least one running ECCS pump and report RCS subcooling <40°F. • **BOP will stop all RCPs.** **Step 9:** Check If SG Pressure Boundary Is Faulted: • BOP will check pressures in all SGs and report pressures as expected. **Step 10:** Check If SG U Tubes Are Intact: • BOP reports Main Steamline, Condenser Air Evacuation and SG Blowdown radiation all NORMAL. • BOP reports no SG narrow range level uncontrolled level increase. **Step 11:** Check If RCS Is Intact: • BOP reports Containment radiation not NORMAL. • US goes to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. Crew should state that Critical Safety Functions are now in effect and identify no Red or Orange challenges.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
FR-P.1, Response to Imminent Pressurized Thermal Shock Conditions		NOTE: Depending on the time taken to process E-0, when the crew transitions to E-1, FR-P.1, Response to Imminent Pressurized Thermal Shock Conditions may be met. If this is the case the crew will validate the conditions and then enter FR-P.1. If not, the crew will enter FR-P.1 when the conditions are met. Crew states that the Critical Safety Functions are challenged with a RED P. The crew will validate the RED P using hardwire indications and report to the US that the conditions are met. US enters FR-P.1, Response to Imminent Pressurized Thermal Shock Conditions **Step 1:** Check RCS Pressure - greater than 300 psig • PSO reports no, RCS is less than 300 psig. • US reads RNO: IF RHR pump flow is greater than 1000 gpm on at least one pump, THEN return to procedure and step in effect. • PSO reports 3500 gpm on the 'B' RHR pump. • US return to E-1.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-1, Loss of Reactor or Secondary Coolant (continued)		E-1, Loss of Reactor or Secondary Coolant. **Step 1:** Check If RCPs Should Be Stopped: • PSO reports all RCPs secured. **Step 2:** Check If SG Pressure Boundary Is Faulted: • BOP checks pressures in all SGs and report pressures as expected. **Step 3:** Check Intact SG Levels: • SG level is greater than 15% NR (Adverse Containment) in at least one SG. • Open EFW pump mini flow valves control feed flow to maintain SG narrow range level between 15% and 50%. **Step 4:** Check Secondary Radiation: • BOP reports Main Steamline, Condenser Air Evacuation and SG Blowdown radiation all NORMAL. • BOP reports no SG narrow range level uncontrolled level increase. **Step 5:** Check PZR PORV And Block Valves: • PSO reports power to block valves is available. • PSO reports PORVs closed. • PSO reports both block valves open. **Step 6:** Check If ECCS Flow Should Be Reduced: • PSO reports RCS subcooling less than 40°F. • US goes to Step 7. **Step 7:** Check If Containment Spray Should Be Stopped: • PSO reports both Containment Spray pumps running. • PSO reports containment pressure greater than 4 psig. • US goes to Step 8 but will come back to Step 7 when containment pressure is less than 4 psig.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-1, Loss of Reactor or Secondary Coolant (continued)		**Step 8:** Check If RHR Pumps Should Be Stopped: • PSO reports RCS pressure less than 300 psig. • US goes to step 10. **Step 10:** Check If Diesel Generators Should Be Stopped: a. PSO resets SI. b. BOP verifies all AC busses energized by offsite power from UATs. c. Stop unloaded emergency diesel generators and reset for auto start: 1) BOP stops DG by depressing both emergency stop buttons. 2) After the DG has stopped, BOP resets DG for auto start. 3) BOP isolates SW to the DGs by closing SW-V16 and V18. **Step 11:** Initiate Evaluation Of Plant Status:
	Terminate the scenario when the crew stops both emergency DGs or at Lead Examiner's direction.	E-Plan Classifications 1. FA1 - ANY Loss or Potential Loss of EITHER Fuel Clad or RCS Barriers (Op. Modes: 1, 2, 3, 4). RCS Barrier is lost with RCS subcooling <40°F due to an RCS leak.

*** END OF SCENARIO ***

	WORLD CLASS PERFORMANCE .....expect it!	**For Simulator Use Only – NRC Exam B** OPERATIONS DEPARTMENT TURNOVER

Plant Status

Plant is in Mode **1** At **8%** Power.

The Security Threat Level is **Yellow**

Protected Train

A

Current PRA Risk is **Green**

Aggregate risk is **6 LOW**

Reactivity

RCS Boron concentration is **1631** ppm

Reactivity changes per the 15-ROER-001.

Rod control is in **Manual** With Control Bank "D" at **90** Steps

RCS Tave Band (Deg. F) **557- 557.3**

Dilution Amount Required To Raise Tave by 1 Deg. F (Gal): **218**

Boration Amount Required To Lower Tave by 1 Deg. F (Gal): **38**

SG Blowdown Lineup: **Ocean** At **60** GPM/SG

Cation Run (Minutes):Mids - **6** Days - **6** Cation Flowrate: **Full Flow**

Turbine Controls: Make adjustments as required to maintain 8 Hour thermal power between 3646.0 MW and 3647.9 MW. The 1 Hour thermal power average will be maintained below 3648 MW.

Control Rods will be manipulated per Reactor Engineering recommendations and will normally be left in automatic control. Utilize OS1000.10 Fig. 11, Rod Motion Checklist.

ODI 56 Values for NEPEX Contingency Downpower

Amount of Boration Needed To reduce Output to 1200 Mwe Net (C6123) Is **124** Gal.

Amount of Boration Needed To reduce Output to 800 Mwe Net (C6123) Is **694** Gal.

Reactivity	Activities that may affect reactivity.

1. **Current Xe concentration is stable.**
2. **Pre-brief 15-ROER-001 for the power increase to 15% to roll the turbine.**

General Plant Status	General Plant Info (Non Watchstation Specific)

After assuming the watch commence a power increase to 15% to roll the turbine. OS1000.02 Plant Startup From Hot Standby To Minimum Load in progress at step 4.30. All prerequisites and initial conditions are complete.

SEPS out of service for maintenance.

CC-P-11D out of service for maintenance.

Evolutions	List non-tagging evolutions and surveillances in progress or planned

Work Control	Name:	RSS

Primary NSO	Name:	FB RSS MED

CC-P-11D out of service for maintenance.

Secondary NSO	Name:	FB RSS MED

Rover NSO	Name:	FB RSS MED

SEPS out of service for maintenance.

Waste NSO	Name:	FB RSS MED

Field Support NSO	Name:	FB RSS MED

Fire Brigade Leader	Name:

Unit Supervisor	Name:

Shift Manager	Name:

Reactor Engineering Operating Recommendation

Number: 15-REOR-001 Revision: 00
Year - REOR - Sequential Number

Title: Guidance for MOL Cycle 17 Power Ascension

This REOR will cover the power ascension for the middle of Cycle 17 to phasing on the turbine. It will be updated, as required, to cover the different phases of the power ascension.

Power Increase Recommendations:

1. The time durations referenced below are taken from the MOC17 power ascension schedule and are the basis for the values on the next page:
   - Increase to 8-15%

Duration

From: Reactor Critical for MOC17 To: Turbine Phasing

Implementation

Prepared by: Eric Johnson Date: Today

Independently Reviewed by: Kevin Randall Date: Today

Approved by: Paul Dundin Date: Today

Shift Manager

Beginning of Cycle 17 Power Ascension

General Operating Guidelines:

1. To raise power to 15% in preparations for the initial turbine phasing, use the following control rod positions and dilution amounts as a guide:
   - For 12%, target a rod position of CB D at 100 steps.
   - For 15%, target a rod position of 125 steps.

2. For the hold at 15% for turbine phasing preparations, if below 125 steps, withdraw CB D up to 130 steps. Once CB D rods are at 130 steps, approximately 170 gal/hr of dilution will be required at the beginning of the hold at 15%. The dilution amount will gradually increase by 10 gal/hr per hour for xenon.

Contingency Guidelines:

1. If a chemistry hold at 15% power is required, xenon will be increasing at 30 pcm/hr. Dilute approximately 150 gal/hr to hold power.

NEXTera ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG

SITE: **Seabrook** **Revision #:** **DRAFT**

LMS ID: **LMS Rev. Date:**

SEG TITLE: **2015 LOIT NRC SIM Exam C**

SEG TYPE: ☐ **Training** ☒ **Evaluation**

PROGRAM: ☐ **LOCT** ☒ **LOIT** ☐ **Other:**

DURATION: **90 minutes**

Developed by: _____ _____
Instructor/Developer Date

Reviewed by: _____ _____
Instructor (Instructional Review) Date

Validated by: _____ _____
SME (Technical Review) Date

Approved by: _____ _____
Training Supervision Date

Approved by: _____ _____
Training Program Owner (Line) Date

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER REVIEWER	DATE DATE

OVERVIEW / SEQUENCE OF EVENTS

OVERVIEW

The crew will take the watch at MOL 55% power with Rods in Auto, boron concentration at 1254 ppm and CB D at 156 steps. The crew will begin a rapid down power, in accordance with OS1231.04, at 25%/hr to 45% power as directed by the Shift Manager due to FW-P-32A high vibrations. 'A' RCP vibration levels increase requiring tripping of the 'A' RCP. 'B' SG controlling feed flow channel fails high requiring manual control of the 'B' Main Feed Regulating valve to restore SG level to band. 'A' SG develops a tube leak requiring a plant shutdown. The 'D' MSIV fails closed requiring a manual reactor trip. The reactor does not trip requiring the NSO to locally trip the reactor. On the trip the 'A' SG tube ruptures requiring SI.

SEQUENCE OF EVENTS

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
1.	Crew begins a 25%/hr rapid down power for FW-P-32-A high vibrations.
2.	'A' RCP, RC-P-1A vibration levels increase requiring tripping of the 'A' RCP.
3.	'B' SG controlling feed flow channel, FW-FT-520 fails high.
4.	'A' SG 30 gpm tube leak
5.	'D' MSIV, MS-PV-3004 fails closed requiring manual reactor trip. ATWS requiring NSO to locally trip the Reactor followed by 'A' SG tube rupture requiring SI.

SIMULATOR SET UP INSTRUCTIONS

Perform simulator set up per the Simulator Setup Checklist.

General Instructions

a. Provide extra copies of procedures to Examiners
b. Reset to preset IC 123.
c. Place simulator in Run
d. Verify the following have been inserted OR reset to MOL 55% IC and insert the following:
   1. A Train is Protected, SV C0755, '1'
   2. FW-P-32A outboard bearing vibrations
      - SELECT: MF List
      - SELECT: FEEDWATER (Component)
      - SELECT: vtZMAOVBYM6801
      - SELECT: FAIL TO SPECIFIED VALUE
      - SELECT: Value = 4.5
      - SELECT: Insert
   3. Block Automatic and Manual Reactor Trip
      - SELECT: MF List
      - SELECT: REACTOR PROTECTION
      - SELECT: mfRPS001
      - SELECT: Insert
      - SELECT: mfRPS002
      - SELECT: Insert
      - SELECT: mfRPS027
      - SELECT: Insert
      - SELECT: mfRPS028
      - SELECT: Insert
e. Ensure boron concentration is 0 ppm in the blender line.
f. Advance logger and tear off any sheets with print.

SHIFT TURNOVER INFORMATION

- See Turnover Sheet

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 1 NOTE: Do not commence Event 2 until Reactor Power less than 48% with all 4 channels of P-8 reset.	Rapid Down Power due to FW-P-32A high vibrations. When the US calls the SM to perform the ODI.61 notifications, then respond **"I will perform the ODI.61 notifications."** **NOTE: Do not commence Event 2 until Reactor Power less than 48% with all 4 channels of P-8 reset.**	**PSO(R), BOP(N), US(N)** Crew begins rapid down power, in accordance with OS1231.04, at 25%/hr to 45% power as directed by the Shift Manager due to FW-P-32A high vibrations. US enters OS1231.04, Rapid Down Power and directs the following actions: **Step 1:** US will call SM to Perform Notifications per ODI.61, Redeclaration/Joint Owner Notification Guidelines. **Step 2:** Perform Down Power Briefing per ATTACHMENT A: • Power decrease priorities: o Load schedule should be maintained. o Tavg/Tref control band should be maintained: ▪ Between ZERO and +3°F to insert control rods in auto ▪ Between -3°F and +3°F with control rods in manual o AFD should be maintained near the administrative control band during the transient. • Reactivity control guidance: o Boration control: ▪ Use ODI.56 or reactivity balance calculation to determine boron quantity. ▪ Boration rate should be controlled to maintain Tavg/Tref control band. ▪ If rapid boration method is selected, it is preferable to add the boron quantity in several batches to maintain a smooth load schedule. ▪ Boration should be established to avoid rod insertion limits.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Rapid downpower (continued)		○ Rod control: ▪ The preferred method is to have control rods in auto to expedite power reduction. ▪ If auto rod withdrawal occurs, control rods may be placed in manual to control AFD. ○ As described in power decrease priorities above, control rods should be used to control AFD near the administrative band. After the transient, AFD should be returned to within the administrative band. ○ Turbine control: ▪ Turbine load should be reduced to maintain load schedule. ▪ Turbine load may be adjusted to help maintain Tavg/Tref within control band. • Human factor protocol guidance ○ The US may direct the operators to perform reactivity changes rather than direct each discrete reactivity manipulation. The operators must announce the intention to perform each manipulation. ○ Peer checks may be waived during transients. • Recovery actions must be taken to remain within the following limits: ○ Tavg/Tref control band (Auto or Manual Rods) ○ Tech Spec 3.2.1, AFD limit **US will read CAUTION prior to Step 3 to PSO:** Control Rods in Auto may initially insert rapidly and must be monitored to prevent exceeding Rod Insertion Limits. **Step 3:** Align Rod Control System: • PSO will verify/place rod control in auto.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Rapid downpower (continued)		**Step 4:** Determine Boration Value For Desired Power Level: • Crew will develop reactivity plan prior to the start of the scenario, (300 gallons of boric acid). • US will verify boration value prior to the start of the scenario. • The crew will borate per Attachment B. NOTE: The US will give Attachment B to the PSO to perform at Step 5. He will then proceed to Step 6 to give direction to the BOP for turbine control. **Step 5:** Perform Boration: a. PSO performs Attachment B as follows: **PSO will read NOTE prior to Attachment B, step 1:** NOTE: The maximum boration flow rate in normal mode is 40 GPM. 1. PSO will place the BLENDER MODE START SWITCH to STOP. 2. PSO will place the BORIC ACID BLENDER MODE SELECTOR SWITCH to BORATE. 3. PSO will perform the following using CS-FIQ-111 controller: a. Set the desired BORIC ACID quantity (300 gallons). b. Set the desired BORIC ACID flow rate (15 gpm). c. Turn off the STEP BACK feature. 4. PSO will turn the BLENDER MODE START SWITCH to START and HOLD for approximately one second. 5. PSO will verify the plant responds as expected. NOTE: Attachment B will remain in progress for the duration of the makeup.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Rapid downpower (continued)	If the crew calls the Chemistry to perform their Rapid Down Power actions, then respond **"I will sample RCS boron, implement CD0905.04, Power Reduction Response Guidance, put together a recommendation for SG blow down rate and sample isotopic iodine if necessary."** If the crew calls the NSO to take action due to the D4196, Heater Drain Tank Level Low alarm, then respond **"I am on my way to the HD Control Panel to take manual control of the HD Pump discharge valve and will maintain the desired level."**	**US will read NOTE prior to Step 6 to BOP:** Turbine load decrease should be less than or equal to 50 MWe/min (225%/hr) to avoid opening condenser steam dump valves. **Step 6:** Reduce Turbine Load to the Desired Power Limit: • BOP will setup to reduce turbine load (MWE) as necessary to maintain load reduction schedule by selecting desired Load Ramp Rate (25%/hr) and the desired Load Setpoint (45%). **Step 7:** Initiate PZR Forced Spray • PSO will turn on C & D (or A & B) backup heaters and monitor that the spray valves respond as expected. NOTE: Once the US identifies the temperature change due to the boration, he will give the order to commence unloading the turbine. NOTE: The Rapid Down Power procedure will remain in progress for the duration of the down power. **Step 8:** Monitor Rod Position: • PSO will check control rod insertion limit LO LO alarms - RESET **Step 9:** Check Steam Dump Operation: • BOP will check steam dumps – CLOSED **Step 10:** Perform Equipment Shut Down Actions per ATTACHMENT E

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 2 NOTE: Do not commence until Reactor Power less than 48% with all 4 channels of P-8 reset.	'A' RCP high vibration: • SELECT: MF List • SELECT: REACTOR COOLANT • SELECT: mfRC020 • SELECT: Final Value = 21 • SELECT: Ramp Time = 150 • SELECT: Insert	**PSO(C), BOP(C), US(C, TS)** 'A' RCP, RC-P-1A vibration ramps up, which will require tripping the RCP. **Initial Alarms:** D5779 RCP A MOTOR FRAME VIBRATION HIGH D5775 RCP A SHAFT VIBRATION HIGH B8300 RCP A MTR FRAME VIB VERT ROC HI B8301 RCP A MTR FRAME VIB HORIZ ROC HI B8308 RCP A SHAFT VIB VERT ROC HI B8309 RCP A SHAFT VIB HORIZ ROC HI US enters OS1201.01, RCP Malfunction and directs the following actions: **Step 1:** Determine Appropriate Procedure Step Transition: • With abnormal RCP vibration level US will go to Step 2.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
'A' RCP high vibration		**Step 2:** Monitor RCP Vibration less than alert and danger limit: • Determine If RCP vibration indication is valid using applicable diverse indication as follows: o BOP will perform Attachment A to confirm RCP vibration rack module output is valid o PSO will use MPCS to obtain RCP vibration readings. o PSO will check RCP seal leak off flows. o PSO will check RCP bearing temperatures. US and PSO determine valid RCP vibration are greater than alert and/or danger limits requiring the crew to enter the RNO. IF valid RCP vibration value(s) reach Step 2b table limits, THEN perform the following: • With reactor power less than P-8 setpoint (reset 48%), THEN: a. BOP places 'A' SG feedwater regulation valve in manual. b. BOP commences feeding 'A' SG level to between 60% and 70%. c. PSO defeats Loop 1 ΔT and Tavg input. d. PSO stops 'A' RCP. e. BOP maintains 'A' SG level between 45% and 55%. f. PSO closes 'A' pressurizer spray: A RCP – RC-PCV-455B, RC-PK-455C g. Crew to shutdown plant to MODE 3 within 6 hours per OS1000.06, POWER DECREASE. Enter T.S. 3.4.1.1 All reactor coolant loops shall be in operation in Modes 1 and 2.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 3	'B' SG controlling feed flow channel fails high. • SELECT: MF List • SELECT: FEEDWATER (component) • SELECT: trFWFT520 • SELECT: FAIL HIGH • SELECT: Insert	**BOP(I), US(I)** 'B' SG controlling feed flow channel, FW-FT-520 fails high. **Initial Alarms:** D4708 SG B STM FLOW/FEED FLOW MISMATCH D4771 SB B LVL REF DEVIATION BOP identifies that the controlling channel for 'B' SG is failed high. US will direct BOP to take manual control of the 'B' SG feed control valve and return 'B' SG level to 45% to 55%. BOP will inform US when 'B' SG level is under his control. US enters OS1235.04, SG Feed Flow Steam Flow or Steam Pressure Instrument Failure and directs the following actions: **Step 1:** Check Steam Generator Water Level Control: a. BOP identifies the controlling feed flow channel is failed high. b. BOP reports 'B' steam generator feed control valve is in MANUAL. c. BOP controls 'B' SG level to 45% to 55%. **Step 2:** Realign Steam Generator Level Control Instruments: • BOP selects an alternate channel for 'B' SG Feed Flow, Steam Flow and Level. **Step 3:** Align Steam Generator Water Level Control: • BOP checks steam flow/feed flow signals matched, 'B' SG level at 50%, proper controller setpoint and then places the controller in Auto. **Step 4:** Check For Failure Of A Steam Generator Pressure Instrument: • BOP reports no Steam Generator Pressure Instrument and US returns to procedure in affect.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4	'A' SG Tube Leak at 30 gpm: • SELECT: MF List • SELECT: STEAM GENERATOR • SELECT: mfSG001A • SELECT: Final Value = 30 • SELECT: Ramp Time = 60 • SELECT: Insert When the crew calls Chemistry, then respond **"Implement CS0905.08, Response to a Primary to Secondary Leak."**	**PSO(C), US(C, TS)** 'A' SG Tube Leak at 30 gpm. PSO will notify US of decreasing PZR pressure and level. US may give direction to the PSO to manually control charging and letdown to maintain PZR level on program or to stabilize PZR level. PSO will obtain a leak rate using a flow balance. BOP will obtain a leak rate using a mass balance. **Initial Alarms:** B8442 PRI TO SEC LEAK RATE OF CHANGE HI B8443 PRI TO SEC LEAK RATE OF CHANGE HIHI CP-295 alarms for PRI TO SEC LEAK RATE OF CHANGE HI and PRI TO SEC LEAK RATE OF CHANGE HIHI US enters OS1227.02, Steam Generator Tube Leak and directs the following actions: **Step 1:** Check RCP Status: • PSO will report 3 RCPs running. **Step 2:** Check If Pressurizer Level Can Be Maintained: • PSO will report PZR level is stable and his leakrate by flow balance is 30 gpm. • BOP will report his leakrate by mass balance is 30 gpm. **Step 3:** Try To Identify Affected SG: • US or BOP will notify chemistry to implement CS0905.08, Response to a Primary to Secondary Leak. • PSO or BOP will report leak is on the 'A' SG based on high radiation from the 'A' SG steamline.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
'A' SG Tube Leak at 30 gpm. (continued)		**Step 4:** Check If VCT Level Can Be Maintained: • PSO will report VCT level and that level can be maintained with auto makeup. **Step 5:** Determine Steam Generator Tube Leakage: • PSO will report his leakrate by flow balance is 30 gpm. • BOP will report his leakrate by mass balance is 30 gpm. • US will transition to the RNO which will require the following: o Be in Mode 3 within the next two hours. o Refer to ER 1.1, Classification of Emergencies • Go to Step 7. Enter T.S. 3.4.6.2 action a for SG tube leakage. The US will transition to OS1231.04, Rapid Down Power while continuing with OS1227.02, Steam Generator Tube Leak.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 5	'D' MSIV Fails Closed: • SELECT: MF List • SELECT: MAIN STEAM (Component) • SELECT: svMSV92 • SELECT: GO TO POS • SELECT: Value = 0 • SELECT: Ramp Time = 20 • SELECT: Insert Modify the following MF on reactor trip. 'A' SG Tube Rupture: • SELECT: MF List • SELECT: Steam Generator • SELECT: mfSG001A • SELECT: Value = 400 • SELECT: Ramp Time = 60 • SELECT: Modify	**PSO(M), BOP(M), US(M)** 'D' MSIV Fails Closed requiring manual reactor trip. Manual reactor trip will not work and the reactor will have to be tripped locally by an NSO. 'A' SG Tube Rupture at 400 gpm triggered by the local reactor trip. SI may automatically actuate on low PZR pressure or be manually actuated by the crew due to plant conditions. BOP reports that 'D' MSIV Failed Closed. US directs manual reactor trip. US will direct crew to enter E-0, Reactor Trip or Safety Injection and perform their immediate actions and directs the following actions: **Step 1:** Verify Reactor Trip: • PSO attempt to manually trip the reactor. Reactor does not trip. • PSO attempt to manually trip the reactor from the second switch. Reactor does not trip. • PSO reports to the US that the reactor did not trip. US will direct crew to enter FR-S.1, Response to Nuclear Power Generation/ATWS and perform their immediate actions and directs the following actions: **Step 1:** Verify Reactor Trip: • PSO reports reactor not tripped. • **PSO is inserting control rods in auto or manual. PSO will have to manually insert control rods when auto rod insertion rate lowers.**
Critical Task		
Critical Task		**NOTE: BOP will trip the turbine when the US directs the crew to perform their immediate actions of FR-S.1.** **Step 2:** Verify Turbine Trip: • BOP will check all stop valves or all control valves closed and the generator breaker open.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
FR-S.1, Response to Nuclear Power Generation/ ATWS (continued)	When the crew calls NSOs for local reactor trip respond **"Perform a local reactor trip."** After 90 second delay, NSO locally trip the reactor as follows: • SELECT: Scenario • SELECT: Local Reactor Trip • SELECT: Run **NOTE:** **If the crew dispatches NSO to locally trip the reactor in a timely fashion, reactor power at the trip will be approximately 20%. If NSOs are not dispatched in a timely fashion, the instructor has the latitude to trip the reactor earlier or later. This is to avoid tripping the reactor within ±5% of 5% reactor power to avoid overly complicating a potential E-Plan declaration.**	**NOTE:** After the immediate actions are complete a member of the crew will call any available NSO on the radio and direct a local reactor trip. **Step 3:** Check EFW Pumps Running: • BOP will report both EFW pumps running. **Step 4:** Initiate Emergency Boration Of RCS: a. PSO reports charging pumps running status. b. Align boration path: 1) PSO starts a boric acid pump. 2) PSO opens emergency borate valve, CS-V426. c. Align charging flow path: 1) PSO places CF-FK-121 in manual and charges at the maximum rate. 2) PSO reports charging pump suction is aligned to the RWST. 3) PSO will report VCT is isolated. d. PSO will report current PZR pressure <2385 psig. **Step 5:** Verify Containment Ventilation Isolation: • PSO will report COP-V-1 to 4 and CAP-V-1 to 4 are closed. **US will read CAUTION prior to Step 6 to PSO:** If an SI signal exists or occurs, ATTACHMENT A of E-0, REACTOR TRIP OR SAFETY INJECTION should be performed while continuing with this procedure. **NOTE:** If the reactor has tripped by this time the US may direct PSO/BOP to perform Attachment A while continuing to Step 6 of FR-S.1.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
FR-S.1, Response to Nuclear Power Generation/ ATWS (continued)		PSO/BOP performing Attachment A while US and BOP/PSO process FR-S.1. 1. PSO/BOP will verify Containment Isolation Phase A Actuation by checking all status panel lights lit for both trains. 2. PSO/BOP will verify Safeguard Equipment Alignment by checking proper alignment by status panel for both trains. 3. PSO/BOP will verify Feedwater Isolation by checking proper alignment by status panel. 4. PSO/BOP will verify a PCCW Pump running in both loops. 5. PSO/BOP will verify ECCS Flow by checking: • CCP indicated flow to RCS cold legs. Note: Depending on RCS pressure when checked, SI flow may be indicated. • RCS pressure >1700 psig, No SI pump flow indicated. • RCS pressure >300 psig, go to Step 6. 6. PSO/BOP will verify MS-V-129 is open. 7. PSO/BOP will verify a SW Pump running in both trains. 8. PSO/BOP will verify SW flow to Train A and Train B Diesels >900 gpm. 9. PSO/BOP will check if main steamlines should be isolated. MSI may be required based on containment pressure.. 10. PSO/BOP will check Containment Pressure has remained less than 18 psig by pressure recording. 11. PSO/BOP will verify Total EFW flow >500 gpm. 12. PSO/BOP will not need to reset RMO. 13. PSO/BOP will notify US of actuation verification status. Attachment A is complete.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
FR-S.1, Response to Nuclear Power Generation/ ATWS (continued)		**Step 6:** Check If The Following Trips Have Occurred: • BOP reports status of reactor trip. • BOP reports that the turbine is tripped. **Step 7:** Check If Reactor Is Subcritical: • BOP checks power range channels LESS THAN 5% • BOP checks intermediate range flux rate – ZERO OR NEGATIVE • BOP checks gammametrics intermediate range flux level LESS THAN 5% • BOP checks gammametrics intermediate range flux rate ZERO OR NEGATIVE • US directs crew to continue boration to obtain adequate shutdown margin during subsequent actions • US directs crew to return to procedure and step in effect US announce going back to E-0 and directs crew to perform their Immediate Actions.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-0, Reactor Trip or Safety Injection (continued)		US enters E-0, Reactor Trip or Safety Injection, Step 1. **Step 1:** Verify Reactor Trip: • PSO checks reactor trip and bypass breakers open and neutron flux decreasing. **Step 2:** Verify Turbine Trip: • BOP checks all stop valves or all control valves closed and the generator breaker open. **Step 3:** Verify Power To AC Emergency Busses: • BOP reports power to both AC emergency busses. **Step 4:** Check If SI Is Actuated: • PSO may actuate SI or reports both trains of SI actuated. US will direct PSO and BOP to bring up their alarms and notify him of any immediate plant concerns and share any pertinent plant information. At this point the BOP may identify the ruptured 'A' SG and per the E-0 OAS page isolate EFW flow to the 'A' SG. **Step 5:** PSO Perform ESF Actuation Verification Per ATTACHMENT A **Step 6:** Monitor RCS Temperature stable at or trending to 557°F. • IF BOP reports temperature >557°F, THEN US will direct the following actions: o Dump steam to condenser OR o Dump steam using SG ASDVs. • IF BOP reports temperature <557°F and decreasing, THEN US will direct the following actions: o Stop dumping steam to condenser and atmosphere. o Check MS to MSRs isolated.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-0, Reactor Trip or Safety Injection (continued)		NOTE: The following 2 steps may have been performed per the E-0 OAS page. o IF cooldown continues, THEN open EFW pump mini flow valves AND throttle total feed flow to maintain greater than 500 GPM. o WHEN SG level is adequate based on 65% WR in at least two SGs OR 6% NR in at least one SG, THEN throttle feed flow to maintain SG narrow range level between 6% and 50%. o IF cooldown continues, THEN close MSIVs, MSIV bypass valves and upstream drains. **Step 7:** Check RCS Isolated: • BOP will check CS-V-145, both PORVs and both normal PZR spray valves closed. **Step 8:** Check If RCPs Should Be Stopped: • BOP will check at least one running ECCS pump and report RCS subcooling greater than 40°F. **Step 9:** Check If SG Pressure Boundary Is Faulted: • BOP will check pressures all SGs and report no SG pressure decreasing in an uncontrolled manner or completely depressurized. **Step 10:** Check If SG U Tubes Are Intact: • BOP will check main steamline radiation and condenser air evacuation radiation and report that the 'A' SG is Ruptured. • US will direct crew to go to E 3, STEAM GENERATOR TUBE RUPTURE, Step 1.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
E-3, Steam Generator Tube Rupture (continued)		E-3, Steam Generator Tube Rupture US will direct crew to enter E-3, Steam Generator Tube Rupture and direct the following actions. US, PSO or BOP will announce that Critical Safety Functions are in effect. **Step 1:** Check If RCPs Should Be Stopped: • PSO checks one charging pump running. • PSO reports RCS subcooling >40°F. **Step 2:** Identify Ruptured SGs: • BOP identifies 'A' SG. **Step 3:** Isolate Flow From Ruptured SG(s): a. BOP verifies 'A' SG ASDV controller setpoint is 1125 psig. b. BOP checks 'A' SG ASDV is closed. c. BOP will identify 'A' SG as the ruptured SG and reports MS-V393 closed. d. PSO/BOP will verify that all SG blowdown isolation valves are closed by status panel. e. PSO/BOP closes 'A' SG upstream drain valve, MSD-V44. f. BOP closes 'A' SG MSIV and verifies the bypass valve is closed. **Step 4:** Check Ruptured SG(s) Level: • BOP verifies 'A' SG NR level >6% and that EFW flow is isolated. **Step 5:** Check Ruptured SG(s) Isolated From Intact SG(s): • BOP verifies 'A' SG MSIV and bypass valves are closed. **Step 6:** BOP checks Ruptured SG(s) Pressure greater than 350 PSIG. **Step 7:** Initiate RCS Cooldown: • Crew determines required core exit temperature based on pressure equal to or less than the 'A' SG pressure.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
	Terminate the scenario when the crew initiates Step 7 of E-3, or at the discretion of the lead examiner.	

*** END OF SCENARIO ***

	WORLD CLASS PERFORMANCE .....*expect it!*	**For Simulator Use Only** OPERATIONS DEPARTMENT TURNOVER

Plant Status

Plant is in Mode **1** At **55**% Power.

The Security Threat Level is **Yellow**

Protected Train

A

Current PRA Risk is **Green**

Aggregate risk is **6 LOW**

Reactivity

RCS Boron concentration is **1254** ppm

Performing A **30** Gal **Dilution** Every 5 hours

Rod control is in **Auto** With Control Bank "D" at **156** Steps

RCS Tave Band (Deg. F) **589- 589.3**

Dilution Amount Required To Raise Tave by 1 Deg. F (Gal): **218**

Boration Amount Required To Lower Tave by 1 Deg. F (Gal): **38**

SG Blowdown Lineup: **Hotwells** At **60** GPM/SG

Cation Run (Minutes):Mids - **6** Days - **6** Cation Flowrate: **Full Flow**

Turbine Controls: Make adjustments as required to maintain 8 Hour thermal power between 3646.0 MW and 3647.9 MW. The 1 Hour thermal power average will be maintained below 3648 MW.

Control Rods will be manipulated per Reactor Engineering recommendations and will normally be left in automatic control. Utilize OS1000.10 Fig. 11, Rod Motion Checklist.

ODI 56 Values for NEPEX Contingency Downpower

Amount of Boration Needed To reduce Output to 1200 Mwe Net (C6123) Is **124** Gal.

Amount of Boration Needed To reduce Output to 800 Mwe Net (C6123) Is **694** Gal.

Reactivity	Activities that may affect reactivity.

1. **Current Xe concentration is stable.**
2. **Develop and discuss shift reactivity plan for rapid down power at 25%/hr to 45%**

General Plant Status	General Plant Info (Non Watchstation Specific)

Rapid down power, in accordance with OS1231.04, at 25%/hr to 45% power as directed by the Shift Manager due to FW-P-32A high vibrations and after reviewing VAS D4847.

Evolutions	List non-tagging evolutions and surveillances in progress or planned

Work Control	Name:	RSS
Primary NSO	Name:	FB RSS MED
Secondary NSO	Name:	FB RSS MED
Rover NSO	Name:	FB RSS MED
Waste NSO	Name:	FB RSS MED
Field Support NSO	Name:	FB RSS MED
Fire Brigade Leader	Name:	
Unit Supervisor	Name:	
Shift Manager	Name:	