JPM TITLE: COOLING TOWER PUMP COMPREHENSIVE TEST DATA

JPM NUMBER: 2018 LOIT NRC Exam RO Admin JPM "A" REV. 0

K/A 2.1.25, Ability to interpret reference materials, such as graphs, curves, tables, etc.

EVALUATION LOCATION:

- **In-Plant:** [ ]
- **Simulator:** [ ]
- **Admin:** [X]

Estimated time for Completion: 20 Min

Alternate Path: NO

Time Critical: NO

PREPARED BY: Sean M. Riley DATE: 12/28/17

APPROVED BY: Chris Adams DATE: 12/28/17
TRAINING SUPERVISOR

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
076: Service Water System (SWS): Perform a service water pump test

STANDARDS:
1) Obtain applicable pump test acceptance criteria.
2) Analyze field data to determine adherence to Tech. Spec. acceptance criteria.

SET-UP:

1. Using the latest revision of OX1416.05, "Service Water Cooling Tower Pumps Quarterly and 2 Year Comprehensive Test", rev. 27, develop an answer key using "Form C: PM Number SW-OT031 Test Data Sheet".

2. Prepare a completed copy of field data for Form C, Sheet 3 of 6, Step 4.3.9.5 (vibration data)

Required Materials:
- Turnover Sheet.
- OX1416.05, "Service Water Cooling Tower Pumps Quarterly and 2 Year Comprehensive Test", rev. 27
- OX1456.86, "Operability Testing of IST Pumps"
- Vibration Data Sheet for 2018 LOIT NRC Exam RO Admin JPM "A"

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the BOP Operator. You are in the process of performing the 2 Year Comprehensive Test on the Train "A" Cooling Tower Pump.

B. The following information is provided to you:

1. You are about to perform the 2 Year Comprehensive Test on the Train "A" Cooling Tower Pump per "OX1416.05, "Service Water Cooling Tower Pumps Quarterly and 2 Year Comprehensive Test".

2. You will be obtaining the applicable test acceptance criteria for "OX1416.05, Form C: PM Number SW-OT031 Test"

C. Perform the task using OX1456.86, Operability Testing of IST Pumps".

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

INITIATING CUE:

Evaluator to Primary Operator, **"BOP Operator (or student's name), "Obtain all of the required test acceptance criteria for the 2 Year Comprehensive Test on the Train "A" Cooling Tower Pump and enter the criteria on "OX1416.05, Form C: PM Number SW-OT031 Test"**

JPM PERFORMANCE INFORMATION

Start Time: __________

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

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

NOTE: 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:	See answer key for information that should be entered on "OX1416.05, Form C: PM Number SW-OT031 Test"

Performance Step: 01 **Critical - YES**	Refer to Figure 2, Pump Instrumentation and Uncertainties, and Figure 3, IST Pump Criteria, and OBTAIN the associated pump's instrumentation and Technical Specification Acceptance Criteria, respectively. RECORD on applicable pump surveillance procedure Test Data Sheets.
Standard:	Student refers to OX1456.86, Operability Testing of IST Pumps", Figures 2 and 3 and RECORDS the acceptance criteria on "OX1416.05, Form C: PM Number SW-OT031 Test" for the following: • Step 4.3.9.5 (sheet 3 of 6), vibration points 1-5 • Step 4.3.9.6 (sheet 4 of 6), pump differential pressure
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	After reading the following cue, provide the Train "A" Cooling Tower Pump Vibration Data Sheet to the student.
Cue:	When the student states that they have recorded all of the acceptance criteria for Form C state **"Time has passed and the NSO has obtained the Train "A" Cooling Tower Pump vibration data. Per OX1416.05, Step 4.3.9.5, record the pump vibration data on Form C and determine if the data meets Tech. Spec. operability requirements."**

Performance Step: 02 Critical - YES	RECORD Cooling Tower Pump "A" vibration data on Form C: Test Data Sheet
Standard:	Student records Cooling Tower Pump "A" vibration data on Form C: Test Data Sheet
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	See answer key for "OX1416.05, Form C: PM Number SW-OT031 Test" for correct information.

Performance Step: 03 Critical - YES	Determine if vibration data meets Tech. Spec. acceptance criteria.
Standard:	Determines if vibration data meets Tech. Spec. acceptance criteria
Note:	Information given must agree with results shown on the key.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________

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

TURNOVER SHEET

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the BOP Operator. You are in the process of performing the 2 Year Comprehensive Test on the Train “A” Cooling Tower Pump.

B. The following information is provided to you:

1. You are about to perform the 2 Year Comprehensive Test on the Train “A” Cooling Tower Pump per “OX1416.05, “Service Water Cooling Tower Pumps Quarterly and 2 Year Comprehensive Test”.

2. You will be obtaining the applicable test acceptance criteria for “OX1416.05, Form C: PM Number SW-OT031 Test”.

C. Perform the task using OX1456.86, Operability Testing of IST Pumps”.

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

INITIATING CUE:

Evaluator to Primary Operator, **“BOP Operator (or student’s name), “Obtain all of the required test acceptance criteria for the 2 Year Comprehensive Test on the Train “A” Cooling Tower Pump and enter the criteria on “OX1416.05, Form C: PM Number SW-OT031 Test”**

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

Handout

2018 LOIT NRC Exam RO Admin JPM A

“A” Cooling Tower Pump Vibration Data	
Vibe Point 1	.150 in/sec
Vibe Point 2	.163 in/sec
Vibe Point 3	.084 in/sec
Vibe Point 4	.068 in/sec
Vibe Point 5	.064 in/sec

Form C: PM Number SW-OT031

Test Data Sheet

(Sheet 3 of 6)

Step 4.3.9.5

TEST QUANTITY	TEST EQUIP	ALERT CRITERIA	T/S ACCEPTANCE CRITERIA	DATA
	(Note 5 & 6)			
Vibe pt 1	Data collector	≤ >.163 -.4392	≤ .4392 IPS	.150 in/sec
Vibe pt 2	Data collector	≤ >.176 -.4224	≤ .4224 IPS	.163 in/sec
Vibe pt 3	Data collector	≤ >.0825-.198	≤ .198 IPS	.084 in/sec
Vibe pt 4	Data collector	≤ >.07525-.1806	≤ .1806 IPS	.068 in/sec
Vibe pt 5	Data collector	≤ >.06325-.1518	≤ .1518 IPS	.064 in/sec
Vibe pt 6	Data collector	N/A	N/A	mils (Note 7)

Note 5: If using the IRD-810 vibration meter, displacement vibration readings must be taken with the mode selector switch in the DISP 350 position.

Note 6: Alert & Acceptance Criteria vibration values obtained from OX1456.86 or as provided by CE&T.

Note 7: Pump shaft vibration must be obtained for trending purposes (Ref: 5.5)

Answer: There are no vibration datapoints that exceed Tech Spec acceptance criteria.

Note: Two of the data points exceed the alert criteria but are within the bounds of the Tech. Spec. criteria

Form C: PM Number SW-OT031

Test Data Sheet

(Sheet 4 of 6)

COOLING TOWER PUMP A COMPREHENSIVE 2 YEAR TEST				
STEP	TEST QUANTITY	INSTRUMENT NUMBER	DATA	ACCEPTANCE CRITERIA
4.3.9.4	SW-P-110A Cooling Tower Pump A Suction Pressure	Calculated from level (Note 8 & 15)	psig	N/A
4.3.9.5	SW-P-110A Cooling Tower Pump A Discharge Pressure (Corrected)	Calculated (Note 9)	psig	N/A
4.3.9.6	SW-P-110A Cooling Tower Pump A Differential Pressure	Calculated (Note 10)	psid	≥72.133 ≤79.889 psid T/S 72.133 – <73.684 psid Alert (Note 11)
4.3.9.7	SW-P-110A Motor Current	SW-AM-6167	amps	N/A

Note 8: Cooling Tower Level, from step 4.3.9.2, (Running) Converted to Pressure
(__________ ft × 0.439) = ____________ psig Suction Pressure

Note 9: Discharge Pressure, from Test Gauge, Plus Correction Factor
____________ psig + 24.53 = ______ psig

Note 10: Corrected Discharge Pressure - Suction Pressure
____________ psig - __________ psig = __________ psid

Note 11: Differential pressure Alert & Acceptance Criteria values obtained from OX1456.86 or as provided by CE&T.

Note 15: If the Cooling Tower TDS concentration is > 18000 ppm ensure Engineering has provided the appropriate conversion factors to calculate the Cooling Tower Pump Suction Pressure from Cooling Tower Level to determine the Cooling Tower Pump Differential Pressure.

JPM TITLE:	**CALCULATE BLENDED MAKEUP TO THE VCT**
JPM NUMBER:	**2018 LOIT NRC Exam RO Admin JPM "B" REV. 0**

K/A 2.1.37, Knowledge of procedures, guidelines, or limitations associated with reactivity management.

EVALUATION LOCATION:	**In-Plant:**	
	Simulator:	
	Admin:	X

Estimated time for Completion:	**20 Min**
Alternate Path:	**NO**
Time Critical:	**NO**

PREPARED BY: Sean M. Riley   DATE: 12/28/17

APPROVED BY: Chris Adams   DATE: 12/28/17
TRAINING SUPERVISOR

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

<u>Protected Content:</u> (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
0040102501 Manually makeup to the VCT (blended makeup)

STANDARDS:
Calculate the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the VCT.

SET-UP:

1. Using the latest revision of RX1735, Form E, “Blended Makeup Worksheet”, develop an answer key.

Required Materials:

- Turnover Sheet.
- RS1735, Reactivity Calculations
- Daily Chemistry Report
- RE-02, Shutdown Boron Concentration Versus Temperature
- Calculator

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are the Primary Operator. You are going to perform calculations for a 250 gallon blended makeup to the Volume Control Tank (VCT).

B. The following information is provided to you:

1. A 250 gallon manual blended makeup to the VCT is required.
2. Makeup total flow rate will be 50 gpm.
3. The makeup boron concentration will be at the current Reactor Coolant System concentration.
4. 'A' Boric Acid Storage Tank will be used for the blended makeup.

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

D. I will act as the Unit Supervisor and provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

Unit Supervisor to Primary Operator, **"Primary Operator (or student's name), determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank (VCT). Discuss the results with me."**

JPM PERFORMANCE INFORMATION

Start Time: ________

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

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

NOTE: 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."**

Performance Step: 01 **Critical - NO**	Obtain copy of procedure RX1735.
Standard:	Student obtains copy of RX1735.
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 02 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank 1. Enter the desired makeup boron concentration.
Standard:	Student enters the desired makeup boron concentration (C_{MU}) for the RCS from the Daily chemistry Report in Step 1 of Form E. **(1268 ppm)**
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 03 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank 2. Enter the ^{10}B adder value from RE-2
Standard:	Student enters the ^{10}B adder value from RE-2 **(79 ppm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank 3. ENTER the desired makeup flow rate SETPOINT: FIQ-111 (F_{TOT}).
Standard:	Student enters the desired makeup flow rate SETPOINT: FIQ-111 (F_{TOT}) in step 2 of Form E. **(50 gpm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank 4. Enter the actual Boric Acid Storage Tank concentration (C_{BAST}).
Standard:	Student enters the actual Boric Acid Storage Tank concentration (CBAST) from the Daily Chemistry Report in step 3 of Form E. **(7416 ppm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank. 5. Enter the desired makeup quantity target: FIQ-111 (GTOT).
Standard:	Student enters the desired makeup quantity TARGET: FIQ-111 (G_{TOT}) in step 4 of Form E. **(250 gallons)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical - YES**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank. 6. CALCULATE the boric acid flow rate setpoint: FIQ-111 (FBA):
Standard:	Student enters the values from steps 1, 2 & 3 in the equation and calculates the boric acid flow rate SETPOINT: FIQ-111 (FBA). **(8.0 GPM. Range 7.9-8.1 GPM)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical - YES**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank. 7. CALCULATE the boric acid quantity target: FIQ-111 (G_{BA}):
Standard:	Student enters the values from steps 1, 3 & 4 in the equation and calculates the boric acid quantity TARGET: FIQ-111 (GBA). **(40 gallons. Range 39.5-40.5 gallons)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 Critical - NO	Calculated By signature and Date.
Standard:	Student signs and dates the Calculated By signature and Date line.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete**

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

Stop Time: __________

Examinee: ______________________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

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

TURNOVER SHEET

Directions to the Student:

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

C. You are the Primary Operator. You are going to perform calculations for a 250 gallon blended makeup to the Volume Control Tank (VCT).

D. The following information is provided to you:

5. A 250 gallon manual blended makeup to the VCT is required.
6. Makeup total flow rate will be 50 gpm.
7. The makeup boron concentration will be at the current Reactor Coolant System concentration.
8. 'A' Boric Acid Storage Tank will be used for the blended makeup.

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

D. I will act as the Unit Supervisor and provide cues and communications for this JPM. Do you have any questions?

Initiating Cue:

Unit Supervisor to Primary Operator, **"Primary Operator (or student's name), determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank (VCT). Discuss the results with me.**

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

NEXTera ENERGY SEABROOK

Daily Chemistry Report

11/17/2017 11:50 AM

Mode 1

THINK

REACTOR COOLANT SYSTEM

Parameter	Current Value	Sample Date / Time	AL1 (1)	AL2 (1)	AL3 (1)
Boron	1268 ppm	11-17-17 / 08:20	Per COLR	N/A	N/A
Lithium	3.56 ppm	11-17-17 / 08:20	N/A	N/A	N/A
Hydrogen	36.8 cc/kg	11-17-17 / 08:20	< 25 or > 50	< 15	< 5
Oxygen (2)	0.4 ppb	11-17-17 / 08:20	> 5	≥ 100	> 1000
Chloride (2)	5.2 ppb	11-17-17 / 08:20	> 50	≥ 150	> 1500
Fluoride (2)	2.6 ppb	11-17-17 / 08:20	> 50	≥ 150	> 1500
Sulfate	0.27 ppb	11-15-17 / 09:11	> 50	≥ 150	> 1500
Zinc	12.90 ppb	11-14-17 / 08:35	N/A	N/A	N/A
Dose Equivalent Iodine (3)	4.13E-05 uci/ml	11-14-17 / 08:35	N/A	N/A	> 1
Gross Activity (3)	1.18E-01 uci/ml	11-17-17 / 08:20	N/A	N/A	76.9

PRESSURIZER

Boron	1282 ppm	11-11-17 / 16:27

BORATED WATER SOURCES

Source	Boron	Sample Date / Time
'A' Boric Acid Storage Tank (5)	7416 ppm	11-16-17 / 10:50
'B' Boric Acid Storage Tank (5)	7356 ppm	11-16-17 / 00:32
Refueling Water Storage Tank (4)	2566 ppm	11-16-17 / 09:11
Spent Fuel Pool (4)	2585 ppm	11-15-17 / 09:05

CAR RM-6505 RESPONSE FACTORS FOR PRIMARY-TO-SECONDARY LEAK *

1 gallon per day	42 cpm	11-17-17 / 08:01
30 gallons per day	1250 cpm	11-17-17 / 08:01
75 gallons per day	3125 cpm	11-17-17 / 08:01

*** NOTE: Leak source is the "B" steam generator**

(1) Refer to CP3.1, Section 4.2.6.3 for recommended actions for action level exceedence
(2) Refer to Technical Requirement 30-3.4.7.
(3) Refer to Technical Specification 3.4.8 and Table 4.4-3.
(4) Refer to COLR for Action Initiation Value.
(5) Refer to Technical Requirement 29-3.1.2.6 and COLR

Cation Bed Runs

Pre-service rinse required?			
No	Swings (~ 18:00)	0	minutes
	Mids (~ 01:00)	8	minutes
	Days (~ 11:00)	8	minutes

Comments
11/17/2017 11:50 AM

KEY

2018 LOIT NRC Exam RO Admin JPM B

Form E: Blended Makeup Worksheet

(Sheet 1 of 1)

1. Desired Makeup Boron Concentration (C_{MU}) 1268 ppm
2. ^{10}B adder from RE-02 (B10) [0 for non RCS makeup] 79 ppm
3. Desired Makeup Flow Rate SETPOINT: FIQ-111 (F_{TOT}) 50 gpm
4. Boric Acid Storage Tank Concentration (C_{BAST}) 7416 ppm
5. Desired Makeup Quantity TARGET: FIQ-111 (G_{TOT}) 250 gals
6. Boric Acid Flow Rate SETPOINT: FIQ-111 (F_{BA})

$$F_{BA} = \frac{(C_{MU} - B10)(F_{TOT})}{C_{BAST}} = \frac{(1268 - 79)(50)}{(7416)} = 8.0 \text{ gpm}$$

7. Boric Acid Quantity TARGET: FIQ-111 (G_{BA})

$$G_{BA} = \frac{(C_{MU} - B10)(G_{TOT})}{C_{BAST}} = \frac{(1268 - 79)(250)}{(7416)} = 40.0 \text{ gal}$$

NOTE

The Blended Makeup Worksheet does not account for the type and quantity of water currently present in the makeup line.

Calculated By: ______________________ Date: __________

Independently Verified By: ______________________ Date: __________

SRO Approval By: ______________________ Date: __________

JPM TITLE:	SHUTDOWN MARGIN (MODE 2)
JPM NUMBER:	2018 LOIT NRC Exam RO Admin JPM "C" REV. 0

K/A 2.2.12, Knowledge of surveillance procedures

EVALUATION LOCATION:	In-Plant:	
	Simulator:	
	Admin:	X

Estimated time for Completion:	20 Min
Alternate Path:	NO
Time Critical:	NO

PREPARED BY:	Sean M. Riley	DATE:	12/28/17
APPROVED BY:	Chris Adams TRAINING SUPERVISOR	DATE:	12/28/17

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
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9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
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11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

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

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
0010100401 Perform shutdown margin calculation

STANDARDS:
Determine the shutdown margin within +/- 0.15% □K/K .

SET-UP:

1. Using the latest revision of RX1707, Form C, "Shutdown Margin Determination Immovable, Untrippable or Dropped Rod(s)", develop an answer key.

Required Materials:

- Turnover Sheet.
- RX1707, Shutdown Margin Surveillance
- BOL Primary Tech. Data Book
- Technical Specifications
- Technical Requirements

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are going to calculate Shutdown Margin in MODE 2.

B. The following information is provided to you:
   1) The plant is in MODE 2, Beginning of Life (BOL) at 3% power.
   2) RCS boron concentration is 1298 ppm.
   3) Rod H-2 has dropped to the bottom of the core.
   4) Rod H-2 cannot be moved.
   5) All other rods are fully withdrawn.
   6) The Unit Supervisor has entered procedure OS1210.05, DROPPED ROD.

C. The evaluator will act as the Unit Supervisor and provide the cues and communications for this JPM. Do you have any questions?

Initiating Cue:

Unit Supervisor to Primary Operator, **"Calculate Shutdown Margin and let me know if we are in compliance with Technical Specifications."**

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

NOTE: 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:	The student should calculate SDM per RX1707, Section 4.4.

Performance Step: 01 **Critical - NO**	Obtain copy of procedure RX1707.
Standard:	Obtains copy of RX1707.
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 02 **Critical - YES**	COMPLETE Part 1 of RX1707, Form C: Shutdown Margin Determination-Immovable, Untrippable,or Dropped Rod(s). a. RECORD number of dropped rods.
Standard:	a. Records number of dropped rods. **(value a=1)**
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 03 **Critical - YES**	COMPLETE Part 1 of RX1707, Form C: Shutdown Margin Determination-Immovable, Untrippable,or Dropped Rod(s). b. Obtain/Record RE-18 value for dropped rod.
Standard:	b. Obtains/Records RE-18 value for dropped rod. **(value b=1051 pcm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - YES**	COMPLETE Part 1 of RX1707, Form C: Shutdown Margin Determination-Immovable, Untrippable,or Dropped Rod(s). c. Calculate total unavailable rod worth.
Standard:	c. Calculates total unavailable rod worth. **(value c=1051 pcm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - NO**	COMPLETE Part 1 of RX1707, Form C: Shutdown Margin Determination-Immovable, Untrippable,or Dropped Rod(s). d. Obtain/Record total power defect.
Standard:	d. Obtains/Records total power defect. **(Range: 50 to 80 pcm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical - NO**	COMPLETE Part 1 of RX1707, Form C: Shutdown Margin Determination-Immovable, Untrippable,or Dropped Rod(s). e. Obtain/Record worth of the control rods inserted to the rod insertion limit-For current relative power.
Standard:	e. Obtains/Records worth of the control rods inserted to the rod insertion limit-For current relative power. **(Range: 1925 to 1975 pcm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical - NO**	COMPLETE Part 1 of RX1707, Form C: Shutdown Margin Determination-Immovable, Untrippable,or Dropped Rod(s). f. Obtain/Record total control and shutdown rod worth minus stuck rod and 10% uncertainty.
Standard:	f. Obtains/Records total control and shutdown rod worth minus stuck rod and 10% uncertainty. **(value f=4854 pcm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical - YES**	COMPLETE Part 1 of RX1707, Form C: Shutdown Margin Determination-Immovable, Untrippable,or Dropped Rod(s). g. Calculate shutdown margin.
Standard:	g. Calculates shutdown margin. **(Within 0.15% ΔK/K of 1.79%ΔK/K. Acceptable range: 1.64 to 1.94 %ΔK/K)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 **Critical - YES**	COMPLETE Part 1 of RX1707, Form C: Shutdown Margin Determination-Immovable, Untrippable,or Dropped Rod(s). h. Determine if shutdown margin is adequate by comparing the calculated shutdown margin with the COLR shutdown margin limit.
Standard:	h. Determines if shutdown margin is adequate by comparing the calculated shutdown margin with the COLR shutdown margin limit. **(COLR Shutdown Margin requirement is: In MODES 1, 2, and 3 the Shutdown Margin shall be greater than 1.3%ΔK/K)**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 10 **Critical - NO**	INFORM Unit Supervisor of results.
Standard:	Informs Unit Supervisor of results.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Terminating Cues: **The JPM is complete**

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

Stop Time: ____________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________

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

TURNOVER SHEET

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are going to calculate Shutdown Margin in MODE 2.

B. The following information is provided to you:
   1) The plant is in MODE 2, Beginning of Life (BOL) at 3% power.
   2) RCS boron concentration is 1298 ppm.
   3) Rod H-2 has dropped to the bottom of the core.
   4) Rod H-2 cannot be moved.
   5) All other rods are fully withdrawn.
   6) The Unit Supervisor has entered procedure OS1210.05, DROPPED ROD.

C. The evaluator will act as the Unit supervisor and provide the cues and communications for this JPM. Do you have any questions?

Initiating Cue:

Unit Supervisor to Primary Operator, **"Calculate Shutdown Margin and let me know if we are in compliance with Technical Specifications."**

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

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)	1051 (b) pcm
Total Unavailable Rod Worth = 1 (a) x 1051 (b) pcm = 1051 (c) pcm	
Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	60 (d) pcm
Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	1950 (e) pcm
Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	4854 (f) pcm
Shutdown Margin [f - (c + d + e)] / 1,000	4854 - (1051 + 60 + 1950) / 1000 %ΔK/K
Notify the SM/US if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report. 1.793	

Completed By ______________ Date ______________

Independently Verified By ______________ Date ______________

US Review ______________ Date ______________

SM Review ______________ Date ______________

JPM TITLE: INITIATE A LIQUID EFFLUENT WASTE SAMPLE REQUEST

JPM NUMBER: 2018 LOIT NRC Exam RO Admin JPM "D" REV. 0

K/A 2.3.11, Ability to control radiation releases

EVALUATION LOCATION: In-Plant: [ ]

Simulator: [ ]

Admin: [X]

Estimated time for Completion: 20 Min

Alternate Path: NO

Time Critical: NO

PREPARED BY: Sean M. Riley DATE: 12/28/17

APPROVED BY: Chris Adams DATE: 12/28/17
TRAINING SUPERVISOR

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
1190153001 Initiate a Liquid Effluent Waste Sample Request (LEWSR) for a tank discharge.

STANDARDS:
Using CP-4.1, Effluent Sampling Program and ON1018.07, Waste Test Tank Recirculation, initiate the following:

- Form CP4.1A, Liquid Effluent Waste Sample Request

SET-UP:

1. Using the latest revision of Form CP 4.1A, "Liquid Effluent Waste Sample Request, develop an answer key.

Required Materials:

- Turnover Sheet.
- Copy of CP-4.1, Effluent Sampling Program
- Copy of ON1018.07, Waste Test Tank Recirculation
- Calculator

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are the Primary Operator. You are going to initiate a Liquid Effluent Waste Sample Request.

B. The following information is provided to you:
   1) The plant is in MODE 1 with two ocean Service Water and two Circulating Water pumps running with no expected change of configuration.
   2) WL-TK-63A, "A" Waste Test Tank has been filled to 18,000 gallons.
   3) WL-TK-63A, "A" Waste Test Tank, was placed on recirculation at 0800 today per ON1018.07, Waste Test Tank Recirculation.
   4) WL-TK-63A, "A" Waste Test Tank has to be sampled to prepare a LEW permit for a release to the transition Structure.
   5) Projected release start time is normally 8 hours after placing the tank on recirc.

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

D. I will act as the Unit Supervisor and provide the cues and communications for this JPM. Do you have any questions?

Initiating Cue:

Unit Supervisor to Primary Operator, **"Primary Operator (or students name), initiate a Liquid Effluent Waste Sample Request for WL-TK-63A, 'A' Waste Test Tank. Discuss the results with me."**

JPM PERFORMANCE INFORMATION

Start Time: __________

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

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

NOTE: 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 the student demonstrates the ability to obtain a controlled copy of CP-4.1, Effluent Sampling Program and ON1018.07, Waste Test Tank Recirculation, provide the student with the required document(s).

Note:	It is assumed that the student will use CP 4.1 to process through the verification and check ON1018.07 to verify the tank volumes and recirculation flow rate. The student may choose to verify the tank volume and recirculation rate prior to referring to CP 4.1. These steps can be performed in any order as long as all steps are completed correctly.

Performance Step: 01 **Critical - YES**	Complete section 1 of CP 4.1A. a. Name of tank, sump, or SG demin vessel to be sampled.
Standard:	Student enters WTT "A"
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Cue:	If the student wants to verify the amount of liquid in the 'A' Waste Test Tank using the Main Plant Computer, tell them **"The MPCS indicates 18,000 gallons."**

Performance Step: 02 **Critical - YES**	Complete section 1 of CP 4.1A. b. Total tank or sump volume to be discharged or transferred.
Standard:	Student enters 18,000 gallons for total tank or sump volume.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	The recirculation rate for WTT 'A' is 150 gpm.

Performance Step: 03 **Critical - YES**	Complete section 1 of CP 4.1A. c. Recirculation rate
Standard:	Student enters the recirculation rate of 150 gpm and calculates the recirculation required time to be 240 minutes.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - YES**	Complete section 1 of CP 4.1A. d. Recirculation starting time and date
Standard:	Student enters 0800 and today's date.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - YES**	Complete section 1 of CP 4.1A. e. Sample date and time
Standard:	Student enters 1200 and todays date.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical - NO**	Complete section 1 of CP 4.1A. f. Disposition of tank
Standard:	Student enters DISCHARGE as disposition.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical - NO**	Complete section 1 of CP 4.1A. g. The projected CW and SW pump combination for the discharge
Standard:	Student enters 2 CW pumps and 2 SW pumps.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical - NO**	Complete section 1 of CP 4.1A. h. The projected release start date and time
Standard:	Student enters 1600 and todays date.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 Critical - NO	Complete section 1 of CP 4.1A. i. Date, time of request, and initials of originator
Standard:	Student enters time, date, and initials.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 10 Critical - NO	Complete section 1 of CP 4.1A. j. Date, time, and initials of individual that performed verification of operational data
Standard:	Student hands form to Unit Supervisor for verification.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Terminating Cues: **The JPM is complete**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

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

TURNOVER SHEET

Directions to the Student:

A. You are the Primary Operator. You are going to initiate a Liquid Effluent Waste Sample Request.

B. The following information is provided to you:
1) The plant is in MODE 1 with two ocean Service Water and two Circulating Water pumps running with no expected change of configuration.
2) WL-TK-63A, "A" Waste Test Tank has been filled to 18,000 gallons.
3) WL-TK-63A, "A" Waste Test Tank, was placed on recirculation at 0800 today per ON1018.07, Waste Test Tank Recirculation.
4) WL-TK-63A, "A" Waste Test Tank has to be sampled to prepare a LEW permit for a release to the transition Structure.
5) Projected release start time is normally 8 hours after placing the tank on recirc.

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

D. I will act as the Unit Supervisor and provide the cues and communications for this JPM. Do you have any questions?

Initiating Cue:

Unit Supervisor to Primary Operator, **"Primary Operator (or students name), initiate a Liquid Effluent Waste Sample Request for WL-TK-63A, 'A' Waste Test Tank. Discuss the results with me."**

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

KEY

2018 LOIT NRC Exam RO Admin JPM "D"

Liquid Effluent Waste Sample Request

Section I	**Operational Data (Completed by Operations Department)**

Tank, Sump, S/G, CPS or SG Demin. Vessel: A WTT

Disposition: X Discharge ____ Recycle

Tank, Sump, or S/G Volume: 18000 gallons

Recirculate Rate: 150 gpm

Minimum Recirc. Time* = 2 x Tank Vol. / Recirc. Rate = 240 min.

Recirc. Start Date and Time: Today / 0800

Sample Date and Time: Today / 1200

NOTE

CW-V-40 position cannot change once this form is submitted to Chemistry.

Project CW and SW pump combination for discharge: CW 2 SW 2

Project Release Start Date and Time: Today / 1600

Originator ________ Date ________ Time ________

Verified By ________ Date ________ Time ________

Section II	**Chemistry Data (Completed by Chemistry Department)**

________ / ________ ________

Sample Date / Sample Time / Sample Collected by (Initials)

Sample Identification No. ________

LEW Permit Number: ________

Dilution Water Flow Rate: ________ gpm

Volume Discharged: ________ gallons

Composite Volume: ________ mls

Composite Updated by: ________ (Initials)

* or as directed by supervision

JPM TITLE: DETERMINE TECH SPEC AOT

JPM NUMBER: 2018 LOIT NRC Exam SRO Admin JPM "A" REV. 0

K/A: K/A 2.1.20, Ability to interpret and execute procedure steps.

EVALUATION LOCATION:

	In-Plant:	[ ]
	Simulator:	[ ]
	Admin:	[X]

Estimated time for Completion: 20 Min

Alternate Path: NO

Time Critical: NO

PREPARED BY: Sean M. Riley DATE: 12/28/17

APPROVED BY: Chris Adams DATE: 12/28/17
TRAINING SUPERVISOR

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
1190101801 Apply Technical Specification actions to existing plant conditions

STANDARDS:
Evaluate plant conditions using Technical Specifications

SET-UP:
1. Using the latest revision of ODI.30, Tech Spec 3.3.2 and ER1.1 develop an answer key using Figure 6.1 and the AOT worksheet (except 3.0.3) of RX1707.
2. In the section containing information provided to the student and in the applicable cue, ensure all the information is consistent with current revisions of required materials. If required, update any information.
3. Ensure that the revisions of ODI.30, Allowed Outage Time Work, and applicable Tech Specs are made available to the student when requested.

Required Materials: Turnover sheet
ODI.30 Allowed Outage Time Work Rev. 7
Technical Specifications 3.3.2 ESF Actuation System Instrumentation
Calculator

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Work Control Supervisor. You are going to evaluate plant conditions using Technical Specifications.

B. The following information is provided to you:

1. The plant was in Mode 1, 95% power.
2. A master SSPS actuation relay failed its quarterly surveillance (IX1680.921). I&C determined that a master relay was faulty and may not cycle if energized.
3. Technical Specifications action statements in effect are:
   - 3.3.2.c, ESFAS Instrumentation Table 3.3-3 item 1b action 13.
4. All required control systems were in automatic and no other equipment was out of service.
5. The crew entered mode 3 at 0245 the next day.

C. Perform the task using ODI.30 Allowed Outage Time Work.

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

INITIATING CUE:

Evaluator to Work Control Supervisor, **" WCS (or student's name), At 1500 hours a master SSPS actuation relay failed its quarterly surveillance test (IX1680.921), and was declared inoperable. We do not have any spare relays on site. I&C said they can obtain parts and replace the relay in approximately 24 hours. We entered T.S. 3.3.2.c Table.3.3-3 item 1b action 13 and started a plant shutdown at 1500 hours. Determine when the mode reduction should have been started by and at what time the plant must be in Mode 3 in accordance with ODI.30 Allowed Outage Time Work.**

JPM PERFORMANCE INFORMATION

Start Time: __________

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

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

NOTE: 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 requested, provide the student with the applicable Tech Specs and ODI.30.

Performance Step: 01 **Critical – NO**	Evaluate Technical Specifications 3.3.2.
Standard:	Determines that T.S. Table 3.3-3 item 1b applies. Action 13 requires the plant to be in mode 3 within 12 hours and mode 5 within the following 30 hours.
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Note:	JPM steps 3 and 4 may be performed in any order. Student may choose not to perform ODI.30 calculation until after ER1.1 review is complete.
Note:	If requested, the date for the AOT worksheet is today's date.

Performance Step: 02 **Critical - NO**	Refers to ODI.30 to calculate AOT - Upon entering an applicable LCO determine the appropriate AOT worksheet using Figure 6.1, AOT flowchart as a guide. • Is the LCO in question shown on list A. • Determine if the LCO in question is 3.03 or is prompt action to initiate a shutdown and cooldown required. • Goes to ODI.30A or ODI.30B.
Standard:	Using Figure 6.1, AOT flowchart as a guide determines the following: • Determines that the LCO in question is shown in List A because T.S. 3.3.2.c, ESFAS instrumentation, action 13 applies. • Determines that prompt action to initiate a shutdown and cooldown is required. • Goes to ODI.30A.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	See answer key for information that should be entered on Form ODI.30A.

Performance Step: 03 **Critical - NO**	Enter Technical Specification LCO #, Action #, and entered from mode - information.
Standard:	Enters LCO specific information on Form ODI.30A.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Enter # HRS AOT provided before mode reduction to mode 3 required for item a.
Standard:	Enters # HRS AOT provided before mode reduction to mode 3 required for item a.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 Critical - YES	Enter # HRS provided to change modes to mode 3 (zero if entered from mode 3 or 4) for item b.
Standard:	Enters # HRS provided to change modes to mode 3 (zero if entered from mode 3 or 4) for item b.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Performance Step: 06 Critical – NO	Enter # HRS additional AOT provided in mode 3 before reduction to mode 4 or 5 required (circle applicable mode) for item c.
Standard:	Enters # HRS additional AOT provided in mode 3 before reduction to mode 4 or 5 required (circle applicable mode) for item c.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Performance Step: 07 Critical – YES	Enter # HRS provided to change modes from mode 3 to mode 4 or 5 (circle applicable mode) for item d.
Standard:	Enters # HRS provided to change modes from mode 3 to mode 4 or 5 (circle applicable mode) for item d.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Performance Step: 08 Critical – NO	Enter time/date LCO action statement entered on line 1 for item e.
Standard:	Enters time/date LCO action statement entered on line 1 for item e.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Performance Step: 09 Critical – NO	Circle applicable mode - action statement entered from.
Standard:	Circles applicable mode - action statement entered from. Goes to line 2.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 10 Critical – NO	Calculate time/date mode reduction to mode 3 must be started by and enter time/date on line 2 item f.
Standard:	Calculates time/date mode reduction to mode 3 must be started by and enters time/date on line 2 item f.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 11 Critical – YES	Calculate time/date plant must be in mode 3 and enter time/date on line 3 item g.
Standard:	Calculates time/date plant must be in mode 3 and enters time/date on line 3 item g.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	Additional information on lines 4 through 10 of ODI.30A is not necessary for this JPM.
Cue:	If necessary, provide the following cue, SM to WCS, **"Additional information will be added to the worksheet when required."**

Terminating Cues: **The JPM is complete.**

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

Stop Time: __________

Examinee: ______________________ Evaluator: ______________________

☐ RO ☐ SRO ☐ Date: ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

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

TURNOVER SHEET

Directions to the Student:

A. You are the Work Control Supervisor. You are going to evaluate plant conditions using Technical Specifications.

C. The following information is provided to you:

1. The plant was in Mode 1, 95% power.
2. A master SSPS actuation relay failed its quarterly surveillance (IX1680.921). I&C determined that a master relay was faulty and may not cycle if energized.
3. Technical Specifications action statements in effect are:
   - 3.3.2.c, ESFAS Instrumentation Table 3.3-3 item 1b action 13.
4. All required control systems were in automatic and no other equipment was out of service.
5. The crew entered mode 3 at 0245 the next day.

C. Perform the task using ODI.30 Allowed Outage Time Work.

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

INITIATING CUE:

Evaluator to Work Control Supervisor, " **WCS (or student's name), At 1500 hours a master SSPS actuation relay failed its quarterly surveillance test (IX1680.921), and was declared inoperable. We do not have any spare relays on site. I&C said they can obtain parts and replace the relay in approximately 24 hours. We entered T.S. 3.3.2.c Table.3.3-3 item 1b action 13 and started a plant shutdown at 1500 hours. Determine when the mode reduction should have been started by and at what time the plant must be in Mode 3 in accordance with ODI.30 Allowed Outage Time Work.**

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

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

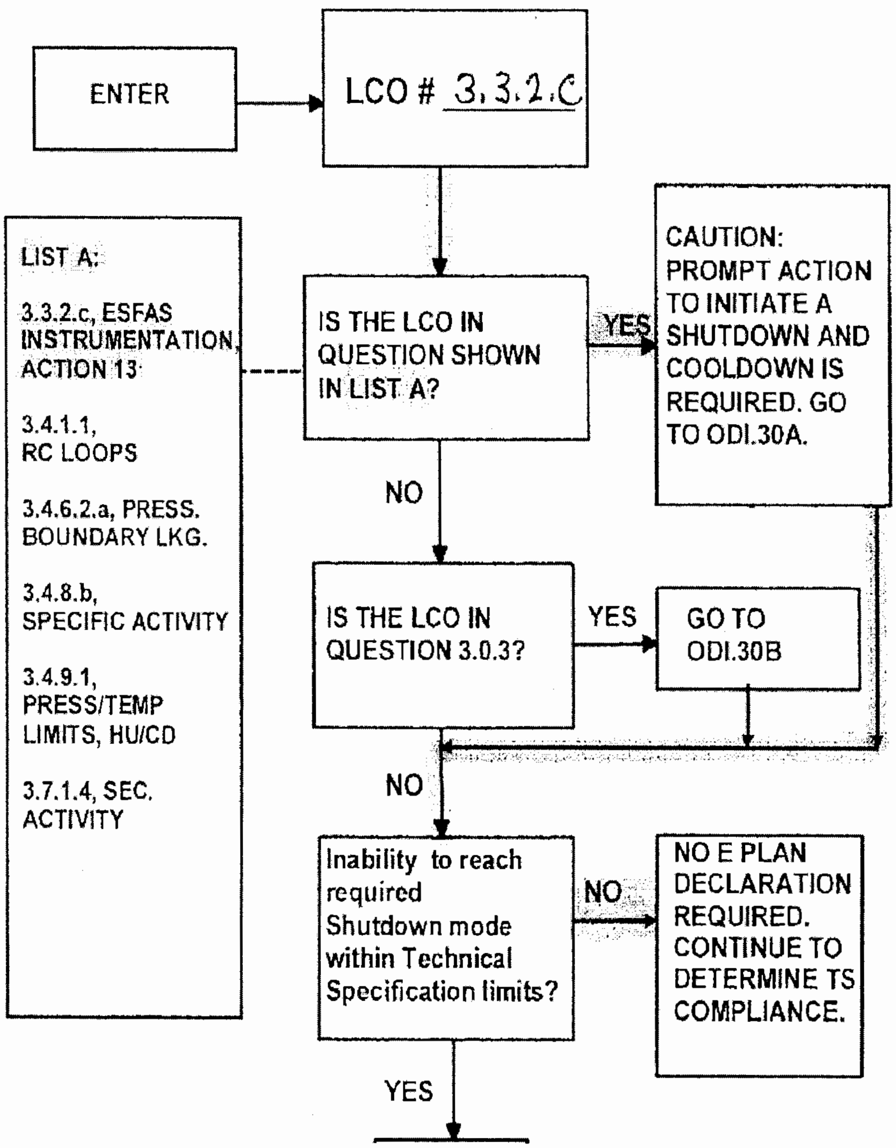
EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________

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

FIGURE 6.1

ALLOWED OUTAGE TIME FLOWCHART



AOT WORKSHEET (EXCEPT 3.0.3)

LCO # 3.3.2.C ACTION 13 ENTERED FROM MODE	1	
# HRS AOT PROVIDED BEFORE MODE REDUCTION TO MODE 3 REQUIRED	0	(a)
# HRS PROVIDED TO CHANGE MODES TO MODE 3 (Zero If Entered From Mode 3 or 4)	12	(b)*
# HRS ADDITIONAL AOT PROVIDED IN MODE 3 BEFORE REDUCTION TO MODE 4 or 5 REQUIRED (Circle Applicable Mode)(Enter 0 if none)	0	(c)
# HRS PROVIDED TO CHANGE MODES FROM MODE 3 TO MODE 4 or 5 (Circle Applicable Mode)	30	(d)

TIME/DATE

1. TIME LCO ACTION STATEMENT ENTERED — 1500 / TODAY (e)

IF ENTERED FROM MODE (Circle Applicable)	GO TO LINE
1 OR 2	2
3 OR 4	7

2. MODE REDUCTION TO MODE 3 MUST BE STARTED BY — 1500 / TODAY (f) e+a

3. TIME PLANT MUST BE IN MODE 3 — 0300 / TOMORROW (g) * e+(a+b)

4. IF TIME PLANT REQUIRED TO BE IN MODE 3 WILL BE EXCEEDED- **REFER TO ER 1.1** (N/A IF TIME LIMIT MET) — N/A (h)

5. TIME PLANT IN MODE 3 — FOR THIS JPM (i)

6. MODE REDUCTION TO MODE 4 or 5 MUST BE STARTED BY* (Circle Applicable Mode) — / (j) e+(a+b+c)

7. TIME PLANT MUST BE IN MODE 4 or 5* — / (k) e+(a+b+c+d)

8. IF TIME PLANT REQUIRED TO BE IN MODE 4 or 5 WILL BE EXCEEDED- **REFER TO ER 1.1** (N/A IF TIME LIMIT MET) — / (l)

JPM TITLE:	**REVIEW BLENDED MAKEUP CALCULATION TO VCT**
JPM NUMBER:	**2018 LOIT NRC Exam SRO Admin JPM "B" REV. 0**

K/A 2.1.37, Knowledge of procedures, guidelines, or limitations associated with reactivity management.

EVALUATION LOCATION:	**In-Plant:**	
	Simulator:	
	Admin:	X

Estimated time for Completion:	**20 Min**
Alternate Path:	**NO**
Time Critical:	**NO**

PREPARED BY:	Sean M. Riley	DATE:	12/28/17
APPROVED BY:	Chris Adams TRAINING SUPERVISOR	DATE:	12/28/17

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
0040102501 Manually makeup to the VCT (blended makeup)

STANDARDS:
Review the flow controller and totalizer setpoint calculations for a 250 gallon manual blended makeup to the VCT.

SET-UP:

1. Using the latest revision of RX1735, Form E, "Blended Makeup Worksheet", develop a handout sheet for the student to review.

Required Materials:

- Turnover Sheet.
- RS1735, Reactivity Calculations
- Daily Chemistry Report
- RE-02, Shutdown Boron Concentration Versus Temperature
- Calculator

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are the Unit Supervisor. You are going to review calculations for a 250 gallon blended makeup to the Volume Control Tank (VCT).

B. The following information is provided to you:

   1. A 250 gallon manual blended makeup to the VCT is required.
   2. Makeup total flow rate will be 50 gpm.
   3. The makeup boron concentration will be at the current Reactor Coolant System concentration.
   4. 'A' Boric Acid Storage Tank will be used for the blended makeup.

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

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

Initiating Cue:

Shift Manager to Unit Supervisor, **"Unit Supervisor (or student's name), review the calculations for a 250 gallon manual blended makeup to the Volume Control Tank (VCT) on RS1735, Reactivity Calculations, Form E. Record on the tear off sheet any issues that you find on Form E. Correct any issues that you find. Discuss the results with me."**

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

NOTE: 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."**

Performance Step: 01 **Critical - NO**	Obtain copy of procedure RX1735.
Standard:	Student obtains copy of RX1735.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 02 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank 1. Enter the desired makeup boron concentration.
Standard:	Student verifies the desired makeup boron concentration (C_{MU}) for the RCS from the Daily Chemistry Report was entered. **(1268 ppm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank 2. Enter the ^{10}B adder value from RE-2
Standard:	Student verifies that the correct ^{10}B adder value was entered. **(79 ppm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank 3. ENTER the desired makeup flow rate SETPOINT: FIQ-111 (F_{TOT}).
Standard:	Student verifies that the desired makeup flow rate SETPOINT: FIQ-111 (F_{TOT}) was entered. **(50 gpm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank 4. Enter the actual Boric Acid Storage Tank concentration (C_{BAST}).
Standard:	Student verifies that the actual Boric Acid Storage Tank concentration (CBAST) from the Daily Chemistry Report was entered. **(7416 ppm)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical - NO**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank. 5. Enter the desired makeup quantity target: FIQ-111 (GTOT).
Standard:	Student verifies that the desired makeup quantity TARGET: FIQ-111 (G_{TOT}) was entered. **(250 gallons)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical - YES**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank. 6. CALCULATE the boric acid flow rate setpoint: FIQ-111 (FBA):
Standard:	Student performs independent calculation and verifies that the calculated boric acid flow rate SETPOINT: FIQ-111 (FBA) is correct. **(8.0 GPM. Range 7.9-8.1 GPM)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical - YES**	Determine the required flow controller and totalizer setpoints for a 250 gallon manual blended makeup to the Volume Control Tank. 7. CALCULATE the boric acid quantity target: FIQ-111 (G_{BA}):
Standard:	Student performs independent calculation and verifies that the calculated boric acid quantity TARGET: FIQ-111 (GBA) is correct. **(40 gallons. Range 39.5-40.5 gallons)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 **Critical - NO**	SRO approval by signature and Date.
Standard:	Student signs and dates the Approval By signature and date line.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Terminating Cues: **The JPM is complete**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________

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

TURNOVER SHEET

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are the Unit Supervisor. You are going to review calculations for a 250 gallon blended makeup to the Volume Control Tank (VCT).

B. The following information is provided to you:

1. A 250 gallon manual blended makeup to the VCT is required.
2. Makeup total flow rate will be 50 gpm.
3. The makeup boron concentration will be at the current Reactor Coolant System concentration.
4. 'A' Boric Acid Storage Tank will be used for the blended makeup.

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

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

Initiating Cue:

Shift Manager to Unit Supervisor, **"Unit Supervisor (or student's name), review the calculations for a 250 gallon manual blended makeup to the Volume Control Tank (VCT) on RS1735, Reactivity Calculations, Form E. Record on the tear off sheet any issues that you find on Form E. Correct any issues that you find. Discuss the results with me."**

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

HANDOUT

2018 LOIT NRC Exam SRO Admin JPM B

Form E: Blended Makeup Worksheet

(Sheet 1 of 1)

1. Desired Makeup Boron Concentration (C_{MU}) 1268 ppm
2. ^{10}B adder from RE-02 (B10) [0 for non RCS makeup] 79 ppm
3. Desired Makeup Flow Rate SETPOINT: FIQ-111 (F_{TOT}) 50 gpm
4. Boric Acid Storage Tank Concentration (C_{BAST}) 7416 ppm
5. Desired Makeup Quantity TARGET: FIQ-111 (G_{TOT}) 250 gals
6. Boric Acid Flow Rate SETPOINT: FIQ-111 (F_{BA})

$$F_{BA} = \frac{(C_{MU} - B10)(F_{TOT})}{C_{BAST}} = \frac{(1268 - 79)(50)}{(7416)} = 8.0 \text{ gpm}$$

7. Boric Acid Quantity TARGET: FIQ-111 (G_{BA})

$$G_{BA} = \frac{(C_{MU} - B10)(G_{TOT})}{C_{BAST}} = \frac{(1268 - 79)(250)}{(7416)} = 40.0 \text{ gal}$$

NOTE

The Blended Makeup Worksheet does not account for the type and quantity of water currently present in the makeup line.

Calculated By: __________ Date: ______

Independently Verified By: __________ Date: ______

SRO Approval By: __________ Date: ______

NEXTera ENERGY SEABROOK

Daily Chemistry Report

11/17/2017 11:50 AM

Mode 1

THINK

REACTOR COOLANT SYSTEM

Parameter	Current Value	Sample Date / Time	AL1 (1)	AL2 (1)	AL3 (1)
Boron	1268 ppm	11-17-17 / 08:20	Per COLR	N/A	N/A
Lithium	3.56 ppm	11-17-17 / 08:20	N/A	N/A	N/A
Hydrogen	36.8 cc/kg	11-17-17 / 08:20	< 25 or > 50	< 15	< 5
Oxygen (2)	0.4 ppb	11-17-17 / 08:20	> 5	≥ 100	> 1000
Chloride (2)	5.2 ppb	11-17-17 / 08:20	> 50	≥ 150	> 1500
Fluoride (2)	2.6 ppb	11-17-17 / 08:20	> 50	≥ 150	> 1500
Sulfate	0.27 ppb	11-15-17 / 09:11	> 50	≥ 150	> 1500
Zinc	12.90 ppb	11-14-17 / 08:35	N/A	N/A	N/A
Dose Equivalent Iodine (3)	4.13E-05 uci/ml	11-14-17 / 08:35	N/A	N/A	> 1
Gross Activity (3)	1.18E-01 uci/ml	11-17-17 / 08:20	N/A	N/A	76.9

PRESSURIZER

Boron	1282 ppm	11-11-17 / 16:27

BORATED WATER SOURCES

Source	Boron	Sample Date / Time
'A' Boric Acid Storage Tank (5)	7416 ppm	11-16-17 / 10:50
'B' Boric Acid Storage Tank (5)	7356 ppm	11-16-17 / 00:32
Refueling Water Storage Tank (4)	2566 ppm	11-16-17 / 09:11
Spent Fuel Pool (4)	2585 ppm	11-15-17 / 09:05

CAR RM-6505 RESPONSE FACTORS FOR PRIMARY-TO-SECONDARY LEAK *

1 gallon per day	42 cpm	11-17-17 / 08:01
30 gallons per day	1250 cpm	11-17-17 / 08:01
75 gallons per day	3125 cpm	11-17-17 / 08:01

*** NOTE: Leak source is the "B" steam generator**

(1) Refer to CP3.1, Section 4.2.6.3 for recommended actions for action level exceedence
(2) Refer to Technical Requirement 30-3.4.7.
(3) Refer to Technical Specification 3.4.8 and Table 4.4-3.
(4) Refer to COLR for Action Initiation Value.
(5) Refer to Technical Requirement 29-3.1.2.6 and COLR

Cation Bed Runs

Pre-service rinse required?			
No	Swings (~ 18:00)	0	minutes
	Mids (~ 01:00)	8	minutes
	Days (~ 11:00)	8	minutes

Comments
11/17/2017 11:50 AM

JPM TITLE:	**REVIEW SHUTDOWN MARGIN SURVEILLANCE (MODE 2)**
JPM NUMBER:	**2018 LOIT NRC Exam RO Admin JPM "C" REV. 0**

K/A 2.2.12, Knowledge of surveillance procedures

EVALUATION LOCATION:	**In-Plant:**	
	Simulator:	
	Admin:	X

Estimated time for Completion:	**20 Min**
Alternate Path:	**NO**
Time Critical:	**NO**

PREPARED BY:	Sean M. Riley	DATE:	12/28/17
APPROVED BY:	Chris Adams TRAINING SUPERVISOR	DATE:	12/28/17

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
0010100401 Perform shutdown margin calculation
1190101802 Apply Technical Specification Actions to existing plant conditions

STANDARDS:
Review shutdown margin calculations and determine impact on Technical Specifications.

SET-UP:

1. Using the latest revision of RX1707, Form C, "Shutdown Margin Determination Immovable, Untrippable or Dropped Rod(s)", develop handout sheet and answer key.

Required Materials:

- Turnover Sheet.
- RX1707, Shutdown Margin Surveillance
- BOL Primary Tech. Data Book
- Technical Specifications
- Technical Requirements

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are going to review and approve a Shutdown Margin in MODE 2.

B. The following information is provided to you:
  1) The plant is in MODE 2, Beginning of Life (BOL) at 3% power.
  2) RCS boron concentration is 1298 ppm.
  3) Rod H-2 has dropped to the bottom of the core.
  4) Rod H-2 cannot be moved.
  5) All other rods are fully withdrawn.
  6) A Shutdown Margin Calculation has been performed as required by T.S. 3.1.3.1.

C. 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 Unit Supervisor, **"Based on given plant conditions review the Shutdown Margin Calculation and report your findings to me."**

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

NOTE: 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:	The student should review SDM per RX1707, Section 4.4.

Performance Step: 01 **Critical - NO**	Obtain copy of procedure RX1707.
Standard:	Student obtains copy of RX1707.
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 02 **Critical - NO**	Review shutdown margin calculation provided on the Handout Sheet.
Standard:	Student reviews the provided shutdown margin calculation.
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 03 **Critical - NO**	Review RX1707, "Shutdown Margin Surveillance" procedure.
Standard:	Student reviews RX1707, "Shutdown Margin Surveillance" procedure.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Review data used to perform SDM calculation
Standard:	Student reviews data used on From C.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - NO**	Review COLR
Standard:	Student reviews COLR in Tech Requirement Manual to determine required SDM for Mode 2.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical - YES**	Review SDM calculation on Handout Sheet (Form C)
Standard:	Student recognizes that the calculated shutdown margin value is incorrect. **(Power defect data from RE-8 (item d on Form C) was entered incorrectly. The value should be 60 pcm vice 600 pcm.)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical - YES**	Recalculate shutdown margin.

Standard:	Student recalculates shutdown margin. **(Within 0.15% ΔK/K of 1.79%ΔK/K. Acceptable range: 1.64 to 1.94 %ΔK/K)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 Critical - YES	Compare calculated shutdown margin value to the limit specified in the COLR.
Standard:	Student determines that shutdown margin is adequate/greater than that required by the COLR. **(COLR SDM limit is 1.252%ΔK/K)**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: The JPM is complete

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

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

TURNOVER SHEET

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are going to review and approve a Shutdown Margin in MODE 2.

B. The following information is provided to you:
   1) The plant is in MODE 2, Beginning of Life (BOL) at 3% power.
   2) RCS boron concentration is 1298 ppm.
   3) Rod H-2 has dropped to the bottom of the core.
   4) Rod H-2 cannot be moved.
   5) All other rods are fully withdrawn.
   6) A Shutdown Margin Calculation has been performed as required by T.S. 3.1.3.1.

C. 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 Unit Supervisor, **"Based on given plant conditions review the Shutdown Margin Calculation and report your findings to me."**

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

HANDOUT SHEET

2018 LOIT NRC Exam SRO Admin JPM C

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

(Sheet 1 of 2)

PART 1

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)	1051 pcm (b)
Total Unavailable Rod Worth	1 (a) x 1051 (b) pcm = 1051 (c) pcm
Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	600 pcm (d)
Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	1950 pcm (e)
Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	4854 pcm (f)
Shutdown Margin [f - (c + d + e)] / 1,000	4854 - (1051 + 600 + 1950) / 1000 %ΔK/K
Notify the SM/US if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report. 1.252	

Completed By		Date	
Independently Verified By		Date	
US Review		Date	
SM Review		Date	

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)	1051 (b) pcm
Total Unavailable Rod Worth = 1 (a) x 1051 (b) pcm = 1051 (c) pcm	
Total Power Defect - For Current Relative Power (Primary Technical Data Book Figure RE-8)	60 (d) pcm
Worth of the Control Banks Inserted to the Rod Insertion Limit - For Current Relative Power (Primary Technical Data Book Figure RE-19)	1950 (e) pcm
Total Control and Shutdown Rod Worth Minus Stuck Rod and less 10% uncertainty (Primary Technical Data Book Figure RE-18)	4854 (f) pcm
Shutdown Margin [f - (c + d + e)] / 1,000	4854 - (1051 + 60 + 1950) / 1000 %ΔK/K
Notify the SM/US if the Shutdown Margin is less than the limit specified in the Core Operating Limits Report. 1.793	

Completed By ____________ Date ____________

Independently Verified By ____________ Date ____________

US Review ____________ Date ____________

SM Review ____________ Date ____________

JPM TITLE:	**REVIEW LIQUID EFFLUENT WASTE SAMPLE REQUEST**
JPM NUMBER:	**2018 LOIT NRC Exam SRO Admin JPM "D" REV. 0**

K/A 2.3.11, Ability to control radiation releases

EVALUATION LOCATION:

In-Plant:	
Simulator:	
Admin:	X

Estimated time for Completion:	**20 Min**
Alternate Path:	**NO**
Time Critical:	**NO**

PREPARED BY:	Sean M. Riley	DATE:	12/28/17
APPROVED BY:	Chris Adams TRAINING SUPERVISOR	DATE:	12/28/17

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

<u>Protected Content:</u> (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
0690301502 Authorize a release of liquid waste

STANDARDS:
Using CP-4.1, Effluent Sampling Program and ON1018.07, Waste Test Tank Recirculation, verify the following:

- Form CP4.1A, Liquid Effluent Waste Sample Request

SET-UP:

1. Using the latest revision of Form CP 4.1A, "Liquid Effluent Waste Sample Request, develop an answer key.

Required Materials:

- Turnover Sheet.
- Copy of CP-4.1, Effluent Sampling Program
- Copy of ON1018.07, Waste Test Tank Recirculation
- Calculator

Directions to the Student:

Evaluator gives Tear Off sheet to the student.
Evaluator reads the following to student (Optional for multiple JPMs):

A. You are the Unit Supervisor. You are going to perform the verification of a Liquid Effluent Waste Sample Request, using the information provided.

B. The following information is provided to you:
1) The plant is in MODE 1 with two ocean Service Water and two Circulating Water pumps running with no expected change of configuration.
2) WL-TK-63A, "A" Waste Test Tank has been filled to 18,000 gallons.
3) WL-TK-63A, "A" Waste Test Tank, was placed on recirculation at 0800 today per ON1018.07, Waste Test Tank Recirculation.
4) WL-TK-63A, "A" Waste Test Tank has to be sampled to prepare a LEW permit for a release to the transition Structure.
5) Projected release start time is normally 8 hours after placing the tank on recirc.
6) The Primary Operator has completed Section 1 of CP 4.1A, Liquid Effluent Waste Sample Request.

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

D. I 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 Unit Supervisor, **"Unit Supervisor (or students name), Section 1 of Form CP 4.1A is complete. Please perform the verification. Record any issues that you find on the tear-off sheet. Correct any issues that you find. Discuss the results with me."**

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

NOTE: 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 the student demonstrates the ability to obtain a controlled copy of CP-4.1, Effluent Sampling Program and ON1018.07, Waste Test Tank Recirculation, provide the student with the required document(s).

Note:	It is assumed that the student will use CP 4.1 to process through the verification and check ON1018.07 to verify the tank volumes and recirculation flow rate. The student may choose to verify the tank volume and recirculation rate prior to referring to CP 4.1. These steps can be performed in any order as long as all steps are completed correctly.

Performance Step: 01 **Critical - NO**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: a. Name of tank, sump, or SG demin vessel to be sampled.
Standard:	Student verifies WTT "A" is entered.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Cue:	If the student wants to verify the amount of liquid in the 'A' Waste Test Tank using the Main Plant Computer, tell them **"The MPCS indicates 18,000 gallons."**

Performance Step: 02 **Critical - NO**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: b. Total tank or sump volume to be discharged or transferred.
Standard:	Student verifies that 18,000 gallons is consistent with initial conditions and indications.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	The recirculation rate for WTT A is actually 150 gpm. Waste Holdup Sump recirculation rate is 400 gpm. The student must correct this mistake to ensure adequate tank recirculation prior to sampling.
Cue:	If the Shift Manager (Evaluator) is informed that the recirculation rate is incorrect, say **"The Primary Operator must have been thinking about the Waste Holdup Sump recirculation rate."**
Cue:	If the student (Unit Supervisor) gives the form back to the Primary Operator to correct, say: **"Use your corrected values and complete the verification."**
Performance Step: 03 **Critical - YES**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: c. Recirculation rate
Standard:	Student corrects the recirculation rate to 150 gpm and the recirculation required time to be 240 minutes.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: d. Recirculation starting time and date
Standard:	Student verifies 0800 and today's date.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 05 **Critical - YES**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: e. Sample date and time
Standard:	Student corrects sample time to 1200.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 06 **Critical - NO**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: f. Disposition of tank
Standard:	Student verifies DISCHARGE disposition.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 07 **Critical - NO**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: g. The projected CW and SW pump combination for the discharge
Standard:	Student verifies 2 CW pumps and 2 SW pump combination is entered.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical - NO**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: h. The projected release start date and time
Standard:	Student verifies projected start time of 1600 is entered.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 **Critical - NO**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: i. Date, time of request, and initials of originator
Standard:	Student verifies time, date, and initials are entered.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 10 **Critical - NO**	Section 1 of CP 4.1A is completed by the Primary Operator and provides the following information: j. Date, time, and initials of individual that performed verification of operational data
Standard:	Student enters date, time, and initials.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete**

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

Stop Time: ___________

Examinee: ______________________ Evaluator: ______________________

☐ RO ☐ SRO ☐ Date: ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________

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

TURNOVER SHEET

Directions to the Student:

A. You are the Unit Supervisor. You are going to perform the verification of a Liquid Effluent Waste Sample Request, using the information provided.

B. The following information is provided to you:

1) The plant is in MODE 1 with two ocean Service Water and two Circulating Water pumps running with no expected change of configuration.
2) WL-TK-63A, "A" Waste Test Tank has been filled to 18,000 gallons.
3) WL-TK-63A, "A" Waste Test Tank, was placed on recirculation at 0800 today per ON1018.07, Waste Test Tank Recirculation.
4) WL-TK-63A, "A" Waste Test Tank has to be sampled to prepare a LEW permit for a release to the transition Structure.
5) Projected release start time is normally 8 hours after placing the tank on recirc.
6) The Primary Operator has completed Section 1 of CP 4.1A, Liquid Effluent Waste Sample Request.

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

D. I 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 Unit Supervisor, **"Unit Supervisor (or students name), Section 1 of Form CP 4.1A is complete. Please perform the verification. Record any issues that you find on the tear-off sheet. Correct any issues that you find. Discuss the results with me."**

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

HANDOUT

2018 LOIT NRC Exam SRO Admin JPM D

Liquid Effluent Waste Sample Request

Section I **Operational Data (Completed by Operations Department)**

Tank, Sump, S/G, CPS or SG Demin. Vessel: ANWT

Disposition: ✓ Discharge ______ Recycle

Tank, Sump, or S/G Volume: 18,120 gallons

Recirculate Rate: 400 gpm

Minimum Recirc. Time* = 2 x Tank Vol. / Recirc. Rate = 91 min.

Recirc. Start Date and Time: TODAY / 0800

Sample Date and Time: TODAY / 0930

NOTE

CW-V-40 position cannot change once this form is submitted to Chemistry.

Project CW and SW pump combination for discharge: CW 2 SW 2

Project Release Start Date and Time: TODAY / 1600

Originator ______ Date ______ Time ______

Verified By ______ Date ______ Time ______

Section II **Chemistry Data (Completed by Chemistry Department)**

______ / ______ ______

Sample Date / Sample Time / Sample Collected by (Initials)

Sample Identification No. ______

LEW Permit Number: ______

Dilution Water Flow Rate: ______ gpm

Volume Discharged: ______ gallons

Composite Volume: ______ mls

Composite Updated by: ______ (Initials)

* or as directed by supervision

KEY

2018 LOIT NRC Exam SRO Admin JPM D

Liquid Effluent Waste Sample Request

Section I **Operational Data (Completed by Operations Department)**

Tank, Sump, S/G, CPS or SG Demin. Vessel: AWMT

Disposition: ✓ Discharge ___ Recycle

Tank, Sump, or S/G Volume: 18,000 gallons

Recirculate Rate: 150 gpm

Minimum Recirc. Time* = 2 x Tank Vol. / Recirc. Rate = 240 min.

Recirc. Start Date and Time: TODAY / 0800

Sample Date and Time: TODAY / 1200

NOTE

CW-V-40 position cannot change once this form is submitted to Chemistry.

Project CW and SW pump combination for discharge: CW 2 SW 2

Project Release Start Date and Time: TODAY / 1600

Originator ______ Date ______ Time ______

Verified By ______ Date ______ Time ______

Section II **Chemistry Data (Completed by Chemistry Department)**

______ / ______ ______

Sample Date / Sample Time / Sample Collected by (Initials)

Sample Identification No. ______

LEW Permit Number: ______

Dilution Water Flow Rate: ______ gpm

Volume Discharged: ______ gallons

Composite Volume: ______ mls

Composite Updated by: ______ (Initials)

* or as directed by supervision

CP 4.1A
Rev. 18

JPM TITLE: **POST SCENARIO E PLAN CLASSIFICATION AND STATE NOTIFICATION (SIM SCENARIO DEPENDENT)**

JPM NUMBER: **2018 LOIT NRC Exam SRO Admin JPM "E"** **REV. 0**

K/A: K/A 2.4.41, Knowledge of SRO responsibilities in emergency plan implementation

EVALUATION LOCATION: In-Plant: [ ]

Simulator: [ ]

Admin: [X]

Estimated time for Completion: **20 Min**

Alternate Path: **NO**

Time Critical: **YES**

PREPARED BY: Sean M. Riley DATE: 12/28/17

APPROVED BY: Chris Adams DATE: 12/28/17
TRAINING SUPERVISOR

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

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

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

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

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

ASSOCIATED TASK DESCRIPTION:
1190402003: Perform required notifications of on-site and off-site personnel for emergency events.

STANDARDS:
Classify the emergency condition and complete the State Notification Fact Sheet within the required time.

SET-UP:
1. 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.

Directions to the Student:

Evaluator gives Turnover sheet to the 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. This task is time critical.

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

INITIATING CUE:

Evaluator 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."**

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

NOTE: 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)**

Performance Step: 01 **Critical – NO**	Depending upon the plant mode in effect when the potential emergency initiating condition occurs, review the following forms: • 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 1.1B, Emergency Initiating Condition Matrix Modes 5, 6 and Defueled
Standard:	Depending upon the plant mode in effect when the potential emergency initiating condition occurs, student review the following forms: • 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 1.1B, Emergency Initiating Condition Matrix Modes 5, 6 and Defueled
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Cue:	If the student is considering an emergency classification under a radiological effluent EAL which requires a dose projection (RS1 or RG1), cue the following, **"No dose projection will be performed. Please continue with the next step."**

Performance Step: 02 **Critical - YES**	If an emergency classification is being considered under a radiological effluent EAL which requires a dose projection (RS1 or RG1), implement offsite dose assessment using procedure ER 5.3," Operation of Rad Dose V"
Standard:	Student goes to step 3 of ER 1.1.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 **Critical - YES**	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.
Standard:	Student circles the potential emergency initiating condition(s) on each Form.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	For Category R, E, H, M 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).
Standard:	Student verifies that the EAL is met or the intent of the initiating condition is met.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 Critical - YES	Identify the most severe (highest) emergency classification for which the EAL(s) is met or the intent of the initiating condition is met.
Standard:	Student identifies the most severe (highest) emergency classification for which the EAL(s) is met or the intent of the initiating condition is met.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	Student reviews NOTE prior to step 9.

Performance Step: 06 Critical – YES	If an emergency declaration is warranted, immediately implement Station Emergency Response Procedure ER 1.2, Emergency Plan Activation.
Standard:	Student determines an emergency declaration is warranted and immediately implements Station Emergency Response Procedure ER 1.2, Emergency Plan Activation.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

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)

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

Performance Step: 07 **Critical – NO**	Assume the role of STED.
Standard:	Student verifies Shift Manager is the STED.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical – YES**	Implement one of the following forms based on the emergency classification: • Form ER 1.2A, Unusual Event 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 1.2D, General Emergency Checklist - Short Term Emergency Director.
Standard:	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 1.2B, Alert 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.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 9 **Critical – YES**	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.
Standard:	Student recalls from the Turnover Sheet no code yellow security event in progress.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

NOTE:	Student reviews CAUTION prior to step 2.

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

Performance Step: 10 **Critical – YES**	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.
Standard:	STED declares the emergency via a crew UPDATE by announcing the emergency classification and records the time of the UPDATE.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 11 **Critical – YES**	Enter the emergency initiating condition designation (e.g., RU1, etc.) ______________.
Standard:	Student enters the emergency initiating condition designation.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

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

Performance Step: 12 **Critical – YES**	DETERMINE REMOTE MONITORING AREA (RMA) ACTIVATION
Standard:	Student determines remote monitoring area (RMA) activation.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 13 **Critical – YES**	NOTIFY GUARD ISLAND SECURITY a. Contact Guard Island Security at x4006 or x4008. 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
Standard:	Student notifies guard island security as follows: d. Contacts Guard Island Security at x4006 or x4008. e. Directs implementation of procedure GN1332.00, Security Response to a Declared Radiological Emergency. f. Provides 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:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 14 **Critical – YES**	NOTIFY STATION PERSONNEL a. Ensure Gaitronics night muting is off. b. Sound the plant emergency alarm. c. Using the Gaitronics override, make the proper announcement. d. Repeat the plant emergency alarm. e. Using the Gaitronics override, repeat the proper announcement.
Standard:	Student notifies station personnel as follows: a. Ensures Gaitronics night muting is off. b. Sounds the plant emergency alarm. c. Using the Gaitronics override, makes the proper announcement. d. Repeats the plant emergency alarm. e. Using the Gaitronics override, repeats the proper announcement.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 15 **Critical – YES**	COMPLETE FORM ER 2.0B, STATE NOTIFICATION FACT SHEET a. Block 1 - Leave blank b. Block 2 – Enter time declared from step 2 and check the proper event. c. Block 3 – Enter the emergency initiating condition designation d. Block 4 - Check the proper block(s). e. Block 5 - Use the procedure "release" guidance when completing this block. f. Block 6 – Requires authorization signature of the STED or SED
NOTE:	Depending on the type of declaration, the student may have to determine appropriate protective action recommendations.
NOTE:	When student presents form for authorization: **Make no comments of any sort on the information recorded. Evaluator should sign form as STED**
Standard:	Student completes ER 2.0B, State Notification Fact Sheet a. Block 1 - Leaves blank b. Block 2 – Enters time declared from step 2 and check the proper event. c. Block 3 – Enters the emergency initiating condition designation d. Block 4 - Checks the proper block(s). e. Block 5 - Uses the procedure "release" guidance when completing this block. f. Block 6 – Requires authorization signature of the STED or SED
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

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

Performance Step: 16 **Critical – YES**	Stop time __________
NOTE:	Evaluator calculates time difference from JPM Step 11 to Step 17. This time must be ≤15 minutes for SAT JPM.
Standard:	Time to complete critical task ≤ 15 minutes
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

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

TITLE:	SHIFTING FROM CCP TO PDP	
JPM NUMBER:	2018 LOIT NRC Exam Sim JPM "A"	REV. 0
SAFETY FUNCTION	1: Reactivity Control	

K/A: 004, Chemical and Volume Control System, A4.08, Ability to manually operate and/or monitor in the control room: Charging

EVALUATION LOCATION:	In-Plant:	
	Simulator:	X
	Admin:	

Estimated time for Completion:	20 Min
Alternate Path:	NO
Time Critical:	NO

SIMULATOR SET-UP:
1. Reset the simulator to IC 30.
2. Place the simulator in RUN.
3. Adjust letdown flow to 80 gpm.
4. Place Simulator in FREEZE

Directions to the Student:

Evaluator gives Tear-Off sheet to the student.

A. You are the Primary Operator. You are going to shift from the centrifugal charging pump to the positive displacement charging pump.

B. The following information is provided to you:

1) The plant is in MODE 1 at 100% power.
2) Tech. Support needs the PDP in service to evaluate long term operation capabilities.
3) OS1002.02, Operation of the Letdown, Charging, and Seal Injection prerequisites are complete.
4) All PDP pump pre-start checks are complete and satisfactory.
5) Heater HTR-369-A, PDP Stabilizer/Separator Heater has been energized for 1 hour.

C. Perform the task in accordance with the appropriate procedure.

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

Initiating Cue:

Unit Supervisor to Primary Operator, **“Shift charging from the running centrifugal charging pump to the positive displacement charging pump.”**

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

NOTE: 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 student asks for boron sample results say: **"The boron sample was taken and boron concentration is within 5 ppm of the Reactor Coolant System concentration."**

Performance Step: 01 **Critical - No**	VERIFY RC-SK-459A, PDP speed controller is in MANUAL and set to MINIMUM.
Standard:	Verifies RC-SK-459A, PDP speed controller is in MANUAL and set to MINIMUM.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	Student may mention need to enter applicable Tech. Spec. per step 4.10.5.
Cue:	If the student mentions addressing Tech. Specs., say: **"I will address the Tech. Specs., continue with the evolution."**
Performance Step: 02 **Critical – No**	PLACE the control switch for the standby centrifugal charging pump in PULL-TO-LOCK.
Standard:	Places the control switch for the standby centrifugal charging pump in PULL-TO-LOCK.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 Critical - YES	OPEN CS-V-205, PDP minimum flow valve.
Standard:	Opens CS-V-205, PDP minimum flow valve.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 Critical - NO	PERFORM pump prestarts.
Standard:	Verifies that pump pre-starts had already been completed.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 Critical - YES	START CS-P-128, Positive Displacement Charging Pump.
Standard:	Starts CS-P-128, Positive Displacement Charging Pump.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 Critical - YES	INCREASE speed of CS-P-128 to 30%.
Standard:	Increases speed of CS-P-128 to 30%.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 Critical - YES	CHECK or PLACE CS-FCV-121, charging flow controller in MANUAL.
Standard:	Places CS-FCV-121, charging flow controller in MANUAL.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 Critical - No	ADJUST seal injection flow to between 6 to 8 gpm.
Standard:	Adjusts seal injection flow to between 6 to 8 gpm.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 Critical – No	ADJUST total charging flow to between 65 and 75 gpm.
Standard:	Adjusts total charging flow to between 65 and 75 gpm.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Cue:	When the student verbalizes that the PDP must be run for 12 minutes, provide the cue, **"For the purpose of the JPM, the pump has been operating for 12 minutes."**
Performance Step: 10 Critical - YES	After the PDP has been running for at least 12 minutes, PLACE the control switch for CS-V-205 to THROTTLE CLOSE.
Standard:	Places the control switch for CS-V-205 to THROTTLE CLOSE.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 11 **Critical - NO**	ADJUST the following to maintain the desired charging and seal injection flows until CS-V-205 is full closed: • CS-FCV-121, charging flow control. • CS-HCV-182, RCP seal flow control
Standard:	Adjusts valves as necessary
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 12 **Critical -NO**	Simultaneously THROTTLE CLOSED CS-FCV-121, charging flow control valve, and INCREASE speed of CS-P-128, positive disp. charging pump, until letdown and charging flows are matched.
Standard:	Simultaneously throttles closed CS-FCV-121, charging flow control valve, and INCREASE speed of CS-P-128, positive disp. charging pump, until letdown and charging flows are matched.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 13 **Critical - YES**	PLACE RC-LK-459, master level controller, in MANUAL.
Standard:	Places RC-LK-459, master level controller, in MANUAL.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 14 Critical - YES	MATCH the output of RC-LK-459, master level controller, with then output of RC-SK-459A, PDP speed controller.
Standard:	Matches the output of RC-LK-459, master level controller, with then output of RC-SK-459A, PDP speed controller.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 15 Critical - YES	PLACE RC-SK-459A, PDP speed controller, in AUTO.
Standard:	Places RC-SK-459A, PDP speed controller, in AUTO.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Performance Step: 16 Critical - YES	PLACE RC-LK-459, master level controller, in AUTO.
Standard:	Places RC-LK-459, master level controller, in AUTO.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Cue:	IF the student requests Unit Supervisor direction to stop the centrifugal charging pump, respond, **"Stop the centrifugal charging pump."**
Performance Step: 17 Critical - YES	As directed by the Unit Supervisor, STOP the running centrifugal charging pump and PLACE the control switch in NORMAL AFTER STOP.
Standard:	Stops STOP the running centrifugal charging pump and PLACE the control switch in NORMAL AFTER STOP.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Cue:	If the student asks, say: **"The Aux. Lube Oil Pump is running."**
Performance Step: 18 **Critical - NO**	PLACE the control switch for CS-V-205, PDP minimum flow valve, to AUTO.
Standard:	Places the control switch for CS-V-205, PDP minimum flow valve, to AUTO.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete.**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ RO ☐ SRO ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

TURNOVER SHEET

Directions to the Student:

A. You are the Primary Operator.

B. The following information is provided to you:

1. The plant is at 100% power.
2. An event will occur. Respond to plant conditions. The BOP will NOT assist you.
3. Due to the nature of the JPM, you will NOT be permitted to review any procedures before the JPM begins.

C. Perform the task in accordance with the appropriate procedure.

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

INITIATING CUE:

Evaluator to Primary Operator, **“Primary Operator (or student’s name), when an event occurs, identify the event. Perform the actions for the required procedure. If required, perform any immediate actions from memory for the applicable procedure and inform the evaluator when the immediate actions are complete.”**

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

TITLE:	PRESSURIZER LEVEL CHANNEL FAILURE
JPM NUMBER:	2018 LOIT NRC Exam Sim JPM "B" REV. 0
SAFETY FUNCTION	2: Reactor Coolant System Inventory Control

K/A: 011, Pressurizer Level Control System, A2.07, Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunction or operations: Isolation of letdown

EVALUATION LOCATION:	In-Plant:	
	Simulator:	X
	Admin:	

Estimated time for Completion:	20 Min
Alternate Path:	NO
Time Critical:	NO

SIMULATOR SET-UP:

Reset the simulator to any 100% power IC and perform the following.

1. Reset the simulator to IC 300 or any 100% power IC.
2. Ensure that LT-459 is selected for controlling PZR level channel and for the PZR level recorder.
3. Place the simulator in RUN.
4. Acknowledge any alarms and setup trends
5. Ensure at least one DEHC screen shows the status of the Main Turbine stop and control valves.
6. Place Simulator in FREEZE
7. With the simulator in FREEZE run scenario file L0007J located in the JPM setup scenarios folder.
8. LT-459 fails low 20 seconds after simulator is placed in RUN.

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Primary Operator.

B. The following information is provided to you:

1. The plant is at 100% power.
2. An event will occur. Respond to plant conditions. The BOP will NOT assist you.
3. Due to the nature of the JPM, you will NOT be permitted to review any procedures before the JPM begins.

C. Perform the task in accordance with the appropriate procedure.

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

INITIATING CUE:

Evaluator to Primary Operator, **"Primary Operator (or student's name), when an event occurs, identify the event. Perform the actions for the required procedure. If required, perform any immediate actions from memory for the applicable procedure and inform the evaluator when the immediate actions are complete."**

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

JPM PERFORMANCE INFORMATION

Start Time: __________

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

NOTE: **Critical steps are marked with a “YES” below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.**

NOTE: 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 identifies the failed PZR level instrument, give the student OS1201.07, PZR Level Instrument Failure. Student may use skill of the operator to reduce charging as necessary to maintain Pzr level on program.

Performance Step: 01 **Critical - No**	Check pressurizer level channels.
Standard:	Checks pressurizer level channels and observes that LT-459 is failed low.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Comments:	Note and caution prior to step 2 should be read.
Performance Step: 02 **Critical – No**	Manually control Pzr level at program.
Standard:	Reduces charging flow. Adjusts seal injection flow as necessary to manually control Pzr level at program.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 **Critical - NO**	Select an alternate level channel for control/backup as necessary.
Standard:	Selects alternate level channels L-461/L-460 for control/backup.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Select an alternate level channel for the recorder as necessary.
Standard:	Selects an alternate level channel for the recorder as necessary • L-461 • L-460
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - YES**	Verify Pzr heaters on as follows: Reset or manually control Pzr heaters as necessary.
Standard:	Resets the Pzr control group of heaters.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical - NO**	Check if letdown was isolated: Letdown isolation valves closed • RC-LCV-459 • RC-LCV-460.
Standard:	Checks if letdown was isolated: Observes letdown isolation valve RC-LCV-459 closed.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical - YES**	Verify charging flow greater than 50 gpm.
Standard:	Verify or adjusts charging flow greater than 50 gpm.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical - No**	Verify Pzr level greater than 17%.
Standard:	Verifies Pzr level greater than 17%.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 **Critical – No**	Align PCCW to letdown heat exchanger as follows: • CC-V-341 – open • CS-TK-130 – auto.
Standard:	Verifies PCCW alignment to letdown heat exchanger by checking: • CC-V-341 – open • CS-TK-130 – auto.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 10 **Critical - YES**	Close letdown flow control valves: • CS-HCV-189 • CS-HCV-190.
Standard:	Checks closed/closes letdown flow control valves: • CS-HCV-189 • CS-HCV-190.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 11 **Critical - YES**	Open letdown line isolation valve RC-LCV-459.
Standard:	Opens letdown line isolation valve RC-LCV-459.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 12 **Critical - No**	Open letdown line isolation valve RC-LCV-460.
Standard:	Checks open letdown line isolation valve RC-LCV-460.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 13 **Critical - YES**	Open letdown line isolation valve CS-V-145.
Standard:	Opens letdown line isolation valve CS-V-145.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Comments:	It is expected that the student will take manual control of CS-PK-131 to approximately 15%, and then slowly open a flow control valve to establish letdown flow. When CS-PK-131 input pressure equals setpoint pressure (about 350 psig), the student should return CS-PK-131 to auto.

Performance Step: 14 Critical - Yes	Manually control or monitor CS-PK-131 response and establish letdown flow using: • CS-HCV-189 • CS-HCV-190.
Standard:	Manually control or monitor CS-PK-131 response and establish letdown flow using: • CS-HCV-189 • CS-HCV-190.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ RO ☐ SRO ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

TURNOVER SHEET

Directions to the Student:

A. You are the Primary Operator.

B. The following information is provided to you:

1. The plant is at 100% power.
2. An event will occur. Respond to plant conditions. The BOP will NOT assist you.
3. Due to the nature of the JPM, you will NOT be permitted to review any procedures before the JPM begins.

C. Perform the task in accordance with the appropriate procedure.

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

INITIATING CUE:

Evaluator to Primary Operator, **"Primary Operator (or student's name), when an event occurs, identify the event. Perform the actions for the required procedure. If required, perform any immediate actions from memory for the applicable procedure and inform the evaluator when the immediate actions are complete."**

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

TITLE:	ISOLATE ACCUMULATORS
JPM NUMBER:	2018 LOIT NRC Exam Sim JPM "C" REV. 0
SAFETY FUNCTION	3: Reactor Pressure Control

K/A: 006, Emergency Core Cooling System (ECCS), A4.02, Ability to manually operate and/or monitor in the control room: Valves

EVALUATION LOCATION: In-Plant: [ ]

Simulator: [X]

Admin: [ ]

Estimated time for Completion: 10 Min

Alternate Path: YES

Time Critical: NO

SIMULATOR SET-UP:

Reset the simulator to IC #325 or any 100% IC which contains the following:

1. Place the simulator in RUN.
2. Using Panel Graphics PBF10, override the control switch for SI-V-17, Accum B Isolation Valve to open.
3. Insert the following malfunctions:
   - Reactor Coolant mfRC049A for RCS cold leg 1 Leak (0-100%)
4. Allow automatic Reactor Trip and Safety Injection.
5. Complete all required actions of E-0 and all actions of E-1 through step 12.
6. Complete alignment for cold leg recirculation per ES-1.3.
7. Insert the following component remote functions when required by ES-1.3:
   - CVCS (component) mvCS1LCV112D 460V MCC E512 RF:Open Breaker.
   - CVCS (component) mvCS1LCV112E 460V MCC E612 RF:Open Breaker.
8. Allow hot leg temperature to decrease to <370°F to provide conditions for accumulator isolation.
9. Place the simulator in FREEZE.

Place the simulator in RUN as long as needed to ensure all alarms are acknowledged prior to start of the JPM.

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Primary Operator. You are going to isolate the Safety Injection Accumulators per step 15 of E-1.

B. The following information is provided to you:

1. Due to an RCS LOCA, the following has occurred:
   - Automatic Reactor Trip
   - Automatic Safety Injection
   - Automatic CBS actuation
2. All associated actions of E-0, Reactor Trip Or Safety Injection, are complete.
3. FR-P.1, Response To Imminent Pressurized Thermal Shock Conditions, is complete.
4. E-1, Loss Of Reactor Or Secondary Coolant, has been completed through step 14.
5. ES-1.3, Transfer To Cold Leg Recirculation, is complete.
6. The US has returned to E-1, and is ready to process step 15.

C. Perform the task using E-1, Loss Of Reactor Or Secondary Coolant.

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

INITIATING CUE:

Evaluator to Primary Operator, **"Primary Operator (or student's name), isolate the SI accumulators in accordance with step 15 of E-1."**

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

JPM PERFORMANCE INFORMATION

Start Time: __________

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

NOTE: **Critical steps are marked with a “YES” below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.**

NOTE: 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 the procedure, provide the student with E-1, Loss Of Reactor Or Secondary Coolant.**

Performance Step: 01 **Critical – NO**	Check if SI accumulators should be isolated: At least two RCS hot leg temperatures less than 370°F.
Standard:	Verifies at least two RCS hot leg temperatures less than 370°F.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 02 **Critical - YES**	Check power to isolation valves – available: Energize MCC-522 and MCC-622.
Standard:	Using MCB control switches, closes the following breakers: • MCC-522. • MCC-622.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 **Critical - NO**	Check power to isolation valves – available: Power available lights – lit.
Standard:	Verifies power available lights lit for the following valves: • SI-V-3. • SI-V-32. • SI-V-17. • SI-V-47.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Reset SI.
Standard:	Resets SI or reports that SI was previously reset.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - YES**	Close all SI accumulator isolation valves.
Standard:	Closes SI accumulator isolation valve SI-V-3.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical – YES**	Close all SI accumulator isolation valves.
Standard:	Closes SI accumulator isolation valve SI-V-32.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	The student should recognize that SI-V-17 will not close and the correct response is to refer to the RNO and vent the B accumulator.
Performance Step: 07 **Critical – NO**	Close all SI accumulator isolation valves.
Standard:	Attempts to close SI accumulator isolation valve SI-V-17
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical – YES**	Close all SI accumulator isolation valves.
Standard:	Closes SI accumulator isolation valve SI-V-47.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 **Critical – YES**	Vent any unisolated accumulators by cycling the accumulator vent valves.
Standard:	Vents any unisolated accumulators as follows: Open the following valves to vent "B" accumulator: • SI-FV-2482. • SI-FV-2483.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	"B" accumulator pressure will take approximately 10 minutes to depressurize from 108 psig to 18 psig. Pressure trend is an extremely slow decreasing trend below 18 psig. Provide the following cue when the student demonstrates the ability to monitor accumulator pressure.
Cue:	If necessary, provide the following cue: US to PSO,"**B accumulator has been vented adequately."**
Performance Step: 10 **Critical – NO**	Vent any unisolated accumulators by cycling the accumulator vent valves.
Standard:	Vents any unisolated accumulators as follows: Closes the following valves: • SI-FV-2482. • SI-FV-2483.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 11 **Critical – NO**	Deenergize MCC-522 and MCC-622.
Standard:	Using MCB control switches, open the following breakers: • MCC-522. • MCC-622.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: The JPM is complete

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

☐ **RO** ☐ **SRO**

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

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

EXAMINER NOTE: **ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.**

EVALUATOR'S SIGNATURE: ______________________________________

TURNOVER SHEET

Directions to the Student:

A. You are the Primary Operator. You are going to isolate the Safety Injection Accumulators per step 15 of E-1.

B. The following information is provided to you:

1. Due to an RCS LOCA, the following has occurred:
   - Automatic Reactor Trip
   - Automatic Safety Injection
   - Automatic CBS actuation
2. All associated actions of E-0, Reactor Trip Or Safety Injection, are complete.
3. FR-P.1, Response To Imminent Pressurized Thermal Shock Conditions, is complete.
4. E-1, Loss Of Reactor Or Secondary Coolant, has been completed through step 14.
5. ES-1.3, Transfer To Cold Leg Recirculation, is complete.
6. The US has returned to E-1, and is ready to process step 15.

C. Perform the task using E-1, Loss Of Reactor Or Secondary Coolant.

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

INITIATING CUE:

Evaluator to Primary Operator, **"Primary Operator (or student's name), isolate the SI accumulators in accordance with step 15 of E-1."**

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

TITLE:	POST LOCA PORV OPERATION
JPM NUMBER:	2018 LOIT NRC Exam Sim JPM “D” REV. 0
SAFETY FUNCTION	4: Heat Removal From Reactor Core: Primary System

K/A: 002, Reactor Coolant System, A2.01, Ability to (a) predict the impacts of the following malfunctions or operations on the RCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of coolant inventory

EVALUATION LOCATION:

In-Plant:	☐
Simulator:	X
Admin:	☐

Estimated time for Completion:	10 Min
Alternate Path:	YES
Time Critical:	NO

SIMULATOR SET-UP:

Reset the simulator to IC #322 or any 100% IC which contains the following:

1. Insert the following malfunctions:
   - Reactor Coolant mfRC049D RCS Cold Leg 4 leak 0-175000gpm Final Value=1200.
2. Run the simulator and allow the reactor to trip and SI to actuate.
3. Complete E-0 and E-1 through step 12 for ES-1.2 transition.
4. Open EFW mini-flow valves and throttle EFW flow.
5. Reset SI.
6. Shut down and reset EDGs. Isolate SW to EDGs
7. Trip all RCPs.
8. Transition to ES-1.2 and perform steps 1-10. Ensure RHR pumps are secured.
9. Modify mfRC049D to restore subcooling to >40°F. Final value was 1500 gpm for 2016 .
10. Activate the following Event Triggers in the rcs folder to cause either PORV to fail open when the MCB switch is placed in the open position:
    - A PORV Fails Open when manually opened
    - B PORV Fails Open when manually opened
11. Place the simulator in FREEZE.

Place the simulator in RUN as long as needed to ensure all alarms are acknowledged prior to start of the JPM. NOTE: if simulator is run too long prior to starting JPM, subcooling requirement >40°F may not be met.

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Primary Operator. You are going to depressurize the RCS to refill the pressurizer.

B. The following information is provided to you:

1. The reactor tripped from 100% due to a LOCA and Safety Injection has actuated.
2. All actions were completed in E-0 and E-1.
3. The crew is presently at step 11 in ES-1.2, Post LOCA Cooldown And Depressurization.
4. An RCS cooldown to cold shutdown is in progress.

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

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

INITIATING CUE:

Evaluator to Primary Operator, **"Primary Operator (or student's name), depressurize the RCS to refill the pressurizer using step 11 of ES-1.2."**

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

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

NOTE: Critical steps are marked with a “YES” below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

NOTE: 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 the procedure, provide the student with ES-1.2, Post LOCA Cooldown And Depressurization.

Note:	If a first out alarm actuates during JPM performance inform student that first out was inadvertently reset and to continue with the JPM.

Performance Step: 01 **Critical – NO**	PZR level less than 30% [44% adverse].
Standard:	Verifies PZR level less than 30% [44% adverse].
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 02 **Critical - YES**	Open normal PZR spray valve(s) to refill PZR.
Standard:	Verifies normal spray is not available.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 **Critical - YES**	ES-1.2 RNO step 11b. Use one PZR PORV to refill PZR.
Standard:	Opens one PZR PORV (with associated block valve open): RC-PCV-456A (with Block valve RC-V-122 open) OR RC-PCV-456B (with Block valve RC-V-124 open).
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	PZR level greater than 30% [44% adverse].
Standard:	Monitors PZR level until greater than 30% [44% adverse]. Continues with ES-1.2 step 12.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Note:	ES-1.2 step 11c RNO directs operator to continue with step 12 of ES-1.2 while waiting for Pzr level to increase to greater than 30% [44% adverse].

Note:	Student should review Caution and Notes prior to step 12.
Cue:	If required, provide the following cue, evaluator to student, **"RCP seal cooling had NOT been previously lost."**

Performance Step: 05 **Critical - NO**	Check if an RCP should be started: All RCPs stopped.
Standard:	Checks all RCPs stopped.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical – NO**	Check if an RCP should be started: RCS subcooling greater than 40°F.
Standard:	Checks RCS subcooling greater than 40°F.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 07 **Critical – NO**	Check if an RCP should be started: PZR level greater than 30% [44% adverse].
Standard:	Checks PZR level less than 30% [44% adverse]. Returns to ES-1.2 step 11.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 08 **Critical – YES**	When PZR level is greater than 30% [44% adverse] stop the RCS depressurization: • If PORV in use then close PZR PORV.
Standard:	When PZR level is greater than 30% [44% adverse] stop the RCS depressurization: Attempts to close PZR PORV. Determines that the PORV is failed open. Closes the block valve for the failed open PORV: • RC-PCV-456A closes Block Valve RC-V-122 -OR- • RC-PCV-456B closes Block Valve RC-V-124.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Note:	Procedural guidance is contained in OP9.2 Transient Response Procedure User's Guide section 4.9.5 for closing the associated block valve for a failed open PORV. Closing the block valve is a skill of the operator task which may be performed from memory. It is expected that the student will isolate the failed open PORV in this manner.

Terminating Cues: **The JPM is complete**

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

Stop Time: ____________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

TURNOVER SHEET

Directions to the Student:

A. You are the Primary Operator. You are going to depressurize the RCS to refill the pressurizer.

B. The following information is provided to you:

1. The reactor tripped from 100% due to a LOCA and Safety Injection has actuated.
2. All actions were completed in E-0 and E-1.
3. The crew is presently at step 11 in ES-1.2, Post LOCA Cooldown And Depressurization.
4. An RCS cooldown to cold shutdown is in progress.

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

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

INITIATING CUE:

Evaluator to Primary Operator, **"Primary Operator (or student's name), depressurize the RCS to refill the pressurizer using step 11 of ES-1.2."**

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

TITLE:	TRANSFER SERVICE WATER FROM THE COOLING TOWER TO THE OCEAN
JPM NUMBER:	2018 LOIT NRC Exam Sim JPM "E" REV. 0
SAFETY FUNCTION	4: Heat Removal From Reactor Core: Secondary System

K/A: 076, Service Water System, A4.01, Ability to manually operate and/or monitor in the control room: SWS pumps

EVALUATION LOCATION:

In-Plant:	☐
Simulator:	X
Admin:	☐

Estimated time for Completion:	20 Min
Alternate Path:	YES
Time Critical:	NO

SIMULATOR SET-UP:

Reset the simulator to IC 331.

Alternatively reset to any 100% IC which contains the following:

1. Place the simulator in RUN.
2. Place Train A service water on the cooling tower per OS1016.05, Service Water Cooling Tower Operation.
3. Place SW-P-41C control switch in PTL.
4. Insert the following malfunctions:
    - Service water SW001 SW-P-41A OC trip.
    - Service water (component) cSWV22 SW-V-22 SW PUMP C DISCHARGE ISOLATION 460V MCC E514 CR7 fail closed.
5. Insert the following remote functions:
    - Service water (component) cSWP41C SW-P-41C TRAIN A SVCE WTR PMPC 4160 V Bus E5 AQ4 RF:rackout.
    - Service water (component) cSWV22 SW-V-22 SW PUMP C DISCHARGE ISOLATION 460V MCC E514 CR7 RF:open breaker.
6. Raise cooling tower basin level to 43.7' as follows:
    - Select External Params
    - Select Tank levels
    - Select epLEVTK17 Cooling Tower Basin SW-TK-1(ft.)
    - Insert final value = 43.7 ramp time = 120
7. Place the simulator in FREEZE after cooling tower basin level reaches 43.7'.

Place a tag on SW-P41-C control switch.
Place the simulator in RUN as long as needed to ensure all alarms are acknowledged prior to start of the JPM.

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Secondary Operator you are going to transfer Train A Service Water from the cooling tower to the ocean.

B. The following information is provided to you:

1. The plant is operating at 100% power.
2. On line maintenance/retests are complete on the Service Water system Train A pump house valves.
3. SW-P-41C is tagged out for maintenance.
4. The SM has requested that Train A Service Water be transferred back to the ocean from the cooling tower.
5. Local pre-starts are complete on the "A" Service Water pump (SW-P-41A).

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

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

INITIATING CUE:

Evaluator to Secondary Operator, **"Secondary Operator (or student's name), using OS1016.05, section 4.4, transfer Train A Service Water from the Cooling Tower to the ocean. All prerequisites, precautions and local pre-starts for SW-P-41A are complete."**

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

JPM PERFORMANCE INFORMATION

Start Time: __________

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

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

NOTE: 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 the procedure, provide the student with the applicable sections of OS1016.05 Service Water Cooling Tower Operation and ODI-05 Rev. 01 Pump Pre-start Guidelines.

Note:	Student should review notes and cautions prior to steps being performed. Student may put up the color graphic on MPCS for service water.

Performance Step: 01 Critical – NO	Check SW Train A and SW Train B is aligned to the cooling tower.
Standard:	Checks SW Train A only is aligned to the cooling tower. Checks SW Train B is aligned to the ocean.
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Note:	If student asks state that fire protection has not been used to fill the cooling tower and no chemistry sampling is required.

Performance Step: 02 Critical - NO	Record initial cooling tower level (transferring from the cooling tower) on form L, Cooling Tower Flush NPDES Tracking Sheet.
Standard:	No action required.
Cue:	Provide the following cue, **"Initial cooling tower level (transferring from the cooling tower) has been recorded on form L, Cooling Tower Flush NPDES Tracking Sheet and will be tracked by the US."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 Critical - NO	Determine if SW-V-44 is closed.
Standard:	Determines that SW-V-44 is open.
Cue:	Student may use MPCS color graphics to determine position If required, provide cue, **"SW-V-44 is open."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Cue:	When student begins to perform pump pre-start checks, provide cue, **"All local pre-starts are complete. Previous pump start was two days ago."**
Performance Step: 04 Critical - NO	Perform SW ocean pump pre-starts as determined by the US.
Standard:	Performs control room SW ocean pump pre-starts.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 Critical - YES	Open SW-V20, SW Train A to discharge structure.
Standard:	Opens SW-V20, SW Train A to discharge structure.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 Critical – YES	Close SW-V-34, SW Train A return to cooling tower.
Standard:	Closes SW-V-34, SW Train A return to cooling tower.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 Critical – YES	Simultaneously place and hold the control switch for SW-V-54, cooling tower pump A discharge to throttle close and the control switch for SW-V-56, cooling tower Train A spray header test valve to open until valves reposition.
Standard:	Simultaneously places and holds the listed control switches until the valves reposition as follows: • SW-V-54 control switch to throttle close. • SW-V-56 control switch to open.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Cue:	If requested by the student make a plant announcement, **"Starting Service Water pump 41A."**
Cue:	If the cooling tower basin low level alarm is received, inform student, **"Copy, low cooling tower basin level. I will dispatch an NSO to initiate fill of the cooling tower basin."**

Note:	SW-P-41A will trip when started
Performance Step: 08 Critical – NO	Start the desired Train A ocean SW pump.
Standard:	Starts SW-P-41A.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	SW-V-2 does not open due to SW-P-41A tripping. Student should apply the caution prior to step 4.4.9 and promptly realign to the cooling tower per step 4.4.10.
Performance Step: 09 Critical – NO	Check the selected SW pump discharge valve opens.
Standard:	Checks SW-V-2 and observes valve is not open and SW-P-41A tripped.
Cue:	If student informs US that SW-P-41A tripped and/or SW-V-2 did not open, respond, **"Continue with OS 1016.05."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 10 Critical – YES	If SW flow cannot be restored reopen SW-V-54, cooling tower pump A discharge isolation.
Standard:	Reopens SW-V-54, cooling tower pump A discharge isolation.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

TURNOVER SHEET

Directions to the Student:

A. You are the Secondary Operator you are going to transfer Train A Service Water from the cooling tower to the ocean.

B. The following information is provided to you:

1. The plant is operating at 100% power.
2. On line maintenance/retests are complete on the Service Water system Train A pump house valves.
3. SW-P-41C is tagged out for maintenance.
4. The SM has requested that Train A Service Water be transferred back to the ocean from the cooling tower.
5. Local pre-starts are complete on the "A" Service Water pump (SW-P-41A).

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

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

INITIATING CUE:

Evaluator to Secondary Operator, **"Secondary Operator (or student's name), using OS1016.05, section 4.4, transfer Train A Service Water from the Cooling Tower to the ocean. All prerequisites, precautions and local pre-starts for SW-P-41A are complete."**

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

TITLE:	CONTAINMENT BARRIER BREACH
JPM NUMBER:	2018 LOIT NRC Exam Sim JPM "F" REV. 0
SAFETY FUNCTION	5: Containment Integrity

K/A: 103, Containment System, A3.01, Ability to monitor automatic operation of the containment system, including: Containment Isolation

EVALUATION LOCATION:

In-Plant:	
Simulator:	X
Admin:	

Estimated time for Completion: 15 Min

Alternate Path: YES

Time Critical: NO

SIMULATOR SET-UP:

1. Reset the simulator to IC 30.
2. Place the simulator in RUN.
3. Ensure "A" CCP is running and "B" CCP is in standby.
4. Acknowledge any alarms and setup trends
5. Ensure at least one DEHC screen shows the status of the Main Turbine stop and control valves.
6. Place Simulator in FREEZE
7. With the simulator in FREEZE run scenario 2018 NRC Exam JPM F.
8. Rx trip/Train A SI will occur 20 seconds after simulator is placed in RUN.

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Primary Operator.

B. The following information is provided to you:

1. The plant is at 100% power.
2. An event will occur. Respond to plant conditions. The BOP will NOT assist you.
3. Due to the nature of the JPM, you will NOT be permitted to review any procedures before the JPM begins.

C. Perform the task in accordance with the appropriate procedure.

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

INITIATING CUES:

Evaluator to Primary Operator, **"Primary Operator (or student's name), when an event occurs, identify the event. Perform the actions for the required procedure. If required, perform any immediate actions from memory for the applicable procedure and inform the evaluator when the immediate actions are complete."**

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

JPM PERFORMANCE INFORMATION

Start Time: ________

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

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

NOTE: 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:	When student identifies the reactor trip provide the following cue, **"Perform your immediate actions."**

Performance Step: 01 **Critical - NO**	Verify Reactor Trip. • Rod bottom lights lit. • Reactor trip and bypass breakers open • Neutron flux decreasing.
Standard:	Verifies Reactor Trip. • Verifies and reports rod bottom lights lit. • Verifies and reports Reactor trip and bypass breakers open • Verifies and reports neutron flux decreasing.
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 02 **Critical - NO**	Verify Turbine Trip. a. Either condition: • All stop valves closed -OR- • All control valves closed b. Generator breaker open.
Standard:	Verifies Turbine Trip. a. Either condition: • All stop valves closed -OR- • All control valves closed b. Generator breaker open.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 **Critical - NO**	Verify power to AC emergency buses: a. AC emergency buses - at least one energized b. AC emergency buses – both energized.
Standard:	Verifies power to AC emergency buses: a. Verifies and reports: AC emergency buses - at least one energized Bus E5 or E6 energized b. Verifies and reports: AC emergency buses – both energized Bus E5 and E6 energized.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Check if SI is actuated: a. Check SI annunciators lit: • Train A • Train B
Standard:	Checks if SI is actuated: a. Checks and reports SI annunciator: • Train A lit • Train B NOT lit
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - NO**	Check if SI is actuated: b. Verify both trains of SI actuated.
Standard:	Checks if SI is actuated: b. Verifies both trains of SI actuated.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical - YES**	All immediate action steps were performed in order.
Standard:	First 4 immediate action steps of E-0 must be performed in order.
Cue:	When informed that immediate actions are complete respond using proper 3 way communication.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	Provide the student with E-0 Reactor Trip Or Safety Injection Attachment A. Do not provide the student Attachment A laminated sheets. Per Attachment A, verbal communication of manual action is not required.
Cue:	Provide the following cue, **"Perform ESF Actuation Verification per Attachment A. The BOP operator has returned and has been briefed on plant conditions. He will continue with E-0 at step 6."**

Performance Step: 07 **Critical - YES**	Verify Containment Isolation Phase A actuation – all status panel lights lit • Train A. • Train B.
Standard:	Verifies Containment Isolation Phase A actuation – all status panel lights lit-NO • Verifies that all status panel lights are NOT lit.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical - No**	Manually actuate "T" signal for BOTH trains.
Standard:	Manually actuate "T" signal for BOTH trains. • Manually actuates "T" signal for both trains.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	

Performance Step: 09 **Critical - YES**	Manually align at least ONE train of equipment by status panel.

Standard:	Manually aligns at least ONE train of equipment for the following containment penetrations:
	• RCDT Pumps Outlet:
	  • WLD-V-81, "RCDT Pumps Outlet Isolation IRC, <u>OR</u>
	  • WLD V-82, "RCDT Pumps Outlet Isolation ORC
	• RCP Seals to Seal Water Heat Exchanger:
	  • CS-V-167, "RCP Seals to Seal Water HX" , <u>OR</u>
	  • CS-V-168, "RCP Seals to Seal Water HX"

Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	

Performance Step: 10 Critical - NO	Manually align BOTH trains of equipment by status panel, as necessary, while continuing with this attachment.
Standard:	Manually aligns BOTH trains of equipment by status panel, as necessary, while continuing with this attachment.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	

Performance Step: 11 Critical - NO	Verify Safeguard Equipment Alignment-PROPER ALIGNEMENT BY STATUS PANEL • TRAIN A-COLD LEG INJECTION • TRAIN B- COLD LEG INJECTION
Standard:	Verifies Safeguard Equipment Alignment-PROPER ALIGNEMENT BY STATUS PANEL-YES • TRAIN A-COLD LEG INJECTION • TRAIN B- COLD LEG INJECTION
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	The Train B status lights will show EAH-FN-5B not running. This condition is satisfactory as EAH-FN-5A is running.

Performance Step: 12 Critical – N0	Verify feedwater isolation – proper alignment indicated by status panel.
Standard:	Verifies feedwater isolation – proper alignment indicated by status panel.-YES
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 13 **Critical - No**	Verify PCCW pumps running: a. Loop A – one pump running b. Loop B – one pump running c. Thermal barrier cooling pumps- at least one running.
Standard:	Verifies PCCW pumps running: a. Loop A – one pump running - Yes b. Loop B – one pump running - Yes c. Thermal barrier cooling pumps- at least one running – Yes.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 14 **Critical - No**	Verify ECCS flow: a. CCP flow indicator – check for flow to RCS cold legs b. RCS pressure – less than 1700 psig.
Standard:	Verify ECCS flow: a. CCP flow indicator – checks SI-FI-917 and verifies flow to RCS cold legs b. RCS pressure – verifies pressure is less than 1700 psig.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 15 **Critical - No**	SI pump flow indications-CHECK FOR FLOW • TRAIN A • TRAIN B
Standard:	SI pump flow indications-CHECK FOR FLOW-YES • TRAIN A • TRAIN B
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 16 **Critical - No**	RCS pressure-LESS THAN 300 PSIG
Standard:	RCS pressure-LESS THAN 300 PSIG-NO. RNO-Go to Step 6.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 17 **Critical - No**	Verify MS-V129 is open.
Standard:	Verifies MS-V129 is open.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 18 **Critical - No**	Verify service water pumps running: • Train A – one pump running • Train B – one pump running.
Standard:	Verifies service water pumps running: • Train A – one pump running - Yes • Train B – one pump running – Yes.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 19 **Critical - No**	Verify SW flow to diesels greater than required: 900 GPM on ocean OR 1800 GPM on cooling tower • Train A.

Standard:	Verifies SW flow to diesels is greater than required: 900 GPM on ocean OR 1800 GPM on cooling tower
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	

Performance Step: 20 **Critical - No**	Check if main steam line isolation required: • Any SG pressure less than 585 psig without prior P-11 block • Main steam line isolation annunciator lit • Containment pressure greater than 4 psig • SG pressure rate high bistable lit with prior P-11 block.
Standard:	Checks main steam line isolation is required: • Any SG pressure less than 585 psig without prior P-11-NO • Main steam line isolation annunciator lit-YES • Containment pressure greater than 4 psig-YES • No SG pressure rate high bistable lit with prior P-11 block.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 21 **Critical - No**	Verify MSIV and MSIV bypass valves-CLOSED
Standard:	Verifies MSIV and MSIV bypass valves-CLOSED
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 22 Critical - No	Check containment pressure has remained less than 18 psig by pressure recorder.
Standard:	Check containment pressure has remained less than 18 psig by pressure recorder-NO
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Performance Step: 23 Critical - No	Verify containment isolation Phase B ("P" signal) and containment spray actuated: • All Phase B status lights-LIT
Standard:	Verify containment isolation Phase B ("P" signal) and containment spray actuated: • Verifies all Phase B status lights-LIT
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Performance Step: 24 Critical - No	Verify total EFW flow-Greater than 500 GPM
Standard:	Verifies total EFW flow-Greater than 500 GPM
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Performance Step: 25 Critical - No	Reset RMO as necessary.
Standard:	Resets RMO as necessary.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**

Terminating Cues: The JPM is complete

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

Stop Time: ____________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** **Date:** ______________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

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

TURNOVER SHEET

Directions to the Student:

A. You are the Primary Operator.

B. The following information is provided to you:

1. The plant is at 100% power.
2. An event will occur. Respond to plant conditions. The BOP will NOT assist you.
3. Due to the nature of the JPM, you will NOT be permitted to review any procedures before the JPM begins.

C. Perform the task in accordance with the appropriate procedure.

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

INITIATING CUES:

Evaluator to Primary Operator, **"Primary Operator (or student's name), when an event occurs, identify the event. Perform the actions for the required procedure. If required, perform any immediate actions from memory for the applicable procedure and inform the evaluator when the immediate actions are complete."**

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

TITLE:	LOP RECOVERY	
JPM NUMBER:	2018 LOIT NRC Exam Sim JPM "G"	REV. 0
SAFETY FUNCTION	6: Electrical	

K/A: 064, Emergency Diesel Generators, A3.07, Ability to monitor automatic operation of the ED/G system, including: Load sequencing

EVALUATION LOCATION:	In-Plant:	
	Simulator:	X
	Admin:	

Estimated time for Completion: 20 Min

Alternate Path: YES

Time Critical: NO

SIMULATOR SET-UP:

Preferred method:

1. Ensure BUS 2 RAT Incoming Line Bkr MCB switch is in Normal After Trip (green flag)
2. Reset the simulator to IC 30 (100% power MOL) and run scenario L0021J setup in the JPM setup scenarios folder.
3. Ensure both SEPS supply breaker control switches in PTL.
4. Place danger tags on both SEPs supply breaker control switches
5. Place the MCB switch for DG1B in PTL.
6. Place UAT and RAT supply breaker control switches for bus 5 and bus 6 in PTL. (ECA-0.0 step 5a)
7. Do not start DG1A.
8. Ensure event trigger L0021J ET has not actuated. If it has, ensure BUS 2 RAT Incoming Line Bkr MCB switch is in Normal After Trip (green flag) then repeat setup.
9. Allow plant to stabilize for one minute, then, FREEZE the simulator.

Alternate method:

Reset the simulator to any 100% IC which contains the following:

A. Initialize to an IC at 100% power.
B. Insert malfunction mfED031 to prevent auto start of DG1A.
C. Insert malfunction mfED034 to cause a low lube oil pressure trip of DG1B.
D. Insert remote function for SEPS rfSEP001 SEPS DG-2A auto start disable Final Value OFF.
E. Insert remote function for SEPS rfSEP002 SEPS DG-2B auto start disable Final Value OFF.
F. Ensure both SEPS supply breaker control switches in PTL.
G. Insert SEPS component remote function bkSEPA7A RF: Rack-out to rack out SEPS bus 6 breaker.
H. Place the MCB switch for DG1B in PTL.
I. Activate event trigger L0021J ET which inserts Main Steam component malfunction ptMSPK3002 STM GEN B MAIN STM HDR PRESS fails to specified value value=1500 ramp=20 when BUS 2 RAT breaker control switch is placed in Pull To Lock. This causes the "B" ASDV to fail open.
J. Insert malfunction mfED038 to cause a loss of offsite power
K. Perform all EOP steps through step 5a of ECA-0.0. Do not start DG1A.
L. Allow plant to stabilize for one minute, then, FREEZE the simulator.

Place danger tags on both SEPs supply breaker control switches. Place the simulator in RUN only as long as needed to ensure all alarms are acknowledged prior to start of the JPM.
Ensure event trigger L0021J ET has not actuated. If it has, ensure BUS 2 RAT Incoming Line Bkr MCB switch is in Normal After Trip (green flag) then reset to IC#319 again.

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Secondary Operator and you are going restore power to at least one AC emergency bus and stabilize SG pressures in accordance with ECA-0.0, Loss Of All AC Power.

B. The following information is provided to you:

1. A site blackout is in progress.
2. The NSO has reported a significant lube oil leak on DG 1B. The MCB switch for DG1B breaker has been placed in PTL. DG1B is not available.
3. Both SEPS supply breakers are in PTL due to maintenance work and are unavailable.
4. The duty electrician and the NSO are investigating the problem with DG1A failure to start.
5. The control room crew is ready to perform step 6 of ECA-0.0.
6. All EOP actions up to step 6 of ECA-0.0 have been performed.

C. Perform the task using ECA-0.0, Loss Of All AC Power.

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

INITIATING CUE:

Evaluator to Secondary Operator, **"Secondary Operator (or student's name), the diesel generators cannot be started and SEPs are not available. Continue beginning with step 6 of ECA-0.0 to place major equipment in pull to lock."**

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

JPM PERFORMANCE INFORMATION

Start Time: __________

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

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

NOTE: 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 the procedure, provide the student with ECA-0.0 Loss Of All AC Power.

Performance Step: 01 **Critical – YES**	Disable automatic loading of equipment as follows: Place thermal barrier cooling pump control switches in the Stop position.
Standard:	Places thermal barrier cooling pump control switches in the Stop position.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Performance Step: 02 **Critical - YES**	**Disable automatic loading of equipment as follows:** **Place the following pump control switches in pull to lock:** • **Charging pumps** • **PCCW pumps** • **CBS pumps** • **RHR pumps** • **SI pumps** • **Motor driven EFW pump** • **SUFP (Bus E5)**

Performance Step: 03 **Critical - YES**	Disable automatic loading of equipment as follows: Place the containment air compressor control switches in Off.
Standard:	Places the containment air compressor control switches in Off.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 04 **Critical - YES**	Disable automatic loading of equipment as follows: Place all UAT and RAT supply breaker control switches in pull to lock: • Bus 1 UAT bkr control switch • Bus 1 RAT bkr control switch • Bus 2 UAT bkr control switch • Bus 2 RAT bkr control switch • Bus 3 UAT bkr control switch • Bus 3 RAT bkr control switch • Bus 4 UAT bkr control switch • Bus 4 RAT bkr control switch • Bus 5 UAT bkr control switch • Bus 5 RAT bkr control switch • Bus 6 UAT bkr control switch • Bus 6 RAT bkr control switch
Standard:	Places all UAT and RAT supply breaker control switches in pull to lock: • Bus 1 UAT bkr control switch • Bus 1 RAT bkr control switch • Bus 2 UAT bkr control switch • Bus 2 RAT bkr control switch • Bus 3 UAT bkr control switch • Bus 3 RAT bkr control switch • Bus 4 UAT bkr control switch • Bus 4 RAT bkr control switch • Bus 5 UAT bkr control switch • Bus 5 RAT bkr control switch • Bus 6 UAT bkr control switch • Bus 6 RAT bkr control switch.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Cue:	When step 6 of ECA-0.0 is complete, NSO to US, **"The duty electrician has found and fixed the "A" DG start circuit problem. He requests that we attempt another emergency start of the "A" DG.** Then provide the following cue, US to BOP**, "using ECA-0.0 OAS guidance emergency start DG-1A. Refer to ECA-0.0 step 5."** If required, provide the following cue if SI actuates, **"SI will be reset prior to manually loading any equipment on an AC emergency bus."**

Note:	Student should refer to ECA-0.0 step 5 to attempt to restore power to at least one AC emergency bus per section 3 of the Operator Action Summary page.
Performance Step: 05 **Critical - YES**	Manually start emergency diesel generator DG1A using emergency start.
Standard:	Manually start emergency diesel generator DG1A by depressing emergency start pushbutton.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical – NO**	Verify diesel generator running.
Standard:	Verifies DG 1A is running.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical – NO**	Verify diesel generator voltage and frequency are normal.
Standard:	Verifies DG 1A voltage and frequency are normal.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 **Critical - NO**	Verify diesel generator breaker is closed.
Standard:	Verifies that DG 1A breaker is closed.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 09 **Critical - NO**	Verify EPS actuated and sequencing.
Standard:	Verifies EPS actuated and sequencing.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	ECA-0.0 step 5g or the caution prior to step 6 directs that recovery actions should continue with step 25 in ECA-0.0 when Bus 5 is energized. Additionally. OAS item 3 states that recovery actions should continue with step 25.

Performance Step: 10 **Critical - YES**	Check equipment loaded: ECA-0.0 step 5g RNO action: If step 6 has been performed then do not start equipment. Go to step 25.
Standard:	Recognize that step 6 has been performed. Does not start equipment. Goes to step 25.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 11 **Critical - NO**	Check at least one emergency bus is energized by either power source: • Emergency diesel generator OR • Offsite power
Standard:	Checks bus E5 powered by DG1A.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Note:	B ASDV is failed open due to the failure of PT-3002. Manual operation of the ASDV will work.
Performance Step: 12 **Critical - YES**	Stabilize SG pressures using SG ASDVs.
Standard:	Stabilizes SG pressures using ASDVs: Reports that "B" ASDV is full open. Places ASDV controller in manual or uses jog switch to close "B" ASDV.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete**

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

Stop Time: __________

Examinee: ____________________ **Evaluator:** ____________________

☐ RO ☐ SRO ☐ **Date:** ____________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____________________

TURNOVER SHEET

Directions to the Student:

A. You are the Secondary Operator and you are going restore power to at least one AC emergency bus and stabilize SG pressures in accordance with ECA-0.0, Loss Of All AC Power.

B. The following information is provided to you:

1. A site blackout is in progress.
2. The NSO has reported a significant lube oil leak on DG 1B. The MCB switch for DG1B breaker has been placed in PTL. DG1B is not available.
3. Both SEPS supply breakers are in PTL due to maintenance work and are unavailable.
4. The duty electrician and the NSO are investigating the problem with DG1A failure to start.
5. The control room crew is ready to perform step 6 of ECA-0.0.
6. All EOP actions up to step 6 of ECA-0.0 have been performed.

C. Perform the task using ECA-0.0, Loss Of All AC Power.

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

INITIATING CUE:

Evaluator to Secondary Operator, **"Secondary Operator (or student's name), the diesel generators cannot be started and SEPs are not available. Continue beginning with step 6 of ECA-0.0 to place major equipment in pull to lock."**

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

JPM TITLE: **SG LEVEL INSTRUMENT FAILURE**

JPM NUMBER: 2018 LOIT NRC Exam Sim JPM "H"~~L0189J~~ **REV.** 00

SAFETY FUNCTION ~~TASK NUMBER(S) / TASK TITLE(S):~~ 7: Instrumentation~~SBK 0350401201 IDENTIFY A FAILED S/G LEVEL DETECTOR~~
~~SBK 0590400401 RESPOND TO S/G HIGH LEVEL~~

~~K/A NUMBERS:~~ ~~035 A2.03~~ ~~K/A VALUE:~~ ~~3.4/3.6~~

~~Justification (FOR K/A VALUES <3.0):~~
K/A: 016. Non-Nuclear Instrumentation System (NNIS), K1.12. Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems:S/G

~~TASK APPLICABILITY:~~
~~☒ RO ☐ SRO ☐ STA ☐ Non-Lic ☐ SRO CERT ☐ OTHER:~~

~~APPLICABLE METHOD OF TESTING:~~ ~~Simulate/Walkthrough:~~ ☐ ~~Perform:~~ X

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

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~~Time for Completion:~~ ~~20~~ ~~Minutes~~ ~~Time Critical:~~ ~~NO~~

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~~Alternate Path [NRC]:~~ ~~NO~~
~~Alternate Path [INPO]:~~ ~~NO~~

EVALUATION LOCATION: **In-Plant:** ☐
Simulator: X
Admin: ☐

Estimated time for Completion: **20 Min**

Alternate Path: **NO**

Time Critical: **NO**

~~Developed by:~~ ~~Mark Martellotta~~ ~~7/1/15~~

	~~Instructor/Developer~~	~~Date~~
~~Reviewed by:~~	~~Douglas Eccleston~~	~~09/24/15~~
	~~Instructor (Instructional Review)~~	~~Date~~
~~Validated by:~~	~~Bob Duarte~~	~~8/21/15~~
	~~SME (Technical Review)~~	~~Date~~
~~Approved by:~~	~~Chris Adams~~	~~10/20/15~~
	~~Training Supervision~~	~~Date~~
~~Approved by:~~	~~Matt Arsenault~~	~~10/20/15~~
	~~Training Program Owner~~	~~Date~~

~~JOB PERFORMANCE MEASURE VALIDATION CHECKLIST~~

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

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

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

~~Protected Content:~~ ~~None~~

~~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~~ ~~SUPERVISOR~~	~~DATE~~ ~~DATE~~
~~1~~	~~Initial development of JPM. Prepared and validated for 2015 annual exam.~~			~~MMM~~ ~~GJA~~	~~7/1/15~~ ~~10/20/15~~

SIMULATOR SET-UP:

Reset the simulator to IC 300 ~~or any 100% power IC~~. Ensure that SG B FEED FLOW, STEAM FLOW and LEVEL are selected to **CHAN I.**

1. Allow simulator to run, acknowledge and clear all alarms.
2. Place Simulator in FREEZE
3. Select: SCENARIO
4. Select NRC~~"JPM setup scenarios"~~
5. Select: Demo Exams
6. Select: 2018 NRC Exam JPM SG Level Inst
7. Select: Open
8. SELECT: Run ~~**L0189J**~~
9. Leave simulator in FREEZE.

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~~**Required Materials:**~~ ~~Turnover sheet~~
~~OS1235.03, SG LEVEL INSTRUMENT FAILURE, Rev. 14~~

~~**General References:**~~ ~~Procedures:~~
~~OS1235.03, SG LEVEL INSTRUMENT FAILURE~~

~~Technical Specifications:~~
~~3.3.1.Reactor Trip System Instrumentation~~

~~**Task Standards:**~~ ~~Identify a failed SG level instrument and restore the system per OS1235.03, SG LEVEL INSTRUMENT FAILURE~~

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

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

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Secondary Operator.

B. The following information is provided to you:

1. The plant is at 100% power.
2. An event will occur. Respond to plant conditions. The PSO will NOT assist you.
3. Due to the nature of the JPM, you will NOT be permitted to review any procedures before the JPM begins.

C. Perform the task in accordance with the appropriate procedure.

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

INITIATING CUE:

Evaluator to Primary Operator, **"Secondary Operator (or student's name), when an event occurs, identify the event. Perform the actions for the required procedure. If required, perform any immediate actions from memory for the applicable procedure and inform the evaluator when the immediate actions are complete."**

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

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

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

Note:	Student may use skill of the operator to restore B SG level.

Performance Step: 01 Critical - YES	Identifies that a SG level instrument has failed.
Standard:	Identifies that a SG level instrument has failed.
Cue:	When student identifies the failed B SG level instrument, give the student **OS1235.03, SG LEVEL INSTRUMENT FAILURE**
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Comments:	Caution prior to step 1 should be read.
Performance Step: 02 Critical – NO	Check SG water level control • Identify failed instrument controlling channel failed.
Standard:	Student identifies that FW-LT-529 has failed low
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 03 **Critical – YES**	Check SG water level control • Place affected steam generator feed control valve in manual
Standard:	Student places FW-FK-520 in manual
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - YES**	Control feed flow to maintain narrow range level 45-55%
Standard:	Student takes manual control of the 'B' main feed regulating (FW-FK-520) valve and restores 'B' SG level to 45-55% by reducing feed flow to lower than steam flow.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 05 **Critical - YES**	Realign steam generator level instruments: monitor feedwater response and select an alternate level channel for control
Standard:	Student selects SG 'B' LEVEL CHAN II
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Comments:	Student should review note before step 3
Performance Step: 06 **Critical - NO**	Align SG level control by checking the following: • Steam flow/feed flow signals matched • Steam generator level at program level 50% (45-55%)
Standard:	Student adjusts 'B' SG feedwater flow to restore SG level to 45-55%
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical - NO**	Align SG level control: • Verify proper feed regulating valve controller set point and place controller in auto
Standard:	Student verifies that FW-FK-520 is set at 50% and places the controller in auto.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ RO ☐ SRO ☐ STA ☐ Non-Lic ☐ SRO CERT **Date:** ______________________

☐ LOIT RO ☐ LOIT SRO

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

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

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

TURNOVER SHEET

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Secondary Operator.

B. The following information is provided to you:

4. The plant is at 100% power.
5. An event will occur. Respond to plant conditions. The PSO will NOT assist you.
6. Due to the nature of the JPM, you will NOT be permitted to review any procedures before the JPM begins.

C. Perform the task in accordance with the appropriate procedure.

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

INITIATING CUE:

Evaluator to Primary Operator, **"Secondary Operator (or student's name), when an event occurs, identify the event. Perform the actions for the required procedure. If required, perform any immediate actions from memory for the applicable procedure and inform the evaluator when the immediate actions are complete."**

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

JPM TITLE:	**PLACE WASTE TEST TANK ON RECIRCULATION**	
JPM NUMBER:	**2018 LOIT NRC Exam In Plant JPM "I"**	**REV. 0**
SAFETY FUNCTION	**9: Radioactivity Release**	

K/A: 068, Liquid Radwaste System (LRS), 2.1.30, Ability to locate and operate components, including local controls.

EVALUATION LOCATION:	**In-Plant:**	**X**
	Simulator:	
	Admin:	

Estimated time for Completion:	**20 Min**
Alternate Path:	**NO**
Time Critical:	**NO**

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Waste Process Building NSO. You are going to simulate placing the "A" Waste Test Tank on recirculation.

B. The following information is provided to you:

   1. Plant is at 100% power.
   2. The control room has directed you to place the "A" Waste Test Tank on recirculation.
   3. All prerequisites are complete.

C. Perform the task using ON1018.07, "Waste Test Tank Recirculation".

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

INITIATING CUE:

Evaluator to Waste Process Building NSO, **"Waste Process Building NSO (or student's name), simulate placing the "A" Waste Test Tank on recirculation per ON1018.07, "Waste Test Tank Recirculation", section 4.1.**

JPM PERFORMANCE INFORMATION

Start Time: __________

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

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

NOTE: 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."**

Performance Step: 01 **Critical - NO**	Check open/open WL-V-168, by placing the control switch for WL-V-168, WL-TK-63B Inlet Valve, to open.
Standard:	Simulates opening WL-V-168.
Cue:	When the student initially checks the position of WL-V-168, evaluator to student, **"The green light is lit. The red light is out."**
Cue:	When the student simulates taking the control switch for WL-V-168 to open, evaluator to student, **"The red light is lit. The green light goes out."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 02 Critical - YES	Check closed/close WL-V-166, by placing the control switch for WL-V-166, WL-TK-63A Inlet Valve to close.
Standard:	Simulates closing WL-V-166.
Cue:	When the student initially checks the position of WL-V-166, evaluator to student, **"The red light is lit. The green light is out."**
Cue:	When the student simulates taking the control switch for WL-V-166 to close, evaluator to student, **"The green light is lit. The red light goes out."**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 03 Critical - NO	Verify closed WL-V-99, waste test tank pump WL-P-96A and WL-P-96B cross connect.
Standard:	Simulates checking WL-V-99 closed.
Cue:	When the student simulates checking WL-V-99 closed, evaluator to student, **"WL-V-99 indicates closed"**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 04 Critical - NO	Verify closed WL-V-105, waste test tank pump WL-P-96A discharge.
Standard:	Simulates checking WL-V-105 closed.
Cue:	When the student simulates checking WL-V-105 closed, evaluator to student, **"WL-V-105 indicates closed"**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 05 **Critical - NO**	Verify closed WL-V-114, waste test tanks WL-TK-63A and WL-TK-63B recirculation cross connect.
Standard:	Simulates checking WL-V-114 closed.
Cue:	When the student simulates checking WL-V-114 closed, evaluator to student, **"WL-V-114 indicates closed"**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 06 **Critical - NO**	Verify closed WL-V-108, waste test tank pumps WL-P-96A and WL-P-96B discharge header stop.
Standard:	Simulates checking WL-V-108 closed.
Cue:	When the student simulates checking WL-V-108 closed, evaluator to student, **"WL-V-108 indicates closed."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 07 **Critical - NO**	Verify open WL-V-221, waste test WL-TK-63A recirculation.
Standard:	Simulates checking WL-V-221 open.
Cue:	When the student simulates checking WL-V-221 open, evaluator to student, **"The valve stem is risen above the valve wheel."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 08 Critical - YES	Open WL-V-170, waste test WL-TK-63A FO 1441 isolation.
Standard:	Simulates opening WL-V-170.
Cue:	When the student simulates opening WL-V-170 open, evaluator to student, **"The handwheel turns counter clockwise and the stem rises."**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Performance Step: 09 Critical - YES	Start WL-P-96A, waste test tank pump A and verify discharge pressure stabilizes at approximately 75 to 90 PSIG..
Standard:	Simulates starting WL-P-96A.
Cue:	When the student simulates starting WL-P-96A, evaluator to student, **"The red light is lit."**
Standard:	Simulates verifying that discharge pressure stabilizes at approximately 75 to 90 PSIG
Cue:	When the student simulates checking pump discharge pressure, evaluator to student **"Pump discharge pressure stabilizes at 80 PSIG"**
Performance:	**SATISFACTORY UNSATISFACTORY**

Terminating Cues: The JPM is complete

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

Stop Time: __________

Examinee: ____________________ **Evaluator:** ____________________

☐ **RO** ☐ **SRO** ☐ **Date:** ____________________

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

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

TURNOVER SHEET

Directions to the Student:

A. You are the Waste Process Building NSO. You are going to simulate placing the "A" Waste Test Tank on recirulation.

B. The following information is provided to you:

1) Plant is at 100% power.
2) The control room has directed you to place the "A" Waste Test Tank on recirulation.
3) All prerequisites are complete.

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

INITIATING CUE:

Evaluator to Waste Process Building NSO, **"Waste Process Building NSO (or student's name), simulate placing the "A" Waste Test Tank on recirculation per ON1018.07, "Waste Test Tank Recirculation", section 4.1.**

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

JPM TITLE:	**SHIFT STARTUP FEED PUMP SUCTION**
JPM NUMBER:	**2018 LOIT NRC Exam In Plant JPM "J"** **REV. 0**
SAFETY FUNCTION	**4: Heat Removal From Reactor Core**

K/A: 061, Auxiliary/Emergency Feedwater (AFW) System, K4.01, Knowledge of AFW design feature (s) and/or interlocks which provide for the following: Water sources and priority of use.

EVALUATION LOCATION:	**In-Plant:**	**X**
	Simulator:	
	Lab:	

Estimated time for Completion:	**15 Min**
Alternate Path:	**NO**
Time Critical:	**NO**

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Secondary NSO. You are going to simulate performing local actions required to establish SUFP flow in accordance with direction from the US.

B. The following information is provided to you:

1. A fire in the EFW pump house has caused the plant to perform a Safe Shutdown from the control room.
2. Neither the motor driven nor the turbine driven EFW pumps are available.
3. Power is available to Bus 5 and the SUFP is available.
4. US is directing establishing SUFP flow in accordance with OS1200.01 Attachment A.
5. CST level is 210,000 gallons.
6. The plant is in Mode 3.

C. Perform the task in accordance with verbal direction from the US.

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

INITIATING CUE:

Evaluator to Secondary NSO, **"Secondary NSO (or student's name), simulate unlocking and opening CO-V-142 CST SUFP low suction. Then simulate bypassing the SUFP low suction pressure trip."**

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

NOTE: 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 contacts the control room regarding the first step to be performed US to NSO, **"Unlock and open CO-V-142."**
Note:	The required key is on the Secondary NSO key ring. CO-V-142 handwheel has arrows in both directions for open. Student must rotate handwheel in the counter clockwise direction to open.

Performance Step: 01 **Critical - YES**	Unlock and open CO-V-142 CST lower tap isolation.
Standard:	Simulates unlocking and opening CO-V-142 CST lower tap isolation.
Cue:	When student simulates unlocking and rotating handwheel counter clockwise to open CO-V-142, evaluator to student, **"The valve is unlocked. The valve is open."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 02 **Critical - NO**	Inform US that CO-V-142 CST lower tap isolation is unlocked and open.
Standard:	Simulates informing US that CO-V-142 CST lower tap isolation is unlocked and open.
Cue:	US to NSO,"**I understand, CO-V-142 is unlocked and open. Bypass the Start Up Feed Pump low suction pressure trip.**"
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 **Critical - YES**	Place SUFP low suction pressure trip in Bypass.
Standard:	Simulates placing SUFP low suction pressure trip in Bypass.
Cue:	When student simulates placing SUFP low suction pressure trip in Bypass, evaluator to student, **"The switch is in the Bypass position."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 **Critical - NO**	Inform US that SUFP low suction pressure trip is in Bypass.
Standard:	Simulates informing US that SUFP low suction pressure trip is in Bypass.
Cue:	US to NSO,"**I understand, SUFP low suction pressure trip is in Bypass.**"
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Terminating Cues: **The JPM is complete.**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________

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

TURNOVER SHEET

Directions to the Student:

A. You are the Secondary NSO. You are going to simulate performing local actions required to establish SUFP flow in accordance with direction from the US.

B. The following information is provided to you:

1. A fire in the EFW pump house has caused the plant to perform a Safe Shutdown from the control room.
2. Neither the motor driven nor the turbine driven EFW pumps are available.
3. Power is available to Bus 5 and the SUFP is available.
4. US is directing establishing SUFP flow in accordance with OS1200.01 Attachment A.
5. CST level is 210,000 gallons.
6. The plant is in Mode 3.

C. Perform the task in accordance with verbal direction from the US.

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

INITIATING CUE:

Evaluator to Secondary NSO, **"Secondary NSO (or student's name), simulate unlocking and opening CO-V-142 CST SUFP low suction. Then simulate bypassing the SUFP low suction pressure trip."**

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

JPM TITLE:	LOCAL REACTOR TRIP
JPM NUMBER:	2018 LOIT NRC Exam In Plant JPM "K" REV. 0
SAFETY FUNCTION	1: Reactivity Control

K/A: 001, Control Rod Drive System, A2.13, Ability to (a) predict the impacts of the following malfunctions or operations on the CRDS-and (b) based on those predictions, use procedures to correct, control, or mitigate consequences of those malfunctions or operations: ATWS

EVALUATION LOCATION: In-Plant: X

Simulator:

Lab:

Estimated time for Completion:	20 Min
Alternate Path:	YES
Time Critical:	NO

Directions to the Student:

Evaluator gives Turnover sheet to the student

A. You are the Secondary NSO. You are going to simulate locally tripping the reactor.

B. The following information is provided to you:

1. The reactor has a trip demand and should have tripped but both reactor trip breakers are still closed and control rods are withdrawn.
2. The reactor trip bypass breakers are open and racked out.
3. The Primary Operator has unsuccessfully tried to manually trip the reactor from both reactor trip switch locations on the MCB.
4. You are being directed to perform FR-S.1 Step 6a RNO to locally trip the reactor.

C. Perform the task per verbal instructions from the Unit Supervisor.

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

INITIATING CUE:

Evaluator to Secondary NSO, **"Secondary NSO (or student's name), locally open the reactor trip breakers per Step 6 of FR-S.1."**

JPM PERFORMANCE INFORMATION

Start Time: ___________

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

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

NOTE: 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: Provide the Student with a copy of FR-S.1 step 6

Note:	**CAUTION -** DO NOT allow the student to depress the trip plate because this will cause an actual reactor trip.

Cue:	If required provide the following cue, **"The reactor trip breaker position indicating flag is red."** Repeat as necessary.
Performance Step: 01 **Critical - NO**	Open the reactor trip breakers locally.
Standard	Simulates depressing red trip plate for each reactor trip breaker, RTA and RTB
Cue:	After demonstrating attempting to locally trip each of the reactor trip breakers, provide the following cue, **"The reactor trip breaker does not open."** Repeat as necessary.
Performance:	**SATISFACTORY** _____ **UNSATISFACTORY** _____

Performance Step: 02 Critical - NO	Inform the control room that the reactor trip breakers will not open
Standard	Informs the control room that the reactor trip breakers will not open
Cue:	**"I copy, the reactor trip breakers will not open. Continue with the procedure."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 Critical –YES	Open the input (motor) and/or output (generator) for "A" MG sets:
Standard:	Simulates opening "A" MG set motor and/or generator breaker
Cue:	**"Red light extinguishes and green light illuminates. The breaker opens."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 03 Critical –YES	Open the input (motor) and/or output (generator) for "B" MG sets:
Standard:	Simulates opening "B" MG set motor and/or generator breaker
Cue:	**"Red light extinguishes and green light illuminates. The breaker opens."**
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**

Performance Step: 04 Critical - NO	Inform the control room that the input and/or output breakers for both rod drive MG sets are open.
Standard:	Informs the control room that the input and/or output breakers for both rod drive MG sets are open.
CUE	**"I copy, the input/output breakers for both rod drive MG sets are open. All control rods are inserted."**
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**

Terminating Cues: **The JPM is complete.**

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

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

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

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

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

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

TURNOVER SHEET

Directions to the Student:

A. You are the Secondary NSO. You are going to simulate locally tripping the reactor.

B. The following information is provided to you:

1. The reactor has a trip demand and should have tripped but both reactor trip breakers are still closed and control rods are withdrawn.
2. The reactor trip bypass breakers are open and racked out.
3. The Primary Operator has unsuccessfully tried to manually trip the reactor from both reactor trip switch locations on the MCB.
4. You are being directed to perform FR-S.1 Step 6a RNO to locally trip the reactor.

C. Perform the task per verbal instructions from the Unit Supervisor.

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

INITIATING CUE:

Evaluator to Secondary NSO, **"Secondary NSO (or student's name), locally open the reactor trip breakers per Step 6 of FR-S.1."**

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

NextEra ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG Page 1 of 24

SITE: Seabrook Station Revision #: 0

LMS ID: n/a LMS Rev. Date: n/a

SEG TITLE: 2018 LOIT NRC Exam #1

SEG TYPE: ☐ Training ☒ Evaluation

PROGRAM: ☐ LOCT ☒ LOIT ☐ Other:

DURATION: 90 minutes

Commented [JPM1]: *NOTE TO DEVELOPER: To the right of "Filename" in the footer of this form is an inserted field code that will automatically update with the file name when the file is saved. If you change the file name after saving, you may update the footer by selecting 'View' and toggling between 'Normal' and 'Print Layout'.*

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

OVERVIEW / SEQUENCE OF EVENTS

OVERVIEW

- After the crew assumes the watch the ISO dispatcher will call and request that plant output be reduced to 1100 MWe net within 30 minutes. The crew will perform a rapid downpower.
- Once the crew has completed the downpower, or at the Lead Examiners discretion, the Steam Generator “A” controlling pressure instrument will fail high. The crew should take manual control of the “A” Feedwater Reg. Valve and implement OS1235.04, “SG Feed Flow-Steam Flow or Steam Pressure Instrument Failure”.
- The “A” Charging Pump will then trip. The crew will implement OS1202.02, “Charging System Failure” and start the “B” Charging Pump.
- Once the crew has mitigated the charging pump failure then the “B” Pressurizer Spray Valve output signal will drift high. The crew should implement OS1201.06, “PZR Pressure Instrument/Component Failure” and take manual control of the “B” spray valve controller.
- Subsequently there will be a loss of offsite power and the “A” Emergency Diesel Generator will trip. The crew will enter E-0, “Reactor Trip or Safety Injection” and then transition to ECA-0.0, “Loss of All AC Power. The crew should re-energize Emergency Bus E6 using SEPs and exit ECA-0.0 at Step 5.
- The Electrically Driven EFW Pump will not automatically start and must be manually started at ECA-0.0, Step 5g RNO.
- The “B” PCCW Pump will trip and the “D” pump will not automatically start. The crew should take manual action to start the “D” pump.

SEQUENCE OF EVENTS

Example table provided below. Modify or delete as needed to meet site/scenario-specific requirements.

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
1.	Rapid downpower to 1100 MWe
2.	Steam Generator pressure instrument fails high
3.	"A" Charging Pump trip
4.	"B" Pressurizer Spray Valve output signal drifts high
5.	Loss of offsite power w/"A" Emergency Diesel Generator trip
6.	Component Cooling Water Pump 11B trip with failure of standby pump to start
7.	Electric driven Emergency Feedwater Pump failure to automatically start with turbine driven pump tripped

SIMULATOR SET UP INSTRUCTIONS

- Reset the simulator to IC-30, MOL, 100% Power, C19, Stable Xenon
- Verify that Train "A" is protected

  On MPCS: SV C0755, "1"

- Remove the "B" Emergency Diesel Generator from service by performing the following:
  - € SELECT: CRF List
  - € SELECT: Component-Electrical Distribution
  - € SELECT: Breakers
  - € SELECT: bkEDE6DG
  - € Action: SELECT "Rack Out"
  - € SELECT: Insert

  - € SELECT: Local Panels
  - € SELECT: DG System
  - € SELECT: DG B
  - € SELECT: SS9710, LOCAL/REMOTE/MAINTENANCE
  - € SELECT: MAINTENANCE

  - € Place "B" EDG breaker control switch in PTL

  - € Put information tag on "B" EDG breaker control switch

- Perform the following to fail CC-P-11D from automatically starting:
  - € SELECT: MF List
  - € SELECT: Primary Component Cooling
  - € SELECT: mfCC015, CC-P-11D Fails to Auto Start
  - € Final: SELECT: "1:True"
  - € SELECT: Insert

- Perform the following to fail the electric driven EFW pump from automatically starting:
  - € SELECT: MF List
  - € SELECT: Feedwater
  - € SELECT: mfFW052, FW-P-37B Auto Start Failure
  - € Final: SELECT: "1:Fail"
  - € SELECT: Insert

(CONTINUED ON NEXT PAGE)

- Perform the following to insert the "A" Emergency Diesel Generator Low Lube Oil Pressure trip:
  - € SELECT: MF List
  - € SELECT: Electrical Distribution
  - € SELECT: mfED032, DG-1A Low Lube Oil Pressure Trip
  - € Final: SELECT: "1:True"
  - € SELECT: Insert
- Perform the following to ensure the boron concentration in the blender pipes = 0:
  - € SELECT: Sim Diagrams
  - € SELECT: CS 5
  - € SELECT: rfCS028
  - € Final Value: INPUT "0"
  - € Ramp Time: INPUT "10"
  - € SELECT: Insert
- Activate the following Event Trigger:
  - € SELECT: Event Triggers
  - € SELECT: NRC
  - € SELECT: Demo Exams
  - € SELECT: 2018 NRC Exam 1 ET 1
  - € SELECT: Open
  - € SELECT: Activate

SHIFT TURNOVER INFORMATION

See Turnover Sheet

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 1: Rapid downpower to 1100 MWe	**Perform the following:** **Call the Unit Supervisor as ISO dispatcher and request that the crew reduce plant output to 1100MWe net within 30 minutes, per grid contingency requirement.** If the US calls the Shift Manager to make ODI-61 notifications state **"I Understand, I will make Joint Owner and NDDO notifications per ODI.61."**	**Event 1: PSO (R), BOP (N), US (N)** The crew should perform the power decrease utilizing OS1231.04, Rapid Downpower. • The US should update the crew and inform them of the required time for the plant output to be at 1100MWe net. • US should perform a rapid downpower brief utilizing OS1231.04, Rapid Downpower, Attachment A. • PSO should develop a boration schedule based on the values in ODI-56 and provide a recommendation to the US. • BOP should create a load schedule. • US should direct the PSO to commence the boration. • US should direct the BOP to reduce turbine load.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

Event 2:
Steam Generator pressure instrument fails high
	Perform the following:
	€ **SELECT: CMF List**
	€ **SELECT: Component-Feedwater**
	€ **SELECT-Pressures**
	€ **SELECT: trFWPT514**
	€ **SELECT: Insert**
		.
		Event 2: BOP (I), US (I,TS)
		
		Associated Alarms:
		• D4706, "SG A Stm Flow/Feed Flow Mismatch"
		• When SG "A" level gets to 55%:
		  • D4770, "SG A Lvl Ref Deviation"
		  • UA-53, A-3, "SG A Level Hi/Lo
		
		NOTE: When the initial alarms come in the US will ask the BOP if a controlling channel has failed. The BOP should identify that PT-514 has failed and is the controlling channel. The US will then direct the BOP to take manual control of the "A" Feedwater Regulating Valve and maintain SG level 45-55%. This action is done as a <u>Skill of the Operator Task</u> prior to formally implementing OS1235.04, ""SG Feed Flow-Steam Flow or Steam Pressure Instrument Failure".
		
		The US should implement OS1235.04, ""SG Feed Flow-Steam Flow or Steam Pressure Instrument Failure".
		Step 1: Check Steam Generator Water Level Control
		a. Identify Failed Instrument-Controlling Channel Failed
		YES- BOP should identify that FW-FI-512 (Steam Flow) is affected.
		b. Place affected steam generator feed control valve-MANUAL
		BOP should place the "A" Feed Reg. Valve in MANUAL.
		c. Control feed flow to maintain narrow range level-45% to 55%
		BOP should manually operate the feed reg. valve to establish stable level at 45% to 55%.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 2 (continued)	If the crew calls the WCS/WWM for the FW-PT-514 failure, then respond **"Understand that FW-PT-514 has failed high. A troubleshooting team is being formed."**	Step 2: Realign Steam Generator Level Control a. Monitor feedwater system response and select an alternate channel for control BOP should select the alternate Feed Flow Channel Step 3: Align Steam Generator Water Level Control a. Check the following: • Steam flow/feed flow signals-Matched • Steam Generator level-At Prog Level 50%. b. Verify proper feed regulating valve controller setpoint and place controller in AUTO BOP should manually return level to 50%, match steam flow/feed flow and then place the controller back to AUTO Step 4: Check For Failure Of A Steam Generator Pressure Instrument: a. Any steam generator pressure channel-FAILED YES-BOP should identify the FW-PI-514A has failed high. b. Verify redundant steam pressure channel bistables-NOT Tripped • UL1-SGPress Rate Hi MSI SG Press Lo SI/MSI YES-PSO should identify that redundant channel bistables are NOT tripped. c. Verify Tech Spec Compliance US should identify the following applicable actions: • TS 3.3.2, Engineering Safety Feature Actuation Instrumentation, item 1e, action 18 • TS 3.3.2, Engineering Safety Feature Actuation Instrumentation, item 4d, action 18 • TS 3.3.2, Engineering Safety Feature Actuation Instrumentation, item 4d, action 18

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
	When the crew has completed OS1235.04, or at the Lead Examiner's discretion, proceed to the next event.	
Event 3: "A" Charging Pump trip	**Perform the following:** € **SELECT: CMF List** € **SELECT: Chemical and Volume Control** € **SELECT: mfCS016, CS-P-2A OC Trip** € **Final: Select "1:True"** € **SELECT: Insert** If the crew calls the WCS/WWM for the "A" Charging Pump trip, then respond **"Understand that the "A" Charging Pump has tripped. A troubleshooting team is being formed."**	**Event 3: PSO (C), US (C,TS)** Associated Alarms: • UA-52, C-3, "RCP Seal Injection Flow Lo" • D7853, "Chg Pmp Disch Combined Hdr Flow Low" • D4652, "Cntrfgl Chg Pump A Bkr Trip & L/O • D4676, "RCP A Seal Injection Flow Low" • D4677, "RCP B Seal Injection Flow Low" • D4678, "RCP C Seal Injection Flow Low" • D4679, "RCP D Seal Injection Flow Low" The US should implement OS1202.02, "Charging System Failure". Step 1: Check Letdown-Normal: a. Charging flow-Greater than 50 gpm: NO-PSO should identify that the running charging pump has tripped and that charging flow is 0 gpm. • RNO-Reduce letdown flow while monitoring REGEN heat exchanger letdown outlet temperature. Note: The crew may close CS-V-145 to prevent flashing in the heat exchanger.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 3 (Cont.)		Step 2: Monitor RCP Seal and Bearing Cooling Inlet Temperature: a. Check RCP seal and bearing inlet temperature indication: PSO should monitor seal water inlet temperature on color graphics and check the following alarms reset: A RCP-A0606 OR A0605 B RCP-A0608 OR A0607 C RCP-A0610 OR A0609 D RCP-A0612 OR A0611 b. Monitor seal water inlet temperature-Less than 230°F YES-PSO should identify that inlet temperature is less than 230°F c. Monitor seal water inlet temperature-Less than 184°F YES-PSO should identify that inlet temperature is less than 184°F Step 3: Check charging Pumps-One Pump Running NO-PSO should identify that CS-P-2A tripped and pump 2B is in standby. RNO-Start one centrifugal charging pump: PSO should start CS-P-2B by performing the following: • Place CS-FK-121 in manual minimum • Start CS-P-2A • Slowly increase output of CS-FK-121 • Adjust CS-HCV-182 as necessary for RCP seal injection flow

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 3 (Cont.)	If the crew directs an NSO to walk down the PAB, then after 5 minutes contact the Control Room and state **"I have walked down the PAB and see no indication of any leaks."**	Step 4: Check Seal Injection Flow Status: a. Check seal water injection filter differential pressure-Less than 19 PSID YES-PSO should identify that CS-F-4A differential pressure is approximately 3 PSID b. Seal Injection flow-Greater than 6 gpm to each RCP YES or ADJUST-PSO should be controlling seal injection flow using CS-HCV-182 Step 5: Check if Charging System Is Intact: a. Check the following: PAB and Contatinment radiation levels, PAB and containment sump levels, PAB area walkdown: YES-The PSO/US should determine that all conditions are NORMAL. US should transition to Step 9 Step 9: Check VCT Conditions-NORMAL a. VCT Level-Greater than 30% YES-PSO should determine that VCT level is greater than 30%

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 3 (Cont.)		Step 10: Check If Normal Letdown Can Be Established a. Verify charging flow-Greater than 50 GPM PSO should verify flow is greater than 50gpm or adjust CS-FK-121 to raise flow. b. Pressurizer level-Greater than 17% YES-PSO should verify that level is adequate. c. Establish normal letdown: PSO should establish letdown per step direction from US Once letdown is established US should transition to Step 12. Step 12: Restore normal pressurizer level a. Control charging and letdown flow b. Control RCP seal injection flow PSO should be adjusting all three parameters pursuant to placing CS-FK-121 back in AUTO. This evolution may take a while well level restores to setpoint. Step 13: Verify Tech. Spec. Compliance: US should identify that TS 3.5.2, ECCS Subsystems-Tavg Greater Than or Equal to 350°F, action a applies.
	When the crew has completed OS1202.02, or at the Lead Examiner's discretion, proceed to the next event.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4: "B" Pressurizer Spray Valve output signal drifts high	**Perform the following:** € **SELECT:** CMF List € **SELECT:** Component-Reactor Coolant € **SELECT:** Controllers € **SELECT:** ctRCPK455C € Action: **SELECT** "Fail Output (Auto)" € **FINAL:** Enter 100 € **RAMP TIME:** Enter 120 € **SELECT:** Insert If the crew calls the WCS/WWM for the "B" Pressurizer Spray Valve controller failure, then respond **"Understand that the "B" Pressurizer Spray Valve controller has failed. A troubleshooting team is being formed."**	**Event 4: PSO (C), US (C)** **Initial Alarm:** D4327, "PZR Pressure Low and Backup Heaters On" (Note: alarm occurs approx. 1 minute after insertion of the component failure) **NOTE:** Depending on the timeliness of the crew's response, pressure may drop below the Tech. Spec. 3.2.5, "DNB Parameters" value of 2185 PSIG. In this case the crew should discuss that they are below the DNB Tech. Spec. limit and should expedite recovering pressure. US may direct the PSO to manually close the "B" PZR Spray Valve using "Skill of the Operator". The US should implement OS1201.06,"PZR Pressure Instrument/Component Failure" Step 1: Check PORVs closed PSO should respond YES Step 2 Check Normal Spray Valves CLOSED NO-PSO should identify that the "B" spray valve is opening. • RNO- If PZR pressure is less than 2260 psig then verify PZR spray control is functioning properly • PSO should respond NO • If PZR spray control has failed then manually close spray valves. • PSO may have already closed the spray valve using "Skill of the Operator", if not then they should close the valve.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		Step 3: Check Pressurizer Pressure Channels PSO should respond that none have failed • RNO- Check pressurizer pressure controllers failed YES- PSO should respond YES (RC-PK-455C auto output signal failed to 100%) RC-PK-455C will have to remain in manual Step 4: Realign Pressure Instruments- No need to do so as no pressure channels have failed. Step 5: Align Pressurizer Pressure Control PSO/US should discuss that RC-PK-455C will have to remain in MANUAL. Step 6: Verify Redundant Bistables-NOT TRIPPED No need to do so as no pressure channels have failed. Step 7: Verify Technical Specification Compliance No Tech. Specs apply
	When the crew has completed OS1201.06, or at the Lead Examiner's discretion, proceed to the next event.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 5: Loss of offsite power w/"A" Emergency Diesel Generator trip	**Perform the following:** € **SELECT:** MF List € **SELECT:** Electrical Distribution € **SELECT:** mfED038, Loss of Offsite Power (No Power) € Final: **SELECT:** "1:True" € **SELECT:** Insert	**Event 5: PSO (M), BOP (M) US (M)** The US should implement E-0, "Reactor Trip or Safety Injection Step 1: Verify Reactor Trip: YES-PSO should verify that the reactor is tripped. Step 2: Verify Turbine Trip: YES-BOP should verify that the turbine is tripped. Step 3: Verify Power to AC Emergency Busses: a. AC Emergency Busses-At Least One Energized NO-The BOP should identify that the "A" Emergency Diesel has tripped. RNO-If power cannot be restored to at least one AC emergency bus then go to ECA-0.0, "Loss of All AC Power"

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 5: (Cont.)	**When the crew has completed ECA-0.0, Step 2 then call as the dispatcher and state the following:** **"This is the dispatcher. For your information we expect to restore your offsite power source within the next 2-3 hours."**	The US should implement ECA-0.0, "Loss of All AC Power" Step 1: Verify Reactor Trip: YES-PSO should verify that the reactor is tripped. Step 2: Verify Turbine Trip: YES-BOP should verify that the turbine is tripped. Step 3: Check if RCS is Isolated: a. Letdown isolation valves-CLOSED: NO- PSO should identify that CS-V-145, RC-LCV-459, and RC-LCV-460 are all open. RNO- PSO should manually close CS-V-145 and CS-V-150. b. PZR PORV's CLOSED: YES- PSO should identify that the PORVs are closed. c. Excess letdown valves-CLOSED YES- PSO should identify that the valves are closed. d. RCS sample valves CLOSED BY PHASE A STATUS PANELS: YES- PSO should identify that the valves are closed. Step 4: Verify EFW Flow- Greater Than 500 GPM Total Flow YES- BOP should identify that flow is greater than 500 GPM.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 5: (Cont.)	**NOTE:** The simulator does not have the physical K relay switch for Train A. There is a photo of the switch that the operator will point to. The Lead Examiner or a booth instructor should state the following if the operator simulates operating Test Switch 909: **"Indications are as shown on the main control board."**	Step 5: Try to Restore Power To Any AC Emergency Bus: a. Place all UAT and RAT supply breaker control switches for the emergency busses in PULL TO LOCK position. BOP should perform these actions. b. Manually start emergency diesel generator(s) from the main control room: • Emergency Start • Slave relay K603 test switch S909 Note: The diesel will not start by either method, however the diesel had tripped on low lube oil pressure so there should not be an attempt to start it. RNO: If SEPS bus feeder breaker is aligned to Bus 6, THEN: 1) Place the following equipment in PULL TO LOCK position: • DG 1B output breaker BOP should do this. • CBS-P-9B PSO should do this. • SI-P-6B PSO should do this. • CAN fans 1A, 1B, and 1D PSO should do this **Critical Task 1: Energize at least one ac emergency bus before placing safeguards equipment control switches in pull-to-lock (ECA-0.0, Step 6)** 2) Manually close SEPS Bus 6 breaker. If breaker will not close, THEN go to Step 6

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 5: (Cont.)		3) Go to Step 5f. f. Verify EPS-ACTUATED AND SEQUENCING: YES-BOP should verify actuation. **Critical Task 2: Manually start electric driven EFW pump prior to exiting ECA-0.0** **Critical Task 3: Manually start CC-P-11D prior to receiving "B" charging pump bearing high temperature alarms.**
Event 6: Component Cooling Water Pump 11B trip with failure of standby pump to start **Event 7:** Electric driven Emergency Feedwater Pump failure to automatically start with turbine driven pump tripped		g. Check equipment loaded: • Charging pump YES • Thermal barrier cooling pump YES • PCCW pump YES **NOTE: CC-P-11B will trip on overcurrent 3 minutes after Bus 6 is energized** • EFW pump NO RNO-BOP should reset RMO and restart the electric driven EFW pump. h. Check AC emergency busses-AT LEAST ONE ENERGIZED: YES-BOP should identify that Bus 6 is energized.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
		i. Check AC emergency bus-ENERGIZED BY EMERGENCY DIESEL GENERATOR: NO- BOP should identify that Bus 6 is energized by SEPS. RNO 1) Maintain SEPS load limit per Attachment A while continuing with next step. 2) Stop any unloaded emergency diesel generator None running 3) If it is expected that at least one AC emergency bus will be energized from an emergency diesel generator or offsite power source within 4 hours of SBO event, then go to step 5j. j. Check Train A DC Buses 11A and 11C-NOT CROSS TIED YES-Bop should state that buses are not cross tied. k. Return to procedure and step in effect. FRPs shall now be implemented as required. US should transition back to E-0, "Reactor Trip or Safety Injection

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
		US should transition to E-0 Step 1: Verify Reactor Trip: YES-PSO should verify that the reactor is tripped. Step 2: Verify Turbine Trip YES-BOP should verify that the reactor is tripped. Step 3: Verify Power to AC Emergency Busses a. AC emergency busses-AT LEAST ONE ENERGIZED YES- BOP should identify that Bus 6 is energized. b. AC emergency busses- BOTH ENERGIZED NO-Bus 5 is de-energized RNO-If power can not be restored, then try to restore power per Attachment B after immediate actions are complete, as time and resources permit. Step 4: Check if SI is Actuated: a. Check SI annunciators lit: NO-PSO should identify that SI is not actuated RNO- Check if SI is required: • RCS pressure less than 1800 PSIG NO-PSO should identify • Pressurizer level less than 7% NO-PSO should identify • Containment pressure greater than 4 PSIG NO-PSO should identify • RCS subcooling-Less than 40°F NO-PSO should identify • Any SG pressure-Less than 585 PSIG NO-BOP should identify

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
		IF SI is NOT required, Then go to ES-0.1, REACTOR TRIP RESPONSE, Step 1.
	End the exam when the crew transitions to ES-0.1 or at the Lead Examiner's discretion.	**Emergency Plan Classification:** **MU1:** Loss of all offsite AC power capability to emergency busses for 15 minutes or longer.

***** END OF SCENARIO**

QUANTITATIVE ATTRIBUTES

(Use this form for NRC/INPO Evaluations only as required to document associated quantitative information.)

Malfunctions:

Before EOP Entry:

1. Steam Generator pressure instrument fails high.
2. "A" Charging Pump trip.
3. "B" Pressurizer Spray Valve output signal drifts high.

After EOP Entry:

1. Component Cooling Water Pump 11B trip with failure of standby pump to start
2. Electric driven Emergency Feedwater Pump failure to automatically start with turbine driven pump tripped

Abnormal Events:

1. Steam Generator pressure instrument fails high.
2. "A" Charging Pump trip
3. "B" Pressurizer Spray Valve output signal drifts high

Major Transient:

1. Loss of offsite power w/ "A" emergency diesel generator trip

Critical Tasks:

1. Energize at least one ac emergency bus before placing safeguards equipment control switches in pull-to-lock (ECA-0.0, Step 6)
2. Manually start electric driven EFW pump prior to exiting ECA-0.0
3. Manually start CC-P-11D prior to receiving "B" Charging Pump Bearing High Temperature Alarms (185°F)

Critical Tasks:

1) Energize at least one ac emergency bus before placing safeguards equipment control switches in pull-to-lock (ECA-0.0, Step 6)

2) Manually start electric driven EFW pump prior to exiting ECA-0.0

3) Manually start CC-P-11D prior to receiving “B” Charging Pump Bearing High Temperature Alarms (185°F)

NextEra ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG Page 1 of 27

SITE: Seabrook Station **Revision #:** 0

LMS ID: n/a **LMS Rev. Date:** n/a

SEG TITLE: 2018 LOIT NRC Exam #2

SEG TYPE: ☐ Training ☒ Evaluation

PROGRAM: ☐ LOCT ☒ LOIT ☐ Other:

DURATION: 90 minutes

Developed by: ______________________ ________
Instructor/Developer Date

Commented [JPM1]: *NOTE TO DEVELOPER: To the right of "Filename" in the footer of this form is an inserted field code that will automatically update with the file name when the file is saved. If you change the file name after saving, you may update the footer by selecting 'View' and toggling between 'Normal' and 'Print Layout'.*

Reviewed by: ______________________ ________
Instructor (Instructional Review) Date

Validated by: ______________________ ________
SME (Technical Review) Date

Approved by: ______________________ ________
Training Supervision Date

Approved by: ______________________ ________
Training Program Owner (Line) Date

OVERVIEW / SEQUENCE OF EVENTS

OVERVIEW:

- Prior to assuming the watch the crew will perform the necessary reactivity calculations to support a power increase from 75% to 100% power at a rate of </= 10%/hr.
- Once the crew has commenced the power increase the "C" Feedwater Reg. Valve will fail to 100% output concurrent with the controlling level instrument failing low. As a result the "C" Feedwater Reg. Valve must remain in manual. The crew will implement OS1235.03, "SG Level Instrument Failure. The US should address applicable Tech. Specs.
- RCS Loop 1 Tcold instrument will fail high. The crew will implement OS1201.08, "Tavg/Delta T Instrument Failure". The US should address applicable Tech. Specs.
- RCS Loop 3 will develop a 30 gpm cold leg leak. The crew will implement OS1201.02, "RCS Leak". The crew should quantify the leak. The US should address applicable Tech. Specs.
- Once the crew has quantified the RCS Cold Leg leak it will increase in size to a 1000 gpm LOCA. The crew should manually trip the reactor, actuate Safety Injection, and implement E-0, "Reactor Trip or Safety Injection.
    - When the reactor trip occurs Main Turbine Stop Valve 1 and Control Valve 2 do not close automatically, and turbine does not trip manually, requiring the BOP to manually actuate a Main Steamline Isolation per E-0 immediate action step 2.
    - When the Safety Injection occurs both Safety Injection Pumps and the "B" RHR Pump fail to start automatically, requiring the PSO to manually start the pumps per E-0, Attachment A.
- The crew should transition to E-1, "Loss of Reactor or Secondary Coolant
- The exam will terminate when the crew transitions to ES-1.2, "Post LOCA Cooldown and Depressurization"

SEQUENCE OF EVENTS

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
1.	Power Increase
2.	"C" Feedwater Reg Valve Fails to 100% Output Concurrent with Controlling Level Channel Failing Low
3.	RCS Loop 1 Tcold Instrument Fails High
4.	RCS Loop 3 Cold Leg Leak (30 gpm)
5.	RCS Cold Leg Break
6.	Main Turbine Stop Valve 1 and Control Valve 2 Stick Open. Manual MSI Required
7.	"A" and "B" SI and "B" RHR Pumps Fail to Auto Start on SI

SIMULATOR SET UP INSTRUCTIONS

- Reset the simulator to IC-32, MOL, 75% Power, Stable Xenon
- Perform the following to fail auto start of S-P-6A, SI-P-6B, and RH-P-8B:

  - SELECT: MF List
  - SELECT: Safety Injection
  - SELECT: mfSI003, SI Pump P-6A Fails to Auto Start
  - Final: 1:True
  - SELECT: Insert

  - SELECT: mfSI004, SI Pump P-6B Fails to Auto Start
  - Final: 1:True
  - SELECT: Insert

  - SELECT: MF List
  - SELECT: Residual Heat Removal
  - SELECT: mfRH006, RH-Pump P-8B Fails to Auto Start
  - Final: 1:True
  - SELECT: Insert

- Perform the following to fail open Turbine Stop Valve #1:

  - SELECT: CMF List
  - SELECT: Component-Main Steam
  - SELECT: VMODs
  - SELECT: avMSVSV1, 1-MS-SV-1, Main Stop Valve #1
  - Action: SELECT "Fail Open"
  - SELECT:Insert

(CONTINUED ON NEXT PAGE)

- Perform the following to fail MSI auto actuation:

  - € SELECT: MF List
  - € SELECT: Reactor Protection
  - € SELECT: mfRPS019, "MS Isolation Fails to Auto Actuate (Train "A")
  - € Final: 1:True
  - € SELECT: Insert

  - € SELECT: mfRPS020, "MS Isolation Fails to Auto Actuate (Train "B")
  - € Final: 1:True
  - € SELECT: Insert

- Activate the following Event Trigger:

  - € SELECT: Event Triggers
  - € SELECT: NRC
  - € SELECT: Demo Exams
  - € SELECT: 2018 NRC Exam 2 ET1
  - € SELECT: Open
  - € SELECT: Activate

SHIFT TURNOVER INFORMATION

- The plant is at 75% power.
- Current RCS boron concentration is 1120 ppm.
- AFD is -1.97% and within admin band.
- Commence power increase to 100% power at a rate not to exceed 10%/hr.
- Power increase should commence per OS1000.05, “Power Increase”, Step 4.2.27.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 1 Power Increase		**Event 1: PSO (R), BOP (N), US (N)** The crew should commence the power increase per OS1000.05, "Power Increase", Step 4.2.47: Step 4.2.47 SET up to change turbine load to desired power not to exceed 100% at the load ramp rate determined by the US. • US will direct the BOP to set up the turbine controls but NOT commence changing turbine load. • BOP will set up the turbine controls per OS1000.10, Figure 18: Turbine Loading/Unloading Instructions. Step 4.2.48 DETERMINE the dilution volume required for the desired plant ramp rate to the desired power level. • The crew will have calculated the required dilution prior to assuming the watch. Step 4.2.49 COMMENCE an RCS dilution which will maintain the desired ramp rate. • US will direct the PSO to commence the dilution. • PSO will perform the dilution utilizing OS1008.01, "Chemical and Volume Control System Makeup Operation". Step 4.2.50 When RCS temperature begins to increase and turbine loading is desired, COMMENCE turbine load change. • US will direct the BOP to commence turbine loading • BOP will commence turbine loading per OS1000.10, Figure 18: Turbine Loading/Unloading Instructions.
	Once the crew has commenced the power increase, at the Lead Examiners direction, proceed to the next event.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 2 "C" Feedwater Reg Valve Fails to 100% Output Concurrent with Controlling Level Channel Failing Low	**Perform the following:** € **SELECT:** CMF List € **SELECT:** Component-Feedwater € **SELECT:** Levels € **SELECT:** trFWLT553 € Action: **SELECT** Fail to Low Limit" € **SELECT:** Insert € **SELECT:** CMF List € **SELECT:** Component-Feedwater € **SELECT:** Controllers € **SELECT:** ctFWFK530 € Action: **SELECT** "Fail Output Auto" € **Final:** Input 100 € **Ramp Time:** Input 30 € **SELECT:** Insert If the crew calls the WCS/WWM for the FW-LT-553 failure, then respond **"Understand that FW-LT-553 has failed low. A troubleshooting team is being formed."**	**Event 2: BOP (I,C), US (I,C,TS)** Associated Alarms: F4841, SG C Level Lo Lo D4772, SG C Level Ref Deviation D4878, SG C Level Low D4710, SG C Stm Flow/Feed Flow Mismatch UA-53, C-3, SG C Level Hi/Lo **NOTE:** When the initial alarms come in the US will ask the BOP if a controlling channel has failed. The BOP should identify that LT-553 has failed and is the controlling channel. The US will then direct the BOP to take manual control of the "C" Feedwater Regulating Valve and maintain SG level 45-55%. This action is done as a <u>Skill of the Operator Task</u> prior to formally implementing OS1235.03, SG Level Instrument Failure The US should implement OS1235.03, SG Level Instrument Failure Step 1: Check Steam Generator Water Level Control: a. Identify failed instrument-CONTROLLING CHANNEL FAILED • BOP should state YES. (LT-553 has failed low) b. Place affected steam generator feed control valve-MANUAL • BOP should have already placed the "C" feed reg valve in MANUAL per the Skill of the Operator task described above. c. Control feed flow to maintain narrow range level-45% to 55% • BOP should be controlling level utilizing the feed reg valve in MANUAL

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 2 (Cont.)		Step 2 Realign Steam Generator Level Instruments: a. Monitor feedwater system response and select an alternate level channel for control. • BOP should select alternate channel LT-539 Step 3 Align Steam Generator Water Level Control: a. Check the following: • Steam flow/feed flow signals MATCHED • Steam generator level-AT PROGRAMMED LEVEL 50%(45% to 55%) • BOP should respond YES when conditions are met. b. Verify proper feed regulating valve controller setpoint and place controller-AUTO • BOP will place the controller in AUTO and should identify that the controller output signal goes to 100%. • BOP should notify the US of the failed controller output signal. • Per step 3,b., RNO, the US should direct the BOP to return the controller to MANAUL and to manually control narrow range level-45% to 55%. **NOTE:** The "C" Feed Reg Valve will have to remain in MANUAL for the rest of the scenario. Step 4 Verify Redundant Channels Bistables <u>NOT</u> Tripped • UL-1, SG LVL HI HI FW ISO TURB TRIP • PSO should respond YES (not tripped) • UL-6, SG LVL LO LO • PSO should respond YES (not tripped) • UL-12, SG LVL HI HI FW ISO TURB TRIP • BOP should respond YES (not tripped)

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 2 (Cont.)		Step 5 Verify Technical Specification Compliance: a. Refer to technical specifications: • US should review applicable Tech. Specs and determine the following: • 3.3.1, Reactor Trip Instrumentation, Item 13, Action 6 (Required to trip bistables within 6 hours) • 3.3.2, ESFAS Instrumentation, Item 5b, Action 18 (Required to trip bistables within 6 hours) • 3.3.2, ESFAS Instrumentation, Item 6a, Action 18 (Required to trip bistables within 6 hours) • 3.3.2, ESFAS Instrumentation, Item 7c, Action 18 (Required to trip bistables within 6 hours) • NOTE: 3.3.3.6, Accident Monitoring Instrumentation, item 7 is NOT APPLICABLE as the failed instrument is not a PAM channel. b. Coordinate with I&C to perform the following: • If desired for testing or troubleshooting, place bistables BYPASS. **NOTE:** This activity would occur later and is not within the time scope of the exam. • Within 6 hours trip the appropriate bistables per Attachment A. **NOTE:** This activity would occur later and is not within the time scope of the exam. Step 6 Verify ATWS Mitigation System Status: a. Check for an ATWS mitigation channel-FAILED • BOP should respond NO. • RNO-Return to procedure in effect.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
	Once the crew has completed OS1235.03, or at the Lead Examiners direction, proceed to Event 3	
Event 3 RCS Loop 1 Tcold Instrument Fails High	**Perform the following:** € **SELECT:** CMF List € **SELECT:** Component-Reactor Coolant € **SELECT:** Temperatures € **SELECT:** trRCTT411 € Action: **SELECT** "Fail to High Limit" € **SELECT:** Insert	**Event 3: PSO (I), US (I,TS)** Associated Alarms: B7457, Rod Motion Detected F5298, OTDT Chan Trip D4435, Pressurizer Level Deviation Low D4421, Tavg-Tref Deviation UA-52, C-7, PZR Level Deviation Lo **NOTE:** If Control Rods are in automatic they will begin inserting. When the initial alarms come in the US will ask the BOP if turbine load is decreasing. The BOP should respond NO. The US will then direct the PSO to place Control Rods in MANUAL. This action is done as a Skill of the Operator Task prior to formally implementing OS1201.08, Tavg/Delta T Instrument Failure.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 3 (Cont.)	If the crew calls the WCS/WWM for the RC-TT-411 failure, then respond **"Understand that RC-TT-411 has failed high. A troubleshooting team is being formed."**	The US should implement OS1201.08, Tavg/Delta T Instrument Failure. Step 1 Check Any Tavg Channel-FAILED: a. PSO should respond YES (Loop 1 Tavg is failed high) Step 2 Stabilize Plant Conditions: a. Place Rod Control-MANUAL • If the Control Rods were in automatic the PSO should have already placed Rod Control in MANUAL per the Skill of the Operator task described above. b. Check condenser steam dump valves-CLOSED • BOP should respond YES c. As necessary, manually restore pressurizer level program. **NOTE:** It will likely not be necessary to manually restore pressurizer level. The crew will likely continue to monitor in automatic. Step 3 Defeat Affected Loop ΔT and Tavg Inputs: • PSO should depress the Loop 1 ΔT channel defeat pushbutton. • PSO should depress the Loop 1 Tavg channel defeat pushbutton. • PSO should select an non affected channel for the ΔT, OT, OP recorder. Step 4 Verify Operation of Control Systems: a. Check Tavg-WITHIN 1°F OF Tref. **NOTE:** If the Control Rods were initially in automatic they will have begun to insert. The answer to Step 4a is dependent upon how timely the crew was in placing Control Rods in MANUAL. The RNO for this step states "Manually control rod motion or turbine load to restore temperature". The crew will likely commence withdrawing Control Rods .

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**

Event 3 (Cont.)		b. Check pressurizer level-AT PROGRAMMED LEVEL
		• If the RNO is needed:
		  • PSO will manually control charging and letdown to restore pressurizer level to programmed level.
		c. Restore pressurizer level to automatic as necessary.
		  NOTE: The need to perform this step is dependent on the conditions stated above.
		d. Verify both steam dump interlock selector switches in the NA RESET NA BYPASS INTERLOCK (neutral) position.
		• BOP should respond YES
		Step 5 Verify Redundant Channel Bistables- <u>NOT</u> Tripped:
		• UL-1
		  • T AVG LO LOOP TO FW ISO
		    • PSO should respond YES (not tripped)
		  • T AVG LO LO LOOP STM DMP ISO
		    • PSO should respond YES (not tripped)
		• UL-6
		  • RCS LOOP OTΔT
		    • PSO should respond YES (not tripped)
		  • RCS LOOP OPΔT
		    • PSO should respond YES (not tripped)
		• UL-12
		  • TAVG LO LOOP TO FW ISO
		    • BOP should respond YES (not tripped)

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 3 (Cont.)		Step 6 Verify Technical Specification And Technical Requirement Compliance: a. Refer to Technical Specifications: • US should identify the following applicable Tech. Spec. items: • T.S. 3.3.1, Reactor Trip System Instrumentation; Table 3.3-1, Items 7 & 8, ACTION 6 • T.R. 19, Feedwater Isolation On Low Tavg Coincident With Reactor Trip- TR conditions are met. b. Coordinate with I&C to perform the following: 1) If desired for testing or troubleshooting, place bistables BYPASS. **NOTE:** This activity would occur later and is not within the time scope of the exam. 2) Within 6 hours trip the appropriate bistables per Attachment A. **NOTE:** This activity would occur later and is not within the time scope of the exam.
	Once the crew has completed OS1201.08, or at the Lead Examiners direction, proceed to Event 4.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 RCS Loop 3 Cold Leg Leak (30 gpm)	**Perform the following:** € **SELECT:** MF List € **SELECT:** Reactor Coolant € **SELECT:** mfRC048C, RCS Hot Leg 3 Leak 0-100% € **Final:** Input .02143 € **SELECT:** Insert **NOTE:** During exam simulator testing the input value of .02143 created a 30 gpm leak. The input value may have to be adjusted as necessary. To monitor the leak rate: € **CLICK ON:** Data € **SELECT:** Open Tables The data table is located at: Seadragon/app/Seabrook DB/Tables/RCS	**Event 4: PSO (C), US (C,TS)** Associated Alarm: **RDMS Panel, "Containment Recirc Noble Gas Hi Hi"** **NOTE:** • The PSO should identify a decreasing pressurizer level trend. • During implementation of OS1201.02, "RCS Leak" the US should direct the PSO to adjust charging and letdown flow rates to stabilize level in an effort to calculate the RCS leak rate. • The RCS leak rate is calculated by stabilizing pressurizer level and then calculating: RCS Leak = Charging Flow- (Letdown flow + Seal Return Flow) The US should implement OS1201.02, "RCS Leak". Step 1 Check if Pressurizer Level Can Be Maintained: a. Control charging and letdown flow as necessary to maintain PZR level on program. • PSO should commence adjusting charging and letdown flows in an attempt to quantify the RCS leak rate. • BOP may provide a backup calculation utilizing the RCS mass balance computer data. b. Check pressurizer level-STABLE OR INCREASING • PSO should respond NO. • RNO-Perform the following: 1) Reduce letdown as necessary. 2) Increase charging flow as necessary

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**

Event 4 (Cont.)		**NOTE:** This step is a continuous action step.
		US should read the step to the PSO with the PSO understanding that the step is continuous action.
		
		• If PZR level can NOT be maintained greater than 7%, THEN perform the following:
		  • IF in MODE 1, 2, or 3 with SI accumulators aligned for injection, THEN perform the following:
		    a) Trip reactor
		    b) WHEN reactor trip verified, THEN actuate SI
		    c) Go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1.
		
		Step 2 Refer to ER1.1: CLASSIFICATION OF EMERGENCIES
		NOTE: 3 person crew. US is not responsible for classifying the event during the scenario.
		Step 3 Determine Appropriate Procedure Step Transition:
		• If RCS leak is suspected, THEN go to Step 4
		• US should transition to Step 5.

	Once the crew has determined the RCS leak rate, or at the Lead Examiners direction, proceed to Event 5	**NOTE:** The intent of this event is to move to Event 5 once the crew has quantified the RCS leak. Implementation of the procedure steps listed below is dependent on the crews timeliness of quantifying the leak.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 5 RCS Cold Leg Break	**Perform the following:** € **SELECT:** MF List € **SELECT:** Reactor Coolant € **SELECT:** mfRC048C, RCS Hot Leg 3 Leak 0-100% € **Final:** Input .92 € **SELECT:** Modify	**Event 5: PSO (M), BOP (M), US (M)** The crew should utilize the OS1201.02 continuous action step as described above.The crew should manually trip the reactor, actuate Safety Injection, and implement E-0, "Reactor Trip or Safety Injection. The US should implement E-0, "Reactor Trip or Safety Injection": Step 1: Verify Reactor Trip a. Rod bottom lights-LIT b. Reactor trip and bypass breakers-OPEN c. Neutron flux-DECREASING YES-PSO should verify that the reactor is tripped. **Critical Task: Manually actuate Main Steam Isolation signal before transitioning to E-1, "Loss of Reactor or Secondary Coolant"**
Event 6 Main Turbine Stop Valve 1 and Control Valve 2 Stick Open. Manual MSI Required		**Event 6: BOP (C), US (C)** Step 2: Verify Turbine Trip: a. Either condition: • All stop valves-CLOSED, or • All control valves-CLOSED NO-The BOP should identify that Stop Valve #1 and Control Valve #2 are both open. • RNO: The BOP should attempt to manually trip the turbine. The turbine will not trip so the BOP should close the MSIVs utilizing the Main Steam Isolation actuation switch.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 5 (Cont.)		Step 3: Verify Power to AC Emergency Busses: a. AC emergency busses-AT LEAST ONE ENERGIZED YES- The BOP should identify that both busses E5 and E6 are energized. b. AC emergency busses-BOTH ENERGIZED YES- The BOP should identify that both busses E5 and E6 are energized. Step 4: Check if SI is Actuated: a. Check SI annunciators let: • TRAIN A, or • TRAIN B YES-PSO should identify both train SI annunc.lit. b. Verify both trains of SI-ACTUATED YES-PSO should identify both train SI annunc.lit. **Critical Task: Manually start either SI-P-6A or 6B before transitioning to E-1, "Loss of Reactor or Secondary Coolant"**
Event 7 "A" and "B" SI and "B" RHR Pumps Fail to Auto Start on SI		**Event 7: PSO (C), US (C)** Step 5: Perform ESF Actuation Verification per Attachment A: **NOTE:** The PSO will perform Attachment A. SI-P-6A and 6B and RH-P-8B failed to stat automatically. The PSO should manually start the pumps per Attachment A, Step 2, as described below:

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 5 (Cont.)		Attachment A Step 2: Verify Safeguard Equipment Alignment-PROPER ALIGNMENT BY STATUS PANEL • Train A- Cold Leg Injection • Train B-Cold Leg Injection NO-The PSO should identify that not all equipment is aligned per status panel. • RNO Perform the following: a. If EFW flow control valves are closed then do not open valves to a faulted or ruptured SG unless needed for cooldown. b. Align at least ONE train of equipment as follows: 1) Manually align valves by status panel or per Attachments N, O, or P. PSO should identify that all valves are properly aligned. 2) Reset RMO as necessary Not necessary 3) Manually start pumps by status panel YES-PSO should manually restart at least one SI pump and RH-P8B.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 5 (Cont.)		4) Manually start fans by status panel Not necessary **Note:** The following material is a continuation of the main body of E-0, starting at Step 6. Step 6: Monitor RCS Temperature-Stable or Trending to 557°F • Tavg recorder, or Wide range cold leg temperature recorders **NOTE:** Depending on the RCS temperature trend, the BOP should identify the need to perform RNO actions. With a LOCA, temperature will be less than 557°F and trending down due to ECCS injection. In this case the BOP should perform the following RNO actions: • RNO: a. Stop dumping steam to condenser and atmosphere b. Check MS to MSRs isolated. c. If cooldown continues then open EFW mini-flow valves and throttle total feed flow to maintain greater than 500 GPM d. When SG level is adequate then throttle EFW flow to maintain SG level between 15% and 50% e. If cooldown continues then: • Close MSIVs • Close MSIV bypass valves • Close upstream drains

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 5 (Cont.)		Step 7: Check RCS Isolated: a. Check letdown valves- CLOSED YES-PSO should verify that CS-V-145, RC-LCV-459, and RC-LCV-460 are all closed. b. PORVs-CLOSED YES-PSO should verify that the PORVs are closed. c. Normal PZR spray valves-CLOSED YES- PSO should verify that the spray valves are closed. Step 8: Check if RCP's Should Be Stopped **NOTE:** During simulator based testing subcooling was greater than 40° and the RCPs were left running. If Subcooling is less than 40° then the PSO or BOP should check at least one ECCS pump running and then stop all of the RCPs. Step 9: Check if SG Pressure Boundary is faulted: a. Check pressures in all SGs • Any SG pressure decreasing in an uncontrolled manner, or • Any SG completely depressurized NO-BOP should identify that there are no faulted SGs Step 10: Check if SG U-Tubes Are Intact: • Main Steamline radiation normal on each line • Condenser air evacuation radiation normal • Steam generator blowdown radiation normal • SG narrow range level-No uncontrolled level increase YES-BOP should identify that SG U-Tubes are intact Step 11: Check if RCS is Intact: • Containment radiation-Normal • Containment pressure-Normal • Containment building level-Normal NO-The PSO should identify that the RCS is NOT intact. • RNO- Go to E-1, "Loss of Reactor or Secondary Coolant", Step 1.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 5 (Cont.)		The US should implement E-1, "Loss of Reactor or Secondary Coolant": **NOTE:** Step 1 is a continuous action step Step 1: Check if RCPs Should Be Stopped a. ECCS pumps-At least one running • CCP -or- • SI Pump YES-CCPs and SI pumps should be running. b. RCS subcooling-Less than 40°F Answer should initially be NO • RNO-Go to step 2. Step 2: Check if SG Pressure Boundary is Faulted a. Check pressures in all SGs • Any SG decreasing in an uncontrolled manner -or- • Any SG completely depressurized NO-BOP should identify that SG pressures are all stable for plant conditions. • RNO-Go to Step 3 Step 3: Check Intact SG Levels **NOTE:** This step is a continuous action. a. Check SG level-Greater Than: • Normal Containment 65% wide range in at least two SGs -or- 6% narrow range in at least one SG YES-BOP should identify that SG level is greater than requirement

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 5 (Cont.)		b. Open EFW pump mini-flow valves and control feed flow to maintain narrow range level between 6% and 50% (15% to 50% for adverse containment) Step 4: Check Secondary Radiation • Main steamline radiation-Normal on each line. • Condenser air evacuation radiation-Normal • Steam Generator Blowdown-Normal • SG narrow range level-No uncontrolled level increase YES-The BOP should identify that all indication of secondary radiation are normal. Step 5: Check PZR PORV and Block Valves a. Power to block valves available YES b. PORVs closed YES c. Block valves-At least one open YES Step 6: Check if ECCS Flow Should Be Reduced a. RCS subcooling-Greater than 40°F YES b. Secondary heat sink: • Total EFW flow greater than 500 GPM YES c. RCS pressure-Stable or Increasing NO • RNO-Go to Step 7 Step 7: Check if Containment Spray Should be Stopped: a. Spray pumps-Running NO • RNO-Go to step 8

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 5 (Cont.)		Step 8: Check if RHR Pumps Should be Stopped: a. Check if RHR Pumps Should be Stopped: 1) Pressure-Greater than 300 PSIG YES 2) Pressure-Stable or increasing NO RNO-Go to Step 9 Step 9: Check RCS and SG Pressure: • Check pressures in all SGs Stable or Increasing YES • Check RCS Pressure-Stable or Decreasing YES Step 10: Check if Diesel Generators Should be Stopped: a. Reset SI b. Verify all AC busses-Energized by Offsite Power From UATs or RATs YES c. Stop unloaded emergency diesel generators and reset for auto start BOP should stop diesels and reset. Step 11: Initiate Evaluation of Plant Status: a. Verify cold leg recirculation capability YES-PSO should verify that availability requirements of both trains are met b. Verify PCCW flow to RHR heat exchangers required: 1) RHR pumps-Running YES 2) Verify PCCW flow to RHR heat exchangers YES c. Verify PCCW flow to CBS heat exchangers required: 1) CBS pumps-Running NO RNO-Go to Step 11d

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 5 (Cont.)		d. Check for Containment Leakage-Auxiliary Building Radiation Levels Normal Using RDMS YES e. Consult with TSC and obtain post accident samples while continuing with this procedure. f. Evaluate ESF equipment operation per Attachment A Step 12: Check if RCS Cooldown and Depressurization is Required a. RCS pressure-Greater than 300 PSIG YES b. Go to ES-1.2, Post LOCA Cooldown and Depressurization, Step 1
	End the exam when the crew transitions to ES-1.2, "Post LOCA Cooldown and Depressurization" or at the Lead Examiners discretion.	**Emergency Plan Classification:** • When the RCS leak occurs in Event 4: **MU4:** RCS leakage for 15 minutes or longer. • When the RCS break occurs in Event 5: **FA1:** Any loss or potential loss of either fuel clad or RCS barriers.

*** END OF SCENARIO ***

QUANTITATIVE ATTRIBUTES

(Use this form for NRC/INPO Evaluations only as required to document associated quantitative information.)

Malfunctions:

Before EOP Entry:

1. "C" Feedwater Regulating Valve fails to 100% output concurrent with controlling level channel failing high
2. RCS Loop 1 Tcold instrument fails high

After EOP Entry:

1. When the reactor trip occurs Main Turbine Stop Valve 1 and Control Valve 2 do not close automatically, and turbine does not trip manually, requiring the BOP to manually actuate a Main Steamline Isolation per E-0 immediate action step 2.
2. When the Safety Injection occurs both Safety Injection Pumps and the "B" RHR Pump fail to start automatically, requiring the PSO to manually start the pumps per E-0, Attachment A.

Abnormal Events:

1. "C" Feedwater Regulating Valve fails to 100% output concurrent with controlling level channel failing high
2. RCS Loop 1 Tcold instrument fails high
3. RCS Loop 3 Cold Leg Leak (30 gpm)

Major Transient:

1. RCS Cold Leg Break

Critical Tasks:

1. Manually actuate Main Steam Isolation signal before transitioning to E-1, "Loss of Reactor or Secondary Coolant"
2. Manually start either SI-P-6A or 6B before transitioning to E-1, "Loss of Reactor or Secondary Coolant"

Critical Tasks:

1. Manually actuate Main Steam Isolation signal before transitioning to E-1, "Loss of Reactor or Secondary Coolant"
2. Manually start either SI-P-6A or 6B before transitioning to E-1, "Loss of Reactor or Secondary Coolant"

NextEra ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG Page 1 of 31

SITE: Seabrook Station **Revision #:** 0

LMS ID: n/a **LMS Rev. Date:** n/a

SEG TITLE: 2018 LOIT NRC Exam #3

SEG TYPE: ☐ **Training** ☒ **Evaluation**

PROGRAM: ☐ **LOCT** ☒ **LOIT** ☐ **Other:**

DURATION: 90 minutes

Developed by: ______________________ ____________
Instructor/Developer Date

Commented [JPM1]: *NOTE TO DEVELOPER: To the right of "Filename" in the footer of this form is an inserted field code that will automatically update with the file name when the file is saved. If you change the file name after saving, you may update the footer by selecting 'View' and toggling between 'Normal' and 'Print Layout'.*

Reviewed by: ______________________ ____________
Instructor (Instructional Review) Date

Validated by: ______________________ ____________
SME (Technical Review) Date

Approved by: ______________________ ____________
Training Supervision Date

Approved by: ______________________ ____________
Training Program Owner (Line) Date

OVERVIEW / SEQUENCE OF EVENTS

OVERVIEW:

- Prior to assuming the watch the crew will perform the necessary reactivity calculations to support a power decrease from 100% to 45% power at a rate of 25%/hr.
- Once the crew has commenced the power decrease the "A" Service Water Pump will trip. The crew will implement OS1216.01, "Degraded Ultimate Heat Sink", and initiate a Tower Actuation to Train "A" SW. SW-V-54, "Cooling Tower Pump "A" Discharge Valve will not open automatically and should be opened manually. The US should address applicable Tech. Specs.
- Once the crew has mitigated the Service Water event then Pressurizer level instrument RC-LT-459 will fail high. The crew should implement OS1201.07, "PZR Level Instrument Failure". The US should address applicable Tech. Specs.
- Once the crew has mitigated the Pressurizer level instrument failure then two control rods will drop. Per OS1210.05, "Dropped Rod" the crew should trip the reactor. The reactor will not trip from the Main Control Board, necessitating implementation of FR-S.1, ""Response to Nuclear Power Generation/ATWS. The reactor will have to be tripped locally. Also, the crew will have to start the Steam Driven EFW Pump.
- When the crew transitions from FR-S.1 back to E-0, "Reactor Trip or Safety Injection" a RCS large break LOCA will occur on the Loop 2 Cold Leg. Safety Injection will automatically actuate, however CBS will not automatically actuate on Train "A" and CBS-P-9B will trip when it starts. The crew will have to manually start CBS-P-9A.
- Per E-0 diagnostic steps the crew should transition to E-1, "Loss of Reactor or Secondary Coolant". Depending on the crews timing they may have to implement FR-Z.1, "Response to High Containment Pressure" based on an ORANGE PATH.
- The crew should process through E-1 based on large break indications. The exam ends at E-1, Step 13, "check if Transfer to Cold Leg Recirculation is Required".

SEQUENCE OF EVENTS

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
1.	Power decrease at 25%/hr
2.	Loss of ocean Service Water Pump Train "A"
3.	Pressurizer level instrument RC-LT-459 fails high
4.	ATWS w/local reactor trip required followed by large break cold leg loss of coolant.
5.	EFW Pump "B" trips with no start of EFW Pump "A"
6.	No automatic CBS signal Train "A" w/ Train "B" CBS pump tripped.

SIMULATOR SET UP INSTRUCTIONS

- Reset the simulator to IC-30, MOL, 100% Power, Stable Xenon
- Perform the following to tag out the Startup Feedwater Pump:
  - € SELECT: CRF List
  - € SELECT: Component-Feedwater
  - € SELECT: Breakers
  - € SELECT: bkFWP113
  - € Action: SELECT "Rack Out"
  - € SELECT: Insert

  - € SELECT: bkFWP113AF
  - € Action: SELECT "Rack Out"
  - € SELECT: Insert

  - € SELECT: bkFWP161
  - € Action: SELECT "Rack Out"
  - € SELECT: Insert

  - € Place tags on both control switches for the SUFP and for the Prelube Pump.
- Place the simulator in RUN
- Perform the following to create ATWS event:
  - € SELECT: MF List
  - € SELECT: Reactor Protection
  - € SELECT: mfRPS001, Automatic Reactor Trip Failure (Train A)
  - € Final: SELECT "1:True"
  - € SELECT: Insert

  - € SELECT: mfRPS002, Automatic Reactor Trip Failure (Train B)
  - € Final: SELECT "1:True"
  - € SELECT: Insert

  - € SELECT: mfRPS027, Reactor Trip Switches Fail to Actuate (Train A)
  - € Final: SELECT "1:True"
  - € SELECT: Insert

(Continued on next page)

- € SELECT: mfRPS028, Reactor Trip Switches Fail to Actuate (Train B)
- € Final: SELECT "1:True"
- € SELECT: Insert

- Perform the following to prevent SW-P-41C from starting:
  - € SELECT: CMF List
  - € SELECT: Component-Service Water
  - € SELECT: Breakers
  - € SELECT: cSWP41C, SW-P-41C Train A Svc Wtr Pmp C
  - € Action: SELECT "Persistent Trip"
  - € SELECT: Insert

- Perform the following to prevent SW-V-54 from automatically opening:
  - € SELECT: CMF List
  - € SELECT: Component-Service Water
  - € SELECT: MOVs
  - € SELECT: cSWV54, Cooling Tower Pump A Discharge Isolation
  - € SELECT: Fail to Open
  - € SELECT: Insert

- Perform the following to prevent CBS Train "A" from automatically actuating:
  - € SELECT: MF List
  - € SELECT: Reactor Protection
  - € SELECT: mfRPS015, Cntmt Spray Fails to Auto Actuate (Train A)
  - € Final: SELECT "1:True"
  - € SELECT: Insert

- Perform the following to prevent MS-V-393 and 394 from opening on ATWS:
  - € SELECT: CMF List
  - € SELECT: Component-Main Steam
  - € SELECT: AOVs
  - € SELECT: svMS1V393
  - € Action: SELECT "Fail Closed"
  - € SELECT: Insert

  - € SELECT: svMS1V394
  - € Action: SELECT "Fail Closed"
  - € SELECT: Insert

(Continued on next page)

- **Perform the following to activate Event Trigger 1:**
  - € **SELECT: Event Triggers**
  - € **SELECT: NRC**
  - € **SELECT: Demo Exams**
  - € **SELECT: 2018 NRC Exam 3 ET1**
  - € **SELECT: Open**
  - € **SELECT: Activate**
- **Perform the following to activate Event Trigger 2:**
  - € **SELECT: Event Triggers**
  - € **SELECT: NRC**
  - € **SELECT: Demo Exams**
  - € **SELECT: 2018 NRC Exam 3 ET2**
  - € **SELECT: Open**
  - € **SELECT: Activate**
- **Perform the following to activate Event Trigger 3:**
  - € **SELECT: Event Triggers**
  - € **SELECT: NRC**
  - € **SELECT: Demo Exams**
  - € **SELECT: 2018 NRC Exam 3 ET3**
  - € **SELECT: Open**
  - € **SELECT: Activate**
- **Perform the following to activate Event Trigger 4:**
  - € **SELECT: Event Triggers**
  - € **SELECT: NRC**
  - € **SELECT: Demo Exams**
  - € **SELECT: 2018 NRC Exam 3 ET4**
  - € **SELECT: Open**
  - € **SELECT: Activate**

(Continued on next page)

- Perform the following to activate Event Trigger 5:
    - € SELECT: Event Triggers
    - € SELECT: NRC
    - € SELECT: Demo Exams
    - € SELECT: 2018 NRC Exam 3 ET5
    - € SELECT: Open
    - € SELECT: Activate

SHIFT TURNOVER INFORMATION

- See turnover sheet

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 1 Power decrease at 25%/hr		**Event 1: PSO (R), BOP (N), US (N)** NOTE: The crew may use the ODI.56 boron value for a 25%/hr downpower. The crew should perform the power decrease utilizing OS1231.04, Rapid Downpower. • US should perform a rapid downpower brief utilizing OS1231.04, Rapid Downpower, Attachment A. • PSO should develop a boration schedule based on the values in ODI-56 and provide a recommendation to the US. • BOP should set up a load schedule. • US should direct the PSO to commence the boration. • US should direct the BOP to reduce turbine load
	Once the crew has commenced the power increase, at the Lead Examiners direction, proceed to the next event.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 2 Loss of ocean Service Water Pump Train "A"	**Perform the following:** € **SELECT:** MF List € **SELECT:** Service Water € **SELECT:** mfSW001, A SW Pmp Overcurrent Trip € Final: **SELECT** "1:True" € **SELECT:** Insert	**Event 2: BOP (C), US (I,C,TS)** **Initial Alarms:** D5523, SW PMP A BKR Trip L/O UA-54-A-1, SW Train A Press Lo **NOTE:** The crew may initially utilize the D5523 Alarm Response Procedure. The steps for that procedure are: 1.1 Verify SW Pump A tripped by amber light indication on MCB. 1.2 If available verify started/start SW pump C. (Pump will not start) 1.2.1 Red Flag Control Switch SW Pump C 1.3 If SW Pump C not available, initiate Train "A" TA from MCB. The US should implement OS1216.01, "Degraded Ultimate Heat Sink". Step 1: Determine Appropriate Response • If affected SW train is aligned to the ocean then go to Step 2 YES-BOP should verify that SW is aligned to the ocean Step 2: Check For Ocean Service Water Pump Failure a. Ocean service water pumps-One Pump Running Per Train With Associated Discharge Valve Open NO-BOP should verify no ocean SW pumps are running RNO 1) Reset RMO if necessary Not necessary 2) Manually start ocean service water pump. If pump cannot be started then:

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 2 (Cont.)		a. Actuate TA for the affected train(S) The BOP should actuate Train "A" TA b. Go to Step 4 Step 4: Verify Tower Actuation Sequence a. Verify proper TA alignment by status panel indication NO-The BOP should identify improper status light indication for SW-V-54 on UL-16 RNO: a. Align equipment for affected train per status panel. BOP should manually open SW-V-54 b. Check cooling tower boundary intact and cooling tower basin level stable or rising. YES-BOP should verify that SW-V-4, SW-V-20, and SW-V-74 are all closed and that cooling tower basin level is stable. Step 5: Determine Step Transition • If one Cooling Tower Pump is in service then go top Step 7. US should transition to Step 7 Step 7: Align Equipment With One Cooling Tower Pump In Service BOP should perform the following a. Place Ocean SW Pump control switches in Pull to Lock b. Place the Train "A" Cooling Tower Pump control switch in Normal After Start c. Reset Train "A" TA d. Operate sprays and fans per Attachment A as necessary e. Initiate normal cooling tower makeup as necessary US should perform the following f. Notify Chemistry and Security that the cooling tower is in operation g. Go to Step 9

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 2 (Cont.)	If the crew calls the WCS/WWM for the "A" SW pump trip, then respond **"Understand that SW Pump "A" has tripped. A troubleshooting team is being formed."** If the crew instructs an NSO to check SCCW heat exchanger outlet temperature, then after 3 minutes respond **"SCCW heat exchanger outlet temperature is 81°F and stable"**	Step 9: Determine SW System Status a. Check SW system heat loads 1) Check PCCW Train A and Train B heat exchanger outlet temperature • Train A 65-75°F • Train B 65-78°F YES-PSO should verify that SW temperatures are within band 2) Check SCCW heat exchanger outlet temperature 77-95°F BOP should dispatch an NSO to check temperatures locally 3) Check service water flow to running diesel-Greater Than Required BOP should determine that no diesel is running b. Verify Technical Specification compliance • T.S. 3.7.4, Service Water System US should verify SW Tech Spec actions Two Service Water Loops inop One Cooling Tower Loop Inop possible via operability determination. T.S. 3.0.3 applies if it is determined that one Cooling Tower loop is inop. c. Return to procedure and step in effect.
	Once the crew has completed OS1216.01, or at the Lead Examiners direction, proceed to Event 3	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 3 Pressurizer level instrument RC-LT-459 fails high	**Perform the following:** € **SELECT:** CMF List € **SELECT:** Component-Reactor Coolant € **SELECT:** Levels € **SELECT:** trRCLT459 € Action: **SELECT** "Fail to High Limit" € **SELECT:** Insert	**Event 3: PSO (I), US (I,TS)** Associated Alarms: D4436, PZR Level Deviation High and BU Htrs On F7861, PZR Level High Channel Trip D4676, RCP A Seal Injection Flow Low D4677, RCP B Seal Injection Flow Low D4678, RCP C Seal Injection Flow Low D4679, RCP D Seal Injection Flow Low UA-52, C-6, PZR Level Deviation Hi **NOTE:** When the initial alarms come in the US will ask the PSO if a controlling channel has failed. The BOP should identify that LT-459 has failed and is the controlling channel. The US should then direct the PSO to take manual control of charging and reduce flow to the RCP seals only. This action is done as a <u>Skill of the Operator Task</u> . The US should implement OS1201.07, "PZR Level Instrument Failure Step 1 Check Pressurizer Level Channels • Controlling Channel-FAILED YES-PSO should determine that RC-LT-459 has failed high and that it is the controlling channel. .

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 3 (Cont.)		Step 2: Realign Pressurizer Level Instruments a. Manually control pressurizer level-AT PROGRAM PSO should take manual control of charging and raise flow back to normal b. Select an alternate level channel for control/backup as necessary PSO should select the 461/460 combination c. Select an alternate level channel for recorder as necessary PSO should select either channel 460 or 461 Step 3: Verify Pressurizer Heaters-ON a. Reset or manually control pzr heaters as necessary PSO should determine that there is no need Step 4: Check If Letdown Was Isolated a. Letdown valves closed RC-LCV-459 -or- RC-LCV-460 NO-PSO should verify that letdown is still in service RNO-Go to Step 7 **Note:** Step 7 may be an open/ongoing step as the board operator will have to return pressurizer level back to programmed value in order to return level control to automatic.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 3 (Cont.)		Step 7: Align Pressurizer Level Control a. Verify proper controller setpoint and place controller in auto • RC-PK-459 • CS-FK-121 RNO-Manually control pressurizer level using letdown and charging to maintain program level.When desired, verify proper controller setpoint and place controller in automatic. Step 8: Verify Redundant Channel Bistables-Not Tripped a. UL-6 • Pressurizer Level Hi YES-PSO should verify that there are no redundant channel bistables lit. Step 9: Verify Technical Specification Compliance a. US should identify the following applicable items: • T.S. 3.3.1, Reactor Trip System Instrumentation, Table 3.3-1, Item 11-Action 6 • T.S. 3.3.3.6, Accident Monitoring Instrumentation, Table 3.3.10, Item 5 **NOTE:** The US should call I&C, however the following step will not take place. b. Coordinate with I&C to perform the following 1) If desired for testing or troubleshooting, place bistable to bypass using BTI for up to 6 hours. 2) Within 6 hours trip appropriate bistables per Attachment A

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
	Once the crew has completed OS1201.07, or at the Lead Examiners direction, proceed to Event 4.	
Event 4 ATWS w/local reactor trip required followed by large break cold leg loss of coolant.	**Perform the following:** € **SELECT:** MF List € **SELECT:** Rod Control and Position € **SELECT:** mfCP011, RCCA F8 and H2 Rod Drop € Final: **SELECT** "1:True" € **SELECT:** Insert	**Event 4: PSO (M), BOP (M), US (N)** Associated Alarms: D7749, Two or More Rods on Bottom D7730, One Rod on Bottom D7753, Control Rod Deviation D4327, PZR Pressure Low and BU Htrs On The US should implement OS1210.05, "Dropped Rod" Step 1: Stabilize Plant Conditions a. Check only one rod dropped NO-The PSO should identify that two rods have dropped. RNO-If more than one rod dropped, then perform the following: 1) Trip the reactor NO-The PSO should attempt to trip the reactor using both MCB reactor trip switches and identify that the reactor did not trip.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		The US should implement E-0, "Reactor Strip or Safety Injection" Step 1: Verify Reactor Trip • Rod bottom lights lit NO • Reactor trip and bypass breakers open NO • Neutron flux decreasing NO RNO-Manually trip reactor, if reactor will not trip the go to FR-S.1, "Response to Nuclear Power Generation/ATWS"

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)	**NOTE:** Trip the reactor locally prior to the crew performing FR-S.1, Step 7, unless the crew never dispatches NSOs for local trip. **To trip the reactor locally perform the following:** € **SELECT:** Malfunctions (Top of screen) € **SELECT:** mfRPS027, Reactor Trip Switches Fail to Activate (Train A) € **SELECT:** Delete € **SELECT:** : mfRPS028, Reactor Trip Switches Fail to Activate (Train B) € **SELECT:** Delete	The US should implement FR-S.1, "Response to Nuclear Power Generation/ATWS" Step 1: Verify Reactor Trip NO RNO-Manually trip reactor, If reactor will not trip then: • Verify control rods are being inserted in auto -or- • Manually insert control rods PSO should be monitoring that rods are inserting in auto and then manually insert if rods stop inserting. Step 2: Verify Turbine Trip NO RNO: a. Manually trip turbine. If turbine will not trip then close MSIVs BOP should manually trip the turbine b. When generator output is zero MWe, then manually open generator breaker BOP should open generator breaker Step 3: Check EFW Pumps Running a. Motor driven pump running NO-BOP should identify that the motor driven pump has tripped

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		**Critical Task 1: Start Steam Driven EFW Pump prior to exiting FR-S.1, "Response to Nuclear Power Generation/ATWS"**
Event 5 EFW Pump "B" trips with no start of EFW Pump "A"	€	**Event 5: BOP (C), US (C)** b. Motor driven pump running • MS-V-393-Open • MS-V-394-Open • MS-V-395-Open • MS-V-129, Trip Valve-Open NO-BOP should identify that MS-V-393,394, and 395 are all closed. RNO-Open valves to establish at least one steam supply BOP should open MS-V-393 and/or MS-V-394 and verify that MS-V-395 opens after a 28 second time delay. Step 4: Initiate Emergency Boration of RCS a. At least one CCP running YES b. Align boration path PSO should start a boric acid pump, open CS-V-426 c. Align charging flow path PSO should Place CS-FK-121 in manual and charge at max rate, and align CCP suction to the RWST d. Check PZR pressure-Less than 2385 PSIG PSO should verify that pressure is less than 2385 PSIG

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)	**NOTE:** When the crew transitions to E-0, Reactor Trip or Safety Injection initiate **Event 6**: **Perform the following:** € **SELECT:** MF List € **SELECT:** Reactor Coolant € **SELECT:** mfRC024B, RCS Cold Leg 2 LOCA € Final: **SELECT** "1:True" € **SELECT:** Insert	Step 5: Verify Containment Ventilation Isolation YES-PSO should verify that bCOP and CAP valves 1-4 are all closed **NOTE:** The crew should have dispatched an NSO to locally trip the reactor, if they did so then the reactor will have been tripped at this point Step 6: Check If The Following Trips Have Occurred a. Reactor trip YES-PSO should verify that the reactor has tripped b. Turbine trip YES-BOP should verify that the turbine has tripped Step 7: Check If Reactor Is Subcritical a. Check power range channels-Less than 5% YES-BOP should verify b. Check intermediate range flux rate-Zero or negative YES-BOP should verify c. Check gammametrics intermediate range flux level-less than 5% YES-BOP should verify d. Check gammametrics intermediate range flux rate-Zero or negative YES-BOP should verify e. Continue boration to obtain adequate shutdown margin during subsequent actions f. Return to procedure and step in effect US should transition back to E-0

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		The US should implement E-0, "Reactor Trip or Safety Injection Step 1: Verify reactor trip Yes-The PSO should verify that the reactor is tripped Step 2: Verify Turbine Trip a. Either condition: • All stop valves-CLOSED, or • All control valves-CLOSED YES-The BOP should identify that all Stop Valves and Control Valves are closed. Step 3: Verify Power to AC Emergency Busses: a. AC emergency busses-AT LEAST ONE ENERGIZED YES- The BOP should identify that both busses E5 and E6 are energized. b. AC emergency busses-BOTH ENERGIZED YES- The BOP should identify that both busses E5 and E6 are energized. Step 4: Check if SI is Actuated: a. Check SI annunciators let: • TRAIN A, or • TRAIN B YES-PSO should identify both train SI annunc.lit. b. Verify both trains of SI-ACTUATED YES-PSO should identify both train SI annunc.lit.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		**Critical Task 2: Start CBS-P-9A prior to transitioning to E-1, Loss of Reactor or Secondary Coolant"**
Event 6 No automatic CBS signal Train "A" w/ Train "B" CBS pump tripped		**Event 6: PSO (C), US (C)** Step 5: Perform ESF Actuation Verification per ATTACHMENT A: **NOTE:** The PSO will perform Attachment A. The Train "A" CBS signal failed to automatically actuate. Also the Train "B" CBS pump will trip on overcurrent when it starts. The PSO should manually actuate Train "A" CBS and verify that at least one CBS pump is running per Attachment A, Step 10, as described below: Attachment A Step 10: Check Containment Pressure-Has Remained Less Than 18 PSIG By Pressure Recording NO-The PSO should identify that containment pressure went above 18 PSIG and that a CBS signal is warranted. RNO: Verify containment Phase B ("P" Signal) and containment spray actuated: a. All Phase B status lights-LIT • Train A • Train B NO-The PSO should identify that not all status lights are lit b. If not, then actuate both CBS/P/CVI manual actuation switches for each train. The PSO should manually actuate the CBS/P/CVI switches.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		c. Reset RMO as necessary Not necessary d. Manually align valves and equipment as necessary by status panel. All equipment should be aligned with the exception of the "B" CBS pump because it tripped. e. Stop all RCPs If not already done so, the PSO should stop all RCPs. **Note:** The following material is a continuation of the main body of E-0, starting at Step 6. Step 6: Monitor RCS Temperature-Stable or Trending to 557°F • Tavg recorder, or Wide range cold leg temperature recorders **NOTE:** Due to the large break LOCA temperature will be less than 557°F and trending down due to ECCS injection. In this case the BOP should perform the following RNO actions: • RNO: a. Stop dumping steam to condenser and atmosphere b. Check MS to MSRs isolated. c. If cooldown continues then open EFW mini-flow valves and throttle total feed flow to maintain greater than 500 GPM d. When SG level is adequate then throttle EFW flow to maintain SG level between 15% and 50%

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		e. If cooldown continues then: • Close MSIVs • Close MSIV bypass valves • Close upstream drains Step 7: Check RCS Isolated: a. Check letdown valves- CLOSED YES-PSO should verify that CS-V-145, RC-LCV-459, and RC-LCV-460 are all closed. b. PORVs-CLOSED YES-PSO should verify that the PORVs are closed. c. Normal PZR spray valves-CLOSED YES- PSO should verify that the spray valves are closed. Step 8: Check if RCP's Should Be Stopped RCP's should be stopped per Attachment A or at this step, whichever is arrived at first. Step 9: Check if SG Pressure Boundary is faulted: a. Check pressures in all SGs • Any SG pressure decreasing in an uncontrolled manner, or • Any SG completely depressurized NO-BOP should identify that there are no faulted SGs Step 10: Check if SG U-Tubes Are Intact: • Main Steamline radiation normal on each line • Condenser air evacuation radiation normal • Steam generator blowdown radiation normal • SG narrow range level-No uncontrolled level increase YES-BOP should identify that SG U-Tubes are intact

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		**NOTE:** Per E-0, Step 11 the crew should transition to E-1, "Loss of Reactor or Secondary Coolant". Depending on the crews timing they may need to implement FR-Z.1, "Response to High Containment Pressure" based on an ORANGE PATH. Step 11: Check if RCS is Intact: • Containment radiation-Normal • Containment pressure-Normal • Containment building level-Normal NO-The PSO should identify that the RCS is NOT intact. • RNO- Go to E-1, "Loss of Reactor or Secondary Coolant", Step 1. • The US should implement E-1, "Loss of Reactor or Secondary Coolant" **NOTE:** RCPs should have already been stopped. Step 1: Check if RCPs Should Be Stopped a. ECCS pumps-At least one running • CCP -or- • SI Pump YES-CCPs and SI pumps should be running. b. RCS subcooling-Less than 40°F YES

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		Step 2: Check if SG Pressure Boundary is Faulted a. Check pressures in all SGs • Any SG decreasing in an uncontrolled manner -or- • Any SG completely depressurized NO-BOP should identify that SG pressures are all stable for plant conditions. • RNO-Go to Step 3 Step 3: Check Intact SG Levels **NOTE:** This step is a continuous action. a. Check SG level-Greater Than: • Normal Containment 65% wide range in at least two SGs -or- 6% narrow range in at least one SG YES-BOP should identify that SG level is greater than requirement b. Open EFW pump mini-flow valves and control feed flow to maintain narrow range level between 6% and 50% (15% to 50% for adverse containment) Step 4: Check Secondary Radiation • Main steamline radiation-Normal on each line. • Condenser air evacuation radiation-Normal • Steam Generator Blowdown-Normal • SG narrow range level-No uncontrolled level increase YES-The BOP should identify that all indication of secondary radiation are normal.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		Step 5: Check PZR PORV and Block Valves a. Power to block valves available YES b. PORVs closed YES c. Block valves-At least one open YES Step 6: Check if ECCS Flow Should Be Reduced a. RCS subcooling-Greater than 40°F NO • RNO-Go to Step 7 **NOTE:** Step 7 is a continuous action step. Step 7: Check if Containment Spray Should be Stopped: a. Spray pumps-Running YES b. Containment pressure-Less than 4.0 PSIG RNO- Go to step 8 Step 8: Check if RHR Pumps Should be Stopped: a. Check if RHR Pumps Should be Stopped: 1) Pressure-Greater than 300 PSIG NO RNO- Go to step 10 Step 10: Check if Diesel Generators Should be Stopped: a. Reset SI b. Verify all AC busses-Energized by Offsite Power From UATs or RATs YES c. Stop unloaded emergency diesel generators and reset for auto start BOP should stop diesels and reset.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		Step 11: Initiate Evaluation of Plant Status: a. Verify cold leg recirculation capability YES-PSO should verify that availability requirements of both trains are met b. Verify PCCW flow to RHR heat exchangers required: 1) RHR pumps-Running YES 2) Verify PCCW flow to RHR heat exchangers YES c. Verify PCCW flow to CBS heat exchangers required: 1) CBS pumps-Running YES 2) Verify PCCW flow to RHR heat exchangers YES d. Check for Containment Leakage-Auxiliary Building Radiation Levels Normal Using RDMS YES e. Consult with TSC and obtain post accident samples while continuing with this procedure. f. Evaluate ESF equipment operation per Attachment A Step 12: Check if RCS Cooldown and Depressurization is Required a. RCS pressure-Greater than 300 PSIG NO RNO-If RHR pump flow is indicated, then go to Step 13 PSO should verify that RHR pump flow is indicated. Step 13: Check if Transfer to Cold Leg Recirculation is Required

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
	End the exam when the crew has reached Step 13, or at the Lead Examiner's discretion.	**Emergency Plan Classification:** **MA5:** Automatic or manual trip fails to shutdown the reactor, and subsequent manual actions taken at the Main Control Board are not successful in shutting down the reactor.

***** END OF SCENARIO *****

QUANTITATIVE ATTRIBUTES

(Use this form for NRC/INPO Evaluations only as required to document associated quantitative information.)

Malfunctions:

Before EOP Entry:

1. Loss of ocean Service Water pumps Train "A"
2. Pressurizer level instrument RC-LT-459 fails high

After EOP Entry:

1. EFW Pump "B" trips with no start of EFW Pump "A"
2. No automatic CBS signal Train "A" w/ Train "B" CBS pump tripped.

Abnormal Events:

1. Loss of ocean Service Water pumps Train "A"
2. Pressurizer level instrument RC-LT-459 fails high
3. EFW Pump "B" trips with no start of EFW Pump "A"
4. No automatic CBS signal Train "A" w/ Train "B" CBS pump tripped.

Major Transient:

ATWS w/local reactor trip required followed by large break cold leg loss of coolant.

Critical Tasks:

1. Start Steam Driven EFW Pump prior to exiting FR-S.1, "Response to Nuclear Power Generation/ATWS"
2. Start CBS-P-9A prior to transitioning to E-1, Loss of Reactor or Secondary Coolant"

Critical Tasks:

3. Start Steam Driven EFW Pump prior to exiting FR-S.1, "Response to Nuclear Power Generation/ATWS"
4. Start CBS-P-9A prior to transitioning to E-1, Loss of Reactor or Secondary Coolant"

NextEra ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG Page 1 of 29

SITE: Seabrook Station **Revision #:** 0

LMS ID: n/a **LMS Rev. Date:** n/a

SEG TITLE: 2018 LOIT NRC Simulator Exam #4

SEG TYPE: ☐ Training ☒ Evaluation

PROGRAM: ☐ LOCT ☒ LOIT ☐ Other:

DURATION: 90 minutes

Developed by: ______________________ ________
Instructor/Developer Date

Commented [JPM1]: ***NOTE TO DEVELOPER:*** *To the right of "Filename" in the footer of this form is an inserted field code that will automatically update with the file name when the file is saved. If you change the file name after saving, you may update the footer by selecting 'View' and toggling between 'Normal' and 'Print Layout'.*

Reviewed by: ______________________ ________
Instructor (Instructional Review) Date

Validated by: ______________________ ________
SME (Technical Review) Date

Approved by: ______________________ ________
Training Supervision Date

Approved by: ______________________ ________
Training Program Owner (Line) Date

OVERVIEW / SEQUENCE OF EVENTS

OVERVIEW

- After the crew assumes the watch the "D" ASDV will fail open due to a failed pressure instrument. The crew will respond utilizing the applicable VPRO procedure.
- The crew will then respond to an inadvertent Train "B" HELB utilizing OS1290.01, "Response to HELB Systems Actuation or Malfunction".
- Once the crew has reestablished letdown from the HELB actuation a 20 GPM tube leak will occur on the "D" Steam Generator. The crew will implement OS1227.02, Steam Generator Tube Leak" and commence a rapid downpower to 50% power.
- Once the crew commences the downpower a loss of offsite power will occur coincident with the SG "D" tube leak progressing to a tube rupture. The "A" Emergency Diesel Generator will fail to automatically start, requiring the crew to perform a manual emergency start. The "B" Emergency Diesel Generator will trip on low lube oil pressure.
- The crew will implement E-0,"Reactor Trip or Safety Injection" and transition to E-3, "Steam Generator Tube Rupture". When the crew performs the first RCS depressurization the applicable PORV will fail open, necessitating the need to close the associated block valve.

SEQUENCE OF EVENTS.

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
1.	ASDV "D" fails open
2.	Inadvertent Train "B" HELB actuation
3.	Steam Generator "D" Tube Leak and Plant downpower to <50% within 1 hour
4.	Steam Generator "D" Tube Rupture and loss of offsite power.
5.	Emergency Diesel Generator "A" fails to automatically start
6.	PORV fails to close at E-3 depressurization

SIMULATOR SET UP INSTRUCTIONS

- Reset the simulator to IC-30, MOL, 100% power.
- Insert the following malfunction to prevent EDG 1A from automatically starting:
  - € SELECT: MF List
  - € SELECT: Electrical Distribution
  - € SELECT: mfED031, DG-1A Auto Start Failure
  - € Final: SELECT "1:True"
  - € SELECT: Insert
- Insert the following malfunction to cause EDG1B to trip on low lube oil pressure:
  - € SELECT: MF List
  - € SELECT: Electrical Distribution
  - € SELECT: mfED034, DG-1B Low Lube Oil Pressure Trip
  - € Final: SELECT "1:True"
  - € SELECT: Insert

SHIFT TURNOVER INFORMATION

See Turnover Sheet

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 1 ASDV "D" fails open	**Perform the following:** € **SELECT:CMF List** € **SELECT: Component-Main Steam** € **SELECT: Pressures** € **SELECT: trMSPK3004, "Stm Gen D Main Stm Hdr Pressure"** € **Action: SELECT "Fail to High Limit"** € **SELECT: Insert** If the crew calls the WCS/WWM for the "D" ASDV pressure instrument MS-PT-3004, then respond **"Understand that MS-PT-3004 has failed high. A troubleshooting team is being formed."** **If the crew directs an NSO to CLOSE MS-V-149 then perform the following:** € **SELECT:RF List** € **SELECT: Main Steam** € **SELECT: rfMS014, "MS-V49 ASDV D Isol"** € **Final: INPUT "0"** € **Ramp: INPUT "30"** € **SELECT: Insert**	**Event 1: BOP (I) US (I,TS)** Associated Alarms: • D5217, "ASDV D Not Full Closed" • UA-53-A-7, "Atmos Stm Dump Valve Open" The crew should implement the Alarm Response Procedure for D5217: 1.1 Verify S/G pressure and compare to ASDV's controller setpoint. BOP should determine that PT-3004 has failed high. 1.2 Adjust ASDV controller setpoint and/or transfer steam load to condenser as required. This action does not apply as the crew should take manual control of the ASDV as it has failed open due to an errant input signal to the controller. 1.3 If ASDV has failed open: 1.3.1 Place ASDV controller switch to close. BOP should take the control switch from "Modulate" to "Close" 1.3.2 Locally isolate ASDV as necessary by closing MS-V-49. This action will not be necessary. The US should determine that the ASDV is still operable per reference to the Tech. Spec. items listed below. 1.3.3 Place Controller for ASDV to Manual-Minimum.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 1 (Cont.)		1.4 Refer to the following Tech. Specs: • TS 3.7.1.6, "Atmospheric Relief Valve The US should determine that the "D" ASDV is operable based upon the availability to control the valve using the "Jog" switch. • TS 3.6.3, "Containment Isolation Valves" 1.5 Refer to FR-H.4, "Response to Loss of Normal Steam Dump Capabilities" The US should determine that the valve remains operable as a containment isolation valve, no additional actions are required.
	When the crew has completed the Alarm Response Procedure or at the Lead Examiner's discretion, proceed to the next event.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 2 Inadvertent Train "B" HELB actuation	**Perform the following:** € **SELECT:Scenario** € **SELECT: NRC** € **SELECT: Demo Exams** € **SELECT: 2018 LOIT NRC Exam Scenario 1** € **SELECT: Open** € **SELECT: Run** **Note:** The associated component malfunctions will automatically clear after 3 minutes. The crew should dispatch NSO's to investigate the cause of the HELB actuation. When they do, after a few minutes report the following: **"A welding machine appears to have been to close to a HELB detector and caused the actuation from the area of the PAB letdown/charging room. The welder was welding a bracket on the wall in preparation for an outage TMOD. I have instructed the welder to stop work."**	**Event 2: PSO (I) US (I)** Associated Alarms: • F5897, "HELB Actuation Train B" • D7410, "SG A Otbd Bldn Iso Vlv Closed (SB-V9) • D7411, "SG A Otbd Bldn Iso Vlv Closed (SB-V10) • D7412, "SG A Otbd Bldn Iso Vlv Closed (SB-V11) • D7413, "SG A Otbd Bldn Iso Vlv Closed (SB-V12) • D7885, "Ltdn Contm Iso Vlv-150 Full Closed" • Since letdown is isolated and charging is being maintained to RCP seals, D4436, "Pzr Lvl Deviation High + BU Htrs On" will eventually come into alarm. **NOTE:** The HELB actuation will cause letdown flow to isolate. The US should direct the PSO to take manual control of charging flow and charge to the RCP seals only. This action is done as a Skill of the Operator Task prior to formally implementing OS1290.01. The US should implement OS1290.01, "Response to HELB Systems Actuation or Malfunction". Step 1: Check if HELB Actuation Required: • F5896 HELB Actuation Train A-In Alarm -or- • F5897 HELB Actuation Train B-In Alarm YES-The PSO should identify that F5897 is in alarm -or- • Any HELB area temperature-Greater than 120°F Step 2: Verify HELB Isolation: YES-The PSO should verify that CS-V-150, AS-V-176, SB-V-9, SB-V-10, SB-V-11, and SB-V-12 are all closed

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 2 (Cont.)	If the crew dispatches an NSO to close the SGBD needle valves then perform the following: € **SELECT:Sim Diagrams** € **SELECT: SB1** € **CLICK ON: rfSB013** € **Final Value: INPUT "0"** € **Ramp Time: INPUT "30"** € **SELECT: Insert** € **Repeat for the other three valves**	Step 3: Align Affected System Following HELB Isolation: • Letdown isolation: a. Check CS-V-145 closed YES-PSO should verify closed b. Adjust charging as necessary for RCP seal injection and pressurizer level control: • CS-FK-121 • CS-HCV-182 PSO should be charging to the RCP seals only while letdown flow is isolated. • Auxiliary steam system isolation: US may tell BOP to begin pursuing the or may call work control or spare NSO • Steam generator blowdown system isolation The crew should dispatch an NSO to close SB-V-21, 22, 23, and 24 Step 4: Check If Line Break Has Occurred: The US should determine that the HELB was inadvertent based on the information received from the NSO. RNO-If line break has not occurred or HELB isolation is spurious, then go to Step 7.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 2 (Cont.)		Step 7: Check If Normal Letdown Can Be Established: a. Check HELB actuation-Reset YES-PSO should verify that the HELB actuation is reset. b. Verify charging flow-Greater than 50 gpm YES-PSO may have reduced charging flow to the seals only, however flow will be adjusted to greater than 50 gpm. c. Pressurizer level-Greater than 17% YES-PSO should verify that level is greater than 17%. d. Establish normal letdown 1) Align PCCW to letdown heat exchanger YES-PSO should verify that CC-V-341 is open and that CS-TK-130 is in auto. 2) Close letdown flow control valves PSO should close/verify closed CS-HCV-189 and 190. 3) Open letdown line isolation valves PSO should verify CS-V-149 is open then open CS-V-150. 4) Open letdown line isolation valves: PSO should open/verify open RC-LCV-459, RC-LCV-460, and CS-V-145

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
		5) Manually control or monitor CS-PK-131 response and establish letdown flow using letdown flow control valves. PSO should slowly establish letdown flow by opening CS-HCV-189 or 190 and establishing/verifying proper backpressure. 6) Go to Step 9
	Once the crew has completed establishing letdown flow, or at the Lead Examiner's discretion proceed to the next event.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

Event 3
Steam Generator "D" Tube Leak and Plant downpower to <50% within 1 hour
	Perform the following:
	€ **SELECT:MF List**
	€ **SELECT: Steam Generator**
	€ **SELECT: mfSG001D, "SG D Dbl End Tube Rupture Hot Side"**
	€ **Final: INPUT "20"**
	€ **Ramp: INPUT "10"**
	€ **SELECT: Insert**
	
	When the "D" steamline is in alarm and the crew identifies the generator leak then perform the following:
	€ **SELECT: Scenario**
	€ **SELECT: NRC**
	€ **SELECT: Demo Exams**
	€ **SELECT: 2018 LOIT NRC Sim Exam 4 Scenario 3**
	€ **SELECT: Open**
	€ **SELECT: Run**
		Event 3: PSO (C,R) BOP (C) US (C,TS)
		
		Associated Alarms:
		• B8442, "Pri to Sec Leak Rate of Change Hi"
		• B8443, "Pri to Sec Leak Rate of Change Hi-hi"
		• RDMS Alarms:
		  • RM6481-2, "Main Steam Line Loop 4 Hi-Hi"
		  • "Pri>Sec Leak Rate Trend-Rate of Change Hi-Hi"
		  • RM6505-1, "Condsr Air Evacuation Hi-Hi"
		
		PSO will notify US of decreasing PZR pressure and level. US will 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.
		
		The crew will implement OS1227.02, "Steam Generator Tube Leak: :
		Step 1: Check RCP Status:
		PSO should report 4 RCPs running.
		Step 2: Check If Pressurizer Level Can Be Maintained:
		PSO should report PZR level is stable and his leakrate by flow balance is 30 gpm.
		BOP should report leak rate by mass balance is 20 gpm.
		Step 3: Try To Identify Affected SG:
		• US should notify chemistry to implement CS0905.08, Response to a Primary to Secondary Leak.
		• PSO or BOP should report leak is on the 'C' SG based on high radiation from the 'D' SG steamline.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 3 (Cont.)		Step 4: Check If VCT Level Can Be Maintained: PSO should report VCT level and that level can be maintained with auto makeup. Step 5: Determine Steam Generator Tube Leakage: • PSO should report leakrate by flow balance is 20 gpm. • BOP should report leakrate by mass balance is 20 gpm. • US should implement the RNO: Reduce power to 50% within one hour <u>AND</u> be in Mode 3 within the next two hours. Refer to ER 1.1, Classification of Emergencies: Category S – System Malfunction Category A – Abnormal Rad Levels/Radiological Effluent Category F – Fission Product Barrier Degradation Matrix Go to Step 7. US should enter T.S. 3.4.6.2 action a for SG tube leakage.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**

Event 3 (Cont.)		US should implement OS1231.04, "Rapid Down Power":
		Step 1: Perform Notifications per ODI.61, Redeclaration/Joint Owner Notification Guidelines.
		US should notify SM to perform the notifications.
		Step 2: Perform Down Power Briefing per ATTACHMENT A
		Power decrease priorities:
		• Load schedule should be maintained.
		• Tavg/Tref control band should be maintained:
		  • Between -1°F and +3.5°F to insert control rods in auto
		  • Between -3°F and +3°F with control rods in manual
		• AFD should be maintained near the administrative control band during the transient.
		Reactivity control guidance:
		• 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
Event 3 (Cont.)		Rod Control guidance: • 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.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 3 (Cont.)		Step 3: Align Rod Control System: PSO should verify/place rod control in auto. Step 4: Determine Boration Value For Desired Power Level: PSO should obtain boration value per ODI.56. US should verify boration value per ODI.56. NOTE: The US should give Attachment B for the PSO to perform at Step 5. The US will then proceed to Step 6 to give direction to the BOP for turbine control. Step 5: Perform Boration: PSO should perform Attachment B: PSO will read NOTE prior to Attachment B, step 1: The maximum boration flow rate in normal mode is 40 GPM. PSO should place the BLENDER MODE START SWITCH to STOP. PSO should place the BORIC ACID BLENDER MODE SELECTOR SWITCH to BORATE. PSOshould perform the following using CS-FIQ-111 controller: • PSO will set the desired BORIC ACID quantity. • PSO will set the desired BORIC ACID flow rate. • PSO will turn off the STEP BACK feature. • PSO will turn the BLENDER MODE START SWITCH to START and HOLD for approximately one second.PSO will verify the plant responds as expected.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 3 (Cont.)		NOTE: Attachment B will remain in progress for the duration of the makeup. US should 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 should setup to reduce turbine load (MWE) as necessary to maintain load reduction schedule by selecting desired Load Ramp Rate and the desired Load Setpoint. Step 7: Initiate PZR Forced Spray PSO should 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.
	Once the crew has commenced the plant downpower, or at the Lead Examiner's discretion proceed to the next event.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 Steam Generator "D" Tube Rupture and loss of offsite power.	**Perform the following:** € **SELECT:MF List** € **SELECT: Electrical Distribution** € **SELECT: mfED038, "Loss of Offsite Power (No Power)** € **Final: SELECT "1:True"** € **SELECT Insert**	**Event 4: PSO (M) BOP (M) US (M)** US should implement E-0, "Reactor Trip or Safety Injection": Step 1: Verify Reactor Trip: YES-PSO should verify that the reactor is tripped. Step 2: Verify Turbine Trip: YES-BOP should verify that the turbine is tripped.
Event 5 EDG "A" fails to automatically start.	**Once the crew had started EDG 1A and the sequencer is progressing, run Scenario 4 by performing the following:** € **SELECT: Scenario** € **SELECT: NRC** € **SELECT: Demo Exams** € **SELECT: 2018 LOIT NRC Sim Exam Scenario 4** € **SELECT: Open** € **SELECT: Run**	**Event 5: BOP (C) US (C)** **Critical Task 1: Energize at least one ac emergency bus prior to necessitating entry into ECA-0.0, "Loss of All AC"** Step 3: Verify Power to AC Emergency Busses: a. AC Emergency Busses-At Least One Energized NO-The BOP should identify that the "A" Emergency Diesel Generator did not start and that the "B" Emergency Diesel has tripped. RNO-The BOP should initiate an emergency start of the "A" diesel by pushing both emergency start pushbuttons. Step 4: Check if SI is actuated The crew may determine that SI is not required and go to ES-0.1, "Reactor Trip Response". If they do this then they should utilize the OAS guidance in OS1227, as follows:

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		"If PZR level can not be maintained greater than 7% using two charging pumps through the normal charging header, 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 US should re-enter E-0, "Reactor Trip or Safety Injection" and perform the immediate actions Step 1: Verify Reactor Trip: YES-PSO should verify that the reactor is tripped. Step 2: Verify Turbine Trip: YES-BOP should verify that the turbine is tripped. Step 3: Verify Power to AC Emergency Busses: a. AC Emergency Busses-At Least One Energized YES-The BOP should verify that Bus 5 is energized. b. AC emergency Busses-Both Energized NO-The BOP should identify that Bus 6 is not energized and the US should state that Bus 6 can be re-energ. per Att B as time permits. Step 4: Check if SI is Actuated: a. Check SI annunciators lit YES-PSO should verify that SI is actuated. b. Verify both trains of SI actuated YES-PSO should verify that both trains are actuated

		Event 6: PSO (C) US (C) **Critical Task 2: Close the Pressurizer PORV Block Valve prior to necessitating entry into ECA-3.1, "SGTR With Loss of Reactor Coolant-Subcooled Recovery Desired**

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		Step 5: Perform ESF Verification Per Attachment A: PSO should perform Attachment A and inform the US that Train A ESF equipment status is satisfactory. Step 6: Monitor RCS Temperature-Stable At Or Trending To 557°F: NO-This is a continuous action step. With a loss of offsite power the condenser steam dumps are not available. RCS temperature will likely trend upward towards the ASDV setpoint, which coincides with 561°F. RNO-If temperature is greater than 557°F, then: • Dump steam to condenser -or- • Dump steam using ASDVs The BOP should be monitoring/operating ASDV controllers to dump steam accordingly. Step 7: Check RCS Isolated: a. Check letdown valves- CLOSED YES-PSO should verify that CS-V-145, RC-LCV-459, and RC-LCV-460 are all closed. b. PORVs-CLOSED YES-PSO should verify that the PORVs are closed. c. Normal PZR spray valves-CLOSED YES- PSO should verify that the spray valves are closed.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		Step 8: Check if RCP's Should Be Stopped **NOTE:** RCPs will not be running due to loss of offsite power. Step 9: Check if SG Pressure Boundary is faulted: a. Check pressures in all SGs • Any SG pressure decreasing in an uncontrolled manner, or • Any SG completely depressurized NO-BOP should identify that there are no faulted SGs Step 10: Check if SG U-Tubes Are Intact: • Main Steamline radiation-Normal on each line • Condenser air evacuation radiation- Normal • Steam generator blowdown radiation- Normal • SG narrow range level-No uncontrolled level increase NO-BOP should identify that condenser air evac radiation and "D" main steam line radiation indications are not normal. RNO-Perform the following: a. If narrow range level in the ruptured SG(s) is greater than 6% (normal containment) then open EFW miniflow valves and stop feed to the ruptured SG. The BOP should take this action as soon as it is identified that level is greater than 6% to avoid SG overfill. b. Go to E-3, Steam Generator Tube Rupture, Step 1 The US should transition to E-3

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		US should implement E-3, "Steam Generator Tube Rupture": Step 1: Check if RCPs should be stopped: Note: RCPs should not be running due to loss of offsite power. Step 2: Identify Ruptured SGs: a. Uncontrolled increase in any SG narrow range level -or- b. High radiation from any SG steamline -or- c. High radiation from any SG sample -or- d. High radiation from any SG blowdown line The BOP should identify that the "D" Steam Generator is ruptured. Step 3: Isolate Flow From Ruptured SG(s): a. Adjust ruptured SG ASDV setpoint to 1125 PSIG BOP should identify that the "D" ASDV is set at 1125 PSIG. b. Check ruptured ASDV-Closed YES-BOP should verify that "D" ASDV is closed c. Isolate the ruptured SG steam supply to turbine driven EFW pump by closing the applicable valve The BOP should identify that the "D" SG does not supply steam to the EFW pump d. Verify blowdown isolation valve(s) from ruptured SG-CLOSED YES-PSO should verify that SB-V-12 is closed e. Close ruptured SG(s) upstream drain valves PSO should identify that MSD-V-47 is closed. f. Close ruptured SG(s) MSIV and bypass valves PSO should verify that the "D" SG MSIV bypass valve is close and then close the "D" MSIV

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		Step 4: Check Ruptured SG Level: NOTE: This is a continuous action step that directs stopping EFW flow to the ruptured SG. The crew likely will have already secured EFW flow to the "D" SG, but if not, this step directs that action. Step 5: Check Ruptured SG(s) Isolated From Intact SG(s): • Ruptured SG(s) MSIV and bypass valves-Closed YES-The BOP should verify that the valves are closed. Step 6: Check Ruptured SG(s) Pressure-Greater Than 350 PSIG YES-The BOP should identify that the "D" SG pressure is greater than 350 PSIG (During sim validation pressure was approx. 1050 PSIG) Step 7: Initiate RCS Cooldown: a. Determine required core exit temperature based on pressure equal to or less than the lowest ruptured SG pressure: The BOP should determine the "D" SG pressure and communicate that info to the US. The US should utilize the chart in step 7 to determine required temperature. (For example, during sim validation the "D" SG pressure was 1050 PSIG. Utilizing the table in Step 7, the required cooldown temperature is 490°F. b. Dump steam to condenser from intact SG as follows: The BOP should identify that the condenser steam dumps are not available. RNO- Manually or locally dump steam at the maximum rate using the intact SG ASDV's: The BOP should dump steam from the A, B, and C SGs

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)	As soon as the PSO has completed the Attachment B depressurization then perform the following: **Insert the following malfunction to fail the "B" PORV closed:** € **SELECT: CMF List** € **SELECT: Component-Reactor Coolant** € **SELECT: AOVs** € **SELECT: avRCPCV456B** € **Action: SELECT "Fail Closed"** € **SELECT: Insert** **Insert the following event triggers to fail the "A" PORV open when used during subsequent depressurization:** € **SELECT: Event Triggers** € **SELECT: NRC** € **SELECT: Demo Exams** € **SELECT: 2018 NRC Exam 4 ET 1** € **SELECT: Open** € **SELECT: Activate**	c. Depressurize the RCS, as necessary and block P-11 per Attachment B The PSO should perform Attachment B d. Core exit TCs-Less Than Required Temperature: Note: Initially the answer will be NO. RNO-Continue with Steps 8 through 13. When core exit TCs are less than required temperature, then do Step 7e. The US should move forward and perform Steps 8-13 while the cooldown continues Step 8: Check Intact SG Levels: This is a continuous action step. The intent of the step is to maintain greater than 500 GPM EFW flow to the intact SGs until level criteria is satisfied. At that point step 8b would be performed to maintain intact SG narrow range levels 25-50% Step 9: Check PZR PORVs And Block Valves: • Power to block valves-Available • PORVs-Closed • Block valves-At Least One Open YES-The PSO should verify that all three conditions are satisfied. Step 10: Reset SI The PSO should take the SI reset switches to Reset and verify that the associated hardwire alarms reset. Step 11: Reset Containment Isolation Phase A And Phase B The PSO should take the "T" and "P" reset switches to Reset and verify that the associated hardwire alarms reset.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		Step 12: Check Instrument Air Supplies: The BOP should verify that the instrument air headers and containment instrument air headers are normal. The PSO should verify that the PCCW containment isolation valves are all open. Step 13: Check if RHR Pumps Should Be Stopped: a. RHR pumps-Any Running With Suction Aligned To The RWST YES-The PSO should verify that both RHR pumps are running b. RCS pressure-Greater Than 300 PSIG YES-The PSO should verify that RCS pressure is greater than 350 PSIG (Note: During sim validation RCS pressure was approx. 1100 PSIG and stable) c. Stop RHR pumps and place in standby PSO should stop both RHR pumps and place them in standby. Step 14: Check If RCS Cooldown Should Be Stopped a. Core exit TCs-Less Than Required Temperature NOTE: This step is a holding point. The RNO states "Do not proceed until core exit TCs are less than required temperature." Once the temperature requirement is satisfied, then the crew should continue executing Step 14: b. Stop RCS cooldown When the cooldown temperature criteria is met then the BOP should close the applicable ASDVs. c. Maintain core exit TCs-Less Than Required Temperature. The BOP should continue to monitor temps.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		Step 15: Check Ruptured SGPressure-Stable Or Increasing YES-The BOP should verify that the "D" SG pressure is stable (Note: During sim validation the "D" SG pressure was stable at 1100 PSIG) Step 16: Check RCS Subcooling-Greater Than 60°F YES-The PSO should verify that subcooling is greater than 60°F. (Note: During sim validation RCS subcooling was approx.. 110°F) Step 17: Depressurize RCS To Minimize Break Flow And Refill PZR: a. Normal PZR spray-Available NO-The PSO should identify that normal spray is not available because the RCPs are not running. RNO-Go to Step 18 Step 18: Depressurize the RCS Using PZR PORV To Minimize Break Flow And Refill PZR: a. PZR PORV-At Least One Available YES-The PSO should identify that both PORVs are available (Note: The "B" PORV block valve is de-energized because Bus 6 is de-energized. If the PSO attempts to open the "B" PORV it will not open. The PSO will have to open the "A" PORV.) b. Open one PZR PORV until ANY of the following conditions are satisfied: • Both of the following: 1) RCS Pressure-Less Than Ruptured SG Pressure -and- 2) PZR Level-Greater than 7% -OR-

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Event 4 (Cont.)		• PZR Level-Greater Than 75% -OR- • RCS Subcooling-Less Than 40°F
Event 6 PORV fails to close at E-3 depressurization		**Event 6: PSO (C), US (C)** **Critical Task 2: Close the Pressurizer PORV Block Valve prior to necessitating entry into ECA-3.1, "SGTR With Loss of Reactor Coolant-Subcooled Recovery Desired** c. Close PZR PORV PSO should identify that the "A" PORV will not close. RNO-Close the block valve PSO should close the "A" PORV Block Valve Step 19: Check RCS Pressure-Increasing YES-PSO should identify that RCS pressure is increasing after the "A" PORV Block Valve is closed Step 20: Check If ECCS Flow Should Be Terminated: a. RCS Subcooling-Greater Than 40°F YES-PSO should verify adequate subcooling b. Secondary heat sink: YES-BOP should verify that there is greater than 500 GPM feed flow AVAILABLE c. RCS pressure-Stable or Increasing YES-PSO should verify that RCS pressure is stable/increasing d. PZR Level-Greater Than 7% YES-PSO should verify level greater than 7%

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Event 4 (Cont.)		Step 21: Stop ECCS Pumps And Place In Standby: • All but one CCP (Note: Bus 6 is de-energized so there is only one pump running.) PSO should identify that only the "A" CCP is running. • SI pumps PSO should stop both SI pumps and place them in standby.
	End the exam when the crew completes Step 21, or at the Lead Examiners discretion.	**Emergency Plan Classification:** (Due to SG tube rupture) **FA1:** Any loss or potential loss of either fuel clad or RCS barriers.

***** END OF SCENARIO *****

QUANTITATIVE ATTRIBUTES

(Use this form for NRC/INPO Evaluations only as required to document associated quantitative information.)

Malfunctions:

Before EOP Entry:

1. ASDV "D" fails open
2. Inadvertent Train "B" HELB actuation
3. Steam Generator "D" tube leak and plant downpower to <50% within 1 hour

After EOP Entry:

1. Emergency Diesel Generator "A" fails to automatically start
2. PORV fails to close at E-3 depressurization

Abnormal Events:

1. ASDV "D" fails open
2. Inadvertent Train "B" HELB actuation
3. Steam Generator "D" tube leak and plant downpower to <50% within 1 hour

Major Transient:

Steam Generator "D" tube rupture and loss of offsite power.

Critical Tasks:

1. Energize at least one ac emergency bus prior to necessitating entry into ECA-0.0, "Loss of All AC"
2. Close the Pressurizer PORV Block Valve prior to necessitating entry into ECA-3.1, "SGTR With Loss of Reactor Coolant-Subcooled Recovery Desired

SIMULATOR EXERCISE GUIDE SCENARIO

Critical Tasks:

1) Energize at least one ac emergency bus prior to necessitating entry into ECA-0.0, “Loss of All AC”
2) Close the Pressurizer PORV Block Valve prior to necessitating entry into ECA-3.1, “SGTR With Loss of Reactor Coolant-Subcooled Recovery Desired