ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: South Texas Project **Date of Examination:** 7-15-19

Examination Level: RO ■ SRO □ **Operating Test Number:** LOT 23 NRC

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A1 K/A Importance: 3.6	M,R	2.1.18 Ability to make accurate, clear, and concise logs, records, status boards, and reports. Record Operator Logs – 0PSP03-ZQ-0028
Conduct of Operations A2 K/A Importance: 3.9	D,R	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. Perform an RWST Blended Makeup Calculation
Equipment Control A3 K/A Importance: 4.6	D,P,R	2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels. Determine H2 Recombiner Power Settings
Radiation Control A4 K/A Importance: 3.2	D,R	2.3.4 Knowledge of radiation exposure limits under normal and emergency conditions. Calculate Maximum Stay Time (Room M108C)
Emergency Plan	N/A	N/A

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

*Type Codes and Criteria:
(C)ontrol Room, (S)imulator, Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1, randomly selected)

ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: South Texas Project **Date of Examination:** 7-15-18

Examination Level: RO ☐ SRO ■ **Operating Test Number:** LOT 23 NRC

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A5 K/A Importance: 3.4	D,P,R	2.1.42 Knowledge of new and spent fuel movement procedures. Determine Close Contact Fuel Assembly Movement
Conduct of Operations A6 K/A Importance: 4.4	D,R	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. Review a Calorimetric Heat Balance and Evaluate Technical Specifications
Equipment Control A7 K/A Importance: 4.1	D,R	2.2.12 Knowledge of surveillance procedures. Review Completed Surveillance (ECW)
Radiation Control A8 K/A Importance: 3.8	D,R	2.3.6 Ability to approve release permits. Approve a Liquid Waste Release Permit
Emergency Plan A9 K/A Importance: 4.4	M,R	2.4.44 Knowledge of emergency plan protective action recommendations. Determine PARs

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

*Type Codes and Criteria:
(C)ontrol Room, (S)imulator, Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1, randomly selected)

STP LOT-23
NRC Admin JPM Description

RO

(A1) Record Operator Logs – 0PSP03-ZQ-0028
Demonstrate the ability to Perform Control Room Operator Logs from 0PSP03-ZQ-0028, Operator Logs, for any adverse trends and the appropriate corrective actions that would need to be taken in accordance with 0POP01-ZQ-0022, Plant Operations Shift Routines.

(A2) Perform an RWST Blended Makeup Calculation
Demonstrate the ability to set the boric acid flow integrator for a blended makeup to the RWST using 0POP02-CV-0001, Makeup to the Reactor Coolant System.

(A3) Determine H2 Recombiner Power Settings
Demonstrate the ability to calculate the required power setting for operation of a Hydrogen Recombiner in a post-LOCA environment.

(A4) Calculate Maximum Stay Time (Room M108C)
Demonstrate the ability to determine stay times based on dose rates given in an RWP.

SRO

(A5) Determine Close Contact Fuel Assemble Movement
Demonstrate the ability to review Fuel Transfer Forms and interpret procedure guidance for Close Contact Fuel Assembly moves in accordance with 0POP08-FH-0001, Refueling Machine Operating Instructions, Addendum 4, Guidelines For Close Contact Fuel Assembly Movements.

(A6) Review a Calorimetric Heat Balance and Evaluate Technical Specifications.
Demonstrate the ability to perform a Calorimetric Verification and evaluate TSs. 0PEP02-CU-0001, Calorimetric Verification, and 0PSP03-NI-0001, Power Range NI Channel Calibration.

(A7) Review Completed Surveillance (ECW)
Demonstrate the ability to review a completed surveillance on the Essential Cooling Water System per 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, in accordance with 0PGP03-ZE-0004, Plant Surveillance Program.

(A8) Approve completed Liquid Waste Release Permit.(alternate path actual release did not match the approved release limits)
Demonstrate the ability to review a completed Liquid Waste Release Permit and determine if it was completed correctly. 0PSP07-WL-LDP1, Liquid Effluent Permit.

(A9) Determine Appropriate Emergency Plan Protective Action Recommendation
Demonstrate the ability to correctly determine an Emergency Protective Action Recommendation for a given condition requiring entry into the STPNOC Emergency Action Plan in accordance with 0ERP01-ZV-IN07, Offsite Protective Action Recommendations.

STPNOC

Job Performance Measure

RECORD OPERATOR LOGS – 0PSP03-ZQ-0028

JPM Number: NRC A1

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS

Unit 1 is in Mode 1 and at 100% power. For Night Shift the Operator Log Surveillance, 0PSP03-ZQ-0028, was turned into the Unit Supervisor, however, the Unit Supervisor noticed that Logsheet 1, Page 13 of 44 was NOT fully completed.

INITIATING CUE

Per 0POP01-ZQ-0022, Plant Operations Shift Routines, and 0PSP03-ZQ-0028, Operator Logs, the Unit Supervisor directs you to complete the following from 0PSP03-ZQ-0028, Operator Logs:

1. Logsheet 1, Modes 1, 2, 3 and 4 Control Room Logsheet, Page 13 of 44
2. Logsheet 1, Modes 1, 2, 3 and 4 Control Room Logsheet, Page 1 of 44

When completed turn the two pages in for review.

NOTE:

- The Unit Supervisor has all other pages of Logsheet 1 and there are no issues on those pages.
- There are no issues on the previous set of logs.
- The current time is 0145.
- Use the given pictures for the data needed for Logsheet 1, Page 13 of 44
- When taking data record to the nearest ones place. (Example: If you interpret a reading of 172.5 put 172 or 173.)
- The Plant Computer (ICS) is NOT available for the selected data.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

In recording the selected data to the Operator Logs, a circle is placed around TI-0412B data to identify LOOP A OPDT Setpoint NOT within Channel Check AND a circle is placed around TI-0431 AND/OR TI-0432B to identify less than 5% margin between LOOP C Delta-T and OPDT Setpoint.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet, Student HO1 of 0PSP03-ZQ-0028, Operator Logs, Student HO2 of 0POP01-ZQ-0022, Plant Operator Shift Routines, Sec. 4, Plant Operations Logs, and Student HO3 associated pictures of Control Room panel CP-005. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. A KEY is provided.					
1	Record data for RCS TAVG and RCS TAVG DNB Parameter.	Records the following RCS TAVG readings: • TI-0412A 592°F • TI-0422A 592°F • TI-0432A 594°F • TI-0442A 593°F • Average reading 592.75°F **NOTE:** **The average of the four channels can be between 592°F and 594°F.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*2	Record data for LOOP DELTA-T.	Records the following LOOP DELTA-T readings and identifies that LOOP C DELTA-T does NOT have a greater than 5% margin to the OPDT Setpoint. • TI-0411 100% • TI-0421 100% • **TI-0431 102%** • TI-0441 101% **NOTE:** **When TI-0431 is compared to TI-0432B there is NOT a 5% margin. At best there is a 4% margin. The data for TI-0431 and/or TI-0432B need to be circled.**	___	___	___
*3	Record data for OPDT Setpoint.	Records the following OPDT Setpoint readings and identifies that LOOP A OPDT Setpoint is NOT within the Channel Check. • **TI-0412B 110%** • TI-0422B 108% • TI-0432B 105% • TI-0442B 108% **NOTE:** **The data for TI-0412B needs to be circled to identify the reading is NOT within the Channel Check.**	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: RECORD OPERATOR LOGS – 0PSP03-ZQ-0028

JPM Number: NRC A1 Revision Number: 0

Task Number and Title: 68900, Maintain required logs, records, charts, printouts and status reports per 0POP01-ZQ-0022.

K/A Number and Importance: 2.1.18 3.6/3.8

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0POP01-ZQ-0022, Plant Operator Shift Routines, Rev 80
0PSP03-ZQ-0028, Operator Logs, Rev 151

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 2, 3

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

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Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 is in Mode 1 and at 100% power. For Night Shift the Operator Log Surveillance, 0PSP03-ZQ-0028, was turned into the Unit Supervisor, however, the Unit Supervisor noticed that Logsheet 1, Page 13 of 44 was NOT fully completed.

INITIATING CUE

Per 0POP01-ZQ-0022, Plant Operations Shift Routines, and 0PSP03-ZQ-0028, Operator Logs, the Unit Supervisor directs you to complete the following from 0PSP03-ZQ-0028, Operator Logs:

1. Logsheet 1, Modes 1, 2, 3 and 4 Control Room Logsheet, Page 13 of 44
2. Logsheet 1, Modes 1, 2, 3 and 4 Control Room Logsheet, Page 1 of 44

When completed turn the two pages in for review.

NOTE:

- The Unit Supervisor has all other pages of Logsheet 1 and there are no issues on those pages.
- There are no issues on the previous set of logs.
- The current time is 0145.
- Use the given pictures for the data needed for Logsheet 1, Page 13 of 44
- When taking data record to the nearest ones place. (Example: If you interpret a reading of 172.5 put 172 or 173.)
- The Plant Computer (ICS) is NOT available for the selected data.

STPNOC

Job Performance Measure

PERFORM AN RWST BLENDED MAKEUP CALCULATION

JPM Number: NRC A2

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS:

Unit 1 is in MODE 1 at 100% steady state conditions.

- Refueling Water Storage Tank (RWST) level is 485,900 gallons.
- RWST Boron Concentration is 2925 ppm.
- Boric Acid Tank 1A Boron Concentration is 7325 ppm.
- Boric Acid Tank 1B Boron Concentration is 7305 ppm.

You are the Unit 1 Extra Reactor Operator.

INITIATING CUE:

A scheduled activity will have the on-shift Crew raise RWST level to 510,000 gallons using the Reactor Makeup Water Storage Tank and Boric Acid Tank 1A.

The Unit Supervisor directs you to calculate the following per 0POP02-CV-0001, Makeup to the Reactor Coolant System, Section 15, Filling the RWST:

- Calculate the 'BA Batch/Gallons'
- Calculate the 'Tot M/U Batch/Gallons'
- Calculate the 'BA Flow Control FK-0110' setpoint

NOTE:

- **RO Calculator is NOT available.**

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Correctly calculates the Boric Acid Batch/Gallons, Step 1 (9623 to 9624 gallons); Total M/U Batch/Gallons, Step 2 (24,100); 'BA Flow Control FK-0110' setpoint, Step 3 (7.9 to 8.0) for the given conditions.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet and Student HO of 0POP02-CV-0001, Makeup to the Reactor Coolant System. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. The Task Standard provides sufficient data to determine successful JPM completion. No KEY is provided.					
*1	SET "BA BATCH/GALLONS FY-0110B" flow integrator for calculated gallons using the following formula: (Refer to Addendum 1, Setting Digital Reactor Makeup Flow Integrators) BA batch/gallons = $\frac{\text{Tot M/U batch gal} * \text{RWST Conc.}}{\text{BAT Conc.}}$ (From Step 15.11)	Calculates the Tot M/U batch gallons for RWST: Desired level (510,000 gallons) minus the current level (485,900 gallons) equals 24,100 gallons. Calculates the BA batch/gallons: Tot M/U batch gallons (24,100 gallons) times RWST Concentration (2925 ppm) divided by BAT 1A Concentration (7325 ppm) **NOTE:** **BA batch/gallons equals 9624 gallons of Boric Acid.** **The actual BA batch/gallons calculates to 9623.549… gallons. If the student rounds the calculated value down to 9623 gallons the task will still be satisfied.** **A calculated value of 9650 gallons would be incorrect as this would be the value if BAT 1B was used in the calculation.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*2	SET "TOT M/U BATCH GALLONS FY-0111B" flow integrator for desired gallons. (From Step 15.12)	Calculates the Tot M/U batch gallons for RWST: Desired level (510,000 gallons) minus the current level (485,900 gallons) equals 24,100 gallons. **NOTE:** **This calculation for total M/U gallons is the same as in the previous step. 24,100 gallons**	___	___	___
*3	SET “BA FLOW CONT FK-0110” setpoint, using the following formula: Setpoint = $\frac{\{\mathbf{K}\} \times \text{Boron Concentration of RWST}}{\text{Boron Concentration of BAT}}$ (From Step 15.13)	Calculates the “BA FLOW CONT FK-0110” setpoint: {K} (20) (Modes 1, 2, 3, & 4 when CV-0198 is open) times Boron Concentration of RWST (2925 ppm) divided by Boron Concentration of BAT 1A (7325 ppm) equals 8.0 for the setpoint. **NOTE:** **The actual setpoint calculates to 7.9863… If the student rounds the calculated value down to 7.9 the task will still be satisfied.** **If the student uses Boron Concentration for BAT 1B the setpoint calculation will not be significantly different however if the student uses 10 for {K} (Modes 4, 5, 6 and Core Off Loaded to SFP, when CV-0198 is throttled to < 110 gpm) then the calculated setpoint will be about 3.99 which would be incorrect.**	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: PERFORM AN RWST BLENDED MAKEUP CALCULATION

JPM Number: NRC A2 Revision Number: 0

Task Number and Title: 70250, Operate the CVCS to Makeup to the RWST

K/A Number and Importance: 2.1.25 3.9/4.2

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0POP02-CV-0001, Makeup to the Reactor Coolant System, Rev 54

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 1, 2, 3

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

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Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS:

Unit 1 is in MODE 1 at 100% steady state conditions.

- Refueling Water Storage Tank (RWST) level is 485,900 gallons.
- RWST Boron Concentration is 2925 ppm.
- Boric Acid Tank 1A Boron Concentration is 7325 ppm.
- Boric Acid Tank 1B Boron Concentration is 7305 ppm.

You are the Unit 1 Extra Reactor Operator.

INITIATING CUE:

A scheduled activity will have the on-shift Crew raise RWST level to 510,000 gallons using the Reactor Makeup Water Storage Tank and Boric Acid Tank 1A.

The Unit Supervisor directs you to calculate the following per 0POP02-CV-0001, Makeup to the Reactor Coolant System, Section 15, Filling the RWST:

- Calculate the 'BA Batch/Gallons'
- Calculate the 'Tot M/U Batch/Gallons'
- Calculate the 'BA Flow Control FK-0110' setpoint

NOTE:

- **RO Calculator is NOT available.**

Provide Answer Below:

BA Batch/Gallons_____

Tot M/U Batch/Gallons_____

BA Flow Control FK-0110 Setpoint_____

STPNOC

Job Performance Measure

DETERMINE H2 RECOMBINER POWER SETTINGS

JPM Number: NRC A3

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS

Unit 1 was operating at 100% power when it experienced a loss of coolant accident. The Control Room crew is currently in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant at the step to monitor Containment Hydrogen levels. Hydrogen concentration is reported to be at 0.7%.

Another operator has completed some initial steps to place the Hydrogen Recombiners in service in accordance with 0POP02-CG-0001, Electric Hydrogen Recombiners and has completed steps 5.1 through 5.7.

INITIATING CUE

You have been given 0POP02-CG-0001 and the Unit Supervisor directs you to continue in the procedure and determine the appropriate Hydrogen Recombiner power setting for BOTH Recombiner 1A AND Recombiner 1B by performing steps 5.8 and 5.9.

NOTE:

- **DO NOT use a 'most conservative' approach. Perform your determination as accurately as you can.**

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Determines Hydrogen Recombiner power setting per the key as follows: Recombiner 1A: 71.91 (+/- 1.02) kW and Recombiner 1B: 66.98 (+/- 1.02) kW

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet and Student HO of 0POP02-CG-0001, Electric Hydrogen Recombiners. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. A KEY is provided for the Examiner.					
1	Determine Pressure Factor Cp from "Recombiner Power Correction Factor versus Containment Pressure Curve". (Refer to Addendum 1)	Determines Pressure Factor Cp is 1.41 based on post-LOCA containment pressure and pre-LOCA containment temperatures provided on the student handout copy of the procedure. NOTE: The operator may review the Prerequisites and/or the Notes and Precautions of the procedure. An acceptable range of Cp will be 1.39 -1.43. These values will be used to calculate the range of correct power settings.	___	___	___
*2	Calculate required power settings for the desired Recombiner by multiplying the Pressure Factor (Cp) times the reference power.	Determines Recombiner 1A power setting should be 71.91 (+/- 1.02) kW Determines Recombiner 1B power setting should be 66.98 (+/- 1.02) kW NOTE: Refer to KEY provided with this JPM for details of calculations.	___	___	___
CUE	This JPM is complete				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: DETERMINE H2 RECOMBINER POWER SETTINGS
JPM Number: NRC A3 Revision Number: 0
Task Number and Title: 12150, PERFORM LINEUPS OF THE HYDROGEN RECOMBINER
K/A Number and Importance: 2.2.2 4.6/4.1
Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other
Alternate Path:☐ Yes ☒No
Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO
Time Critical: ☐Yes ☒No
Level of Difficulty: **3**
Reference(s): 0POP02-CG-0001, Electric Hydrogen Recombiners, Rev 9

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other
Testing Method: ☐ Simulate ☐ Perform
Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes
Critical Steps (*) 2
Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No
The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

_____

_____

_____

_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 was operating at 100% power when it experienced a loss of coolant accident. The Control Room crew is currently in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant at the step to monitor Containment Hydrogen levels. Hydrogen concentration is reported to be at 0.7%.

Another operator has completed some initial steps to place the Hydrogen Recombiners in service in accordance with 0POP02-CG-0001, Electric Hydrogen Recombiners and has completed steps 5.1 through 5.7.

INITIATING CUE

You have been given 0POP02-CG-0001 and the Unit Supervisor directs you to continue in the procedure and determine the appropriate Hydrogen Recombiner power setting for BOTH Recombiner 1A AND Recombiner 1B by performing steps 5.8 and 5.9.

NOTE:

- **DO NOT use a 'most conservative' approach. Perform your determination as accurately as you can.**

STPNOC

Job Performance Measure

CALCULATE MAXIMUM STAY TIME (Rm M108C)

JPM Number: NRC A4

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS

Unit 1 is shutdown for maintenance. An individual has been assigned to work on ED-FV-7800 that is located in room 108C in the Unit 1 MAB. The worker has the following radiation history:

- 40 year old radiation worker.
- NRC Form 4 on file
- Lifetime exposure 5.75 Rem TEDE.
- Annual exposure 1.4 Rem TEDE.

INITIATING CUE

You are to determine the maximum length of time the worker may spend in the area of the valve without exceeding the STPNOC Administrative Action Level (AAL) for Annual TEDE.

Use the Survey Map given for room 108C.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

*Calculates the maximum stay time of **12 hours** that the worker may spend in the radiation area without exceeding the Administrative Action Level (AAL) for Annual TEDE. JPM Step 2.*

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet, Student HO1 of 0PGP03-ZR-0050, Radiation Protection Program, and HO2 Survey Map. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. A KEY is provided.					
1	Obtain value for AAL on Annual TEDE from plant procedure.	Obtains the AAL on Annual TEDE of **2.0 Rem** from 0PGP03-ZR-0050, Radiation Protection Program procedure. **NOTE:** **Candidate may or may not reference plant procedures to determine the Annual TEDE AAL.** **Reference: 0PGP03-ZR-0050, Radiation Protection Program, Step 6.5.2.**	___	___	___
*2	Calculate the maximum stay time without exceeding the Annual TEDE AAL.	Determines that 1-ED-FV-7800 is in a 50 mrem/hr radiation field as per the Survey Map and calculates the maximum stay time to be **12 hours**. **NOTE:** **AAL for Annual TEDE 2000mr** **Annual exposure TEDE -1400mr** **Available Margin 600mr** Available Margin / Dose Rate = Max. Stay Time 600 mr / 50 mr/hour = **12 hours**	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: CALCULATE MAXIMUM STAY TIME (Rm M108C)

JPM Number: NRC A4 Revision Number: 0

Task Number and Title: 92186 - Given the title of an administrative procedure, DISCUSS the requirements associated with the referenced procedure.

K/A Number and Importance: 2.3.4 3.2/3.7

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0PGP03-ZR-0050, Radiation Protection Program, Rev 14

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 5 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 2

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

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_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 is shutdown for maintenance. An individual has been assigned to work on ED-FV-7800 that is located in room 108C in the Unit 1 MAB. The worker has the following radiation history:

- 40 year old radiation worker.
- NRC Form 4 on file
- Lifetime exposure 5.75 Rem TEDE.
- Annual exposure 1.4 Rem TEDE.

INITIATING CUE

You are to determine the maximum length of time the worker may spend in the area of the valve without exceeding the STPNOC Administrative Action Level (AAL) for Annual TEDE.

Use the Survey Map given for room 108C.

Write Answer Below

STPNOC

Job Performance Measure

DETERMINE CLOSE CONTACT FUEL ASSEMBLY MOVEMENT

JPM Number: NRC A5

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS

Unit 1 is in Mode 6 and core reload is in progress.

The last Fuel Assembly placed in the core was at location C4.

INITIATING CUE

You have just relieved the Core Load Supervisor on the Refueling Machine and you have the following:

- 0POP08-FH-0001, Refueling Machine Operating Instructions, Addendum 4, Instructions For Close Contact Assembly Movements, for reference.
- A copy of the current Fuel Transfer Form.
- A map of all core locations showing the current status of Fuel Assemblies that have been placed in the core.

You are to determine the type of Close Contact movement to be performed for the next three (3) Fuel Assemblies to be moved.

Use area below to describe Close Contact movement for each identified Fuel Assembly.

First Fuel Assembly:

Second Fuel Assembly:

Third Fuel assembly:

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Determines the correct Close Contact Movement for the identified Fuel Assemblies per the key. The first assembly to be moved is to core location B4, lowering on index in slow speed (Case 2). The second assembly to be moved is to core location H8, lowering off index in open water to 'open water jog height', then jog to on index and lower rest of way in slow speed (Case 3). The third assembly to be moved is to core location H7, lowering on index in slow speed (Case 2).

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet plus; Student HO1 of 0POP08-FH-0001, Refueling Machine Operating Instructions, Addendum 4, Instructions For Close Contact Assembly Movements; Student HO2 of the Fuel Transfer Form; and Student HO3 of core map showing current locations of Fuel Assemblies already placed into the core. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. A KEY is provided for the Examiner.					
*1	Determine correct Close Contact Movement for Fuel Assembly to be placed in core location B4.	Determines that Fuel Assembly to be placed in core location B4 should be LOWERED on-index at slow speed. (Case 2) **NOTE:** **Refer to KEY. Overload/Underload switch position is not required to be identified for this JPM.**	___	___	___
*2	Determine correct Close Contact Movement for Fuel Assembly to be placed in core location H8.	Determines that Fuel Assembly to be placed in core location H8 should be LOWERED in open water until clear of lower core plate pins (equal to “open water jog height” from bottom). Using manual or jog mode, move in one direction to on-index then the other direction to on-index and then lower at slow speed. (Case 3) **NOTE:** **Refer to KEY. Overload/Underload switch position is not required to be identified for this JPM.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*3	Determine correct Close Contact Movement for Fuel Assembly to be placed in core location H7.	Determines that Fuel Assembly to be placed in core location H7 should be LOWERED on-index at slow speed. (Case 2) **NOTE:** **Refer to KEY. Overload/Underload switch position is not required to be identified for this JPM.**	___	___	___
CUE	This JPM is complete				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: DETERMINE CLOSE CONTACT FUEL ASSEMBLY MOVEMENT

JPM Number: NRC A5 Revision Number: 0

Task Number and Title: 148344, Supervise Refueling Operations as the Core Load Supervisor.

K/A Number and Importance: 2.1.42 2.5/3.4

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other

Alternate Path:☐ Yes ☒No

Task Designed For: ☒ SRO Only; ☐ RO/SRO; ☐ AO/RO/SRO

Time Critical: ☐Yes ☒No

Level of Difficulty: **3**

Reference(s): 0POP08-FH-0001, Refueling Machine Operating Instruction, Rev 51, and CR 16-13605

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 1, 2, 3

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

_____

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_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 is in Mode 6 and core reload is in progress.

The last Fuel Assembly placed in the core was at location C4.

INITIATING CUE

You have just relieved the Core Load Supervisor on the Refueling Machine and you have the following:

- 0POP08-FH-0001, Refueling Machine Operating Instructions, Addendum 4, Instructions For Close Contact Assembly Movements, for reference.
- A copy of the current Fuel Transfer Form.
- A map of all core locations showing the current status of Fuel Assemblies that have been placed in the core.

You are to determine the type of Close Contact movement to be performed for the next three (3) Fuel Assemblies to be moved.

Use area below to describe Close Contact movement for each identified Fuel Assembly.

First Fuel Assembly:

Second Fuel Assembly:

Third Fuel assembly:

STPNOC

Job Performance Measure

REVIEW A CALORIMETRIC HEAT BALANCE & EVALUATE TSs

JPM Number: NRC A6

Revision Number: 0

Date: 07/15/19

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS

Unit 1 is being brought back to 100% power after a 7 day forced outage. Currently Delta-T power is at 98%. A Reactor Operator has performed a calorimetric per step 7.58.4 of 0POP03-ZG-0005, Plant Startup to 100%.

INITIATING CUE

You are the Shift Manager and you have been given the calorimetric, 0PSP03-NI-0001, Power Range NI Channel Calibration, for review per step 6.11.12.

Determine if the surveillance is ACCEPTABLE or UNACCEPTABLE

NOTE:

- **The RO Calculator for performing NI-0001 was NOT working.**
- **You are NOT required to determine Reportability.**

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

The Shift Manager determines that the Qsec %power from Data Sheet 3 was transcribed incorrectly over to Data Sheet 2 and calculates the correct As Left Difference. This miscalculation caused the As Left Difference between Qsec %power and %RTP on all 4 Power Range NI Channels to be in error.

The Shift Manager determines from the miscalculation that all 4 Power Range NI Channels must be adjusted and that Power Range Channel NI-0041 is INOPERABLE until the channel is adjusted. Refer to TS 3.3.1, Instrumentation, for Power Range Neutron Flux.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet and Student HO of 0PSP03-NI-0001, Power Range NI Channel Calibration. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. A KEY is provided for the Examiner.					
*1	The Shift Manager/Unit Supervisor SHALL: • PERFORM a second review of the test data. • SIGN and RECORD the date and time on Data Sheet 1. • TRANSFER the Data Package in accordance with 0PGP03-ZA-0055, Plant Surveillance Scheduling. (Step 6.11.12) **CUE:** **If the student identifies the error regarding Qsec %power but says Data Sheet 3 was written incorrectly instead of Data Sheet 2 then inform them that ICS point ICQUG1118O is reading correctly at 97.77%**	_ The Shift Manager determines that the Qsec %power from Data Sheet 3 was transcribed incorrectly over to Data Sheet 2 and calculates the correct As Left Difference. This miscalculation caused the As Left Difference between Qsec %power and %RTP on all 4 Power Range NI Channels to be in error. _ The Shift Manager determines from the miscalculation that all 4 Power Range NI Channels must be adjusted and that Power Range Channel NI-0041 is INOPERABLE until the channel is adjusted. Refer to TS 3.3.1, Instrumentation, for Power Range Neutron Flux.	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: REVIEW A CALORIMETRIC HEAT BALANCE & EVALUATE TSs

JPM Number: NRC A6 Revision Number: 0

Task Number and Title: SRO-12000 Authorize the start of and review surveillance tests.

K/A Number and Importance: 2.1.23 4.3/4.4

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☒ SRO Only ☐ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0PSP03-NI-0001, Power Range NI Channel Calibration, Rev 31

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 25 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 1

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

_____

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_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 is being brought back to 100% power after a 7 day forced outage. Currently Delta-T power is at 98%. A Reactor Operator has performed a calorimetric per step 7.64.4 of 0POP03-ZG-0005, Plant Startup to 100%.

INITIATING CUE

You are the Shift Manager and you have been given the calorimetric, 0PSP03-NI-0001, Power Range NI Channel Calibration, for review per step 6.11.12.

Determine if the surveillance is ACCEPTABLE or UNACCEPTABLE

NOTE:

- **The RO Calculator for performing NI-0001 was NOT working.**
- **You are NOT required to determine Reportability.**

WHEN YOU'VE COMPLETED YOUR REVIEW, PRESENT YOUR RESULTS TO THE EXAMINER.

WRITE RESULTS BELOW:

STPNOC

Job Performance Measure

REVIEW COMPLETED SURVEILLANCE (ECW)

JPM Number: NRC A7

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS

Unit 1 is operating at 100% power. ECW Pump 1A surveillance has just been completed and 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, has been presented to you for the Plant Operations review. Section 5.3 of the procedure was not required to be performed.

INITIATING CUE

You have been directed by the Shift Manger to perform the Plant Operations Review as per 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, Procedure Performance Data Sheet.

NOTE:

- **0PGP03-ZE-0004, Plant Surveillance Program, section 6.6 is available for reference.**

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Operator determines that the wrong ECW Total Flow Range was used to determine acceptability of Test Delta P and that Test Delta P IS within the acceptable range AND determines that ECW Flow to the ESF DG was NOT returned to the normal range after the surveillance per Step 5.5.5 of 0PSP03-EW-0017, Essential Cooling Water System Train A Testing.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet plus; Student HO1 of 0PSP03-EW-0017, Essential Cooling Water System Train A Testing and Student HO2 of 0PGP03-ZE-0004, Plant Surveillance Program, Section 6.6, Surveillance Test Results and Review. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. A KEY is provided for the Examiner.					
*1	Review the completed surveillance per 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, Procedure Performance Data Sheet.	Reviews the completed surveillance and determines the following: • Pump Test Results on page 2 are actually "Acceptable – All data within Acceptance Criteria". (Error carried forward) • ***On page 21, the Test Delta P is recorded under the incorrect ECW Total Flow Range of 18,000-18,049. Should be recorded on page 22 with ECW Total Flow Range of 19,000-19,049 instead.** • Step 5.4.14.4 is incorrectly completed (5.4.14.4.a should be initialed instead of 5.4.14.4.d). (Error carried forward) • ***On page 31, step 5.5.5, ECW Flow to ESF DG is outside the required range (Table 6).**	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: REVIEW COMPLETED SURVEILLANCE (ECW)

JPM Number: NRC A7 Revision Number: 0

Task Number and Title: SRO-12000 – Authorize the start of and review surveillance tests.

K/A Number and Importance: 2.2.12 3.7/4.1

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☒ SRO Only ☐ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, Rev 40
0PGP03-ZE-0004, Plant Surveillance Program, Rev 29

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 25 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 1

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

_____

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_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 is operating at 100% power. ECW Pump 1A surveillance has just been completed and 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, has been presented to you for the Plant Operations review. Section 5.3 of the procedure was not required to be performed.

INITIATING CUE

You have been directed by the Shift Manger to perform the Plant Operations Review as per 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, Procedure Performance Data Sheet.

NOTE:

- **0PGP03-ZE-0004, Plant Surveillance Program, section 6.6 is available for reference.**

STPNOC

Job Performance Measure

APPROVE A COMPLETED LIQUID WASTE RELEASE PERMIT

JPM Number: NRC A8

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS

Unit 1 is preparing to release Waste Monitor Tank (WMT) 1E. RT-8038 is Operable. Per step 5.38.4 of 0POP02-WL-0100, Liquid Waste Release, a Plant Operator has just contacted the control room to ensure that the Shift Manager has signed 0PSP07-WL-LDP1, Liquid Effluent Permit, which will authorize the release.

INITIATING CUE

You are the Shift Manager. You are to perform step 5.26 of 0PSP07-WL-LDP1, Liquid Effluent Permit, to authorize the release of WMT 1E.

NOTE:

- **Review the Liquid Effluent Permit in its entirety.**

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

*Determines **BOTH** of the two following errors **AND** that WMT 1E is NOT to be released at this time. (i.e. Does NOT sign Permit)*

- *Total sample activity is greater than the total activity guidelines. (Step 5.11)*
- *Projected Total Body Dose (31 Day) does NOT meet the Acceptance Criteria. (Step 5.14)*

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet and Student HO of 0PSP07-WL-LDP1, Liquid Effluent Permit, which includes the data for the Liquid Effluent Permit. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. A KEY is provided for the Examiner.					
1	**Procedure Step 5.1.11:** COMPARE the sample results of the WMT to be released to the activity guidelines listed below: (Ref. 0PCP01-ZA-0021) Cs-137 ≤ 1E-06 µCi/mL Total Activity (excluding Tritium and Noble Gases) ≤ 1E-06 µCi/mL **Procedure Step 5.1.14:** Verify the 31 Day Dose Projection does not exceed the limits of ODCM Part A, Control 3.11.1.3: Projected Total Body Dose (31 Day) and the Projected Max Organ Dose (31 Day) both indicate “PASS” in the Verifications Section of the Liquid Effluent Permit.	Determines the following: _ Determines that total activity is greater than 1E-06 µCi/mL. _ Determines that Acceptance Criteria for Projected Total Body Dose (31 Day) is NOT satisfied. _ Determines that the Effluent Release Permit authorizing the release of WMT 1E should not be signed at this time.	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: APPROVE A COMPLETED LIQUID WASTE RELEASE PERMIT

JPM Number: NRC A8 Revision Number: 0

Task Number and Title: 13400 - Authorize a release of liquid waste.

K/A Number and Importance: 2.3.6 2.0/3.8

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☒ SRO Only ☐ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0PSP07-WL-LDP1, Liquid Effluent Permit, Rev 22

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 1

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

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_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

Unit 1 is preparing to release Waste Monitor Tank (WMT) 1E. RT-8038 is Operable. Per step 5.38.4 of 0POP02-WL-0100, Liquid Waste Release, a Plant Operator has just contacted the control room to ensure that the Shift Manager has signed 0PSP07-WL-LDP1, Liquid Effluent Permit, which will authorize the release.

INITIATING CUE

You are the Shift Manager. You are to perform step 5.26 of 0PSP07-WL-LDP1, Liquid Effluent Permit, to authorize the release of WMT 1E.

NOTE:

- **Review the Liquid Effluent Permit in its entirety.**

STPNOC

Job Performance Measure

DETERMINE APPROPRIATE PROTECTIVE ACTION RECOMMENDATION

JPM Number: NRC A9

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

1. This is an Admin JPM.

INITIAL CONDITIONS

Due to degrading plant conditions a General Emergency was declared in Unit 1. Emergency Plan requirements with the exception of Protective Action Recommendations (PARs) are in progress or have been delegated to other individuals.

INITIATING CUE

You are the Emergency Director in the Control Room. The General Emergency was declared due to a loss of all AC Power and it will take at least 5 hours before any power can be restored.

You are at Step 1.4 of 0ERP01-ZV-SH01, Shift Manager, Checklist 4, General Emergency Checklist.

You are to determine the PARs for the State and County, including downwind Zones and Sectors, in accordance with 0ERP01-ZV-IN07, Offsite Protective Action Recommendations.

Additional Information:

- A radiological release is NOT in progress.
- Current Weather conditions are:
  - ⇒ Wind - Blowing from 30° at 5 mph.
  - ⇒ Temperature – 28°F
  - ⇒ Precipitation – Freezing Rain

THIS JPM IS TIME CRITICAL.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

The applicant considers the weather as an impediment to the Protective Action Recommendation (PAR) and determines that the PAR is as follows:

- *Shelter In Place (SIP)* ***Zone 1*** *and SIP Downwind Zones 2 – 5 Miles,* ***Zone 4****.*
- *The affected downwind sectors are J, K, L, and M.*

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Provide Initial Cue Sheet; Student HO1 of 0ERP01-ZV-IN01, Emergency Classification; Student HO2 of 0ERP01-ZV-IN07, Offsite Protective Action Recommendations; and Student HO3 of 0ERP01-ZV-SH01, Shift Manger, Checklist 4, General Emergency Checklist. When the student has reviewed the Initial Cue and they have indicated they are ready to begin the JPM, then record the start time for the JPM. A KEY is provided for the Examiner.					

1	Determine Protective Action Recommendations (PARs) at a General Emergency by one of the following methods:
	• IF a radiological release is ongoing:
	  • Performing dose assessment (STAMPEDE).
	OR
	  • Manually using procedure 0ERP01-ZV-TP01, Offsite Dose Calculations with Addendum 1, Radiological Release Protective Action Recommendations.
	• IF no radiological release, determine using Addendum 2 Protective Action Recommendation Decision Flowchart.
	• To Expand a PAR use Addendum 2, Protective Action Recommendation Decision Flowchart.
	(0ERP01-ZV-IN07, Step 5.1)
		With no radiological release in progress, the operator will go to 0ERP01-ZV-IN07, Addendum 2, Protective Action Recommendation Decision Flowchart, to determine protective action recommendations.
		(0ERP01-ZV-IN07, Step 5.1.2)
			___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
2	With no radiological release in progress, the operator evaluates PAR flowchart from 0ERP01-ZV-IN07, Offsite Protective Action Recommendations, Addendum 2, Protective Action Recommendation Decision Flowchart.	Determines PAR is to SIP ZONE 1 and downwind zones 2-5 miles. All others Monitor and Prepare. Refer to Addendum 3 for evacuated zones & affected downwind sectors. Operator goes to 0ERP01-ZV-IN07, Offsite Protective Action Recommendations, Addendum 3, Evacuate zones and affected downwind sectors.	___	___	___
*3	Determine Protective Response Zones and Affected Downwind Sectors to enter on 0ERP01-ZV-IN02, Form 1, Offsite Notification Message.	Determines PAR as follows: • SIP Zone 1 • SIP Downwind Zones 2 - 5 Miles: Zone 4. • The affected downwind sectors are J, K, L, and M.	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: DETERMINE APPROPRIATE PROTECTIVE ACTION RECOMMENDATION

JPM Number: NRC A9 Revision Number: 0

Task Number and Title: 221375 (SRO), Determine protective action recommendations (PARs)

K/A Number and Importance: 2.4.44 2.4/4.4

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☒ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☒ SRO Only ☐ RO/SRO ☐ AO/RO/SRO

Time Critical: ☒ Yes ☐ No

Level of Difficulty: **4**

Reference(s): 0ERP01-ZV-IN01, Emergency Classification, Rev 10
0ERP01-ZV-IN07, Offsite Protective Action Recommendations, Rev 17
0ERP01-ZV-SH01, Shift Manger, Rev 32

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 3

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Due to degrading plant conditions a General Emergency was declared in Unit 1. Emergency Plan requirements with the exception of Protective Action Recommendations (PARs) are in progress or have been delegated to other individuals.

INITIATING CUE

You are the Emergency Director in the Control Room. The General Emergency was declared due to a loss of all AC Power and it will take at least 5 hours before any power can be restored.

You are at Step 1.4 of 0ERP01-ZV-SH01, Shift Manager, Checklist 4, General Emergency Checklist.

You are to determine the PARs for the State and County, including downwind Zones and Sectors, in accordance with 0ERP01-ZV-IN07, Offsite Protective Action Recommendations.

Additional Information:

- A radiological release is NOT in progress.
- Current Weather conditions are:
  - ⇒ Wind - Blowing from 30° at 5 mph.
  - ⇒ Temperature – 28°F
  - ⇒ Precipitation – Freezing Rain

THIS JPM IS TIME CRITICAL.

ES-301 Control Room/In-Plant Systems Outline Form ES-301-2

Facility: South Texas Project Date of Examination: 7-15-18

Exam Level: RO ■ SRO-I ☐ SRO-U ☐ Operating Test No.: LOT 23 NRC

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
a. (S1) Re-Establish Letdown During ES-11 KA: 004 A4.06 (3.6/3.1)	A,D,E,L,S	1
b. (S2) Isolate SI Accumulators KA: 006 A4.02 (4.0/3.8)	A,D,EN,L,P,S	2
c. (S3) Transfer to Hot Leg Recirculation KA: 006 A4.05 (3.9/3.8)	D,E,L,S	3
d. (S4) Respond to High Alarm on RT-8033 or RT-8034 KA: 072 A3.01 (2.9/3.1)	A,E,L,N,S	7
e. (S5) Start an RCP KA: 003 A4.06 (2.9/2.9)	L,M,S	4P
f. (S6) Start ECW Pump and Lower ECP Level KA: 075 A4.01 (3.2/3.2)	D,L,S	8
g. (S7) Place SGFPT in service from 3300 RPM KA: 039 A4.03 (2.8/2.8)	D,S	4S
h. (S8) Roll a 13.8KV Electrical Bus KA: 062 A4.07 (3.1/3.1)	D,P,S	6
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. (P1) Fill SFP from RWST KA: 033 A1.01 (2.7/3.3)	D,R	8
j. (P2) Locally Start an ESF DG per 0POP04-ZO-0001, Control Room Evacuation, Addendum 7 KA: 064 A4.01 (4.0/4.3)	A,E,N	6
k. (P3) Failing Air to MSIVs and MSIBs KA: 039 A4.01 (2.9/2.8)	A,D,E,L	4S

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all 5 SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO/SRO-I/SRO-U
(A)lternate Path	4-6 / 4-6 / 2-3
(C)ontrol Room	
(D)irect from Bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN) gineered Safety Features	≥ 1 / ≥ 1 / ≥ 1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

ES-301 Control Room/In-Plant Systems Outline Form ES-301-2

Facility: South Texas Project Date of Examination: 7-15-18

Exam Level: RO ☐ SRO-I ■ SRO-U ☐ Operating Test No.: LOT 23 NRC

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
a. (S1) Re-Establish Letdown During ES-11 KA: 004 A4.06 (3.6/3.1)	A,D,E,L,S	1
b. (S2) Isolate SI Accumulators KA: 006 A4.02 (4.0/3.8)	A,D,EN,L,P,S	2
c. (S3) Transfer to Hot Leg Recirculation KA: 006 A4.05 (3.9/3.8)	D,E,L,S	3
d. (S4) Respond to High Alarm on RT-8033 or RT-8034 KA: 072 A3.01 (2.9/3.1)	A,E,L,N,S	7
e. (S5) Start an RCP KA: 003 A4.06 (2.9/2.9)	L,M,S	4P
f.		
g. (S7) Place SGFPT in service from 3300 RPM KA: 039 A4.03 (2.8/2.8)	D,S	4S
h. (S8) Roll a 13.8KV Electrical Bus KA: 062 A4.07 (3.1/3.1)	D,P,S	6
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. (P1) Fill SFP from RWST KA: 033 A1.01 (2.7/3.3)	D,R	8
j. (P2) Locally Start an ESF DG per 0POP04-ZO-0001, Control Room Evacuation, Addendum 7 KA: 064 A4.01 (4.0/4.3)	A,E,L,N	6
k. (P3) Failing Air to MSIVs and MSIBs KA: 039 A4.01 (2.9/2.8)	A,D,E,L	4S

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all 5 SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO/SRO-I/SRO-U
(A)lternate Path	4-6 / 4-6 / 2-3
(C)ontrol Room	
(D)irect from Bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN) gineered Safety Features	≥ 1 / ≥ 1 / ≥ 1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

ES-301 Control Room/In-Plant Systems Outline Form ES-301-2

Facility: South Texas Project Date of Examination: 7-15-18

Exam Level: RO ☐ SRO-I ☐ SRO-U ■ Operating Test No.: LOT 23 NRC

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
a.		
b. (S2) Isolate SI Accumulators KA: 006 A4.02 (4.0/3.8)	A,D,EN,L,P,S	2
c. (S3) Transfer to Hot Leg Recirculation KA: 006 A4.05 (3.9/3.8)	D,E,L,S	3
d. (S4) Respond to High Alarm on RT-8033 or RT-8034 KA: 072 A3.01 (2.9/3.1)	A,E,L,N,S	7
e.		
f.		
g.		
h.		
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. (P1) Fill SFP from RWST KA: 033 A1.01 (2.7/3.3)	D,R	8
j.		
k. (P3) Failing Air to MSIVs and MSIBs KA: 039 A4.01 (2.9/2.8)	A,D,E,L	4S

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all 5 SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO/SRO-I/SRO-U
(A)lternate Path	4-6 / 4-6 / 2-3
(C)ontrol Room	
(D)irect from Bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN) gineered Safety Features	≥ 1 / ≥ 1 / ≥ 1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

STP LOT-23
NRC Systems JPM Description

Control Room Systems JPMs

(S1) Re-Establish Letdown During ES-11
Demonstrate the ability to establish normal letdown flow after an SI in accordance with 0POP05-EO-ES11, SI Termination.

(S2) Isolate SI Accumulators
Demonstrate the ability to isolate SI Accumulators from the RCS by closing the discharge isolation valve and/or depressurizing the accumulator in accordance with 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant. This is an Alternate Path JPM.

(S3) Transfer to Hot Leg Recirculation
Demonstrate the ability to align ECCS Hot Leg Recirculation in accordance with 0POP05-EO-ES14, Transfer to Hot Leg Recirculation

(S4) Respond to High Alarm on RT-8033 or RT-8034
Demonstrate the ability to change ventilation alignment due to Radiation Monitor Failure in accordance with 0POP04-RA-0001, Radiation Monitoring System Alarm Response.

(S5) Start a Reactor Coolant Pump
Demonstrate the ability to operate a Reactor Coolant Pump and monitor parameters in accordance with 0POP02-RC-0004, Operation of Reactor Coolant Pump.

(S6) Start an Essential Cooling Water Pump and Lower Essential Cooling Pond Level
Demonstrate the ability to operate an Essential Cooling Water Pump and associated valves in accordance with 0POP02-EW-0001, Essential Cooling Pump Operations.

(S7) Place a SGFPT in Service (from 3300 rpm)
Demonstrate the ability to control steam to a SGFPT while placing it in service to feed Steam Generators in accordance with 0POP02-FW-0001, S.G.F.P. Turbine.

(S8) Roll a 13.8KV Electrical Bus
Demonstrate the ability to transfer 13.8KV electrical power from one source of power to another in accordance with 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup.

NOTE: All Control Room JPMs will be performed dynamically in the Simulator. JPMs will be performed in pairs; S1 & S2 together, S3 & S4 together, S5 & S6 together and S7 & S8 together.

STP LOT-23
NRC Systems JPM Description

In Plant Systems JPMs

(P1) Fill SFP from the RWST
Demonstrate the ability to perform a fill of the SFP from the RWST per 0POP02-FC-0001, SFP Cooling and Cleanup System.

(P2) Locally Start an ESF DG per 0POP04-ZO-0001, Control Room Evacuation, Add. 7
Demonstrate the ability to locally start an ESF DG during a control room evacuation in accordance with 0POP04-ZO-0001, Control Room Evacuation, Addendum 7. This is an Alternate Path JPM.

(P3) Failing Air to MSIVs and MSIBs
Demonstrate the ability to locally close Main Steam Isolation Valves and Main Steam Isolation Bypass Valves in accordance with 0POP05-EO-EC00, Loss of all AC Power, Addendum #4. This is an Alternate Path JPM.

STPNOC

Job Performance Measure

RE-ESTABLISH LETDOWN (ES11)

JPM Number: NRC S1

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

NOTE: The following IC setup may be modified depending on JPMs that may be performed at the same time with this one.

IC Setup

1. Set up a 100% IC and then manually initiate SI
2. Go through EO00 to ES11 and stop at step 12 with CVCS charging flow adjusted to about 75 gpm.
3. Insert CVCS Remote Function BM-97 (PCV-0135 Proportional Gain) to 5.0
4. Store the IC

After IC is Stored and ready to perform JPM

1. For LOT 23 NRC Exam this JPM is scheduled to be performed with JPM S2 but will use a separate IC.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and clean the following procedures:
   - 0POP05-EO-ES11, SI Termination, Rev. 16

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

5. Reset the simulator to IC 203 and verify the following:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
6. Place simulator in RUN and quickly silence/acknowledge/reset alarms, **including plant computer/ICS alarms.**
7. PLACE simulator in FREEZE.
8. When the student and the examiners are ready to proceed, place the simulator in RUN.
9. There is no simulator lesson plan for this JPM.

Booth Instructor Actions

1. None

INITIAL CONDITIONS

An inadvertent Reactor Trip and Safety Injection occurred.

The Crew has transitioned from 0POP05-EO-EO00, Reactor Trip or Safety Injection, to 0POP05-EO-ES11, SI Termination, and are currently at step 12. The crew restored charging flow for inventory control and Pressurizer Level is slowly rising.

INITIATING CUE

The Unit Supervisor directs you to continue with 0POP05-EO-ES11, SI Termination, at Step 12, Check if letdown can be established.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Normal Letdown Flow is restored with manual control of CV-PCV-0135, Letdown Pressure Control Valve. All Critical JPM Steps (#3, 4, 6, 7, 9, 10, 11, 13, 14) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE No Handout is provided with this JPM. The operator should use the copy of 0POP05-EO-ES11, SI Termination, provided in the simulator.					
1	CHECK if Letdown can be established: • Pressurizer level – GREATER THAN 22% [50%] • ESTABLISH normal letdown per Addendum 2, Establishing Normal Letdown (Step 12)	The operator determines that Pressurizer level is greater than 22% [No Adverse Containment] and determines normal letdown can be placed in service by proceeding to Addendum 2. **NOTE:** **The operator also will determine normal letdown can be placed in service by checking charging available (charging is in service per the initiating cue) and CCW available for the letdown heat exchanger.**	___	___	___
2	VERIFY charging - IN SERVICE (Add 2 Step 1)	The operator verifies charging is in service. **NOTE:** **Charging will be aligned and in service with about 80 gpm flow to the PZR.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*3	VERIFY at least one train of CCW - ALIGNED TO THE LETDOWN HEAT EXCHANGER **(RNO)** START CCW pump(s) and ALIGN valves to establish CCW flow to letdown heat exchanger. (Add 2 Step 2)	The operator verifies CCW Pumps running and then opens CC-MOV-0235 and CC- MOV-0236 to align CCW to the letdown heat exchanger per the RNO step. **NOTE:** **All CCW Pumps will be running.** **CC-MOVs-0235 & 0236 are non-essential CCW Header isolation valves that are normally open but are closed on a Safety Injection.**	___	___	___
*4	CLOSE RCS letdown orifice isolation valves (Add 2 Step 3)	The operator closes valves: ***FV-0012***, FV-0013 and MOV-0014 on CP-004. **NOTE:** **FV-0012 is the only valve that is actually open prior to this step and must be closed.**	___	___	___
5	VERIFY letdown pressure – WITHIN 100 psi of RCS PRESSURE • 1(2)-CV-PI-0469, EXCESS/NORMAL LETDN PRESSURE (Add 2 Step 4) **CUE:** **As a plant operator report that CV-PI-0469 reads 2200 psig.** **OR** **Give a value that would be within 100psi of RCS pressure.**	The operator verifies the pressure on "1-CV-PI-0469 EXCESS/NORMAL LETDN PRESSURE" is within 100 PSI of RCS pressure. **NOTE:** **A Plant Operator is normally dispatched to read the pressure on PI-0469.** **RCS pressure should be about 2235 psig by this time.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*6	PLACE letdown pressure controller in MANUAL AND THROTTLE letdown pressure control valve 1(2)-PCV-0135 to 50% (Add 2 Step 5 & 6)	The operator pushes the "MAN" button on Letdown Pressure Controller PCV-0135 and adjusts the demand to 50%.	___	___	___
*7	OPEN letdown line containment isolation valves • OCIV MOV-0024 • ICIV MOV-0023 (Add 2 Step 7)	The operator opens ICIV MOV-0023 and OCIV MOV-0024. **NOTE:** **CIV MOV-0024 and ICIV MOV-0023 are normally open but will be closed due to the Safety Injection.**	___	___	___
8	OPEN letdown line loop isolation valves • LETDN ISOL LCV-0465 • LETDN ISOL LCV-0468 (Add 2 Step 8)	The operator opens LETDN ISOL LCV-0465 and LCV-0468. **NOTE:** **These valves will already be open.**	___	___	___
*9	OPEN letdown orifice header isolation valve • LTDN ORIF HDR ISOL FV-0011 (Add 2 Step 9)	The operator opens LTDN ORIF HDR ISOL FV-0011. **NOTE:** **LTDN ORIF HDR ISOL FV-0011 will be closed due the inadvertent SI signal.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*10	OPEN desired letdown line orifice isolation valve: • FV-0012 OR • FV-0013 OR • MOV-0014 (Add 2 Step 10) **CUE:** **If the student elects to open FV-0013 or MOV-0014, as the US, direct the 120-150 gpm letdown orifice be placed in service, FV-0012.**	The operator opens FV-0012 on CP-004. **NOTE:** **This step must be performed in rapid sequence with the next step to prevent letdown flashing or lifting of the letdown relief valve to PRT.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*11	THROTTLE letdown pressure controller to maintain 375 to 385 psig (Add 2 Step 11)	The operator adjusts pressure controller PCV-0135 to establish a letdown pressure of 375 to 385 psig. **NOTE:** **Operator should reduce controller output (throttle PCV-135 in the closed direction) if Letdown Pressure is below 375 psig.** **Operator should raise controller output (throttle PCV-135 in the open direction) if Letdown Pressure is above 385 psig.** **This step must be performed in rapid sequence with the previous step to prevent letdown flashing or lifting of the letdown relief valve to PRT.** **If there is letdown flashing from low pressure or the letdown relief valve lifts it would not be a failure of this critical step as long as letdown pressure is controlled between 375 to 385 psig prior to going to the next step.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
12	OPEN additional letdown orifice isolation valves as desired (Add 2 Step 12) **CUE:** **If the student starts to open additional letdown orifice isolation valves, then as the US, tell the student that opening additional letdown orifice isolation valves is not desired at this time.**	The operator will open additional orifice isolation valves if desired.	___	___	___
*13	PLACE letdown pressure controller to AUTO (Add 2 Step 13)	The operator places the letdown pressure controller in AUTO but then realizes that auto control is not working. **NOTE:** **A malfunction has been inserted that affects the letdown pressure control valve when placed in auto.**	___	___	___
NOTE **Alternate Path Starts Here**					
*14	CONTROL letdown pressure in MANUAL. (Add 2 Step 13 RNO)	The operator places the letdown pressure controller in MANUAL and restores letdown pressure to between 375 and 385 psig. **Note:** The letdown pressure controller is very sensitive when in MANUAL control.	___	___	___
CUE	This JPM is complete				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: RE-ESTABLISH LETDOWN (ES11)

JPM Number: NRC S1 Revision Number: 0

Task Number and Title: T48700 - Place the CVCS in Service

K/A Number and Importance: 004 A4.06 3.6/3.1

Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Alternate Path: ☒ Yes ☐ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0POP05-ES-ES11, SI Termination, Rev 16

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 3, 4, 6, 7, 9, 10, 11, 13, 14

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

An inadvertent Reactor Trip and Safety Injection occurred.

The Crew has transitioned from 0POP05-EO-EO00, Reactor Trip or Safety Injection, to 0POP05-EO-ES11, SI Termination, and are currently at step 12. The crew restored charging flow for inventory control and Pressurizer Level is slowly rising.

INITIATING CUE

The Unit Supervisor directs you to continue with 0POP05-EO-ES11, SI Termination, at Step 12, Check if letdown can be established.

STPNOC

Job Performance Measure

ISOLATE SI ACCUMULATORS

JPM Number: NRC S2

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

NOTE: The following IC setup may be modified depending on JPMs that may be performed at the same time with this one.

IC Setup

1. Set up an IC that has a Post large break LOCA
2. Have ES13 complete
3. Ensure Hot leg temps less than 435°F
4. Insert malfunction to keep Train 'A' Accumulator Isolation Valve open. (Malfunction SI System 04-15-01 1)
5. Store the IC

After IC is Stored and ready to perform JPM

1. For LOT 23 NRC Exam this JPM is scheduled to be performed with JPM S1 but will use a separate IC.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and clean the following procedures:
   - 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, Rev. 23

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

5. Reset the simulator to IC 206 and verify the following:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
6. Place simulator in RUN and quickly silence/acknowledge/reset alarms, **including plant computer/ICS alarms.**
7. PLACE simulator in FREEZE.
8. When the student and the examiners are ready to proceed, place the simulator in RUN.
9. There is no simulator lesson plan for this JPM.

Booth Instructor Actions

1. None

INITIAL CONDITIONS

A Large Break LOCA has occurred. The crew was performing 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, when they had to transfer to 0POP05-EO-ES13, Transfer to Cold Leg Recirculation. The Shift Crew is completing the remaining steps of 0POP05-EO-ES13, Transfer to Cold Leg Recirculation.

INITIATING CUE

The Unit Supervisor directs you to continue in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, at step 23, CHECK If SI Accumulators Should Be Isolated.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

The Operator isolates SI Accumulator 1A by depressurizing the accumulator (alternate path) and isolates SI Accumulators 1B and 1C by closing the discharge valve. All Critical JPM Steps (#2, 3, 5 & 6) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE No Handout is provided with this JPM. The operator should use the copy of 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, provided in the simulator.					
1	Check if SI Accumulators should be isolated: o At least two RCS hot leg temperatures LESS THAN 435˚F (Step 23.a)	The operator determines that at least two RCS hot leg temperatures are less than 435°F.	___	___	___
*2	ENERGIZE all SI Accumulator Isolation Valves. (Step 23.b)	The operator energizes each SI Accumulator Isolation Valve by momentarily placing each valve's "ACC PWR LOCKOUT" switch to the "POWER ON" position: _ Train "A" _ Train "B" _ Train "C"	___	___	___
NOTE **Alternate Path Starts Here**					
*3	CLOSE all SI Accumulator Isolation Valves. (Step 23.c)	The operator closes each "ACC DISCH ISOL" valve by using its control room handswitch. _ **Train "A"** _ Train "B" _ Train "C" **NOTE:** **Train A valve does not close.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
4	VENT any unisolated accumulators: • CLOSE N2 supply. "N2 SPLY OCIV FV-3983" (Step 23 RNO c.1)	The operator verifies that "N2 SPLY OCIV FV-3983" is closed.	___	___	___
*5	OPEN unisolated ("A") accumulator vent isolation valve. (Step 23 RNO c.2)	The operator opens "ACC 1A(2A) N2 SPLY/VENT PV-3930".	___	___	___
*6	OPEN accumulator vent to containment: • "HDR VENT HV-0899" OR • "HDR VENT HCV-0900"	The operator depressurizes "A" SI Accumulator by opening either of the following valves: _ "HDR VENT HV-0899" OR _ "HDR VENT HCV-0900" **NOTE:** **When properly aligned, Accumulator 'A' pressure will lower but very slowly. (about 1 psig/minute) If the student looks at an ICS trend they will be able to see the lowering of pressure better than on the board meter.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
7	DEENERGIZE all SI Accumulator Isolation Valves. (Step 23.d)	The operator de-energizes each SI Accumulator Isolation Valve by momentarily placing each "ACC POWER LOCKOUT" switch to the "POWER OFF" position: _ Train "A" _ Train "B" _ Train "C"	___	___	___
CUE	This JPM is complete				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: ISOLATE SI ACCUMULATORS

JPM Number: NRC S2 Revision Number: 0

Task Number and Title: 30200, Vent Accumulator Pressure

K/A Number and Importance: 006 A4.02 4.0/3.8

Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Alternate Path: ☒ Yes ☐ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: 3

Reference(s): 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, Rev 23

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 2, 3, 5 & 6

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

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Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

A Large Break LOCA has occurred. The crew was performing 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, when they had to transfer to 0POP05-EO-ES13, Transfer to Cold Leg Recirculation. The Shift Crew is completing the remaining steps of 0POP05-EO-ES13, Transfer to Cold Leg Recirculation.

INITIATING CUE

The Unit Supervisor directs you to continue in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, at step 23, CHECK If SI Accumulators Should Be Isolated.

STPNOC

Job Performance Measure

TRANSFER TO HOT LEG RECIRCULATION

JPM Number: NRC S3

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

NOTE: The following IC setup may be modified depending on JPMs that may be performed at the same time with this one.

IC Setup

1. Set up an IC that has a Post large break LOCA
2. Have ES13 complete
3. Ensure SI-MOVs-0031A, B & C are energized.
4. Ensure Hot leg temps less than 435°F
5. Store the IC

After IC is Stored and ready to perform JPM

1. For LOT 23 NRC Exam this JPM is scheduled to be performed with JPM S4.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and clean the following procedures:
   - 0POP05-EO-ES14, Transfer to Hot Leg Recirculation, Rev. 8

NOTE: It is okay to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

5. Reset the simulator to IC 207 and verify the following:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
6. Place simulator in RUN and quickly silence/acknowledge/reset alarms, **including plant computer/ICS alarms.**
7. PLACE simulator in FREEZE.
8. When the student and the examiners are ready to proceed, place the simulator in RUN.
9. There is no simulator lesson plan for this JPM.

Booth Instructor Actions

1. None

INITIAL CONDITIONS

A large break LOCA occurred 5.5 hours ago. The control room operators have completed 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, & 0POP05-EO-ES13, Transfer to Cold Leg Recirculation, and are evaluating long term plant status.

INITIATING CUE

The Unit Supervisor directs you to transfer SI Trains to Hot Leg recirculation in accordance with 0POP05-EO-ES14, Transfer to Hot Leg Recirculation, starting at Step 1 with Train A.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

The Performer transfers SI Recirculation Flow from Cold Leg to Hot Leg for SI Train 'A' per 0POP05-EO-ES14. All Critical JPM Steps (#3 & 4) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE No Handout is provided with this JPM. The operator should use the copy of 0POP05-EO-ES14, Transfer to Hot Leg Recirculation, provided in the simulator.					
1	CHECK Three SI Trains - OPERABLE (Step 1)	Determines that all three Trains of SI are OPERABLE. **NOTE:** **All three SI trains are operable.**	___	___	___
2	SELECT First SI Train for HOT Leg Recirculation. (Step 2)	Selects Train A as the first SI Train to be aligned for Hot Leg Recirculation. **NOTE:** **Selecting Train A is in the Initiating Cue.**	___	___	___
*3	ALIGN selected HHSI for hot leg recirculation. (Train A) • **ENERGIZE selected SI train HHSI hot leg injection valve. (Train A, MOV-0008A)** • **OPEN HHSI hot leg injection valve. (Train A, MOV-0008A)** • **CLOSE HHSI cold leg injection valve. (Train A, MOV-0006A)** • VERIFY Hot Leg Injection flow. (Train A, FI-0917) • **DEENERGIZE selected SI train HHSI hot leg injection valve. (Train A, MOV-0008A)** (Step 2.a)	Operator aligns selected HHSI for hot leg recirculation in Train A. _ **ENERGIZE MOV-0008A** _ **OPEN MOV-0008A** _ **CLOSE MOV-0006A** _ Verify Flow _ **DEENERGIZE MOV-0008A**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*4	ALIGN selected LHSI for hot leg recirculation. (Train A) DISPATCH Operator to UNLOCK and CLOSE the selected LHSI Cold Leg Injection Valve Breakers. (Train A, MOV-0031A) • **ENERGIZE selected SI train LHSI hot leg injection valve. (Train A, MOV-0019A)** • **OPEN LHSI hot leg injection valve. (Train A, MOV-0019A)** • **CLOSE LHSI cold leg injection valve. (Train A, MOV-0031A)** • VERIFY Hot Leg Injection flow. (Train A, FI-0927) • **DEENERGIZE selected SI train LHSI hot leg injection valve. (Train A, MOV-0019A)** (Step 2.b)	Operator aligns selected LHSI for hot leg recirculation in Train A. _ DISPATCH Operator to UNLOCK and CLOSE breaker for MOV-0031A _ **ENERGIZE MOV-0019A** _ **OPEN MOV-0019A** _ **CLOSE MOV-0031A** _ Verify Flow _ **DEENERGIZE MOV-0019A** **NOTE:** **LHSI Cold Leg Injection Valves, SI-MOV-0031A,B,C are already energized.** **Once the student has verified hot leg injection flow on Train A the JPM can be terminated.**	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: TRANSFER TO HOT LEG RECIRCULATION
JPM Number: NRC S3 Revision Number: 0
Task Number and Title: 81637 - Transfer to Hot Leg Recirculation
K/A Number and Importance: 006 A4.05 [3.9/3.8]
Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other
Alternate Path: ☐ Yes ☒ No
Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO
Time Critical: ☐ Yes ☒ No
Level of Difficulty: **2**
Reference(s): 0POP05-E0-ES14, Transfer to Hot Leg Recirculation, Rev 8

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other
Testing Method: ☐ Simulate ☐ Perform
Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes
Critical Steps (*) 3 and 4
Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No
The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

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Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

A large break LOCA occurred 5.5 hours ago. The control room operators have completed 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, & 0POP05-EO-ES13, Transfer to Cold Leg Recirculation, and are evaluating long term plant status.

INITIATING CUE

The Unit Supervisor directs you to transfer SI Trains to Hot Leg recirculation in accordance with 0POP05-EO-ES14, Transfer to Hot Leg Recirculation, starting at Step 1 with Train A.

STPNOC

Job Performance Measure

RESOND TO HIGH ALARM ON RT-8033 OR RT-8034

JPM Number: NRC S4

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

NOTE: The following IC setup may be modified depending on JPMs that may be performed at the same time with this one.

IC Setup

1. Set up an IC that has a Post large break LOCA
2. Insert a value for RT-8033 that creates a High (Red) Alarm and a value for RT-8034 that creates an Alert (Yellow) Alarm
3. Reset CRE HVAC and align for normal operation
4. Store the IC

After IC is Stored and ready to perform JPM

1. For LOT 23 NRC Exam this JPM is scheduled to be performed with JPM S4.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and clean the following procedures:
   - 0POP04-RA-0001, Radiation Monitoring System Alarm Response, Rev. 37

NOTE: It is okay to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

5. Reset the simulator to IC 207 and verify the following:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
6. Place simulator in RUN and quickly silence/acknowledge/reset alarms, **including plant computer/ICS alarms.**
7. On RM – 11 DO NOT acknowledge alarms on Grid 1. Acknowledge all other Grid alarms. This will leave RT-8033 flashing yellow and RT-8034 flashing red.
8. PLACE simulator in FREEZE.
9. When the student and the examiners are ready to proceed, place the simulator in RUN.
10. There is no simulator lesson plan for this JPM.

Booth Instructor Actions

1. None

INITIAL CONDITIONS

The unit has experienced a Large Break LOCA.

INITIATING CUE

A new alarm has come in on Rad Monitor Panel RM-11. The Unit Supervisor directs you to investigate the Rad Monitor that is in an alarm condition in accordance with 0POP04-RA-0001, Radiation Monitoring System Alarm Response, and take appropriate action.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

After determining that CRE HVAC Train A is not in the emergency mode of operation, the Operator manually aligns CRE HVAC Train A to the emergency mode. All critical JPM steps (#1, 3, 7) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE No Handout is provided with this JPM. The operator should use the copy of 0POP04-RA-0001, Radiation Monitoring System Alarm Response, provided in the simulator. Per a procedure NOTE, the initial actions before going to Addendum 9 are considered skill of the craft and may be performed before entering the procedure.					
*1	Investigates the alarm on the RM-11. (Steps 1-4) **CUE:** *If the student starts to evaluate E-Plan classification, inform the student that another SRO will evaluate E-Plan status.*	_ ***Determines RT-8033 is in Alarm (Red) and RT-8034 is in Alert (Yellow)** _ Calls up a Trend and Status display for RT-8033 _ Goes to Addendum 9 of the procedure *** - critical portion**	___	___	___
2	Check High alarm exists on RT-8033 or RT-8034 (Addendum 9, Step 1)	Determines a High Alarm exists on RT-8033	___	___	___
NOTE **The operator will have to evaluate the CRE HVAC status on Control Room Panel CP-022 to determine the Train A system is not operating in Emergency Mode.**					
NOTE **Alternate Path Starts Here**					

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*3	CHECK Train A, B And C Of Control Room Ventilation System In Emergency Recirculation And Makeup Filtration Mode The following fans – RUNNING Train A: "SPLY AHU 11A", "RET FAN 11A", "C/U FAN 11A", "M/U FAN 11A" Train B: "SPLY AHU 11B", "RET FAN 11B", "C/U FAN 11B", "M/U FAN 11B" Train C: "SPLY AHU 11C", "RET FAN 11C", "C/U FAN 11C", "M/U FAN 11C" (Addendum 9, Step 2.a)	Operator Manually Starts Fans **NOTE:** **Will have to start all 4 Train A Fans:** • **"SPLY AHU 11A"** • **"RET FAN 11A"** • **"C/U FAN 11A"** • **"M/U FAN 11A"**	___	___	___
4	The following CR HVAC Inlet Isolation Dampers - CLOSED: Train A: FV-9670, FV-9671 Train B: FV-9667, FV-9668 Train C: FV-9664, FV-9665 (Addendum 9, Step 2.b)	Operator Manually Closes Dampers **NOTE:** **Train A Dampers already closed.** • **FV-9670** • **FV-9671** **Train C Damper FV-9665 needs to be closed.**	___	___	___
5	The following CR HVAC Return Isolation Dampers – CLOSED: Train A: FV-9698 Train B: FV-9697 Train C: FV-9696 (Addendum 9, Step 2.c)	Operator Manually Closes Dampers **NOTE:** **All Dampers are closed.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
6	The following CR HVAC Intake Dampers – OPEN: Train A FV-9339 Train B FV-9365 Train C FV-9391 (Addendum 9, Step 2.d)	Operator Manually Opens Dampers **NOTE:** **All Dampers are open.** **FV-9339 opened when M/U Fan 11A was started.**	___	___	___
*7	The following CR HVAC Return Dampers – OPEN: Train A FV-9677 Train B FV-9676 Train C FV-9675 (Addendum 9, Step 2.e)	Operator Manually Opens Dampers **NOTE:** **FV-9677 has to be opened.**	___	___	___
8	The Kitchen/Toilet Exhaust fan – STOPPED (Addendum 9, Step 2.f)	Operator Manually stops fan	___	___	___
9	The Kitchen/Toilet Exhaust fan Isolation Dampers – CLOSED: • FV-9673 • FV-9674 (Addendum 9, Step 2.g)	Operator Manually Closes Dampers **NOTE:** **FV-9673 needs to be closed.**	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: RESOND TO HIGH ALARM ON RT-8033 OR RT-8034

JPM Number: NRC S4 Revision Number: 0

Task Number and Title: 86200, Respond to Radiation Monitoring System Alarms

K/A Number and Importance: 072 A3.01 2.9/3.1

Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Alternate Path: ☒ Yes ☐ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty:

Reference(s): 0POP04-RA-0001, Radiation Monitoring System Alarm Response, Rev 37.

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 1, 3, 7

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

_____

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_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

The unit has experienced a Large Break LOCA.

INITIATING CUE

A new alarm has come in on Rad Monitor Panel RM-11. The Unit Supervisor directs you to investigate the Rad Monitor that is in an alarm condition in accordance with 0POP04-RA-0001, Radiation Monitoring System Alarm Response, and take appropriate action.

STPNOC

Job Performance Measure

START AN RCP

JPM Number: NRC S5

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

NOTE: The following IC setup may be modified depending on JPMs that may be performed at the same time with this one.

IC Setup

1. This JPM is performed in Mode 3 at NOP/NOT. RCPs 1A, 1B and 1D will be running. RCP 1C will be secured.
2. Ensure RCP 1C seal injection flow is > 8 gpm.
3. Set 13.8KV Bus 1H to the preferred electrical lineup. (NOT CROSSTIED) Refer to NOTE prior to Step 3.10 of 0POP02-RC-0004, Operation of Reactor Coolant Pump.
4. Save IC to a designated IC for LOT NRC Exam usage.

After IC is Stored and ready to perform JPM

1. For LOT 23 NRC Exam this JPM is scheduled to be performed with JPM S6.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and clean the following procedures:
   - 0POP02-RC-0004, Operation of Reactor Coolant Pump, Rev. 39

NOTE: It is okay to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

5. Reset the simulator to IC 208 and verify the following:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
6. Place simulator in RUN and quickly silence/acknowledge/reset alarms, **including plant computer/ICS alarms.**
7. PLACE simulator in FREEZE.
8. When the student and the examiners are ready to proceed, place the simulator in RUN.
9. There is no simulator lesson plan for this JPM.

Booth Instructor Actions

1. None

INITIAL CONDITIONS

Unit 1 is in Mode 3 at NOP/NOT. RCPs 1A, 1B and 1D are in operation.

INITIATING CUE

The Unit Supervisor directs you to start RCP 1C in accordance with Section 9.0 of 0POP02-RC-0004, Operation of Reactor Coolant Pump.

NOTE:

- All Section 3.0 Prerequisites have been met.
- Section 6.0 has been completed satisfactorily.
- RCPs 1A, 1B and 1D have been running for greater than 5 minutes.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Starts RCP 1C Oil Lift Pump, starts RCP 1C and then secures RCP 1C Oil Lift Pump. All critical JPM steps (#11, 13, and 17) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE If allowed by the examiner, handout the provided copy of 0POP02-RC-0004, Operation of Reactor Coolant Pump, to student for review of Section 3.0 Prerequisites and Section 4.0 Notes & Precautions prior to the start of the JPM.					
1	ENSURE Section 6.0 of this procedure has been completed. (Step 9.1)	Ensures section 6.0 has been completed. **NOTE:** **Section 6.0 has been completed per the Initiating Cue.**	___	___	___
2	ENSURE the Unit Supervisor/Shift Manager has reviewed 7300/SSPS normalization status. (Step 9.2) **CUE:** **If asked, as Unit Supervisor, report that 7300/SSPS normalization is not installed.**	Ensures the status of 7300/SSPS normalization.	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
3	CHECK the following annunciators extinguished. IF any annunciators listed below are NOT extinguished, THEN PERFORM an evaluation of the annunciator's impact on RCP operation PRIOR to pump start: "MTR AIR CLR CCW FLOW LO" Lampbox 2M03, Window A-4 "RCP 1C SEAL WTR INJ FLOW LO" Lampbox 4M07, Window A-5 "RCP 1C NO 1 SEAL DP LO" Lampbox 4M07, Window A-6 "RCP 1C NO 1 SEAL LKF FLOW HI/LO" Lampbox 4M07, Window B-5 "RCP 1C STDPIPE LVL HI" Lampbox 4M07, Window B-6 "RCP 1C NO 2 SEAL LKF FLOW HI" Lampbox 4M07, Window C-5 "RCP 1C STDPIPE LVL LO" Lampbox 4M07, Window C-6 "RCP 1C THERM BAR CCW FLOW/TEMP TRBL" Lampbox 4M07, Window D-6 "SEAL WTR INJ TEMP HI" Lampbox 4M08, Window C-1 "RCP 1C UPPR OIL RSVR LVL HI/LO" Lampbox 5M02, Window C-3 "RCP 1C LOWR OIL RSVR LVL HI/LO" Lampbox 5M02, Window D-3 "RCP CCW FLOW LO" Lampbox 5M02, Window E-1 (Step 9.3)	Checks that all listed annunciators are clear.	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
4	VERIFY RCP 1C SEAL INJ FLOW FT-0146 is between 8 and 13 gpm on "RCP 1C SEAL FLOW FR-0158". (Step 9.4)	Verifies seal injection flow between 8 and 13 gpm for RCP 1C. **NOTE:** **RCP 1C is right at 8 gpm so the operator may make an adjustment to optimize flow.**	___	___	___
5	IF RCP 1C No. 1 Seal leakoff flow is high and RCP operation to assist Number 1 Seal normal seating is desired, THEN N/A step 9.6 (Step 9.5)	Does NOT N/A step 9.6 as No. 1 Seal leakoff flow is NOT high and operation to assist the No. 1 seal is NOT desired.	___	___	___
6	VERIFY RCP 1C No. 1 seal water leakoff flow, as indicated on "RCP 1C SEAL FLOW FR-0158", is in the normal operating range per Addendum 1, RCP Number 1 Seal Leakoff Normal Operating Range. (Step 9.6)	Uses Addendum 1 to verify RCP 1C No. 1 seal leakoff flow is in the normal range.	___	___	___
7	VERIFY RCP 1C No. 1 seal differential pressure is GREATER THAN 250 psid on "SEAL 1 DP PI-0154". (Step 9.7)	Verifies RCP 1C No. 1 seal DP is > 250 psid.	___	___	___
8	ENSURE RCP 1C "SEAL NO 1 LKF ISOL FV-3156" is OPEN. (Step 9.8)	Ensures RCP 1C "SEAL NO 1 LKF ISOL FV-3156" is OPEN. **NOTE:** **Valve will already be open.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
9	VERIFY seal water injection temperature LESS THAN 135°F on "TEMP TI-0216". (Step 9.9)	Verifies seal water injection temperature < 135°F. **NOTE:** TI-0216 is on CP-004.	___	___	___
10	WHEN RCS Temperature is LESS THAN 140°F, THEN ENSURE **NO** MORE THAN three RCPs are in operation. (Step 9.10)	Only 3 RCPs are in operation and RCS temperature is above 140°F.	___	___	___
*11	START RCP 1C "OIL LIFT PUMP" by momentarily turning its handswitch to the START position. (Step 9.11)	Starts RCP 1C Oil Lift Pump.	___	___	___
12	VERIFY the RCP 1C blue "START PERM" indicator light illuminates. (Step 9.12)	Verifies blue start permissive light for RCP 1C comes on.	___	___	___
*13	WHEN the RCP 1C blue "START PERM" has been ON for at least two minutes, THEN START "RCP 1C" by momentarily turning its handswitch to the START position. (Step 9.13) **CUE:** **If Operator starts to make a PA announcement then inform the operator a PA announcement has been made.**	**NOTE:** **Time compression may be used by the examiner if desired.** Starts RCP 1C.	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
14	VERIFY loop C flow increases to GREATER THAN 90% on "LOOP C FLOW FI-0437A". (Step 9.14)	Verifies Loop 1C flow rises to > 90%.	___	___	___
15	VERIFY RCP 1C No. 1 seal differential pressure is GREATER THAN 220 psid on "SEAL 1 DP PI-0154". (Step 9.15)	Verifies No. 1 seal differential pressure is > 220 psid.	___	___	___
16	CHECK RCP 1C vibration level. SHAFT Vibration Brg2-Vert Brg2-Horiz CASE Vibration Mtr_Accel-Vert Mtr_Accel-Horiz (Step 9.16) **CUE:** **WHEN operator starts to step behind CP004 to view CP014, THEN supply the following:** **Shaft Vibration on Bgr2 Vertical and Horizontal is 3.5 mils and stable.** **Case Vibration on Mtr_Accel Vertical and Horizontal is 1.25 mils and stable.**	Records vibration data for RCP 1C Shaft and Case. **NOTE:** **Vibration panel CP014 is NOT modeled. The operator may look up vibration data from the ICS computer but the procedure stipulates getting the data from CP014.**	___	___	___
*17	WHEN RCP 1C has run for at least one minute, THEN STOP RCP 1C "OIL LIFT PUMP" by momentarily turning its handswitch to the STOP position. (Step 9.17)	Stops RCP 1C Oil Lift Pump. **NOTE:** **Time compression may be used by the examiner if desired.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
18	DISPATCH an Operator to verify RCP 1C breaker charging springs charged. (Step 9.18) **CUE:** **As a Plant Operator report that RCP 1C breaker charging springs are charged.**	Contacts a Plant Operator to verify RCP 1C breaker charging springs are charged.	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: START AN RCP

JPM Number: NRC S5 Revision Number: 0

Task Number and Title: 50800 Start a Reactor Coolant Pump

K/A Number and Importance: 003 A4.06 2.9/2.9

Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **2**

Reference(s): 0POP02-RC-0004, Operation of Reactor Coolant Pump, Rev 39.

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 11, 13 & 17

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 is in Mode 3 at NOP/NOT. RCPs 1A, 1B and 1D are in operation.

INITIATING CUE

The Unit Supervisor directs you to start RCP 1C in accordance with Section 9.0 of 0POP02-RC-0004, Operation of Reactor Coolant Pump.

NOTE:

- All Section 3.0 Prerequisites have been met.
- Section 6.0 has been completed satisfactorily.
- RCPs 1A, 1B and 1D have been running for greater than 5 minutes.

STPNOC

Job Performance Measure

START ECW PUMP AND LOWER ECW LEVEL

JPM Number: NRC S6

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

NOTE: The following IC setup may be modified depending on JPMs that may be performed at the same time with this one.

IC Setup

1. This JPM can be performed in any Mode.
2. In the selected IC align ECW with ECW Pumps 1A and 1C running.
3. Save IC to a designated IC for LOT NRC Exam usage.

After IC is Stored and ready to perform JPM

1. For LOT 23 NRC Exam this JPM is scheduled to be performed with JPM S5.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and clean the following procedures:
   - 0POP02-EW-0001, Essential Cooling Water Operations, Rev. 80

NOTE: It is okay to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

5. Reset the simulator to IC 208 and verify the following:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
6. Place simulator in RUN and quickly silence/acknowledge/reset alarms, **including plant computer/ICS alarms.**
7. PLACE simulator in FREEZE.
8. When the student and the examiners are ready to proceed, place the simulator in RUN.
9. There is no simulator lesson plan for this JPM.

Booth Instructor Actions

1. None.

INITIAL CONDITIONS

Unit 1 is in Mode 3 at NOP/NOT. ECW Pumps 1A and 1C are in service. A surveillance is scheduled to be performed on ECW Pump 1C.

INITIATING CUE

In preparation for the surveillance scheduled for ECW Pump 1C, the Unit Supervisor directs you to start ECW Pump 1B and ENSURE control of ECW Pond level.

NOTE:

- Another operator will work on swapping ECW cooling loads from ECW Train C to ECW Train B.
- ECP level is currently 26.2'
- A major overhaul of ECW Pump 1B has NOT been performed.
- A Plant Operator is standing by at ECW Pump 1B and the pump is NOT uncoupled.
- ECW Train C will become the Standby Train after the surveillance.
- Prerequisite Section 3.0 lineups are complete.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Starts ECW Pump 1B and begins lowering ECP level by opening at least one of the following three valves:

- *1-EW-FV-6935, ECW TRAIN A BLWDN ISOL*
- *1-EW-FV-6936, ECW TRAIN B BLWDN ISOL*
- *1-EW-FV-6937, ECW TRAIN C BLWDN ISOL*

All critical JPM steps (#3 & 10) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE If allowed by the examiner, handout the provided copy of 0POP02-EW-0001, Essential Cooling Water Operations, to student for review of Section 3.0 Prerequisites and Section 4.0 Notes & Precautions prior to the start of the JPM.					
1	IF uncoupled operations of the ECW Pump motor is desired, THEN GO TO Addendum 2, Uncoupled Run of ECW Pump Motors. (Step 5.1.1)	Step is N/A. **NOTE:** **Per Initiating Cue, a Plant Operator is standing by at ECW Pump 1B and the pump is NOT uncoupled.**	___	___	___
2	IF a major overhaul has been performed on an ECW Pump, THEN GO TO Section 9.0 for the affected ECW Pump. (Step 5.1.2)	Step is N/A. **NOTE:** **Per Initiating Cue, ECW Pump 1B has NOT been recently overhauled.**	___	___	___
*3	START the desired ECW pump: • ESSEN CLG WTR PUMP 1B (Step 5.1.3)	Operator will start ECW Pump 1B	___	___	___

4	PERFORM the following to verify proper ECW Pump operation:
	• VERIFY associated ECW pump discharge valve starts to open within 11 seconds after the ECW pump starts.
	  • DISCH ISOL MOV-0137
	• VERIFY the associated ECW pump discharge pressure increases to a nominal value of 45 psig
	  • DISCH PRESS PI-6886
	(Step 5.1.4)
		Verifies proper operation of ECW Pump 1B Discharge valve and ECW Pump 1B discharge pressure.	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
5	IF the ECW pump is started for maintenance (e.g. PMT, continuity check) or weekly chlorination AND will **NOT** remain running, THEN N/A Steps 5.1.6 through 5.1.8 as determined by the Unit Supervisor/Shift Manager. (Step 5.1.5)	Step is N/A. **NOTE:** **Per Initiating Cue, ECW Pump 1B will remain running. Operator will continue with step 5.1.6.**	___	___	___
6	NOTIFY I&C Maintenance to perform instrument venting per Instrument Vent Lineup 23 for the ECW Train started in Step 5.1.3. (Step 5.1.6) **CUE:** **As I&C Maintenance report that a team will perform AND has completed Instrument Vent Lineup 23 for ECW Pump 1B.**	Operator will contact I&C Maintenance to perform Instrument Vent Lineup 23 for ECW Pump 1B.	___	___	___
7	WHEN I&C Maintenance has completed Instrument Vent Lineup 23, THEN VERIFY flow to the following components is within the specified range for the ECW Train started in Step 5.1.3: • CCW HX - 15,059 to 17,400 gpm • STBY DG HX - 1596 to 1743 gpm • ESSENTIAL CHILLER - 1181 to 1272 gpm • CCW SUPPLEMENTARY COOLER - 40 to 50 gpm (Step 5.1.7)	Operator will verify flows to the specified cooling loads using QDPS. **NOTE:** **All Train B ECW flows will be within the required range.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
8	IF flow is **NOT** within the specified range of Step 5.1.7, THEN ADJUST ECW flow for the associated train started per the following steps: • Train B, Step 9.2.22 to 9.2.27 (Step 5.1.8)	Step is N/A. **NOTE:** **All Train B ECW flows will be within the required range.**	___	___	___
9	IF it is desired to lower ECP level, THEN GO TO Section 10.0. (Step 5.1.9)	Operator will GO TO Step 10.0 to control ECP level. **NOTE:** **Even though this step askes 'IF DESIRED" the operator has to determine if ECP level is in the required band and if NOT does it need to be raised or lowered.** **The CAUTION at the beginning of step 10.0 helps the operator make the determination.** **In this case the ECP level needs to be lowered.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*10	To Lower ECP Level OPEN the blowdown isolation valve(s) on the running ECW Trains by placing the associated handswitch in “AUTO”, as directed by the Unit Supervisor/Shift Manager. • IF TCC for FV-6935 is NOT installed. THEN OPEN “ECW TRAIN A BLWDN ISOL FV-6935” • "ECW TRAIN B BLWDN ISOL FV-6936" • "ECW TRAIN C BLWDN ISOL FV-6937" (Step 10.2.1) **CUE:** **If asked, a TCC is NOT installed on Train A Blowdown FV-6935**	The Operator will open at least one of the following valves: – IF TCC for FV-6935 is NOT installed. THEN OPEN “ECW TRAIN A BLWDN ISOL FV-6935” – "ECW TRAIN B BLWDN ISOL FV-6936" – "ECW TRAIN C BLWDN ISOL FV-6937" **NOTE :** **The preferred Blowdown Valve would be Train A and/or Train B because Train C will be shut down after the surveillance.** **However, opening at least one of the Blowdown Valves will satisfy this step.**	___	___	___
11	VERIFY the associated ECW train's blowdown isolation valve opens. • “ECW TRAIN A BLWDN ISOL FV-6935” • "ECW TRAIN B BLWDN ISOL FV-6936" • "ECW TRAIN C BLWDN ISOL FV-6937" (Step 10.2.2)	Operator verifies the valve(s) opened in the previous step is actually open.	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: START ECW PUMP AND LOWER ECW LEVEL

JPM Number: NRC S6 Revision Number: 0

Task Number and Title: 41400 Start/Stop an ECW Train

K/A Number and Importance: 075 A4.01 3.2/3.2

Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **2**

Reference(s): Example: Procedures, drawings, logics etc. used in developing and/or performing the JPM.

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 3 & 10

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 is in Mode 3 at NOP/NOT. ECW Pumps 1A and 1C are in service. A surveillance is scheduled to be performed on ECW Pump 1C.

INITIATING CUE

In preparation for the surveillance scheduled for ECW Pump 1C, the Unit Supervisor directs you to start ECW Pump 1B and ENSURE control of ECW Pond level.

NOTE:

- Another operator will work on swapping ECW cooling loads from ECW Train C to ECW Train B.
- ECP level is currently 26.2’
- A major overhaul of ECW Pump 1B has NOT been performed.
- A Plant Operator is standing by at ECW Pump 1B and the pump is NOT uncoupled.
- ECW Train C will become the Standby Train after the surveillance.
- Prerequisite Section 3.0 lineups are complete.

STPNOC

Job Performance Measure

PLACE A SGFPT IN SERVICE (From 3300RPM)

JPM Number: NRC S7

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

NOTE: The following IC setup may be modified depending on JPMs that may be performed at the same time with this one.

IC Setup

1. This JPM is performed using an IC with at least one other SGFPT in service and one at 3300 RPM.
2. Save IC to a designated IC for LOT NRC Exam usage.

After IC is Stored and ready to perform JPM

1. For LOT 23 NRC Exam this JPM is scheduled to be performed with JPM S8.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and clean the following procedures:
   - 0POP02-FW-0002, S.G.F.P. Turbine, Rev. 80

NOTE: It is okay to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

5. Reset the simulator to IC 209 and verify the following:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
6. Place simulator in RUN and quickly silence/acknowledge/reset alarms, **including plant computer/ICS alarms.**
7. PLACE simulator in FREEZE.
8. When the student and the examiners are ready to proceed, place the simulator in RUN.
9. There is no simulator lesson plan for this JPM.

Booth Instructor Actions

1. None.

INITIAL CONDITIONS

A plant startup to 100% is being performed in Unit 1. Reactor Power is at approximately 75% with Steam Generator Feed Pumps (SGFPTs) #11 and 12 in service. SGFPT #13 is operating at approximately 3300 rpm.

INITIATING CUE

The Unit Supervisor directs you to continue with placing SGFPT #13 in service in accordance with Section 14.0 of 0POP02-FW-0002, S.G.F.P. Turbine.

NOTE:

- 0POP02-FW-0002, S.G.F.P. Turbine, Section 3.0, Prerequisites, are complete.
- Pre startup testing of the SGFP Turbine (step 14.1.1) is not required.
- SGFPT #13 was NOT started per 0POP05-ZG-0005, Plant Startup to 100%.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

SGFP #13 is in service and in AUTO. All critical JPM steps (#6, 10, 11) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE No Handout is provided with this JPM. The operator should use the copy of 0POP02-FW-0002, S.G.F.P. Turbine, provided in the simulator.					
1	PERFORM the following for the SGFP turbine to be placed on line: ENSURE Pre-Startup Testing of SGFP Turbine from Turning Gear Operations has been completed at the discretion of the Shift Manager. (Step 14.1.1)	Operator ensures SGFPT #13 pre-startup testing is complete. **NOTE:** **Per the Initiating Cue SGFPT #13 pre-startup testing is complete.**	___	___	___
2	IF SGFP Turbine is at 3300 RPM, THEN GO TO Step 14.1.17, OTHERWISE continue. (Step 14.1.2)	Operator determines SGFPT speed is at 3300 rpm and GOes TO Step 14.1.17. **NOTE:** **SGFPT #13 is already at 3300 rpm.**	___	___	___
3	VERIFY the “SG LVL CONTROL” light is lit, indicating the “SPEED” controller has shifted to “SG LVL CONTROL”. (Step 14.1.17)	Operator determines the “SG LVL CONTROL” light is lit for SGFPT #13.	___	___	___
*4	IF the S/U SGFP 14(24) was placed in “PULL TO LOCK” for a SGFP start, THEN PLACE S/U SGFP 14(24) handswitch to AUTO. (Step 14.1.18)	Operator places the S/U SGFP 14 handswitch is in AUTO **NOTE:** **SU SGFP #14 is already in AUTO.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
5	DEPRESS the "Δ SPEED" pushbutton until it becomes continuously lit. (Step 14.1.19)	Operator verifies the Increase "Δ SPEED" pushbutton is continuously lit. **NOTE:** **Light will already be lit, however, operator may still depress pushbutton.**	___	___	___
*6	OPEN the applicable SGFP "FW DISCH" valve: • SGFP 13 "MOV-0061" (Step 14.1.20)	Operator opens #13 SGFPT Discharge Valve, MOV-0061	___	___	___
7	IF SGFP was started per 0POP03-ZG-0005 Plant Startup to 100%, THEN return to applicable step of 0POP03-ZG-0005 Plant Startup to 100%. (Step 14.1.21)	This step is N/A. **NOTE:** **Per Initiating Cue, SGFPT #13 was NOT started per 0POP03-ZG-0005.**	___	___	___
8	IF this is the first SGFP started, THEN PERFORM the following: (Step 14.1.22)	This step is N/A. **NOTE:** **Per Initiating Cue, SGFPT #13 was NOT the first SGFPT started.**	___	___	___
9	ENSURE the SGFP "SPEED" controller is in the "MAN" position at minimum output. (Step 14.1.23)	This step is N/A. **NOTE:** **SGFPT #13 speed controller will be in MANUAL and minimum output.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*10	RAISE SGFPT speed to approximately match the discharge pressure of the operating SGFPs using the “RAISE” pushbutton on the SGFP turbine “SPEED” controller. (Step 14.1.24)	Operator slowly raises SGFPT #13 speed to approximately match the discharge pressure of operating SGFPs using the ‘RAISE” pushbutton on the SGFP turbine “SPEED” controller. **NOTE:** **After the pump discharge check valve opens (position indication is displayed on CP-005 immediately above the pump discharge valve position indication), as speed is increased further and discharge pressure increases, the operating SGFPTs will sense a higher DP and reduce speed and consequently their discharge pressure and flowrates. There will be interaction between these pumps and the one being placed in service until balanced by the operator and system controls. Additionally, the Main Feed Reg Valves may respond to the changes in Feedpump speed thereby causing SG levels to change.** **The applicant should closely monitor operating pump speed and pressure to prevent inadvertent SG level reactor trips. There’s a NOTE in the procedure to this effect.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*11	WHEN the SGFP speed matches the “SGFP MASTER SPEED” controller **OR** any operating SGFP speed, THEN PLACE the “SPEED” controller in “AUTO”. (Step 14.1.25)	Operator places SGFPT #13 SPEED controller in AUTO.	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: PLACE A SGFPT IN SERVICE (From 3300RPM)

JPM Number: NRC S7 Revision Number: 0

Task Number and Title: 20700 Startup/Shutdown Main Feedwater Pumps at Power

K/A Number and Importance: 039 A4.03 2.8/2.8

Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0POP02-FW-0002, S.G.F.P. Turbine, Rev. 80.

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 6, 10, 11

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

_____

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_____

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_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

A plant startup to 100% is being performed in Unit 1. Reactor Power is at approximately 75% with Steam Generator Feed Pumps (SGFPTs) #11 and 12 in service. SGFPT #13 is operating at approximately 3300 rpm.

INITIATING CUE

The Unit Supervisor directs you to continue with placing SGFPT #13 in service in accordance with Section 14.0 of 0POP02-FW-0002, S.G.F.P. Turbine.

NOTE:

- 0POP02-FW-0002, S.G.F.P. Turbine, Section 3.0, Prerequisites, are complete.
- Pre startup testing of the SGFP Turbine (step 14.1.1) is not required.
- SGFPT #13 was NOT started per 0POP05-ZG-0005, Plant Startup to 100%.

STPNOC

Job Performance Measure

ROLL A 13.8KV ELECTRICAL BUS

JPM Number: NRC S8

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

NOTE: The following IC setup may be modified depending on JPMs that may be performed at the same time with this one.

IC Setup

1. This JPM can performed in any Mode that has the 13.8KV Buses in a normal lineup.
2. Roll 13.8KV Standby Bus 1H from the cross tie to the Unit 1 Standby Transformer.
3. Place the 4.16KV Train B ESF Load Tap Changer in Manual.
4. Save IC to a designated IC for LOT NRC Exam usage.

After IC is Stored and ready to perform JPM

1. For LOT 23 NRC Exam this JPM is scheduled to be performed with JPM S7.
2. Ensure Radio volume for both stations are set to a reasonable level.
3. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
4. Check and clean the following procedures:
   - 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup, Rev 68

NOTE: It is okay to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

5. Reset the simulator to IC 209 and verify the following:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
6. Place simulator in RUN and quickly silence/acknowledge/reset alarms, **including plant computer/ICS alarms.**
7. PLACE simulator in FREEZE.
8. When the student and the examiners are ready to proceed, place the simulator in RUN.
9. There is no simulator lesson plan for this JPM.

Booth Instructor Actions

1. None.

INITIAL CONDITIONS

Unit 1 is at 75% Power.

Emergent work was performed on ‘AUX TO STBY BUS 1G TIE BKR’ and ‘STBY XFMR 2 TO STBY BUS 1G SPLY’ Handswitches in the Control Room on CP010.

The Handswitches have been repaired and are ready for PMT.

In preparation for the PMT, 13.8KV STBY Bus 1H has been aligned to the Unit 1 STBY Transformer so that all ESF Buses will not be aligned to the Unit Aux Transformer at one time and the Train ‘B’ ESF Load Tap Changer is in MANUAL with the Tap Changer at ‘N’ as verified by the Head Plant Operator.

INITIATING CUE

Steps for performing the PMT have been developed, recorded, reviewed and approved by the Unit Supervisor on 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup, Addendum 4, Transferring 13.8 KV Bus Power Supply Checklist.

The Unit Supervisor directs you to perform procedure step 16.9 of 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup, to complete the PMT.

NOTE: TS 3.8.1.1 has been evaluated and implemented for this ALTERNATE LINEUP of the 13.8KV 1G BUS. The electrical alignment performed will be placed back to the NORMAL LINEUP on the next shift.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Performs the following 13.8 KV bus transfers without causing an automatic breaker actuation:

- *13.8 KV STBY Bus 1G from the STBY XFMR 1 to the Unit 1 UAT via the TIE BKR.*
- *13.8 KV STBY Bus 1G from the Unit 1 UAT via the TIE BKR to the STBY XFMR 2.*

All critical JPM steps (#1, 2, 3, 5, 6 and 7) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup, Addendum 4, Transferring 13.8 KV Bus Power Supply Checklist is filled out and attached with this JPM. It is to be given to the Operator along with the portions of procedure section 16 leading up to step 16.9. '13KV BUS BKR PARALLELED' Alarm 10M1 B-3 will annunciate if a 13.8KV Bus is paralleled more than 15 seconds. Depending on the breaker lineup at the time of parallel breaker operation, supply breakers will trip open to separate the AUX and STBY Bus after 30 to 30.5 seconds of being paralleled.					
*1	13.8 KV Bus 1G Tie Breaker Sync Switch to 'ON'	Places 'TIE BKR SYNC SW' T-0140 to 'ON'	___	___	___
*2	Close 13.8 KV Bus 1G Tie Breaker.	Places 'AUX TO STBY BUS 1G TIE BKR' T-0140 to 'CLOSE'	___	___	___
*3	Open STBY Transformer 1 Supply to 13.8 KV STBY Bus 1G Breaker.	Places 'STBY XFMR 1 TO STBY BUS 1G SPLY' ST-0160 to 'TRIP'	___	___	___
4	13.8 KV Bus 1G Tie Breaker Sync Switch to 'OFF'	Places 'TIE BKR SYNC SW' T-0140 to 'OFF'	___	___	___
*5	13.8 KV Bus 1G STBY 2 Supply Breaker Sync Switch to 'ON'	Places 'SPLY BKR SYNC SW' ST-0180 to 'ON'	___	___	___
*6	Close 13.8 KV STBY Bus 1G STBY 2 Supply Breaker.	Places 'STBY XFMR 2 TO STBY BUS 1G SPLY' ST-0180 to 'CLOSE'	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*7	Open 13.8 KV Bus 1G Tie Breaker.	Places 'AUX TO STBY BUS 1G TIE BKR' T-0140 to 'TRIP'	___	___	___
8	13.8 KV Bus 1G STBY 2 Supply Breaker Sync Switch to 'OFF	Places 'SPLY BKR SYNC SW' ST-0180 to 'OFF	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: ROLL 13.8 KV ELECTRICAL BUSES

JPM Number: NRC S8 Revision Number: 0

Task Number and Title: 62800, Shift Auxiliary Busses between the Unit Aux XFMR and the Standby XFMR

K/A Number and Importance: 062 A4.07 3.1/3.1

Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☐ SRO Only ☒ RO/SRO ☐ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **3**

Reference(s): 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup, Rev 68

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 5 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 1, 2, 3, 5, 6 and 7

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

_____

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_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

Unit 1 is at 75% Power.

Emergent work was performed on ‘AUX TO STBY BUS 1G TIE BKR’ and ‘STBY XFMR 2 TO STBY BUS 1G SPLY’ Handswitches in the Control Room on CP010.

The Handswitches have been repaired and are ready for PMT.

In preparation for the PMT, 13.8KV STBY Bus 1H has been aligned to the Unit 1 STBY Transformer so that all ESF Buses will not be aligned to the Unit Aux Transformer at one time and the Train ‘B’ ESF Load Tap Changer is in MANUAL with the Tap Changer at ‘N’ as verified by the Head Plant Operator.

INITIATING CUE

Steps for performing the PMT have been developed, recorded, reviewed and approved by the Unit Supervisor on 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup, Addendum 4, Transferring 13.8 KV Bus Power Supply Checklist.

The Unit Supervisor directs you to perform procedure step 16.9 of 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup, to complete the PMT.

NOTE: TS 3.8.1.1 has been evaluated and implemented for this ALTERNATE LINEUP of the 13.8KV 1G BUS. The electrical alignment performed will be placed back to the NORMAL LINEUP on the next shift.

STPNOC

Job Performance Measure

FILL SFP FROM RWST

JPM Number: NRC P1

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

IC Setup

- No setup required. This is an In-Plant JPM.

INITIAL CONDITIONS

A ‘SFP WATER LEVEL HI/LO’ alarm has been received in the Control Room. Investigation has revealed a low level condition in the Spent Fuel Pool (SFP). The ‘SFP LOW LEVEL’ alarm is in on Local Panel, ZLP-749. Current SFP level is 66’.

INITIATING CUE

SFP boron concentration has been evaluated with Chemistry and it has been determined that the SFP needs to be filled to 66’10” from the Refueling Water Storage Tank (RWST) using 0POP02-FC-0001, Spent Fuel Pool Cooling and Cleanup System, Section 9.3.

Plant Operator, Bob Jones, started the task but now has to be relieved to go to Fitness for Duty. Bob Jones completed up to and including step 9.3.4.

The Unit Supervisor requests that you go back and review Notes and Precautions

4.13, 4.20, 4.21, 4.22, 4.45, 4.53, 4.58

of 0POP02-FC-0001, Spent Fuel Pool Cooling and Cleanup System and then continue the task at step 9.3.5.

You have been given the wrench required to operate Reach Rod Valves per Prerequisite step 3.5. A Plant Operator is ready to assist at the Refueling Water Purification Pump (RWPP) on the 10’ MAB and a Plant Operator is stationed at the SFP to monitor level.

The Unit Supervisor requests that you call the Control Room when SFP level starts to go up.

NOTE:

- No Spent Fuel Assemblies are being moved in the SFP and there are no loads over the SFP.
- RWST level is 498,000 gallons.
- RWST boron concentration is 2910 ppm.
- SFP boron concentration is 2809 ppm.
- Chemistry concurs with filling SFP from RWST.
- SFP Purification and RWST Purification have been secured.
- There are NO TCCs installed.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

The Spent Fuel Pool is being filled from the Refueling Water Storage Tank. All Critical JPM Steps (#1, 2, 4) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Hand out the Student Initiating Cue Sheet along with the Student HO1 of 0POP02-FC-0001, Spent Fuel Pool Cooling and Cleanup System. Student HO2 of TS 3.5.5, Refueling Water Storage Tank, is part of this JPM but can be withheld unless asked for by the performer. TS limit on SFP boron concentration is ≥ 2500 ppm but is normally kept at ≥ 2800 ppm. JPM Steps 1 through 4 can be performed in any order. SFP HX Rooms require permission from the Shift Manager prior to entry. Make sure the Examiner has made arrangements with the Shift Manager prior to performing this JPM. This JPM is written so that two Plant Operators can be used for assistance at JPM step *4. One can be used for monitoring the SFP level and one can be used to be at the Refueling Water Purification Pump (RWPP) when it is started. This JPM can be performed in either Unit.					

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*1	ENSURE the following valve are OPEN: • 1(2)-FC-0033 "SFP PURIFICATION LOOP 1A(2A) NORMAL RETURN TO SFPCCS ISOLATION VALVE" (Step 9.3.5 1st bullet) **CUE:** **INITIALLY: Valve is Closed** **FINALLY: Valve is Open**	Operator locates and opens: 1(2)-FC-0033 **NOTE:** **Valve is located in Room 237Q - 41 ft MAB Filter Row** **Valve FC-0033 will require the use of a wrench. Per the Initiating Cue, the proper wrench has been given to the performer.** **FC-0033 has a position indicator on the remote operator for the valve which will move about 1 to 1½ inch when positioning the valve. The position indicator will line up with marks on an 'OPEN' or 'CLOSED' label to indicate what position the valve is in. The Examiner can cue the performer by pointing to these label marks.** **The 'OPEN' label mark is missing in Unit 2.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*2	ENSURE the following valve are OPEN: • 1(2)-FC-0016A "SPENT FUEL POOL PURIFICATION LOOP 1A(2A) RETURN VALVE" (Step 9.3.5 2nd bullet) **CUE:** **INITIALLY: Valve is Closed** **FINALLY: Valve is Open**	Operator locates and opens: 1(2)-FC-0016A **NOTE:** **Valve is located in FHB SFPC HX room – 36'** **SFP HX Rooms require Control Room permission prior to entry.** **FC-0016A is a globe valve. The Examiner can point to the valve stem as being flush with the valve handle for 'CLOSED' and extended from the valve handle for 'OPEN.'** **In Unit 2, poor lighting is an issue in both SFP HX rooms. It's hard to see the tag for FC-0016A. A Condition Report has been written for the lighting issue.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
3	ENSURE the following valves are OPEN: • "RWST TO SFP CLEANUP SYS FV-3936" • "RWST TO SFP CLEANUP SYS FV-3937" (Step 9.3.5 3rd & 4th bullet) **CUE:** **INITIALLY: Valves are Closed** **FINALLY: Valves are Open**	Operator verifies open SI-FV-3936 and SI-FV-33937 by contacting the control room. **NOTE:** **These valves are in the penetration area of the 10' MAB. They are located near the RWPP where a Plant Operator is stationed for assistance. Positioning these valves is not a critical step because they can only be operated from the Control Room.** **If the performer at any time starts to go to the 10' MAB Penetration area to verify valve position of FV-3936 & FV-3937 locally, request that he/she radio the Control Room and have the RO position these valves using the CRHS.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*4	START "N1(2)FCHS1419 RWPP 1A(2A)" (Step 9.3.6) **CUE:** **If asked, the red LED light for low SFP level is illuminated on ZLP-749.** **If asked, the Plant Operator at the RWPP reports that the pump looks good for a start.** **For the pump start:** • **INITIALLY: Green light ON, Red light OFF** • **FINALLY: Red light ON, Green light OFF** **If asked after pump start, the RWPP is running SAT and flow has been adjusted to 195 gpm. (Step 9.37 of procedure)** **If the operator does not ask about SFP level after starting the RWPP, then CUE the operator as the Plant Operator at the SFP that level is now 66' ½" and slowly going up.**	Operator proceeds to ZLP-749 and places the handswitch for the Refueling Water Purification Pump (RWPP) in the START position.	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
5	Inform the Unit Supervisor that SFP level is slowly going up. (Per Initiating Cue) **CUE:** **If the operator calls the Plant Operator at the SFP, report back that SFP level is 66'1/2" and slowly going up.** **If the operator goes up to the FHB 68' to check SFP level, indicate that SFP level is 66'1/2" and slowly going up.** **If the operator leaves the FHB to continue with the procedure without checking SFP level, then, as the Unit Supervisor, ask the performer if SFP level is being raised.**	Operator contacts the Unit Supervisor to report that SFP level is slowly going up. **NOTE:** **Operator can call the Plant Operator at the SFP to verify level is going up or he/she can go up to the FHB 68' and do their own visual check of SFP level after starting the RWPP.** **SFP level can be checked from outside the contaminated area of the SFP by checking the SFP Transfer Canal level indicator at the north end of the SFP Transfer Canal. During non-outage conditions, the SFP Transfer canal gates are removed and the SFP Transfer Canal and SFP are at the same level.**	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: FILL SFP FROM RWST

JPM Number: NRC P1 Revision Number: 0

Task Number and Title: 43650, Respond to Spent Fuel Cooling and Cleanup System alarms.

K/A Number and Importance: 033 A1.01 2.7/3.3

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☒ In-Plant ☐ Other

Alternate Path: ☐ Yes ☒ No

Task Designed For: ☐ SRO Only ☐ RO/SRO ☒ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **2**

Reference(s): 0POP02-FC-0001, Spent Fuel Pool Cooling and Cleanup System, Rev. 94

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 20 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 1, 2, 4

Evaluation Summary:

Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

A ‘SFP WATER LEVEL HI/LO’ alarm has been received in the Control Room. Investigation has revealed a low level condition in the Spent Fuel Pool (SFP). The ‘SFP LOW LEVEL’ alarm is in on Local Panel, ZLP-749. Current SFP level is 66’.

INITIATING CUE

SFP boron concentration has been evaluated with Chemistry and it has been determined that the SFP needs to be filled to 66’10” from the Refueling Water Storage Tank (RWST) using 0POP02-FC-0001, Spent Fuel Pool Cooling and Cleanup System, Section 9.3.

Plant Operator, Bob Jones, started the task but now has to be relieved to go to Fitness for Duty. Bob Jones completed up to and including step 9.3.4.

The Unit Supervisor requests that you go back and review Notes and Precautions

4.13, 4.20, 4.21, 4.22, 4.45, 4.53, 4.58

of 0POP02-FC-0001, Spent Fuel Pool Cooling and Cleanup System and then continue the task at step 9.3.5.

You have been given the wrench required to operate Reach Rod Valves per Prerequisite step 3.5. A Plant Operator is ready to assist at the Refueling Water Purification Pump (RWPP) on the 10’ MAB and a Plant Operator is stationed at the SFP to monitor level.

The Unit Supervisor requests that you call the Control Room when SFP level starts to go up.

NOTE:

- No Spent Fuel Assemblies are being moved in the SFP and there are no loads over the SFP.
- RWST level is 498,000 gallons.
- RWST boron concentration is 2910 ppm.
- SFP boron concentration is 2809 ppm.
- Chemistry concurs with filling SFP from RWST.
- SFP Purification and RWST Purification have been secured.
- There are NO TCCs installed.

STPNOC

Job Performance Measure

LOCALLY START AN ESF DG PER 0POP04-ZO-0001, CONTROL ROOM EVACUATION, ADDENDUM 7

JPM Number: NRC P2

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

IC Setup

- No setup required. This is an In-Plant JPM.

INITIAL CONDITIONS

The Unit Control Room was evacuated due to a fire in the Relay Room. The 4.16KV ESF Bus for Train B was deenergized for maintenance.

INITIATING CUE

The Shift Manager is on Step 23.0.a of 0POP04-ZO-0001, Control Room Evacuation.

You are an extra operator and the Shift Manager directs you to verify the status of 4.16KV ESF Busses starting with Train C.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Evaluate the status of 4.16KV ESF Busses and determine that only 4.16KV ESF Bus Train A is energized. Start ESF DG #13(23) and energize 4.16KV Bus Train C so that at least two 4.16KV ESF Busses are energized. All Critical JPM Steps (#6, 7, 10, 11, 12, 15) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Hand out the Student Initiating Cue Sheet along with the Student HO1 which is the selected pages that start at step 23.0.a of 0POP04-ZO-0001, Control Room Evacuation. The Student HO2 of 0POP04-ZO-0001, Control Room Evacuation, Addendum 7, Local Manual Standby Diesel Generator Starting, is NOT to be handed until the student identifies that Addendum 7 needs to be performed.					
1	VERIFY at least two 4.16 KV ESF busses – ENERGIZED (Step 23.0.b) **CUE:** **All voltage meters for 4.16KV ESF Bus Train C read zero (0) volts. (Indicated by pointing to 0 on the voltage meter.)** **4.16KV ESF Bus Train C Cubicle 1 Breaker (normal power)** • **Green Light ON** • **Red Light OFF** **4.16KV ESF Bus Train C Cubicle 14 Breaker (diesel generator power)** • **Green Light ON** • **Red Light OFF** **When the operator goes to check Train A report as another operator that Train A is energized.**	Operator determines that there is only one 4.16KV ESF Bus energized, Train A, and continues to RNO step 23.0.b.1. **NOTE:** **The Initiating Cue states that 4.16KV ESF Bus Train B was already de-energized due to maintenance. Then it directs the operator to check 4.16KV ESF Bus Train C first.** **With 2 ESF Busses de-energized the operator goes to RNO Step 23.0.b.1.**	___	___	___
NOTE **Alternate Path Starts Here**					

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
2	PERFORM the following: • PERFORM Addendum 6, Stripping Loads from 4.16 KV ESF Busses for the deenergized 4.16 KV ESF Bus. (RNO Step 23.0.b.1) **CUE:** **Another operator will perform Addendum 6, Stripping Loads from 4.16KV ESF Busses for the deenergized 4.16KV ESF Bus.**	Operator recognizes that another operator will perform Addendum 6, Stripping Loads From 4.16 KV ESF Busses for the deenergized 4.16 KV ESF Bus, and then continues to RNO Step 23.0.b.2.	___	___	___
3	DISPATCH operator to start the DG for the deenergized 4.16 KV ESF Bus per Addendum 7, Local Manual Standby Diesel Generator Starting (RNO Step 23.0.b.2)	Operator heads to ESF DG #13(23). **NOTE:** **Hand out Student HO2 which is 0POP04-ZO-0001, Addendum 7.**	___	___	___
4	CHECK Standby Diesel Generator Status – RUNNING (Add. 7 Step 1.0) **CUE:** **There are NO sounds coming from the Diesel Engine.** **If asked, Diesel Engine rpm is reading 0.** **If asked, personnel are in position to start ECW for Train C when needed.**	Operator determines that ESF DG #13(23) is NOT running and continues with RNO Step 1.0.a.	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
5	PERFORM the following at the Standby Diesel Generator Control Panels: ENSURE that any existing alarm(s) will not hinder startup or cause damage to the Standby Diesel Generator. (Add. 7 RNO Step 1.0.a) **CUE:** **The following local annunciator is lit:** **F-1; Raw Water Low Pressure**	Operator determines there are NO local annunciator alarms in that will hinder startup of ESF DG #13(23).	___	___	___
*6	ENSURE the “LOCAL/REMOTE TRANSFER SW” key lock switch in “LOCAL”. (Add. 7 RNO Step 1.0.b) **CUE:** **Initially: Switch is in REMOTE** **Finally: Switch is in LOCAL**	Operator selects the “LOCAL” position on the “LOCAL/REMOTE TRANSFER SW” **NOTE:** **A key for the switch would be located in the small metal lock box located near the local diesel panel.**	___	___	___
*7	ENSURE the “ESF BUS SUPPLY BKR TRANSFER SWITCH” key lock switch in “LOCAL”. (Add. 7 RNO Step 1.0.c) **CUE:** **Initially: Switch is in REMOTE** **Finally: Switch is in LOCAL**	Operator selects the “LOCAL” position on the “ESF BUS SUPPLY BKR TRANSFER SWITCH” **NOTE:** **A key for the switch would be located in the small metal lock box located near the local diesel panel.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
8	ENSURE the "VOLTAGE REG SEL SWITCH" in the AUTO position. (Add. 7 RNO Step 1.0.d) **CUE:** **Switch would already be in Auto, 'so as you see it.'**	Operator ensures "VOLTAGE REG SEL SWITCH" in the AUTO position. **NOTE:** **Switch will already be in Auto.**	___	___	___
9	ENSURE that personnel are in position to start the associated ECW pump and open the ECW pump discharge valve within 2 minutes after starting the Standby Diesel Generator. (Add. 7 RNO Step 1.0.e) **CUE:** **All required personnel are in position.**	Operator calls the Aux shutdown panel to determine that all required personnel are in position to support starting ESF DG #13(23).	___	___	___
*10	OBTAIN key for operation of the "TEST MODE START" Switch. PLACE Diesel Generator "TEST MODE START" switch to the ON position. (Add. 7 RNO Step 1.0.f & g) **CUE:** **Initially: Switch is in OFF** **Finally: Switch is in ON**	Operator places key in lock above switch, unlocks switch and then places "TEST MODE START" switch to the ON position. **NOTE:** **A key for the switch would be located in the small metal lock box located near the local diesel panel.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*11	DEPRESS the “ENGINE START” Pushbutton. GO TO Step 5 of this Addendum. (Add. 7 RNO Step 1.0.h & i) **CUE:** **Noise of Diesel Engine starting is heard.** **Diesel Engine RPM goes from 0 rpm to 600 rpm in about 10 seconds.** **The Diesel Engine “SEQUENCE INDICATION” goes from:** • **STOP Green light ON then OFF when engine starts to crank** • **CRANK Amber light ON during 10 seconds of cranking** • **READY TO LOAD Red light OFF then ON when engine at 600 rpm**	Operator depresses the “ENGINE START” Pushbutton and ensures the engine speeds up to 600rpm and is Ready for Load. **NOTE:** **The “ENGINE START MODE” switch would be in the RATED position so engine would speed up to 600 rpm in about 10 seconds.**	___	___	___
*12	PLACE The “SYNCHRONIZING METER SEL” Switch In The ON Position (Add. 7 Step 5.0) **CUE:** **Initially: Switch is in OFF** **Finally: Switch is in ON**	Operator places “SYNCHRONIZING METER SEL” switch in the ON position.	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
13	VERIFY The Synchroscope Status - STATIONARY (Add. 7 Step 6.0) **CUE:** **Synchroscope indication is NOT moving.**	Operator verifies that synchroscope status is NOT moving. **NOTE:** **With 4.16KV ESF Bus Train C deenergized the synchroscope will NOT be moving.**	___	___	___
14	Momentarily PLACE The ESF BUS E1C(E2C) 4.16 KV SUPPLY BRK E1C(E2C)/1 Switch To The TRIP Position (Add. 7 Step 7.0) **CUE:** **Initially: Green light ON & Red light OFF** **Finally: Green light ON & Red light OFF**	Operator momentarily places the ESF BUS E1C(E2C) 4.16 KV SUPPLY BRK E1C(E2C)/1 switch to the TRIP position. **NOTE:** **This action ensures the breaker is open, however, the breaker is already open.**	___	___	___
*15	CLOSE The Standby Diesel Generator Output Breaker • EMERG DIESEL GEN 13(23) OUTPUT BRK E1C(E2C)/14 (Add. 7 Step 7.0) **CUE:** **Initially: Green light ON & Red light OFF** **Finally: Green light OFF & Red light ON** **4.16KV ESF Bus Train C voltage reads about 4160 volts**	Operator energizes 4.16KV ESF Bus Train C.	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: LOCALLY START AN ESF DG PER 0POP04-ZO-0001, CONTROL ROOM EVACUATION, ADDENDUM 7

JPM Number: NRC P2 Revision Number: 0

Task Number and Title: 85700, Respond to a Control Room evacuation per 0POP04-ZO-0001, Control Room Evacuation

K/A Number and Importance: 064 A4.01 4.0/4.3

Suggested Testing Environment: ☐ Simulator ☐ Control Room ☒ In-Plant ☐ Other

Alternate Path: ☒ Yes ☐ No

Task Designed For: ☐ SRO Only ☐ RO/SRO ☒ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: 3

Reference(s): 0POP04-ZO-0001, Control Room Evacuation, Rev. 45

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 20 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 6, 7, 10, 11, 12, 15

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:_____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

The Unit Control Room was evacuated due to a fire in the Relay Room. The 4.16KV ESF Bus for Train B was de-energized for maintenance.

INITIATING CUE

The Shift Manager is on Step 23.0.a of 0POP04-ZO-0001, Control Room Evacuation.

You are an extra operator and the Shift Manager directs you to verify the status of 4.16KV ESF Busses starting with Train C.

STPNOC

Job Performance Measure

FAILING AIR TO MSIV AND MSIB

JPM Number: NRC P3

Revision Number: 0

Date: 07/15/2019

Developed By:	N/A Instructor (Print/Sign)	N/A Date
Approved By:	N/A Training Supervisor (Print/Sign)	N/A Date
Approved By:	N/A Line Management (Print/Sign)	N/A Date

NOTE: N/A signature blocks if this JPM is being used on an NRC LOT Exam.

Revision Record (Summary)

Revision 0; Drafted JPM for use on the LOT 23 NRC exam.

SIMULATOR SETUP INSTRUCTIONS

IC Setup

1. No setup required. This is an In-Plant JPM.

INITIAL CONDITIONS

The unit has experienced a loss of all AC power, and procedure 0POP05-EO-EC00, LOSS OF ALL AC, is being performed. The crew is currently at step 7 and has determined that there are no ESF busses energized.

INITIATING CUE

The Unit Supervisor directs you to perform Addendum 4, VITAL DC BUS MONITORING, starting at step 4.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Information For Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes critical steps.

If Time Critical, estimated time is the Time Critical time.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Task Standard:

Instrument air to one train of MSIVs and MSIBs has been isolated and vented. All Critical JPM Steps (#3, 4) are completed.

JPM Start Time: _____

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
NOTE Hand out the Student Initiating Cue Sheet along with the Student HO1 which is the selected pages of 0POP05-EO-EC00, Loss of All AC Power, Addendum 4, Vital DC Bus Monitoring. The Student HO2 of 0POP05-EO-EC00, Loss of All AC Power, Addendum 3, Failing Air to MSIVs and MSIBs, is NOT to be handed until the student identifies that Addendum 3 needs to be performed.					
1	Train A AND B bus voltages – greater than 105.5 VDC. (Add 4 Step 4.a) **CUE:** **Inform applicant that the Control Room Class 1E 125 VDC volt meters are not working. The applicant should check voltage locally (Train A or B battery):** • **On the first train checked, the battery switchboard analog meter or the battery charger digital output indicator (on the charger with its output breaker closed) is reading 103 VDC.** • **If a second train is checked (Train A or B), the same indications described above will read 107 VDC.**	The operator determines the voltage on one bus is less than required and continues to Step 4.a.1 RNO. **NOTE:** **This step is to be accomplished locally at the battery switchboard room.** **The voltage on first battery checked will be low (Train A or B)**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
2	PERFORM the following: DISPATCH operator to perform ADDENDUM 3, FAILING AIR TO MSIVs AND MSIBs for all MSIV(s) and MSIB(s). (Add 4 RNO Step 4.a.1) **CUE:** **A pipe wrench will be needed to perform Addendum 3. If asked inform the Operator that a pipe wrench has been provided.**	Operator heads to the IVC to perform ADDENDUM 3, FAILING AIR TO MSIVs AND MSIBs for all MSIV(s) and MSIB(s). **NOTE:** **After the Operator determines that Addendum 3 must be performed, handout Student HO2.**	___	___	___
NOTE **Alternate Path Starts Here**					

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*3	CLOSE IA isolation to MSIV and MSIB • S/G A - "1(2)-IA-0555 INSTRUMENT AIR SUBHEADER ISOLATION VALVE" • S/G B - "1(2)-IA-0551 INSTRUMENT AIR SUBHEADER ISOLATION VALVE" • S/G C - "1(2)-IA-0547 INSTRUMENT AIR SUBHEADER ISOLATION VALVE" • S/G D - "1(2)-IA-0559 INSTRUMENT AIR SUBHEADER ISOLATION VALVE" (Add 3 Step 1) **CUE:** **When appropriate have the Operator go to the Train that was pre-determined and is NOT protected.** **Selected Instrument Air Subheader Isolation Valve:** **Initially - OPEN** **Finally - CLOSED**	Operator closes IA isolation to MSIV and MSIB _ S/G A - "1(2)-IA-0555 INSTRUMENT AIR SUBHEADER ISOLATION VALVE" _ S/G B - "1(2)-IA-0551 INSTRUMENT AIR SUBHEADER ISOLATION VALVE" _ S/G C - "1(2)-IA-0547 INSTRUMENT AIR SUBHEADER ISOLATION VALVE" _ S/G D - "1(2)-IA-0559 INSTRUMENT AIR SUBHEADER ISOLATION VALVE" **NOTE:** **The Operator will simulate closing just one of the listed valves.** **As the operator simulates rotating the hand lever, indicate to the operator that the valve is closed once the lever reaches a position 90° clockwise from where it began.**	___	___	___

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*4	VENT IA line to atmosphere by uncapping and opening vent valve to the affected train. • S/G A - "1(2)-IA-7783 INSTRUMENT AIR TO A1(2)MSFSV7414 VENT VALVE" • S/G B - "1(2)-IA-7784 INSTRUMENT AIR TO A1(2)MSFSV7424 VENT VALVE" • S/G C - "1(2)-IA-7785 INSTRUMENT AIR TO A1(2)MSFSV7434 VENT VALVE" • S/G D - "1(2)-IA-7782 INSTRUMENT AIR TO A1(2)MSFSV7444 VENT VALVE" (Add 3 Step 1) **CUE:** **Selected Vent Valve:** **Initially - CLOSED** **Finally - OPEN** **When the vent line is simulated uncapped then air is heard venting from the line and the MSIV closes. (The MSIB is already closed)**	Operator vents IA line by uncapping the vent line and opening the associated vent valve from JPM Step 3. _ S/G A - "1(2)-IA-7783 INSTRUMENT AIR TO A1(2)MSFSV7414 VENT VALVE" _ S/G B - "1(2)-IA-7784 INSTRUMENT AIR TO A1(2)MSFSV7424 VENT VALVE" _ S/G C - "1(2)-IA-7785 INSTRUMENT AIR TO A1(2)MSFSV7434 VENT VALVE" _ S/G D - "1(2)-IA-7782 INSTRUMENT AIR TO A1(2)MSFSV7444 VENT VALVE" **NOTE:** **Once completed with this Train the JPM can be terminated.**	___	___	___
CUE	This JPM is completed				

JPM Stop Time: _____

JPM SUMMARY

Operator's Name: _____ **Job Title**: ☐ RO ☐SRO

JPM Title: FAILING AIR TO MSIV AND MSIB

JPM Number: NRC P3 Revision Number: 0

Task Number and Title: 82044, Respond to a Loss of All AC Power in per with 0POP05-EO-EC00, Loss of All AC Power

K/A Number and Importance: 039 A4.01 2.9/2.8

Suggested Testing Environment: ☒ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Alternate Path: ☒ Yes ☐ No

Task Designed For: ☐ SRO Only ☐ RO/SRO ☒ AO/RO/SRO

Time Critical: ☐ Yes ☒ No

Level of Difficulty: **2**

Reference(s): 0POP05-EO-EC00, Loss of All AC Power, Rev. 32

Actual Testing Environment: ☐ Simulator ☐ Control Room ☐ In-Plant ☐ Other

Testing Method: ☐ Simulate ☐ Perform

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

Critical Steps (*) 3, 4

Evaluation Summary:
Were all the Critical Steps performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against standards contained within this JPM and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: _____

_____

_____

_____

_____

_____

_____

Evaluator's Name: _____
(Print)

Evaluator's Signature: _____ **Date**: _____

Student Handout

INITIAL CONDITIONS

The unit has experienced a loss of all AC power, and procedure 0POP05-EO-EC00, LOSS OF ALL AC, is being performed. The crew is currently at step 7 and has determined that there are no ESF busses energized.

INITIATING CUE

The Unit Supervisor directs you to perform Addendum 4, VITAL DC BUS MONITORING, starting at step 4.

LOT 23 NRC EXAM

SIMULATOR OPERATING TEST

SCENARIO #1

Revision 0

Week of 07/15/2019

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 1** **Op-Test No.: LOT 23 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:
- **Mode 2 with Reactor Power at 1% to 3%. Currently on step 5.16 of 0POP03-ZG-0005, Plant Startup to 100%.**

Turnover:
- **No Equipment Out of Service.**

Critical Tasks:
- **Event 5 – Trip RCPs**
- **Event 7 – Manually Start CS Pumps**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	N/A	RO (R) SRO (R)	Raise reactor power to 3% to 4% with control rods in manual.
2 (10 min)	01-37-01 1	BOP (I) SRO (I, TS)	Intermediate Range Channel NI 35 fails low.
3 (25 min)	02-26-02 1.0	RO (I) SRO (I, TS)	Loop 1B Cold Leg RTD T-0420B fails high
4 (35 min)	05-14-01 0.9	BOP (I) SRO (I)	Steam Header PT-0557 fails high. At low power this causes steam dumps to fail open.
5 (45min)	02-01-04 .01	All (M)	SBLOCA on Loop D Cold Leg. **(Critical Task)**
6 (N/A)	Multiple	BOP (C) SRO (C)	RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close. **(Integral to Scenario)**
7 (N/A)	02-01-04 .5	RO (C) SRO (C)	LBLOCA **(Critical Task)** **(SBLOCA on Loop D Cold Leg gets bigger 30 seconds after resetting the ESF DG Load Sequencers)**

Lot* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specification

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Malfunctions after EOP entry (1–2)	2
2. Abnormal events (2–4)	4
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	2
5. Entry into a contingency EOP with substantive actions (≥1 per scenario set)	1
6. Preidentified critical tasks (≥2)	2

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

- Critical Tasks are indicated by "**CT-##**" in the position column and indicated in bold type. In some instances an "*" will indicate that only a portion of the task listed is considered critical.
- Shaded cells indicate procedural entry points.

RECORDED PARAMETERS:

Recorded parameters will be determined during NRC Validation week.

The parameters identified for recording may be of value in evaluating crew performance. Once the scenario is complete for each crew, printout the recorded parameters and label the printout with date, time, crew number and scenario number. See Scenario Instructions section for further details on how to save the Recorded Parameters.

- Main Turbine Throttle Valve #1 position
- Core Exit T/C
- RCS Wide Range Pressure
- LHSI Pump 1A Red Light

SCENARIO OBJECTIVES

Event 1 Objective

- Perform an increase or decrease in reactor power per 0POP03-ZG-0005, Plant Startup to 100%.

Event 2 Objective

- Respond to a failure of an Intermediate Range Channel per 0POP04-NI-0001, Nuclear Instrument Malfunction.

Event 3 Objective

- Respond to a failure of an RCS Loop RTD per 0POP04-RP-0004, Failure of RCS Loop RTD Protection Channel.

Event 4 Objective

- Respond to a failure of Steam Header Pressure Transmitter, PT-0557, at low power per 0POP04-MS-0001, Excessive Steam Demand.

Event 5 Objective

- Respond to a SBLOCA where RCPs have to be secured per 0POP05-EO-ES01, Reactor Trip Response, and 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.

Event 6 Objective

- Respond to equipment failures during a reactor trip per 0POP05-EO-ES01, Reactor Trip Response.

Event 7 Objective

- Respond to a Containment high pressure condition per 0POP05-EO-FRZ1, Response to High Containment Pressure.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 1

Event Description: Raise reactor power to 3% to 4% with control rods in manual.

Time	Position	Required Operator Actions	Notes
	SRO	Directs actions of 0POP03-ZG-0005, Plant Startup to 100% and supervises reactivity additions.	
	RO	Starts raising reactor power from 1%-3% to 3%-4% with control rods in manual. *(Step 5.16)*	
	RO	ENSURE "ROD BANK SEL" switch is in "MAN" position. *(Form 2 Step 1)*	
	RO	WITHDRAW/INSERT Control Banks by holding Rod Control Switch in OUT/IN position. *(Form 2 Step 2)*	
	SRO	PLACE the "ROD BANK SEL" switch in the "AUTO" or "MAN" position as deemed necessary by Shift Manager/Unit Supervisor. *(Form 2 Step 3)* *(The RO will repeat these steps as needed to raise power to 3%-4%.)* *(**Event 2** can be triggered when the lead examiner is satisfied with crew performance for reactivity.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 2 **(Examiner Trigger)**			
Event Description: Intermediate Range Channel NI 35 fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	Acknowledges and announces the following annunciators from 05M3: • IR HI VOLT FAIL (F-2)	
	SRO/RO	Determines Intermediate Range Channel NI 35 has failed low.	
	SRO	Directs actions of 0POP04-NI-0001, Nuclear Instrument Failure.	
	RO	CHECK Power Range Nuclear Instruments - NORMAL *(Step 1)*	
	RO	CHECK Source Range Nuclear Instruments - NORMAL *(Step 2)*	
	RO	CHECK Intermediate Range Nuclear Instruments – NORMAL **(RNO)** GO TO Addendum 2, Intermediate Range Nuclear Instrumentation Malfunction. *(Step 3)*	
	BOP	CHECK Intermediate Range Trip – BLOCKED *(Add 2 Step 1)* *(The Intermediate Range Trip is NOT blocked but the channel is failed low so the crew will continue to the next step.)*	
	BOP	CHECK Reactor Power – GREATER THAN P-6 (10-10 IR amps) *(Add 2 Step 2)*	
	BOP	CHECK Reactor Power - GREATER THAN 10% **(RNO)** RESTORE inoperable channel prior to raising reactor power above 10%. *(Add 2 Step 3)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 2 **(Examiner Trigger)**			
Event Description: Intermediate Range Channel NI 35 fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	BYPASS The Malfunctioning Intermediate Range Channel By Placing The "LEVEL TRIP" Switch In BYPASS *(Add 2 Step 4)* *(Performed at Nuclear Instrument Panel CP011)*	
	SRO	VERIFY Reactor Shutdown – IN PROGRESS **(RNO)** GO TO Addendum 2 Step 9.0 *(Add 2 Step 5)*	
	SRO	INITIATE A Condition Report To Repair The Inoperable Channel *(Add 2 Step 9)*	
	SRO	REVIEW applicable Technical Specifications. REFER TO Addendum 8 *(Add 2 Step 10)* *(**Event 3** can triggered after the SRO has checked TSs.)*	
TS 3.3.1.5 Action 3b *Above the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint but below 10% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10% of RATED THERMAL POWER.* ***NOTE: TS 3.3.1.19.a Action 8 is NOT applicable above P-6.***			
	SRO	ENSURE An OAS Log Entry Has Been Made Indicating The Technical Specification Surveillance(s) To Be Performed Prior To Returning The Out Of Service Channel To Service *(Add 2 Step 11)*	
	SRO	REVIEW 0PGP03-ZO-0042, Reactivity Management Program *(Add 2 Step 12)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Loop 1B Cold Leg RTD T-0420B Fails High.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	Acknowledges and announces the following annunciators from 05M2: • OPDT RX PRETRIP (A-6) • T AVG/AUCT T AVG DEV (C-6) • DT/AUCT DT DEV (D-6)	
	SRO/RO	Determines LOOP B Cold Leg RTD T-420B failed high. *(The crew may put FK-0205 in manual due to the failure of LOOP B Cold Leg RTD T-420B which causes PZR Program Level to read high but there is NOT a specific step for this.)*	
	SRO	Directs actions of 0POP04-RP-0004, Failure of RCS Loop RTD Protection Channel.	
	RO	ENSURE "ROD BANK SEL" Switch In MANUAL *(Step 1)*	
	RO	CHECK The Following Indications - NORMAL • RCS loop temperature indicators (Tavg, Th, Tc, and ΔT) {CP005} • QDPS DETAIL DATA Page 2 for RCS Loop Th • Plant Computer **(RNO)** IF any RCS loop RTD channel is **NOT** operable, THEN PERFORM the following: {CP005} • SELECT The Failed Loop On "BYP SEL ΔT" Switch. • SELECT The Failed Loop On "BYP SEL T AVG" Switch. *(Step 2 and Step 2 RNO)*	
	RO	CHECK Tavg - WITHIN 1.5°F OF Tref (REFER TO Addendum 1) *(Step 3)* *(Tavg will probably be within 1.5°F of Tref.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Loop 1B Cold Leg RTD T-0420B Fails High.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	CHECK Pressurizer Level - • AT PRESSURIZER PROGRAM LEVEL OR • TRENDING TO PRESSURIZER PROGRAM LEVEL *(Step 4)* *(The crew may have put FK-0205 in manual due to the failure of LOOP B Cold Leg RTD T-420B)*	

	RO	Establish Automatic Rod Control:
		• DETERMINE if it is desired to place Rod Control System in Automatic
		(RNO)
		PERFORM the following:
		• *MAINTAIN* Tavg within 1.5°F of Tref by any of the following methods:
		  • Manually ADJUST Control Rod position
		  • ADJUST Turbine Load
		  • ADJUST RCS boron concentration
		• GO TO Step 6.0
		(Step 5)
		(Placing Controls remain in Manual at low power.)	

	BOP	CHECK "ΔT AND ΔT SETPTS TR-0412" Recorder - SELECTED TO OPERABLE CHANNEL **(CP-018)** • SELECT an operable channel on "ΔT AND ΔT SETPTS TR-0412" Recorder. *(Step 6)* *(Will select an operable channel for the recorder.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Loop 1B Cold Leg RTD T-0420B Fails High.			
Time	**Position**	**Required Operator Actions**	**Notes**
	SRO	TAKE Appropriate Actions Per Technical Specifications. TS 3.3.1.8 & 9 OT & OPDT Action 6 TS 3.3.2.5.f LOW Tavg P4 Action 20 **Most Limiting Condition:** Place the failed channel in the tripped condition within 72 hours. *(Step 7)* *(See next page for TS details.)* *(**Event 4** can be triggered after SRO has checked Tech Specs.)*	
TS 3.3.1.8 & 9 Action 6 and TS 3.3.2.5.f Action 20 *NOTE: Action 6 and Action 20 are the same.* *With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:* *a. For Functional Units with installed bypass test capability, the inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours.* *Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1, provided no more than one channel is in bypass at any time.* ***NOTE: TS 3.3.2.9.b Action 21 does NOT apply for this event.***			
	SRO	NOTIFY I&C To Place The Affected Channel In Trip Or Bypass. REFER TO Addendum 2, Procedure List For The Appropriate Procedure *(Step 8)*	
	SRO	INITIATE A Condition Report To Repair Failed Component *(Step 9)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 4 **(Examiner Trigger)**			
Event Description: Steam Header PT-0557 fails high. At low power this causes steam dumps to fail open			
Time	**Position**	**Required Operator Actions**	**Notes**
	ALL	Notice RCS temperature and pressure dropping and notice that steam dumps are unexpectedly open. *(NOTE: If the crew is slow to diagnose this condition, then alarms will come in associated with the lowering RCS temperature and pressure.)*	
	SRO BOP	Takes manual control of Steam Dumps in Pressure Control Mode to restore RCS temperature and pressure. *(NOTE: This is not an immediate action per 0POP04-MS-0001 but is an action taken for a controller NOT responding in automatic. Per the COP Chapter 2, 11.1.11 - Controllers and equipment designed to operate in automatic are not to be operated in manual unless specified by Procedures, Maintenance Activities, or because of known material condition issues affecting the automatic controls ability to perform its intended function. Operators have an obligation to take manual control of any controller that is malfunctioning and causing plant perturbations or to optimize the automatic performance of a controller. The Unit Supervisor/Shift Manager will evaluate controller performance prior to directing manual operations.)*	
	SRO	Enters 0POP04-MS-0001, Excessive Steam Demand.	
	BOP	CHECK Reactor Power – LESS THAN OR EQUAL TO 100% *(Step 1, an immediate action step.)* *(Reactor Power should still be less than 5%.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 4 **(Examiner Trigger)**

Event Description: Steam Header PT-0557 fails high. At low power this causes steam dumps to fail open

Time	Position	Required Operator Actions	Notes

	BOP	IDENTIFY And ISOLATE Steam Leak:
		• CHECK Condenser Steam Dump Valves - CLOSED
		(RNO)
		IF Steam Dump(s) failed open, THEN PERFORM the following:
		• IF Steam Dumps are operating improperly in AUTO for low power in Steam Pressure Mode, THEN PERFORM the following:
		  • PLACE Steam Dump "HDR PRESS CONT" PK-0557 in MANUAL.
		  • Manually ADJUST Steam Dumps to maintain RCS Tavg within 3°F of Tref.
		• GO TO Step 3.0
		(Step 2)	

	SRO
	BOP
		EVALUATE Unit Shutdown As Follows:
		• DETERMINE if unit shutdown or load reduction is warranted based on the following criteria:
		  • Size of leak
		  • Location of leak
		  • Rate of depletion of secondary inventory
		  • Will a Turbine Trip isolate Steam Leak OR will MSIVs need to be closed to isolate leak
		• CHECK Unit Shutdown or Load Reduction - REQUIRED
		(RNO)
		PERFORM the following:
		• *MAINTAIN* present plant conditions until leak can be isolated or repaired.
		• GO TO the appropriate plant procedure as directed by the Shift Manager/Unit Supervisor.
		(Step 3)
		***(<u>Event 5</u>** can be triggered on signal from lead examiner.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)

Event Description: Event 5 - SBLOCA on Loop D Cold Leg. **(Critical Task)**
Event 6 - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close.

Time	Position	Required Operator Actions	Notes
	ALL	Notice RCS temperature and pressure dropping along with rising containment radiation levels. *(NOTE: If the crew is slow to diagnose this condition, then alarms will come in associated with the lowering RCS temperature and pressure.)*	
	SRO	Directs a Reactor Trip and Safety Injection	
	SRO	Enters 0POP05-EO-EO00, Reactor Trip or safety Injection, and ensures immediate actions are performed.	
	RO BOP	Completes immediate actions of 0POP05-EO-EO00 and determines: • Reactor is tripped (Step 1) • Turbine is tripped (Step 2) • AC ESF Busses are energized (Step 3) • Check SI status (Step 4) *(RO will complete immediate actions. BOP Operator will monitor the plant and make an announcement of the Reactor trip.)* *(During a pause between performing immediate actions and verifying immediate actions, the BOP will throttle AFW to reduce the RCS cooldown by:* • ***Resetting the AFW Reg Valves*** • ***Throttling the AFW Reg Valves to lower total AFW flow.*** *Total AFW flow must remain above 576 gpm until at least one SG level is >14% NR {34% for adverse containment})*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)

Event Description: Event 5 - SBLOCA on Loop D Cold Leg. **(Critical Task)**
Event 6 - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close.

Time	Position	Required Operator Actions	Notes
	SRO **CT-16**	**Reactor Trip Criteria** **IF BOTH conditions listed below occur,** **THEN TRIP ALL RCPs:** **HHSI pumps – AT LEAST ONE RUNNING** **RCS pressure – LESS THAN 1430 PSIG** *(From Conditional Information Page - CIP)* *(When conditions are met then RCPs will be stopped.)*	
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	
	BOP	VERIFY Proper SI Equipment Operation Per ADDENDUM 5, VERIFICATION OF SI EQUIPMENT OPERATION *(Step 5)* *(See Actions on pages 21-24)*	

	RO	MONITOR If Containment Spray Is Required:
		• Containment pressure ‑ GREATER THAN 9.5 PSIG (QDPS)
		(RNO)
		• PERFORM the following:
		  • CHECK Containment pressure - HAS EXCEEDED 9.5 PSIG
		  • "PRESS PR-0934"
		  • "EXTD RNG PRESS PR-9759"
		  • IF containment pressure HAS EXCEEDED 9.5 PSIG, THEN GO TO Step 6.b.
		  • IF containment pressure HAS REMAINED LESS THAN 9.5 PSIG, THEN GO TO Step 7.
		(Step 6)
		(Containment pressure will be less than 9.5 psig and the crew will GO TO Step 7)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)

Event Description: Event 5 - SBLOCA on Loop D Cold Leg. **(Critical Task)**
Event 6 - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close.

Time	Position	Required Operator Actions	Notes
	RO	CHECK RCP Seal Cooling: • ENSURE seal injection flow between 6 and 13 gpm *(Step 7)* *(RO may have to adjust seal injection.)*	
	RO	MONITOR RCS Temperatures ‑ • WITH ANY RCP RUNNING, RCS TAVG STABLE AT OR TRENDING TO 567°F OR • **WITHOUT ANY RCP RUNNING, RCS TCOLD STABLE AT OR TRENDING TO 567°F** *(Step 8)* *(With RCB pressure greater than 3 psig and Main Steam Isolated there is nothing else the crew can do.)*	
	RO	CHECK Pressurizer Status: • PORVs ‑ CLOSED • Normal pressurizer spray valves - CLOSED • Auxiliary spray valve - CLOSED • Excess letdown isolation valves - CLOSED *(Step 9)*	
	RO **CT-16**	**MONITOR If RCPs Should Be Stopped:** • **HHSI pump - AT LEAST ONE RUNNING** • **RCS pressure - LESS THAN 1430 PSIG** • **STOP all RCPs** *(Step 10)* *(RCPs will probably have already been stopped using CIP instructions.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 1	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SBLOCA on Loop D Cold Leg. **(Critical Task)** **Event 6** - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	VERIFY The Following Containment Isolation Valve – CLOSED • Seal return isolation valves • **Containment atmosphere radiation monitor isolation valves** *(Step 11)* ***(Event 6 – RCB Atmosphere Radiation Monitor Isolation Valves failed to automatically close. If not already closed using Addendum 5 then the crew will manually close the valves.)***	
	RO	CHECK If SG Secondary Pressure Boundary Intact: • CHECK pressures in all SGs – • CONTROLLED OR RISING • GREATER THAN CONTAINMENT PRESSURE *(Step 12)*	
	RO	CHECK If SG Tubes Are Intact: • Main steamline radiation - NORMAL • IF SG blowdown in service, THEN SG blowdown radiation - NORMAL • CARS pump radiation - NORMAL • NO SG level rising in an uncontrolled manner *(Step 13)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)

Event Description: Event 5 - SBLOCA on Loop D Cold Leg. **(Critical Task)**
Event 6 - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close.

Time	Position	Required Operator Actions	Notes
	RO	CHECK If RCS Is Intact: • Containment radiation - NORMAL • Containment pressure - NORMAL • Containment wide range water level - NORMAL **(RNO)** GO TO 0POP05-EO-EO10, LOSS OF REACTOR OR SECONDARY COOLANT, Step1. • MONITOR Critical Safety Functions. • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED. *(Step 14)* *(Will not transition to a Functional Recovery Procedure until Addendum 5 is complete.)*	
	BOP	Completes 0POP05-EO-EO00, Addendum 5.	
	SRO	The crew will transition to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.	
	RO **CT-16**	**MONITOR If RCPs Should Be Stopped:** • **HHSI pump - AT LEAST ONE RUNNING** • **RCS pressure - LESS THAN 1430 PSIG** • **STOP all RCPs** *(Step 1)* *(RCPs will probably have already been stopped using CIP instructions from 0POP05-EO-EO00.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)

Event Description: Event 5 - SBLOCA on Loop D Cold Leg. **(Critical Task)**
Event 6 - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close.

Time	Position	Required Operator Actions	Notes

	BOP	DEPRESSURIZE Intact SGs To 1000 PSIG
		• CHECK RCS pressure - GREATER THAN 415 PSIG
		• CHECK pressurizer pressure LESS THAN 1985 PSIG
		• BLOCK Low Steamline Pressure SI
		• CHECK condenser – AVAILABLE
		(RNO)
		• PERFORM the following:
		  • USE SG PORVs to depressurize intact SGs to BETWEEN 990 PSIG and 1000 PSIG.
		  • ADJUST intact SG PORV controller setpoints to BETWEEN 990 PSIG and 1000 PSIG
		  • ENSURE SG PORV controllers in AUTO.
		  • VERIFY SG PORVs controlling SG pressure LESS THAN OR EQUAL TO 1000 PSIG.
		  • GO TO Step 3
		(Step 2)	

	BOP	MONITOR If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT
		  • PRESSURE
		(Step 3)	

	RO	RESET SI *(Step 4)*	
	RO	RESET ESF Load Sequencers *(Step 5)* ***(<u>Event 7</u> will occur 30 seconds after resetting Load Sequencers)***	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 7 **(Occurs 30 seconds after resetting ESF Load Sequencers)** **Event Description:** LB LOCA (**Critical Task**)			
Time	**Position**	**Required Operator Actions**	**Notes**
	ALL	Notice RCS pressure dropping to a level where SI accumulators start injecting and below LHSI Pump shutoff head – 350 psig. Also a significant Containment pressure rise above Containment Spray Actuation – 9.5 psig) *(NOTE: If the crew is slow to diagnose this condition, then alarms will come in associated with the lower RCS pressure and higher RCB pressure.)*	
	SRO	The crew will transition to 0POP05-EO-FRZ1, Response to High Containment Pressure, due to an Orange Path on the Containment Critical Safety Function.	

	RO	VERIFY Containment Spray – ESTABLISHED
		• Containment Pressure LESS THAN 56.5 PSIG.
		• At least one Containment Spray pump – RUNNING
		  • Discharge Valve OPEN
		  • Flow indicated
		(RNO)
		• GO TO Step 2
		(Step 1)
		(Containment pressure will be less than 56.5 psig with no containment spray pumps running due to resetting the ESF Load Sequencer.)	

	RO	VERIFY Containment Isolation Phase A Valves - CLOSED, REFER TO ADDENDUM 1, PHASE A ISOLATION VERIFICATION. *(Step 2)* *(Valves previously verified closed in 0POP05-EO-EO00, Addendum 5)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 7 **(Occurs 30 seconds after resetting ESF Load Sequencers)** **Event Description:** LB LOCA (**Critical Task**)			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	VERIFY Containment Ventilation Isolation: • Containment atmosphere radiation monitor isolation valves – CLOSED • Normal purge supply and exhaust fans – STOPPED • Supplementary purge supply and exhaust fans – STOPPED • Purge dampers – CLOSED *(Step 3)* *(Valves previously verified closed in 0POP05-EO-EO00, Addendum 5)*	

	RO
	CT-3
		CHECK If Containment Spray Is Required:
		• Containment pressure – HAS EXCEEDED 9.5 PSIG
		  • "PRESS PR-0934"
		  • "EXTD RNG PRESS PR-9759"
		• STOP ALL RCPs
		• VERIFY containment spray pumps – RUNNING
		(RNO)
		• **START a maximum of two containment spray pumps.**
		(A/ER)
		• VERIFY containment spray valve alignment - PROPER EMERGENCY ALIGNMENT
		• VERIFY containment isolation phase B valves – CLOSED
		(Step 4)
		(The Crew may start CS Pumps prior to entry into 0POP05-EO-FRZ1)
		(Terminate Scenario)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close. Step 13)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY FW isolation: • SGFPTs – TRIPPED • SU SGFP – TRIPPED • VERIFY the following valves –CLOSED o FWIVs o FWIBs o FW preheater bypass valves o FW regulating valves o Low power FW regulating valves o SG blowdown isolation valves o SG sample isolation valves *(EO00 Addendum 5, Step 1)* *(0POP05-EO-EO00, Reactor Trip or Safety Injection, Addendum 5, Verification of Equipment Operation.)* *(This addendum is performed in parallel with Steps 5 to 14 of 0POP05-EO-EO00, Reactor Trip or Safety Injection.)*	
	BOP	CHECK if main steamline should be isolated: • CHECK for any of the following conditions: o Containment pressure – GREATER THAN OR EQUAL TO 3 PSIG OR o SG pressure (without low steamline pressure SI blocked) - LESS THAN OR EQUAL TO 735 PSIG OR o SG pressure (with low steamline pressure SI blocked) - LOWERING AT A RATE GREATER THAN OR EQUAL TO 100 PSI/SEC, BY OBSERVANCE OF THE STEAMLINE PRESSURE RATE BISTABLES • VERIFY Main Steamline Isolation: o MSIVs – CLOSED o MISBs - CLOSED *(Step 2)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close. Step 13)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY AFW system status: • Motor-driven pump – RUNNING • Turbine-driven pump – RUNNING *(Step 3)*	
	BOP	VERIFY AFW valve alignment - PROPER EMERGENCY ALIGNMENT *(Step 4)*	
	BOP	VERIFY total AFW Flow - GREATER THAN 576 GPM *(Step 5)*	
	BOP	VERIFY containment isolation phase A: • Phase A – ACTUATED *(Step 6)*	
	BOP	VERIFY ECW status: • ECW pumps – RUNNING • ECW pump discharge isolation valves – OPEN *(Step 7)*	
	BOP	VERIFY CCW pumps – RUNNING *(Step 8)*	
	BOP	VERIFY RCFC status: • RCFCs – RUNNING • Cooling water - TRANSFERRED TO CCW *(Step 9)*	
	BOP	VERIFY SI pump status: • HHSI pumps – RUNNING • LHSI pumps – RUNNING *(Step 10)*	
	BOP	VERIFY SI valve alignment – PROPER EMERGENCY ALIGNMENT *(Step 11)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close. Step 13)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY SI flow: • RCS pressure - LESS THAN 1745 PSIG • HHSI pump flow – INDICATED • RCS pressure - LESS THAN 415 PSIG **(RNO)** • GO TO Step 13 of this Addendum. *(Step 12)* *(Before LBLOCA occurs.)*	
	BOP	VERIFY containment ventilation isolation: • **Containment atmosphere radiation monitor isolation valves – CLOSED** **(RNO)** • **Manually CLOSE valves.** **(A/ER)** • Normal purge supply and exhaust fans – STOPPED • Supplemental purge supply and exhaust fans – STOPPED • Purge Dampers – CLOSED *(Step 13)* ***(Event 6 - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close. If not already closed using 0POP05-EO-EO00, Step 11 then the crew will manually close the valves.)***	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** - RCB Atmosphere Radiation Monitor Isolation Valves fail to automatically close. Step 13)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY ventilation actuation: • Control room HVAC – OPERATING IN EMERGENCY RECIRC • EAB HVAC - OPERATING IN EMERGENCY RECIRC • FHB HVAC - OPERATING IN EMERGENCY MODE • FHB Exhaust Fans - ONLY TWO TRAINS OPERATING o Exhaust booster fans o Main exhaust fans **(RNO)** • PERFORM the following: o IF three trains FHB exhaust fans running, THEN PLACE one train FHB exhaust fans in PULL TO LOCK. **(Back to A/ER)** • SECURE one FHB filter train by PERFORMING the following: o PLACE the outlet damper Controller in manual o Manually close the outlet damper o VERIFY proper operation of filter train in service • Essential chilled water pumps – RUNNING • Essential chillers – RUNNING • ECCS pump room fan coolers – RUNNING • AFW pump cubicle fans – RUNNING • FHB truck bay doors – CLOSED *(Step 14)*	
	BOP	NOTIFY Unit Supervisor that Addendum 5 is COMPLETE *(Step 15)*	
	SRO	IMPLEMENT Functional Restoration Procedures as required *(Step 16)*	
	SRO	RETURN TO procedure step in effect. *(Step 17)*	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**CT-16** **MANUALLY TRIP THE REACTOR COOLANT PUMPS**	Trip all RCPs so that an Orange Path on Core Cooling (CET temperatures > 707°F) does not occur when forced circulation in the RCS stops. SAFETY SIGNIFICANCE -- Failure to trip the RCPs under the postulated plant conditions leads to core uncovery and to fuel cladding temperatures in excess of 2200°F, which is the limit specified in the ECCS acceptance criteria. Thus, failure to perform the task represents "mis-operation or incorrect crew performance which leads to degradation of the fuel cladding barrier to fission product release" and to "violation of the facility license condition."	
SRO/RO	**CT-3** **MANUALLY START AT LEAST ONE CONTAINMENT SPRAY PUMP**	Manually initiate at least one train of Containment Spray flow prior to completion of step 4 of 0POP05-EO-FRZ1, Response to High Containment Pressure. SAFETY SIGNIFICANCE -- Failure to manually actuate CONTAINMENT SPRAY or start at least one CONTAINMENT SPRAY Train under the postulated conditions constitutes a "demonstrated inability by the crew to recognize a failure/incorrect auto actuation of an ESF system or component." In this case, at least one train of CONTAINMENT SPRAY can be manually actuated from the control room. Therefore, failure to manually actuate CONTAINMENT SPRAY or start at least one CONTAINMENT SPRAY Train also represents a "demonstrated inability by the crew to effectively direct/manipulate ESF controls that would lead to violation of the facility license condition."	

NOTE: (Per NUREG-1021, Appendix D)
If an operator or the Crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.

EXPECTED BOOTH COMMUNICATIONS

EVENT 1:

- There are no Booth Communications expected for Event 1.

EVENT 2:

- As I&C Maintenance or the Duty Maintenance Supervisor, if notified of the failure of Intermediate Range Channel NI-35, report that an I&C maintenance crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the failure of Intermediate Range Channel NI-35. No further action is necessary.

EVENT 3:

- As I&C Maintenance or the Duty Maintenance Supervisor, if notified of the failure of Loop 1B Cold Leg RTD, T-0420B, report that an I&C maintenance crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the failure of Loop 1B Cold Leg RTD, T-0420B. No further action is necessary.

EVENT 4:

- As I&C Maintenance or the Duty Maintenance Supervisor, if notified of the failure of Steam Header Pressure Transmitter, PT-0557, report that an I&C maintenance crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the failure of Steam Header Pressure Transmitter, PT-0557. No further action is necessary.

EVENT 5:

- There are no Booth Communications expected for Event 5.

EVENT 6:

- There are no Booth Communications expected for Event 6.

EVENT 7:

- There are no Booth Communications expected for Event 7.

EXPECTED BOOTH ACTIONS

1. If asked to open the Deaerator High Level Dump Bypass Valves then trigger the step for ‘DA HLD Bypass Valves FW-486 & FW-487’.
2. If asked to fill the AFWST then trigger the step for ‘AFWST Makeup’.

SIMULATOR SETUP

NOTE

ALL Annunciator Response Procedures (ARP's) must be checked if this scenario is the first to be run on this day. Setup for subsequent runs of this scenario only requires those ARP's that were actually marked in to be checked.

Instructors running the scenario must keep track of which ARP's these are, otherwise, all will have to be checked for subsequent scenarios as well.

Each time before running the scenario check and/or clean the following:									
Specific Scenario Procedures	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
0POP03-ZG-0005, Plant Startup to 100%									
0POP04-NI-0001, Nuclear Instrument Malfunction									
0POP04-RP-0004, Failure of RCS Loop RTD Protection Channel									
0POP04-MS-0001, Excessive Steam Demand									
0POP05-EO-EO00, Reactor Trip or Safety Injection									
0POP05-EO-EO10, Loss of Reactor or Secondary Coolant									
0POP05-EO-FRZ1, Response to High Containment Pressure									
Other Procedures Used By Students During Scenario Including POP09s.	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
Miscellaneous Items to Restore	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
STA ICS Screens to PD Menu									
All ICS Trends to normal (not scenario specific)									
Student Selected ICS Points changed to U1118									
Control Panel ICS Screens to Normal									
RM 11 History and Screens									
RM 23 – No Alarm Indications									

SIMULATOR SETUP (cont'd.)

NOTE

The Scenario Lesson Plan MUST be run from the left most Instructor Station in Simulator Booth to allow for recording and storing of recorded parameter data.

- Log into Instructor Workstation as 'lotnrc' user, open Orchid (nstps server), then 'Unlock' Initial Conditions Group 'lotnrc'.
- Reset to IC #201 and perform the following:
  - Switch Check
  - Ensure red light on end of CP-010 off
  - Ensure ICS Annunciators have stopped counting up
- Go to RUN and perform the following:
  - Ensure Simulator is ready by performing applicable checkoffs from LOR-GL-0006, LOR Conduct of Simulator Training Guidelines, Addendum 5, Simulator Readiness Checklist.
  - **Ensure Steam Dump Controller Pot setting is EXACTLY 8.30**
  - Ensure VCT Makeup Integrators are set as follows:
    - Momentarily place RC M/U CONT to STOP and then START to reset BA BATCH/GALLONS and TOT M/U BATCH/GALLONS counters to zero.
    - Reset BA BATCH/GALLONS setpoint to 0 gallons and reset TOT M/U BATCH/GALLONS setpoint to 0 gallons.
    - Verify BA Controller Pot setting is 5.24
- Open lesson plan for 'Scenario 1' in 'lotnrc' directory for LOT 23, then EXECUTE lesson plan. These actions will set up any initial conditions for the scenario.
- If this scenario IC has changing conditions (i.e. Xenon is changing, etc.), then place the simulator in FREEZE, otherwise it is OK to leave in RUN.
- Run the scenario in accordance with the next section, 'Scenario Instructions'.

SCENARIO INSTRUCTIONS

NOTE
Steps 1 to 4 below can be performed in the LOR Debrief Room prior to the crew coming into the Simulator provided exam security measures are taken.

1. Provide Shift Turnover sheets to the crew and review the information.
2. Have the Crew perform a Pre-Job Brief for raising power. Ensure the crew doesn't have any other questions about the Shift Turnover.
3. Ensure the Beacon book from the simulator is available to the crew if they are in the LOR Debrief Room.
4. Review the Simulator Differences list with the crew if needed.
5. When signaled by Simulator Staff, have the crew perform their board walkdown and inform the floor instructor when ready to take the watch.
6. Ensure the simulator is in RUN and verify simulator clock is set correctly. Note the time that the Crew takes the watch. _____ Start Time.

NOTE

Malfunction Step and/or Lesson Plan Steps (Events) are triggered upon the Lead Examiners signal during the scenario unless an agreed upon time is discussed with the examiner prior to the start of the scenario.

Always 'TRIGGER' events in the Simulator Scenario Lesson Plans. This way delays associated with events will take place as intended.

Refer to 'EXPECTED BOOTH COMMUNCATIONS' and 'EXPECTED BOOTH ACTIONS' Sections for instructions for Instructor actions during the scenario.

7. Trigger the step titled 'Start Chart' and ensure specified Recorded Parameters for the scenario begin recording as the scenario runs. If the chart speed is NOT set to 5400 seconds (90 minutes) then perform the following:
   - Under 'CHARTS' click on 'SET TIME'
   - In the dialog box enter 5400 seconds (90 minutes)
   - Click OK.
8. The crew will raise power to 3%-4% - Event #1
9. When signaled by Lead Examiner, trigger **MALFUNCTION STEP –** This will insert Step #1, Event #2.
10. When signaled by Lead Examiner, trigger **STEP 2 –** Event #3
11. When signaled by Lead Examiner, trigger **STEP 3 –** Event #4
12. When signaled by Lead Examiner, trigger **STEP 4 –** Event #5
13. Place simulator in FREEZE when cued by the Lead Examiner to terminate scenario.
14. DO NOT RESET simulator until the steps on the next page are completed and all Examiners have completed Follow-Up Questioning.

SCENARIO INSTRUCTIONS (cont'd.)

NOTE
Some scenarios will have more than one chart. For these, each chart file must be separately saved with a unique filename.

15. Saving Recorded Parameters Data
    - Click on the 'Charts' icon on the left side of the screen
    - Select 'Pause' icon, then select 'All'
    - Click on the 'Print Chart' icon, then select 'All'
    - This will bring up a window in the TASK BAR called PRIMOPDF.
    - Click on 'Create PDF'
    - This will bring up a File Save As window.
    - Save to folder **c:\Users\lotnrc\Desktop\LOT23 Charts**. The file name will be 'LOT23 Scenario 1' followed by a name that identifies the crew (e.g. 'Crew A).
    - Save the new file. It will be saved in a folder already on the desktop. LOT23 Charts.
16. Saving Scenario SAM (Simulator Action Monitor)
    - Under 'TOOLS' click on 'SAM'
    - In the dialog box that comes up click on 'SAVE TO'
    - Save as a 'TEXT FILE' to folder **c:\Users\lotnrc\Desktop\LOT23 Charts.** The file name will be 'LOT23 SAM INFO Scenario 1' followed by a name that identifies the crew (e.g. 'Crew A).

SCENARIO - 01

	0POP01-ZQ-0022		
Plant Operations Shift Routines			
For Training Only	Shift Turnover Checklist		Page 1 of 1

PART I - To be completed prior to shift turnover.

Unit: **1** Off- Going Shift: **Days / Nights** Date: **Today** Mode: **1**

Dilution			Boration			Control Rods		
Current Setpoint	1% Pwr Change	1° F Change	Current Setpoint	1% Pwr Change	1° F Change	Current Position	1% Pwr Change	1° F Change
0	**130**	**114**	**0** flushing with	**29**	**25**	**102**	**7**	**6**
As Required			As Required			As Required		

ΔI Target	Channel	RCS Boron
0.01%	**U1144**	**1947**

Unit 1 Status

- Operating at 1% power by Power Range NIs. 1%-2% by Delta-Ts.
- Core burnup is 150 MWD / MTU

Load Reduction:

- 100-90%/1hr = **162**
- 100-80%/10min = **382**
- 100-75%/30min = **444**
- 100-60%/1hr = **620**
- 100-50%/10min = **925**

Information:

- The crew is to continue at Step 5.16 of 0POP03-ZG-0005, Plant Startup to 100%, and raise power to 3%-4%. The Unit is starting up after a Reactor Trip that occurred 3 days ago.
- BAT 1A & 1B Concentrations are 7300 ppm
- Fuel Handling Building truck bay doors are closed
- No personnel are in containment
- Ron Gibbs has the duty
- The NLO compliment is 5 watch standers and a head operator

ECO/LCO/RAsCAL:

None

LOT 23 NRC EXAM

SIMULATOR OPERATING TEST

SCENARIO #2

Revision 0

Week of 07/15/2019

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 2** **Op-Test No.: LOT 23 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- **Reactor power is at 95%. Currently on step 7.63 of 0POP03-ZG-0005, Plant Startup to 100%.**

Turnover:

- **AFW Pump #11 is out of service.**

Critical Tasks:

- **Event 6 – Reduce 2 SGs to ≤1000 psig**
- **Event 7 – Manually start HHSI Pump 1B**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	N/A	RO (R) BOP (R) SRO (R)	Crew will begin raising Reactor Power to 98% per step 7.63 of 0POP03-ZG-0005, Plant Startup to 100%.
2 (10 min)	11-01-02 True	BOP (C) SRO (C)	OL ACW Pump #12 trips and #11 fails to auto start.
3 (25 min)	02-19-03 1.0	RO (I) SRO (I, TS)	Pressurizer pressure transmitter PT-0457 fails high.
4 (35 min)	10-11-01 True	ALL (C) SRO (TS)	Train A 4160V Bus Lockout.
5 (45min)	UD-27 & 28 1	ALL (C)	Main Turbine Trip due to malfunction with SCW Pumps.
6 (N/A)	02-01-02 .0009	ALL (M)	Small Break Loss of Coolant Accident, pressure will lower to below HHSI discharge pressure. **(Critical Task)** **(Occurs 2 minutes after tripping of SGFPTs)**
7 (N/A)	50-BF-08 04-13-03	BOP (C) SRO (C)	HHSI Pump 1B fails to auto start and HHSI Pump 1C trips on overcurrent after starting. **(Critical Task)** **(Integral to Scenario)**

Lot* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specification

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Malfunctions after EOP entry (1–2)	1
2. Abnormal events (2–4)	4
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	2
5. Entry into a contingency EOP with substantive actions (≥1 per scenario set)	0
6. Preidentified critical tasks (≥2)	2

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

- Critical Tasks are indicated by "**CT-##**" in the position column and indicated in bold type. In some instances an "*" will indicate that only a portion of the task listed is considered critical.
- Shaded cells indicate procedural entry points.

RECORDED PARAMETERS:

Recorded parameters will be determined during NRC Validation week.

The parameters identified for recording may be of value in evaluating crew performance. Once the scenario is complete for each crew, printout the recorded parameters and label the printout with date, time, crew number and scenario number. See Scenario Instructions section for further details on how to save the Recorded Parameters.

- Main Turbine Throttle Valve #1 position
- Core Exit T/C
- RCS Wide Range Pressure
- LHSI Pump 1A Red Light

SCENARIO OBJECTIVES

Event 1 Objective

- Perform an increase or decrease in reactor power per 0POP03-ZG-0005, Plant Startup to 100%.

Event 2 Objective

- Respond to a loss of Open Loop Auxiliary Cooling Water per 0POP04-OC-0001, Loss of Open Loop Auxiliary Cooling Water

Event 3 Objective

- Respond to a pressurizer pressure control malfunction per 0POP04-RP-0001, Loss of Automatic Pressurizer Pressure Control.

Event 4 Objective

- Respond to a loss of pwer on a 4.16KV ESF Bus per 0POP04-AE-0001, First Response to Loss of any or all 13.8 KV or 4.16KV Bus.

Event 5 Objective

- Respond to a Reactor Trip per 0POP05-EO-EO00, Reactor Trip or Safety Injection, and per 0POP05-EO-ES01, Reactor Trip Response.

Event 6 Objective

- Respond to a SBLOCA where RCS pressure stays just below HHSI Pump shutoff head per 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.

Event 7 Objective

- During all modes and/or plant conditions, operate the Safety Injection System per the applicable operating procedure.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 1 **Event Description:** Raise reactor power from 95% to 98%.			
Time	**Position**	**Required Operator Actions**	**Notes**
	SRO	RAISE reactor power to 98%, while closely monitoring the following critical parameters associated with OTDT and OPDT: • Pressurizer Pressure • Loop Average Temperature • NI Power • Loop Delta-Ts • OTDT Setpoints • OPDT Setpoints *(Starts at Step 7.63 of 0POP03-ZG-0005, Plant Startup to 100%)*	
	RO	Start a dilution per 0POP02-CV-0001, Makeup to the Reactor Coolant System. *(NOTE: Operator normally uses Form 2, Dilution Checklist, or Form 3, Alt. Dilution Checklist, to perform a dilution to the RCS. The methods are similar. Form 2 is given.)*	
	RO	DETERMINE amount of dilution water to be added. *(0POP02-CV-0001, Form 2, Step 1.0)* *(RO will confer with SRO to determine the amount of water to add to the RCS to start raising reactor power.)*	
	RO	ENSURE VCT will accept the volume increase without initiating an auto diversion to the RHT at 68%. *(0POP02-CV-0001, Form 2, Step 2.0)*	
	RO	TURN "RC M/U CONT SYS ON" switch to "STOP" *(0POP02-CV-0001, Form 2, Step 3.0)*	
	RO	TURN "RC M/U CONT" to "DILUTE" *(0POP02-CV-0001, Form 2, Step 4.0)*	
	RO	ENSURE "TOT M/U BATCH GALLONS FY-0111B" flow integrator is set for required gallons of dilution water. *(0POP02-CV-0001, Form 2, Step 5.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 1 **Event Description:** Raise reactor power from 95% to 98%.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	ENSURE "RMW FLOW CONT FK-0111" is set for desired flowrate. *(0POP02-CV-0001, Form 2, Step 6.0)* *(Normal dilution flow rate is set for 100 gpm [3.3 pot setting])*	
	RO	TURN "RC M/U CONT SYS ON" switch to "START". *(0POP02-CV-0001, Form 2, Step 7.0)* *(This starts the dilution sequence.)*	
	RO	VERIFY "RMW PUMP 1A" OR "RMW PUMP 1B" is running. *(0POP02-CV-0001, Form 2, Step 8.0)*	
	RO	WHEN the required gallons of dilution water are added, THEN ENSURE makeup is stopped. *(0POP02-CV-0001, Form 2, Step 9.0)* ***(Dilution will auto stop after set amount of water added. The RO may request to leave Reactor Makeup line up as is and just return to Form 2, Step 7.0 for additional dilutions.)***	
	RO	ENSURE Reactor Makeup Water System is returned to Automatic Operation per Form 4, Modes 1-2 Automatic Operation Checklist. *(0POP02-CV-0001, Form 2, Step 10.0)*	
	RO	ENSURE the following in "AUTO" positon: • BA FLOW CONT FK-0110 • BA FLOW CONT VLV FCV-0110A • Makeup Stop to Charging Pumps "TO VCT OUTL FCV-011B" valve • RMW FLOW CONT FK-0111 • RMW FLOW CONT VLV FCV-0111A • Makeup Stop to VCT "FILL FCV-0111B" *(0POP02-CV-0001, Form 4, Step 1.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 1 **Event Description:** Raise reactor power from 95% to 98%.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	IF desired, THEN STOP the running RMW OR BAT pump(s) by placing the handswitch in "STOP", THEN return to "AUTO" (√ the desired Standby pump(s) ONLY) • RMW PUMP 1A _____ • RMW PUMP 1B _____ • BA XFER PUMP 1A _____ • BA XFER PUMP 1B _____ *(0POP02-CV-0001, Form 4, Step 2.0)*	
	RO	ENSURE the **STANDBY** RMW and BAT pumps are in "AUTO" (√ the desired Standby pumps ONLY) • RMW PUMP 1A _____ • RMW PUMP 1B _____ • BA XFER PUMP 1A _____ • BA XFER PUMP 1B _____ *(0POP02-CV-0001, Form 4, Step 3.0)*	
	RO	ENSURE the pumps **NOT** selected for **STANDBY** are in "PULL TO LOCK" (normal Lineup) or as directed by the Unit Supervisor/Shift Manager. (√ the desired **Non-Standby** pump(s) ONLY) • RMW PUMP 1A _____ • RMW PUMP 1B _____ • BA XFER PUMP 1A _____ • BA XFER PUMP 1B _____ *(0POP02-CV-0001, Form 4, Step 4.0)*	
	RO	PLACE "RC M/U CONT" switch in "AUTO" *(0POP02-CV-0001, Form 4, Step 5.0)*	
	RO	ENSURE "BA FLOW CONT FK-0110 setpoint for flowrate, is at the desired value. (Refer to Section 8.0 for setpoint formula) *(0POP02-CV-0001, Form 4, Step 6.0)* ***Setpoint Formula:*** $$\textbf{\textit{Setpoint} = } \frac{\textbf{\textit{20 x Boron Concentration of RCS}}}{\textbf{\textit{Born Concentration of BAT}}}$$	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 1 **Event Description:** Raise reactor power from 95% to 98%.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	TURN "RC M/U CONT SYS ON" switch to "START" *(0POP02-CV-0001, Form 4, Step 7.0)*	
	RO	IF all boration evolutions have been completed, THEN STOP Boric Acid Transfer Pump Fan AND PLACE its handswitch in "AUTO" • Pump 1B SUPP CLR 11A HM-VAH008 • Pump 1A SUPP CLR 11B HM-VAH009 *(0POP02-CV-0001, Form 4, Step 8.0)*	
	BOP	Crew will make Turbine Load Changes using Form 1 of 0POP03-ZG-0005, Plant Startup to 100%. *(NOTE: There are other Plant Operating Procedures that have these same steps that the Operator can use.)*	
	BOP	ENSURE the LOAD RATE - PRCT MW/MIN" Thumbwheel is set to the ".25" position OR as authorized by the Shift Manager/Unit Supervisor. *(0POP03-ZG-0005, Form 1, Step 1.0)* *(BOP will confer with SRO to determine the Thumbwheel setpoint.)*	
	BOP	RAISE/LOWER (ADJUST) "SETPOINT" to the desired value. *(0POP03-ZG-0005, Form 1, Step 2.0)*	
	BOP	DEPRESS the SETPOINT CONTROL **"GO"** pushbutton and **MONITOR** for the proper load changes. *(0POP03-ZG-0005, Form 1, Step 3.0)*	
	RO	ENSURE "ROD BANK SEL" switch is in "MAN" position. *(0POP03-ZG-0005, Form 2 Step 1)* *(This and the next two steps are used if control rods are used for delta-I control)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 1 **Event Description:** Raise reactor power from 95% to 98%.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	WITHDRAW/INSERT Control Banks by holding Rod Control Switch in OUT/IN position. *(0POP03-ZG-0005, Form 2 Step 2)*	
	SRO	PLACE the "ROD BANK SEL" switch in the "AUTO" or "MAN" position as deemed necessary by Shift Manager/Unit Supervisor. *(0POP03-ZG-0005, Form 2 Step 3)* *(**Event 2** can be triggered when the lead examiner is satisfied with crew performance for reactivity.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 2 **(Examiner Trigger)** **Event Description:** OL ACW Pump #12 trips and #11 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	Acknowledges and announces the following annunciators from 09M1: • ACW OPEN LOOP PUMP TRIP (D-3) • BASEMENT SHELTER PANEL TRBL (F-8)	
	SRO/RO	Determines Open Loop Pump #12 has tripped and #11 failed to auto start.	
	SRO	Directs actions of 0POP04-OC-0001, Loss of Open Loop Auxiliary Cooling Water.	
	BOP	CHECK OL-ACW Pump Status - ANY RUNNING *(Step 1)*	
	BOP	DIRECT MAB Operator To Secure Any Liquid Rad Waste Discharge *(Step 2)* *(No Liquid Rad Waste Discharges are in progress.)*	
	BOP	*MONITOR* OL-ACW Pressure - GREATER THAN 68 PSIG • OC-PI-6756, OPEN LOOP HDR PRESS (CP009) • Plant Computer Point P6700 **(RNO)** • ENSURE standby OL-ACW pump running. *(Step 3)* *(If not already done the crew will manually start Open Loop Pump #11 and header pressure will return to normal.)*	
	BOP	DISPATCH Operator To Check OL-ACW System Inside Protected Area For Leakage - NO LEAKAGE DETECTED *(Step 4)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 2 **(Examiner Trigger)** **Event Description:** OL ACW Pump #12 trips and #11 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**

	BOP	DISPATCH An Operator To CWIS To Perform The Following:
		• CHECK seal water - SUPPLIED TO CW AND OL-ACW PUMPS
		  • CW pump seal water flow - APPROXIMATELY 12 GPM
		  • OL-ACW pump seal water pressure - 30 TO 70 PSIG (NORMALLY 40 PSIG)
		• CHECK OL-ACW discharge strainer DP - LESS THAN 12 PSID
		• CHECK OL-ACW System for leakage - NO LEAKAGE DETECTED
		• INVESTIGATE cause of OL-ACW pump trip
		(Step 5)
		(<u>Event 3</u> can be triggered at this step as no other procedural steps are applicable except for investigating why the OL-ACW pump tripped.)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 3 **(Examiner Trigger)** **Event Description:** Pressurizer pressure transmitter PT-0457 fails high.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	Acknowledges and announces the following annunciators on 04M8: • PRZR PRESS HI RX TRIP ALERT (A-7) • PRZR PRES DEV HI (C-7)	
	SRO/RO	Determines PZR Pressure Channel PT-0457 failed high. Performs immediate actions of 0POP04-RP-0001: • IF any channel has failed HIGH, THEN POSITION Pressurizer Pressure Control Selector Switch to remove failed channel from control.	
	SRO	Directs actions of 0POP04-RP-0001, Loss of Automatic Pressurizer Pressure Control.	
	RO	CHECK Pressurizer Pressure Channels - ALL OPERABLE **(RNO)** • IF any channel has failed **HIGH**, THEN POSITION Pressurizer Pressure Control Selector Switch to remove failed channel from control: {CP004} Failed Channel — Select RC-PI-0455 — P457/456 RC-PI-0456 — P455/458 **RC-PI-0457 — P455/456 OR P455/458** RC-PI-0458 — P455/456 OR P457/456 *(Step 1)* *(Immediate Action Step)*	
	RO	CHECK Pressurizer Pressure Controller RC-PK-0655A - OPERABLE *(Step 2)*	
	RO	CHECK Pressurizer PORVs - CLOSED {CP004} • PCV-0655A • PCV-0656A *(Step 3)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Pressurizer pressure transmitter PT-0457 fails high.			
Time	**Position**	**Required Operator Actions**	**Notes**

	RO	CHECK Normal Pressurizer Spray Valves: {CP004}
		• Normal Pressurizer Spray Valves – CLOSED
		  • "PRZR SPR PCV-0655B"
		  • "PRZR SPR PCV-0655C"
		• Pressurizer Spray Line temperature - NORMAL
		(Step 4)	

	RO	CHECK Pressurizer Auxiliary Spray Valve LV-3119 CLOSED. *(Step 5)*	
	RO	CHECK Pressurizer Pressure - GREATER THAN 2210 PSIG. *(Step 6)* *(If no then ensure PZR Backup Heaters energized and go to step 11.0.)*	
	RO	CHECK Pressurizer Pressure - GREATER THAN 2250 PSIG. *(Step 7)* *(PZR Pressure will probably be less than 2250 and SRO/RO will go to step 11.0.)*	
	RO	ENSURE An Operable Pressurizer Pressure Channel Is Selected On The Pressurizer Pressure Recorder Selector Switch *(Step 11)*	
	RO	CHECK Pressurizer Pressure Controller RC-PK-0655A – OPERABLE. *(Step 12)*	
	RO	CHECK Pressurizer Pressure - BETWEEN 2220 AND 2250 PSIG. *(Step 13)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Pressurizer pressure transmitter PT-0457 fails high.			
Time	**Position**	**Required Operator Actions**	**Notes**

	RO	CHECK The Following:
		• Pressurizer Pressure Controller RC-PK-0655A demand signal - INDICATING NORMAL FOR EXISTING PLANT CONDITIONS
		• Pressurizer spray valves - IN AUTO
		  • "PRZR SPR PCV-0655B"
		  • "PRZR SPR PCV-0655C"
		• Pressurizer heater controls - IN AUTO
		  • HTR CONT GRP 1C(2C)
		  • HTR B/U GRP 1A(2A)
		  • HTR B/U GRP 1B(2B)
		  • HTR B/U GRP 1D(2D)
		  • HTR B/U GRP 1E(2E)
		• Pressurizer PORVs - IN AUTO
		  • PCV-0655A
		  • PCV-0656A
		• Pressurizer PORV Isolation Valves - OPEN
		  • "ISOL MOV-0001A" for PCV-0655A
		  • "ISOL MOV-0001B" for PCV-0656A
		• Pressurizer Pressure Controller RC-PK-0655A - IN AUTO
		• Pressurizer pressure being maintained - BETWEEN 2220 AND 2250 PSIG
		(Step 14)	

	RO	CHECK Pressurizer Pressure Channels - ALL OPERABLE. **(RNO)** • NOTIFY I&C to place the affected Channel in trip or bypass. REFER TO Addendum 1, Procedure List for the appropriate procedure. • CHECK P-11 permissive in proper state for plant conditions per Technical Specification Table 3.3-3, Item 9.a. *(Step 15)*	
	RO	REFER TO Addendum #3 For Applicable Technical Specifications. *(Step 16)* *(See TS details on next page.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 2	**Event No.:** 3 **(Examiner Trigger)**	
Event Description: Pressurizer pressure transmitter PT-0457 fails high.			
Time	**Position**	**Required Operator Actions**	**Notes**
TS 3.3.1.8 10 & 11 Action 6 and TS 3.3.2.1.e Action 20 *NOTE: Action 6 and Action 20 are the same.* *With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:* *a. For Functional Units with installed bypass test capability, the inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours.* *Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1, provided no more than one channel is in bypass at any time.* ***NOTE: TS 3.4.1.1 and 3.4.1.2 do NOT apply for this event.***			
	SRO	CHECK Reactor Coolant Pumps - ALL OPERATING *(Step 17)*	
	SRO	INITIATE Corrective Action For Failed Component *(Step 18)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4 **(Examiner Trigger)** **Event Description:** Train A 4160V Bus Lockout.			
Time	**Position**	**Required Operator Actions**	**Notes**
	ALL	Acknowledges and announces the following annunciators on 03M3: • 4KV E1A U.V ALERT (C-4) *(There are many other alarms that will annunciate due to the lockout on Class 1E 4.16KV Bus E1A.)*	
	SRO	Determines that Class 1E 4.16KV Bus E1A has an over current lockout.	
	SRO	Enters 0POP04-AE-0001, First Response To Loss Of Any Or All 13.8 KV Or 4.16 KV Bus.	
	RO	CHECK Plant Is In Mode 1 Or 2 *(Step 1)*	
	RO	CHECK All RCPs – RUNNING *(Step 2)*	

	BOP	CHECK 4.16 KV ESF Bus Status:
		• ANY 4.16 KV ESF Bus NOT energized from offsite power (VERIFY the voltage on all three phases of each ESF Bus).
		• VERIFY Applicable STBY DG(s) running
		• VERIFY Applicable STBY DG(s) output breaker(s) closed to the associated 4.16 KV ESF bus
		(RNO)
		PERFORM the following for each STBY DG that is running with the output breaker open:
		• IF "4KV BUS O/C LOCKOUT" indicating lamp on applicable BSMP is illuminated, THEN PERFORM the following:
		  • PLACE the associated SDG in PULL-TO-STOP
		  • GO TO Step 6.0
		(Step 3)
		(ESF DG #11 will be placed in PTL and SRO will go to step 6)	

	BOP	CHECK At Least One CL-ACW Pump – RUNNING *(Step 6)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4 **(Examiner Trigger)** **Event Description:** Train A 4160V Bus Lockout.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	CHECK At Least One IA Compressor – RUNNING *(Step 7)*	
	BOP	CHECK At Least One Condensate Pump – IN SERVICE *(Step 8)*	
	BOP	CHECK TSC DG – RUNNING AND SUPPLYING LC 1W(2W) {East Yard} *(Step 9)*	
	BOP	CHECK Lighting DG – RUNNING AND SUPPLYING MCC 12K3 {Lighting DG SWBD ZLP-672 South Yard} *(Step 10)*	
	SRO	CHECK EOPs – IN PROGRESS **(RNO)** GO TO Step 13.0 *(Step 11)* *(SRO will GO TO Step 13)*	
	RO	CHECK RCP Seal Cooling At Least One Of The Following – IN SERVICE: • RCP thermal barrier CCW flow **OR** • RCP seal injection flow *(Step 13)*	
	RO	CHECK Charging System Status – ANY PUMP RUNNING *(Step 14)* *(Charging Pump 1A from Train C power will be running.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4 **(Examiner Trigger)**			
Event Description: Train A 4160V Bus Lockout.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	CHECK One Of The Following – RUNNING • Centrifugal Charging Pump 1A(2A) • PDP *(Step 15)* *(Charging Pump 1A from Train C power will be running.)*	
	BOP	CHECK "COMP CLG WTR PUMP" 1C(2C) – RUNNING *(Step 16)* *(CCW Pump 1C started when Train A lost power.)*	
	BOP	CHECK Centrifugal Charging Pump 1B(2B) – RUNNING *(Step 17)* *(Charging Pump 1B is powered from Train A. SRO will go to Step 19))*	
	RO	CHECK Normal Letdown – IN SERVICE **(RNO)** PERFORM the following: • PLACE Letdown in service per 0POP04-CV-0004, Loss Of Normal Letdown. IF letdown can NOT be established, THEN PERFORM the following: • ISOLATE charging. • REDUCE Seal injection flow to between 6 and 8 gpm per RCP. *(Step 19)* *(Normal Letdown cannot be re-established quickly because of the loss of power to the TRAIN A 4.16KV ESF BUS.)* *(If not already done the crew will isolate charging and control RCP seal injection at 6-8 gpm.)*	
	RO	VERIFY At Least One RCP Running *(Step 20)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4 **(Examiner Trigger)** **Event Description:** Train A 4160V Bus Lockout.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	MAINTAIN The Following RCS Parameters – IN NORMAL RANGE: • RCS Pressure • RCS Temperature • Pressurizer Level *(Step 21)*	
	BOP	MAINTAIN SG levels – AS APPLICABLE: • Modes 1-4 - Narrow Range SG Levels BETWEEN 68% And 74% Using One Of The Following: • Main Feedwater OR • Auxiliary Feedwater • Modes 5, 6 or defueled – DISPATCH an operator to secure the SG recirc pumps *(Step 22)*	

	BOP	CHECK All 4.16 KV ESF Buses – ENERGIZED
		(RNO)
		PERFORM the following:
		• PLACE the SG PORV associated with any deenergized ESF bus in MANUAL control.
		• IF control of the SG PORV associated with any deenergized ESF bus is required, THEN PERFORM:
		  • DEPRESS SG PORV down arrow pushbutton at least 20 seconds.
		  • DISPATCH an Operator to PLACE associated SG PORV “STATION BLACKOUT PWR” bypass switch to “BYP” position.
		• IF "4KV BUS O/C LOCKOUT" indicating lamp on applicable BSMP {CP003} is illuminated THEN GO TO Step 24.0.
		(Step 23)
		(Places ‘A’ and ‘D’ SG PORV’s in MANUAL. This action may have already been performed because the action is listed on the CIP.)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4 **(Examiner Trigger)**			
Event Description: Train A 4160V Bus Lockout.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	CHECK All 13.8 KV Standby Buses – ENERGIZED (VERIFY the voltage on all three phases of each Bus). *(Step 24)*	
	BOP	CHECK All 13.8 KV Auxiliary Buses – ENERGIZED (VERIFY the voltage on all three phases of each Bus). *(Step 25)*	
	BOP	CHECK 4.16 KV buses 1D1 And 1D2 – ENERGIZED (VERIFY the voltage on all three phases of each Bus). *(Step 26)*	
	SRO	GO TO Procedure and Step in Effect. *(Step 27)* *(There are several TS associated with this loss of power event and are listed below and on the next page.)* *(**Event 5** can be triggered after SRO has checked TSs or on signal from the Lead Examiner. **NOTE:** Many HVAC systems will need to be swapped over to Train B so the Lead Examiner may consider continuing and then check TS on this event after the scenario is over.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 2	**Event No.:** 4 **(Examiner Trigger)**	
Event Description: Train A 4160V Bus Lockout.			
Time	**Position**	**Required Operator Actions**	**Notes**
TS 3.4.4 Action d (PZR PORV PCV-0655A block valve MOV-0001A) With one block valve inoperable, within **1 hour** restore the block valve to OPERABLE status or place its associated PORV in closed position; within 72 hours restore the block valve to OPERABLE status or apply the requirements of the CRMP; otherwise be in at least HOT STANBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. **TS 3.8.1.1 Action a (One Offsite Circuit)** With one offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Specification 4.8.1.1.1a within **1 hour** and at least once per 8 hours thereafter; within **72 hours** restore the offsite circuit to OPERABLE status or apply the requirements of the CRMP, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. **TS 3.8.2.1.a & b, Action d (Battery Chargers for E1A11 and E1D11)** d. With more than one channel with no battery chargers OPERABLE, 1 Restore terminal voltage for at least three battery banks to greater than or equal to the minimum established float voltage **within 1 hour**, AND 2. Verify float current for the affected batteries does not exceed 2 amps once per 12 Hours, AND 3. Restore one battery charger to OPERABLE status on at least three channels within 1 hour. If the battery terminal voltage cannot be restored in the allowed time, float current is excessive, or a battery charger is not restored to operability in the time allowed, apply the requirements of the CRMP or the affected reactor unit is to be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.		

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4 **(Examiner Trigger)**

Event Description: Train A 4160V Bus Lockout.

Time	Position	Required Operator Actions	Notes

TS 3.8.3.1.a, d & e, Action a & d (4.16KV ESF Bus E1A, DP-0001 & DP-1201 and DP-1202)
a. With one of the required trains of A.C. ESF busses not fully energized, within **8 hours** reenergize the train or apply the requirements of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
d. With more than one A.C. vital distribution panel either not energized from its associated inverter, or with the inverter not connected to its associated D.C. bus: (1) within 1 hour reenergize at least five AC. distribution panels or apply the of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and (2) within 1 hour reenergize at least five A.C. vital distribution panels from their associated inverter connected to their associated D.C. bus or apply the requirements of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The following TSs have 7 day action statements:
TS 3.7.4 ECW, 3.7.3 CCW, 3.6.2.1 CS, 3.6.2.3 RCFCs, 3.5.2 SI, 3.7.14 Essential Cooling Water, 3.7.7 CRE HVAC (NO CRMP), TRM 3.1.2.2 Charging Pump 1B

With one … inoperable, within 7 days restore the inoperable (group/train) to OPERABLE status or apply the requirements of the CRMP (except for CRE HVAC), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
(Note: Charging pump is 7 days or initiate CAP as soon as practical.)

TS 3.7.1.2 Action a for AFW Pump #11 (Already in effect due to AFW Pump #11 OOS)

With one motor-driven auxiliary feedwater pump inoperable, within 28 days restore the pump to OPERABLE status or apply the requirements of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

TS 3.6.1.4 for RCB Pressure (May come in due to reduced Chilled Water cooling to RCFCs)

With the containment internal pressure outside of the limits above (-0.1 to +3.0 psig), restore the internal pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 5 (**Examiner Trigger**)			
Event Description: Main Turbine trip due to malfunction with SCW Pumps.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	Acknowledges and announces the following annunciators from 07M3: • STATR CLG SYS TRBL (A-6)	
	RO BOP	Acknowledges and announces Reactor/Main Turbine Trip *(After about 40 seconds Main Turbine trips.)*	
	SRO	Enters 0POP05-EO-EO00, Reactor Trip or safety Injection, and ensures immediate actions are performed.	
	RO BOP	Completes immediate actions of 0POP05-EO-EO00 and determines: • Reactor is tripped (Step 1) • Turbine is tripped (Step 2) • AC ESF Busses are energized (Step 3) • Check SI status (Step 4) *(RO will complete immediate actions. BOP Operator will monitor the plant and make an announcement of the Reactor trip.)* *(During a pause between performing immediate actions and verifying immediate actions, the BOP will throttle AFW to reduce the RCS cooldown by:* • ***Resetting the AFW Reg Valves*** • ***Throttling the AFW Reg Valves to lower total AFW flow.*** *Total AFW flow must remain above 576 gpm until at least one SG level is >14% NR {34% for adverse containment})*	
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	
	SRO	Directs a transition to 0POP05-EO-ES01, Reactor Trip Response, and directs the MONITORING on Critical Safety Functions. *(The crew will continue in ES01 until the SB LOCA is recognized and transition is made back to EO00)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 5 (**Examiner Trigger**)			
Event Description: Main Turbine trip due to malfunction with SCW Pumps.			
Time	**Position**	**Required Operator Actions**	**Notes**

	RO	CHECK RCS Temperature Control:
		• CHECK RCPs – ANY RUNNING
		• MONITOR RCS Temperatures
		  • **WITH ANY RCP RUNNING, RCS TAVG STABLE AT OR TRENDING TO 567°F**
		  • WITHOUT ANY RCP RUNNING, RCS TCOLD STABLE AT OR TRENDING TO 567°F
		(Step 1)
		(RCS temperature should be trending to 567°F if AFW has been throttled to a lower rate.)	

	BOP	CHECK FW Status:
		• CHECK RCS Tavg – LESS THAN 574°F
		• VERIFY FW isolation:
		  • FWIVs - CLOSED
		  • FWIBs - CLOSED
		  • FW preheater bypass valves - CLOSED
		  • FW regulating valves - CLOSED
		  • Low Power FW regulating valves – CLOSED
		• TRIP all SGFPTs
		(Step 2)
		*(**Event 6** - Two minutes after this step the SB LOCA will begin.)*	

	BOP	VERIFY Feedwater Flow Established to GREATER THAN OR EQUAL TO Three (3) SGs: • Main Feedwater flow OR • AFW flow *(Step 3)* *(AFW has actuated and Main Feedwater has isolated.)*	
	RO	VERIFY Control Rods Fully Inserted • All rod bottom lights - LIT *(Step 4)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 5 (**Examiner Trigger**) **Event Description:** Main Turbine trip due to malfunction with SCW Pumps.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	CHECK STBY DG Status: • STBY DG – RUNNING **(RNO)** • GO TO Step 6 *(Step 5)*	
	ALL	Recognize a Loss of Coolant Accident has occurred. *(**Event 5** - SB LOCA will probably have occurred by this time.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 (**Integral**) and 7 (**Integral**)

Event Description: Event 6 - SB LOCA **(Critical Task) (2 minutes after tripping SGFPTs)**
Event 7 - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	SRO	Re-enters 0POP05-EO-EO00, Reactor Trip or Safety Injection. *(Train A equipment will not be available due to the 4.16KV Bus Lockout.)*	
	RO SRO	Completes read through of 0POP05-EO-EO00, Reactor Trip or Safety Injection. • Reactor Tripped. • Turbine Tripped. • AC ESF Busses energized. • SI is actuated. *(0POP05-EO-EO00, Reactor Trip or Safety Injection Steps 1-4. Read through only.)*	
	RO **CT-6**	During the read through of step 1 – 4, RO notices that no HHSI pumps are running. **Manual starts HHSI Pumps 1B.** *(Step 4 of 0POP05-EO-EO00)* ***(Action is to be completed prior to transitioning out of 0POP05-EO-EO00. The action can also be accomplished while performing Addendum 5 of 0POP05-EO-EO00.)*** ***(Also see action in Add 5 on Page 34)***	
	BOP	VERIFY Proper SI Equipment Operation Per ADDENDUM 5, VERIFICATION OF SI EQUIPMENT OPERATION *(Step 5)* *(See Actions on pages 31 - 35)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 (**Integral**) and 7 (**Integral**)

Event Description: Event 6 - SB LOCA **(Critical Task) (2 minutes after tripping SGFPTs)**
Event 7 - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO	MONITOR If Containment Spray Is Required: • Containment pressure – GREATER THAN 9.5 PSIG (QDPS) **(RNO)** • CHECK Containment Pressure - HAS EXCEEDED 9.5 PSIG • "PRESS PR-0934" • "EXTD RNG PRESS PR-9759" • IF containment pressure HAS EXCEEDED 9.5 PSIG, THEN GO TO Step 6.b. • IF containment pressure HAS REMAINED LESS THAN 9.5 PSIG, THEN GO TO Step 7. *(Step 6)* *(Containment pressure will be less than 9.5 psig and the crew will go to step 7.)*	
	RO	CHECK RCP Seal Cooling: • ENSURE seal injection flow between 6 and 13 gpm *(Step 7)* *(RO may have to adjust seal injection.)*	
	RO	MONITOR RCS Temperatures – • **WITH ANY RCP RUNNING, RCS TAVG STABLE AT OR TRENDING TO 567°F** OR • WITHOUT ANY RCP RUNNING, RCS TCOLD STABLE AT OR TRENDING TO 567°F *(Step 8)* *(Because of the SB LOCA the crew may have to throttle down significantly on AFW to restore RCS temperature but should not have to isolate Main Steam.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 (**Integral**) and 7 (**Integral**)

Event Description: Event 6 - SB LOCA **(Critical Task) (2 minutes after tripping SGFPTs)**
Event 7 - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO	CHECK Pressurizer Status: • PORVs - CLOSED • Normal pressurizer spray valves - CLOSED • Auxiliary spray valve - CLOSED • Excess letdown isolation valves - CLOSED *(Step 9)*	
	RO	MONITOR If RCPs Should Be Stopped: • HHSI pump - AT LEAST ONE RUNNING • RCS pressure - LESS THAN 1430 PSIG **(RNO)** • GO TO Step 11. *(Step 10)* *(Crew should not have to stop RCPs.)*	
	RO	VERIFY The Following Containment Isolation Valve – CLOSED • Seal return isolation valves • Containment atmosphere radiation monitor isolation valves *(Step 11)*	

	RO	CHECK If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs –
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT PRESSURE
		(Step 12)	

	RO	CHECK If SG Tubes Are Intact: • Main steamline radiation - NORMAL • IF SG blowdown in service, THEN SG blowdown radiation - NORMAL • CARS pump radiation - NORMAL • NO SG level rising in an uncontrolled manner *(Step 13)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 (**Integral**) and 7 (**Integral**)

Event Description: Event 6 - SB LOCA **(Critical Task) (2 minutes after tripping SGFPTs)**
Event 7 - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO	CHECK If RCS Is Intact: • Containment radiation - NORMAL • Containment pressure - NORMAL • Containment wide range water level - NORMAL **(RNO)** GO TO 0POP05-EO-EO10, LOSS OF REACTOR OR SECONDARY COOLANT, Step1. • MONITOR Critical Safety Functions. • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED. *(Step 14)* *(Will not transition to a Functional Recovery Procedure until Addendum 5 is complete.)*	
	BOP	Completes 0POP05-EO-EO00, Addendum 5.	
	SRO	Informs crew of transition to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant. *(Train A equipment will not be available due to the 4.16KV Bus Lockout.)*	
	RO	MONITOR If RCPs Should Be Stopped: • HHSI pump - AT LEAST ONE RUNNING • RCS pressure - LESS THAN 1430 PSIG **(RNO)** • GO TO Step 11. *(Step 1)* *(Crew should not have to stop RCPs.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 (**Integral**) and 7 (**Integral**)

Event Description: Event 6 - SB LOCA **(Critical Task) (2 minutes after tripping SGFPTs)**
Event 7 - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	BOP CT EO10-D-STP	DEPRESSURIZE Intact SGs To 1000 PSIG
		• CHECK RCS pressure - GREATER THAN 415 PSIG
		• CHECK pressurizer pressure LESS THAN 1985 PSIG
		• BLOCK Low Steamline Pressure SI
		• CHECK Condenser – AVAILABLE
		• CHECK steam dumps in steam pressure mode
		(RNO)
		• PERFORM the following:
		  • PLACE steam dump controller in MANUAL with zero demand.
		  • ADJUST "HDR PRESS CONT PK-0557" setpoint to BETWEEN 7.0 (980 PSIG) and 7.1 (994 PSIG).
		  • PLACE steam dump "MODE SEL" switch in the STEAM PRESS position.
		  • DEPRESSURIZE intact SGs to BETWEEN 980 PSIG and 994 PSIG using steam dumps in MANUAL.
		  • GO TO Step 2.i.
		(Step 2 continued on next page.)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 (**Integral**) and 7 (**Integral**)

Event Description: Event 6 - SB LOCA **(Critical Task) (2 minutes after tripping SGFPTs**)
Event 7 - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	BOP CT EO10-D-STP	*(Step 2 continued from previous page.)*
		(A/ER)
		• CHECK RCS TAVG – Less THAN 563°F
		(RNO)
		• PERFORM the following:
		  • WHEN RCS TAVG lowers to 563°F, THEN PLACE steam dump "INTLK SEL" switches to BYPASS INTERLCK.
		  • GO TO Step 2.k.
		(A/ER)
		• ENSURE "HDR PRESS CONT PK-0557" in AUTO
		• VERIFY steam dumps controlling SG pressures LESS THAN OR EQUAL TO 994 PSIG.
		• ADJUST intact SG PORV controller setpoints to BETWEEN 995 PSIG and 1000 PSIG.
		• ENSURE SG PORV controllers in AUTO.
		(Step 2)
		(This step is written assume the condenser will be available for steam dumps. The crew has 45 minutes from the time of the SB LOCA to complete the critical task. If the crew lowers steam generator pressures too fast during the depressurization they may have to secure RCPs and/or complete the depressurization using the SG PORVs.)
		(Terminate Scenario)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 7** - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. Step 10 **Critical Task**)

Time	Position	Required Operator Actions	Notes

	BOP	VERIFY FW isolation:
		• SGFPTs – TRIPPED
		• SU SGFP – TRIPPED
		• VERIFY the following valves –CLOSED
		  o FWIVs
		  o FWIBs
		  o FW preheater bypass valves
		  o FW regulating valves
		  o Low power FW regulating valves
		  o SG blowdown isolation valves
		  o SG sample isolation valves
		(EO00 Addendum 5, Step 1)
		(0POP05-EO-EO00, Reactor Trip or Safety Injection, Addendum 5, Verification of Equipment Operation.)
		(This addendum is performed in parallel with Steps 5 to 14 of 0POP05-EO-EO00, Reactor Trip or Safety Injection.)
		(Train A equipment will not be available due to the 4.16KV Bus Lockout.)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 7** - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. Step 10 **Critical Task**)

Time	Position	Required Operator Actions	Notes
	BOP	CHECK if main steamline should be isolated: • CHECK for any of the following conditions: o Containment pressure – GREATER THAN OR EQUAL TO 3 PSIG OR o SG pressure (without low steamline pressure SI blocked) - LESS THAN OR EQUAL TO 735 PSIG OR o SG pressure (with low steamline pressure SI blocked) - LOWERING AT A RATE GREATER THAN OR EQUAL TO 100 PSI/SEC, BY OBSERVANCE OF THE STEAMLINE PRESSURE RATE BISTABLES **(RNO)** • GO TO Step 3 of the Addendum. *(Step 2)*	
	BOP	VERIFY AFW system status: • Motor-driven pump – RUNNING • Turbine-driven pump – RUNNING *(Step 3)*	
	BOP	VERIFY AFW valve alignment - PROPER EMERGENCY ALIGNMENT *(Step 4)*	
	BOP	VERIFY total AFW Flow - GREATER THAN 576 GPM *(Step 5)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 7** - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. Step 10 **Critical Task**)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY containment isolation phase A: • Phase A – ACTUATED • Phase A valves - CLOSED, REFER TO ADDENDUM 1, PHASE A ISOLATION VERIFICATION **(RNO)** • Manually CLOSE valves. *(Step 6)* *(Operator may use 0POP05-EO-EO00, Add. 1 to help verify penetrations associated with Train A power.)*	
	BOP	VERIFY ECW status: • ECW pumps – RUNNING • ECW pump discharge isolation valves – OPEN *(Step 7)*	
	BOP	VERIFY CCW pumps – RUNNING *(Step 8)*	
	BOP	VERIFY RCFC status: • RCFCs – RUNNING • Cooling water - TRANSFERRED TO CCW *(Step 9)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 7** - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. Step 10 **Critical Task**)

Time	Position	Required Operator Actions	Notes
	BOP CT-6	VERIFY SI pump status: • **HHSI pumps – RUNNING** • LHSI pumps – RUNNING **(RNO)** • WHEN the respective ESF Load Sequencer has completed its automatic sequence OR it is determined that the respective ESF Load Sequencer has failed, THEN manually START pump(s). *(Step 10)* ***(Event 7 – With HHSI Pump 1A not having power and Pump 1C tripping on overcurrent, the operator will manually start HHSI Pump 1B which failed to auto start. Action is to be completed prior to transitioning out of 0POP05-EO-EO00 which includes performing Addendum 5.)***	
	BOP	VERIFY SI valve alignment – PROPER EMERGENCY ALIGNMENT *(Step 11)*	
	BOP	VERIFY SI flow: • RCS pressure - LESS THAN 1745 PSIG • HHSI pump flow – INDICATED • RCS pressure - LESS THAN 415 PSIG **(RNO)** • GO TO Step 13 of this Addendum. *(Step 12)*	
	BOP	VERIFY containment ventilation isolation: • Containment atmosphere radiation monitor isolation valves – CLOSED • Normal purge supply and exhaust fans – STOPPED • Supplemental purge supply and exhaust fans – STOPPED • Purge Dampers – CLOSED *(Step 13)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 7** - HHSI Pumps; 1A no power, 1B fails to auto start & 1C trips on overcurrent. Step 10 **Critical Task**)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY ventilation actuation: • Control room HVAC – OPERATING IN EMERGENCY RECIRC • EAB HVAC - OPERATING IN EMERGENCY RECIRC • FHB HVAC - OPERATING IN EMERGENCY MODE • FHB Exhaust Fans - ONLY TWO TRAINS OPERATING o Exhaust booster fans o Main exhaust fans **(RNO)** • PERFORM the following: o IF three trains FHB exhaust fans running, THEN PLACE one train FHB exhaust fans in PULL TO LOCK. **(Back to A/ER)** • SECURE one FHB filter train by PERFORMING the following: o PLACE the outlet damper Controller in manual o Manually close the outlet damper o VERIFY proper operation of filter train in service • Essential chilled water pumps – RUNNING • Essential chillers – RUNNING • ECCS pump room fan coolers – RUNNING • AFW pump cubicle fans – RUNNING • FHB truck bay doors – CLOSED *(Step 14)*	
	BOP	NOTIFY Unit Supervisor that Addendum 5 is COMPLETE *(Step 15)*	
	SRO	IMPLEMENT Functional Restoration Procedures as required *(Step 16)*	
	SRO	RETURN TO procedure step in effect. *(Step 17)*	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**CT-6** **START HHSI PUMP 1B PRIOR TO EXITING 0POP05-EO-EO00 WHICH INCLUDES ADDENDUM 5.**	Establish flow to at least one HHSI Pump before transition out of EO00 during a Small Break LOCA where RCS pressure remains between 400 and 1680 psig. SAFETY SIGNIFICANCE -- Failure to manually start at least one high-head ECCS pump under the postulated conditions constitutes "mis-operation or incorrect crew performance which leads to degraded ECCS ... capacity." In this case, at least one high-head ECCS pump can be manually started from the control room. Therefore, failure to manually start a high-head ECCS pump also represents a "demonstrated inability by the crew to: • Recognize a failure/incorrect auto actuation of an ESF system or component • Effectively direct/manipulate ESF controls" Failure to perform the critical task means that the plant is needlessly left in an unanalyzed condition. Performance of the critical task would return the plant to a condition for which analysis shows acceptable results. Because compliance with the assumptions of the FSAR is part of the facility license condition, failure to perform the critical task (under the postulated plant conditions) constitutes a violation of the license condition.	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**CT-EO-10-D-STP** **REDUCE AT LEAST 2 STEAM GENERATOR PORV SET POINTS TO ≤ 1000 PSIG WITHIN 45 MINUTES FROM THE INITIATION OF A SBLOCA.** **OR** **WITH STEAM DUMPS AVAILABLE FOR HEAT REMOVAL IN THE STEAM PRESSURE MODE, THE SETPOINT IS SET AT OR BELOW 7.14 (CORRESPONDING TO < 1000 PSIG) IN 45 MINUTES OR LESS FROM THE INITIATION OF A SBLOCA.**	Reduce SG PORV or Steam Dump setpoint to 1000 psig within 45 minutes of the initiation of a SBLOCA. SAFETY SIGNIFICANCE -- Small break LOCA flow is inadequate to provide core cooling, additional heat removal from the steam generators is required. If at least 2 SG PORV setpoints are not reduced to 1000 psig within 45 minutes the peak clad temperature can or will exceed the 10CFR50.46 criteria.	

NOTE: (Per NUREG-1021, Appendix D)
If an operator or the Crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.

EXPECTED BOOTH COMMUNICATIONS

EVENT 1:

- There are no Booth Communications expected for Event 1.

EVENT 2:

- As a Plant Operator, if asked to check Open Loop ACW Pumps #11 & #12, report the following:
  - Wait 1 minute – The breaker for OL ACW Pump #12 as an overcurrent indication.
  - Wait 2 minutes – Locally there is no issues with OL ACW Pump #12 and OL ACW Pump #11 is running SAT with good seal water pressure.
- As Mechanical/Electrical Maintenance or the Duty Maintenance Supervisor, if notified of the issue with OL ACW Pump #12, report that a crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the issue with OL ACW Pump #12. No further action is necessary.

EVENT 3:

- As I/C Maintenance or the Duty Maintenance Supervisor, if notified of the failure of PZR PT-0457, report an I/C Maintenance crew will be assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the failure of PZR PT-0457. No further action is necessary.

EVENT 4:

- As a Plant Operator, if asked to check 4.16KV ESF Bus 1A, after 1 minute report back that the bus indicates an overcurrent lockout.
- As Electrical Maintenance or the Duty Maintenance Supervisor, if notified of the lockout on 4.16KV ESF Bus 1A, report an Electrical Maintenance crew will be assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the lockout on 4.16KV ESF Bus 1A. No further action is necessary.

EVENT 5:

- There are no Booth Communications expected for Event 5.

EVENT 6:

- There are no Booth Communications expected for Event 6.

EVENT 7:

- There are no Booth Communications expected for Event 7.

EXPECTED BOOTH ACTIONS

1. If asked to open the Deaerator High Level Dump Bypass Valves then trigger the step for ‘DA HLD Bypass Valves FW-486 & FW-487’.
2. If asked to fill the AFWST then trigger the step for ‘AFWST Makeup’.

SIMULATOR SETUP

NOTE

ALL Annunciator Response Procedures (ARP's) must be checked if this scenario is the first to be run on this day. Setup for subsequent runs of this scenario only requires those ARP's that were actually marked in to be checked.

Instructors running the scenario must keep track of which ARP's these are, otherwise, all will have to be checked for subsequent scenarios as well.

Each time before running the scenario check and/or clean the following:									
Specific Scenario Procedures	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
0POP03-ZG-0005, Plant Startup to 100%									
0POP04-OC-0001, Loss of Open Loop Auxiliary Cooling Water									
0POP04-RP-0001, Loss of Automatic Pressurizer Pressure Control									
0POP04-AE-0001, First Response to Loss of any or all 13.8KV or 4.16KV Bus									
0POP05-EO-EO00, Reactor Trip or Safety Injection									
0POP05-EO-ES01, Reactor Trip Response									
0POP05-EO-EO10, Loss of Reactor or Secondary Coolant									
Other Procedures Used By Students During Scenario Including POP09s.	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
Miscellaneous Items to Restore	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
STA ICS Screens to PD Menu									
All ICS Trends to normal (not scenario specific)									
Student Selected ICS Points changed to U1118									
Control Panel ICS Screens to Normal									
RM 11 History and Screens									
RM 23 – No Alarm Indications									

SIMULATOR SETUP (cont'd.)

NOTE

The Scenario Lesson Plan MUST be run from the left most Instructor Station in Simulator Booth to allow for recording and storing of recorded parameter data.

- Log into Instructor Workstation as 'lotnrc' user, open Orchid (nstps server), then 'Unlock' Initial Conditions Group 'lotnrc'.
- Reset to IC #202 and perform the following:
  - Switch Check
  - Ensure red light on end of CP-010 off
  - Ensure ICS Annunciators have stopped counting up
- Go to RUN and perform the following:
  - Ensure Simulator is ready by performing applicable checkoffs from LOR-GL-0006, LOR Conduct of Simulator Training Guidelines, Addendum 5, Simulator Readiness Checklist.
  - Ensure VCT Makeup Integrators are set as follows:
    - Momentarily place RC M/U CONT to STOP and then START to reset BA BATCH/GALLONS and TOT M/U BATCH/GALLONS counters to zero.
    - Reset BA BATCH/GALLONS setpoint to 0 gallons and reset TOT M/U BATCH/GALLONS setpoint to 0 gallons.
    - Verify BA Controller Pot setting is 3.70
- Hang following ECO/Caution Tags:
    - AFW Pump #11 Handswitch in PTL
- Open lesson plan for 'Scenario 2' in 'lotnrc' directory for LOT 23, then EXECUTE lesson plan. These actions will set up any initial conditions for the scenario.
- If this scenario IC has changing conditions (i.e. Xenon is changing, etc.), then place the simulator in FREEZE, otherwise it is OK to leave in RUN.
- Run the scenario in accordance with the next section, 'Scenario Instructions'.

SCENARIO INSTRUCTIONS

NOTE
Steps 1 to 4 below can be performed in the LOR Debrief Room prior to the crew coming into the Simulator provided exam security measures are taken.

1. Provide Shift Turnover sheets to the crew and review the information.
2. Have the Crew perform a Pre-Job Brief. Ensure the crew doesn't have any other questions about the Shift Turnover.
3. Ensure the Beacon book from the simulator is available to the crew if they are in the LOR Debrief Room.
4. Review the Simulator Differences list with the crew if needed.
5. When signaled by Simulator Staff, have the crew perform their board walkdown and inform the floor instructor when ready to take the watch.
6. Ensure the simulator is in RUN and verify simulator clock is set correctly. Note the time that the Crew takes the watch. _____ Start Time.

NOTE

Malfunction Step and/or Lesson Plan Steps (Events) are triggered upon the Lead Examiners signal during the scenario unless an agreed upon time is discussed with the examiner prior to the start of the scenario.

Always 'TRIGGER' events in the Simulator Scenario Lesson Plans. This way delays associated with events will take place as intended.

Refer to 'EXPECTED BOOTH COMMUNCATIONS' and 'EXPECTED BOOTH ACTIONS' Sections for instructions for Instructor actions during the scenario.

7. Trigger the step titled 'Start Chart' and ensure specified Recorded Parameters for the scenario begin recording as the scenario runs. If the chart speed is NOT set to 5400 seconds (90 minutes) then perform the following:
   - Under 'CHARTS' click on 'SET TIME'
   - In the dialog box enter 5400 seconds (90 minutes)
   - Click OK.
8. The crew will raise power to 98% - Event #1
9. When signaled by Lead Examiner, trigger **MALFUNCTION STEP –** This will insert Step #1, Event #2.
10. When signaled by Lead Examiner, trigger **STEP 2 –** Event #3
11. When signaled by Lead Examiner, trigger **STEP 3 –** Event #4
12. When signaled by Lead Examiner, trigger **STEP 4 –** Event #5
13. Place simulator in FREEZE when cued by the Lead Examiner to terminate scenario.
14. DO NOT RESET simulator until the steps on the next page are completed and all Examiners have completed Follow-Up Questioning.

SCENARIO INSTRUCTIONS (cont'd.)

NOTE
Some scenarios will have more than one chart. For these, each chart file must be separately saved with a unique filename.

15. Saving Recorded Parameters Data
    - Click on the 'Charts' icon on the left side of the screen
    - Select 'Pause' icon, then select 'All'
    - Click on the 'Print Chart' icon, then select 'All'
    - This will bring up a window in the TASK BAR called PRIMOPDF.
    - Click on 'Create PDF'
    - This will bring up a File Save As window.
    - Save to folder **c:\Users\lotnrc\Desktop\LOT23 Charts**. The file name will be 'LOT23 Scenario 2' followed by a name that identifies the crew (e.g. 'Crew A).
    - Save the new file. It will be saved in a folder already on the desktop. LOT23 Charts.
16. Saving Scenario SAM (Simulator Action Monitor)
    - Under 'TOOLS' click on 'SAM'
    - In the dialog box that comes up click on 'SAVE TO'
    - Save as a 'TEXT FILE' to folder **c:\Users\lotnrc\Desktop\LOT23 Charts.** The file name will be 'LOT23 SAM INFO Scenario 2' followed by a name that identifies the crew (e.g. 'Crew A).

SCENARIO - 03

	0POP01-ZQ-0022		
Plant Operations Shift Routines			
For Training Only	Shift Turnover Checklist		Page 1 of 1

PART I - To be completed prior to shift turnover.

Unit: **1** Off- Going Shift: **Days / Nights** Date: **Today** Mode: **1**

Dilution			Boration			Control Rods		
Current Setpoint	1% Pwr Change	1° F Change	Current Setpoint	1% Pwr Change	1° F Change	Current Position	1% Pwr Change	1° F Change
0	**130**	**114**	**0** flushing with	**29**	**25**	**232**	**7**	**6**
As Required			As Required			As Required		

ΔI Target	Channel	RCS Boron
4.74%	**U1144**	**1357**

Unit 1 Status

- Operating at 95% power
- Core burnup is 150 MWD / MTU

Load Reduction:

- 100-90%/1hr = **162**
- 100-80%/10min = **382**
- 100-75%/30min = **444**
- 100-60%/1hr = **620**
- 100-50%/10min = **925**

Information:

- The crew is to continue at Step 7.63 of 0POP03-ZG-0005, Plant Startup to 100%, and raise power to 98%.
- AFW Pump #11 is OOS.
- BAT 1A & 1B Concentrations are 7300 ppm
- Fuel Handling Building truck bay doors are closed
- No personnel are in containment
- Ron Gibbs has the duty
- The NLO compliment is 5 watch standers and a head operator

ECO/LCO/RAsCAL:

TS 3.7.1.2
Action a. – With one motor-driven auxiliary feedwater pump inoperable, within 28 days restore the pump to OPERABLE status or apply the requirements of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

LOT 23 NRC EXAM

SIMULATOR OPERATING TEST

SCENARIO #3

Revision 0

Week of 07/15/2019

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 3** **Op-Test No.: LOT 23 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:
- **Mode 1 at 100% Power**

Turnover:
- **AFW Pump #11 is out of service.**

Critical Tasks:
- **Event 4 - Manually trip the reactor from the control room.**
- **Event 5 – Isolate the faulted SG.**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	Multiple	BOP (C) SRO (C)	CW Pump #13 trip and Discharge valve fails to close.
2 (15 min)	02-20-01 0	RO (I) SRO (I, TS)	PZR level channel LT-0465 fails low.
3 (25 min)	06-16-02 0	BOP (I) SRO (I, TS)	Turbine Impulse Pressure, PT-0505, fails low
4 (35 min)	05-06-03 1	RO (C) BOP (C) SRO (C)	SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)**
5 (N/A)	05-04-03 1	ALL (M)	Two (2) SG 1C safety valves fail open. **(Critical Task)** **(Occurs 30 seconds after SG 1C MSIV closes)**
6 (N/A)	50-KA-05 1	BOP (C) SRO (C)	CCW Pump 1B fails to Auto Start. **(Integral to Scenario)**

Lot* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specification

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Malfunctions after EOP entry (1–2)	1
2. Abnormal events (2–4)	4
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	1
5. Entry into a contingency EOP with substantive actions (≥1 per scenario set)	0
6. Preidentified critical tasks (≥2)	2

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

- Critical Tasks are indicated by "**CT-##**" in the position column and indicated in bold type. In some instances an "*" will indicate that only a portion of the task listed is considered critical.
- Shaded cells indicate procedural entry points.

RECORDED PARAMETERS:

Recorded parameters will be determined during NRC Validation week.

The parameters identified for recording may be of value in evaluating crew performance. Once the scenario is complete for each crew, printout the recorded parameters and label the printout with date, time, crew number and scenario number. See Scenario Instructions section for further details on how to save the Recorded Parameters.

- Main Turbine Throttle Valve #1 position
- Core Exit T/C
- RCS Wide Range Pressure
- LHSI Pump 1A Red Light

SCENARIO OBJECTIVES

Event 1 Objective

- Respond to loss of circulating water flow per 0POP04-CW-0001, Loss of Circulating Water Flow.

Event 2 Objective

- Respond to pressurizer level control malfunctions per 0POP04-RP-0002, Loss of Automatic pressurizer Level Control.

Event 3 Objective

- Respond to a failure of a Turbine Impulse Pressure Transmitter per 0POP04-TM-0004, Failure of Turbine Impulse Pressure Transmitter (PT-505/506).

Event 4 Objective

- Respond to a Reactor Trip where the reactor must be tripped by de-energizing the Rod Drive MG Sets per 0POP05-EO-EO00, Reactor Trip or Safety Injection.

Event 5 Objective

- Respond to a faulted steam generator per 0POP05-EO-EO20, Faulted Steam Generator Isolation.

Event 6 Objective

- Respond to equipment failures during a reactor trip per 0POP05-EO-EO00, Reactor Trip or Safety Injection, Addendum 5, Verification of SI Equipment Operation.

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 3	**Event No.:** 1 (**Triggers 1 min after Crew takes watch.**)	
Event Description: CW Pump #13 trip and Discharge valve fails to close.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	Acknowledges and announces the following annunciators from 09M1: • CWP TRIP/FAIL START (A-3)	
	BOP SRO	Determines Circulating Water Pump #13 tripped.	
	SRO	Directs actions of 0POP04-CW-0001, Loss of Circulating Water Flow.	
	BOP	CHECK This Procedure Has Been Entered Due To Circulating Water Traveling Screen High Differential Level (RNO) GO TO Step 3.0 *(Step 1.0)*	
	RO	CHECK Two or More Circulating Water Pumps RUNNING *(Step 3.0)*	
	RO	CHECK All Secured/Tripped Circulating Water Pumps Discharge Valves – CLOSED (RNO) IF affected circulating water pump discharge valve is NOT closed, THEN PERFORM the following: • **PLACE the affected circulating water pump hand switch to STOP and RETURN to NORMAL.** • IF affected circulating water pump discharge valve is still NOT closed, THEN DISPATCH operator to close valve with the local hand switch OR manually. *(Step 4.0)* *(CW Pump #13 discharge valve will not close on the trip. The operator will have to close the valve by placing the CW Pump #13 handswitch in STOP and back to NORMAL.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 3	**Event No.:** 1 (**Triggers 1 min after Crew takes watch.**)	
Event Description: CW Pump #13 trip and Discharge valve fails to close.			
Time	**Position**	**Required Operator Actions**	**Notes**
	SRO	**START A Standby Circulating Water Pump Per Addendum 1, Circulating Water Pump Start** *(Step 5.0)* *(Three out of the four CW Pumps will be running.)* *(**Event 2** can triggered on signal by the lead examiner.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2 **(Examiner Trigger)** **Event Description:** PZR level channel LT-0465 fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	Acknowledges and announces the following annunciators on 04M8: • LETDN HX OUTL FLOW HI/LO (D-4) • PRZR LEVEL DEV LO (D-6)	
	SRO/RO	Determines PZR Level Channel LT-0465 failed low. Performs immediate actions of 0POP04-RP-0002: • PLACES "CHG FLOW CONT FK-0205" in Manual and controls PZR Level on Program. *(Failed Channel is RC-LI-0465. Immediate Action – RO Places CV-FV-0205 in manual and controls PZR Level on Program.)*	
	SRO	Directs actions of 0POP04-RP-0002, Loss of Automatic Pressurizer Level Control.	
	RO	PLACE "CHG FLOW CONT FK-0205" Controller In MANUAL *(Step 1.0 – Immediate Action)*	
	RO	ADJUST "CHG FLOW CONT FK-0205" To Maintain Pressurizer Program Level *(Step 2.0 – Immediate Action)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2 **(Examiner Trigger)** **Event Description:** PZR level channel LT-0465 fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**

	RO	VERIFY Letdown – IN SERVICE
		(RNO)
		PERFORM the following:
		• ENSURE "LETDN ORIF HDR ISOL FV-0011" is closed.
		• ENSURE "CHG FLOW CONT FK-0205" in "MAN" and CLOSED.
		• OPEN Centrifugal Charging Pump miniflow valve for operating pump:
		  • CCP 1A(2A) "RECIRC FCV-0201"
		  • CCP 1B(2B) "RECIRC FCV-0202"
		• *MAINTAIN* RCP seal injection between
		• 6 and 13 gpm using "FLOW CONT HCV-0218."
		• ENSURE all letdown orifice isolation valves are closed:
		  • "120-150 GPM ORIFICE ISOL VLV 1(2)-CV-FV-0012"
		  • "85-100 GPM ORIFICE ISOL VLV 1(2)-CV-FV-0013"
		  • "25-30 GPM ORIFICE ISOL VLV 1(2)-CV-MOV-0014"
		• ENSURE "LETDN ISOL LCV-0465" is closed.
		• ENSURE "LETDN ISOL LCV-0468" is closed.
		• GO TO Step 4.0.
		(Step 3.0)
		(Letdown will have isolated due to the failure of LT-0465.)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2 **(Examiner Trigger)**

Event Description: PZR level channel LT-0465 fails low.

Time	Position	Required Operator Actions	Notes
	RO	CHECK All Pressurizer Level Channels - OPERABLE **(RNO)** PERFORM the following: • POSITION Pressurizer level control selector switch to remove failed channel from service: <u>Failed Channel</u> <u>Select</u> **RC-LT-0465 L467/466** RC-LT-0466 L465/467 RC-LT-0467 L465/466 • POSITION Pressurizer level recorder selector switch to an operable channel. • PLACE Pressurizer "HTR CONT GRP 1C" to ON. • IF normal letdown has isolated, THEN PLACE excess letdown in service as necessary per Addendum 3 to maintain Pressurizer level on Pressurizer Program Level. • NOTIFY I&C to bypass or trip the Pressurizer low level for the failed channel, using plant surveillance procedure listed in Addendum 4. *(Step 4.0)* *(The Crew will begin placing Excess Letdown in service. See Page 10)* *(Placing LT-0465 in TRIP or BYPASS will allow normal letdown to be placed back in service. However, it would realistically take I/C a couple of hours to do this.)*	
	I/C	*(If contacted, I/C Maintenance will report that it will take about 2 hours to place LT-0465 in TRIP or BYPASS.)*	
	RO	CHECK All Tavg Channels –OPERABLE *(Step 5.0)*	
	RO	CHECK Tavg – WITHIN 1.5°F OF Tref *(Step 6.0)*	
	RO	CHECK Pressurizer Level - GREATER THAN 17% *(Step 7.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2 **(Examiner Trigger)** **Event Description:** PZR level channel LT-0465 fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	CHECK Normal Letdown – IN SERVICE **(RNO)** • PLACE normal letdown in service per Addendum 5, Placing Normal Letdown In Service, to maintain Pressurizer level. • **DO NOT CONTINUE with procedure until Addendum 5, Placing Normal Letdown In Service, is complete.** *(Step 8.0)* ***(Event 3** can be triggered on a signal from the Lead Examiner.)* *(NOTE: The Crew will stop at this point and wait on I/C. TSs may have to be looked at after the scenario. See below for TSs.)*	
TS 3.3.1.12 Action 6 *With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:* *a. For Functional Units with installed bypass test capability, the inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours.* *Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1, provided no more than one channel is in bypass at any time.*			
	SRO	The Crew places Excess Letdown in service 0POP04-RP-0002, Loss of Automatic Pressurizer Level Control, Addendum 3, Placing Excess Letdown in Service.	
	RO	CHECK CCW In Service To The Excess Letdown Heat Exchanger *(Add 3 Step 1.0)*	
	RO	PLACE Excess Letdown "DIVERT FV-3123" In The "RCDT" Position *(Add 3 Step 2.0)*	
	RO AO	CHECK "EXCESS/NORMAL LETDN CROSS CONNECTION 1-CV-HS-0469" In The "CLOSE" Position *(Add 3 Step 3.0)* *(Plant Operator will report that 1-CV-HS-0469 is CLOSED.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2 **(Examiner Trigger)** **Event Description:** PZR level channel LT-0465 fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	OPEN Excess Letdown Heat Exchanger Inlet Isolation Valve "LOOP D ISOL MOV-0083" *(Add 3 Step 4.0)*	
	RO	OPEN Excess Letdown Heat Exchanger Inlet Isolation Valve "ISOL MOV-0082" *(Add 3 Step 5.0)*	
	RO	MAINTAIN Both Of The Following Parameters While Flushing Excess Letdown Heat Exchanger: • Excess Letdown "HX OUTL TEMP TI-0229" – LESS THAN 175°F • Excess Letdown "HX OUTL PRESS PI-0228" – LESS THAN 145 psig *(Add 3 Step 6.0)*	
	RO	Slowly OPEN Excess Letdown "TEMP CONT HCV-0227" To Avoid Thermal Transients *(Add 3 Step 7.0)*	
	RO	ADJUST Excess Letdown And Seal Injection Flows To Maintain • Pressurizer level • RCDT level (8 – 92%) • RCDT pressure (LESS THAN 6 psig) *(Add 3 Step 8.0)*	
	RO	FLUSH Excess Letdown To The RCDT For At Least Six (6) Minutes *(Add 3 Step 9.0)*	
	RO	PERFORM One Of The Following: • PLACE excess letdown "DIVERT FV-3123" in the "VCT" position **OR** • ENSURE excess letdown "DIVERT FV-3123" remains in the "RCDT" position *(Add 3 Step 10.0)* *(Will position FV-3123 to the VCT position.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2 **(Examiner Trigger)** **Event Description:** PZR level channel LT-0465 fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**

	RO	Determine Excess Letdown will be in service - GREATER THAN 24 HOURS.
		(RNO)
		PERFORM the following:
		• IF CVCS Seal Return to the VCT is desired by the Shift/Unit Supervisor, THEN PERFORM the following:
		  • OPEN "1-CV-0171 CVCS SEAL RETURN VCT ISOL."
		  • CLOSE "1-CV-0170 CVCS SEAL RETURN CHARGING PUMP SUCTION ISOL."
		• RETURN TO the procedure step in effect.
		(Add 3 Step 11.0)
		(The Crew will probably elect NOT to align CVCS Seal Return to the VCT.)	

	I/C	*(If contacted, I/C Maintenance will report that the repairs can be completed within 18 hours.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Turbine Impulse Pressure, PT-0505, fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP RO	Acknowledges and announces the following annunciators from 05M2: • TURB IMP PRESS ROD WITHDRWL BLKD (E-5) • T REF/AUCT T AVG DEV (E-6)	
	SRO BOP	Determines Impulse Pressure channel PT-0505 as failed low.	
	SRO	Directs actions of 0POP04-TM-0004, Failure of Turbine Impulse Pressure Transmitter (PT-505/506).	
	BOP RO	VERIFY Rod Control - IN MANUAL. **(RNO)** PLACE Rod Control in MANUAL *(Step 1.0)* *(In this procedure Step 1.0 is NOT an immediate step, however, per Conduct of Ops the crew may put Rod Control in MANUAL when it is determined that PT-0505 has failed.)*	
	BOP RO	VERIFY RCS Tavg – WITHIN 1.5ºF OF PROGRAM RCS TAVG PER Addendum 1, Percent Power vs Program Tavg **(RNO)** RESTORE RCS Tavg to within 1.5°F of Program RCS Tavg by any of the following methods: • INSERT Control Rods • WITHDRAW Control Rods • ADJUST Boron Concentration • ADJUST Turbine Load *(Step 2.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 3 **(Examiner Trigger)** **Event Description:** Turbine Impulse Pressure, PT-0505, fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**

	BOP	CHECK Steam Dump Control - PRESSURE CONTROL MODE
		(RNO)
		TRANSFER steam dump control to pressure control mode as follows:
		• ADJUST Steam Dump "HDR PRESS CONT" PK-0557 setpoint for no load steam pressure of 1185 psig (approximately 8.46 controller setpoint)
		• PLACE "INTLK SEL" Switch to OFF/RESET for the following:
		  • Train "A"
		  OR
		  • Train "B"
		• PLACE Steam Dump "MODE SEL" switch in STEAM PRESS position.
		• ENSURE steam dump "DEMAND" UI-0555 is 0% using Steam Dump "HDR PRESS CONT" PK-0557.
		• ENSURE "INTLK SEL" Switch to ON for both the following:
		  • Train "A"
		  • Train "B"
		• ENSURE Steam Dump "HDR PRESS CONT" PK-0557 in AUTO.
		• ENSURE all steam dump valves closed.
		(Step 3.0)	

	BOP	SELECT The Failed Channel To "DEFEAT" On The "IMP SEL" Switch *(Step 4.0)*	
	BOP	CHECK "TURB IMP PRESS WTHDRWL BLKD" Annunciator - EXTINGUISHED (Lampbox 5M02, Window E-5) *(Step 5)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Turbine Impulse Pressure, PT-0505, fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	VERIFY Permissive P-13 Annunciator Window Is In The Correct State For Current Plant Conditions Within **One Hour** Per Technical Specifications 3.3.1. • **Turbine Load GREATER THAN 10% Permissive lampbox for P-13 should be dark (not illuminated).** • Turbine Load LESS THAN 10% Permissive lampbox for P-13 should be illuminated. *(Step 6.0)* ***(TS 3.3.1.19.f – Action 8 This procedure step will satisfy the TS requirements.)*** *(See below for full TS Action.)*	
	BOP	CHECK Reactor Power – LESS THAN 10% *(Step 7.0)*	
	BOP	CHECK PT-505, Turbine First Stage Pressure (Impulse Pressure) - FAILED *(Step 8.0)*	
	BOP	INITIATE A Condition Report To Repair The Inoperable Channel *(Step 9.0)*	
	SRO	GO TO The Appropriate Plant Procedure As Determined By The Shift Manager/Unit Supervisor *(Step 10.0)* *(**Event 4** can be triggered after SRO has checked TS.)*	
TS 3.3.1.19.f Action 8 *With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.*			

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4 **(Examiner Trigger)** and 5 **(Occurs 30 seconds after SG 1C MSIV closes)**

Event Description: Event 4 - SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)**
Event 5 - Two (2) SG 1C safety valves fail open. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 6M03: • MSIV NOT FULL OPEN (B-1)	

	SRO
	BOP
		Determines Main Steam Isolation Valve for SG 1C is closing in an uncontrolled manner.
		Per 0POP09-AN-06M3 B1:
		• IF the Unit is in Mode 1 AND an MSIV is closing in an uncontrolled manner, THEN PERFORM the following:
		  • TRIP the Reactor
		  • GO TO 0POP05-EO-EO00, Reactor Trip or Safety Injection.	

	SRO	Enters 0POP05-EO-EO00, Reactor Trip or safety Injection, and ensures immediate actions are performed.	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 3	**Event No.:** 4 **(Examiner Trigger)** and 5 **(Occurs 30 seconds after SG 1C MSIV closes)**	
Event Description: Event 4 - SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)** **Event 5** - Two (2) SG 1C safety valves fail open. **(Critical Task)**			
Time	**Position**	**Required Operator Actions**	**Notes**

	RO
	CT-1
		VERIFY Reactor Trip:
		• Rod bottom lights – LIT
		• Reactor trip and bypass breakers – OPEN
		• Neutron flux – LOWERING
		(RNO)
		PERFORM the following:
		• Manually TRIP reactor using both reactor trip switches
		• IF reactor will NOT trip, THEN:
		  • **OPEN 480V LC 1K1 and 1L1 feeder breakers**
		  • IF reactor will NOT trip, THEN GO TO 0POP05-EO-FRS1, Response to Nuclear Power Generation ATWS, Step 1 AND MONITOR Critical Safety Functions
		  • IF reactor trip and bypass breakers DO NOT OPEN, THEN DISPATCH and operator to OPEN reactor trip and bypass breakers.
		  • WHEN the reactor is verified tripped, THEN CLOSE 480V LC 1K1 and 1L1 feeder breakers.
		(0POP05-EO-EO00, Step 1 and RNO)
		(The reactor will trip when the 480V LC 1K1 and 1L1 feeder breakers are open. The crew will still have to dispatch an operator to locally open the reactor trip breakers and also reclose the 480V LC 1K1 and 1L1 feeder breakers.)	

	AO	*(The plant operator, after 2 minutes, will report back that the reactor trip and bypass breakers have been locally opened.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4 **(Examiner Trigger)** and 5 **(Occurs 30 seconds after SG 1C MSIV closes)**

Event Description: Event 4 - SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)**
Event 5 - Two (2) SG 1C safety valves fail open. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO BOP	Completes the rest of the immediate actions of 0POP05-EO-EO00 and determines: • Turbine is tripped (Step 2) • AC ESF Busses are energized (Step 3) • Check SI status (Step 4) *(RO will complete immediate actions. BOP Operator will monitor the plant and make an announcement of the Reactor trip.)* *(During a pause between performing immediate actions and verifying immediate actions, the BOP will throttle AFW to reduce the RCS cooldown by:* • ***Resetting the AFW Reg Valves*** • ***Throttling the AFW Reg Valves to lower total AFW flow.*** *Total AFW flow must remain above 576 gpm until at least one SG level is >14% NR {34% for adverse containment})*	
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	
	SRO	During the pause and/or the read through of the immediate action steps, the crew will notice that RCS pressure and temperature are not recovering to normal values and are still lowering due to the 2 Main Steam Safety valves that opened on SG 1C 30 seconds after the MSIV went closed. **The SRO will direct a Safety Injection and a Main Stem Isolation.** *(With the Safety Injection actuated the Crew will remain in 0POP05-EO-EO00, Reactor Trip or Safety Injection.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 3	**Event No.:** 4 **(Examiner Trigger)** and 5 **(Occurs 30 seconds after SG 1C MSIV closes)**	
Event Description: Event 4 - SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)** **Event 5** - Two (2) SG 1C safety valves fail open. **(Critical Task)**			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	VERIFY Proper SI Equipment Operation Per ADDENDUM 5, VERIFICATION OF SI EQUIPMENT OPERATION *(Step 5)* *(See Actions on pages 24 – 27)*	
	RO	MONITOR If Containment Spray Is Required: • Containment pressure ‑ GREATER THAN 9.5 PSIG (QDPS) **(RNO)** • CHECK Containment Pressure - HAS EXCEEDED 9.5 PSIG • "PRESS PR-0934" • "EXTD RNG PRESS PR-9759" • IF containment pressure HAS EXCEEDED 9.5 PSIG, THEN GO TO Step 6.b. • IF containment pressure HAS REMAINED LESS THAN 9.5 PSIG, THEN GO TO Step 7. *(Step 6)* *(Containment pressure will be less than 9.5 psig and the crew will go to step 7.)*	
	RO	CHECK RCP Seal Cooling: • ENSURE seal injection flow between 6 and 13 gpm *(Step 7)* *(RO may have to adjust seal injection.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4 **(Examiner Trigger)** and 5 **(Occurs 30 seconds after SG 1C MSIV closes)**

Event Description: Event 4 - SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)**
Event 5 - Two (2) SG 1C safety valves fail open. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO	MONITOR RCS Temperatures ‑ • **WITH ANY RCP RUNNING, RCS TAVG STABLE AT OR TRENDING TO 567°F** OR • WITHOUT ANY RCP RUNNING, RCS TCOLD STABLE AT OR TRENDING TO 567°F *(Step 8)* *(Because of the faulted SG 1C Main Steam will already be isolated and the crew will continue to next step.)*	
	RO	CHECK Pressurizer Status: • PORVs ‑ CLOSED • Normal pressurizer spray valves - CLOSED • Auxiliary spray valve - CLOSED • **Excess letdown isolation valves - CLOSED** *(Step 9)* *(Excess letdown was placed in service earlier and the valves will have to be closed.)*	
	RO	MONITOR If RCPs Should Be Stopped: • HHSI pump - AT LEAST ONE RUNNING • RCS pressure - LESS THAN 1430 PSIG **(RNO)** • GO TO Step 11. *(Step 10)* *(Crew should not have to stop RCPs.)*	
	RO	VERIFY The Following Containment Isolation Valve – CLOSED • Seal return isolation valves • Containment atmosphere radiation monitor isolation valves *(Step 11)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4 **(Examiner Trigger)** and 5 **(Occurs 30 seconds after SG 1C MSIV closes)**

Event Description: Event 4 - SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)**
Event 5 - Two (2) SG 1C safety valves fail open. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	RO	CHECK If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs –
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT PRESSURE
		(RNO)
		• IF any faulted SG is NOT isolated, AND is NOT needed for RCS cooldown, THEN PERFORM the following:
		  • GO TO 0POP05-EO-EO20, Faulted Steam Generation Isolation, Step 1.
		  • MONITOR Critical Safety Functions.
		  • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED.
		(Step 12)	

	SRO	Informs crew of transition to 0POP05-EO-EO20, Faulted Steam Generator Isolation.	
	BOP	Checks MSIV's and MSIB's closed. *(Step 1, 0POP05-EO-EO20, Faulted SG Isolation)* *(MSIVs and MSIBs will already be closed.)*	
	BOP	CHECK If Any SG Secondary Pressure Boundary Intact: • CHECK pressures in all SGs – ANY SG PRESSURE CONTROLLED OR RISING *(Step 2)* *(SG's 'A', 'B' and 'D' pressures are 'controlled'. SG 'C' pressure is NOT controlled.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 3	**Event No.:** 4 **(Examiner Trigger)** and 5 **(Occurs 30 seconds after SG 1C MSIV closes)**	
Event Description: Event 4 - SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)** **Event 5** - Two (2) SG 1C safety valves fail open. **(Critical Task)**			
Time	**Position**	**Required Operator Actions**	**Notes**
	SRO/BOP	IDENTIFY Faulted SG(s): • CHECK pressure in all SGs – o ANY SG PRESSURE LOWERING IN AN UNCONTROLLED MANNER OR o ANY SG COMPLETELY DEPRESSURIZED *(Step 3)* *(SG 1C is faulted)*	
	SRO **BOP** **CT-17** ***** **denotes critical steps of CT**	Isolates the faulted SG (1C) • Verifies all FWIV's closed. • Verifies all FWIB's closed. • Verifies all FW Preheater bypass valves closed. • Verifies all FW Regulating and Low Power FW Regulating Valves closed. • Isolates AFW flow to 'C' SG • **Resets SI*** • **Resets ESF load sequencers*** • **Resets SG LO-LO level AFW actuations*** • Checks SG 1D intact • **Closes 'C' SG AFW OCIV, AF-MOV-0085*** • Verifies SG 'C' PORV closed • Verifies SG 'C' Blowdown and sample isolation valves closed *(Step 4)* *(All valves listed get an automatic closed signal. No malfunctions are inserted on these valves. AF-MOV-0085 is the only one that requires action by the operator to close.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4 **(Examiner Trigger)** and 5 **(Occurs 30 seconds after SG 1C MSIV closes)**

Event Description: Event 4 - SG 1C MSIV inadvertently closes. Reactor will not trip until LCs 1K1 and 1L1 are denergized. **(Critical Task)**
Event 5 - Two (2) SG 1C safety valves fail open. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	BOP Chem Tech	Check Secondary Radiation: • Resets SI • Resets SG LO-LO level AFW actuations • **Resets SG Blowdown and Sampling Isolations** • Notifies Chemistry to sample all SG's hourly for activity. • Checks the following Rad Monitors: o Main Steamline o SG Blowdown o CARS Pump • WHEN SG sample results are received, THEN VERIFY SG sample activity – NORMAL *(Step 5)* *(The first 2 resets have already been done so the operator will just check that they are still reset.)* *(Chemistry acknowledges the request to sample all SGs for activity.)*	
	SRO	Check if SI flow should be terminated • RCS subcooling - >35°F [45°F] • Secondary heat sink – NR level in one SG > 14% [34%] OR total AFW Flow > 576 gpm. • RCS pressure > 1745 psig and stable or rising • Pressurizer level > 8% [44%] *(Step 6)* *(If conditions are met, a transition to 0POP05-EO-ES11, SI Termination, will be made.)* *(Conditions will likely NOT be met for transition at this time.)* *(If not met [expected], the crew will transition to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.)*	
	SRO	Announces transition from 0POP05-EO-EO20 to 0POP05-EO-ES11 or 0POP05-EO-E010, as appropriate. ***Terminate the scenario.***	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** – CCW Pump 1B fails to Auto Start.)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY FW isolation: • SGFPTs – TRIPPED • SU SGFP – TRIPPED • VERIFY the following valves –CLOSED o FWIVs o FWIBs o FW preheater bypass valves o FW regulating valves o Low power FW regulating valves o SG blowdown isolation valves o SG sample isolation valves *(EO00 Addendum 5, Step 1)* *(0POP05-EO-EO00, Reactor Trip or Safety Injection, Addendum 5, Verification of Equipment Operation.)* *(This addendum is performed in parallel with Steps 5 to 14 of 0POP05-EO-EO00, Reactor Trip or Safety Injection.)*	
	BOP	CHECK if main steamline should be isolated: • CHECK for any of the following conditions: o Containment pressure – GREATER THAN OR EQUAL TO 3 PSIG OR o SG pressure (without low steamline pressure SI blocked) - LESS THAN OR EQUAL TO 735 PSIG OR o SG pressure (with low steamline pressure SI blocked) - LOWERING AT A RATE GREATER THAN OR EQUAL TO 100 PSI/SEC, BY OBSERVANCE OF THE STEAMLINE PRESSURE RATE BISTABLES • VERIFY Main Steamline Isolation: o MSIVs – CLOSED o MISBs - CLOSED *(Step 2)* *(Main Steam will be isolated due to SG 1C being faulted.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** – CCW Pump 1B fails to Auto Start.)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY AFW system status: • Motor-driven pump – RUNNING • Turbine-driven pump – RUNNING *(Step 3)*	
	BOP	VERIFY AFW valve alignment - PROPER EMERGENCY ALIGNMENT *(Step 4)*	
	BOP	VERIFY total AFW Flow - GREATER THAN 576 GPM *(Step 5)*	
	BOP	VERIFY containment isolation phase A: • Phase A – ACTUATED • Phase A valves - CLOSED, REFER TO ADDENDUM 1, PHASE A ISOLATION VERIFICATION *(Step 6)*	
	BOP	VERIFY ECW status: • ECW pumps – RUNNING • ECW pump discharge isolation valves – OPEN *(Step 7)*	
	BOP	VERIFY CCW pumps – RUNNING **(RNO)** **WHEN the respective ESF Load Sequencer has completed its automatic sequence OR it is determined that the respective ESF Load Sequencer has failed, THEN manually START pump(s).** *(Step 8)* *(**Event 6** - CCW Pump 1B will be manually started.)*	
	BOP	VERIFY RCFC status: • RCFCs – RUNNING • Cooling water - TRANSFERRED TO CCW *(Step 9)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** – CCW Pump 1B fails to Auto Start.)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY SI pump status: • HHSI pumps – RUNNING • LHSI pumps – RUNNING *(Step 10)*	
	BOP	VERIFY SI valve alignment – PROPER EMERGENCY ALIGNMENT *(Step 11)*	
	BOP	VERIFY SI flow: • RCS pressure - LESS THAN 1745 PSIG • HHSI pump flow – INDICATED • RCS pressure - LESS THAN 415 PSIG **(RNO)** • GO TO Step 13 of this Addendum. *(Step 12)*	
	BOP	VERIFY containment ventilation isolation: • Containment atmosphere radiation monitor isolation valves – CLOSED • Normal purge supply and exhaust fans – STOPPED • Supplemental purge supply and exhaust fans – STOPPED • Purge Dampers – CLOSED *(Step 13)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** – CCW Pump 1B fails to Auto Start.)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY ventilation actuation: • Control room HVAC – OPERATING IN EMERGENCY RECIRC • EAB HVAC - OPERATING IN EMERGENCY RECIRC • FHB HVAC - OPERATING IN EMERGENCY MODE • FHB Exhaust Fans - ONLY TWO TRAINS OPERATING o Exhaust booster fans o Main exhaust fans **(RNO)** • PERFORM the following: o IF three trains FHB exhaust fans running, THEN PLACE one train FHB exhaust fans in PULL TO LOCK. **(Back to A/ER)** • SECURE one FHB filter train by PERFORMING the following: o PLACE the outlet damper Controller in manual o Manually close the outlet damper o VERIFY proper operation of filter train in service • Essential chilled water pumps – RUNNING • Essential chillers – RUNNING • ECCS pump room fan coolers – RUNNING • AFW pump cubicle fans – RUNNING • FHB truck bay doors – CLOSED *(Step 14)*	
	BOP	NOTIFY Unit Supervisor that Addendum 5 is COMPLETE *(Step 15)*	
	SRO	IMPLEMENT Functional Restoration Procedures as required *(Step 16)*	
	SRO	RETURN TO procedure step in effect. *(Step 17)*	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**CT-1** **MANUALLY TRIP THE REACTOR FROM THE CONTROL ROOM BY OPENING 480V LC 1K1 AND 1L1 FEEDER BREAKERS PRIOR TO COMPLETING THE READ THROUGH OF STEP 4 IN 0POP05-EO-EO00, REACTOR TRIP OR SAFETY INJECTION.**	Manually trip the reactor from the control room prior to completing the read through of Step 4 in 0POP05-EO-EO00, Reactor Trip or Safety Injection. SAFETY SIGNIFICANCE -- Failure to manually trip the reactor causes a challenge to the subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an incorrect performance that "necessitates the crew taking compensating action that would complicate the event mitigation strategy" and demonstrates the inability of the crew to "recognize a failure of an automatic actuation of the RPS." The ERG Background Document for E-0 states that one function of E-0 is to verify that all required automatic protective actions occur before transitioning the crew to the appropriate ORG. The verification is important because the subsequent ORGs are based on the assumption that protective systems will protect all CSFs while the ORG is implemented.	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**CT-17** **ISOLATE FAULTED SG 1C BY PERFORMING THE FOLLOWING:** • **RESET SI** • **RESET ESF LOAD SEQUENCER** • **RESET LO-LO LEVEL AFW ACTUATION** • **CLOSE SG 1C AFW OCIV, AF-MOV-0085** **OR** **PLACE AFW PUMP 13 HANDSWITCH IN PTL OR CLOSE AFW PUMP 1C REG VALVE, AF-FV-7523** **Note: 0POP05-EO-EO00, Reactor Trip or Safety Injection CIP has a step to isolate a faulted SG early if the crew determines that a Faulted SG needs to be isolated.**	Isolate a Faulted Steam Generator before transitioning out of 0POP05-EO-EO20, Faulted Steam Generator Isolation **OR** Prior to receiving a RED path indication on the following CSFs: • Integrity • Subcriticality • Containment (if the break is inside containment) Failure to isolate a faulted SG that can be isolated causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Also, depending upon the plant conditions, it could constitute a demonstrated inability by the crew to recognize a failure of the automatic actuation of an ESF system or component.	
NOTE: (Per NUREG-1021, Appendix D) **If an operator or the Crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.**			

EXPECTED BOOTH COMMUNICATIONS

EVENT 1:

- As a Plant Operator, when dispatched to check CW Pump #13, report the following:
  - After 1 minute – CW Pump #13 breaker indicates an overcurrent.
  - After 3 minutes – There are no obvious reasons locally as to why CW Pump #13 tripped.
- As Electrical/Mechanical Maintenance or the Duty Maintenance Supervisor, if notified of the status of CW Pump #13, report that a Maintenance crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge issue with CW Pump #13. No further action is necessary.

EVENT 2:

- As a Plant Operator, when asked, report that handswitch for CV-0469 is closed.
- As I&C Maintenance or the Duty Maintenance Supervisor, if notified of the failure of PZR level transmitter, LT-0465, report that an I&C maintenance crew is being assembled for support.
  - If asked how long it will take to TRIP or BYPASS LT-0465, report that it will take about 2 hours.
  - If asked how long it will take to repair LT-0465, report that it will take about 18 hours.
- As Operations Manager, acknowledge the failure of RTD-0410B. No further action is necessary.

EVENT 3:

- As I&C Maintenance or the Duty Maintenance Supervisor, if notified of the failure of Impulse Pressure Channel PT-0505, report that an I/C maintenance crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the failure of Impulse Pressure Channel PT-0505. No further action is necessary.

EVENT 4:

- As a Plant Operator, when directed to open the Reactor Trip and Bypass Breakers, wait 2 minutes and then trigger the Lesson Plan step to open the reactor trip breakers and report back that the breakers are open.

EVENT 5:

- As a Chemistry Technician, if asked, acknowledge that all SGs will be sampled for activity.

EVENT 6:

- As a Plant Operator, if asked to check CCW Pump 1B, report the following:
  - After 1 minute – CCW Pump 1B breaker indicates an overcurrent.
  - After 2 minutes – CCW Pump 1B looks OK locally.

EXPECTED BOOTH ACTIONS

1. If asked to open the DA High level Dump Valves then trigger the step for ‘DA High Level Dump Valves’.
2. If asked to fill the AFWST then trigger the step for ‘AFWST Makeup’.
3. When directed to locally open the reactor trip breakers, wait 2 minutes, then trigger the step for ‘Locally Open Reactor Trip Breakers.’

SIMULATOR SETUP

NOTE

ALL Annunciator Response Procedures (ARP's) must be checked if this scenario is the first to be run on this day. Setup for subsequent runs of this scenario only requires those ARP's that were actually marked in to be checked.

Instructors running the scenario must keep track of which ARP's these are, otherwise, all will have to be checked for subsequent scenarios as well.

Each time before running the scenario check and/or clean the following:									
Specific Scenario Procedures	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
0POP04-CW-0001, Loss of Circulating Water Flow									
0POP04-RP-0002, Loss of Automatic Pressurizer Level Control									
0POP04-TM-0004, Failure of Turbine Impulse Pressure Transmitter (PT-505/506)									
0POP05-EO-EO00, Reactor Trip or Safety Injection									
0POP05-EO-EO20, Faulted Steam Generator Isolation									
Other Procedures Used By Students During Scenario Including POP09s.	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
Miscellaneous Items to Restore	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
STA ICS Screens to PD Menu									
All ICS Trends to normal (not scenario specific)									
Student Selected ICS Points changed to U1118									
Control Panel ICS Screens to Normal									
RM 11 History and Screens									
RM 23 – No Alarm Indications									

SIMULATOR SETUP (cont'd.)

NOTE

The Scenario Lesson Plan MUST be run from the left most Instructor Station in Simulator Booth to allow for recording and storing of recorded parameter data.

- Log into Instructor Workstation as 'lotnrc' user, open Orchid (nstps server), then 'Unlock' Initial Conditions Group 'lotnrc'.
- Reset to IC #204 and perform the following:
  - Switch Check
  - Ensure red light on end of CP-010 off
  - Ensure ICS Annunciators have stopped counting up
- Go to RUN and perform the following:
  - Ensure Simulator is ready by performing applicable checkoffs from LOR-GL-0006, LOR Conduct of Simulator Training Guidelines, Addendum 5, Simulator Readiness Checklist.
  - Ensure VCT Makeup Integrators are set as follows:
    - Momentarily place RC M/U CONT to STOP and then START to reset BA BATCH/GALLONS and TOT M/U BATCH/GALLONS counters to zero.
    - Reset BA BATCH/GALLONS setpoint to 0 gallons and reset TOT M/U BATCH/GALLONS setpoint to 10 gallons.
    - Verify BA Controller Pot setting is 3.80
- Hang following ECO/Caution Tags:
    - AFW Pump #11 Handswitch in PTL.
- Open lesson plan for 'Scenario 2' in 'lotnrc' directory for LOT 22, then EXECUTE lesson plan. These actions will set up any initial conditions for the scenario.
- If this scenario IC has changing conditions (i.e. Xenon is changing, etc.), then place the simulator in FREEZE, otherwise it is OK to leave in RUN.
- Run the scenario in accordance with the next section, 'Scenario Instructions'.

SCENARIO INSTRUCTIONS

NOTE
Steps 1 to 4 below can be performed in the LOR Debrief Room prior to the crew coming into the Simulator provided exam security measures are taken.

1. Provide Shift Turnover sheets to the crew and review the information.
2. Have the Crew perform a Pre-Job Brief. Ensure the crew doesn't have any other questions about the Shift Turnover.
3. Ensure the Beacon book from the simulator is available to the crew if they are in the LOR Debrief Room.
4. Review the Simulator Differences list with the crew if needed.
5. When signaled by Simulator Staff, have the crew perform their board walkdown and inform the floor instructor when ready to take the watch.
6. Ensure the simulator is in RUN and verify simulator clock is set correctly. Note the time that the Crew takes the watch. _____ Start Time.

NOTE

Malfunction Step and/or Lesson Plan Steps (Events) are triggered upon the Lead Examiners signal during the scenario unless an agreed upon time is discussed with the examiner prior to the start of the scenario.

Always 'TRIGGER' events in the Simulator Scenario Lesson Plans. This way delays associated with events will take place as intended.

Refer to 'EXPECTED BOOTH COMMUNCATIONS' and 'EXPECTED BOOTH ACTIONS' Sections for instructions for Instructor actions during the scenario.

7. Trigger the step titled 'Start Chart' and ensure specified Recorded Parameters for the scenario begin recording as the scenario runs. If the chart speed is NOT set to 5400 seconds (90 minutes) then perform the following:
   - Under 'CHARTS' click on 'SET TIME'
   - In the dialog box enter 5400 seconds (90 minutes)
   - Click OK.
8. Trigger **MALFUNCTION STEP –** This will insert Step #1, Event #1.
9. Trigger **STEP 2 –** Event #2
10. Trigger **STEP 3 –** Event #3
11. Trigger **STEP 4 –** Event #4
12. Place simulator in FREEZE when cued by the Lead Examiner to terminate scenario.
13. DO NOT RESET simulator until the steps on the next page are completed and all Examiners have completed Follow-Up Questioning.

SCENARIO INSTRUCTIONS (cont'd.)

NOTE
Some scenarios will have more than one chart. For these, each chart file must be separately saved with a unique filename.

14. Saving Recorded Parameters Data
    - Click on the 'Charts' icon on the left side of the screen
    - Select 'Pause' icon, then select 'All'
    - Click on the 'Print Chart' icon, then select 'All'
    - This will bring up a window in the TASK BAR called PRIMOPDF.
    - Click on 'Create PDF'
    - This will bring up a File Save As window.
    - Save to folder **c:\Users\lotnrc\Desktop\LOT23 Charts**. The file name will be 'LOT23 Scenario 3' followed by a name that identifies the crew (e.g. 'Crew A).
    - Save the new file. It will be saved in a folder already on the desktop. LOT23 Charts.
15. Saving Scenario SAM (Simulator Action Monitor)
    - Under 'TOOLS' click on 'SAM'
    - In the dialog box that comes up click on 'SAVE TO'
    - Save as a 'TEXT FILE' to folder **c:\Users\lotnrc\Desktop\LOT23 Charts.** The file name will be 'LOT23 SAM INFO Scenario 3' followed by a name that identifies the crew (e.g. 'Crew A).

SCENARIO - 03

	0POP01-ZQ-0022		
Plant Operations Shift Routines			
For Training Only	Shift Turnover Checklist		Page 1 of 1

PART I - To be completed prior to shift turnover.

Unit: **1** Off- Going Shift: **Days / Nights** Date: **Today** Mode: **1**

Dilution			Boration			Control Rods		
Current Setpoint	1% Pwr Change	1° F Change	Current Setpoint	1% Pwr Change	1° F Change	Current Position	1% Pwr Change	1° F Change
10	**130**	**114**	**0** flushing with	**29**	**25**	**240**	**7**	**6**
As Required			As Required			As Required		

ΔI Target	Channel	RCS Boron
5.06%	**U1144**	**1348**

Unit 1 Status

- Operating at 100% power
- Core burnup is 150 MWD / MTU

Load Reduction:

- 100-90%/1hr = **162**
- 100-80%/10min = **382**
- 100-75%/30min = **444**
- 100-60%/1hr = **620**
- 100-50%/10min = **925**

Information:

- AFW Pump #11 is OOS.
- BAT 1A & 1B Concentrations are 7300 ppm
- Fuel Handling Building truck bay doors are closed
- No personnel are in containment
- Ron Gibbs has the duty
- The NLO compliment is 5 watch standers and a head operator

ECO/LCO/RAsCAL:

TS 3.7.1.2
Action a. – With one motor-driven auxiliary feedwater pump inoperable, within 28 days restore the pump to OPERABLE status or apply the requirements of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

LOT 23 NRC EXAM

SIMULATOR OPERATING TEST

SCENARIO #4

Revision 0

Week of 07/15/2019

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 4** **Op-Test No.: LOT 23 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:
- **Mode 1 at 100% Power**

Turnover:
- **AFW Pump #11 is out of service.**

Critical Tasks:
- **Event 5 – Isolate ruptured SG**
- **Event 5 – Depressurize RCS**
- **Event 5 – Terminate SI**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	N/A	BOP (N) SRO (N)	Shift Control Room Envelop HVAC from Train C to Train A.
2 (10 min)	H1A028_ FT427TV SP 0.0	SRO (TS ONLY)	Loop 2, Channel 1 RCS Flow Transmitter, FT-0427, fails low.
3 (20 min)	03-11-01 0.02	RO (C) SRO (C, TS)	30 GPM RCS leak on the letdown line in containment. Leak can be isolated.
4 (30 min)	LA10M2 B8 2	RO (R) BOP (R) SRO (R)	Fast load reduction to 50% power due to loss of Bus Duct Cooling Fans.
5 (40 min)	05-03-03 0.3	ALL (M)	SG 1C Tube Rupture. **(3 Critical Tasks)**
6 (N/A)	50-AF-02 1	BOP (C) SRO (C)	AFW Pump #12 fails to auto start. **(Integral to Scenario)**

Lot* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specification

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Malfunctions after EOP entry (1–2)	1
2. Abnormal events (2–4)	4
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	1
5. Entry into a contingency EOP with substantive actions (≥1 per scenario set)	0
6. Preidentified critical tasks (≥2)	2

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

- Critical Tasks are indicated by "**CT-##**" in the position column and indicated in bold type. In some instances an "*" will indicate that only a portion of the task listed is considered critical.
- Shaded cells indicate procedural entry points.

RECORDED PARAMETERS:

Recorded parameters will be determined during NRC Validation week.

The parameters identified for recording may be of value in evaluating crew performance. Once the scenario is complete for each crew, printout the recorded parameters and label the printout with date, time, crew number and scenario number. See Scenario Instructions section for further details on how to save the Recorded Parameters.

- Main Turbine Throttle Valve #1 position
- Core Exit T/C
- RCS Wide Range Pressure
- LHSI Pump 1A Red Light

SCENARIO OBJECTIVES

Event 1 Objective

- Startup and Shutdown the CRE HVAC System per 0POP02-HE-0001, Electrical Auxiliary Building HVAC System.

Event 2 Objective

- Respond to a failure of an RCS Loop Flow Transmitter per 0POP04-RP-0003, Failure of RCS Loop Flow Transmitter.

Event 3 Objective

- Respond to excessive RCS leakage per 0POP04-RC-0003, Excessive RCS Leakage.

Event 4 Objective

- With the plant operating in Mode 1 and the Shift Manager or Unit Supervisor determines that a load reduction is required, perform a load reduction per 0POP04-TM-0005, Fast Load Reduction.

Event 5 Objective

- Respond to a Steam Generator Tube Rupture per 0POP05-EO-EO00, Reactor Trip or Safety Injection, and 0POP05-EO-EO30, Steam Generator Tube Rupture.

Event 6 Objective

- Respond to equipment failures during a reactor trip per 0POP05-EO-EO00, Reactor Trip or Safety Injection, Addendum 5, Verification of SI Equipment Operation.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 1

Event Description: Shift Control Room Envelop HVAC from Train C to Train A.

Time	Position	Required Operator Actions	Notes
	SRO	Directs actions of 0POP02-HE-0001, Electrical Auxiliary Building HVAC System.	
	BOP	OPEN Train A "INL ISOL DMPR FV-9670" by holding handswitch in "OPEN" until the damper indicates fully OPEN. *(Step 5.1.2.1)*	
	BOP	OPEN Train A "INL ISOL DMPR FV-9671" by holding handswitch in "OPEN" until the damper indicates fully OPEN. *(Step 5.1.2.2)*	
	BOP	OPEN Train A "RET DMPR FV-9698" by holding handswitch in "OPEN" until the damper indicates fully OPEN. *(Step 5.1.2.3)*	
	BOP	START Train A "RET FAN 11A". *(Step 5.1.2.4)*	
	BOP	START Train A "SPLY FAN 11A". *(Step 5.1.2.5)*	
	BOP	ENSURE Computer Room/Relay Room Dampers are OPEN per Section 5.4. *(Step 5.1.2.6)*	
	BOP	STOP Train C "SPLY AHU 11C" by momentarily turning handswitch to "STOP". *(Step 5.3.3.1)*	
	BOP	STOP Train C "RET AHU 11C" by momentarily turning handswitch to "STOP". *(Step 5.3.3.2)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 1 **Event Description:** Shift Control Room Envelop HVAC from Train C to Train A.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	ENSURE Train C "RET DMPR FV-9696" is CLOSED by placing handswitch in "CLOSE" until the damper is CLOSED AND RETURN the handswitch to the "AUTO" position. *(Step 5.3.3.3)*	
	BOP	ENSURE Train C "INL ISOL DMPR FV-9664" is CLOSED by placing handswitch in "CLOSE" until the damper is CLOSED AND RETURN the handswitch to the "AUTO" position. *(Step 5.3.3.4)*	
	BOP	ENSURE Train C "INL ISOL DMPR FV-9665" is CLOSED by placing handswitch in "CLOSE" until the damper is CLOSED AND RETURN the handswitch to the "AUTO" position. *(Step 5.3.3.5)* *(**Event 2** can be triggered on signal from the lead examiner.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 2 **(Examiner Trigger)** **Event Description:** Loop 2, Channel 1 RCS Flow Transmitter, FT-0427, fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	Acknowledges and announces the following annunciators from 05M2: • RC LOOP 2 FLOW LO RX PRETRP (A-2)	
	SRO/RO	Determines Loop 2, Channel 1, FT-0427 has failed low.	
	SRO	Directs actions of 0POP04-RP-0003, Failure of RCS Loop Flow Transmitter.	

	RO	CHECK RCS Loop Flow Indicators – ALL OPERABLE
		(RNO)
		PERFORM the following:
		• IDENTIFY the failed flow indicator.
		• CHECK all operable flow indicators in affected RCS loop – GREATER THAN 92%
		• IF operating in Mode 1 AND more than one flow indicator per loop fails, THEN PERFORM the following:
		  • REFER TO Technical Specification 3.0.3
		  • COMMENCE a load reduction per 0POP03-ZG-0006, Plant Shutdown from 100% to Hot Standby.
		• NOTIFIY I&C to place the affected channel in trip or bypass. REFER TO Addendum1, Procedure List for the appropriate procedure.
		(Step 1)
		(FT-0427 has failed low but it is the only one out of three.)	

	RO	REFER TO Addendum 2 for applicable Technical Specifications. *(Step 2)* *(See TS details on next page.)*	
	RO	INITIATE corrective action for failed component. *(Step 3)* *(**Event 3** can be triggered after the SRO has checked TSs.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 2 **(Examiner Trigger)**	
Event Description: Loop 2, Channel 1 RCS Flow Transmitter, FT-0427, fails low.			
Time	**Position**	**Required Operator Actions**	**Notes**
TS 3.3.1.13.a (Single Loop Above P-8) Action 6a *With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:* *For Functional Units with installed bypass test capability, the inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours.* *Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1, provided no more than one channel is in bypass at any time.*			

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: 30 GPM RCS leak on the letdown line in containment. Leak can be isolated.			
Time	**Position**	**Required Operator Actions**	**Notes**
	ALL	The crew notices a rise in RCS leakage and lowering VCT level. *(Associated alarms will start to come in depending on the length of time to diagnose the event)*	
	SRO	Directs actions of 0POP04-RC-0003, Excessive RCS Leakage.	
	SRO	From Conditional Information Page (CIP): IF the location of the RCS leakage is identified, THEN the steps within this procedure necessary to isolate the leakage may be performed out of order provided that the remainder of the procedure is completed to identify any additional leakage that may exist. • Addendum 8, RCS Leakage Walkdown Plan, can be used to help identify and isolate leakage. *(The Crew will have indication from Radiation Monitor Alarms inside containment that the RCS leak is in the RCB.)* *(The SRO will use Addendum 3, RCS Leakage to Containment, to isolate the RCS leakage.)*	
	RO	NOTIFY Health Physics Of The Problem AND REQUEST Assistance. *(Add. 3 Step 1)*	
	RO	DISPATCH An Operator To The RCB To Attempt To IDENTIFY The Source Of The RCS Leakage *(Add. 3 Step 2)* *(Realistically this would take some time for the Plant Operator to coordinate with HP to make a Containment entry.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 3 **(Examiner Trigger)**

Event Description: 30 GPM RCS leak on the letdown line in containment. Leak can be isolated.

Time	Position	Required Operator Actions	Notes
	RO	CHECK RCP Seal Parameters – NORMAL: • Individual RCP injection flow • Seal inlet Temperature • Seal Injection Filter differential pressure *(Add. 3 Step 3)*	

	RO	REMOVE Normal Letdown And Charging From Service:
		• CLOSE FV-0011 "LTDN ORIF HDR ISOL" valve
		• CLOSE FCV-0205, "CHG FLOW CONT VLV"
		• OPEN Centrifugal Charging Pump miniflow valve for operating pump:
		  • CCP 1A "RECIRC FCV-0201"
		  • CCP 1B "RECIRC FCV-0202"
		• ADJUST HCV-0218, to maintain RCP seal injection flow – BETWEEN 6 AND 13 GPM
		• CLOSE orifice isolation valves
		  • CV-FV-0012 (120-150 gpm)
		  • CV-FV-0013 (85-100 gpm)
		  • CV-MOV-0014 (25-30 gpm)
		• CLOSE LCV-0465 and LCV-0468 "LETDN ISOL" valves
		• CLOSE MOV-0025 "OCIV" Charging valve
		(Add. 3 Step 4)	

	RO	PLACE Excess Letdown In Service, If Desired, Per 0POP02-CV-0004, Chemical And Volume Control System Subsystem *(Add. 3 Step 5)* *(See page 12 for required operator actions to place Excess Letdown in service.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: 30 GPM RCS leak on the letdown line in containment. Leak can be isolated.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO SRO	**DETERMINE If The RCS Leakage Has Been Isolated:** • MONITOR RCB Parameters • MONITOR RCS Inventory, REFER TO 0PSP03-RC-0006, Reactor Coolant Inventory • DETERMINE the RCS leak rate using pressurizer level, VCT level, and comparing charging and letdown flows *(Add. 3 Step 6)* *(Leak will have now been isolated)*	
	RO	NOTIFY RCB Operator Of The Suspected Leak Location AND That The Leak Has Been Isolated *(Add. 3 Step 7)*	
	SRO	CONSULT System Engineering AND Plant Management To Determine A Plan Of Action *(Add. 3 Step 8)*	
	SRO	VERIFY RCS Leakage – WITHIN THE TECHNICAL SPECIFICATION LIMIT *(Add. 3 Step 9)* *(There will be now leakage at this time because the leak was isolated. However, the TS that was in effect prior to the isolation is listed below for lead examiner to use as a follow up.)*	
TS 3.4.6.2 Action b *With Reactor Coolant System operational UNIDENTIFIED or IDENTIFIED LEAKAGE greater than the above limits, reduce leakage to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.*			
	SRO	GO TO The Appropriate Plant Procedure As Directed By The Unit Supervisor/Shift Manager *(Add. 3 Step 10)* *(**Event 4** can be triggered on a signal from the lead examiner.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 3 **(Examiner Trigger)**	
Event Description: 30 GPM RCS leak on the letdown line in containment. Leak can be isolated.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	Operator will use 0POP02-CV-0004, Chemical And Volume Control System Subsystem, to place Excess Letdown in service.	
	RO	ENSURE adequate RCDT Volume exists to receive Excess Letdown flow or commence lowering RCDT level per 0POP02-RC-0001 "Pressurizer Relief Tank And Reactor Coolant Drain Tank System Operation". *(Step 13.1)*	
	RO	NOTIFY Health Physics of pending changes in the letdown or charging flow paths to ensure they can survey the area that has changed. *(Step 13.2)*	
	RO	NOTIFY Chemistry of pending changes in the letdown or charging flow paths to ensure they can sample the RCS when needed. *(Step 13.3)*	
	RO	ENSURE Component Cooling Water (CCW) in service to the Excess Letdown Heat Exchanger. *(Step 13.4)*	
	RO	IF letdown has been isolated, THEN ISOLATE charging flow to prevent thermal shock. *(Step 13.5)* *(If Charging Flow is not isolated yet it should be done now because the RCS leak will have been isolated.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: 30 GPM RCS leak on the letdown line in containment. Leak can be isolated.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	IF charging flow has been isolated, THEN OPEN the Mini Flow Recirc Valve for the running Charging Pump: • CCP 1A(2A) "RECIRC FCV-0201" • CCP 1B(2B) "RECIRC FCV-0202" *(Step 13.6)* *(The appropriate recirc valve will have been already opened.)*	
	RO	ENSURE excess letdown "DIVERT FV-3123" in the "RCDT" position. *(Step 13.7)*	
	RO	ENSURE "EXCESS/NORMAL LETDN CROSS CONNECTION N1(2)CV-HS-0469" in the CLOSE position. *(Step 13.8)* *(The Plant Operator will report back that CV-HS-0469 is in the closed position.)*	
	RO	OPEN excess letdown heat exchanger inlet isolation valve "LOOP D ISOL MOV-0083". *(Step 13.9)*	
	RO	OPEN excess letdown heat exchanger inlet isolation valve "LOOP D ISOL MOV-0082". *(Step 13.10)*	
	RO	MAINTAIN Excess letdown "HX OUTL TEMP TI-0229" Less Than or Equal to 175°F AND Excess letdown "HX OUTL PRESS PI-0228" Less Than or Equal 145 psig while performing the following: • Slowly throttle OPEN excess letdown "TEMP CONT HCV-0227" to avoid thermal transients. *(Step 13.11)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: 30 GPM RCS leak on the letdown line in containment. Leak can be isolated.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	RECORD current time. *(Step 13.12)*	
	RO	ADJUST excess letdown AND seal injection flows as required to maintain the desired: • Pressurizer level • RCDT level • RCDT pressure. *(Step 13.13)*	
	RO	WHEN excess letdown has been diverted to the RCDT for six (6) minutes, THEN PERFORM the following: • IF the VCT is available to receive excess letdown, THEN PLACE excess letdown "DIVERT FV-3123" in the "VCT" position. • IF the VCT is **NOT** available to receive excess letdown, THEN ENSURE excess letdown "DIVERT FV-3123" remains in the "RCDT" position. *(Step 13.14)* *(The VCT will be available)*	
	RO	IF excess letdown will be in service for greater than 24 hours, THEN PERFORM the following: • OPEN "1-CV-0171 CVCS SEAL RETURN VCT ISOL". • CLOSE "1-CV-0170 CVCS SEAL RETURN TO CHARGING PUMP SUCTION ISOL". *(Step 13.15)* *(Realistically it would probably take more than 24 hours to fix any type of letdown leak in containment. If the crew gets this far before the next event then it will be up to the crew to make this decision because maintenance will not have been given a chance yet to adequately evaluate the time for a repair.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 4 **(Examiner Trigger)**			
Event Description: Fast load reduction to 50% power due to loss of Bus Duct Cooling Fans.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	Acknowledges and announces the following annunciators from 10M2: • ISO PHASE BUS TROUBLE (B-2)	
	SRO	Directs actions of 1POP09-AN-10M2 B-8, ISO PHASE BUS TROUBLE.	
	BOP	VERIFY trouble by checking Plant Computer points BD3351 and TD3350. *(Step 1)*	
	BOP	IF a relay flag exists on Relay 51/74, THEN reset the relay *(Step 2)* *(The relay flag does not exist.)*	

	BOP
	
	AO
		DISPATCH an Operator to ZLP122, ISO PHASE BUS CONTROL PANEL, to determine cause of alarm.
		• IF either "COOLING FAN 1A or 1B CONTROL POWER UNDERVOLTAGE" red lights are illuminated, THEN DIRECT Operator to start the alternate cooling fan AND stop the affected fan.
		• IF HIGH AIR DUCT TEMP alarm occurs, THEN ENSURE VFN-005 “TG HVAC TRANSFER FAN” is running.
		• IF both fans are inoperable, THEN PERFORM the following:
		  • REDUCE Generator load at 5 percent per minute. REFER TO 0POP04-TM-0005, Fast Load Reduction.
		  • WHEN Generator current is less than or equal to 18,500 amps as indicated on CP007, THEN SECURE fast load reduction.
		(Step 3)
		(A Plant Operator will report that Iso-Phase Bus Duct Fan #11 tripped and #12 is not running because the belts broke when it auto started.)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 4 **(Examiner Trigger)**			
Event Description: Fast load reduction to 50% power due to loss of Bus Duct Cooling Fans.			
Time	**Position**	**Required Operator Actions**	**Notes**
	SRO	Enters 0POP04-TM-0005, Fast Load Reduction. *(NOTE: This down power will be challenging for the crew with CVCS letdown and charging out of service. If the crew decides to take conservative action and trip the Reactor and Main Turbine then **Event 5** will be triggered.)*	

	ALL	PERFORM The Following To Reduce Turbine Load:
		• NOTIFY STP Co-Owners Using The EMS Website That Load Reduction Is Commencing
		• DETERMINE Amount Of Boric Acid To Add To Reduce Reactor Power To Desired Level AND COMMENCE RCS Boration
		• CHECK Rod Control System - IN AUTOMATIC
		• ENERGIZE Pressurizer Heaters For Boron Equalization
		• PERFORM The Following To Lower Turbine Load:
		  • CHECK Main Turbine - IN THE IMPULSE PRESSURE FEEDBACK MODE IMP IN
		  • REDUCE Turbine Load At A Rate Of Less Than Or Equal To 5% Per Minute Using Operator Auto
		(Step 1.0)	

	BOP	MAINTAIN Main Generator Reactive Load (VARs) Within The Following: • Less than 450 MVARs • Guidelines of The Plant Curve Book, Figure 7.1. *(Step 2.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 4 **(Examiner Trigger)**			
Event Description: Fast load reduction to 50% power due to loss of Bus Duct Cooling Fans.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	MONITOR Rod Control System Responding To RCS TAVG/TREF Deviation By Ensuring The Following: • Control Rods Are Inserting AND RCS Tavg trending to within 3°F of Tref OR • RCS Tavg within 3°F of Tref *(Step 3.0)*	
	RO	MAINTAIN Pressurizer Level Within The Following: REFER TO Addendum 5, Pressurizer Level Table • Trending to Program Level OR • At Program Level *(Step 4.0)*	
	RO	MAINTAIN Pressurizer Pressure Within The Following: • Trending to between 2220 psig and 2250 psig OR • Between 2220 psig and 2250 psig *(Step 5.0)*	
	BOP	MAINTAIN Steam Generator NR Level Within The Following: • Trending to between 68% and 74% OR • Between 68% and 74% *(Step 6.0)*	
	BOP	CHECK Steam Dumps – ARMED **(RNO)** GO TO Step 9.0 *(Step 7.0)* *(**Event 5** can be triggered on a signal from the lead examiner.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	ALL	Notice RCS pressure dropping more than expected during the down power along with N-16 monitor alarms on ICS. *(NOTE: If the crew is slow to diagnose this condition, then alarms will come in associated with the lowering RCS pressure.)*	
	SRO	Directs a Reactor Trip and Safety Injection	
	SRO	Enters 0POP05-EO-EO00, Reactor Trip or safety Injection, and ensures immediate actions are performed.	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	Completes immediate actions of 0POP05-EO-EO00 and determines: • Reactor is tripped (Step 1) • Turbine is NOT tripped (Step 2) • AC ESF Busses are energized (Step 3) • Check SI status (Step 4) *(RO will complete immediate actions. BOP Operator will monitor the plant and make an announcement of the Reactor trip.)*	
	BOP	*(During a pause between performing immediate actions and verifying immediate actions, the BOP will throttle AFW to reduce the RCS cooldown by:* • ***Resetting the AFW Reg Valves*** • ***Throttling the AFW Reg Valves to lower total AFW flow.*** • ***Event 6 – Manually start AFW Pump #12*** *Total AFW flow must remain above 576 gpm until at least one SG level is >14% NR {34% for adverse containment})* *(Because of the SGTR and before beginning the verification of immediate actions* ***the US may direct the BOP operator to secure AFW to SG 1C by:*** • ***Placing AFW Pump #13 in PTL*** ***OR*** • ***Closing AFW Reg Valve - FV-7523*** ***if NR level >14%{34%}, per the CIP for a ruptured SG****. This is part of CT-18. See Page 23.)*	
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	VERIFY Proper SI Equipment Operation Per ADDENDUM 5, VERIFICATION OF SI EQUIPMENT OPERATION *(Step 5)* *(See Actions on pages 29-32)*	

	RO	MONITOR If Containment Spray Is Required:
		• Containment pressure ‑ GREATER THAN 9.5 PSIG (QDPS)
		(RNO)
		• PERFORM the following:
		  • CHECK Containment pressure - HAS EXCEEDED 9.5 PSIG (CP - 18)
		  • "PRESS PR‑0934"
		  OR
		  • "EXTD RNG PRESS PR‑9759"
		  • IF containment pressure HAS EXCEEDED 9.5 PSIG, THEN GO TO Step 6.b.
		  • IF containment pressure HAS REMAINED LESS THAN 9.5 PSIG, THEN GO TO Step 7.
		(Step 6)
		(Containment pressure will be less than 9.5 psig.)	

	RO	CHECK RCP Seal Cooling: • ENSURE seal injection flow between 6 and 13 gpm *(Step 7)* *(RO may have to adjust seal injection.)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	MONITOR RCS Temperatures ‑ • **WITH ANY RCP RUNNING, RCS TAVG STABLE AT OR TRENDING TO 567°F** OR • WITHOUT ANY RCP RUNNING, RCS TCOLD STABLE AT OR TRENDING TO 567°F *(Step 8)* *(If AFW has been properly throttled from the original Reactor Trip then RCS temperature should be trending to 567°F)*	
	RO	CHECK Pressurizer Status: • PORVs ‑ CLOSED • Normal pressurizer spray valves - CLOSED • Auxiliary spray valve - CLOSED • Excess letdown isolation valves - CLOSED *(Step 9)*	
	RO	MONITOR If RCPs Should Be Stopped: • HHSI pump - AT LEAST ONE RUNNING • RCS pressure - LESS THAN 1430 PSIG **(RNO)** • GO TO Step 11 *(Step 10)* *(Reactor Coolant Pump Trip Criteria will probably NOT be met if AFW has been properly throttled.)*	
	RO	VERIFY The Following Containment Isolation Valves – CLOSED • Seal return isolation valves • Containment atmosphere radiation monitor isolation valves *(Step 11)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**

	RO	CHECK If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs –
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT PRESSURE
		(Step 12)	

	RO	CHECK If SG Tubes Are Intact: • Main steamline radiation - NORMAL • IF SG blowdown in service, THEN SG • blowdown radiation - NORMAL • CARS pump radiation - NORMAL • NO SG level rising in an uncontrolled manner **(RNO)** • GO TO 0POP05-EO-EO30, STEAM GENERATOR TUBE RUPTURE, Step 1. • MONITOR Critical Safety Functions. • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED. *(Step 13)*	
	BOP	Completes 0POP05-EO-EO00, Addendum 5.	
	SRO	Informs crew of transition to 0POP05-EO-EO30, Steam Generator Tube Rupture, and to monitor Critical Safety Functions	
	ALL	Monitors the status of Critical Safety Functions when the crew transitions to 0POP05-EO-EO30. *(Cannot implement FRP's until Addendum 5 of 0POP05-EO-EO00, Reactor Trip or Safety Injection, is completed.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**) **Event Description: Event 5 -** SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	MONITOR If RCPs Should Be Stopped: • HHSI pumps – AT LEAST ONE RUNNING • RCS pressure – LESS THAN 1430 PSIG *(Step 1)* *(Pressure should be greater than RCP trip criteria.)*	
	BOP	Identifies Ruptured SG as SG 1C. *(Step 2)*	

	BOP (CT-18)	ISOLATE Flow From Ruptured SG(s):
		• **ADJUST ruptured SG(s) PORV controller setpoint to BETWEEN 1260 PSIG AND 1265 PSIG**
		• **CHECK ruptured SG(s) PORV controller – IN AUTO**
		• CHECK ruptured SG(s) PORV – CLOSED
		• VERIFY blowdown isolation valve(s) from ruptured SG(s) – CLOSED
		• CHECK SG 1D – RUPTURED
		(RNO)
		• GO TO Step 3.h.
		(Back to A/ER)
		• **CLOSE ruptured SG(s) MSIV(s) and MSIB(s)**
		• Verifies SG 1C level is >14% then isolates AFW to SG 1C.
		  • RESET SI AND SG LO-LO LEVEL SIGNALS.
		  • **CLOSE SG 1C AFW OCIV.**
		(Steps 3 and 4	

	BOP	CHECK Ruptured SG(s) Pressure – GREATER THAN 468 PSIG *(Step 5)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	CHECK Pressurizer PORVs And Isolation Valves: • Power to isolation valves – AVAILABLE • PORVs – CLOSED • Isolation valves – AT LEAST ONE OPEN *(Step 6)*	
	SRO	DETERMINE required core exit temperature based on ruptured SG pressure. *(Step 7.a)* *(If 'C' SG pressure is 1200-1250 psig {expected range}, target temperature will be 524°F. If pressure is not within this range the Evaluator will have to note what SG pressure is and check if correct target temperature was used after scenario termination.)*	
	RO	CHECK pressurizer pressure LESS THAN 1985 PSIG BLOCK Low Steamline Pressure SI *(Steps 7.b and 7.c)*	
	BOP	CHECK condenser – AVAILABLE *(Step 7.d)*	
	BOP	CHECK steam dump in steam pressure mode **(RNO)** • PLACE steam dump controller in MANUAL with zero demand. • PLACE steam dump mode selector switch to STEAM PRESSURE mode. *(Step 7.e)*	
	RO	CHECK RCS TAVG – LESS THAN 563°F *(Step 7.f)* *(At this time TAVG should be >563°F)*	
	BOP	DUMP steam to condenser from intact SG(s) at maximum rate *(Step 7.h)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	Core exit T/Cs – LESS THAN REQUIRED TEMPERATURE SPECIFIED IN STEP 7.a. **(RNO)** PERFORM the following: • WHEN core exit T/Cs LESS THAN required temperature, THEN PERFORM Steps 7.j and 7.k. • GO TO Step 8. *(Step 7.i.)* *(The crew will continue to Step 8 but when core exit T/Cs less than required then they will:* • *STOP RCS cooldown – Step 7.j* • *MAINTAIN core exit TCs – LESS THAN REQUIRED TEMPERATURE – Step 7.k)*	
	RO	RESET the following: • SI • SI AUTO RECIRC • ESF Load Sequencers • Containment Isolation Phase A • Containment Isolation Phase B *(Steps 8-12)*	
	RO/BOP	ESTABLISH IA To Containment: • IA pressure ‑ GREATER THAN 95 PSIG • OPEN IA OCIV *(Step 13)*	
	BOP	MONITOR Intact SG Levels: • NR levels ‑ GREATER THAN 14% • CONTROL AFW to maintain NR levels BETWEEN 22% and 50% *(Step 14)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	CHECK If RCS Cooldown Should Be Stopped: • Core exit T/Cs – LESS THAN REQUIRED TEMPERATURE • STOP RCS cooldown • MAINTAIN core exit TCs – LESS THAN REQUIRED TEMPERATURE *(Step 15)* *(Crew will not continue until target temperature is reached and cooldown is stopped.)*	
	BOP	CHECK Ruptured SG(s) Pressure – STABLE OR RISING *(Step 16)*	
	RO	CHECK RCS Subcooling Based On Core Exit T/Cs – GREATER THAN 55°F *(Step 17)*	

OPERATOR ACTIONS

Op-Test No.: 1	**Scenario No.:** 4	**Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**)	
Event Description: Event 5 - SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**

	ALL (CT-19)	DEPRESSURIZE RCS To Minimize Break Flow And Refill Pressurizer:
		• Normal pressurizer spray - AVAILABLE
		• **PLACE group "C" pressurizer heater control switch to PULL TO LOCK**
		• **PLACE all other pressurizer heater group control switches to OFF**
		• **INITIATE maximum pressurizer spray**
		• CHECK Any of the following conditions - SATISFIED
		  • BOTH of the following:
		  • RCS pressure - LESS THAN RUPTURED SG PRESSURE
		  • Pressurizer level - GREATER THAN 8%
		  OR
		  • BOTH of the following:
		  • RCS pressure - WITHIN 300 PSI OF RUPTURED SG PRESSURE
		  • Pressurizer level - GREATER THAN 38%
		  OR
		  • Pressurizer level - GREATER THAN 70%
		  OR
		  • RCS subcooling based on core exit T/Cs - LESS THAN 35°F
		WHEN one of the above conditions are met:
		• **STOP RCS depressurization:**
		  • **Normal spray valves - CLOSED**
		  • **ENSURE one Loop Isolation valve open.**
		  • **Auxiliary spray valve - CLOSED**
		  • GO TO Step 21, OBSERVE CAUTION prior to Step 21
		(Step 18.a to 18.g)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 5 (**Examiner Trigger**) & 6 (**Integral to Scenario**) **Event Description: Event 5 -** SG 1C Tube Rupture. **(3 Critical Tasks)** **Event 6** - AFW Pump #12 fails to auto start.			
Time	**Position**	**Required Operator Actions**	**Notes**

	ALL	CHECK If SI Flow Should Be Terminated:
		• RCS subcooling based on core exit T/Cs - GREATER THAN 35°F
		• Secondary heat sink:
		  • Total AFW flow to intact SGs - GREATER THAN 576 GPM AVAILABLE
		  OR
		  • NR level in at least one intact SG - GREATER THAN 14%
		• RCS pressure - STABLE OR RISING
		• Pressurizer level - GREATER THAN 8%
		(Step 21)	

	RO (C-20)	**STOP HHSI Pumps And PLACE In AUTO** *(Step 22)* ***Terminate Scenario***	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** – AFW Pump #12 fails to auto start. Addendum 5, Step 3)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY FW isolation: • SGFPTs – TRIPPED • SU SGFP – TRIPPED • VERIFY the following valves –CLOSED o FWIVs o FWIBs o FW preheater bypass valves o FW regulating valves o Low power FW regulating valves o SG blowdown isolation valves o SG sample isolation valves *(EO00 Addendum 5, Step 1)* *(0POP05-EO-EO00, Reactor Trip or Safety Injection, Addendum 5, Verification of Equipment Operation.)* *(This addendum is performed in parallel with Steps 5 to 14 of 0POP05-EO-EO00, Reactor Trip or Safety Injection.)*	
	BOP	CHECK if main steamline should be isolated: • CHECK for any of the following conditions: o Containment pressure – GREATER THAN OR EQUAL TO 3 PSIG OR o SG pressure (without low steamline pressure SI blocked) - LESS THAN OR EQUAL TO 735 PSIG OR o SG pressure (with low steamline pressure SI blocked) - LOWERING AT A RATE GREATER THAN OR EQUAL TO 100 PSI/SEC, BY OBSERVANCE OF THE STEAMLINE PRESSURE RATE BISTABLES • VERIFY Main Steamline Isolation: o MSIVs – CLOSED o MISBs – CLOSED *(Step 2)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** – AFW Pump #12 fails to auto start. Addendum 5, Step 3)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY AFW system status: • Motor-driven pump – RUNNING **(RNO)** • **WHEN the respective ESF Load Sequencer has completed its automatic sequence OR it is determined that the respective ESF Load Sequencer has failed, THEN manually Start pump(s)** **(Back to A/ER)** • Turbine-driven pump – RUNNING *(Step 3)* ***(Event 6 – Operator manually starts AFW Pump #12)***	
	BOP	VERIFY AFW valve alignment - PROPER EMERGENCY ALIGNMENT *(Step 4)*	
	BOP	VERIFY total AFW Flow - GREATER THAN 576 GPM *(Step 5)*	
	BOP	VERIFY containment isolation phase A: • Phase A – ACTUATED • Phase A valves - CLOSED, REFER TO ADDENDUM 1, PHASE A ISOLATION VERIFICATION *(Step 6)*	
	BOP	VERIFY ECW status: • ECW pumps – RUNNING • ECW pump discharge isolation valves – OPEN *(Step 7)*	
	BOP	VERIFY CCW pumps – RUNNING *(Step 8)*	
	BOP	VERIFY RCFC status: • RCFCs – RUNNING • Cooling water - TRANSFERRED TO CCW *(Step 9)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** – AFW Pump #12 fails to auto start. Addendum 5, Step 3)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY SI pump status: • HHSI pumps – RUNNING • LHSI pumps – RUNNING *(Step 10)*	
	BOP	VERIFY SI valve alignment – PROPER EMERGENCY ALIGNMENT *(Step 11)*	
	BOP	VERIFY SI flow: • RCS pressure - LESS THAN 1745 PSIG • HHSI pump flow – INDICATED • RCS pressure - LESS THAN 415 PSIG **(RNO)** • GO TO Step 13 of this Addendum. *(Step 12)*	
	BOP	VERIFY containment ventilation isolation: • Containment atmosphere radiation monitor isolation valves – CLOSED • Normal purge supply and exhaust fans – STOPPED • Supplemental purge supply and exhaust fans – STOPPED • Purge Dampers – CLOSED *(Step 13)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** N/A

Event Description: 0POP05-EO-EO00, Addendum 5 Actions.
(Includes **Event 6** – AFW Pump #12 fails to auto start. Addendum 5, Step 3)

Time	Position	Required Operator Actions	Notes
	BOP	VERIFY ventilation actuation: • Control room HVAC – OPERATING IN EMERGENCY RECIRC • EAB HVAC - OPERATING IN EMERGENCY RECIRC • FHB HVAC - OPERATING IN EMERGENCY MODE • FHB Exhaust Fans - ONLY TWO TRAINS OPERATING o Exhaust booster fans o Main exhaust fans **(RNO)** • PERFORM the following: o IF three trains FHB exhaust fans running, THEN PLACE one train FHB exhaust fans in PULL TO LOCK. **(Back to A/ER)** • SECURE one FHB filter train by PERFORMING the following: o PLACE the outlet damper Controller in manual o Manually close the outlet damper o VERIFY proper operation of filter train in service • Essential chilled water pumps – RUNNING • Essential chillers – RUNNING • ECCS pump room fan coolers – RUNNING • AFW pump cubicle fans – RUNNING • FHB truck bay doors – CLOSED *(Step 14)*	
	BOP	NOTIFY Unit Supervisor that Addendum 5 is COMPLETE *(Step 15)*	
	SRO	IMPLEMENT Functional Restoration Procedures as required *(Step 16)*	
	SRO	RETURN TO procedure step in effect. *(Step 17)*	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/BOP	**CT-18** **ISOLATE RUPTURED SG 1C BY:** • **ADJUSTING RUPTURED SG(S) PORV CONTROLLER SETPOINT TO BETWEEN 1260 PSIG AND 1265 PSIG** • **PLACING SG 1C PORV IN AUTO.** • **CLOSING RUPTURED SG(S) MSIV(S) AND MSIB(S)** • **CLOSING SG 1C AFW OCIV.** **AND** SECURE AFW TO SG 1C BY: • **CLOSING SG 1C AFW OCIV.** OR • **CLOSING SG 1C AFW VALVE** OR • **PLACING AFW PUMP #13 IN PTL**	Isolate feedwater flow into and steam flow from the ruptured SG before a transition to EC31 occurs. SAFETY SIGNIFICANCE -- Failure to isolate the ruptured SG causes a loss of differential pressure between the ruptured SG and the intact SGs. Upon a loss of differential pressure, the crew must transition to a contingency procedure that constitutes an incorrect performance that "...necessitates the crew taking compensating action which complicates the event mitigation strategy....." If the leakage continues, the SG inventory increase leads to water release through the PORV or safety valve(s) or to SG overfill, which seriously damages the SG as a fission-product barrier and complicates mitigation. To stop the primary-to-secondary leakage, the crew must intervene to mitigate excessive inventory increase in the ruptured SG.	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	CT-20 DEPRESSURIZE RCS TO SI TERMINATION CRITERIA PER STEP 19 OF 0POP05-EO-EO30, STEAM GENERATOR TUBE RUPTURE.	Depressurize RCS to meet SI termination criteria before either of the following occur: 1) SG PORV or Safety Valve opens, 2) SG narrow range level goes offscale high. SAFETY SIGNIFICANCE -- Failure to stop reactor coolant leakage into a ruptured SG by depressurizing the RCS (when it is possible to do so) needlessly complicates mitigation of the event. It also constitutes a "significant reduction of safety margin beyond that irreparably introduced by the scenario." The STP FSAR assumes that for a design SGTR ("the complete severance of a single Steam Generator tube") that flow from the RCS to the SG is terminated in time to prevent a radioactive discharge through SG PORVs or Safety Valves. If the primary-to-secondary leakage is not stopped, the SG pressure increases until either the SG PORV or the safety valve(s) opens; releasing radioactivity to the environment.	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	CT-21 TERMINATE SI BY PLACING ALL THREE HHSI PUMPS IN STOP AND THEN BACK TO AUTO.	Terminate SI prior to radioactive discharge through a SG PORV or safety valve. SAFETY SIGNIFICANCE -- Failure to terminate SI and control RCS pressure and makeup flow during a SGTR (when it is possible to do so) needlessly complicates the mitigation strategy. It also constitutes a "significant reduction of safety margin beyond that irreparably introduced by the scenario." The STP FSAR assumes that flow from the RCS to the SG is terminated in time to prevent a radioactive discharge through SG PORVs or Safety Valves. If the primary-to-secondary leakage is not stopped, the SG pressure increases until either the SG PORV or the safety valve(s) opens, releasing radioactivity to the environment. If the leakage continues, the SG inventory increase leads to water release through the PORV or safety valve(s) or to SG overfill, which could cause an insoluble fault in the ruptured SG, greatly complicating mitigation. To stop the primary-to-secondary leakage, the crew must intervene.	

NOTE: (Per NUREG-1021, Appendix D)
If an operator or the Crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.

EXPECTED BOOTH COMMUNICATIONS

EVENT 1:

- There are no Booth Communications expected for Event 1.

EVENT 2:

- As I&C Maintenance or the Duty Maintenance Supervisor, if notified of the failure of Loop 2, Channel 1 RCS Flow Transmitter, FT-0427, report that an I&C maintenance crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the failure of Loop 2, Channel 1 RCS Flow Transmitter, FT-0427. No further action is necessary.

EVENT 3:

- As a Plant Operator, if asked to check RCS leak in containment, report that you will get with HP to plan a containment entry.
- As the Duty Maintenance Supervisor, if notified of the RCS leak, report that appropriate maintenance crews are being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the issues with the RCS leak. No further action is necessary.

EVENT 4:

- As a Plant Operator, if asked to check the ISO Phase Bus Duct Cooling, report that Fan #11 trip and #12 failed to auto start and will not start manually.
- As the Duty Maintenance Supervisor, if notified about the ISO Phase Bus Duct Cooling Fans, report that appropriate maintenance crews are being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the issues with the ISO Phase Bus Duct Cooling Fans. No further action is necessary.

EVENT 5:

- There are no Booth Communications expected for Event 5.

EVENT 6:

- There are no Booth Communications expected for Event 6.

EXPECTED BOOTH ACTIONS

1. If asked to open the DA High level Dump Valves then trigger the step for ‘DA High Level Dump Valves’.
2. If asked to fill the AFWST then trigger the step for ‘AFWST Makeup’.

SIMULATOR SETUP

NOTE

ALL Annunciator Response Procedures (ARP's) must be checked if this scenario is the first to be run on this day. Setup for subsequent runs of this scenario only requires those ARP's that were actually marked in to be checked.

Instructors running the scenario must keep track of which ARP's these are, otherwise, all will have to be checked for subsequent scenarios as well.

Each time before running the scenario check and/or clean the following:									
Specific Scenario Procedures	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
0POP02-HE-0001, Electrical Auxiliary Building HVAC System									
0POP04-RP-0003, Failure of RCS Loop Flow Transmitter									
0POP04-RC-0003, Excessive RCS Leakage.									
0POP02-CV-0004, Chemical And Volume Control System Subsystem									
1POP09-AN-10M2 B-8, ISO PHASE BUS TROUBLE.									
0POP04-TM-0005, Fast Load Reduction.									
0POP05-EO-EO00, Reactor Trip or Safety Injection									
0POP05-EO-EO30, Steam Generator Tube Rupture									
Other Procedures Used By Students During Scenario Including POP09s.	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
Miscellaneous Items to Restore	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
STA ICS Screens to PD Menu									
All ICS Trends to normal (not scenario specific)									
Student Selected ICS Points changed to U1118									
Control Panel ICS Screens to Normal									
RM 11 History and Screens									
RM 23 – No Alarm Indications									

SIMULATOR SETUP (cont'd.)

NOTE

The Scenario Lesson Plan MUST be run from the left most Instructor Station in Simulator Booth to allow for recording and storing of recorded parameter data.

- Log into Instructor Workstation as 'lotnrc' user, open Orchid (nstps server), then 'Unlock' Initial Conditions Group 'lotnrc'.
- Reset to IC #204 and perform the following:
  - Switch Check
  - Ensure red light on end of CP-010 off
  - Ensure ICS Annunciators have stopped counting up
- Go to RUN and perform the following:
  - Ensure Simulator is ready by performing applicable checkoffs from LOR-GL-0006, LOR Conduct of Simulator Training Guidelines, Addendum 5, Simulator Readiness Checklist.
  - Ensure VCT Makeup Integrators are set as follows:
    - Momentarily place RC M/U CONT to STOP and then START to reset BA BATCH/GALLONS and TOT M/U BATCH/GALLONS counters to zero.
    - Reset BA BATCH/GALLONS setpoint to 0 gallons and reset TOT M/U BATCH/GALLONS setpoint to 10 gallons.
    - Verify BA Controller Pot setting is 3.80
- Hang following ECO/Caution Tags:
  - AFW Pump #11 Handswitch in PTL
- Open lesson plan for 'Scenario 4' in 'lotnrc' directory for LOT 23, then EXECUTE lesson plan. These actions will set up any initial conditions for the scenario.
- If this scenario IC has changing conditions (i.e. Xenon is changing, etc.), then place the simulator in FREEZE, otherwise it is OK to leave in RUN.
- Run the scenario in accordance with the next section, 'Scenario Instructions'.

SCENARIO INSTRUCTIONS

NOTE
Steps 1 to 4 below can be performed in the LOR Debrief Room prior to the crew coming into the Simulator provided exam security measures are taken.

1. Provide Shift Turnover sheets to the crew and review the information.
2. Have the Crew perform a Pre-Job Brief. Ensure the crew doesn't have any other questions about the Shift Turnover.
3. Ensure the Beacon book from the simulator is available to the crew if they are in the LOR Debrief Room.
4. Review the Simulator Differences list with the crew if needed.
5. When signaled by Simulator Staff, have the crew perform their board walkdown and inform the floor instructor when ready to take the watch.
6. Ensure the simulator is in RUN and verify simulator clock is set correctly. Note the time that the Crew takes the watch. _____ Start Time.

NOTE

Malfunction Step and/or Lesson Plan Steps (Events) are triggered upon the Lead Examiners signal during the scenario unless an agreed upon time is discussed with the examiner prior to the start of the scenario.

Always 'TRIGGER' events in the Simulator Scenario Lesson Plans. This way delays associated with events will take place as intended.

Refer to 'EXPECTED BOOTH COMMUNCATIONS' and 'EXPECTED BOOTH ACTIONS' Sections for instructions for Instructor actions during the scenario.

7. Trigger the step titled 'Start Chart' and ensure specified Recorded Parameters for the scenario begin recording as the scenario runs. If the chart speed is NOT set to 5400 seconds (90 minutes) then perform the following:
   - Under 'CHARTS' click on 'SET TIME'
   - In the dialog box enter 5400 seconds (90 minutes)
   - Click OK.
8. The Crew will perform Event #1.
9. Trigger **MALFUNCTION STEP –** This will insert Step #1, Event #2.
10. Trigger **STEP 2 –** Event #3
11. Trigger **STEP 3 –** Event #4
12. Trigger **STEP 4 –** Event #5
13. Place simulator in FREEZE when cued by the Lead Examiner to terminate scenario.
14. DO NOT RESET simulator until the steps on the next page are completed and all Examiners have completed Follow-Up Questioning.

SCENARIO INSTRUCTIONS (cont'd.)

NOTE
Some scenarios will have more than one chart. For these, each chart file must be separately saved with a unique filename.

15. Saving Recorded Parameters Data
    - Click on the 'Charts' icon on the left side of the screen
    - Select 'Pause' icon, then select 'All'
    - Click on the 'Print Chart' icon, then select 'All'
    - This will bring up a window in the TASK BAR called PRIMOPDF.
    - Click on 'Create PDF'
    - This will bring up a File Save As window.
    - Save to folder **c:\Users\lotnrc\Desktop\LOT23 Charts**. The file name will be 'LOT23 Scenario 4' followed by a name that identifies the crew (e.g. 'Crew A).
    - Save the new file. It will be saved in a folder already on the desktop. LOT23 Charts.
16. Saving Scenario SAM (Simulator Action Monitor)
    - Under 'TOOLS' click on 'SAM'
    - In the dialog box that comes up click on 'SAVE TO'
    - Save as a 'TEXT FILE' to folder **c:\Users\lotnrc\Desktop\LOT23 Charts.** The file name will be 'LOT23 SAM INFO Scenario 4' followed by a name that identifies the crew (e.g. 'Crew A).

SCENARIO - 03

	0POP01-ZQ-0022		
Plant Operations Shift Routines			
For Training Only	Shift Turnover Checklist		Page 1 of 1

PART I - To be completed prior to shift turnover.

Unit: **1** Off- Going Shift: **Days / Nights** Date: **Today** Mode: **1**

Dilution			Boration			Control Rods		
Current Setpoint	1% Pwr Change	1° F Change	Current Setpoint	1% Pwr Change	1° F Change	Current Position	1% Pwr Change	1° F Change
10	**130**	**114**	**0** flushing with	**29**	**25**	**240**	**7**	**6**
As Required			As Required			As Required		

ΔI Target	Channel	RCS Boron
5.06%	**U1144**	**1348**

Unit 1 Status

- Operating at 100% power
- Core burnup is 150 MWD / MTU

Load Reduction:

- 100-90%/1hr = **162**
- 100-80%/10min = **382**
- 100-75%/30min = **444**
- 100-60%/1hr = **620**
- 100-50%/10min = **925**

Information:

- AFW Pump #11 is Out of Service.
- The Crew is to start CRE HVAC Train A and secure Train C
- BAT 1A & 1B Concentrations are 7300 ppm
- Fuel Handling Building truck bay doors are closed
- No personnel are in containment
- Ron Gibbs has the duty
- The NLO compliment is 5 watch standers and a head operator

ECO/LCO/RAsCAL:

None

LOT 23 NRC EXAM

SIMULATOR OPERATING TEST

SCENARIO #5

Revision 0

Week of 07/15/2019

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 5** **Op-Test No.: LOT 23 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- **Mode 1 at 80% Power. Management requests power be lowered to 65% at a rate of 40%/hour due to trip of SGFPT #13.**

Turnover:

- **AFW Pump #11 is out of service.**

Critical Tasks:

- **Event 6 – Establish 576 gpm AFW flow**
- **Event 6 – Energize an ESF 4.16 KV Bus**
- **Event 7 – Manually close PZR PORV**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	N/A	RO (R) BOP (R) SRO (R)	Continue to lower reactor power to 65%
2 (10 min)	Multiple	RO (C) SRO (C, TS)	EAB Battery Room Exhaust Fan 11C develops sheared shaft. When RO tries to start Battery Room Exhaust Fan 11B the fan trips.
3 (20 min)	04-08-03 0.0	BOP (C) SRO (C, TS)	Over current trip on ECW Pump 1C.
4 (30 min)	FAP003PT5 58TVSP 0.9	BOP (I) SRO (I)	Feedwater Header Pressure Transmitter PT-558 fails to intermediate position.
5 (40 min)	10-14-01 1	ALL (M)	Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
6 (N/A)	Multiple	ALL (C)	Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)** **(Occurs 5 seconds after ESF DG output breakers close)**
7 (N/A)	50-HV-01 1	RO (C) SRO (C)	Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)** **(Occurs 2 minutes after the reactor trip)**

Lot* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specification

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Malfunctions after EOP entry (1–2)	2
2. Abnormal events (2–4)	4
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	1
5. Entry into a contingency EOP with substantive actions (≥1 per scenario set)	1
6. Preidentified critical tasks (≥2)	2

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

- Critical Tasks are indicated by "**CT-##**" in the position column and indicated in bold type. In some instances an "*" will indicate that only a portion of the task listed is considered critical.
- Shaded cells indicate procedural entry points.

RECORDED PARAMETERS:

Recorded parameters will be determined during NRC Validation week.

The parameters identified for recording may be of value in evaluating crew performance. Once the scenario is complete for each crew, printout the recorded parameters and label the printout with date, time, crew number and scenario number. See Scenario Instructions section for further details on how to save the Recorded Parameters.

- Main Turbine Throttle Valve #1 position
- Core Exit T/C
- RCS Wide Range Pressure
- LHSI Pump 1A Red Light

SCENARIO OBJECTIVES

Event 1 Objective

- Perform an increase or decrease in reactor power per 0POP03-ZG-0008, Power Operations.

Event 2 Objective

- Respond to an EAB Battery Room Exhaust Fan trouble alarm per 0POP09-AN-22M3.

Event 3 Objective

- Respond to an ECW Pump trip alarm per 0POP09-AN-02M4.

Event 4 Objective

- Respond to a Main Feedwater transient per 0POP04-FW-0002, Steam Generator Feed Pump Trip.

Event 5 Objective

- Respond to a loss of offsite power per 0POP05-EO-EO00, Reactor Trip or Safety Injection and 0POP05-EO-ES01, Reactor Trip Response.

Event 6 Objective

- Respond to a loss of all AC condition per 0POP05-EO-EC00, Loss of All AC Power.

Event 7 Objective

- Respond to equipment failures during a loss of all AC power per 0POP05-EO-EC00, Loss of All AC Power.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 1

Event Description: Continue to lower reactor power to 65%.

Time	Position	Required Operator Actions	Notes
	SRO	Directs actions of 0POP03-ZG-0008, Power Operations. *(Starts at Step 6.7 of 0POP03-ZG-0008, Power Operations.)*	
	RO	COMMENCE RCS boration to establish the desired Tavg ramp rate to the desired Reactor Power level. *(Step 6.7)*	
	RO	COMMENCE Main Turbine load reduction at the desired ramp rate to the desired Reactor Power level. *(Step 6.8)*	
	RO	ADJUST Main Turbine load reduction or RCS boron concentration, as necessary, to maintain Tavg within 1.5°F of Program RCS Tavg (Refer to Addendum 7, Percent Power vs Program RCS Tavg). *(Step 6.9)*	
	RO	The crew will borate the RCS per 0POP02-CV-0001, Makeup to the Reactor Coolant System. *(NOTE: Operator normally uses Form 1, Boration Checklist.)*	
	RO	DETERMINE amount of boric acid to be added. *(0POP02-CV-0001, Form 1, Step 1.0)* *(RO will confer with SRO to determine the amount of boric acid to add to the RCS to start lowering reactor power.)*	
	RO	ENSURE VCT will accept the volume increase without initiating an auto diversion to the RHT at 68%. *(0POP02-CV-0001, Form 1, Step 2.0)*	
	RO	TURN "RC M/U CONT SYS ON" switch to "STOP" *(0POP02-CV-0001, Form 1, Step 3.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 1 **Event Description:** Continue to lower reactor power to 65%.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	TURN "RC M/U CONT" to "BORATE" *(0POP02-CV-0001, Form 1, Step 4.0)*	
	RO	ENSURE "BA BATCH/GALLONS FY-0110B" flow integrator is set for required number of gallons. *(0POP02-CV-0001, Form 1, Step 5.0)*	
	RO	ENSURE "BA FLOW CONT FK-0110" is set for desired flow rate. *(0POP02-CV-0001, Form 1, Step 6.0)*	
	RO	TURN "RC M/U CONT SYS ON" switch to "START". *(0POP02-CV-0001, Form 1, Step 7.0)* *(This starts the boration sequence.)*	
	RO	VERIFY "BA XFER PUMP 1A" OR "BA XFER PUMP 1B" is running. *(0POP02-CV-0001, Form 1, Step 8.0)*	
	RO	WHEN the required gallons of boric acid are added, THEN ENSURE makeup is stopped. *(0POP02-CV-0001, Form 1, Step 9.0)* ***(Boration will auto stop after set amount is added. The RO may request to leave Reactor Makeup line up as is and just return to Form 1, Step 7.0 for additional borations.)***	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 1 **Event Description:** Continue to lower reactor power to 65%.			
Time	**Position**	**Required Operator Actions**	**Notes**
		FLUSH Makeup line with 15 to 20 gallons of RMW as follows: • TURN "RC M/U CONT SYS ON" switch to "STOP". • PLACE "RC M/U CONT" in "ALT DIL". • ENSURE "TOT M/U BATCH GALLONS FY-0111B" flow integrator is SET for 15 - 20 gallons. (Refer to Addendum 1) • ENSURE “RMW FLOW CONT FK-0111” is SET for the desired flowrate. (Nominal 3.3, which corresponds to 100 gpm) • PLACE makeup stop to VCT "FILL FCV-0111B" switch in "CLOSE". • TURN "RC M/U CONT SYS ON" switch to "START". • VERIFY "RMW PUMP 1A(2A)" OR "RMW PUMP 1B(2B)"starts. • WHEN 15 - 20 gallons of water are added, THEN ENSURE makeup is stopped. *(0POP02-CV-0001, Form 1, Step 10.0)*	
	RO	ENSURE Reactor Makeup Water System is returned to Automatic Operation per Form 4, Modes 1-2 Automatic Operation Checklist. *(0POP02-CV-0001, Form 1, Step 11.0)*	
	RO	ENSURE the following in “AUTO” positon: • BA FLOW CONT FK-0110 • BA FLOW CONT VLV FCV-0110A • Makeup Stop to Charging Pumps “TO VCT OUTL FCV-011B” valve • RMW FLOW CONT FK-0111 • RMW FLOW CONT VLV FCV-0111A • Makeup Stop to VCT “FILL FCV-0111B” *(0POP02-CV-0001, Form 4, Step 1.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 1 **Event Description:** Continue to lower reactor power to 65%.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	IF desired, THEN STOP the running RMW OR BAT pump(s) by placing the handswitch in "STOP", THEN return to "AUTO" (√ the desired Standby pump(s) ONLY) • RMW PUMP 1A _____ • RMW PUMP 1B _____ • BA XFER PUMP 1A _____ • BA XFER PUMP 1B _____ *(0POP02-CV-0001, Form 4, Step 2.0)*	
	RO	ENSURE the **STANDBY** RMW and BAT pumps are in "AUTO" (√ the desired Standby pumps ONLY) • RMW PUMP 1A _____ • RMW PUMP 1B _____ • BA XFER PUMP 1A _____ • BA XFER PUMP 1B _____ *(0POP02-CV-0001, Form 4, Step 3.0)*	
	RO	ENSURE the pumps **NOT** selected for **STANDBY** are in "PULL TO LOCK" (normal Lineup) or as directed by the Unit Supervisor/Shift Manager. (√ the desired **Non-Standby** pump(s) ONLY) • RMW PUMP 1A _____ • RMW PUMP 1B _____ • BA XFER PUMP 1A _____ • BA XFER PUMP 1B _____ *(0POP02-CV-0001, Form 4, Step 4.0)*	
	RO	PLACE "RC M/U CONT" switch in "AUTO" *(0POP02-CV-0001, Form 4, Step 5.0)*	
	RO	ENSURE "BA FLOW CONT FK-0110 setpoint for flowrate, is at the desired value. (Refer to Section 8.0 for setpoint formula) *(0POP02-CV-0001, Form 4, Step 6.0)* ***Setpoint Formula:*** $$\textbf{\textit{Setpoint} = } \frac{\textbf{\textit{20 x Boron Concentration of RCS}}}{\textbf{\textit{Born Concentration of BAT}}}$$	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 1 **Event Description:** Continue to lower reactor power to 65%.			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	TURN "RC M/U CONT SYS ON" switch to "START" *(0POP02-CV-0001, Form 4, Step 7.0)*	
	RO	IF all boration evolutions have been completed, THEN STOP Boric Acid Transfer Pump Fan AND PLACE its handswitch in "AUTO" • Pump 1B SUPP CLR 11A HM-VAH008 • Pump 1A SUPP CLR 11B HM-VAH009 *(0POP02-CV-0001, Form 4, Step 8.0)*	
	BOP	The crew will make Turbine Load Changes using Form 2 of 0POP03-ZG-0008, Power Operations. *(NOTE: There are other Plant Operating Procedures that have these same steps that the Operator can use.)*	
	BOP	ENSURE permission to perform a Turbine Load Change is obtained from the Shift Manager/Unit Supervisor. *(0POP03-ZG-0008, Form 2, Step 1.0)*	
	BOP	ENSURE the LOAD RATE - PRCT MW/MIN" Thumbwheel is set to the ".25" position OR as authorized by the Shift Manager/Unit Supervisor. *(0POP03-ZG-0008, Form 2, Step 2.0)* *(BOP will confer with SRO to determine the Thumbwheel setpoint.)* *(0POP03-ZG-0008, Form 2, Step 3.0, 4.0 & 5.0 are N/A.)*	
	BOP	**RAISE/LOWER** (ADJUST) the value of the Setter (as read on the "SETPOINT" display) to the desired value by momentary depressing (**TAP**) the SETPOINT CONTROL "⮝" **or** "⮟" pushbutton, as required. *(0POP03-ZG-0008, Form 2, Step 6.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 1

Event Description: Continue to lower reactor power to 65%.

Time	Position	Required Operator Actions	Notes
	BOP	DEPRESS the SETPOINT CONTROL **"GO"** pushbutton and **MONITOR** for the proper load changes. *(0POP03-ZG-0008, Form 2, Step 7.0)*	
	RO	The crew will make Miner Rod Movements using Form 5 of 0POP03-ZG-0008, Power Operations. *(NOTE: There are other Plant Operating Procedures that have these same steps that the Operator can use.)*	
	RO	ENSURE permission to perform a Miner Rod Movement is obtained from the Shift Manager/Unit Supervisor. *(0POP03-ZG-0008, Form 5, Step 1.0)*	
	RO	ENSURE "ROD BANK SEL" switch is in "MAN" position. *(0POP03-ZG-0008, Form 5 Step 2.0)*	
	RO	WITHDRAW/INSERT Control Banks by holding Rod Control Switch in OUT/IN position. *(0POP03-ZG-0008, Form 5 Step 3.0)*	
	SRO	PLACE the "ROD BANK SEL" switch in the "AUTO" position or as deemed necessary by Shift Manager/Unit Supervisor. *(0POP03-ZG-0008, Form 5 Step 4.0)* *(The RO will repeat these steps as needed to lower power and maintain Delta-I.)* *(**Event 2** can triggered when the lead examiner is satisfied with crew performance for reactivity.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 2 **(Examiner Trigger)**			
Event Description: EAB Battery Room Exhaust Fan 11C develops sheared shaft. When RO tries to start Battery Room Exhaust Fan 11B the fan trips. **(TS)**			
Time	**Position**	**Required Operator Actions**	**Notes**
	RO	Acknowledges and announces the following annunciators on 22M3: • **BATT ROOM EXH FAN TRBL (C-3)** • BATT RM EXH FLOW LO (D-3) • NON 1E BATT RM EXH FLOW LO (D-4) *(Battery Room exhaust fan trouble will have the operator start the standby fan.)*	
	RO	Operator uses 0POP09-AN-22M3, C-3, BATT ROOM EXH FAN TRBL.	
	RO	Determines affected EAB battery room exhaust fan using Plant Computer points. • HEPD9572 {Train C, EAB "BATTERY ROOM EXH FAN 11C"} *(Window C-3, Step 1)*	
	RO AO	Dispatches an operator to the affected EAB battery room exhaust fan to check local fan DP indication. • 1-HE-PDIS-9572 {72 ft EAB Rm 410} *(Window C-3, Step 2)* *(Plant Operator reports back that fan DP is low {almost 0} and EAB Battery Room Exhaust Fan 11C motor is running but is vibrating and making a loud noise. {if fan has not been turned off yet})*	
	RO	Initiates a Condition Report to investigate the cause of fan trouble. *(Window C-3, Step 3)*	
	RO	May transition to 0POP02-HE-0001, Electrical Auxiliary Building HVAC System, to start a backup train and secure the affected train. *(Window C-3, Step 4)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 2 **(Examiner Trigger)**

Event Description: EAB Battery Room Exhaust Fan 11C develops sheared shaft. When RO tries to start Battery Room Exhaust Fan 11B the fan trips. **(TS)**

Time	Position	Required Operator Actions	Notes
	RO	**Starts BATTERY ROOM EXH FAN 11B** *(Window C-3, Step 4.a* *OR* *0POP02-HE-0001, Step 7.2.1)* *(Fan will trip shortly after starting)*	
	AO	*(If asked to check EAB Battery Room Exhaust Fan 11B after it has tripped, EAB Watch reports that they don't see any reason why the fan is not running locally, however, the breaker is in the tripped position.)*	
	RO	**Stops BATTERY ROOM EXH FAN 11C and, after determining that 11B tripped, places both Handswitches in PTL.** *(Window C-3, Step 4.b* *OR* *0POP02-HE-0001, Step 7.2.2 and 7.3.2)* *(Bypass-INOP alarm windows will illuminate when handswitches are placed in PTL)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 2 **(Examiner Trigger)**			
Event Description: EAB Battery Room Exhaust Fan 11C develops sheared shaft. When RO tries to start Battery Room Exhaust Fan 11B the fan trips. **(TS)**			
Time	**Position**	**Required Operator Actions**	**Notes**
	SRO	Refers to TS 3.3.3.5 for required actions. *(Window C-3, Step 5)* **TS 3.3.3.5 (5.e. for EAB HVAC Fans, including Electrical Penetration Space Fans and Battery Room Fans)** **The Remote Shutdown System Functions shall be OPERABLE.** **ACTION** **With one or more required channels of one or more Remote Shutdown System Functions inoperable, restore the inoperable Function(s) to OPERABLE status within 30 days, or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.** *(Per Table B 3.3.5-1, located in the Bases section of TSs, 2 Battery Room Fans are required.)* ***(Event 3** can be triggered after SRO has checked TS or at the discretion of the lead examiner.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Over current trip on ECW Pump 1C. **(TS)**			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	Acknowledges and announces the following annunciators from 02M4: • ECW PUMP 1C TRIP (C-7)	
	SRO BOP	Determines Essential Cooling water Pump 1C tripped.	
	SRO	Directs actions of 0POP09-AN-02M4 C-7.	
	BOP	ENSURE standby ECW train started and is operating per 0POP02-EW-0001, Essential Cooling Water Operations. *(Step 1)*	
	BOP	ENSURE standby CCW train started and is operating per 0POP02-CC-0001, Component Cooling water. *(Step 2)*	
	BOP	PLACE Standby DG 13 "EMER STOP" plunger in the PULL TO STOP position to prevent diesel operation without cooling water. *(Step 3)*	
	BOP	PLACE the following handswitches in PULL TO LOCK: • ECW Pump '1C' • ECW Screenwash Booster Pump '1C' • ECW Traveling Screen '1C' *(Step 4)*	
	BOP	IF ECW Train 1C is being used for ECP Blowdown, THEN ENSURE "ECW TRAIN C BLWDN ISOL FV-6937" closed. *(Step 5)* *(The Blowdown Valve should have automatically closed with the ECW Pump tripped.)*	
	BOP	SECURE the affected CCW train (IF running) per 0POP02-CC-0001, Component Cooling Water. *(Step 5)* *(NA CCW Pump 1A was running.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 3 **(Examiner Trigger)**			
Event Description: Over current trip on ECW Pump 1C. **(TS)**			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	SECURE the affected ECW train (IF running) per 0POP02-EW-0001, Essential Cooling Water Operations. *(Step 7)*	
	BOP	IF adequate CCW pumps are NOT available to provide flow for current plant conditions, THEN adjust loads as needed per 0POP02-CC-0001, Component Cooling Water. *(Step 8)*	
	BOP	PERFORM the following: • ENSURE Essential Chiller 12C secured per 0POP02-CH- 0005, Essential Chiller Operation. • PLACE Essential Chiller 12C handswitch in PTL. • START essential chiller(s) as needed per 0POP02-CH-0005, Essential Chiller Operation. *(Step 9)*	
	BOP	PLACE Essential Chilled Water Train C Pump 11C to PTL. *(Step 10)*	
	BOP	START additional trains of CRE and EAB HVAC, as necessary, per 0POP02-HE-0001, Electrical Auxiliary Building HVAC System. *(Step 11)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 3 **(Examiner Trigger)** **Event Description:** Over current trip on ECW Pump 1C. **(TS)**			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	IF RHR Train C was in service, THEN PERFORM the following: • PLACE an alternate RHR train in service per 0POP02-RH-0001, Residual Heat Removal System Operation. • SECURE RHR Train C per 0POP02-RH-0001, Residual Heat Removal System Operation. • PLACE the pump handswitch in PTL. *(Step 12)* *(This step is NA as RHR is not in service.)*	
	BOP	PERFORM the following: • ENSURE CCW Train C secured per 0POP02-CC-0001, Component Cooling Water • PLACE "COMP CLG WTR PUMP 1C" handswitch in PTL *(Step 13)*	
	BOP	ENSURE ECW Train C secured per 0POP02-EW-0001, Essential Cooling Water Operations. *(Step 14)*	
	SRO	TAKE appropriate action per Technical Specifications 3.5.2, 3.6.2.1, 3.6.2.3, 3.7.3, 3.7.4, 3.7.7, 3.7.14, 3.8.1.1, 3.8.1.2 and 3.8.1.3 *(Step 15)* *(See next page for TS details.)*	
	BOP	INVESTIGATE cause of ECW Pump 1C trip. *(Step 16)* ***(Event 4** can be triggered on a signal from the NRC Examiner.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 3 **(Examiner Trigger)**

Event Description: Over current trip on ECW Pump 1C. **(TS)**

Time	Position	Required Operator Actions	Notes

Tech Specs Information:

TS 3.7.4, Action a applies. ECW

- With only two essential cooling water loops OPERABLE, within 7 days restore at least three loops to OPERABLE status or apply the requirements of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

TS 3.8.1.1, Action b & d applies. ESF DG

- With a standby diesel generator inoperable, demonstrate the OPERABILITY of the above-required A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. If the standby diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE standby diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2) for each such standby diesel generator separately within 8 hours1 unless it can be demonstrated there is no common mode failure for the remaining diesel generator(s). Within 14 days restore the inoperable standby diesel generator to OPERABLE status or apply the requirements of the CAMP, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

NOTE: TS 3.5.2 SI, 3.6.2.1 CS, 3.6.2.3 RCFCs, 3.7.3, CCW, TS 3.7.7 CRE HVAC, 3.7.14 Ess. Chill Water cascade in inoperability due to this event. All have an Action a that is similar to Action a in TS 3.7.4.

NOTE: TS 3.8.1.2 and 3.8.1.3 Do NOT Apply.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 4 **(Examiner Trigger)**			
Event Description: Feedwater Header Pressure Transmitter, PT-0558, fails to an intermediate position.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	Acknowledges and announces annunciators: • "SG STM/FW FLOW MSMTCH" on all SGs *(The combination of these four alarms is a direct entry for 0POP04-FW-0002, SGFPT Trip.)*	
	BOP	Determines Feedwater Header Pressure PT-0558 has failed. Performs required immediate actions of 0POP04-FW-0002: • Checks SGFP Master Speed Controller and determines it is NOT responding appropriately in Automatic. • Takes manual control of SGFP Master Speed Controller and adjusts output to match feedwater flow to steam flow. *(Steps 1 and 2 are immediate action steps. No SGFPTs are tripped for step 1.)*	
	SRO	Enters 0POP04-FW-0002, Steam Generator Feed Pump Trip.	
	BOP	CHECK SGFPT's – required number running. *(Step 1.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 4 **(Examiner Trigger)** **Event Description:** Feedwater Header Pressure Transmitter, PT-0558, fails to an intermediate position.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	CHECK SGFP Master Speed Controller: • Controller - Operable in Automatic • Steam Header Pressure PT-557 status – OPERABLE • Feedwater Pump Discharge Pressure PT-558 status – OPERABLE • Controlling Steam Flow Channels – OPERABLE **(RNO)** PERFORM the following: • PLACE SGFP Master Speed Controller in Manual • ADJUST controller output to match feedwater flow to steam flow. • IF SGFP Master Speed Controller is NOT operable in Automatic or Manual, THEN CONTROL individual SGFP Speed Controllers in Manual to match feedwater flow to steam flow. *(Step 2.0)* *(The PT-558 failure should be revealed during this step if not already done.)*	
	BOP	CHECK Feedwater FLOW – ADEQUATE FOR CURRENT STEAM DEMAND. *(Step 3.0)* *(By now, the BOP operator should have lowered the output of the SGFP Master Speed Controller sufficiently to match feed flow with steam flow.)*	
	BOP	CHECK SGFP Recirculation Valve status: • CHECK SGFP Recirculation Valve On Running SGFP(s) – STABLE AND RESPONDING IN AUTOMATIC • CHECK SGFP Recirculation Valve On Tripped SGFP - CLOSED *(Step 4.0)* *(Should be responding in Automatic)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 4 **(Examiner Trigger)** **Event Description:** Feedwater Header Pressure Transmitter, PT-0558, fails to an intermediate position.			
Time	**Position**	**Required Operator Actions**	**Notes**
	BOP	MONITOR Reactor Power - GREATER THAN OR EQUAL TO 5% *(Step 5.0)*	
	BOP	MONITOR SG NR Levels - TRENDING TO PROGRAM LEVEL *(Step 6.0)*	
	BOP	CHECK Feedwater/Steam Header DP - • GREATER THAN OR EQUAL TO DP REQUIRED PER ADDENDUM 3 OR • SGFP Master Speed Controller at 100% demand in Auto *(Step 7.0)* *(BOP may have to make manual adjustments to SGFP Master Speed Controller to maintain Feedwater/Steam Header DP per Addendum 3. Example - for 75% power the DP needs to be about 137psi.)*	
	BOP	CHECK DELTA I Within the Required Band For Current Reactor Power *(Step 8.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 4 **(Examiner Trigger)**

Event Description: Feedwater Header Pressure Transmitter, PT-0558, fails to an intermediate position.

Time	Position	Required Operator Actions	Notes

	BOP	CHECK Steam Dumps status:
		• CHECK Steam Dumps - in Tave mode
		• MONITOR the following:
		  • UI-0555 - at minimum demand
		  • Steam Dumps are closed.
		• RESET Steam Dump Controller (C-7) by momentarily placing the Steam Dump "MODE SEL" Switch to the "RESET" position
		• CHECK PERM Lampbox 5M24 Window D2 "C7 TURB IMP PRESS STM DUMP PERMISSIVE" extinguished"
		• CHECK the "STEAM DUMP UNBLOCK AVAILABLE" light extinguished
		(Step 9.0)
		(The operator will reset C7 if it actuated during the event.)	

	BOP	CHECK SGFP Speed - LESS THAN OR EQUAL TO 5,400 RPM OR 5,500 RPM With A Flow Greater Than 8250 GPM *(Step 10.0)* *(**Event 5** can occur here since SRO and BOP have essentially completed the steps of 0POP04-FW-0002, Steam Generator Feed Pump Trip.)*	
	SRO	INITIATE Corrective Action For Failed Component. *(Step 11.0)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	ALL	Notice indications of a loss of offsite power. *(There will be multiple alarms at the initiation of the LOOP)*	
	SRO	Enters 0POP05-EO-EO00, Reactor Trip or safety Injection, and ensures immediate actions are performed.	
	RO	Completes immediate actions of 0POP05-EO-EO00 and determines: • Reactor is tripped (Step 1) • Turbine is tripped (Step 2) • **AC ESF Busses are NOT energized (The next Required Operator Actions list the RNO actions for Step 3)** • Check SI status (Step 4) *(RO will complete immediate actions. BOP Operator will monitor the plant and make an announcement of the Reactor trip.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO	VERIFY Power to AC ESF Busses: • AC ESF busses – AT LEAST ONE ENERGIZED • 4.16KV ESF bus • 480V ESF LCs • 480V ESF MCCs **(RNO)** • PERFORM the following: • RESTORE power to at least one AC ESF bus by EMERGENCY STARTING STBY DG. • WHEN STBY DG is running, THEN ENSURE STBY DG Output Breaker CLOSED. • ENSURE "SPLY" and "OUTP" breakers for "4.16KV/480V XFMR"(s) – CLOSED • **IF power can NOT be restored to at least one AC ESF bus. THEN GO TO 0POP05-EO-EC00, LOSS OF ALL AC POWER, Step 1 AND MONITOR Critical Safety Functions** *(0POP05-EO-EO00, Step 3)* *(With ESF DG 13 already OOS and a Generator Differential Trip on ESF DGs 11 & 12, the SRO will enter 0POP05-EO-EC00.)*	
	SRO	Enters 0POP05-EO-EC00, Loss of ALL AC Power, and ensures immediate actions are performed.	
	RO	Completes immediate actions of 0POP05-EO-EO00 and determines: • Reactor is tripped *(EC00 Step 1)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	BOP	Completes immediate actions of 0POP05-EO-EC00 and determines: • Turbine is tripped *(EC00 Step 2)*	

	RO	ESTABLISH RCP Seal Injection Flow:
		• CHECK power available to PDP
		• MONITOR VCT level - GREATER THAN 3%
		• MONITOR RCP seal 1 inlet and lower seal water bearing temperatures on Plant Computer display RC-010 OR RC-011 – ALL LESS THAN 230°F
		  • T0181, T0417 RCP 1A
		  • T0182, T0437 RCP 1B
		  • T0183, T0457 RCP 1C
		  • T0184, T0477 RCP 1D
		• OPEN PDP recirculation valve to 100%
		• START PDP
		(RNO)
		• IF PDP can NOT be started, THEN GO TO Step 4.
		(EC00 Step 3)
		(The operator will probably try to start the PDP prior to seal 1 inlet temperatures reaching 230°F, however, the PDP will NOT start.)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO **CT-22**	CHECK If RCS Is Isolated: • Pressurizer PORVs – CLOSED **(RNO)** • **IF pressurizer pressure LESS THAN 2335 PSIG, THEN manually CLOSE PORVs.** **(Back to A/ER)** • Letdown orifice header isolation valve – CLOSED • DISPATCH operator to close the RCP seal return OCIV • 1-CV-MOV-0079 *(EC00 Step 4)* ***(PZR PORV, RC-PCV-0655A, is OPEN and must be Manually CLOSED.)***	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	BOP CT-23	VERIFY AFW Flow - GREATER THAN 576 GPM • AFW pump 14(24) - IN SERVICE • **ESTABLISH Cross Connections Of Intact SG(s) While Maintaining Flow GREATER THAN 576 GPM** *(EC00 Step 5)* ***(This step will require the operator to open AFW Train D Cross Connect, FV-7518, AND at least one other AFW Cross Connect, FV-7517 {Train A} OR FV-7516 {Train B} OR FV-7515 {Train C})***	
	AO	*(In addition, this step requires coordination with a Plant Operator to manually OPEN AFW OCIVs and THROTTLE AFW reg valves in at least one of the de-energized Trains of AFW.)* *(NOTE: Total AFW flow is also limited to less than 675 gpm for one pump based on pump run out.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	BOP CT-24	**TRY TO Restore Power To Any AC ESF Bus:**
		• ENERGIZE AC ESF bus with DG:
		  • START STBY DG – EMERGENCY START
		  • VERIFY AC ESF bus automatically energized
		(RNO)
		• PERFORM the following:
		  • Manually ENERGIZE AC ESF bus.
		  • IF bus can NOT be energized, THEN:
		  • TRIP STBY DG.
		  • **ENERGIZE AC ESF bus from the emergency transformer per ADDENDUM 1, TRANSFER ESF BUSSES TO THE EMERGENCY TRANSFORMER.**
		(EC00 Step 6)
		(EC00 Add. 1 starts with the next Required Operator Action. Completion of EC00 Add. 1 satisfies the Critical Task when performed prior to placing ESF equipment in the PTL position.)	

	BOP	VERIFY power available from the emergency transformer *(EC00 Add 1 Step 1)* *(Since ECW Pump 1C tripped earlier and is NOT available, the next preferred Bus to energize is 4.16KV E1A.)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	BOP	OPEN feeder breakers from normal power source to deenergized ESF busses: • E1A • STBY BUS 1F TO XFMR E1A BKR SW – NORM *(EC00 Add 1 Step 2)*	
	BOP	OPEN motor operated disconnects from normal power source to deenergized ESF busses: • E1A • STBY BUS 1F TO XFMR E1A DISC SW – NORM *(EC00 Add 1 Step 3)*	
	BOP	VERIFY OPEN emergency feeder breakers from 1L to ESF busses: • E1A • EMER BUS 1L TO XFMR E1A BKR SW – EMER *(EC00 Add 1 Step 4)*	
	BOP	CLOSE motor operated disconnects from emergency bus 1L to one deenergized ESF bus: • E1A • EMER BUS 1L TO XFMR E1A DISC SW – EMER *(EC00 Add 1 Step 5)*	
	BOP	CLOSE emergency transformer feeder breaker to emergency bus 1L: • EMER XFMR TO BUS 1K/1L SPLY *(EC00 Add 1 Step 6)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	BOP	CLOSE emergency feeder breakers from emergency bus 1L to energize desired ESF transformer: • E1A • EMER BUS 1L TO XFMR E1A BKR SW – EMER *(EC00 Add 1 Step 7)*	
	BOP	CLOSE supply breaker from ESF transformer to ESF bus *(EC00 Add 1 Step 8)*	
	BOP	Manually ENERGIZE AC ESF bus. • 480V ESF LCs • 480V ESF MCCs *(EC00 Add 1 Step 9)* *(Closes the two OUTP BKRs {E1A/2E and E1A/2A} to 480V LCs E1A1 and E1A2.)*	
	SRO	VERIFY procedure Step 7 RNO ADDENDUM 4, VITAL DC BUS MONITORING – INITIATED **(RNO)** RETURN TO procedure Step 6.b. *(EC00 Add 1 Step 10)*	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5 **Event No.:** 5 (**Examiner Trigger**), 6 (**5 seconds after ESF DG Output BKRs close**) & 7 (**2 minutes after RX Trip**)

Event Description: **Event 5 -** Loss of offsite power causes a reactor trip. The Emergency Transformer will still be available.
Event 6 - Generator Differential Trip on ESF DGs #11 and #12. Crew enters 0POP05-EO-EC00, Loss of all AC Power. **(2 Critical Tasks – NOTE: PDP will fail to start)**
Event 7 - Pressurizer PORV PCV-0655A opens and must be manually closed. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	BOP	• CHECK AC ESF busses - AT LEAST ONE ENERGIZED
		• START applicable ECW pump (ECW Pump 1A)
		• PERFORM the following:
		  • RETURN TO procedure and step in effect
		  • IMPLEMENT Functional Restoration Procedures
		(EC00 Step 6.b, c & d)
		Terminate Scenario	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**CT-22 MANUALLY CLOSE PZR PORV RC-PCV-0655A PRIOR TO COMPLETING STEP 4 OF 0POP05-EO-EC00, LOSS OF ALL AC POWER**	Manually close the open PZR PORV before completing step 4 of EC00 SAFETY SIGNIFICANCE -- Failure to close the PORV under the postulated plant conditions constitutes "mis-operation or incorrect crew performance which leads to degradation of any barrier to fission product release." In this case, the RCS fission-product barrier can be restored to full integrity simply by closing the PORV manually from the control room. Therefore, failure to close the PORV also represents a "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plant safety." The open PORV greatly increases the rate at which RCS inventory is depleted, at a time when the lost inventory cannot be replaced by active injection. Thus, failure to close the PORV defeats the basic purpose of EC00.	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**CT-23** **ESTABLISH CROSS CONNECTIONS OF INTACT SG(S) WHILE MAINTAINING FLOW GREATER THAN 576 GPM** ***NOTE: SG 1D must be cross connected to at least one of the other SGs by opening AFW Train D Cross Connect, FV-7518, AND at least one other AFW Cross Connect, FV-7517 {Train A} OR FV-7516 {Train B} OR FV-7515 {Train C}.*** ***In addition, coordination is required with a Plant Operator to manually OPEN AFW OCIVs and THROTTLE AFW reg valves in at least one of the de-energized Trains of AFW to establish a total of at least 576 gpm AFW flow to at least 2 intact SGs.***	Establish a total of at least 576 GPM AFW flow to at least 2 intact SGs prior to completing step 5 of EC00 SAFETY SIGNIFICANCE -- Failure to establish the minimum required AFW flow rate, under the postulated plant conditions, results in "adverse consequence(s) or a significant degradation in the mitigative capability of the plant." The analyses also show that the crew could dramatically delay the adverse consequences of a continued ac power outage by initiating a plant cooldown. Without ac power, the crew would accomplish the cooldown through SG depressurization using the SG PORVs and the turbine-driven AFW pump. The cooldown would decrease the RCS temperature and pressure, reducing the RCP seal leakage rates. The decrease in RCS pressure would also allow the injection of the accumulator water to help replenish the RCS inventory and to add negative reactivity with the boron addition. Failure to establish minimum AFW flow (under the postulated conditions) is a violation of the basic objective of EC00 and of the assumptions of the analyses upon which ECOO is based. Both intend to mitigate deterioration of RCS conditions while ac emergency power is not available. Without AFW flow, the SGs could not support any significant plant cooldown. Thus, the crew would lose the ability to delay the adverse consequences of core uncovery. Also without AFW flow, decay heat would still open the SG safety valves and would rapidly deplete the SG inventory, leading to a loss of secondary heat sink, or SG dryout. Decay heat would then increase RCS temperature and pressure until the pressurizer PORVs open, imposing a larger LOCA than RCP seal leakage. Both of these examples violate the basic assumptions of the analyses on which ECOO is based, complicating the mitigation actions.	

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
	CT-24 ENERGIZE AN ESF 4.16KV BUS FROM THE EMERGENCY TRANSFORMER BEFORE PLACING SAFEGUARDS EQUIPMENT HANDSWITCHES IN THE PULL-TO-LOCK POSITION.	Energize at least one ac emergency bus before transition out of EO00, unless the transition is to EC00, in which case the critical task must be performed before placing safeguards equipment handswitches in the pull-to-lock position SAFETY SIGNIFICANCE -- Failure to energize an ac emergency bus constitutes "mis-operation or incorrect crew performance which leads to degraded emergency power capacity." Failure to perform the critical task also results in needless degradation of a barrier to fission product release, specifically of the RCS barrier at the point of the RCP seals. Additionally, failure to perform the critical task results in the unnecessary continuation of a situation in which RCS inventory is being lost uncontrollably and cannot be replaced. This situation is equivalent to "mis-operation or incorrect crew performance which leads to degraded ECCS…capacity" at a time when a small-break LOCA is in progress.	

NOTE: (Per NUREG-1021, Appendix D)
If an operator or the Crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.

EXPECTED BOOTH COMMUNICATIONS

EVENT 1:

There are no Booth Communications expected for Event 1.

EVENT 2:

- As a Plant Operator, when dispatched to check EAB Battery Room Exhaust Fans, report the following:
  - Fan 11C PD indicator, 1-HE-PDIS-9572, is reading low (almost 0) and the fan is making a loud noise and vibrating; *if the crew has not secured the fan yet.*
  - Fan 11B breaker is in the tripped position
- As Electrical Maintenance or the Duty Maintenance Supervisor, if notified of the status of EAB Battery Room Exhaust Fans, report that an Electrical maintenance crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge issue with EAB Battery Room Exhaust Fans. No further action is necessary.

EVENT 3:

- As a Plant Operator, when dispatched to check ECW Pump 1C, report the following:
  - ECW Pump 1C locally does not appear to have any problems.
  - ECW Pump 1C breaker indicates an overcurrent
- As Electrical Maintenance or the Duty Maintenance Supervisor, if notified about ECW Pump 1C, report that a Maintenance crew is being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the failure of ECW Pump 1C. No further action is necessary.

EVENT 4:

- As a Plant Operator, if asked to check Feedwater Pressure Transmitter, PT-0558, report that there are no indications of a problem locally.
- As the Duty Maintenance Supervisor, if notified of Feedwater Pressure Transmitter, PT-0558, report that appropriate maintenance crews are being assembled for support. No further action is necessary.
- As Operations Manager, acknowledge the issue with Feedwater Pressure Transmitter, PT-0558. No further action is necessary.

EVENT 5:

- There are no Booth Communications expected for Event 5.

EVENT 6:

- There are no Booth Communications expected for Event 6.

EVENT 7:

- There are no Booth Communications expected for Event 7.

EXPECTED BOOTH ACTIONS

1. If asked to open the Deaerator High Level Dump Bypass Valves then trigger the step for ‘DA HLD Bypass Valves FW-486 & FW-487’.
2. If asked to fill the AFWST then trigger the step for ‘AFWST Makeup’.
3. If asked to place the SG PORV Station Blackout Switches to BYP, then trigger the step ‘SG PORV SBO Switches to BYP’

SIMULATOR SETUP

NOTE

ALL Annunciator Response Procedures (ARP's) must be checked if this scenario is the first to be run on this day. Setup for subsequent runs of this scenario only requires those ARP's that were actually marked in to be checked.

Instructors running the scenario must keep track of which ARP's these are, otherwise, all will have to be checked for subsequent scenarios as well.

Each time before running the scenario check and/or clean the following:									
Specific Scenario Procedures	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
0POP03-ZG-0008, Power Operations									
0POP09-AN-22M3 C-3									
0POP02-HE-0001, Electrical Auxiliary Building HVAC System									
0POP09-AN-02M4 C-7									
0POP04-FW-0002, Steam Generator Feed Pump Trip									
0POP05-EO-EO00, Reactor Trip or Safety Injection									
0POP05-EO-ES01, Reactor Trip Response									
0POP05-EO-EC00, Loss of all AC Power									
Other Procedures Used By Students During Scenario Including POP09s.	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
Miscellaneous Items to Restore	**1st √**	**Peer √**	**2nd √**	**Peer √**	**3rd √**	**Peer √**	**4th √**	**Peer √**	**After Last Scenario**
STA ICS Screens to PD Menu									
All ICS Trends to normal (not scenario specific)									
Student Selected ICS Points changed to U1118									
Control Panel ICS Screens to Normal									
RM 11 History and Screens									
RM 23 – No Alarm Indications									

SIMULATOR SETUP (cont'd.)

NOTE

The Scenario Lesson Plan MUST be run from the left most Instructor Station in Simulator Booth to allow for recording and storing of recorded parameter data.

- Log into Instructor Workstation as 'lotnrc' user, open Orchid (nstps server), then 'Unlock' Initial Conditions Group 'lotnrc'.
- Reset to IC #205 and perform the following:
  - Switch Check
  - Ensure red light on end of CP-010 off
  - Ensure ICS Annunciators have stopped counting up
- Go to RUN and perform the following:
  - Ensure Simulator is ready by performing applicable checkoffs from LOR-GL-0006, LOR Conduct of Simulator Training Guidelines, Addendum 5, Simulator Readiness Checklist.
  - Ensure VCT Makeup Integrators are set as follows:
    - Momentarily place RC M/U CONT to STOP and then START to reset BA BATCH/GALLONS and TOT M/U BATCH/GALLONS counters to zero.
    - Reset BA BATCH/GALLONS setpoint to 0 gallons and reset TOT M/U BATCH/GALLONS setpoint to 100 gallons.
    - Verify BA Controller Pot setting is 3.80
- Hang following ECO/Caution Tags:
    - AFW Pump #11 Handswitch in PTL
- Open lesson plan for 'Scenario 5' in 'lotnrc' directory for LOT 23, then EXECUTE lesson plan. These actions will set up any initial conditions for the scenario.
- If this scenario IC has changing conditions (i.e. Xenon is changing, etc.), then place the simulator in FREEZE, otherwise it is OK to leave in RUN.
- Run the scenario in accordance with the next section, 'Scenario Instructions'.

SCENARIO INSTRUCTIONS

NOTE
Steps 1 to 4 below can be performed in the LOR Debrief Room prior to the crew coming into the Simulator provided exam security measures are taken.

1. Provide Shift Turnover sheets to the crew and review the information.
2. Have the Crew perform a Pre-Job Brief. Ensure the crew doesn't have any other questions about the Shift Turnover.
3. Ensure the Beacon book from the simulator is available to the crew if they are in the LOR Debrief Room.
4. Review the Simulator Differences list with the crew if needed.
5. When signaled by Simulator Staff, have the crew perform their board walkdown and inform the floor instructor when ready to take the watch.
6. Ensure the simulator is in RUN and verify simulator clock is set correctly. Note the time that the Crew takes the watch. _____ Start Time.

NOTE

Malfunction Step and/or Lesson Plan Steps (Events) are triggered upon the Lead Examiners signal during the scenario unless an agreed upon time is discussed with the examiner prior to the start of the scenario.

Always 'TRIGGER' events in the Simulator Scenario Lesson Plans. This way delays associated with events will take place as intended.

Refer to 'EXPECTED BOOTH COMMUNCATIONS' and 'EXPECTED BOOTH ACTIONS' Sections for instructions for Instructor actions during the scenario.

7. Trigger the step titled 'Start Chart' and ensure specified Recorded Parameters for the scenario begin recording as the scenario runs. If the chart speed is NOT set to 5400 seconds (90 minutes) then perform the following:
   - Under 'CHARTS' click on 'SET TIME'
   - In the dialog box enter 5400 seconds (90 minutes)
   - Click OK.
8. The Crew will perform Event #1.
9. Trigger **MALFUNCTION STEP –** This will insert Step #1, Event #2.
10. Trigger **STEP 2 –** Event #3
11. Trigger **STEP 3 –** Event #4
12. Trigger **STEP 4 –** Event #5
13. Place simulator in FREEZE when cued by the Lead Examiner to terminate scenario.
14. DO NOT RESET simulator until the steps on the next page are completed and all Examiners have completed Follow-Up Questioning.

SCENARIO INSTRUCTIONS (cont'd.)

NOTE
Some scenarios will have more than one chart. For these, each chart file must be separately saved with a unique filename.

15. Saving Recorded Parameters Data
    - Click on the 'Charts' icon on the left side of the screen
    - Select 'Pause' icon, then select 'All'
    - Click on the 'Print Chart' icon, then select 'All'
    - This will bring up a window in the TASK BAR called PRIMOPDF.
    - Click on 'Create PDF'
    - This will bring up a File Save As window.
    - Save to folder **c:\Users\lotnrc\Desktop\LOT23 Charts**. The file name will be 'LOT22 Scenario 5' followed by a name that identifies the crew (e.g. 'Crew A).
    - Save the new file. It will be saved in a folder already on the desktop. LOT23 Charts.
16. Saving Scenario SAM (Simulator Action Monitor)
    - Under 'TOOLS' click on 'SAM'
    - In the dialog box that comes up click on 'SAVE TO'
    - Save as a 'TEXT FILE' to folder **c:\Users\lotnrc\Desktop\LOT23 Charts.** The file name will be 'LOT23 SAM INFO Scenario 5' followed by a name that identifies the crew (e.g. 'Crew A).

SCENARIO - 05

	0POP01-ZQ-0022		
Plant Operations Shift Routines			
For Training Only	Shift Turnover Checklist		Page 1 of 1

PART I - To be completed prior to shift turnover.

Unit: **1** Off- Going Shift: **Days / Nights** Date: **Today** Mode: **1**

Dilution			Boration			Control Rods		
Current Setpoint	1% Pwr Change	1° F Change	Current Setpoint	1% Pwr Change	1° F Change	Current Position	1% Pwr Change	1° F Change
100	**130**	**114**	**0** flushing with	**29**	**25**	**218**	**7**	**6**
As Required			As Required			As Required		

ΔI Target	Channel	RCS Boron
4.02%	**U1144**	**1378**

Unit 1 Status

- Operating at 80% power
- Core burnup is 150 MWD / MTU

Load Reduction:

- 100-90%/1hr = **162**
- 100-80%/10min = **382**
- 100-75%/30min = **444**
- 100-60%/1hr = **620**
- 100-50%/10min = **925**

Information:

- AFW Pump #11 is Out of Service.
- SGFPT #13 tripped on the previous shift and reactor power was reduced to 80%.
- Management now requests the crew lower reactor power to 65% using section 6.0 of 0POP03-ZG-0008, Power Operations, in order to ensure adequate feedwater margin until SGFPT #13 can be repaired.
- The crew is to start at step 6.7 of 0POP03-ZG-0008, Power Operations. The previous crew armed the main Steam to DA valves & placed the Main Turbine in IMP-IN, step 6.10 and also CLOSED 1-FW-MOV-0108, Feedwater Heater 11A/11B Bypass Isolation, step 6.11. The crew was diluting about 100 gallons every 10 minutes while stabilized at 80% for turnover.
- BAT 1A & 1B Concentrations are 7300 ppm
- Fuel Handling Building truck bay doors are closed
- No personnel are in containment
- Ron Gibbs has the duty
- The NLO compliment is 5 watch standers and a head operator

ECO/LCO/RAsCAL:

None

Facility: South Texas Project **Date of Exam: 7-15-18** **Operating Test No.: LOT 23**

APPLICANT Crew A	EVENT TYPE	Scenarios 1			5									TOTAL	MINIMUM(*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO-1 ■ SRO-I □ SRO-U □	RX					1								1	1	1	0
	NOR													0	1	1	1
	I/C			2,4,6		3,6,7								6	4	4	2
	MAJ			5		5								2	2	2	1
	TS													0	0	2	2
RO □ SRO-I1 ■ SRO-U □	RX		1		1									2	1	1	0
	NOR													0	1	1	1
	I/C		3,7		2,3,4,6,7									7	4	4	2
	MAJ		5		5									2	2	2	1
	TS				2,3									2	0	2	2
RO □ SRO-I □ SRO-U1 ■	RX	1					1							2	1	1	0
	NOR													0	1	1	1
	I/C	2,3,4,6,7					2,4,6							8	4	4	2
	MAJ	5					5							2	2	2	1
	TS	2,3												2	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls" (ATC) and "balance-of-plant" (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: South Texas Project	Date of Exam: 7-15-18	Operating Test No.: LOT 23

APPLICANT Crew B	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			5			4									
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO-2 ■ SRO-I □ SRO-U □	RX					1				4				2	1	1	0
	NOR									1				1	1	1	1
	I/C			2,4,6		3,6,7				6				7	4	4	2
	MAJ			5		5				5				3	2	2	1
	TS													0	0	2	2
RO □ SRO-I2 ■ SRO-U □	RX	1					1		4					3	1	1	0
	NOR													0	1	1	1
	I/C	2,3,4,6,7					2,4,6		3					9	4	4	2
	MAJ	5					5		5					3	2	2	1
	TS	2,3												2	0	2	2
RO-2 □ SRO-I3 ■ SRO-U □	RX		1		1			4						3	1	1	0
	NOR							1						1	1	1	1
	I/C		3,7		2,3,4,6,7			3						8	4	4	2
	MAJ		5		5			5						3	2	2	1
	TS				2,3			2,3						4	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls" (ATC) and "balance-of-plant" (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: South Texas Project	Date of Exam: 7-15-18	Operating Test No.: LOT 23

APPLICANT Crew C	EVENT TYPE	Scenarios 1 CREW POSITION SRO	1 ATC	1 BOP	2 CREW POSITION SRO	2 ATC	2 BOP	4 CREW POSITION SRO	4 ATC	4 BOP	CREW POSITION SRO	CREW POSITION ATC	CREW POSITION BOP	TOTAL	MINIMUM(*) R	I	U
RO-3 ■ SRO-I □ SRO-U □	RX						1			4				2	1	1	0
	NOR									1				1	1	1	1
	I/C			2,4, 6			2,4, 5,7			6				8	4	4	2
	MAJ			5			6			5				3	2	2	1
	TS													0	0	2	2
RO □ SRO-I4 ■ SRO-U □	RX	1				1			4					3	1	1	0
	NOR													0	1	1	1
	I/C	2,3, 4,6, 7				3,4, 5			3					9	4	4	2
	MAJ	5				6			5					3	2	2	1
	TS	2,3												2	0	2	2
RO □ SRO-I5 ■ SRO-U □	RX		1		1			4						3	1	1	0
	NOR							1						1	1	1	1
	I/C		3,7		2,3, 4,5, 7			3						8	4	4	2
	MAJ		5		6			5						3	2	2	1
	TS				3,4			2,3						4	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls" (ATC) and "balance-of-plant" (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: South Texas Project	Date of Exam: 7-15-18	Operating Test No.: LOT 23

APPLICANT Crew D	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			4									
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO-4 ■ SRO-I ☐ SRO-U ☐	RX						1		4					2	1	1	0
	NOR													0	1	1	1
	I/C			2,4,6			2,4,5,7		3					8	4	4	2
	MAJ			5			6		5					3	2	2	1
	TS													0	0	2	2
RO ☐ SRO-I6 ■ SRO-U ☐	RX		1		1					4				3	1	1	0
	NOR									1				1	1	1	1
	I/C		3,7		2,3,4,5,7					6				8	4	4	2
	MAJ		5		6					5				3	2	2	1
	TS				3,4									2	0	2	2
RO ☐ SRO-I7 ■ SRO-U ☐	RX	1				1		4						3	1	1	0
	NOR							1						1	1	1	1
	I/C	2,3,4,6,7				3,4,5		3						9	4	4	2
	MAJ	5				6		5						3	2	2	1
	TS	2,3						2,3						4	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls" (ATC) and "balance-of-plant" (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: South Texas Project	Date of Exam: 7-15-18	Operating Test No.: LOT 23

APPLICANT Crew E	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		5			2												
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO-5 ■ SRO-I ☐ SRO-U ☐	RX		1				1							2	1	1	0
	NOR													0	1	1	1
	I/C		3,6,7				2,4,5,7							7	4	4	2
	MAJ		5				6							2	2	2	1
	TS													0	0	2	2
RO ☐ SRO-I8 ■ SRO-U ☐	RX	1				1								2	1	1	0
	NOR													0	1	1	1
	I/C	2,3,4,6,7				3,4,5								8	4	4	2
	MAJ	5				6								2	2	2	1
	TS	2,3												2	0	2	2
RO ☐ SRO-I ☐ SRO-U2 ■	RX			1	1									2	1	1	0
	NOR													0	1	1	1
	I/C			2,4,6	2,3,4,5,7									8	4	4	2
	MAJ			5	6									2	2	2	1
	TS				3,4									2	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls" (ATC) and "balance-of-plant" (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: South Texas Project	Date of Exam: 7-15-18	Operating Test No.: LOT 23

APPLICANT Crew F	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		5			2			4									
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I9 ■ SRO-U ☐	RX		1		1					4				3	1	1	0
	NOR									1				1	1	1	1
	I/C		3,6, 7		2,3, 4,5, 7					6				9	4	4	2
	MAJ		5		6					5				3	2	2	1
	TS				3,4									2	0	2	2
RO ☐ SRO-I10 ■ SRO-U ☐	RX			1		1		4						3	1	1	0
	NOR							1						1	1	1	1
	I/C			2,4, 6		3,4, 5		3						7	4	4	2
	MAJ			5		6		5						3	2	2	1
	TS							2,3						2	0	2	2
RO ☐ SRO-I11 ■ SRO-U ☐	RX	1					1		4					3	1	1	0
	NOR													0	1	1	1
	I/C	2,3, 4,6, 7					2,4, 5,7		3					10	4	4	2
	MAJ	5					6		5					3	2	2	1
	TS	2,3												2	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls" (ATC) and "balance-of-plant" (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a one-for-one basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: South Texas Project	Date of Examination: 7-15-18				Operating Test No.: LOT 23											
Competencies	APPLICANTS – Crew A															
	RO ☐ SRO-I ☐ SRO-U1 ■				RO ☐ SRO-I1 ■ SRO-U ☐				RO-1 ■ SRO-I ☐ SRO-U ☐							
	SCENARIO				SCENARIO				SCENARIO							
	1u	6b			1a	6u			1b	6a						
Interpret/Diagnose Events and Conditions	2,3, 4	2,4, 6			3	2,3, 4,6, 7			2,4, 6	3,6, 7						
Comply With and Use Procedures (1)	All	2,4, 6			1,3, 7	All			2,4, 6	3,6, 7						
Operate Control Boards (2)	N/A	2,4, 5,6			1,3, 5,7	N/A			2,4, 5,6	3,5, 6,7						
Communicate and Interact	All	All			All	All			All	All						
Demonstrate Supervisory Ability (3)	All	N/A			N/A	All			N/A	N/A						
Comply With and Use Tech. Specs. (3)	2,3	N/A			N/A	2,3			N/A	N/A						

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Forms ES-303-1 and ES-303-3 describe the competency rating factors.)

Facility: South Texas Project	Date of Examination: 7-15-18	Operating Test No.: LOT 23

Competencies	APPLICANTS – Crew B															
	RO ☐ SRO-I2 ■ SRO-U ☐				RO ☐ SRO-I3 ■ SRO-U ☐				RO-2 ■ SRO-I ☐ SRO-U ☐							
	SCENARIO				SCENARIO				SCENARIO							
	1u	6b	2a		1a	6u	2u		1b	6a	2b					
Interpret/Diagnose Events and Conditions	2,3, 4	2,4, 6	3,4, 5		3	2,3, 4,6, 7	2,3, 4,5, 7		2,4, 6	3,6, 7	2,4, 5,7					
Comply With and Use Procedures (1)	All	2,4, 6	1,3, 4,5		1,3, 7	All	All		2,4, 6	3,6, 7	1,2, 4,5, 7					
Operate Control Boards (2)	N/A	2,4, 5,6	1,3, 4,5, 6		1,3, 5,7	N/A	N/A		2,4, 5,6	3,5, 6,7	1,2, 4,5, 6,7					
Communicate and Interact	All	All	All		All	All	All		All	All	All					
Demonstrate Supervisory Ability (3)	All	N/A	N/A		N/A	All	All		N/A	N/A	N/A					
Comply With and Use Tech. Specs. (3)	2,3	N/A	N/A		N/A	2,3	3,4		N/A	N/A	N/A					

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Forms ES-303-1 and ES-303-3 describe the competency rating factors.)

Facility: South Texas Project	Date of Examination: 7-15-18	Operating Test No.: LOT 23

Competencies	APPLICANTS – Crew C															
	RO ☐ SRO-I4 ■ SRO-U ☐				RO ☐ SRO-I5 ■ SRO-U ☐				RO-3 ■ SRO-I ☐ SRO-U ☐							
	SCENARIO				SCENARIO				SCENARIO							
	1u	6b	2a		1a	6u	2u		1b	6a	2b					
Interpret/Diagnose Events and Conditions	2,3, 4	2,4, 6	3,4, 5		3	2,3, 4,6, 7	2,3, 4,5, 7		2,4, 6	3,6, 7	2,4, 5,7					
Comply With and Use Procedures (1)	All	2,4, 6	1,3, 4,5		1,3, 7	All	All		2,4, 6	3,6, 7	1,2, 4,5, 7					
Operate Control Boards (2)	N/A	2,4, 5,6	1,3, 4,5, 6		1,3, 5,7	N/A	N/A		2,4, 5,6	3,5, 6,7	1,2, 4,5, 6,7					
Communicate and Interact	All	All	All		All	All	All		All	All	All					
Demonstrate Supervisory Ability (3)	All	N/A	N/A		N/A	All	All		N/A	N/A	N/A					
Comply With and Use Tech. Specs. (3)	2,3	N/A	N/A		N/A	2,3	3,4		N/A	N/A	N/A					

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Forms ES-303-1 and ES-303-3 describe the competency rating factors.)

Facility: South Texas Project	Date of Examination: 7-15-18				Operating Test No.: LOT 23											
Competencies	**APPLICANTS – Crew D**															
	RO ☐ SRO-I6 ■ SRO-U ☐				**RO ☐ SRO-I7 ■ SRO-U ☐**				**RO-R4 ■ SRO-I ☐ SRO-U ☐**							
	SCENARIO				**SCENARIO**				**SCENARIO**							
	2u	**4b**	**5a**		**2a**	**4u**	**5u**		**2b**	**4a**	**5b**					
Interpret/Diagnose Events and Conditions	2,3, 4,5, 7	4,6	3,5		3,4, 5	2,3, 4,6	2,3, 4,5, 6		2,4, 5,7	3,4	4,5					
Comply With and Use Procedures (1)	All	1,4, 6	1,3, 5		1,3, 4,5	2,3, 4,5, 6	2,3, 4,5, 6		1,2, 4,5, 7	3,4, 5	4,5					
Operate Control Boards (2)	N/A	1,4, 5,6	1,3, 5,6		1,3, 4,5, 6	N/A	N/A		1,2, 4,5, 6,7	3,4, 5	4,5, 6					
Communicate and Interact	All	All	All		All	All	All		All	All	All					
Demonstrate Supervisory Ability (3)	All	N/A	N/A		N/A	All	All		N/A	N/A	N/A					
Comply With and Use Tech. Specs. (3)	3,4	N/A	N/A		N/A	2,3	2,3		N/A	N/A	N/A					

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Forms ES-303-1 and ES-303-3 describe the competency rating factors.)

Facility: South Texas Project	Date of Examination: 7-15-18				Operating Test No.: LOT 23											
Competencies	**APPLICANTS – Crew E**															
	RO ☐ SRO-I ☐ SRO-U2 ■				**RO ☐ SRO-I8 ■ SRO-U ☐**				**RO-5 ■ SRO-I ☐ SRO-U ☐**							
	SCENARIO				**SCENARIO**				**SCENARIO**							
	1u	**6b**			**1a**	**6u**			**1b**	**6a**						
Interpret/Diagnose Events and Conditions	2,3, 4	2,4, 6			3	2,3, 4,6, 7			2,4, 6	3,6, 7						
Comply With and Use Procedures (1)	All	2,4, 6			1,3, 7	All			2,4, 6	3,6, 7						
Operate Control Boards (2)	N/A	2,4, 5,6			1,3, 5,7	N/A			2,4, 5,6	3,5, 6,7						
Communicate and Interact	All	All			All	All			All	All						
Demonstrate Supervisory Ability (3)	All	N/A			N/A	All			N/A	N/A						
Comply With and Use Tech. Specs. (3)	2,3	N/A			N/A	2,3			N/A	N/A						

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Forms ES-303-1 and ES-303-3 describe the competency rating factors.)

Facility: South Texas Project	Date of Examination: 7-15-18	Operating Test No.: LOT 23

Competencies	APPLICANTS – Crew F															
	RO ☐ SRO-I9 ■ SRO-U ☐				RO ☐ SRO-I10 ■ SRO-U ☐				RO ☐ SRO-I11 ■ SRO-U ☐							
	SCENARIO				SCENARIO				SCENARIO							
	2u	4b	5a		2a	4u	5b		2b	4a	5u					
Interpret/Diagnose Events and Conditions	2,3, 4,5, 7	4,6	3,5		3,4, 5	2,3, 4,6	4,5		2,4, 5,7	3,4	2,3, 4,5, 6					
Comply With and Use Procedures (1)	All	1,4, 6	1,3, 5		1,3, 4,5	2,3, 4,5, 6	4,5		1,2, 4,5, 7	3,4, 5	2,3, 4,5, 6					
Operate Control Boards (2)	N/A	1,4, 5,6	1,3, 5,6		1,3, 4,5, 6	N/A	4,5, 6		1,2, 4,5, 6,7	3,4, 5	N/A					
Communicate and Interact	All	All	All		All	All	All		All	All	All					
Demonstrate Supervisory Ability (3)	All	N/A	N/A		N/A	All	N/A		N/A	N/A	All					
Comply With and Use Tech. Specs. (3)	3,4	N/A	N/A		N/A	2,3	N/A		N/A	N/A	2,3					

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Forms ES-303-1 and ES-303-3 describe the competency rating factors.)