

Administrative Topics Outline

Facility: SONGS Units 2 and 3		Date of Examination: 10/12/12
Examination Level	RO	Operating Test Number: NRC
Administrative Topic (see Note)	Type Code*	Describe Activity to be Performed
Conduct of Operations (A1)	M, R	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (3.9) JPM: Determine Time to Boil (J213A).
Conduct of Operations (A2)	M, R	2.1.19 Ability to use plant computers to evaluate system or component status (3.9). JPM: Calculate Azimuthal Power Tilt (J250A).
Equipment Control (A3)	N, R	2.2.12 Knowledge of surveillance procedures. (3.7) JPM: Perform a Manual Water Inventory Balance (New).
Radiation Control	-	-
Emergency Plan (A4)	M, S	2.4.39 Knowledge of RO responsibilities in emergency plan implementation. (3.9) JPM: Perform PA/Siren Coordination (J157A).
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; \leq for 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Administrative Topics Outline

Task Summary

- A1 The applicant will use data provided to perform a Time to Boil calculation using SO23-5-1.8.1, Shutdown Nuclear Safety. This is a modified bank JPM.
- A2 The applicant will use provided data from the Core Protection Calculator System to calculate Azimuthal Power Tilt in the core per SO23-3-3.6, COLSS Out of Service Surveillance. This is a modified bank JPM.
- A3 The applicant will use provided data to manually calculate a water inventory balance per SO23-3-3.37, Reactor Coolant System Water Inventory Balance. This is a new JPM.
- A4 The applicant will perform a PA/Siren coordination per SO23-VIII-30, Units 2/3 Operations Leader Duties. This JPM will be conducted in the simulator. This is a modified bank JPM.

Facility: SONGS JPM # NRC JPM A-1 Task # 176136 K/A # G 2.1.25 3.9 / 4.2Title: Calculate RCS Time-To-Boil Margin

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: xActual Performance: x

Simulator: _____

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions during a refueling outage on Unit 3:

- The Reactor was tripped 45 days ago.
- RCS level is 30" above the bottom of the hot leg.
- Core Exit Temperature (Thot) is 95°F.
- Fuel is loaded into the core.
- There are 72 new fuel assemblies.
- No Time to Boil transmittal has been provided by Reactor Engineering.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Calculate RCS Time to Boil margin using SO23-5-1.8.1, Shutdown Nuclear Safety, Attachment 7, Calculation of RCS Time-To-Boil Margin/Boil-Off Rate.
- Document the Time to Boil margin on the Cue Sheet.

Task Standard: Calculated the RCS Time to Boil.

Required Materials: SO23-5-1.8.1, Shutdown Nuclear Safety, Attachment 7, Calculation of RCS Time-To-Boil Margin/Boil-Off Rate.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:Result: SAT  UNSAT 



Examiner (Print / Sign): _____ Date: _____



CLASSROOM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO23-5-1.8.1, Shutdown Nuclear Safety, Attachment 7, Calculation of RCS Time-To-Boil Margin/Boil-Off Rate.



√ - Check Mark Denotes Critical Step



START TIME:

Perform Step: 1 √ 1.1	Record the Time-to-Boil Margin (BMref) based on a reference Hot Leg level of 26 inches from Table A. (If an outage specific Time-to-Boil Margin Data Transmittal has been prepared by Reactor Engineering (located in the Ops. Physics Summary book), then that Time-to-Boil Margin value should be used.	
Standard:	RECORDED 48.12 minutes (acceptable range 48.1 – 48.2) Interpolation required for 45 days since Reactor trip. $(45.18 + 51.06) / 2 = 48.12$	
Comment:	SAT  UNSAT 	

Perform Step: 2 √ 1.2	Record the Level Correction Factor (Lcf) based on the level to which you are draining from Table B.	
Standard:	RECORDED 1.031 from Table B, corresponding to a level of 30" above the bottom of the hot leg.	
Comment:	SAT  UNSAT 	

Perform Step: 3 √ 1.3, 1.3.1	Record the Temperature Correction Factor (Tcf) based on one of the following temperature correction equations: For TE levels: Use: $Tcf = (212 - THOT) / 92$	
Standard:	RECORDED Tcf as 1.27 (acceptable range 1.270 – 1.272) $Tcf = (212 - 95) / 92$ $Tcf = 1.2717$	
Comment:	SAT  UNSAT 	

Perform Step: 4√ 1.4, 1.4.2	Record the New Fuel Correction Factor (Ncf). Use the following decay heat correction factor which represents the reload Reactor Core status: For New Fuel Assemblies (Not Irradiated) less than or greater than 108, Use: $Ncf = \frac{217 \text{ Irradiated Assemblies}}{217 \text{ Irradiated Assemblies} - \# \text{ of New Assemblies}}$	
Standard:	RECORDED Ncf of 1.50 (acceptable range 1.49 – 1.50) $Ncf = 217 / (217 - 72)$ $Ncf = 1.4965$	
Comment:		SAT  UNSAT 

Perform Step: 5√ 1.5	Calculate the RCS Actual Time-To-Boil Margin (BMact) as follows: $BMact = (BMref) \times (Lcf) \times (Tcf) \times (Ncf)$	
Standard:	CALCULATED BMact of 94.51 minutes $BMact = (48.12) \times (1.031) \times (1.2717) \times (1.4965)$ $BMact = 94.416 \text{ minutes (acceptable range 93.84 – 94.82 minutes)}$	
Comment:		SAT  UNSAT 

STOP TIME:	
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Initial Conditions: **Given the following conditions during a refueling outage on Unit 3:**

- The Reactor was tripped 45 days ago.
- RCS level is 30" above the bottom of the hot leg.
- Core Exit Temperature (Thot) is 95°F.
- Fuel is loaded into the core.
- There are 72 new fuel assemblies.
- No Time to Boil transmittal has been provided by Reactor Engineering.

Initiating Cue: **The Control Room Supervisor directs you to PERFORM the following:**

- Calculate RCS Time to Boil margin using SO23-5-1.8.1, Shutdown Nuclear Safety, Attachment 7, Calculation of RCS Time-To-Boil Margin/Boil-Off Rate.
- Document the Time to Boil margin on the Cue Sheet.

Time to Boil margin: _____

Facility: SONGS JPM # NRC JPM A-2 Task # 182119 K/A # G 2.1.26 3.4 / 3.6Title: Perform Receiving Chemicals Independent Verification

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: xActual Performance: x

Simulator: _____

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions:

- A PEO is preparing to receive acid for Sulfuric Acid Storage Tank T-194.
- Current level in Tank T-194 is 56%.
- The driver has 54,000 pounds of Sulfuric Acid and wants to unload the entire volume into T-194.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Calculate an independent verification of final expected volume in Sulfuric Acid Storage Tank T-194 using SO23-4-4, Receiving and Storing Chemicals, Attachment 1, Receiving Acid for Sulfuric Acid Storage Tank T-194.
- Determine if T-194 can accept the full chemical offload.
- Document final expected volume in T-194 AND whether or not T-194 is ready to receive the full chemical offload on the Cue Sheet.

Task Standard: CALCULATED final expected volume of T-194 and DETERMINED that the full chemical offload cannot be accepted do the administrative limit of 90%.

Required Materials: SO23-4-4, Receiving and Storing Chemicals, Attachment 1, Receiving Acid for Sulfuric Acid Storage Tank T-194.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP**EXAMINER:**

PROVIDE the examinee with a blank copy and the PEO's marked up copy of SO23-4-4, Receiving and Storing Chemicals, Attachment 1, Receiving Acid for Sulfuric Acid Storage Tank T-194.

√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1 1.3	DETERMINE the weight of chemicals being delivered from the initial conditions.	
Standard:	IDENTIFIED 54,000 lbs as the weight of chemicals being delivered (from the initial conditions).	
Comment:	SAT	UNSAT

Perform Step: 2 2.1	RECORD T-194 Initial Volume.	
Standard:	RECORDED T-194 Initial Volume as 56% (from initial conditions) and CONVERTED to 5600 gallons (100% = 10,000 gallons).	
Comment:	SAT	UNSAT

Perform Step: 3 2.1	RECORD quantity of Sulfuric Acid to be added.	
Standard:	CONVERTED 54,000 lbs to gallons and RECORDED 3529 gallons as the quantity to be added. (acceptable range = 3529 – 3530 gallons)	
Comment:	SAT	UNSAT

Perform Step: 4 2.1	CALCULATE T-194 expected final volume.	
Standard:	CALCULATED a final volume of 9129 gallons and CONVERTED to 91.29% final volume and DOCUMENTED on the Cue Sheet. (acceptable range = 9129 – 9130 gallons, 91 – 91.3%)	
Comment:	SAT	UNSAT

Perform Step: 5 ✓ 2.1.1	VERIFY tank expected volume is \leq 90%.
Standard:	DETERMINED tank expected volume is $>$ 90%.
Comment:	SAT  UNSAT 

Perform Step: 6 ✓ L&S 3.2	To allow space for liquid expansion, tanks should not be filled $>$ 90%.
Standard:	DETERMINED that T-194 is NOT ready to receive chemicals and DOCUMENTED on the Cue Sheet.
Terminating Cue:	This JPM is complete.
Comment:	SAT  UNSAT 

STOP TIME:	
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- Initial Conditions:**
- A PEO is preparing to receive acid for Sulfuric Acid Storage Tank T-194.
 - Current level in Tank T-194 is 56%.
 - The driver has 54,000 pounds of Sulfuric Acid and wants to unload the entire volume into T-194.

- Initiating Cue:** The Control Room Supervisor directs you to **PERFORM** the following:
- Calculate an independent verification of final expected volume in Sulfuric Acid Storage Tank T-194 using SO23-4-4, Receiving and Storing Chemicals, Attachment 1, Receiving Acid for Sulfuric Acid Storage Tank T-194.
 - Determine if T-194 can accept the full chemical offload.
 - Document final expected volume in T-194 **AND** whether or not T-194 is ready to receive the full chemical offload on the Cue Sheet.

Final expected volume in T-194: _____

T-194 can receive the full chemical offload: Yes / No

Facility: SONGS JPM # NRC JPM A-3 Task # 185300 K/A # G 2.2.12 3.7 / 4.1

Title: Manual Water Inventory Balance Calculation

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: x

Actual Performance: x

Simulator: _____

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions on Unit 2 at full power:

	Initial Data	Final Data
Time	0200	0400
VCT Level	51.6%	48.1%
PZR Level	53.0%	52.7%
Tavg	577.0°F	578.0°F
SIT-008	79.1%	79.1%
SIT-007	79.4%	79.4%
SIT-009	79.6%	80.0%
SIT-010	79.8%	79.8%
Quench Tank (QT) Level	77%	78%

- There is no known in-leakage to the RCS.
- RCS Pressure is 2250 psig.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Perform a manual leak rate calculation per SO23-3-3.37, Reactor Coolant System Water Inventory Balance, Attachment 2, Manual Leak Rate Calculation.
- Start at step 2.7.
- Stop after step 3.1 is completed.
- Independent verification has been suspended for the performance of this attachment.
- Document results on the Cue Sheet.

Task Standard: CALCULATED RCS leak rate.

Required Materials: SO23-3-3.37, Reactor Coolant System Water Inventory Balance, Attachment 2, Manual Leak Rate Calculation.

Validation Time: 20 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____



CLASSROOM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO23-3-3.37, Reactor Coolant System Water Inventory Balance, Attachment 2, Manual Leak Rate Calculation.



INFORM applicant of typo on SO23-3-3.37, page 26, step 2.10.1. Refers to Table 4 but should say Table 3.

√ - Check Mark Denotes Critical Step

START TIME:



Perform Step: 1 √ 2.7	Record all final data and perform calculations on Table 1.	
Standard:	RECORDED all final data and PERFORMED calculations on Table 1.	
Comment:	SAT  UNSAT 	



Perform Step: 2 2.8	Table 1 Calculation Independently Verified by:	
Standard:	MARKED step N/A (from initial conditions)	
Comment:	SAT  UNSAT 	



Examiner Note:	From note at bottom of step 2.9.1: A 1°F change in T_{AVG} will change RCS volume as shown on Table 2. With SDC in service, the volume change is multiplied 1.2 times the value obtained in Table 2. The final T_{AVG} value is used to determine conversion value. The volume change is multiplied by a factor of 1.01702 in order to account for the Replacement Steam Generator's (RSG's) slight increase to the RCS volume.	
Perform Step: 3 √ 2.9.1	Determine Δ gal T_{AVG} : Δ gal T_{AVG} (From Table 1) (+) (-) _____ gal x 1.01702 for RSG's = (+) (-) _____ gal If SDC is in Service then Multiply by 1.2. (Multiply by 1 if SDC is Not in Service) = (+) (-) _____ gal	
Standard:	DETERMINED Δ gal T_{AVG} = 92.51 gal from Table 1. (92.51 gal x 1.01702) = 94.08 gal DETERMINED SDC not in service from initial conditions (unit operating at full power).	
Comment:	SAT  UNSAT 	



Perform Step: 4 ✓ 2.9.2	Add Volume Changes (Algebraic Sum): Δ gal VCT (From Table 1) (+) (-) _____ gal Δ gal PZR (From Table 1) (+) (-) _____ gal Δ gal TAVG (From Final Gallonage Step 2.9.1) (+) (-) _____ gal Subtotal = _____ gal
Standard:	CALCULATED subtotal of volume changes to be 244.7 gal. Δ gal VCT = 134.75 gal Δ gal PZR = 15.87 gal Δ gal Tavg = 94.08 gal 134.75 gal + 15.87 gal + 94.08 gal = 244.7 gal
Comment:	SAT ✎ UNSAT ✎



Perform Step: 5 ✓ 2.9.3	Calculate (divide): Subtotal _____ gal Test Duration ÷ _____ min Calculated Total Leak Rate _____ gpm <small>Calculate to the nearest hundredth (e.g., .01)</small> Identified In-leakage + _____ gpm TOTAL LEAK RATE = _____ gpm		
Standard:	CALCULATED total leak rate of 2.04 gpm. Subtotal from step 2.9.2 was 244.7 gal. Test duration was 120 minutes (from initial conditions). Calculated total leak rate was 2.04 gpm. No identified in-leakage (from initial conditions). TOTAL LEAK RATE = 2.04 gpm.		
<table border="1" style="width: 100%;"> <tr> <td style="width: 70%;">Comment:</td> <td style="width: 30%; text-align: center;"> SAT UNSAT </td> </tr> </table>		Comment:	SAT UNSAT
Comment:	SAT UNSAT		

Perform Step: 6 2.9.4	Total Leak Rate Calculation Independently Verified by:	
Standard:	MARKED step N/A (from initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 7 ✓ 2.9.5	If Total Leak Rate, Step 2.9.3, is < 1 gpm, then Mark N/A Sections 2.10 and 2.11, and Circle N/A for Identified Leak Rate and Unidentified Leak Rate in Step 3.1. (Mark N/A if Total Leak Rate > 1 gpm.)	
Standard:	DETERMINED leak rate to be > 1gpm, MARKED step 2.9.5 N/A and PROCEEDED to step 2.10.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 8 ✓ 2.10.1	Using final and initial Tank level from Table 1 and conversion values from Table 3 , Calculate Quench Tank Volume Change.	
Standard:	CALCULATED Quench Tank volume change to be 22 gpm. 78% = 1876 gal 77% = 1854 gal 1876 gal – 1854 gal = 22 gal	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 9 2.10.2	Add volume changes from Table 1 and Step 2.10.1: T-008 _____ gal T-007 _____ gal T-009 _____ gal T-010 _____ gal Quench Tank _____ gal Subtotal _____ gal	
Standard:	CALCULATED subtotal volume changes to be 82.12 gal. SIT T-009 level increased 0.4% (60.12 gal). Quench Tank volume change = 22 gal (from step 2.10.1). 60.12 gal + 22 gal = 82.12 gal	
Comment:		SAT  UNSAT 

Perform Step: 10 2.10.3	Calculate (divide): Subtotal _____ gal <div style="text-align: center;">\div</div> Test Duration _____ min <div style="text-align: center;">$=$</div> IDENTIFIED LEAK RATE _____ gpm	
Standard:	CALCULATED identified leak rate to be 2.2 gpm. Subtotal = 82.12 gal (from step 2.10.2). Test duration = 120 min (from initial conditions). 82.12 gal / 120 min = 0.684 gpm.	
Comment:		SAT  UNSAT 

Perform Step: 11 2.10.4	Identified Leak Rate Calculation Independently Verified by:	
Standard:	MARKED step N/A (from initial conditions)	
Comment:	SAT	UNSAT

Perform Step: 12 2.11.1	Determine difference between Total and Identified volume: TOTAL LEAK RATE _____ gpm (Step 2.9.3) - IDENTIFIED LEAK RATE _____ gpm (Step 2.10.3) = UNIDENTIFIED LEAK RATE _____ gpm	
Standard:	CALCUATED unidentified leak rate to be 1.356 gpm. Total leak rate = 2.04 gpm. Identified leak rate = 0.684 gpm. Unidentified leak rate = 2.04 gpm – 0.684 gpm = 1.356 gpm.	
Comment:	SAT	UNSAT

Perform Step: 13 2.11.2	Unidentified Leak Rate Calculation Independently Verified by:	
Standard:	MARKED step N/A (from initial conditions)	
Comment:	SAT	UNSAT

Perform Step: 14 3.1	Acceptance Criteria Result:			
	MEASUREMENT	VALUE	ACCEPTANCE CRITERIA	RESULT
	Total Leak Rate (TLR) Step 2.9.3		≤ 1 gpm	YES / NO
	Unidentified Leak Rate Step 2.11.1		≤ 1 gpm	YES / NO
	Identified Leak Rate Step 2.10.3		≤ 10 gpm	YES / NO
Standard:	DETERMINED Total Leak Rate (2.04 gpm) and Unidentified Leak Rate (1.356 gpm) DID NOT satisfy the acceptance criteria. DETERMINED Identified Leak Rate (0.684 gpm) DID satisfy the acceptance criteria.			
Comment:			SAT  UNSAT 	

STOP TIME:	
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Initial Conditions: Given the following conditions on Unit 2 at full power:

	Initial Data	Final Data
Time	0200	0400
VCT Level	51.6%	48.1%
PZR Level	53.0%	52.7%
Tavg	577.0°F	578.0°F
SIT-008	79.1%	79.1%
SIT-007	79.4%	79.4%
SIT-009	79.6%	80.0%
SIT-010	79.8%	79.8%
Quench Tank (QT) Level	77%	78%

- There is no known in-leakage to the RCS.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Perform a manual leak rate calculation per SO23-3-3.37, Reactor Coolant System Water Inventory Balance, Attachment 2, Manual Leak Rate Calculation.
- Start at step 2.7.
- Stop after step 3.1 is completed.
- Independent verification has been suspended for the performance of this attachment.
- Document results on the Cue Sheet.

Acceptance Criteria Result?

Total Leak Rate: _____ **YES / NO**

Unidentified Leak Rate: _____ **YES / NO**

Identified Leak Rate: _____ **YES / NO**

Facility: SONGS JPM # NRC JPM A-4

Task # 186728

K/A # G 2.4.27

3.4 / 3.9

Title: Local Area Evacuation

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: xSimulator: x

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions on Unit 2 at full power:

- An at-power Containment Entry is in progress on Unit 2 for emergent repairs.
- One of the maintenance workers inside Containment has just called the Control Room and informed you that a small fire has started due to welding inside Containment.
- The CRS has entered SO23-13-21, Fire.
- The CRS has ordered a Containment evacuation.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Perform the actions of SO23-13-1, Local Area Evacuation, due to the fire inside the Unit 2 Containment.

Task Standard: MADE the local area evacuation PA announcement (at least two times) AND ACUATED the Containment Emergency Evacuation Siren.

Required Materials: SO23-13-1, Local Area Evacuation.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

INITIALIZE to IC- 219

EXAMINER:



PROVIDE the examinee with a copy of SO23-13-1, Local Area Evacuation.



√ - Check Mark Denotes Critical Step



START TIME:



NOTE



All PA Announcements should be made and repeated at least once.

Perform Step: 1 1.a	Make PA Announcement per Attachment 1.	
Standard:	DIALED 429 on the phone, OR pressed CONTROL ROOM PAGE ALL, OR pressed CONTROL ROOM PAGE PA, and MADE the following announcement at least two times: “Attention all personnel. Due to a fire , a local evacuation of the Unit 2 Containment is required. All unnecessary personnel should evacuate the area immediately. All other personnel should remain clear of Unit 2 Containment until further notice.”	
Examiner Note:	The bolded/italicized words are the “fill in the blank” portions of the PA Announcement sheet in Attachment 1. Words to this effect that accurately convey that there is a fire in Unit 2 Containment and that personnel should evacuate and remain clear of Unit 2 Containment, satisfy this step.	
Comment:	SAT  UNSAT 	

Perform Step: 2 1.b	Verify the Control Room is NOT receiving smoke or other airborne irritants from the outside.	
Standard:	RECOGNIZED the Control Room would not be receiving smoke from a fire in the Unit 2 Containment.	
Comment:	SAT  UNSAT 	

Perform Step: 3 1.c	Verify a Control Room evacuation is NOT required.	
Standard:	RECOGNIZED that a Control Room evacuation is NOT required.	
Comment:	SAT  UNSAT 	

Perform Step: 4 1.d	Verify Containment evacuation is NOT required.
Standard:	RECOGNIZED that a Containment evacuation IS required and PROCEEDED to the RNO actions.
Comment:	SAT  UNSAT 

Perform Step: 5 ✓ 1.d RNO	Actuate the CNTMT EMER EVAC SIREN (CR-57).
Standard:	ACTUATED the Containment Emergency Evacuation Siren on CR-57.
Terminating Cue:	This JPM is complete.
Comment:	SAT  UNSAT 


STOP TIME:	
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Initial Conditions: Given the following conditions on Unit 2 at full power:

- An at-power Containment Entry is in progress on Unit 2 for emergent repairs.
- One of the maintenance workers inside Containment has just called the Control Room and informed you that a small fire has started due to welding inside Containment.
- The CRS has entered SO23-13-21, Fire.
- The CRS has ordered a Containment evacuation.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Perform the actions of SO23-13-1, Local Area Evacuation, due to the fire inside the Unit 2 Containment.

Facility: SONGS Units 2 and 3		Date of Examination: 10/12/12
Examination Level SRO 		Operating Test Number: NRC
Administrative Topic (see Note)	Type Code*	Describe Activity to be Performed
Conduct of Operations (A5)	M, R	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (4.2) JPM: Determine Time to Boil and Containment Closure Requirements (J213A).
Conduct of Operations (A6)	M, R	2.1.19 Ability to use plant computers to evaluate system or component status (3.8). JPM: Calculate Azimuthal Power Tilt and Evaluate Technical Specifications (J250A).
Equipment Control (A7)	N, R	2.2.40 Ability to apply Technical Specification for a system (4.7). JPM: Determine Technical Specification Applicability (New).
Radiation Control (A8)	N, R	2.3.11 Ability to control radiation releases (4.3). JPM: Perform Process Flow Estimation for Waste Gas Decay Tank Release (New).
Emergency Plan (A9)	M, R	2.4.41 Knowledge of the emergency action level thresholds and classifications (4.6). JPM: Classify an Emergency Plan Event (J274A).
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; \leq for 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Administrative Topics Outline

Task Summary

- A5 The applicant will use data provided to perform a Time to Boil calculation using SO23-5-1.8.1, Shutdown Nuclear Safety, and determine containment closure requirements based on the time to boil calculation. This is a modified bank JPM.
- A6 The applicant will use provided data from the Core Protection Calculator System to calculate Azimuthal Power Tilt in the core per SO23-3-3.6, COLSS Out of Service Surveillance, and evaluate potential Technical Specification Actions based on the Azimuthal Power Tilt calculation. This is a modified bank JPM.
- A7 The applicant will determine applicable Technical Specification Conditions and Actions based on a provided timeline of events. This is a new JPM.
- A8 The applicant will calculate an estimated Waste Gas Decay Tank flowrate with an inoperable flow detector per SO23-8-15, Radwaste Gas Discharge. This is a new JPM.
- A9 The applicant will classify an emergency plan event per SO23-VIII-1, Recognition and Classification of Emergencies, and make protective action recommendations per SO23-VIII-10.3, Protective Action Recommendations. This is a modified bank JPM.

Facility: SONGS JPM # NRC JPM A-5 Task # 176136 K/A # G 2.1.25 3.9 / 4.2Title: Calculation of RCS Time-To-Boil Margin

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: xActual Performance: x

Simulator: _____

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions during a refueling outage on Unit 3:

- The Reactor was tripped 45 days ago.
- RCS level is 30" above the bottom of the hot leg.
- Core Exit Temperature (Thot) is 95°F.
- Fuel is loaded into the core.
- There are 72 new fuel assemblies.
- No Time to Boil transmittal has been provided by Reactor Engineering.

Initiating Cues: The Shift Manager directs you to PERFORM the following:

- Calculate RCS Time to Boil margin using SO23-5-1.8.1, Shutdown Nuclear Safety, Attachment 7, Calculation of RCS Time-To-Boil Margin/Boil-Off Rate.
- Document the Time to Boil Margin on the Cue Sheet.

Task Standard: Calculated the RCS Time to Boil Margin.

Required Materials: SO23-5-1.8.1, Shutdown Nuclear Safety, Attachment 7, Calculation of RCS Time-To-Boil Margin/Boil-Off Rate.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

CLASSROOM SETUP**EXAMINER:**

PROVIDE the examinee with a copy of SO23-5-1.8.1, Shutdown Nuclear Safety, Attachment 7, Calculation of RCS Time-To-Boil Margin/Boil-Off Rate.



√ - Check Mark Denotes Critical Step



START TIME:

Perform Step: 1 √ 1.1	Record the Time-to-Boil Margin (BMref) based on a reference Hot Leg level of 26 inches from Table A. (If an outage specific Time-to-Boil Margin Data Transmittal has been prepared by Reactor Engineering (located in the Ops. Physics Summary book), then that Time-to-Boil Margin value should be used.	
Standard:	RECORDED 48.12 minutes. Interpolation required for 45 days since Reactor trip. $(45.18 + 51.06) / 2 = 48.12$ (acceptable range 48.1 – 48.2 minutes)	
Comment:	SAT	UNSAT

Perform Step: 2 √ 1.2	Record the Level Correction Factor (Lcf) based on the level to which you are draining from Table B.	
Standard:	RECORDED 1.031 from Table B, corresponding to a level of 30" above the bottom of the hot leg.	
Comment:	SAT	UNSAT

Perform Step: 3 √ 1.3, 1.3.1	Record the Temperature Correction Factor (Tcf) based on one of the following temperature correction equations: For TE levels: Use: $Tcf = (212 - THOT) / 92$	
Standard:	RECORDED Tcf as 1.272 (acceptable range 1.270 – 1.272) $Tcf = (212 - 95) / 92$ $Tcf = 1.2717$	
Comment:	SAT	UNSAT

Perform Step: 4√ 1.4, 1.4.2	Record the New Fuel Correction Factor (Ncf). Use the following decay heat correction factor which represents the reload Reactor Core status: For New Fuel Assemblies (Not Irradiated) less than or greater than 108, Use: $Ncf = \frac{217 \text{ Irradiated Assemblies}}{217 \text{ Irradiated Assemblies} - \# \text{ of New Assemblies}}$	
Standard:	RECORDED Ncf of 1.50 (acceptable range 1.49 – 1.50) $Ncf = 217 / (217 - 72)$ Ncf = 1.4965	
Comment:		SAT  UNSAT 

Perform Step: 5√ 1.5	Calculate the RCS Actual Time-To-Boil Margin (BMact) as follows: $BMact = (BMref) \times (Lcf) \times (Tcf) \times (Ncf)$	
Standard:	CALCULATED BMact of 94.51 minutes $BMact = (48.12) \times (1.031) \times (1.2717) \times (1.4965)$ BMact = 94.416 minutes (acceptable range 93.84 – 94.82 minutes)	
Comment:		SAT  UNSAT 

STOP TIME:	
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INITIAL CONDITIONS:

Given the following conditions during a refueling outage on Unit 3:

- The Reactor was tripped 45 days ago.
- RCS level is 30" above the bottom of the hot leg.
- Core Exit Temperature (Thot) is 95°F.
- Fuel is loaded into the core.
- There are 72 new fuel assemblies.
- No Time to Boil transmittal has been provided by Reactor Engineering.

INITIATING CUES:

The Shift Manager directs you to PERFORM the following:

- Calculate RCS Time to Boil margin using SO23-5-1.8.1, Shutdown Nuclear Safety, Attachment 7, Calculation of RCS Time-To-Boil Margin/Boil-Off Rate.
- Document the Time to Boil Margin on the Cue Sheet.

Time to Boil Margin: _____

Facility: SONGS JPM # NRC A-6 Task # 188318 K/A # G 2.1.37 4.3 / 4.6
Title: Calculate Shutdown Margin With a Withdrawn CEA

Examinee (Print): _____

Testing Method:

Simulated Performance:	_____	Classroom:	<u>X</u>
Actual Performance:	<u>X</u>	Simulator:	_____
Alternate Path:	_____	Plant:	_____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is in MODE 3 following a Reactor trip from 100% power 50 hours ago.
- The Unit was at full power for 90 EFPD prior to the trip per Reactor Engineering.
- RCS Boron Concentration is 2600 ppm per Chemistry sample at 0700 today.
- Tave is 545°F.
- All CEAs are fully inserted except for CEA #52 which is trippable but fully withdrawn.
- No correction factors for B-10 depletion have been provided.
- Use OPS Table 4.4 for CEA Worths.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- CALCULATE Shutdown Margin, Percent Shutdown of the Reactor, and Projected Shutdown Margin (for 4 hours later) using SONGS Unit 2 Cycle 17 BOC Operations Physics Summary Data (Revision 61), and SO23-3-3.29, Determination of Reactor Shutdown Margin and DOCUMENT on the Cue Sheet.
- DETERMINE acceptance criteria and DOCUMENT on the Cue Sheet.
- Start at Step 2.1.

Task Standard: CALCULATE Shutdown Margin with one (1) stuck CEA per SO23-3-3.29, Determination of Reactor Shutdown Margin.

Required Materials: SO23-3-3.29, Determination of Reactor Shutdown Margin, Determination of Reactor Shutdown Margin, AND M38100, Operations Physics Summary, Unit 2, Cycle 17, BOC, Rev. 61.

Validation Time: 20 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____











CLASSROOM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of Handout:



- **SO23-3-3.29, Determination of Reactor Shutdown Margin, Attachment 2, Calculation of Actual Shutdown Margin - MODES 3-6.**
 - **INITIAL Steps 1.1, 1.2, 1.3, & 1.4.**
 - **CHECK Boxes in Steps 1.2 (Actual and 4 hour projected SDM), & 1.3 (All CEAs are OPERABLE).**
 - **MARK N/A Step 2.6.3.**
- **M-38100, Operations Physics Summary, Unit 2, Cycle 17, BOC, Rev. 61.**



√ - Check Mark Denotes Critical Step



START TIME:

Perform Step: 1 2.1.1	Record present RCS Boron concentration and indicate Source.	
Standard:	RECORDED present RCS boron concentration of 2600 ppm and CHECKED Chemical Analysis as the source of information.	
Comment:	SAT  UNSAT 	
Perform Step: 2 2.1.2	Record present RCS average temperature.	
Standard:	RECORDED RCS T _{AVG} of 545°F.	
Comment:	SAT  UNSAT 	
Perform Step: 3 2.1.3	Record present cycle burnup and indicate source:	
Standard:	RECORDED present cycle burnup of 90 EFPD and CHECKED Reactor Engineering as the source of information.	
Comment:	SAT  UNSAT 	
Perform Step: 4 √ 2.2.1	Calculate adjusted CBC for potential Reactivity Bias/Boron-10 depletion, as follows: (Use 150 ppm as the correction factor for Boron-10 depletion or a correction factor provided by Reactor Engineering.)	
Standard:	CALCULATED the adjusted Critical Boron Concentration from OPS Fig. 2.2-1 and ADDED 150 ppm for B-10 depletion for a total of 2050 ppm. (acceptable range is 2050 – 2075 ppm)	
Comment:	SAT  UNSAT 	
Perform Step: 5 √ 2.3	Calculate the critical Boron margin.	
Standard:	CALCULATED the Critical Boron Margin to be 550 ppm. (acceptable range is 525 - 550 ppm)	
Comment:	SAT  UNSAT 	

Perform Step: 6 2.4	Determine the inverse Boron worth for the present RCS Tavg and Boron concentration using OPS Figure 3.3
Standard:	DETERMINE Inverse Boron Worth from OPS Figure 3.3 to be 144.5 ppm/%ΔK/K and CHECKED OPS Figure 3.3 as the data source. (acceptable range is 144.0 – 145.0 ppm/%ΔK/K)
Comment:	SAT  UNSAT 

Perform Step: 7 2.5	Calculate the Boron reactivity defect.
Standard:	CALCULATE the Boron Reactivity Defect of + 3.806 %ΔK/K. (acceptable range is 3.620 – 3.819 %ΔK/K)
Comment:	SAT  UNSAT 

Perform Step: 8 2.6.1	Determine Total CEA Worth from OPS Table 4.4.
Standard:	DETERMINED Total CEA Worth from OPS Table 4.4 to be 8.289 %ΔK/K and CHECKED OPS Table 4.4 as the data source.
Comment:	SAT  UNSAT 



Perform Step: 9 2.6.2	Determine Net CEA Worth from OPS Table 4.4.
Standard:	DETERMINED Net CEA Worth from OPS Table 4.4 to be 7.820 %ΔK/K and CHECKED OPS Table 4.4 as the data source.
Comment:	SAT  UNSAT 



GUIDELINES



1. If all CEAs are fully inserted [i.e., All CEAs are ≤ 5 " withdrawn (ARI)], then record Withdrawn CEA Worth as zero, and mark N/A for remaining data spaces.
2. If one (individual) CEA is withdrawn (or stuck out) > 5 ", and the remaining CEAs are ≤ 5 " withdrawn, then record Withdrawn CEA Worth as the "Stuck Worth" value from OPS Table 4.4, and mark N/A for remaining data spaces.
3. If 2 (individual) CEAs are withdrawn (or stuck out) > 5 ", and the remaining CEAs are ≤ 5 " withdrawn, then record Withdrawn CEA Worth as the "Stuck Pair" value from OPS Table 4.4, and mark N/A for remaining data spaces.

NOTE

The difference between Shutdown Margin and Percent Shutdown is that the Shutdown Margin assumes that all CEAs except the CEA of the highest worth are fully inserted and the highest worth CEA is fully withdrawn, whereas Percent Shutdown assumes no change in CEA position. Neither calculation includes the worth of the PLCEAs.

Examiner Note:	Step 2.6.3 marked N/A per step 1.3.		
Perform Step: 10√ 2.7	Determine withdrawn CEA worth.		
Standard:	DETERMINED withdrawn CEA worth to be 0.469 %ΔK/K from OPS Table 4.4 Stuck Worth value (per Guideline # 2) and CHECKED OPS Table 4.4 as the data source.		
Comment:	<div style="text-align: right;"> SAT  UNSAT  </div>		

Perform Step: 11√ 2.8.1	Determine elapsed time since trip or start of power descension.		
Standard:	DETERMINED time since trip to be 50 hours (from initial conditions).		
Comment:	<div style="text-align: right;"> SAT  UNSAT  </div>		

Perform Step: 12√ 2.8.2	Determine Reactor power level prior to trip.		
Standard:	DETERMINED Reactor power level prior to trip to be 100% (from initial conditions).		
Comment:	<div style="text-align: right;"> SAT  UNSAT  </div>		

NOTES

In order to use OPS Table 7.1, all of the following conditions must be met. Otherwise, Reactor Engineering will provide the Xenon value or Xenon value can be obtained from PCS (Primary or Backup) using the Xenon Calculator:

- 1) Equilibrium Xenon existed at the above recorded previous power level.
- 2) The previous power level was greater than 95%.
- 3) The method of shutdown was a plant trip.

Perform Step: 13 ✓ 2.8.3	Determine present Xenon worth.		
Standard:	DETERMINED present Xenon worth to be 0.428 %ΔK/K and CHECKED OPS Table 7.1 as the source of information.		
Comment:		SAT ⚙ UNSAT ⚙	

Perform Step: 14 ✓ 2.8.4.1	Xenon worth 4 hours later than step 2.8.1.		
Standard:	DETERMINED Xenon worth 4 hours later than step 2.8.1 to be 0.326 %ΔK/K.		
Comment:		SAT ⚙ UNSAT ⚙	



Perform Step: 15 ✓ 2.8.4.2	Change in Xenon worth in 4 hours.		
Standard:	DETERMINED the change in Xenon worth 4 hours later to be 0.102 %ΔK/K. (0.428 – 0.326 = .0102)		
Comment:		SAT ⚙ UNSAT ⚙	



GUIDELINES



- 1) Equilibrium Samarium (Sm) concentration is included in the Critical Boron Curves. Transient Sm reactivity is always > transient Plutonium (Pu) reactivity; therefore it is conservatively ignored in the calculation of SDM. (Ref. 2.4.3.2)
- 2) When summing the following reactivity defects, then the correct sign must be used for Boron Defect.
- 3) Shutdown Margin CEA Worth Determination:
 - If all CEAs are fully inserted (i.e., All CEAs are $\leq 5''$ withdrawn (ARI) and RTCBs Open), then Total CEA Worth shall be used.
 - If all CEAs are fully inserted (i.e., all CEAs $< 5''$ withdrawn and RTCBs are Closed), then net CEA worth shall be used.
 - If any CEA is withdrawn, and all CEAs are Operable, then Net CEA Worth shall be used.
 - If any CEAs are untrippable, then Available CEA Worth shall be used.



Perform Step: 16√ 2.9	Calculate Shutdown Margin.		
Standard:	CALCULATED Shutdown Margin of 12.054 %ΔK/K (acceptable range is 11.868 – 12.067 %ΔK/K)		
Comment:		SAT ↻	UNSAT ↻

Perform Step: 17√ 2.10	Calculate percent shutdown of the Reactor.		
Standard:	CALCULATED percent shutdown of the Reactor to be 12.054 %ΔK/K. (acceptable range is 11.868 – 12.067 %ΔK/K)		
Comment:		SAT ↻	UNSAT ↻

Perform Step: 18 √ 2.11	IF credit was taken for Xenon in the SDM calculation, THEN calculate the projected SDM for the time of the next SDM verification (4 hours later).	
Standard:	CALCULATED projected SDM to be 11.952 %ΔK/K. (acceptable range is 11.766 – 11.695 %ΔK/K)	
Comment:	SAT  UNSAT 	

Perform Step: 19 √ 3.1	<u>ACCEPTANCE CRITERIA</u> SDM calculation for “ACTUAL Shutdown Margin” is: <ul style="list-style-type: none"> • MODE 3 • SDM >5.15%ΔK/K • SHUTDOWN MARGIN SATISFIED YES / NO 	
Standard:	DETERMINE the Actual Shutdown Margin is greater than 5.15% ΔK/K for MODE 3 and CIRCLE YES .	
Comment:	SAT  UNSAT 	

Perform Step: 20 3.1.1	Mark N/A if SDM is satisfied.	
Standard:	MARKED N/A on step 3.1.1.	
Comment:	SAT  UNSAT 	

Perform Step: 21 √ 3.2	<u>ACCEPTANCE CRITERIA</u> SDM calculation for “PROJECTED Shutdown Margin” is: <ul style="list-style-type: none"> • MODE 3 • SDM >5.15%ΔK/K • SHUTDOWN MARGIN SATISFIED YES / NO 	
Standard:	DETERMINE the Projected Shutdown Margin is greater than 5.15% ΔK/K for MODE 3 and CIRCLE YES .	
Terminating Cue:	This JPM is complete.	
Comment:	SAT  UNSAT 	

STOP TIME:	
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Initial Conditions: Given the following conditions:

- Unit 2 is in MODE 3 following a Reactor trip from 100% power 50 hours ago.
- The Unit was at full power for 90 EFPD prior to the trip per Reactor Engineering.
- RCS Boron Concentration is 2600 ppm per Chemistry sample at 0700 today.
- Tave is 545°F.
- All CEAs are fully inserted except for CEA #52 which is trippable but fully withdrawn.
- No correction factors for B-10 depletion have been provided.
- Use OPS Table 4.4 for CEA Worths.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- CALCULATE Shutdown Margin, Percent Shutdown of the Reactor, and Projected Shutdown Margin (for 4 hours later) using SONGS Unit 2 Cycle 17 BOC Operations Physics Summary Data (Revision 61), and SO23-3-3.29, Determination of Reactor Shutdown Margin and DOCUMENT on the Cue Sheet.
- DETERMINE acceptance criteria and DOCUMENT on the Cue Sheet.
- Start at Step 2.1.

Shutdown Margin: _____

Percent Shutdown of the Reactor: _____

Projected Shutdown Margin (4 hours later): _____

Shutdown Margin Acceptance Criteria Satisfied: Yes / No

Projected Shutdown Margin Acceptance Criteria Satisfied: Yes / No

Facility: SONGS JPM # NRC JPM A-7 Task # 189963 K/A # G 2.2.40 3.4 / 4.7
Title: Technical Specification Determination

Examinee (Print): _____

Testing Method:

Simulated Performance:	_____	Classroom:	<u>x</u>
Actual Performance:	<u>x</u>	Simulator:	_____
Alternate Path:	_____	Plant:	_____
Time Critical:	_____		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Unit 2 is in Mode 1 at 100% power. The following events have occurred over the past 24 hours:

- At 0400, Train A EDG 2G002 was declared inoperable.
- At 1100, Train B AFW Pump P-504 was declared inoperable.
- At 1900, Train B EDG 2G003 was declared inoperable.
- At 2000, Train A EDG 2G002 was returned to operable status.
- At 2200, Train B AFW Pump P-504 was returned to operable status.
- At 2300, Train B EDG 2G003 was returned to operable status.

Initiating Cue: Based on the provided information, identify all required Technical Specification LCO Conditions and entry and exit times and document on the Cue Sheet.

Task Standard: IDENTIFIED all required Technical Specification LCO Conditions and entry and exit times and DOCUMENTED on the Cue Sheet.

Required Materials: SONGS Unit 2 Technical Specifications.

Validation Time: 15 minutes Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 



Examiner (Print / Sign): _____ Date: _____



CLASSROOM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SONGS Unit 2 Technical Specifications.



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1√	IDENTIFY LCO entry for Train A EDG 2G002 being declared inoperable at time 0400.	
Standard:	DOCUMENTED entry into LCO 3.8.1 Condition B, one required EDG inoperable, at time 0400.	
Comment:	SAT  UNSAT 	



Perform Step: 2√	IDENTIFY LCO entry for Train B Motor Driven AFW Pump P-504 at time 1100.	
Standard:	DOCUMENTED entry into LCO 3.7.5 Condition B, one train of AFW inoperable for reasons other than inoperable steam supply to Turbine Driven AFW Pump P-140, at time 1100.	
Comment:	SAT  UNSAT 	

Perform Step: 3√	IDENTIFY LCO entry for Train A Motor Driven AFW Pump P-141 at time 1500.	
Standard:	DOCUMENTED entry into LCO 3.7.5 Condition C, two AFW trains with two motor driven pumps inoperable in MODES 1, 2, or 3, at time 1500.	
Examiner Note:	Per LCO 3.8.1 Condition B Action B.2, 4 hours after an EDG is declared inoperable, any required features supported the inoperable EDG are declared inoperable when its redundant required feature is inoperable. The four hour clock started for AFW Pump P-141 at 1100 when AFW Pump P-504 was declared inoperable.	
Comment:	SAT  UNSAT 	

Perform Step: 4√	IDENTIFY LCO entry for Train B EDG 2G003 at time 1900.	
Standard:	DOCUMENTED entry into LCO 3.8.1 Condition E, two required EDGs inoperable, at time 1900.	
Comment:	SAT  UNSAT 	

Perform Step: 5√	IDENTIFY LCO 3.8.1 Condition E and LCO 3.7.5 Condition C exit conditions met due to Train A EDG 2G002 being declared OPERABLE at time 2000.	
Standard:	DOCUMENTED exit from LCO 3.8.1 Condition E and LCO 3.7.5 Condition C at time 2000.	
Comment:	SAT  UNSAT 	

Perform Step: 6√	IDENTIFY LCO 3.7.5 Condition B exit conditions met due to AFW Pump P-504 being declared OPERABLE at time 2200.	
Standard:	DOCUMENTED exit from LCO 3.7.5 Condition B at time 2200.	
Comment:	SAT  UNSAT 	

Perform Step: 7√	IDENTIFY LCO 3.8.1 Condition B exit conditions met due to Train B EDG 2G003 being declared OPERABLE at time 2300.	
Standard:	DOCUMENTED exit from LCO 3.8.1 Condition B at time 2300.	
Comment:	SAT  UNSAT 	

STOP TIME:	
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Initial Conditions: Unit 2 is in Mode 1 at 100% power. The following events have occurred over the past 24 hours:

- At 0400, Train A EDG 2G002 was declared inoperable.
- At 1100, Train B AFW Pump P-504 was declared inoperable.
- At 1900, Train B EDG 2G003 was declared inoperable.
- At 2000, Train A EDG 2G002 was returned to operable status.
- At 2200, Train B AFW Pump P-504 was returned to operable status.
- At 2300, Train B EDG 2G003 was returned to operable status.

Initiating Cue: Based on the provided information, identify all required Technical Specification LCO Conditions and entry and exit times in the table below.

Answer Sheet:

LCO	Condition	Time Entered	Time Exited

Facility: SONGS JPM # NRC JPM A-8

Task # 193003

K/A # G 2.3.4

3.2 / 3.7

Title: Determine Stay Times

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: xActual Performance: x

Simulator: _____

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

- Initial Conditions: Maintenance is required in a high radiation area. The work is expected to take 2 – 4 hours. Expected dose rate (TEDE) is 300 mrem/hr. The maintenance workers have the following doses (TEDE) year to date:
- Worker #1: Adult contractor with 500 mrem at SONGS, 600 mrem off-site.
 - Worker #2: Adult contractor with 200 mrem at SONGS, 1100 mrem off-site.
 - Worker #3: 17-year old contractor with no dose year to date.
 - Worker #4: Adult SONGS employee with 100 mrem.
 - Worker #5: Adult pregnant SONGS employee with no dose year to date.

- Initiating Cue: The Shift Manager directs you to:
- Determine stay times for the 5 maintenance workers to prevent exceeding each of their Administrative Dose Control limits per SO123-VII-20, Health Physics Program.
 - Document stay times on the Cue Sheet.

Task Standard: DETERMINED stay times of the 5 workers and DOCUMENTED on Cue Sheet.

Required Materials: SO123-VII-20, Health Physics Program.

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 



Examiner (Print / Sign): _____ Date: _____



CLASSROOM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO123-VII-20, Health Physics Program.



√ - Check Mark Denotes Critical Step



START TIME:

Perform Step: 1 √	DETERMINE Worker #1 stay time.	
Standard:	DETERMINED Worker #1 stay time of 1 hour and 40 minutes . SONGS limit = 1 rem, 500 mrem / 300 mrem/hr = 1.67 hrs (100 min).	
Comment:	SAT  UNSAT 	

Perform Step: 2 √	DETERMINE Worker #2 stay time.	
Standard:	DETERMINED Worker #2 stay time of 2 hours and 20 minutes . Combined SONGS and off-site limit = 2 rem, 700 mrem / 300 mrem/hr = 2.33 hours (140 min).	
Comment:	SAT  UNSAT 	

Perform Step: 3 √	DETERMINE Worker #3 stay time.	
Standard:	DETERMINED Worker #3 stay time of 20 minutes . SONGS limit for minors = 100 mrem, 100 mrem / 300 mrem/hr = 0.33 hours (20 min).	
Comment:	SAT  UNSAT 	

Perform Step: 4 √	DETERMINE Worker #4 stay time.	
Standard:	DETERMINED Worker #4 stay time of 3 hours . SONGS limit = 1 rem, 900 mrem / 300 mrem/hr = 3 hours (180 min).	
Comment:	SAT  UNSAT 	

Perform Step: 5√	DETERMINE Worker #5 stay time.	
Standard:	DETERMINED Worker #5 stay time of 10 minutes . SONGS limit for unborn child = 50 mrem / month, 50 mrem / 300 mrem/hr = 0.17 hours (10 min).	
Terminating Cue:	This JPM is complete.	
Comment:	SAT  UNSAT 	

STOP TIME:	
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Initial Conditions: Maintenance is required in a high radiation area. The work is expected to take 2 – 4 hours. Expected dose rate (TEDE) is 300 mrem/hr. The maintenance workers have the following doses (TEDE) year to date:

- Worker #1: Adult contractor with 500 mrem at SONGS, 600 mrem off-site.
- Worker #2: Adult contractor with 200 mrem at SONGS, 1100 mrem off-site.
- Worker #3: 17-year old contractor with no dose year to date.
- Worker #4: Adult SONGS employee with 100 mrem.
- Worker #5: Adult pregnant SONGS employee with no dose year to date.

Initiating Cue: The Shift Manager directs you to:

- Determine stay times for the 5 maintenance workers to prevent exceeding each of their Administrative Dose Control limits per SO123-VII-20, Health Physics Program.
- Document stay times on the Cue Sheet.

Stay Times:

Worker #1: _____

Worker #2: _____

Worker #3: _____

Worker #4: _____

Worker #5: _____

Facility: SONGS JPM # NRC JPM A-9 Task # 189860 K/A # G 2.4.41 2.9 / 4.6

Title: Classify an Emergency Plan Event and Determine Protective Actions

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: x

Actual Performance: x

Simulator: _____

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Both Units have just tripped from 100% Reactor power due to a loss of the grid stemming from wildfires throughout Southern California.
- Unit 2 Train A EDG 2G002 is disabled for Boundary of the Week activities. Expected time to restore 2G002 to service is 6 hours.
- Unit 2 Train B 1E 4kV bus 2A06 has tripped on overcurrent. Expected time to restore to service is 2 hours.
- Unit 3 Train A EDG has experienced a mechanical fault and will not start. Expected time to restore to operation is 12 hours.
- Unit 3 Train B EDG is running, however EDG Output Breaker is mechanically bound and will not close. Expected time to replace breaker is 1 hour.
- The GOC reports that offsite power will not be available to the switchyard for 8 hours.
- REPCET on Unit 2 is 705°F and stable.
- Wind direction obtained from RADD0SE-V is from the West (240°) at 5 mph.
- Interstate 5 and Camp Pendleton are both closed to traffic due to the wildfires.

Initiating Cue: The Shift Manager directs you to:

- Classify the event per SO123-VIII-1, Recognition and Classification of Emergencies and document on the Cue Sheet.
- Determine any Protective Actions per SO123-VIII-10.3, Protective Action Recommendations and document on the Cue Sheet.

Task Standard: Classified the event per SO123-VIII-1, Recognition and Classification of Emergencies and determined the protective actions per SO123-VIII-10.3, Protective Action Recommendations.

Required Materials: SO123-VIII-1, Recognition and Classification of Emergencies and SO123-VIII-10.3, Protective Action Recommendations.

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____



CLASSROOM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of:



- **SO123-VIII-1, Recognition and Classification of Emergencies**
- **EP(123) 1, Emergency Classification And Event Code Chart**
- **SONGS EPSD-1, Emergency Action Level Technical Bases**
- **SO123-VIII-10.3, Protective Action Recommendations**



√ - Check Mark Denotes Critical Step

START TIME:

Examiner Note:	The following steps are from SO123-VIII-1, Recognition and Classification of Emergencies.	
Perform Step: 1 √ 2.a.1	CLASSIFY Emergency by Event Code: IDENTIFY Event Code using Attachment 1, EVENT CODES / MODE APPLICABILITY and Attachment 2, RECOGNITION CATEGORIES. REVIEW applicable Recognition Categories and subcategories.	
Standard:	IDENTIFIED Recognition Category S (System Malfunction).	
Examiner Note:	NOTE: EP(123) 1, EMERGENCY CLASSIFICATION AND EVENT CODE CHART, may also be used for classifying events. NOTE: SONGS EPSD-1, EMERGENCY ACTION LEVEL TECHNICAL BASES, may be referenced for detailed EAL technical information.	
Comment:	SAT  UNSAT 	

Perform Step: 2 √ 2.a.2	REVIEW applicable Emergency Action Levels.	
Standard:	IDENTIFIED Emergency Action Level G (General Emergency).	
Comment:	SAT  UNSAT 	

Perform Step: 3 √ 2.a.3	CLASSIFY emergency using highest applicable Event Code based on Emergency Class.	
Standard:	IDENTIFIED Event Code 1.1 (Event Classification is SG1.1)	
Comment:	SAT  UNSAT 	

Examiner Note:	<p>The following table is from SO123-VIII-10.3, Protective Action Recommendations:</p> <table border="1"> <thead> <tr> <th>WIND DIRECTION (From)</th><th>DOWNWIND PAZ</th></tr> </thead> <tbody> <tr> <td>0 - 100°</td><td>PAZ 1 and 2</td></tr> <tr> <td>101°</td><td>PAZ 1, 2, and 4</td></tr> <tr> <td>102° - 213°</td><td>PAZ 1 and 4</td></tr> <tr> <td>214°</td><td>PAZ 1, 3, and 4</td></tr> <tr> <td>215° - 326°</td><td>PAZ 1 and 3</td></tr> <tr> <td>327°</td><td>PAZ 1, 2, and 3</td></tr> <tr> <td>328° - 360°</td><td>PAZ 1 and 2</td></tr> </tbody> </table>	WIND DIRECTION (From)	DOWNWIND PAZ	0 - 100°	PAZ 1 and 2	101°	PAZ 1, 2, and 4	102° - 213°	PAZ 1 and 4	214°	PAZ 1, 3, and 4	215° - 326°	PAZ 1 and 3	327°	PAZ 1, 2, and 3	328° - 360°	PAZ 1 and 2
WIND DIRECTION (From)	DOWNWIND PAZ																
0 - 100°	PAZ 1 and 2																
101°	PAZ 1, 2, and 4																
102° - 213°	PAZ 1 and 4																
214°	PAZ 1, 3, and 4																
215° - 326°	PAZ 1 and 3																
327°	PAZ 1, 2, and 3																
328° - 360°	PAZ 1 and 2																
Perform Step: 4√ 2.1	If a GE classification exists, then Determine affected downwind PAZs by referring to the following table:																
Standard:	DETERMINED PAZ 1 and 3 to be the affected downwind PAZs																
Comment:	<div>SAT  UNSAT </div>																

Examiner Note:	<p>The following table is from SO123-VIII-10.3, Protective Action Recommendations:</p> <p style="text-align: center;">GENERAL EMERGENCY PAR TABLE</p> <table border="1"> <thead> <tr> <th>Condition</th><th>Protective Action Recommendation</th></tr> </thead> <tbody> <tr> <td>General Emergency - with NO known evacuation impediments (1)</td><td>Evacuate the State Beach <u>within PAZ 1 immediately adjacent to SONGS</u>. Evacuate PAZ 1 and the affected downwind zone(s), and ingest Potassium Iodide (KI) for the public in the affected PAZs. (This applies to PAZs 1, 2, 3, or 4 only)</td></tr> <tr> <td>General Emergency - with KNOWN evacuation impediments (1)</td><td>Evacuate State Beach <u>within PAZ 1 immediately adjacent to SONGS</u>. Shelter PAZ 1 and affected downwind PAZ(s). If wind is toward PAZ 2, then evacuate that zone. Ingest KI for the public in affected PAZs. (Applies to PAZs 1, 2, 3, or 4 only)</td></tr> <tr> <td>General Emergency - with an event related radiological release < 1 hour in duration</td><td></td></tr> <tr> <td>General Emergency - with a dose ≥ 5000 mrem TEDE at the EAB (measured or projected) and the wind towards PAZ 5, and NO known evacuation impediments (1)</td><td>Evacuate the State Beach <u>within PAZ 1 immediately adjacent to SONGS</u>. Evacuate PAZ 1, 4, 5, and ingest KI for the public in those PAZs</td></tr> <tr> <td>General Emergency - with a dose ≥ 5000 mrem TEDE at the EAB (measured or projected) and the wind towards PAZ 5, and KNOWN evacuation impediments (1)</td><td>Evacuate the State Beach <u>within PAZ 1 immediately adjacent to SONGS</u>. Shelter PAZs 1, 4, 5, and ingest KI for the public in those PAZs</td></tr> </tbody> </table> <p>(1) A known evacuation impediment is a physical obstacle to evacuation; caused by events such as earthquakes, flooding, roadway conditions, etc.; the EC is aware of at PAR issuance.</p>	Condition	Protective Action Recommendation	General Emergency - with NO known evacuation impediments (1)	Evacuate the State Beach <u>within PAZ 1 immediately adjacent to SONGS</u> . Evacuate PAZ 1 and the affected downwind zone(s), and ingest Potassium Iodide (KI) for the public in the affected PAZs. (This applies to PAZs 1, 2, 3, or 4 only)	General Emergency - with KNOWN evacuation impediments (1)	Evacuate State Beach <u>within PAZ 1 immediately adjacent to SONGS</u> . Shelter PAZ 1 and affected downwind PAZ(s). If wind is toward PAZ 2, then evacuate that zone. Ingest KI for the public in affected PAZs. (Applies to PAZs 1, 2, 3, or 4 only)	General Emergency - with an event related radiological release < 1 hour in duration		General Emergency - with a dose ≥ 5000 mrem TEDE at the EAB (measured or projected) and the wind towards PAZ 5, and NO known evacuation impediments (1)	Evacuate the State Beach <u>within PAZ 1 immediately adjacent to SONGS</u> . Evacuate PAZ 1, 4, 5, and ingest KI for the public in those PAZs	General Emergency - with a dose ≥ 5000 mrem TEDE at the EAB (measured or projected) and the wind towards PAZ 5, and KNOWN evacuation impediments (1)	Evacuate the State Beach <u>within PAZ 1 immediately adjacent to SONGS</u> . Shelter PAZs 1, 4, 5, and ingest KI for the public in those PAZs
Condition	Protective Action Recommendation												
General Emergency - with NO known evacuation impediments (1)	Evacuate the State Beach <u>within PAZ 1 immediately adjacent to SONGS</u> . Evacuate PAZ 1 and the affected downwind zone(s), and ingest Potassium Iodide (KI) for the public in the affected PAZs. (This applies to PAZs 1, 2, 3, or 4 only)												
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General Emergency - with a dose ≥ 5000 mrem TEDE at the EAB (measured or projected) and the wind towards PAZ 5, and KNOWN evacuation impediments (1)	Evacuate the State Beach <u>within PAZ 1 immediately adjacent to SONGS</u> . Shelter PAZs 1, 4, 5, and ingest KI for the public in those PAZs												
Perform Step: 5 GE PAR Table	Identify the Protective Action.												
Standard:	IDENTIFIED "Evacuate State Beach within PAZ 1 immediately adjacent to SONGS. Shelter PAZ 1 and affected downwind PAZ(s). If wind is toward PAZ 2, then evacuate that zone. Ingest KI for the public in affected PAZs. (Applies to PAZs 1, 2, 3, or 4 only)" as the correct Protective Action.												
Comment:	<div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> SAT UNSAT </div>												

Perform Step: 6√	Identify the Protective Action.				
Standard:	IDENTIFIED the correct Protective Action using data from Perform Steps 6 and 7 as follows: Evacuate State Beach within PAZ 1 immediately adjacent to SONGS. Shelter PAZ 1 and 3. Ingest KI for the public in PAZs 1 and 3.				
Terminating Cue:	This JPM is complete.				
Comment:	<table border="1"><tr><td>SAT</td><td>🔗</td><td>UNSAT</td><td>🔗</td></tr></table>	SAT	🔗	UNSAT	🔗
SAT	🔗	UNSAT	🔗		

STOP TIME:	
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Initial Conditions: Given the following conditions:




- Both Units have just tripped from 100% Reactor power due to a loss of the grid stemming from wildfires throughout Southern California.
- Unit 2 Train A EDG 2G002 is disabled for Boundary of the Week activities. Expected time to restore 2G002 to service is 6 hours.
- Unit 2 Train B 1E 4kV bus 2A06 has tripped on overcurrent. Expected time to restore to service is 2 hours.
- Unit 3 Train A EDG has experienced a mechanical fault and will not start. Expected time to restore to operation is 12 hours.
- Unit 3 Train B EDG is running, however EDG Output Breaker is mechanically bound and will not close. Expected time to replace breaker is 1 hour.
- The GOC reports that offsite power will not be available to the switchyard for 8 hours.
- REPCET on Unit 2 is 705°F and stable.
- Wind direction obtained from RADD0SE-V is from the West (240°) at 5 mph.
- Interstate 5 and Camp Pendleton are both closed to traffic due to the wildfires.

Initiating Cue: The Shift Manager directs you to:

- Classify the event per SO123-VIII-1, Recognition and Classification of Emergencies and document on the Cue Sheet.
- Determine any Protective Actions per SO123-VIII-10.3, Protective Action Recommendations and document on the Cue Sheet.

Event Classification: _____

Protective Actions:

Facility:	SONGS Units 2 and 3		Date of Examination:	10/12/12
Exam Level:	RO  SRO(I)  SRO (U) 	Operating Test No.:		NRC
Control Room Systems® (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)				
System / JPM Title			Type Code*	Safety Function
S-1	004 – Chemical and Volume Control System (J275S) Perform 50 gallon dilution to the RCS	D, S		1
S-2	011 – Pressurizer Level Control System (New) Transfer in-service letdown flow controllers	N, S		2
S-3	006 – Emergency Core Cooling System (New) Transfer Charging Pump Suction Post-SIAS	A, EN, L, N, S		3
S-4	045 – Main Turbine Generator System (New) Synch the Main Turbine to the grid and apply block load	A, N, S		4S
S-5	022 – Containment Cooling System (New) Perform Containment Cooling Actuation System Relay Testing	A, EN, N, S		5
S-6	062 – AC Electrical Distribution System (J007) Transfer 6.9kV bus 2A01 from UAT to RAT	A, M, S		6
S-7	073 – Process Radiation Monitoring System (J290) Change Radiation Monitor setpoints during small S/G tube leak	D, S		7
S-8	071 – Align and Discharge a Waste Gas Decay Tank (J231FS) (RO only)	A, D, S		9
In-Plant Systems® (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)				
P-1	039 – Main and Reheat Steam System (J038) Manually open an Atmospheric Dump Valve	D, E		4S
P-2	064 – Emergency Diesel Generators (J016) Locally start Emergency Diesel Generator	D, E		6
P-3	001 – Control Rod Drive System (J017) Remove MG Set # 1 from service	D, R		1

@ 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; 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	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

**NRC JPM Examination
Summary Description**

- S-1 The applicant will perform a 50 gallon dilution to the RCS per SO23-3-2.2, Makeup Operations. This is a bank JPM under the Chemical Volume and Control System – Reactivity Control Safety Function.
- S-2 The applicant will place the standby Letdown Flow Control Valve controller in service and remove the in-service Letdown Flow Control Valve from service per SO23-3-2.1, CVCS Operations. This is a new JPM under the Chemical Volume and Control System – Reactor Coolant System Inventory Control Safety Function.
- S-3 The applicant will perform FS-24, Transfer Charging Pump Suction, per SO23-12-11, EOI Supporting Attachments. The alternate path occurs when a valve is found to be out of its required position. This is a new JPM under the Emergency Core Cooling System – Reactor Pressure Control Safety Function.
- S-4 The applicant will raise Main Generator load per SO23-5-1.7, Power Operations. The alternate path occurs when high Turbine vibrations require the Reactor to be immediately tripped. This is a new JPM under the Main Turbine Generator System – Secondary System Heat Removal From Reactor Core Safety Function.
- S-5 The applicant will perform Containment Cooling Actuation Signal K-Relay testing per SO23-3-3.43.38, ESF Subgroup Relays K-306A and K-306B Semiannual Test. The alternate path occurs when the expected test response is not obtained. This is a new JPM under the Containment Cooling System – Containment Integrity Safety Function.
- S-6 The applicant will transfer 6.9kV bus 2A01 from the Unit Auxiliary Transformer to the Reserve Auxiliary Transformer per SO23-6-1, Transferring 6.9kv Buses, in preparation for

breaker maintenance. The alternate path occurs following the transfer when the supply breaker to bus 2A01 trips on overcurrent. The Reactor will fail to automatically trip on RCS Low Flow and the applicant will have to manually trip the Reactor. This is a modified JPM under the AC Electrical Distribution System – Electrical Safety Function.

- S-7 The applicant will reset RE-7870, Condenser Air Ejector Wide Range Gas Monitor, Hi and HI-HI setpoints during a small SGTR per SO23-3-2.36, Radiation Monitoring Data Acquisition System. This is a bank JPM under the Process Radiation Monitoring System – Instrumentation Safety Function.
- S-8 The applicant will line up and discharge a Waste Gas Decay Tank per SO23-8-15, Radwaste Gas Discharge. The alternate path occurs when radiation monitors respond abnormally after the discharge is commenced. This is a bank JPM under the Waste Gas Disposal System – Radioactivity Release Safety Function.
- P-1 The applicant will locally open an Atmospheric Dump Valve to establish RCS Heat Removal per SO23-13-2, Shutdown From Outside the Control Room. This is a bank JPM under the Main and Reheat Steam System - Secondary System Heat Removal From Reactor Core Safety Function.
- P-2 The applicant will locally start an Emergency Diesel Generator per SO23-13-2, Shutdown from Outside the Control Room. This is a bank JPM under the Emergency Diesel Generators System – Electrical Safety Function.
- P-3 The applicant will remove Control Rod Drive System Motor Generator # 1 from service per SO23-3-2.19, Control Element Drive Mechanism Control System Operation. This is a bank JPM under the Control Rod Drive System – Reactivity Control Safety Function.

Facility: SONGS JPM # NRC JPM S-1 Task # 141244 K/A # 004 A2.06 4.2 / 4.3 SF-1
Title: Perform a Blended Makeup to the VCT

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: x

Simulator: x

Alternate Path: x

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is operating at 100% Reactor power.
- VCT Level Transmitter LT-226 has failed to 45% and has been placed in BYPASS.
- VCT Level Transmitter LT-227 is indicating 39% level in the VCT.
- Boric Acid Makeup Pump P-174 is OOS.
- Current Boron Concentration is 892 ppm per Chemistry sample.
- Blend setpoints of 13.2 gpm for Boric Acid and 74.8 gpm for PMW were verified at the beginning of shift.
- PMW tanks are NOT cross-tied.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Perform a manual blended makeup to the VCT to raise VCT level to 50% per SO23-3-2.2, Makeup Operations, Section 6.7, Manual Blended Makeup Mode.
- A Reactivity Brief has been conducted and the CRS has suspended peer checking for this evolution.
- Start at step 6.7.9.

Task Standard: INITIATED a blended makeup to the VCT and TERMINATED the blend within one minute of the overcurrent trip of Boric Acid Makeup Pump P-175.

Required Materials: SO23-3-2.2, Makeup Operations, Section 6.7, Manual Blended Makeup Mode.

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**



- INITIALIZE to IC- 221
- ENSURE NRC JPM S-1 event is loaded (event will automatically actuate based on applicant actions).
- ENSURE FIC-0210Y, BAMU Flow Controller, is set to a flowrate of 13.2 gpm.
- ENSURE FIC-0210X, PMW Flow Controller, is set to a flowrate of 74.8 gpm.
- ENSURE an OOS MAGTAG is placed over the BAMU Pump P-174 handswitch.
- ENSURE trend setup on the PCS computer facing the CVCS DCS screen with the following monitoring points:
 - Pressurizer Level
 - Pressurizer Pressure
 - VCT Level
 - Reactor Power (CV9739)



EXAMINER:



- PROVIDE the examinee with a copy of SO23-3-2.2, Makeup Operations, Section 6.7, Manual Blended Makeup Mode.



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1 6.7.9	ENSURE ENTERED required flowrate on FIC-0210Y, BAMU Flow Controller.		
Standard:	VERIFIED BAMU Flowrate of 13.2 gpm entered on FIC-0210Y.		
Comment:			SAT  UNSAT 



Perform Step: 2 6.7.9.1	If flowrate change, then SELECT SET.		
Standard:	MARKED step N/A due to flowrate of 13.2 gpm entered on FIC-0210Y.		
Comment:			SAT  UNSAT 



Perform Step: 3 6.7.9.2	ENSURE FIC-0210Y in AUTO.		
Standard:	VERIFIED FIC-0210Y selected to AUTO.		
Comment:			SAT  UNSAT 



Perform Step: 4 6.7.10	ENSURE ENTERED required flowrate on FIC-0210X, PMW Flow Controller.		
Standard:	VERIFIED PMW Flowrate of 74.8 gpm entered on FIC-0210X.		
Comment:			SAT  UNSAT 



Perform Step: 5 6.7.10.1	If flowrate change, then SELECT SET.		
Standard:	MARKED step N/A due to flowrate of 74.8 gpm entered on FIC-0210X.		
Comment:			SAT  UNSAT 



Perform Step: 6 6.7.10.2	ENSURE FIC-0210X in AUTO.		
Standard:	VERIFIED FIC-0210X selected to AUTO.		
Comment:			SAT  UNSAT 



Perform Step: 7 6.7.11.1	From the MODE SELECTOR, SELECT MODIFY.		
Standard:	SELECTED MODIFY from the MODE SELECTOR.		
Examiner Note:	The applicant may not select MODIFY since the MODE SELECTOR is already in MANUAL.		
Comment:			SAT  UNSAT 



Perform Step: 8 6.7.11.2	From the MODE SELECTOR, SELECT MANUAL.		
Standard:	SELECTED MANUAL from the MODE SELECTOR.		
Examiner Note:	The applicant may not select MANUAL since the MODE SELECTOR is already in MANUAL.		
Comment:			SAT  UNSAT 



Perform Step: 9 6.7.11.3	From the MODE SELECTOR, SELECT EXIT.		
Standard:	SELECTED EXIT from the MODE SELECTOR.		
Examiner Note:	The applicant may not select EXIT if steps 6.7.11.1 and 6.7.11.2 were not performed due to the MODE SELECTOR already being in MANUAL.		
Comment:			SAT  UNSAT 



Perform Step: 10 ✓ 6.7.12	OPEN FV-9253, Blended Makeup to VCT Isolation.		
Standard:	OPENED FV-9253, Blended Makeup to VCT Isolation by DEPRESSING the OPEN pushbutton.		
Examiner Note:	Opening FV-9253 causes 58A54, CVCS DCS Trouble, to reset and immediately reflash.		
Comment:			SAT  UNSAT 



Perform Step: 11 6.7.13	SELECT the BAMU Pump associated with the BAMU Tank used.	
Standard:	VERIFIED selected BAMU Pump is aligned to a BAMU Tank with sufficient inventory and boron concentration.	
Comment:	<div style="border: 1px solid black; padding: 2px;"> SAT  UNSAT  </div>	



Perform Step: 12√ 6.7.14	START the selected BAMU Pump.	
Standard:	STARTED the selected BAMU Pump by DEPRESSING the selected BAMU Pump START pushbutton.	
Comment:	<div style="border: 1px solid black; padding: 2px;"> SAT  UNSAT  </div>	

Perform Step: 13 6.7.15	VERIFY the PMW Pump selected matches the PMW Pump Discharge Valve Placard.	
Standard:	VERIFIED the PMW Pump selected on the DCS screen matched the PMW Pump Discharge Valve indicated open on the DCS screen.	
Comment:	<div style="border: 1px solid black; padding: 2px;"> SAT  UNSAT  </div>	

Perform Step: 14√ 6.7.16	START the selected PMW Pump.	
Standard:	STARTED the selected PMW Pump on the DCS screen by clicking the PMW Pump Control box, clicking the PMW Pump Control header (to enable pump controls), then clicking the START button.	
Comment:	<div style="border: 1px solid black; padding: 2px;"> SAT  UNSAT  </div>	

Perform Step: 15 6.7.17	ENSURE OPEN FV-0210Y, BAMU to VCT Flow Control Valve.	
Standard:	ENSURED OPEN FV-0210Y, BAMU to VCT Flow Control Valve by OBSERVING FV-0210Y throttling open on the DCS screen.	
Comment:	<div style="border: 1px solid black; padding: 2px;"> SAT  UNSAT  </div>	

Perform Step: 16 6.7.18	ENSURE OPEN FV-0210X, PMW to VCT Flow Control Valve.	
Standard:	ENSURED OPEN FV-0210X, PMW to VCT Flow Control Valve by OBSERVING FV-0210X throttling open on the DCS screen.	
Examiner Note:	~ 30 seconds after starting the PMW Pump, the running Boric Acid Makeup Pump will trip, requiring the Manual Blended Makeup to be secured.	
Comment:	SAT 	UNSAT 

Examiner Note:	The following step represents the alternate path portion of the JPM.	
Perform Step: 17 √	IDENTIFY the running BAMU Pump has tripped and take action to secure the Manual Blended Makeup.	
Standard:	IDENTIFIED the running BAMU Pump has tripped and SECURED the blended makeup by any ONE of the following actions: <ul style="list-style-type: none"> • Stopping the running PMW Pump from the DCS screen. • Closing FV-9253, Blended Makeup to VCT Isolation Valve. • Closing FV-0210X, PMW to VCT Flow Control Valve by placing PMW Flow Controller in MANUAL and lowering output to zero. 	
Terminating Cue:	This JPM is complete.	
Comment:	SAT 	UNSAT 

STOP TIME:	
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Initial Conditions: Given the following conditions:

- Unit 2 is operating at 100% Reactor power.
- VCT Level Transmitter LT-226 has failed to 45% and has been placed in BYPASS.
- VCT Level Transmitter LT-227 is indicating 39% level in the VCT.
- Boric Acid Makeup Pump P-174 is OOS.
- Current Boron Concentration is 892 ppm per Chemistry sample.
- Blend setpoints of 13.2 gpm for Boric Acid and 74.8 gpm for PMW were verified at the beginning of shift.
- PMW tanks are NOT cross-tied.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Perform a manual blended makeup to the VCT to raise VCT level to 50% per SO23-3-2.2, Makeup Operations, Section 6.7, Manual Blended Makeup Mode.
- A Reactivity Brief has been conducted and the CRS has suspended peer checking for this evolution.
- Start at step 6.7.9.

Facility: SONGS JPM # NRC JPM S-2 Task #185145 K/A # 011 A4.05 3.2 / 2.9 SF-2
Title: Shift In-Service Letdown Flow Control Valves

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: x

Simulator: x

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is in Mode 1.
- The in-service Letdown Flow Control Valve, 2LV-0110A, is to be taken out of service for maintenance.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Place 2LV-0110B in service in accordance with SO23-3-2.1, CVCS Operation, Attachment 5, Shifting Flow and Backpressure Control Valves, Section 2.1, Shifting the Letdown Flow Control Valves.
- A Reactivity Brief has been conducted and the CRS has suspended peer checking for this evolution.
- The CRS has determined that Accumulator blowdown is NOT required.
- Start at step 2.1.2.

Task Standard: PLACED 2LV-0110B in service while maintaining Pressurizer level > 51.5% (backup charging pump start) and < 57% (TS limit).

Required Materials: SO23-3-2.1, CVCS Operation, Attachment 5, Shifting Flow and Backpressure Control Valves, Section 2.1, Shifting the Letdown Flow Control Valves

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

- INITIALIZE to IC- 222
- ENSURE Letdown flow and backpressure are stable prior to starting the JPM.

EXAMINER:



- PROVIDE the examinee with a copy of SO23-3-2.1, CVCS Operation, Attachment 5, Shifting Flow and Backpressure Control Valves, Section 2.1, Shifting the Letdown Flow Control Valves.



√ - Check Mark Denotes Critical Step



START TIME:

GUIDELINES

1. When initially raising the output signal for the incoming valve, the valve may not respond until > 20%, requiring prompt adjustment to lower the output signal. (AR 060800929)
2. Prior to placing a Letdown Flow Control Valve in AUTO, Pressurizer level should be as stable and close to setpoint as reasonable, to prevent the Letdown Flow Control Valve controller from cycling excessively.

Perform Step: 1 2.1.2	ENSURE HIC-0110B, the out of service (incoming) Letdown Flow Valve Controller, in MANUAL with zero output.
Standard:	ENSURED HIC-0110B in MANUAL with zero output.
Comment:	SAT  UNSAT 

Perform Step: 2 √ 2.1.3	OPEN Out of Service Letdown Flow Control Valve Outlet Valve, S21208MU163 (LV-0110B).
Standard:	DIRECTED outside operator to open S21208MU163.
Examiner Cue:	Letdown Flow Control Valve Outlet Valve, S21208MU163, is open and has been independently verified open.
Comment:	SAT  UNSAT 



Perform Step: 3 √ 2.1.4	PLACE the controller for the in-service (outgoing) Letdown Flow Control Valve in MANUAL.
Standard:	PLACED HIC-0110A in MANUAL by DEPRESSING the A/M pushbutton on HIC-0110A.
Comment:	SAT  UNSAT 

Perform Step: 4 ✓ 2.1.5	SLOWLY RAISE the output signal of the incoming Letdown Flow Control Valve Controller, and SLOWLY LOWER the output signal of the outgoing Letdown Flow Control Valve Controller, while monitoring for proper response of the Letdown Flow Control Valves and Pressurizer level.	
Standard:	MAINTAINED Pressurizer level > 51.5% (backup charging pump start) and < 57% (TS limit) while transferring Letdown Flow Control Valves in MANUAL.	
Comment:		SAT ☞ UNSAT ☞

Perform Step: 5 ✓ 2.1.6.1	When the Output signal of the incoming Letdown Flow Control Valve Controller equals the Auto Demand Signal (at or above the controllers floor setting) from its own controller, then perform the following: PLACE the controller for the incoming Letdown Flow Control Valve in AUTO, and ENSURE proper response.	
Standard:	PLACED HIC-0110B in AUTO by DEPRESSING the A/M pushbutton on HIC-0110B and ENSURED proper response by observing Letdown Flow Control Valve LV-0110B throttle open/closed in response to current level deviation.	
Comment:		SAT ☞ UNSAT ☞

Perform Step: 6 ✓ 2.1.6.2	ENSURE CLOSED the outgoing Letdown Flow Control Valve by SLOWLY LOWERING the output signal, to zero while monitoring for proper response of the Letdown Flow Control Valves and Pressurizer level.	
Standard:	CLOSED LV-0110A by lowering Letdown Flow Controller HIC-0110A output to zero and MONITORED proper response of Letdown Flow Control Valve LV-0110B.	
Comment:		SAT ☞ UNSAT ☞

Perform Step: 7 2.1.7	ENSURE that the incoming Letdown Flow Control Valve automatically throttles to maintain letdown flow, and a stable Pressurizer level.	
Standard:	ENSURED LV-0110B automatically throttled to maintain Pressurizer level stable.	
Comment:		SAT ☞ UNSAT ☞

Perform Step: 8 2.1.8	CLOSE the Outlet Valve for the Letdown Flow Control Valve which was taken out of service (S21208MU162)		
Standard:	DIRECTED outside operator to close S21208MU162.		
Examiner Cue:	Letdown Flow Control Valve Outlet Valve, S21208MU162, is closed and has been independently verified closed.		
Terminating Cue:	This JPM is complete.		
Comment:			SAT  UNSAT 

STOP TIME:	
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Initial Conditions: Given the following conditions:

- Unit 2 is in Mode 1.
- The in-service Letdown Flow Control Valve, 2LV-0110A, is to be taken out of service for maintenance.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Place 2LV-0110B in service in accordance with SO23-3-2.1, CVCS Operation, Attachment 5, Shifting Flow and Backpressure Control Valves, Section 2.1, Shifting the Letdown Flow Control Valves.
- A Reactivity Brief has been conducted and the CRS has suspended peer checking for this evolution.
- The CRS has determined that Accumulator blowdown is **NOT** required.
- Start at step 2.1.2.

Facility: SONGS JPM # S-3

Task #141295

K/A #005 A4.01

3.6 / 3.4 SF-4P

Title: Transfer From Parallel to Single LPSI Pump Operation (Shutdown Cooling)

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: xSimulator: x

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is in MODE 5.
- RCS temperature is 75°F.
- Pressurizer level is 15%.
- Two trains of Shutdown Cooling are in service.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Secure Train B LPSI Pump P-016 per SO23-3-2.6, Shutdown Cooling Operation, Section 6.12, Transfer from Parallel to Single LPSI Pump Operation.
- The CRS has set a temperature band of 70 to 80°F for this evolution.
- The CRS has directed SDC flowrates remain within the administrative limits of SO23-3-2.6, Shutdown Cooling Operation.

Task Standard: SECURED Train B LPSI Pump while MAINTAINING the following parameters:

- RCS temperature between 70 and 80°F
- SDC flowrate between 5000 and 8300 gpm with two LPSI pumps in service.
- SDC flowrate between 2500 (or 2400 per CFMS) and 5500 gpm with one LPSI pump in service.

Required Materials: SO23-3-2.6, Shutdown Cooling Operation.

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**



- INITIALIZE to IC-219
- Bring up PCS Page 314 at the 21 desk and turn the screen to face CR57.
- Leave the simulator in FREEZE until the applicant is ready to begin.



EXAMINER:



- PROVIDE the examinee with a copy of: SO23-3-2.6, Shutdown Cooling Operation, Sections 6.2, 6.3, 6.12, and the Limits & Specifications.



√ - Check Mark Denotes Critical Step

START TIME:

Perform Step: 1 6.12.1	Ensure RCS and/or SFP alternate cooling procedures SO23-3-2.6.1, SO23-3-2.6.2, SO23-3-2.6.3, and SO23-3-2.6.4 are not in use.	
Standard:	VERIFIED no alternate RCS and/or SFP cooling procedures are in use.	
Examiner Cue:	No alternate cooling procedures are in use.	
Comment:	SAT  UNSAT 	

Perform Step: 2 6.12.2	Notify HP 70' Control Point that radiation levels in the affected areas may increase.	
Standard:	INFORMED the 70' Control Point of the potential for increased radiation levels.	
Examiner Cue:	Control Point has been notified.	
Comment:	SAT  UNSAT 	

Perform Step: 3 √ 6.12.3	Adjust RCS/SDCS temperature and flow per Main Body Section 6.3 during this evolution.	
Standard:	MAINTAINED the following parameters: <ul style="list-style-type: none"> • RCS temperature between 70 and 80°F. • SDC flowrate between 5000 and 8300 gpm with two LPSI pumps in service. 	
Examiner Note:	Main body Section 6.3 is always in effect while Shutdown Cooling is in service.	
Comment:	SAT  UNSAT 	

Perform Step: 4 √ 6.12.4	SLOWLY CLOSE two LPSI Header Isolation Valves. Valves selected should be associated with the LPSI Pump being removed from service: MP-016: 2(3)HV-9322 and 2(3)HV-9331.	
Standard:	CLOSED LPSI Header Isolation Valves 2HV-9322 and 2HV-9331 while MAINTAINING the following parameters: <ul style="list-style-type: none"> • RCS temperature between 70 and 80°F. • SDC flowrate between 5000 and 8300 gpm with two LPSI pumps in service. 	
Comment:	SAT  UNSAT 	

Perform Step: 5√ 6.12.5	STOP the LPSI Pump being removed from service: 2(3)MP-016, Train B LPSI Pump.	
Standard:	STOPPED LPSI Pump P-016 and MAINTAINED the following parameters: <ul style="list-style-type: none"> • RCS temperature between 70 and 80°F. • SDC flowrate between 2500 and 5500 gpm. 	
Examiner Note:	When LPSI Pump P-016 is secured, SDC flowrate will lower ~ 1000 gpm. If the applicant maintains SDC flowrate between 5000 and 8300 gpm before P-016 is secured, and flowrate lowers to between 2500 and 5500 gpm after the pump is secured, he/she has performed the step correctly.	
Terminating Cue:	When the applicant has secured LPSI Pump P-016 and has control of SDC flowrate and RCS temperature, the JPM can be terminated.	
Comment:	<div style="display: flex; justify-content: flex-end; align-items: center;"> <div style="border: 1px solid black; padding: 2px 10px;">SAT </div> <div style="border: 1px solid black; padding: 2px 10px; margin-left: 10px;">UNSAT </div> </div>	

STOP TIME:

Initial Conditions: Given the following conditions:

- Unit 2 is in MODE 5.
- RCS temperature is 75°F.
- Pressurizer level is 15%.
- Two trains of Shutdown Cooling are in service.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Secure Train B LPSI Pump P-016 per SO23-3-2.6, Shutdown Cooling Operation, Section 6.12, Transfer from Parallel to Single LPSI Pump Operation.
- The CRS has set a temperature band of 70 to 80°F for this evolution.
- The CRS has directed SDC flowrates remain within the administrative limits of SO23-3-2.6, Shutdown Cooling Operation.

Facility: SONGS JPM # NRC JPM S-4 Task #192835 K/A # 045 A4.02 2.7 / 2.6 SF-4S
Title: Synchronize the Main Generator to the Grid and Apply Block Load

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: x

Simulator: x

Alternate Path: x

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is ready to synchronize the Main Generator to the grid.
- Reactor Power is stable at 18.5%.
- Shift Manager's permission has been obtained for this evolution.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Synchronize the Main Generator to the grid and apply block load per SO23-10-1, Turbine Startup and Normal Operation, Attachment 2, Cold Turbine Startup, Section 2.6, Synchronize and Apply Block Load of 55 MW.
- A Reactivity Brief has been conducted and the CRS has suspended peer checking for this evolution.

Task Standard: SYNCHRONIZED the Main Generator to the grid and TRIPPED the Main Turbine when Turbine vibrations exceeded 12.5 mils.

Required Materials: SO23-10-1, Turbine Startup and Normal Operation, Attachment 2, Cold Turbine Startup, Section 2.6, Synchronize and Apply Block Load, and ARP SO23-15-99.B, window 99B49, Turbine Vibration Hi.

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**



- **INITIALIZE to IC-220**
- **ENSURE the synchroscope keyswitch is in the OFF position.**
- **ENSURE the Main Turbine Emergency Trip pushbutton key has been removed.**
- **LEAVE the simulator in FREEZE until the applicant is ready to begin the JPM.**
- **ENSURE the malfunction auto actuates when the 1st generator output breaker is closed.**



EXAMINER:



- **PROVIDE the examinee with a copy of SO23-10-1, Turbine Startup and Normal Operation, Attachment 2, Cold Turbine Startup, Section 2.6, Synchronize and Apply Block Load and the Limits & Specifications.**



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1 2.6.1	DEPRESS the Generator Output Breakers Trip pushbuttons to ensure they do not have a trip relay energized.	
Standard:	DEPRESSED the Generator Output Breakers Trip pushbuttons.	
Comment:	SAT  UNSAT 	



Perform Step: 2 2.6.2	Ensure Reactor Power is $\geq 17\%$.	
Standard:	VERIFIED Reactor Power is $\geq 17\%$.	
Comment:	SAT  UNSAT 	



Perform Step: 3 2.6.3	Verify Turbine Vibration (XR2110) is not trending up toward alarm setpoint. (Setpoint is 9 mils.)	
Standard:	VERIFIED Turbine Vibration (XR2110) is not trending up toward alarm setpoint.	
Comment:	SAT  UNSAT 	

Perform Step: 4 2.6.3.1	If Turbine Vibration is trending up toward alarm setpoint, then contact Engineering prior to synchronizing to the grid.	
Standard:	MARKED step N/A due to normal vibration levels identified in step 2.6.3.	
Comment:	SAT  UNSAT 	

Perform Step: 5 2.6.4	Obtain Shift Manager's approval to synchronize the Unit and apply Block Load.	
Standard:	IDENTIFIED Shift Manager's approval has already been obtained from the Initial Conditions.	
Comment:	SAT  UNSAT 	



Perform Step: 6 2.6.5	TURN key operated HS-1627A to ON to place the Non-ESF Synchroscope in service.	
Standard:	TURNED key operated HS-1627A to ON to place the Non-ESF Synchroscope in service.	
Comment:	SAT  UNSAT 	

Examiner Note:	Either Generator Output Breaker 4062 or 6062 may be used first when synching the Generator to the grid.	
Perform Step: 7 2.6.6	DEPRESS Generator Output Breaker 4062 or 6062 SYNC pushbutton to place the synchronizing circuit in service across the respective breaker.	
Standard:	DEPRESSED Generator Output Breaker 4062 or 6062 SYNC pushbutton to place the synchronizing circuit in service across the respective breaker.	
Comment:	SAT  UNSAT 	

Perform Step: 8 2.6.7	Wait at least 30 seconds for operation of sync check relay.	
Standard:	WAITED at least 30 seconds for operation of sync check relay.	
Comment:	SAT  UNSAT 	



GUIDELINES



1. Adjusting the generator voltage above the running voltage will ensure the voltage regulator is not at its lowest setting and MVARs will not be in a 'buck' condition when the unit is synchronized to the grid.
2. If Block Load > 55 MWe is needed, then load increase should be initiated concurrently with the automatic loading to 55 MWe. (LS-1.5, LS-4.5, LS-4.7)



Perform Step: 9 2.6.8	Adjust the Generator voltage above running voltage (HS-2971).	
Standard:	ADJUSTED the Generator voltage above running voltage (HS-2971).	
Comment:	SAT  UNSAT 	



- 5.6 There are three characteristics associated with the Main Generator synchronizing circuit to be aware of:
- For successful breaker closure, the close switch must not be depressed until after the synchroscope enters the sync window. Depressing the switch early disables the close circuit and prevents breaker closure even after entering the sync window.
 - The synchroscope must make one full revolution in the clockwise direction before it will enable the sync window.
 - The sync window is not a fixed area. It has a maximum width of +/- 10 degrees, but the window shrinks as synchroscope speed decreases. The window is also locked out if synchroscope speed is too fast. The following table summarizes the available sync window depending on the speed of revolution of the synchroscope:



FULL REVOLUTION OF SYNCHROSCOPE TIME	CORRESPONDING WINDOW FOR BREAKER CLOSURE
< 14.4 seconds	None - Close circuit locked out
14.4 seconds	+/- 10.0 Degrees of 12 o'clock
30.0 seconds	+/- 4.8 Degrees of 12 o'clock
45.0 seconds	+/- 3.2 Degrees of 12 o'clock
60.0 seconds	+/- 2.4 Degrees of 12 o'clock
120.0 seconds	+/- 1.2 Degrees of 12 o'clock

Examiner Note:	L&S 5.6 is above.		
Perform Step: 10 √ 2.6.9	Adjust Turbine Speed, so the synchroscope is moving slowly in the clockwise direction (HS-2210). [LS-5.6]		
Standard:	ADJUSTED Turbine Speed using Turbine Speed RAISE/LOWER pushbutton HS-2210 as necessary to move the synchroscope slowly in the clockwise direction.		
Comment:	SAT  UNSAT 		

Perform Step: 11 √ 2.6.10	CLOSE the Generator Output Breaker.		
Standard:	CLOSED the Generator Output Breaker.		
Comment:	SAT  UNSAT 		

Perform Step: 12 2.6.11	VERIFY CLOSED Generator Output Breaker, and the synchroscope stopped in the straight up position.	
Standard:	VERIFIED closed Generator Output Breaker, and the synchroscope stopped in the straight up position.	
Comment:	SAT  UNSAT 	

Examiner Note:	This step may or may not be performed based on applicant speed.	
Perform Step: 13 2.6.12	ENSURE Turbine picks up initial Block Load of 55 MWe.	
Standard:	ENSURED Turbine picked up initial Block Load of 55 MWe.	
Comment:	SAT  UNSAT 	

Examiner Note:	The following step is from Alarm Response Procedure 99B49, Turbine Vibration Hi	
Perform Step: 14 2.1.3	If sustained, and confirmed real, vibration exceeds 12.5 mils , <u>then</u> : <ul style="list-style-type: none"> • If < 55% Reactor Power, <u>then</u> Manually Trip the Turbine. 	
Standard:	Manually tripped the Turbine.	
Terminating Cue:	This JPM is complete.	
Comment:	SAT  UNSAT 	

STOP TIME:	
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Initial Conditions: Given the following conditions:

- Unit 2 is ready to synchronize the Main Generator to the grid.
- Shift Manager's permission has been obtained for this evolution.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Synchronize the Main Generator to the grid and apply block load per SO23-10-1, Turbine Startup and Normal Operation, Attachment 2, Cold Turbine Startup, Section 2.6, Synchronize and Apply Block Load of 55 MW.

Facility: SONGS JPM # S-5

Task # 192833

K/A # 103 A3.01

3.9 / 4.2

SF-5

Title: Verify Containment Isolation Actuation

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: xSimulator: xAlternate Path: x

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 tripped from 100% Reactor power due to an Excess Steam Demand Event.
- Standard Post Trip Actions have been completed and the crew has transitioned to SO23-12-5, Excess Steam Demand Event.
- The Plant Computer System (PCS) is out of service.
- You are the ARO and have been called to the Control Room.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Verify proper actuation of Containment Isolation per SO23-3-2.22, Engineered Safety Features Actuation System Operations, Attachment 7, CIAS Actuation Verification.

Task Standard:

- IDENTIFIED HV-6212, HV-6218, HV-6223, and HV-6236 failed to close on CIAS and CLOSED the valves per SO23-3-2.22.

Required Materials: SO23-3-2.22, Engineered Safety Features Actuation System Operations, Attachment 7, CIAS Actuation Verification.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**



- **INITIALIZE to IC-229**
- **ENSURE K-Relays K213A, K205A, and K301A are in the “fail energized” condition.**
- **ENSURE OOS Tags are placed on the PCS computers and ALL PCS monitors are turned OFF.**
- **LEAVE the simulator in FREEZE until the applicant is ready to begin.**



EXAMINER:



PROVIDE the examinee with a copy of SO23-3-2.22, Engineered Safety Features Actuation System Operations, Attachment 7, CIAS Actuation Verification.



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1 2.2.1	ENSURE CIAS Train A component actuation at CR-57: HV-4048, S/G E-088 Main FW Isolation Valve	
Standard:	VERIFIED CLOSED, HV-4048, S/G E-088 Main FW Isolation Valve	
Comment:	SAT 	UNSAT 



Perform Step: 2 2.2.2	ENSURE CIAS Train A component actuation at CR-57: HV-8205, S/G E-088 Main Steam Isolation Valve	
Standard:	VERIFIED CLOSED, HV-8205, S/G E-088 Main Steam Isolation Valve	
Comment:	SAT 	UNSAT 



Perform Step: 3 √ 2.2.3	ENSURE CIAS Train A component actuation at CR-57: HV-6223, CCW NCL Containment Supply Isolation	
Standard:	RECOGNIZED HV-6223, CCW NCL Containment Supply Isolation failed to close and CLOSED HV-6223, CCW NCL Containment Supply Isolation.	
Examiner Note:	If the applicant mentions writing a notification about the failed component, inform him/her that another operator will write the notification.	
Comment:	SAT 	UNSAT 



Perform Step: 4 √ 2.2.4	ENSURE CIAS Train A component actuation at CR-57: HV-6236, CCW NCL Containment Return Isolation	
Standard:	RECOGNIZED HV-6236, CCW NCL Containment Return Isolation failed to close and CLOSED HV-6236, CCW NCL Containment Return Isolation.	
Comment:	SAT 	UNSAT 



Perform Step: 5 √ 2.2.5	ENSURE CIAS Train A component actuation at CR-57: HV-6212, CCW Loop A to NCL Isolation	
Standard:	RECOGNIZED HV-6212, CCW Loop A to NCL Isolation failed to close and CLOSED HV-6212, CCW Loop A to NCL Isolation.	
Comment:	SAT 	UNSAT 



Perform Step: 6 2.2.6	ENSURE CIAS Train A component actuation at CR-57: HV-6218, CCW Loop A from NCL Isolation	
Standard:	RECOGNIZED HV-6218, CCW Loop A from NCL Isolation failed to close and CLOSED HV-6218, CCW Loop A from NCL Isolation.	
Comment:	SAT  UNSAT 	



Perform Step: 7 2.2.7	ENSURE CIAS Train A component actuation at CR-57: HV-9218, RCP CBO to VCT Isolation	
Standard:	VERIFIED CLOSED, HV-9218, RCP CBO to VCT Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 8 2.2.8	ENSURE CIAS Train A component actuation at CR-57: HV-9205, Letdown Containment Isolation	
Standard:	VERIFIED CLOSED, HV-9205, Letdown Containment Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 9 2.2.9	ENSURE CIAS Train A component actuation at CR-57: HV-0509, Common Hot Leg Sample Isolation	
Standard:	VERIFIED CLOSED, HV-0509, Common Hot Leg Sample Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 10 2.2.10	ENSURE CIAS Train A component actuation at CR-57: HV-0511, PZR STM Space Sample Isolation	
Standard:	VERIFIED CLOSED, HV-0511, PZR STM Space Sample Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 11 2.2.11	ENSURE CIAS Train A component actuation at CR-57: HV-0513, PZR Surge Line Sample Isolation	
Standard:	VERIFIED CLOSED, HV-0513, PZR Surge Line Sample Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 12 2.2.12	ENSURE CIAS Train A component actuation at CR-57: HV-0514, Quench Tank Gas Sample	
Standard:	VERIFIED CLOSED, HV-0514, Quench Tank Gas Sample	
Comment:	SAT  UNSAT 	



Perform Step: 13 2.2.13	ENSURE CIAS Train A component actuation at CR-57: HV-0516, RCDT T-012 Gas Sample Isolation	
Standard:	VERIFIED CLOSED, HV-0516, RCDT T-012 Gas Sample Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 14 2.2.14	ENSURE CIAS Train A component actuation at CR-57: HV-7802, Containment Rad Mon Tr A Outlet Isolation	
Standard:	VERIFIED CLOSED, HV-7802, Containment Rad Mon Tr A Outlet Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 15 2.2.15	ENSURE CIAS Train A component actuation at CR-57: HV-7811, Containment Rad Mon Tr B Outlet Isolation	
Standard:	VERIFIED CLOSED, HV-7811, Containment Rad Mon Tr B Outlet Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 16 2.2.16	ENSURE CIAS Train A component actuation at CR-57: HV-9920, Containment Chill Water Inlet Isolation	
Standard:	VERIFIED CLOSED, HV-9920, Containment Chill Water Inlet Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 17 2.2.17	ENSURE CIAS Train A component actuation at CR-57: HV-5388, Inst. Air to Containment Isolation	
Standard:	RECOGNIZED HV-6218, CCW Loop A from NCL Isolation failed to close and CLOSED HV-6218, CCW Loop A from NCL Isolation.	
Comment:	SAT  UNSAT 	



Perform Step: 18 2.2.18	ENSURE CIAS Train A component actuation at CR-57: HV-9334, SIT Drain to RWT Isolation	
Standard:	VERIFIED CLOSED, HV-9334, SIT Drain to RWT Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 19 2.2.19	ENSURE CIAS Train A component actuation at CR-57: HV-7512, RCDT T-012 Drain Isolation	
Standard:	VERIFIED CLOSED, HV-7512, RCDT T-012 Drain Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 20 2.2.20	ENSURE CIAS Train A component actuation at CR-57: HV-7259, Containment Waste Gas Vent Hdr Isolation	
Standard:	VERIFIED CLOSED, HV-7259, Containment Waste Gas Vent Hdr Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 21 2.2.21	ENSURE CIAS Train A component actuation at CR-57: HV-5803, Containment Sump Pump Discharge Isolation	
Standard:	VERIFIED CLOSED, HV-5803, Containment Sump Pump Discharge Isolation	
Comment:	SAT  UNSAT 	



Perform Step: 22 2.2.22	ENSURE CIAS Train A component actuation at CR-57: HV-7801, Containment Rad Mon Tr A Inlet Isolation	
Standard:	VERIFIED CLOSED, HV-7801, Containment Rad Mon Tr A Inlet Isolation	
Comment:	SAT  UNSAT 	

Perform Step: 23 2.2.23	ENSURE CIAS Train A component actuation at CR-57: HV-7810, Containment Rad Mon Tr B Outlet Isolation	
Standard:	VERIFIED CLOSED, HV-7810, Containment Rad Mon Tr B Outlet Isolation	
Comment:	SAT  UNSAT 	

Perform Step: 24 2.2.24	ENSURE CIAS Train A component actuation at CR-57: HV-9921, Containment Chill Water Outlet Isolation	
Standard:	VERIFIED CLOSED, HV-9921, Containment Chill Water Outlet Isolation	
Comment:		SAT  UNSAT 

Perform Step: 25 2.2.25	ENSURE CIAS Train A component actuation at CR-57: HV-7816, Containment Air Emergency Sample Isolation	
Standard:	VERIFIED CLOSED, HV-7816, Containment Air Emergency Sample Isolation	
Comment:		SAT  UNSAT 

Perform Step: 26 2.2.26	ENSURE CIAS Train A component actuation at CR-57: HV-9823, Containment Mini Purge Supply Isolation	
Standard:	VERIFIED CLOSED, HV-9823, Containment Mini Purge Supply Isolation	
Comment:		SAT  UNSAT 

Perform Step: 27 2.2.27	ENSURE CIAS Train A component actuation at CR-57: HV-9825, Containment Mini Purge Exhaust Isolation	
Standard:	VERIFIED CLOSED, HV-9825, Containment Mini Purge Exhaust Isolation	
Terminating Cue:	This JPM is complete.	
Comment:		SAT  UNSAT 

STOP TIME:	
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Initial Conditions: Given the following conditions:

- Unit 2 tripped from 100% Reactor power due to an Excess Steam Demand Event.
- Standard Post Trip Actions have been completed and the crew has transitioned to SO23-12-5, Excess Steam Demand Event.
- The Plant Computer System (PCS) is out of service.
- You are the ARO and have been called to the Control Room.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Verify proper actuation of Containment Isolation per SO23-3-2.22, Engineered Safety Features Actuation System Operations, Attachment 7, CIAS Actuation Verification.

Facility: SONGS JPM # NRC JPM S-6 Task #186193 K/A # 062 A4.07 3.1 / 3.1 SF-6
Title: Manually transfer 6.9kV Bus 2A01 from UAT to RAT

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: x

Simulator: x

Alternate Path: x

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is operating at 100% Reactor power.
- Maintenance is scheduled for Unit Auxiliary Transformer breaker 2A0104.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Manually transfer 6.9kV bus 2A01 from Unit Auxiliary Transformer 2XU2 to Reserve Auxiliary Transformer 2XR3 in accordance with SO23-6-1, Transferring 6.9kV Buses, Section 6.1, Manual Transfer of 6.9kV Bus from 2XU2 to 2XR3.
- The CRS has suspended Peer Checking for this evolution.

Task Standard: TRANSFERRED 6.9kV bus 2A01 from the Unit Auxiliary Transformer to the Reserve Auxiliary Transformer and TRIPPED the Reactor within one minute of the subsequent loss of 2A01.

Required Materials:

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**



- **INITIALIZE** to IC-224.
- **OPEN** 2012 NRC JPM S-6 event file. The malfunction will automatically actuate based on operator actions.
- **VERIFY** the event file actuates when 2A01 is transferred from the UAT to the RAT.
- **ENSURE** running and incoming voltages and frequencies are matched (adjust the meter calibration dials if necessary).



EXAMINER:



- **PROVIDE** the examinee with a copy of SO23-6-1, Transferring 6.9kV Buses, Section 6.1, Manual Transfer of 6.9kV Bus from 2XU2 to 2XR3.



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1 6.1.1	ENSURE the affected Switchgear area is clear of all unnecessary personnel and maintain it clear until after 6.9 kV bus is energized.	
Standard:	ENSURED the affected Switchgear area is clear of all unnecessary personnel and maintain it clear until after 6.9 kV bus is energized.	
Examiner Cue:	The switchgear area is clear of personnel and I will maintain clear of personnel.	
Comment:	SAT  UNSAT 	



Perform Step: 2 6.1.2	VERIFY ENERGIZED 2XR3 Transformer.	
Standard:	VERIFIED 2XR3 is energized by visually checking the alignment of power to 2XR3.	
Comment:	SAT  UNSAT 	



Perform Step: 3 6.1.3	ENSURE OPEN 3A0105, Res Aux XFMR 2XR3 FDR Breaker. (3HS-1754A)	
Standard:	VERIFIED OPEN 3A0105, Res Aux XFMR 2XR3 FDR Breaker.	
Examiner Note:	3A0105, Res Aux XFMR 2XR3 FDR Breaker is not modeled in the simulator.	
Examiner Cue:	Breaker 3A0105 is OPEN.	
Comment:	SAT  UNSAT 	



Perform Step: 4 6.1.4	PLACE IN MANUAL 2HS-1613B, Res Aux XFMR 2XR3 FDR Bkr 2A0102 Mode Selector.	
Standard:	PLACED IN MANUAL 2HS-1613B, Res Aux XFMR 2XR3 FDR Bkr 2A0102 Mode Selector.	
Comment:	SAT  UNSAT 	



Perform Step: 5 6.1.5	PLACE IN SERVICE 2/3HS-1627A, NON-1E Sync Master CNTRL.	
Standard:	PLACED 2/3HS-1627A, NON ESF SYNC MASTER keyswitch to the ON position.	
Comment:		SAT  UNSAT 



Perform Step: 6 6.1.6	DEPRESS 2HS-1613A, Res Aux XFMR 2XR3 FDR Breaker 2A0102, SYNC pushbutton to place the synchronizing circuit in service.	
Standard:	DEPRESSED 2HS-1613A, Res Aux XFMR 2XR3 FDR Breaker 2A0102, SYNC pushbutton.	
Comment:		SAT  UNSAT 

Perform Step: 7 6.1.6.1	VERIFY Breaker SYNC light ILLUMINATED.	
Standard:	OBSERVED Breaker SYNC light ILLUMINATED.	
Comment:		SAT  UNSAT 

Perform Step: 8 6.1.6.2	VERIFY SYNC IN MODE light ILLUMINATED.	
Standard:	OBSERVED SYNC IN MODE light ILLUMINATED.	
Comment:		SAT  UNSAT 



Perform Step: 9 6.1.6.3	VERIFY SYNC RELAYS TROUBLE light EXTINGUISHED.	
Standard:	OBSERVED SYNC RELAYS TROUBLE light EXTINGUISHED.	
Comment:		SAT  UNSAT 



Perform Step: 10 6.1.6.4	VERIFY INCOMING and RUNNING voltage and frequencies matched.	
Standard:	OBSERVED INCOMING and RUNNING voltage and frequencies matched.	
Comment:		SAT  UNSAT 



Perform Step: 11 6.1.6.5	VERIFY Synchroscope moves to within ± 5 minutes of the straight up position.
Standard:	OBSERVED Synchroscope moved to within ± 5 minutes of the straight up position.
Comment:	SAT  UNSAT 

NOTE

When transferring a 6.9kV bus, then 63C53, UNIT 2(3) NON ESF XFMRs PARALLELED, alarm will be received.

Examiner Note:	~ 10 seconds after closing Res Aux XFMR 2XR3 FDR Breaker 2A0102, the breaker will trip on overcurrent.
Perform Step: 12 6.1.7	DEPRESS 2HS-1613A, Res Aux XFMR 2XR3 FDR Breaker 2A0102, CLOSE pushbutton to parallel 2XU2 and 2XR3.
Standard:	DEPRESSED 2HS-1613A, Res Aux XFMR 2XR3 FDR Breaker 2A0102, CLOSE pushbutton to parallel 2XU2 and 2XR3
Comment:	SAT  UNSAT 

Perform Step: 13	VERIFY OPEN 2A0104, Unit Aux XFMR 2XU2 FDR Breaker. (2HS-1614)
Standard:	VERIFIED OPEN 2A0104, Unit Aux XFMR 2XU2 FDR Breaker.
Examiner Note:	The following steps represent the alternate path portion of the JPM.
Comment:	SAT  UNSAT 

Perform Step: 14 6.1.8	RECOGNIZE the failure of the Reactor to automatically trip due to the loss of two RCPs and MANUALLY TRIP the Reactor.
Standard:	MANUALLY TRIPPED the Reactor by depressing two manual trip pushbuttons OR by deenergizing 480V loadcenters B15 and B16 within one minute of the loss of 6.9kV bus 2A01.
Termination Cue:	This JPM is complete.
Comment:	SAT  UNSAT 

STOP TIME:

Initial Conditions: Given the following conditions:

- Unit 2 is operating at 100% Reactor power.
- Maintenance is scheduled for Unit Auxiliary Transformer breaker 2A0104.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Manually transfer 6.9kV bus 2A01 from Unit Auxiliary Transformer 2XU2 to Reserve Auxiliary Transformer 2XR3 in accordance with SO23-6-1, Transferring 6.9kV Buses, Section 6.1, Manual Transfer of 6.9kV Bus from 2XU2 to 2XR3.
- The CRS has suspended Peer Checking for this evolution.

Facility: SONGS JPM # S-7

Task #191191

K/A #073.A4.02

3.7 / 3.7

SF-7

Title: Reset HI and HI-HI Alarm Setpoint on DAS

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: XSimulator: X

Alternate Path: _____

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions on Unit 2:

- A small Steam Generator tube leak has developed in E-088.
- The leak rate is approximately 35 gallons per day (GPD) and stable.
- RE-7870, Condenser Air Ejector Wide Range Gas Monitor HI and HI-HI Alarm setpoints must be raised to 40 GPD and 65 GPD, respectively.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- RESET the HI Alarm setpoint on DAS LEAK RATE page for RE-7870, Condenser Air Ejector Wide Range Gas Monitor, to a value of 40 GPD per SO23-3-2.36, Radiation Monitoring Data Acquisition System, Section 6.14, Using the DAS Primary-to-Secondary Leak Rate Page.
- RESET the HI-HI Alarm setpoint on DAS LEAK RATE page for RE-7870, Condenser Air Ejector Wide Range Gas Monitor, to a value of 65 GPD per SO23-3-2.36, Radiation Monitoring Data Acquisition System, Section 6.14, Using the DAS Primary-to-Secondary Leak Rate Page.
- The CRS has suspended Peer Checking for this evolution.

Task Standard: RESET the HI and HI-HI Alarm setpoints to 40 and 65 GPD (respectively) on the DAS LEAK RATE page for RE-7870, Condenser Air Ejector Wide Range Gas Monitor, per SO23-3-2.36, Radiation Monitor Data Acquisition System.

Required Materials: SO23-3-2.36, Radiation Monitoring Data Acquisition System.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**









- INITIALIZE to IC-225
- EXECUTE malfunction RM04ZD, Condenser Air Ejector WRGM, RE-7870 LEAKRATE at a severity of 35 GPD (7.2×10^{-7}).
- ENSURE RE-7870 HI and HIHI setpoints in DAS are reset to 5 gpd and 30 gpd respectively prior to each performance of this JPM.
- ENSURE the DAS Home Page is being displayed on the Control Operators Desk.
- ENSURE RE-7870 is reading approximately 35 gpd.
- ENSURE 60A46, Secondary Rad Hi, alarm is locked in.
- ACKNOWLEDGE all DAS alarms. RE-7870 Hi and Hi-Hi will remain locked in.
- ENSURE conditions are stable prior to commencing the JPM.



EXAMINER:



- PROVIDE the examinee with a copy of SO23-3-2.36, Radiation Monitoring Data Acquisition System.



√ - Check Mark Denotes Critical Step



START TIME:



Examiner Note:	Changes on the Data Acquisition System (DAS) can be performed using the mouse, keyboard, or both.		
GUIDELINE All operations that change the status of the DAS (e.g., bypass/restoration operations, changing alarms, etc.) should be Peer checked.			
Perform Step: 1 6.14.1 & 6.14.1.1	Confirm that the Setpoint has been changed in the applicable Radiation Monitor.		
Standard:	DETERMINED status of setpoint change in Condenser Air Ejector WRGM, RE-7870.		
Examiner Cue:	The setpoint has been changed in RE-7870 by Radiation Monitoring I & C and has been peer checked.		
Comment:			SAT  UNSAT 
<hr/>			
Perform Step: 2 √ 6.14.1 & 6.14.1.2	Go to the DAS Home Page and select the applicable Unit Leak Rate button at the top of the screen. Navigate to the applicable monitor Leak Rate page.		
Standard:	CLICKED on the U2 LEAK RATE button at top of Home Page.		
Comment:			SAT  UNSAT 
<hr/>			
Perform Step: 3 6.14.1 & 6.14.1.2	Go to the DAS Home Page and select the applicable Unit Leak Rate button at the top of the screen. Navigate to the applicable monitor Leak Rate page.		
Standard:	DETERMINED correct Leak Rate Page is displayed by its title, RE-7870.		
Comment:			SAT  UNSAT 
<hr/>			
Perform Step: 4 √ 6.14.1 & 6.14.1.3	Double click the parameter to be changed (upper left corner). The only parameter normally changed without indication of leakage is the setpoint (not the HI SP or HI-HI SP). A pop-up window with keypad will be displayed.		
Standard:	DOUBLE CLICKED the HI Alarm Setpoint parameter and CAUSED the keypad pop-up window to appear on screen.		
Comment:			SAT  UNSAT 



Perform Step: 5 ✓ 6.14.1 & 6.14.1.4	Enter new value in pop-up window (Setpoint Format X.XE±X)	
Standard:	ENTERED new value for HI Alarm Setpoint in keypad pop-up window and CLICKED on numerals "4" then "0" <u>or</u> TYPED in new setpoint using keyboard.	
Examiner Note:	The setpoint can be changed either by entering "40" or "4.0E±1"	
Comment:	SAT  UNSAT 	



Perform Step: 6 ✓ 6.14.1 & 6.14.1.5	SELECT the ENTER button.	
Standard:	CLICKED on ENTER button.	
Comment:	SAT  UNSAT 	



Perform Step: 7 6.14.1 & 6.14.1.6	SELECT OK to confirm, and the parameter has been changed.	
Standard:	CLICKED on OK and CONFIRMED the RE-7870 HI setpoint was changed to 40 GPD.	
Comment:	SAT  UNSAT 	



Perform Step: 8 6.14.1 & 6.14.1.7	Repeat Steps 6.14.1.3 to 6.14.1.6 for other parameters to be changed.	
Standard:	REINITIATED Steps 6.14.1.3 through 6.14.1.6.	
Comment:	SAT  UNSAT 	

Perform Step: 9 ✓ 6.14.1 & 6.14.1.3	Double click the parameter to be changed (upper left corner). The only parameter normally changed without indication of leakage is the setpoint (not the HI SP or HI HI SP). A pop-up window with keypad will be displayed.	
Standard:	DOUBLE CLICKED the HI-HI Alarm Setpoint parameter and CAUSED the keypad pop-up window to appear on screen.	
Comment:	SAT  UNSAT 	

Perform Step: 10 ✓ 6.14.1 & 6.14.1.4	Enter new value in pop-up window (Setpoint Format X.XE±X)	
Standard:	ENTERED new value for HI-HI Alarm Setpoint in keypad pop-up window and CLICKED on numerals "6" then "5" <u>or</u> TYPED in new setpoint using keyboard.	
Examiner Note:	The setpoint can be changed either by entering "65" or "6.5E±1"	
Comment:	SAT  UNSAT 	

Perform Step: 11 ✓ 6.14.1 & 6.14.1.5	SELECT the ENTER button.	
Standard:	CLICKED on ENTER button.	
Comment:	SAT  UNSAT 	

Perform Step: 12 6.14.1 & 6.14.1.6	SELECT OK to confirm, and the parameter has been changed.	
Standard:	CLICKED on OK and CONFIRMED the RE-7870 HI-HI setpoint was changed to 65 GPD.	
Comment:	SAT  UNSAT 	

Perform Step: 13 ✓ 6.14.1 & 6.14.1.8	SELECT the UPDATE SCADA button.	
Standard:	CLICKED on UPDATE SCADA button.	
Terminating Cue:	This JPM is complete.	
Comment:	SAT  UNSAT 	

STOP TIME:	
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Initial Conditions: Given the following conditions on Unit 2:

- A small Steam Generator tube leak has developed in E-088.
- The leak rate is approximately 35 gallons per day (GPD) and stable.
- RE-7870, Condenser Air Ejector Wide Range Gas Monitor HI and HI-HI Alarm setpoints must be raised to 40 GPD and 65 GPD, respectively.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- **RESET** the HI Alarm setpoint on DAS LEAK RATE page for RE-7870, Condenser Air Ejector Wide Range Gas Monitor, to a value of 40 GPD per SO23-3-2.36, Radiation Monitoring Data Acquisition System, Section 6.14, Using the DAS Primary-to-Secondary Leak Rate Page.
- **RESET** the HI-HI Alarm setpoint on DAS LEAK RATE page for RE-7870, Condenser Air Ejector Wide Range Gas Monitor, to a value of 65 GPD per SO23-3-2.36, Radiation Monitoring Data Acquisition System, Section 6.14, Using the DAS Primary-to-Secondary Leak Rate Page.
- The CRS has suspended Peer Checking for this evolution.

Facility: SONGS JPM # S-8

Task # 185146

K/A # 010 A4.01

3.7 / 3.5

SF-3

Title: Respond to a Pressurizer Transmitter Failure

Examinee (Print): _____

Testing Method:

Simulated Performance: _____

Classroom: _____

Actual Performance: xSimulator: xAlternate Path: x

Plant: _____

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is operating at 98% Reactor power.
- Pressurizer Pressure Transmitter PT-0100X is out of service.
- Pressurizer Pressure Control is selected to channel Y.
- Pressurizer Pressure Controller PIC-0100 is in AUTO.

Initiating Cue: You are the 21. Maintain steady state conditions on Unit 2.

Task Standard: CONTROLLED Pressurizer Pressure in MANUAL per SO23-13-27, Pressurizer Pressure and Level Malfunctions.

Required Materials: SO23-15-50.A1, Window 50A14, PZR Press Hi/Lo, Alarm Response Procedure and SO23-13-27, Pressurizer Pressure and Level Malfunction.

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

- INITIALIZE to IC-228
- OPEN the 2012 NRC JPM S-8 event file
- ENSURE a MAGTAG installed for PT-0100X OOS
- When DIRECTED by the Floor Instructor, INITIATE 2012 NRC JPM S-8 Event 1

EXAMINER:



- If referenced, PROVIDE the examinee with a copy of SO23-15-50.A1, Window 50A14, PZR Press Hi/Lo, Alarm Response Procedure.
- If referenced, PROVIDE the examinee with a copy of SO23-13-27, Pressurizer Pressure and Level Malfunction.



EXAMINER NOTE:



- The applicant may use Prompt and Prudent actions to take manual control of Pressurizer Pressure due to both control transmitters failing.



√ - Check Mark Denotes Critical Step



START TIME:



Examiner Note:	The following steps are from SO23-15-50.A1, Window 50A14, PZR Press Hi/Lo. The applicant may go directly to SO23-13-27, Pressurizer Pressure and Level Malfunction.	
Perform Step: 1 1.1.1, 1.1.2	If a control channel failure has occurred, then perform the following: <ul style="list-style-type: none"> • POSITION HS-0100A, PZR Pressure Channel Select Switch, to the other channel. • Initiate SO23-13-27, Pressurizer Pressure and Level Malfunction. 	
Standard:	INITIATED SO23-13-27, Pressurizer Pressure and Level Malfunction. The applicant should not transfer HS-0100A to channel X due to channel X being OOS.	
Comment:	SAT  UNSAT 	



Examiner Note:	The following steps are from SO23-13-27, Pressurizer Pressure and Level Malfunction.	
Perform Step: 2 3.a	Verify Pressurizer Spray Valve is NOT stuck OPEN.	
Standard:	VERIFIED both Pressurizer Spray Valves are CLOSED.	
Comment:	SAT  UNSAT 	



Perform Step: 3 3.b	VERIFY the selected Pressurizer Pressure channel is between 2225 and 2275 psia and stable.	
Standard:	OBSERVED the selected Pressurizer Pressure channel is failed low and PROCEEDED to the RNO actions.	
Comment:	SAT  UNSAT 	

Perform Step: 4 3.b RNO	VERIFY the other pressure channel is available by observing PR-0100A or PR-0100B or CFMS page 325.	
Standard:	OBSERVED both pressure channels are NOT available and PROCEEDED to step C.	
Comment:	SAT  UNSAT 	

Perform Step: 5 3.c	VERIFY Pressurizer Pressure is stable.	
Standard:	OBSERVED actual Pressurizer Pressure is rising and PROCEEDED to the RNO actions.	
Comment:	SAT  UNSAT 	

Perform Step: 6 ✓ 3.c RNO 1	TRANSFER PIC-0100, Pressurizer Pressure Controller to MANUAL.	
Standard:	TRANSFERRED PIC-0100 to MANUAL by depressing the PIC-0100 A/M pushbutton and observing "M" displayed on PIC-0100.	
Comment:	SAT  UNSAT 	

Perform Step: 7 ✓ 3.c RNO 2	ADJUST output as necessary to maintain setpoint.	
Standard:	RAISED output on PIC-0100 by depressing the SEL pushbutton until the green dot is above the output column (right hand column) and then depressing the up arrow on PIC-0100 to raise output to restore Pressurizer Pressure to 2225 – 2275 psia.	
Examiner Note:	Raising output on PIC-0100 will lower the output from the Proportional Heaters until 67% output. Above 67% output, the Pressurizer Spray Valves will modulate open.	
Comment:	SAT  UNSAT 	

Perform Step: 8 ✓ 3.c RNO 3	SECURE heaters, as necessary, to limit pressure increase.	
Standard:	SECURED heaters, as necessary, to restore Pressurizer Pressure to 2225 – 2275 psia.	
Terminating Cue:	When the applicant has control of Pressurizer Pressure and is lowering pressure towards the setpoint of 2250 psia, the JPM can be terminated.	
Comment:	SAT  UNSAT 	

STOP TIME:

Initial Conditions: Given the following conditions:

- Unit 2 is operating at 98% Reactor power.
- Pressurizer Pressure Transmitter PT-0100X is out of service.
- Pressurizer Pressure Control is selected to channel Y.
- Pressurizer Pressure Controller PIC-0100 is in AUTO.

Initiating Cue: You are the 21. Maintain steady state conditions on Unit 2.

Facility: SONGS JPM # NRC JPM P-1 Task # 167206 K/A # 068 AA1.01 **4.3 / 4.5 SF-4S**
Title: Manually Open an Atmospheric Dump Valve (HV-8421)

Examinee (Print): _____

Testing Method:

Simulated Performance: x

Classroom: _____

Actual Performance: _____

Simulator: _____

Alternate Path: _____

Plant: x

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to toxic gas in the Control Room area.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Transfer Atmospheric Dump Valve 2HV-8421 to Local Manual operation per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.
- You have retrieved the Safe Shutdown bag from the Safe Shutdown locker.

Task Standard: Locally OPENED the ADV per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.

Required Materials: SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 



Examiner (Print / Sign): _____ Date: _____



JPM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1 1.0	Establish communication with the cognizant CRS.	
Standard:	ESTABLISHED communication with the cognizant CRS.	
Comment:	SAT  UNSAT 	

Perform Step: 2 2.1	CLOSE S21301MU1306, 2HV-8421 Instrument Air Isolation Valve.	
Standard:	CLOSED S21301MU1306, 2HV-8421 Instrument Air Isolation Valve.	
Comment:	SAT  UNSAT 	



Perform Step: 3 2.2	CLOSE S21301MU021, 2HV-8421 Nitrogen Isolation Valve.	
Standard:	CLOSED S21301MU021, 2HV-8421 Nitrogen Isolation Valve.	
Comment:	SAT  UNSAT 	

Perform Step: 4 2.3	OPEN S21301MU1265, 2HV-8421 Positioner Equalizing Valve.	
Standard:	OPENED S21301MU1265, 2HV-8421 Positioner Equalizing Valve.	
Examiner Note:		
Comment:	SAT  UNSAT 	



Perform Step: 5 3.1	Unscrew the clevis from the Manual Override Shaft.	
Standard:	UNSCREWED the clevis from the Manual Override Shaft.	
Comment:	SAT  UNSAT 	

Perform Step: 6 3.2	Turn the Handwheel to the CLOSE (Clockwise) position until the clevis detent on the Actuator Shaft is exposed.
Standard:	TURNED the Handwheel to the CLOSE (Clockwise) position until the clevis detent on the Actuator Shaft is exposed.
Comment:	SAT  UNSAT 

CAUTION: Failure to have the clevis fully engaged prior to operating the ADV with the handwheel could result in damage to the ADV rendering it Inoperable.

Perform Step: 7 3.3	When the clevis detent on the Actuator Shaft is exposed below the Manual Override Shaft, then slide the clevis into the detent.
Standard:	VERIFIED the clevis detent on the Actuator Shaft is exposed below the Manual Override Shaft, then SLID the clevis into the detent.
Comment:	SAT  UNSAT 

CAUTION: Leverage devices shall not be used when manually operating the Atmospheric Dump Valves locally. Excessive force could be applied to the ADVs, rendering the valve inoperable, if a leverage device is used.

Perform Step: 8 4.0	Coordinate with the CRS and 21 to manually Throttle 2HV-8421 as necessary to maintain required S/G pressure.
Standard:	INFORMED the CRS 2HV-8421 is ready to be operated and OPERATED 2HV-8421 as directed by the CRS.
Examiner Cue:	The CRS directs you to slowly open the ADV approximately 10% open.
Terminating Cue:	When the applicant has begun opening the ADV by turning the handwheel in the counterclockwise position, the JPM may be terminated.
Comment:	SAT  UNSAT 

STOP TIME:

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to toxic gas in the Control Room area.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Transfer Atmospheric Dump Valve 2HV-8421 to Local Manual operation per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.
- You have retrieved the Safe Shutdown bag from the Safe Shutdown locker.

Facility: SONGS JPM # NRC JPM P-1 Task # 167206 K/A # 068 AA1.01 **4.3 / 4.5 SF-4S**
Title: Manually Open an Atmospheric Dump Valve (HV-8419)

Examinee (Print): _____

Testing Method:

Simulated Performance: x

Classroom: _____

Actual Performance: _____

Simulator: _____

Alternate Path: _____

Plant: x

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to toxic gas in the Control Room area.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Transfer Atmospheric Dump Valve 2HV-8419 to Local Manual operation per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.
- You have retrieved the Safe Shutdown bag from the Safe Shutdown locker.

Task Standard: Locally OPENED the ADV per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.

Required Materials: SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 



Examiner (Print / Sign): _____ Date: _____



JPM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1	Establish communication with the cognizant CRS.		
Standard:	ESTABLISHED communication with the cognizant CRS.		
Comment:			SAT  UNSAT 

Perform Step: 2	CLOSE S21301MU1304, 2HV-8419 Instrument Air Isolation Valve.		
Standard:	CLOSED S21301MU1304, 2HV-8419 Instrument Air Isolation Valve.		
Comment:			SAT  UNSAT 



Perform Step: 3	CLOSE S21301MU1328, 2HV-8419 Nitrogen Isolation Valve.		
Standard:	CLOSED S21301MU1328, 2HV-8419 Nitrogen Isolation Valve.		
Comment:			SAT  UNSAT 

Perform Step: 4	OPEN S21301MU1264, 2HV-8419 Positioner Equalizing Valve.		
Standard:	OPENED S21301MU1264, 2HV-8419 Positioner Equalizing Valve.		
Examiner Note:			
Comment:			SAT  UNSAT 



Perform Step: 5	Unscrew the clevis from the Manual Override Shaft.		
Standard:	UNSCREWED the clevis from the Manual Override Shaft.		
Comment:			SAT  UNSAT 

Perform Step: 6	Turn the Handwheel to the CLOSE (Clockwise) position until the clevis detent on the Actuator Shaft is exposed.
Standard:	TURNED the Handwheel to the CLOSE (Clockwise) position until the clevis detent on the Actuator Shaft is exposed.
Comment:	SAT  UNSAT 

CAUTION: Failure to have the clevis fully engaged prior to operating the ADV with the handwheel could result in damage to the ADV rendering it Inoperable.

Perform Step: 7	When the clevis detent on the Actuator Shaft is exposed below the Manual Override Shaft, then slide the clevis into the detent.
Standard:	VERIFIED the clevis detent on the Actuator Shaft is exposed below the Manual Override Shaft, then SLID the clevis into the detent.
Comment:	SAT  UNSAT 

CAUTION: Leverage devices shall not be used when manually operating the Atmospheric Dump Valves locally. Excessive force could be applied to the ADVs, rendering the valve inoperable, if a leverage device is used.

Perform Step: 8	Coordinate with the CRS and 21 to manually Throttle 2HV-8419 as necessary to maintain required S/G pressure.
Standard:	INFORMED the CRS 2HV-8419 is ready to be operated and OPERATED 2HV-8419 as directed by the CRS.
Examiner Cue:	The CRS directs you to slowly open the ADV approximately 10% open.
Terminating Cue:	When the applicant has begun opening the ADV by turning the handwheel in the counterclockwise position, the JPM may be terminated.
Comment:	SAT  UNSAT 

STOP TIME:

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to toxic gas in the Control Room area.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Transfer Atmospheric Dump Valve 2HV-8419 to Local Manual operation per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.
- You have retrieved the Safe Shutdown bag from the Safe Shutdown locker.

Facility: SONGS JPM # NRC JPM P-1 Task # 167206 K/A # 068 AA1.01 **4.3 / 4.5 SF-4S**
Title: Manually Open an Atmospheric Dump Valve (HV-8421)

Examinee (Print): _____

Testing Method:

Simulated Performance: x

Classroom: _____

Actual Performance: _____

Simulator: _____

Alternate Path: _____

Plant: x

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to toxic gas in the Control Room area.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Transfer Atmospheric Dump Valve 3HV-8421 to Local Manual operation per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.
- You have retrieved the Safe Shutdown bag from the Safe Shutdown locker.

Task Standard: Locally OPENED the ADV per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.

Required Materials: SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 



Examiner (Print / Sign): _____ Date: _____



JPM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1 1.0	Establish communication with the cognizant CRS.	
Standard:	ESTABLISHED communication with the cognizant CRS.	
Comment:	SAT  UNSAT 	

Perform Step: 2 2.1	CLOSE S31301MU1306, 3HV-8421 Instrument Air Isolation Valve.	
Standard:	CLOSED S31301MU1306, 3HV-8421 Instrument Air Isolation Valve.	
Comment:	SAT  UNSAT 	



Perform Step: 3 2.2	CLOSE S31301MU021, 3HV-8421 Nitrogen Isolation Valve.	
Standard:	CLOSED S31301MU021, 3HV-8421 Nitrogen Isolation Valve.	
Comment:	SAT  UNSAT 	

Perform Step: 4 2.3	OPEN S31301MU1265, 3HV-8421 Positioner Equalizing Valve.	
Standard:	OPENED S31301MU1265, 3HV-8421 Positioner Equalizing Valve.	
Examiner Note:		
Comment:	SAT  UNSAT 	



Perform Step: 5 3.1	Unscrew the clevis from the Manual Override Shaft.	
Standard:	UNSCREWED the clevis from the Manual Override Shaft.	
Comment:	SAT  UNSAT 	

Perform Step: 6 3.2	Turn the Handwheel to the CLOSE (Clockwise) position until the clevis detent on the Actuator Shaft is exposed.
Standard:	TURNED the Handwheel to the CLOSE (Clockwise) position until the clevis detent on the Actuator Shaft is exposed.
Comment:	SAT  UNSAT 

CAUTION: Failure to have the clevis fully engaged prior to operating the ADV with the handwheel could result in damage to the ADV rendering it Inoperable.

Perform Step: 7 3.3	When the clevis detent on the Actuator Shaft is exposed below the Manual Override Shaft, then slide the clevis into the detent.
Standard:	VERIFIED the clevis detent on the Actuator Shaft is exposed below the Manual Override Shaft, then SLID the clevis into the detent.
Comment:	SAT  UNSAT 

CAUTION: Leverage devices shall not be used when manually operating the Atmospheric Dump Valves locally. Excessive force could be applied to the ADVs, rendering the valve inoperable, if a leverage device is used.

Perform Step: 8 4.0	Coordinate with the CRS and 31 to manually Throttle 3HV-8421 as necessary to maintain required S/G pressure.
Standard:	INFORMED the CRS 3HV-8421 is ready to be operated and OPERATED 3HV-8421 as directed by the CRS.
Examiner Cue:	The CRS directs you to slowly open the ADV approximately 10% open.
Terminating Cue:	When the applicant has begun opening the ADV by turning the handwheel in the counterclockwise position, the JPM may be terminated.
Comment:	SAT  UNSAT 

STOP TIME:

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to toxic gas in the Control Room area.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Transfer Atmospheric Dump Valve 3HV-8421 to Local Manual operation per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.
- You have retrieved the Safe Shutdown bag from the Safe Shutdown locker.

Facility: SONGS JPM # NRC JPM P-1 Task # 167206 K/A # 068 AA1.01 **4.3 / 4.5 SF-4S**
Title: Manually Open an Atmospheric Dump Valve (HV-8419)

Examinee (Print): _____

Testing Method:

Simulated Performance: x

Classroom: _____

Actual Performance: _____

Simulator: _____

Alternate Path: _____

Plant: x

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to toxic gas in the Control Room area.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Transfer Atmospheric Dump Valve 3HV-8419 to Local Manual operation per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.
- You have retrieved the Safe Shutdown bag from the Safe Shutdown locker.

Task Standard: Locally OPENED the ADV per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.

Required Materials: SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 



Examiner (Print / Sign): _____ Date: _____



JPM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.



√ - Check Mark Denotes Critical Step



START TIME:



Perform Step: 1	Establish communication with the cognizant CRS.		
Standard:	ESTABLISHED communication with the cognizant CRS.		
Comment:			SAT  UNSAT 

Perform Step: 2	CLOSE S31301MU1304, 3HV-8419 Instrument Air Isolation Valve.		
Standard:	CLOSED S31301MU1304, 3HV-8419 Instrument Air Isolation Valve.		
Comment:			SAT  UNSAT 



Perform Step: 3	CLOSE S31301MU1328, 3HV-8419 Nitrogen Isolation Valve.		
Standard:	CLOSED S31301MU1328, 3HV-8419 Nitrogen Isolation Valve.		
Comment:			SAT  UNSAT 

Perform Step: 4	OPEN S31301MU1264, 3HV-8419 Positioner Equalizing Valve.		
Standard:	OPENED S31301MU1264, 3HV-8419 Positioner Equalizing Valve.		
Examiner Note:			
Comment:			SAT  UNSAT 



Perform Step: 5	Unscrew the clevis from the Manual Override Shaft.		
Standard:	UNSCREWED the clevis from the Manual Override Shaft.		
Comment:			SAT  UNSAT 

Perform Step: 6	Turn the Handwheel to the CLOSE (Clockwise) position until the clevis detent on the Actuator Shaft is exposed.
Standard:	TURNED the Handwheel to the CLOSE (Clockwise) position until the clevis detent on the Actuator Shaft is exposed.
Comment:	SAT  UNSAT 

CAUTION: Failure to have the clevis fully engaged prior to operating the ADV with the handwheel could result in damage to the ADV rendering it Inoperable.

Perform Step: 7	When the clevis detent on the Actuator Shaft is exposed below the Manual Override Shaft, then slide the clevis into the detent.
Standard:	VERIFIED the clevis detent on the Actuator Shaft is exposed below the Manual Override Shaft, then SLID the clevis into the detent.
Comment:	SAT  UNSAT 

CAUTION: Leverage devices shall not be used when manually operating the Atmospheric Dump Valves locally. Excessive force could be applied to the ADVs, rendering the valve inoperable, if a leverage device is used.

Perform Step: 8	Coordinate with the CRS and 31 to manually Throttle 3HV-8419 as necessary to maintain required S/G pressure.
Standard:	INFORMED the CRS 3HV-8419 is ready to be operated and OPERATED 3HV-8419 as directed by the CRS.
Examiner Cue:	The CRS directs you to slowly open the ADV approximately 10% open.
Terminating Cue:	When the applicant has begun opening the ADV by turning the handwheel in the counterclockwise position, the JPM may be terminated.
Comment:	SAT  UNSAT 

STOP TIME:

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to toxic gas in the Control Room area.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Transfer Atmospheric Dump Valve 3HV-8419 to Local Manual operation per SO23-13-2, Shutdown From Outside the Control Room, Attachment 23, Local Manual Operation of Atmospheric Dump Valves.
- You have retrieved the Safe Shutdown bag from the Safe Shutdown locker.

Facility: SONGS JPM # NRC JPM P-2 Task # 192837 K/A # 068 AA1.31 **3.9 / 4.0** **SF-6**
Title: Verify Proper Operation of the Emergency Diesel Generator (Unit 2)

Examinee (Print): _____

Testing Method:

Simulated Performance: x

Classroom: _____

Actual Performance: _____

Simulator: _____

Alternate Path: x

Plant: x

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to an Operating Basis Earthquake and a Loss of Offsite Power.
- Both Unit 2 Emergency Diesel Generators (EDGs) have started and loaded onto their respective buses.
- A toxic gas leak has forced an evacuation of the Control Room.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.
- You have obtained SSD KIT 23.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- ENSURE proper operation of the Unit 2 Train A EDG per SO23-13-2, Shutdown From Outside the Control Room, Attachment 8, 23 Duties..
- Start at step 3.0.

Task Standard: ALIGNED firewater cooling to the Unit 2 Train A EDG per SO23-13-2, Shutdown From Outside the Control Room, Attachment 8, 23 Duties.

Required Materials: SO23-13-2, Shutdown From Outside the Control Room, Attachment 8, 23 Duties.

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

JPM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO23-13-2, Shutdown From Outside the Control Room, Attachment 8, 23 Duties.



√ - Check Mark Denotes Critical Step



START TIME:



NOTES



1. If 2G002 is supplying Bus A04, then the following will ensure proper EDG operation.
2. If Offsite power is supplying Bus A04, then the following will start the EDG in idle in preparation for a potential loss of Offsite power.



Perform Step: 1	Connect Headset to CKT No. 1 jack in the west lobby area.
Standard:	CONNECTED Headset to CKT No. 1 jack in the west lobby area.
Comment:	SAT  UNSAT 



Perform Step: 2 √	SELECT all three (3) of the following 2G-002 Equipment Fire Isolation Switches to LOCAL on 2L-160: <ul style="list-style-type: none"> • Fire Iso. Switch D/G Control. (2HS-1670A1) • Fire Iso. Switch Gov. & Exct. Cont. (2HS-1669A1) • Fire Iso. Switch D/G Bldg. Fans. (2HS-9537E1)
Standard:	SELECTED 2HS-1670A1, 2HS-1669A1 and 2HS-9537E1 to LOCAL on 2L-160.
Comment:	SAT  UNSAT 



Examiner Note:	The following steps represent the alternate path portion of the JPM.
Perform Step: 3 √	Determine whether 2G-002 Cooling Water System has been impaired, as indicated by presence of either of the following alarms: <ul style="list-style-type: none"> • "HI-HI COOLANT TEMPERATURE ENGINE #1" • "HI-HI COOLANT TEMPERATURE ENGINE #2"
Standard:	IDENTIFIED both annunciators in alarm.
Examiner Cue:	You hear an audible alarm HI-HI COOLANT TEMPERATURE ENGINE #1 and #2 annunciators are fast flashing.
Comment:	SAT  UNSAT 



Perform Step: 4√	<p>IF either of Step 3.2.4.1 alarms are present, THEN align Firewater Makeup to D/G 2G-002 Coolant Expansion Tanks, as follows:</p> <ul style="list-style-type: none"> • OPEN S22420MR032, DG G002 ENG #2 (20 CYL) Coolant Expansion Tank T162 Fire Water Emergency Makeup Valve (north side of engine, below grating). • OPEN S22420MR025, DG G002 ENG #1 (16 CYL) Coolant Expansion Tank T190 Fire Water Emergency Makeup Valve (north side of engine, below grating). • OPEN S22301MU586, Firewater Makeup to 2G-002 (northwest corner, near Fuel Oil Day Tank).
Standard:	<p>OPENED the following valves:</p> <ul style="list-style-type: none"> • S22420MR032, DG G002 ENG #2 (20 CYL) Coolant Expansion Tank T162 Fire Water Emergency Makeup Valve (north side of engine, below grating). • S22420MR025, DG G002 ENG #1 (16 CYL) Coolant Expansion Tank T190 Fire Water Emergency Makeup Valve (north side of engine, below grating). • S22301MU586, Firewater Makeup to 2G-002 (northwest corner, near Fuel Oil Day Tank).
Comment:	
<div style="text-align: right;"> SAT  UNSAT  </div>	



Perform Step: 5	SELECT the Diesel Generator Control Panel Ammeter to 1, 2, or 3.
Standard:	ENSURED the Diesel Generator Control Panel Ammeter selected to 1, 2, or 3
Comment:	
<div style="text-align: right;"> SAT  UNSAT  </div>	



Perform Step: 6	SELECT the Diesel Generator Control Panel voltmeter to 1-2, 2-3, or 3-1.
Standard:	ENSURED the Diesel Generator Control Panel voltmeter selected to 1-2, 2-3, or 3-1.
Comment:	
<div style="text-align: right;"> SAT  UNSAT  </div>	



Perform Step: 7	ENSURE the Diesel Generator Lockout Relay is reset (2HS-E934; Reset Lamp 2ZL-E906 illuminated).	
Standard:	IDENTIFIED the Diesel Generator Lockout Relay is reset by observing Reset Lamp 2ZL-E906 extinguished.	
Examiner Cue:	The Reset Lamp is as you see it.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 8	Establish Communications with, and notify the 22 that 2G-002 is ready to start. (Mark N/A if EDG is already running.)	
Standard:	MARKED step N/A due to the EDG already running (from the initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 9	If the EDG is NOT supplying the Bus and will NOT be supplying the Bus, then DEPRESS Idle Speed on (2HS-1701A). (Mark N/A if EDG is or will be supplying Bus A04.)	
Standard:	MARKED step N/A due to the EDG already loaded onto the bus (from the initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 10	WHEN directed by the 22, THEN Start 2G-002 by momentarily placing the Local Engine Control Switch to START (2HS-5995-1). (Mark N/A if EDG is already running.)	
Standard:	MARKED step N/A due to the EDG already running (from the initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 11	IF 2G-002 will not start, THEN notify the 22 and the Unit 2 CRS, terminate this attachment, AND initiate Attachment 25. (Mark N/A if 2G-002 starts or is already running.)	
Standard:	MARKED step N/A due to the EDG already running (from the initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 12√	If "HI-HI COOLANT TEMPERATURE ENGINE #1" or "HI-HI COOLANT TEMPERATURE ENGINE #2" is in Alarm, then OPEN S22301MU587, Firewater Makeup to 2G-002. (northwest corner, near Fuel Oil Day Tank). [Mark N/A if "Hi-Hi Coolant Temp." NOT in Alarm]	
Standard:	OPENED S22301MU587, Firewater Makeup to 2G-002. (northwest corner, near Fuel Oil Day Tank).	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 13	Observe 2G-002 runup to proper speed and/or output.	
Standard:	OBSERVED proper output of 2G002 (performed in next two steps).	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 14	Adjust 2G-002 frequency to 60 Hz. (2HS-E940) (Mark N/A if running at Idle speed.)	
Standard:	OBSERVED EDG output of 60 Hz and MARKED step N/A.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 15	Adjust 2G-002 voltage to 4360 VAC. (2HS-E942) (Mark N/A if running at Idle speed.)	
Standard:	OBSERVED EDG output of 4360 VAC and MARKED step N/A.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 16	Notify the 22 of 2G-002 status.	
Standard:	INFORMED the CRS of EDG 2G002 status.	
Terminating Cue:	This JPM is complete.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

STOP TIME:

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to an Operating Basis Earthquake and a Loss of Offsite Power.
- Both Unit 2 Emergency Diesel Generators (EDGs) have started and loaded onto their respective buses.
- A toxic gas leak has forced an evacuation of the Control Room.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.
- You have obtained SSD KIT 23.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- **ENSURE** proper operation of the Unit 2 Train A EDG per SO23-13-2, Shutdown From Outside the Control Room, Attachment 8, 23 Duties..
- Start at step 3.0.

Facility: SONGS JPM # NRC JPM P-2 Task # 192837 K/A # 068 AA1.31 **3.9 / 4.0** **SF-6**
Title: Locally Start an Emergency Diesel Generator (Unit 3)

Examinee (Print): _____

Testing Method:

Simulated Performance: x

Classroom: _____

Actual Performance: _____

Simulator: _____

Alternate Path: x

Plant: x

Time Critical: _____

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to an Operating Basis Earthquake and a Loss of Offsite Power.
- Both Unit 3 Emergency Diesel Generators (EDGs) have started and loaded onto their respective buses.
- A toxic gas leak has forced an evacuation of the Control Room.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.
- You have obtained SSD KIT 33.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- ENSURE proper operation of the Unit 3 Train A EDG per SO23-13-2, Shutdown From Outside the Control Room, Attachment 9, 33 Duties..
- Start at step 3.0.

Task Standard: ALIGNED firewater cooling to the Unit 3 Train A EDG per SO23-13-2, Shutdown From Outside the Control Room, Attachment 9, 33 Duties.

Required Materials: SO23-13-2, Shutdown From Outside the Control Room, Attachment 9, 33 Duties.

Validation Time: 15 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

JPM SETUP**EXAMINER:**



PROVIDE the examinee with a copy of SO23-13-2, Shutdown From Outside the Control Room, Attachment 9, 33 Duties.



√ - Check Mark Denotes Critical Step



START TIME:



NOTES



1. If 3G002 is supplying Bus A04, then the following will ensure proper EDG operation.
2. If Offsite power is supplying Bus A04, then the following will start the EDG in idle in preparation for a potential loss of Offsite power.



Perform Step: 1	Connect Headset to CKT No. 1 jack in the west lobby area.
Standard:	CONNECTED Headset to CKT No. 1 jack in the west lobby area.
Comment:	SAT  UNSAT 



Perform Step: 2 √	SELECT all three (3) of the following 3G-002 Equipment Fire Isolation Switches to LOCAL on 3L-160: <ul style="list-style-type: none"> • Fire Iso. Switch D/G Control. (3HS-1670A1) • Fire Iso. Switch Gov. & Exct. Cont. (3HS-1669A1) • Fire Iso. Switch D/G Bldg. Fans. (3HS-9537E1)
Standard:	SELECTED 3HS-1670A1, 3HS-1669A1 and 3HS-9537E1 to LOCAL on 3L-160.
Comment:	SAT  UNSAT 



Examiner Note:	The following steps represent the alternate path portion of the JPM.
Perform Step: 3 √	Determine whether 3G-002 Cooling Water System has been impaired, as indicated by presence of either of the following alarms: <ul style="list-style-type: none"> • "HI-HI COOLANT TEMPERATURE ENGINE #1" • "HI-HI COOLANT TEMPERATURE ENGINE #2"
Standard:	IDENTIFIED both annunciators in alarm.
Examiner Cue:	You hear an audible alarm HI-HI COOLANT TEMPERATURE ENGINE #1 and #2 annunciators are fast flashing.
Comment:	SAT  UNSAT 



Perform Step: 4√	<p>IF either of Step 3.2.4.1 alarms are present, THEN align Firewater Makeup to D/G 3G-002 Coolant Expansion Tanks, as follows:</p> <ul style="list-style-type: none"> • OPEN S32420MR032, DG G002 ENG #2 (20 CYL) Coolant Expansion Tank T162 Fire Water Emergency Makeup Valve (north side of engine, below grating). • OPEN S32420MR025, DG G002 ENG #1 (16 CYL) Coolant Expansion Tank T190 Fire Water Emergency Makeup Valve (north side of engine, below grating). • OPEN S32301MU586, Firewater Makeup to 3G-002 (northwest corner, near Fuel Oil Day Tank).
Standard:	<p>OPENED the following valves:</p> <ul style="list-style-type: none"> • S32420MR032, DG G002 ENG #2 (20 CYL) Coolant Expansion Tank T162 Fire Water Emergency Makeup Valve (north side of engine, below grating). • S32420MR025, DG G002 ENG #1 (16 CYL) Coolant Expansion Tank T190 Fire Water Emergency Makeup Valve (north side of engine, below grating). • S32301MU586, Firewater Makeup to 2G-002 (northwest corner, near Fuel Oil Day Tank).
Comment:	
<div style="text-align: right;"> SAT  UNSAT  </div>	



Perform Step: 5	SELECT the Diesel Generator Control Panel Ammeter to 1, 2, or 3.
Standard:	ENSURED the Diesel Generator Control Panel Ammeter selected to 1, 2, or 3
Comment:	
<div style="text-align: right;"> SAT  UNSAT  </div>	



Perform Step: 6	SELECT the Diesel Generator Control Panel voltmeter to 1-2, 2-3, or 3-1.
Standard:	ENSURED the Diesel Generator Control Panel voltmeter selected to 1-2, 2-3, or 3-1.
Comment:	
<div style="text-align: right;"> SAT  UNSAT  </div>	



Perform Step: 7	ENSURE the Diesel Generator Lockout Relay is reset (3HS-E934; Reset Lamp 3ZL-E906 illuminated).	
Standard:	IDENTIFIED the Diesel Generator Lockout Relay is reset by observing Reset Lamp 3ZL-E906 extinguished.	
Examiner Cue:	The Reset Lamp is as you see it.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 8	Establish Communications with, and notify the 32 that 3G-002 is ready to start. (Mark N/A if EDG is already running.)	
Standard:	MARKED step N/A due to the EDG already running (from the initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 9	If the EDG is NOT supplying the Bus and will NOT be supplying the Bus, then DEPRESS Idle Speed on (3HS-1701A). (Mark N/A if EDG is or will be supplying Bus A04.)	
Standard:	MARKED step N/A due to the EDG already loaded onto the bus (from the initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 10	WHEN directed by the 32, THEN Start 3G-002 by momentarily placing the Local Engine Control Switch to START (3HS-5995-1). (Mark N/A if EDG is already running.)	
Standard:	MARKED step N/A due to the EDG already running (from the initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	



Perform Step: 11	IF 3G-002 will not start, THEN notify the 32 and the Unit 3 CRS, terminate this attachment, AND initiate Attachment 25. (Mark N/A if 3G-002 starts or is already running.)	
Standard:	MARKED step N/A due to the EDG already running (from the initial conditions)	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 12√	If "HI-HI COOLANT TEMPERATURE ENGINE #1" or "HI-HI COOLANT TEMPERATURE ENGINE #2" is in Alarm, then OPEN S32301MU587, Firewater Makeup to 3G-002. (northwest corner, near Fuel Oil Day Tank). [Mark N/A if "Hi-Hi Coolant Temp." NOT in Alarm]	
Standard:	OPENED S32301MU587, Firewater Makeup to 3G-002. (northwest corner, near Fuel Oil Day Tank).	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 13	Observe 3G-002 runup to proper speed and/or output.	
Standard:	OBSERVED proper output of 2G002 (performed in next two steps).	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 14	Adjust 3G-002 frequency to 60 Hz. (3HS-E940) (Mark N/A if running at Idle speed.)	
Standard:	OBSERVED EDG output of 60 Hz and MARKED step N/A.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 15	Adjust 3G-002 voltage to 4360 VAC. (3HS-E942) (Mark N/A if running at Idle speed.)	
Standard:	OBSERVED EDG output of 4360 VAC and MARKED step N/A.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

Perform Step: 16	Notify the 32 of 3G-002 status.	
Standard:	INFORMED the CRS of EDG 3G002 status.	
Terminating Cue:	This JPM is complete.	
Comment:	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> SAT  UNSAT  </div>	

STOP TIME:

Initial Conditions: Given the following conditions:

- Both Units have been tripped due to an Operating Basis Earthquake and a Loss of Offsite Power.
- Both Unit 3 Emergency Diesel Generators (EDGs) have started and loaded onto their respective buses.
- A toxic gas leak has forced an evacuation of the Control Room.
- SO23-13-2, Shutdown From Outside the Control Room, has been initiated.
- You have obtained SSD KIT 33.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- **ENSURE** proper operation of the Unit 3 Train A EDG per SO23-13-2, Shutdown From Outside the Control Room, Attachment 9, 33 Duties..
- Start at step 3.0.

Facility: SONGS JPM # NRC JPM P-3 Task # 191346 K/A # 005 AA1.01 **3.6 / 3.4 SF-1**
Title: Place CEA Subgroup on the Hold Bus

Examinee (Print): _____

Testing Method:

Simulated Performance: x

Classroom: _____

Actual Performance: _____

Simulator: _____

Alternate Path: _____

Plant: x

Time Critical: x

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is operating at full power.
- Annunciator window 50A40, CEDMCS Timer Failure, has just alarmed.
- 50A40, CEDMCS Time Failure, is in solid.
- I&C is NOT on station.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Go to the Unit 2 CEDMCS Room and perform the actions of SO23-15-50.A2, 50A40, CEDMCS Timer Failure.
- This is a time critical JPM.

Task Standard:

- TRANSFERRED CEA subgroup 11 to the hold bus within 15 minutes per SO23-15-50.A2, 50A40, CEDMCS Timer Failure.

Required Materials: SO23-15-50.A2, 50A40, CEDMCS Timer Failure.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

JPM Setup**EXAMINER:**

When the applicant has arrived in the CEDMCS room and identified the posted laminated copy of ARP 50A40, PROVIDE the examinee with a paper copy of SO23-15-50.A2, 50A40, CEDMCS Timer Failure.

√ - Check Mark Denotes Critical Step

START TIME:

NOTE



High voltage applied to the CEDM Coils for longer than 15 minutes may result in coil damage and would require an Engineering evaluation with the potential for a plant shutdown to repair. (This condition raises voltage from a nominal 35 to > 155 volts.)



Perform Step: 1 1.1	VERIFY alarm is in solid. If alarm resets during performance of the following steps, then GO TO Section 3.0
Standard:	VERIFIED alarm is in solid (from initial conditions).
Examiner Cue:	If the applicant calls the Control Room to verify 50A40 is still in solid, inform them that 50A40, CEDMCS Timer Failure, is in solid.
Comment:	SAT UNSAT



Perform Step: 2 1.1.1	If while on station for testing, I&C reports that Coil Voltages are normal, then GO TO Section 4.0
Standard:	READ step and proceeded with the procedure.
Comment:	SAT UNSAT



Perform Step: 3 1.2	Dispatch an Operator to the CEDMCS Room 37 foot Radwaste Building to check local indications at the CEDMCS Panel.
Standard:	RECOGNIZED that they are the Operator who was dispatched to the CEDMCS Room by the Control Room.
Comment:	SAT UNSAT









Perform Step: 4 √ 1.2.1	If there is more than one subgroup associated with the same hold bus timer failure or the holding bus is NOT available for the failed subgroup(s), then trip the Reactor and GO TO SO23-12-1, Standard Post Trip Actions
Standard:	IDENTIFIED only Subgroup 11 is affected and a Reactor trip is NOT required.
Comment:	SAT UNSAT



Perform Step: 5 1.2.2	If actions to complete transferring all the affected CEAs to the hold bus will not be performed within 15 minutes of this alarm being in solid, then trip the Reactor and GO TO SO23-12-1, Standard Post Trip Actions.	
Standard:	READ the step and continued with the procedure.	
Comment:	SAT  UNSAT 	



Perform Step: 6 1.2.3	If NO lamp is illuminated, then perform a lamp test and replace burnt out bulbs (use nearby working light bulbs for a quick check).	
Standard:	IDENTIFIED CEA 47 lamp is illuminated	
Examiner Cue:	If applicant looks at the Timer Failure Alarm lamps, hold up the picture of CEA 47 lamp being illuminated.	
Comment:	SAT  UNSAT 	

Perform Step: 7 ✓ 1.3	VERIFY the Holding Bus is available as indicated by the following lamps extinguished (on appropriate Maintenance Supply Lamp Panel): <ul style="list-style-type: none"> • HOLDING BUS FAILURE • SUBGROUP MAINTENANCE 	
Standard:	OBSERVES "HOLDING BUS FAILURE" and "SUBGROUP MAINTENANCE" lamps extinguished on Maintenance Supply Lamp Panel.	
Examiner Cue:	When applicant looks at the listed lamps, display picture showing lamps extinguished.	
Comment:	SAT  UNSAT 	

Perform Step: 8 ✓ 1.3.1	DETERMINE CEA(s) affected by observing the CEA Timer Failure Alarm lamps.	
Standard:	OBSERVED CEA 47 lamp is illuminated.	
Examiner Cue:	If applicant looks at the Timer Failure Alarm lamps, hold up the picture of CEA 47 lamp being illuminated.	
Comment:	SAT  UNSAT 	

Perform Step: 9 1.3.2	If a HOLDING BUS FAILURE or SUBGROUP MAINTENANCE lamp is illuminated (bus not available), then notify the Control Room to TRIP the Reactor and GO TO SO23-12-1, Standard Post Trip Actions.
Standard:	OBSERVES "HOLDING BUS FAILURE" and "SUBGROUP MAINTENANCE" lamps are still extinguished
Examiner Cue:	When applicant looks at the listed lamps, display picture showing lamps extinguished.
Comment:	
SAT  UNSAT 	
Perform Step: 10 1.3.3	NOTIFY the Control Room that the Holding Bus Failure lamp is EXTINGUISHED and the affected Subgroup is ready to be place on the Holding Bus.
Standard:	INFORMED the Control Room that CEA is ready to be placed on the Holding Bus.
Examiner Cue:	When the applicant calls the Control Room, acknowledge the information.
Comment:	
SAT  UNSAT 	
Perform Step: 11 1.3.4	SELECT the Subgroup Maintenance switch to the UP position for the affected subgroup (subgroup 11).
Standard:	SELECTED the Subgroup Maintenance switch to the UP position for the affected subgroup (subgroup 11).
Examiner Cue:	When the applicant simulates placing the Subgroup Maintenance switch to the UP position, display the picture showing the Subgroup Maintenance lamp ILLUMINATED on Subgroup 11.
Comment:	
SAT  UNSAT 	
Perform Step: 12 1.3.5	VERIFY the Subgroup Maintenance lamp ILLUMINATES.
Standard:	VERIFIED the Subgroup Maintenance lamp ILLUMINATED.
Comment:	
SAT  UNSAT 	

Perform Step: 13 1.3.6	ACTUATE the MAN TRANS switch on the respective ACTM.	
Standard:	ACTUATED the MAN TRANS switch on the CEA 47 ACTM.	
Examiner Cue:	The Manual Transfer switch has spring returned to its normal position.	
Comment:	SAT 	UNSAT 

Perform Step: 14 ✓ 1.3.7	OPEN the circuit breaker(s) to the CEAs that have their CEA Timer Failure Alarm Lamps illuminated.	
Standard:	OPENED the CEA 47 individual disconnect circuit breaker.	
Terminating Cue:	The breaker for CEA 47 is open. This JPM is complete.	
Comment:	SAT 	UNSAT 

STOP TIME:	
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Initial Conditions: Given the following conditions:

- Unit 2 is operating at full power.
- Annunciator window 50A40, CEDMCS Timer Failure, has just alarmed.
- 50A40, CEDMCS Time Failure, is in solid.
- I&C is NOT on station.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Go to the Unit 2 CEDMCS Room and perform the actions of SO23-15-50.A2, 50A40, CEDMCS Timer Failure.
- This is a time critical JPM.

Facility: SONGS JPM # NRC JPM P-3 Task # 191346 K/A # 005 AA1.01 **3.6 / 3.4 SF-1**
Title: Place CEA Subgroup on the Hold Bus

Examinee (Print): _____

Testing Method:

Simulated Performance: x

Classroom: _____

Actual Performance: _____

Simulator: _____

Alternate Path: _____

Plant: x

Time Critical: x

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 3 is operating at full power.
- Annunciator window 50A40, CEDMCS Timer Failure, has just alarmed.
- 50A40, CEDMCS Time Failure, is in solid.
- I&C is NOT on station.

Initiating Cue: The Control Room Supervisor directs you to PERFORM the following:

- Go to the Unit 3 CEDMCS Room and perform the actions of SO23-15-50.A2, 50A40, CEDMCS Timer Failure.
- This is a time critical JPM.

Task Standard:

- TRANSFERRED CEA subgroup 11 to the hold bus within 15 minutes per SO23-15-50.A2, 50A40, CEDMCS Timer Failure.

Required Materials: SO23-15-50.A2, 50A40, CEDMCS Timer Failure.

Validation Time: 10 minutes

Completion Time: _____ minutes

Comments:

Result: SAT  UNSAT 

Examiner (Print / Sign): _____ Date: _____

JPM Setup**EXAMINER:**

When the applicant has arrived in the CEDMCS room and identified the posted laminated copy of ARP 50A40, PROVIDE the examinee with a paper copy of SO23-15-50.A2, 50A40, CEDMCS Timer Failure.

√ - Check Mark Denotes Critical Step

START TIME:

NOTE



High voltage applied to the CEDM Coils for longer than 15 minutes may result in coil damage and would require an Engineering evaluation with the potential for a plant shutdown to repair. (This condition raises voltage from a nominal 35 to > 155 volts.)



Perform Step: 1 1.1	VERIFY alarm is in solid. If alarm resets during performance of the following steps, then GO TO Section 3.0
Standard:	VERIFIED alarm is in solid (from initial conditions).
Examiner Cue:	If the applicant calls the Control Room to verify 50A40 is still in solid, inform them that 50A40, CEDMCS Timer Failure, is in solid.
Comment:	SAT UNSAT



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Standard:	RECOGNIZED that they are the Operator who was dispatched to the CEDMCS Room by the Control Room.
Comment:	SAT UNSAT









Perform Step: 4 √ 1.2.1	If there is more than one subgroup associated with the same hold bus timer failure or the holding bus is NOT available for the failed subgroup(s), then trip the Reactor and GO TO SO23-12-1, Standard Post Trip Actions
Standard:	IDENTIFIED only Subgroup 11 is affected and a Reactor trip is NOT required.
Comment:	SAT UNSAT



Perform Step: 5 1.2.2	If actions to complete transferring all the affected CEAs to the hold bus will not be performed within 15 minutes of this alarm being in solid, then trip the Reactor and GO TO SO23-12-1, Standard Post Trip Actions.	
Standard:	READ the step and continued with the procedure.	
Comment:	SAT  UNSAT 	



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Standard:	IDENTIFIED CEA 47 lamp is illuminated	
Examiner Cue:	If applicant looks at the Timer Failure Alarm lamps, hold up the picture of CEA 47 lamp being illuminated.	
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Perform Step: 7 ✓ 1.3	VERIFY the Holding Bus is available as indicated by the following lamps extinguished (on appropriate Maintenance Supply Lamp Panel): <ul style="list-style-type: none"> • HOLDING BUS FAILURE • SUBGROUP MAINTENANCE 	
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Comment:	SAT  UNSAT 	

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Examiner Cue:	If applicant looks at the Timer Failure Alarm lamps, hold up the picture of CEA 47 lamp being illuminated.	
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Perform Step: 9 1.3.2	If a HOLDING BUS FAILURE or SUBGROUP MAINTENANCE lamp is illuminated (bus not available), then notify the Control Room to TRIP the Reactor and GO TO SO23-12-1, Standard Post Trip Actions.
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SAT  UNSAT 	
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Standard:	INFORMED the Control Room that CEA is ready to be placed on the Holding Bus.
Examiner Cue:	When the applicant calls the Control Room, acknowledge the information.
Comment:	
SAT  UNSAT 	
Perform Step: 11 1.3.4	SELECT the Subgroup Maintenance switch to the UP position for the affected subgroup (subgroup 11).
Standard:	SELECTED the Subgroup Maintenance switch to the UP position for the affected subgroup (subgroup 11).
Examiner Cue:	When the applicant simulates placing the Subgroup Maintenance switch to the UP position, display the picture showing the Subgroup Maintenance lamp ILLUMINATED on Subgroup 11.
Comment:	
SAT  UNSAT 	
Perform Step: 12 1.3.5	VERIFY the Subgroup Maintenance lamp ILLUMINATES.
Standard:	VERIFIED the Subgroup Maintenance lamp ILLUMINATED.
Comment:	
SAT  UNSAT 	

Perform Step: 13 1.3.6	ACTUATE the MAN TRANS switch on the respective ACTM.	
Standard:	ACTUATED the MAN TRANS switch on the CEA 47 ACTM.	
Examiner Cue:	The Manual Transfer switch has spring returned to its normal position.	
Comment:		SAT  UNSAT 

Perform Step: 14 ✓ 1.3.7	OPEN the circuit breaker(s) to the CEAs that have their CEA Timer Failure Alarm Lamps illuminated.	
Standard:	OPENED the CEA 47 individual disconnect circuit breaker.	
Terminating Cue:	The breaker for CEA 47 is open. This JPM is complete.	
Comment:		SAT  UNSAT 

STOP TIME:	
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Initial Conditions: Given the following conditions:

- Unit 3 is operating at full power.
- Annunciator window 50A40, CEDMCS Timer Failure, has just alarmed.
- 50A40, CEDMCS Time Failure, is in solid.
- I&C is NOT on station.

Initiating Cue: The Control Room Supervisor directs you to **PERFORM** the following:

- Go to the Unit 3 CEDMCS Room and perform the actions of SO23-15-50.A2, 50A40, CEDMCS Timer Failure.
- This is a time critical JPM.

Facility:	SONGS 2 & 3	Scenario No.:	1	Op Test No.:	October 2012 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions: 100% power MOC. Train B LPSI Pump P-016 is OOS.					
Turnover: Maintain steady state conditions.					
Critical Tasks: <ul style="list-style-type: none"> • Restore Feedwater to both Steam Generators prior to exiting SO23-12-1, Standard Post Trip Actions. • Restore power to a 1E 4kV bus following a Station Blackout prior to battery depletion and loss of associated 1E 125 DC bus. • Establish SI flow following the restoration of 1E 4kV power prior to exiting SO23-12-9, Functional Recovery. 					

Event No.	Malf. No.	Event Type*	Event Description
1 (10 min)	RM06	I (RO, SRO) TS (SRO)	Containment High Range Area Radiation Monitor RI-7820-1 Fails High
2 (15 min)	NSW LP	C (BOP, SRO)	Nuclear Service Water Pump P-139 O/C Trip, P-138 Fails to Auto Start
3 (25 min)	RC03	C (RO, SRO) TS (SRO)	Reactor Coolant System Leak (30 GPM)
4 (45 min)		R (RO, BOP, SRO)	Rapid Power Reduction due to RCS Leak
5 (50 min)	ED04A	C (RO)	Non-1E 4kV Bus 2A03 O/C Trip
6 (50 min)	RC03	M (RO, BOP, SRO)	RCS Leak Increases to 300 GPM on Reactor Trip
7 (50 min)	PG24	C (RO, BOP, SRO)	Loss of Offsite Power upon Reactor Trip (10 second time delay)
8 (50 min)	AFW LP	C (RO, SRO)	AFW Pump P-140 Fails to Start on EFAS
9 (55 min)	EG08A	C (BOP, SRO)	Train A EDG Fails to Start (cannot be started from CR)
10 (55 min)	EG16B	C (BOP, SRO)	Train B EDG Output Breaker Fails to Auto Close
11 (55 min)	ED03B	M (RO, BOP, SRO)	Train B EDG Output Breaker O/C Trip (60 seconds after EDG Output Breaker is manually closed – Station Blackout)

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

Actual	Target Quantitative Attributes
9	Total malfunctions (5-8)
5	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
2	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
1	EOP contingencies requiring substantive actions (0-2)
3	Critical tasks (2-3)

Scenario Event Description NRC Scenario #1

SCENARIO SUMMARY NRC #1

The crew will take the watch at 100% power with no scheduled activities per SO23-5-1.7, Power Operations.

Upon taking the watch, Containment High Range Area Radiation Monitor RI-7820-1 will fail high. The crew will respond using the Alarm Response Procedure and validate the high radiation indication using alternate Containment radiation monitors. The crew should determine RI-7820-1 has failed high and the SRO will refer to Technical Specifications.

Following the Technical Specification review, the running Nuclear Service Water Pump will trip on overcurrent and the standby pump will fail to auto start. The crew will either start the standby pump using prompt and prudent actions or refer to the Alarm Response Procedure and start the standby pump per the ARP.

When the standby NSW Pump is started, a 30 GPM RCS leak will occur. The crew will respond per SO23-13-14, RCS Leak. The crew will identify leakage is greater than 25 GPM and commence a rapid down power per SO23-13-28, Rapid Power Reduction. The CRS will refer to Technical Specifications due to excess RCS leakage.

When power has been lowered 3-5%, Non-1E 4kV Bus 2A03 will trip on overcurrent requiring a Reactor trip.

When the Reactor is tripped, the RCS leak will increase to 300 GPM and a Loss of Offsite Power will occur. Both 1E 4kV buses will be deenergized. Train A 1E 4kV bus will remain deenergized due to a mechanical fault on the Train A EDG. The BOP will place the EDG in Maintenance Lockout per SPTA RNO direction. Train B 1E 4kV bus can be reenergized by manually closing the EDG output breaker. One minute after closing the Train B EDG output breaker, the Train B 1E 4kV bus will trip on overcurrent resulting in a Station Blackout. Additionally, Turbine Driven AFW Pump P-140 will fail to start on EFAS and must be manually started to restore feedwater flow to the Steam Generators.

The crew will perform SO23-12-1, Standard Post Trip Actions and transition to SO23-12-9, Functional Recovery due to the Loss of Coolant Accident and Station Blackout. The scenario is terminated when power is restored to the Train A 1E 4kV bus and HPSI flow is established.

Scenario Event Description NRC Scenario #1	
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Risk Significance:

- Failure of risk important system prior to trip: Reactor Coolant Leak
Loss of 4kV Bus 2A03
- Risk significant core damage sequence: Loss of Coolant Accident
Station Blackout
Loss of Feedwater
- Risk significant operator actions: Start TDAFW Pump P-140 following EFAS
Restore Power to a 1E 4kV Bus
Establish HPSI flow

Scenario Event Description
NRC Scenario #1

MACHINE OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC-215 NRC Scenario #1 and run associated Setup File.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP	MALF	EG08A	2G002 Train A EDG Failure	Failure	
	MALF	EG16B	2G003 Train B EDG Breaker Fails to Auto Close	Fail to Auto Close	
	MALF	ED03B	Train B 1E 4kV Bus 2A06 OC Fault	Fault	2HS-1642-2-CR63-S03 (+1 minute)
	MALF	PG24	Loss of Edison Grid	Loss	Rx Trip
	MALF	RC03	RCS Leak into Containment	7.5	Rx Trip
	RF	PG57	Trip all SDG&E Switchyard Breakers	Trip	Rx Trip
	LP	N/A	AFW Pump P-140 Fails to Auto Start	Fail to Auto Start	
	LP	N/A	LPSI Pump P-016 OOS	Bkr Racked out	
1	MALF	RM06	Containment High Range Radiation Monitor Fails High	100	
2	LP	N/A	Nuclear Service Water Pump P139 OC Trip / P-138 Fails to Auto Start	Trip / Fail to Auto Start	
3	MALF	RC03	RCS Leak (30 GPM)	.75	
4	N/A	N/A	Rapid Power Reduction due to RCS leak		
5	MALF	ED04A	Non-1E 4kV Bus 2A03 OC Trip	Fault	
6	Setup	Setup	RCS Leak Increased to 300 GPM on Rx Trip		
7	Setup	Setup	Loss of Offsite Power Upon Rx Trip		
8	Setup	Setup	AFW Pump P-140 Fails to Start on EFAS		

<p>Scenario Event Description NRC Scenario #1</p>

9	Setup	Setup	Train A EDG Fails to Start (Cannot be started from CR)		
10	Setup	Setup	Train B EDG Output Breaker Fails to Auto Close		
11	Setup	Setup	Train B EDG Output Breaker OC Trip (60 seconds after EDG Output Breaker is manually closed)		

Scenario Event Description
NRC Scenario #1

Machine Operator:

- **RESTORE to IC-215**
- **OPEN 2012 NRC Scenario #1 event file**
- **RUN Setup Files 1 and 2**
- **ENSURE OOS Tag on LPSI Pump P-016**
- **ENSURE Pressurizer Level and Pressure Selector Switches are selected to Channel Y**
- **ENSURE blend setpoints are 13.2 gpm for BA and 74.8 gpm for PMW**
- **ENSURE SO23-5-1.7 Attachment 9 MOC placard is posted**
- **ENSURE OP AID 005-23 on CR63 has BQ aligned to Unit 2, BS aligned to Unit 3**
- **ENSURE OP AID 005-11 on CR64 has E336 aligned to Unit 2, E335 aligned to Unit 3**
- **ENSURE OP AID 005-5 for Backpressure Control Valves has PV201B circled**
- **ENSURE OP AID 005-5 for Letdown Flow Control Valve has LV110A circled**
- **ENSURE alarms are active**

Control Room Annunciators in Alarm:

- **57B51 SI/ECW SYS TRAIN B INOPERABLE**
- **LPSI PP 2P016 (sugar cube)**

Operating Test : <u> NRC </u> Scenario # <u> 1 </u> Event # <u> 1 </u> Page <u> 7 </u> of <u> 28 </u>		
Event Description: <u> Containment High Range Radiation Monitor RI-7820-1 Fails High </u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 1, Containment High Range Radiation Monitor Fails High

Indications Available:

- 57C10 - Containment Rad Hi
- RI-7820-1 Alarm on Data Acquisition System (DAS)

Examiner Note: The following steps are from Alarm Response Procedure 57C10, Containment Rad Hi

	RO	DETERMINE a high radiation condition DOES NOT exist inside Containment by using alternate Containment radiation monitors.
	RO	DETERMINE the alarm was invalid and notify the Radiation Monitoring Department of the instrument failure.
	RO	NOTIFY the CRS to review Tech. Specs. LCO 3.3.8, LCS 3.3.112, LCO 3.3.11, LCO 3.4.15.
	RO	INFORM CRS of compensatory actions (Monitor radiation levels twice every shift).
	SRO	EVALUATE Technical Specifications : <ul style="list-style-type: none"> • LCO 3.3.11 • Condition A - One or more Functions with one required channel inoperable. • Action A.1 – Restore required channel to OPERABLE status within 30 days.

Examiner Note: When Technical Specifications have been evaluated or at lead evaluator's discretion, proceed to Event 2, Nuclear Service Water P-139 Overcurrent Trip.

Operating Test : <u> NRC </u> Scenario # <u> 1 </u> Event # <u> 2 </u> Page <u> 8 </u> of <u> 28 </u>		
Event Description: Nuclear Service Water Pump P-139 O/C Trip, P-138 Fails to Auto Start		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 2, NSW Pump P-139 O/C Trip, P-138 Fails to Auto Start		
Indications Available:		
<ul style="list-style-type: none"> 61A43 – Nuclear Service Water Pump OC 		
Examiner Note: The following steps are from Alarm Response Procedure 61A43, Nuclear Service Water Pump OC		
	BOP	Start stand-by Nuclear Service Water Pump.
	BOP	Dispatch an outside operator to investigate tripped pump breaker and affected pump motor.
	BOP	DIRECT performance of SO23-6-9, Section for MCC Feeder Circuit Fault Relay/Guidelines for Resetting Tripped Breakers and/or Thermals.
Examiner Note: When NSW Pump P-138 is started or at lead evaluator's discretion, proceed to Event 3, Reactor Coolant System Leak.		

Operating Test : <u>NRC</u>		Scenario # <u>1</u>	Event # <u>3</u>	Page <u>9</u> of <u>28</u>
Event Description: <u>Reactor Coolant System Leak (30 GPM)</u>				
Time	Position	Applicant's Actions or Behavior		

Machine Operator: When directed, INITIATE Event 3, Reactor Coolant System Leak
Indications Available:

- Slowly lowering PZR level
- Charging / Letdown mismatch
- Rising Containment Sump level
- 57C43 RCS Leakage Abnormal (+90 sec)
- 57C20 RCS Leakage Detection Activity Hi (+120 sec)

Examiner Note: The following steps are from SO23-13-14, RCS Leak.

	RO	VERIFY Pressurizer level – NOT LOWERING. <ul style="list-style-type: none"> • (RNO) START Charging Pumps to maintain Pressurizer level.
	RO	VERIFY Pressurizer level – NOT LOWERING with all available Charging Pumps in operation.
	RO	VERIFY Pressurizer Level - STABLE or RISING.
	RO	VERIFY RCS leak is less than 25 gpm. <ul style="list-style-type: none"> • (RNO) INITIATE SO23-13-28, Rapid Power Reduction (RPR), at a rate of approximately 15-20% per hour.
	SRO	Evaluate Technical Specifications: <ul style="list-style-type: none"> • LCO 3.4.13 • Condition A – RCS Operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE. • Action A.1 – Reduce LEAKAGE to within limits within 4 hours.

Operating Test :	NRC	Scenario #	1	Event #	4	Page	10	of	28
Event Description: Rapid Power Reduction									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: The following steps are from SO23-13-28, Rapid Power Reduction.

	SRO	INITIATE notifying the GOC.
	SRO	If taking the Unit Offline or to target power plateau < 750 MWe ($\approx 65\%$ Rx Power), then INITIATE an immediate MSR Cooldown per SO23-10-2, Attachment for MSR Cooldown for Load Reduction/Turbine Shutdown.
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>GUIDELINES</p> <ol style="list-style-type: none"> If RCS Boron is < 110 ppm, <u>then</u> the optimal approach is to use CEAs and MTC with little or no boration. A 5% power reduction credit can be taken for MTC, because the temperature increase adds considerable negative reactivity due to the large negative MTC at the EOC along with Xenon building in. Expect average Tcold to be initially high outside the control band. (LS-1.1, LS-1.4) At EOC, existing conditions may necessitate slowing power change rate when between 80% and 70% power. </div>		
	SRO	INITIATE monitoring CV-9739, COLSS Raw Delta-T Power.
	RO	INITIATE Forcing PZR spray flow using two valves per SO23-3-1.10: <ul style="list-style-type: none"> ENSURE a Reactivity Brief has been conducted for this activity per SO123-0-A1, Section for Reactivity. COMMENCE monitoring RCS pressure. VERIFY RCS pressure > 1500 psia. PLACE both PZR Spray Valve Controllers in AUTO. POSITION all Non-1E Backup Heaters to ON. LOWER PIC-0100, PZR Pressure Controller, setpoint as required to maintain RCS pressure as directed by the CRS (set setpoint to ~ 2225 psia).

Operating Test : <u> NRC </u> Scenario # <u> 1 </u> Event # <u> 4 </u> Page <u> 11 </u> of <u> 28 </u>	
Event Description: <u> Rapid Power Reduction </u>	
Time	Position
Applicant's Actions or Behavior	

	RO	<p>BORATE to the Charging Pump Suction or through HV-9247:</p> <ul style="list-style-type: none"> Implement the requirements for a Reactivity Brief and Peer check per OSM-14, Operations Department Expectations, Section for Reactivity Management. ENSURE ENTERED required <i>boration</i> flowrate on FIC-0210Y, BAMU Flow Controller. If flowrate change, then SELECT SET. ENSURE FIC-0210Y in AUTO. SET FQIS-0210Y, Boration Counter, to the desired volume as follows: <ul style="list-style-type: none"> SELECT MODIFY. ENTER gallons in PRESET. SELECT SET PRESET. SELECT EXIT. SELETE the BAMU Pump associated with the BAMU Tank used. VERIFY CLOSED FV-9253, Blended Makeup to VCT Isolation. ENSURE HV-9257, BAMU to Charging Pump Suction Block Valve, in AUTO. COMMENCE monitoring plant parameters. From the MODE SELECTOR: <ul style="list-style-type: none"> SELECT MODIFY. SELECT BORATE. SELECT GO.
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Operating Test :	NRC	Scenario #	1	Event #	4	Page	12	of	28
Event Description: Rapid Power Reduction									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>INSERT CEAs for ASI Control per SO23-3-2.19, to the target level within the following guidance:</p> <ul style="list-style-type: none"> • INSERT PLCEAs (Insertion Limit is 112.5. Insertion should be limited to ≈115 inches or until Power reaches target plateau.) • INSERT Group 6 to target level. [90" if RCS Boron is < 110 ppm.] (The maximum recommended is 75 inches.) • POSITION Group Select switch to the CEA group to be moved. • POSITION Mode Select Switch to the appropriate mode. • VERIFY the group indicator lamps are ILLUMINATED for the group selected. • POSITION CEA(s) as directed by SRO Ops. Supv. • When CEA positioning has completed, then POSITION the Mode Select Switch to OFF.
	BOP	<p>INITIATE SO23-5-1.7, Section for Turbine Load Change using Setpoint Adjustment:</p> <ul style="list-style-type: none"> • Implement the requirements for a Reactivity Brief and Peer Check per OSM-14, Operations Department Expectations, Section for Reactivity Management. • INITIATE monitoring TCOLDAVG using PCS. • PLACE the 1st STAGE PRESSURE feedback loop in service. • ACTIVATE the Turbine DCS Setpoints Box and SELECT MODIFY. • SET the Demand to the target MW value and SELECT ENTER. • Set the Rate to the target MW/MIN value and SELECT ENTER. • INITIATE Turbine load change, SELECT P2. • Control RCS Tcold within the operating band by adjusting the rate setpoint or by canceling and reinitiating the load change as necessary. • VERIFY Turbine load stabilizes at the target value. • REMOVE 1st STAGE PRESSURE feedback loop from service. • RESTORE the Rate to 100 MW/MIN and SELECT ENTER.
	SRO	INITIATE SO23-5-1.7, Attachment for Power Descension.
	SRO	If Reactor power changed > 15% in one hour, then NOTIFY Chemistry and LOG the notification.
	SRO	NOTIFY Reactor Engineering and log the notification.

Operating Test : <u> NRC </u> Scenario # <u> 1 </u> Event # <u> 4 </u> Page <u> 13 </u> of <u> 28 </u>		
Event Description: <u> Rapid Power Reduction </u>		
Time	Position	Applicant's Actions or Behavior

	ALL	Maintain Turbine load, RCS Temperature, and ASI within the expected operating bands per SO23-5-1.7.
Examiner Note: When Reactor power has been lowered 3-5% or at lead evaluator's discretion, proceed to Event 5, Non-1E 4kV Bus 2A03 O/C Trip.		

Operating Test : <u> NRC </u>		Scenario # <u> 1 </u>	Event # <u> 5 </u>	Page <u> 14 </u> of <u> 28 </u>
Event Description: <u>Non-1E 4kV Bus 2A03 O/C Trip</u>				
Time	Position	Applicant's Actions or Behavior		

Machine Operator: When directed, INITIATE Event 5, 2A03 O/C Trip
Indications Available:

- **63A16 - 2A03 SUPPLY BKR 2A0311 OC**

Examiner Note: The following steps are from Alarm Response Procedure 63A16, 2A03 Supply Bkr 2A0311 OC.

	BOP	Notify the CRS/SM of the bus fault on 2A03.
	SRO	If 2A03 is de-energized, then GO TO SO23-13-26.3, Loss of Power to Non-ESF Bus A03 or Associated L/C or MCC.

Examiner Note: The following steps are from SO23-13-26.3, Loss of Power to A03.

	SRO	<p>VERIFY a RX AND Turbine trip have occurred.</p> <ul style="list-style-type: none"> • (RNO) IF one of the following conditions exist, <ul style="list-style-type: none"> • RX power is > 30% • Main Feedwater Supply is lost • SG levels are uncontrolled <p>THEN TRIP the Reactor.</p>
	RO/BOP	Trip the Reactor by depressing Reactor Trip Pushbuttons 1 and 4 or 2 and 3.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	15	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

Examiner Note: The following steps are from SO23-12-1, Standard Post Trip Actions:

	RO	VERIFY Reactor Trip Circuit Breakers (8) OPEN.
	RO	VERIFY Reactor power – LOWERING AND Startup rate NEGATIVE.
	RO	VERIFY maximum of one full length CEA NOT fully inserted.
	BOP	ALL HP and LP Stop and Governor valves CLOSED.
	BOP	VERIFY BOTH Unit Output Breakers OPEN.
	BOP	VERIFY Main Turbine speed less than 2000 RPM OR lowering.

Critical Task: Manually start TDAFW Pump P-140 following the failure to auto start on EFAS prior to exiting SO23-12-1, Standard Post Trip Actions.

CCT Time: _____

	SRO	INITIATE Attachment 1, WORKSHEET.
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CAUTION

DO NOT OPERATE TRIP pushbuttons for tripped breakers. Operation of TRIP pushbuttons will reset overcurrent protection allowing Diesel Generator output breaker to close to a fault.

	BOP	VERIFY BOTH 1E 4kV Buses ENERGIZED. <ul style="list-style-type: none"> • (RNO) ENSURE associated EDG OPERATING. • (RNO) ENSURE associated EDG output breaker CLOSED.
	BOP	VERIFY all 1E 480V buses ENERGIZED: <ul style="list-style-type: none"> • (RNO) IF Train A 1E 480V bus B24 DE-ENERGIZED THEN ENSURE Train A EDG (G002) HS-1767-1, MAINTENANCE LOCKOUT in MAINT. AND INITIATE Attachment 5, DIESEL GENERATOR FAILURE FOLLOW-UP ACTIONS. • (RNO) IF Train B 1E 480V bus B26 DE-ENERGIZED THEN ENSURE Train B EDG (G003) HS-1770-2, MAINTENANCE LOCKOUT in MAINT. AND INITIATE Attachment 5, DIESEL GENERATOR FAILURE FOLLOW-UP ACTIONS.
	BOP	VERIFY all Class 1E DC Buses ENERGIZED.

Operating Test : <u>NRC</u>		Scenario # <u>1</u>	Event # <u>6, 7, 8, 9, 10, 11</u>	Page <u>16</u> of <u>28</u>
Event Description: RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS				
Time	Position	Applicant's Actions or Behavior		
	BOP	VERIFY all Non-1E 4kV Buses ENERGIZED. <ul style="list-style-type: none"> • (RNO) RESTORE power to affected bus(es) as time and resources permit. 		
	BOP	VERIFY one CCW Train OPERATING AND aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger. <ul style="list-style-type: none"> • (RNO) START an available CCW Train. • (RNO) IF CIAS ACTUATED, THEN ENSURE all RCPs STOPPED AND GO TO step 5. • (RNO) ALIGN the CCW NCL and Letdown Heat Exchanger to an operating CCW Train. 		
	RO	VERIFY PZR level between 10% and 70% AND trending to between 30% and 60%. <ul style="list-style-type: none"> • (RNO) ENSURE PZR Level Control System OPERATING in AUTO or MANUAL to restore PZR level. 		
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F.		
	RO	VERIFY PZR pressure between 1740 PSIA and 2380 PSIA AND trending to between 2025 PSIA and 2275 PSIA. <ul style="list-style-type: none"> • (RNO) ENSURE PZR Pressure Control System OPERATING in AUTO or MANUAL to restore PZR pressure. • (RNO) IF PZR pressure less than PZR Pressure Control System Setpoint and lowering, THEN ENSURE Normal and Auxiliary Spray valves CLOSED. • (RNO) IF PZR pressure less than 1740 PSIA, THEN ENSURE the following ACTUATED: <ul style="list-style-type: none"> • SIAS • CCAS • CRIS. • (RNO) IF PZR pressure less than or equal to 1430 PSIA, THEN ENSURE one RCP in each loop STOPPED. • (RNO) IF RCP NPSH requirements of Attachment 3, POST-ACCIDENT PRESSURE / TEMPERATURE LIMITS NOT SATISFIED, THEN ENSURE all RCPs – STOPPED. 		
	RO	VERIFY at least one RCP OPERATING. <ul style="list-style-type: none"> • (RNO) GO TO step c. 		
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F:		

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	17	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

	BOP	VERIFY at least one S/G level between 21% NR and 80% NR AND Feedwater – AVAILABLE.
	BOP	VERIFY RCS T _{COLB} between 540°F and 550°F.
	BOP	VERIFY S/G pressures between 960 PSIA and 1050 PSIA.
	RO	VERIFY Containment pressure less than 1.5 PSIG. <ul style="list-style-type: none"> • (RNO) IF Containment pressure greater than 3.4 PSIG, THEN ENSURE the following have ACTUATED: <ul style="list-style-type: none"> • SIAS • CIAS • CCAS • CRIS • ENSURE all RCPs – STOPPED.
	RO	VERIFY Containment Area Radiation Monitors NOT alarming or trending to alarm. (Although Containment Area Radiation Monitors ARE alarming, there is no RNO action for this step – diagnosis use only).
	RO	VERIFY Secondary Plant Radiation Monitors NOT alarming or trending to alarm.
	RO	VERIFY Containment average temperature less than 120°F.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	18	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

	RO	<p>VERIFY Containment pressure less than 1.5 PSIG.</p> <ul style="list-style-type: none"> • (RNO) ENSURE proper functioning of Normal Containment Cooling. • (RNO) ENSURE at least one Containment Dome Air Circulator OPERATING. • (RNO) IF Containment pressure greater than 3.4 PSIG, THEN: <ul style="list-style-type: none"> • ENSURE the following ACTUATED: <ul style="list-style-type: none"> • SIAS • CIAS • CCAS • CRIS • ENSURE all RCPs STOPPED. • ENSURE all available Containment Emergency Cooling Units OPERATING. • (RNO) IF Containment pressure greater than 14 PSIG, THEN <ul style="list-style-type: none"> • ENSURE CSAS – ACTUATED. • ENSURE all available Containment Spray Header flows greater than 1600 GPM.
	RO	<p>VERIFY all safety function criteria per Attachment 1, WORKSHEET RECOVERED.</p> <ul style="list-style-type: none"> • (RNO) COMPLETE Attachment 2, RECOVERY DIAGNOSTICS.
Examiner Note: The CRS should diagnose two events (Station Blackout and LOCA) and identify SO23-12-9, Functional Recovery, as the optimal EOI.		
MO CUE: If the GOC is called about the status of getting offsite power back, inform them that Santiago # 1 is immediately available.		
	SRO	<p>VERIFY REACTOR TRIP RECOVERY DIAGNOSED.</p> <ul style="list-style-type: none"> • (RNO) ENSURE at least one RCP in each loop stopped.
	SRO	INITIATE steps 12 through 17.
Examiner Note: Steps 12 through 17 of SO23-12-1, Standard Post Trip Actions, are located at the end of the scenario guide.		
	SRO	IMPLEMENT EOI diagnosed.
Examiner Note: The following steps are from SO23-12-9, Functional Recovery:		
	SRO	RECORD time of EOI entry _____.
	SRO	INITIATE SO23-12-10, SAFETY FUNCTION STATUS CHECKS.

Operating Test : <u>NRC</u>		Scenario # <u>1</u>	Event # <u>6, 7, 8, 9, 10, 11</u>	Page <u>19</u> of <u>28</u>
Event Description: RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS				
Time	Position	Applicant's Actions or Behavior		

	SRO	<p>INITIATE FOLDOUT PAGE.</p> <ul style="list-style-type: none"> • IF SIAS has actuated, THEN INITIATE FS-7, VERIFY SI Throttle/Stop Criteria. • IF all RCPs are stopped, THEN INITIATE FS-3, MONITOR Natural Circulation Established. • IF at least one 220kV switchyard section is not energized to the Unit via Reserve Auxiliary or Unit Auxiliary transformers, THEN INITIATE SO23-12-11, Attachment 8, RESTORATION OF OFFSITE POWER. • IF 4kV bus A04 or A06 becomes de-energized, THEN INITIATE SO23-12-11, Attachment 6, DIESEL GENERATOR FAILURE FOLLOW-UP ACTIONS. • IF there is a loss of offsite power, THEN INITIATE SO23-12-11, Attachment 19, NON-1E DC LOAD REDUCTION. • IF 4kV buses A04 or A06 are de-energized, THEN INITIATE SO23-12-11, Attachment 9, CONTROL BUILDING VENTILATION EMERGENCY ACTIONS and SO23-12-11, Attachment 20, CLASS 1E BATTERY LOAD REDUCTION. • IF 4kV bus A04 or A06 remains de-energized, THEN EVALUATE 4kV bus cross tie per SO23-12-11, Attachment 24, SUPPLYING 1E 4KV BUS WITH OPPOSITE UNIT DIESEL. • If SIAS has initiated, THEN INITIATE SO23-12-11, Attachment 22, NON-QUALIFIED LOAD RESTORATION. • IF ALL Circulating Water pumps are OFF, THEN INITIATE FS-18, ESTABLISH Secondary Plant Protection.
	SRO	DIRECT Chemistry to sample both S/Gs for radioactivity and boron.
	SRO	NOTIFY Shift Manager/Operations Leader of entry into SO23-12-9, FUNCTIONAL RECOVERY.
	SRO	ENSURE Emergency Plan is initiated.
	SRO	IMPLEMENT PLACEKEEPER.
	SRO	IMPLEMENT TIME DEPENDENT STEPS
	SRO	VERIFY SIAS actuation required.
	SRO	<p>ENSURE the following have actuated:</p> <ul style="list-style-type: none"> • SIAS • CCAS • CRIS

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	20	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

	SRO	RECORD time of SIAS _____.
	SRO	VERIFY CIAS actuated.
	RO	STOP unloaded Diesel Generators.
	RO	INITIATE SO23-12-11, Attachment 22, NON-QUALIFIED LOAD RESTORATION.
	RO	VERIFY RCP NPSH requirements of SO23-12-11, Attachment 30, POST-ACCIDENT PRESSURE / TEMPERATURE LIMITS satisfied. <ul style="list-style-type: none"> (RNO) STOP all RCPs AND INITIATE FS-3, MONITOR Natural Circulation Established.
	SRO	ESTABLISH two train SI operation. <ul style="list-style-type: none"> (RNO) REQUEST Shift Manager/Operations Leader to direct plant resources to establish the following support systems for non-operating/unavailable equipment.
	SRO	VERIFY any safety function recovery attachments (FR-1 through FR-7) indicated by any optimal EOI. <ul style="list-style-type: none"> (RNO) GO TO step 6c.
	SRO	IMPLEMENT precautionary actions: <ul style="list-style-type: none"> INITIATE Boration greater than 40 GPM. ENSURE one RCP in each loop stopped.
	SRO	VERIFY ESDE NOT indicated.
	SRO	VERIFY SGTR NOT indicated.
	SRO	VERIFY LOFW NOT indicated.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	21	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

NOTE

Cooldown should be initiated as soon as possible to aid in:

- 1) Maintaining adequate subcooled margin reducing the potential for fuel clad failure and radioactive release to the environment,
- 2) Conserving condensate inventory, and
- 3) Providing plant conditions to support repair work for restoring optimal safety function Success Paths.

NOTE

RCS cooldown strategy should be based on the particular set of in-use and available safety function Success Paths that exist for the event in progress.

	SRO	EVALUATE initiation of SO23-3-2.22, ESFAS OPERATION to reset any signals no longer needed.
	SRO	OBTAIN approval from Shift Manager / Operations Leader to initiate plant cooldown.
	SRO	INITIATE SO23-12-11, Attachment 3, COOLDOWN / DEPRESSURIZATION, as directed by the Shift Manager/ Operations Leader.
Examiner Note: The following steps are from SO23-12-11, Attachment 8, Restoration of Offsite Power.		
	BOP	VERIFY annunciators for Reserve Auxiliary Transformers reset.
	BOP	VERIFY any 220kV section bus deenergized.
	BOP	VERIFY System Separation alarm reset.
	BOP	ESTABLISH communication with one of the following within 5 minutes: <ul style="list-style-type: none"> • SCE Generation Operations Center • SCE Grid Control Center • SDG&E Grid Control Center • CAISO Alhambra Dispatch Office • CAISO Folsom Dispatch Office • Orange County Switching Center
	BOP	VERIFY all four 220kV section buses deenergized.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	22	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

	BOP	ENSURE all SCE controlled 220kV circuit breakers are open.
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>NOTE</p> <p>Opening the 127 F1 through 127F4 knife switches will cause the LOVS signal to be removed and allow auto closure of breakers with an ESF signal present on the de-energized 1E 4kV bus and 480V loadcenter buses.</p> </div>		
	BOP	<p>VERIFY BOTH 1E 4kV buses energized.</p> <ul style="list-style-type: none"> (RNO) Perform the following for each deenergized 1E 4kV bus: <ul style="list-style-type: none"> ENSURE 1E 4kV Bus Tie breaker AUTO/MANUAL transfer switches selected to MANUAL. DISPATCH an operator to OPEN TS-2 DC knife switches 127F1 through 127F4 at EDG Bus PT Cubicle for each deenergized 1E 4kV bus. <p>Examiner Note: Since Train B 1E 4kV bus is faulted, only the knife switches on Train A 1E 4kV bus should be operated.</p>
	BOP	ENSURE 1E 4kV Bus Tie breaker AUTO/MANUAL transfer switches selected to MANUAL.
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p><u>CAUTION</u></p> <p>DO NOT OPERATE TRIP pushbuttons for tripped breakers. Operation of TRIP pushbuttons will reset overcurrent protection allowing breakers to close to a fault.</p> </div>		

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	23	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

	BOP	<p>ENSURE all 6.9kV AUTO/MANUAL and supply breaker switches are aligned:</p> <p>2A01:</p> <ul style="list-style-type: none">• 2HS-1613B – MANUAL• 2HS-1754B – MANUAL• 2HS-1614 – TRIP• 2HS-1613A – TRIP• 2HS-1754A – TRIP <p>2A02:</p> <ul style="list-style-type: none">• 2HS-1610B – MANUAL• 2HS-1755B – MANUAL• 2HS-1611 – TRIP• 2HS-1610A – TRIP• 2HS-1755A – TRIP
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CAUTION

DO NOT OPERATE TRIP pushbuttons for tripped breakers. Operation of TRIP pushbuttons will reset overcurrent protection allowing breakers to close to a fault.

Operating Test : <u>NRC</u>		Scenario # <u>1</u>	Event # <u>6, 7, 8, 9, 10, 11</u>	Page <u>24</u> of <u>28</u>
Event Description: RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS				
Time	Position	Applicant's Actions or Behavior		

	BOP	<p>ENSURE all Non-1E 4kV AUTO/MANUAL and supply breaker switches are aligned:</p> <p>2A08:</p> <ul style="list-style-type: none"> • 2HS-1683B – MANUAL • 2HS-1684 – TRIP • 2HS-1683 – TRIP <p>2A09:</p> <ul style="list-style-type: none"> • 2HS-1741B – MANUAL • 2HS-1740 – TRIP • 2HS-1741A – TRIP <p>2A07:</p> <ul style="list-style-type: none"> • 2HS-1629B – MANUAL • 2HS-1628 – TRIP • 2HS-1629A – TRIP <p>2A03:</p> <ul style="list-style-type: none"> • 2HS-1674 – MANUAL <p>Examiner Note: 2HS-1673 and 2HS-1674A trip pushbuttons should not be depressed per the CAUTION above.</p>
	BOP	<p>ENSURE the following loads are aligned:</p> <ul style="list-style-type: none"> • Heater Drain Pumps - STOP • Main Condensate Pumps – STOP/OUT OF AUTO • Main Condenser Vacuum Pump – STOP/OUT OF AUTO • Turbine Plant Cooling Water Pumps – STOP/OUT OF AUTO • Main Circulating Water Pumps - STOP
	BOP	<p>VERIFY 220kV Bus Section B energized from a SDG&E 220kV line.</p> <ul style="list-style-type: none"> • (RNO) If at least one SCE 220kV line energized, then GO TO step 14. <p>Examiner Note: If the crew has not yet informed the GOC that they are ready to receive the line from the switchyard, they should do so at this point.</p>
	BOP	ENSURE deenergized 220kV Bus Section A isolated.

Operating Test : <u>NRC</u>		Scenario # <u>1</u>	Event # <u>6, 7, 8, 9, 10, 11</u>	Page <u>25</u> of <u>28</u>
Event Description: RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS				
Time	Position	Applicant's Actions or Behavior		

	BOP	ENERGIZE the isolated section bus from a SCE 220kV line – DEPRESS TRIP and then CLOSE energized line CB.
	BOP	VERFIY System Separation alarm reset.
	BOP	ENERGIZE Unit 2 Reserve Auxiliary Transformer – DEPRESS TRIP and then CLOSE associated section bus Transformer CB 4042 or 6042.
	BOP	VERIFY System Separation alarm reset.
	BOP	ENERGIZE adjacent isolated B section bus associated A section bus – DEPRESS TRIP and then CLOSE Bus Tie CB 4112 or 6112.
	BOP	VERIFY System Separation alarm reset.
	BOP	ENERGIZE Unit 3 Reserve Auxiliary Transformer – DEPRESS TRIP and then CLOSE associated section bus CB 4172 or 6172.
	BOP	ENSURE (2/3HS-1600) Bus Metering Selector Switch aligned to an energized 220kV bus.
	BOP	VERIFY BOTH 1E 4kV buses energized. <ul style="list-style-type: none"> • (RNO) ENSURE 1E 4kV Bus Tie Breaker AUTO/MANUAL transfer switches selected to MANUAL and GO TO step 20.
	BOP	ENSURE TS-2 DC knife switches 127F1 through 127F4 at EDG Bus PT Cubicle for each deenergized 1E 4kV bus open. Examiner Note: Since Train B 1E 4kV bus is faulted, only the knife switches on Train A 1E 4kV bus should be operated.
	BOP	OVERRIDE and STOP not operating 1E 4kV loads: <ul style="list-style-type: none"> • Emergency Chillers • Containment Spray Pumps • HPSI Pumps • LPSI Pumps • Auxiliary Feedwater Pumps • Component Cooling Water Pumps • Salt Water Cooling Pumps
	BOP	NOTIFY Control Room Watchstanders before reenergizing the buses.
	BOP	ENERGIZE the deenergized 1E 4kV buses. Examiner Note: Only Train A 1E 4kV bus 2A04 should be energized.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	26	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

Critical Task: Restore power to a 1E 4kV bus following a Station Blackout prior to battery depletion and loss of associated 1E 125 DC bus.

CCT Time: _____

	BOP	ENSURE TS-2 DC 127F1 through 127F4 knife switches at EDG Bus PT Cubicle closed.
	BOP	VERIFY 4kV bus low voltage annunciators reset.
	BOP	ENSURE associated 1E 480V bus energized.
	BOP	VERIFY SIAS NOT actuated. <ul style="list-style-type: none"> (RNO) Start the following loads for energized bus for desired plant conditions as directed by the Shift Manager: <ul style="list-style-type: none"> HPSI Pump LPSI Pump Containment Spray Pump Component Cooling Water Pump Salt Water Cooling Pump Auxiliary Feedwater Pump Emergency Chillers

Critical Task: Establish SI flow following the restoration of 1E 4kV power prior to exiting SO23-12-9, Functional Recovery.

CCT Time: _____

Scenario Termination: When the crew has established SI flow following the restoration of power to 1E 4kV bus 2A04, or at lead evaluator's discretion, the scenario may be terminated.

Examiner Note: The following are steps 12-17 of SO23-12-1, Standard Post Trip Actions.

	RO	INITIATE Attachment 4, ADMINISTRATIVE ACTIONS.
	RO	ENSURE a PA System announcement was made regarding the Reactor trip.
	RO	OPERATE SBCS to maintain RCS T _{COLD} between 540°F and 550°F. <ul style="list-style-type: none"> (RNO) OPERATE ADVS to maintain RCS T_{COLD} between 540°F and 550°F.

Operating Test : <u>NRC</u>		Scenario # <u>1</u>	Event # <u>6, 7, 8, 9, 10, 11</u>	Page <u>27</u> of <u>28</u>
Event Description: RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS				
Time	Position	Applicant's Actions or Behavior		

	RO	<p>VERIFY TELECOM 480VAC FDR BKR HS0800S-2 (Q800S) CLOSED:</p> <ul style="list-style-type: none"> • (RNO) DEPRESS OVERRIDE pushbutton HS0800S-2 AND VERIFY associated breaker closed. <p>OR</p> <ul style="list-style-type: none"> • (RNO) ENSURE opposite unit TELECOM 480VAC FDR BKR HS0800S-2 CLOSED. <p>OR</p> <ul style="list-style-type: none"> • (RNO) REQUEST Shift Manager/Operations Leader to direct plant resources to resources to restore Telecom power.
	RO	<p>VERIFY TELECOM 480VAC FDR BKR HS0800N-2 (Q800N) CLOSED:</p> <ul style="list-style-type: none"> • (RNO) DEPRESS OVERRIDE pushbutton HS0800N-2 AND VERIFY associated breaker closed <p>OR</p> <ul style="list-style-type: none"> • (RNO) ENSURE opposite unit TELECOM 480VAC FDR BKR HS0800N-2 CLOSED <p>OR</p> <ul style="list-style-type: none"> • (RNO) REQUEST Shift Manager/Operations Leader to direct plant resources to resources to restore Telecom power.
	RO	<p>VERIFY all Non-1E 4kV Buses ENERGIZED.</p> <ul style="list-style-type: none"> • (RNO) TRANSFER Non-1E 4kV Buses to available Reserve Auxiliary Transformers. • (RNO) IF ALL Circulating Water pumps OFF, THEN: <ul style="list-style-type: none"> • ENSURE MSIVs closed. <p>AND</p> • OPERATE ADVs to maintain S/G pressure between 960 PSIA and 1050 PSIA.
	RO	<p>VERIFY 480V Load Centers B15 and B16 ENERGIZED:</p> <ul style="list-style-type: none"> • (RNO) VERIFY 56A20, REACTOR TRIPPED CEDMCS DE-ENERGIZED alarming. • (RNO) VERIFY CEDM M/G Set Output contactors OPEN.
	RO	ENSURE 3rd Point Heater Drain Pumps STOPPED.
	RO	<p>VERIFY RTO RESET.</p> <ul style="list-style-type: none"> • (RNO) IF a MFW pump in service THEN RESET RTO per SO23-9-6, Feedwater Control System Operation
	RO	<p>MAINTAIN one MFW Pump and a maximum of three Condensate Pumps in operation.</p> <ul style="list-style-type: none"> • (RNO) ENSURE S/G levels – being maintained by AFW Pumps.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, 9, 10, 11	Page	28	of	28
Event Description:	RCS Leak Increases to 300 GPM, Loss of Offsite Power, Train A EDG Mechanical Failure, Train B EDG Output Breaker Fails to Auto Close, Train B 1E 4kV Bus 2A06 O/C Trip, AFW Pump P-140 Fails to Start on EFAS								
Time	Position	Applicant's Actions or Behavior							

	RO	ENSURE FIC-3294, Condensate Pump miniflow controller to – set for proper Condensate pump configuration: <ul style="list-style-type: none"> One pump – 4500 GPM Two pumps – 6000 GPM Three pumps – 9000 GPM
	RO	PLACE Condensate Draw-off valve LV-3245 to – DISABLE.
	RO	VERIFY SO23-12-2, REACTOR TRIP RECOVERY being implemented. <ul style="list-style-type: none"> (RNO) ENSURE S/G Blowdown valves HV-4054 and HV-4053 – CLOSED. (RNO) GO TO step 16.
	RO	ENSURE the following valves closed: <ul style="list-style-type: none"> Extraction Steam Block valves HV-8800, HV-8812, HV-8804, HV-8810, HV-8808, HV-8820, HV-8806, and HV-8816. Main Steam to Reheater Block, Bypass, Warmup and Control valves HV-2703 or HV-2704, HV-2721, and HV-2751. Bled Steam to Reheaters Block Valve HV-2712A/B. (RNO) IF MSR isolation valves CANNOT be verified closed AND RCS T_{COLD} uncontrolled, THEN: <ul style="list-style-type: none"> CLOSE MSIVs. OPERATE ADVs to maintain S/G pressure – between 960 PSIA and 1050 PSIA.
	RO	VERIFY Main Generator voltage – less than 24kV.
	RO	VERIFY annunciators 99A26 TURBINE LUBE OIL TEMP HI and 99A46 TURBINE BRG OIL DRAIN TEMP HI – RESET. <ul style="list-style-type: none"> (RNO) CONTROL lube oil temperature locally.
	RO	INITIATE SO23-10-2, TURBINE SHUTDOWN, Attachment for Unloading the Generator and Removing the Unit from Line.
	RO	VERIFY BOTH Start-Up Range channels – OPERABLE. <ul style="list-style-type: none"> (RNO) NOTIFY SRO-in-charge of TS 3.3.13 and LCS 3.3.111 entry. (RNO) INITIATE SO23-3-2.15, section for Start-Up Range Channel failure.

Facility:	SONGS 2 & 3	Scenario No.:	2	Op Test No.:	October 2012 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions: 100% Power MOC					
Turnover: Maintain steady state conditions.					
Critical Tasks: <ul style="list-style-type: none"> Emergency Borate the RCS following Reactor Trip following the failure of two full-length CEAs to insert on Reactor trip per SO23-12-1, Standard Post Trip Actions. Trip all 4 RCPs within 30 minutes of the CIAS due to the loss of Component Cooling Water to the RCPs. 					

Event No.	Malf. No.	Event Type*	Event Description
1 (10 min)	SG03G	I (BOP, SRO) TS (SRO)	S/G E-089 Pressure Transmitter PT-1013-3 fails low
2 (25 min)	MFW LP	N (RO, BOP, SRO)	MFW Pump K-006 Trip (Rapid Power Reduction to 65% Power)
3 (30 min)	FW02A	TS (SRO)	AFW Pump P-141 O/C Trip
4 (40 min)	RC11	I (RO, SRO)	Thot instrument TT-0111X1 Fails High
5 (50 min)	ED08A	C (RO, BOP, SRO)	Loss of Non-1E Instrument Bus 2Q065
6 (55 min)	RP23B	M (RO, BOP, SRO)	Inadvertent CIAS – Loss of Forced Circulation
7 (55 min)	ED03A	C (BOP)	1E 4kV Bus 2A04 O/C Trip on Reactor Trip
8 (60 min)	RD1002 RD4002	R (RO, SRO)	Two Full Length CEAs Fail to Fully Insert – Gravity Feed Emergency Boration Required
9 (65 min)	ELEC LP	I (BOP)	Non-1E 4kV Bus 2A09 Fails to Auto Transfer on Reactor Trip

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

Actual	Target Quantitative Attributes
9	Total malfunctions (5-8)
3	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
1	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
2	Critical tasks (2-3)

Scenario Event Description NRC Scenario #2

SCENARIO SUMMARY NRC #2

The crew will take the watch at 100% power with no scheduled activities per SO23-5-1.7, Power Operations.

Upon taking the watch, SG E089 Pressure Transmitter PT-1013-3 will fail low. The crew will identify the failed transmitter and enter SO23-13-18, RPS Malfunctions. The crew will bypass the affected bistables and the BOP will bypass the affected pressure transmitter on the FWCS DCS. The CRS will refer to the Technical Specifications.

Following the Technical Specification review, MFP K006 will trip. The crew will perform a rapid power reduction to lower power 30% in 5 min per SO23-13-28, Rapid Power Reduction. Two minutes after the crew initiates EFAS, Train A AFW Pump P-141 will trip on overcurrent due to a seized shaft. The CRS will address Technical Specifications due to the loss of the motor driven AFW pump.

When power has stabilized at ~ 70%, Loop 1 Thot instrument TT-0111X1 will fail high. The crew will take prompt and prudent action to stabilize Pressurizer level per OSM-14, Operations Department Expectations, and enter AOI SO23-13-27, Pressurizer Pressure and Level Malfunctions. The crew will transfer the Pressurizer level input to Loop 2 and transfer the SBCS Quick Open Block Selector Switch to the unaffected loop.

When automatic level control has been restored, a loss of Non-1E Instrument Bus #1 will occur. The crew will enter SO23-13-19, Loss of a Non-1E Instrument Bus, to address the malfunction. Major actions for the loss of Instrument Bus #1 include placing SBCS in MANUAL, securing charging flow due to letdown automatically isolating, and operating 1E Pressurizer heaters as necessary to control Pressurizer pressure.

When Instrument Bus #1 has been reenergized on its emergency power source, an inadvertent CIAS will occur, requiring a Reactor trip.

Upon the Reactor trip, two full length CEAs will fail to insert requiring an emergency boration to be performed. Train A 1E 4kV Bus will trip on the Reactor trip causing the RO to use gravity feed to emergency borate. The Train A EDG must be placed in maintenance lockout due to the loss of EDG auxiliaries. Non-1E 4kV Bus 2A09 will fail to auto transfer on the Reactor trip and will be manually transferred in SPTA follow up actions. The CIAS will isolate cooling water to the RCPs which the crew will manually secure during the Vital Auxiliaries verification.

The CRS will diagnose a loss of forced circulation and enter SO23-12-7, Loss of Offsite Power/Loss of Forced Circulation. The scenario is terminated when the crew verifies natural circulation has been established.

Scenario Event Description NRC Scenario #2

Risk Significance:

- Failure of risk important system prior to trip: MFP K-006 Trip
AFW Pump P-141 OC trip
- Risk significant core damage sequence: Failure of two full-length CEAs to insert on Rx trip
Loss of 1E 4kV Bus 2A04
Loss of forced circulation
- Risk significant operator actions: Initiate emergency boration following failure of two full length CEAs to insert on Rx trip
Trip all RCPs following the loss of cooling water following the inadvertent CIAS

Scenario Event Description
NRC Scenario #2

MACHINE OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC-230 NRC Scenario #2 and associated Setup File.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP	MALF	ED03A	Train A 1E 4kV Bus 2A04 OC Trip	Fault	Rx Trip
	MALF	RD0502	Stuck CEA # 05	Stuck	
	MALF	RD6802	Stuck CEA # 68	Stuck	
	MALF	FW02A	AFW Pump P-141 Shaft Seizure	Seizure	EFAS (+2 min)
	LP	N/A	Non-1E 4kV Bus 2A09 Fails to Auto Transfer on Rx Trip	Fail to Transfer	Rx Trip
1	MALF	SG03G	SG E089 Pressure Transmitter PT-1013-3 Fails Low	0	
	RF	RP51	PPS Door Open Annunciator	Open	
	RF	RP54K	Lo SG-1 Pressure Channel C Bypass	Bypass	
	RF	RP54U	Hi SG-1 DP EFAS-1 Channel C Bypass	Bypass	
	RF	RP54V	Hi SG-2 DP EFAS-2 Channel C Bypass	Bypass	
	RF	RP51	PPS Door Open Annunciator	Close	
2	RF	MFP PB	MFW Pump 2K006 Trip	Trip	
3	Setup	Setup	AFW Pump P-141 OC Trip (Shaft Seizure)	Seizure	
4	MALF	RC11A	TT-0111X1 RCS Hot Leg # 1 Temperature Instrument Fails High	625	
5	MALF	ED08A	Loss of Non-1E Instrument Bus 2Q065	Loss	
	RF	ED80	2Q065 Transfer to Emergency Power Source	Emer	
	MALF	ED08A	Loss of Non-1E Instrument Bus 2Q065	Normal	(+2 sec)
6	MALF	RP23B	Inadvertent CIAS (AB Power Matrix Loss)	Loss Power	
7	Setup	Setup	Train A 1E 4kV Bus 2A04 OC Trip		

Scenario Event Description NRC Scenario #2

8	Setup	Setup	Two Full Length CEAs Fail to Insert on Rx Trip		
9	Setup	Setup	Non-1E 4kV Bus 2A08 Fails to Auto Transfer on Rx Trip		

Scenario Event Description
NRC Scenario #2

Machine Operator:

- **RESTORE to IC-215**
- **OPEN 2012 NRC Scenario #2 event file**
- **RUN Setup Files 1 and 2**
- **ENSURE Pressurizer Level and Pressure Selector Switches are selected to Channel Y**
- **ENSURE blend setpoints are 13.2 gpm for BA and 74.8 gpm for PMW**
- **ENSURE SO23-5-1.7 Attachment 9 MOC placard is posted**
- **ENSURE OP AID 005-23 on CR63 has BQ aligned to Unit 2, BS aligned to Unit 3**
- **ENSURE OP AID 005-11 on CR64 has E336 aligned to Unit 2, E335 aligned to Unit 3**
- **ENSURE OP AID 005-5 for Backpressure Control Valves has PV201B circled**
- **ENSURE OP AID 005-5 for Letdown Flow Control Valve has LV110A circled**
- **ENSURE alarms are active**
- **ENSURE Pressurizer level setpoint selected to IN1.**

Control Room Annunciators in Alarm:

- **None**

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 1 </u> Page <u> 7 </u> of <u> 23 </u>		
Event Description: <u> S/G E-089 Pressure Transmitter PT-1013-3 Fails Low </u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 1, S/G E-089 Pressure Transmitter PT-1013-3 Fails Low		
Indications Available: <ul style="list-style-type: none"> 56A52/56A42 SG2 E088 Press > SG1 E089 ESFAS Ch Pretrip/Trip 56A53/56A43 SG1 E089 Press Lo Channel Pretrip/Trip 52A13 FWCS Trouble 		
Examiner Note: The following steps are from SO23-13-18, RPS Malfunction		
	RO	DETERMINE failure by observing instrumentation for the affected channel AND alternate redundant indications monitoring the same plant parameters.
<p>NOTE</p> <p>For failures affecting RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip or ESFAS Actuation Logic, refer to Tech. Spec. LCO 3.3.4 and LCO 3.3.6.</p>		
	SRO	DETERMINE a Single PPS Channel has FAILED and GO TO Step 3.
<p>NOTE</p> <p>Failure of a measured variable channel may affect more than one Functional Unit (e.g., PZR Pressure Hi affects DNBR and LPD).</p>		
	SRO	REFER to Attachment 10 and determine Functional Unit(s) affected. Examiner Note: Affected bistables are Channel C bistables 11, 21, and 22.
	SRO	PLACE the affected Functional Unit in BYPASS per SO23-3-2.12, Section for Bypass Operation of Trip Channels.
MO CUE: If requested to place Channel C bistables 11, 21, and 22 in bypass, execute PPS Bypasses event.		
	SRO	CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.

Operating Test :	NRC	Scenario #	2	Event #	1	Page	8	of	23
Event Description: S/G E-089 Pressure Transmitter PT-1013-3 Fails Low									
Time	Position	Applicant's Actions or Behavior							

	BOP	<p>CONFIRM failure does NOT affect the Feedwater Digital Control System.</p> <ul style="list-style-type: none"> • (RNO) BYPASS the affected instrument for E-088 and/or E-089 per SO23-3-2.38, Section for Bypassing Selected Feedwater Control Signals: <ul style="list-style-type: none"> • Implement the requirements for a Reactivity Brief as Peer Check per OSM-14, Section for Reactivity Management. • From the applicable SG FW Control DCS, go to the SELECTED SIGNALS screen. • Verify the "D" channel signal is valid. • SELECT BYPASS for the instrument to be placed in bypass. • Verify the instrument indicates BYPASS. • Verify the "D" channel is not in BYPASS. • Verify the Selected Signal (SS) output looks valid.
	SRO	<p>FOLLOW the action requirements of the applicable Tech. Spec./LCS listed in Attachment 10.</p> <ul style="list-style-type: none"> • LCO 3.3.1 • Condition A – One or more Functions with one automatic RPS trip channel inoperable. • Action A.1 – Place Channel in bypass or trip within 1 hour. • LCO 3.3.5 • Condition B – One automatic trip channel inoperable for RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function. • Action B.1 – Place Functional Unit in bypass within 1 hour.
<p>Examiner Note: When bistables have been bypassed and Technical Specifications have been evaluated, or at lead examiner's discretion, proceed to Event 2, MFW Pump K-006 trip.</p>		

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 2, 3 </u> Page <u> 9 </u> of <u> 23 </u>	
Event Description: <u> MFW Pump K-006 Trip, AFW Pump P-141 O/C Trip </u>	
Time	Position
Applicant's Actions or Behavior	

Machine Operator: When directed, INITIATE Event 2, MFW Pump K-006 Trip (Event 3, P-141 O/C Trip will automatically occur 2 min after EFAS is actuated.)		
Indications Available: <ul style="list-style-type: none"> MFWP/Turbine P062/K-006 Trip 		
Examiner Note: The following steps are from SO23-13-28, Rapid Power Reduction.		
	SRO RO/BOP	If MFW Pump tripped, then INITIATE EFAS by depressing all (8) EFAS Actuation Pushbuttons once.
	RO	BORATE through HV-9247, as established in Rx Brief (Alternate Boration): <ul style="list-style-type: none"> SELECT ALTERNATE BORATION. SELECT CONFIRM. SELECT GO. ENSURE two Charging Pumps are running. When the Alternate Boration time has timed out, then verify HV-9247 CLOSED. SELECT CANCEL. OPERATE Charging Pumps per CRS direction.
	BOP	ENSURE all available Condensate Pumps - running.
	BOP	INITIATE Attachment 4 for Turbine Load Change - Manual Runback: <ul style="list-style-type: none"> ENSURE only the FREQUENCY Loop is in service. Select INITIATE/CANCEL in the MANUAL RUNBACK box. Select INITIATE RUNBACK (P2) in the Confirm Manual Runback window. CANCEL and INITIATE the Manual Runback to maintain Tcoldavg within Operating Band. VERIFY Turbine load stabilizes at the target value of 70% Rx Power. If Rx Power has NOT reached target value of 70%, then continue load reduction by using 2HS-2210, Main Turbine Speed/Load Control LOWER pushbutton at a rate of 100 MW/MIN to obtain target value of 70% Rx Power while maintaining Tcoldavg within operating band.

Operating Test :	NRC	Scenario #	2	Event #	2, 3	Page	10	of	23
Event Description: MFW Pump K-006 Trip, AFW Pump P-141 O/C Trip									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>INSERT Group 6 to 105 inches per SO23-3-2.19:</p> <ul style="list-style-type: none"> • POSITION Group Select switch to the CEA group to be moved. • POSITION Mode Select Switch to Manual Sequential. • VERIFY the group indicator lamps are ILLUMINATED for the group selected. • POSITION CEA(s) as directed by SRO Ops. Supv. or controlling Procedure • When CEA positioning has completed, then POSITION the Mode Select Switch to OFF.
	RO/BOP	INITIATE monitoring CV-9739, COLSS Raw Delta-T Power.
	RO/BOP	MAINTAIN Tcold AVG within Operating Band per SO23-5-1.7 Attachment for Unit 2 and Unit 3 Tcold vs Reactor Power.
	BOP	<p>If EFAS initiated, then RESET the EFAS cycling relays, as follows:</p> <ul style="list-style-type: none"> • VERIFY Steam Generator level(s) - stable or rising. • VERIFY Steam Generator Low Level Alarm(s) - reset. • VERIFY Feedwater Control Valves - < 100% Open and controlling level. • When directed by the SRO Ops. Supv., then DEPRESS all (8) EFAS Actuation Pushbuttons a second time to reset the cycling relays.
	BOP	INITIATE SO23-2-2, Section for On-Line Operation of MP-053.
	SRO	Notify the GOC and log the notification.
	RO	<p>INITIATE forcing PZR spray flow using two valves, per SO23-3-1.10:</p> <ul style="list-style-type: none"> • ENSURE a Reactivity Brief has been conducted for this activity per SO123-0-A1, Section for Reactivity. • COMMENCE monitoring RCS pressure. • VERIFY RCS pressure > 1500 psia. • PLACE both PZR Spray Valve Controllers in AUTO. • POSITION all Non-1E Backup Heaters to ON. • LOWER PIC-0100, PZR Pressure Controller, setpoint as required to maintain RCS pressure as directed by the CRS (set setpoint to ~ 2225 psia).
	SRO	Refer to SO23-5-1.7, Attachment for Recommended Power Plateaus, for operation with one MFW Pump.

Operating Test :	NRC	Scenario #	2	Event #	2, 3	Page	11	of	23
Event Description: MFW Pump K-006 Trip, AFW Pump P-141 O/C Trip									
Time	Position	Applicant's Actions or Behavior							

	SRO	<p>After stabilizing the Unit at the target power level, then perform the following:</p> <ul style="list-style-type: none"> • INITIATE SO23-5-1.7, Attachment for Power Descension. • INITIATE SO23-3-2.2, Makeup Operations, to ensure CVCS makeup is returned to automatic operation. • NOTIFY Chemistry and LOG the notification. • NOTIFY Reactor Engineering and LOG the notification.
<p>Examiner Note: Technical Specification for AFW P-141 O/C Trip:</p> <ul style="list-style-type: none"> • LCO 3.7.5 • Condition B – One AFW train inoperable for reasons other than Condition A in Mode 1, 2, or 3. • Action B.1 – Restore AFW train to OPERABLE status within 72 hours AND 10 days from discovery of failure to meet the LCO. 		
<p>Examiner Note: When Rx Power has been stabilized at ~ 70% Rx Power and Technical Specifications have been evaluated, or at lead evaluator's discretion, proceed to Event 4, That instrument TT-111X1 fails high.</p>		

Operating Test :	NRC	Scenario #	2	Event #	4	Page	12	of	23
Event Description: Thot Instrument TT-0111X1 Fails High									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, INITIATE Event 4, Thot instrument TT-111X1 fails high

Indications Available:

- 50A05 Tavg Hi

Examiner Note: The following steps are from Alarm Response Procedure 50A05, Tave Hi:

	SRO	If the Letdown and Charging Systems are not responding as desired, then Initiate SO23-13-27, Pressurizer Pressure and Level Malfuction.
	RO	<p>Ensure the following are transferred to the unaffected loop:</p> <p>2(3)LIC-0110, Pressurizer Level Controller, per SO23-3-1.10, Attachment for Transferring PZR Level and Pressure Controls, Section for Transfer Remote PZR Level Setpoint Inputs (IN1 ↔ IN2):</p> <ul style="list-style-type: none"> • Ensure a Reactivity Brief has been conducted for this activity per SO123-0-A1, Section for Reactivity. • Ensure LIC-0110, PZR Level Controller, is in MANUAL with the Output set to ensure Charging and Letdown are matched. • Go (TAG) to Page 2 on the controller and observe "IN1" displayed. • Note the displayed PZR level. • Depress SEL pushbutton to display "IN2". • Note the displayed PZR level. • If both displays IN1 and IN2 appear faulty, then transfer LIC-0110 to Local Setpoint control. • Depress the SEL pushbutton until the Selected Indicating Light (small dot) is extinguished. This displays the selected setpoint. • To prevent Charging Pump Auto Start, match actual Pressurizer Level to within 2% of the "new" selected level setpoint. • Select the new remote setpoint: <ul style="list-style-type: none"> • To select IN1, depress the lower pushbutton once. • To select IN2, depress the raise pushbutton once. • To return LIC-0110 to AUTO: <ul style="list-style-type: none"> • Go (TAG) to Page 1 on the controller. • Manually adjust the output (right column) until actual level (middle column) is matches with the generated setpoint (left column). • Transfer LIC-0110 to AUTO by depressing the A/M button.

Operating Test :	NRC	Scenario #	2	Event #	4	Page	13	of	23
Event Description: Thot Instrument TT-0111X1 Fails High									
Time	Position	Applicant's Actions or Behavior							

	BOP	<p>Ensure the following are transferred to the unaffected loop:</p> <p>2(3)HS-8430, SBCS Quick Open Block Tavg Selector Switch per SO23-3-2.18, Section for Transferring SBCS Tavg Inputs:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">NOTES</p> <ol style="list-style-type: none"> 1. <u>If</u> there is no Tavg signal available, <u>then</u> the SBCS Quick Open Block Signal will be affected. 2. <u>If</u> the Tavg signal is failed High, <u>then</u> it will not block the Quick Open Signal when it should. </div> <ul style="list-style-type: none"> • Implement the requirements for a Reactivity Brief and Peer Check per OSM-14, Section for Reactivity Management. • VERIFY a Quick Open Signal is not present. • POSITION 2(3)HS-8430, SBCS Quick Open Block Tavg Selector Switch, to the opposite Loop.
Examiner Note: The following steps are from SO23-13-27, Pressurizer Level and Pressure Malfunction.		
	RO	PLACE LIC-0110, Pressurizer Level Controller in MANUAL by depressing the A/M button.
	RO	START or STOP Charging Pumps to control Pressurizer Level.
	RO	SECURE Pressurizer heaters to control Pressurizer pressure.
	RO	ADJUST the output on LIC-0110 to maintain a steady PZR level.
	RO	VERIFY normal Charging and Letdown in service.
	RO	VERIFY Level Indicators LI-0110A1, LI-0110A2 and LI-103 are reading approximately the same.
	RO	VERIFY Pressurizer level is not lowering due to an RCS leak.
	RO	GO TO Step 2j.
	RO	TRANSFER Remote Pressurizer Level setpoint (IN1-IN2) to the non-faulted channel (See steps above, if necessary)
	RO	Restore Pressurizer Heaters to service to control RCS Pressure.
	RO	OPERATE Charging Pumps as directed by the CRS.

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 4 </u> Page <u> 14 </u> of <u> 23 </u>		
Event Description: <u>Thot Instrument TT-0111X1 Fails High</u>		
Time	Position	Applicant's Actions or Behavior

	BOP	TRANSFER SBCS Quick Open Block Tavg Selector Switch to the non-affected loop (See steps above, if necessary)
Examiner Note: When LIC-0110 setpoint has been selected to IN2, LIC-0110 has been returned to AUTO, Pressurizer heaters have been restored to normal lineup, and SBCS Quick Open Block Tavg Selector Switch has been transferred to Loop 2, or at lead evaluator's discretion, proceed to Event 5, Loss of Non-1E Instrument Bus 2Q065.		

Operating Test :	NRC	Scenario #	2	Event #	5	Page	15	of	23
Event Description: Loss of Non-1E Instrument Bus 2Q065									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, INITIATE Event 5, Loss of Non-1E Instrument Bus 2Q065		
Indications Available:		
<ul style="list-style-type: none"> 63B24 2Q065 Inst Bus 1 Power Supply Failure 		
Examiner Note: The following steps are from SO23-13-19, Loss of a Non-1E Instrument Bus		
	SRO	VERIFY Instrument Bus #1 (Q065) ENERGIZED. <ul style="list-style-type: none"> (RNO) PLACE SBSCS in - MANUAL. (RNO) INITIATE transfer of Instrument Bus #1 to EMERGENCY. (RNO) GO TO Step 2.
MO CUE: When directed to place Instrument Bus #1 on its emergency power source, acknowledge but wait for direction/confirmation from the Floor Instructor prior to transferring to emergency.		
	BOP	VERIFY FWCS operating NORMALLY.
	BOP	VERIFY Steam Generator E-089 level NOT lowering uncontrollably.
	BOP	VERIFY Steam Generator E-088 level NOT lowering uncontrollably.
NOTE Loss of power to either Q065 or Q0612 will de-energize and lockout <u>ALL</u> Non-1E Pressurizer Heater Banks. Only 1E Heaters Banks remain available.		
	RO	VERIFY Pressurizer Pressure Control System maintaining Pressurizer pressure at approximately 2250 psia. <ul style="list-style-type: none"> (RNO) Use 1E Pressurizer Heaters to maintain RCS pressure 2250 psia.
NOTE Loss of power to Q0612 will stop Charging Pumps Selected to "AUTO". Loss of Q065 or Q0612 will also cause a loss of Letdown Flow due to TV-0221 or TV-9267 closing.		
	RO	VERIFY Pressurizer Level in Program Band of 41% to 53%. <ul style="list-style-type: none"> (RNO) START and STOP Charging Pumps to maintain programmed PZR level.
	RO	VERIFY Boration NOT in progress from Charging Pump Suction Path.
	RO	VERIFY Secondary Water Chemistry Computers – ENERGIZED.
	RO	VERIFY Rad Monitors being used for releases or processing – ENERGIZED.

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 5 </u> Page <u> 16 </u> of <u> 23 </u>		
Event Description: Loss of Non-1E Instrument Bus 2Q065		
Time	Position	Applicant's Actions or Behavior

	SRO	REFER to Attachments 1 through 5 to identify important points to monitor based on the identified loss of the Instrument Bus Power.
	SRO	GO TO Section 6, Actions After Restoration of NON 1E Power.
	BOP	VERIFY Power was NOT lost to SBCS.
	BOP	ENSURE SBCS in Auto.
Examiner Note: When power has been restored to 2Q065 and SBCS has been placed back in AUTO, or at lead evaluator's discretion, proceed to Event 6, Inadvertent CIAS.		

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 6 </u> Page <u> 17 </u> of <u> 23 </u>		
Event Description: <u> Inadvertent CIAS </u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 6, Inadvertent CIAS		
Indications Available: <ul style="list-style-type: none"> 57A02 CIAS Train A Actuation 57B02 CIAS Train B Actuation 		
Examiner Note: The following steps are from SO23-13-17, Inadvertent SIAS/CIAS/CSAS		
	SRO	ENSURE TRIPPED the Reactor and Turbine.
	SRO	INITIATE SO23-12-1, Standard Post Trip Actions.
	RO	AFTER Initial Actions (Step 1 and 2) of SO23-12-1, THEN TRIP all RCPs
Examiner Note: If the crew trips the Reactor without referring to SO23-13-17, Inadvertent CIAS, they may not trip the RCPs until the verification of Vital Auxiliaries in SPTAs.		

Operating Test :	NRC	Scenario #	2	Event #	7, 8, 9	Page	18	of	23
Event Description: 1E 4kV Bus 2A04 OC Trip, Two Full Length CEAs Fail to Insert on Rx Trip, Non-1E 4kV Bus 2A08 Fails to Auto Transfer on Rx Trip									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: Events 7, 8, and 9 will automatically initiate on Rx Trip
Examiner Note: The following steps are from SO23-12-1, Standard Post Trip Actions

	RO	VERIFY Reactor Trip Circuit Breakers (8) OPEN.
	RO	VERIFY Reactor power – LOWERING AND Startup rate NEGATIVE.
	RO	<p>VERIFY maximum of one full length CEA NOT fully inserted.</p> <ul style="list-style-type: none"> • (RNO) INITIATE Emergency Boration. <ul style="list-style-type: none"> • VERIFY Refueling NOT in progress. • VERIFY at least one Charging Pump is available. • DEPRESS OPEN on 2HV-9247, Emergency Boration Block Valve and verify valve is open AND DEPRESS START for either BAMU Pump and verify pump is running. <ul style="list-style-type: none"> • (RNO) INITIATE Emergency Boration using Gravity Feed: <ul style="list-style-type: none"> • ENSURE CLOSED 2HV-9247, Emergency Boration Block Valve. • OPEN 2HV-9240, BAMU Tank MT-071 to Charging Pump Gravity Feed Valve. • OPEN 2HV-9235, BAMU Tank MT-072 to Charging Pump Gravity Feed Valve. • VERIFY OPEN 2HV-9240, BAMU Tank MT-071 to Charging Pump Gravity Feed Valve. • VERIFY OPEN 2HV-9235, BAMU Tank MT-072 to Charging Pump Gravity Feed Valve. • ENSURE IN MANUAL AND CLOSE 2LV-0227B, VCT MT-077 Outlet Valve. • ENSURE charging flow > 40 gpm. • START additional Charging Pumps as necessary to increase flow rate. • VERIFY Boric Acid delivery to RCS by monitoring BAMU Tank level lowering. • (RNO) Record time of Emergency Boration initiation _____.

Critical Task: Emergency Borate the RCS following Reactor Trip following the failure of two full-length CEAs to insert on Reactor trip per SO23-12-1, Standard Post Trip Actions.

CCT Time: _____

Operating Test :	NRC	Scenario #	2	Event #	7, 8, 9	Page	19	of	23
Event Description: 1E 4kV Bus 2A04 OC Trip, Two Full Length CEAs Fail to Insert on Rx Trip, Non-1E 4kV Bus 2A08 Fails to Auto Transfer on Rx Trip									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: Emergency boration may be stopped when power is <10⁻⁴% power and power decreasing or stable.

	BOP	ALL HP and LP Stop and Governor valves CLOSED.
	BOP	VERIFY BOTH Unit Output Breakers OPEN.
	BOP	VERIFY Main Turbine speed less than 2000 RPM OR lowering.
	SRO	INITIATE Attachment 1, WORKSHEET.

CAUTION

DO NOT OPERATE TRIP pushbuttons for tripped breakers. Operation of TRIP pushbuttons will reset overcurrent protection allowing Diesel Generator output breaker to close to a fault.

	BOP	VERIFY BOTH 1E 4kV Buses ENERGIZED. <ul style="list-style-type: none"> • (RNO) ENSURE associated EDG OPERATING. • (RNO) ENSURE associated EDG output breaker CLOSED. <p>Examiner Note: Due to the bus being faulted, the BOP should NOT attempt to close the EDG output breaker.</p>
	BOP	VERIFY all 1E 480V buses ENERGIZED: <ul style="list-style-type: none"> • (RNO) IF Train A 1E 480V bus B24 DE-ENERGIZED THEN ENSURE Train A EDG (G002) HS-1767-1, MAINTENANCE LOCKOUT in MAINT. AND INITIATE Attachment 5, DIESEL GENERATOR FAILURE FOLLOW-UP ACTIONS.
	BOP	VERIFY all Class 1E DC Buses ENERGIZED.
	BOP	VERIFY all Non-1E 4kV Buses ENERGIZED. <ul style="list-style-type: none"> • (RNO) RESTORE power to affected bus(es) as time and resources permit.
	BOP	VERIFY one CCW Train OPERATING AND aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger. <ul style="list-style-type: none"> • (RNO) START an available CCW Train. • (RNO) IF CIAS ACTUATED, THEN ENSURE all RCPs STOPPED AND GO TO step 5.

Critical Task: Trip all 4 RCPs within 30 minutes of the CIAS due to the loss of Component Cooling Water to the RCPs.

CCT Time: _____

Operating Test :	NRC	Scenario #	2	Event #	7, 8, 9	Page	20	of	23
Event Description: 1E 4kV Bus 2A04 OC Trip, Two Full Length CEAs Fail to Insert on Rx Trip, Non-1E 4kV Bus 2A08 Fails to Auto Transfer on Rx Trip									
Time	Position	Applicant's Actions or Behavior							

	RO	VERIFY PZR level between 10% and 70% AND trending to between 30% and 60%.
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F.
	RO	VERIFY PZR pressure between 1740 PSIA and 2380 PSIA AND trending to between 2025 PSIA and 2275 PSIA.
	RO	VERIFY at least one RCP OPERATING. • (RNO) GO TO step c.
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F:
	BOP	VERIFY at least one S/G level between 21% NR and 80% NR AND Feedwater AVAILABLE.
	BOP	VERIFY RCS T _{COLD} between 540°F and 550°F.
	BOP	VERIFY S/G pressures between 960 PSIA and 1050 PSIA.
	RO	VERIFY Containment pressure less than 1.5 PSIG.
	RO	VERIFY Containment Area Radiation Monitors NOT alarming or trending to alarm.
	RO	VERIFY Secondary Plant Radiation Monitors NOT alarming or trending to alarm.
	RO	VERIFY Containment average temperature less than 120°F.
	RO	VERIFY Containment pressure less than 1.5 PSIG.
	RO	VERIFY all safety function criteria per Attachment 1, WORKSHEET RECOVERED. • (RNO) COMPLETE Attachment 2, RECOVERY DIAGNOSTICS.
Examiner Note: The CRS should diagnose a single event, Loss of Forced Circulation, and identify SO23-12-7, Loss of Forced Circulation/Loss of Offsite Power, as the optimal EOI.		
	SRO	VERIFY REACTOR TRIP RECOVERY DIAGNOSED. • (RNO) ENSURE at least one RCP in each loop stopped.
	SRO	INITIATE steps 12 through 17.
Examiner Note: Steps 12 through 17 of SO23-12-1, Standard Post Trip Actions, are located at the end of the scenario guide.		
	SRO	IMPLEMENT EOI diagnosed.
Examiner Note: The following steps are from SO23-12-7, Loss of Forced Circulation/Loss of Offsite Power.		
	SRO	RECORD time of EOI entry _____.
	SRO	INITIATE SO23-12-10, SAFETY FUNCTION STATUS CHECKS.

Operating Test :	NRC	Scenario #	2	Event #	7, 8, 9	Page	21	of	23
Event Description: 1E 4kV Bus 2A04 OC Trip, Two Full Length CEAs Fail to Insert on Rx Trip, Non-1E 4kV Bus 2A08 Fails to Auto Transfer on Rx Trip									
Time	Position	Applicant's Actions or Behavior							

	SRO	<p>INITIATE FOLDOUT PAGE.</p> <ul style="list-style-type: none"> IF all RCPs have stopped, THEN INITIATE FS-3, MONITOR Natural Circulation Established. IF 4kV bus A04 or A06 becomes de-energized, THEN INITIATE SO23-12-11, Attachment 6, DIESEL GENERATOR FAILURE FOLLOW-UP ACTIONS. IF 4kV bus A04 or A06 remains de-energized, THEN INITIATE SO23-12-11, Attachment 20, CLASS 1E BATTERY LOAD REDUCTION.
	SRO	VERIFY at least one train of 1E electrical AC and associated 1E DC Control Power (Train A - D1, Train B - D2) available.
	SRO	VERIFY at least one Class 1E 120V Vital AC Instrument Bus available.
	SRO	<p>VERIFY Class 1E 4kV Buses A04 and A06 energized.</p> <ul style="list-style-type: none"> INITIATE SO23-12-11, Attachment 6, DIESEL GENERATOR FAILURE FOLLOW-UP ACTIONS, for NOT energized bus.
	SRO	VERIFY all RCPs stopped OR all Non-1E 4kV buses de-energized.
	SRO	NOTIFY Shift Manager/Operations Leader of SO23-12-7, LOSS OF FORCED CIRCULATION/LOSS OF OFFSITE POWER initiation.
	SRO	ENSURE Emergency Plan is initiated.
	SRO	IMPLEMENT PLACEKEEPER.
	SRO	IMPLEMENT TIME DEPENDENT STEPS
	SRO	VERIFY Reserve AUX Transformers to unit energized.
	SRO	VERIFY all Non-1E 4kV buses energized.
	RO/BOP	STOP unloaded Diesel Generators.
	SRO	VERIFY all of the following: At least one CCW critical loop in service AND CCW Pump aligned to Non-Critical Loop (NCL) and Letdown operating.
	SRO	INITIATE applicable actions of SO23-12-11, Attachment 2, FLOATING STEPS.
	RO	VERIFY PZR level between 10% and 70% AND trending to between 30% and 60%.
	RO	VERIFY PZR pressure (NR and WR) controlled between 1740 PSIA and 2380 PSIA AND trending to between 2025 PSIA and 2275 PSIA.
	BOP	<p>VERIFY SBCS available: MSIVs – open AND Condenser Backpressure less than SBCS Interlock Setpoint.</p> <ul style="list-style-type: none"> (RNO) OVERRIDE (as required) and OPERATE available S/G ADVs.

Operating Test :	NRC	Scenario #	2	Event #	7, 8, 9	Page	22	of	23
Event Description: 1E 4kV Bus 2A04 OC Trip, Two Full Length CEAs Fail to Insert on Rx Trip, Non-1E 4kV Bus 2A08 Fails to Auto Transfer on Rx Trip									
Time	Position	Applicant's Actions or Behavior							

	BOP	OPERATE MFW to establish at least one intact S/G level between 40% NR and 80% NR <ul style="list-style-type: none"> (RNO) OVERRIDE and operate AFW to establish at least one intact S/G level between 40% NR and 80% NR.
	RO	VERIFY operating Loop RCS T _{COLD} stable or controlled.
	SRO	VERIFY at least one RCP operating. <ul style="list-style-type: none"> (RNO) GO TO step 11.

NOTE

Low flow during Natural Circulation slows RCS response to temperature changes. Loop transit time rises to between 5 minutes and 10 minutes.

	RO	VERIFY Natural Circulation Established in at least one loop: <ul style="list-style-type: none"> VERIFY operating loop ΔT (T_{HOT} – T_{COLD}) less than 58°F. VERIFY RCS T_{HOT} and T_{COLD} NOT rising. VERIFY Core Exit Saturation Margin greater than or equal to 20°F. VERIFY operating loop RCS T_{HOT} and REP CET within 16°F. VERIFY Reactor Vessel level greater than or equal to 100% (Plenum).
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Scenario Termination: When the crew has verified Natural Circulation and Non-1E 4kV bus 2A08 has been manually transferred to the Reserve Auxiliary Transformer, or at Lead Evaluator's discretion, the scenario may be terminated.

Examiner Note: The following are steps 12-17 of SO23-12-1, Standard Post Trip Actions.

	RO	INITIATE Attachment 4, ADMINISTRATIVE ACTIONS.
	RO	ENSURE a PA System announcement was made regarding the Reactor trip.
	RO	OPERATE SBCS to maintain RCS T _{COLD} between 540°F and 550°F. <ul style="list-style-type: none"> (RNO) OPERATE ADVS to maintain RCS T_{COLD} between 540°F and 550°F.
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800S-2 (Q800S) CLOSED
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800N-2 (Q800N) CLOSED.
	RO	VERIFY all Non-1E 4kV Buses ENERGIZED. <ul style="list-style-type: none"> (RNO) TRANSFER Non-1E 4kV Buses to available Reserve Auxiliary Transformers.
	RO	VERIFY 480V Load Centers B15 and B16 ENERGIZED.

Operating Test :	NRC	Scenario #	2	Event #	7, 8, 9	Page	23	of	23
Event Description: 1E 4kV Bus 2A04 OC Trip, Two Full Length CEAs Fail to Insert on Rx Trip, Non-1E 4kV Bus 2A08 Fails to Auto Transfer on Rx Trip									
Time	Position	Applicant's Actions or Behavior							

	RO	ENSURE 3 rd Point Heater Drain Pumps STOPPED.
	RO	VERIFY RTO RESET. <ul style="list-style-type: none"> (RNO) IF a MFW pump in service THEN RESET RTO per SO23-9-6, Feedwater Control System Operation Examiner Note: RTO will not be reset until AFW valves are overridden and opened to raise SG levels to 40-80% NR due to the CIAS tripping both MFW pumps.
	RO	MAINTAIN one MFW Pump and a maximum of three Condensate Pumps in operation. <ul style="list-style-type: none"> (RNO) ENSURE S/G levels being maintained by AFW Pumps.
	RO	ENSURE FIC-3294, Condensate Pump miniflow controller set for proper Condensate pump configuration: <ul style="list-style-type: none"> One pump – 4500 GPM Two pumps – 6000 GPM Three pumps – 9000 GPM
	RO	PLACE Condensate Draw-off valve LV-3245 to DISABLE.
	RO	VERIFY SO23-12-2, REACTOR TRIP RECOVERY being implemented. <ul style="list-style-type: none"> (RNO) ENSURE S/G Blowdown valves HV-4054 and HV-4053 CLOSED. (RNO) GO TO step 16.
	RO	ENSURE the following valves closed: <ul style="list-style-type: none"> Extraction Steam Block valves HV-8800, HV-8812, HV-8804, HV-8810, HV-8808, HV-8820, HV-8806, and HV-8816. Main Steam to Reheater Block, Bypass, Warmup and Control valves HV-2703 or HV-2704, HV-2721, and HV-2751. Bled Steam to Reheaters Block Valve HV-2712A/B.
	RO	VERIFY Main Generator voltage less than 24kV.
	RO	VERIFY annunciators RESET: <ul style="list-style-type: none"> 99A26 TURBINE LUBE OIL TEMP HI 99A46 TURBINE BRG OIL DRAIN TEMP HI
	RO	INITIATE SO23-10-2, TURBINE SHUTDOWN, Attachment for Unloading the Generator and Removing the Unit from Line.
	RO	VERIFY BOTH Start-Up Range channels OPERABLE.

Facility:	SONGS 2 & 3	Scenario No.:	3	Op Test No.:	October 2012 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions: 100% Power MOC					
Turnover: Perform post-maintenance testing of CEA 21. Maintain steady state conditions.					
Critical Tasks:					
<ul style="list-style-type: none"> Emergency Borate the RCS following a failure of two full-length CEAs to insert on the Reactor trip per SO23-12-1, Standard Post Trip Actions. Within 10 minutes of loss of heat removal from S/G E088, the crew transfers the primary to secondary heat sink to S/G E089 by steaming S/G E089, maintaining Psat for the lowest RCS Tc, per SO23-12-11, FS-30, Establish Stable RCS Temperature During ESDE. Perform SI Throttle Stop prior to the Pressurizer going solid per SO23-12-11, FS-7, Verify SI Throttle Stop Criteria. Isolate S/G E-088 prior to exiting SO23-12-5, Excess Steam Demand Event. 					
Event No.	Malf. No.	Event Type*	Event Description		
1 (10 min)	SG05A	I (BOP, SRO) TS (SRO)	S/G E-088 Level Transmitter LT-1123-1 fails high		
2 (15 min)		N (RO)	Exercise CEA 21 for post-maintenance testing		
3 (30 min)	RD2103	I (RO, SRO) TS (SRO)	CEA 21 Drop ~ 75"		
4 (45 min)		R (RO, BOP, SRO)	Rapid Power Reduction to 90%		
5 (50 min)	TP02B TP08A	C (BOP)	TPCW Pump P-120 O/C, Standby Pump P-119 Fails to Auto Start		
6 (55 min)	FW04A	M (RO, BOP, SRO)	MFW Rupture in Containment (100% severity, 10 minute ramp)		
7 (60 min)	RD5902 RD2102	R (RO)	Two Full Length CEAs Fail to Fully Insert on Reactor Trip		
8 (65 min)	RP01P	C (RO)	AFW Pump P-141 Fails to Auto Start on EFAS		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

Actual	Target Quantitative Attributes
6	Total malfunctions (5-8)
2	Malfunctions after EOP entry (1-2)
3	Abnormal events (2-4)
1	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
4	Critical tasks (2-3)

Scenario Event Description NRC Scenario #3

SCENARIO SUMMARY NRC #3

The crew will take the watch at 100% Reactor power with a turnover item to exercise CEA #21 for post-maintenance testing.

Prior to exercising the CEA, S/G E-088 level transmitter LT-1123-1 will fail high. The crew will enter SO23-13-18, RPS Malfunctions, and identify the appropriate bistables to bypass for the failed transmitter. The BOP will also bypass the failed indicator in the DCS FWCS as a result of the failure. When the CRS identifies applicable Technical Specifications, the SM will prompt the CRS to exercise CEA 21.

The ATC will insert CEA 21 2 steps and attempt to withdraw the CEA 2 steps, however when the rod withdrawal switch is placed in the withdraw position, CEA 21 will drop to ~ 75". The crew will enter SO23-13-13, Misaligned CEA to mitigate the rod drop. Major recovery actions include reducing Turbine load to restore Tcold to the pre-drop value and commence a downpower to comply with Technical Specifications.

After the downpower has been commenced, the running TPCW pump will trip on overcurrent and the standby TPCW pump will fail to auto start. The BOP will take prompt and prudent action to start the standby TPCW pump manually.

When the standby TPCW pump has been started, a MFW rupture will occur inside Containment. The crew will identify the MFW rupture and manually trip the Reactor.

Upon the Reactor trip, two full-length CEAs will fail to insert, requiring an emergency boration. The emergency boration will be performed using a Boric Acid Makeup Pump.

EFAS will automatically actuate ~ 30 seconds after the trip and AFW Pump P-141 will fail to auto-start. A member of the crew will recognize this and manually start P-141.

Following SPTAs, the CRS will diagnose an Excess Steam Demand Event and transition to SO23-12-5, ESDE. The major recovery actions for the ESDE will be the performance of FS-30, Stabilization of RCS Temperature during an ESDE. SIAS will actuate due to high Containment pressure, however since there is no inventory loss from the RCS, SI throttle/stop will be performed by the ATC. Once RCS temperature has been stabilized, the CRS will direct the isolation of the affected S/G, at which point the scenario may be terminated.

Scenario Event Description NRC Scenario #3

Risk Significance:

- Failure of risk important system prior to trip: Slipped CEA
MFW Rupture
- Risk significant core damage sequence: MFW Rupture
Two full length CEAs fail to insert on Rx trip.
- Risk significant operator actions: Emergency boration following two full length CEAs failing to insert on Rx trip.

Stabilization of RCS temperature following loss heat sink on S/G E088.

Perform SI Throttle Stop actions to prevent the Pressurizer from going solid.

Isolate S/G E088 following transfer of primary to secondary heat sink to S/G E089.

Scenario Event Description
NRC Scenario #3

MACHINE OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC-230 and OPEN NRC Scenario #3 event file.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP	MALF	RP01P	AFW Pump P-141 Fails to Auto Start on EFAS	Fail to Start	
1	MALF	SG05A	SG E088 Level Transmitter LT-1123-1 Fails High	100	
	RF	RP51	PPS Door Open Annunciator	Open	
	RF	RP52H	Lo SG-2 Level Channel A Bypass	Bypass	
	RF	RP52J	Hi SG-2 Level Channel A Bypass	Bypass	
	RF	RP52V	Hi SG-2 DP EFAS-2 Channel A Bypass	Bypass	
	RF	RP51	PPS Door Open Annunciator	Close	
2	N/A	N/A	Post-maintenance Exercise of CEA 21		
3	MALF	RD2103	CEA 21 Drop	Drop	Rod withdrawl switch to the withdraw position
	MALF	RD2103	CEA 21 Drop (malfunction delete)	Normal	CEA 21 less than 100 inches
4	N/A	N/A	Rapid Downpower to 90%		
5	MALF	TP02B	TPCW Pump P-120 OC Trip	Fault	
	MALF	TP08A	TPCW Pump P-119 Fails to Auto Start	Fail to Start	
6	MALF	FW04A	MFW Rupture Inside Containment	Fault	
7	MALF	RD5802	CEA 58 Fails to Insert on Rx Trip	Stuck	
	MALF	RD2102	CEA 21 Fails to Insert on Rx Trip	Stuck	
8	Setup	Setup	AFW Pump P-141 Fails to Auto Start on EFAS	Fail to Start	

Scenario Event Description
NRC Scenario #3

Machine Operator:

- **RESTORE to IC-215**
- **OPEN 2012 NRC Scenario #3 event file**
- **RUN Setup File 1**
- **ENSURE Pressurizer Level and Pressure Selector Switches are selected to Channel Y**
- **ENSURE blend setpoints are 13.2 gpm for BA and 74.8 gpm for PMW**
- **ENSURE SO23-5-1.7 Attachment 9 MOC placard is posted**
- **ENSURE OP AID 005-23 on CR63 has BQ aligned to Unit 2, BS aligned to Unit 3**
- **ENSURE OP AID 005-11 on CR64 has E336 aligned to Unit 2, E335 aligned to Unit 3**
- **ENSURE OP AID 005-5 for Backpressure Control Valves has PV201B circled**
- **ENSURE OP AID 005-5 for Letdown Flow Control Valve has LV110A circled**
- **ENSURE alarms are active**

Control Room Annunciators in Alarm:

- **None**

Operating Test : <u> NRC </u> Scenario # <u> 3 </u> Event # <u> 1 </u> Page <u> 6 </u> of <u> 28 </u>		
Event Description: <u>SG E088 Level Transmitter LT-1123-1 Fails High</u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 1, S/G E-088 Level Transmitter Fails High		
Indications Available: <ul style="list-style-type: none"> 56A21 SG2 E088 Level Hi Channel Trip 56A31 SG2 E088 Level Hi Pretrip 52A13 FWCS Trouble 		
Examiner Note: The following steps are from SO23-13-18, RPS Malfunction		
	RO	DETERMINE failure by observing instrumentation for the affected channel AND alternate redundant indications monitoring the same plant parameters.
<p>NOTE</p> <p>For failures affecting RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip or ESFAS Actuation Logic, refer to Tech. Spec. LCO 3.3.4 and LCO 3.3.6.</p>		
	SRO	DETERMINE a Single PPS Channel has FAILED and GO TO Step 3.
<p>NOTE</p> <p>Failure of a measured variable channel may affect more than one Functional Unit (e.g., PZR Pressure Hi affects DNBR and LPD).</p>		
	SRO	REFER to Attachment 10 and determine Functional Unit(s) affected.
Examiner Note: Affected bistables are Channel A bistables 8, 10, and 22 and Channel A DEFAS-2.		
	SRO	PLACE the affected Functional Unit in BYPASS per SO23-3-2.12, Section for Bypass Operation of Trip Channels.
MO CUE: If requested to place Channel A bistables 8, 10, and 22, and Channel A DEFAS-2 in bypass, EXECUTE PPS Bypasses event.		
	SRO	CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.

Operating Test :	NRC	Scenario #	3	Event #	1	Page	7	of	28
Event Description: SG E088 Level Transmitter LT-1123-1 Fails High									
Time	Position	Applicant's Actions or Behavior							

	BOP	<p>CONFIRM failure does NOT affect the Feedwater Digital Control System.</p> <ul style="list-style-type: none">• (RNO) BYPASS the affected instrument for E-088 and/or E-089 per SO23-3-2.38, Section for Bypassing Selected Feedwater Control Signals:• Implement the requirements for a Reactivity Brief as Peer Check per OSM-14, Section for Reactivity Management.• From the applicable SG FW Control DCS, go to the SELECTED SIGNALS screen.• Verify the “D” channel signal is valid.• SELECT BYPASS for the instrument to be placed in bypass.• Verify the instrument indicates BYPASS.• Verify the “D” channel is not in BYPASS.• Verify the Selected Signal (SS) output looks valid.
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Operating Test :	NRC	Scenario #	3	Event #	1	Page	8	of	28
Event Description: SG E088 Level Transmitter LT-1123-1 Fails High									
Time	Position	Applicant's Actions or Behavior							

	SRO	<p>FOLLOW the action requirements of the applicable Tech. Spec./LCS listed in Attachment 10.</p> <ul style="list-style-type: none"> • LCO 3.3.1 • Condition A – One or more Functions with one automatic RPS trip channel inoperable. • Action A.1 – Place Channel in bypass or trip within 1 hour. • LCO 3.3.5 • Condition A – One or more Functions with one automatic ESFAS trip channel inoperable (other than RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function). • Action A.1 – Place Functional Unit in bypass or trip within 1 hour. <p>Examiner Note: When taking the action for LCO 3.3.1, the crew will bypass the SG Pressure Difference – High for the EFAS function which now puts the crew in LCO 3.3.5, Condition B (for which the action is immediately completed). Applicable LCO and Action below:</p> <ul style="list-style-type: none"> • LCO 3.3.5 • Condition B – One automatic trip channel inoperable for RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function. • Action B.1 – Place Functional Unit in bypass within 1 hour.
<p>Examiner Note: When affected bistables have been bypassed and Technical Specifications have been evaluated, or at Lead Evaluator's discretion, proceed to the next event.</p>		
<p>FLOOR CUE: If the crew does not perform the CEA exercise following the RPS failure, AND the Lead Evaluator is ready to proceed to the next event, REPORT as the Shift Manger and ask the CRS for the status of the CEA exercise.</p>		

Operating Test : <u>NRC</u> Scenario # <u>3</u> Event # <u>2, 3, 4</u> Page <u>9</u> of <u>28</u>		
Event Description: Exercise CEA 21 for Post Maintenance Testing, CEA 21 drops ~ 50" into the core, Rapid Power Reduction		
Time	Position	Applicant's Actions or Behavior

Examiner Note: The following steps are from SO23-3-2.19, CEDMCS Operation (for CEA 21 post-maintenance test).

GUIDELINE

All CEA manipulations shall be Peer-Checked by a Licensed Operator. (Ref. OSM-14)
 Since CEA positioning may require multiple interim positions, placekeeping is not required for the actual CEA repositioning steps. Section 6.12 may be used for repetitive positioning.

	RO	POSITION Group Select Switch to the group containing the CEA to be moved.
	RO	POSITION the Individual CEA Selection Switch to the CEA to be moved.
	RO	VERIFY the individual CEA light is ILLUMINATED.
	RO	POSITION Mode Select Switch to MI.
	RO	VERIFY the group indicator lamps are ILLUMINATED for the group selected.
	RO	WITHDRAW or INSERT CEA.
Examiner Note: The following steps are from SO23-13-13, Misaligned CEA.		
	SRO	VERIFY Special Test Exception 3.1.12 (Low Power Physics Testing) is NOT invoked.
	RO	VERIFY NOT more than one CEA is misaligned > 7 inches.
	RO	ENSURE CEDMCS Mode Select Switch positioned to OFF.
	RO	VERIFY CEA misaligned.

Operating Test :	NRC	Scenario #	3	Event #	2, 3, 4	Page	10	of	28
Event Description: Exercise CEA 21 for Post Maintenance Testing, CEA 21 drops ~ 50" into the core, Rapid Power Reduction									
Time	Position	Applicant's Actions or Behavior							

	BOP	<p>REDUCE Turbine load to RESTORE RCS Cold Leg temperature to approximately the pre-drop value per SO23-5-1.7, Turbine Load Change Using Speed/Load Adjustment.</p> <ul style="list-style-type: none"> Implement the requirements for a Reactivity Brief and Peer Check per OSM-14, Operations Department Expectations, Section for Reactivity Management. INITIATE monitoring $T_{COLD AVG}$ using PCS. ADJUST Turbine load to maintain T_{cold} per Attachment 15 by one or both of the following methods: <ul style="list-style-type: none"> Coarse Adjustment – Use HS-2210, Main Turbine Speed/Load Control, RAISE or LOWER pushbuttons. Fine Adjustment – ACTIVATE the DCS Speed/Load Pushbuttons Box and ENSURE the Rate is set at an acceptable MW/MIN value. <ul style="list-style-type: none"> SELECT MODIFY. Use the UP or DOWN buttons or the +0.5 or -0.5 buttons. VERIFY Turbine load stabilizes at the target value.
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GUIDELINE

Since the misaligned CEA will affect Excore RX power, stabilized RX power must be determined from a source **other than** Excore power. Preferred sources are Delta-T power (CV-9739) during transient conditions and Secondary Calibrated Power (CV-9005) after stabilization.

	SRO	VERIFY the Reactor is critical and RECORD initial and stabilized Reactor power levels in the NCO Log.
	SRO	Within 15 minutes, INITIATE monitoring DNBR and LPD per SO23-3-3.6, Attachment for DNBR Margin/Linear Heat Rate Limit Monitoring.
	SRO	INITIATE Attachment 3, Misaligned CEA Checklist.
	SRO	VERIFY Reactor power is > 50%.
	SRO	Within 15 minutes of discovery, INITIATE Reactor power reduction in accordance with region of Acceptable Operation of selected graph from Attachment 4. Use Table below to aid in graph selection.

Operating Test : <u>NRC</u> Scenario # <u>3</u> Event # <u>2, 3, 4</u> Page <u>11</u> of <u>28</u>		
Event Description: <u>Exercise CEA 21 for Post Maintenance Testing, CEA 21 drops ~ 50" into the core, Rapid Power Reduction</u>		
Time	Position	Applicant's Actions or Behavior

✓	TYPE OF CEA	REQUIRED POWER REDUCTION FIGURE	GRAPH LOCATION
	Non-group 6 Full Length	Figure 3.1.105-1	Attachment 4, Page 1 of 4
	Group 6 Full Length	Figure 3.1.105-2	Attachment 4, Page 2 of 4
	Part Length Initially ≥ 112.5 Inches Withdrawn	None	Attachment 4, Page 3 of 4
	Part Length Initially < 112.5 Inches Withdrawn	Figure 3.1.105-4	Attachment 4, Page 4 of 4

Examiner Note: CEA 21 is a Group 6 Full Length CEA, which requires a 5% power reduction in the first hour and a total of 10% power reduction within 2 hours.

Examiner Note: Technical Specifications for Slipped CEA:

- LCO 3.1.5
- Condition A – One Regulating CEA trippable and misaligned from its group by > 7 inches.
- Action A.1 – Initiate THERMAL POWER reduction in accordance with COLR requirements within 15 minutes.
- Action A.2 – Restore the misaligned CEA(s) to within 7 inches of its group within two (2) hours.

- LCO 3.2.1
- Condition B – With COLSS not in service and any OPERABLE CPC local power density channel exceeding the LHR limit.
- Action B.1 – Initiate SR 3.2.1.2 within 15 minutes.
- Action B.2 – Restore LHR to within limits within 4 hours.

- LCO 3.2.4
- Condition B – With COLSS not in service and DNBR outside the COLR specified limits using any OPERABLE channel.
- Action B.1 – Initiate SR 3.2.4.1 within 15 minutes.
- Action B.2 – Restore DNBR to within limits within 4 hours.

	BOP	COMMENCE LOWERING Turbine Generator load while maintaining Tcold per SO23-5-1.7, Guidelines for Changing Turbine Load and Reactor Power.
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Operating Test :	NRC	Scenario #	3	Event #	2, 3, 4	Page	12	of	28
Event Description: Exercise CEA 21 for Post Maintenance Testing, CEA 21 drops ~ 50" into the core, Rapid Power Reduction									
Time	Position	Applicant's Actions or Behavior							

GUIDELINES

- 1) If a Group 6 CEA has dropped, then a Group 6 insertion for the power reduction cannot be performed due to the lower electrical interlock in the CEDMCS. For this condition at EOC, a combination of boration and temperature control may be required, as directed by the Shift Manager.
- 2) The power reduction due to the negative reactivity caused by the misaligned CEA is considered part of the required power reduction.

Examiner Note: The following steps are from SO23-13-28, Rapid Power Reduction.

	SRO	INITIATE notifying the GOC.
	SRO	If taking the Unit Offline or to target power plateau < 750 MWe (≈65% Rx Power), then INITIATE an immediate MSR Cooldown per SO23-10-2, Attachment for MSR Cooldown for Load Reduction/Turbine Shutdown.

GUIDELINES

1. If RCS Boron is < 110 ppm, then the optimal approach is to use CEAs and MTC with little or no boration. A 5% power reduction credit can be taken for MTC, because the temperature increase adds considerable negative reactivity due to the large negative MTC at the EOC along with Xenon building in. Expect average Tcold to be initially high outside the control band. (LS-1.1, LS-1.4)
2. At EOC, existing conditions may necessitate slowing power change rate when between 80% and 70% power.

	SRO	INITIATE monitoring CV-9739, COLSS Raw Delta-T Power.
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Operating Test :	NRC	Scenario #	3	Event #	2, 3, 4	Page	13	of	28
Event Description: Exercise CEA 21 for Post Maintenance Testing, CEA 21 drops ~ 50" into the core, Rapid Power Reduction									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>INITIATE Forcing PZR spray flow using two valves per SO23-3-1.10:</p> <ul style="list-style-type: none"> • ENSURE a Reactivity Brief has been conducted for this activity per SO123-0-A1, Section for Reactivity. • COMMENCE monitoring RCS pressure. • VERIFY RCS pressure > 1500 psia. • PLACE both PZR Spray Valve Controllers in AUTO. • POSITION all Non-1E Backup Heaters to ON. • LOWER PIC-0100, PZR Pressure Controller, setpoint as required to maintain RCS pressure as directed by the CRS (set setpoint to ~ 2225 psia).
	RO	<p>BORATE to the Charging Pump Suction per SO23-3-2.2:</p> <ul style="list-style-type: none"> • Implement the requirements for a Reactivity Brief and Peer check per OSM-14, Operations Department Expectations, Section for Reactivity Management. • ENSURE ENTERED required boration flowrate on FIC-0210Y, BAMU Flow Controller. • If flowrate change, then SELECT SET. • ENSURE FIC-0210Y in AUTO. • SET FQIS-0210Y, Boration Counter, to the desired volume as follows: <ul style="list-style-type: none"> • SELECT MODIFY. • ENTER gallons in PRESET. • SELECT SET PRESET. • SELECT EXIT. • SELETE the BAMU Pump associated with the BAMU Tank used. • VERIFY CLOSED FV-9253, Blended Makeup to VCT Isolation. • ENSURE HV-9257, BAMU to Charging Pump Suction Block Valve, in AUTO. • COMMENCE monitoring plant parameters. • From the MODE SELECTOR: <ul style="list-style-type: none"> • SELECT MODIFY. • SELECT BORATE. • SELECT GO.

Operating Test : <u>NRC</u>		Scenario # <u>3</u>	Event # <u>2, 3, 4</u>	Page <u>14</u> of <u>28</u>
Event Description: <u>Exercise CEA 21 for Post Maintenance Testing, CEA 21 drops ~ 50" into the core, Rapid Power Reduction</u>				
Time	Position	Applicant's Actions or Behavior		
	RO	<p>INSERT CEAs for ASI Control per SO23-3-2.19, to the target level within the following guidance:</p> <ul style="list-style-type: none"> • INSERT PLCEAs (Insertion Limit is 112.5. Insertion should be limited to ~115 inches or until Power reaches target plateau.) • INSERT Group 6 to target level. [90" if RCS Boron is < 110 ppm.] (The maximum recommended is 75 inches.) • POSITION Group Select switch to the CEA group to be moved. • POSITION Mode Select Switch to the appropriate mode. • VERIFY the group indicator lamps are ILLUMINATED for the group selected. • POSITION CEA(s) as directed by SRO Ops. Supv. • When CEA positioning has completed, then POSITION the Mode Select Switch to OFF. 		
	BOP	<p>INITIATE SO23-5-1.7, Section for Turbine Load Change using Setpoint Adjustment:</p> <ul style="list-style-type: none"> • Implement the requirements for a Reactivity Brief and Peer Check per OSM-14, Operations Department Expectations, Section for Reactivity Management. • INITIATE monitoring TCOLD AVG using PCS. • PLACE the 1st STAGE PRESSURE feedback loop in service. • ACTIVATE the Turbine DCS Setpoints Box and SELECT MODIFY. • SET the Demand to the target MW value and SELECT ENTER. • Set the Rate to the target MW/MIN value and SELECT ENTER. • INITIATE Turbine load change, SELECT P2. • Control RCS Tcold within the operating band by adjusting the rate setpoint or by canceling and reinitiating the load change as necessary. • VERIFY Turbine load stabilizes at the target value. • REMOVE 1st STAGE PRESSURE feedback loop from service. • RESTORE the Rate to 100 MW/MIN and SELECT ENTER. 		
	SRO	INITIATE SO23-5-1.7, Attachment for Power Descension.		
	SRO	If Reactor power changed > 15% in one hour, then NOTIFY Chemistry and LOG the notification.		
	SRO	NOTIFY Reactor Engineering and log the notification.		

Operating Test : <u> NRC </u> Scenario # <u> 3 </u> Event # <u> 2, 3, 4 </u> Page <u> 15 </u> of <u> 28 </u>		
Event Description: Exercise CEA 21 for Post Maintenance Testing, CEA 21 drops ~ 50" into the core, Rapid Power Reduction		
Time	Position	Applicant's Actions or Behavior

	ALL	Maintain Turbine load, RCS Temperature, and ASI within the expected operating bands per SO23-5-1.7.
Examiner Note: When Reactor Power has been lowered 3-5%, or at Lead Evaluator's discretion, proceed to Event 5, TPCW Pump OC Trip, Standby TPCW Pump Fails to Auto Start.		

Operating Test : <u> NRC </u> Scenario # <u> 3 </u> Event # <u> 5 </u> Page <u> 16 </u> of <u> 28 </u>		
Event Description: TPCW Pump OC Trip, Standby TPCW Fails to Auto Start		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, EXECUTE Event 5, TPCW Pump OC Trip, Standby TPCW Pump Fails to Auto Start.		
Indications Available: <ul style="list-style-type: none"> 99A31 TPCW Pump OC 99A12 TPCW Press Lo-Lo 		
Examiner Note: The following steps are from Alarm Response Procedure 99A31, TPCW Pump OC.		
	BOP	ENSURE Standby TPCW Pump Has Auto started.
Examiner Note: The standby TPCW Pump may be started prior to referring to the ARP per OSM-14, Operations Department Expectations, Prompt and Prudent Actions.		
	BOP	If a TPCW Pump Supply Breaker has Tripped, then initiate SO23-6-9, Section for 4 kV Feeder Circuit Relay.
Examiner Note: When the standby TPCW Pump has been started, or at Lead Evaluator's discretion, proceed to Event 6, MFW Rupture Inside Containment.		

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	17	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, INITIATE Event 6, MFW Rupture Inside Containment.

Indication Available:

- 60A02 Containment Humidity Hi
- 57C43 RCS Leakage Abnormal
- 56A56 Containment Sump Level Hi

Examiner Note: The crew should recognize a non-radioactive HELB inside Containment and trip the Reactor. The following steps are from SO23-12-1, Standard Post Trip Actions.

	RO	VERIFY Reactor Trip Circuit Breakers (8) OPEN.
	RO	VERIFY Reactor power – LOWERING AND Startup rate NEGATIVE.
	RO	VERIFY maximum of one full length CEA NOT fully inserted. <ul style="list-style-type: none"> • (RNO) INITIATE Emergency Boration. <ul style="list-style-type: none"> • VERIFY Refueling NOT in progress. • VERIFY at least one Charging Pump is available. • DEPRESS OPEN on 2HV-9247, Emergency Boration Block Valve and verify valve is open AND DEPRESS START for either BAMU Pump and verify pump is running. • CLOSE 2HV-9236, BAMU Pump 2MP-174 Recirculation Valve. • CLOSE 2HV-9231, BAMU Pump 2MP-175 Recirculation Valve. • CLOSE 2FV-9253, Blended Makeup to VCT Isolation, in MANUAL. • ENSURE charging flow > 40 gpm. • START additional Charging Pumps as necessary to increase flow rate. • VERIFY Boric Acid delivery to RCS by monitoring BAMU Tank level lowering. • (RNO) Record time of Emergency Boration initiation _____.

Critical Task: Emergency Borate the RCS following Reactor Trip following the failure of two full-length CEAs to insert on Reactor trip per SO23-12-1, Standard Post Trip Actions.

CCT Time: _____

Examiner Note: Emergency boration may be stopped when power is <10⁻⁴% power and power decreasing or stable.

	BOP	ALL HP and LP Stop and Governor valves CLOSED.
	BOP	VERIFY BOTH Unit Output Breakers OPEN.
	BOP	VERIFY Main Turbine speed less than 2000 RPM OR lowering.

Operating Test : <u> NRC </u> Scenario # <u> 3 </u> Event # <u> 6, 7, 8 </u> Page <u> 18 </u> of <u> 28 </u>		
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS		
Time	Position	Applicant's Actions or Behavior

Examiner Note: The crew should identify AFW Pump P-141 failed to start on EFAS and manually start P-141.		
	SRO	INITIATE Attachment 1, WORKSHEET.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	19	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: The crew will request to pull forward FS-30 during SPTAs. The BOP will perform this procedure and the RO will perform the BOP's SPTA verifications. The following steps are from SO23-12-11, FS-30, Stabilize RCS Temperature During ESDE:

NOTE

WHEN excess steam demand remains NOT isolated and all RCPs are stopped, **THEN** RCS T_{COLD} in loop with least affected S/G may be higher than REP CET temperature

VERIFY S/G least affected by ESDE NOT isolated for SGTR,

CAUTION

Failure to establish steaming flow path on least affected S/G before most affected S/G loses effective heat removal capabilities will result in rapid re-pressurization (PTS consideration).

- VERIFY most affected S/G level less than 50% WR.
- On the least affected S/G:
 - POSITION ADV controller to match existing S/G pressure.
 - ENSURE OVERRIDE pushbutton DEPRESSED.
 - ENSURE OPEN/MODULATE pushbutton DEPRESSED.
 - MAINTAIN least affected S/G pressure approximately 200 psia above most affected S/G pressure.
- VERIFY S/G dryout on most affected S/G:
 - RCS T_{cold} stable or rising.
 - OR
 - S/G pressure less than 200 psia.

NOTE

When MSIS is actuated, unstable S/G pressures can cause cycling of AFW flow due to differential steam pressure between the two S/Gs.

- STABILIZE least affected S/G pressure:
 - VERIFY ADV in AUTO/MODULATE.
 - MAINTAIN P_{sat} for lowest RCS T_{cold}.
 - STABILIZE AFW flow.
- VERIFY RCS pressure is to the right of the Appendix E curve on Attachment 30, Post-Accident Pressure / Temperature Limits.
- OPERATE feedwater on least affected S/G to maintain level between 40 and 80% NR.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	20	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

Critical Task: Within 10 minutes of loss of heat removal from S/G E088, the crew transfers the primary to secondary heat sink to S/G E089 by steaming S/G E089, maintaining Psat for the lowest RCS Tc, per SO23-12-11, FS-30, Establish Stable RCS Temperature During ESDE.

CCT Time: _____

Examiner Note: The following steps are the continuation of SO23-12-1, Standard Post Trip Actions.

CAUTION

DO NOT OPERATE TRIP pushbuttons for tripped breakers. Operation of TRIP pushbuttons will reset overcurrent protection allowing Diesel Generator output breaker to close to a fault.

	BOP	VERIFY BOTH 1E 4kV Buses ENERGIZED.
	BOP	VERIFY all 1E 480V buses ENERGIZED.
	BOP	VERIFY all Class 1E DC Buses ENERGIZED.
	BOP	VERIFY all Non-1E 4kV Buses ENERGIZED.
	BOP	VERIFY one CCW Train OPERATING AND aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger.
	RO	VERIFY PZR level between 10% and 70% AND trending to between 30% and 60%.
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F.
	RO	VERIFY PZR pressure between 1740 PSIA and 2380 PSIA AND trending to between 2025 PSIA and 2275 PSIA.
	RO	VERIFY at least one RCP OPERATING.
	RO	VERIFY core loop ΔT ($T_{HOT} - T_{COLD}$) less than 10°F.
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F.
	BOP	VERIFY at least one S/G level between 21% NR and 80% NR AND Feedwater – AVAILABLE.
	BOP	VERIFY RCS T _{COLD} between 540°F and 550°F.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	21	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

	BOP	<p>VERIFY S/G pressures between 960 PSIA and 1050 PSIA.</p> <ul style="list-style-type: none"> • (RNO) IF S/G pressure less than 740 PSIA THEN ENSURE MSIS ACTUATED AND GO TO step 9. • (RNO) IF S/G pressure less than 960 PSIA THEN ENSURE Main Steam to Reheaters valves CLOSED. IF Main Steam to Reheaters CANNOT be verified isolated, AND RCS T_{COLB} uncontrolled, THEN CLOSE MSIVs AND OPERATE ADVs to maintain S/G pressure between 960 PSIA and 1050 PSIA. • (RNO) IF S/G pressure greater than 1050 PSIA THEN OPERATE SBCS to maintain S/G pressure between 960 PSIA and 1050 PSIA OR OPERATE ADVs to maintain S/G pressure between 960 PSIA and 1050 PSIA.
	RO	<p>VERIFY Containment pressure less than 1.5 PSIG.</p> <ul style="list-style-type: none"> • (RNO) IF Containment pressure greater than 3.4 PSIG, THEN: <ul style="list-style-type: none"> • ENSURE the following – ACTUATED: <ul style="list-style-type: none"> • SIAS • CIAS • CCAS • CRIS • ENSURE all RCPs STOPPED.
	RO	VERIFY Containment Area Radiation Monitors NOT alarming or trending to alarm.
	RO	VERIFY Secondary Plant Radiation Monitors NOT alarming or trending to alarm.
	RO	VERIFY Containment average temperature less than 120°F.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	22	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>VERIFY Containment pressure less than 1.5 PSIG.</p> <ul style="list-style-type: none"> ENSURE proper functioning of Normal Containment Cooling. ENSURE at least one Containment Dome Air Circulator OPERATING. IF Containment pressure greater than 3.4 PSIG, THEN: <ul style="list-style-type: none"> ENSURE the following ACTUATED: <ul style="list-style-type: none"> SIAS CIAS CCAS CRIS ENSURE all RCPs – STOPPED. ENSURE all available Containment Emergency Cooling Units OPERATING. IF Containment pressure greater than 14 PSIG, THEN: <ul style="list-style-type: none"> ENSURE CSAS – ACTUATED. ENSURE all available Containment Spray Header flows greater than 1600 GPM.
	RO	<p>VERIFY all safety function criteria per Attachment 1, WORKSHEET RECOVERED.</p> <ul style="list-style-type: none"> (RNO) COMPLETE Attachment 2, RECOVERY DIAGNOSTICS.
Examiner Note: The CRS should diagnose a single event, Excess Steam Demand Event (MFW Rupture), and identify SO23-12-5, Excess Steam Demand Event, as the optimal EOI.		
	SRO	<p>VERIFY REACTOR TRIP RECOVERY DIAGNOSED.</p> <p>(RNO) ENSURE at least one RCP in each loop stopped.</p>
		INITIATE steps 12 through 17.
Examiner Note: Steps 12 through 17 of SO23-12-1, Standard Post Trip Actions, are located at the end of the scenario guide.		
	SRO	IMPLEMENT EOI diagnosed.
Examiner Note: The following steps are from SO23-12-5, Excess Steam Demand Event.		
	SRO	RECORD time of EOI entry _____.
	SRO	INITIATE SO23-12-10, SAFETY FUNCTION STATUS CHECKS.

Operating Test : NRC Scenario # 3 Event # 6, 7, 8 Page 23 of 28
 Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>INITIATE FOLDOUT PAGE:</p> <ul style="list-style-type: none"> • IF SIAS has actuated, THEN INITIATE FS-7, VERIFY SI Throttle/Stop Criteria. • IF all RCPs are stopped, THEN INITIATE FS-3, MONITOR Natural Circulation Established. • IF SIAS has initiated, THEN INITIATE SO23-12-11, Attachment 22, NON-QUALIFIED LOAD RESTORATION. • IF any S/G steaming rate – NOT operator controlled, THEN INITIATE FS-30, ESTABLISH Stable RCS Temperature during ESDE.
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Examiner Note: The following steps are from FS-7, Verify SI Throttle/Stop Criteria.

	RO	<ul style="list-style-type: none"> • VERIFY at least one S/G operating: <ul style="list-style-type: none"> • SBCS or ADV available AND feedwater available. • VERIFY PZR level greater than 30% and NOT lowering. • VERIFY Core Exit Saturation Margin greater than or equal to 20°F. • VERIFY Reactor Vessel level greater than or equal to 100% in the plenum. • RCS Cooldown NOT in progress. • VERIFY SI Pumps NOT operating to meet Reactivity Control RC-3 Success Path. • THROTTLE OR STOP SI Pumps as required, one train at a time. • VERIFY Charging Pumps NOT operating to meet Reactivity Control RC-2 Success Path. • VERIFY PZR Level less than 80%. • STOP Charging Pumps as required one at a time. <p>Examiner Note: OSM-9, Standard EOI Good Practices and Strategies, provides direction for SI Throttle/Stop during an ESDE as follows, "If a SINGLE event ESDE with two trains HPSI running, then stop HPSI Pump on one train, and close the valves on the other train."</p>
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Critical Task: Perform SI Throttle Stop prior to the Pressurizer going solid per SO23-12-11, FS-7, Verify SI Throttle Stop Criteria.

CCT Time: _____

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	24	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: The following steps are from FS-3, Monitor Natural Circulation Established.

NOTE

Low flow during Natural Circulation slows RCS response to temperature changes. Loop transit time rises to between 5 minutes and 10 minutes.

	RO	<ul style="list-style-type: none"> • VERIFY at least one S/G is operating: <ul style="list-style-type: none"> • SBSCS or ADV available AND feedwater available. • VERIFY all RCPs are stopped. <ul style="list-style-type: none"> ○ VERIFY operating loop ΔT less than 58°F. ○ VERIFY Thot and Tcold NOT rising. ○ VERIFY Core Exit Saturation Margin greater than or equal to 20°F. ○ VERIFY operating loop Thot and REP CET within 16°F. ○ VERIFY Reactor Vessel level greater than or equal to 100% in the plenum. <p>Examiner Note: If any steps marked with a ° are not satisfied:</p> <ul style="list-style-type: none"> • MAXIMIZE available S/G level less than 80% NR. • RAISE available S/G steaming rate. • RAISE Core Exit Saturation Margin greater than or equal to 20°F.
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Examiner Note: The following steps are the Control Room actions from SO23-12-11, Attachment 22, Restoration of Non-Qualified Loads.

	RO	<ul style="list-style-type: none"> • OBTAIN approval of Shift Manager to restore non-qualified loads required for plant operations. • VERIFY TELECOM 480VAC FDR BKR HS-0800S-2 closed. • VERIFY TELECOM 480VAC FDR BKR HS-0800N-2 closed. • ENSURE HS-1738-1, Non-1E UPS Normal Feeder, is placed in OVERRIDE/CLOSED on panel CR63.
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Examiner Note: The following steps are the continuation of SO23-12-5, Excess Steam Demand Event.

	SRO	VERIFY ESDE diagnosis using Figure 1, BREAK IDENTIFICATION CHART.
	SRO	INITIATE sampling of both Steam Generators for radioactivity and boron.
	SRO	NOTIFY Shift Manager/Operations Leader of SO23-12-5, EXCESS STEAM DEMAND EVENT, initiation.
	SRO	ENSURE Emergency Plan is initiated.
	SRO	IMPLEMENT PLACEKEEPER.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	25	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

	SRO	IMPLEMENT TIME DEPENDENT STEPS.
	SRO	VERIFY SIAS actuation required: <ul style="list-style-type: none"> PZR pressure less than SIAS setpoint. OR <ul style="list-style-type: none"> Containment pressure greater than 3.4 PSIG.
	SRO	ENSURE the following actuated: <ul style="list-style-type: none"> SIAS CCAS CRIS
	SRO	RECORD time of SIAS _____.
	RO	STOP unloaded Diesel Generators.
	RO	INITIATE SO23-12-11, Attachment 22, NON-QUALIFIED LOAD RESTORATION.
	SRO	VERIFY MSIS actuation required: <ul style="list-style-type: none"> S/G pressure less than 740 PSIA.
	SRO	ENSURE MSIS actuated.
	SRO	VERIFY CIAS actuation required: <ul style="list-style-type: none"> Containment pressure greater than 3.4 PSIG.
	SRO	ENSURE CIAS actuated.
	SRO	VERIFY SIAS actuated.
	SRO	ESTABLISH two train operation: <ul style="list-style-type: none"> All available Charging Pumps operating. One HPSI and one LPSI per train operating. All Cold Leg flow paths aligned. VERIFY SI flow required: <ul style="list-style-type: none"> SI flow indicated OR <ul style="list-style-type: none"> RCS pressure greater than 1250 PSIA. OR <ul style="list-style-type: none"> VERIFY FS-7, VERIFY SI Throttle/Stop Criteria satisfied.
	SRO	ENSURE MSIVs closed: <ul style="list-style-type: none"> E-088 - HV-8205 E-089 - HV-8204

Operating Test : NRC Scenario # 3 Event # 6, 7, 8 Page 26 of 28
 Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS

Time	Position	Applicant's Actions or Behavior
	SRO	ENSURE MSIV bypasses closed: <ul style="list-style-type: none"> E-088 - HV-8203 E-089 - HV-8202
<div style="border: 1px solid black; padding: 10px; text-align: center;"> NOTE WHEN excess steam demand remains NOT isolated and all RCPs are stopped, THEN RCS T_{COLD} in loop with <i>least affected</i> S/G may be higher than REP CET temperature. </div>		
<div style="border: 1px solid black; padding: 10px; text-align: center;"> CAUTION Failure to establish steaming flow path on least affected S/G before most affected S/G loses effective heat removal capabilities will result in rapid re-pressurization (PTS consideration). </div>		
	SRO	INITIATE FS-30, ESTABLISH Stable RCS Temperature during ESDE.
	SRO	IF SIAS actuated THEN INITIATE FS-7, VERIFY SI Throttle/Stop Criteria.
<div style="border: 1px solid black; padding: 10px; text-align: center;"> NOTE Continued forced circulation improves operator control of RCS Safety Functions. At least one RCP operating in each loop is preferred for this event. </div>		
	SRO	VERIFY RCP NPSH requirements of SO23-12-11, Attachment 30, POST-ACCIDENT PRESSURE / TEMPERATURE LIMITS satisfied.
	SRO	VERIFY excess steam demand isolated: <ul style="list-style-type: none"> VERIFY BOTH S/Gs levels greater than 10% WR. Both S/G pressures stable or rising AND RCS T_{COLD} in each loop stable or rising. <ul style="list-style-type: none"> (RNO) GO TO Step c.
<div style="border: 1px solid black; padding: 10px; text-align: center;"> NOTE IF a most affected S/G CANNOT be defined, THEN either or both S/Gs may be defined as least affected. </div>		
	SRO	IDENTIFY most affected S/G.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	27	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

NOTE

IF the electric AFW Pump associated with the *most affected* S/G is x-tied to supply the *least affected* S/G, THEN it should NOT be secured.

	BOP	<p>ISOLATE affected S/G:</p> <ul style="list-style-type: none"> CLOSE/STOP the following components for most affected S/G (E-089): <ul style="list-style-type: none"> MSIV HV-8204 MSIV Bypass HV-8202 ADV HV-8421 MFIV HV-4052 AFW valves HV-4731 and HV-4715 Steam to AFW P-140 HV-8200 S/G Blowdown Isolation HV-4053 S/G Water Sample Isolation HV-4057 Electric AFW Pump P-141 ENSURE ADV on most affected S/G selected to MANUAL.
<p>Critical Task: Isolate S/G E-089 prior to exiting SO23-12-5, Excess Steam Demand Event.</p> <p>CCT Time: _____</p> <p>Scenario Termination: When RCS Temperature has been stabilized, SI Throttle Stop has been performed, and S/G E-089 has been isolated, or at Lead Evaluator's discretion, the scenario may be terminated.</p>		
<p>Examiner Note: The following are steps 12-17 of SO23-12-1, Standard Post Trip Actions.</p>		
	RO	INITIATE Attachment 4, ADMINISTRATIVE ACTIONS.
	RO	ENSURE a PA System announcement was made regarding the Reactor trip.
	RO	<p>OPERATE SBCS to maintain RCS T_{COLD} between 540°F and 550°F.</p> <ul style="list-style-type: none"> (RNO) OPERATE ADVS to maintain RCS T_{COLD} between 540°F and 550°F.
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800S-2 (Q800S) CLOSED
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800N-2 (Q800N) CLOSED.
	RO	VERIFY all Non-1E 4kV Buses ENERGIZED.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	28	of	28
Event Description: MFW Rupture Inside Containment, Two Full Length CEAs Fail to Insert on Reactor Trip, AFW Pump P-141 Fails to Auto Start on EFAS									
Time	Position	Applicant's Actions or Behavior							

	RO	VERIFY 480V Load Centers B15 and B16 ENERGIZED.
	RO	ENSURE 3rd Point Heater Drain Pumps STOPPED.
	RO	VERIFY RTO RESET. <ul style="list-style-type: none"> (RNO) IF a MFW pump in service THEN RESET RTO per SO23-9-6, Feedwater Control System Operation Examiner Note: RTO will not be reset due to the loss of all feedwater.
	RO	MAINTAIN one MFW Pump and a maximum of three Condensate Pumps in operation. <ul style="list-style-type: none"> (RNO) ENSURE S/G levels being maintained by AFW Pumps.
	RO	ENSURE FIC-3294, Condensate Pump miniflow controller set for proper Condensate pump configuration: <ul style="list-style-type: none"> One pump – 4500 GPM Two pumps – 6000 GPM Three pumps – 9000 GPM
	RO	PLACE Condensate Draw-off valve LV-3245 to DISABLE.
	RO	VERIFY SO23-12-2, REACTOR TRIP RECOVERY being implemented. <ul style="list-style-type: none"> (RNO) ENSURE S/G Blowdown valves HV-4054 and HV-4053 CLOSED. (RNO) GO TO step 16.
	RO	ENSURE the following valves closed: <ul style="list-style-type: none"> Extraction Steam Block valves HV-8800, HV-8812, HV-8804, HV-8810, HV-8808, HV-8820, HV-8806, and HV-8816. Main Steam to Reheater Block, Bypass, Warmup and Control valves HV-2703 or HV-2704, HV-2721, and HV-2751. Bled Steam to Reheaters Block Valve HV-2712A/B.
	RO	VERIFY Main Generator voltage less than 24kV.
	RO	VERIFY annunciators RESET: <ul style="list-style-type: none"> 99A26 TURBINE LUBE OIL TEMP HI 99A46 TURBINE BRG OIL DRAIN TEMP HI
	RO	INITIATE SO23-10-2, TURBINE SHUTDOWN, Attachment for Unloading the Generator and Removing the Unit from Line.
	RO	VERIFY BOTH Start-Up Range channels OPERABLE.

Facility:	SONGS 2 & 3	Scenario No.:	4	Op Test No.:	October 2012 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions: 100% Power MOC, AFW Pump P-141 OOS.					
Turnover: Maintain steady state conditions.					
Critical Tasks: <ul style="list-style-type: none"> Transfer the CCW Non-Critical Loop prior to exceeding an RCP operating temperature limits following a loss of Train A SWC Pump P-112. Restore Feedwater to at least one S/G prior to a complete loss of secondary inventory per SO23-12-6, Loss of Feedwater. 					

Event No.	Malf. No.	Event Type*	Event Description
1 (5 min)	SC01A	C (BOP, SRO) TS (SRO)	Train A Saltwater Cooling Pump P-112 Shaft Seizure
2 (15 min)	RC15B	I (RO, SRO)	Pressurizer Pressure Transmitter PT-0100Y Fails High
3 (25 min)	ED07B	C (RO, BOP, SRO) TS (SRO)	Loss of Vital Bus Y02
4 (45 min)	SWC LP	C (BOP, SRO)	Stator Water Cooling Pump P-291 OC Trip, P-290 Fails to Auto Start
5 (50 min)	SEIS LP	C (RO, BOP, SRO)	Earthquake / MFBV HV-4051 Closes
6 (55 min)	FW23	C (BOP)	Loss of Condenser Vacuum on Rx Trip
7 (58 min)	FW02B	C (BOP, SRO)	AFW Pump P-504 Shaft Seizure (+ 3 min)
8 (61 min)	FW25	M (RO, BOP, SRO)	AFW Pump P-140 Overspeed Trip (+ 6 min)
9 (70 min)	ELEC LP	C (RO)	RCP P-003 Breaker Fails to Open

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

Actual	Target Quantitative Attributes
9	Total malfunctions (5-8)
3	Malfunctions after EOP entry (1-2)
3	Abnormal events (2-4)
1	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
2	Critical tasks (2-3)

SCENARIO SUMMARY NRC #4

The crew will take the watch with the Reactor operating at 100% power and AFW Pump P-141 OOS.

The running Saltwater Cooling Pump, P-112, will experience a shaft seizure. Approximately 1 minute later, the pump will trip on overcurrent. The crew will enter SO23-13-7, Loss of CCW/SWC, and transfer CCW and SWC to Train B. The crew will also transfer the Letdown Heat Exchanger and Non-Critical Loop from Train A to Train B. The CRS will evaluate Technical Specifications for the loss of Train A SWC.

Following the trip of P-112, the in-service Pressurizer pressure control transmitter will fail high. The crew will take prompt and prudent actions per OSM-14, Operations Department Expectations, to verify the alternate channel is functioning properly and select the opposite channel. The crew will then enter SO23-13-27, Pressurizer Pressure and Level Malfunctions to restore the Pressurizer Pressure Control System to a normal operating lineup.

When pressure control has been restored, Vital Bus Y02 will lose the normal power source. The crew will enter SO23-13-18, Loss of a Vital Bus. The crew will transfer Pressurizer level control to the opposite channel due to the loss of the Vital Bus and direct an operator to transfer Y02 to its alternate source of power.

When the crew has reenergized Y02, restored affected systems, and the CRS has evaluated Technical Specifications, the running Stator Water Cooling Pump will trip. The standby Stator Water Cooling Pump will trip and the BOP will start the standby pump manually with CRS concurrence.

An earthquake will occur and 30 seconds after the earthquake hits, Main Feedwater Isolation Valve HV-4052 will trip closed. This will cause a trip of both Main Feedwater Pumps approximately 30 seconds later. The crew will recognize the loss of both MFW Pumps and trip the Reactor.

Upon the Reactor trip, an air leak in the Main Condenser will require the crew to place Atmospheric Dump Valves in service to control RCS temperature.

3 minutes after the Reactor trip, AFW Pump P-504 will trip and 6 minutes after the Reactor trip, AFW Pump P-140 will trip on overspeed, placing the crew in a complete Loss of Feedwater condition. The crew will complete SPTAs and transition to SO23-12-6, Loss of Feedwater.

When directed by SO23-12-6 to trip all RCPs, RCP P-003 breaker will fail to open, requiring the crew to deenergize 6.9 kV Bus 2A02 to secure the RCP. The crew will identify low pressure condensate as their feedwater restoration success path and depressurize the S/Gs to less than Condensate Pump discharge pressure to restore feedwater flow to the S/Gs. When feedwater flow has been reestablished, the scenario may be terminated.

Scenario Event Description NRC Scenario #4

Risk Significance:

- Failure of risk important system prior to trip: SWC Pump P-112 Shaft Seizure
Loss of MFW due to the closure of HV-4052
- Risk significant core damage sequence: Complete loss of Main and Aux feedwater
- Risk significant operator actions: Transfer RCP cooling to standby loop
Restore feedwater to at least one S/G

Scenario Event Description
NRC Scenario #4

MACHINE OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC-230 NRC Scenario #4 and associated Setup File.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP	MALF	FW25	Turbine Driven AFW Pump P-140 OS Trip	Trip	Rx Trip (+ 6 min)
	MALF	FW23	Condenser Air Leakage	100	Rx Trip
	MALF	FW02B	AFW Pump P-504 Shaft Seizure	Seizure	Rx Trip (+ 3 min)
	LP	N/A	AFW Pump P-141 OOS	OOS	
	LP	N/A	RCP P-003 Breaker Fails As Is	Fail As Is	
1	MALF	SC01A	SWC Pump P-112 Seized Shaft	Seizure	
2	MALF	RC15B	Pressurizer Pressure Transmitter PT-0100Y Fails High	2500	
3	MALF	ED07B	Vital Bus Y02 Inverter Failure	Loss	
	RF	ED51B	Vital Bus Y02 Transfer to Emergency Power	Alternate	
4	LP	N/A	Stator Water Cooling Pump P-291 OC Trip, P-290 Fails to Auto Start	Trip / Fail to Start	
5	LP	N/A	Earthquake	OBE	
	LP	N/A	SG E089 Feedwater Block Valve 2HV-4051 Closes	Close	Earthquake (+ 10 sec)
6	Setup	Setup	Loss of Condenser Vacuum		Rx Trip
7	Setup	Setup	AFW Pump P-504 Shaft Seizure		Rx Trip (+ 3 min)

Scenario Event Description NRC Scenario #4

8	Setup	Setup	Turbine Driven AFW Pump P-140 OS Trip		Rx Trip (+ 6 min)
9	Setup	Setup	RCP P-003 Breaker Fails As Is		

Scenario Event Description
NRC Scenario #4

Machine Operator:

- **RESTORE to IC-215**
- **OPEN 2012 NRC Scenario #4 event file**
- **RUN Setup Files 1, 2, and 3**
- **INSTALL AFW P-141 OOS MAGTAG installed**
- **ENSURE Pressurizer Level and Pressure Selector Switches are selected to Channel Y**
- **ENSURE blend setpoints are 13.2 gpm for BA and 74.8 gpm for PMW**
- **ENSURE SO23-5-1.7 Attachment 9 MOC placard is posted**
- **ENSURE OP AID 005-23 on CR63 has BQ aligned to Unit 2, BS aligned to Unit 3**
- **ENSURE OP AID 005-11 on CR64 has E336 aligned to Unit 2, E335 aligned to Unit 3**
- **ENSURE OP AID 005-5 for Backpressure Control Valves has PV201B circled**
- **ENSURE OP AID 005-5 for Letdown Flow Control Valve has LV110A circled**
- **ENSURE alarms are active**

Control Room Annunciators in Alarm:

- **57A58 EMERGENCY FEEDWATER SYS TRAIN A INOPERABLE**
- **TR A EMER FW SYS INOPERABLE (sugar cube)**

Operating Test : <u> NRC </u> Scenario # <u> 4 </u> Event # <u> 1 </u> Page <u> 7 </u> of <u> 18 </u>		
Event Description: <u>Train A Salt Water Cooling Pump P-112 Shaft Seizure</u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 1, Salt Water Cooling Pump P-112 Shaft Seizure.		
Indications Available: <ul style="list-style-type: none"> 64A24 SWC Pump Motor Brg Temp Hi SWC Pump P-112 Amps Off-Scale High 64A41 SWC Pump Train A OC (+40 sec) 		
The following steps are from SO23-13-7, Loss of CCW/SWC.		
	BOP	ENSURE CCW/SWC on the unaffected loop - IN SERVICE.
	BOP	TRANSFER Noncritical loop to the unaffected loop.
	BOP	TRANSFER the Letdown HX to the unaffected loop.
Critical Task: Transfer the CCW Non-Critical Loop prior to exceeding an RCP operating temperature limits following a loss of Train A SWC Pump P-112.		
CCT Time: _____		
	SRO	INITIATE placing the standby SWC Pump for the affected loop - IN SERVICE.
	BOP	VERIFY normal parameters on the in-service SWC Train: <ul style="list-style-type: none"> SWC flow is in acceptable range per PCS min Saltwater Flow VS Saltwater injection Temperature Calculation. CCW HX Delta Pressure > 3psid and < 12psid. CCW HX outlet Temperature < 90°F.
	SRO	VERIFY reset: <ul style="list-style-type: none"> UA64A47, CCW HX TRAIN A OUTLET TEMP HI UA64A48, CCW HX TRAIN B OUTLET TEMP HI
	SRO	VERIFY affected Train SWC flow - RESTORED.
	SRO	EVALUATE Technical Specifications: <ul style="list-style-type: none"> LCO 3.7.8 Condition A – One SWC train inoperable. Action A.1 – Restore SWC train to OPERABLE status within 72 hours.
Examiner Note: When Train B CCW and SWC has been placed in service, the Non-Critical Loop and Letdown Heat Exchanger have been aligned to Train B, and Technical Specifications have been evaluated, or at Lead Evaluator's discretion, proceed to Event 2, Pressurizer Pressure Transmitter PT-0100Y Fails High.		

Operating Test : <u> NRC </u> Scenario # <u> 4 </u> Event # <u> 2 </u> Page <u> 8 </u> of <u> 18 </u>		
Event Description: <u>Pressurizer Pressure Transmitter PT-0100Y Fails High</u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 2, Pressurizer Pressure Transmitter PT-0100Y Fails High.		
Indications Available: <ul style="list-style-type: none"> 50A04 PZR Press Deviation Hi/Lo 50A14 PZR Press Hi/Lo 		
Examiner Note: The following steps are from 50A14 Alarm Response Procedure.		
	RO	If a control channel failure has occurred, then perform the following: <ul style="list-style-type: none"> POSITION HS-0100A, PZR Pressure Channel Select Switch, to the other channel. Initiate SO23-13-27, Pressurizer Pressure and Level Malfunction.
Examiner Note: Placing PZR Pressure Channel Select Switch to Channel X in this situation is an approved Prompt and Prudent action per OSM-14, Operations Department Expectations. In this case, the operator may take this action prior to referencing the ARP.		
Examiner Note: The following steps are from SO23-13-27, Pressurizer Pressure and Level Malfunction.		
	RO	VERIFY Pressurizer Spray Valve is NOT stuck OPEN.
	RO	VERIFY the selected Pressurizer Pressure channel is between 2225 and 2275 psia and stable. <ul style="list-style-type: none"> (RNO) VERIFY the other pressure channel is available by observing PR-0100A or PR-0100 B or CFMS page 325. (RNO) POSITION HS-0100A, PZR Pressure Channel Select Switch, to the other channel (this may have already been done using Prompt and Prudent actions).
	RO	VERIFY Pressurizer Pressure is stable.
	SRO	VERIFY normal Charging and Letdown in service.
	SRO	GO TO Step 3i.
	RO	VERIFY the Pressurizer Pressure signal had not failed high. <ul style="list-style-type: none"> OPERATE PZR Non-1E Backup and Proportional Heaters per SRO Ops Supv. Direction.
	RO	VERIFY Pressurizer Pressure Control System is operating properly in automatic.
	SRO	VERIFY Pressurizer Spray was not initiated with delta temperature > 180°F.
	SRO	INITIATE a Notification for I&C to reprogram the affected pressure controller(s) or to restore the pressure input.
Examiner Note: When Pressurizer Pressure Control Channel has been selected to Channel X and Non-1E Pressurizer Heaters have been restored, or at Lead Evaluator's discretion, proceed to Event 3, Loss of Vital Bus Y02.		

Operating Test :	NRC	Scenario #	4	Event #	3	Page	9	of	18
Event Description: Loss of Vital Bus Y02									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, INITIATE Event 3, Loss of Vital Bus Y02.

Indications Available for the Loss of Y02:

- 57C13 Vital Bus 2 Inverter Failure

Examiner Note: The following steps are from SO23-13-18, Loss of a Vital Bus.

	SRO	<p>CONFIRM that a single Vital Bus is lost by checking:</p> <ul style="list-style-type: none"> • Alarms on CR57 associated with a single Vital Bus Inverter trouble or failure ANNUNCIATED. • Lumigraphs for associated single channel FAILED on CR56.
	RO	<p>VERIFY 125V DC Bus indication for the associated Inverter has voltage indicated (not blank) and indication is ≥ 101 Volts.</p>
	RO	<p>CONFIRM Loss of Vital Bus Y01 or Y02 has NOT occurred.</p> <ul style="list-style-type: none"> • (RNO) If the Pressurizer Level Controls are selected to the affected channel, then perform the following: <ul style="list-style-type: none"> • PLACE LIC-0110, Pressurizer Level Controller, in MANUAL by depressing the A/M button. • START or STOP Charging Pumps as necessary to control Pressurizer level and match Letdown flow as close as possible. • ADJUST the output on LIC-0110 as necessary to match Letdown flow as closely as possible and maintain a steady PZR level. • SELECT HS-0110, PZR Level Channel Select Switch, to the unaffected channel. • (RNO) If Pressurizer Heaters have de-energized as a result of a failed Low PZR Level signal, then perform the following: <ul style="list-style-type: none"> • DEPRESS HS-0100C, PZR Lo-Lo Level Heater Cutout Channel Selector, selecting the unaffected level transmitter. • RESET PZR Heaters by DEPRESSING OFF, then AUTO/ON.
	SRO	<p>CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.</p>
	SRO	<p>INITIATE re-energizing the affected Vital Bus from the Alternate source per SO23-6-17 within 2 hours. (Tech. Spec. LCO 3.8.7 and LCO 3.8.9).</p>
	SRO	<p>GO TO Attachment for affected loss of Vital Bus.</p>

Operating Test :	NRC	Scenario #	4	Event #	3	Page	10	of	18
Event Description: Loss of Vital Bus Y02									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: Technical Specifications for loss of Y02:

- LCO 3.8.7
- Condition A – One required inverter inoperable.
- Action A.1 – Power AC vital bus from its Class 1E constant voltage source transformer within 2 hours.
- AND
- Action A.2 – Restore inverter to OPERABLE status within 24 hours.

- LCO 3.8.9
- Condition B – One or more AC vital bus inoperable.
- Action B.1 – Restore AC vital bus subsystem to OPERABLE status within 2 hours and 16 hours from discovery of failure to meet LCO.

Examiner Note: The following steps list the affected equipment in BOLD and the associated actions / information unbolded.

	RO	PPS B Status Lights extinguished - VERIFY protection system bistables NOT TRIPPED on PPS Channels A and C ROMs.
	RO	Channels 1-4 Red ESFAS Functions lights along the bottom of the ROM extinguished - VERIFY all ESFAS function lights EXTINGUISHED on PPS Channels A, B, C and D ROMs.
	RO	Channel B Lumigraphs on CR56 extinguished - VERIFY Safety Channel indications providing input to PPS Channels A, C, and D DO NOT indicate that a Plant Protection Trip Setpoint has been exceeded.
	RO	Charging Pumps P-190, P-191, and P-192 - Operate Charging Pumps as necessary to control PZR level.
	RO	PZR Pressure and Level Control - ENSURE PZR Level Channel X is SELECTED. <ul style="list-style-type: none"> • If LIC-0110 is selected to setpoint LS2, then transfer Pressurizer level setpoint to LS1 per SO23-3-1.10, Attachment for Transferring Pressurizer Level and Pressure Controls. • If an ACTUAL Pressurizer Lo-Lo level exists, then ENSURE all heaters are de-energized.
	RO	Vital Bus Inverter Y002 de-energized - ENSURE SO23-6-17, Attachment for Re-energizing Vital Bus Y02 from the Alternate Source, in progress.
	RO	Atmospheric Dump Valve/Controller HV-8421/PIC-8421-2 - HV-8421, Atmospheric Dump Valve, FAILS CLOSED. HV-8421, Atmospheric Dump Valve, may be operated locally.
	RO	Atmospheric Dump Valve/Controller HV-8419/PIC-8419-1 - HV-8419, Atmospheric Dump Valve, will lose its Pressure input but can be operated from the Controller in MANUAL using PIC-8419-1.

Operating Test :	NRC	Scenario #	4	Event #	3	Page	11	of	18
Event Description: Loss of Vital Bus Y02									
Time	Position	Applicant's Actions or Behavior							

	RO	EFAS Trip Paths 2 & 4 Valves: <ul style="list-style-type: none"> • HV-4712, AFWP 2(3)MP-504 to SG E-088 Disch Valve • HV-4705, AFWP 2(3)MP-140 to SG E-088 Disch. Valve • HV-4715, AFW to SG E-089 Iso. Valve • HV-4731, AFW to SG E-089 Iso. Valve • HV-4716, AFWPT 2(3)K-007 Steam Inlet Valve <ul style="list-style-type: none"> • Valves Open. • If an Auxiliary Feed Pump is in service in Mode 2 or 3, then ensure closed HV4730 and HV4714 to prevent S/G E088 Overfill. • If Required to feed S/G E088, then throttle open HV4730 and batch feed S/G to high end of control band (70% NR). • If AFW Pump P140 not required for feeding S/G's, then override and close HV4716. • The affected Unit is in a 4 hour Action Statement (Tech. Spec. LCO 3.7.5) since these valves will not close on a MSIS signal.
Machine Operator: When the crew secures AFW Pump P-140, or when directed, place Vital Bus # 2 Y02 on its alternate source of power.		
Examiner Note: The following steps will be performed after Y02 has been placed on its alternate source of power.		
	BOP	ENSURE AFW Valves CLOSED: <ul style="list-style-type: none"> • HV-4712, AFWP 2(3)MP-504 to SG E-088 Disch Valve • HV-4705, AFWP 2(3)MP-140 to SG E-088 Disch. Valve • HV-4731, AFW to SG E-089 Iso. Valve • HV-4715, AFW to SG E-089 Iso. Valve • HV-4716, AFWPT 2(3)K-007 Steam Inlet Valve
Examiner Note: When Y02 has been placed on its alternate source, AFW Valves have been closed, and Technical Specifications have been evaluated, or at Lead Evaluator's discretion, proceed to Event 4, Stator Water Cooling Pump OC Trip (Standby pump fails to auto start).		

Operating Test : <u> NRC </u> Scenario # <u> 4 </u> Event # <u> 4 </u> Page <u> 12 </u> of <u> 18 </u>		
Event Description: <u>Stator Water Cooling Pump P-291 OC Trip, P-290 Fails to Auto Start</u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 4, Stator Water Cooling Pump P-291 OC Trip, P-290 Fails to Auto Start.		
Indications Available: <ul style="list-style-type: none"> 99C35 Stator Water Pump OC 99C16 Stator Water Flow Lo Pretrip 		
Examiner Note: The following steps are from Alarm Response Procedure 99C35.		
	BOP	Ensure standby Stator Water Pump running.
Examiner Note: Starting the standby Stator Water Cooling Pump is an approved Prompt and Prudent Action per OSM-14, Operations Department Expectations. This action may be taken prior to referencing the ARP.		
	BOP	Dispatch an Operator to the field to check for SPECIFIC CAUSES.
Examiner Note: After Stator Water Cooling Pump P-290 has been started, or at Lead Evaluator's discretion, proceed to Event 5, Earthquake / Main Feedwater Block Valve HV-4051.		

Operating Test : <u>NRC</u> Scenario # <u>4</u> Event # <u>5, 6, 7, 8, 9</u> Page <u>13</u> of <u>18</u>		
Event Description: Earthquake / S/G E-089 Main Feedwater Block Valve HV-4051 Closes, Loss of Vacuum on Reactor Trip, AFW Pump P-504 Shaft Seizure (+ 3 min), AFW Pump P-140 Overspeed Trip (+ 6 min), RCP P-003 Breaker Fails to Open		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 5, Earthquake / S/G E-089 Main Feedwater Block Valve HV-4051 Closes. Events 6, 7, 8, and 9 will automatically activate on Reactor Trip.

Indications Available:

- 61C22 Operating Basis Earthquake Detected
- 52A60 FWBV HV-4051 Trouble
- 52A07 FWCS SG1 E089 Level Deviation

Examiner Note: The crew may enter the Earthquake AOI momentarily, however the closure of the Main Feedwater Block Valve will cause two Main Feedwater Pumps to trip in ~ 30 seconds, requiring a Reactor Trip.

	BOP	RECOGNIZE both Main Feedwater Pumps have tripped and trip the Reactor.
Examiner Note: The following steps are from SO23-12-1, Standard Post Trip Actions.		
	RO	VERIFY Reactor Trip Circuit Breakers (8) OPEN.
	RO	VERIFY Reactor power – LOWERING AND Startup rate NEGATIVE.
	RO	VERIFY maximum of one full length CEA NOT fully inserted.
	BOP	ALL HP and LP Stop and Governor valves CLOSED.
	BOP	VERIFY BOTH Unit Output Breakers OPEN.
	BOP	VERIFY Main Turbine speed less than 2000 RPM OR lowering.
	SRO	INITIATE Attachment 1, WORKSHEET.

CAUTION

DO NOT OPERATE TRIP pushbuttons for tripped breakers. Operation of TRIP pushbuttons will reset overcurrent protection allowing Diesel Generator output breaker to close to a fault.

	BOP	VERIFY BOTH 1E 4kV Buses ENERGIZED.
	BOP	VERIFY all 1E 480V buses ENERGIZED.
	BOP	VERIFY all Class 1E DC Buses ENERGIZED.
	BOP	VERIFY all Non-1E 4kV Buses ENERGIZED.
	BOP	VERIFY one CCW Train OPERATING AND aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger.
	RO	VERIFY PZR level between 10% and 70% AND trending to between 30% and 60%.
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F.
	RO	VERIFY PZR pressure between 1740 PSIA and 2380 PSIA AND trending to between 2025 PSIA and 2275 PSIA.

Operating Test :		NRC	Scenario #	4	Event #	5, 6, 7, 8, 9	Page	14	of	18
Event Description:		Earthquake / S/G E-089 Main Feedwater Block Valve HV-4051 Closes, Loss of Vacuum on Reactor Trip, AFW Pump P-504 Shaft Seizure (+ 3 min), AFW Pump P-140 Overspeed Trip (+ 6 min), RCP P-003 Breaker Fails to Open								
Time	Position	Applicant's Actions or Behavior								
	RO	VERIFY at least one RCP OPERATING.								
	RO	VERIFY core loop ΔT ($T_{HOT} - T_{COLD}$) less than 10°F.								
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F.								
	BOP	VERIFY at least one S/G level between 21% NR and 80% NR AND Feedwater – AVAILABLE. <ul style="list-style-type: none"> (RNO) ENSURE EFAS – ACTUATED. 								
	BOP	VERIFY RCS T_{COLD} between 540°F and 550°F.								
	BOP	VERIFY S/G pressures between 960 PSIA and 1050 PSIA.								
	RO	VERIFY Containment pressure less than 1.5 PSIG.								
	RO	VERIFY Containment Area Radiation Monitors NOT alarming or trending to alarm.								
	RO	VERIFY Secondary Plant Radiation Monitors NOT alarming or trending to alarm.								
	RO	VERIFY Containment average temperature less than 120°F.								
	RO	VERIFY Containment pressure less than 1.5 PSIG.								
	RO	VERIFY all safety function criteria per Attachment 1, WORKSHEET RECOVERED. <ul style="list-style-type: none"> (RNO) COMPLETE Attachment 2, RECOVERY DIAGNOSTICS. 								
Examiner Note: The CRS should diagnose a single event, Loss of Feedwater, and identify SO23-12-6, Loss of Feedwater, as the optimal EOI.										
	SRO	VERIFY REACTOR TRIP RECOVERY DIAGNOSED. <ul style="list-style-type: none"> (RNO) ENSURE at least one RCP in each loop stopped. 								
Examiner Note: If the CRS directs securing RCPs 2 and 3, the RO will have to stop RCP P-003 by de-energizing 6.9kV Bus 2A02 (RCP P-003 breaker fails to open).										
	SRO	INITIATE steps 12 through 17.								
Examiner Note: Steps 12 through 17 of SO23-12-1, Standard Post Trip Actions, are located at the end of the scenario guide.										
	SRO	IMPLEMENT EOI diagnosed.								
Examiner Note: The following steps are from SO23-12-6, Loss of Feedwater.										
	SRO	RECORD time of EOI entry _____.								
	SRO	INITIATE SO23-12-10, SAFETY FUNCTION STATUS CHECKS.								
	SRO	INITIATE FOLDOUT PAGE. (No steps of the Foldout Page are applicable at this time)								
	SRO	ENSURE EFAS 1 and EFAS 2 actuated.								

Operating Test :		NRC	Scenario #	4	Event #	5, 6, 7, 8, 9	Page	15	of	18
Event Description:		Earthquake / S/G E-089 Main Feedwater Block Valve HV-4051 Closes, Loss of Vacuum on Reactor Trip, AFW Pump P-504 Shaft Seizure (+ 3 min), AFW Pump P-140 Overspeed Trip (+ 6 min), RCP P-003 Breaker Fails to Open								
Time	Position	Applicant's Actions or Behavior								
	SRO	VERIFY LOFW diagnosis: <ul style="list-style-type: none"> Both S/Gs level less than 40% NR. AND <ul style="list-style-type: none"> TOTAL AFW less than 400 GPM. AND <ul style="list-style-type: none"> Both MFW Pumps NOT operating. PZR level – stable or rising. PZR pressure – stable or rising. S/G E-088 pressure greater than 740 PSIA AND stable or rising. S/G E-089 pressure greater than 740 PSIA AND stable or rising. 								
	SRO	NOTIFY Shift Manager/Operations Leader of SO23-12-6, LOSS OF FEEDWATER, initiation.								
	SRO	ENSURE Emergency Plan is initiated.								
	SRO	IMPLEMENT PLACEKEEPER.								
	SRO	IMPLEMENT TIME DEPENDENT STEPS.								
	SRO	ENSURE all RCPs stopped.								
Examiner Note: If the CRS has not previously directed securing RCPs 2 and 3, the RO will have to stop RCP P-003 by de-energizing 6.9kV Bus 2A02 (RCP P-003 breaker fails to open).										
	BOP	ENSURE S/G blowdown and sample valves – closed: <ul style="list-style-type: none"> E-088: HV-4054 and HV-4058 E-089: HV-4053 and HV-4057 								
	SRO	IF AFW Pump available, THEN GO TO step 7.								
	SRO	IF MFW Pump and 2 Condensate Pumps available, THEN GO TO step 8.								
	SRO	IF at least one Condensate Pump from either unit available, THEN GO TO step 10.								
Examiner Note: The success path is low pressure Condensate, the CRS should go to step 10.										
	SRO	VERIFY at least one Condensate Pump from either Unit available.								
	BOP	ENSURE Full Flow Condensate Polishing Demineralizers – bypassed: <ul style="list-style-type: none"> FV-4902A – open HV-4900A – closed HV-4900B – closed 								
	BOP	DISPATCH an operator to UNLOCK and INITIATE OPENING 1305MU024, MFW Pump Bypass.								

Operating Test :	NRC	Scenario #	4	Event #	5, 6, 7, 8, 9	Page	16	of	18
Event Description: Earthquake / S/G E-089 Main Feedwater Block Valve HV-4051 Closes, Loss of Vacuum on Reactor Trip, AFW Pump P-504 Shaft Seizure (+ 3 min), AFW Pump P-140 Overspeed Trip (+ 6 min), RCP P-003 Breaker Fails to Open									
Time	Position	Applicant's Actions or Behavior							

	BOP	ENSURE FIC-3294, Condensate Pump miniflow controller set for proper Condensate pump configuration: <ul style="list-style-type: none"> One pump – 3000 GPM Two pumps – 6000 GPM Three pumps – 9000 GPM
	BOP	TRANSFER Individual MFW Regulator Bypass valve controllers to LOCAL: <ul style="list-style-type: none"> E-088: HIC-1106 E-089: HIC-1105
	BOP	ENSURE MFW Block valves closed: <ul style="list-style-type: none"> E-088: HV-4047 E-089: HV-4051
	BOP	ENSURE MFW Regulator Bypass valves closed: <ul style="list-style-type: none"> E-088: HV-1106 E-089: HV-1105
	RO	INITIATE the following: <ul style="list-style-type: none"> SIAS CCAS
	RO	INITIATE raising PZR level. OVERRIDE and operate Charging Pumps as necessary to establish PZR level between 45% and 55%.
	SRO	VERIFY Boration in progress at greater than or equal to 40 GPM.

CAUTION

Steaming the available S/G dry could result in excessive thermal stresses in the tubes and possible tube damage when cool feedwater is added. In the event that both S/Gs do become dry, feed should be restored to only **one** S/G when reinitiating core cooling.

CAUTION

IF S/G dryout occurs, THEN S/G pressure will rapidly drop and MSIS will initiate. Failure to reset S/G low Pressure setpoints during a controlled cooldown will result in MSIS actuation and a loss of the Main Feedwater flowpath.

Operating Test :		NRC	Scenario #	4	Event #	5, 6, 7, 8, 9	Page	17	of	18
Event Description:		Earthquake / S/G E-089 Main Feedwater Block Valve HV-4051 Closes, Loss of Vacuum on Reactor Trip, AFW Pump P-504 Shaft Seizure (+ 3 min), AFW Pump P-140 Overspeed Trip (+ 6 min), RCP P-003 Breaker Fails to Open								
Time	Position	Applicant's Actions or Behavior								
	BOP	ADJUST available S/G steaming rate to initiate lowering S/G pressure less than 500 PSIA: <ul style="list-style-type: none"> • RESET MSIS setpoint as controlled cooldown proceeds. • MAINTAIN available S/G steaming rates to control RCS temperature within the following limits: <ul style="list-style-type: none"> • Core Exit Saturation Margin between 20°F and 160°F. 								
	BOP	ENSURE MFW Pump tripped AND MFW Pump miniflow valves closed.								
	SRO	VERIFY intact feedwater flowpath available.								
	SRO	VERIFY CIAS NOT actuated.								
	BOP	VERIFY MFIV to available S/G – OPEN: <ul style="list-style-type: none"> • E-088: HV-4048 • E-089: HV-4052 								
	BOP	START at least one Condensate Pump on affected unit.								
	BOP	THROTTLE MFW Regulator Bypass valve to available S/G – 20% open: <ul style="list-style-type: none"> • E-088: HV-1106 • E-089: HV-1105 AND ENSURE Condensate Pump discharge pressure – greater than S/G pressure.								
	BOP	MAINTAIN reduced feedwater flow for 5 minutes.								
Critical Task: Restore Feedwater to at least one S/G prior to a complete loss of secondary inventory per SO23-12-6, Loss of Feedwater.										
CCT Time: _____										
Scenario Termination: When Feedwater has been restored to at least one S/G, or at Lead Evaluator's discretion, the scenario may be terminated.										
Examiner Note: The following are steps 12-17 of SO23-12-1, Standard Post Trip Actions.										
	RO	INITIATE Attachment 4, ADMINISTRATIVE ACTIONS.								
	RO	ENSURE a PA System announcement was made regarding the Reactor trip.								
	RO	OPERATE SBCS to maintain RCS T _{COLO} between 540°F and 550°F. <ul style="list-style-type: none"> • (RNO) OPERATE ADVS to maintain RCS T_{COLO} between 540°F and 550°F. 								
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800S-2 (Q800S) CLOSED								
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800N-2 (Q800N) CLOSED.								
	RO	VERIFY all Non-1E 4kV Buses ENERGIZED.								
	RO	VERIFY 480V Load Centers B15 and B16 ENERGIZED.								

Operating Test :		NRC	Scenario #	4	Event #	5, 6, 7, 8, 9	Page	18	of	18
Event Description:		Earthquake / S/G E-089 Main Feedwater Block Valve HV-4051 Closes, Loss of Vacuum on Reactor Trip, AFW Pump P-504 Shaft Seizure (+ 3 min), AFW Pump P-140 Overspeed Trip (+ 6 min), RCP P-003 Breaker Fails to Open								
Time	Position	Applicant's Actions or Behavior								
	RO	ENSURE 3 rd Point Heater Drain Pumps STOPPED.								
	RO	VERIFY RTO RESET. <ul style="list-style-type: none"> (RNO) IF a MFW pump in service THEN RESET RTO per SO23-9-6, Feedwater Control System Operation Examiner Note: RTO will not be reset due to the loss of all feedwater.								
	RO	MAINTAIN one MFW Pump and a maximum of three Condensate Pumps in operation. <ul style="list-style-type: none"> (RNO) ENSURE S/G levels being maintained by AFW Pumps. 								
	RO	ENSURE FIC-3294, Condensate Pump miniflow controller set for proper Condensate pump configuration: <ul style="list-style-type: none"> One pump – 4500 GPM Two pumps – 6000 GPM Three pumps – 9000 GPM 								
	RO	PLACE Condensate Draw-off valve LV-3245 to DISABLE.								
	RO	VERIFY SO23-12-2, REACTOR TRIP RECOVERY being implemented. <ul style="list-style-type: none"> (RNO) ENSURE S/G Blowdown valves HV-4054 and HV-4053 CLOSED. (RNO) GO TO step 16. 								
	RO	ENSURE the following valves closed: <ul style="list-style-type: none"> Extraction Steam Block valves HV-8800, HV-8812, HV-8804, HV-8810, HV-8808, HV-8820, HV-8806, and HV-8816. Main Steam to Reheater Block, Bypass, Warmup and Control valves HV-2703 or HV-2704, HV-2721, and HV-2751. Bled Steam to Reheaters Block Valve HV-2712A/B. 								
	RO	VERIFY Main Generator voltage less than 24kV.								
	RO	VERIFY annunciators RESET: <ul style="list-style-type: none"> 99A26 TURBINE LUBE OIL TEMP HI 99A46 TURBINE BRG OIL DRAIN TEMP HI 								
	RO	INITIATE SO23-10-2, TURBINE SHUTDOWN, Attachment for Unloading the Generator and Removing the Unit from Line.								
	RO	VERIFY BOTH Start-Up Range channels OPERABLE.								

Facility:	SONGS 2 & 3	Scenario No.:	5	Op Test No.:	October 2012 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions: 100% Power MOC					
Turnover: Maintain steady state conditions.					
Critical Tasks: <ul style="list-style-type: none"> Restore CCW flow to the RCPs within 10 minutes and prior to exceeding RCP operating limits. Within 10 minutes of loss of heat removal from S/G E088, the crew transfers the primary to secondary heat sink to S/G E089 by steaming S/G E089, maintaining Psat for the lowest RCS Tc, per SO23-12-11, FS-30, Establish Stable RCS Temperature During ESDE. Manually initiate Containment Spray prior to exceeding Containment temperature and pressure limits following a failure of Containment Spray to automatically actuate. Isolate S/G E-088 prior to exiting SO23-12-9, Functional Recovery. 					
Event No.	Malf. No.	Event Type*	Event Description		
1 (10 min)	RC16B	I (RO, SRO) TS (SRO)	Pressurizer Level Control Channel Transmitter LT-0110-2 fails low		
2 (20 min)	CC06B	C (BOP, SRO) TS (SRO)	CCW Pump P-025 O/C		
3 (30 min)	CV03C CV04C	C (RO, SRO)	RCP P-003 Upper and Middle Seal Failures		
4 (50 min)		N (RO, BOP, SRO)	Rapid Power Reduction		
5 (55 min)	OBE LP SG01A	M (RO, BOP, SRO)	Earthquake (OBE w/o MFW Pump Trip) 400 GPM SGTR on S/G E-088		
6 (55 min)	MS03A	M (RO, BOP, SRO)	ESDE inside containment from S/G E-088 on Reactor Trip		
7 (55 min)	TU07	I (BOP)	Main Turbine Fails to Trip on Reactor Trip		
8 (60 min)	PPS LP	I (RO)	CSAS Fails to Auto Actuate		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

Actual	Target Quantitative Attributes
7	Total malfunctions (5-8)
3	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
2	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
1	EOP contingencies requiring substantive actions (0-2)
4	Critical tasks (2-3)

SCENARIO SUMMARY NRC #1

The crew will take the watch operating at 100% Reactor power and no equipment out of service.

The in-service Pressurizer level control transmitter will fail low. The crew will take manual control of the letdown flow controller to stabilize Pressurizer level per OSM-14, Operations Department Expectations and enter SO23-13-27, Pressurizer Pressure and Level Malfunctions. The CRS will evaluate Technical Specifications due to one Train of 1E backup heaters being inoperable with a failed low level transmitter.

When the crew has established Pressurizer level control on the opposite channel, CCW Pump P-025 will trip on overcurrent. The crew will start the standby CCW pump on the same train and will not transfer the Letdown Heat Exchanger and Non-Critical Loop. Although there is still two trains of CCW available, the CRS will declare Train A CCW inoperable until P-025 is racked out as it would still be aligned to receive the auto start signal on a SIAS however it would not start.

Following the Technical Specification evaluation, RCP P-003 will have a failure of the upper seal and 2 minutes later the middle seal will fail. The two failed seals will require a down power and the crew will enter SO23-13-28, Rapid Power Reduction, to commence taking the unit offline.

An operating basis earthquake will occur and cause a 400 GPM SGTR on S/G E-088. When the crew recognizes the leak, they will enter SO23-13-14, Reactor Coolant Leak, and attempt to mitigate the leak. When it is recognized that the leak exceeds makeup capacity, they crew will trip the Reactor.

Upon the Reactor trip, the Main Turbine will fail to auto trip and will be manually tripped by the BOP. Additionally, an ESDE will occur inside Containment on E-088 when the Reactor is tripped. The crew will pull forward FS-30, Stabilization of RCS Temperature During an ESDE, during SPTAs and then transition to SO23-12-9, Functional Recovery, due to the SGTR and EDSE. The crew will identify that CSAS failed to auto actuate when Containment pressure exceeded 14 psig and will manually actuate CSAS.

When RCS heat removal is transferred to the intact S/G and the faulted S/G has reached dryout, the crew will isolate S/G E-088 and the scenario can be terminated.

Scenario Event Description NRC Scenario #5

Risk Significance:

- Failure of risk important system prior to trip:
 - Loss of CCW Pump P-025
 - Two RCP Seal Failures
 - Operating Basis Earthquake
- Risk significant core damage sequence:
 - SGTR and ESDE on S/G E-088
 - Failure of the Main Turbine to trip
 - Failure of CSAS to actuate
- Risk significant operator actions:
 - Transfer RCS cooling to the intact S/G
 - Manually initiate CSAS
 - Isolate S/G E-088

Scenario Event Description
NRC Scenario #5

MACHINE OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC-215 NRC Scenario #5 and run associated Setup Files.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP	MALF	MS03A	Main Steam Line Break Inside Containment	1.5	Rx Trip (+ 30 sec)
	MALF	TU07	Main Turbine Fails to Trip on Rx Trip	Failure	
	LP	N/A	Containment Spray Fails to Auto Actuate	Fail to Actuate	
1	MALF	RC16B	Pressurizer Level Transmitter LT-0110-2 Fails Low	0	
2	MALF	CC06B	CCW Pump P-025 OC Trip	Fault	
3	MALF	CV04C	RCP P-003 Upper Seal Failure	100	
	MALF	CV03C	RCP P-003 Middle Seal Failure	100	(+ 2 min)
4	N/A	N/A	Rapid Power Reduction due to Failed RCP Seals		
5	LP	N/A	Earthquake	OBE	
	MALF	SG01A	SGTR From SG E088	.6	(5 min ramp)
6	Setup	Setup	ESDE From SG E088	1.5	Rx Trip (+ 30 sec)
7	Setup	Setup	Main Turbine Fails to Trip on Rx Trip	Failure	
8	Setup	Setup	Containment Spray Fails to Auto Actuate	Fail to Actuate	

Scenario Event Description
NRC Scenario #5

Machine Operator:

- **RESTORE to IC-215**
- **OPEN 2012 NRC Scenario #5 event file**
- **RUN Setup Files 1 and 2**
- **ENSURE Pressurizer Level and Pressure Selector Switches are selected to Channel Y**
- **ENSURE blend setpoints are 13.2 gpm for BA and 74.8 gpm for PMW**
- **ENSURE SO23-5-1.7 Attachment 9 MOC placard is posted**
- **ENSURE OP AID 005-23 on CR63 has BQ aligned to Unit 2, BS aligned to Unit 3**
- **ENSURE OP AID 005-11 on CR64 has E336 aligned to Unit 2, E335 aligned to Unit 3**
- **ENSURE OP AID 005-5 for Backpressure Control Valves has PV201B circled**
- **ENSURE OP AID 005-5 for Letdown Flow Control Valve has LV110A circled**
- **ENSURE alarms are active**

Control Room Annunciators in Alarm:

- **None**

Operating Test :	NRC	Scenario #	5	Event #	1	Page	6	of	26
Event Description: Pressurizer Level Control Channel Transmitter LT-0110-2 fails low									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, INITIATE Event 1, Pressurizer level Control channel Transmitter LT-0110-2 Fails Low.

Indications Available:

- 50A03 - PZR Level LO-LO
- 50A23 - PZR Level Error LO

Examiner Note: The following steps are from OSM-14 Operations Department Expectations Prompt and Prudent Actions.

	RO	Place LIC 0110 in Manual.
	RO	Stop Charging Pumps that auto-started.
	RO	Adjust LIC 0110 to stabilize level.

Examiner Note: The following steps are from SO23-13-27, Pressurizer Pressure and Level Malfunction

	RO	VERIFY normal Charging and Letdown in Service.
	RO	VERIFY Level Indicators LI-0110A1, LI-0110A2 and LI-103 are reading approximately the same. <ul style="list-style-type: none"> • (RNO) Go to step 2h.
	RO	Transfer to the operable level channel as follows: <ul style="list-style-type: none"> • VERIFY the channel not selected is reading within the program band. • TRANSFER HS-0110, Pressurizer Level Channel Selector, to the operable Channel. • ADJUST LIC-0110 to match the actual level with Pressurize Level Setpoint by adjusting the output. • WHEN the level is within 2% of the setpoint, THEN TRANSFER LIC-0110 to AUTO by depressing the A/M pushbutton. • SELECT the operable level transmitter by depressing HS-0100C, Non-1E PZR Lo-Lo Level Heater Cutout Channel Selector. • Verify Non-1E Pressurizer Heaters have not tripped. <ul style="list-style-type: none"> • (RNO) RESET ALL PZR Non-1E Backup and Proportional Heaters, by going to Manual/Off THEN Back to Auto. • OPERATE PZR Non-1E Backup, unaffected 1E Heaters and Proportion Heaters as directed by CRS. • OPERATE Charging Pumps as directed by CRS. • VERIFY PZR Level Control System is operating satisfactory in AUTO within the level band.
	RO	ENSURE LIC-0110 is in AUTO.

Operating Test : <u> NRC </u> Scenario # <u> 5 </u> Event # <u> 1 </u> Page <u> 7 </u> of <u> 26 </u>		
Event Description: <u>Pressurizer Level Control Channel Transmitter LT-0110-2 fails low</u>		
Time	Position	Applicant's Actions or Behavior

<p>Examiner Note: Technical Specification for failed Pressurizer level transmitter:</p> <ul style="list-style-type: none"> LCO 3.4.9 Condition B – One required group of pressurizer heaters inoperable. Action B.1 – Restore required group of pressurizer heaters to OPERABLE status within 72 hours.
<p>Examiner Note: When Technical Specifications have been evaluated or at Lead Evaluator's discretion, proceed to Event 2.</p>

Operating Test : <u> NRC </u> Scenario # <u> 5 </u> Event # <u> 2 </u> Page <u> 8 </u> of <u> 26 </u>		
Event Description: <u> CCW Pump P-025 OC Trip </u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 2, CCW Pump P-025 OC Trip.		
Indications Available:		
<ul style="list-style-type: none"> 64A21 – CCW Pump Train A OC 		
Examiner Note: The following steps are from Alarm Response Procedure 64A21, CCW Pump Train A OC		
	BOP	Start stand-by CCW Pump aligned to Train A.
Critical Task: Restore CCW flow to the RCPs within 10 minutes and prior to exceeding RCP operating limits.		
CCT Time: _____		
	SRO	EVALUTE Technical Specifications: <ul style="list-style-type: none"> LCO 3.7.7 Condition A - One CCW Train inoperable. Action A.1 – Restore CCW Train to OPERABLE status within 72 hours.
Examiner Note: When Technical Specifications have been evaluated or at lead evaluator's discretion, proceed to Event 3, RCP P-003 Upper and Middle Seal Failure.		

Operating Test : <u> NRC </u> Scenario # <u> 5 </u> Event # <u> 3 </u> Page <u> 9 </u> of <u> 26 </u>		
Event Description: RCP P-003 Upper and Middle Seal Failure		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 3, RCP P-003 Upper and Middle Seal Failure.		
Indications Available:		
<ul style="list-style-type: none"> 56C26 - RCP P003 SEAL PRESSURE HI/LO 		
Examiner Note: The following steps are from SO23-13-6 RCP Seal Failure		
	RO	DETERMINE if RCP seal failure has occurred by observing PCS screen for RCP Seal Status, or by using Attachment 1 if PCS page NOT available.
	RO	DETERMINE if any RCP operating parameters are out of normal range per Attachment 2.
	SRO	INFORM Maintenance Engineering of the situation.
	RO	TREND abnormal parameters on Plant Computer System per Attachment 3.
	SRO	IDENTIFY that 2 Seals stages have failed: <ul style="list-style-type: none"> INTIATE a plant shutdown per SO23-5-1.7 Power Operations. After the Reactor is tripped then trip the affected RCP after Steps 1 and 2 of SO23-12-1 Standard Post Trip Actions.
Examiner Note: The crew will commence a downpower using SO23-13-28 Rapid Power Reduction at a rate of 15%/hour. Proceed to Event 4, Rapid Power Reduction.		

Operating Test :	NRC	Scenario #	5	Event #	4	Page	10	of	26
Event Description: Rapid Power Reduction									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: The following steps are from SO23-13-28, Rapid Power Reduction.

	SRO	INITIATE notifying the GOC.
	SRO	If taking the Unit Offline or to target power plateau < 750 MWe (≈65% Rx Power), then INITIATE an immediate MSR Cooldown per SO23-10-2, Attachment for MSR Cooldown for Load Reduction/Turbine Shutdown.
<p style="text-align: center;">GUIDELINES</p> <ol style="list-style-type: none"> If RCS Boron is < 110 ppm, then the optimal approach is to use CEAs and MTC with little or no boration. A 5% power reduction credit can be taken for MTC, because the temperature increase adds considerable negative reactivity due to the large negative MTC at the EOC along with Xenon building in. Expect average Tcold to be initially high outside the control band. (LS-1.1, LS-1.4) At EOC, existing conditions may necessitate slowing power change rate when between 80% and 70% power. 		
	SRO	INITIATE monitoring CV-9739, COLSS Raw Delta-T Power.
	RO	INITIATE Forcing PZR spray flow using two valves per SO23-3-1.10: <ul style="list-style-type: none"> ENSURE a Reactivity Brief has been conducted for this activity per SO123-0-A1, Section for Reactivity. COMMENCE monitoring RCS pressure. VERIFY RCS pressure > 1500 psia. PLACE both PZR Spray Valve Controllers in AUTO. POSITION all Non-1E Backup Heaters to ON. LOWER PIC-0100, PZR Pressure Controller, setpoint as required to maintain RCS pressure as directed by the CRS (set setpoint to ~ 2225 psia).

Operating Test :	NRC	Scenario #	5	Event #	4	Page	11	of	26
Event Description: Rapid Power Reduction									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>BORATE to the Charging Pump Suction per SO23-3-2.2:</p> <ul style="list-style-type: none"> • Implement the requirements for a Reactivity Brief and Peer check per OSM-14, Operations Department Expectations, Section for Reactivity Management. • ENSURE ENTERED required <i>boration</i> flowrate on FIC-0210Y, BAMU Flow Controller. • If flowrate change, then SELECT SET. • ENSURE FIC-0210Y in AUTO. • SET FQIS-0210Y, Boration Counter, to the desired volume as follows: <ul style="list-style-type: none"> • SELECT MODIFY. • ENTER gallons in PRESET. • SELECT SET PRESET. • SELECT EXIT. • SELETE the BAMU Pump associated with the BAMU Tank used. • VERIFY CLOSED FV-9253, Blended Makeup to VCT Isolation. • ENSURE HV-9257, BAMU to Charging Pump Suction Block Valve, in AUTO. • COMMENCE monitoring plant parameters. • From the MODE SELECTOR: <ul style="list-style-type: none"> • SELECT MODIFY. • SELECT BORATE. • SELECT GO
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Operating Test :	NRC	Scenario #	5	Event #	4	Page	12	of	26
Event Description: Rapid Power Reduction									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>INSERT CEAs for ASI Control per SO23-3-2.19, to the target level within the following guidance:</p> <ul style="list-style-type: none"> • INSERT PLCEAs (Insertion Limit is 112.5. Insertion should be limited to ≈115 inches or until Power reaches target plateau.) • INSERT Group 6 to target level. [90" if RCS Boron is < 110 ppm.] (The maximum recommended is 75 inches.) • POSITION Group Select switch to the CEA group to be moved. • POSITION Mode Select Switch to the appropriate mode. • VERIFY the group indicator lamps are ILLUMINATED for the group selected. • POSITION CEA(s) as directed by SRO Ops. Supv. • When CEA positioning has completed, then POSITION the Mode Select Switch to OFF.
	BOP	<p>INITIATE SO23-5-1.7, Section for Turbine Load Change using Setpoint Adjustment:</p> <ul style="list-style-type: none"> • Implement the requirements for a Reactivity Brief and Peer Check per OSM-14, Operations Department Expectations, Section for Reactivity Management. • INITIATE monitoring TCOLD AVG using PCS. • PLACE the 1st STAGE PRESSURE feedback loop in service. • ACTIVATE the Turbine DCS Setpoints Box and SELECT MODIFY. • SET the Demand to the target MW value and SELECT ENTER. • Set the Rate to the target MW/MIN value and SELECT ENTER. • INITIATE Turbine load change, SELECT P2. • Control RCS Tcold within the operating band by adjusting the rate setpoint or by canceling and reinitiating the load change as necessary. • VERIFY Turbine load stabilizes at the target value. • REMOVE 1st STAGE PRESSURE feedback loop from service. • RESTORE the Rate to 100 MW/MIN and SELECT ENTER.
	SRO	INITIATE SO23-5-1.7, Attachment for Power Descension.
	SRO	If Reactor power changed > 15% in one hour, then NOTIFY Chemistry and LOG the notification.
	SRO	NOTIFY Reactor Engineering and log the notification.

Operating Test : <u> NRC </u> Scenario # <u> 5 </u> Event # <u> 4 </u> Page <u> 13 </u> of <u> 26 </u>		
Event Description: <u> Rapid Power Reduction </u>		
Time	Position	Applicant's Actions or Behavior

	ALL	Maintain Turbine load, RCS Temperature, and ASI within the expected operating bands per SO23-5-1.7.
Examiner Note: When Reactor power has been lowered 3-5% or at lead evaluator's discretion, proceed to Event 5, Earthquake (OBE w/o MFW Pump Trip) and 400 GPM SGTR on S/G E-088.		

Operating Test : <u> NRC </u> Scenario # <u> 5 </u> Event # <u> 5 </u> Page <u> 14 </u> of <u> 26 </u>		
Event Description: <u>Earthquake (OBE w/o MFW Pump Trip) and 400 GPM SGTR on S/G E-088</u>		
Time	Position	Applicant's Actions or Behavior

Machine Operator: When directed, INITIATE Event 5, Earthquake (OBE w/o MFW Pump Trip) 400 GPM SGTR on S/G E-088		
Indications Available: <ul style="list-style-type: none"> 61C21 – Seismic Recording System Activated 61C22 – OP Basis EQ Detected 60A46 – Secondary Radiation High (+ 60 sec) DAS Leak Rate 		
Examiner Note: The following steps are from SO23-13-3 Earthquake.		
<h2 style="margin: 0;">NOTES</h2> <ol style="list-style-type: none"> 1. If an aftershock occurs, then this AOI must be re-initiated for the aftershock along with the completion of the current usage of this AOI. 2. Seismic Panels of Units 2/3 alarm at g rating ≥ 0.019. 		
	SRO	<p>VERIFY the following occurred:</p> <p>Valid activation of any of the following Alarms or Seismic Instrument Panel indications:</p> <ul style="list-style-type: none"> 2UA61C21, Seismic Recording System Activated alarm - illuminated (SO123-VIII-1, EAL HU1.1) Strong Motion Acceleration System Activation (light indication on 2UA-8020, actuates at 0.019g) Event 2ZLH-8020G (light indication on 2XY-8020) <p>AND</p> <p>Ground motion that is readily felt by a consensus of Control Room personnel.</p>

Operating Test : <u>NRC</u> Scenario # <u>5</u> Event # <u>5</u> Page <u>15</u> of <u>26</u>		
Event Description: <u>Earthquake (OBE w/o MFW Pump Trip) and 400 GPM SGTR on S/G E-088</u>		
Time	Position	Applicant's Actions or Behavior

	SRO	<p>VERIFY Operating Basis Earthquake occurred(SO123-VIII-1, EAL HA1.1):</p> <ul style="list-style-type: none"> • 2UA61C22, Operating Basis Earthquake Acceleration alarm - illuminated (actuates at 0.33g) <p>AND</p> <ul style="list-style-type: none"> • OBE alarms (both white lamps: Containment Base OBE AND Containment Operating Level OBE) on Seismic Instrumentation Panel - illuminated. <p>OR</p> <ul style="list-style-type: none"> • Confirmation of earthquake ground acceleration by offsite agency \geq 0.33g
	SRO	INITIATE Attachment 1.
<p>Examiner Note: The crew may enter SO23-13-14 RCS Leak momentarily before tripping the reactor due to the 400 GPM SGTR on S/G E-088. Proceed to Event #6 ESDE inside containment from S/G E-088 on Reactor Trip.</p>		

Operating Test : <u>NRC</u> Scenario # <u>5</u> Event # <u>6, 7, 8</u> Page <u>16</u> of <u>26</u>		
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.		
Time	Position	Applicant's Actions or Behavior

Examiner Note: The following steps are from SO23-12-1, Standard Post Trip Actions:

	RO	VERIFY Reactor Trip Circuit Breakers (8) OPEN.
	RO	VERIFY Reactor power – LOWERING AND Startup rate NEGATIVE.
	RO	VERIFY maximum of one full length CEA NOT fully inserted.
	BOP	ALL HP and LP Stop and Governor valves CLOSED. <ul style="list-style-type: none"> • (RNO) Manually trip turbine.
	BOP	VERIFY BOTH Unit Output Breakers OPEN.
	BOP	VERIFY Main Turbine speed less than 2000 RPM OR lowering.

Examiner Note: RCP P-003 should be tripped at this time per SO23-13-6, RCP Seal Failure.

	RO	Trip RCP P-003 due to the failed seals.
	SRO	INITIATE Attachment 1, WORKSHEET.
	BOP	VERIFY BOTH 1E 4kV Buses ENERGIZED.
	BOP	VERIFY all 1E 480V buses ENERGIZED.
	BOP	VERIFY all Class 1E DC Buses ENERGIZED.
	BOP	VERIFY all Non-1E 4kV Buses ENERGIZED.
	BOP	VERIFY one CCW Train OPERATING AND aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger. <ul style="list-style-type: none"> • (RNO) START an available CCW Train. • (RNO) IF CIAS – ACTUATED, THEN ENSURE all RCPs STOPPED AND GO TO step 5.

Operating Test : <u>NRC</u>		Scenario # <u>5</u>	Event # <u>6, 7, 8</u>	Page <u>17</u> of <u>26</u>
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.				
Time	Position	Applicant's Actions or Behavior		

Examiner Note: The crew will request to pull forward FS-30 during SPTAs. The BOP will perform this procedure and the RO will perform the BOP's SPTA verifications. The following steps are from SO23-12-11, FS-30, Stabilize RCS Temperature During ESDE:

NOTE

WHEN excess steam demand remains NOT isolated and all RCPs are stopped, **THEN** RCS T_{COLD} in loop with least affected S/G may be higher than REP CET temperature

VERIFY S/G least affected by ESDE NOT isolated for SGTR,

CAUTION

Failure to establish steaming flow path on least affected S/G before most affected S/G loses effective heat removal capabilities will result in rapid re-pressurization (PTS consideration).

- VERIFY most affected S/G level less than 50% WR.
- On the least affected S/G:
 - POSITION ADV controller to match existing S/G pressure.
 - ENSURE OVERRIDE pushbutton DEPRESSED.
 - ENSURE OPEN/MODULATE pushbutton DEPRESSED.
 - MAINTAIN least affected S/G pressure approximately 200 psia above most affected S/G pressure.
- VERIFY S/G dryout on most affected S/G:
 - RCS T_{cold} stable or rising.
 - OR
 - S/G pressure less than 200 psia.

NOTE

When MSIS is actuated, unstable S/G pressures can cause cycling of AFW flow due to differential steam pressure between the two S/Gs.

- STABILIZE least affected S/G pressure:
 - VERIFY ADV in AUTO/MODULATE.
 - MAINTAIN P_{sat} for lowest RCS T_{cold}.
 - STABILIZE AFW flow.
- VERIFY RCS pressure is to the right of the Appendix E curve on Attachment 30, Post-Accident Pressure / Temperature Limits.
- OPERATE feedwater on least affected S/G to maintain level between 40% and 80% NR.

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	18	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

Critical Task: Within 10 minutes of loss of heat removal from S/G E088, the crew transfers the primary to secondary heat sink to S/G E089 by steaming S/G E089, maintaining Psat for the lowest RCS Tc, per SO23-12-11, FS-30, Establish Stable RCS Temperature During ESDE.

CCT Time: _____

	RO	<p>VERIFY PZR level between 10% and 70% AND trending to between 30% and 60%.</p> <ul style="list-style-type: none"> (RNO) ENSURE PZR Level Control System – OPERATING in AUTO or MANUAL to restore PZR level.
	RO	<p>VERIFY Core Exit Saturation Margin greater than or equal to 20°F.</p>
	RO	<p>VERIFY PZR pressure between 1740 PSIA and 2380 PSIA AND trending to between 2025 PSIA and 2275 PSIA.</p> <ul style="list-style-type: none"> (RNO) ENSURE PZR Pressure Control System OPERATING in AUTO or MANUAL to restore PZR pressure. (RNO) IF PZR pressure less than PZR Pressure Control System Setpoint and lowering, THEN ENSURE Normal and Auxiliary Spray valves CLOSED. (RNO) IF PZR pressure less than 1740 PSIA, THEN ENSURE the following ACTUATED: <ul style="list-style-type: none"> SIAS CCAS CRIS. (RNO) IF PZR pressure less than or equal to 1430 PSIA, THEN ENSURE one RCP in each loop STOPPED. (RNO) IF RCP NPSH requirements of Attachment 3, POST-ACCIDENT PRESSURE / TEMPERATURE LIMITS NOT SATISFIED, THEN ENSURE all RCPs STOPPED.
	RO	<p>VERIFY at least one RCP OPERATING.</p> <ul style="list-style-type: none"> (RNO) GO TO Step c.
	RO	<p>VERIFY Core Exit Saturation Margin greater than or equal to 20°F.</p>
	RO	<p>VERIFY at least one S/G level between 21% NR and 80% NR AND Feedwater AVAILABLE.</p>

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	19	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>VERIFY RCS T_{COLD} between 540°F and 550°F.</p> <ul style="list-style-type: none"> (RNO) IF RCS T_{COLD} less than 540°F THEN: <ul style="list-style-type: none"> ENSURE feed water flow is NOT excessive. ENSURE SBSCS valves CLOSED. ENSURE ADVs CLOSED. IF MSIS ACTUATED AND cooldown terminates THEN STABILIZE RCS temperature for lowest RCS T_{COLD}.
	RO	<p>VERIFY S/G pressures between 960 PSIA and 1050 PSIA.</p> <ul style="list-style-type: none"> (RNO) IF S/G pressure less than 740 PSIA THEN ENSURE MSIS ACTUATED AND GO TO step 9.
	RO	<p>VERIFY Containment pressure less than 1.5 PSIG.</p> <ul style="list-style-type: none"> (RNO) IF Containment pressure greater than 3.4 PSIG, THEN ENSURE the following ACTUATED: <ul style="list-style-type: none"> SIAS CIAS CCAS CRIS (RNO) ENSURE all RCPs STOPPED.
	RO	VERIFY Containment Area Radiation Monitors NOT alarming or trending to alarm.
	RO	VERIFY Secondary Plant Radiation Monitors NOT alarming or trending to alarm.
<p>Examiner Note: Secondary Plant Radiation Monitors are alarming or were trending to alarm before the MSIS and CIAS, however there are no RNO actions for this step. This information will be used during event diagnosis.</p>		

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	20	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

	ROR	<p>VERIFY Containment average temperature less than 120°F.</p> <ul style="list-style-type: none"> • (RNO) ENSURE proper functioning of Normal Containment Cooling. • (RNO) ENSURE at least one Containment Dome Air Circulator OPERATING. • (RNO) IF Containment pressure greater than 3.4 PSIG, THEN: <ul style="list-style-type: none"> • ENSURE the following ACTUATED: <ul style="list-style-type: none"> • SIAS • CIAS • CCAS • CRIS • ENSURE all RCPs STOPPED. • ENSURE all available Containment Emergency Cooling Units OPERATING. • (RNO) IF Containment pressure greater than 14 PSIG, THEN: <ul style="list-style-type: none"> • ENSURE CSAS ACTUATED. • ENSURE all available Containment Spray Header flows greater than 1600 GPM.
<p>Critical Task: Manually initiate Containment Spray prior to exceeding Containment temperature and pressure limits following a failure of Containment Spray to automatically actuate.</p> <p>CCT Time: _____</p>		
	RO	VERIFY Containment pressure less than 1.5 PSIG.
<p>Examiner Note: Containment pressure is not less than 1.5 psig, however the RNO actions for high Containment pressure and high Containment temperature are the same, therefore the RNO actions are not addressed twice.</p>		
	SRO	<p>VERIFY all safety function criteria per Attachment 1, WORKSHEET RECOVERED.</p> <ul style="list-style-type: none"> • (RNO) COMPLETE Attachment 2, RECOVERY DIAGNOSTICS.
<p>Examiner Note: The CRS should diagnose two events (Excess Steam Demand and Steam Generator Tube Rupture) and identify SO23-12-9, Functional Recovery, as the optimal EOI.</p>		
	SRO	<p>VERIFY REACTOR TRIP RECOVERY DIAGNOSED.</p> <ul style="list-style-type: none"> • (RNO) ENSURE at least one RCP in each loop stopped.
	SRO	INITIATE steps 12 through 17.
	SRO	IMPLEMENT EOI diagnosed.
<p>Examiner Note: The following steps are from SO23-12-9, Functional Recovery:</p>		

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	21	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

	SRO	RECORD time of EOI entry _____.
	SRO	INITIATE SO23-12-10, SAFETY FUNCTION STATUS CHECKS.
	SRO	INITIATE FOLDOUT PAGE. <ul style="list-style-type: none"> IF SIAS has actuated, THEN INITIATE FS-7, VERIFY SI Throttle/Stop Criteria. IF all RCPs are stopped, THEN INITIATE FS-3, MONITOR Natural Circulation Established. If SIAS has initiated, THEN INITIATE SO23-12-11, Attachment 22, NON-QUALIFIED LOAD RESTORATION.
	SRO	DIRECT Chemistry to sample both S/Gs for radioactivity and boron.
	SRO	NOTIFY Shift Manager/Operations Leader of entry into SO23-12-9, FUNCTIONAL RECOVERY.
	SRO	ENSURE Emergency Plan is initiated.
	SRO	IMPLEMENT PLACEKEEPER.
	SRO	IMPLEMENT TIME DEPENDENT STEPS
	SRO	VERIFY SIAS actuation required.
	SRO	ENSURE the following have actuated: <ul style="list-style-type: none"> SIAS CCAS CRIS
	SRO	RECORD time of SIAS _____.
	SRO	VERIFY CIAS actuated.
	RO	STOP unloaded Diesel Generators.
	RO	INITIATE SO23-12-11, Attachment 22, NON-QUALIFIED LOAD RESTORATION.
	RO	VERIFY RCP NPSH requirements of SO23-12-11, Attachment 30, POST-ACCIDENT PRESSURE / TEMPERATURE LIMITS satisfied. <ul style="list-style-type: none"> (RNO) STOP all RCPs AND INITIATE FS-3, MONITOR Natural Circulation Established.
	SRO	ESTABLISH two train SI operation. <ul style="list-style-type: none"> (RNO) REQUEST Shift Manager/Operations Leader to direct plant resources to establish the following support systems for non-operating/unavailable equipment.
	SRO	VERIFY any safety function recovery attachments (FR-1 through FR-7) indicated by any optimal EOI. <ul style="list-style-type: none"> (RNO) GO TO step 6c.

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	22	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

	SRO	<p>IMPLEMENT precautionary actions:</p> <ul style="list-style-type: none"> INITIATE Boration greater than 40 GPM. ENSURE one RCP in each loop stopped.
	SRO	<p>VERIFY ESDE NOT indicated.</p> <ul style="list-style-type: none"> (RNO) INITIATE SO23-12-11, Attachment 29 ISOLATION OF STEAM GENERATOR WITH ESDE. (RNO) INITIATE FS-30, ESTABLISH Stable RCS Temperature during ESDE.
	SRO	<p>VERIFY SGTR NOT indicated.</p> <ul style="list-style-type: none"> (RNO) INITIATE Attachment FR-6, RECOVERY – CONTAINMENT ISOLATION Success Path CI-2, S/G ISOLATION.
<p>Examiner Note: The following steps are from SO23-12-9, Functional Recovery, FR-6, Recovery – Containment Isolation.</p>		
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p><u>CAUTION</u></p> <p>IF the acceptance criteria of all CI Success Paths are NOT satisfied, THEN Containment Isolation Control remains jeopardized. Actions to restore Containment Isolation Control must be continued, while addressing other jeopardized safety functions.</p> </div>		
	SRO	<p>VERIFY Containment Isolation Success Path IDENTIFIED by SO23-12-10, SAFETY FUNCTION STATUS CHECKS, Attachment for Functional Recovery OR implementation directed by another EOI.</p>
<p>Examiner Note: The CRS will determine Success Path CI-2 will not work due to high containment pressure and proceed to Success Path CI-3. The following steps are from Success Path CI-3.</p>		
	SRO	<p>VERIFY Containment pressure greater than 3.4 PSIG OR Containment Area Radiation Monitors alarming or trending to alarm.</p>
	SRO	<p>VERIFY MFW NOT required for RCS Heat Removal Success Paths.</p>
	SRO	<p>ENSURE SIAS actuated.</p>
	SRO	<p>VERIFY CIAS actuated.</p>
	SRO	<p>VERIFY at least one valve in each Containment penetration not required to be open closed unless penetration open to support:</p> <ul style="list-style-type: none"> ECCS RCP operation Instrument Air S/G heat sink.
	SRO	<p>VERIFY SGTR indicated.</p>

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	23	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

NOTE

Lowering RCS T_{HOT} below 530°F using BOTH S/Gs is preferred to minimize the possibility of lifting Steam Generator safeties after isolating a Steam Generator.

	BOP	INITIATE lowering RCS T _{HOT} less than 530°F using SBCS. <ul style="list-style-type: none"> (RNO) INITIATE lowering RCS T_{HOT} less than 530°F using ADVs.
	BOP	PERFORM SO23-12-11, Attachment 28, SGTR ACTIONS.

Examiner Note: The following steps are from SO23-12-11, Attachment 28, SGTR Actions.

NOTE

Lowering RCS T_{HOT} below 530°F using BOTH S/Gs is preferred to minimize the possibility of lifting Steam Generator safeties after isolating a Steam Generator.

	BOP	ENSURE one RCP in each loop is stopped.
	BOP	INITIATE lowering RCS T _{hot} to less than 530°F using SBCS. <ul style="list-style-type: none"> (RNO) INITIATE lowering RCS T_{hot} to less than 530°F using ADVs.

CAUTION

Failure to reset S/G Low Pressure setpoints during a controlled cooldown will result in MSIS actuation.

	RO/BOP	RESET S/G low pressure setpoint during controlled cooldown.
	BOP	VERIFY SIAS actuation required: <ul style="list-style-type: none"> PZR pressure less than SIAS setpoint or trending to SIAS setpoint.
	BOP	ENSURE the following actuated: <ul style="list-style-type: none"> SIAS CCAS CRIS
	BOP	VERIFY Containment pressure less than Instrument Air pressure.

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	24	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

	BOP	OVERRIDE and OPEN HV-5388, Instrument Air to Containment Isolation valve and ENSURE HV-5343, Excess Flow Check valve open.
	BOP	IDENTIFY S/G most affected by SGTR (E088).

NOTE

Until the ruptured S/G is isolated, it is preferred to maintain the level greater than 40% NR while still maintaining Tech. Spec. cooldown limits. Maintaining level at or greater than the prescribed level improves scrubbing action and the retention of iodine in the S/G and may require override of EFAS equipment.

	BOP	OPERATE MFW or AFW to maintain affected S/G level greater than 40% NR and RCS cooldown less than 100°F in one hour. Examiner Note: This step will not be met due to the concurrent ESDE, however there is no RNO action for this step.
	SRO	NOTIFY Shift Manager of S/G most affected by SGTR.

NOTE

Heat Removal takes priority over Containment Isolation. If the ruptured S/G is the only S/G available for heat removal, it should remain in service until an alternate heat sink is made available. Alternate heat sinks can be the other S/G being made available (feedwater or steaming capability for example), or SDC can become available.

NOTE

When one S/G has an ESDE and the other S/G has a SGTR, then it is generally preferred to use the SGTR S/G for heat removal and isolate the ESDE S/G. In this context the SGTR S/G may be considered least affected.

	BOP	VERIFY at least one electric AFW Pump operating.
	BOP	VERIFY electric AFW Pump to least affected S/G operating.
	BOP	VERIFY least affected S/G available for continued heat removal.
	BOP	ENSURE RCS Thot less than 530°F.

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	25	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

NOTE

IF the electric AFW Pump associated with the *most affected* S/G is cross-tied to supply the *least affected* S/G, **THEN** it should NOT be secured.

	BOP	ISOLATE affected S/G: <ul style="list-style-type: none"> • CLOSE/STOP the following components for most affected S/G (E088): • MSIV HV-8205 • MSIV Bypass HV-8203 • ADV HV-8419 • MFIV HV-4048 • AFW valves HV-4714 and HV-4730 • Steam to AFW P-140 HV-8201 • S/G Blowdown Isolation HV-4054 • S/G Water Sample Isolation HV-4058 • Electric AFW Pump P-504
	BOP	RECORD time of S/G isolation ____.
Critical Task: Isolate S/G E-088 prior to exiting SO23-12-9, Functional Recovery.		
CCT Time: _____		
Scenario Termination: When the crew has stabilized RCS temperature and isolated SG E088, or at Lead Evaluator's discretion, the scenario may be terminated.		
Examiner Note: The following are steps 12-17 of SO23-12-1, Standard Post Trip Actions.		
	RO	INITIATE Attachment 4, ADMINISTRATIVE ACTIONS.
	RO	ENSURE a PA System announcement was made regarding the Reactor trip.
	RO	OPERATE SBCS to maintain RCS T _{COLD} between 540°F and 550°F. <ul style="list-style-type: none"> • (RNO) OPERATE ADVS to maintain RCS T_{COLD} between 540°F and 550°F.
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800S-2 (Q800S) CLOSED
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800N-2 (Q800N) CLOSED.
	RO	VERIFY all Non-1E 4kV Buses ENERGIZED.
	RO	VERIFY 480V Load Centers B15 and B16 ENERGIZED.
	RO	ENSURE 3rd Point Heater Drain Pumps STOPPED.

Operating Test :	NRC	Scenario #	5	Event #	6, 7, 8	Page	26	of	26
Event Description: ESDE from S/G E-088 on Reactor Trip, Main Turbine Fails to Trip on Reactor Trip, CSAS Fails to Auto Actuate.									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>VERIFY RTO RESET.</p> <ul style="list-style-type: none"> (RNO) IF a MFW pump in service THEN RESET RTO per SO23-9-6, Feedwater Control System Operation <p>Examiner Note: RTO will not be reset due to the loss of all feedwater.</p>
Examiner Note: RTO will not be reset due to the loss of all feedwater.		
	RO	<p>MAINTAIN one MFW Pump and a maximum of three Condensate Pumps in operation.</p> <ul style="list-style-type: none"> (RNO) ENSURE S/G levels being maintained by AFW Pumps.
	RO	<p>ENSURE FIC-3294, Condensate Pump miniflow controller set for proper Condensate pump configuration:</p> <ul style="list-style-type: none"> One pump – 4500 GPM Two pumps – 6000 GPM Three pumps – 9000 GPM
	RO	PLACE Condensate Draw-off valve LV-3245 to DISABLE.
	RO	<p>VERIFY SO23-12-2, REACTOR TRIP RECOVERY being implemented.</p> <ul style="list-style-type: none"> (RNO) ENSURE S/G Blowdown valves HV-4054 and HV-4053 CLOSED. (RNO) GO TO step 16.
	RO	<p>ENSURE the following valves closed:</p> <ul style="list-style-type: none"> Extraction Steam Block valves HV-8800, HV-8812, HV-8804, HV-8810, HV-8808, HV-8820, HV-8806, and HV-8816. Main Steam to Reheater Block, Bypass, Warmup and Control valves HV-2703 or HV-2704, HV-2721, and HV-2751. Bled Steam to Reheaters Block Valve HV-2712A/B.
	RO	VERIFY Main Generator voltage less than 24kV.
	RO	<p>VERIFY annunciators RESET:</p> <ul style="list-style-type: none"> 99A26 TURBINE LUBE OIL TEMP HI 99A46 TURBINE BRG OIL DRAIN TEMP HI
	RO	INITIATE SO23-10-2, TURBINE SHUTDOWN, Attachment for Unloading the Generator and Removing the Unit from Line.
	RO	VERIFY BOTH Start-Up Range channels OPERABLE.

Facility:	SONGS 2 & 3	Scenario No.:	6	Op Test No.:	October 2012 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions: 4% Reactor Power MOC					
Turnover: Raise power to 18% and stabilize for > 20% power surveillances.					
Critical Tasks: <ul style="list-style-type: none"> Manually trip the Reactor within one minute of the Reactor Trip Pushbuttons failure to trip the Reactor. Restore power to at least one 1E 4kV bus prior to exiting SO23-12-1, Standard Post Trip Actions. Lower Thot to less than 530°F prior to exiting SO23-12-4, Steam Generator Tube Rupture. Isolate SG E089 prior to exiting SO23-12-4, Steam Generator Tube Rupture. 					

Event No.	Malf. No.	Event Type*	Event Description
1 (20 min)		R (RO, BOP, SRO)	Raise Reactor Power to 18%
2 (30 min)	CS05C	C (RO) TS (SRO)	Refueling Water Storage Tank Level Transmitter LT-0305-3 Fails Low
3 (40 min)	FC05B	I (BOP, SRO)	SG E088 FWCS Master Controller Setpoint Fails High
4 (45 min)	ED11	I (RO, BOP, SRO)	Loss of Control Room Annunciators
5 (50 min)	SG06B	M (RO, BOP, SRO) TS (SRO)	400 GPM SGTR SG E089 (10 minute ramp)
6 (50 min)	RP02A RP02B	C (RO, SRO)	Failure of All Reactor Trip Pushbuttons to Trip the Reactor
7 (50 min)	PG24 PG57	M (RO, BOP, SRO)	Loss of Offsite Power on Reactor Trip
8 (55 min)	ELEC LP	C (BOP)	1E 4kV Bus 2A04 Reserve Aux Transformer Breaker Fails to Open on Rx Trip (EDG won't load until manually opened)
9 (55 min)	EG15B	C (BOP)	Train B EDG Fails to Auto Start (can be manually started from CR)
10 (60 min)	RP01BA		HPSI Pump P-018 Fails to Auto Start on SIAS

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

Actual	Target Quantitative Attributes
9	Total malfunctions (5-8)
5	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
2	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
4	Critical tasks (2-3)

Scenario Event Description NRC Scenario #6

SCENARIO SUMMARY NRC #6

The crew will take the watch at 4% Reactor power, preparing to enter MODE 1 and raise power to 18%. The crew will use a combination of dilutions and rod withdrawals to raise power.

When the crew has raised power to approximately 7%, Refueling Water Storage Tank transmitter LT-0305-3 will fail low. The crew will enter SO23-13-28, RPS Malfunctions and direct bypassing of the associated bistables. The CRS will evaluate Technical Specifications due to the failed transmitter.

Following the failed transmitter, S/G E-089 FWCS Master Controller setpoint will fail high. The crew will take prompt and prudent action per OSM-14, Operations Department Expectations, to take manual control of feedwater and stabilize E-089 level.

When level has been controlled, a complete loss of Control Room annunciators will occur. The crew will enter SO23-13-22, Loss of Control Room Annunciators, and take compensatory actions. When the crew directs an outside operator to investigate the cause, the operator will report that the feeder breaker for annunciator power is in the trip free position. When the CRS directs closing the breaker, a SGTR will initiate. The crew will use non-annunciator indications to determine a SGTR is in progress and enter SO23-13-14, Reactor Coolant Leak, to mitigate the leak. Annunciator power will be restored and when the SGTR becomes too large for the Reactor Coolant makeup capacity, the crew will trip the Reactor.

The manual Reactor trip pushbuttons will fail to trip the Reactor and the crew will deenergize the CEDM MG sets to insert CEAs. A loss of offsite power will occur on the Reactor trip and both 1E 4kV buses will fail to automatically reenergize. Train A 1E 4kV bus will have a Reserve Aux Transformer breaker fail to automatically open, preventing the EDG from loading onto the bus. The BOP will manually open the RAT breaker and the EDG output breaker will automatically close and reenergize the bus. Train B 1E 4kV bus will remain deenergized due to the Train B EDG failing to auto start. The BOP will recognize that there are no apparent faults and attempt to manually start the EDG. The EDG will start and load onto the bus.

SIAS will actuate when RCS pressure lowers to 1740 psia and HPSI Pump P-018 will fail to auto start. The crew will recognize this and manually start P-018.

Following SPTAs, the crew will enter SO23-12-4, SGTR, and lower RCS Thot to < 530°F. After RCS temperature has been lowered to < 530°F, the crew will isolate S/G E-089 and the scenario can be terminated.

Scenario Event Description NRC Scenario #6

Risk Significance:

- Failure of risk important system prior to trip:
 - FWCS Master Controller failure
 - Steam Generator Tube Rupture on E-089
 - Failure of RTCBs to trip the Reactor
- Risk significant core damage sequence:
 - Steam Generator Tube Rupture
 - Loss of Offsite Power
 - Failure of both 1E 4kV Buses to automatically reenergize
- Risk significant operator actions:
 - Taking manual control of the FWCS
 - Deenergizing CEDM MG sets
 - Reenergizing 1E 4kV buses
 - Manually starting HPSI Pump P-018

Scenario Event Description
NRC Scenario #6

MACHINE OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC-216, open NRC Scenario #6 and run Setup Files # 1 and # 2.

EVENT	TYPE	MALF #	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP	MALF	RP02A	Manual Rx Trip Failure Channels 2 and 3	Failure	
	MALF	RP02B	Manual Rx Trip Failure Channels 1 and 4	Failure	
	MALF	PG24	Loss of Edison Grid	Loss	Rx Trip
	MALF	EG15B	2G003 EDG Fail to Auto Start	Fail to Start	
	MALF	RP01BA	HPSI Pump P-018 Fail to Start on SIAS	Fail to Start	
	RF	PG57	Trip all SDG&E Switchyard Breakers	Trip	Rx Trip
	LP		2A04 RAT Breaker Fails As Is	Fail As Is	
	LP		2A04 RAT Breaker Fails As Is	Normal	2HS-1659-CR63-S01
1	N/A	N/A	Raise Reactor Power to 18%		
2	MALF	CS05C	RWST Level Transmitter LT-0305-3 Fails Low	0	
	RF	RP51	PPS Door Open Annunciator	Open	
	RF	RP54T	Low RWST Level Channel C Bypass	Bypass	
	RF	RP51	PPS Door Open Annunciator	Close	
3	MALF	FC05B	SG E088 Master Controller Setpoint Fails High	100	
4	MALF	ED11	Loss of Control Room Annunciators	Loss	
	MALF	ED11	Loss of Control Room Annunciators	Normal	
5	MALF	SG06B	SG E089 Tube Rupture at Top of U-Tubes	1.2	
6	Setup	Setup	Failure of All Rx Trip Pushbuttons	Failure	
7	Setup	Setup	Loss of Offsite Power	Loss	Rx Trip

Scenario Event Description NRC Scenario #6

8	Setup	Setup	2A04 RAT Breaker Fails to Auto Open on Rx Trip	Fail As Is	
9	Setup	Setup	Train B EDG 2G003 Fails to Auto Start	Fail to Start	
10	Setup	Setup	HPSI Pump P-018 Fails to Auto Start on SIAS		

Scenario Event Description
NRC Scenario #6

Machine Operator:

- **RESTORE to IC-216**
- **OPEN 2012 NRC Scenario #6 event file**
- **RUN Setup Files 1 and 2**
- **ENSURE Pressurizer Level and Pressure Selector Switches are selected to Channel Y**
- **ENSURE blend setpoints are 19.7 gpm for BA and 68.3 gpm for PMW**
- **ENSURE SO23-5-1.7 Attachment 9 MOC placard is posted**
- **ENSURE OP AID 005-23 on CR63 has BQ aligned to Unit 2, BS aligned to Unit 3**
- **ENSURE OP AID 005-11 on CR64 has E336 aligned to Unit 2, E335 aligned to Unit 3**
- **ENSURE OP AID 005-5 for Backpressure Control Valves has PV201B circled**
- **ENSURE OP AID 005-5 for Letdown Flow Control Valve has LV110A circled**
- **ENSURE alarms are active**

Control Room Annunciators in Alarm:

- **Several alarms due to being at 4% Reactor power, however no abnormal alarms**

Operating Test :	NRC	Scenario #	6	Event #	1	Page	7	of	23
Event Description: Raise Reactor Power to 18%									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: The following steps are from SO23-5-1.3.1, Plant Startup from Hot Standby to Minimum Load.

	SRO	CONTINUE power increase and log the MODE 1 Entry (> 5%): Time: _____ Date: _____
	SRO	Ensure the guidelines of Attachment 5 are being followed.

Examiner Note: The following are the most applicable guidelines of Attachment 5 for this condition:

- When power is between 3% and 17%, then MONITOR Pseudo Hot Pin ASI on CPC PID 266.
- DO NOT withdraw CEAs in response to an unplanned RCS cooldown or transient.
- CEA withdrawal shall NEVER be in response to an RCS temperature transient. Instead, the Secondary Plant should be controlled to restore RCS temperature to previous values.
- Between 1% and 20% RX Power, especially during the initial power ascension following a Refueling Outage, then use the following to determine "True" RX Power:
 - (Preferred) COLSS raw Delta-T Power, CV-9739
 - (Alternate) CPC Delta-T Power, PID-177
- If Reactor Power is above the Point of adding heat, and Power unintentionally lowers below the point of adding heat, then trip the Reactor and carry out SPTAs per SO23-12-1.

	RO	COMMENCE targeting CPC Pseudo Hot Pin ASI (PID 266) to a value of between 0.0 and -0.1 per the guidelines of Attachment 5.
	RO	INCREASE power by Boron Dilution per SO23-3-2.2 and/or CEA withdrawal per SO23-3-2.19 as directed by the SRO Ops. Supv. Periodically review Attachment 5 for power increase guidelines.

Examiner Note: The following steps are from SO23-3-2.2, Makeup Operations.

GUIDELINE

This method should normally be used for the following purposes:

- When adjusting Boron concentration prior to or during plant startup
- When diluting to raise power from one plateau to another

	RO	Implement the requirements for a Reactivity Brief and Peer check per OSM-14, Operations Department Expectations, Section for Reactivity Management.
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Operating Test :	NRC	Scenario #	6	Event #	1	Page	8	of	23
Event Description: Raise Reactor Power to 18%									
Time	Position	Applicant's Actions or Behavior							

	RO	If diluting to support plant startup, then ENSURE Shutdown Bank A is withdrawn.
	RO	ENSURE that SO23-3-2.4, Attachment for Boron Saturation of Ion Exchanger(s) is not in progress with a flowpath directed to the VCT.
	RO	VERIFY that at least one RCP is running or one train of Shutdown Cooling is in service on the RCS.
	RO	COMMENCE periodically changing Boronometer setpoints to (+50 -25 ppm) of existing Boron concentration per SO23-3-2.26, Section for Boronometer Normal Operation.
	RO	ENSURE ENTERED required dilution flowrate on FIC-0210X, PMW Flow Controller.
	RO	If flowrate change, then SELECT SET.
	RO	ENSURE FIC-0210X in AUTO.
	RO	SET FQIS-0210X, Dilution Counter, to the volume determined, as follows: <ul style="list-style-type: none"> • SELECT MODIFY. • ENTER gallons in PRESET. • SELECT SET PRESET. • SELECT EXIT.
	RO	ENSURE FV-9253, Blended Makeup to VCT Isolation, selected to AUTO.
	RO	VERIFY the correct PMW Pump is in AUTO.
	RO	COMMENCE monitoring plant parameters.
	RO	To lower VCT pressure, CYCLE HV-9209, VCT Vent Valve.
	RO	From the MODE SELECTOR, perform the following: <ul style="list-style-type: none"> • SELECT MODIFY. • SELECT DILUTE. • SELECT GO.
	RO	When the target volume has been added, then: <ul style="list-style-type: none"> • CONFIRM dilution stops automatically. • SELECT CANCEL. • SELECT AUTO. • SELECT EXIT.

Operating Test :	NRC	Scenario #	6	Event #	1	Page	9	of	23
Event Description: Raise Reactor Power to 18%									
Time	Position	Applicant's Actions or Behavior							

	RO	<p>When the dilution is complete, then perform the following:</p> <ul style="list-style-type: none"> • ENSURE FV-9253, Blended Makeup to VCT Isolation, selected to AUTO. • ENSURE LV-0227A, VCT Inlet Valve, selected to VCT. • ENSURE CLOSED HV-9209, VCT Vent Valve.
	RO	<p>Restore blend setpoint, as follows:</p> <ul style="list-style-type: none"> • ENSURE ENTERED required blend flowrate on FIC-0210X, PMW Flow Controller. • If flowrate change, then SELECT SET. • ENSURE FIC-0210X in AUTO. • Record the dilution volume added in the NCO Log.

Examiner Note: The following steps are from SO23-3-2.19, CEDMCS Operation.

GUIDELINE

This section may be used for the second and additional CEA movements after previous performance of Section 6.1, 6.2, 6.3, or when directed by SO23-3-3.5 or SO23-3-2.19.2. For repetitive manual CEA positioning, these sections and procedures ensure that a Reactivity Brief was evaluated per OSM-14.

	RO	POSITION Group Select switch to the CEA group to be moved.
Examiner Note: At this point in the startup, both groups 5 and 6 will be moving. In order to observe both groups rod position indication as they begin to move, the Group Select switch should be selected to either group 5 or 6, and an individual rod in the other group should be selected.		
	RO	If moving a single CEA, then POSITION the Individual CEA Selection Switch to the CEA to be moved.
	RO	VERIFY the Individual CEA light is ILLUMINATED.
	RO	POSITION Mode Select Switch to Manual Sequential.
	RO	VERIFY the group indicator lamps are ILLUMINATED for the group selected.
	RO	POSITION CEA(s) as directed by SRO Ops. Supv. or controlling procedure
	RO	If a CEA does not move in response to an electrical demand, then IMPLEMENT SO23-13-13.
	RO	When CEA positioning has completed, then POSITION the Mode Select Switch to OFF.

Examiner Note: When MODE 1 has been entered and Reactor Power has been raised by 3-5%, or at Lead Evaluator's discretion, proceed to Event 2, RWST Level Transmitter LT-0305-3 Fails Low.

Appendix D		Operator Action	Form ES-D-2
Operating Test : <u> NRC </u> Scenario # <u> 6 </u> Event # <u> 2 </u> Page <u> 10 </u> of <u> 23 </u>			
Event Description: <u> RWST Level Transmitter LT-0305-3 Fails Low </u>			
Time	Position	Applicant's Actions or Behavior	
Machine Operator: When directed, INITIATE Event 2, RWST Level Transmitter LT-0305-3 Fails Low.			
Indications Available: <ul style="list-style-type: none"> 56A37 RWST Level Lo Pretrip 56A27 RWST Level Lo ESFAS Channel Trip 2LI-0305-3 Lumigraph off-scale low 			
Examiner Note: The following steps are from SO23-13-18, RPS Malfunctions.			
	RO	DETERMINE failure by observing instrumentation for the affected channel AND alternate redundant indications monitoring the same plant parameters.	
NOTE For failures affecting RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip or ESFAS Actuation Logic, refer to Tech. Spec. LCO 3.3.4 and LCO 3.3.6.			
	SRO	DETERMINE a Single PPS Channel has FAILED and GO TO Step 3.	
NOTE Failure of a measured variable channel may affect more than one Functional Unit (e.g., PZR Pressure Hi affects DNBR and LPD).			
	SRO	REFER to Attachment 10 and determine Functional Unit(s) affected.	
Examiner Note: Affected bistable is Channel C bistable 20.			
	SRO	PLACE the affected Functional Unit in BYPASS per SO23-3-2.12, Section for Bypass Operation of Trip Channels.	
MO CUE: If requested to place Channel C bistable 20 in bypass, execute PPS Bypasses event.			
	SRO	CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.	
	SRO	CONFIRM failure does NOT affect the Feedwater Digital Control System.	

Operating Test : <u> NRC </u> Scenario # <u> 6 </u> Event # <u> 2 </u> Page <u> 11 </u> of <u> 23 </u>		
Event Description: <u> RWST Level Transmitter LT-0305-3 Fails Low </u>		
Time	Position	Applicant's Actions or Behavior

	SRO	<p>FOLLOW the action requirements of the applicable Tech. Spec./LCS listed in Attachment 10.</p> <ul style="list-style-type: none"> LCO 3.3.5 Condition B – One automatic trip channel inoperable for RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function. Action B.1 – Place Functional Unit in bypass within 1 hour.
Examiner Note: When the affected bistable has been placed in bypass and Technical Specifications have been evaluated, or at Lead Evaluator's discretion, proceed to Event 3, SG E088 Master Controller Setpoint Fails High.		

Operating Test : <u>NRC</u>		Scenario # <u>6</u>	Event # <u>3</u>	Page <u>12</u> of <u>23</u>
Event Description: <u>SG E088 Master Controller Setpoint Fails High</u>				
Time	Position	Applicant's Actions or Behavior		

Machine Operator: When directed, INITIATE Event 3, SG E088 Master Controller Setpoint Fails High.

Indications Available:

- 52A02 FWCS SG2 E088 Level Deviation
- Rising Level in SG E088
- Rising Output on SG E088 Master Controller

Examiner Note: The crew should take Prompt and Prudent actions to stabilize feedwater prior to referencing the applicable AOI per OSM-14, Operations Department Expectations.

	BOP	IDENTIFY failed setpoint on the Master Controller, rising SG level and rising Master Controller output.
	BOP	PLACE SG E088 Master Controller in MANUAL and lower output to control SG E088 level.
Examiner Note: The following steps are from SO23-13-24, FWCS Malfunctions. These actions will be taken after the plant is stabilized using Prompt and Prudent actions.		
	BOP	VERIFY SG Level Control Channel NOT FAILED.
	BOP	VERIFY the FWCS in AUTO.
	BOP	VERIFY Steam Generator levels remain stable. <ul style="list-style-type: none"> • (RNO) GO TO Attachment 1.
	BOP	VERIFY most affected S/G Master Controller output lowering. <ul style="list-style-type: none"> • (RNO) Place the Master Controller in MANUAL and lower output.
	BOP	VERIFY the FWCS is functioning correctly with all components in AUTO. <ul style="list-style-type: none"> • (RNO) OPERATE the FWCS in MANUAL per SRO direction to control Steam Generator levels.

Examiner Note: When SG E088 Master Controller has been placed in MANUAL and level is being controlled, or at Lead Evaluator's discretion, proceed to Event 4, Loss of Control Room Annunciators.

Operating Test :	NRC	Scenario #	6	Event #	4, 5	Page	13	of	23
Event Description: Loss of Control Room Annunciators, SG E089 Tube Rupture									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, INITIATE Event 4, Loss of Control Room Annunciators.		
Indications Available: <ul style="list-style-type: none"> Loss of Annunciator Power alarm Loss of power to all other Control Room annunciators 		
Examiner Note: The following steps are from SO23-13-22, Loss of Control Room Annunciators.		
	SRO	Verify that a Unit trip has not occurred.
	RO/BOP	TEST all Control Room annunciator panels to determine the extent of the power loss.
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="margin: 0;">NOTE</p> <p style="margin: 5px 0;">Loss of All Control Room Annunciator power can be identified by annunciator UA0050C being in alarm. This alarm is powered from the NON 1-E UPS Instrument Bus Q065.</p> </div>		
	SRO	VERIFY a loss of ALL Control Room Annunciator Panels has occurred. <ul style="list-style-type: none"> NOTIFY the Shift Manager to determine event classification and reportability per SO123-VIII-1 and SO123-0-A7. RECORD time that ALL annunciators were lost . GO to Step 3.
	SRO	INITIATE increased monitoring of plant parameters per Attachment 3 guidelines.
	SRO	VERIFY no activities or evolutions are in progress which could potentially disrupt plant stability.
	SRO	NOTIFY Electrical Maintenance to assist with troubleshooting and restoration of power.
	SRO	INITIATE Attachment 4 to determine location of Annunciator power loss and to restore power.
Examiner Note: The following steps are from Attachment 4 to determine the location of Annunciator power loss and to restore power.		
	SRO	VERIFY ENERGIZED D5 125V D.C. Bus.
	SRO	VERIFY CLOSED D5-06, D5P4 Distribution Panel Power Supply Breaker.
MO CUE: When directed to verify closed D5-06, wait 2 minutes and report that breaker D5-06 is closed.		
Machine Operator: When directed, INITIATE Event 5, SG E089 Steam Generator Tube Rupture.		
	SRO	VERIFY CLOSED D5P4-74, L-040 Annunciator Logic Cabinet Power Supply Breaker. <ul style="list-style-type: none"> (RNO) ATTEMPT one reclose of Breaker D5P4-74.

Operating Test :	NRC	Scenario #	6	Event #	4, 5	Page	14	of	23
Event Description: Loss of Control Room Annunciators, SG E089 Tube Rupture									
Time	Position	Applicant's Actions or Behavior							

MO CUE: When directed to verify closed D5P4-74, report that D5P4-74 is in the tripped free position. Wait for direction from the Floor Instructor prior to reclosing D5P4-74.		
Examiner Note: The intention of this timing sequence is for the crew to recognize that a SG Tube Rupture has occurred prior to restoring power to Control Room Annunciators. When the crew recognizes the leak, the Floor Instructor will direct the Machine Operator to close breaker D5P4-74.		
Examiner Note: The following steps are from SO23-13-14, Reactor Coolant Leak.		
	SRO	EVALUATE plant conditions against the following to Identify leak location and Procedural Steps to perform.
Examiner Note: The CRS should determine a SGTL is in progress and go to step 4.		
	RO	VERIFY Pressurizer level – NOT LOWERING. <ul style="list-style-type: none"> ENSURE all available Charging Pumps in AUTO to maintain Pressurizer level.
	RO	VERIFY Pressurizer level – NOT LOWERING with all available Charging Pumps in operation. <ul style="list-style-type: none"> (RNO) ISOLATE Letdown by closing one of the following valves: <ul style="list-style-type: none"> TV-0221, LTDN Temperature Control Valve HV-9204, LTDN Isolation Valve TV-9267, LTDN Containment Isolation Valve
	RO	VERIFY Pressurizer Level - STABLE or RISING. <ul style="list-style-type: none"> (RNO) If in Mode 1 or 2, then TRIP the Reactor and GO TO SO23-12-1, Standard Post Trip Actions.
Examiner Note: Events 6, 7, 8, 9, and 10 will automatically initiate when the crew attempts to trip the Reactor.		

Operating Test :	NRC	Scenario #	6	Event #	6, 7, 8, 9, 10	Page	15	of	23
Event Description: Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: The following steps are from SO23-12-1, Standard Post Trip Actions.

	RO	VERIFY Reactor Trip Circuit Breakers (8) OPEN. <ul style="list-style-type: none"> (RNO) PERFORM the following as necessary to insert CEAs: <ul style="list-style-type: none"> MANUALLY TRIP the Reactor 480V Load Centers B15 and B16 DE-ENERGIZED ALL RTCBs LOCALLY OPENED.
Critical Task: Manually trip the Reactor within one minute of the Reactor Trip Pushbuttons failure to trip the Reactor.		
CCT Time: _____		
	RO	VERIFY Reactor power LOWERING AND Startup rate NEGATIVE.
	RO	VERIFY maximum of one full length CEA NOT fully inserted.
	BOP	ALL HP and LP Stop and Governor valves CLOSED.
	BOP	VERIFY BOTH Unit Output Breakers OPEN.
	BOP	VERIFY Main Turbine speed less than 2000 RPM OR lowering.
	SRO	INITIATE Attachment 1, WORKSHEET.
	BOP	VERIFY BOTH 1E 4kV Buses ENERGIZED. <ul style="list-style-type: none"> (RNO) ENSURE associated EDG OPERATING. (RNO) ENSURE associated EDG output breaker CLOSED.
Critical Task: Restore power to at least one 1E 4kV bus prior to exiting SO23-12-1, Standard Post Trip Actions.		
CCT Time: _____		
	BOP	VERIFY all 1E 480V buses ENERGIZED.
	BOP	VERIFY all Class 1E DC Buses ENERGIZED.
	BOP	VERIFY all Non-1E 4kV Buses ENERGIZED. <ul style="list-style-type: none"> (RNO) RESTORE power to affected bus(es) as time and resources permit.

Operating Test :	NRC	Scenario #	6	Event #	6, 7, 8, 9, 10	Page	16	of	23
Event Description: Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

	BOP	<p>VERIFY one CCW Train OPERATING AND aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger.</p> <ul style="list-style-type: none"> • (RNO) START an available CCW Train. • (RNO) IF CIAS ACTUATED, THEN ENSURE all RCPs STOPPED AND GO TO step 5. • (RNO) ALIGN the CCW NCL and Letdown Heat Exchanger to an operating CCW Train.
	RO	<p>VERIFY PZR level between 10% and 70% AND trending to between 30% and 60%.</p> <ul style="list-style-type: none"> • (RNO) ENSURE PZR Level Control System OPERATING in AUTO or MANUAL to restore PZR level.
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F.
	RO	<p>VERIFY PZR pressure between 1740 PSIA and 2380 PSIA AND trending to between 2025 PSIA and 2275 PSIA.</p> <ul style="list-style-type: none"> • (RNO) ENSURE PZR Pressure Control System OPERATING in AUTO or MANUAL to restore PZR pressure. • (RNO) IF PZR pressure less than PZR Pressure Control System Setpoint and lowering, THEN ENSURE Normal and Auxiliary Spray valves CLOSED. • (RNO) IF PZR pressure less than 1740 PSIA, THEN ENSURE the following ACTUATED: <ul style="list-style-type: none"> • SIAS • CCAS • CRIS. • (RNO) IF PZR pressure less than or equal to 1430 PSIA, THEN ENSURE one RCP in each loop STOPPED. • (RNO) IF RCP NPSH requirements of Attachment 3, POST-ACCIDENT PRESSURE / TEMPERATURE LIMITS NOT SATISFIED, THEN ENSURE all RCPs – STOPPED.
	RO	<p>VERIFY at least one RCP OPERATING.</p> <ul style="list-style-type: none"> • (RNO) GO TO step c.
	RO	VERIFY Core Exit Saturation Margin greater than or equal to 20°F:
	BOP	VERIFY at least one S/G level between 21% NR and 80% NR AND Feedwater – AVAILABLE.
	BOP	VERIFY RCS T _{coLD} between 540°F and 550°F.
	BOP	VERIFY S/G pressures between 960 PSIA and 1050 PSIA.

Operating Test :	NRC	Scenario #	6	Event #	6, 7, 8, 9, 10	Page	17	of	23
Event Description: Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

	RO	VERIFY Containment pressure less than 1.5 PSIG.
	RO	VERIFY Containment Area Radiation Monitors NOT alarming or trending to alarm.
	RO	VERIFY Secondary Plant Radiation Monitors NOT alarming or trending to alarm. (Although Secondary Plant Radiation Monitors ARE alarming, there is no RNO action for this step – diagnosis use only)
	RO	VERIFY Containment average temperature less than 120°F.
	RO	VERIFY Containment pressure less than 1.5 PSIG.
	RO	VERIFY all safety function criteria per Attachment 1, WORKSHEET RECOVERED. <ul style="list-style-type: none"> • (RNO) COMPLETE Attachment 2, RECOVERY DIAGNOSTICS.
Examiner Note: The CRS should diagnose a single event, Steam Generator Tube Rupture and identify SO23-12-4, Steam Generator Tube Rupture, as the optimal EOI.		
MO CUE: If the GOC is called about the status of getting offsite power back, inform them that offsite power is not expected to be available for 1-2 hours.		
	SRO	VERIFY REACTOR TRIP RECOVERY DIAGNOSED. <ul style="list-style-type: none"> • (RNO) ENSURE at least one RCP in each loop stopped.
	SRO	INITIATE steps 12 through 17.
Examiner Note: Steps 12 through 17 of SO23-12-1, Standard Post Trip Actions, are located at the end of the scenario guide.		
	SRO	IMPLEMENT EOI diagnosed.
Examiner Note: The following steps are from SO23-12-4, Steam Generator Tube Rupture.		
	SRO	RECORD time of EOI entry _____.
	SRO	INITIATE SO23-12-10, SAFETY FUNCTION STATUS CHECKS.

Operating Test :	NRC	Scenario #	6	Event #	6, 7, 8, 9, 10	Page	18	of	23
Event Description: Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

	SRO	<p>INITIATE FOLDOUT PAGE:</p> <ul style="list-style-type: none"> IF SIAS has actuated, THEN INITIATE FS-7, VERIFY SI Throttle/Stop Criteria. IF all RCPs are stopped, THEN INITIATE FS-3, MONITOR Natural Circulation Established. IF at least one 220kV switchyard section is NOT energized to the Unit via Reserve Auxiliary or Unit Auxiliary Transformers, THEN INITIATE SO23-12-11, Attachment 8, RESTORATION OF OFFSITE POWER. IF there is a loss of offsite power, THEN INITIATE SO23-12-11, Attachment 19, NON-1E DC LOAD REDUCTION. IF SIAS has initiated, THEN INITIATE SO23-12-11, Attachment 22, NON-QUALIFIED LOAD RESTORATION. IF ALL Circulating Water pumps are OFF, THEN INITIATE FS-18, ESTABLISH Secondary Plant Protection.
	SRO	VERIFY SGTR diagnosis using Figure 1, BREAK IDENTIFICATION CHART.
	SRO	INITIATE sampling of both Steam Generators for radioactivity and boron.
	SRO	NOTIFY Shift Manager/Operations Leader of SO23-12-4, STEAM GENERATOR TUBE RUPTURE initiation.
	SRO	ENSURE Emergency Plan is initiated.
	SRO	IMPLEMENT PLACEKEEPER.
	SRO	IMPLEMENT TIME DEPENDENT STEPS

NOTE

Lowering RCS T_{HOT} below 530°F using BOTH S/Gs is preferred to minimize the possibility of lifting Steam Generator safeties after isolating a Steam Generator.

	SRO	ENSURE one RCP in each loop stopped.
	BOP	<p>INITIATE lowering RCS T_{HOT} to less than 530°F using SBCS.</p> <ul style="list-style-type: none"> (RNO) INITIATE lowering RCS T_{HOT} to less than 530°F using both ADVs.

CAUTION

Failure to reset S/G Low Pressure setpoints during a controlled cooldown will result in MSIS actuation.

Operating Test :	NRC	Scenario #	6	Event #	6, 7, 8, 9, 10	Page	19	of	23
Event Description: Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

	RO/BOP	RESET S/G low pressure setpoint during controlled cooldown.
	SRO	VERIFY SIAS actuation required: <ul style="list-style-type: none"> PZR pressure: <ul style="list-style-type: none"> less than SIAS setpoint OR trending to SIAS setpoint
	SRO	ENSURE the following actuated: <ul style="list-style-type: none"> SIAS CCAS CRIS
	SRO	RECORD time of SIAS _____.
	RO	STOP unloaded Diesel Generators.
	SRO	INITIATE SO23-12-11, Attachment 22, NON-QUALIFIED LOAD RESTORATION.
	SRO	VERIFY Containment pressure less than Instrument Air pressure.
	RO	OVERRIDE and OPEN HV-5388 Instrument Air to Containment Isolation Valve AND ENSURE Excess Flow Check valve HV-5343 open.
	SRO	ESTABLISH two train operation: <ul style="list-style-type: none"> All available Charging Pumps operating. One HPSI and one LPSI per train operating. All Cold Leg flow paths aligned. VERIFY SI flow required: <ul style="list-style-type: none"> SI flow indicated OR RCS pressure greater than 1250 PSIA. OR VERIFY FS-7, VERIFY SI Throttle/Stop Criteria satisfied.
	SRO	VERIFY most affected S/G identified.
	BOP	OPERATE MFW or AFW to maintain affected S/G level greater than 40% NR AND RCS cooldown less than 100°F in one hour.
	SRO	NOTIFY Shift Manager/Operations Leader most affected S/G identified.

Operating Test :	NRC	Scenario #	6	Event #	6, 7, 8, 9, 10	Page	20	of	23
Event Description: Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

NOTE

Heat Removal takes priority over Containment Isolation. If the ruptured S/G is the only S/G available for heat removal, it should remain in service until an alternate heat sink is made available. Alternate heat sinks can be the other S/G being made available (feedwater or steaming capability for example), or SDC can become available.

	SRO	VERIFY at least one electric AFW Pump operating.
	SRO	VERIFY electric AFW Pump to least affected S/G operating.
	SRO	VERIFY least affected S/G available for continued heat removal.
	BOP	ENSURE RCS T _{HOT} less than 530°F.

Critical Task: Lower T_{hot} to less than 530°F prior to exiting SO23-12-4, Steam Generator Tube Rupture.

CCT Time: _____

NOTE

IF the electric AFW Pump associated with the *most* Affected S/G is X-tied to supply the *least affected* S/G, THEN it should NOT be secured.

	BOP	ISOLATE affected S/G by CLOSING/STOPPING the following components for most affected S/G (E089): <ul style="list-style-type: none"> • MSIV HV-8204 • MSIV Bypass HV-8202 • ADV HV-8421 • MFIV HV-4052 • AFW valves HV-4731 and HV-4715 • Steam to AFW P-140 HV-8200 • S/G Blowdown Isolation HV-4053 • S/G Water Sample Isolation HV-4057 • Electric AFW Pump P-141
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Critical Task: Isolate SG E089 prior to exiting SO23-12-4, Steam Generator Tube Rupture.

CCT Time: _____

	SRO	RECORD time of S/G isolation _____.
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Operating Test :	NRC	Scenario #	6	Event #	6, 7, 8, 9, 10	Page	21	of	23
Event Description: Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Scenario Termination: When RCS Thot has been lowered to < 530°F and SG E089 has been isolated, or at Lead Evaluator's discretion, the scenario may be terminated.

Examiner Note: The following are steps 12-17 of SO23-12-1, Standard Post Trip Actions.

	RO	INITIATE Attachment 4, ADMINISTRATIVE ACTIONS.
	RO	ENSURE a PA System announcement was made regarding the Reactor trip.
	RO	OPERATE SBCS to maintain RCS T _{COLD} between 540°F and 550°F. <ul style="list-style-type: none"> • (RNO) OPERATE ADVS to maintain RCS T_{COLD} between 540°F and 550°F.
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800S-2 (Q800S) CLOSED: <ul style="list-style-type: none"> • (RNO) DEPRESS OVERRIDE pushbutton HS0800S-2 AND VERIFY associated breaker closed. OR • (RNO) ENSURE opposite unit TELECOM 480VAC FDR BKR HS0800S-2 CLOSED. OR • (RNO) REQUEST Shift Manager/Operations Leader to direct plant resources to resources to restore Telecom power.
	RO	VERIFY TELECOM 480VAC FDR BKR HS0800N-2 (Q800N) CLOSED: <ul style="list-style-type: none"> • (RNO) DEPRESS OVERRIDE pushbutton HS0800N-2 AND VERIFY associated breaker closed OR • (RNO) ENSURE opposite unit TELECOM 480VAC FDR BKR HS0800N-2 CLOSED OR • (RNO) REQUEST Shift Manager/Operations Leader to direct plant resources to resources to restore Telecom power.
	RO	VERIFY all Non-1E 4kV Buses ENERGIZED. <ul style="list-style-type: none"> • (RNO) TRANSFER Non-1E 4kV Buses to available Reserve Auxiliary Transformers. • (RNO) IF ALL Circulating Water pumps OFF, THEN: <ul style="list-style-type: none"> • ENSURE MSIVs closed. AND • OPERATE ADVs to maintain S/G pressure between 960 PSIA and 1050 PSIA.

Operating Test :	NRC	Scenario #	6	Event #	6, 7, 8, 9, 10	Page	22	of	23
Event Description:	Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start								
Time	Position	Applicant's Actions or Behavior							

	RO	<p>VERIFY 480V Load Centers B15 and B16 ENERGIZED:</p> <ul style="list-style-type: none"> • (RNO) VERIFY 56A20, REACTOR TRIPPED CEDMCS DE-ENERGIZED alarming. • (RNO) VERIFY CEDM M/G Set Output contactors OPEN.
	RO	ENSURE 3 rd Point Heater Drain Pumps STOPPED.
	RO	<p>VERIFY RTO RESET.</p> <ul style="list-style-type: none"> • (RNO) IF a MFW pump in service THEN RESET RTO per SO23-9-6, Feedwater Control System Operation
	RO	<p>MAINTAIN one MFW Pump and a maximum of three Condensate Pumps in operation.</p> <ul style="list-style-type: none"> • (RNO) ENSURE S/G levels – being maintained by AFW Pumps.
	RO	<p>ENSURE FIC-3294, Condensate Pump miniflow controller to – set for proper Condensate pump configuration:</p> <ul style="list-style-type: none"> • One pump – 4500 GPM • Two pumps – 6000 GPM • Three pumps – 9000 GPM
	RO	PLACE Condensate Draw-off valve LV-3245 to – DISABLE.
	RO	<p>VERIFY SO23-12-2, REACTOR TRIP RECOVERY being implemented.</p> <ul style="list-style-type: none"> • (RNO) ENSURE S/G Blowdown valves HV-4054 and HV-4053 CLOSED. • (RNO) GO TO step 16.
	RO	<p>ENSURE the following valves closed:</p> <ul style="list-style-type: none"> • Extraction Steam Block valves HV-8800, HV-8812, HV-8804, HV-8810, HV-8808, HV-8820, HV-8806, and HV-8816. • Main Steam to Reheater Block, Bypass, Warmup and Control valves HV-2703 or HV-2704, HV-2721, and HV-2751. • Bled Steam to Reheaters Block Valve HV-2712A/B. • (RNO) IF MSR isolation valves CANNOT be verified closed AND RCS T_{COLO} uncontrolled, THEN: <ul style="list-style-type: none"> • CLOSE MSIVs. • OPERATE ADVs to maintain S/G pressure between 960 PSIA and 1050 PSIA.
	RO	VERIFY Main Generator voltage less than 24kV.
	RO	<p>VERIFY annunciators 99A26 TURBINE LUBE OIL TEMP HI and 99A46 TURBINE BRG OIL DRAIN TEMP HI RESET.</p> <ul style="list-style-type: none"> • (RNO) CONTROL lube oil temperature locally.

Operating Test : <u> NRC </u> Scenario # <u> 6 </u> Event # <u> 6, 7, 8, 9, 10 </u> Page <u> 23 </u> of <u> 23 </u>		
Event Description: Failure of all Rx Trip Pushbuttons, Loss of Offsite Power, Train B EDG Fails to Auto Start, 2A04 RAT Breaker Fails to Auto Open, HPSI Pump P-018 Fails to Auto Start		
Time	Position	Applicant's Actions or Behavior

	RO	INITIATE SO23-10-2, TURBINE SHUTDOWN, Attachment for Unloading the Generator and Removing the Unit from Line.
	RO	VERIFY BOTH Start-Up Range channels OPERABLE.