Facility: SONGS JPM # NRC SA1 Task #187652 K/A #2.1.23 4.3 / 4.4

Title: Perform DNBR Margin Limit Verification

Examinee (Print): _____ Examiner (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	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 1 at 90% power.
- Core Axial Shape Index (ASI) and DNBR readings are as follows:

Point ID 268	Point ID 406
Channel A ASI = - 0.0163	Channel A DNBR = 2.24
Channel B ASI = - 0.0201	Channel B DNBR = 2.15
Channel C ASI = - 0.0285	Channel C DNBR = 1.34
Channel D ASI = - 0.0196	Channel D DNBR = 2.28

- Both CEACs and all CPCs are OPERABLE.

Initiating Cue: The SRO Operations Supervisor directs you to PERFORM the following:

- CALCULATE DNBR Margin Limit Verification per SO23-3-3.6, COLSS Out of Service Surveillance, Attachment 2, DNBR Margin / Linear Heat Rate / ASI Limit Verification.
- COMPLETE Attachment 2 through Step 3.5.

Task Standard: Calculate DNBR Margin Limit and verify Acceptance Criteria per SO23-3-3.6.

Required Materials: SO23-3-3.6, COLSS Out of Service Surveillance, Rev. 13.

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

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Signature): _____ Date: _____

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-3-3.6, COLSS Out of Service Surveillance.**
- **INITIAL Step 1.1.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-3-3.6, Attachment 2. Specific steps in the Attachment are annotated in each Comment box.**
Perform Step:	Determine CEAC operability status: • One or both CEACs are Operable. Mark N/A for Step 3.3 and perform all other steps.
Standard:	DETERMINE both CEACs OPERABLE per Initial Conditions and CHECK (✓) box for One or both CEACs are OPERABLE and MARK Step 3.3 N/A.
Comment: Steps 1.2 & 1st box	**SAT ☐ UNSAT ☐**

Examiner Note:	**Failure to carry forward the negative (-) signs from the Initial Conditions will result in an UNSAT.**
Perform Step: √	Record Axial Shape Index (ASI) values from each operable CPC channel (Point ID 268).
Standard:	RECORD Axial Shape Index (ASI) values from information provided in the Initial Conditions at Step 3.1.
Comment: Step 3.1	**SAT ☐ UNSAT ☐**

Perform Step: √	When one or both CEACs are Operable, then determine for each CPC channel, the "CPC Minimum Allowable DNBR" (MINDNBR) for the ASI value from Step 3.1: • **Current power ≥ 90% RTP:** Use LCS Figure 3.2.101-1A or the following expression for each CPC Channel: • If ASI (Step 3.1) is less than 0.1, then MINDNBR is equal to (0.6 x ASI) + 2.14.
Standard:	CALCULATE then RECORD MINDNBR using the equation from Step 3.2.1.1.
Comment: Steps 3.2, 3.2.1, & 3.2.1.1	**SAT ☐ UNSAT ☐**

Perform Step:	If ASI is greater than 0.1, then MINDNBR is equal to 2.2.
Standard:	DETERMINE ASI is less than 0.1.
Comment: Step 3.2.1.2	**SAT ☐ UNSAT ☐**

Perform Step: √	Record MINDNBR from either Step 3.2.1.1 or 3.2.1.2 for each Operable CPC channel.
Standard:	RECORD MINDNBR from Step 3.2.1.1 for each OPERABLE CPC Channel at Step 3.2.1.3.
Comment: Step 3.2.1.3	**SAT** ☐ **UNSAT** ☐

Perform Step:	**Current power < 90% RTP:** Use LCS Figure 3.2.101-1B or the following expression for each CPC Channel: (Mark N/A Step 3.2.2 if current power > 90% RTP.)
Standard:	MARK Step 3.2.2 N/A.
Comment: Step 3.2.2	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Record the indicated DNBR from each Operable CPC channel (Point ID 406).
Standard:	RECORD indicated DNBR values from information provided in the Initial Conditions.
Comment: Step 3.4	**SAT** ☐ **UNSAT** ☐

Perform Step: √	**Acceptance Criteria**: At least one Operable CPC channel is indicating a DNBR (Step 3.4) greater than the MINDNBR determined in Step 3.2 or 3.3 (as applicable).
Standard:	DETERMINE Acceptance Criteria is met and CIRCLE YES.
Terminating Cue:	**This JPM is complete.**
Comment: Steps 3.5 & 3.5.1	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 is in MODE 1 at 90% power.**
- **Core Axial Shape Index (ASI) and DNBR readings are as follows:**

	Point ID 268	Point ID 406
•	**Channel A ASI = - 0.0163**	**Channel A DNBR = 2.24**
•	**Channel B ASI = - 0.0201**	**Channel B DNBR = 2.15**
•	**Channel C ASI = - 0.0285**	**Channel C DNBR = 1.34**
•	**Channel D ASI = - 0.0196**	**Channel D DNBR = 2.28**

- **Both CEACs and all CPCs are OPERABLE.**

INITIATING CUE: **The SRO Operations Supervisor directs you to PERFORM the following:**

- **CALCULATE DNBR Margin Limit Verification per SO23-3-3.6, COLSS Out of Service Surveillance, Attachment 2, DNBR Margin / Linear Heat Rate / ASI Limit Verification.**
- **COMPLETE Attachment 2 through Step 3.5.**

Facility: SONGS JPM # NRC SA2 Task #187652 K/A #2.1.25 3.9 / 4.2

Title: Perform Monthly Surveillance to Update Power Maneuvering Guidelines

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	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 on October 18, 2010:

- Unit 2 is at Hot Full Power (HFP) boron concentration of 1475 ppm.
- Beginning of Core burnup is 75 EFPD.
- T-071, Boric Acid Makeup Tank is at 5800 ppm.
- Reactor Engineering has just released a revision to the Operations Physics Summary using normalized values for Cycle 16 operation.

Initiating Cue: The SRO Operations Supervisor directs you to PERFORM the following:

- COMPLETE a Cycle 16 BOC Power Maneuvering Guideline per SO23-5-1.7, Power Operations, Attachment 8, Power Maneuvering Guidelines, through Step 2.6.
- COMPLETE the Operating Thumbrules Table at the end of Attachment 8, Power Maneuvering Guidelines.

Task Standard: Complete a Cycle 16 BOC Power Maneuvering Guideline per SO23-5-1.7.

Required Materials: SO23-5-1.7, Power Operations, Rev. 45.

SO23-XXXVII-13, Document M-38100, Ops Physics Summary Change Unit 2, Cycle 16, Rev.58.

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:

- **SO23-5-1.7, Power Operations.**
  - **Attachment 8, Power Maneuvering Guidelines.**
    - **INITIAL Step 1.1.**
  - **Attachment 15, Power Operations Limitations and Specifics.**
- **M-38100 Ops Physics Summary Unit 2 Cycle 16.**
  - **Table 10-1, HFP Operating Thumbrules.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-5-1.7, Attachment 8. Specific steps in the Attachment are annotated in each Comment box.**
Perform Step:	SELECT a BAMU Tank to be used. • ☐ MT-071 ☐ MT-072 • Boron Conc. _____ ppm
Standard:	CHECK box for BAMU Tank T-071 and RECORD 5800 ppm and INITIAL at Step 2.1.
Comment: Step 2.1	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Calculate Boron Concentration in Percent Weight for the selected BAMU Tank in Step 2.1. • % Weight = Concentration in ppm / 1748 ppm / % weight = _____ = _____ % weight
Standard:	CALCULATE and RECORD BAMU Tank 3.32% weight and INITIAL at Step 2.2.
Comment: Step 2.2	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Enter the Thumbrule Boration Gallons for 1% Power Decrease from the Ops Physics Summary (OPS) Table 10.1: • _____ Gallons
Standard:	INTERPOLATE burnup using Operations Physics Summary Table 10.1 and ENTER 21 Boration Gallons for 1% Power Decrease and INITIAL at Step 2.3.
Comment: Step 2.3	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Calculate the volume of boron needed for a 1% power reduction, as follows: • Gallons = Thumbrule Gallons (Step 2.3) X 3.4 %weight / Actual %weight (Step 2.2)
Standard:	CALCULATE 21.5 gallons of Boric Acid and INITIAL at Step 2.4.
Comment: Step 2.4	**SAT** ☐ **UNSAT** ☐

Perform Step:	Use the Gallons calculated in Step 2.4 to fill in the Table on the top of the following Page for the appropriate percent power decrease.
Standard:	ENTER Unit 2, 75 EFPD, 1475 ppm, and October at the top of page 2 and COMPLETE Table for Boration and INITIAL at Step 2.5.
Comment: Step 2.5	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Calculate the change in MWE for a 1ºF change in Tcold, as follows: • (OPS) Table 10.1, "% pwr change for 1 deg. temperature change
Standard:	CALCULATE % power per 1ºF change in T_{COLD} using Operations Physics Summary Table 10.1 and ENTER 1.0 and 10 MWe and INITIAL at Step 2.6.
Comment: Step 2.6	**SAT** ☐ **UNSAT** ☐

Perform Step:	<u>OPERATING THUMBRULES</u> • Fill in the Table below using the Operating Thumbrules of the Operations Physics Summary.
Standard:	COMPLETE the Operating Thumbrules Table in Attachment 8 per the Answer Key.
Terminating Cue:	**This JPM is complete.**
Comment: Attachment 8, Page 2 of 2	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions on October 18, 2010:**

- **Unit 2 is at Hot Full Power (HFP) boron concentration of 1475 ppm.**
- **Beginning of Core burnup is 75 EFPD.**
- **T-071, Boric Acid Makeup Tank is at 5800 ppm.**
- **Reactor Engineering has just released a revision to the Operations Physics Summary using normalized values for Cycle 16 operation.**

INITIATING CUE: **The SRO Operations Supervisor directs you to PERFORM the following:**

- **COMPLETE a Cycle 16 BOC Power Maneuvering Guideline per SO23-5-1.7, Power Operations, Attachment 8, Power Maneuvering Guidelines, through Step 2.6.**
- **COMPLETE the Operating Thumbrules Table at the end of Attachment 8, Power Maneuvering Guidelines.**

Facility: SONGS JPM # NRC SA3 Task #187652 K/A #2.2.37 3.6 / 4.6

Title: Evaluate Reactor Trip Breaker Operability

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
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:

- A Partial Scheduled Surveillance is due on four (4) Reactor Trip Circuit Breakers.
- I&C is standing by in the CEDMCS Room to verify Undervoltage Coils are RESET following testing.
- All Prerequisites have been met.

Initiating Cue: The SRO Operations Supervisor directs you to PERFORM the following:

- EXERCISE Reactor Trip Circuit Breakers 1 & 5 then 3 & 7, per SO23-3-3.5, CEA / Reactor Trip Circuit Breaker Operability Testing, Attachment 3, Reactor Trip Circuit Breaker Monthly Test - Modes 1 and 2.

Task Standard: Exercise Reactor Trip Circuit Breakers 1 & 5 and 3 & 7 per SO23-3-3.5 and identify Limiting Conditions for Operations that are NOT met per Unit 2 Technical Specifications.

Required Materials: SO23-3-3.5 CEA / Reactor Trip Circuit Breaker Operability Testing, Rev. 17-1.

Unit 2 Technical Specifications located in Simulator.

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

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC SA3 or any at power Initial Condition and ENSURE the following:

- **ENSURE Key #95 is located in the Key Locker at the ACO Desk.**
- **EXECUTE the following malfunctions:**
  - **RP22C, RTCB #3 fails AS IS.**
  - **RP22G, RTCB #7 fails AS IS.**

MACHINE OPERATOR NOTE:

- **REMOVE Key #95 from Channel C PPS and REPLACE in the Key Locker at the ACO Desk.**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-3-3.5, CEA / Reactor Trip Circuit Breaker Operability Testing.**
  - **Attachment 3, Reactor Trip Circuit Breaker Monthly Test - Modes 1 and 2.**
    - **INITIAL and N/A as appropriate through Step 1.3.**
    - **CHECK box at Step 1.2 for Partial Scheduled Surveillance.**
  - **Attachment 6, CEA / Reactor Trip Circuit Breaker Operability Testing Limitations and Specifics.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-3-3.5, Attachment 3. Specific steps in the Attachment are annotated in each Comment box.**
Perform Step:	**Test Reactor Trip Circuit Breakers TCB-1 and TCB-5:** • Verify all RTCBs are Closed.
Standard:	OBSERVE Control Room Reactor Trip Status Panel and DETERMINE all Reactor Trip Circuit Breakers are CLOSED and INITIAL at Step 2.1.1.
Comment: Steps 2.1 & 2.1.1	**SAT ☐ UNSAT ☐**

Perform Step:	Verify current flow on each phase of TCB-1 and TCB-5.
Standard:	OBSERVE Control Room Reactor Trip Status Panel and DETERMINE three (3) TCB-1 and three (3) TCB-5 white current lights LIT and INITIAL at Step 2.1.2.
Comment: Step 2.1.2	**SAT ☐ UNSAT ☐**

Perform Step: √	At CR-53, depress HS-9132-1, Reactor Trip 1 pushbutton.
Standard:	DEPRESS 2HS-9132-1, Reactor Trip 1 pushbutton, ACKNOWLEDGE Annunciator 56A19 - REACTOR TRIP CIRCUIT BREAKER OPEN (expected) and INITIAL at Step 2.1.3.
Comment: Step 2.1.3	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY TCB-1 OPEN indication ILLUMINATED on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status Panel.
Standard:	OBSERVE green TCB-1 OPEN light LIT on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status Panel, CIRCLE YES, and INITIAL at Step 2.1.3.1.
Comment: Step 2.1.3.1	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY TCB-5 OPEN indication ILLUMINATED on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status.
Standard:	OBSERVE green TCB-5 OPEN light LIT on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status Panel, CIRCLE YES, and INITIAL at Step 2.1.3.2.
Comment: Step 2.1.3.2	**SAT ☐ UNSAT ☐**

Perform Step:	If either RTCB fails to open, then perform the following: (Mark N/A if both RTCBs opened.)
Standard:	MARK N/A and INITIAL at Step 2.1.3.3.
Comment: Step 2.1.3.3	**SAT** ☐ **UNSAT** ☐

Perform Step:	Verify TCB-1 REMAINS OPEN after Reactor Trip 1 pushbutton is released.
Standard:	DETERMINE TCB-1 green OPEN light remains LIT on Control Room Reactor Trip Status Panel and INITIAL at Step 2.1.3.4.
Comment: Step 2.1.3.4	**SAT** ☐ **UNSAT** ☐

Perform Step:	Verify TCB-5 REMAINS OPEN after Reactor Trip 1 pushbutton is released.
Standard:	DETERMINE TCB-5 green OPEN light remains LIT on Control Room Reactor Trip Status Panel and INITIAL at Step 2.1.3.5.
Comment: Step 2.1.3.5	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY current interrupted to each phase of TCB-1 and TCB 5.
Standard:	OBSERVE Control Room Reactor Trip Status Panel and DETERMINE three (3) TCB-1 and three (3) TCB-5 white current lights OFF, CIRCLE YES, and INITIAL at Step 2.1.3.6.
Comment: Step 2.1.3.6	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Close Reactor Trip Breakers at PPS Bay A, as follows: • Unlock Actuation Reset Panel.
Standard:	OBTAIN Key #95, RPS Bypass and INSERT at PPS Bay A, TURN to UNLK position, and INITIAL at Step 2.1.4.1.
Comment: Steps 2.1.4 & 2.1.4.1	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Firmly depress and hold RPS-1 pushbutton until breaker closes, then release.
Standard:	DEPRESS and HOLD RPS-1 pushbutton until breaker CLOSES, RELEASE, and INITIAL at Step 2.1.4.2.
Examiner Cue:	**I&C reports UV coils are reset on TCB-1.**
Examiner Note:	**A procedure enhancement will be submitted to have the operator contact I&C to verify the UV coils are reset (as read on the bakelite).**
Comment: Step 2.1.4.2	**SAT ☐ UNSAT ☐**

Perform Step: √	Firmly depress and hold RPS-5 pushbutton until breaker closes, then release.
Standard:	DEPRESS and HOLD RPS-5 pushbutton until breaker CLOSES, RELEASE, and INITIAL at Step 2.1.4.3.
Examiner Cue:	**I&C reports UV coils are reset on TCB-5.**
Comment: Step 2.1.4.3	**SAT ☐ UNSAT ☐**

Perform Step:	If either RTCB fails to open, then perform the following: (Mark N/A if both RTCBs opened.)
Standard:	MARK N/A and INITIAL at Step 2.1.4.4.
Comment: Step 2.1.4.4	**SAT ☐ UNSAT ☐**

Perform Step:	Lock Closed PPS Actuation Reset Panel Bay A.
Standard:	At PPS Bay A, TURN to LK position, and INITIAL at Step 2.1.4.5.
Comment: Step 2.1.4.5	**SAT ☐ UNSAT ☐**

Perform Step:	Verify TCB-1 CLOSED indication ILLUMINATED on the local RPS Status Panel and Control Room Status Panel.
Standard:	OBSERVE red TCB-1 CLOSED light LIT on PPS Reactor Trip Status Panel and Control Room Reactor Trip Status Panel and INITIAL at Step 2.1.4.6.
Comment: Step 2.1.4.6	**SAT ☐ UNSAT ☐**

Perform Step:	Verify TCB-5 CLOSED indication ILLUMINATED on the local RPS Status Panel and Control Room Status Panel.
Standard:	OBSERVE red TCB-5 CLOSED light LIT on PPS Reactor Trip Status Panel and Control Room Reactor Trip Status Panel and INITIAL at Step 2.1.4.7.
Comment: Step 2.1.4.7	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY current flow on each phase of TCB-1 and TCB-5.
Standard:	OBSERVE Control Room Reactor Trip Status Panel and DETERMINE three (3) TCB-1 and three (3) TCB-5 white current lights LIT and INITIAL at Step 2.1.5.
Comment: Step 2.1.5	**SAT** ☐ **UNSAT** ☐

Perform Step:	**Test Reactor Trip Circuit Breakers TCB-3 and TCB-7:** • Verify all RTCBs are Closed.
Standard:	OBSERVE Control Room Reactor Trip Status Panel and DETERMINE all Reactor Trip Circuit Breakers are CLOSED and INITIAL at Step 2.4.1.
Comment: Steps 2.4 & 2.4.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	Verify current flow on each phase of TCB-3 and TCB-7.
Standard:	OBSERVE Control Room Reactor Trip Status Panel and DETERMINE three (3) TCB-3 and three (3) TCB-7 white current lights LIT and INITIAL at Step 2.4.2.
Comment: Step 2.4.2	**SAT** ☐ **UNSAT** ☐

Perform Step: √	At CR-53, depress HS-9132-3, Reactor Trip 3 pushbutton.
Standard:	DEPRESS 2HS-9132-3, Reactor Trip 3 pushbutton and INITIAL at Step 2.4.3.
Comment: Step 2.4.3	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY TCB-3 OPEN indication ILLUMINATED on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status Panel.
Standard:	OBSERVE red TCB-3 CLOSED light LIT on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status Panel, CIRCLE NO, and INITIAL at Step 2.4.3.1.
Comment: Step 2.4.3.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY TCB-7 OPEN indication ILLUMINATED on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status.
Standard:	OBSERVE red TCB-7 CLOSED light LIT on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status Panel, CIRCLE NO, and INITIAL at Step 2.4.3.2.
Comment: Step 2.4.3.2	**SAT** ☐ **UNSAT** ☐

Perform Step:	If either RTCB fails to open, then perform the following: (Mark N/A if both RTCBs opened.) • Declare the affected RTCB(s) INOP • Leave remainder of Section 2.0 blank • Go to Section 3.0
Standard:	DECLARE TCB-3 and TCB-7 INOPERABLE, INITIAL at Step 2.4.3.3, and GO to Section 3.0.
Comment: Steps 2.4.3.3, 1st , 2nd, & 3rd bullets	**SAT** ☐ **UNSAT** ☐

Perform Step: √	ACCEPTANCE CRITERIA This test is satisfactory if each tested breaker Opens as determined by Open indication Illuminated on Control Room Reactor Trip Status Panel or on the PPS Reactor Trip Status Panel.
Standard:	DETERMINE TCB-3 and TCB-7 did NOT open, CIRCLE UNSAT and INITIAL at Step 3.1.
Comment: Steps 3.0 & 3.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	This test is satisfactory if each tested breaker Opens as determined by verifying current interrupted to each phase of each tested breaker.
Standard:	DETERMINE TCB-3 and TCB-7 current NOT interrupted, CIRCLE UNSAT and INITIAL at Step 3.2.
Examiner Cue:	**The Shift Manager directs you to determine the Technical Specifications affected per Step 3.4 and REQUIRED ACTIONS, if any.**
Comment: Step 3.2	**SAT ☐ UNSAT ☐**

Perform Step: √	If Step 3.1, 3.2, or Step 3.3 is UNSAT, then: • Refer to Tech. Spec. LCO 3.3.4.
Standard:	REFER to Technical Specification LCO 3.3.4, Reactor Protective System Logic and Trip Initiation and DETERMINE Condition B applies. • OPEN TCB-3 and TCB-7 within one (1) hour.
Terminating Cue:	**This JPM is complete.**
Comment: Step 3.4	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **A Partial Scheduled Surveillance is due on four (4) Reactor Trip Circuit Breakers.**
- **I&C is standing by in the CEDMCS Room to verify Undervoltage Coils are RESET following testing.**
- **All Prerequisites have been met.**

INITIATING CUE: **The SRO Operations Supervisor directs you to PERFORM the following:**

- **EXERCISE Reactor Trip Circuit Breakers 1 & 5 then 3 & 7, per SO23-3-3.5, CEA / Reactor Trip Circuit Breaker Operability Testing, Attachment 3, Reactor Trip Circuit Breaker Monthly Test - Modes 1 and 2.**

Facility: SONGS JPM # NRC SA4 Task #187396 K/A #2.3.15 2.9 / 3.1

Title: Determine Change in Steam Generator Tube Leakage

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	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 with at 100% power:

- SO23-13-14, Reactor Coolant Leak, actions are in progress for a Steam Generator Tube Leak.
- RT-7870 Condenser Air Ejector Radiation Monitor setpoint is 9.25 E-1 µci/sec and the Pre-Determined Steam Generator Tube Leak Rate is 15 gpd.
  - One (1) hour later RE-7870 is reading 1.54 E+0 µci/sec and is slowly rising.
  - Two (2) hour later RE-7870 is reading 2.84 E+0 µci/sec and remains stable.

Initiating Cue: The SRO Operations Supervisor directs you to PERFORM the following:

- CALCULATE change in a Steam Generator Tube Leak using data from RE-7870, Condenser Air Ejector Wide Range Gas Monitor per SO23-13-14, Reactor Coolant Leak, Attachment 1, RE-7870 Steam Generator Radiation and Leakage Readings.
- CIRCLE the required action based on the final leakrate at SO23-13-14, Step 4s, Primary to Secondary Leakage.

Task Standard: Calculate the change in a Steam Generator Tube Leak using data from RE-7870, Condenser Air Ejector Wide Range Gas Monitor per SO23-13-14.

Required Materials: SO23-13-14, Reactor Coolant Leak, Rev. 14.

Validation Time: 15 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:

- **SO23-13-14, Reactor Coolant Leak.**
- **Attachment 1, RE-7870 Steam Generator Radiation and Leakage Readings.**
  - **INITIAL Step 1.1.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-13-14, Attachment 1. Specific steps in the Attachment are annotated in each Comment box.**
Perform Step:	RECORD RE-7870 information from the setpoint placard. • RE-7870 (setpoint) _____ µCi/sec.
Standard:	RECORD RE-7870 at 9.25 E-1 µCi/sec per the Initial Conditions.
Comment: Steps 2.2 & 2.2.1	**SAT ☐ UNSAT ☐**

Perform Step:	RECORD RE-7870 information from the setpoint placard. • Pre-determined S/G Tube Leak Rate Value _____ gpd.
Standard:	RECORD Pre-Determined Steam Generator Tube leakrate of 15 gpd per the Initial Conditions.
Comment: Steps 2.2 & 2.2.2	**SAT ☐ UNSAT ☐**

Perform Step:	DEPRESS RE-7870 EFF pushbutton to display µCi/sec.
Standard:	RECORD RE-7870 at 1.54 E+0 µCi/sec per the Initial Conditions.
Comment: Step 2.3	**SAT ☐ UNSAT ☐**

Perform Step: √	CALCULATE S/G tube leakage in the following table at the appropriate frequency stated in Step 2.1. (1440 gpd = 1 gpm).
Standard:	CALCULATE Steam Generator tube leakage after 1 hour as follows: • 1.54 E+0 µCi/sec / 9.25 E-1 µCi/sec x 15 gpd = **25 gpd ± 1 gpd**
Comment: Step 2.4	**SAT ☐ UNSAT ☐**

Perform Step: √	CALCULATE S/G tube leakage in the following table at the appropriate frequency stated in Step 2.1. (1440 gpd = 1 gpm).
Standard:	CALCULATE Steam Generator tube leakage after 2 hours as follows: • 2.84 E+0 µCi/sec / 9.25 E-1 µCi/sec x 15 gpd = **46 gpd ± 1 gpd**
Comment: Step 2.4	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following step is from SO23-13-14. Specific step is annotated in the Comment box.**
Perform Step: √	MONITOR for Leak Rate changes in any Steam Generator and perform associated action(s): • Leakage is ≥ 30 gpd **and** < 75 gpd.
Standard:	REFER to SO23-13-14, Step 4s and DETERMINE required action is to INITIATE Attachment 3 and CIRCLE.
Terminating Cue:	**This JPM is complete.**
Comment: Step 4s	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions with at 100% power:**

- **SO23-13-14, Reactor Coolant Leak, actions are in progress for a Steam Generator Tube Leak.**
- **RT-7870 Condenser Air Ejector Radiation Monitor setpoint is 9.25 E-1 µci/sec and the Pre-Determined Steam Generator Tube Leak Rate is 15 gpd.**
  - **One (1) hour later RE-7870 is reading 1.54 E+0 µci/sec and is slowly rising.**
  - **Two (2) hour later RE-7870 is reading 2.84 E+0 µci/sec and remains stable.**

INITIATING CUE: **The SRO Operations Supervisor directs you to PERFORM the following:**

- **CALCULATE change in a Steam Generator Tube Leak using data from RE-7870, Condenser Air Ejector Wide Range Gas Monitor per SO23-13-14, Reactor Coolant Leak, Attachment 1, RE-7870 Steam Generator Radiation and Leakage Readings.**
- **CIRCLE the required action based on the final leakrate at SO23-13-14, Step 4s, Primary to Secondary Leakage.**

Facility: SONGS JPM # NRC SA5 Task #190033 K/A #2.4.38 2.4 / 4.4

Title: Perform Actions for an Aircraft Attack Security Event

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
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 at 0900:

- The Site has received an aircraft attack notification from the Federal Bureau of Investigation that was confirmed by Security.
- The actions of SO23-13-25, Operator Actions During Security Events, are being implemented.
- The Shift Manager has declared an UNUSUAL EVENT due to notification of a validated aircraft attack threat greater than 30 minutes away.
- The estimated time of arrival is in 40 minutes.

Initiating Cue: The SRO Operations Supervisor directs you to PERFORM the following:

- INITIATE a notification to the Nuclear Regulatory Commission per SO23-13-25, Operator Actions During Security Events, Attachment 5, Aircraft Attack Threat, START at Step 1.6.

Task Standard: Notify the NRC using the red phone, notify plant personnel and initiate a Train of Toxic Gas Isolation Signal (TGIS) per SO23-13-25, Attachment 5.

Required Materials: SO23-13-25, Operator Actions During Security Events, Rev. 13-1.

Validation Time: 10 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

- **ENTER the following 7 digit alphanumeric code in black marker inside the cabinet where the NRC phone resides.**
  - **UANP3C6**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-13-25, Operator Actions During Security Events.**
  - **Attachment 5, Aircraft Attack Threat.**
    - **INITIAL and ENTER data as required for Steps 1.1, 1.1.1, 1.2, 1.3 (including times), 1.4, 1.5.1, 1.5.2, 1.5.3, and 2.3.1.**
  - **Attachment 11, Operator Actions During Security Events Limitations And Specifics.**

EXAMINER NOTE: This JPM will be performed in the Simulator.

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-13-25, Attachment 5. Specific steps in the Attachment are annotated in each Comment box.**
Perform Step:	ENSURE the following notifications have been made: • NRC, via the Red Phone. (LS-1.6)
Standard:	REFER to Attachment 9, Limitations and Specifics 1.6 of SO23-13-25.
Comment: Step 1.6	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SO23-13-25, Attachment 9. Specific steps in the Attachment are annotated in each Comment box.**

Perform Step:	Call to the NRC for a Security Event should be made promptly (within 15 minutes if possible), and should only provide the following information before terminating the call:
	• SONGS (Site Name)
	• Emergency Classification (only if determined at time of the call)
	• Nature of the threat (described briefly, if known)
	  • Type Of Attack (armed assault by land, water or aircraft)
	  • Attack Status (imminent, in progress, etc)

Standard:	DETERMINE the required information is as follows: • Site name is SONGS. • Emergency Classification is an UNUSUAL EVENT. • Aircraft attack is probable within 40 minutes.
Comment: Step 1.6	**SAT ☐ UNSAT ☐**

Examiner Cue:	**Simulate dialing the number.**
Perform Step: √	Notify the NRC using the Red Phone: • To use the Emergency Notification (Red Phone), lift the receiver from the cradle and dial one of the numbers listed on the phone. (The first number listed is the primary number, the remaining numbers are alternates.)
Standard:	Open CABINET AND remove PHONE, LIFT the handset, DIAL the first number listed, and LISTEN for the NRC to answer.
Examiner Cue:	**The NRC Operator has answered.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Cue:	**The NRC Operator requests the SONGS authentication code.**
Perform Step: √	Provide the SONGS authentication code.
Standard:	REPORT the SONGS authentication code as Uniform/Alpha/November/Papa/Three/Charlie/Six **or** UANP3C6.
Examiner Cue:	**The NRC Operator has authenticated the code.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: √	Make the accelerated notification.
Standard:	REPORT the required information as: • San Onofre Nuclear Generating Station has declared an UNUSUAL EVENT due to an Informational Aircraft Attack with an estimated arrival time in 40 minutes.
Examiner Cue:	**NRC Operator acknowledges that SONGS has declared an UNUSUAL EVENT due to a Informational Aircraft Attack with an estimated arrival time in 40 minutes.**
Comment: Step 1.6, 1st, 2nd, & 3rd bullets	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SO23-13-25, Attachment 5. Specific steps in the Attachment are annotated in each Comment box.**
Examiner Cue:	**The SRO Operations Supervisor directs you to continue in Attachment 5, Step 2.3.2.**
Perform Step:	Initiate a Protected Area Evacuation, per SO23-VIII-30, Section for Evacuation.
Standard:	INITIATE a Protected Area Evacuation, per SO23-VIII-30, Section for Evacuation.
Examiner Cue:	**Another operator has initiated the evacuation.**
Comment: Step 2.3.2	**SAT ☐ UNSAT ☐**

Perform Step: √	Make Sitewide PA announcement, as follows: • **"Attention all Personnel. An Aircraft Attack warning has been received. All essential personnel take shelter in a concrete area, below ground if possible. All other personnel in the Protected Area assemble in the AWS Building or K50."**
Standard:	DEPRESS Sitewide PA announcement pushbutton and REPORT: • "Attention all Personnel. An Aircraft Attack warning has been received. All essential personnel take shelter in a concrete area, below ground if possible. All other personnel in the Protected Area assemble in the AWS Building or K50."
Comment: Step 2.3.3	**SAT** ☐ **UNSAT** ☐

Perform Step:	Direct all field Operators required for Tech Spec. manning to take shelter in concrete areas, preferably below ground.
Standard:	DIRECT all field Operators required for Technical Specification manning to take shelter in concrete areas, preferably below ground.
Examiner Cue:	**Field Operators have been informed.**
Comment: Step 2.3.4	**SAT** ☐ **UNSAT** ☐

Perform Step:	Direct all Operators **not** required for Tech. Spec. manning or to be staged at L-042 to assemble in the AWS Building.
Standard:	DIRECT all Operators not required for Technical Specification manning or to be staged at L-042 to assemble in the AWS Building.
Examiner Cue:	**Operators have been informed.**
Comment: Step 2.3.4.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	If the estimated Time of Arrival of the threat aircraft is between sundown and sunrise, then initiate opening lighting breakers per Attachments 9 and 10, starting with Section for Priority One Breaker List and continuing with the Section for Priority Two Breaker List. (Mark N/A if aircraft arrival time is during daylight hours.)
Standard:	DETERMINE time is 0900 from Initial Conditions and MARK N/A.
Comment: Step 2.3.5	**SAT** ☐ **UNSAT** ☐

Perform Step:	If refueling, then place fuel assemblies in a safe location.
Standard:	DETERMINE both Units in MODE 1 from Attachment 5 cover page and MARK N/A.
Comment: Step 2.3.6	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Initiate one train of TGIS.
Standard:	DEPRESS one of the following to INITIATE one train of TGIS: • 2/3HS-9784A1, TGIS Manual Initiation Train A • 2/3HS-9784A2, TGIS Manual Initiation Train B
Terminating Cue:	**This JPM is complete.**
Comment: Step 2.3.7	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **The Site has received an aircraft attack notification from the Federal Bureau of Investigation that was confirmed by Security.**
- **The actions of SO23-13-25, Operator Actions During Security Events, are being implemented.**
- **The Shift Manager has declared an UNUSUAL EVENT due to notification of a validated aircraft attack threat greater than 30 minutes away.**
- **The estimated time of arrival is in 40 minutes.**

INITIATING CUE: **The SRO Operations Supervisor directs you to PERFORM the following:**

- **INITIATE a notification to the Nuclear Regulatory Commission per SO23-13-25, Operator Actions During Security Events, Attachment 5, Aircraft Attack Threat, START at Step 1.6.**

Facility: SONGS JPM # NRC RA1 Task #185151 K/A #2.1.25 3.9 / 4.2

Title: Determine Boration Required to Cooldown to MODE 5

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	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 with a burnup of 70 EFPD.
- Preparations are currently underway to go to MODE 5.
- BAMU Tank concentration is 5855 ppm boron.
- Reactor Coolant System boron concentration, by Chemistry sample, is 1620 ppm.
- Reactor Coolant System T_{AVE} is currently 545ºF.

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

- DETERMINE Target boron concentration required for 200ºF per SO23-5-1.5, Plant Shutdown from Hot Standby to Cold Shutdown, Section 6.3, RCS Boration to Shutdown or Refueling Concentration, Step 6.3.5, Determine Target Boron Concentration.
- DETERMINE gallons of boric acid required for the Reactor Coolant System per SO23-3-2.2, Makeup Operations.

Task Standard: Calculate the Target boron concentration for 200ºF per SO23-5-1.5 and gallons of boric acid required to achieve this concentration per SO23-3-2.2.

Required Materials: SO23-5-1.5, Plant Shutdown from Hot Standby to Cold Shutdown, Rev. 31.
SO23-3-2.2, Makeup Operations, Rev. 28.
SO23-XXXVII-13, Document M-38100, Operations Physics Summary, Unit 2, Cycle 16, Rev.58.

Validation Time: 25 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:

- **SO23-3-2.2, Makeup Operations.**
  - **Attachment 10, Formula to Calculate a Boration or Dilution.**
- **SO23-5-1.5, Plant Shutdown from Hot Standby to Cold Shutdown.**
  - **Section 6.3, RCS Boration to Shutdown or Refueling Concentration.**
    - **INITIAL Steps 6.3.2 to 6.3.4.**
- **M-38100, Ops Physics Summary, Unit 2, Cycle 16, Revision 58.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following step is from SO23-5-1.5, Section 6.3. Specific step is annotated in each Comment box.**
Perform Step: √	DETERMINE Target boron concentration: • Non-Refueling outage_____ • (OPS fig. 2.3-1, SDM 5.15% delta k/k @ 200ºF)
Standard:	READ curve for ARI-PLR @ 200ºFon Figure 2.3-1, SONGS Unit 2 Cycle 16 Minimum Boron Concentration for 5.15% SHUTDOWN MARGIN: • **1800 ppm ± 10 ppm** is minimum boron concentration.
Comment: Step 6.3.5	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SO23-3-2.2, Section 2.3. Specific steps are annotated in each Comment box.**
Perform Step: √	Determine the difference between initial and final (desired) boron concentration of the RCS.
Standard:	SUBTRACT 1800 ±10 ppm from 1620 ppm = **180 ± 10 ppm**
Comment: Step 2.3.1	**SAT ☐ UNSAT ☐**

Perform Step: √	Obtain the gallons of Boric Acid or PMW to be added from the Boration / Dilution Table located on Operations Web Page under ***Reactivity Management***.
Standard:	Determine Boration / Dilution Table in Handout and CALCULATE gallons of Boric Acid as follows: • Boration from 1620 ppm to 1700 ppm = 1370 gallons. • Boration from 1700 ppm to 1800 ppm = 1756 gallons. • 1370 + 1756 **= 3126 ± 178 gallons of boric acid**
Comment: Step 2.3.2	**SAT ☐ UNSAT ☐**

Perform Step:	If RCS Average Temperature is **not** at HZP, 545ºF, then perform a temperature correction for the Boric Acid or PMU to be added, as follows: • From the below table, interpolate to obtain Temp Correction Factor. Multiply the Temp Correction Factor by the number obtained in the boration / dilution tables for HZP, Step 2.3.2.
Standard:	DETERMINE Temperature Correction Factor for 545ºF is 1.0.
Comment: Steps 2.3.3 & 2.3.3.1	**SAT ☐ UNSAT ☐**

Perform Step: √	If boration is required, then multiply the amount of Boric Acid to be added by the Boric Acid Concentration Factor from Attachment 11 (calculations assume 3 wt% Boric Acid concentration).

Standard:	DETERMINE Boric Acid Concentration Factor from Attachment 11.
	• BAMU concentration:
	  • 5855 ppm / 1748 ppm = 3.35 wt%
	  • 3.35 wt% = 0.9 ± 0.01 = Boric Acid Concentration Factor
	  • ± 0.01 = 0.89 to 0.91 band
	  • 0.89 x 3126 ± 178 = 1840 ± 160 gallons of Boric Acid
	  • 0.91 x 3126 ± 180 = 1880 ± 164 gallons of Boric Acid
	  • **Final Volume = 2941 to 3007 gallons of Boric Acid**

Terminating Cue:	**This JPM is complete.**
Comment: Step 2.3.4	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 is in MODE 3 with a burnup of 70 EFPD.**
- **Preparations are currently underway to go to MODE 5.**
- **BAMU Tank concentration is 5855 ppm boron.**
- **Reactor Coolant System boron concentration, by Chemistry sample, is 1620 ppm.**
- **Reactor Coolant System T_{AVE} is currently 545ºF.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **DETERMINE Target boron concentration required for 200ºF per SO23-5-1.5, Plant Shutdown from Hot Standby to Cold Shutdown, Section 6.3, RCS Boration to Shutdown or Refueling Concentration, Step 6.3.5, Determine Target Boron Concentration.**
- **DETERMINE gallons of boric acid required for the Reactor Coolant System per SO23-3-2.2, Makeup Operations.**

Facility: SONGS JPM # NRC RA2 Task #191191 K/A #2.1.19 3.9 / 3.8

Title: Remove a Nuisance Radiation Monitor From Scan on DAS

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
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:

- 2R-7818, Condenser Air Ejector Low Range Radiation Monitor has been spiking intermittently for the last three hours.
- Chemistry has determined that both Steam Generator radiation levels are normal.
- The Shift Manager has determined this is a nuisance alarm.

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

- BYPASS 2R-7818, Condenser Air Ejector Low Range Radiation Monitor alarm per SO23-3-2.36, Radiation Monitor Data Acquisition System, Section 6.4, Bypassing and Restoring RTP Chassis Monitor Alarms.

Task Standard: Bypass the nuisance alarm on 2R-7818, Condenser Air Ejector Low Range Radiation Monitor from Scan per SO23-3-2.36.

Required Materials: SO23-3-2.36, Radiation Monitor Data Acquisition System, Rev. 6.

Validation Time: 12 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to any Initial Condition (MODES 1-6) and PERFORM the following:

- **ENSURE alarm for 2R-7818 is active.**
- **ENSURE DAS Screen on HOME page.**

MACHINE OPERATOR NOTE:

- **After each JPM, VERIFY the following:**
  - **ENSURE alarm for 2R-7818 is active.**
  - **RESET alarm status of 2R-7818 to NORMAL.**
  - **PLACE DAS Screen on HOME page.**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-3-2.36, Radiation Monitor Data Acquisition System.**
  - **Section 6.4, Bypassing and Restoring RTP Chassis Monitor Alarms.**
  - **Attachment 4, Radiation Monitor DAS Limitations and Specifics.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-3-2.36, Section 6.4. Specific Steps in this Section are annotated in each Comment box.**
Examiner Note:	**Procedure Step 6.4.1.1 can be performed several different ways.**
Perform Step:	Place an RTP Chassis Monitor Alarm in Bypass: • Go to the Monitor Page for the desired Rad Monitor.
Standard:	From HOME page, CLICK on 2R-7818 green dot, and then CLICK on green dot in Turbine Area.
Comment: Steps 6.4.1 & 6.4.1.1	**SAT ☐ UNSAT ☐**

Perform Step: √	Place an RTP Chassis Monitor Alarm in Bypass: • Select the pull-down menu for **UNIT MODE**.
Standard:	CLICK down (↓) arrow on UNIT MODE pull-down menu.
Comment: Steps 6.4.1 & 6.4.1.2	**SAT ☐ UNSAT ☐**

Perform Step: √	Place an RTP Chassis Monitor Alarm in Bypass: • Select **ALM BYP** to bypass the alarm.
Standard:	CLICK on ALM BYP to bypass alarm.
Comment: Steps 6.4.1 & 6.4.1.3	**SAT ☐ UNSAT ☐**

Perform Step:	Place an RTP Chassis Monitor Alarm in Bypass: • Verify Status box indicates INST FAIL.
Standard:	VERIFY Status box reads INST FAIL.
Comment: Steps 6.4.1 & 6.4.1.4	**SAT ☐ UNSAT ☐**

Perform Step: √	Place an RTP Chassis Monitor Alarm in Bypass: • Verify the Icon on the Home Screen has turned Light Blue, indicating Instrument Fail / Alarm Bypass.
Standard:	CLICK on NAVIGATE page, then CLICK on HOME page, and OBSERVE blue light icon for 2R-7818 lit.
Comment: Steps 6.4.1 & 6.4.1.5	**SAT ☐ UNSAT ☐**

Perform Step:	Place an RTP Chassis Monitor Alarm in Bypass: • Acknowledge the Alarm Bypass Status Change alarm on the Alarm Summary Page.
Standard:	Either action will ACKNOWLEDGE the Alarm Bypass Status change: • CLICK on NAVIGATE page, then CLICK on 2C ALMS page **or** 2C3 ALMS page, then CLICK on ACK ALL. • DOUBLE-CLICK 2R-7818 Alarm Bypass Status.
Terminating Cue:	**The CRS will implement actions of the ODCM. This JPM is complete.**
Comment: Steps 6.4.1 & 6.4.1.6	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **2R-7818, Condenser Air Ejector Low Range Radiation Monitor has been spiking intermittently for the last three hours.**
- **Chemistry has determined that both Steam Generator radiation levels are normal.**
- **The Shift Manager has determined this is a nuisance alarm.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **BYPASS 2R-7818, Condenser Air Ejector Low Range Radiation Monitor alarm per SO23-3-2.36, Radiation Monitor Data Acquisition System, Section 6.4, Bypassing and Restoring RTP Chassis Monitor Alarms.**

Facility: SONGS JPM # NRC RA3 Task #186469 K/A #2.2.12 3.7 / 4.1

Title: Perform QSPDS Administrative Channel Checks

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
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 at 2% power.
- Qualified Safety Parameter Display System surveillance needs to be performed.

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

- RECORD SO23-3-2.35, Qualified Safety Parameter Display System, Attachment 3, QSPDS Administrative Channel Checks.
- COMPLETE Attachment 3 through Step 3.1.

Task Standard: Complete QSPDS Administrative Channel Checks and verify Acceptance Criteria per SO23-3-2.35.

Required Materials: SO23-3-2.35, Qualified Safety Parameter Display System, Rev. 4-1.

Validation Time: 8 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-5 JPM Initial Condition and ENSURE the following:

- **VERIFY power level is STABLE.**

MACHINE OPERATOR NOTE:

- **After each JPM, VERIFY Channel A and Channel B QSPDS is selected to CFMS Page 311.**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-3-2.35, Qualified Safety Parameter Display System.**
  - **Attachment 3, QSPDS Administrative Channel Checks.**
    - **INITIAL Section 1.0.**
    - **CHECK Scheduled Surveillance in the box at Step 1.2.**
  - **Calculator.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-3-2.35, Attachment 3. Specific Steps in this Section are annotated in each Comment box.**
Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Record the value of selected parameters from QSPDS Channel A.
Standard:	RECORD value of QSPDS Page 501 - Core from QSPDS Channels A.
Comment: Steps 2.1, 2.1.1 & 2.2 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Record the value of selected parameters from QSPDS Channel B.
Standard:	RECORD value of QSPDS Page 501 - Core from QSPDS Channels B.
Comment: Steps 2.1, 2.1.2 & 2.2 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Compare the values obtained from QSPDS Channel A and QSPDS Channel B to determine that they are within the allowable tolerance.
Standard:	COMPARE value of QSPDS Channel A with QSPDS Channel B and DETERMINE value is within allowable tolerance and CIRCLE SAT and INITIAL at Step 2.2.
Comment: Steps 2.1, 2.1.3 & 2.2 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Record the value of selected parameters from QSPDS Channel A.
Standard:	RECORD values of QSPDS Page 502 - RCS from QSPDS Channel A.
Comment: Steps 2.1, 2.1.1 & 2.3 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Record the value of selected parameters from QSPDS Channel B.
Standard:	RECORD values of QSPDS Page 502 - RCS from QSPDS Channel B.
Comment: Steps 2.1, 2.1.2 & 2.3 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Compare the values obtained from QSPDS Channel A and QSPDS Channel B to determine that they are within the allowable tolerance.
Standard:	COMPARE values of QSPDS Channel A with QSPDS Channel B and DETERMINE value is within allowable tolerance and CIRCLE SAT and INITIAL at Step 2.3.
Comment: Steps 2.1, 2.1.3 & 2.3 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Record the value of selected parameters from QSPDS Channel A.
Standard:	RECORD values of QSPDS Page 611 - SATURATION MARGIN from QSPDS Channel A.
Comment: Steps 2.1, 2.1.1 & 2.4 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Record the value of selected parameters from QSPDS Channel A.
Standard:	RECORD values of QSPDS Page 611 - SATURATION MARGIN from QSPDS Channel B.
Comment: Steps 2.1, 2.1.2 & 2.4 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Perform a channel check on selected QSPDS parameters by recording the required data in Steps 2.2 through 2.4: • Compare the values obtained from QSPDS Channel A and QSPDS Channel B to determine that they are within the allowable tolerance.
Standard:	COMPARE values of QSPDS Channel A with QSPDS Channel B and DETERMINE value is within allowable tolerance and CIRCLE SAT and INITIAL at Step 2.4.
Comment: Steps 2.1, 2.1.3 & 2.4 (data)	**SAT** ☐ **UNSAT** ☐

Perform Step:	Have all selected QSPDS parameters in Steps 2.2 through 2.4 allowable tolerance been circled SAT? • ☐ YES ☐ NO
Standard:	DETERMINE all selected QSPDS parameters in Steps 2.2 through 2.4 allowable tolerance are CIRCLED SAT and CHECK the YES box and INITIAL and DATE.
Terminating Cue:	**This JPM is complete.**
Comment: Step 3.1	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 is at 2% power.**
- **Qualified Safety Parameter Display System surveillance needs to be performed.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **RECORD SO23-3-2.35, Qualified Safety Parameter Display System, Attachment 3, QSPDS Administrative Channel Checks.**
- **COMPLETE Attachment 3 through Step 3.1.**

Facility: SONGS JPM # NRC RA4 Task #187452 K/A #2.3.7 3.5 / 3.6

Title: Determine Stay Times / Respond to Changing Radiological Conditions

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	X
Actual Performance:	X	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:

- A valve alignment needs to be performed in the Shutdown Cooling Heat Exchanger 3E004 located in Room #029 on the -2'0" Elevation.
- The task involves closing/opening valves supporting a Clearance.
- All areas of the room must be accessed for the Clearance.
- Assume all radiation exposure received is in the General Area.
- Health Physics has approved use of REP 200116.

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

- SELECT the applicable Survey Map.
- DETERMINE stay time in the general work area based on Max EDE / Entry (External Dose Evaluation) of the REP.

Task Standard: Select the appropriate Survey Map for the work to be performed, then determine correct stay times per the REP and SO123-VII-20.9.

Required Materials: SO123-VII-20.9, Radiological Surveys, Rev. 11.

Validation Time: 25 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:

- **SO123-VII-20.9, Radiological Surveys.**
- **Radiation Entry Permit:**
  - **200116**
- **Survey Maps:**
  - **080210-006 U3 Safety Equipment Building at Elevations 8′0" & -15′0"**
    - **Form Number HP (2/3)1259-1652 (Page 1).**
    - **Form Number HP (2/3)1259-1653 (Page 2).**
    - **Form Number HP (2/3)1259-1678 (Page 3).**
    - **Form Number HP (2/3)1259-1677 (Page 4).**
  - **080216-004 U3 Safety Equipment Building at Elevations at -2′0" & -15′0"**
    - **Form Number HP (2/3)1259-1654 (Page 1).**
    - **Form Number HP (2/3)1259-1680 (Page 2).**
- **Plant Layouts:**
  - **SE.6 U3 Safety Equipment Building at Elevations at -15′6″ & -5′3″**
  - **SE.7 U3 Safety Equipment Building at Elevation at 8′0″**
- **If required, Blank Survey Maps can be obtained via SAP CASE Management, Nuclear Controlled Forms.**
- **Active REPs and Survey Maps can be obtained via IHPS.**

EXAMINER NOTE:

- **Information regarding methods of posting Radiological conditions on Survey Maps can be found in Section 6.2 of SO123-VII-20.9. Definitions for Survey Map abbreviations and acronyms can be found in Attachments 2 and 4 of SO123-VII-20.9.**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: √	LOCATE applicable Survey Map.
Standard:	LOCATE Safety Equipment Building Survey Map #080216-004, Page 1 of 2 for the task to be performed: • Train A Shutdown Cooling Heat Exchanger Room 3E-029 Room.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Survey Map #080216-004, Page 1 of 2 is the <u>only</u> map with a General Area dose rate of 10 mrem/hr.**
Perform Step: √	DETERMINE general area dose rate on Survey Map #080216-004, Page 1 of 2.
Standard:	REVIEW Safety Equipment Building Survey Map #080216-004, Page 1 of 2 and DETERMINE 10 mrem/hr is the maximum General Area radiation level.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step:	REVIEW REP that provides coverage of the task performed.
Standard:	REVIEW REP #200116, which allows entry into a Contaminated Area.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: √	DETERMINE Stay Time in work area.
Standard:	Based upon general area radiation levels in area and required setpoint of alarming dosimeter, DETERMINE that stay time will be **7.5 hours** based on 10 mrem/hr General Area Radiation and 75 mrem Max EDE / Entry.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **A valve alignment needs to be performed in the Shutdown Cooling Heat Exchanger 3E004 located in Room #029 on the -2'0" Elevation.**
- **The task involves closing/opening valves supporting a Clearance.**
- **All areas of the room must be accessed for the Clearance.**
- **Assume all radiation exposure received is in the General Area.**
- **Health Physics has approved use of REP 200116.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **SELECT the applicable Survey Map.**
- **DETERMINE stay time in the general work area based on Max EDE / Entry (External Dose Evaluation) of the REP.**

Facility: SONGS JPM # NRC P-1 Task #185304 K/A #033.A2.03 3.1 / 3.5 SF-8

Title: Align Spent Fuel Pool Makeup from the RWST

Examinee (Print): _____

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:		Plant:	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 during MODE 1:

- Unit 2 has experienced a loss of Spent Fuel Pool Inventory.
- SO23-13-23, Loss of Spent Fuel Pool Cooling, is in progress.
- An operator is standing by at the Spent Fuel Pool to monitor level.
- The Nuclear Operations Assistant has provided Unit 2 Key B.

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

- INITIATE Spent Fuel Pool makeup per SO23-3-2.11.1, Spent Fuel Pool Level Change and Purification Crosstie Operations, Attachment 3, SFP Makeup Using the RWST and SFP Pump P-009.

Task Standard: Refueling Water Storage Tank is aligned to provide makeup to the Spent Fuel Pool using P-009, Spent Fuel Pool Pump per SO23-3-2.11.1.

Required Materials: SO23-3-2.11.1, Spent Fuel Pool Level Change and Purification Crosstie Operations, Rev. 15.

Validation Time: 10 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

PLANT SETUP

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-3-2.11.1, Spent Fuel Pool Level Change and Purification Crosstie Operations.**
  - **Attachment 3, SFP Makeup Using the RWST and SFP Pump MP-009.**
    - **INITIAL Steps 1.1 through 1.6.**
    - **CALCULATE volume of RWST required to RAISE SFP level from 25" to 28".**
      - **USE Plant Computer System (MAIN MENU → USER FUNCTIONS) to CALCULATE volume.**
      - **ENTER Data at Step 1.5.**
  - **Attachment 27, SFP Level Change and Purification Crosstie System Limitations and Specifics.**

EXAMINER NOTE:

This JPM should NOT be performed on Unit 3 due to the start of the Steam Generator Replacement Outage.

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**To minimize time the SFP Cooling Pump has no suction aligned AND prevent water transfer (gravity feed), the alignments must be performed in the sequence shown.**
Examiner Cue:	**Remind examinee to simulate all actions.**
Perform Step:	GO to the Spent Fuel Pool Pump Room in the Fuel Handling Building.
Standard:	ENTER the Radiological Control Building and GO to the Spent Fuel Pool Pump Room in the Fuel Handling Building 17' elevation.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SO23-3-2.11.1, Attachment 3. Specific steps in the Attachment are annotated in each Comment box.**
Perform Step: √	HCV-7743 MP-009 Discharge Valve - CLOSED
Standard:	CLOSE 2HCV-7743, Spent Fuel Pool Pump 2P009 Discharge Isolation.
Examiner Cue:	**The valve is closed.**
Comment: Step 2.1.1	**SAT ☐ UNSAT ☐**

Perform Step: √	HCV-7741 MP-009 Suction from SFP – CLOSED.
Standard:	CLOSE 2HCV-7741, Spent Fuel Pool Pump 2P009 Suction Isolation.
Examiner Cue:	**The valve is closed.**
Comment: Step 2.1.2	**SAT ☐ UNSAT ☐**

Perform Step: √	Starting Fill: • UNLOCK OPEN [B] S2(3)1219MU123, MP-009 Suction from RWST.
Standard:	Using Key B, UNLOCK then OPEN S21219MU123, SFP 2P009 Suction Isolation from 2T006.
Examiner Cue:	**The valve is open.**
Comment: Step 2.2.1	**SAT ☐ UNSAT ☐**

Perform Step:	START MP-009, SFP Cooling Pump.
Standard:	CONTACT the Control Room and INFORM them P-009, SFP Cooling Pump is ready for starting.
Examiner Cue:	**P-009 has been started.**
Comment: Step 2.2.2	**SAT ☐ UNSAT ☐**

Perform Step: √	SLOWLY OPEN HCV-7743, MP-009 Discharge Valve to obtain 20-22 psig. (PI-7707).
Standard:	SLOWLY OPEN 2HCV-7743, Spent Fuel Pool Pump 2P009 Discharge Isolation and OBSERVE 2PI-7707, SFP Pump 2P009 Discharge Pressure to OBTAIN 20 psig to 22 psig.
Examiner Cue:	**When examinee locates gauge and valve is being opened, REPORT pressure at 21 psig.**
Comment: Step 2.2.3	**SAT ☐ UNSAT ☐**

Perform Step:	Station an Operator at the SFP to MONITOR SFP level and in communication with the Control Room.
Standard:	CONTACT the Control Room to VERIFY Spent Fuel Pool level is rising.
Terminating Cue:	**Spent Fuel Pool level is rising. This JPM is complete.**
Comment: Step 2.2.4	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions during MODE 1:**

- **Unit 2 has experienced a loss of Spent Fuel Pool Inventory.**
- **SO23-13-23, Loss of Spent Fuel Pool Cooling, is in progress.**
- **An operator is standing by at the Spent Fuel Pool to monitor level.**
- **The Nuclear Operations Assistant has provided Unit 2 Key B.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **INITIATE Spent Fuel Pool makeup per SO23-3-2.11.1, Spent Fuel Pool Level Change and Purification Crosstie Operations, Attachment 3, SFP Makeup Using the RWST and SFP Pump P-009.**

Facility: SONGS JPM # NRC P-2 Task #141183 K/A #039.A2.04 3.4 / 3.7 SF-4S

Title: Restore Atmospheric Dump Valve to Remote Operation

Examinee (Print): _____

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:		Plant:	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 with Unit 2 is in MODE 3, HOT STANDBY:

- Unit 2 Atmospheric Dump Valve (ADV), 2HV-8419 (2HV-8421), was operated locally during the last shift and is currently 10% open.
- A Reactivity Brief has been conducted.
- Communication with the Control Room and Evacuation Shutdown Panel has been established.

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

- RESTORE remote operation of Unit 2 ADV 2HV-8419 per SO23-3-2.18.1, Atmospheric Dump Valve Operation, Attachment 4, Local Manual Operation of HV-8419 Atmospheric Dump Valve, then INFORM the Control Room when ready to stroke test.

or

- RESTORE remote operation of Unit 2 ADV 2HV-8421 per SO23-3-2.18.1, Atmospheric Dump Valve Operation, Attachment 5, Local Manual Operation of HV-8421 Atmospheric Dump Valve, then INFORM the Control Room when ready to stroke test.

Task Standard: Restore remote operation of the Atmospheric Dump Valve per SO23-3-2.18.1.

Required Materials: SO23-3-2.18.1, Atmospheric Dump Valve Operation, Rev. 16.

Validation Time: 10 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

PLANT SETUP

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-3-2.18.1, Atmospheric Dump Valve Operation (Handout).**
  - **Attachment 4, Local Manual Operation of HV-8419 Atmospheric Dump Valve, Section 2.2, Restoration from HV-8419 Local Manual Operation.**
    - **INITIAL Sections 1.0 & 2.1 as appropriate (procedure in use).**
  - **Attachment 5, Local Manual Operation of HV-8421 Atmospheric Dump Valve, Section 2.2, Restoration from HV-8421 Local Manual Operation.**
    - **INITIAL Sections 1.0 & 2.1 as appropriate (procedure in use).**
  - **Attachment 13, Atmospheric Dump Valve Operation Limitations and Specifics.**

EXAMINER NOTE:

- **This JPM can be performed on either Unit 2 Atmospheric Dump Valve (ADV) 2HV-8419 or 2HV-8421.**
- **The preferred valve is 2HV-8419 due to positioner valve locations.**
- **CIRCLE the ADV on which the JPM is to be performed on the JPM Worksheet and the JPM Cue Sheet.**
- **HV-8421 Steps are annotated in parentheses in the JPM.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-3-2.18.1, Attachments 4 & 5. Specific steps in each Attachment are annotated in the Comment box. 2HV-8421 valve numbers are in parentheses.**
Examiner Cue:	**Remind examinee to simulate all actions.**
Perform Step: √	MANUALLY CLOSE HV-8419 (HV-8421).
Standard:	TURN 2HV-8419 (2HV-8421) handwheel in CLOCKWISE direction.
Examiner Cue:	**The valve is closed.**
Comment: Step 2.2.1	**SAT ☐ UNSAT ☐**

Perform Step: √	Disengage the Manual Override Shaft, as follows: • ROTATE the Handwheel back and forth until pressure is relieved from the clevis.
Standard:	ROTATE 2HV-8419 (2HV-8421) handwheel back and forth until pressure is relieved from the clevis.
Examiner Cue:	**Pressure is relieved from the clevis.**
Comment: Steps 2.2.2 & 2.2.2.1	**SAT ☐ UNSAT ☐**

Perform Step: √	Disengage the Manual Override Shaft, as follows: • REMOVE the clevis from the detent in the Actuator Shaft.
Standard:	REMOVE clevis from the detent in the Actuator Shaft.
Examiner Cue:	**The clevis is removed.**
Comment: Steps 2.2.2 & 2.2.2.2	**SAT ☐ UNSAT ☐**

Perform Step: √	Disengage the Manual Override Shaft, as follows: • FULLY EXTEND the Manual Override Shaft by TURNING the Handwheel Counter-Clockwise until resistance is encountered.
Standard:	TURN handle COUNTER-CLOCKWISE until resistance is encountered to FULLY EXTEND the Manual Override Shaft.
Examiner Cue:	**Resistance is felt.**
Comment: Steps 2.2.2 & 2.2.2.3	**SAT ☐ UNSAT ☐**

Perform Step: √	Disengage the Manual Override Shaft, as follows: • When the Manual Override Shaft is fully extended, then SCREW the Clevis fully into the Manual Override Shaft.
Standard:	SCREW clevis into the Manual Override Shaft.
Examiner Cue:	**Clevis is in the Manual Override Shaft.**
Comment: Steps 2.2.2 & 2.2.2.4	**SAT ☐ UNSAT ☐**

Perform Step:	ENSURE 2(3)PIC-8419-1 (PIC-8421-2), HV-8419 (HV-8421) Controller, is adjusted to FULL CLOSED (0%) (CR-52).
Standard:	CONTACT the Control Room to VERIFY that the Atmospheric Dump Valve Position Controller is adjusted to FULL CLOSED (0%).
Examiner Cue:	**Positioner is at zero (fully closed).**
Comment: Step 2.2.3	**SAT ☐ UNSAT ☐**

Perform Step:	ENSURE 2(3)HS-8419-A1 (HS-8421-A2), HV-8419 (HV-8421) Handswitch, selected to CLOSE (CR-52).
Standard:	CONTACT the Control Room to VERIFY that the Atmospheric Dump Valve Control Switch is selected to CLOSE.
Examiner Cue:	**Handswitch is selected to CLOSE.**
Comment: Step 2.2.4	**SAT ☐ UNSAT ☐**

Perform Step:	ENSURE 2(3)HIC-8419-1 (HIC-8421-2), HV-8419 (HV-8421) Controller, is adjusted to FULL CLOSED (0%) (L-042).
Standard:	CONTACT the Remote Shutdown Panel to VERIFY that the Atmospheric Dump Valve Controller is adjusted to FULL CLOSED (0%).
Examiner Cue:	**The ARO at L-042 reports the positioner is at zero (fully closed).**
Comment: Step 2.2.5	**SAT ☐ UNSAT ☐**

Perform Step:	ENSURE 2(3)HS-8419-B1 (HS-8421-B2), HV-8419 (HV-8421) Handswitch, selected to CLOSE (L-042).
Standard:	CONTACT the Remote Shutdown Panel to VERIFY that the Atmospheric Dump Valve Handswitch is selected to CLOSE.
Examiner Cue:	**The ARO at L-042 reports the handswitch is selected to CLOSE.**
Comment: Step 2.2.6	**SAT ☐ UNSAT ☐**

Perform Step: √	CLOSE S2(3)1301MU1264(1265), HV-8419 (HV-8421) Controller Equalizing Valve.
Standard:	CLOSE S21301MU1264(1265), 2HV-8419 (2HV-8421) Positioner Equalizing Valve.
Examiner Cue:	**The equalizing valve is closed.**
Comment: Step 2.2.7	**SAT ☐ UNSAT ☐**

Perform Step: √	OPEN S2(3)1301MU1304(1306), HV-8419 (HV-8421) Controller Instrument Air Isolation Valve.
Standard:	OPEN S21301MU1304(1306), Positioner Instrument Air Iso Valve to 2HV-8419 (2HV-8421).
Examiner Cue:	**The valve is open.**
Comment: Step 2.2.8	**SAT ☐ UNSAT ☐**

Perform Step: √	OPEN S2(3)1301MU1328(021), HV-8419 (HV-8421) Positioner Nitrogen Isolation Valve.
Standard:	OPEN S21301MU1328(021), 8419 (8421) Positioner N_2 Isolation Valve.
Examiner Cue:	**The valve is open.**
Comment: Step 2.2.9	**SAT ☐ UNSAT ☐**

Perform Step:	Perform remote functional stroke test of HV-8419 (HV-8421) Atmospheric Dump Valve, as follows:
Standard:	INFORM Control Room that 2HV-8419 (2HV-8421) Atmospheric Dump Valve is ALIGNED for remote operation and READY for remote functional stroke testing.
Terminating Cue:	**The Control Room acknowledges ADV ready for testing. This JPM is complete.**
Comment: Step 2.2.10	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions with Unit 2 is in MODE 3, HOT STANDBY:**

- **Unit 2 Atmospheric Dump Valve (ADV), 2HV-8419 (2HV-8421), was operated locally during the last shift and is currently 10% open.**
- **A Reactivity Brief has been conducted.**
- **Communication with the Control Room and Evacuation Shutdown Panel has been established.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **RESTORE remote operation of Unit 2 ADV 2HV-8419 per SO23-3-2.18.1, Atmospheric Dump Valve Operation, Attachment 4, Local Manual Operation of HV-8419 Atmospheric Dump Valve, then INFORM the Control Room when ready to stroke test.**

or

- **RESTORE remote operation of Unit 2 ADV 2HV-8421 per SO23-3-2.18.1, Atmospheric Dump Valve Operation, Attachment 5, Local Manual Operation of HV-8421 Atmospheric Dump Valve, then INFORM the Control Room when ready to stroke test.**

Facility: SONGS JPM # NRC P-3 Task #187757 K/A #068.AA1.06 4.1 / 4.2 SF-2

Title: Locally Close a Charging Pump Breaker

Examinee (Print): _____

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:		Plant:	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 after a Control Room evacuation:

- SO23-13-2, Shutdown from Outside the Control Room, actions are complete up to the point of reenergizing a Charging Pump.
- You are performing Attachment 4, 21 Duties from SO23-13-2.
- DC Control Power for Unit 2 Train A Charging Pump 2P-190 (Unit 2 Train B Charging Pump 2P-192) is tripped and can NOT be reset.
- 2P-190 (2P-192) Charging Pump Breaker is OPEN.

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

- REPORT to the Safe Shutdown Locker and OBTAIN SSD Kit 21 and a 480 Volt Breaker Charging Lever to operate Charging Springs.
- CLOSE Unit 2 Train A Charging Pump 2P-190 Breaker per SO23-13-2, Shutdown from Outside the Control Room, Attachment 21, Circuit Breaker Abnormal Operation.

or

- CLOSE Unit 2 Train B Charging Pump 2P-192 Breaker per SO23-13-2, Shutdown from Outside the Control Room, Attachment 21, Circuit Breaker Abnormal Operation.

Task Standard: Obtain the necessary equipment from the Safe Shutdown Locker then locally close the Unit 2 Train A Charging Pump 2P-190 Breaker (Train B Charging Pump 2P-192 Breaker) per SO23-13-2.

Required Materials: SO23-13-2, Shutdown from Outside the Control Room, Rev. 14.

Validation Time: 10 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

PLANT SETUP

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-13-2, Shutdown from Outside the Control Room.**
  - **Attachment 21, Circuit Breaker Abnormal Operation.**

EXAMINER NOTE:

- **This JPM can be performed on either Unit 2 Train A Charging Pump 2P-190 or Unit 2 Train B Charging Pump 2P-192.**
- **CIRCLE the Train and Charging Pump on which the JPM is to be performed on the JPM Worksheet and the JPM Cue Sheet.**
- **If desired, OBTAIN the Safe Shutdown Locker Key from the Nuclear Operations Assistant.**
- **2P-192 Steps are annotated in parentheses.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Cue:	**Remind examinee to simulate all actions.**
Perform Step:	REPORT to the Safe Shutdown Locker and OBTAIN SSD Kit 21.
Standard:	TRANSITION from the Technical Support Center to the 50' Control Building Safe Shutdown Locker and OBTAIN SSD Kit 21 and a Charging Lever.
Examiner Cue:	**You have Safe Shutdown Bag 21 and the Charging Tool.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SO23-13-2, Attachment 21. Specific steps in the Attachment are annotated in each Comment box. P-192 Steps are annotated in parentheses.**
Perform Step:	If **DC control power is Tripped** (position indication extinguished on auxiliary cubicle, or DC control power breaker tripped and will not reset), then: • ENSURE "Springs Charged" flag visible.
Standard:	OBSERVE 52-2B0413, Charging Pump P-190 (52-2B0613, Charging Pump P-192) breaker charging spring indicator window.
Examiner Cue:	**The SPRINGS DISCHARGED indication is visible.**
Comment: Steps 3.2.1.2 & 3.2.1.2.1	**SAT ☐ UNSAT ☐**

Perform Step:	If operating spring is not charged, then manually charge the spring, as follows: • Open front cubicle door.
Standard:	OPEN breaker front cubicle door for 52-2B0413, Charging Pump P-190 (52-2B0613, Charging Pump P-192).
Examiner Cue:	**The front cubicle door is open.**
Comment: Steps 3.2.1.3 & 3.2.1.3.1	**SAT ☐ UNSAT ☐**

Perform Step: √	If operating spring is not charged, then manually charge the spring, as follows: • Insert accessory charge lever as indicated.
Standard:	INSERT charge lever into breaker 52-2B0413, Charging Pump P-190 (52-2B0613, Charging Pump P-192).
Examiner Cue:	**The charge lever is inserted.**
Comment: Steps 3.2.1.3 & 3.2.1.3.2	**SAT ☐ UNSAT ☐**

Perform Step: √	If operating spring is not charged, then manually charge the spring, as follows: • Pump charge lever until "Springs Charged" flag appears.
Standard:	PUMP charge lever until SPRINGS CHARGED flag appears on breaker 52-2B0413, Charging Pump P-190 (52-2B0613, Charging Pump P-192).
Examiner Cue:	**The SPRINGS CHARGED indication is visible.**
Comment: Steps 3.2.1.3 & 3.2.1.3.3	**SAT ☐ UNSAT ☐**

Perform Step: √	If operating spring is not charged, then manually charge the spring, as follows: • Remove charge lever and close door.
Standard:	REMOVE charge lever on breaker 52-2B0413, Charging Pump P-190 (52-2B0613, Charging Pump P-192).
Examiner Cue:	**The charge lever is removed.**
Comment: Steps 3.2.1.3 & 3.2.1.3.4	**SAT ☐ UNSAT ☐**

Perform Step: √	If operating spring is not charged, then manually charge the spring, as follows: • Remove charge lever and close door.
Standard:	CLOSE cubicle door on breaker 52-2B0413, Charging Pump P-190 (52-2B0613, Charging Pump P-192).
Examiner Cue:	**The door is closed.**
Comment: Steps 3.2.1.3 & 3.2.1.3.4	**SAT ☐ UNSAT ☐**

Perform Step: √	If operating spring is not charged, then manually charge the spring, as follows: • Lift manual Close lever on front of Breaker.
Standard:	LIFT manual CLOSE lever on front of breaker 52-2B0413, Charging Pump P-190 (52-2B0613, Charging Pump P-192) and OBSERVE breaker CLOSE indication.
Terminating Cue:	**The breaker is closed. This JPM is complete.**
Comment: Steps 3.2.1.3 & 3.2.1.3.5	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions after a Control Room evacuation:**

- **SO23-13-2, Shutdown from Outside the Control Room, actions are complete up to the point of reenergizing a Charging Pump.**
- **You are performing Attachment 4, 21 Duties from SO23-13-2.**
- **DC Control Power for Unit 2 Train A Charging Pump 2P-190 (Unit 2 Train B Charging Pump 2P-192) is tripped and can NOT be reset.**
- **2P-190 (2P-192) Charging Pump Breaker is OPEN.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **REPORT to the Safe Shutdown Locker and OBTAIN SSD Kit 21 and a 480 Volt Breaker Charging Lever to operate Charging Springs.**
- **CLOSE Unit 2 Train A Charging Pump 2P-190 Breaker per SO23-13-2, Shutdown from Outside the Control Room, Attachment 21, Circuit Breaker Abnormal Operation.**

or

- **CLOSE Unit 2 Train B Charging Pump 2P-192 Breaker per SO23-13-2, Shutdown from Outside the Control Room, Attachment 21, Circuit Breaker Abnormal Operation.**

Facility: SONGS JPM # NRC S-1 Task #141263 K/A #001.A4.03 4.0 / 3.7 SF-1

Title: Perform an Individual Control Rod Exercise

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	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:

- CEA #21 ACTM card was replaced by I & C.
- CEA #21 needs to be exercised for OPERABILITY.
- The ARO is recording data for Return-to-Service Testing per SO23-3-3.5, CEA / Reactor Trip Circuit Breaker Operability Testing, Attachment 1, CEA Quarterly Operability Test.
- A Reactivity Brief has been conducted.

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

- EXERCISE Control Element Assembly #21 per SO23-3-2.19, Control Element Drive Mechanism Control System, Section 6.12, Repetitive or Emergent Manual CEA Positioning (Hard Card).
- INSERT CEA #21 two (2) inches then WITHDRAW.
- THIS IS A TIME CRITICAL JPM.

Task Standard: Exercise a CEA per SO23-3-2.19 and manually trip the reactor when two CEAs drop into the core per SO23-13-13.

Required Materials: SO23-3-2.19, Control Element Drive Mechanism Control System, Rev. 23-1.
SO23-13-13, Misaligned or Immovable Control Element Assembly, Rev. 12.

Validation Time: 8 minutes Time Critical: 5 minutes Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-1 or any at power Initial Condition with Group 6 CEAs withdrawn 10 inches or more and PERFORM the following:

- **PLACE Group Select Switch to Group P.**
- **PLACE Individual CEA Selection to CEA #35.**
- **RUN the Event File for the malfunctions:**
  - **When CEA Control Switch is placed in WITHDRAW, TRIGGER malfunctions RD2103 and RD0103.**

MACHINE OPERATOR NOTE:

- **After each JPM, PLACE Group Select Switch in Group P and Individual CEA Selection to CEA #35.**
- **CLEAN the Repetitive or Emergent Manual CEA Positioning hard card.**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-3-2.19, Control Element Drive Mechanism Control System.**
  - **Section 6.12, Repetitive or Emergent Manual CEA Positioning.**
  - **Attachment 8, CEDMCS Limitations and Specifics Limitations and Specifics.**

If requested, PROVIDE the examinee with a copy of:

- **SO23-13-13, Misaligned or Immovable Control Element Assembly.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**Controls are located on CEA Operator Module 2UI-9134. The green Hard Card that contains Section 6.12 steps.**
Examiner Note:	**The following steps are from SO23-3-2.19, Section 6.12. Specific steps are annotated in each Comment box.**
Perform Step: √	POSITION Group Select Switch to the CEA group to be moved. • ☐ Regulating CEAs. (SELECT 1 through 6)
Standard:	PLACE Group Select Switch to 6.
Comment: Step 6.12.1	**SAT** ☐ **UNSAT** ☐

Perform Step: √	If moving a single CEA, then POSITION the Individual CEA Selection Switch to the CEA to be moved.
Standard:	PLACE Individual CEA Tens Selection Switch to 2.
Comment: Step 6.12.2	**SAT** ☐ **UNSAT** ☐

Perform Step: √	If moving a single CEA, then POSITION the Individual CEA Selection Switch to the CEA to be moved.
Standard:	PLACE Individual CEA Units Selection Switch to 1.
Comment: Step 6.12.2	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY the individual CEA light is ILLUMINATED.
Standard:	OBSERVE white CEA #21 light lit.
Comment: Step 6.12.2.1	**SAT** ☐ **UNSAT** ☐

Perform Step: √	POSITION Mode Select Switch: • ☐ MI - Manual Individual
Standard:	PLACE Mode Select Switch to MI.
Comment: Step 6.12.3	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY the group indicator lamps are ILLUMINATED for the group selected.
Standard:	OBSERVE white MANUAL INDIVIDUAL light lit.
Comment: Step 6.12.3.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY the group indicator lamps are ILLUMINATED for the group selected.
Standard:	OBSERVE white GRP 6 indicator lamp lit.
Comment: Step 6.12.3.1	**SAT** ☐ **UNSAT** ☐

Perform Step: √	POSITION CEA(s) as directed by SRO Ops. Supv. or controlling procedure (i.e., surveillance or test procedure).
Standard:	PLACE CEA Control Switch to INSERT and OBSERVE CEA #21 position indicator then RELEASE CEA Control Switch when CEA #21 is INSERTED two (2) inches.
Comment: Step 6.12.4	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**When the CEA Control Switch is placed in WITHDRAW, the CEAs will drop.**
Perform Step: √	POSITION CEA(s) as directed by SRO Ops. Supv. or controlling procedure (i.e., surveillance or test procedure).
Standard:	PLACE CEA Control Switch to WITHDRAW and OBSERVE CEA #21 position indicator then RELEASE CEA Control Switch when CEA #21 is WITHDRAWN two (2) inches.
Machine Operator:	**ENSURE malfunctions RD2103 and RD0103 have executed.**
Comment: Step 6.12.4	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**The Mode Select Switch may NOT be taken to OFF.**
Perform Step:	When CEA positioning has completed, then POSITION the Mode Select Switch to OFF.
Standard:	PLACE Mode Select Switch to OFF and OBSERVE red OFF light lit.
Comment: Step 6.12.5	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Perform Step:	RESPOND to Annunciators alarms and indications.
Standard:	DETERMINE CEAs #1 and #21 have dropped based on Annunciators, Secondary Rod Position Display, and Rod Bottom lights.
Comment:	**SAT ☐ UNSAT ☐**

√ - Check Mark Denotes Critical Step **CRITICAL START TIME:**

Examiner Note:	**The examinee may immediately trip the Reactor when both CEAs drop without referencing SO23-13-13.**
Examiner Note:	**The following steps are from SO23-13-13, Misaligned or Immovable Control Element Assemblies.**
Perform Step:	VERIFY NOT more than one CEA is misaligned by > 7 inches.
Standard:	OBSERVE amber Rod Bottom lights illuminated for CEAs #1 and #21 on 2ZI-9131, CEA Bottom Indication (Core Mimic) **and/or** CEAs #1 and #21 fully inserted on 2ZI-9133, Secondary Rod Position (CEAC CRT) **and/or** CEA Operator Module green Lower Electrical Limit lights.
Comment: Step 1.b	**SAT ☐ UNSAT ☐**

Perform Step: √	ENSURE Reactor – tripped, AND GO TO SO23-12-1.
Standard:	DEPRESS Reactor Trip pushbuttons 2HS-9132-4 **and** 2HS-9132-1 **or** 2HS-9132-2 **and** 2HS-9132-3 and DETERMINE Reactor Trip and OBSERVE all amber Rod Bottom lights illuminated on 2ZI-9131, CEA Bottom Indication (Core Mimic) **and/or** all CEAs fully inserted on 2ZI-9133, Secondary Rod Position (CEAC CRT).
Terminating Cue:	**Another operator will perform Standard Post Trip Actions. This JPM is complete.**
Comment: Step 1.b RNO	**SAT ☐ UNSAT ☐**

CRITICAL STOP TIME:

INITIAL CONDITIONS: **Given the following conditions:**

- **CEA #21 ACTM card was replaced by I & C.**
- **CEA #21 needs to be exercised for OPERABILITY.**
- **The ARO is recording data for Return-to-Service Testing per SO23-3-3.5, CEA / Reactor Trip Circuit Breaker Operability Testing, Attachment 1, CEA Quarterly Operability Test.**
- **A Reactivity Brief has been conducted.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **EXERCISE Control Element Assembly #21 per SO23-3-2.19, Control Element Drive Mechanism Control System, Section 6.12, Repetitive or Emergent Manual CEA Positioning (Hard Card).**
- **INSERT then WITHDRAW CEA #21 two (2) inches.**

THIS IS A TIME CRITICAL JPM

Facility: SONGS JPM # NRC S-2 Task #192834 K/A # 013.A4.02 4.3 / 4.4 SF-2

Title: Reset a Safety Injection Actuation Signal and Containment Cooling Actuation Signal

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
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 tripped when a Steam Generator Safety Valve opened.
- This led to a Reactor Coolant System cooldown and subsequent Safety Injection Actuation Signal (SIAS) and Containment Cooling Actuation Signal (CIAS).
- Reactor Coolant System pressure has been stabilized.
- The requirement for Peer Checking has been waived by the Shift Manager.

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

- RESET SIAS and CCAS per SO23-3-2.22, Engineered Safety Features Actuation System Operation, Attachment 5, SIAS / CCAS and CIAS Reset.

Task Standard: Reset the SIAS and CCAS per SO23-3-2.22, Attachment 5.

Required Materials: SO23-3-2.22, Engineered Safety Features Actuation System Operation, Rev. 18.

Validation Time: 14 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-2 or any 100% power Initial Condition and PERFORM the following:

- **INSERT malfunction MS01A at 100% and TRIP the Reactor.**
- **When RCS pressure reaches 1700 psia, DELETE malfunction MS01A.**

When requested by Examiner, PERFORM the following:

- **RESET SIAS & CCAS Trip Paths on Channels B & D using remote functions RP51 & RP53.**

MACHINE OPERATOR NOTES:

- **ENSURE PPS Cabinet 2UIK078 key returned to key locker.**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-3-2.22, Engineered Safety Features Actuation System Operation.**
  - **Attachment 5, SIAS/CCAS and CIAS Reset.**
    - **INITIAL through Step 1.3.**
    - **CHECK the 1st box at Step 1.3.**
    - **MARK Step 2.2.3 N/A for all four (4) channels.**
  - **Attachment 24, Engineered Safety Features Actuation System Limitations and Specifics.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-3-2.22, Attachment 5. Specific steps in this Attachment are annotated in each Comment box.**
Examiner Note:	**Examinee may reset all Channels at the same time.**
Perform Step:	RESET each tripped SIAS bistable, as follows: • LOWER the LO PZR PRESS TRIP Setpoint by depressing the LO PZR PRESS Setpoint Reset pushbutton until setpoint pressure is less than present PZR pressure.
Standard:	COMPARE 2PI-0101-1, Pressurizer 2E087 Pressure Narrow Range to 2PI-0102B1, Pressurizer 2E087 Pressure Setpoint **then** DEPRESS Channel A 2UI-9149-1, LOW PZR PRESS SETPOINT RESET pushbutton until setpoint pressure is less than current PZR pressure.
Comment: Steps 2.1 & 2.1.1.1 for Channel A	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET each tripped SIAS bistable, as follows: • RESET the LO PZR PRESS TRIP and PRETRIP alarm lights on the PPS ROM.
Standard:	DEPRESS Channel A 2UI-9149-1, PPS Operator Module RESET pushbutton and OBSERVE LO PZR PRESS lights OFF.
Comment: Steps 2.1 & 2.1.1.2 for Channel A	**SAT** ☐ **UNSAT** ☐

Perform Step:	RESET each tripped SIAS bistable, as follows: • LOWER the LO PZR PRESS TRIP Setpoint by depressing the LO PZR PRESS Setpoint Reset pushbutton until setpoint pressure is less than present PZR pressure.
Standard:	COMPARE 2PI-0101-2, Pressurizer 2E087 Pressure Narrow Range to 2PI-0102B2, Pressurizer 2E087 Pressure Setpoint **then** DEPRESS Channel B 2UI-9150-2, LOW PZR PRESS SETPOINT RESET pushbutton until setpoint pressure is less than current PZR pressure.
Comment: Steps 2.1 & 2.1.1.1 for Channel B	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET each tripped SIAS bistable, as follows: • RESET the LO PZR PRESS TRIP and PRETRIP alarm lights on the PPS ROM.
Standard:	DEPRESS Channel B 2UI-9150-2, PPS Operator Module RESET pushbutton and OBSERVE LO PZR PRESS lights OFF.
Comment: Steps 2.1 & 2.1.1.2 for Channel B	**SAT** ☐ **UNSAT** ☐

Perform Step:	RESET each tripped SIAS bistable, as follows: • LOWER the LO PZR PRESS TRIP Setpoint by depressing the LO PZR PRESS Setpoint Reset pushbutton until setpoint pressure is less than present PZR pressure.
Standard:	COMPARE 2PI-0101-3, Pressurizer 2E087 Pressure Narrow Range to 2PI-0102B3, Pressurizer 2E087 Pressure Setpoint **then** DEPRESS Channel C 2UI-9151-3, LOW PZR PRESS SETPOINT RESET pushbutton until setpoint pressure is less than current PZR pressure.
Comment: Steps 2.1 & 2.1.1.1 for Channel C	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET each tripped SIAS bistable, as follows: • RESET the LO PZR PRESS TRIP and PRETRIP alarm lights on the PPS ROM.
Standard:	DEPRESS Channel C 2UI-9151-3, PPS Operator Module RESET pushbutton and OBSERVE LO PZR PRESS lights OFF.
Comment: Steps 2.1 & 2.1.1.2 for Channel C	**SAT** ☐ **UNSAT** ☐

Perform Step:	RESET each tripped SIAS bistable, as follows: • LOWER the LO PZR PRESS TRIP Setpoint by depressing the LO PZR PRESS Setpoint Reset pushbutton until setpoint pressure is less than present PZR pressure.
Standard:	COMPARE 2PI-0101-4, Pressurizer 2E087 Pressure Narrow Range to 2PI-0102B4, Pressurizer 2E087 Pressure Setpoint **then** DEPRESS Channel D 2UI-9152-4, LOW PZR PRESS SETPOINT RESET pushbutton until setpoint pressure is less than current PZR pressure.
Comment: Steps 2.1 & 2.1.1.1 for Channel D	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET each tripped SIAS bistable, as follows: • RESET the LO PZR PRESS TRIP and PRETRIP alarm lights on the PPS ROM.
Standard:	DEPRESS Channel D 2UI-9152-4, PPS Operator Module RESET pushbutton and OBSERVE LO PZR PRESS lights OFF.
Comment: Steps 2.1 & 2.1.1.2 for Channel D	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET the Trip Paths for each tripped PPS Channel, as follows: • TURN keyswitch to UNLK position for affected channel at Actuation Reset Panels.
Standard:	OBTAIN Key #47, PPS RESET / RX TRIP from the Key Locker and PERFORM the following: • INSERT Key #47 into PPS Cabinet 2UIK078 Channel A keyswitch. • TURN keyswitch to UNLK position.
Comment: Steps 2.2 & 1st bullet for Channel A	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET the Trip Paths for each tripped PPS Channel, as follows: • DEPRESS ESFAS Reset pushbutton(s). • RESET SIAS Trip Path.
Standard:	DEPRESS the SIAS Reset Actuation Trip Path No. 1 pushbutton on PPS Cabinet 2UIK078 for Channel A.
Comment: Steps 2.2, 2nd bullet, & 2.2.1 for Channel A	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET the Trip Paths for each tripped PPS Channel, as follows: • DEPRESS ESFAS Reset pushbutton(s). • RESET CCAS Trip Path.
Standard:	DEPRESS the CCAS Reset Actuation Trip Path No. 1 pushbutton on PPS Cabinet 2UIK078 for Channel A.
Comment: Steps 2.2, 2nd bullet, & 2.2.2 for Channel A	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET the Trip Paths for each tripped PPS Channel, as follows: • RETURN keyswitch to LK position.
Standard:	TURN keyswitch to LK position on PPS Cabinet 2UIK078 Channel A.
Examiner Cue:	**Another operator will reset Channels B and D.**
Examiner Note:	**After Channel A has been reset, DIRECT the Machine Operator to reset Channels B and D prior to proceeding.**
Comment: Steps 2.2 & 3rd bullet for Channel A	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET the Trip Paths for each tripped PPS Channel, as follows: • TURN keyswitch to UNLK position for affected channel at Actuation Reset Panels.
Standard:	REMOVE Key #47, PPS RESET / RX TRIP from Channel A and PERFORM the following: • INSERT Key #47 into PPS Cabinet 2UIK078 Channel C keyswitch. • TURN keyswitch to UNLK position.
Comment: Steps 2.2 & 1st bullet for Channel C	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET the Trip Paths for each tripped PPS Channel, as follows: • DEPRESS ESFAS Reset pushbutton(s). • RESET SIAS Trip Path.
Standard:	DEPRESS the SIAS Reset Actuation Trip Path No. 3 pushbutton on PPS Cabinet 2UIK078 for Channel C.
Comment: Steps 2.2, 2nd bullet, & 2.2.1 for Channel C	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET the Trip Paths for each tripped PPS Channel, as follows: • DEPRESS ESFAS Reset pushbutton(s). • RESET CCAS Trip Path.
Standard:	DEPRESS the CCAS Reset Actuation Trip Path No. 3 pushbutton on PPS Cabinet 2UIK078 for Channel C.
Comment: Steps 2.2, 2nd bullet, & 2.2.2 for Channel C	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RESET the Trip Paths for each tripped PPS Channel, as follows: • RETURN keyswitch to LK position
Standard:	TURN keyswitch to LK position on PPS Cabinet 2UIK078 Channel C and REMOVE Key #47.
Comment: Steps 2.2 & 3rd bullet for Channel C	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**Not all lights may be illuminated. Provide the Terminating Cue if the Examinee has completed the actions according to the procedure.**
Perform Step:	VERIFY the red, yellow, green, and blue Trip Path indicating lights for SIAS, CCAS and CIAS illuminated on ESFAS status panel.
Standard:	OBSERVE red, yellow, green, and blue Trip Path lights ON for SIAS, CCAS and CIAS on Engineered Safety Features System Status Panel.
Terminating Cue:	**All Trip Path lights are illuminated. This JPM is complete.**
Comment: Step 2.2.4	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 tripped when a Steam Generator Safety Valve opened.**
- **This led to a Reactor Coolant System cooldown and subsequent Safety Injection Actuation Signal (SIAS) and Containment Cooling Actuation Signal (CIAS).**
- **Reactor Coolant System pressure has been stabilized.**
- **The requirement for Peer Checking has been waived by the Shift Manager.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **RESET SIAS and CCAS per SO23-3-2.22, Engineered Safety Features Actuation System Operation, Attachment 5, SIAS / CCAS and CIAS Reset.**

Facility: SONGS JPM # NRC S-3 Task #192535 K/A# 010.A2.02 3.9 / 3.9 SF-3

Title: Respond to an Open Pressurizer Spray Valve

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	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 at 100% power.
- PV-0100A, Pressurizer Spray Valve has inadvertently opened.

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

- RESPOND per the appropriate Abnormal Operating Instruction.

Task Standard: Respond to lowering Pressurizer pressure, trip the Reactor, then trip Reactor Coolant Pumps P-001 & P-004 per SO23-13-27.

Required Materials: SO23-13-27, Pressurizer Pressure and Level Malfunction, Rev 4.

Validation Time: 12 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-3 or any 100% power Initial Condition and PERFORM the following:

- **EXECUTE malfunction RC24A, PV-0100A Pressurizer Spray Valve Failure, at 100%.**
- **After 60 seconds, ADJUST RC24A to 50% on a 30 second ramp.**

MACHINE OPERATOR NOTE:

- **ENSURE PIC-0100A, Pressurizer Spray Valve Controller has PRESSURE displayed vice SETPOINT.**

EXAMINER:

When identified, PROVIDE the examinee with a copy of Handout:

- **SO23-13-27, Pressurizer Pressure and Level Malfunction.**

EXAMINER NOTE:

- **During JPM testing, and using the malfunction parameters listed above, it was determined that 20 minutes would elapse before the Reactor tripped on Low Pressurizer Pressure (assuming NO operator action is taken).**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The examinee may attempt to close the Spray Valve as a "prompt and prudent action" per SO123-0-A1, Conduct of Operations, Step 6.3.3.3. This action is addressed at Step 3.b RNO.**
Perform Step:	RESPOND per the appropriate Abnormal Operating Instruction.
Standard:	DETERMINE 2PV-0100A, Pressurizer Spray Valve is OPEN and REFER to SO23-13-27, Pressurizer Pressure and Level Malfunction.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SO23-13-27. Specific steps are annotated in each Comment box.**
Perform Step:	EVALUATE plant conditions per the following to identify required ACTIONS: • UNCONTROLLED PRESSURE CHANGE, as indicated by: • 50A14, PZR PRESS HI / LO in alarm, or • UNEXPLAINED PRESSURIZER PRESSURE CHANGE
Standard:	DETERMINE uncontrolled pressure change, as indicated by: • Annunciator 50A14 – PZR PRESS HI / LO in alarm. • 2PV-0100A, Pressurizer Spray Valve OPEN. and TRANSITION to Step 3.
Comment: Step 1	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY the selected Pressurizer Pressure channel is between 2225 and 2275 psig and stable.
Standard:	OBSERVE the following indications: • 2PIC-0100, Pressure Control • 2PR-0100A, NR Channel X • 2PR-0100B, NR Channel Y DETERMINE that Pressurizer Pressure is between 2225 and 2275 psig and LOWERING and REFER to RNO column.
Comment: Step 3.a	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY the other pressure channel is available by observing PR-0100A or PR-0100B or CFMS page 325.
Standard:	DETERMINE that Pressurizer Pressure Channel X and Channel are both LOWERING the same amount.
Comment: Step 3.a RNO	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY Pressurizer Pressure is stable.
Standard:	OBSERVE Pressurizer Pressure instruments: • 2PIC-0100, Pressure Control • 2PR-0100A, NR Channel X • 2PR-0100B, NR Channel Y DETERMINE pressure is LOWERING and REFER to RNO column.
Comment: Step 3.b	**SAT** ☐ **UNSAT** ☐

Perform Step:	If Pressurizer pressure is trending **low**, then: • START Pressurizer heaters, as necessary.
Standard:	VERIFY ALL Pressurizer Heaters ENERGIZED.
Comment: Step 3.b. RNO 1)	**SAT** ☐ **UNSAT** ☐

Perform Step:	If Pressurizer pressure is trending **low**, then: • ENSURE both Pressurizer Spray Valves are closed.
Standard:	DETERMINE 2PV-0100B, PZR Spray Valve CLOSED and 2PV-0100A, PZR Spray Valve 50% OPEN and REFER to RNO column.
Comment: Step 3 b. RNO 2)	**SAT** ☐ **UNSAT** ☐

Perform Step: √	If unable to close affected Spray Valve in manual, then GO TO STEP 3e.
Standard:	DEPRESS 2HIC-0100A, Spray Control SEL pushbutton until SETPOINT is displayed then DEPRESS A/M pushbutton to place in MANUAL and then LOWER (▼) pushbutton and DETERMINE 2PV-011A remains OPEN and TRANSITION to Step 3e.
Comment: Step 3 b. RNO	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY PV-0100A, Pressurizer Spray Valve from Loop 1A, is **not** failed open.
Standard:	OBSERVE 2HIC-0100A, Spray Control and DETERMINE 2PV-0100A, PZR Spray Valve FAILED 50% OPEN and REFER to RNO column.
Comment: Step 3.e.	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**Removing the connector block at the Spec 200 Cabinet must be simulated. The Controller will still indicate that it is energized.**
Perform Step:	FAIL CLOSED PV-0100A, PZR Spray Valve, by carefully removing the connector block at L138, SPEC 200 Power Supply Cabinet, NEST 4, SLOT 10. (PC-0100/HC-0100A)
Standard:	CONTACT the ARO to REMOVE the connector block at 2L138, Spec 200 Power Supply Cabinet, Nest 4, Slot 10 for 2PC-0100 / 2HC-0100A.
Examiner Cue:	**The ARO reports that the connector block at the Spec 200 Cabinet has been disconnected.**
Comment: Step 3 RNO e.	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY PV-0100B, Pressurizer Spray Valve from Loop 1B, is **not** failed open.
Standard:	OBSERVE 2HIC-0100B, Spray Control and DETERMINE 2PV-0100B, PZR Spray Valve CLOSED.
Comment: Step 3.f	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY Pressurizer Pressure is controlled.
Standard:	OBSERVE Pressurizer Pressure instruments and DETERMINE pressure is LOWERING and REFER to RNO column: • 2PIC-0100, Pressure Control • 2PR-0100A, NR Channel X • 2PR-0100B, NR Channel Y
Comment: Step 3.g	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Perform Step: √	TRIP the reactor.
Standard:	DEPRESS Reactor Trip pushbuttons 2HS-9132-4 **and** 2HS-9132-1 **or** 2HS-9132-2 **and** 2HS-9132-3 and DETERMINE Reactor Trip and OBSERVE all amber Rod Bottom lights lit on 2ZI-9131, CEA Bottom Indication (Core Mimic) **and/or** all CEAs fully inserted on 2ZI-9133, Secondary Rod Position (CEAC CRT) **and/or** CEA Operator Module green Lower Electrical Limit lights.
Examiner Cue:	**Another operator will perform Standard Post Trip Actions.**
Comment: Step 3.g RNO g	**SAT ☐ UNSAT ☐**

Perform Step: √	5 seconds after CEA rod bottom lights are illuminated, TRIP the affected RCPs: • PV-0100A: P001 and P004
Standard:	VERIFY all amber Rod Bottom lights lit on 2ZI-9131, CEA Bottom Indication (Core Mimic), WAIT at least 5 seconds, then: • DEPRESS 2HS-9160A, 2P001 (SE) STOP pushbutton and OBSERVE green STOP light lit and ammeter at zero (0) amps.
Comment: Step 3.g RNO g.1)	**SAT ☐ UNSAT ☐**

Perform Step: √	5 seconds after CEA rod bottom lights are illuminated, TRIP the affected RCPs: • PV-0100A: P001 and P004
Standard:	VERIFY all amber Rod Bottom lights lit on 2ZI-9131, CEA Bottom Indication (Core Mimic), WAIT at least 5 seconds, then: • DEPRESS 2HS-9162A, 2P004 (NW) STOP pushbutton and OBSERVE green STOP light lit and ammeter at zero (0) amps.
Terminating Cue:	**Another operator will perform Standard Post Trip Actions. This JPM is complete.**
Comment: Step 3.g RNO g.1)	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 is at 100% power.**
- **PV-0100A, Pressurizer Spray Valve has inadvertently opened.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **RESPOND per the appropriate Abnormal Operating Instruction.**

Facility: SONGS JPM # NRC S-4 Task #188158 K/A #025.AA1.02 3.8 / 3.9 SF-4P

Title: Perform Actions for Loss of Shutdown Cooling

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	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: Unit 2 is in MODE 5 Mid-Loop Operations with the following conditions:

- Train A Shutdown Cooling System was operating when a Loss of Offsite Power occurs.
- Train B Emergency Diesel Generator (2G003) failed to start and is in MAINTENANCE LOCKOUT.
- Containment Spray Pumps are NOT aligned for Shutdown Cooling.
- Reactor Coolant System level is ~36 inches and stable in the Hot Leg.

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

- INITIATE Loss of Shutdown Cooling actions.

Task Standard: Restore Shutdown Cooling flow then refill the Reactor Coolant System with a High Pressure Safety Injection Pump per SO23-13-15.

Required Materials: SO23-13-15, Loss of Shutdown Cooling, Rev. 21.

Validation Time: 16 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-4 or any MODE 5 Initial Condition with SDC in service and then PERFORM the following:

- **PLACE 2G003 in MAINTENANCE LOCKOUT using Key #78.**
- **EXECUTE malfunction PG24, Loss of Offsite Power and allow Emergency Diesel to load on the bus.**
- **PLACE tag over HPSI Pump P-017 labeled "RIC OPERABLE PUMP."**
- **PLACE tag over HPSI Pump P-019 labeled "RIC AVAILABLE PUMP."**
- **PLACE Plant Computer System screen on RO desk to Page 314, DLMS.**
- **INSTALL SDC System PVC plugs on key switches.**
- **MAINTAIN Simulator in FREEZE until level is verified on DLMS at Step 3b.**
- **When Intake Cooling Unit running is verified on CR-60, EXECUTE malfunction ECCS LP, LPSI Pump amps fluctuate ± 15 amps.**

MACHINE OPERATOR CAUTION:

- **MAINTAIN Simulator in FREEZE until level is verified on DLMS at Step 3b.**

EXAMINER:

When identified, PROVIDE the examinee with a copy of Handout:

- **SO23-13-15, Loss of Shutdown Cooling.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Machine Operator:	**MAINTAIN Simulator in FREEZE until level is verified at Step 3b.**
Examiner Note:	**When identified, PROVIDE the examinee with the Handout.**
Perform Step:	IDENTIFY correct procedure to use.
Standard:	IDENTIFY SO23-13-15, Loss of Shutdown Cooling as the correct procedure to use.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SO23-13-15.** **Specific steps are annotated in each Comment box.**
Perform Step:	INITIATE evacuation of non-essential personnel from Containment per SO23-13-1, Local Area Evacuation.
Standard:	INITIATE evacuation of non-essential personnel from Containment per SO23-13-1, Local Area Evacuation.
Examiner Cue:	**All personnel have evacuated Containment.**
Comment: Step 1.a	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY Containment Equipment Hatch - Closed.
Standard:	VERIFY Containment Equipment Hatch is CLOSED.
Examiner Cue:	**Containment Equipment Hatch is closed.**
Comment: Step 1.b	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY Offsite Power Sources - energized. • INITIATE SO23-12-11, Attachment for Restoration of Offsite Power.
Standard:	DETERMINE Offsite Power Sources are DEENERGIZED per the Initial Conditions and PERFORM SO23-12-11, Attachment for Restoration of Offsite Power.
Examiner Cue:	**The ARO will perform Attachment for Restoration of Offsite Power.**
Comment: Steps 1.c & 1.c RNO	**SAT ☐ UNSAT ☐**

Perform Step:	INITIATE Attachment 4, Containment Closure / RCS Vent Checklist.
Standard:	INITIATE Attachment 4, Containment Closure / RCS Vent Checklist.
Examiner Cue:	**Attachment 4 is being performed by the 51.**
Comment: Step 1.d	**SAT ☐ UNSAT ☐**

Perform Step:	IMPLEMENT Attachment 1, RCS / SDCS Parameter Monitoring.
Standard:	IMPLEMENT Attachment 1, RCS / SDCS Parameter Monitoring.
Examiner Cue:	**Attachment 1 is being performed by the 41.**
Comment: Step 1.e	**SAT ☐ UNSAT ☐**

Perform Step:	NOTIFY the Shift Manager to: • Determine the requirement for event classification per SO123-VIII-1. • Determine reporting requirements of SO123-0-A7.
Standard:	NOTIFY the Shift Manager to perform Event Classification and Reporting Requirement actions.
Examiner Cue:	**The Shift Manager has been notified.**
Comment: Steps 1.f.1) & 1.f.2)	**SAT ☐ UNSAT ☐**

Perform Step:	ENSURE all RCS dilutions in progress are stopped.
Standard:	OBSERVE Primary Water Pumps OFF due to Loss of Offsite Power and DETERMINE no RCS dilutions in progress at this time.
Comment: Step 2.a	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY RCS / SDCS parameters: • ALL SDCS / LTOP Isolation Valves - OPEN: • Train A - HV-9337, HV-9377, HV-9379
Standard:	OBSERVE red OPEN lights lit and DETERMINE all Train A SDCS / LTOP Isolation Valves are OPEN: • Train A - 2HV-9337, 2HV-9377, 2HV-9379
Examiner Cue:	**The Control Room Supervisor reports that Train B SDCS/LTOP Valves were open before the Loss of Offsite Power.**
Comment: Steps 3 & 3.a	**SAT ☐ UNSAT ☐**

Machine Operator:	**PLACE Simulator in RUN when level is verified on DLMS.**
Perform Step:	VERIFY RCS / SDCS parameters: • RCS level – greater than or equal to 21 inches in the Hot Leg AND – NOT lowering.
Standard:	OBSERVE LT-1520N, Digital Level Monitoring System (DLMS) indication on Page 6314 of Plant Computer System and DETERMINE RCS level ~36 inches in the Hot Leg and NOT lowering.
Comment: Steps 3 & 3.b	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY RCS / SDCS parameters: • SDC flow – ≥ 2500 gpm (≥ 2400 on CFMS) AND SDC Pump amperage – normal. • GO TO Step 5.
Standard:	OBSERVE 2FI-0306, LPSI / SDC Flow indication and DETERMINE SDC flow is < 2300 gpm and Train A SDC Pump 2P015 START light is OFF **and/or** motor amperage is zero and TRANSITION to Step 5.
Comment: Steps 3, 3.c, & 3.c RNO	**SAT** ☐ **UNSAT** ☐

Perform Step:	RECOVER SDC flow: • VERIFY at least one SDC pump – running. • IF 4 kV Buses A04 or A06 – energized, THEN
Standard:	DETERMINE that SDC Pump is NOT running. • REFER to RNO for 4 kV Buses A04 or A06 energized.
Comment: Steps 5, 5.a, & 5.a RNO	**SAT** ☐ **UNSAT** ☐

Perform Step: √	IF 4 kV Buses A04 or A06 – energized, THEN: • START available CCW Pump.
Standard:	DEPRESS 2HS-6320-1, CCW Pump 2P025 (C) START pushbutton and OBSERVE red START light lit and amps normal.
Comment: Step 5.a RNO 2).a	**SAT** ☐ **UNSAT** ☐

Perform Step:	IF 4 kV Buses A04 or A06 energized, THEN: • ENSURE Salt Water Pump – started on loop with running CCW Pump.
Standard:	OBSERVE 2HS-6380-1, Saltwater Pump 2P112 (W) red START light lit and amps normal.
Comment: Step 5.a RNO 2).b	**SAT ☐ UNSAT ☐**

Perform Step: √	IF 4 kV Buses A04 or A06 energized, THEN: • START the SDC Pump associated with running CCW Pump.
Standard:	DEPRESS 2HS-9390-1, LPSI Pump 2P015 (E) START pushbutton and OBSERVE red START light lit and amps normal.
Comment: Step 5.a RNO 2).c	**SAT ☐ UNSAT ☐**

Machine Operator:	**When examinee goes to CR-60, EXECUTE malfunction ECCS LP.**
Perform Step:	IF 4 kV Buses A04 or A06 energized, THEN: • ENSURE Intake Cooling Unit associated with operating SWC Pump – started.
Standard:	OBSERVE 2ZL-9600-1, SWTR Pump 2P112 Room Vent Unit 2A370 Unit 2 Intake START light lit on CR-60.
Examiner Note:	**Examinee may contact a PEO to verify Intake Cooling Unit running.**
Comment: Step 5.a RNO 2).d	**SAT ☐ UNSAT ☐**

Perform Step:	RECOVER SDC flow: • VERIFY running SDC Pump amperage – normal.
Standard:	OBSERVE 2HS-9390-1, LPSI Pump 2P015 (E) with fluctuating amperage indication.
Comment: Steps 5 & 5.b	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps represent the alternate path for this JPM.**
Perform Step:	IF running SDC Pump amperage – fluctuating greater than ±10 amps, • THEN, FILL RCS per Steps 4i through 4l, **AND** • VENT SDCS per Attachment 2.
Standard:	DETERMINE SDC Pump amperage is fluctuating greater than ±10 amps and TRANSITION to Steps 4i through 4l.
Examiner Cue:	**Another operator will vent the Shutdown Cooling System per Attachment 2.**
Comment: Step 5.b RNO b.1)	**SAT ☐ UNSAT ☐**

Perform Step:	RECOVER RCS Inventory: • ANNOUNCE, “Commencing emergency refill of the RCS. All personnel stand clear of RCS openings."
Standard:	ANNOUNCE over Public Address system: • Commencing emergency refill of the RCS. All personnel stand clear of RCS openings.
Comment: Steps 4 & 4.i	**SAT ☐ UNSAT ☐**

Perform Step: √	RECOVER RCS Inventory: • START operable or available HPSI Pump.
Standard:	DEPRESS 2HS-9392-1, HPSI Pump 2P017 (E) and OBSERVE red START light lit and amps normal.
Comment: Steps 4 & 4.j	**SAT ☐ UNSAT ☐**

Perform Step:	RECOVER RCS Inventory: • ENSURE selected flowpath does not bypass the RX Core through known leaks.
Standard:	DETERMINE flowpath does not bypass the Reactor Core through known leaks.
Examiner Cue:	**The Control Room Supervisor reports that there are no known leakage flowpaths. Use the Cold Leg Injection Valves.**
Comment: Steps 4 & 4.j.1)	**SAT ☐ UNSAT ☐**

Perform Step: √	RECOVER RCS Inventory: • ESTABLISH flow by throttling OPEN two Cold Leg Injection Valves.
Standard:	DEPRESS any two (2) HPSI Cold Leg Injection Valve JOG OPEN pushbuttons and OBSERVE red JOG OPEN lights lit and green JOG CLOSE lights off: • 2HV-9324, HDR 1 to Loop 1A • 2HV-9327, HDR 1 to Loop 1B • 2HV-9330, HDR 1 to Loop 2A • 2HV-9333, HDR 1 to Loop 2B
Comment: Steps 4 & 4.j.2)	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**Flow will be observed where the HPSI Valves are opened.**
Perform Step:	RECOVER RCS Inventory: • ESTABLISH flow by throttling OPEN two Cold Leg Injection Valves.
Standard:	OBSERVE injection flow on two (2) of the following instruments: • 2FI-0311-2, HPSI Flow to Cold Legs Loop 1A (SE) • 2FI-0341-2, HPSI Flow to Cold Legs Loop 2B (NE) • 2FI-0321-1, HPSI Flow to Cold Legs Loop 1B (SW) • 2FI-0331-1, HPSI Flow to Cold Legs Loop 2A (NW)
Terminating Cue:	**This JPM is complete.**
Comment: Steps 4 & 4.j.2)	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Unit 2 is in MODE 5 Mid-Loop Operations with the following conditions:**

- **Train A Shutdown Cooling System was operating when a Loss of Offsite Power occurs.**
- **Train B Emergency Diesel Generator (2G003) failed to start and is in MAINTENANCE LOCKOUT.**
- **Containment Spray Pumps are NOT aligned for Shutdown Cooling.**
- **Reactor Coolant System level is ~36 inches and stable in the Hot Leg.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **INITIATE Loss of Shutdown Cooling actions.**

Facility: SONGS JPM # NRC S-5 Task #141237 K/A #061.A3.01 4.2 / 4.2 SF-4S

Title: Transfer From Main Feedwater to Auxiliary Feedwater

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
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 shutdown is in progress.
- Reactor power is approximately 2%.
- Main Feedwater Pump 2P-062 is in service.
- Auxiliary Feedwater Pumps 2P-141 and 2P-504 are running.

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

- TRANSFER from Main Feedwater to Auxiliary Feedwater per SO23-9-6, Feedwater Control System Operation, Attachment 6, Feedwater Control System Operation - Unit Shutdown, START at Step 2.7, Transfer Feed to AFW System.
- MAINTAIN both Steam Generator levels 55% ± 5% narrow range.

Task Standard: Transfer Steam Generator level control from the Main Feedwater System to the Auxiliary Feedwater System per SO23-9-6.

Required Materials: SO23-9-6, Feedwater Control System Operation, Rev. 25.

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

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-2 or any low power Initial Condition and PERFORM the following:

- **REDUCE power to 2% to 4%.**
- **SECURE Main Feedwater Pump 2P-063.**
- **ENSURE 2HV-4047 & 2HV-4051, Main Feedwater Control Block Valves CLOSED.**
- **START 2P-141 & 2P-504, Auxiliary Feedwater Pumps.**
- **ENSURE 2HV-4712 & 2HV-4731, Auxiliary Feedwater Block Valves OPEN.**
- **PLACE Feedwater Control System in MANUAL and maintain 55% narrow range.**
- **ACCESS Trend Screen at RO PCS Monitor called STEAM GENERATOR 6 TREND.**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-9-6, Feedwater Control System Operation.**
  - **Attachment 6, Feedwater Control System Operation - Unit Shutdown.**
    - **INITIAL and N/A through Step 2.6.3.**
  - **Attachment 12, Feedwater Control System Limitations and Specifics.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-9-6, Attachment 6. Specific steps in this Attachment are annotated in each Comment box.**
Perform Step: √	TRANSFER feed to AFW System, as follows: • Throttle OPEN HV-4712 to feed E088 while throttling Closed Bypass Control Valve HV-1106.
Standard:	Throttle OPEN 2HV-4712 while throttling CLOSED 2HV-1106: • DEPRESS 2HV-4712, AFW 2P504 to SG 2E088 (N) DISCH Valve red JOG OPEN pushbutton to OPEN valve. • DEPRESS 2HIC-1106, FW to SG 2E088 (N) Bypass Control Valve MANUAL (**M**) pushbutton then DOWN arrow (▼) to CLOSE valve.
Comment: Steps 2.7 & 2.7.1	**SAT** ☐ **UNSAT** ☐

Perform Step: √	TRANSFER feed to AFW System, as follows: • Throttle OPEN HV-4713 to feed E089 while throttling Closed Bypass Control Valve, HV-1105.
Standard:	Throttle OPEN 2HV-4713 while throttling CLOSED 2HV-1105: • DEPRESS 2HV-4713, AFW 2P141 to SG 2E089 (S) DISCH Valve red JOG OPEN pushbutton to OPEN valve. • DEPRESS 2HIC-1105, FW to SG 2E089 (S) Bypass Control Valve MANUAL (**M**) pushbutton then DOWN arrow (▼) to CLOSE valve.
Comment: Steps 2.7 & 2.7.2	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY S/G level is being maintained by AFW.
Standard:	OBSERVE Steam Generator E-088 and E-089 narrow range levels on Feedwater Control System DCS **and/or** PCS at 55% ± 5%.
Examiner Note:	**SG levels will stabilize when AFW flow to each SG is ~230 gpm.**
Comment: Step 2.7.3	**SAT** ☐ **UNSAT** ☐

Perform Step:	ENSURE Main Feedwater Master Controllers in MANUAL with controller output adjusted to zero. • FIC-1111, S/G E089
Standard:	DEPRESS 2FIC-1111, FW to SG 2E089 (S) Master Control MANUAL (**M**) pushbutton then DOWN arrow (▼) until output ADJUSTED to zero (0).
Comment: Steps 2.7.4 & 2.7.4.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	ENSURE Main Feedwater Master Controllers in MANUAL with controller output adjusted to zero. • FIC-1121, S/G E088
Standard:	DEPRESS 2FIC-1121, FW to SG E088 (N) Master Control MANUAL (**M**) pushbutton then DOWN arrow (▼) until output ADJUSTED to zero (0).
Comment: Steps 2.7.4 & 2.7.4.2	**SAT** ☐ **UNSAT** ☐

Perform Step:	**Unit 2:** ENSURE FW Pump Turbine Speed Controllers in MANUAL in the DCS. • [**K005 (E089) Graphic Menu** => Overview => HIC1107 K005 / P063 A/M STATION]
Standard:	CLICK Home Page then K005 SG1 (E089) and OBSERVE HIC 1107 K005 / P063 blue MANUAL backlight lit.
Comment: Steps 2.7.5 & 2.7.5.1	**SAT** ☐ **UNSAT** ☐

Perform Step: √	**Unit 2:** ENSURE FW Pump Turbine Speed Controllers in MANUAL in the DCS. • [**K006 (E088) Graphic Menu** => Overview => HIC1108 K006 / P062 A/M STATION]
Standard:	CLICK Home Page then K006 SG2 (E088) and OBSERVE HIC 1108 K006 / P062 yellow AUTO backlight lit. • ACTIVATE HIC 1108 and CLICK on **M** icon and OBSERVE blue MANUAL backlight lit.
Comment: Steps 2.7.5 & 2.7.5.2	**SAT** ☐ **UNSAT** ☐

Perform Step:	**Unit 3:** ENSURE FW Pump Turbine Speed Controllers in MANUAL. • HIC-1107 K005 Speed • HIC-1108 K006 Speed
Standard:	MARK Steps 2.7.6.1 & 2.7.6.2 N/A.
Comment: Steps 2.7.6.1 & 2.7.6.2	**SAT** ☐ **UNSAT** ☐

Perform Step:	ENSURE FW Bypass Regulator controller in MANUAL with output at zero. • HIC-1105, S/G E089
Standard:	OBSERVE 2HIC-1105, FW to SG 2E089 (S) Bypass Control Valve MANUAL (**M**) pushbutton lit with OUTPUT at zero (0).
Comment: Steps 2.7.7 & 2.7.7.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	ENSURE FW Bypass Regulator controller in MANUAL with output at zero. • HIC-1106, S/G E088
Standard:	OBSERVE 2HIC-1106, FW to SG 2E088 (N) Bypass Control Valve MANUAL (**M**) pushbutton lit with OUTPUT at zero (0).
Comment: Steps 2.7.7 & 2.7.7.2	**SAT** ☐ **UNSAT** ☐

Perform Step:	ENSURE Main Regulator controllers in Manual with Output at zero. • HIC-1111, S/G E089
Standard:	DEPRESS 2HIC-1111, FW to SG 2E089 (S) Control Valve MANUAL (**M**) pushbutton then DOWN arrow (▼) until OUTPUT at zero (0).
Comment: Steps 2.7.8 & 2.7.8.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	ENSURE Main Regulator controllers in Manual with Output at zero. • HIC-1121, S/G E088
Standard:	DEPRESS 2HIC-1121, FW to SG 2E088 (N) Control Valve MANUAL (**M**) pushbutton then DOWN arrow (▼) until OUTPUT at zero (0).
Comment: Steps 2.7.8 & 2.7.8.2	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**Depressing <u>both</u> pushbuttons in <u>either</u> Train will close the valve.**
Perform Step: √	CLOSE the Main Feedwater Containment Isolation Valve 2HV-4048.
Standard:	DEPRESS **<u>both</u>** 2HV-4048, FW to SG 2E088 (N) ISO Valve CLOSE pushbuttons for **<u>either</u>** Train A **<u>or</u>** Train B and OBSERVE both green CLOSE lights lit.
Comment: Step 2.7.9	**SAT** ☐ **UNSAT** ☐

Perform Step: √	CLOSE Main Feedwater Containment Isolation Valve 2HV-4052.
Standard:	DEPRESS **both** 2HV-4052, FW to SG 2E089 (S) ISO Valve CLOSE pushbuttons for **either** Train A or Train B and OBSERVE both green CLOSE lights lit.
Terminating Cue:	**This JPM is complete.**
Comment: Step 2.7.10	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 shutdown is in progress.**
- **Reactor power is approximately 2%.**
- **Main Feedwater Pump 2P-062 is in service.**
- **Auxiliary Feedwater Pumps 2P-141 and 2P-504 are running.**
- **There is minimal decay heat at this time.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **TRANSFER from Main Feedwater to Auxiliary Feedwater per SO23-9-6, Feedwater Control System Operation, Attachment 6, Feedwater Control System Operation - Unit Shutdown, START at Step 2.7, Transfer Feed to AFW System.**
- **MAINTAIN both Steam Generator levels 55% ± 5% narrow range.**

Facility: SONGS JPM # NRC S-6 Task #186330 K/A #064.A4.07 3.4 / 3.4 SF-6

Title: Parallel Isochronous Emergency Diesel Generator with Reserve Auxiliary Transformer

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
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 at 100% power.
- Train A Emergency Diesel Generator 2G002 is supplying Bus 2A04.
- Train A Switchgear Room 2A04 is clear of personnel and posted.

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

- PARALLEL Bus 2A04 to Reserve Auxiliary Transformer 2XR1 per SO23-2-13, Diesel Generator Operation, Attachment 2, Diesel Generator Operation, Section 2.6, Paralleling a Diesel Supplied Isochronous Bus to the RAT.
- UNLOAD Train A Emergency Diesel Generator per SO23-2-13, Diesel Generator Operation, Attachment 2, Diesel Generator Operation, Section 2.8, Unloading the Diesel Generator.

Task Standard: Parallel EDG 2G002 to Bus 2A04 then unload the EDG per SO23-2-13.

Required Materials: SO23-2-13, Diesel Generator Operation, Rev. 46.

Validation Time: 15 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-6 or any 100% power Initial Condition and PERFORM the following:

- **ENSURE EDG is carrying the 4160 Volt 1E Buses and the Reserve Auxiliary Transformers are ready to be aligned to supply the 1E 4160 Volt Buses.**

MACHINE OPERATOR NOTE:

- **After each JPM, PLACE Sync Switch key in the Non-ESF Sync Master keylock on the vertical section of CR-63.**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-2-13, Diesel Generator Operation.**
  - **Attachment 2, Diesel Generator Operation.**
    - **Section 2.6, Paralleling a Diesel Supplied Isochronous Bus to the RAT.**
    - **Section 2.8, Unloading the Diesel Generator.**
  - **Attachment 23, Diesel Generator Limitations and Specifics.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from SO23-2-13, Attachment 2, Section 2.6. Specific steps are annotated in each Comment box.**
Perform Step:	Ensure the affected Switchgear Room is clear of all unnecessary personnel and maintain it clear until after the Diesel is paralleled to the 4 kV bus.
Standard:	DETERMINE Train A 2A04 Switchgear Room clear of personnel per the Initial Conditions.
Comment: Step 2.6.1	**SAT ☐ UNSAT ☐**

Perform Step:	Verify that the associated Reserve Auxiliary Transformer is energized and available to pick up the load.
Standard:	OBSERVE Breakers 4042 and 6042, Unit 2 Res Aux XFMR, red CLOSE lights lit and all 2XR1, Reserve Auxiliary Transformer annunciators CLEAR on CR-63.
Comment: Step 2.6.2	**SAT ☐ UNSAT ☐**

Perform Step: √	PLACE Synchronization Master Control switch to ON.
Standard:	INSERT key and TURN 2HS-1627-1, Train A Sync Circuit Control ESF A SYNC MASTER to ON position.
Comment: Step 2.6.3	**SAT ☐ UNSAT ☐**

Perform Step: √	DEPRESS the Reserve Auxiliary Transformer XR1 (XR2) FDR BKR A0418 (A0618) SYNC Pushbutton.
Standard:	DEPRESS 2HS-1659-1, RES AUX XFMR 2XR1 FDR Breaker 2A0418 SYNC pushbutton and OBSERVE white SYNC light lit.
Comment: Step 2.6.4	**SAT ☐ UNSAT ☐**

Perform Step:	Using HS-1669-1 (HS-1648-2), VOLTAGE REGULATOR, MATCH incoming and running voltages at the synchroscope.
Standard:	DEPRESS 2HS-1669-1, Voltage Regulator RAISE pushbutton **or** LOWER pushbutton to equal incoming and running voltages and OBSERVE 2/3EI-1627A, Running Volts & 2/3EI-1627B, Incoming Volts voltage meters MATCHED.
Comment: Step 2.6.5	**SAT ☐ UNSAT ☐**

Perform Step: √	Using HS-1671-1 (HS-1650-2), GOVERNOR CONTROL, ADJUST D/G SPEED so that the synchroscope is ***moving slowly in the clockwise direction***.
Standard:	DEPRESS 2HS-1671-1, Governor Control LOWER pushbutton to slow the speed in CLOCKWISE direction **or** RAISE pushbutton to change synchroscope rotation from COUNTER CLOCKWISE to CLOCKWISE and speed up CLOCKWISE rotation.
Comment: Step 2.6.6	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**To prevent a reverse power condition, the EDG should have a minimum load applied immediately after being paralleled to the 4 kV bus.**
Perform Step: √	When the Synchroscope is within "3 minutes" of the straight up position, then CLOSE the Reserve Auxiliary Transformer Breaker.
Standard:	When Synchroscope is within "3 minutes" of straight up position, DEPRESS 2HS-1659-1, RES AUX XFMR 2XR1 FDR Breaker 2A0418 CLOSE pushbutton and OBSERVE red CLOSE light lit and green TRIP light off.
Comment: Step 2.6.7	**SAT** ☐ **UNSAT** ☐

Perform Step: √	RAISE LOAD on the Diesel to approximately 1.2 MW by depressing HS-1671-1 (HS-1650-2), GOVERNOR CONTROL.
Standard:	DEPRESS 2HS-1671-1, Governor Control RAISE pushbutton and: • OBSERVE 2JI-1672A1, Diesel GEN 2G002 Watts. • RAISE to 1.2 MW and then RELEASE the RAISE pushbutton.
Comment: Step 2.6.8	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY ILLUMINATED HS-1671-1(HS-1650-2), GOVERNOR CONTROL DROOP IN light.
Standard:	OBSERVE 2HS-1671-1, Governor Control white DROOP IN light lit.
Comment: Step 2.6.9	**SAT** ☐ **UNSAT** ☐

Perform Step:	MAINTAIN VARS between 0.1 to 0.5 MVARS positive by adjusting the D/G Voltage Regulator using HS-1669-1 (HS-1648-2), VOLTAGE REGULATOR.
Standard:	OBSERVE 2JI-1672B1, Diesel GEN 2G002 VARS and DEPRESS 2HS-1669-1, Voltage Regulator RAISE pushbutton to raise MVARS to between 0.1 and 0.5 MVARS.
Comment: Step 2.6.10	**SAT ☐ UNSAT ☐**

Perform Step:	REMOVE the Reserve Auxiliary Transformer Breaker from sync circuit.
Standard:	DEPRESS 2HS-1659-1, RES AUX XFMR 2XR1 FDR Breaker 2A0418 SYNC pushbutton and OBSERVE white SYNC light off.
Comment: Step 2.6.11	**SAT ☐ UNSAT ☐**

Perform Step:	SELECT HS-1627-1(2), SYNC CKT CONTROL, to OFF.
Standard:	TURN key 2HS-1627-1, Train A Sync Circuit Control ESF A SYNC MASTER to OFF position.
Comment: Step 2.6.12	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SO23-2-13, Attachment 2, Section 2.8. Specific steps are annotated in each Comment box.**
Perform Step:	Ensure all required operating readings are complete.
Standard:	ENSURE all required operating readings are complete.
Examiner Cue:	**No readings are required.**
Comment: Step 2.8.1	**SAT ☐ UNSAT ☐**

Perform Step:	REDUCE load on the Diesel Generator to the following values: • 0.1 MW to 0.2 MW using HS-1671-1(HS-1650-2), GOVERNOR CONTROL.
Standard:	DEPRESS 2HS-1671-1, Governor Control LOWER pushbutton and OBSERVE 2JI-1672A1, Diesel GEN 2G002 Watts and LOWER to 0.1 to 0.2 MW and then RELEASE the LOWER pushbutton.
Comment: Steps 2.8.2 & 2.8.2.1	**SAT ☐ UNSAT ☐**

Perform Step:	REDUCE load on the Diesel Generator to the following values: • 0.1 to 0.5 MVARS using HS-1669-1 (HS-1648-2), VOLTAGE REGULATOR.
Standard:	DEPRESS 2HS-1669-1, Voltage Regulator LOWER pushbutton and OBSERVE 2JI-1672B1, Diesel GEN 2G002 VARS and LOWER to 0.1 to 0.5 MVAR and then RELEASE the LOWER pushbutton.
Comment: Steps 2.8.2 & 2.8.2.2	**SAT** ☐ **UNSAT** ☐

Perform Step: √	OPEN A0413 (A0613), Diesel Generator Breaker.
Standard:	DEPRESS 2HS-1664-1, Generator Breaker 2A0413 TRIP pushbutton and OBSERVE green TRIP light lit and red CLOSE light off.
Terminating Cue:	**This JPM is complete.**
Comment: Step 2.8.3	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 is at 100% power.**
- **Train A Emergency Diesel Generator 2G002 is supplying Bus 2A04.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **PARALLEL Bus 2A04 to Reserve Auxiliary Transformer 2XR1 per SO23-2-13, Diesel Generator Operation, Attachment 2, Diesel Generator Operation, Section 2.6, Paralleling a Diesel Supplied Isochronous Bus to the RAT.**
- **UNLOAD Train A Emergency Diesel Generator per SO23-2-13, Diesel Generator Operation, Attachment 2, Diesel Generator Operation, Section 2.8, Unloading the Diesel Generator.**

Facility: SONGS JPM # NRC S-7 Task #190077 K/A #016.A2.03 3.0 / 3.3 SF-7

Title: Respond to Loss of Turbine DCS Control Panels

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	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 on Unit 2:

- Southern California Edison Grid Control Center requests a temporary power reduction to 1100 MWe at 5 MWe per minute.
- A Reactivity Brief has been conducted.
- Another operator will monitor T_{COLD} and ASI.

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

- Lower Turbine load to 1100 MWe at 5 MWe/min per SO23-5-1.7, Power Operations, Section 6.3, Turbine Load Change Using Setpoint Adjustment.

Task Standard: Lower Turbine load using Setpoint Adjustment per SO23-5-1.7 then transfer Turbine DCS to the PCS Console and stop the load change per SO23-5-1.7.

Required Materials: SO23-5-1.7, Power Operations, Rev. 45.

Validation Time: 10 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-7 or any full power Initial Condition and PERFORM the following:

- **PLACE a tag over 2HS-2210, Raise/Lower Load pushbutton with an OOS label.**
- **ENSURE PCS Console at ACO Desk displaying Plant Computer System info (#2).**

Once the Turbine load change is underway, PERFORM the following:

- **EXECUTE override TCS-CR64-L01, Deenergize Turbine DCS Computer Monitor #1.**
- **EXECUTE override TCS-CR64-L02, Deenergize Turbine DCS Computer Monitor #2.**
- **EXECUTE override TCS-CR64-L03, Deenergize Turbine DCS Ovation Keyboard.**

MACHINE OPERATOR NOTE:

After each JPM, PERFORM the following prior to performance by the next examinee:

- **SET Turbine Load Rate in SETPOINTS box at 100 MWe/min.**
- **ALIGN PCS Console at ACO Desk to the Plant Computer System (#2).**

EXAMINER:

PROVIDE the examinee with a copy of Handout:

- **SO23-5-1.7, Power Operations.**
  - **Section 6.3, Turbine Load Change Using Setpoint Adjustment.**
  - **Attachment 15, Power Operations Limitations and Specifics.**

√ - Check Mark Denotes Critical Step | **START TIME:** |

Examiner Note:	**The following steps are from SO23-5-1.7, Section 6.3. Specific steps are annotated in each Comment box.**
Perform Step:	ENSURE a Reactivity Brief is conducted for this activity per SO123-0-A1, Section for Reactivity.
Standard:	DETERMINE a Reactivity Brief was conducted from Initial Conditions.
Comment: Step 6.3.1	**SAT** ☐ **UNSAT** ☐

Perform Step:	INITIATE monitoring TCOLDAVG (PCS or per LS-1.13).
Standard:	DETERMINE another operator is monitoring from Initial Conditions.
Comment: Step 6.3.2	**SAT** ☐ **UNSAT** ☐

Perform Step:	If raising load, then SET CVOL to about 10% above the **final** projected Flow Demand.
Standard:	DETERMINE load is being lowered and MARK Step N/A.
Comment: Step 6.3.3	**SAT** ☐ **UNSAT** ☐

Perform Step: √	ACTIVATE the Turbine DCS Setpoints Box and SELECT MODIFY.
Standard:	CLICK on MODIFY to ACTIVATE Turbine DCS Setpoints Box on Turbine DCS Monitor screen.
Comment: Step 6.3.4	**SAT** ☐ **UNSAT** ☐

Perform Step: √	SET the Demand to the target MW value and SELECT ENTER.
Standard:	CLICK in blue DEMAND box and ENTER 1100 for MW then CLICK on ENTER on Turbine DCS Monitor screen.
Comment: Step 6.3.5	**SAT** ☐ **UNSAT** ☐

Perform Step: √	SET the Rate to the target MW / MIN value and SELECT ENTER.
Standard:	CLICK in blue DEMAND box and ENTER 5 for MW / MIN then CLICK on ENTER on Turbine DCS Monitor screen.
Comment: Step 6.3.6	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**There is some delay to observe load change as the Turbine Governor Valves are wide open.**
Perform Step: √	If initiating the Turbine load change, then SELECT P2.
Standard:	DEPRESS P2 on Turbine Ovation Keyboard **or** CLICK GO on Turbine DCS Monitor screen.
Comment: Step 6.3.7	**SAT** ☐ **UNSAT** ☐

Perform Step:	VERIFY Turbine load stabilizes at the target value.
Standard:	MONITOR Turbine Load on Turbine DCS Monitor.
Comment: Step 6.3.8	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Machine Operator:	**When the signaled, INSERT overrides of Turbine DCS.**
Perform Step:	Observe loss of both Turbine DCS Computer Monitors.
Standard:	OBSERVE loss of both Turbine DCS Computer Monitors.
Examiner Cue:	**The Shift Manager directs you to STOP the Turbine load change at the ACO Desk.**
Comment:	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**These steps are considered "skill of the craft" and are performed from memory.**
Perform Step: √	Align a Turbine DCS Monitor to the Turbine at the ACO Desk.
Standard:	DEPRESS 2SW0055A, Control Room Console 2CR055 Remote Control Unit pushbutton until #1 is DISPLAYED.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Align a Turbine DCS Monitor to the Turbine at the ACO Desk.
Standard:	CLICK on Home Page for SONGS U2 DCS System at the ACO Desk DCS Monitor then CLICK on TURBINE.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: √	Stop the Turbine Load change.
Standard:	CLICK on P3 HOLD pushbutton and VERIFY that Turbine load change has STOPPED.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions on Unit 2:**

- **Southern California Edison Grid Control Center requests a temporary power reduction to 1100 MWe at 5 MWe per minute.**
- **A Reactivity Brief has been conducted.**
- **Another operator will monitor T_{COLD} and ASI.**

INITIATING CUE: **The Control Room Supervisor directs you to PERFORM the following:**

- **Lower Turbine load to 1100 MWe at 5 MWe/min per SO23-5-1.7, Power Operations, Section 6.3, Turbine Load Change Using Setpoint Adjustment.**

Facility: SONGS JPM # NRC S-8 Task #184637 K/A #029.A3.01 3.8 / 4.0 SF-8

Title: Respond to a Refueling Accident in Containment

Examinee (Print): _____

Testing Method:

Simulated Performance:		Classroom:	
Actual Performance:	X	Simulator:	X
Alternate Path:	X	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 6.
- A Containment Purge is in progress.
- Annunciator 57C10 - CONTAINMENT RADIATION HI has just gone into alarm.
- The Refueling SRO Reports a Fuel Handling Accident in the Transfer Carriage.
- The Transfer Carriage has been placed in the horizontal position.

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

- RESPOND to a Refueling Accident in Containment per the Abnormal Operating Instruction.

Task Standard: Respond to a Refueling Accident in Containment and initiate CRIS and CPIS per SO23-13-20 then isolate Containment Purge during CPIS Actuation Verification per SO23-3-2.22.

Required Materials: SO23-13-20, Fuel Handling Accidents, Rev. 10-1.

SO23-3-2.22, Engineered Safety Features Actuation System Operation, Rev. 18

Validation Time: 10 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP

MACHINE OPERATOR:

INITIALIZE to NRC S-8 or any MODE 6 Initial Condition and PERFORM the following:

- **EXECUTE the following remote functions:**
  - **CH73A, HV-9951, Purge Exhaust Isolation Valve to ON.**
  - **CH73B, HV-9948, Purge Supply Isolation Valve to ON.**
  - **CH73C, HV-9949, Purge Supply Isolation Valve to ON.**
  - **CH73D, HV-9950, Purge Exhaust Isolation Valve to ON.**
  - **CH53A, A-374, Purge Supply Fan to START.**
  - **CH53B, A-060, Purge Exhaust Fan to START.**
  - **CH58, A-353, Recirculation Filtration Unit to START.**
  - **RC51A/B/C/D, Reactor Coolant Pump P-001/2/3/4 DC Control Power to OFF.**
- **EXECUTE the following malfunctions:**
  - **RP09, CPIS Fails to Actuate.**
  - **RM06/ RM07, RE-7820-1/ RE-7820-2, Containment High Range Area Monitor @20 REM/hr.**
  - **RM08, RE-7845, Containment Low Range Area Monitor @100 mrem/hr.**
  - **RM10, RE-7845, Containment Low Range Area Monitor @100 mrem/hr.**

EXAMINER:

When identified, PROVIDE the examinee with a copy of Handout 1:

- **SO23-13-20, Fuel Handling Accidents.**

When identified, PROVIDE the examinee with a copy of Handout 2:

- **SO23-3-2.22, Engineered Safety Features Actuation System Operation.**
  - **Attachment 20, CPIS Actuation Verification.**
    - **INITIAL Steps 1.1 & 1.2.**
    - **MARK the first box at Step 1.2.**
  - **Attachment 24, Engineered Safety Features Actuation System Limitations and Specifics.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**When identified, PROVIDE a copy of Handout 1.**
Examiner Note:	**The following steps are from SO23-13-20. Specific steps are annotated in each Comment box.**
Perform Step:	Immediate Diagnosis/actions: • Fuel handling accident <u>with</u> high radiation – GO TO STEP 2.
Standard:	DETERMINE Fuel handling accident with high radiation in progress and TRANSITION to Step 2.
Comment: Step 1	**SAT ☐ UNSAT ☐**

Perform Step: √	IMMEDIATELY INITIATE CRIS.
Standard:	DEPRESS 2/3HS-7824A1 **<u>and/or</u>** 2/3HS-7825A2, Train A / Train B CRIS Manual Initiation pushbuttons and OBSERVE Annunciator 60B07 – CRIS ACTUATION in alarm.
Comment: Step 2.a	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY no core alterations / fuel movement are in progress.
Standard:	DETERMINE from Initial Conditions that fuel movement has STOPPED.
Comment: Step 2.b	**SAT ☐ UNSAT ☐**

Perform Step:	VERIFY Containment Area Radiation Monitors - NOT alarming <u>or</u> trending to alarm.
Standard:	DETERMINE Annunciator 57C10 - CONTAINMENT RADIATION HI is in alarm **<u>or</u>** OBSERVE DAS Alarms for Containment.
Comment: Step 2.c	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Perform Step: √	PERFORM the following: • INITIATE CPIS.
Standard:	DEPRESS 2HS-7807A2 and 2HS-7804A1, CPIS Manual Initiation pushbuttons and DETERMINE CPIS did NOT actuate.
Examiner Cue:	**The Control Room Supervisor directs you to verify the Containment Purge Isolation Signal.**
Comment: Step 2.c RNO c.1)	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**When identified, PROVIDE a copy of Handout 2.**
Examiner Note:	**The following steps are from SO23-3-2.22, Attachment 20. Specific steps in the Attachment are annotated in each Comment box.**
Perform Step: √	ENSURE CPIS Train A component actuation: • HV-9949, Containment Normal Purge Supply – CLOSED
Standard:	DETERMINE 2HV-9949, Power Lockout CNTMT PRG SPLY 2A374 ISO Valve is OPEN and DEPRESS 2HV-9949 CLOSE pushbutton and OBSERVE green CLOSE light lit.
Comment: Steps 2.1 & 2.1.1	**SAT** ☐ **UNSAT** ☐

Perform Step: √	ENSURE CPIS Train A component actuation: • HV-9951, Containment Normal Purge Exhaust – CLOSED
Standard:	DETERMINE 2HV-9951, Power Lockout CNTMT PRG EXH 2A060 ISO Valve is OPEN and DEPRESS 2HV-9951 CLOSE pushbutton and OBSERVE green CLOSE light lit.
Comment: Steps 2.1 & 2.1.2	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**This valve position can be verified on <u>either</u> CR-57 <u>or</u> CR-60.**
Perform Step:	ENSURE CPIS Train A component actuation: • HV-9823, Containment Mini Purge Supply – CLOSED
Standard:	OBSERVE 2HV-9823, CNTMT Mini-Purge Supply ISO Valve green CLOSE light lit on CR-57 **or** CR-60.
Comment: Steps 2.1 & 2.1.3	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**This valve position can be verified on <u>either</u> CR-57 <u>or</u> CR-60.**
Perform Step:	ENSURE CPIS Train A component actuation: • HV-9825, Containment Mini Purge Exhaust – CLOSED
Standard:	DETERMINE 2HV-9825, CNTMT Mini Purge Exhaust ISO Valve green CLOSE light lit on CR-57 **or** CR-60.
Comment: Steps 2.1 & 2.1.4	**SAT ☐ UNSAT ☐**

Perform Step: √	ENSURE CPIS Train B component actuation: • HV-9948, Containment Normal Purge Supply – CLOSED
Standard:	DETERMINE 2HV-9948, Power Lockout CNTMT PRG SPLY 2A374 ISO Valve is OPEN and DEPRESS 2HV-9948 CLOSE pushbutton and OBSERVE green CLOSE light lit.
Comment: Steps 2.2 & 2.2.1	**SAT ☐ UNSAT ☐**

Perform Step: √	ENSURE CPIS Train B component actuation: • HV-9950, Containment Normal Purge Exhaust – CLOSED
Standard:	DETERMINE 2HV-9950, Power Lockout CNTMT PRG EXH 2A060 ISO Valve is OPEN and DEPRESS 2HV-9950 CLOSE pushbutton and OBSERVE green CLOSE light lit.
Comment: Steps 2.2 & 2.2.2	**SAT ☐ UNSAT ☐**

Examiner Note:	**This valve position can be verified on <u>either</u> CR-57 <u>or</u> CR-60.**
Perform Step:	ENSURE CPIS Train B component actuation: • HV-9821, Containment Mini Purge Supply – CLOSED
Standard:	DETERMINE 2HV-9821, CNTMT Mini-Purge Supply ISO Valve green CLOSE light lit on CR-57 **or** CR-60.
Comment: Steps 2.2 & 2.2.3	**SAT ☐ UNSAT ☐**

Examiner Note:	**This valve position can be verified on <u>either</u> CR-57 <u>or</u> CR-60.**
Perform Step:	ENSURE CPIS Train B component actuation: • HV-9824, Containment Mini Purge Exhaust – CLOSED
Standard:	DETERMINE 2HV-9824, CNTMT Mini-Purge Exhaust ISO Valve green CLOSE light lit on CR-57 **or** CR-60.
Terminating Cue:	**Another operator will complete the procedure at Panel L-155. This JPM is complete.**
Comment: Steps 2.2 & 2.2.4	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 is in MODE 6.**
- **A Containment Purge is in progress.**
- **Annunciator 57C10 - CONTAINMENT RADIATION HI has just gone into alarm.**
- **The Refueling SRO Reports a Fuel Handling Accident in the Transfer Carriage.**
- **The Transfer Carriage has been placed in the horizontal position.**

INITIATING CUE: **The Control Room Supervisor directs you PERFORM the following:**

- **RESPOND to a Refueling Accident in Containment per the Abnormal Operating Instruction.**

Facility:	SONGS 2 and 3	Scenario No.:	2	Op Test No.:	October 2010 NRC
Examiners:		Operators:			

Initial Conditions:
- 70% power MOC - RCS Boron is 1070 ppm (by sample).
- Train A Component Cooling Water Pump (P-025) in service.
- Charging Pump (P-192) running with (P-191) aligned to 480 Volt Bus 2B04.
- Train A Auxiliary Feedwater Pump (P-141) OOS for oil change.
- Channel X Pressurizer Pressure and Level in service.

Turnover: Maintain steady-state conditions following return of Main Feedwater Pump to service.

Critical Tasks:
- Restore Component Cooling Water Flow due to Loss of CCW Pump.
- Manually Trip Reactor Due to Reactor Protection System Failure.
- Isolate the Faulted Steam Generator During Excess Steam Demand Event.

Event No.	Malf. No.	Event Type*	Event Description
1 +15 min	RC17B	I (RO, BOP, CRS) TS (CRS)	Pressurizer Pressure Wide Range Transmitter (PT-0102-2) Fails Low.
2 +25 min	CV22C	C (RO, CRS) TS (CRS)	Charging Pump (P-192) Overcurrent Trip.
3 +30 min	CC06B	C (BOP, CRS)	Train A Component Cooling Water Pump (P-025) Trip.
4 +32 min	OBE with RC07A	C (RO, CRS)	Seismic Event with Reactor Coolant Pump (P-001) Seized Shaft (60 second time delay).
5 +32 min	RP15	I (RO)	Reactor Fails to Automatically Trip.
6 +35 min	MS05A	M (RO, BOP, CRS)	Steam Generator (E-088) Main Steam Leak Upstream of Main Steam Isolation Valve.
7 +35 min	TU07	I (BOP)	Turbine Trip Failure on Reactor Trip.
8 +35 min	RC03 RC19	M (RO, BOP, CRS)	Reactor Coolant System Leakage at 500 GPM. Failed Fuel due to RCP Seized Shaft Exceeding DNBR & LPD.
9 +40 min	RP01M	C (RO)	Containment Spray Pump (P-012) Auto Start Failure.

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

SCENARIO SUMMARY NRC #2

The crew will assume the watch and maintain steady-state conditions per SO23-5-1.7, Power Operations. Main Feedwater Pump P-063 was just returned to service following bearing replacement. Train A Auxiliary Feedwater Pump P-141 is out of service for oil change. Unit is forcing Pressurizer Sprays in preparation for power ascension.

The first event is a Pressurizer Wide Range Pressure Transmitter failure. The crew will enter SO23-13-18, Reactor Protection System Failure. Crew actions include restoring indication to the Subcooled Margin Monitor as well as disabling the input to Pressurizer Compensated Level indication. Entry into SO23-3-1.10, Pressurizer Pressure and Level Control, as well as SO23-3-2.12, Reactor Protective System Operation, is required. The SRO will refer to Technical Specifications.

The next event is a trip of the Train B Charging Pump. The RO should attempt to start a Train A Charging Pump before Letdown isolates. Crew actions are addressed in the Annunciator Response Procedures and SO23-3-2.1, Chemical and Volume Control System Operations. The SRO will refer to Technical Specifications.

When Technical Specifications have been addressed, the Train A Component Cooling Water Pump will trip. The crew will respond per SO23-13-7, Loss of Component Cooling Water/Salt Water Cooling. Crew actions and start the standby Train A CCW Pump.

The major event starts with an Earthquake causing a Reactor Coolant Pump (RCP) seized shaft. A manual trip is required due to automatic Reactor and Turbine Trip failures. When the Reactor is tripped, Steam Generator E-088 develops a Main Steam leak outside of Containment and upstream of the Main Steam Isolation Valve coupled with a Reactor Coolant System leak of 500 GPM. Fuel failure due to exceeding DNBR and Local Power Density limits following the RCP Seized shaft and a Containment Spray Pump will fail to auto start on the Safety Injection Actuation Signal.

Entry into SO23-12-1, Standard Post Trip Actions (SPTAs) is required. When the SPTAs are completed, the Control Room Supervisor will diagnose an Excess Steam Demand Event with a Reactor Coolant System leak and transition to SO23-12-9, Functional Recovery.

This scenario is terminated when the affected Steam Generator is isolated and actions to continue cooldown and depressurization of the Reactor Coolant System are in progress.

Risk Significance:

- Risk important components out of service: Train A Auxiliary Feedwater Pump P-141
- Failure of risk important system prior to trip: Loss of Train B Charging Pump
- Risk significant core damage sequence: RCP Seized Shaft Without Reactor Trip
  Seismic Event with ESDE and LOCA
- Risk significant operator actions: Restore Component Cooling Water Flow
  Manually Start Containment Spray Pump
  Isolate Steam Generator with ESDE

Scenario Event Description
NRC Scenario #2

Machine Operator Instructions for Simulator Setup

INITIALIZE to IC NRC Dynamic 2 and associated Setup File.

Event Number	Event Type	MF / RF ID	Instrument/Component Description	Demand Value	Condition
SETUP		–	Train A Auxiliary Feedwater Pump P-141 OOS	STOP	
SETUP		–	Charging Pump P-192 running	RUNNING	
SETUP		–	Charging Pump P-191 aligned to Bus 2B04	Train A	
SETUP		–	Channel X PZR Pressure and Level in service.	Channel X	
1	MF	RC17B	Pressurizer Pressure WR PT-0102-2 fails low	0 psia	
1	RF	RP51	PPS Door Open Annunciator 56B46 ON	OPEN	By Direction
1	RF	RP53F	Low Pressurizer Pressure Channel B	BYPASS	5 sec TD
1	RF	RP51	PPS Door Open Annunciator 56B46 OFF	CLOSE	10 sec TD
2	MF	CV22C	Charging Pump P-192 overcurrent trip	FAULT	
2	RF	CV77D	Charging Pump P-192 DC power	OFF	By Direction
2	RF	CV78D	Charging Pump P-192 breaker	RACKOUT	By Direction
3	MF	CC06B	Train A CCW Pump (P-025) overcurrent trip	TRIP	
4	MF	OBE	Seismic Event without Main Feedwater Pump trip		
4	MF	RC07A	Reactor Coolant Pump P-001 seized shaft	SEIZED	60 sec TD
5	MF	RP15	Reactor trip failure	FAILURE	
6	MF	MS05A	SG E-088 Main Steam Leak Upstream of MSIV	3.0%	Reactor Trip
7	MF	TU07	Turbine trip failure	FAILURE	
8	MF	RC03	Reactor Coolant System Leakage @500 gpm	10%	Reactor Trip
8	MF	RC19	Failed Fuel due to exceeding DNBR & LPD	0.1%	Reactor Trip

Scenario Event Description
NRC Scenario #2

Event Number	Event Type	MF / RF ID	Instrument/Component Description	Demand Value	Condition
9	MF	RP01M	Containment Spray Pump (P-012) auto start	FAILURE	Upon SIAS
	RF	ED85	Non-Qualified Loads Restoration	RESTORE	By Direction

Scenario Event Description
NRC Scenario #2

Machine Operator:	**EXECUTE IC NRC Dynamic 2 and SETUP file to align components.**
	HANG Control Board Tag on P-141.
	ENSURE Charging Pump P-192 is RUNNING.
	ENSURE CVCS Blend Setpoints MATCH Shift Turnover Sheet.
	ENSURE Channel X Pressurizer Pressure and Level in service.
	CHANGE Operator Aid Tag #029 (CVCS) to reflect boron concentration.
	VERIFY forcing Pressurizer Spray flow with Backup PZR Heaters ON.
	PROVIDE procedures in progress, Shift Turnover, and Reactivity Management Guide to crew in Briefing Room:
	- COPY of SO32-5-1.7, Power Operations, Section 6.1, Guidelines for Steady State Power Operation.
	- LAMINATED COPY of SO23-5-1.7, Power Operations, Attachment 8, Power Maneuvering Guidelines.
	ENSURE MOC copy of OPS Physics Summary Book on SRO Desk.
	VERIFY CEA positions (Group 6 @ ARO / PLCEAs @ 115).

Significant Control Room Annunciators in Alarm:

57A58 – EMERGENCY FEEDWATER SYS TRAIN A INOPERABLE

Operating Test :	NRC	Scenario #	2	Event #	1	Page	6	of	22
Event Description:	Pressurizer Wide Range Pressure Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 1. - RC17B, PZR Pressure Wide Range Transmitter (PT-0102-2) fails low.		
Indications Available: **56A06 – PZR PRESS LO CHANNEL TRIP** **56A16 – PZR PRESS LO PRETRIP** **56B16 – PPS CHANNEL 2 TROUBLE** **56B45 – RCS SUBCOOLED MARGIN LO** **2PI-0102A2, Pressurizer Pressure Wide Range indication fails low** **Subcooled Margin Monitor indicates superheat**		
+30 sec	RO	REFER to Annunciator Response Procedures.
	RO	RECOGNIZE Pressurizer Wide Range Pressure Channel failure and INFORM the CRS SO23-13-18 entry required.
	CRS	DIRECT performance of SO23-13-18, Reactor Protection System Failure.
	RO	OBSERVE instrumentation for the affected channel and alternate redundant indications monitoring the same parameter to DETERMINE failure.
	RO	IDENTIFY Pressurizer Wide Range Pressure Channel indication PI-0102-2 failure.
	CRS	REFER to Attachment 10 and DETERMINE Functional Unit affected is Pressurizer Wide Range Pressure Transmitter PT-0102-2.
	CRS	DIRECT placing the Functional Unit in BYPASS per SO23-3-2.12, Reactor Protection System Operation.
	RO	PLACE Functional Unit in BYPASS per SO23-3-2.12, RPS Operation, Section 6.3, Bypass Operation of Trip Channels.
Examiner Note: The following steps are from SO23-3-2.12, Reactor Protection System Operation, Section 6.3, Bypass Operation of Trip Channels.		

Operating Test :	NRC	Scenario #	2	Event #	1	Page	7	of	22
Event Description:	Pressurizer Wide Range Pressure Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY that the same bistable is not in BYPASS on any other Channel.
	RO	UNLOCK and OPEN the Bistable Control Panel.
Examiner Note: Trip BYPASS is performed by the MO and verified by the RO.		
M.O. Cue:		**When directed, EXECUTE the following remote functions:** **RP51 = OPEN (PPS Door Open Annunciator 56B46)** **RP53F = BYPASS (Low PZR PRESS Channel B)** **Delete RP51 (PPS Door Open Annunciator 56B46)**
	RO	OBSERVE Annunciator 56A39 - PPS CHANNEL 2 TRIP BYPASS in alarm.
	RO	LOG the Bypass and Reason in the Control Operator Log.
	CRS	INITIATE a LCOAR or follow guidelines of SO123-0-A5.
Examiner Note: The following steps are from SO23-13-18, Reactor Protection System Failure.		
	CRS	CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.
	CRS/BOP	CONFIRM failure does NOT affect the Feedwater Digital Control System.
	CRS	TRANSFER PT-0102-2 input to LIC-0103 per SO23-3-1.10, Pressurizer Pressure and Level Control, Attachment 1, Transferring Pressurizer Level and Pressure Controls.

Time	Position	Applicant's Actions or Behavior
	CRS	EVALUATE Technical Specifications.
		• LCO 3.3.1.A - Reactor Protective System Instrumentation-Operating.
		• CONDITION A - One or more Functions with one automatic RPS trip channel INOPERABLE. • ACTION A.1 - Place Channel in trip or bypass within 1 hour.
		• LCO 3.3.5.A - Engineered Safety Features Actuation System Instrumentation.
		• CONDITION A - One or more Functions with one automatic ESFAS trip channel INOPERABLE. • ACTION A.1 - Place Functional Unit in trip or bypass within 1 hour.
	CRS	CONFIRM failure did NOT involve a failed PPS Power Supply.
	CRS	NOTIFY Shift Manager to PERFORM Administrative Actions.
Examiner Note: The following steps are from SO23-3-1.10, Pressurizer Pressure and Level Control, Attachment 1, Transferring Pressurizer Level and Pressure Controls.		
	CRS	CONDUCT a Reactivity Brief per S0123-0-A7, Section for Reactivity.
	RO	ACKNOWLEDGE controller process alarm.
	RO	TAG forward to Page 3 of LIC-0103, Pressurizer Level Controller.
	RO	DEPRESS the SEL pushbutton until PI-0102B appears.
	RO	DEPRESS the increase (▲) pushbutton and VERIFY the digital display changes to DISABLE B, then PRESS SEL pushbutton.
	RO	VERIFY proper system response.
	CRS	TRANSFER PT-0102-2 input to the SCM indication per SO23-3-2.32, Section for Operation of the Subcooled Margin Monitor Display.

Operating Test :	NRC	Scenario #	2	Event #	1	Page	9	of	22
Event Description:	Pressurizer Wide Range Pressure Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Examiner Note: The following steps are from SO23-3-2.32, Critical Functions Monitoring System, Attachment 1, CFMS Operation, Section 2.16, Subcooled Margin Monitor.		
+15 min	BOP	ACCESS the SCM as follows using Attachment 1, Section 2.16:
		• From Main Menu, SELECT REMOTE DISPLAYS then SELECT SCM.
		• From the SCM page, SELECT Channel A (PT-0102-1).
		• SELECT SEND.
When Technical Specifications have been addressed, or at Lead Evaluator's discretion, PROCEED to Event 2.		

Operating Test : NRC	Scenario # 2	Event # 2	Page 10 of 22
Event Description: Charging Pump Trip			

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 2. - CV22C, Charging Pump P-192 trip.		
Indications Available: **58A12 – CHARGING HEADER FLOW LO** **58A44 – CHARGING PUMP P192 OC**		
+10 secs	RO	REFER to Annunciator Response Procedures.
	RO	DETERMINE Charging Pump P-192 has tripped and INFORM CRS that ARP SO23-15.58.A - 58A44 entry required.
	CRS	DIRECT performance of SO23-15.58.A, Annunciator 58A44 - CHARGING PUMP P192 OC.
	CRS	DIRECT placing Standby Charging Pump P-190 or P-191 in service.
	RO	START Charging Pump P-190 or P-191.
	RO	PLACE Charging Pump P-192 in MANUAL and STOP.
	RO	DISPATCH a PEO to Charging Pump P-192 to determine cause of alarm.
	RO	If desired, POSITION Backup Charging Pump Selector Switch to P190 / P191.
	RO	If desired, PLACE selected Charging Pump in AUTO.
	CRS	DISPATCH PEO to 50' Control Building to determine cause of trip and DIRECT performance of SO23-3-2.1, CVCS Operations to align systems.
M.O. Cue: When directed to check Charging Pump P192 breaker, WAIT 2 minutes, then REPORT that there are no signs of distress and the white RESET indicator on the front of the breaker is sticking out.		

Operating Test : NRC	Scenario # 2	Event # 2	Page 11 of 22
Event Description: Charging Pump Trip			

Time	Position	Applicant's Actions or Behavior
M.O. Cue: When directed to check Charging Pump P-192, WAIT 2 minutes, then REPORT that the motor is unusually warm and there is lube oil on the floor.		
	CRS	CONTACT Maintenance to investigate Charging Pump P-192.
M.O. Cue: If Electrical Maintenance is called to investigate 2P-192, WAIT 3 minutes and then RECOMMEND racking out the breaker.		
M.O. Cue: When directed to rack out 2P-192 breaker, WAIT 2 minutes then EXECUTE remote functions CV77D and CV78D, P-192 Charging Pump DC Power and Pump Breaker, and REPORT that 2P-192 breaker is racked out.		
	CRS/RO	DIRECT performance of SO23-6-9, Section for 6.9 kV, 4kV and 480V Bus and Feeder Faults for P-192.
+10 min	CRS	EVALUATE Technical Specifications.
		• 3.1.9.A, Boration Systems - Operating.
		• CONDITION A - One boron injection flowpath INOPERABLE. • ACTION A.1 - Restore boron injection flowpath to OPERABLE within 72 hours.
When systems are re-aligned and Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Operating Test :	NRC	Scenario #	2	Event #	3	Page	12	of	22
Event Description:	Train A Component Cooling Water Pump Trip								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 3. - CC06B, Train A CCW Pump (P-025) overcurrent trip.		
Indications Available: **64A21 – CCW PUMP TRAIN A OC** **64A07 – CCW PUMP TRAIN A DISCH PRESS LO** **64A10 – CCW NON-CRITICAL LOOP RETURN FLOW LO** **56C34 / 36 / 38 / 40 – RCP P001 / P003 / P004 / P002 CCW FLOW LO**		
+30 secs	BOP	REFER to Annunciator Response Procedures.
	BOP	RECOGNIZE CCW Pump P-025 trip and INFORM the CRS SO23-13-7 entry required.
	CRS	DIRECT performance of SO23-13-7, Loss of CCW/SWC.
	BOP	DETERMINE CCW Pump P-024 is available for starting.
	CRS	DIRECT starting CCW Pump P-024.
CRITICAL TASK STATEMENT		**With loss of Flow to CCW Non-Critical Loop and prior to Exceeding RCP Operating Limits, Restore Flow to NCL from any CCW Train.**
CRITICAL TASK	BOP	START CCW Pump P-024 and VERIFY SWC Pump P-112 is running.
	CRS/BOP	ENSURE Non-Critical Loop aligned to Train A CCW.
	CRS/BOP	ENSURE Letdown Heat Exchanger aligned to Train A CCW.
	CRS/BOP	VERIFY E-335/E-336, Emergency Chillers, ALIGNED to the operating Loop.
+ 5 min	CRS	NOTIFY the Shift Manager and STA to INITIATE reports as required.
When Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Events 4 and 5.		

Operating Test :	NRC	Scenario #	2	Event #	4 & 5	Page	13	of	22
Event Description:	Earthquake / Automatic Reactor Trip Failure								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Events 4 and 5. - SEISMIC LP, Seismic OBE without Main Feedwater Pump trip. - RC07A, RCP P-001 seized shaft (6O second time delay).		
Indications Available: **61C21 – SEISMIC RECORDING SYSTEM ACTIVATED** **61C22 – OPERATING BASIS EARTHQUAKE DETECTED** **Numerous Seismic related alarms** **Numerous tank level alarms due to sloshing** **The following indications occur 60 seconds later when the RCP shaft is seized:** **56A03 – LOCAL POWER DENSITY HI CHANNEL TRIP** **56A04 – DNBR LO CHANNEL TRIP** **56A15 – PZR PRESS HI PRETRIP** **56B55 – RCS FLOW LO CHANNEL TRIP** **56B06 / 16 / 26 / 36 – PPS CHANNEL 1 / 2 / 3 / 4 TROUBLE** **Reactor Coolant Pump 2P-001 ammeter pegged high** **56C04 – RCP P001 OC (10 seconds later)**		
+10 secs	RO/BOP	REFER to Annunciator Response Procedures.
	RO/BOP	RECOGNIZE Operating Basis Earthquake and INFORM the CRS SO23-13-3 entry required.
+60 secs	RO	RECOGNIZE Reactor Coolant Pump P-001 overcurrent trip with SG Low Flow PPS Trips and INFORM the CRS Reactor Trip required.
CRITICAL TASK STATEMENT		**Manually Trip Reactor due to Reactor Protection System Failure Within One (1) Minute of Reactor Trip Criteria Being Exceeded.** **Elapsed Time:** _____
CRITICAL TASK	RO/BOP	MANUALLY TRIP the Reactor.
+2 min	CRS	DIRECT performance of SO23-12-1, Standard Post Trip Actions.
When Reactor is manually tripped, or at Lead Evaluator's discretion, PROCEED to Events 6, 7, 8, and 9.		

Operating Test :	NRC	Scenario #	2	Event #	6, 7, 8, & 9	Page	14	of	22
Event Description:	Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Events 6, 7, 8, and 9. **- MS05A @ 3%, SG E-088 Main Steam Leak Upstream of MSIV.** **- RC03, @ 10%, Reactor Coolant System Leakage @ 500 gpm.** **- RC19 @ 0.1%, Fuel failure** **- TU07, Turbine trip failure.** **- RP01M, Containment Spray Pump (P-012) start failure.**		
Indications Available: **Numerous Reactor and Turbine Trip related alarms**		
+10 sec	CRS	DIRECT performance of SO23-12-1, Standard Post Trip Actions.
	RO	VERIFY Reactor Trip:
		• VERIFY Reactor Trip Circuit Breakers (8) OPEN.
		• VERIFY Reactor Power lowering and Startup Rate NEGATIVE.
		• VERIFY maximum of one full length CEA NOT fully inserted.
	CRS	VERIFY Reactivity Control criteria satisfied.
	BOP	DETERMINE Turbine did NOT Trip:
	BOP	• [RNO] DEPRESS Turbine Emergency Trip pushbutton.
		• VERIFY Turbine TRIPPED.
		• VERIFY HP and LP Stop and Governor Valves CLOSED.
		• VERIFY both Unit Output Breakers OPEN.
		• VERIFY Main Turbine speed < 2000 RPM or LOWERING.
	CRS	INITIATE Administrative Actions:
		• ANNOUNCE Reactor trip via PA System.
		• INITIATE Attachment 4, Worksheet.
		• INITIATE Attachment 5, Administrative Actions.
	BOP	VERIFY Vital Auxiliaries criteria satisfied:
		• VERIFY both 1E 4 kV Buses ENERGIZED.
		• VERIFY all 1E 480 V Buses ENERGIZED.

Operating Test : NRC	Scenario # 2	Event # 6, 7, 8, & 9	Page 15 of 22
Event Description: Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure			

Time	Position	Applicant's Actions or Behavior
		• VERIFY all 1E DC Buses ENERGIZED.
		• VERIFY all Non-1E 4 kV Buses ENERGIZED.
		• VERIFY CCW Train operating and ALIGNED to Non-Critical Loop and Letdown Heat Exchanger.
	RO	DETERMINE RCS Inventory Control criteria NOT satisfied:
		• DETERMINE PZR level NOT between 10% and 70% and NOT trending to between 30% and 60%.
		• [RNO] ENSURE Pressurizer Level Control System operating in AUTO to restore Pressurizer level.
		• DETERMINE Core Exit Saturation Margin ≥ 20ºF:
		• QSPDS page 611.
		• CFMS page 311.
	RO	DETERMINE RCS Pressure Control criteria NOT satisfied:
		• DETERMINE PZR pressure (WR and NR) NOT between 1740 PSIA and 2380 PSIA and NOT controlled AND trending between 2025 PSIA and 2275 PSIA.
		• [RNO] DETERMINE PZR Pressure Control System is NOT restoring PZR pressure.
		• [RNO] ENSURE Normal and Aux Spray Valves CLOSED.
		• [RNO] DETERMINE PZR pressure less than 1740 PSIA.
		• [RNO] STOP one (1) RCP in each Loop.
	RO	VERIFY Core Heat Removal criteria satisfied:
		• VERIFY RCPs are operating.
		• VERIFY Core Loop ΔT less than 10ºF.
		• VERIFY Core Exit Saturation Margin ≥ 20ºF.
		• QSPDS page 611.
		• CFMS page 311.
	BOP	DETERMINE RCS Heat Removal criteria NOT satisfied:
		• VERIFY both SGs level > 21% NR.

Operating Test :	NRC	Scenario #	2	Event #	6, 7, 8, & 9	Page	16	of	22
Event Description:	Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure								

Time	Position	Applicant's Actions or Behavior
		• VERIFY both SGs level < 80% NR.
		• VERIFY Main and Auxiliary Feedwater available to restore both SG levels between 40% NR and 80% NR.
		• DETERMINE T_{COLD} NOT trending to between 540ºF and 550ºF.
		• [RNO] ENSURE SBCS Valves CLOSED.
		• [RNO] ENSURE ADVs CLOSED.
		• [RNO] ENSURE Blowdown Valves HV-4054 & HV-4053 CLOSED.
		• [RNO] ENSURE HV-2703 or HV-2704, HV-2721, and HV-2751, Main Steam to Reheater Valves CLOSED.
		• DETERMINE SG pressures < 740 PSIA.
		• [RNO] If SG pressure < 740 PSIA, ENSURE MSIS actuated.
	RO	DETERMINE Containment Isolation criteria NOT satisfied:
		• DETERMINE Containment pressure > 1.5 PSIG.
		• [RNO] VERIFY Containment pressure < 3.4 PSIG.
		• DETERMINE Containment Area Radiation Monitors energized AND alarming or trending to alarm.
		• DETERMINE Secondary Plant Radiation Monitors energized and NOT alarming or trending to alarm.
	RO	DETERMINE Containment Spray Pump (P-012) start failure and MANUALLY START P-012.
	RO	DETERMINE Containment Temperature and Pressure criteria satisfied:
		• VERIFY Containment average temperature < 120ºF.
		• DETERMINE Containment pressure > 1.5 PSIG.
		• [RNO] ENSURE proper functioning of Normal Containment Cooling.
		• [RNO] ENSURE at least one Containment Dome Air Circulator operating.
+15 min	CRS	DIAGNOSE Event in Progress:
		• DETERMINE some Safety Function criteria are NOT met per Attachment 4, Worksheet.

Operating Test : NRC	Scenario # 2	Event # 6, 7, 8, & 9	Page 17 of 22
Event Description: Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure			

Time	Position	Applicant's Actions or Behavior
		• [RNO] COMPLETE Attachment 1, Recovery Diagnostics.
		• [RNO] DIAGNOSE ESDE outside Containment and Loss of Coolant Accident.
		• DETERMINE that Reactor Trip Recovery is NOT diagnosed.
		• [RNO] STOP one (1) RCP in each Loop.
		• DIRECT initiating Steps 12 through 15.
	BOP	INITIATE Steps 12 through 15.
		• VERIFY HS-0800S2, Telecom 480 VAC Feeder Breaker CLOSED.
		• VERIFY HS-0800N2, Telecom 480 VAC Feeder Breaker CLOSED.
		• VERIFY B15 & B16 480 VAC Load Centers ENERGIZED.
		• ENSURE Extractions Steam Block Valves CLOSED.
		• ENSURE Main Steam to Reheater Block, Bypass, Warmup, and Control Valves CLOSED.
		• VERIFY Generator lowering to less than 24 kV.
		• VERIFY 99A26 - TURBINE LUBE OIL TEMP HI and 99A46 - TURBINE BRG OIL DRAIN TEMP HI Annunciators RESET.
		• INITIATE SO23-10-2, Turbine Shutdown, Attachment for Unloading the Generator and Removing the Unit from Line.
		• ESTABLISH desired Condensate and Feedwater Status:
		• ENSURE 3rd Point Heater Drain Pumps STOPPED.
		• VERIFY Reactor Trip Override RESET.
		• DETERMINE Main Feedwater Pump NOT in operation.
		• [RNO] ENSURE Steam Generator levels being maintained by Auxiliary Feedwater Pumps.
		• ENSURE FIC-3294, Condensate Pump Miniflow Controller set for Condensate Pump configuration.
		• PLACE LV-3245, Condensate Drawoff Valve to DISABLE.
		• DETERMINE SO23-12-2, Reactor Trip Recovery, NOT being implemented.
		• [RNO] ENSURE HV-4053 & HV-4054, SG Blowdown Valves CLOSED.
		• VERIFY both Start Up Range Channels OPERABLE.

Operating Test : NRC	Scenario # 2	Event # 6, 7, 8, & 9	Page 18 of 22
Event Description: Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure			

Time	Position	Applicant's Actions or Behavior
	CRS	DIRECT performance of SO23-12-9, Functional Recovery.
		• RECORD time of EOI entry _____.
+15 min	CRS	VERIFY Functional Recovery diagnosis:
		• INITIATE SO23-12-10, LOCA Safety Function Status Checks.
		• INITIATE Foldout Page.
		• DIRECT performance of FS-7, Verify SI Throttle/Stop Criteria.
		• DIRECT performance of Attachment 22, Non-Qualified Loads Restoration.
		• DIRECT performance of FS-18, Secondary Plant Protection.
		• DIRECT performance of Attachment 29, Isolation of SG with ESDE.
		• DIRECT performance of FS-30, Establish Stable RCS Temperature during ESDE.
		• INITIATE sampling of both Steam Generators for radioactivity and boron.
M.O. Cue:		**If directed to sample SGs, WAIT 5 minutes and then REPORT that E088 and E089 both have activity near background, and normal boron levels. If the SG Sample Valves are closed, REPORT unable to establish sample flow.**
	CRS	INITIATE Administrative actions:
		• NOTIFY Shift Manager/Operations Leader of entry into SO23-12-9, Functional Recovery.
		• ENSURE Emergency Plan is initiated.
		• IMPLEMENT Placekeeper.
		• IMPLEMENT Time Dependent Steps.
	RO	VERIFY ESF actuation.
		• ENSURE the following actuated:
		• SIAS / CCAS / CRIS
	CRS	RECORD time of SIAS _____.

Operating Test : NRC	Scenario # 2	Event # 6, 7, 8, & 9	Page 19 of 22
Event Description: Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure			

Time	Position	Applicant's Actions or Behavior
	BOP	STOP both Diesel Generators (SIAS Override STOP).
	BOP	INITIATE SO23-12-11, Attachment 22, Non-Qualified Load Restoration.
M.O. Cue:		**When directed to restore non-qualified loads, WAIT 2 minutes, then EXECUTE remote function ED85, Non-Qualified Loads Restoration. INFORM the Control Room that you have restored Non-Qualified Loads.**
	RO	VERIFY RCP NPSH requirements satisfied per SO23-12-11, Attachment 30, Post-Accident Pressure/Temperature Limits.
	RO	ESTABLISH Optimum SI Alignment:
		• ESTABLISH single train operation:
		• Train A Charging Pumps operating.
		• One HPSI and one LPSI per Train operating.
		• Train A and B Cold Leg flow paths aligned.
		• VERIFY SI flow required:
		• SI flow indicated.
		• DETERMINE FS-7, VERIFY SI Throttle/Stop Criteria NOT satisfied.
	CRS	DETERMINE NO Safety Function Recovery Attachments (FR-1 through FR-8) indicated by optimal EOIs.
	CRS	IMPLEMENT Precautionary Actions:
	RO	• VERIFY boration > 40 GPM.
	RO	• ENSURE one RCP in each loop STOPPED.
	CRS	DETERMINE Excess Steam Demand Event indicated on E-088.
	BOP	• [RNO] INITIATE SO23-12-11, Attachment 29, Isolation of Steam Generator with ESDE.
	BOP	• [RNO] INITIATE FS-30, Establish Stable RCS Temperature during ESDE.

Operating Test :	NRC	Scenario #	2	Event #	6, 7, 8, & 9	Page	20	of	22
Event Description:	Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure								

Time	Position	Applicant's Actions or Behavior
	BOP	• [RNO] INITIATE SO23-12-11, Attachment 3, Cooldown / Depressurization.
	CRS	DETERMINE SGTR NOT indicated on either SG.
Examiner Note: The following steps are from SO23-12-11, Attachment 29, Isolation of SG with ESDE.		
	CRS/BOP	DETERMINE E-088 is the most affected SG.
	CRS	NOTIFY Shift Manager/Operations Leader SG E-088 most affected by ESDE.
	BOP	VERIFY SG E-089 is least affected by ESDE and available for heat removal.
CRITICAL TASK STATEMENT		**Identify and Isolate the Most Affected Steam Generator (ESDE) prior to Exiting SO23-12-9.**
CRITICAL TASK	BOP	ISOLATE SG E-088. CLOSE/STOP the following components:
		• MSIV HV-8205
		• MSIV Bypass HV-8203
		• ADV HV-8419
		• MFIV HV-4048
		• AFW valves HV-4714, HV-4730
		• Steam to AFW P-140 HV-8201
		• SG Blowdown Isolation HV-4054
		• SG Water Sample Isolation HV-4058
		• Electric AFW Pump P-504
+30 min	BOP	ENSURE SG E-088 ADV HV-8419 selected to MANUAL.

Operating Test :	NRC	Scenario #	2	Event #	6, 7, 8, & 9	Page	21	of	22
Event Description:	Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure								

Time	Position	Applicant's Actions or Behavior
Examiner Note: The following steps are from SO23-12-11, EOI Supporting Attachments, FS-30, Establish Stable RCS Temperature during ESDE.		
	BOP	VERIFY SG least affected by ESDE, SG E-089, NOT isolated for SGTR.
	BOP	VERIFY most affected SG level E-088 - less than 50% WR.
	BOP	PERFORM the following on least affected SG E-089:
		• TRANSFER HV-8421, SG E-089 ADV to AUTO / MODULATE.
		• MAINTAIN SG E-089 pressure 200 PSIA above SG E-088 pressure.
	BOP	VERIFY SG dryout on most affected SG E-088:
		• RCS T_{COLD} - stable or rising OR SG pressure - 200 PSIA.
	BOP	STABILIZE least affected SG E-089 pressure:
		• VERIFY ADV on SG E-089 in AUTO / MODULATE.
		• MAINTAIN P_{SAT} for lowest RCS T_{COLD} on SG E-088.
		• STABILIZE AFW flow on SG E-089.
	RO	VERIFY RCS pressure is to the right of the Appendix E curve on Attachment 29, Post-Accident Pressure/Temperature Limits.
	BOP	OPERATE Feedwater on SG E-089 to maintain between 40% and 80% NR.
Examiner Note: The following steps are from SO23-12-11, EOI Supporting Attachments, Attachment 3, Cooldown / Depressurization, and is a continuation of SO23-12-9, Functional Recovery, Step 7.		
	BOP	OVERRIDE and OPERATE HV-8421, SG E-089 Atmospheric Dump Valve.
	BOP	OVERRIDE and OPERATE Auxiliary Feedwater on SG E-089 to maintain between 40% and 80% NR.

Operating Test : NRC	Scenario # 2	Event # 6, 7, 8, & 9	Page 22 of 22
Event Description: Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure			

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY Instrument Air to Containment and Normal Pressurizer Spray available.
	RO/BOP	VERIFY adequate SHUTDOWN MARGIN with boration ≥ 40 GPM.
	RO/BOP	ENSURE Reactor power <1 x 10^{-4}% and STABLE or LOWERING.
	RO/BOP	VERIFY both Start Up Range Channels OPERABLE.
	RO/BOP	DETERMINE one RCP in each Loop OPERATING.
	BOP	INITIATE RCS cooldown at less than 100ºF per hour.
	CRS	VERIFY Excess Steam Demand ISOLATED and MSIS actuated.
	CRS	VERIFY Excess Steam Demand located between Containment and MSIVs.
+40 min	RO/BOP	VERIFY all SG Safety Valves CLOSED.
When RCS temperature is stabilized and pressure is lowering, TERMINATE the scenario.		

Appendix D	Scenario Outline	Form ES-D-1

Facility:	SONGS 2 and 3	Scenario No.:	3	Op Test No.:	October 2010 NRC
Examiners:		Operators:			

Initial Conditions:
- 1.5% power MOC - RCS Boron is 1415 ppm (by sample).
- Train A Component Cooling Water Pump (P-025) in service.
- Channel Y Pressurizer Pressure and Level in service.
- Steam Bypass Control System in operation.

Turnover: Secure Auxiliary Feedwater System and Raise Power to 18%.

Critical Tasks:
- Trip Any Reactor Coolant Pump Not Satisfying Operating Limits.
- Initiate Emergency Boration for Two (2) Stuck Control Element Assemblies.

Event No.	Malf. No.	Event Type*	Event Description
1 +15 min		N (BOP)	Place Auxiliary Feedwater System in Standby.
2 +30 min		R (RO) N (BOP, CRS)	Power increase to 18% power.
3 +40 min	CH03A	TS (CRS)	Containment Pressure Transmitter (PT-0351-1) Fails High.
4 +70 min	ED07B	C (RO, BOP, CRS) TS (CRS)	Loss of Vital AC Instrument Bus (Y-02).
5 +72 min	RP23B	M (RO, BOP, CRS)	Train A & B Inadvertent Containment Isolation Actuation Signal (CIAS) Actuation.
6 +72 min	RD0102 RD0202	C (RO)	Two (2) Stuck CEAs (#1 & #2) upon Reactor Trip. Emergency Boration Required.
7 +78 min	RP01O RP01P	C (BOP)	Auxiliary Feedwater Pumps (P-141 & P-504) Fail to Start on Emergency Feedwater Actuation Signal.

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

SCENARIO SUMMARY NRC #3

The crew will assume the watch with Reactor power at ~2% per SO23-5-1.3.1, Plant Startup from Hot Standby to Minimum Load. The Steam Bypass Control System is in operation controlling Reactor Coolant System temperature.

When the Shift Turnover is complete, the Auxiliary Feedwater System will be placed in standby per SO23-2-4, Auxiliary Feedwater System Operation.

When the Auxiliary Feedwater Pumps are secured, a power increase to 18% using CEAs with entry into MODE 1 per SO23-5-1.3.1, Plant Startup from Hot Standby to Minimum Load, will be performed.

The next event is a Containment Pressure Transmitter failure. Actions are performed per the Annunciator Response Procedures and SO23-13-18, Reactor Protection System Failure. The SRO will refer to Technical Specifications.

Once Technical Specifications are referenced, a Loss of Vital Instrument Bus Y-02 will occur. The crew will respond per SO23-13-18, Loss of Vital Bus. Crew actions include transferring Pressurizer Pressure and Level Control, controlling Charging flow, aligning the alternate power supply, and restoring plant equipment once power is available. The SRO will refer to Technical Specifications.

The major event is initiated by an inadvertent Containment Isolation Actuation Signal. The crew will enter SO23-13-17, Recovery from Inadvertent Containment Isolation Actuation Signal, and manually trip the Reactor. During performance of SO23-13-17, the Reactor Coolant Pumps are secured due to a loss of Component Cooling Water. Additionally, two stuck Control Element Assemblies will require Emergency Boration and both Motor Driven Auxiliary Feedwater Pumps will fail to start on an Emergency Feedwater Actuation Signal and must be manually started. This condition should be recognized during performance of the Standard Post Trip Actions.

The crew will enter SO23-12-1, Standard Post Trip Actions (SPTAs), and perform this procedure in concert with SO23-13-17, Recovery from Inadvertent Containment Isolation Actuation Signal. When SPTAs are completed, the crew should diagnose a Loss of Forced Circulation and enter SO23-12-7, Loss of Forced Circulation / Loss of Offsite Power.

The event will be terminated once Natural Circulation is verified in SO23-12-7, Loss of Forced Circulation / Loss of Offsite Power.

Risk Significance:

- Failure of risk important system prior to trip: Loss of Vital Instrument Bus Y-02
- Risk significant core damage sequence: Automatic Reactor Trip Failure
- Risk significant operator actions: Reenergize Vital Instrument Bus
  Manually Initiate Reactor Trip
  Initiate Emergency Boration
  Trip Reactor Coolant Pumps with Loss of CCW
  Manually Start Auxiliary Feedwater Pumps

Machine Operator Instructions for Simulator Setup

INITIALIZE to IC NRC Dynamic 3 and associated Setup File.

Event Number	Event Type	MF / RF ID	Instrument / Component Description	Demand Value	Condition
SETUP	–	N/A	Channel Y PZR Pressure and Level in service	Channel Y	
SETUP	–	N/A	Charging Pump P-191 aligned to Bus 2B04	Train A	
1		–	Secure Auxiliary Feedwater System	–	
1	RF	FW73A	LIC-3293 CST T-121 Makeup Valve	MANUAL	By Direction
1	RF	FW73B	LIC-3293 CST T-121 Makeup Valve	0%	By Direction
2		–	Power increase to 18% power	–	
3	MF	RC20A	Containment pressure PT-0351-1 failure	20 psig	
3	RF	RP51	PPS Door Open Annunciator 56B46	OPEN	By Direction
3	RF	RP52M	Containment pressure PT-0351-1 Channel A	BYPASS	5 sec TD
3	RF	RP52R	Containment pressure PT-0351-1 Channel A	BYPASS	10 sec TD
3	RF	RP51	PPS Door Open Annunciator 56B46	CLOSE	15 sec TD
4	MF	ED07B	Loss of Vital Instrument Bus Y-02		
4	RF	ED51B	Vital Instrument Bus Y-02 to Alternate power	TRNSFR	By Direction
4	RF	RP69C	DEFAS 1 RS-1A Channel 1 reset	RESET	By Direction
4	RF	RP61A	L-032 Key Lock Channel B	OPEN	By Direction
4	RF	RP62G	L-032 RTCB-2	CLOSE	By Direction
4	RF	RP62H	L-032 RTCB-6	CLOSE	By Direction
4	RF	RP61A	L-032 Key Lock Channel B	CLOSE	By Direction
5	MF	RP23B	Inadvertent CIAS	LOSS POWER	
6	MF	RD0102	Stuck CEA #1	STUCK	Reactor Trip
6	MF	RD0202	Stuck CEA #2	STUCK	Reactor Trip
7	MF	RP01O	AFW Pump P-504 start failure	FAILURE	EFAS Actuation
7	MF	RP01P	AFW Pump P-141 start failure	FAILURE	EFAS Actuation

Scenario Event Description
NRC Scenario #3

Machine Operator: **EXECUTE IC NRC Dynamic 3 and SETUP file to align components.**

ENSURE all Control Board Tags REMOVED.

ENSURE CVCS Blend Setpoints MATCH Shift Turnover Sheet.

ENSURE only one Train of Component Cooling Water in operation.

CHANGE Operator Aid Tag #029 (CVCS) to reflect boron concentration.

CHANGE Operator Aid Tag #005-9 (AFW T-120/121 alignment) to AUTO MAKEUP for both T-120 and T-121.

VERIFY forcing Pressurizer Spray flow with Backup PZR Heaters ON.

ENSURE Steam Generator level is controlled at 50% to 55%.

PLACE Channel Y Pressurizer Pressure and Level in service.

PLACE Steam Generator Level on TREND at the 22 PCS Monitor.

ENSURE HV-3354, Condenser Overboard Valve CLOSED.

ENSURE AFW Cross-Connect Valves indicate CLOSED on Feedwater DCS.

PROVIDE procedures in progress, Shift Turnover, and Reactivity Management Guide to crew in Briefing Room:

- MARKED UP copy of SO23-5-1.3.1, Plant Startup from Hot Standby to Minimum Load INITIALED and N/A as appropriate through Step 6.7.1.

- MARKED UP copy of SO23-5-1.7, Power Operations, Attachment 9, Power Maintenance and Change Calculation.

- COPY of SO23-2-4, Auxiliary Feedwater System Operation.

- LAMINATED COPY of SO23-5-1.7, Power Operations, Attachment 8, Power Maneuvering Guidelines.

ENSURE MOC copy of OPS Physics Summary Book on SRO Desk.

VERIFY CEA positions (Group 5 @127; Group 6 @29; PLCEAs @75).

Significant Control Room Annunciators in Alarm:

50A02 – COLSS ALARM
50A07 – SBCS DEMAND PRESENT
56A30/40/50/60 – LOSS OF LOAD CHANNEL 1/2/3/4 TRIP DISABLED
63E10 – SCE CB TRIP
99A24 – TURBINE TRIP RELAY TRIPPED
99B01 – GENERATOR TRIP
99B19 – VACUUM PROTECTION PLC TROUBLE
Numerous low power condition alarms

Operating Test :	NRC	Scenario #	3	Event #	1	Page	5	of	22
Event Description:	Place Auxiliary Feedwater System in Standby								

Time	Position	Applicant's Actions or Behavior
Machine Operator: ENSURE all Simulator Scenario Setup actions are complete.		
	CRS	DIRECT performance of SO23-2-4, Auxiliary Feedwater System Operation, Section 6.3, Stopping Auxiliary Feedwater Pumps.
Examiner Note: The following steps are from SO23-2-4, Auxiliary Feedwater System Operation, Section 6.3, Stopping Auxiliary Feedwater Pumps.		
	BOP	PLACE the AFW System in STANDBY per SO23-2-4, Section 6.3, Stopping AFW Pumps.
		• ENSURE the following valves are CLOSED:
		• HV-4713, P-141 to E-089 DISCH Valve.
		• HV-4706, P-140 to E-089 DISCH Valve.
		• HV-4712, P-504 to E-088 DISCH Valve.
		• HV-4705, P-140 to E-088 DISCH Valve.
		• HV-4762, P-504 to E-088 DISCH Bypass Valve.
		• HV-4763, P-141 to E-089 DISCH Bypass Valve.
		• HV-4731, AFW to E-089 Isolation Valve.
		• HV-4715, AFW to E-089 Isolation Valve.
		• HV-4714, AFW to E-088 Isolation Valve.
		• HV-4730, AFW to E-088 Isolation Valve.
		• STOP all Auxiliary Feedwater Pumps.
		• DEPRESS HS-4733-2, P-504 AFW Pump STOP pushbutton.
		• DEPRESS HS-4707-1, P-141 AFW Pump STOP pushbutton.
+15 min	BOP	ISOLATE Nitrogen per SO23-9-5, Section for Placing Nitrogen to MT-121 in Automatic for Aux Feed, **and** SECURE Auto Makeup Level Control per SO23-9-5, Section for Isolating Automatic Makeup to MT-121.
M.O. Cue: When contacted, REPORT N_2 isolated & Auto Makeup Level Control to T-121 is secured. EXECUTE remote functions FW 73A to MANUAL and FW 73B to 0%.		
When Auxiliary Feedwater is secured, or at Lead Evaluator's discretion, PROCEED to Event 2.		

Operating Test :	NRC	Scenario #	3	Event #	2	Page	6	of	22
Event Description:	Rod Withdrawal and Power Increase to ~5% Power								

Time	Position	Applicant's Actions or Behavior
Examiner Note: The following steps are from SO23-5-1.3.1, Plant Startup from Hot Standup to Minimum Load, Section 6.7, Entry into MODE 1.		
+1 min	CRS	VERIFY Requisite Steps 6.2, 6.3, 6.5, and 6.6 in SO23-5-1.3.1 completed.
	CRS	CONTINUE power increase and LOG entry into MODE 1.
	CRS	ENSURE the guidelines of Attachment 5 are being followed.
Examiner Note: The following steps are from SO23-3-2.19, CEDMCS Operation, Section 6.12, Repetitive or Emergent Manual CEA Positioning.		
	RO	POSITION Group Select Switch to CEA Group 5.
	RO	POSITION Mode Select Switch to MS (Manual Sequential).
	RO	VERIFY Group 5 indicator lamps are ILLUMINATED.
	RO/CRS	When directed by CRS, WITHDRAW Control Rods as required.
	RO	When CEA positioning is complete, PLACE Mode Select Switch to OFF.
Examiner Note: The following steps are from SO23-5-1.3.1, Plant Startup from Hot Standup to Minimum Load, Section 6.7, Entry into MODE 1.		
	RO	ESTABLISH a Startup Rate of ≤ 0.5 DPM.
	BOP	MONITOR Main Feedwater flow as required to maintain Steam Generator levels ~ 55%.
+15 min	BOP	MAINTAIN Tcold within band by monitoring SBCS operation.
When power has been raised to ~5%, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Operating Test :	NRC	Scenario #	3	Event #	3	Page	7	of	22
Event Description:	Containment Pressure Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 3. - CH03A, Containment Pressure Transmitter PT-0351-1 fails high.		
Indications Available: **56A07 – CONTAINMENT PRESS HI ESFAS CHANNEL TRIP** **56A17 – CONTAINMENT PRESS HI ESFAS PRETRIP** **56A25 – CONTAINMENT PRESS HI CHANNEL TRIP** **56A35 – CONTAINMENT PRESS HI PRETRIP** **56B06 – PPS CHANNEL 1 TROUBLE** **2PI-0351-1, Containment Pressure Narrow Range indication failed high**		
+1 min	RO	REFER to Annunciator Response Procedures.
	RO	RECOGNIZE Containment Pressure Channel failure and INFORM the CRS SO23-13-18 entry required.
	CRS	DIRECT performance of SO23-13-18, Reactor Protection System Failure.
	RO	OBSERVE instrumentation for the affected channel and alternate redundant indications monitoring the same parameter to DETERMINE failure.
	RO	IDENTIFY Containment Narrow Range Pressure Channel indication PI-0351-1 failure.
	CRS	REFER to Attachment 10 and DETERMINE Functional Unit affected is Containment Pressure Narrow Range Transmitter PT-0351-1.
	CRS	DIRECT placing the Functional Unit in BYPASS per SO23-3-2.12, Reactor Protection System Operation.
	RO	PLACE Functional Unit in BYPASS per SO23-3-2.12, RPS Operation, Section 6.3, Bypass Operation of Trip Channels.
Examiner Note: The following steps are from SO23-3-2.12, RPS Operation, Section 6.3, Bypass Operation of Trip Channels.		
	RO	VERIFY that the same bistable is not in BYPASS on any other Channel.

Time	Position	Applicant's Actions or Behavior
	RO	UNLOCK and OPEN the Bistable Control Panel.
Examiner Note: Trip BYPASS is performed by the MO and verified by the RO.		
M.O. Cue: When directed, EXECUTE the following remote functions: **RP51 = OPEN (PPS Door Open Annunciator 56B46)** **RP52M = BYPASS (Containment Pressure Channel A)** **RP52R = BYPASS (Containment Pressure Channel A)** **Delete RP51 (PPS Door Open Annunciator 56B46)**		
	RO	OBSERVE Annunciator 56A29 - PPS CHANNEL 1 TRIP BYPASS in alarm.
	RO	LOG the Bypass and Reason in the Control Operator Log.
	CRS	INITIATE a LCOAR or follow guidelines of SO123-0-A5.
Examiner Note: The following steps are from SO23-13-18, Reactor Protection System Failure.		
	CRS	CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.
	CRS	CONFIRM failure does NOT affect the Feedwater Digital Control System.
	CRS	EVALUATE Technical Specifications.
		• LCO 3.3.1.A, Reactor Protection System.
		• CONDITION A - One or more Functions with one automatic RPS trip channel inoperable. • ACTION A.1 - Place channel in bypass or trip within one (1) hour.
		• LCO 3.3.5.A, ESFAS Instrumentation.
		• CONDITION A - One or more Functions with one automatic ESFAS trip channel inoperable. • ACTION A.1 - Place Functional Unit in bypass or trip within one (1) hour.

Operating Test :	NRC	Scenario #	3	Event #	3	Page	9	of	22
Event Description:	Containment Pressure Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
	CRS	CONFIRM failure did NOT involve a failed PPS Power Supply.
Examiner Note: Do NOT proceed without placing Containment Pressure Channel A Trip in BYPASS. Failure to do so will result in a Reactor Trip when Event 4 is initiated.		
+10 min	CRS	NOTIFY Shift Manager to PERFORM Administrative Actions.
When Technical Specifications have been evaluated, or at Lead Evaluator's discretion, PROCEED to Event 4.		

Operating Test :	NRC	Scenario #	3	Event #	4	Page	10	of	22
Event Description:	Loss of Vital AC Bus								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 4. - ED07B, Loss of Vital AC Bus Y02.		
Indications Available: **57C11 – VITAL BUS 2 INVERTER INPUT VOLTAGE LO** **57C13 – VITAL BUS 2 INVERTER FAILURE** **57C17 – CHANNEL B INST RACK POWER SUPPLY FAILURE** **Numerous other Vital Bus 2 related alarms**		
+30 sec	RO/BOP	DETERMINE failure by observing instrumentation for the affected channel AND alternate redundant indications monitoring the same plant parameters.
	RO/BOP	RECOGNIZE inverter failure and INFORM the CRS SO23-13-18 entry required.
	CRS	DIRECT performance of SO23-13-18, Loss of a Vital Bus.
	CREW	DETERMINE a Loss of a Vital Bus Y02 has occurred.
	BOP	VERIFY annunciator 63A33 – 2D2 125 VDC BUS TROUBLE not alarming.
	RO	DEPRESS A/M button to PLACE LIC-0110, Pressurizer Level Controller, in MANUAL.
	RO	START or STOP Charging Pumps as necessary to control Pressurizer level and MATCH Letdown flow as close as possible.
	RO	ADJUST output on LIC-0110 to MATCH Letdown flow as closely as possible and MAINTAIN a steady PZR level.
	RO	TRANSFER Pressurizer Level Control to Channel X.
	RO	DEPRESS HS-0100C, PZR Lo-Lo Level Heater Cutout Channel Selector and SELECT Channel X Level Transmitter.
	RO	DEPRESS OFF, then AUTO, to RESET PZR Heaters.

Operating Test : NRC	Scenario # 3	Event # 4	Page 11 of 22
Event Description: Loss of Vital AC Bus			

Time	Position	Applicant's Actions or Behavior
	RO/BOP	CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, or RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.
	CRS	INITIATE reenergizing Vital Bus Y02 from Alternate Source per SO23-6-17 within 2 hours.
M.O. Cue:		**When contacted to place Y-02 on its Alternate Source, WAIT until the CRS has referenced the Attachment 2 step for Bypassing Selected Feedwater Control Signals, then EXECUTE remote function ED51B. This will allow TS calls to be made.**
Examiner Note:		**Depending on time of power restoration some events may or may not be performed.**
	CRS	DIRECT performance of Attachment 2 for Loss of Vital Bus Y-02.
+10 min	CRS	EVALUATE Technical Specifications.
		• LCO 3.8.7.A, Inverters - Operating.
		• CONDITION A - One required inverter inoperable. • ACTION A.1 - Power AC vital bus from its Class 1E constant voltage source transformer within 2 hours. • ACTION A.2 - Restore inverter to OPERABLE status within 24 hours.
		• LCO 3.8.9.B, Distributions Systems - Operating.
		• CONDITION B - One or more AC vital bus inoperable. • ACTION B.1 - Restore AC vital bus subsystem to OPERABLE status within 2 hours.
		• LCO 3.7.5.H, Auxiliary Feedwater System.
		• CONDITION H - An automatic valve in any flowpath incapable of closing upon receipt of a Main Steam Isolation signal. • ACTION H.1 - Close the affected valve or its block valve within 4 hours. • ACTION H.2 - Enter the appropriate ACTIONS (A, B, C, D, F, or G) if there is a loss of flow path(s) immediately upon completion of ACTION H.1.

Operating Test : NRC	Scenario # 3	Event # 4	Page 12 of 22
Event Description: Loss of Vital AC Bus			

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY Protection System bistable NOT TRIPPED on PPS Channels A and C ROMs.
	RO	VERIFY all ESFAS function lights EXTINGUISHED on PPS Channels A, B, C and D ROMs.
	RO	VERIFY Safety Channel indications providing input to PPS Channels A, C, and D do not indicate that a PPS Trip setpoint has been exceeded.
	RO	OPERATE Charging Pumps as necessary to control Pressurizer level.
	RO	ENSURE PZR Level Channel X is SELECTED.
		• If required, TRANSFER Pressurizer Level Setpoint to LS1 per SO23-3-1.10, Attachment for Transferring Pressurizer Level and Pressure Controls.
	BOP	ENSURE SO23-6-17, Attachment for Reenergizing Vital Bus Y02 from the Alternate Source, in progress.
	BOP	VERIFY EFAS Valves OPEN:
		• HV-4712 / HV-4705 / HV-4715 / HV-4731 / HV-4716
	RO	VERIFY extinguished indicating lamps for both RPS Status Panels (RTCBs).
M.O. Cue: When contacted as the 43, WAIT one (1) minute then REPORT Reactor Trip Circuit Breakers 1, 2, 5, and 6 are OPEN and 3, 4, 7 and 8 are CLOSED (and 9, if asked).		
	CRS/RO	INITIATE local verification that RTCBs 1, 2, 5, and 6 are OPEN.
	CRS/RO	INITIATE local verification that RTCBs 3, 4, 7 and 8 are CLOSED.
	CRS/RO	VERIFY Channel B CPC tripped, CEAC 1 failed, and PPS HI Log Power tripped.

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY TGIS, FHIS, CPIS, and CRIS Train B actuated.
		• VERIFY proper actuation of ESFAS components.
	RO	VERIFY SIAS, CCAS, CIAS, MSIS, CSAS, RAS:
		• Trip Paths 2 and 4 actuated.
		• VERIFY ESFAS alarms on CR-57 NOT annunciated.
	RO	VERIFY valve indications EXTINGUISHED:
		• HV-9340, SIT Outlet Valve.
		• HV-9370, SIT Outlet Valve.
		• HV-9434, Hot Leg Injection Valve.
	CRS	INITIATE SO123-0-A7, Section for State Office of Emergency Services Communication Guidelines.
	CRS	DETERMINE that PZR Compensated Level indication LI-0103 is NOT needed for PZR level indication.
	CRS	DIRECT performance of SO23-3-2.38, Section for Bypassing Selected Feedwater Control Signals.
	BOP	BYPASS Channel B SG Pressure, NR Level, and WR Level per SO23-3-2.38, Section for Bypassing Selected Feedwater Signals.
	CRS	INFORM crew that P094 and P095, Fuel Oil Transfer Pumps, will NOT run in AUTO, and must be operated locally.
<u>Examiner Note</u>: The next steps are performed when power is restored.		
	BOP	When directed, ENSURE AFW Valves CLOSED:
		• HV-4712 / HV-4705 / HV-4715 / HV-4731 / HV-4716
<u>Examiner Note</u>: DEFAS 2 must be RESET by the crew.		

Operating Test : NRC	Scenario # 3	Event # 4	Page 14 of 22
Event Description: Loss of Vital AC Bus			

Time	Position	Applicant's Actions or Behavior
		M.O. Cue: When directed, EXECUTE remote function RP69C to RESET DEFAS 1.
	RO/BOP	RESET DEFAS per SO23-3-2.22, Section for ESFAS Actuation and Reset.
	RO	VERIFY Panel Status lamps illuminated to reflect actual PPS / ESFAS condition.
		Examiner Note: Reactor Trip Circuit Breakers 1 and 5 must be CLOSED by the crew.
	RO	CLOSE the affected RTCBs per SO23-3-2.12, Section for Closing Operation of the Reactor Trip Breakers.
		M.O. Cue: When directed, EXECUTE remote functions RP61A, RP62G, RP62H, then RP61A to CLOSE RTCBs 2 and 6.
	RO	When CPC Channel B DNBR and LPD values are within range, RESET the associated Auxiliary Trips.
	RO	VERIFY CEAC 1 Auto restarts:
		• VERIFY CEAC 1 sensor failure light EXTINGUISHED.
	RO	RESET the HI Log Power Trip:
		• LIFT cover then DEPRESS HI Log Power Trip pushbutton.
+30 min	BOP	RESET ESFAS per SO23-3-2.22, Section for ESFAS Actuation and Reset.
		When the Vital Bus power is restored, or at Lead Evaluator's discretion, PROCEED to Event 5.

Operating Test : NRC	Scenario # 3	Event # 5	Page 15 of 22
Event Description: Inadvertent Containment Isolation Actuation Signal			

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 5. - RP23B, Inadvertent Containment Isolation Actuation Signal.		
Indications Available: **57A02 – CIAS TRAIN A ACTUATION** **57B02 – CIAS TRAIN B ACTUATION** **56C34/36/38/40 – RCP P001/P003/P004/P002 CCW FLOW LO**		
+10 sec	BOP	REFER to Annunciator Response Procedures.
	BOP	RECOGNIZE Train A and B CIAS and INFORM the CRS SO23-13-17 entry required.
	CRS	DIRECT performance of SO23-13-17, Recovery from Inadvertent Safety Injection / Containment Isolation or Containment Spray.
	RO/BOP	ENSURE the Reactor and Main Turbine are tripped.
	RO/BOP	MANUALLY TRIP the Reactor.
Examiner Note: If RCPs are not stopped by the RO, they will be stopped by the BOP during performance of verifying Vital Auxiliaries.		
	RO	When CEAs have been inserted for greater than five (5) seconds as indicated by CEA bottom lights, STOP all Reactor Coolant Pumps.
CRITICAL TASK STATEMENT		**Within 10 minutes of Loss of Component Cooling Water Flow and Prior to Exceeding RCP Operating Limits, Stop Affected RCP(s).** **Elapsed Time: _____**
CRITICAL TASK	RO/BOP	STOP all Reactor Coolant Pumps due to CIAS.
When transition to SO23-12-1 is addressed, or at Lead Evaluator's discretion, PROCEED to Events 6 and 7.		

Operating Test :	NRC	Scenario #	3	Event #	6 & 7	Page	16	of	22
Event Description:	Two Stuck Control Element Assemblies / Auxiliary Feedwater Pump EFAS Start Failures								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Events 6 and 7. - RD0102 & RD0202, Stuck CEAs #1 & #2. - RP01O, Auxiliary Feedwater Pump P-504 EFAS start failure. - RP01P, Auxiliary Feedwater Pump P-141 EFAS start failure.		
Indications Available: **Numerous Reactor Trip related alarms**		
	CRS	DIRECT performance of SO23-12-1, Standard Post Trip Actions.
	RO	VERIFY Reactor Trip:
		• VERIFY Reactor Trip Circuit Breakers (8) OPEN.
		• VERIFY Reactor Power lowering and Startup Rate NEGATIVE.
		• DETERMINE two (2) Full Length CEAs NOT fully inserted.
CRITICAL TASK STATEMENT		**Perform an Emergency Boration at ≥ 40 GPM when two (2) or more Full Length CEAs Fail to Fully Insert, Prior to Exiting SO23-12-1.**
CRITICAL TASK	RO	• [RNO] COMMENCE emergency boration at greater than 40 gpm.
		• OPEN HV-9247, Emergency Boration Block Valve.
		• START either BAMU Pump P-174 or P-175.
		• CLOSE HV-9236, BAMU Pump P-174 Recirculation Valve.
		• CLOSE HV-9231, BAMU Pump P-175 Recirculation Valve.
		• CLOSE HV-9253, Makeup to VCT Valve, in MANUAL.
		• ENSURE Charging flow > 40 gpm.
	CRS	VERIFY Reactivity Control criteria satisfied.
	BOP	VERIFY Turbine Trip:
		• VERIFY Main Turbine TRIPPED.
		• VERIFY HP and LP Stop and Governor Valves CLOSED.
		• VERIFY both Unit Output Breakers OPEN.
		• VERIFY Main Turbine speed < 2000 RPM or LOWERING.

Operating Test :	NRC	Scenario #	3	Event #	6 & 7	Page	17	of	22
Event Description:	Two Stuck Control Element Assemblies / Auxiliary Feedwater Pump EFAS Start Failures								

Time	Position	Applicant's Actions or Behavior
	CRS	INITIATE Administrative Actions:
		• ANNOUNCE Reactor trip via PA System.
		• INITIATE Attachment 4, Worksheet.
		• INITIATE Attachment 5, Administrative Actions.
	BOP	VERIFY Vital Auxiliaries criteria satisfied:
		• VERIFY both 1E 4 kV Buses ENERGIZED.
		• VERIFY all 1E 480 V Buses ENERGIZED.
		• VERIFY all 1E DC Buses ENERGIZED.
		• VERIFY all Non-1E 4 kV Buses ENERGIZED.
		• DETERMINE CCW Train operating and NOT ALIGNED to Non-Critical Loop and Letdown Heat Exchanger due to CIAS.
		• [RNO] If CIAS actuated, STOP all RCPs.
Examiner Note: The Critical Task from Event 5 is shown here if not performed in SO23-13-17.		
CRITICAL TASK STATEMENT		**Within 10 minutes of Loss of Component Cooling Water Flow and Prior to Exceeding RCP Operating Limits, Stop Affected RCP(s).** **Elapsed Time: _____**
CRITICAL TASK	RO/BOP	STOP all RCPs due to CIAS.
Examiner Note: With the Unit at low power, any delay in tripping the Reactor will result in RCS Inventory Control and RCS Pressure Control NOT being satisfied. This results in increasing RCS temperature and pressure outside the bands established for the Safety Function Status Checks.		
	RO	DETERMINE RCS Inventory Control criteria NOT satisfied:
		• DETERMINE PZR level between 10% and 70% and NOT TRENDING to between 30% and 60%.
		• [RNO] ENSURE Pressurizer Level Control System operating in AUTO to restore Pressurizer level.
		• VERIFY Core Exit Saturation Margin ≥ 20ºF:
		• QSPDS page 611.

Operating Test :	NRC	Scenario #	3	Event #	6 & 7	Page	18	of	22
Event Description:	Two Stuck Control Element Assemblies / Auxiliary Feedwater Pump EFAS Start Failures								

Time	Position	Applicant's Actions or Behavior
		• CFMS page 311.
	RO	DETERMINE RCS Pressure Control criteria NOT satisfied:
		• DETERMINE PZR pressure between 1740 PSIA and 2380 PSIA and controlled and NOT TRENDING to between 2025 PSIA and 2275 PSIA.
		• [RNO] DETERMINE PZR Pressure Control System is NOT restoring PZR pressure.
		• [RNO] ENSURE Normal and Aux Spray Valves CLOSED.
	RO	DETERMINE Core Heat Removal criteria NOT satisfied:
		• DETERMINE no RCPs operating.
		• VERIFY Core Exit Saturation Margin ≥ 20ºF.
		• QSPDS page 611.
		• CFMS page 311.
	BOP	VERIFY RCS Heat Removal criteria satisfied:
		• VERIFY both SGs level > 21% NR.
		• VERIFY both SGs level < 80% NR.
		• VERIFY Auxiliary feedwater available to restore both SGs level between 40% NR and 80% NR.
		• [RNO] Manually INITIATE EFAS.
		• VERIFY T_{COLD} trending to between 540ºF and 550ºF.
		• VERIFY SG pressures between 960 and 1050 PSIA.
Examiner Note:		**With SG levels ~50%, starting P-141 and P-504 may be delayed until SPTA Step 14 is performed by the BOP.**
Examiner Note:		**When EFAS is initiated, there is a 30 second time delay before the AFW Pumps receive a START signal.**
	RO/BOP	DETERMINE Auxiliary Feedwater Pumps P-504 and P-141 did NOT start on EFAS and Manually START both AFW Pumps.
		• DEPRESS HS-4733-2, P-504 AFW Pump START pushbutton.
		• DEPRESS HS-4707-1, P-141 AFW Pump START pushbutton.

Operating Test :	NRC	Scenario #	3	Event #	6 & 7	Page	19	of	22
Event Description:	Two Stuck Control Element Assemblies / Auxiliary Feedwater Pump EFAS Start Failures								

Time	Position	Applicant's Actions or Behavior
		• VERIFY TDAFW Pump P-140 running.
	RO	VERIFY Containment Isolation criteria satisfied:
		• VERIFY Containment pressure < 1.5 PSIG.
		• VERIFY Containment Area Radiation Monitors energized and NOT alarming or trending to alarm.
		• VERIFY Secondary Plant Radiation Monitors energized and NOT alarming or trending to alarm.
<u>Examiner Note</u>: Containment Temperature and Pressure criteria are NOT satisfied because the CIAS causes a loss of Normal Containment Cooling.		
	RO	DETERMINE Containment Temperature and Pressure criteria NOT satisfied:
		• VERIFY Containment average temperature > 120ºF.
		• VERIFY Containment pressure < 1.5 PSIG.
+15 min	CRS	DIAGNOSE event in progress:
		• DETERMINE some Safety Function criteria are NOT met per Attachment 4, Worksheet.
		• [RNO] COMPLETE Attachment 1, Recovery Diagnostics.
		• [RNO] DIAGNOSE event as a Loss of Forced Circulation.
		• DETERMINE that Reactor Trip Recovery is NOT diagnosed.
	RO	• [RNO] DETERMINE all RCPs STOPPED.
		• DIRECT initiating Steps 12 through 15.
	BOP	INITIATE Steps 12 through 15.
		• VERIFY HS-0800S2, Telecom 480 VAC Feeder Breaker CLOSED.
		• VERIFY HS-0800N2, Telecom 480 VAC Feeder Breaker CLOSED.
		• VERIFY B15 & B16 480 VAC Load Centers ENERGIZED.
		• ENSURE Extractions Steam Block Valves CLOSED.
		• ENSURE Main Steam to Reheater Block, Bypass, Warmup, and Control Valves CLOSED.
		• VERIFY Generator lowering to less than 24 kV.

Time	Position	Applicant's Actions or Behavior
		• VERIFY 99A26 - TURBINE LUBE OIL TEMP HI and 99A46 - TURBINE BRG OIL DRAIN TEMP HI Annunciators RESET.
		• INITIATE SO23-10-2, Turbine Shutdown, Attachment for Unloading the Generator and Removing the Unit from Line.
		• ESTABLISH desired Condensate and Feedwater Status:
		• ENSURE 3rd Point Heater Drain Pumps STOPPED.
		• VERIFY Reactor Trip Override RESET.
		• DETERMINE Main Feedwater Pump NOT in operation.
		• [RNO] ENSURE Steam Generator levels being maintained by Auxiliary Feedwater Pumps.
		• ENSURE FIC-3294, Condensate Pump Miniflow Controller set for Condensate Pump configuration.
		• PLACE LV-3245, Condensate Drawoff Valve to DISABLE.
		• DETERMINE SO23-12-2, Reactor Trip Recovery, NOT being implemented.
		• [RNO] ENSURE HV-4053 & HV-4054, SG Blowdown Valves CLOSED.
		• VERIFY both Start Up Range Channels OPERABLE.
	CRS	DIRECT performance of SO23-12-7, Loss of Forced Circulation / Loss of Offsite Power.
	CRS	RECORD time of EOI entry _____.
	CRS	VERIFY LOFC / LOOP Diagnosis:
		• INITIATE SO23-12-10, Safety Function Status Checks.
		• INITIATE Foldout Page.
		• DIRECT performance of FS-3, Monitor Natural Circulation Established.
		• VERIFY at least one Train of 1E electrical AC and associated 1E DC Control Power.
		• VERIFY at least one Train of 1E 120 VAC Instrument Bus.
		• VERIFY Train A and B Safeguards Buses energized.
		• VERIFY all RCPs stopped.

Operating Test :	NRC	Scenario #	3	Event #	6 & 7	Page	21	of	22
Event Description:	Two Stuck Control Element Assemblies / Auxiliary Feedwater Pump EFAS Start Failures								

Time	Position	Applicant's Actions or Behavior
	CRS	INITIATE Administrative actions:
		• NOTIFY Shift Manager/Operations Leader of SO23-12-7, LOFC / LOOP initiation.
		• ENSURE Emergency Plan is initiated.
		• IMPLEMENT Placekeeper.
		• IMPLEMENT Time Dependent Steps.
	BOP	VERIFY Electrical Power Distribution:
		• VERIFY Reserve Auxiliary Transformers ENERGIZED.
		• VERIFY all Non-1E 4 kV Buses ENERGIZED.
		• STOP unloaded Diesel Generators.
	BOP	VERIFY CCW Configuration:
		• VERIFY Train A Critical Loop in service.
		• VERIFY Train A CCW Pump operating and ALIGNED to Non-Critical Loop and Letdown Heat Exchanger.
	CRS	INITIATE applicable actions of SO23-12-11, Attachment 2, Floating Steps.
	RO	ESTABLISH Pressurizer Level Control:
		• VERIFY Pressurizer level between 10% and 70% and TRENDING to between 30% and 60%.
	RO	ESTABLISH Pressurizer Pressure Control:
		• VERIFY PZR pressure between 1740 PSIA and 2380 PSIA and controlled and TRENDING to between 2025 PSIA and 2275 PSIA.
	BOP	VERIFY RCS Heat Removal:
		• DETERMINE SBCS NOT available.
		• [RNO] OVERRIDE and OPERATE ADVs as required.
		• DETERMINE Main Feedwater NOT available.
		• [RNO] OVERRIDE and OPERATE AFW to establish one Steam Generator between 40% and 80% narrow range.

Operating Test : NRC	Scenario # 3	Event # 6 & 7	Page 22 of 22
Event Description: Two Stuck Control Element Assemblies / Auxiliary Feedwater Pump EFAS Start Failures			

Time	Position	Applicant's Actions or Behavior
	RO	• VERIFY RCS Loop T_{COLD} STABLE and CONTROLLED.
	CRS/RO	DETERMINE forced circulation NOT established in any RCS Loops.
+30 min	RO	VERIFY Natural Circulation established in at least one RCS Loop.
		• VERIFY operating Loop ΔT less than 58ºF.
		• VERIFY RCS T_{HOT} and T_{COLD} NOT rising.
		• VERIFY Core Exit Saturation Margin ≥ 20ºF.
		• VERIFY operating Loop T_{HOT} and REPCET within 16ºF.
		• VERIFY Reactor Vessel level ≥ 100% (Plenum).
When Natural Circulation is verified, or at the Lead Evaluator's discretion, TERMINATE the scenario.		

Appendix D	Scenario Outline	Form ES-D-1

Facility:	SONGS 2 and 3	Scenario No.:	4	Op Test No.:	October 2010 NRC
Examiners:		Operators:			

Initial Conditions:
- 70% power MOC - RCS Boron is 1070 ppm (by sample).
- Train A Component Cooling Water Pump (P-025) in service.
- Charging Pump (P-191) aligned to 480 Volt Bus 2B04.
- Train A Auxiliary Feedwater Pump (P-141) OOS for oil change.
- Channel X Pressurizer Pressure and Level in service.

Turnover: Transfer Reactor Coolant Pump (RCP) 6900 V Bus 2A01 from UAT to RAT.

Critical Tasks:
- Manually Trip the Reactor due to Reactor Protection System Failure.
- Reduce Reactor Coolant System T_{HOT} to less than 530ºF.
- Isolate the Ruptured Steam Generator.

Event No.	Malf. No.	Event Type*	Event Description
1 +10 min		N (BOP)	Transfer Reactor Coolant Pump 6900 Volt Bus 2A01 from Unit Auxiliary Transformer to Reserve Auxiliary Transformer.
2 +20 min	RC16A	I (RO, CRS) TS (CRS)	Pressurizer Level Control Channel X (LT-0110-1) Fails High.
3 +30 min	CS05B	TS (CRS)	Refueling Water Storage Tank Level Transmitter (LT-0305-2) Fails Low.
4 +35 min	SG01A	C (RO, CRS)	Steam Generator (E-088) Tube Leak Greater Than 150 GPD.
5 +50 min		R (RO) N (BOP, CRS)	Rapid Power Reduction for Steam Generator (E-088) Tube Leak.
6 +55 min	SG01A	M (RO, BOP, CRS)	Steam Generator (E-088) Tube Rupture at 300 GPM (5 minute ramp).
7 +55 min	RP02A RP02B	I (RO)	All Reactor Trip Pushbuttons Disabled / Anticipated Transient without Scram.
8 +60 min	2A03 LP	C (BOP)	Non-1E 4160 Volt Bus 2A03 Fails to Auto Transfer on Reactor Trip.

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

SCENARIO SUMMARY NRC #4

The crew will assume the watch and maintain steady-state conditions per SO23-5-1.7, Power Operations. Train A Auxiliary Feedwater Pump P-141 is out of service for oil change.

In preparation for breaker maintenance, the crew will transfer the Reactor Coolant Pump (RCP) 6900 Volt Bus 2A01 from the Unit Auxiliary Transformer to the Reserve Auxiliary Transformer per SO23-6-1, Transferring of 6.9 kV Buses.

When the RCP Bus transfer is complete, a Pressurizer Level Channel fails high. The crew will respond per SO23-13-27, Pressurizer Pressure and Level Malfunction. The alternate controlling channel will be placed in service and Charging and Letdown will be restored to normal. The SRO will refer to Technical Specifications.

When Pressurizer Level is restored, a Refueling Water Storage Tank Level Transmitter fails low. The crew will reference SO23-13-18, Reactor Protection System Failure, and place the non-functioning unit in BYPASS. The SRO will refer to Technical Specifications.

The next event is the onset of a Steam Generator Tube Leak. Entry into SO23-13-4, Reactor Coolant Leak, will direct the crew to identify the source and quantity of leakage. Based on leakage indications, the crew will commence a plant shutdown using SO23-13-28, Rapid Power Reduction.

When the Rapid Power Reduction is underway, the Steam Generator Tube Leak will increase to 300 GPM over a 5 minute period. When unable to maintain Pressurizer level, the Control Room Supervisor should order a Reactor and Turbine Trip.

An Anticipated Transient without Scram is identified when the manual Reactor Trip pushbuttons fail. The Reactor will trip when the Control Element Drive Mechanism Motor Generators are deenergized on Buses 15 and 16. Additionally, Non-1E 4160 Volt Bus 2A03 fails to automatically transfer requiring actions by the BOP to reenergize during Standard Post Trip Actions.

The crew will enter SO23-12-1, Standard Post Trip Actions, and transition to SO23-12-4, Steam Generator Tube Rupture. Post trip actions include cooling the affected Steam Generator to less than 530ºF and isolating the Steam Generator.

When the ruptured Steam Generator is isolated, the scenario will be terminated.

Risk Significance:

- Risk important components out of service: Train A Auxiliary Feedwater Pump
- Risk significant core damage sequence: Anticipated Transient without Scram (ATWS)
  Steam Generator Tube Rupture
- Risk significant operator actions: Manually Trip Reactor During ATWS
  Cooldown RCS T_{HOT} to less than 530ºF
  Isolate Ruptured Steam Generator

Scenario Event Description
NRC Scenario #4

Machine Operator Instructions for Simulator Setup

INITIALIZE to IC NRC Dynamic 4 and associated Setup File.

Event Number	Event Type	MF / RF ID	Instrument/Component Description	Demand Value	Condition
SETUP		–	Channel X PZR Pressure and Level in service	Channel X	
SETUP		–	Charging Pump P-191 aligned to Bus 2B04	Train A	
SETUP		–	Train A Auxiliary Feedwater Pump P-141 OOS	TAGOUT	
1		–	Transfer RCP Bus 2A01 from UAT to RAT	–	
2	MF	RC16A	Channel X PZR Level LT-0110-1 failure	100%	
3	MF	CS05B	RWST Level Transmitter LT-0305-2 failure	0%	
3	RF	RP51	PPS Door Open Annunciator 56B46	OPEN	By Direction
3	RF	RP53T	RWST Level Transmitter LT-0305-2	BYPASS	5 sec TD
3	RF	RP51	PPS Door Open Annunciator 56B46	CLOSE	10 sec TD
4	MF	SG01A	SG E-088 Tube Leak > 150 GPD	0.0005%	
5	–	–	Rapid Power Reduction		1%/min
6	MF	SG01A	SG E-088 Tube Rupture at 300 GPM	0.7%	300 sec ramp
7	MF	RP02A	All Reactor Trip Pushbuttons Disabled / ATWS	FAILURE	
7	MF	RP02B	All Reactor Trip Pushbuttons Disabled / ATWS	FAILURE	
8	MF	2A03 LP	Non-1E Bus 2A03 failure to auto transfer		
	RF	ED85	Non-Qualified Loads Restoration		By Direction

Scenario Event Description
NRC Scenario #4

Machine Operator:

EXECUTE IC NRC Dynamic 4 and SETUP file to align components.

ENSURE Control Board Tag on P-141.

ENSURE CVCS Blend Setpoints MATCH Shift Turnover Sheet.

CHANGE Operator Aid Tag #029 (CVCS) to reflect boron concentration.

VERIFY forcing Pressurizer Spray flow with Backup PZR Heaters ON.

ENSURE Turbine Ramp Rate SET to 100 MWe per minute.

ENSURE one (1) Charging Pump running.

ENSURE only one Train of Component Cooling Water in operation.

PLACE Channel X Pressurizer Pressure and Level in service.

PROVIDE procedures in progress, Shift Turnover, and Reactivity Management Guide to crew in Briefing Room:

- COPY of SO23-5-1.7, Power Operations, Section 6.1, Guidelines for Steady State Operation.

- COPY of SO23-6-1, Transferring 6.9 kV Buses, Section 6.1, MARKED UP for Bus 2A01.

- COPY of SO23-6-1, Transferring 6.9 kV Buses, Section 6.1, MARKED UP for Bus 2A02.

- LAMINATED COPY of SO23-5-1.7, Power Operations, Attachment 8, Power Maneuvering Guidelines.

ENSURE MOC copy of OPS Physics Summary Book on SRO Desk.

VERIFY CEA positions (Group 6 @ ARO / PLCEAs @ 115).

Significant Control Room Annunciators in Alarm:

57A58 – EMERGENCY FEEDWATER SYS TRAIN A INOPERABLE

Operating Test : NRC	Scenario # 4	Event # 1	Page 5 of 21
Event Description: Transfer Reactor Coolant Pump Bus 2A01 from UAT to RAT			

Time	Position	Applicant's Actions or Behavior
Machine Operator: ENSURE all Simulator Scenario Setup actions are complete.		
	CRS	DIRECT performance of SO23-6-1, Transferring 6.9 kV Buses, Section 6.1, Manual Transfer of 6.9 kV Bus from 2XU2 to 2XR3.
	BOP	ENSURE Bus 2A01 clear of all unnecessary personnel and maintain it clear until after 6.9 kV bus is energized.
M.O. Cue: When contacted, REPORT all personnel are clear of Bus 2A01 and Penetration Building is posted.		
	BOP	DETERMINE 2XR3 Transformer is energized.
	BOP	ENSURE 3A0105, Res Aux XFMR 2XR3 FDR Breaker OPEN.
Floor Cue: When contacted, REPORT as Unit 3 that 3A0105, Bus 3A01 Feeder Breaker from Reserve Auxiliary Transformer 2XR3 is OPEN.		
	BOP	PLACE 2HS-1613B, Res Aux XFMR 2XR3 FDR Bkr 2A0102 Mode Selector in MANUAL.
	BOP	TURN 2/3HS-1627A, Non-1E Sync Master Control Switch key to ON.
Examiner Note: The following steps will transfer RCP Bus 2A01 from the Unit Auxiliary Transformer to the Reserve Auxiliary Transformer.		
	BOP	DEPRESS 2A0102, Res Aux XFMR 2XR3 FDR Breaker, SYNC pushbutton.
	BOP	VERIFY Breaker SYNC light illuminated.
	BOP	VERIFY SYNC IN MODE light illuminated.
	BOP	VERIFY SYNC RELAYS TROUBLE light extinguished.

Operating Test :	NRC	Scenario #	4	Event #	1	Page	6	of	21
Event Description:	Transfer Reactor Coolant Pump Bus 2A01 from UAT to RAT								

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY INCOMING and RUNNING voltage and frequencies matched.
	BOP	VERIFY Synchroscope moves to straight up (12 o'clock) position.
	BOP	DEPRESS 2A0102, Res Aux XFMR 2XR3 FDR Breaker CLOSE pushbutton.
		• ACKNOWLEDGE Annunciator 63C53, UNIT 2 NON ESF XFMRS PARALLELED alarm.
	BOP	VERIFY OPEN 2A0104, Unit Aux XFMR 2XU2 FDR Breaker.
	BOP	DEPRESS 2A0102, Res Aux XFMR 2XR3 FDR Breaker SYNC pushbutton.
		• VERIFY Breaker SYNC light extinguished.
+10 min	BOP	TURN 2/3HS-1627A, Non-1E Sync Master Control Switch key to OFF.
When RCP Buses are transferred, or at Lead Evaluator's discretion, PROCEED to Event 2.		

Operating Test :	NRC	Scenario #	4	Event #	2	Page	7	of	21
Event Description:	Pressurizer Level Control Channel X Failure								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 2. - RC16A, PZR Level Controlling Channel X LT-0110-1 fails high.		
Indications Available: **50A22 – PZR LEVEL ERROR HI** **50A12 – PZR LEVEL ERROR HI-HI** **Letdown flow increasing** **2LI-0110A1, Hot Calibrated Pressurizer Level indication failed high**		
+1 min	RO	REFER to Annunciator Response Procedures.
	RO	OBSERVE minimum Charging flow and maximum Letdown flow.
	RO	DETERMINE that PZR Level Channel X (LI-0110A1) is cause of failure and INFORM the CRS SO23-13-27 entry required.
	CRS	DIRECT performance of SO23-13-27, Pressurizer Pressure and Level Malfunction, to transfer PZR Level Control to the OPERABLE transmitter.
	RO	DETERMINE Letdown and Charging are NOT responding as desired and PERFORM the following (as applicable):
		• DEPRESS the A/M button on LIC-0110, PZR Level Controller, and PLACE PZR Level Control in MANUAL.
		• START Charging Pumps to MATCH Letdown flow as closely as possible.
		• ADJUST LIC-0110, PZR Level Controller, to MATCH Letdown and Charging flows.
		• SECURE PZR heaters as necessary to control RCS pressure.
		• VERIFY normal Charging and Letdown in service.
	RO	DETERMINE Level Channel indications NOT reading the same.
	RO	VERIFY Level Channel Y (LI-0110Y) is OPERABLE.
	RO	POSITION HS-0110, PZR Level Channel Select Switch, to Channel Y.

Operating Test : NRC	Scenario # 4	Event # 2	Page 8 of 21
Event Description: Pressurizer Level Control Channel X Failure			

Time	Position	Applicant's Actions or Behavior
	RO	ADJUST output on LIC-0110 to MATCH actual level (middle column) with the Pressurizer Level Setpoint (left column) to within 2%.
	RO	DEPRESS A/M pushbutton and TRANSFER LIC-0110, PZR Level Controller to AUTO.
	RO	DEPRESS Level Transmitter Y on HS-0100C, PZR LO-LO Level Heater Cutout Channel Selector.
	RO	DETERMINE PZR Heaters have NOT tripped.
	RO	RESTORE Backup Charging Pumps to AUTO.
Examiner Note: Crew may elect to switch the CFMS point display for PZR level from Channel X to Channel Y.		
+10 min	CRS	EVALUATE Technical Specifications.
		• 3.3.11.A, Post Accident Monitoring Instrumentation.
		• CONDITION A - One or more Functions with one required channel inoperable. • ACTION A.1 - Restore required channel to OPERABLE status within 30 days.
		• 3.3.12.A, Remote Shutdown System.
		• CONDITION A - One or more required Functions inoperable. • ACTION A.1 - Restore required Functions to OPERABLE status within 30 days.
When Technical Specifications have been addressed, or at Lead Evaluator's discretion, PROCEED to Event 3.		

Operating Test :	NRC	Scenario #	4	Event #	3	Page	9	of	21
Event Description:	Refueling Water Storage Tank Level Transmitter Failure								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 3. - CS05B, RWST Level Indication LT-0305-2 fails low.		
Indications Available: **56A27 - RWST LEVEL LO ESFAS CHANNEL TRIP** **56A37 - RWST LEVEL LO PRETRIP** **56B16 - PPS CHANNEL 2 TROUBLE** **2LI-0305-2, RWT 2T006 LEVEL indication failed low**		
+10 secs	RO	REFER to Annunciator Response Procedures.
	RO	RECOGNIZE Refueling Water Storage Tank Level Channel failure and INFORM the CRS SO23-13-18 entry required.
	CRS	DIRECT performance of SO23-13-18, Reactor Protection System Failure.
	RO	OBSERVE instrumentation for the affected channel and alternate redundant indications monitoring the same parameter to DETERMINE failure.
	RO	IDENTIFY RWST Level Channel indication LI-0305-2 failure.
	CRS	REFER to Attachment 10 and DETERMINE Functional Unit affected is RWST Level Transmitter LT-0305-2.
	CRS	DIRECT placing the Functional Unit in BYPASS per SO23-3-2.12, Reactor Protection System Operation.
	RO	PLACE Functional Unit in BYPASS per SO23-3-2.12, RPS Operation, Section 6.3, Bypass Operation of Trip Channels.
Examiner Note: If desired, the SG Tube Leak (Event 4) can be started at this time.		
Examiner Note: The following steps are from SO23-3-2.12, Reactor Protection System Operation, Section 6.3, Bypass Operation of Trip Channels.		
	RO	VERIFY that the same bistable is not in BYPASS on any other Channel.

Operating Test : NRC	Scenario # 4	Event # 3	Page 10 of 21
Event Description: Refueling Water Storage Tank Level Transmitter Failure			

Time	Position	Applicant's Actions or Behavior
	RO	UNLOCK and OPEN the Bistable Control Panel.
Examiner Note: Trip BYPASS is performed by the MO and verified by the RO.		
M.O. Cue: When directed, EXECUTE the following remote functions: **RP51 = OPEN (PPS Door Open Annunciator 56B46)** **RP53T = BYPASS (Low RWST Channel B)** **Delete RP51 (PPS Door Open Annunciator 56B46)**		
	RO	OBSERVE Annunciator 56A39 - PPS CHANNEL 2 TRIP BYPASS in alarm.
	RO	LOG the Bypass and Reason in the Control Operator's Log.
	CRS	INITIATE a LCOAR or follow guidelines of SO123-0-A5.
Examiner Note: The following steps are from SO23-13-18, Reactor Protection System Failure.		
	CRS	CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.
	CRS	CONFIRM failure does NOT affect the Feedwater Digital Control System.
	CRS	EVALUATE Technical Specifications.
		• 3.3.5.B, Engineered Safety Features Actuation System Instrumentation.
		• CONDITION B - One automatic trip channel inoperable for RWST Level-Low for the RAS function. • ACTION B.1 - Place Functional Unit in Bypass within 1 hour.
	CRS	CONFIRM failure did NOT involve a failed PPS Power Supply.
+ 10 min	CRS	NOTIFY Shift Manager to PERFORM Administrative Actions.
When Technical Specifications have been addressed, or at Lead Evaluator's discretion, PROCEED to Events 4 and 5.		

Operating Test :	NRC	Scenario #	4	Event #	4 & 5	Page	11	of	21
Event Description:	Steam Generator Tube Leak / Rapid Power Reduction								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Event 4 and 5. - SG06A @ 0.0005%, SG E-088 Tube Leak at > 150 GPD.		
Indications Available: 60A46 – SECONDARY RADIATION HI		
+2-3 min	RO/BOP	REFER to Annunciator Response Procedures.
	BOP	RECOGNIZE increasing Secondary Radiation levels and INFORM the CRS SO23-13-14 entry required.
	CRS	DIRECT performance of SO23-13-14, Reactor Coolant System Leak, Step 4, Primary to Secondary leakage.
	CRS/RO	DETERMINE PZR level NOT lowering.
	CRS/RO	DETERMINE VCT level is maintained within program band.
M.O. Cue: If directed to sample SGs, WAIT 3 minutes and then REPORT that E-088 has elevated radiation levels and boron levels and SG E-089 at background.		
	CRS/RO	DETERMINE Steam Generator tube leak is greater than 150 GPD and increasing at greater than 30 GPD/hr.
	CRS	INITIATE SO23-13-18, Rapid Power Reduction, to be ≤ 50% power in one hour and in MODE 3 within the next 2 hours.
Examiner Note: The following steps are from SO23-13-28, Rapid Power Reduction, Attachment 3, Rapid Power Reduction - 1% per Minute.		
	BOP	INITIATE Turbine Load Reduction at a ramp rate of 10 MWe/min to a Demand of 250 MWe, per SO23-5-1.7.
Examiner Note: The next step is from SO23-5-1.7, Power Operations, Section for Turbine Load Change using Setpoint Adjustment.		

Operating Test :	NRC	Scenario #	4	Event #	4 & 5	Page	12	of	21
Event Description:	Steam Generator Tube Leak / Rapid Power Reduction								

Time	Position	Applicant's Actions or Behavior
	BOP	INITIATE Turbine Load Change using Setpoint Adjustment.
		• ACTIVATE Turbine DCS Setpoints Box and SELECT MODIFY.
		• SET Demand to 250 MWe and SELECT ENTER.
		• SET Rate to ~10 MWe/min and SELECT ENTER.
		• SELECT P2 to INITIATE Turbine load change.
		• VERIFY Turbine load stabilizes at the target value.
	RO	INITIATE Manual Boration to the Charging Pump Suction, per Section 2.0.
Examiner Note: The next step is from SO23-13-28, Rapid Power Reduction, Section 2.0, Perform Manual Boration to the Charging Pump Suction.		
	RO	ACTIVATE FIC-0210Y, BAMU Flow Controller:
		• SELECT SET and ENTER 20 gpm.
		• ENSURE FIC-0210Y, BAMU Flow Controller in AUTO
		SET FQIS-0210Y, Boration Counter, to 1000 gallons, as follows:
		• SELECT MODIFY and ACTIVATE FQIS0210Y, Boration Counter.
		• ENTER 1000 gallons in PRESET and SELECT SET PRESET then EXIT.
		• SELECT and START BAMU Pump P-174 **or** P-175.
		• VERIFY CLOSED FV-9253, Blended Makeup to VCT Isolation.
		• ENSURE HV-9257, BAMU to Charging Pump Suction Block Valve, in AUTO.
		PERFORM the following from the MODE SELECTOR:
		• SELECT MODIFY and ACTIVATE the MODE SELECTOR.
		• SELECT BORATE and ACTIVATE the BORATE MODE then SELECT GO.
		• When the target VCT level is attained, then SELECT CANCEL.
	RO	DETERMINE Forcing PZR Spray flow in progress.
Floor Cue: The ARO will perform SO23-10-2, Turbine Shutdown, Attachment for MSR Cooldown.		

Operating Test :	NRC	Scenario #	4	Event #	4 & 5	Page	13	of	21
Event Description:	Steam Generator Tube Leak / Rapid Power Reduction								

Time	Position	Applicant's Actions or Behavior
	BOP	INITIATE SO23-10-2, Attachment for MSR Cooldown for Load Reduction/Turbine Shutdown.
	CRS	NOTIFY the Generation Operations Controller (GOC).
	CRS/RO	INITIATE monitoring the following:
		• T_{COLD} AVG on the PCS.
		• CV-9739, COLSS Raw Delta-T Power.
		• Axial Shape Index.
	RO/BOP	INITIATE monitoring T_{COLD} AVG to maintain T_{COLD} per the Operating Band.
+20 min	CRS	INITIATE SO23-5-1.7, Power Operations, Attachment for Power Descension.
When power is lowered 3% to 5%, or at Lead Evaluator's discretion, PROCEED to Events 6, 7, and 8.		

Operating Test :	NRC	Scenario #	4	Event #	6, 7, & 8	Page	14	of	21
Event Description:	Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure								

Time	Position	Applicant's Actions or Behavior
Machine Operator: When directed, EXECUTE Events 6, 7, and 8. **- SG01A @ 0.7%, E-088 SGTR @ 300 gpm on 300 second ramp.** **- RP02A / RP02B, Reactor Trip Pushbuttons Disabled / ATWS.** **- 2A03 LP, Non-1E Bus 2A03 fails to auto transfer.**		
Indications Available: **60A46 – SECONDARY RADIATION HI (reflash)** **Charging Pump Auto start**		
+1 min	RO	RECOGNIZE lowering PZR pressure with reflash of Secondary Radiation alarms and AUTO START of Backup Charging Pumps.
	CRS	DIRECT isolation of Letdown.
	RO	ISOLATE Letdown by closing valve TV-0221, HV-9204, or TV-9207.
	RO	DETERMINE that Pressurizer level continues to lower and INFORM the CRS that Reactor Trip is required.
	CRS	DIRECT a Reactor and Turbine Trip and entry into SO23-12-1, Standard Post Trip Actions.
	RO/BOP	Manually INITIATE a Reactor and Turbine Trip.
		• DEPRESS Reactor Trip pushbuttons 2HS-9132-4 **and** 2HS-9132-1 **or** 2HS-9132-2 **and** 2HS-9132-3 and DETERMINE Reactor did NOT Trip.
	RO/BOP	REPORT MANUAL Reactor Trip failure.
CRITICAL TASK STATEMENT		**Manually Trip Reactor due to Reactor Protection System Failure Within One (1) Minute of Reactor Trip Criteria Being Exceeded.** **Elapsed Time:** _____
CRITICAL TASK	RO/BOP	OPEN B15 and B16 Load Center Supply Breakers.
		• PLACE HS-1691, 480 V Bus B15 Feeder Breaker 2B1501 in TRIP.
		• PLACE HS-1707, 480 V Bus B16 Feeder Breaker 2B1601 in TRIP.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, & 8	Page	15	of	21
Event Description:	Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure								

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY Reactor Trip:
		• VERIFY Reactor Trip Circuit Breakers (8) OPEN.
		• VERIFY Reactor Power lowering and Startup Rate NEGATIVE.
		• VERIFY maximum of one full length CEA NOT fully inserted.
	CRS	VERIFY Reactivity Control criteria satisfied.
	BOP	VERIFY Turbine Trip:
		• VERIFY Main Turbine TRIPPED.
		• VERIFY HP and LP Stop and Governor Valves CLOSED.
		• VERIFY both Unit Output Breakers OPEN.
		• VERIFY Main Turbine speed < 2000 RPM or LOWERING.
	CRS	INITIATE Administrative Actions:
		• ANNOUNCE Reactor trip via PA System.
		• INITIATE Attachment 4, Worksheet.
		• INITIATE Attachment 5, Administrative Actions.
	BOP	VERIFY Vital Auxiliaries criteria satisfied:
		• VERIFY both 1E 4 kV Buses ENERGIZED.
		• VERIFY all 1E 480 V Buses ENERGIZED.
		• VERIFY all 1E DC Buses ENERGIZED.
	BOP	• DETERMINE one Non-1E 4 kV Bus DEENERGIZED.
		• [RNO] TRANSFER Non-1E 4 kV Bus 2A03. to Reserve Auxiliary Transformer.
		• [RNO] SELECT 2/3HS-1627A, NON-1E Synchroscope to ON.
		• [RNO] DEPRESS the SYNC pushbutton for Breaker 2A0313.
		• [RNO] PLACE Breaker 2A0313 Mode Selector in MANUAL.
		• [RNO] DEPRESS 2HS-1674A, 2A0313 RES AUX XFMR 2XR1 FDR Breaker CLOSE pushbutton.
		• DETERMINE CCW Train OPERATING and ALIGNED to Non-Critical Loop and Letdown Heat Exchanger.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, & 8	Page	16	of	21
Event Description:	Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure								

Time	Position	Applicant's Actions or Behavior
	RO	DETERMINE RCS Inventory Control criteria NOT satisfied:
		• DETERMINE PZR level between 10% and 70% and NOT trending to between 30% and 60%.
		• [RNO] DETERMINE PZR Level Control System is NOT restoring PZR level.
		• VERIFY Core Exit Saturation Margin ≥ 20ºF:
		• QSPDS page 611.
		• CFMS page 311.
Examiner Note: Depending on crew actions, RCS Pressure Control may or may not be satisfied as it was observed both ways during validation.		
	RO	DETERMINE RCS Pressure Control criteria NOT satisfied:
		• DETERMINE PZR pressure (WR and NR) between 1740 PSIA and 2380 PSIA and NOT controlled AND NOT trending to between 2025 PSIA and 2275 PSIA.
		• [RNO] DETERMINE PZR Pressure Control System is NOT restoring PZR pressure.
		• [RNO] ENSURE Normal and Aux Spray Valves CLOSED.
	RO	VERIFY Core Heat Removal criteria satisfied:
		• VERIFY all RCPs are operating.
		• VERIFY Core Loop ΔT less than 10ºF.
		• VERIFY Core Exit Saturation Margin ≥ 20ºF.
		• QSPDS page 611.
		• CFMS page 311.
	BOP	VERIFY RCS Heat Removal criteria satisfied:
		• VERIFY both SGs level > 21% NR.
		• VERIFY both SGs level < 80% NR.
		• VERIFY Main and Auxiliary Feedwater available to restore both SG levels between 40% NR and 80% NR.
		• VERIFY T_{COLD} trending to between 540ºF and 550ºF.
		• VERIFY SG pressures between 960 and 1050 PSIA.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, & 8	Page	17	of	21
Event Description:	Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure								

Time	Position	Applicant's Actions or Behavior
	RO	DETERMINE Containment Isolation criteria NOT satisfied:
		• VERIFY Containment pressure < 1.5 PSIG.
		• VERIFY Containment Area Radiation Monitors energized and NOT alarming or trending to alarm.
		• DETERMINE Secondary Plant Radiation Monitors energized AND alarming or trending to alarm.
	RO	VERIFY Containment Temperature and Pressure criteria satisfied:
		• VERIFY Containment average temperature < 120ºF.
		• VERIFY Containment pressure < 1.5 PSIG.
+15 min	CRS	DIAGNOSE event in progress:
		• DETERMINE some Safety Function criteria are NOT met per Attachment 4, Worksheet.
		• [RNO] COMPLETE Attachment 1, Recovery Diagnostics.
		• [RNO] DIAGNOSE event as SGTR on SG E-088.
		• DETERMINE that Reactor Trip Recovery is NOT diagnosed.
	RO	• [RNO] STOP one (1) RCP in each Loop.
		• DIRECT initiating Steps 12 through 15.
	BOP	INITIATE Steps 12 through 15.
		• VERIFY HS-0800S2, Telecom 480 VAC Feeder Breaker CLOSED.
		• VERIFY HS-0800N2, Telecom 480 VAC Feeder Breaker CLOSED.
		• DETERMINE B15 & B16 480 VAC Load Centers NOT energized.
		• [RNO] VERIFY Annunciator 56A20 - REACTOR TRIPPED CEDMCS DE-ENERGIZED in alarm.
		• [RNO] VERIFY CEDM Motor Generator Set Output Contactors OPEN.
		• [RNO] PLACE HS-1691, 480 V Bus B15 Feeder Breaker 2B1501 in CLOSE.
		• [RNO] PLACE HS-1707, 480 V Bus B16 Feeder Breaker 2B1601 in CLOSE.
		• ENSURE Extractions Steam Block Valves CLOSED.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, & 8	Page	18	of	21
Event Description:	Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure								

Time	Position	Applicant's Actions or Behavior
		• ENSURE Main Steam to Reheater Block, Bypass, Warmup, and Control Valves CLOSED.
		• VERIFY Generator lowering to less than 24 kV.
		• VERIFY 99A26 - TURBINE LUBE OIL TEMP HI and 99A46 - TURBINE BRG OIL DRAIN TEMP HI Annunciators RESET.
		• INITIATE SO23-10-2, Turbine Shutdown, Attachment for Unloading the Generator and Removing the Unit from Line.
		• ESTABLISH desired Condensate and Feedwater Status:
		• ENSURE 3rd Point Heater Drain Pumps STOPPED.
		• VERIFY Reactor Trip Override RESET.
		• MAINTAIN one MFW Pump and maximum of 3 Condensate Pumps in operation.
		• ENSURE FIC-3294, Condensate Pump Miniflow Controller set for three Condensate Pump configuration.
		• PLACE LV-3245, Condensate Drawoff Valve to DISABLE.
		• DETERMINE SO23-12-2, Reactor Trip Recovery, NOT being implemented.
		• [RNO] ENSURE HV-4053 & HV-4054, SG Blowdown Valves CLOSED.
		• VERIFY both Start Up Range Channels OPERABLE.
	CRS	DIRECT performance of SO23-12-4, Steam Generator Tube Rupture.
	CRS	RECORD time of EOI entry _____.
	CRS	VERIFY SGTR Diagnosis:
		• INITIATE SO23-12-10, Safety Function Status Checks.
		• INITIATE Foldout Page.
		• VERIFY SGTR diagnosis using Figure 1, Break Identification Chart.
		• INITIATE sampling of both Steam Generators for radioactivity and boron.
M.O. Cue:		**If directed to sample SGs, WAIT 5 minutes and then REPORT that E-088 has elevated radiation and boron levels.**

Operating Test : NRC	Scenario # 4	Event # 6, 7, & 8	Page 19 of 21
Event Description: Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure			

Time	Position	Applicant's Actions or Behavior
	CRS	INITIATE Administrative actions:
		• NOTIFY Shift Manager/Operations Leader of SO23-12-4, Steam Generator Tube Rupture initiation.
		• ENSURE Emergency Plan is initiated.
		• IMPLEMENT Placekeeper.
		• IMPLEMENT Time Dependent Steps.
CRITICAL TASK STATEMENT		**Reduce Reactor Coolant System T_{HOT} to less than 530ºF within 30 minutes of SO23-12-4 Entry.** **Elapsed Time:** _____
CRITICAL TASK	CRS	DIRECT lowering RCS T_{HOT} to less than 530ºF:
	BOP	• VERIFY both SGs available for cooldown.
		• ENSURE one RCP in each loop – STOPPED.
		• INITIATE lowering T_{HOT} to less than 530ºF using SBCS.
	RO	• As required, RESET SG Low Pressure setpoints during cooldown.
Examiner Note: During validation, SIAS did not occur until the cooldown was in progress.		
Examiner Note: When SIAS has actuated, the following steps are performed.		
	RO	VERIFY ESF actuation.
		• VERIFY SIAS actuation required by Pressurizer pressure less than SIAS setpoint OR TRENDING to SIAS setpoint.
		• ENSURE SIAS / CCAS / CRIS actuated.
	CRS	RECORD time of SIAS _____.
	RO	STOP unloaded Diesel Generators (SIAS Override STOP).
	BOP	INITIATE SO23-12-11, Attachment 22, Non-Qualified Load Restoration.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, & 8	Page	20	of	21
Event Description:	Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure								

Time	Position	Applicant's Actions or Behavior
M.O. Cue: When directed to restore non-qualified loads, WAIT 2 minutes, then EXECUTE remote function ED85, Non-Qualified Loads Restoration. INFORM the Control Room that you have restored Non-Qualified Loads.		
	CRS/RO	VERIFY Containment pressure less than Instrument Air pressure.
	RO	OVERRIDE and OPEN HV-5388, Instrument Air to Containment and ENSURE HV-5343, Excess Flow Check Valve OPEN.
	RO	ESTABLISH Optimum SI Alignment:
		• ESTABLISH two train operation:
		• Train A and B Charging Pumps operating.
		• One HPSI and one LPSI per Train operating.
		• All Cold Leg flow paths aligned.
		• VERIFY SI flow required:
		• SI flow indicated.
Examiner Note: SO23-12-4, SGTR, Step 7 starts here.		
	CRS	IDENTIFY E-088 as affected SG:
		• EVALUATE SG radioactive release indications - rising.
		• SG Blowdown monitors.
		• SG sample results.
		• Main Steam Line monitors.
	BOP	• EVALUATE indications on E-088:
		• SG level rising when not feeding.
		• SG feedwater flowrate - significantly mismatched between SGs.
		• Steam/feed flow prior to trip NOT normal.
	BOP	• OPERATE MFW to maintain Steam Generator E-088 level > 40% AND RCS cooldown less than 100ºF.
	CRS	• NOTIFY Shift Manager/Operations Leader that E-088 is affected SG.

Operating Test : NRC	Scenario # 4	Event # 6, 7, & 8	Page 21 of 21
Event Description: Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure			

Time	Position	Applicant's Actions or Behavior	
	BOP	DETERMINE MFW Pump operating.	
	BOP	DETERMINE SG E-089 available for continued heat removal.	
CRITICAL TASK STATEMENT		**Isolate Most Affected Steam Generator within 30 Minutes of SO23-12-4 Entry. Elapsed Time: _____**	
CRITICAL TASK	BOP	ISOLATE SG E-088, CLOSE / STOP the following components:	
		MSIV	HV-8205
		MSIV Bypass	HV-8203
		ADV	HV-8419
		MFIV	HV-4048
		AFW Valves	HV-4730 and HV-4714
		Steam to AFW P-140	HV-8201
		SG Blowdown Isolation	HV-4054
		SG Water Sample Isolation	HV-4058
		Electric AFW Pump	P-504
	CRS	• RECORD time of SG isolation _____.	
	BOP	ENSURE HV-8419, Steam Generator E-088 Atmospheric Dump Valve selected to MANUAL.	
	BOP	INITIATE closure of Main Steam Drain Isolation Valves.	
+30 min	CRS	INITIATE FS-28, Monitor Isolated SG.	
When Steam Generator E-088 is isolated, or at the Lead Evaluator's discretion, TERMINATE the scenario.			