

Facility: SONGS JPM # 2008 NRC A-1b Task # 192221 K/A # G 2.1.25 3.9 / 4.2

Title: Determine Time Shutdown Cooling Required

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____
 Actual Performance: _____ Simulator: _____
 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 information:

- Unit 3 is performing SO23-12-7, Loss of Forced Circulation/Loss of Offsite Power following a Reactor trip 2 hours ago.
- SO23-12-11, EOI Supporting Attachments, Attachment 3, Cooldown and Depressurization have been started.
- 3LI-4357B, T-120 Condensate Storage Tank level is 31%.
- 3LI-3204-1, T-121 Condensate Storage Tank level is 85%.
- 3LI-3204-2, T-121 Condensate Storage Tank level is 85%.
- REP CET temperature is 515°F.
- T-120 and T-121 are the only feedwater sources to the Steam Generators.

Initiating Cue: The Shift Manager directs you to PERFORM SO23-12-11, EOI Supporting Attachments, Attachment 16, Determine Time Until Shutdown Cooling Required for Unit 3.

- DETERMINE time remaining until Shutdown Cooling required for decay heat removal per Steps 1 through 8.
- DETERMINE minimum cooldown rate required to establish Shutdown Cooling entry conditions before feedwater source inventory is depleted per Step 9.

Task Standard: Locate and correctly perform Critical Steps of SO23-12-11, Attachment 16.

Required Materials: SO23-12-11, EOI Supporting Attachments, Attachment 16, Rev. 6

Validation Time: 12 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:

- SO23-12-11, EOI Supporting Attachments, Attachment 16.

Denotes a Critical Step

START TIME:

Perform Step: 1	Verify T-120/T-121 the only current feedwater source to S/G's.
Standard:	DETERMINE T-120/T-121 are the only feedwater sources to the Steam Generators per the Initial Conditions.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	DETERMINE T-120 inventory from Table 1, CONDENSATE STORAGE TANK INVENTORY: <ul style="list-style-type: none"> Gallons in T-120 = _____
Standard:	DETERMINE Unit 3 T-120 inventory from Table 1, Condensate Storage Tank Inventory by interpolating between levels of 30% and 32%. <ul style="list-style-type: none"> T-120 @ 31% = $134,231 + 143,179 / 2 = 138,705 \pm 5$ gallons
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	DETERMINE T-121 inventory from Table 1, CONDENSATE STORAGE TANK INVENTORY: <ul style="list-style-type: none"> Gallons in T-121 = _____
Standard:	DETERMINE Unit 3 T-121 inventory from Table 1, Condensate Storage Tank Inventory by interpolating between levels of 84% and 86%. <ul style="list-style-type: none"> T-121 @ 85% = $124,851 + 127,824 / 2 = 126,337.5 \pm 5$ gallons
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	DETERMINE Combined inventory from both Condensate Storage Tanks: <ul style="list-style-type: none"> • _____ = (Gallons in T-120) • _____ = (Gallons in T-121) • _____ = (TOTAL T-120 / T-121)
Standard:	DETERMINE Combined inventory from both Condensate Storage Tanks: <ul style="list-style-type: none"> • 138,705 gallons = in T-120 • 126,337.5 gallons = in T-121 • 265,042.5 ± 5 total gallons = in T-120 & T-121
Comment:	
SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 5	DETERMINE additional Feedwater Source Inventory: <ul style="list-style-type: none"> • ENTER additional Feedwater Source Inventory (provided by Shift Manager/Operations Leader): • Feedwater Source(s): _____ • TOTAL (gallons): _____
Standard:	DETERMINE additional feedwater source inventory = 0 gallons.
Comment:	
SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 6	DETERMINE total Feedwater Source Inventory: <ul style="list-style-type: none"> • ENTER combined volume of all sources: • TOTAL T-120/T-121 _____ Gallons • TOTAL additional + _____ Gallons • TOTAL Combined = _____ Gallons
Standard:	DETERMINE total Feedwater Source Inventory = 265,042.5 ± 5 gallons
Comment:	
SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 7	DETERMINE Net Available Feedwater for decay heat removal: <ul style="list-style-type: none"> • SUBTRACT 55,000 Gallons from TOTAL Combined Gallons calculated in step 6: • TOTAL Combined _____ Gallons • -55,000 Gallons • NET AVAILABLE = _____ Gallons
Standard:	DETERMINE Net Available Feedwater Inventory = 210,042.5 ± 5 gallons
Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 8a	DETERMINE time remaining until Shutdown Cooling required for decay heat removal: <ul style="list-style-type: none"> • DETERMINE number of hours reactor has been shutdown. • _____ hours
Standard:	DETERMINE Reactor has been shut down 2 hours .
Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 8b	DETERMINE time remaining until Shutdown Cooling required for decay heat removal: <ul style="list-style-type: none"> • Using Figure 3, REMAINING TIME S/Gs AVAILABLE AS HEAT SINK: <ul style="list-style-type: none"> • 1) PLOT Net Available Feedwater from step 7 on the left axis. • 2) PLOT across to the appropriate TIME REACTOR HAS BEEN SHUTDOWN curve (refer to step 8a - values may be interpolated between curves). • 3) PLOT down to determine the Time (hours) S/Gs remain available as a heat sink and SDC will be required. _____ HR (from lower axis)
Standard:	DETERMINE 16 hours is time remaining until Shutdown Cooling is required.
Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 9a	DETERMINE minimum cooldown rate required to establish SDC entry conditions before Feedwater Source Inventory is depleted: <ul style="list-style-type: none"> • CALCULATE ΔT: <ul style="list-style-type: none"> • Present REP CET: _____ °F • SDC entry: _____ °F • $\Delta T =$ _____ °F
Standard:	DETERMINE $\Delta T = 515^{\circ}\text{F} - 375^{\circ}\text{F} = 140^{\circ}\text{F} \Delta T$.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9b	DETERMINE minimum cooldown rate required to establish SDC entry conditions before Feedwater Source Inventory is depleted: <ul style="list-style-type: none"> • CALCULATE minimum cooldown rate: <ul style="list-style-type: none"> • ΔT (step 9a) = _____ °F • Time (step 8b.3) minus 375°F • _____ = _____ °F
Standard:	DETERMINE minimum cooldown rate = 8.75°F / hr.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9c	DETERMINE minimum cooldown rate required to establish SDC entry conditions before Feedwater Source Inventory is depleted: <ul style="list-style-type: none"> • RECORD minimum cooldown rate on Attachment 3, COOLDOWN / DEPRESSURIZATION, Figure 2.
Standard:	RECORD minimum cooldown rate on Attachment 3, Cooldown / Depressurization, Figure 2.
Terminating Cue:	This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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- INITIAL CONDITIONS:** Given the following information:
- Unit 3 is performing SO23-12-7, Loss of Forced Circulation/Loss of Offsite Power following a Reactor trip 2 hours ago.
 - SO23-12-11, EOI Supporting Attachments, Attachment 3, Cooldown and Depressurization have been started.
 - 3LI-4357B, T-120 Condensate Storage Tank level is 31%.
 - 3LI-3204-1, T-121 Condensate Storage Tank level is 85%.
 - 3LI-3204-2, T-121 Condensate Storage Tank level is 85%.
 - REP CET temperature is 515°F.
 - T-120 and T-121 are the only feedwater sources to the Steam Generators.

- INITIATING CUE:** The Shift Manager directs you to PERFORM SO23-12-11, EOI Supporting Attachments, Attachment 16, Determine Time Until Shutdown Cooling Required for Unit 3.
- DETERMINE time remaining until Shutdown Cooling required for decay heat removal per Steps 1 through 8.
 - DETERMINE minimum cooldown rate required to establish Shutdown Cooling entry conditions before feedwater source inventory is depleted per Step 9.

Facility: SONGS JPM # 2008 NRC RO A-1a Task # 141283 K/A # G 2.1.23 4.3 / 4.4

Title: Perform Boric Acid Makeup Tank Inventory Determination

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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 information with Unit 2 is in MODE 3 at 350°F:

- Refueling Water Storage Tank T-005 is at 92% and 2520 ppm and was sampled 3 days ago.
- Refueling Water Storage Tank T-006 is at 92% and 2605 ppm and was sampled 8 days ago.
- Boric Acid Makeup Tank T-071 is at 90% and 5950 ppm.
- Boric Acid Makeup Tank T-072 is at 87% and 6150 ppm.

Initiating Cue: The Shift Manager directs you to PERFORM SO23-3-3.27, Once A Week Surveillances (MODES 1-4), Section 2.1, Borated Water Source Operability Verification.

- PERFORM Section 2.1 up to and including Step 2.1.1.

Task Standard: Locate and correctly perform Critical Steps of SO23-3-3.27, Attachment 1.

Required Materials: SO23-3-3.27, Once A Week Surveillances (MODES 1-4), Rev. 18

Unit 2 Technical Specifications

Unit 2 Licensee Controlled Specifications

Validation Time: 8 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:

- **SO23-3-3.27, Once A Week Surveillances (MODES 1-4).**
- **Unit 2 Technical Specifications.**
- **Unit 2 Licensee Controlled Specifications.**

Denotes a Critical Step

START TIME:

Perform Step: 1	a.) Level, enter zero for any INOP BAMU tank or BAMU tank not associated with an Operable boron injection flowpath.
Standard:	ENTER 90% for T-071 and 0% for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	b.) TLU correction.
Standard:	ENTER 6% for T-071 and 6% for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	c.) a - b.
Standard:	ENTER 84% for T-071 and 0% for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	d.) Usable volume from Attachment 5 using BAMU tank level from c.).
Standard:	ENTER 9403 gallons for T-071 and 0 gallons for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	Total Usable Volume: d.) for T-071 + d.) for T-072.
Standard:	CALCULATE Total Usable Volume = 9403 + 0 = 9403 gallons.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	BAMU Tank Boron Concentration in ppm.
Standard:	ENTER 5950 ppm for T-071 and 6150 ppm for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	RWST Boron Concentration in ppm.	
Standard:	ENTER 2520 ppm for T-005.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	OPERABILITY CHECK:	
	<ul style="list-style-type: none"> Total Usable Volume and Boron Concentration falls within Region of Acceptable Operation on Attachment 2. 	
Standard:	DETERMINE OP CHECK COMPLETED SAT and CIRCLE YES .	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	OPERABILITY CHECK:	
	<ul style="list-style-type: none"> Operable channels are > 90%. RWST Boron concentration between 2600 ppm and 2800 ppm. 	
Standard:	DETERMINE OP CHECK COMPLETED SAT and CIRCLE NO .	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	Readings and Operability Checks performed by:	
Standard:	INITIAL Step 2.1.1.	
Terminating Cue:	This JPM is complete.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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INITIAL CONDITIONS: Given the following information with Unit 2 is in MODE 3 at 350°F:

- Refueling Water Storage Tank T-005 is at 92% and 2520 ppm and was sampled 3 days ago.
- Refueling Water Storage Tank T-006 is at 92% and 2605 ppm and was sampled 8 days ago.
- Boric Acid Makeup Tank T-071 is at 90% and 5950 ppm.
- Boric Acid Makeup Tank T-072 is at 87% and 6150 ppm.

INITIATING CUE: The Shift Manager directs you to PERFORM SO23-3-3.27, Once A Week Surveillances (MODES 1-4), Section 2.1, Borated Water Source Operability Verification.

- PERFORM Section 2.1 up to and including Step 2.1.1.

Facility: SONGS JPM # 2008 RO NRC A-2 Task # 192864 K/A # 2.2.6 3.0 / 3.6

Title: Prepare a Procedure Modification Permit

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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: Diesel Generator 2G-003 is being run for a Post Maintenance Test per SO23-2-13, Attachment 2. Maintenance requests the following one time change:

- Procedure change to allow monitoring of Air Receiver pressure drop for the Diesel Generator start, requiring Air Compressor C-013B Control Switch to be placed in OFF as an added substep to Step 2.2.10.
- Procedure change to return Air Compressor C-013B Control Switch to AUTO as an added substep to Step 2.5.4.
- Control Room Supervisor has provided a current controlled copy of SO23-2-13, Diesel Generator Operation.

Initiating Cue: The Control Room Supervisor directs you to PREPARE a Procedure Modification Permit to document the required changes to SO23-2-13, Diesel Generator Operation.

Task Standard: Locate and correctly perform Critical Steps of SO123-0-A3 and Form OP (123) 28.

Required Materials: SO123-0-A3, Procedure Use, Rev. 6
SO23-2-13, Diesel Generator Operation, Rev. 34
Form OP (123) 28 Procedure Modification Permit, Rev. 0

Validation Time: 10 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:

- SO123-0-A3, Procedure Use, Section 6.16 Procedure Modification Permit.
- SO23-2-13, Diesel Generator Operation.
- Form OP (123) 28 Procedure Modification Permit.

Denotes a Critical Step

START TIME:

Perform Step: 1	Document Permit #, Unit, Procedure Number, REV / TCN, Attachment #, PMP Pages, and Procedure Section / Attachment Title.
Standard:	<p>ENTER the following on Form OP (123) 28, page 1:</p> <ul style="list-style-type: none"> • Permit # "<u>XX</u>" • CHECK (✓) box for "<u>Unit 2</u>" • Procedure Number is "<u>SO23-2-13</u>" • REV/TCN is "<u>34-1</u>" • Attachment is "<u>2</u>" • PMP Page is "<u>1 of 2</u>" • Procedure Title is "<u>Diesel Generator Operation</u>"
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	Does this activity conflict with the Operating License, Technical Specifications, and/or LCS (Licensee Controlled Specifications)?
Standard:	DETERMINE that the activity does NOT conflict with the Plant Operating License, Technical Specifications, or Licensee Controlled Specifications and CHECK (✓) NO in box for Item 1 on Form OP (123) 28, page 1.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	<p>Could implementation of this activity:</p> <ul style="list-style-type: none"> A. Pose adverse ENVIRONMENTAL EFFECTS? B. Potentially impact the TOPICAL REPORT, SECURITY PLANS, EMERGENCY PLAN, FIRE PROTECTION PROGRAM (including UFHA), ODCM, IST, and/or ISI Program? C. Potentially impact TECHNICAL REQUIREMENTS? D. Potentially move fluid and/or gas in a radioactive system?
Standard:	<p>DETERMINE that implementation of activity does NOT:</p> <ul style="list-style-type: none"> • Pose adverse ENVIRONMENTAL EFFECTS of any type directly or indirectly. • Potentially impact the TOPIC REPORT, SECURITY PLANS, EMERGENCY PLAN, FIRE PROTECTION PROGRAM, ODCM, IST, and/or ISI programs. • Potentially impact TECHNICAL REQUIREMENTS, e.g., non-conservative changes to setpoints and/or acceptance criteria. • Potentially move fluid and/or gas in a radioactive system. <p>CHECK (✓) NO for each box in Item 2 on Form OP (123) 28, page 1.</p>
<p>Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/></p>	

Perform Step: 4	<p>Check (✓) all items that apply to this PMP activity.</p> <ul style="list-style-type: none"> • Implements ALREADY APPROVED changes. Enter identifiers and associated numbers: _____ • Involves MAINTENANCE ACTIVITIES • Implements EDITORIAL CORRECTIONS (ECs) or MINOR PROCEDURE MODIFICATIONS • Involves a procedure that is 50.59 DNA
Standard:	<p>DETERMINE that the change involves MAINTENANCE ACTIVITIES and CHECK (✓) box on Form OP (123) 28, page 1.</p>
<p>Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/></p>	

Perform Step: 5	Does this PMP Change INTENT of the Operating Instruction by: <ul style="list-style-type: none"> • Allowing performance of a new, unrelated function, or creates a new evolution or new flow path, not originally authorized? • Requiring a new or additional 50.59 Evaluation?
Standard:	DETERMINE that the PMP does NOT change the INTENT of the Operating Instruction by: <ul style="list-style-type: none"> • Allowing performance of a new, unrelated function, or creates a new evolution or new flow path, not originally authorized. • Requiring a new or additional 50.59 evaluation. CHECK (✓) NO in boxes for Items 4.a and 4.b on Form OP (123) 28, page 1.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	Does this activity involve DCS/ISFSI?
Standard:	DETERMINE step does NOT involve SCS/ISFSI and CHECK the NO box on FORM OP (123) 28, page 1.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	Does the proposed change affect Reactivity Management?
Standard:	DETERMINE the change does NOT affect Reactivity Management and CHECK (✓) NO box on Form OP (123) 28, page 1.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	Enter preparer name, date, and time.
Standard:	ENTER preparer name, date, and time.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	Document Permit #, Unit, Procedure Number, REV / TCN, Attachment #, PMP Pages, and Procedure Section / Attachment Title.
Standard:	<p>ENTER the following on Form OP (123) 28, page 2:</p> <ul style="list-style-type: none"> • Permit # "<u>XX</u>" • CHECK (✓) box for "<u>Unit 2</u>" • Procedure Number is "<u>SO23-2-13</u>" • REV/TCN is "<u>34-1</u>" • Attachment is "<u>2</u>" • PMP Page is "<u>2 of 2</u>" • Procedure Title is "<u>Diesel Generator Operation</u>"
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	Verify this form is current by checking a controlled copy or by using the method described in SO123-VI-0.9.
Standard:	DETERMINE SO23-2-13, Diesel Generator Operation revision is current and INITIAL Step 1.1 on Form OP (123) 28, page 2.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 11a	<p>List the step(s) to be modified:</p> <ul style="list-style-type: none"> • STEP NUMBER(S)
Standard:	<p>ENTER Step Number(s) on Form OP (123) 28, page 2:</p> <ul style="list-style-type: none"> • Step 2.2.10 (Substep 2.2.10.8) • Step 2.5.4 (Substep 2.5.4.4) • INITIAL Step 2.1.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 11b	Describe the modification: <ul style="list-style-type: none"> • MODIFICATION DESCRIPTION
Standard:	ENTER Modification Description on Form OP (123) 28, page 2: <ul style="list-style-type: none"> • Step 2.2.10.8 – PLACE Air Compressor C013B Control Switch to OFF. • Step 2.5.4.4 – PLACE Air Compressor C013B Control Switch to AUTO.
Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 11c	Reason for the modification, and any additional prerequisites or required conditions: <ul style="list-style-type: none"> • REASON FOR MODIFICATION
Standard:	ENTER Reason for Modification on FORM OP (123) 28, page 2: <ul style="list-style-type: none"> • Step 2.2.10.8 – Monitor Air Receiver pressure drop after Diesel Generator start. • Step 2.5.4.4 – Restore system to normal alignment.
Terminating Cue:	This JPM is complete.
Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

STOP TIME:	
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- INITIAL CONDITIONS:** Diesel Generator 2G-003 is being run for a Post Maintenance Test per S023-2-13, Attachment 2. Maintenance requests the following:
- Procedure change to allow monitoring of Air Receiver pressure drop for the DG start, requiring Air Compressor C-013B Control Switch to be placed in OFF as an added substep to Step 2.2.10.
 - Procedure change to return Air Compressor C-013B Control Switch to AUTO as an added substep to Step 2.5.4.

INITIATING CUE: The Control Room Supervisor directs you to PREPARE a Procedure Modification Permit to document the required changes to SO23-2-13, Diesel Generator Operation.

Facility: SONGS JPM # 2008 NRC RO A-4 Task # 186728 K/A # G 2.4.39 3.9 / N/A

Title: Perform Public Address and Siren Notification

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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: You are the spare Reactor Operator given the following information:

- A Code Red Security Event, ALERT classification has just been declared at SONGS.
- The Shift Manager (Emergency Coordinator) has assigned you to the position of Operations Leader.
- The Shift Manager has informed you that:
 - Imminent or probable aircraft attack is in progress.
 - All onsite **emergency response personnel** report to the MESA Training Building E-50. All Emergency News Center **emergency response personnel** report to the ENC.
 - All **non-emergency response personnel** report to a designated assembly area.

Initiating Cue: The Shift Manager directs you to PERFORM the Siren and PA coordination using SO23-VIII-30, Units 2 / 3 Operations Leader Duties, Attachment 1.

Task Standard: Locate and correctly perform Critical Steps of SO23-VIII-30.

Required Materials: SO23-VIII-30, Units 2 / 3 Operations Leader Duties, Rev. 14

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

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

Execute any Initial Condition:

- The Phone Turret and Emergency Evacuation Siren pushbuttons will function in any Simulator Initial Condition.

EXAMINER:

Provide the examinee with a copy of:

- SO23-VIII-30, Units 2/3 Operations Leader Duties.

NOTE: If performed in the Control Room, the steps will need to be simulated.

Denotes a Critical Step

START TIME:

Examiner Note:	The lights on the phone turret pushbuttons do not work.
Examiner Cue:	The Siren / PA process is <u>not</u> being coordinated from outside the Control Room.
Perform Step: 1	Prepare Site Public Address System message, with input from the EC and if possible a peer check, using page 2 for non-security events, page 3 for Code Red security events, or page 4 for Code Blue security events, and announce it <u>once</u> over Site Public Address System.
Standard:	PREPARE the Site PA message using page 3 of Attachment 1 and the information provided by the Shift Manager (Emergency Coordinator) per the Initial Conditions.
Examiner Note:	Refer to Answer Key for properly completed Attachment 1 form.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	Announce the prepared Site Public Address message <u>once</u> over the Site Public Address System.
Standard:	DEPRESS the PA SITE pushbutton (bottom two rows, left-hand button) on the phone turret. <ul style="list-style-type: none"> • USE the black phone handset indicated by the directional arrow on the Site Public Address pushbutton <u>or</u> • DIAL 429 on a Control Room phone to make a Site Public Address announcement. • MAKE prepared Site Public Address announcement <u>one time</u>.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	The lights on the phone turret pushbuttons do not work.	
Perform Step: 3	Sound Units 2 / 3 sirens as follows: <ul style="list-style-type: none"> Press the Site Public Address System Tone Generator "Siren All" button on phone turret until "kill" button lights up. 	
Standard:	SOUND Unit 2/3 sirens by DEPRESSING and HOLDING "Siren All" button (phone turret top row, third from right).	
Examiner Cue:	The SIREN KILL light illuminates in 1 to 4 seconds, and extinguishes after 60 seconds.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	Sound Units 2 / 3 sirens as follows: <ul style="list-style-type: none"> Press the Emergency Evacuation Siren start pushbutton (HS-7890-1) on CR 57. 	
Standard:	DEPRESS 2HS-7890-1, Emergency Evacuation Siren START pushbutton on CR-57.	
Examiner Cue:	60 seconds has elapsed.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	After a 60-second run, press the Emergency Evacuation Siren stop pushbutton on CR 57.	
Standard:	DEPRESS 2HS-7890-1, Emergency Evacuation Siren STOP pushbutton on CR-57.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	<u>If</u> the Site Public Address System Tone Generator does not time out and stop after 60 seconds, <u>then</u> press "kill" button to secure them.	
Standard:	If the Site Public Address System Tone Generator does not time out and stop after 60 seconds, then DEPRESS "kill" button to secure them.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	Ensure all sirens are secured.
Standard:	ENSURE all sirens are secured.
Examiner Cue:	All sirens are secured.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	Repeat Site Public Address System announcement from Attachment 1 <u>two</u> times.
Standard:	<p>DEPRESS the PA SITE pushbutton (bottom two rows, left-hand button) on the phone turret.</p> <ul style="list-style-type: none"> • USE the black phone handset indicated by the directional arrow on the Site Public Address pushbutton <u>or</u> • DIAL 429 on a Control Room phone to make a Site Public Address announcement. • REPEAT prepared Site Public Address announcement <u>two times</u>.
Terminating Cue:	This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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- INITIAL CONDITIONS:** You are the spare Reactor Operator given the following information:
- A Code Red Security Event, ALERT classification has just been declared at SONGS.
 - The Shift Manager (Emergency Coordinator) has assigned you to the position of Operations Leader.
 - The Shift Manager has informed you that:
 - Imminent or probable aircraft attack is in progress.
 - All onsite **emergency response personnel** report to the MESA Training Building E-50. All Emergency News Center **emergency response personnel** report to the ENC.
 - All **non-emergency response personnel** report to a designated assembly area.

INITIATING CUE: The Shift Manager directs you to PERFORM the Siren and PA coordination using SO23-VIII-30, Units 2 / 3 Operations Leader Duties, Attachment 1.

Facility: SONGS JPM # 2008 NRC SRO A-1a Task # 141283 & 192875 K/A # G 2.1.23 4.3 / 4.4

Title: Perform Boric Acid Makeup Tank Inventory Determination

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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 information with Unit 2 is in MODE 3 at 350°F:

- Refueling Water Storage Tank T-005 is at 92% and 2520 ppm and was sampled 3 days ago.
- Refueling Water Storage Tank T-006 is at 92% and 2605 ppm and was sampled 8 days ago.
- Boric Acid Makeup Tank T-071 is at 90% and 5950 ppm.
- Boric Acid Makeup Tank T-072 is at 87% and 6150 ppm.

Initiating Cue: The Shift Manager directs you to PERFORM SO23-3-3.27, Once A Week Surveillances (MODES 1-4), Section 2.1, Borated Water Source Operability Verification.

- PERFORM Section 2.1 up to and including Step 2.1.5.
- CIRCLE the following for Step 2.1.5:
 - Unit 2 Technical Specification LCO 3.1.9 is SAT / UNSAT.
 - Unit 2 Technical Specification LCO 3.5.4 is SAT / UNSAT.
 - Unit 2 Licensee Controlled Specifications LCS 3.1.104 is SAT / UNSAT.

Task Standard: Locate and correctly perform Critical Steps of SO23-3-3.27, Attachment 1.

Required Materials: SO23-3-3.27, Once A Week Surveillances (MODES 1-4), Rev. 18
 Unit 2 Technical Specifications
 Unit 2 Licensee Controlled Specifications

Validation Time: 13 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:

- **SO23-3-3.27, Once A Week Surveillances (MODES 1-4).**
- **Unit 2 Technical Specifications.**
- **Unit 2 Licensee Controlled Specifications.**

Denotes a Critical Step

START TIME:

Perform Step: 1	a.) Level, enter zero for any INOP BAMU tank or BAMU tank not associated with an Operable boron injection flowpath.
Standard:	ENTER 90% for T-071 and 0% for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	b.) TLU correction.
Standard:	ENTER 6% for T-071 and 6% for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	c.) a - b.
Standard:	ENTER 84% for T-071 and 0% for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	d.) Usable volume from Attachment 5 using BAMU tank level from c.).
Standard:	ENTER 9403 gallons for T-071 and 0 gallons for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	Total Usable Volume: d.) for T-071 + d.) for T-072.
Standard:	CALCULATE Total Usable Volume = 9403 + 0 = 9403 gallons.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	BAMU Tank Boron Concentration in ppm.
Standard:	ENTER 5950 ppm for T-071 and 6150 ppm for T-072.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	RWST Boron Concentration in ppm.	
Standard:	ENTER 2520 ppm for T-005.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 8	OPERABILITY CHECK:	
	<ul style="list-style-type: none"> Total Usable Volume and Boron Concentration falls within Region of Acceptable Operation on Attachment 2. 	
Standard:	DETERMINE OP CHECK COMPLETED SAT and CIRCLE YES .	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 9	OPERABILITY CHECK:	
	<ul style="list-style-type: none"> Operable channels are > 90%. RWST Boron concentration between 2600 ppm and 2800 ppm. 	
Standard:	DETERMINE OP CHECK COMPLETED SAT and CIRCLE NO .	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 10	Readings and Operability Checks performed by:	
Standard:	INITIAL Step 2.1.1.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 11	Calculations independently verified by:	
Standard:	CONTACT another operator to independently verify calculations.	
Examiner Cue:	Another operator will independently verify calculations.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 12	If BAMU Tank concentration is ≤ 5500 ppm or ≥ 6050 ppm, <u>then</u> notify the SRO Ops. Supv. to evaluate borating or diluting the BAMU Tanks.
Standard:	DETERMINE BAMU Tank T-072 is greater than 6050 ppm and NOTIFY the SRO Operations Supervisor.
Examiner Cue:	The SRO Operations Supervisor has been notified.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 13	If any of the above criteria is NO, <u>then</u> refer to Tech. Spec. LCO 3.1.9, LCO 3.5.4, and LCS 3.1.104.
Standard:	DETERMINE Unit 2 Technical Specification LCO 3.1.9 is SAT .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 14	If any of the above criteria is NO, <u>then</u> refer to Tech. Spec. LCO 3.1.9, LCO 3.5.4, and LCS 3.1.104.
Standard:	DETERMINE Unit 2 Technical Specification LCO 3.5.4 is SAT .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 15	If any of the above criteria is NO, <u>then</u> refer to Tech. Spec. LCO 3.1.9, LCO 3.5.4, and LCS 3.1.104.
Standard:	DETERMINE Unit 2 Licensee Controlled Specifications 3.1.104 is SAT .
Terminating Cue:	This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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- INITIAL CONDITIONS:** Given the following information with Unit 2 is in MODE 3 at 350°F:
- Refueling Water Storage Tank T-005 is at 92% and 2520 ppm and was sampled 3 days ago.
 - Refueling Water Storage Tank T-006 is at 92% and 2605 ppm and was sampled 8 days ago.
 - Boric Acid Makeup Tank T-071 is at 90% and 5950 ppm.
 - Boric Acid Makeup Tank T-072 is at 87% and 6150 ppm.

- INITIATING CUE:** The Shift Manager directs you to PERFORM SO23-3-3.27, Once A Week Surveillances (MODES 1-4), Section 2.1, Borated Water Source Operability Verification.
- PERFORM Section 2.1 up to and including Step 2.1.5.
 - CIRCLE the following for Step 2.1.5:
 - Unit 2 Technical Specification LCO 3.1.9 is SAT / UNSAT.
 - Unit 2 Technical Specification LCO 3.5.4 is SAT / UNSAT.
 - Unit 2 Licensee Controlled Specifications LCS 3.1.104 is SAT / UNSAT.

Facility: SONGS JPM # 2008 NRC SRO A-2 Task # 182111 K/A # G 2.2.23 3.1 / 4.6

Title: Determine Technical Specification Limiting Condition for Operation

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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 3 while performing a power ascension:

- Train A Saltwater Cooling System Breaker for 3HV-6497, Saltwater Outlet Valve was OPENED to support a partial stroke test of the valve.
- HPSI Pump 3P-018 is being TRANSFERRED to Train B as a prerequisite for CLEARING Train A Component Cooling Water/ Saltwater Cooling Heat Exchanger 3ME-001.
- Train B 4 kV Supply Breaker 3A0609 Kirk Key for HPSI Pump 3P-018 was ENABLED before the DC control power was ENERGIZED.

Initiating Cue: IDENTIFY the Unit 3 Technical Specification Limiting Condition for Operation applicability for:

- Train A Emergency Core Cooling System.
- Train A Component Cooling Water System.
- Train A Saltwater Cooling System.
- Train B Emergency Core Cooling System.
- Train B Component Cooling Water System.
- Train B Saltwater Cooling System.

LIST the "most restrictive" ACTION(s) based on LCO OPERABILITY.

Task Standard: Locate and correctly perform Critical Steps of Unit 3 Technical Specifications.

Required Materials: Unit 3 Technical Specifications

Validation Time: 10 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:

- Unit 3 Technical Specifications.

Denotes a Critical Step

START TIME:

Perform Step: 1	DETERMINE if Train A Emergency Core Cooling System is OPERABLE.
Standard:	REFER to Unit 3 Technical Specification LCO 3.5.2 and DETERMINE Train A Emergency Core Cooling System is INOPERABLE .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	DETERMINE if Train A Component Cooling Water System is OPERABLE.
Standard:	REFER to Unit 3 Technical Specification LCO 3.7.7 and DETERMINE Train A Component Cooling Water System is INOPERABLE .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	DETERMINE if Train A Saltwater Cooling System is OPERABLE.
Standard:	REFER to Unit 3 Technical Specification LCO 3.7.8 and DETERMINE Train A Saltwater Cooling System is INOPERABLE .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	DETERMINE if Train B Emergency Core Cooling System is OPERABLE.
Standard:	REFER to Unit 3 Technical Specification LCO 3.5.2 and DETERMINE Train B Emergency Core Cooling System is INOPERABLE .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	DETERMINE if Train B Component Cooling Water System is OPERABLE.
Standard:	REFER to Unit 3 Technical Specification LCO 3.7.7 and DETERMINE Train B Component Cooling Water System is OPERABLE .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	DETERMINE if Train B Saltwater Cooling System is OPERABLE.
Standard:	REFER to Unit 3 Technical Specification LCO 3.7.8 and DETERMINE Train B Saltwater Cooling System is OPERABLE .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Cue:	If asked, the most restrictive ACTION(s) is that Technical Specification that is most limiting in terms of time.
Perform Step: 7	LIST the " <u>most restrictive</u> " actions based on LCO OPERABILITY.
Standard:	DETERMINE both Trains of Emergency Core Cooling System are INOPERABLE and REFER to Unit 3 Technical Specification LCO 3.0.3 and DETERMINE " <u>most restrictive</u> " actions as follows: <ul style="list-style-type: none"> • INITIATE action to commence Unit shutdown within 1 hour. • Be in MODE 3 within 7 hours. • Be in MODE 4 within 13 hours. • Be in MODE 5 within 37 hours.
Terminating Cue:	This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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INITIAL CONDITIONS: Given the following conditions on Unit 3 while performing a power ascension:

- Train A Saltwater Cooling System Breaker for 3HV-6497, Saltwater Outlet Valve was OPENED to support a partial stroke test of the valve.
- HPSI Pump 3P-018 is being TRANSFERRED to Train B as a prerequisite for CLEARING Train A Component Cooling Water/ Saltwater Cooling Heat Exchanger 3ME-001.
- Train B 4 kV Supply Breaker 3A0609 Kirk Key for HPSI Pump 3P-018 was ENABLED before the DC control power was ENERGIZED.

INITIATING CUE: IDENTIFY the Unit 3 Technical Specification Limiting Condition for Operation applicability for:

- Train A Emergency Core Cooling System.
 - OPERABLE / INOPERABLE (circle one)
- Train A Component Cooling Water System.
 - OPERABLE / INOPERABLE (circle one)
- Train A Saltwater Cooling System.
 - OPERABLE / INOPERABLE (circle one)
- Train B Emergency Core Cooling System.
 - OPERABLE / INOPERABLE (circle one)
- Train B Component Cooling Water System.
 - OPERABLE / INOPERABLE (circle one)
- Train B Saltwater Cooling System
 - OPERABLE / INOPERABLE (circle one)

LIST the “most restrictive” ACTION(s) based on LCO OPERABILITY:

- _____
- _____
- _____
- _____
- _____

Facility: SONGS JPM # 2008 NRC SRO A-3 Task # 186266 K/A # G 2.3.4 3.2 / 3.7

Title: Choose a Volunteer for Emergency Radiation Exposure

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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 Large Break Loss of Coolant Accident has occurred on Unit 2.
- An Emergency Core Cooling System Valve in the -15' Safety Equipment Building needs to be opened.
- The Emergency Coordinator has authorized a volunteer to attempt to open the valve.
- Health Physics estimates the dose to the volunteer is between 5 and 8 REM.
- The Technical Support Center and Operations Support Center have NOT been activated.

Initiating Cue: The Emergency Coordinator has directed you to SELECT a volunteer from the list of candidates available in accordance with SO23-VIII-30, Units 2/3 Operations Leader Duties.

Task Standard: Locate and correctly perform Critical Steps of SO23-VIII-30 and EPIP Form EP (123) 3.

Required Materials: SO23-VIII-30, Units 2/3 Operations Leader Duties, Rev. 14
EPIP Form EP (123) 3, Emergency Exposure Authorization, Rev. 1

Validation Time: 10 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:

- SO23-VIII-30, Units 2/3 Operations Leader Duties.
- EPIP Form EP (123) 3.
- List of Available Volunteers at back of the JPM.

Denotes a Critical Step

START TIME:

Perform Step: 1	Refer to SO23-VIII-30, Section 6.7, Emergency Exposure Authorization and EPIP Form EP (123) 3.
Standard:	REFER to guidance in SO23-VIII-30, Section 6.7, Emergency Exposure Authorization and EPIP Form EP (123) 3.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	Determine if individual is a volunteer.
Standard:	DETERMINE that all individuals have volunteered for Emergency Exposure.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	Determine age of volunteer.
Standard:	DETERMINE the desired age of the volunteer is > 45 years old and ELIMINATE Volunteers C .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	Determine if volunteer is pregnant.
Standard:	DETERMINE that the ideal volunteer has not declared herself pregnant and ELIMINATES Volunteers E & F .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	Determine if volunteer can read and understand the potential biological consequences.
Standard:	DETERMINE that the ideal volunteer can read and understand the potential biological consequences and ELIMINATE Volunteer G .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	Determine if volunteer is allergic to shellfish and has a history of thyroid disease.
Standard:	DETERMINE that the ideal volunteer has NO history of thyroid disease and is NOT allergic to shellfish and ELIMINATE Volunteer B .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	Determine lifetime exposure of volunteer.
Standard:	DETERMINE Volunteer D has a lifetime exposure of 165 REM including a previous Protecting Valuable Property Dose and ELIMINATE Volunteer D .
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	Select a volunteer.
Standard:	SELECT Volunteer A as the most appropriate candidate for Emergency Exposure.
Terminating Cue:	This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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INITIAL CONDITIONS: Given the following conditions:

- A Large Break Loss of Coolant Accident has occurred on Unit 2.
- An Emergency Core Cooling System Valve in the -15' Safety Equipment Building needs to be opened.
- The Emergency Coordinator has authorized a volunteer to attempt to open the valve.
- Health Physics estimates the dose to the volunteer is between 5 and 8 REM.
- The Technical Support Center and Operations Support Center have NOT been activated.

INITIATING CUE: The Emergency Coordinator has directed you to SELECT a volunteer from the list of candidates available in accordance with SO23-VIII-30, Units 2/3 Operations Leader Duties.

List of Available Volunteers

1. Volunteer A is a 58-year-old male with a lifetime exposure of 22.75 REM.
2. Volunteer B is a 48-year-old female with sensitivity to clams, mussels and shrimp but NOT lobster.
3. Volunteer C is a 24-year-old male who was recently qualified as a Primary Plant Equipment Operator.
4. Volunteer D is a 52-year-old male with a lifetime exposure of 165 REM, including a Protecting Valuable Property dose of 15 REM at another facility.
5. Volunteer E is a 35-year-old female who is trying to start a family.
6. Volunteer F is a 27-year-old female that tells you she is pregnant.
7. Volunteer G is a 60-year-old male that speaks but does not read English.
8. Volunteer H is a 52-year-old male contractor that is familiar with the RCA but does not have an NRC Form 4 completed at SONGS.

Facility: SONGS JPM # 2008 NRC SRO A-4 Task # 192840 K/A # G 2.4.29 3.1 / 4.4

Title: Prepare an Event Notification Form

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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:

- An Earthquake has collapsed all towers supporting the 220 kV lines entering the Switchyard.
- Control Room annunciator 61C22 - OPERATING BASIS EARTHQUAKE DETECTED is in alarm.
- All Emergency Diesel Generators have started and are supplying their respective 1E 4 kV buses.
- A piping break has flooded the Auxiliary Feedwater Pump Room.
- On Unit 2, RCS pressure dropped to and stabilized at 600 psia with Containment pressure at 12 psig.
- Health physics reports radiation levels detected outside of Unit 2 Containment at the Emergency Radiation Monitoring System locations is 0.5 mr/hr above background.
- Unit 3 has no complications from the trip and the Control Room Supervisor has diagnosed a Loss of Offsite Power.
- Wind direction is from the East (90°) at 15 to 20 mph.

Initiating Cue: The Emergency Coordinator directs you to PREPARE Page 1 of 2 of an Event Notification Form per SO123-VIII-30.7, Emergency Notifications.

Task Standard: Locate and correctly perform Critical Steps of SO123-VIII-30.7, SO123-VIII.1, and SO123-VIII.10.3.

Required Materials: SO123-VIII-30.7, Emergency Notifications, Rev. 10
 EP(123) 10, Event Notification Form, Rev. 12
 SO123-VIII.1, Recognition and Classification of Emergencies, Rev. 27
 SO123-VIII.10.3, Protective Action Recommendations, Rev. 11

Validation Time: 10 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:

- SO123-VIII-30.7, Emergency Notifications.

Denotes a Critical Step

START TIME:

Perform Step: 1	Determine Emergency Classification.
Standard:	DETERMINE a General Emergency is in progress Tab B4-1
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	Enter Meteorological Data.
Standard:	ENTER Meteorological Data: <ul style="list-style-type: none"> • Wind direction is 90° and 15 to 20 mph.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	Determine Protective Action Recommendations.
Standard:	DETERMINE Protective Action Recommendations (CHECK boxes): <ul style="list-style-type: none"> • There <u>IS</u> a need for protective action beyond the EAB. <ul style="list-style-type: none"> • EVACUATE State Beach. • EVACUATE PAZ(s) 1 and 2. • INGEST KI for PAZ(s) 1 and 2.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	Determine Release Information.
Standard:	DETERMINE the following Release Information (CHECK boxes): <ul style="list-style-type: none"> • There <u>has not been</u> a radioactive release to the environment. • The event related radiation dose <u>IS</u> measurable at the Exclusion Area Boundary.
Terminating Cue:	This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:

INITIAL CONDITIONS: Given the following conditions:

- An Earthquake has collapsed all towers supporting the 220 kV lines entering the Switchyard.
- Control Room annunciator 61C22 - OPERATING BASIS EARTHQUAKE DETECTED is in alarm.
- All Emergency Diesel Generators have started and are supplying their respective 1E 4 kV buses.
- A piping break has flooded the Auxiliary Feedwater Pump Room.
- On Unit 2, RCS pressure dropped to and stabilized at 600 psia with Containment pressure at 12 psig.
- Health physics reports radiation levels detected outside of Unit 2 Containment at the Emergency Radiation Monitoring System locations is 0.5 mr/hr above background.
- Unit 3 has no complications from the trip and the Control Room Supervisor has diagnosed a Loss of Offsite Power.
- Wind direction is from the East (90°) at 15 to 20 mph.

INITIATING CUE: The Emergency Coordinator directs you to PREPARE Page 1 of 2 of an Event Notification Form per SO123-VIII-30.7, Emergency Notifications.

Facility: SONGS JPM # 2008 NRC C-3 Task # 191346 K/A # 001.A2.01 3.1 / 3.7 SF-1
 Title: Respond to a Control Element Drive Mechanism Annunciator

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____
 Actual Performance: _____ Simulator: _____
 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 (Unit 3) is in MODE 1.
- Unit 2 (Unit 3) Annunciator 60A14 - CEDM COOLING AIR FLOW LOW has just alarmed in the Control Room.
- Both Trains of Component Cooling Water are in operation.

Initiating Cue: The Control Room Supervisor directs you to acknowledge the Unit 2 (Unit 3) Annunciator 60A14 - CEDM COOLING AIR FLOW LOW alarm and perform any necessary actions.

Task Standard: Locate and correctly perform Critical Steps of SO23-15-60.A1 and SO23-1-4.

Required Materials: SO23-15-60.A1, Emergency HVAC, Annunciator 60A15, Rev. 9-3
 SO23-1-4, Containment Normal Heat Removal, Rev. 17
 SO23-5-2.27, Containment HVAC 84A Alarm Response, Rev. 5

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

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

CONTROL ROOM SETUP

This JPM will be simulated in the Control Room.

EXAMINER:

PROVIDE the examinee with a copy of:

- SO23-15-60.A1, Emergency HVAC, Annunciator 60A14 - CEDM COOLING AIR FLOW LOW when the JPM begins.

PROVIDE the examinee with a copy of:

- SO23-1-4, Containment Normal Heat Removal when required at Panel 2(3) L-155.

Examiner Note: CR-60 is located on the Common Panel in the Control Room. Panel 2(3) L-155 is located in the Control Room hallway beyond each Unit's Fire Door.

Denotes a Critical Step

START TIME:

Examiner Note:	Remind the examinee to simulate all actions.
Perform Step: 1	Respond to annunciator alarm on Panel CR-60.
Standard:	ACKNOWLEDGE annunciator alarm on Panel CR-60.
Examiner Cue:	PROVIDE the examinee with a copy of SO23-15-60.A1, Emergency HVAC, Annunciator 60A14.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	Panel 2(3) L-155 is located in the Control Room hallway beyond each Unit's Fire Door.
Perform Step: 2	Dispatch an Operator to 2(3)L-155, HVAC Control Panel.
Standard:	GO to 2(3)L-155, HVAC Control Panel, to check for SPECIFIC CAUSES listed in Section 2.0.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	Check for SPECIFIC CAUSES listed in Section 2.0: <ul style="list-style-type: none"> • Fan Tripped.
Standard:	OBSERVE CEDM Cooling Fan indications on 2(3) L-155 to determine if any fan has tripped.
Examiner Cue:	Annunciator 2UA0084-11, CEDM E403 COOLING AIR FLOW LO is in alarm at 2(3)L-155.
Examiner Cue:	All ME-403 lights are extinguished. Fan is tripped. ME-404 green STOP lights are illuminated.
Examiner Cue:	Another operator will perform SO23-6-9, Section for 480 Volt Loadcenter Feeder Circuit Relay.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	Check for SPECIFIC CAUSES listed in Section 2.0: <ul style="list-style-type: none"> • Inlet Damper Shut.
Standard:	OBSERVE 2(3)ZLL / ZLH-9907AB, CEDM Cooling Damper 2(3)HV-9907AB on 2(3) L-155 to DETERMINE if damper is OPEN.
Examiner Cue:	The CEDM Cooling (Service Unit Inlet) Damper is closed.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	If the inlet damper on the in service unit is closed, <u>then</u> START the standby unit, per SO23-1-4 Section for Startup of the CEDM Cooling System.
Standard:	OBTAIN a copy of SO23-1-4, Section for Startup of the CEDM Cooling System.
Examiner Note:	Provide the examinee with a copy of SO23-1-4, Containment Normal Heat Removal.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	The following steps represent the alternate path for this JPM.
Perform Step: 6	Prior to starting the first CEDM Cooling unit, notify the Containment Work Manager and personnel in Containment.
Standard:	Prior to starting CEDM Cooling Unit ME-404, NOTIFY the Containment Work Manager and personnel in Containment.
Examiner Cue:	There are no personnel in Containment.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	START either CEDM Cooling Unit by placing its associated Handswitch to AUTO: <ul style="list-style-type: none"> • ME-403 HS-9907A • ME-404 HS-9907B
Standard:	OBSERVE position of CEDM Cooling Unit Handswitches 2(3)HS-9907A, CEDM Cooling Damper/Fan E403 and 2(3)HS-9907B, CEDM Cooling Damper/Fan E404.
Examiner Cue:	ME-403 is in AUTO with no lights illuminated; ME-404 is in OFF with green STOP light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	START either CEDM Cooling Unit by placing its associated Handswitch to AUTO: <ul style="list-style-type: none"> • ME-403 HS-9907A • ME-404 HS-9907B
Standard:	PLACE 2(3)HS-9907B, CEDM Cooling Damper/Fan E404 handswitch in AUTO.
Examiner Cue:	ME-404 is in AUTO and running.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	OBSERVE cooling unit temperatures on PCS. <ul style="list-style-type: none"> • ME-403 OUTLET TE-9909A • ME-403 INLET TE-9910A • ME-404 OUTLET TE-9909B • ME-404 INLET TE-9910B
Standard:	OBSERVE cooling unit temperatures on the Plant Computer System. <ul style="list-style-type: none"> • ME-403 OUTLET TE-9909A • ME-403 INLET TE-9910A • ME-404 OUTLET TE-9909B • ME-404 INLET TE-9910B
Examiner Cue:	The Reactor Operator reports that all CEDM Cooling Unit temperatures are rising.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	SELECT the other CEDM Cooling Unit to Standby by placing its associated handswitch to AUTO: <ul style="list-style-type: none"> • ME-403 HS-9907A • ME-404 HS-9907B
Standard:	DETERMINE ME-403 already in AUTO.
Examiner Cue:	ME-403 is in AUTO. The Control Room Supervisor directs you to continue performing the steps of Annunciator 60A14.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 11	Check the operating CEDM cooling units differential pressure on Panel 2(3)L-155 is greater than 5" water column.
Standard:	OBSERVE 2(3)PDI-9908B CEDM Cooling Fan E404 DIFF PRESS on Panel 2(3)L-155 is greater than 5" water column.
Examiner Cue:	The differential pressure on Panel 2(3)L-155 is 3" water column.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 12	Request Maintenance Engineering to provide rapid response in assessing CEDM temperature data.
Standard:	REQUEST Maintenance Engineering to provide rapid response in assessing CEDM temperature data.
Examiner Cue:	Maintenance Engineering has been contacted.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 13	Request I&C to initiate temperature measurements of CEDM Upper Gripper Coil temperatures per RMO 50000821005(U2) or 60000821005(U3) to ensure temperatures are maintained < 330°F and provide feedback to Operations.
Standard:	CONTACT Control Room to request I&C initiate temperature measurements of CEDM Upper Gripper Coils.
Examiner Cue:	I&C has initiated temperature measurements.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Cue:	I&C reports that CEDM Cooling Shroud Discharge Temperature exceeds 190°F.
Perform Step: 14	<u>If</u> CEDM Cooling Shroud Discharge Temperature exceeds 180°F, <u>or</u> CEDM Upper Gripper Coil temperature exceeds 330°F, <u>then</u> start one train of ECUs, and notify Maintenance Engineering.
Standard:	DETERMINE Cooling Shroud Discharge Temperature exceeds 180°F: <ul style="list-style-type: none"> • START one train of Containment Emergency Cooling Units. • NOTIFY Maintenance Engineering.
Examiner Cue:	Maintenance Engineering is reporting to the Control Room.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 15	START one train of ECUs.	
Standard:	RETURN to the Control Room Panel CR-60 and DEPRESS the START pushbuttons for either Train of Containment Emergency Cooling Units as follows: <ul style="list-style-type: none"> • 2(3)HS-9953-1 for Containment ECU 2(3)E-399. • 2(3)HS-9947-1 for Containment ECU 2(3)E-401 <u>or</u> <ul style="list-style-type: none"> • 2(3)HS-9939-2 for Containment ECU 2(3)E-400. • 2(3)HS-9955-2 for Containment ECU 2(3)E-402. 	
Terminating Cue:	CEDM Cooling Unit temperatures are starting to lower. This JPM is complete.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

STOP TIME:	
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INITIAL CONDITIONS: Given the following conditions:

- Unit 2 (Unit 3) is in MODE 1.
- Unit 2 (Unit 3) Annunciator 60A14 - CEDM COOLING AIR FLOW LOW has just alarmed in the Control Room.
- Both Trains of Component Cooling Water are in operation.

INITIATING CUE: The Control Room Supervisor directs you to acknowledge the Unit 2 (Unit 3) Annunciator 60A14 - CEDM COOLING AIR FLOW LOW alarm and perform any necessary actions.

Facility: SONGS JPM # 2008 NRC P-1 Task # 2645 K/A # 055.EA2.03 3.9 / 4.7 SF-6

Title: Perform the Diesel Generator Cross-Tie Permissive Switch Alignment

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

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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: Both units have experienced a Loss of Offsite Power. Both Emergency Diesel Generators for Unit 2 (Unit 3) are not operating due to mechanical problems. Both Emergency Diesel Generators for Unit 3 (Unit 2) are functioning normally.

The Unit 2 (Unit 3) Control Room Supervisor is in the process of energizing 2A06 from 3G003 (3A06 from 2G003), the opposite Unit's Emergency Diesel Generator.

Initiating Cue: The Control Room Supervisor directs you to perform the Unit 2 (Unit 3) Diesel Generator Cross-Tie Permissive Switch Alignment on the 50' Elevation per SO23-12-11, Attachment 24, Supplying 1E 4KV Bus with Opposite Unit Diesel, Step 13, Supplying 2A06 with 3G003 (3A06 with 2G003).

Task Standard: Locate and correctly perform Critical Steps of SO23-12-11, Attachment 24.

Required Materials: SO23-12-11, EOI Supporting Attachments, Rev. 6

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

Comments:

Result: SAT UNSAT

Examiner (Signature): _____ Date: _____

PLANT SETUP**EXAMINER:**

Provide the examinee with a copy of:

- SO23-12-11, Attachment 24, Supplying 1E 4KV Bus with Opposite Unit Diesel, Step 13.

EXAMINER NOTE:

- This JPM can be performed on either Unit.
- Circle the Unit on which the JPM is to be performed on the JPM Worksheet and the JPM Cue Sheet.

Denotes a Critical Step

START TIME:

Examiner Note:	Remind the examinee to simulate all actions.
Examiner Cue:	The NOA has provided you with keys for the Fire Isolation Panels, L-413 on both Units.
Perform Step: 1	VERIFY feeder faults NOT indicated by relay flags on: <ul style="list-style-type: none"> • A0616 - Unit Aux XFMR.
Standard:	OBSERVE relay flags on breaker 2(3)A0616 UNIT AUX XFMR 2(3)XU1.
Examiner Cue:	There are no relay flags visible on Unit Auxiliary Transformer 2(3)XU1 breaker, 2(3)A0616.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	VERIFY feeder faults NOT indicated by relay flags on: <ul style="list-style-type: none"> • A0618 - Reserve Aux XFMR.
Standard:	OBSERVE relay flags on breaker 2(3)A0618 RESERVE AUX XFMR 2(3)XR2.
Examiner Cue:	There are no relay flags visible on Reserve Auxiliary Transformer 2(3)XR2 breaker, 2(3)A0618.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	VERIFY feeder faults NOT indicated by relay flags on: <ul style="list-style-type: none"> • 2A0619 / 3A0603 - A06 Bus Tie.
Standard:	OBSERVE relay flags on breaker 2A0619 (3A0603) EMERGENCY SUPPLY 3(2)A06.
Examiner Cue:	There are no relay flags visible on 2(3)A06 Bus Tie Breaker, 2A0619 (3A0603).
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	VERIFY feeder faults NOT indicted by relay flags on: <ul style="list-style-type: none"> • A0613 - Diesel Generator.
Standard:	OBSERVE relay flags on breaker 2(3)A0613 DIESEL GEN 2(3)G003.
Examiner Cue:	There are no relay flags visible on Diesel Gen Breaker, 2(3)A0613.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	SELECT both Diesel Generator Cross-Tie Permissive Switches on Fire Isolation Panel L-413 - to 50.54X: <u>Train B</u> HS-5054XA2
Standard:	SELECT Unit 2 (Unit 3) Diesel Generator Cross-Tie Permissive Switch 2(3)HS-5054XA2 to 50.54X position on Fire Isolation Panel 2(3)L413.
Examiner Cue:	Switch is in the 50.54X position.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	SELECT both Diesel Generator Cross-Tie Permissive Switches on Fire Isolation Panel L-413 - to 50.54X: <u>Train B</u> HS-5054XB2
Standard:	SELECT Unit 2 (Unit 3) Diesel Generator Cross-Tie Permissive Switch 2(3)HS-5054XB2 to 50.54X position on Fire Isolation Panel 2(3)L 413.
Examiner Cue:	Switch is in the 50.54X position.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	VERIFY feeder faults NOT indicated by relay flags on: <ul style="list-style-type: none"> • 2A0619 / 3A0603 - A06 Bus Tie.
Standard:	OBSERVE relay flags on the opposite unit BREAKER 3A0603 (2A0619) BUS 2(3)A06.
Examiner Cue:	There are no relay flags visible on the opposite Unit A06 Tie Breaker 3A0603 (2A0619).
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	SELECT both Diesel Generator Cross-Tie Permissive switches on Fire Isolation Panel L-413 - to 50.54X: <u>Train B</u> HS-5054XA2
Standard:	SELECT Unit 3 (Unit 2) Diesel Generator Cross-Tie Permissive Switch 3(2)HS-5054XA2 to 50.54X position on Fire Isolation Panel 3(2)L413.
Examiner Cue:	Switch is in the 50.54X position.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	SELECT both Diesel Generator Cross-Tie Permissive switches on Fire Isolation Panel L-413 - to 50.54X: <u>Train B</u> HS-5054XB2
Standard:	SELECT Unit 3 (Unit 2) Diesel Generator Cross-Tie Permissive Switch 3(2)HS-5054XB2 to 50.54X position on Fire Isolation Panel 3(2)L 413.
Terminating Cue:	Switch is in the 50.54X position. This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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INITIAL CONDITIONS: Both units have experienced a Loss of Offsite Power. Both Emergency Diesel Generators for Unit 2 (Unit 3) are not operating due to mechanical problems. Both Emergency Diesel Generators for Unit 3 (Unit 2) are functioning normally.

The Unit 2 (Unit 3) Control Room Supervisor is in the process of energizing 2A06 from 3G003 (3A06 from 2G003), the opposite Unit's Emergency Diesel Generator.

INITIATING CUE: The Control Room Supervisor directs you to perform the Unit 2 (Unit 3) Diesel Generator Cross-Tie Permissive Switch Alignment on the 50' Elevation per SO23-12-11, Attachment 24, Supplying 1E 4KV Bus with Opposite Unit Diesel, Step 13, Supplying 2A06 with 3G003 (3A06 with 2G003).

Facility: SONGS JPM # 2008 NRC P-2 Task # 193557 K/A # 068.AA1.02 4.3 / 4.5 SF-4S
 Title: Perform Auxiliary Feedwater Pump Local Manual Operations

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

Testing Method:

Simulated Performance: _____ Classroom: _____
 Actual Performance: _____ Simulator: _____
 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: The Control Room has just been evacuated. You have been to the Safe Shutdown Locker and have an emergency lantern, earplugs, and the ACO Keyset.

Initiating Cue: The Control Room Supervisor directs you to manually feed the Unit 2 (Unit 3) Steam Generators with the Steam Driven Auxiliary Feedwater Pump, P-140, in Local-Manual using SO23-13-2, Shutdown from Outside the Control Room, Attachment 12, AFW Pump Local Manual Operation.

Task Standard: Locate and correctly perform Critical Steps of SO23-13-2, Attachment 12.

Required Materials: SO23-13-2, Shutdown from Outside the Control Room, Rev. 11

Validation Time: 13 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT UNSAT

Examiner (Signature): _____ Date: _____

PLANT SETUP**EXAMINER:**

Provide the examinee with a copy of:

- SO23-13-2, Shutdown from Outside the Control Room Attachment 12, AFW Pump Local Manual Operation.

EXAMINER NOTE:

- This JPM can be performed on either Unit.
- Circle the Unit on which the JPM is to be performed on the JPM Worksheet and the JPM Cue Sheet.
- A flashlight is required and a LASER pointer would be helpful when performing this JPM.

Denotes a Critical Step

START TIME:

Examiner Note:	Remind the examinee to simulate all actions.	
Perform Step: 1	OPEN MS4716DS01, HV-4716 DC Control Power Disconnect Switch inside panel MS-4716 (west side of MP-140).	
Standard:	OPEN the disconnect switch for DC power to 2(3) HV4716, AFWP Turbine 2(3)K-007 Steam Supply Throttle Valve inside Panel 2(3)MS-4716.	
Examiner Cue:	The switch is open.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 2	MANUALLY CLOSE HV-4716.	
Standard:	CLOSE 2(3) HV4716, AFWP Turbine 2(3)K-007 Steam Supply Throttle Valve by DEPRESSING the clutch lever and ROTATING the handwheel clockwise.	
Examiner Cue:	The valve is closed.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 3	ENSURE Trip Rod is pulled toward HV-4716 and latched.	
Standard:	DETERMINE that 2(3) HV4716, AFWP Turbine 2(3)K-007 Steam Supply Throttle Valve Trip Rod is latched into the gripper pawl.	
Examiner Cue:	The hook is latched with the gripper pawl.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 4	ENSURE trip plunger is fully seated and flat side is toward HV-4716.	
Standard:	OPEN cover on shatter shield over the Front Standard. <ul style="list-style-type: none"> LOCATE the trip plunger and INDICATE the plunger would be fully seated with the flat side of the washer toward 2(3) HV4716 AFWP Turbine 2(3)K-007 Steam Supply Throttle Valve. 	
Examiner Cue:	The plunger is fully seated with the flat side of the washer toward 2(3)HV-4716.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 5	OPEN HV-4716 1-1/2 turns to roll turbine to approximately 1800 RPM on SI-4732 (panel L-298-C).	
Standard:	OPEN 2(3) HV4716 AFWP Turbine 2K-007 Steam Supply Throttle Valve by ROTATING handwheel counter clockwise. OBSERVE Turbine speed indication on 2(3)SI-4732, AFWPT K007 Tach Indicator on Panel 2(3)L-298-C.	
Examiner Cue:	Turbine speed is 1800 rpm, as indicated on 2(3)SI-4732.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 6	Continue opening HV-4716; ENSURE K-007 governor controls speed at approximately 3570 RPM on SI-4732.	
Standard:	Continue to OPEN 2(3) HV4716 by ROTATING handwheel counter-clockwise. <ul style="list-style-type: none"> OBSERVE Turbine speed on 2(3)SI-4732, AFWPT K007 Tach Indicator. MONITOR the Governor to control speed at 3570 RPM on Panel 2(3)L-298. 	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 7	Verify turbine speed is stable at approximately 3570 RPM (K-007 Governor Controlling).
Standard:	OBSERVE turbine speed is stable at approximately 3570 RPM with 2(3)K-007 Governor Controlling.
Examiner Cue:	Turbine speed is erratic at approximately 3570 rpm.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	MANUALLY CLOSE HV-4716.
Standard:	CLOSE 2(3) HV-4716, AFWP Turbine 2(3)K-007 Steam Supply Throttle Valve by ROTATING the handwheel in the CLOCKWISE direction.
Examiner Cue:	2(3)HV-4716 is closed.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	OPEN MS4716DS02, K-007 Governor DC Control Power Disconnect Switch inside Panel MS-4716.
Standard:	OPEN DC to K007 Governor Disconnect Switch, MS4716DS02, inside Panel 2(3)MS-4716.
Examiner Cue:	The disconnect switch for DC to K007 Governor is open.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	ENSURE Trip Rod is pulled toward HV-4716 and latched.
Standard:	PULL Trip Rod toward 2(3) HV4716, AFWP Turbine 2(3)K-007 Steam Supply Throttle Valve and VERIFYING Trip Rod is latched into the gripper pawl.
Examiner Cue:	The hook is latched with the gripper pawl.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 11	ENSURE Trip Plunger is fully seated and flat side is toward HV-4716.	
Standard:	OPEN cover on shatter shield over the front standard. LOCATE the trip plunger and INDICATE the plunger would be fully seated with the flat side of the washer toward 2(3) HV4716.	
Examiner Cue:	The plunger is fully seated with the flat side of the washer toward 2(3)HV-4716.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 12	SLOWLY THROTTLE OPEN HV-4716, to raise MP-140 discharge pressure to 1350 psig on PI-4703L, east (west) side of MP-140.	
Standard:	SLOWLY OPEN 2(3) HV4716, AFW Turbine 2(3)K-007 Steam Supply Throttle Valve by: <ul style="list-style-type: none"> • SLOWLY ROTATING handwheel in the COUNTER CLOCKWISE direction. • OBSERVE 2(3)PI4703L Turbine Driven AFW Pump 2(3)P140 Disch Press Indication to monitor pump discharge pressure. 	
Examiner Cue:	2(3)PI-4703L indicates pump discharge pressure of 1350 psig.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 13	OPEN HV-4706, MP-140 Discharge to ME-089.	
Standard:	Manually OPEN: <ul style="list-style-type: none"> • 2HV4706 AFW P140 to S/G 2E089 control valve for Unit 2 by DEPRESSING the clutch lever and ROTATING the handwheel COUNTER CLOCKWISE. • 3HV4706 Aux Feedwater Control Valve to 3E089 for Unit 3 by DEPRESSING the clutch lever and ROTATING the handwheel COUNTER CLOCKWISE. 	
Examiner Cue:	2(3)HV-4706 is open.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 14	OPEN HV-4705, MP-140 Discharge to ME-088 (inside West RWST Vault).	
Standard:	TRANSITION to West RWST vault to OPEN HV-4705, P140 Discharge to ME-088.	
Examiner Cue:	Due to personal safety considerations, 2(3)HV-4705 will not be accessed. Assume 2(3)HV-4705 is open.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 15	Establish communications with the 21 / 31.	
Standard:	ESTABLISH communications with the 21 / 31 at the AFW Access gate.	
Examiner Cue:	Communications are established with the 21 (31).	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Examiner Cue:	The 21 (31) directs you to open 2(3)HV-4730 until flow is heard.	
Perform Step: 16	MANUALLY OPEN HV-4730, AFW Isolation Valve.	
Standard:	Manually OPEN: <ul style="list-style-type: none"> • 2HV-4730 Aux Feed Water Discharge to S/G 2E088 by DEPRESSING the clutch lever and ROTATING the handwheel COUNTER CLOCKWISE. • 3HV-4730 AFW Discharge to SG 3F088 Isolation Valve by DEPRESSING the clutch lever and ROTATING the handwheel COUNTER CLOCKWISE. 	
Examiner Cue:	You hear flow.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Examiner Cue:	The 21 (31) directs you to open 2(3)HV-4715 until flow is heard.	
Perform Step: 17	MANUALLY OPEN HV-4715, AFW Isolation Valve.	
Standard:	Manually OPEN: <ul style="list-style-type: none"> • 2HV-4715 Steam Generation 2E089 Auxiliary Feed Water Isolation Valve by DEPRESSING the clutch lever and ROTATING the handwheel COUNTER CLOCKWISE. • 3HV4715 Aux Feed Water Isolation Valve to 3E089) by DEPRESSING the clutch lever and ROTATING the handwheel COUNTER CLOCKWISE. 	
Terminating Cue:	You hear flow. This JPM is complete.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

STOP TIME:	
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INITIAL CONDITIONS: The Control Room has just been evacuated. You have been to the Safe Shutdown Locker and have an emergency lantern, earplugs, and the ACO Keyset.

INITIATING CUE: The Control Room Supervisor directs you to manually feed the Unit 2 (Unit 3) Steam Generators with the Steam Driven Auxiliary Feedwater Pump, P-140, in Local-Manual using SO23-13-2, Shutdown from Outside the Control Room, Attachment 12, AFW Pump Local Manual Operation.

Facility: SONGS JPM # 2008 NRC P-3 Task # 192231 K/A # 055.EA2.03 3.9 / 4.7 SF-7

Title: Align Essential Plant Parameters Monitoring Panel for Startup Channel Operation

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

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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: A station blackout has occurred seven (7) hours ago. Class 1E Battery Bus voltages are currently 105 VDC and lowering. Power is not expected to be restored for at least 20 hours.

Initiating Cue: The Shift Manager directs you to perform SO23-12-11, EOI Supporting Attachments, Attachment 2, Floating Step 26, Connect 2G005 (Unit 2) or 3G005 (Unit 3) Portable Generator to 2L-411 (3L-411) EPPM Panel / Startup Channel.

Task Standard: Locate and correctly perform Critical Steps of SO23-12-11, Attachment 2, FS-26.

Required Materials: SO23-12-11, EOI Supporting Attachments, Attachment 2, FS-26 Rev. 6

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

Comments:

Result: SAT UNSAT

Examiner (Signature): _____ Date: _____

PLANT SETUP**EXAMINER:**

Provide the examinee with a copy of:

- SO23-12-11, Attachment 2, Floating Step 26, CONNECT G005 Portable Generator to L-411 EPPM Panel / Startup Channel.

EXAMINER NOTE:

- This JPM can be performed on either Unit.
- Circle the Unit on which the JPM is to be performed on the JPM Worksheet and the JPM Cue Sheet.
- Obtain permission from the Shift Manager in order to open cabinet doors associated with this JPM.

Denotes a Critical Step

START TIME:

Examiner Note:	Remind the examinee to simulate all actions.	
Perform Step: 1	VERIFY elapsed time from Station Blackout greater than 6 hours AND restoration of power NOT expected to occur within 8 hours following a Station Blackout, OR ALL Class 1E Battery Bus voltages – less than 108 VDC.	
Standard:	From the Initial Conditions: <ul style="list-style-type: none"> • DETERMINE elapsed time from Station Blackout greater than 6 hours and restoration of power <u>not</u> expected to occur within 8 hours. • DETERMINE Class 1E Battery Bus voltages are 105 VDC and lowering from Initial Conditions. 	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	OBTAIN approval of Shift Manager to use G005, Portable Generator to supply: <ul style="list-style-type: none"> • L411, EPPM Panel • Start-up Channel B 	
Standard:	ACKNOWLEDGE that the Shift Manager has already directed performance of this Floating Step.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	INFORM Security and Health Physics that the following doors will be blocked open: <ul style="list-style-type: none"> • Unit 2 Door C2-302 (45' Pen. To 50' SEB Roof) • Unit 2 Door AC-307 (45' Pen. To Cable Spreading Room) • Unit 3 Door C3-302 (45' Pen. To 50' SEB Roof) • Unit 3 Door AC-342 (45' Pen. To Cable Spreading Room)
Standard:	INFORM Security and Health Physics that the following doors will be blocked open: <ul style="list-style-type: none"> • Unit 2 Door C2-302 (45' Pen. To 50' SEB Roof) • Unit 2 Door AC-307 (45' Pen. To Cable Spreading Room) • Unit 3 Door C3-302 (45' Pen. To 50' SEB Roof) • Unit 3 Door AC-342 (45' Pen. To Cable Spreading Room)
Examiner Cue:	(When located) The doors are blocked open.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4a	ALIGN L411, EPPM Panel: <ul style="list-style-type: none"> • CONNECT extension cord to L411P, Plug for EPPM Panel. • SELECT HS-411X – to L411P. • SELECT XS-411 – to ALTERNATE.
Standard:	ALIGN 2(3)L411, EPPM Panel: <ul style="list-style-type: none"> • CONNECT extension cord to 2(3)L411P, Plug for EPPM Panel.
Examiner Cue:	Extension cord is plugged into EPPM Panel.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4b	ALIGN L411, EPPM Panel: <ul style="list-style-type: none"> • CONNECT extension cord to L411P, Plug for EPPM Panel. • SELECT HS-411X – to L411P. • SELECT XS-411 – to ALTERNATE.
Standard:	PLACE 2(3)HS411X in the 2(3)L411P position.
Examiner Cue:	2(3)HS411X is selected to 2(3)L411P.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4c	ALIGN L411, EPPM Panel: <ul style="list-style-type: none"> • CONNECT extension cord to L411P, Plug for EPPM Panel. • SELECT HS-411X – to L411P. • SELECT XS-411 – to ALTERNATE.
Standard:	PLACE 2(3)XS411 in the ALTERNATE position.
Examiner Cue:	2(3)XS411 is selected to ALTERNATE.
Examiner Cue:	Another operator will align 2(3)L539 Start-up Channel in the Train A Switchgear Room.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	Step 5 is left for Examiner reference only. These actions are not performed in this JPM as it would require the candidate to violate the HP Radiation Control Area and go to the 50' Control Building.
Perform Step: 5	ALIGN L539, Start-up Channel: <ul style="list-style-type: none"> • On Panel L539X (Train A 1E Switchgear Room) <ul style="list-style-type: none"> • CONNECT extension cord L539P, Plug for Start-up Channel AND • SELECT HS-539X – to L539P. • On Panel L539X (Train B 1E Switchgear Room) <ul style="list-style-type: none"> • SELECT XS-539B to ALTERNATE SOURCE.
Standard:	Another operator ALIGNS L539, Start-up Channel: <ul style="list-style-type: none"> • On Panel 2(3)L539X (Train A 1E Switchgear Room) <ul style="list-style-type: none"> • CONNECT extension cord 2(3)L539P, Plug for Start-up Channel AND • SELECT 2(3)HS-539X – to 2(3)L539P. • On Panel 2(3)L539X (Train B 1E Switchgear Room) <ul style="list-style-type: none"> • SELECT 2(3)XS-539B to ALTERNATE SOURCE.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	The candidate will be unable to go out onto the SEB roof without violating HP Radiation Controls. Have them explain where they would go (outside onto the roof) and what they would do (get gas can from locker to fill G005 tank). The gasoline is located in a locker approximately 30' from Door 302.
Perform Step: 6	MOVE G005, Portable Generator from G005 locker, (45' Pen. Bldg, west end), to SEB roof outside of Door 302.
Standard:	MOVE 2(3)G005, Portable Generator from 2(3)G005 locker, (45' Pen. Bldg, west end), to SEB roof outside of Door C2-302 (C3-302).
Examiner Cue:	(When located) Assume G005 is on the SEB Roof.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	The next step cannot be performed until after exiting the RCA.	
Perform Step: 7	ADD gasoline located in storage area on SEB Roof (key #199) (Between feedwater regulating valves Rooms 110 and 111) to G005.	
Standard:	ADD gasoline located in storage area on SEB Roof (Between Feedwater Regulating Valves Rooms 110 and 111) to 2(3)G005.	
Examiner Cue:	(When located) The gas tank is full.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	VERIFY oil level between marks.	
Standard:	VERIFY G005 oil level is between marks on the oil fill stick.	
Examiner Cue:	(When located) The oil level is between the marks.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	ENSURE all loads at G005 – disconnected.	
Standard:	ENSURE all loads at G005 are disconnected.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	ENSURE tank vent – on.	
Standard:	PLACE the G005 gas tank vent to ON.	
Examiner Cue:	(When located) The gas tank vent is on.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 11	ENSURE choke – closed.	
Standard:	PLACE the G005 choke to CLOSED.	
Examiner Cue:	(When located) The choke is closed.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 12	ENSURE Eco-throttle switch – off.
Standard:	PLACE the G005 Eco-throttle switch to OFF.
Examiner Cue:	(When located) The Eco-throttle switch is closed.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 13	ENSURE engine switch – on.
Standard:	PLACE the G005 engine switch to ON.
Examiner Cue:	(When located) The engine switch is on.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 14	PULL starter.
Standard:	PULL the starter on G005.
Examiner Cue:	If the previous steps were completed correctly, tell the examinee that G005 is running and the engine is warm.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 15	MOVE choke – to open as engine warms up.
Standard:	MOVE choke to OPEN as engine warms up.
Examiner Cue:	(When located) The choke is open.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	Connecting extension cords to Startup Channel B cannot be performed without exiting the RCA.	
Perform Step: 16	CONNECT extension cords to G005 from L411P, EPPM Panel AND from L539P, Start-up Channel B.	
Standard:	CONNECT extension cords to G005 from 2(3)L411P, EPPM Panel and from 2(3)L539P, Start-up Channel B.	
Examiner Cue:	(When located) The extension cords are connected.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Examiner Note:	L411 (Essential Plant Parameters Monitoring Panel) power supplies are located inside L411 at the bottom of the cabinet. If permission has not been obtained to open the cabinet door then the examinee should explain the general location of the indicating lights and breakers.	
Perform Step: 17	VERIFY L411 power supply PS-A energized: <ul style="list-style-type: none"> • Breaker CLOSED AND Red and Green lights illuminated. 	
Standard:	VERIFY 2(3)L411 power supply PS-A energized with breaker CLOSED and Red and Green lights illuminated.	
Examiner Cue:	(When located) The breaker is closed and the red and green lights are illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 18	VERIFY L411 power supply PS-A energized: <ul style="list-style-type: none"> • Breaker CLOSED AND Red and Green lights illuminated. 	
Standard:	VERIFY 2(3)L411 power supply PS-A energized with breaker CLOSED and Red and Green lights illuminated.	
Examiner Cue:	(When located) The breaker is closed and the red and green lights are illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 19	SELECT HS-0100F, PZR pressure indication – to LOCAL.
Standard:	SELECT 2(3)HS-0100F to LOCAL.
Examiner Cue:	(When located) The PZR pressure indication hand switch is in LOCAL.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 20	SELECT HS-0103A, PZR level indication – to LOCAL.
Standard:	SELECT 2(3)HS-0103A to LOCAL.
Examiner Cue:	(When located) The PZR level indication hand switch is in LOCAL.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 21	VERIFY Startup-up Channel B – energized.
Standard:	VERIFY Startup-up Channel B is energized.
Terminating Cue:	Another operator will energize Startup Channel B. This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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INITIAL CONDITIONS: A station blackout has occurred seven (7) hours ago. Class 1E Battery Bus voltages are currently 105 VDC and lowering. Power is not expected to be restored for at least 20 hours.

INITIATING CUE: The Shift Manager directs you to perform SO23-12-11, EOI Supporting Attachments, Attachment 2, Floating Step 26, Connect 2G005 (Unit 2) **or** 3G005 (Unit 3) Portable Generator to 2L-411 (3L-411) EPPM Panel / Startup Channel.

Facility: SONGS JPM # 2008 NRC S-1 Task # 677 K/A # 025.AA1.01 3.6 / 3.7 SF-4P
 Title: Respond to a Loss of Shutdown Cooling

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____
 Actual Performance: _____ Simulator: _____
 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 B Shutdown Cooling System was operating when a Loss of Offsite Power occurs.
- The Train A Emergency Diesel Generator (2G002) is Out-of-Service and in Maintenance Lockout.
- The Containment Spray Pumps are not aligned for Shutdown Cooling.
- Reactor Coolant System level is at 22 inches and stable in the Hot Leg.

Initiating Cue: The Control Room Supervisor directs you to perform actions for a Loss of Shutdown Cooling.

Task Standard: Locate and correctly perform Critical Steps of SO23-13-15.

Required Materials: SO23-13-15, Loss of Shutdown Cooling, Rev. 18

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

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

Execute IC-XX or any Mode 5 Initial Condition with Mode 5 SDC in service and then perform the following:

- Place 2G002 in Maintenance Lockout.
- Insert malfunction PG24, Loss of Offsite Power and allow Emergency Diesel to load on the bus.
- Insert ECCS LP to make LPSI Pump amps fluctuate ± 15 amps upon pump start.
- Place tag over HPSI Pump P-019 labeled "RIC OPERABLE PUMP."
- Place tag over HPSI Pump P-018 labeled "RIC AVAILABLE PUMP."
- Place Plant Computer System screen on Reactor Operator desk to page 314, DLMS.

CAUTION: Prior to starting this JPM ensure that the SDC valves have cycled to their fully open position. This may take several minutes after the Simulator is placed in RUN. Failure to wait for the valves to fully open will result in an RNO attempt that is not addressed by this JPM.

EXAMINER:

Provide the examinee with a copy of:

- SO23-13-15, Loss of Shutdown Cooling, when identified.

Denotes a Critical Step

START TIME:

Examiner Note:	Provide the examinee with a copy of SO23-13-15, Loss of Shutdown Cooling, when identified.
Perform Step: 1	IDENTIFY correct procedure to use.
Standard:	IDENTIFY SO23-13-15, Loss of Shutdown Cooling as the correct procedure to use.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	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:	There are no personnel in Containment.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	Verify Containment Equipment Hatch - Closed.
Standard:	VERIFY Containment Equipment Hatch is closed.
Examiner Cue:	The Containment Equipment Hatch is closed.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	INITIATE Attachment 4, Containment Closure / RCS Vent Checklist.
Standard:	INITIATE Attachment 4, Containment Closure / RCS Vent Checklist.
Examiner Cue:	Attachment 4, Containment Closure / RCS Vent Checklist is being performed by the ARO.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	IMPLEMENT Attachment 1, RCS / SDCS Parameter Monitoring.	
Standard:	IMPLEMENT Attachment 1, RCS / SDCS Parameter Monitoring.	
Examiner Cue:	Attachment 1, RCS / SDCS Parameter Monitoring is being performed by the 51.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 6	NOTIFY the Shift Manager to: <ul style="list-style-type: none"> • Determine the requirement for event classification (D1-3, D2-7, or D3-7) 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:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 7	ENSURE all RCS dilutions in progress are stopped.	
Standard:	DETERMINE no RCS dilutions in progress at this time by OBSERVING Primary Water Pumps OFF.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 8	VERIFY RCS / SDCS parameters: <ul style="list-style-type: none"> • ALL SDCS / LTOP Isolation Valves - OPEN: <ul style="list-style-type: none"> • Train A - HV-9337, HV-9377, HV-9379 • Train B - HV-9339, HV-9378, HV-9336 	
Standard:	DETERMINE all SDCS / LTOP Isolation Valves are OPEN by OBSERVING red OPEN lights illuminated for the following: <ul style="list-style-type: none"> • Train A - 2HV-9337, 2HV-9377, 2HV-9379 • Train B - 2HV-9339, 2HV-9378, 2HV-9336 	
Examiner Cue:	If asked, report all SDCS / LTOP Isolation Valves are open.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 9	VERIFY RCS / SDCS parameters: <ul style="list-style-type: none"> • VERIFY RCS level - greater than or equal to 21 inches in the Hot Leg AND NOT lowering.
Standard:	DETERMINE RCS level greater than or equal to 21 inches in the Hot Leg and NOT lowering by OBSERVING page 622 of QSPDS or CFMS.
Examiner Cue:	RCS level at 22" and stable.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	VERIFY RCS / SDCS parameters: <ul style="list-style-type: none"> • SDC flow \geq 2500 gpm (\geq 2400 on CFMS) AND SDC Pump amperage - normal.
Standard:	RECOGNIZE that SDC flow is $<$ 2300 gpm and the SDC Pump START light is off and/or motor amperage is zero and TRANSITION to Step 5.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	The following steps represent the alternate path for this JPM.
Perform Step: 11	RECOVER SDC flow: <ul style="list-style-type: none"> • VERIFY at least one SDC pump - running.
Standard:	DETERMINE that SDC Pump is NOT running. <ul style="list-style-type: none"> • REFER to RNO for 4 kV Buses A04 or A06 energized.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 12	<u>IF</u> 4 kV Buses A04 or A06 energized, <u>THEN</u> : <ul style="list-style-type: none"> • START available CCW Pump.
Standard:	DEPRESS 2HS-6324-2, CCW Pump 2P026 (W) START pushbutton and OBSERVE red START light illuminated and amps normal.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 13	<u>IF</u> 4 kV Buses A04 or A06 energized, <u>THEN</u> : <ul style="list-style-type: none"> ENSURE Salt Water Pump - started on loop with running CCW Pump. 	
Standard:	OBSERVE 2HS-6383-2, Saltwater Pump 2P114 (E) Unit 3 Intake red START light illuminated and amps normal.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 14	<u>IF</u> 4 kV Buses A04 or A06 energized, <u>THEN</u> : <ul style="list-style-type: none"> START the SDC Pump associated with running CCW Pump. 	
Standard:	DEPRESS 2HS-9391-2, LPSI Pump 2P016 (N) START pushbutton and OBSERVE red START light illuminated and amps normal.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 15	<u>IF</u> 4 kV Buses A04 or A06 energized, <u>THEN</u> : <ul style="list-style-type: none"> ENSURE Intake Cooling Unit associated with operating SWC Pump - started. 	
Standard:	OBSERVE SWTR Pump 2ZL-9606-2, 2P114 Room Vent Unit 2A372 Unit 3 Intake START light illuminated on CR-60.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 16	VERIFY running SDC Pump amperage - normal.	
Standard:	OBSERVE 2HS-9391-2, LPSI Pump 2P016 (N) with fluctuating amperage indication.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 17	IF running SDC Pump amperage - fluctuating greater than ± 10 amps, <ul style="list-style-type: none"> • <u>THEN</u>, FILL RCS per Steps 4i through 4l.
Standard:	DETERMINE SDC Pump amperage is fluctuating greater than ± 10 amps and TRANSITION to Steps 4i through 4l.
Examiner Cue:	If asked, state that another operator will vent the Shutdown Cooling System per Attachment 2.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 18	ANNOUNCE, "Commencing emergency refill of the RCS. All personnel stand clear of RCS openings."
Standard:	ANNOUNCE over Public Address system; <ul style="list-style-type: none"> • Commencing emergency refill of the RCS. All personnel stand clear of RCS openings.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 19	RECOVER RCS Inventory: <ul style="list-style-type: none"> • START operable or available HPSI Pump.
Standard:	DEPRESS 2HS-9394-2, HPSI Pump 2P019 (N) and OBSERVE red START light illuminated with normal running amps.
Examiner Cue:	There are no known leakage flowpaths.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 20	RECOVER RCS Inventory: <ul style="list-style-type: none"> • ENSURE selected flowpath does not bypass the RX Core through known leaks.
Standard:	DETERMINE flowpath does not bypass the Reactor Core through known leaks.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 21	RECOVER RCS Inventory: <ul style="list-style-type: none"> • ESTABLISH flow by throttling OPEN two Cold Leg Injection Valves.
Standard:	DEPRESS the JOG OPEN pushbutton for any two (2) HPSI Cold Leg Injection Valves and OBSERVE the white JOG OPEN light illuminated and the white JOG CLOSE light extinguished: <ul style="list-style-type: none"> • 2HV-9323, HDR 2 to Loop 1A • 2HV-9326, HDR 2 to Loop 1B • 2HV-9329, HDR 2 to Loop 2A • 2HV-9332, HDR 2 to Loop 2B
Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 22	RECOVER RCS Inventory: <ul style="list-style-type: none"> • ESTABLISH flow by throttling OPEN two Cold Leg Injection Valves.
Standard:	OBSERVE injection flow on the following instruments: <ul style="list-style-type: none"> • 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: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

STOP TIME:	
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- INITIAL CONDITIONS:** Unit 2 is in Mode 5 mid-loop operations with the following conditions:
- Train B Shutdown Cooling System was operating when a Loss of Offsite Power occurs.
 - The Train A Emergency Diesel Generator (2G002) is Out-of-Service and in Maintenance Lockout.
 - The Containment Spray Pumps are not aligned for Shutdown Cooling.
 - Reactor Coolant System level is at 22 inches and stable in the Hot Leg.
- INITIATING CUE:** The Control Room Supervisor directs you to perform actions for a Loss of Shutdown Cooling.

Facility: SONGS JPM # 2008 NRC S-2 Task # 186263 K/A # 064.A2.09 3.1 / 3.3 SF-6
 Title: Synchronize the Emergency Diesel Generator to Bus 2A04

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____
 Actual Performance: _____ Simulator: _____
 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: 2G002 Diesel Generator scheduled monthly test is in progress in accordance with SO23-3-3.23, Diesel Generator Monthly and Semi-Annual Testing, Attachment 1. The diesel is running at rated speed, control has been transferred to the Control Room and Attachment 1 has been completed up to and including Step 2.3.

Initiating Cue: The Control Room Supervisor directs you to synchronize the Diesel Generator to Bus 2A04 and fully load per SO23-3-3.23, Diesel Generator Monthly and Semi-Annual Testing, Attachment 1, Section 2.4.

Task Standard: Locate and correctly perform Critical Steps of SO23-3-3.23, Attachment 1.

Required Materials: SO23-3-3.23, Diesel Generator Monthly and Semi-Annual Testing, Attachment 1, Section 2.4, Rev. 33
 SO2-15-63.B.39, DIESEL GEN 2G002 OVEREXCITED/OVERLOADED, Rev. 12

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

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

Execute IC-242 or any 100% power Initial Condition and then perform the following:

- Start 2G002 EDG by using 2HS-1670-1.
- Ensure lesson plan for Diesel Generator Loading and 63B39, DIESEL GEN 2G002 OVEREXCITED / OVERLOADED executes when examinee reaches 3.0 MVARs.

EXAMINER:

Provide the examinee with a copy of:

- SO23-3-3.23, Diesel Generator Monthly and Semi-Annual Testing, Attachment 1 with initials and N/As as appropriate up to Step 2.4.

Denotes a Critical Step

START TIME:

Examiner Note:	Allow examinee time to review Limitations & Specifics prior to starting JPM.
Perform Step: 1	Ensure DG control aligned to the Control Room.
Standard:	DETERMINE 2HS-1665-1, LOCAL CONTROL white LOCAL CONTROL light extinguished.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	SELECT HS-1627-1, SYNC CKT CONTROL to ON.
Standard:	INSERT key into 2HS-1627-1, Train A SYNC CIRCUIT CONTROL and TURN to ON.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	DEPRESS HS-1664-1, D/G Breaker SYNC pushbutton.
Standard:	DEPRESS 2HS-1664-1, Generator Breaker 2A0413 SYNC pushbutton and OBSERVE white SYNC light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	Using HS-1669-1, VOLTAGE REGULATOR, and the Control Room digital voltmeters MATCH incoming and running voltages.
Standard:	MATCH incoming and running voltages using 2HS-1669-1, Voltage Regulator RAISE / LOWER pushbuttons and OBSERVE 2EI-1672-1, Diesel Gen 2G002 Volts Digital Voltmeter and 2EI-1662-1, 4.16 kV Bus 2A04 Volts Digital Voltmeter or 2/3EI-1627A, RUNNING VOLTS and 2/3EI-1627B INCOMING VOLTS.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	Using HS-1671-1, GOVERNOR CONTROL, ADJUST D/G SPEED so that the synchroscope is <i>moving slowly in the clockwise direction.</i>
Standard:	ADJUST Diesel Generator speed using 2HS-1671-1, Governor Control RAISE / LOWER pushbuttons, so that synchroscope is moving SLOWLY in the CLOCKWISE direction.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	<u>When</u> the synchroscope is within 2 minutes of the straight up position, <u>then</u> CLOSE A0413, Diesel Generator Breaker.
Standard:	When the synchroscope is within 2 minutes of the straight up position, DEPRESS 2HS-1664-1, Generator Breaker 2A0413 CLOSE pushbutton and OBSERVE the red CLOSE light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	RAISE LOAD to approximately 1.2 MW using HS-1671-1, GOVERNOR CONTROL.
Standard:	RAISE load to approximately 1.2 MW by DEPRESSING 2HS-1671-1, Governor Control RAISE pushbutton.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	ADJUST positive VAR loading of 0.1 to 0.5 MVARS using HS-1669-1, VOLTAGE REGULATOR.
Standard:	MAINTAIN positive VAR loading of 0.1 to 0.5 MVARS for duration of load ramp using 2HS-1669-1, Voltage Regulator RAISE / LOWER pushbuttons.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	VERIFY ILLUMINATED HS-1671-1, GOVERNOR CONTROL DROOP IN light.
Standard:	VERIFY white DROOP IN light illuminated on 2HS-1671-1, Governor Control.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	DEPRESS HS-1664-1, DG breaker SYNC pushbutton.
Standard:	DEPRESS 2HS-1664-1, Generator Breaker 2A0413 SYNC pushbutton and OBSERVE white SYNC light extinguished.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 11	SELECT HS-1627-1, SYNC CKT CONTROL to OFF.
Standard:	PLACE 2HS-1627-1, Train A SYNC CKT CONTROL to OFF.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Cue:	State that power has been at approximately 1.2 MW for 5 minutes. Also, after 2.4 MW and 3.6 MW has been reached, state that the 5 minutes have elapsed.
Perform Step: 12	<p>After Diesel Generator load has been maintained at ~1.2 MW for 5 to 10 minutes, <u>then</u> RAISE load per the following guidelines by using HS-1671-1, GOVERNOR CONTROL:</p> <ul style="list-style-type: none"> • ~ 2.4 MW for 5 to 10 minutes • ~ 3.6 MW for 5 to 10 minutes • ≥ 4.45 MW and ≤ 4.70 MW
Standard:	<p>When Diesel Generator load has been maintained at ~1.2 MW for 5 to 10 minutes, RAISE load per the following guidelines by depressing 2HS-1671-1, GOVERNOR CONTROL RAISE pushbutton:</p> <ul style="list-style-type: none"> • ~ 2.4 MW for 5 to 10 minutes • ~ 3.6 MW for 5 to 10 minutes • ≥ 4.45 MW and ≤ 4.70 MW
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	Load must be between 4.45 and 4.70 MW and VAR loading should be between 3.0 and 3.2 MVAR, to satisfy the following critical step.
Perform Step: 13	<p><u>When</u> load is ≥ 4.45 and ≤ 4.70 MW, <u>then</u> ADJUST positive VAR loading using HS-1669-1, VOLTAGE REGULATOR until one of the following conditions is met:</p> <ul style="list-style-type: none"> • 3.0 to 3.2 MVAR • 4.53 kV to 4.55 kV Bus Voltage • 730 to 750 amps D/G Output Current • Exciter field current of 3.8 to 4.0 amps DC
Standard:	<p>When load is ≥ 4.45 and ≤ 4.70 MW, ADJUST positive VAR loading by DEPRESSING HS-1669-1, VOLTAGE REGULATOR until one of the following conditions is met:</p> <ul style="list-style-type: none"> • 3.0 - 3.2 MVAR on 2J1-1672B1, Diesel Gen 2G002 Vars. • 4.53 kV - 4.55 kV Bus Voltage on 2EI-1662-1, 4.16 kV Bus 2A04 Volts. • 730 - 750 amps D/G Output Current on 2II-1672B1 Diesel Gen 2G002 B Phase Amps. • Exciter field current of 3.8 - 4.0 amps DC on 2II-1766-1, Field Amps.
Examiner Note:	When VAR loading reaches 3.0 MVARs, a Governor Load Control circuit malfunction will raise load until annunciator 63B39 alarms.
M.O. Cue:	Ensure Diesel Generator Loading and 63B39, DIESEL GEN 2G002 OVEREXCITED / OVERLOADED malfunction executes.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	The following steps represent the alternate path for this JPM.
Perform Step: 14	Respond to ANNUNCIATOR alarm 63B39 - DIESEL GEN 2G002 OVEREXCITED / OVERLOADED.
Standard:	ACKNOWLEDGE alarm and REFER to Annunciator Response Procedure SO2-15-63.B, 63B39 - DIESEL GEN 2G002 OVEREXCITED / OVERLOADED.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 15	If Diesel has not tripped, then perform <u>ONE OR BOTH</u> of the following: <ul style="list-style-type: none"> • Manually reduce voltage to normal using the Voltage Regulator "Lower" pushbutton • Reduce load using the "Gov Cont Lower" pushbutton.
Standard:	DEPRESS 2HS-1671-1, GOVERNOR CONTROL LOWER pushbutton until 2G002 load is less then 4.70 MWe <u>or</u> Annunciator 63B39 clears.
Terminating Cue:	This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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INITIAL CONDITIONS: 2G002 Diesel Generator scheduled monthly test is in progress in accordance with SO23-3-3.23, Diesel Generator Monthly and Semi-Annual Testing, Attachment 1. The diesel is running at rated speed, control has been transferred to the Control Room and Attachment 1 has been completed up to and including Step 2.3.

INITIATING CUE: The Control Room Supervisor directs you to synchronize the Diesel Generator to Bus 2A04 and fully load per SO23-3-3.23, Diesel Generator Monthly and Semi-Annual Testing, Attachment 1, Section 2.4.

Facility: SONGS JPM # 2008 NRC S-4 Task # 2039 K/A # 013.A4.02 4.3 / 4.4 SF-2

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

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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: A Steam Generator Safety Valve had been stuck open. This led to an RCS overcooling and subsequent SIAS/CCAS. Unit 2 has tripped and is presently in a stable condition. RCS Pressure has been stabilized.

Initiating Cue: The Control Room Supervisor directs you to reset SIAS / CCAS using SO23-3-2.22, Engineered Safety Features Actuation System Operation, Attachment 5, SIAS / CCAS and CIAS Reset.

Task Standard: Locate and correctly perform Critical Steps of SO23-3-2.22, Attachment 5.

Required Materials: SO23-3-2.22, Engineered Safety Features Actuation System Operation, Attachment 5, Rev. 15-5

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

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

Execute IC-244 or any 100% power Initial Condition and then perform the following:

- Insert malfunction MS01A at 100% and trip Reactor.
- When RCS pressure reaches 1700 psia, delete the malfunction.

When requested by Examiner, reset SIAS & CCAS trip paths on Channels B & D using remote function RP51 & RP53.

EXAMINER:

Provide the examinee with a copy of:

- SO23-3-2.22, Engineered Safety Features Actuation System Operation, Attachment 5.

Denotes a Critical Step

START TIME:

Perform Step: 1	Determine the performance requirements of this Attachment: <ul style="list-style-type: none"> SIAS/CCAS initiated by Low Pressurizer Pressure PPS automatic trip and Pressurizer pressure remains below 1740 psia; PERFORM entire attachment.
Standard:	DETERMINE the entire Attachment needs to be performed per Attachment 5, Step 1.3.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	RESET each tripped SIAS bistable, as follows: <ul style="list-style-type: none"> LOWER the LO PZR PRESS TRIP Setpoint by depressing the LO PZR PRESS Setpoint Reset pushbutton for Channel A until setpoint pressure is less than present PZR pressure.
Standard:	DEPRESS Channel A 2UI-9149-1, LO PZR PRESS Setpoint Reset pushbutton until setpoint pressure is less than current PZR pressure by COMPARING 2PI-0101-1, Pressurizer 2E087 Pressure Narrow Range to 2PI-0102B1, Pressurizer 2E087 Pressure Setpoint.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	RESET each tripped SIAS bistable, as follows: <ul style="list-style-type: none"> LOWER the LO PZR PRESS TRIP Setpoint by depressing the LO PZR PRESS Setpoint Reset pushbutton for Channel B until setpoint pressure is less than present PZR pressure.
Standard:	DEPRESS Channel B 2UI-9150-2, LO PZR PRESS Setpoint Reset pushbutton until setpoint pressure is less than current PZR pressure by COMPARING 2PI-0101-2, Pressurizer 2E087 Pressure Narrow Range to 2PI-0102B2, Pressurizer 2E087 Pressure Setpoint.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	RESET each tripped SIAS bistable, as follows: <ul style="list-style-type: none"> LOWER the LO PZR PRESS TRIP Setpoint by depressing the LO PZR PRESS Setpoint Reset pushbutton for Channel C until setpoint pressure is less than present PZR pressure.
Standard:	DEPRESS Channel C 2UI-9151-3, LO PZR PRESS Setpoint Reset pushbutton until setpoint pressure is less than current PZR pressure by COMPARING 2PI-0101-3, Pressurizer 2E087 Pressure Narrow Range to 2PI-0102B3, Pressurizer 2E087 Pressure Setpoint.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	RESET each tripped SIAS bistable, as follows: <ul style="list-style-type: none"> LOWER the LO PZR PRESS TRIP Setpoint by depressing the LO PZR PRESS Setpoint Reset pushbutton for Channel D until setpoint pressure is less than present PZR pressure.
Standard:	DEPRESS Channel D 2UI-9152-4, LO PZR PRESS Setpoint Reset pushbutton until setpoint pressure is less than current PZR pressure by COMPARING 2PI-0101-4, Pressurizer 2E087 Pressure Narrow Range to 2PI-0102B4, Pressurizer 2E087 Pressure Setpoint.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	RESET each tripped SIAS bistable, as follows: <ul style="list-style-type: none"> 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 extinguish.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 7	RESET each tripped SIAS bistable, as follows: <ul style="list-style-type: none"> 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 extinguish.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 8	RESET each tripped SIAS bistable, as follows: <ul style="list-style-type: none"> 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 extinguish.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	RESET each tripped SIAS bistable, as follows: <ul style="list-style-type: none"> 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 extinguish.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	RESET the Trip Paths for each tripped PPS Channel, as follows: <ul style="list-style-type: none"> TURN keyswitch to UNLK position for Affected Channel at Actuation Reset Panels.
Standard:	OBTAIN PPS Cabinet 2UIK078 key from the key locker and PERFORM the following: <ul style="list-style-type: none"> INSERT key into PPS Cabinet 2UIK078 Channel A keyswitch. TURN the keyswitch to the UNLOCK position.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 11	RESET the Trip Paths for each tripped PPS Channel, as follows: <ul style="list-style-type: none"> • DEPRESS ESFAS Reset pushbutton(s).
Standard:	DEPRESS the ESFAS reset pushbutton for SIAS Trip Path Channel A on PPS Cabinet 2UIK078.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 12	RESET the Trip Paths for each tripped PPS Channel, as follows: <ul style="list-style-type: none"> • DEPRESS ESFAS Reset pushbutton(s).
Standard:	DEPRESS the ESFAS reset pushbutton for CCAS Trip Path Channel A on PPS Cabinet 2UIK078.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 13	RESET the Trip Paths for each tripped PPS Channel, as follows: <ul style="list-style-type: none"> • RETURN keyswitch to LK position.
Standard:	RETURN keyswitch on PPS Cabinet 2UIK078 Channel A to the LOCK position.
Examiner Cue:	Another operator will reset Channels B and D.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 14	RESET the Trip Paths for each tripped PPS Channel, as follows: <ul style="list-style-type: none"> • TURN keyswitch to UNLK position for Affected Channel at Actuation Reset Panels.
Standard:	REMOVE PPS Cabinet 2UIK078 key from Channel A and PERFORM the following: <ul style="list-style-type: none"> • INSERT key into PPS Cabinet 2UIK078 Channel C keyswitch. • TURN the keyswitch to the UNLOCK position.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 15	RESET the Trip Paths for each tripped PPS Channel, as follows: <ul style="list-style-type: none"> • DEPRESS ESFAS Reset pushbutton(s).
Standard:	DEPRESS the ESFAS reset pushbutton for SIAS Trip Path Channel C on PPS Cabinet 2UIK078.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 16	RESET the Trip Paths for each tripped PPS Channel, as follows: <ul style="list-style-type: none"> • DEPRESS ESFAS Reset pushbutton(s).
Standard:	DEPRESS the ESFAS reset pushbutton for CCAS Trip Path Channel C on PPS Cabinet 2UIK078.
Examiner Note:	After Channel C has been reset, direct the Machine Operator to reset Channels B and D prior to proceeding.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 17	RESET the Trip Paths for each tripped PPS Channel, as follows: <ul style="list-style-type: none"> • RETURN keyswitch to LK position
Standard:	RETURN keyswitch on PPS Cabinet 2UIK078 for Channel C to the LOCK position and REMOVE the key.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

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: 18	Verify the red, yellow, green, and blue Trip Path indicating lights for SIAS, CCAS and CIAS illuminated on ESFAS status panel.
Standard:	OBSERVE the red, yellow, green, and blue Trip Path indicating lights for SIAS, CCAS and CIAS illuminated on Engineered Safety Feature Actuation System Status Panel.
Terminating Cue:	All trip path lights are illuminated. This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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INITIAL CONDITIONS: A Steam Generator Safety Valve had been stuck open. This led to an RCS overcooling and subsequent SIAS / CCAS. Unit 2 has tripped and is presently in a stable condition. RCS Pressure has been stabilized.

INITIATING CUE: The Control Room Supervisor directs you to reset SIAS / CCAS using SO23-3-2.22, Engineered Safety Features Actuation System Operation, Attachment 5, SIAS / CCAS and CIAS Reset.

Facility: SONGS JPM # 2008 NRC S-5 Task # 139717 K/A # 045.A4.02 2.7 / 2.6 SF-4S

Title: Perform a Manual Turbine Runback

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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: A portion of the San Fernando Valley has separated from the Grid due to a substation failure. The Grid Operations Center is requesting a load decrease to 1100 MWe.

Initiating Cue: The Control Room Supervisor directs you to perform a Manual Turbine Runback to 1100 MWe per SO23-3-2.38, Digital Control System Operation, Section 6.8, Turbine Control Using the DCS, Step 6.8.4, Manual Runback Operation. The Steam Bypass Control System will be used to control Reactor Coolant System temperature.

Task Standard: Locate and correctly perform Critical Steps of SO23-3-2.38.

Required Materials: SO23-3-2.38, Digital Control System Operation, Rev. 3

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

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

Execute IC-245 or any 100% power Initial Condition and then perform the following:

- Place both the 1st Stage Pressure Loop and Frequency Loop in service.

EXAMINER:

Provide the examinee with a copy of:

- SO23-3-2.38, Digital Control System Operation.

Denotes a Critical Step

START TIME:

Perform Step: 1	ENSURE <u>only</u> the FREQUENCY Loop is in service.	
Standard:	DETERMINE that the 1 st STAGE PRESSURE Loop is in service and remove it by performing the following: <ul style="list-style-type: none"> • DEPRESS the LOOPS IN SERVICE SELECT / DESELECT window. • DEPRESS {P2} on the Ovation Keyboard or click 1st STAGE PRESSURE in the W1 Graphics Window. • CLOSE W1 Graphics Window. 	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	Select INITIATE / CANCEL in the MANUAL RUNBACK box.	
Standard:	SELECT INITIATE / CANCEL in the MANUAL RUNBACK box.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	Select INITIATE RUNBACK {P2} in the Confirm Manual Runback window.	
Standard:	SELECT INITIATE RUNBACK {P2} in the Confirm Manual Runback window or DEPRESS {P2} on the Ovation Keyboard	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	Select INITIATE / CANCEL again to reopen the window, if it is closed. This will allow canceling the Runback quickly {P3}, if needed.	
Standard:	SELECT INITIATE / CANCEL again to REOPEN the window in preparation for cancelling the Runback at 1100 MWe.	
Examiner Cue:	Another operator will acknowledge alarms.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Note:	The Manual Runback feature is an approximation. If the examinee stops the Manual Runback at exactly 1100 MWe, it will continue for a few more MWe. This is due to the response of the Governor Control Valves.	
Perform Step: 5	Select INITIATE / CANCEL again to reopen the window, if it is closed. This will allow canceling the Runback quickly {P3}, if needed.	
Standard:	When Turbine load reaches approximately 1100 MWE, DEPRESS {P3} on the Ovation Keyboard <u>or</u> SELECT CANCEL RUNBACK in the W1 Graphics Window.	
Examiner Cue:	Another operator will acknowledge alarms.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 6	<u>When</u> the Manual Runback has completed, <u>then</u> ensure RCS T _{cold} is in the proper band by adjusting Turbine load as required, using the SPEED / LOAD pushbuttons.	
Standard:	ADJUST RCS T _{cold} using the SPEED / LOAD pushbuttons.	
Examiner Cue:	Another operator will monitor temperature.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Examiner Cue:	The Control Room Supervisor directs you to adjust the Control Valve Open Limit (CVOL) to within 5% of current load.	
Perform Step: 7	During steady state operation, CVOL should normally be maintained ≥ 10% above Flow Demand (or 100%, whichever is lower). In some cases (such as a dropped Control Rod), it may be desired to use CVOL to limit load, and it may be set < 10% above flow demand.	
Standard:	SELECT MODIFY in the CONTROL VALVE OPEN LIMIT Box and ADJUST CVOL using the ▼ arrow <u>or</u> DEPRESS 2HS-2211, Main Turbine Valve Open Limit Control LOWER pushbutton to SET within 5% of Load Reference.	
Terminating Cue:	This JPM is complete.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

STOP TIME:	
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INITIAL CONDITIONS: A portion of the San Fernando Valley has separated from the Grid due to a substation failure. The Grid Operations Center is requesting a load decrease to 1100 MWe.

INITIATING CUE: The Control Room Supervisor directs you to perform a Manual Turbine Runback to 1100 MWe per SO23-3-2.38, Digital Control System Operation, Section 6.8, Turbine Control Using the DCS, Step 6.8.4, Manual Runback Operation. The Steam Bypass Control System will be used to control Reactor Coolant System temperature.

Facility: SONGS JPM # 2008 NRC S-6 Task # 186171 K/A # 022.A4.01 3.6 / 3.6 SF-5
 Title: Placing the Containment Emergency Cooling System in Service

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____
 Actual Performance: _____ Simulator: _____
 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 operating in MODE 1. Both Component Cooling Water loops are in service. Both Containment Normal Chillers 2E-201 and 2E-202 have tripped. Containment temperature is greater than 105°F and rising.

Initiating Cue: The Control Room Supervisor directs you to perform SO23-1-4.1, Containment Emergency Cooling, Section 6.1, Placing the Containment Emergency Cooling System in Service.

Task Standard: Locate and correctly perform Critical Steps of SO23-1-4.1 and SO23-2-17.

Required Materials: SO23-1-4.1, Containment Emergency Cooling, Rev. 13
 SO23-2-17, Component Cooling Water System Operation, Rev. 26

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

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

Execute IC-246 or any 100% power Initial Condition and then perform the following:

- Place both CCW Critical Loops in service and start CCW Pump P-026.
- OPEN ECU Valves 2HV-6369, 2HV-6373, 2HV-6367, and 2HV-6371.
- Execute remote functions CH56C & CH56D to secure Normal Containment Chillers.

EXAMINER:

Provide the examinee with a copy of:

- SO23-1-4.1, Containment Emergency Cooling.
- SO23-2-17, Component Cooling Water System Operation.

Denotes a Critical Step

START TIME:

Perform Step: 1	If Containment Emergency Cooling is automatically initiated on high Containment pressure or low Pressurizer pressure, <u>THEN</u> VERIFY system components are operating properly PER SO23-3-2.22, Attachment for SIAS/CCAS Actuation Verification.	
Standard:	DETERMINE that Containment Emergency Cooling is not automatically actuated by OBSERVING Annunciators 57A07 - CCAS TRAIN A ACTUATION and 57B07 - CCAS TRAIN B ACTUATION not illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 2	If average Containment temperature exceeds 105°F, as determined by averaging the temperature at locations TE9902F thru TE9902J digital readout on recorder TJR-9899 (CR60) or TE9902A thru TE9902E on PMS, <u>then</u> PLACE the Containment Emergency Cooling System in service on a system level per the remaining steps of Section 6.1, <u>or</u> PLACE in service on a component level per Section 6.5 as directed by the SRO Ops. Supervisor.	
Standard:	OBSERVE average Containment temperature greater than 105°F using TE9902F through TE9902J digital readout on recorder TJR-9899 on CR-60 or using TE9902A through TE9902E on the Plant Monitoring System.	
Examiner Cue:	The Control Room Supervisor directs you to place the Containment Emergency Cooling System in service on a system level.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 3	ENSURE associated CCW Train is in service.	
Standard:	DETERMINE that both CCW Trains are in service by OBSERVING Train A and Train B CCW Pumps START lights illuminated on CR-64.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Examiner Note:	Provide a copy of SO23-2-17 to the examinee.
Perform Step: 4	Ensure proper CCW Valve configuration per SO23-2-17, Section for CCW ECU Return / SDCHX Outlet Valves Preferred Alignment.
Standard:	<p>REVIEW SO23-2-17, Step 6.1, CCW ECU Return / SDCHX Outlet Valves Preferred Alignment and DETERMINE the following:</p> <ul style="list-style-type: none"> • PLANT STATUS: <ul style="list-style-type: none"> • SDC IS OUT OF SERVICE. • CCW TRAIN STATUS: <ul style="list-style-type: none"> • 2 in SERVICE. • PREFERRED ALIGNMENT: <ul style="list-style-type: none"> • 2 ECU Return Valves OPEN on Both Trains. • 1 SDCHX Outlet Valve OPEN on Train without NCL aligned. • 1 SDCHX Outlet Valve CLOSED on Train with NCL aligned.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	<p>At CR-60, ENSURE by indication that the following Motor Operated Valves are OPEN: CCW to Containment Emergency Cooling Units</p> <ul style="list-style-type: none"> • HV-6366, CCW to CNTMT ECU ME-401 Isolation Valve. • HV-6370, CCW to CNTMT ECU ME-399 Isolation Valve. • HV-6368, CCW to CNTMT ECU ME-400 Isolation Valve. • HV-6372, CCW to CNTMT ECU ME-402 Isolation Valve.
Standard:	<p>At CR-60, VERIFY OPEN CCW to Containment Emergency Cooling Units:</p> <ul style="list-style-type: none"> • 2HV-6366, CCW to CNTMT ECU 2E401 ISO Valve red OPEN light illuminated. • 2HV-6370, CCW to CNTMT ECU 2E399 ISO Valve red OPEN light illuminated. • 2HV-6368, CCW to CNTMT ECU 2E400 ISO Valve red OPEN light illuminated. • 2HV-6372, CCW to CNTMT ECU 2E402 ISO Valve red OPEN light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 6	<p>At CR-60, ENSURE by indication that the following Motor Operated Valves are OPEN: CCW from Containment Emergency Cooling Units</p> <ul style="list-style-type: none"> • HV-6367, CCW from CNTMT ECU ME-401 Isolation Valve. • HV-6371, CCW from CNTMT ECU ME-399 Isolation Valve. • HV-6369, CCW from CNTMT ECU ME-400 Isolation Valve. • HV-6373, CCW from CNTMT ECU ME-402 Isolation Valve.
Standard:	<p>At CR-60, VERIFY OPEN CCW from Containment Emergency Cooling Units:</p> <ul style="list-style-type: none"> • 2HV-6367, CCW from CNTMT ECU 2E401 ISO Valve red OPEN light illuminated. • 2HV-6371, CCW from CNTMT ECU 2E399 ISO Valve red OPEN light illuminated. • 2HV-6369, CCW from CNTMT ECU 2E400 ISO Valve red OPEN light illuminated. • 2HV-6373, CCW from CNTMT ECU 2E402 ISO Valve red OPEN light illuminated.
<p>Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/></p>	

Perform Step: 7	<p>PLACE the Containment Emergency Cooling System in service on a system level by manually initiating a Containment Cooling Actuation Signal using:</p> <ul style="list-style-type: none"> • HS-9138-1 and HS-9138-2 at CR-56 <u>or</u> • HS-9138-3 and HS-9138-4 at CR-53.
Standard:	<p>ACTUATE the Containment Emergency Cooling System by DEPRESSING the following pushbuttons:</p> <ul style="list-style-type: none"> • 2HS-9138-1 CCAS Manual Initiation <u>and</u> 2HS-9138-2 CCAS Manual Initiation at CR-56 <u>or</u> • 2HS-9138-3 CCAS Manual Initiation <u>and</u> 2HS-9138-4 CCAS Manual Initiation at CR-53.
<p>Comment: SAT <input type="checkbox"/> UNSAT <input type="checkbox"/></p>	

Perform Step: 8	VERIFY the following Annunciators actuate: <ul style="list-style-type: none"> • 57A07 - CCAS TRAIN A ACTUATION • 57B07 - CCAS TRAIN B ACTUATION
Standard:	DETERMINE that Containment Emergency Cooling is actuated by OBSERVING the following Annunciators illuminated: <ul style="list-style-type: none"> • 57A07 - CCAS TRAIN A ACTUATION • 57B07 - CCAS TRAIN B ACTUATION
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 9	At CR-60, VERIFY by indication that the following fans have started: Containment Emergency Cooling Fans: <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"><u>Train A</u></td> <td style="text-align: center;"><u>Train B</u></td> </tr> <tr> <td style="text-align: center;">ME-399</td> <td style="text-align: center;">ME-400</td> </tr> <tr> <td style="text-align: center;">ME-401</td> <td style="text-align: center;">ME-402</td> </tr> </table>	<u>Train A</u>	<u>Train B</u>	ME-399	ME-400	ME-401	ME-402
<u>Train A</u>	<u>Train B</u>						
ME-399	ME-400						
ME-401	ME-402						
Standard:	At CR-60, DETERMINE that <u>only</u> the Train B Containment Emergency Cooling Fans 2E-400 and 2E-402 have started and OBSERVE both red START lights illuminated.						
Examiner Cue:	The SRO Operations Supervisor directs you to align components as required per SO23-1-4.1, Section 6.5.						
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>						

Examiner Note:	The following steps represent the alternate path of this JPM. The next Step the examinee will perform is 6.5.4.							
Perform Step: 10	At CR-60, START the following fans as required: Containment Emergency Cooling Fans: <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"><u>Train A</u></td> <td style="text-align: center;"><u>Train B</u></td> </tr> <tr> <td style="text-align: center;">ME-399</td> <td style="text-align: center;">ME-400</td> </tr> <tr> <td style="text-align: center;">ME-401</td> <td style="text-align: center;">ME-402</td> </tr> </table>		<u>Train A</u>	<u>Train B</u>	ME-399	ME-400	ME-401	ME-402
<u>Train A</u>	<u>Train B</u>							
ME-399	ME-400							
ME-401	ME-402							
Standard:	DEPRESS the START pushbuttons for 2HS-9953-1, Containment ECU 2E399 (SW) and 2HS-9947-1, 2E401 Containment ECU (NW) Train A Containment Emergency Cooling Fans and OBSERVE the red START lights illuminated.							
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>							

Perform Step: 11	At CR-60, START the following fans as required: Containment Dome Air Circulator Fans: <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"><u>Train A</u></td> <td style="text-align: center;"><u>Train B</u></td> </tr> <tr> <td style="text-align: center;">MA-071</td> <td style="text-align: center;">MA-072</td> </tr> <tr> <td style="text-align: center;">MA-074</td> <td style="text-align: center;">MA-073</td> </tr> </table>		<u>Train A</u>	<u>Train B</u>	MA-071	MA-072	MA-074	MA-073
<u>Train A</u>	<u>Train B</u>							
MA-071	MA-072							
MA-074	MA-073							
Standard:	DETERMINE that <u>one</u> Train A (2A-071) and <u>two</u> Train B (2A-072 and 2A-073) Containment Dome Air Circulator Fans have started and OBSERVE the red START lights illuminated.							
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>							

Perform Step: 12	At CR-60, START Train A Containment Dome Air Circulator Fan MA-071.	
Standard:	DEPRESS the START pushbutton for 2HS-9967-1, CNTMT Dome Air Circ Fan 2A074 (NE) Train A Containment Dome Air Circulator Fan 2A-074 and OBSERVE the red START light illuminated.	
Terminating Cue:	The Radwaste Operator will verify Component Cooling Water flow to the ECUs. This JPM is complete.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

STOP TIME:	
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INITIAL CONDITIONS: Unit 2 is operating in MODE 1. Both Component Cooling Water loops are in service. Both Containment Normal Chillers 2E-201 and 2E-202 have tripped. Containment temperature is greater than 105°F and rising.

INITIATING CUE: The Control Room Supervisor directs you to perform SO23-1-4.1, Containment Emergency Cooling, Section 6.1, Placing the Containment Emergency Cooling System in Service.

Facility: SONGS JPM # 2008 NRC S-7 Task # 141245 K/A # 006.A1.13 3.5 / 3.7 SF-3
Title: Pressurize a Safety Injection Tank

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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: The Unit is in MODE 1 with all systems OPERABLE. Safety Injection Tank (SIT) T-008 pressure is below the low pressure alarm setpoint.

Initiating Cue: The Control Room Supervisor directs you to increase pressure in SIT T-008 to 630 psia per SO23-3-2.7.1, Safety Injection Tank Operation.

Task Standard: Locate and correctly perform Critical Steps of SO23-3-2.7.1.

Required Materials: SO23-3-2.7.1 Safety Injection Tank Operation, Rev. 16

Validation Time: 7 minutes Time Critical: N/A Completion Time: _____ minutes

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

Execute IC-242 or any 100% power Initial Condition and then perform the following:

- Reduce SIT T-008 pressure to about 620 psig.

EXAMINER:

Provide the examinee with a copy of:

- SO23-3-2.7.1 Safety Injection Tank Operation.

Denotes a Critical Step

START TIME:

Perform Step: 1	Ensure SIT pressure is ≥ 300 psia.
Standard:	OBSERVE 2PI-0312 and/or 2PI-0313, SIT Narrow Range Pressure 2T008 (Loop 1A) and DETERMINE SIT T-008 Narrow Range Pressure is ≥ 300 psia.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 2	VERIFY SIT level is between 79.2% and 82.9% NR.
Standard:	OBSERVE 2LI-0312 and/or 2LI-0313, SIT Narrow Range Level 2T008 (Loop 1A) and DETERMINE that it is between 79.2% and 82.9%.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 3	OPEN SIT Nitrogen Supply Containment Isolation Valve 2(3)HV-5434 and verify SIT Nitrogen header pressure is at least 610 psig (PI-5410).
Standard:	DEPRESS 2HV-5434, SIT N2 Supply ISO Valve OPEN pushbutton and VERIFY SIT Nitrogen header pressure is at least 610 psig on 2PI-5410, N2 Fill Line to SI Tanks Pressure and OBSERVE the red OPEN light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 4	Open Nitrogen Supply Valve to SIT T-008, 2(3)HV-9344.
Standard:	DEPRESS 2HV-9344, SIT 2T008 (Loop 1A) N2 Supply Valve OPEN pushbutton and OBSERVE the red OPEN light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 5	After achieving 630 psia, CLOSE the Nitrogen Supply Valve to SIT T-008, 2HV-9344.	
Standard:	DEPRESS 2HV-9344, SIT 2T008 (Loop 1A) N2 Supply Valve CLOSE pushbutton when the pressure has increased to 630 psia ± 2 psia and OBSERVE the green CLOSE light illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 6	Verify SIT level is between 79.2% and 82.9% NR.	
Standard:	OBSERVE 2LI-0312 and/or 2LI-0313, SIT Narrow Range Level 2T008 (Loop 1A) and DETERMINE that it is between 79.2% and 82.9%.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 7	CLOSE 2(3)HV-5434, SIT Nitrogen Supply Containment Isolation Valve.	
Standard:	DEPRESS 2HV-5434, SIT N2 Supply ISO Valve CLOSE pushbutton and OBSERVE the green CLOSE light illuminated.	
Terminating Cue:	This JPM is complete.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

STOP TIME:	
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INITIAL CONDITIONS: The Unit is in MODE 1 with all systems OPERABLE. Safety Injection Tank (SIT) T-008 pressure is below the low pressure alarm setpoint.

INITIATING CUE: The Control Room Supervisor directs you to increase pressure in SIT T-008 to 630 psia per SO23-3-2.7.1, Safety Injection Tank Operation.

Facility: SONGS JPM # 2008 NRC S-8 Task # 577 K/A # 008.A4.01 3.3 / 3.1 SF-8

Title: Place the Train A CCW / SWC Loop in Standby

Examinee (Print): _____

Testing Method:

Simulated Performance: _____ Classroom: _____

Actual Performance: _____ Simulator: _____

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 operating in MODE 1. Both Component Cooling Water Loops are in service. Preparations are in progress to place the Train A Component Cooling Water / Saltwater Cooling (CCW/SWC) Loop in Standby per Section 6.5, Placing CCW / SWC in Standby Condition. Another operator started the transfer, and has completed up to and including Step 6.5.4.

Initiating Cue: The Control Room Supervisor directs you to continue placing the Train A CCW / SWC Loop in Standby per SO23-2-17, Component Cooling Water System Operation starting at Section 6.7, Transferring the CCW Non-Critical Loop from Critical Loop A to Critical Loop B.

Task Standard: Locate and correctly perform Critical Steps of SO23-2-17.

Required Materials: SO23-2-17, Component Cooling Water System Operation, Rev. 26

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

Comments:

Result: SAT UNSAT

Examiner (Print / Sign): _____ Date: _____

SIMULATOR SETUP**MACHINE OPERATOR:**

Execute IC-248 or any 100% power Initial Condition and then perform the following:

- Place both CCW Critical Loops in service and start CCW Pump P-026.
- Open SDCHX Valve 2HV-6500 and close SDCHX Valve 2HV-6501.
- Ensure the Non-Critical Loop and the Letdown Heat Exchanger are aligned to the Train A CCW Critical Loop.
- Ensure CCW Operator Aid Tags 005-11 has Unit 3 circled on E-336 and Unit 2 circled on E-335.
- Pull CCW Out of Service tags off the Control Board.

EXAMINER:

Provide the examinee with a copy of:

- SO23-2-17, Component Cooling Water System Operation, completed through Step 6.5.4.

Denotes a Critical Step

START TIME:

Examiner Note:	JPM Steps 1 through 12 are done in accordance with Section 6.7 of SO23-2-17.	
Perform Step: 1	ENSURE CCW Train B is running.	
Standard:	OBSERVE CCW Pump P-026 is running on Train B with red START light illuminated and ammeter at ~ 70 amps.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 2	ENSURE CLOSED HV-6500, CCW from SDCHX, ME-003 Block Valve.	
Standard:	DEPRESS 2HV-6500, CCW from SDC HX 2E003 (N) Block Valve CLOSE pushbutton and OBSERVE green CLOSE light illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 3	ENSURE OPEN HV-6371, Containment Emergency Cooler ME-399 CCW Return (PEN 61) Containment Isolation Valve.	
Standard:	OBSERVE 2HV-6371, CCW from CNTMT ECU 2E399 ISO Valve red OPEN light illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 4	ENSURE OPEN HV-6367, Containment Emergency Cooler ME-401 CCW Return (PEN 62) Containment Isolation Valve.	
Standard:	OBSERVE 2HV-6367, CCW from CNTMT ECU 2E401 ISO Valve red OPEN light illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 5	ENSURE OPEN HV-6369, Containment Emergency Cooler ME-400 CCW Return (PEN 60) Containment Isolation Valve.	
Standard:	OBSERVE 2HV-6369, CCW from CNTMT ECU 2E400 ISO Valve red OPEN light illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 6	ENSURE OPEN HV-6373, Containment Emergency Cooler ME-402 CCW Return (PEN 63) Containment Isolation Valve.	
Standard:	OBSERVE 2HV-6373, CCW from CNTMT ECU 2E402 ISO Valve red OPEN light illuminated.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 7	DEPRESS and MAINTAIN DEPRESSED the Open pushbutton for HV-6213 and HV-6219, Critical Loop B Supply and Return to NCL.	
Standard:	DEPRESS and HOLD the OPEN pushbuttons for 2HV-6213 and 2HV-6219, CCW to NCL to/from Loop B Isolation Valves.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 8	<u>When</u> HV-6212 and HV-6218, Critical Loop A Supply and Return to NCL indicate CLOSED, <u>then</u> RELEASE the Open pushbutton for HV-6213 and HV-6219.	
Standard:	OBSERVE the green CLOSE lights illuminate for 2HV-6212 and 2HV-6218, CCW to NCL to/from Loop A Isolation Valves and then RELEASE the OPEN pushbuttons for 2HV-6213 and 2HV-6219, CCW to NCL to/from Loop B Isolation Valves.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 9	Verify 2HV-6213 and 2HV-6219 remain OPEN.
Standard:	VERIFY 2HV-6213 and 2HV-6219 remain OPEN and OBSERVE red OPEN lights remain illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 10	Verify 2HV-6212 and 2HV-6218 are fully CLOSED.
Standard:	VERIFY 2HV-6212 and 2HV-6218 are fully CLOSED and OBSERVE green CLOSE lights remain illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 11	ENSURE OPEN 2HV-6501, CCW from SDCHX ME-004 Block Valve.
Standard:	DEPRESS 2HV-6501, CCW from SDC HX 2E004 (S) Block Valve OPEN pushbutton and OBSERVE red OPEN light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 12	<u>If</u> the Letdown Heat Exchanger is Aligned to Critical Loop A, <u>then</u> evaluate aligning the LDHX to Critical Loop B.
Standard:	DETERMINE that the Letdown Heat Exchanger should be aligned to Critical Loop B.
Examiner Cue:	The Control Room Supervisor directs you to align the Letdown Heat Exchanger to Train B per Section 6.9.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 13	ENSURE the CCW Train that the L/D HX is being transferred to is running.
Standard:	DETERMINE Train B CCW is in service.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 14	CLOSE HV-6293B/A, CCW Critical Loop A Letdown HX ME-062 Return/Supply Valves.	
Standard:	DEPRESS 2HV-6293B/A, CCW CLA LTDN HX 2E062 Supply / Return Valves CLOSE pushbutton and OBSERVE the green CLOSE light illuminated.	
Examiner Cue:	Another operator will acknowledge alarms for the Letdown Heat Exchanger.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 15	OPEN 2HV-6522B/A, CCW Critical Loop B Letdown HX ME-062 Return / Supply Valves.	
Standard:	DEPRESS 2HV-6522B/A, CCW CLB LTDN HX 2E062 Supply / Return Valves OPEN pushbutton and OBSERVE the red OPEN light illuminated.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Examiner Cue:	The Control Room Supervisor directs you to continue with Step 6.5.5.	
Perform Step: 16	ENSURE the Non-Critical Loop is aligned to the train that is to remain in service.	
Standard:	DETERMINE the Non-Critical Loop is aligned to Train B.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 17	ENSURE the Letdown Heat Exchanger is aligned to the train that is to remain in service.	
Standard:	DETERMINE the Letdown Heat Exchanger is aligned to Train B.	
Comment:		SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 18	STOP the CCW Pump on the train being placed in standby.	
Standard:	DEPRESS 2HS-6320-1, CCW Pump 2P025 (C) STOP pushbutton and OBSERVE that the green STOP light illuminates and ammeter indicates 0 amps.	
Examiner Cue:	The Control Room Supervisor directs you to stop the Saltwater Cooling Pump on the train being placed in standby. An operator is standing by the Saltwater Cooling Pump at this time.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 19	If required to stop the SWC Pump on the train being placed in standby, <u>then</u> perform the following: <ul style="list-style-type: none"> • STOP the SWC Pump. 	
Standard:	DEPRESS 2HS-6380-1, Saltwater Pump 2P112 (W) STOP pushbutton and OBSERVE that the green STOP light illuminated and ammeter indicates 0 amps.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 20	If required to stop the SWC Pump on the train being placed in standby, <u>then</u> perform the following: <ul style="list-style-type: none"> • Verify air is entering the piping through the Automatic Vent Valve. 	
Standard:	CONTACT the operator to DETERMINE if air is entering the piping through the Automatic Vent Valve	
Examiner Cue:	Air is entering the piping through the Automatic Vent Valve.	
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>	

Perform Step: 21	<p>If required to stop the SWC Pump on the train being placed in standby, <u>then</u> perform the following:</p> <ul style="list-style-type: none"> • CLOSE the Discharge Valve on the Salt Water Cooling Pump that was secured.
Standard:	DEPRESS 2HV-6200, Saltwater Pump 2P112 (W) Discharge Valve CLOSE pushbutton and OBSERVE that the green CLOSE light illuminated.
Examiner Cue:	Saltwater Cooling Pump P-112 will be secured for 24 hours.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 22	<p>If required to stop the SWC Pump on the train being placed in standby, <u>then</u> perform the following:</p> <ul style="list-style-type: none"> • CLOSE SWC Bearing Seal Water Supply Valve.
Standard:	DEPRESS 2HV-6376, Saltwater Pump 2P112 (W) Bearing Water Supply Valve CLOSE pushbutton and OBSERVE green CLOSE light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 23	<p>If required to stop the SWC Pump on the train being placed in standby, <u>then</u> perform the following:</p> <ul style="list-style-type: none"> • ENSURE CLOSED the SWC Heat Exchanger Outlet Valve.
Standard:	DEPRESS 2HV-6497, Saltwater from CCW HX 2E001 Circ Water Block Valve CLOSE pushbutton and OBSERVE green CLOSE light illuminated.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 24	<p>If required to stop the SWC Pump on the train being placed in standby, <u>then</u> perform the following:</p> <ul style="list-style-type: none"> If the SWC Pump Discharge is aligned to the Seawall, <u>then</u> ENSURE OPEN the SWC from CCW HX Overflow Block Valve to Seawall.
Standard:	DETERMINE SWC Pump Discharge is not aligned to the Seawall.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 25	ENSURE ECU Return Valves and Shutdown Cooling Heat Exchanger CCW Outlet Valves are positioned per table in Section 6.1.
Standard:	<p>OBSERVE two (2) ECU Return Valves are OPEN on both Trains:</p> <ul style="list-style-type: none"> 2HV-6367, CCW from CNTMT ECU to 2E401 ISO Valve for Train A. 2HV-6371, CCW from CNTMT ECU to 2E399 ISO Valve for Train A. 2HV-6369, CCW from CNTMT ECU to 2E400 ISO Valve for Train B. 2HV-6373, CCW from CNTMT ECU to 2E402 ISO Valve for Train B.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Perform Step: 26	ENSURE ECU Return Valves and Shutdown Cooling Heat Exchanger CCW Outlet Valves are positioned per table in Section 6.1.
Standard:	DEPRESS the CLOSE pushbutton for 2HV-6501, CCW from SDC HX 2E004 (S) Block Valve and OBSERVE green CLOSE light illuminated and VERIFY that 2HV-6500, CCW from SDC HX 2E003 (N) Block Valve is closed and OBSERVE green CLOSE light illuminated.
Terminating Cue:	Component Cooling Water Out of Service tags will be placed on the Control Boards by another operator. This JPM is complete.
Comment:	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STOP TIME:	
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INITIAL CONDITIONS: Unit 2 is operating in MODE 1. Both Component Cooling Water Loops are in service. Preparations are in progress to place the Train A Component Cooling Water / Saltwater Cooling Loop in Standby per Section 6.5, Placing CCW / SWC in Standby Condition. Another operator started the transfer, and has completed up to and including Step 6.5.4.

INITIATING CUE: The Control Room Supervisor directs you to continue placing the Train A CCW / SWC Loop in Standby per SO23-2-17, Component Cooling Water System Operation starting at Section 6.7, Transferring the CCW Non-Critical Loop from Critical Loop A to Critical Loop B.

Facility:	SONGS 2 and 3	Scenario No.:	2	Op Test No.:	2008 NRC
Examiners:	_____	Operators:	_____	_____	_____
	_____		_____	_____	_____
	_____		_____	_____	_____

- Initial Conditions:
- 72% power MOC - RCS Boron is 1353 ppm (by sample)
 - Train A Component Cooling Water Pump (P-025) in service
 - Train B Charging Pump (P-192) OOS
 - Train B Auxiliary Feedwater Pump (P-504) OOS
 - Train B Saltwater Cooling Pump (P-113) OOS
 - Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS
 - Fire Computer OOS

Turnover: Dilution and power ascension in progress at 10% per hour.

- Critical Tasks:
- Restore flow to the Non-Critical Loop (RCPs operating).
 - Stabilize RCS Temperature following loss of heat removal from the faulted SG.
 - Isolate the most affected Steam Generator (ESDE).

Event No.	Malf. No.	Event Type*	Event Description
1 + 15 min		R (RO) N (BOP, CRS)	Dilution and power ascension at 10% per hour.
2 + 20 min	FC05B	I (BOP, CRS)	Steam Generator E-088 Master Controller Setpoint failure to 55% Steam Generator level.
3 + 35 min	SG06A	C (RO, CRS) TS (CRS)	Steam Generator tube leak on E-088 at ~1 gpm.
4 + 45 min	CV22A	C (RO, CRS) TS (CRS)	Charging Pump (P-190) low lube oil pressure alarm and subsequent trip.
5 + 50 min	SG06A	M (ALL)	Steam Generator tube rupture on E-088 at 300 gpm (5 minute ramp).
6 + 55 min	MS01J MS01K	M (ALL)	Excess Steam Demand Event outside Containment due to two (2) Main Steam Safety Valves failing open on SG E-089.
7 + 55 min	CCW LP	C (BOP)	Component Cooling Water Non-Critical Loop Valves (HV-6212 & HV-6218) close.
8 + 55 min	SIAS / CCAS LP	I (RO)	Safety Injection Actuation and Containment Cooling Actuation Signals (CCAS) fail to actuate. Manual actuation required.

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

SCENARIO SUMMARY NRC #2

The crew will assume the watch and resume a dilution and power ascension per SO23-5-1.7, Power Operations at 10% per hour.

When the power change is underway, Steam Generator E-088 Feedwater Master Controller Setpoint will fail to 55% level. The crew will regain control of feedwater flow and restore Steam Generator level per the Annunciator Response Procedures (ARP) and Abnormal Operating Instruction (AOI) SO23-13-24, Feedwater Malfunctions.

Once the secondary plant has stabilized, a small leak (~1 gpm) will develop on Steam Generator E-088. The crew will diagnose a Steam Generator tube leak per the ARP and AOI SO23-13-14, Reactor Coolant System Leak. The CRS will evaluate Technical Specifications.

This event is followed by a trip of the running Charging Pump, P-190. The RO should attempt to start Charging Pump P-191 before Letdown isolates. RO actions are addressed per the ARPs and SO23-3-2.1, Chemical and Volume Control System Operations. With a second Charging Pump out of service, the CRS will be required to evaluate Technical Specifications and determine that a plant shutdown is required.

Once the decision to shutdown is made, the Steam Generator tube leak will progress to a rupture at 300 gpm. The crew will trip the Reactor and Turbine and perform Emergency Operating Instruction (EOI) SO23-12-1, Standard Post Trip Actions (SPTAs). The crew will transition to EOI SO23-12-4, Steam Generator Tube Rupture and commence actions to cool down the Reactor Coolant System. Once entry into SO23-12-4 is started, two Main Steam Safety Valves will open on Steam Generator E-089. The crew diagnoses an ESDE outside Containment along with a SGTR. This will necessitate a transition to EOI SO23-12-9, Functional Recovery.

Following the trip, the BOP will be required re-open the Component Cooling Water Non-Critical Loop Valves (HV-6212 & HV-6218) or transfer CCW to Train B and the RO will be required to manually initiate a Safety Injection Actuation Signal (SIAS) and Containment Cooling Actuation Signal (CCAS).

The scenario is terminated when the most affected Steam Generator is isolated and Reactor Coolant System temperature is stabilized following SG dryout.

Risk Significance:

- Risk important components out of service: CHG P-192, AFW P-504, SWC P-113
- Failure of risk important system prior to trip: Charging Pump trip
- Risk significant core damage sequence: SGTR with ESDE
- Risk significant operator actions: Restore CCW NCL flow
Manually initiate SIAS and CCAS
Isolate most affected Steam Generator
Stabilize RCS temperature

Scenario Event Description

NRC Scenario 2

SONGS

2008 Facility NRC Initial License Examination

Simulator Scenario Setup

Scenario 2

Machine Operator: EXECUTE IC #222 and NRC Scenario #2 SETUP file to align components.

HANG Control Board Tags on P-192, P-504, and P-113.

CHANGE Operator Aid Tags #029 (CVCS) and #005-4 (CVCS Ion Exchanger) to reflect the scenario boron concentration.

RESET CVCS PMW Batch Counter to 990 gallons.

ENSURE Charging Pump P190 is running and P191 is OFF.

VERIFY both Pressurizer Spray Valves in AUTO.

PLACE procedures in progress on the RO desk:

- MARKED UP copy of SO23-5-1.7 open to Step 6.3.15.9, 50-80% Reactor Power.

- MARKED UP copy of SO23-5-1.7, Attachment 9.

- MARKED UP copy of SO23-3-2.2 with Steps 6.5.1 through 6.5.5 checked off.

- Copy of SO23-3-1.10 open to Section 6.2, Forcing Pressurizer Sprays.

VERIFY that dilution alignment is required then PLACE in FREEZE.

PLACE the MOC copies of OPS Physics Summary Book on RO Desk and SO23-5-1.7, Attachment 8 on Control Board.

If Group Position(s) is (are) not correct (PLCEAs @120"), MOVE CEAs and then RETURN CEAs to Shift Turnover Sheet position(s).

Control Room Annunciators in Alarm:

57B58 – EMERGENCY FEEDWATER SYS TRAIN B INOPERABLE

58A52 – CHARGING PUMP P191 OVERRIDE / NOT IN AUTO

58A53 – CHARGING PUMP P192 OVERRIDE / NOT IN AUTO

Operating Test :	<u> NRC </u>	Scenario #	<u> 2 </u>	Event #	<u> 1 </u>	Page	<u> 146 </u>	of	<u> 216 </u>
Event Description: Power Ascension at 10% per hour									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When turnover is complete, PLACE Simulator in RUN.

+1 min	CRS	DIRECT performance of SO23-5-1.7, Power Operations and SO23-3-2.2, Makeup Operations.
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	RO	VERIFY Batch Counter and Makeup Integrator settings.
--	----	--

Floor Cue: If Shift Manager is asked about starting a 2nd Charging Pump or if the CRS directs starting a 2nd Charging Pump, REPORT that Charging Pump P191 is for Emergency Use Only per the Shift Turnover Sheet.

	RO	PERFORM dilution valve alignment.
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- PLACE FV-9253 in OPEN.

- VERIFY FIC-0210X in AUTO at ~16.5 gpm.

- PLACE HS-0210 in DILUTE.

	RO	VERIFY Tcold changing as dilution progresses.
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Floor Cue: If asked about ASI control, REPORT as Reactor Engineering to attempt to maintain ASI per the MOC ESI Curves.

	RO	ADJUST CEAs as required for ASI control.
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+15 min	BOP	MAINTAIN Tcold within required band by raising Main Generator load using HS-2210, Main Turbine Speed Load Control to RAISE.
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When power has been raised 3 to 5%, or at Lead Evaluator's discretion, PROCEED to Event 2.

Operating Test :	<u> NRC </u>	Scenario #	<u> 2 </u>	Event #	<u> 2 </u>	Page	<u> 147 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator E088 Master Controller Setpoint Failure </u>									
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 2.
- FC05B, E088 Master Controller Setpoint failure to 55% level.**

Indications available:

52A02 - FWCS SG2 E088 LEVEL DEVIATION

52A13 - FWCS TROUBLE

53B23 - CONDENSATE FLOW BALANCE TROUBLE

SG E088 Feedwater Control Valve modulating closed then open

SG E088 level lowering

+30 sec	BOP	REFER to Annunciator Response Procedure.
	BOP	RECOGNIZE E088 Master Controller Setpoint at 55% and INFORM the CRS AOI SO23-13-24 entry required.
	CRS	DIRECT performance of AOI SO23-13-24, Feedwater Control System Malfunctions.
	BOP	DETERMINE that SG E088 level is low.
	BOP	DETERMINE that SG E088 Master Controller output is lowering.
+5 min	BOP	PLACE SG E088 Master Controller in PREFERRED MANUAL and raise output.
<u>Floor Cue:</u> REPORT as Shift Manager to maintain SG level at 68%.		
	BOP	DETERMINE that SG E088 Feed Control Valve is opening.
	BOP	DETERMINE that Main Feedwater Pumps K-005 and K-006 speed is rising.

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 2 </u> Page <u> 148 </u> of <u> 216 </u>		
Event Description: <u> Steam Generator E088 Master Controller Setpoint Failure </u>		
Time	Position	Applicant's Actions or Behavior

M.O. Cue: When SG level is controlled, DELETE malfunction FC05B and REPORT as I&C that the problem has been corrected and the Master Controller may be returned to AUTO.

+10 min	BOP	VERIFY SG E088 level is stable at or near program level with SG E088 Master Controller in MANUAL.
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When SG level is restored, or at Lead Evaluator's discretion, PROCEED to Event 3.

Operating Test :	<u> NRC </u>	Scenario #	<u> 2 </u>	Event #	<u> 3 </u>	Page	<u> 149 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Leak on E088 </u>									
Time	Position	Applicant's Actions or Behavior							

<u>Machine Operator:</u> When directed, EXECUTE Event 3. - SG06A @ 0.01%, Steam Generator E088 Tube Leak at ~1 gpm.		
<u>Indications available:</u> 60A46 – SECONDARY RADIATION HI		
+5 min	RO/BOP	REFER to Annunciator Response Procedures.
	BOP	RECOGNIZE increasing radiation levels and INFORM the CRS AOI SO23-13-14 entry required.
	CRS	DIRECT performance of SO23-13-14, RCS Leak, Section for Primary to Secondary leakage.
		<ul style="list-style-type: none"> REQUEST Chemistry to confirm and quantify the Steam Generator tube leak by sampling the Condenser Air Ejector discharge.
<u>M.O. Cue:</u> When contacted as Chemistry, WAIT 5 minutes and REPORT that a frisk of the SG sample indicates high activity in SG E088. WAIT another 5 minutes, and then REPORT that high activity in SG E088 is verified.		
	CREW	DETERMINE Radiation Monitor status: <ul style="list-style-type: none"> Air Ejector High Range 7870 in alarm. Main Steam Line 7874A1 (E-088) in alarm. SG Blowdown 6759 (E-088) in alarm after a time delay.
	CRS	DETERMINE that high radiation is due to a SG tube leak on SG E-088.
	CRS/RO	VERIFY PZR level is lowering and START Charging Pumps as required to maintain Pressurizer level.
	CRS/RO	VERIFY VCT level is being maintained within programmed band.
	CRS/RO	VERIFY RCS leak is less than 25 gpm.
	CRS/RO	VERIFY Pressurizer level NOT lowering with all available Charging Pumps

Operating Test :	<u> NRC </u>	Scenario #	<u> 2 </u>	Event #	<u> 3 </u>	Page	<u> 150 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Leak on E088 </u>									
Time	Position	Applicant's Actions or Behavior							

		operating.
	CRS/RO	VERIFY PZR level stable or rising.
	CRS/RO	VERIFY that the SG tube leak is large enough to be confirmed by:
		<ul style="list-style-type: none"> • A mismatch in Charging and Letdown indications, AND
		<ul style="list-style-type: none"> • Air Ejector, Steam Generator Blowdown, or Main Steam Line Rad Monitor indications.
	BOP	Manually INITIATE one Train of CRIS.
	CREW	CONFIRM leakage using all available indications.
	CRS	DETERMINE leak rate and action from Step 4.p table:
		<ul style="list-style-type: none"> • Leakage is > 720 GPD (1/2 gpm).
		<ul style="list-style-type: none"> • DIRECT performance of Attachment 3, Minimizing Contamination During a SG Tube Leak.
		<ul style="list-style-type: none"> • Concurrently DIRECT a rapid shutdown per SO23-5-1.7 to be < 50% power within 1 hour and in Mode 3 within next 2 hours.
	BOP	PERFORM Attachment 3, Minimizing Contamination During a SG Tube Leak.
		<ul style="list-style-type: none"> • PLACE Vacuum Pump P-054 in service.
		<ul style="list-style-type: none"> • PLACE A-361, Air ejector Unit in DIRECT.
		<ul style="list-style-type: none"> • CLOSING HV-4054, Blowdown Isolation to E-088.
		<ul style="list-style-type: none"> • PLACE LV-3245, Condenser Draw Off Valve to DISABLE.
		<ul style="list-style-type: none"> • NOTIFY Chemistry to sample Condenser Draw Off line.
		<ul style="list-style-type: none"> • PLACE Condenser Hotwell Overboarding System in MANUAL.
		<ul style="list-style-type: none"> • BYPASS the Full Flow Condensate Polishers.

Operating Test :	<u> NRC </u>	Scenario #	<u> 2 </u>	Event #	<u> 3 </u>	Page	<u> 151 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Leak on E088 </u>									
Time	Position	Applicant's Actions or Behavior							

+15 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> • LCO 3.4.13.B, RCS Operational Leakage.
		<ul style="list-style-type: none"> • CONDITION B - Primary to secondary LEAKAGE not within limits. • ACTION B.1 - Be in MODE 3 in 6 hours. • ACTION B.2 - Be in MODE 5 in 36 hours.
<p><i>When Technical Specifications have been addressed, or at Lead Evaluator's discretion, PROCEED to Event 4.</i></p>		

Operating Test :	<u> NRC </u>	Scenario #	<u> 2 </u>	Event #	<u> 4 </u>	Page	<u> 152 </u>	of	<u> 216 </u>
Event Description: Charging Pump (P-190) Low Lube Oil Pressure and Subsequent Trip									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, EXECUTE Event 4.
- CV22A, Charging Pump P190 low lube oil pressure and subsequent trip.

Indications Available:

58A38 - CHARGING PUMP P190 LUBE OIL PRESS LO (initial alarm)
58A12 - CHARGING HEADER FLOW LO (following pump trip unless P191 is started)
58A41 - CHARGING PUMP P190 OC (following pump trip)

+30 secs	RO	REFER to Annunciator Response Procedures.
	RO	DISPATCH an operator to Charging Pump P190 to determine cause of alarm.
	RO	DETERMINE Charging Pump P190 has tripped and INFORM the CRS.
	CRS	DIRECT placing Standby Charging Pump P191 in service.
	RO	START Charging Pump P191.
	RO	PLACE Charging Pump P190 in MANUAL and STOP.
	RO	If desired, POSITION Backup Charging Pump Selector Switch to P192 / P190.
	RO	If desired, PLACE Charging Pump P191 in AUTO.
	CRS	DISPATCH a PEO to the 50' Control Building to determine the cause of the trip and DIRECT performance of SO23-3-2.1, CVCS Operations to align systems to normal.

M.O. Cue: When directed to check Charging Pump 2P190, WAIT 3 minutes, then REPORT that the motor is unusually warm and there is lube oil on the floor.

M.O. Cue: When directed to check Charging Pump 2P190 Train A breaker (2B0413), WAIT 3 minutes, then REPORT that there are no signs of distress and the trip indicator on the front of the breaker is sticking out.

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 4 </u> Page <u> 153 </u> of <u> 216 </u>		
Event Description: Charging Pump (P-190) Low Lube Oil Pressure and Subsequent Trip		
Time	Position	Applicant's Actions or Behavior

	CRS	CONTACT Maintenance to investigate Charging Pump P190.
<u>M.O. Cue:</u> If Maintenance is called to investigate 2P190, WAIT 3 minutes and then RECOMMEND racking out the breaker.		
<u>M.O. Cue:</u> When directed to rack out 2P190 breaker (2B0413), WAIT 2 minutes then EXECUTE remote functions CV77A and CV78A, P190 Charging Pump DC Power and Pump Breaker, and REPORT that 2P190 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-190.
+10 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> • 3.1.9.A, Boration Systems - Operating. • CONDITION A - One boron injection flowpath INOPERABLE. • ACTION A - Restore boron injection flowpath to OPERABLE within 72 hours.
<i>When systems are re-aligned to normal <u>and</u> Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Events 5, 6, 7, and 8.</i>		

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	154	of	216
Event Description: SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, EXECUTE Events 5, 6, 7, and 8.

- SG06A @0.83%, SGTR on E088 at ~300 gpm (on 5 minute ramp).
- MS01J, Main Steam Safety Valve opens on SG E089 on Reactor trip.
- MS01K, Main Steam Safety Valve lifts on SG E089 (+5 minutes).
- SIAS / CCAS LP, SIAS and CCAS fail to actuate.
- CCW LP, CCW Non-Critical Loop Valves (HV-6212 & 6218) close.

Indications available:

63B02 – UNIT 2 CRITICAL PARAMETER PROBLEM (reflash)

60A46 – SECONDARY RADIATION HI (reflash)

50A23 – PZR LEVEL ERROR LO

+1 min	RO	RECOGNIZE that Steam Generator tube leak has increased.
	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	VERIFY Reactor Trip:
		<ul style="list-style-type: none"> • 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:
		<ul style="list-style-type: none"> • VERIFY Main Turbine tripped. • HP and LP Stop and Governor Valves closed. • VERIFY both Unit Output Breakers open. • VERIFY Main Turbine speed <2000 RPM or lowering.

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 5, 6, 7, & 8 </u> Page <u> 155 </u> of <u> 216 </u>		
Event Description: <u> SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close </u>		
Time	Position	Applicant's Actions or Behavior
	CRS	INITIATE Administrative Actions:
		<ul style="list-style-type: none"> ANNOUNCE Reactor trip via PA system.
		<ul style="list-style-type: none"> INITIATE Attachment 4, Worksheet.
		<ul style="list-style-type: none"> INITIATE Attachment 5, Administrative Actions.
	BOP	VERIFY Vital Auxiliaries functioning properly:
		<ul style="list-style-type: none"> VERIFY both 1E 4 kV Buses A04 and A06 energized.
		<ul style="list-style-type: none"> VERIFY both 1E 480 V Buses B04 and B06 energized.
		<ul style="list-style-type: none"> VERIFY all Class 1E DC Buses energized.
		<ul style="list-style-type: none"> VERIFY all Non-1E 4 kV Buses energized.
		<ul style="list-style-type: none"> DETERMINE one CCW Train operating and aligned to Letdown Heat Exchanger and NOT aligned to Non-Critical Loop.
CRITICAL TASK STATEMENT		With loss of flow to the CCW Non-Critical Loop and prior to exceeding RCP operating limits, restore flow to the NCL from any available CCW train.
CRITICAL TASK	BOP	OPEN Component Cooling Water Non-Critical Loop Valves HV-6212 and HV-6218 <u>or</u> START Train B CCW Pump and TRANSFER the CCW Non-Critical Loop and Letdown Heat Exchanger to Train B.
<u>M.O. Cue:</u>		If directed to check Main Steam Safety Valve status, REPORT that there is steam coming from the south MSIV roof.
	RO	DETERMINE RCS Inventory Control criteria NOT satisfied:
		<ul style="list-style-type: none"> DETERMINE PZR level NOT between 10% and 70% AND NOT trending to between 30% and 60%.
		<ul style="list-style-type: none"> [RNO] DETERMINE PZR Level Control System is NOT restoring PZR level.
		<ul style="list-style-type: none"> VERIFY Core Exit Saturation Margin $\geq 20^{\circ}\text{F}$:
		<ul style="list-style-type: none"> QSPDS page 611.
		<ul style="list-style-type: none"> CFMS page 311.

Operating Test :	<u> NRC </u>	Scenario #	<u> 2 </u>	Event #	<u> 5, 6, 7, & 8 </u>	Page	<u> 156 </u>	of	<u> 216 </u>
Event Description: <u> SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close </u>									
Time	Position	Applicant's Actions or Behavior							

	RO	DETERMINE RCS Pressure Control criteria NOT satisfied:
		<ul style="list-style-type: none"> DETERMINE PZR pressure (WR and NR) NOT between 1740 PSIA and 2380 PSIA AND NOT trending to between 2025 PSIA and 2275 PSIA.
		<ul style="list-style-type: none"> [RNO] DETERMINE PZR Pressure Control System is NOT restoring PZR pressure.
		<ul style="list-style-type: none"> [RNO] ENSURE Normal and Auxiliary Spray valves closed.
		<ul style="list-style-type: none"> [RNO] ENSURE SIAS, CCAS, and CRIS actuated.
	RO	<ul style="list-style-type: none"> [RNO] DETERMINE CCAS did not actuate and manually ALIGN Containment Cooling components.
		<ul style="list-style-type: none"> [RNO] If PZR pressure is < 1430 PSIA, then ENSURE at least one RCP in each loop - stopped.
	RO	<ul style="list-style-type: none"> [RNO] STOP one RCP in each loop.
		<ul style="list-style-type: none"> [RNO] If RCP NPSH requirements NOT satisfied, then ENSURE all RCPs - stopped.
	RO	VERIFY Core Heat Removal criteria satisfied:
		<ul style="list-style-type: none"> VERIFY at least one RCP operating.
		<ul style="list-style-type: none"> VERIFY Core Loop $\Delta T < 10^{\circ}\text{F}$.
		<ul style="list-style-type: none"> VERIFY Core Exit Saturation Margin $\geq 20^{\circ}\text{F}$.
		<ul style="list-style-type: none"> QSPDS page 611.
		<ul style="list-style-type: none"> CFMS page 311.
	BOP	DETERMINE RCS Heat Removal criteria NOT satisfied:
		<ul style="list-style-type: none"> VERIFY at least one SG level between 21% and 80% NR and Feedwater available.
		<ul style="list-style-type: none"> DETERMINE T_{cold} less than 545°F and NOT controlled.
		<ul style="list-style-type: none"> DETERMINE heat removal is excessive:
		<ul style="list-style-type: none"> [RNO] $T_{\text{cold}} < 545^{\circ}\text{F}$.
		<ul style="list-style-type: none"> [RNO] ENSURE SBCS valves closed.
		<ul style="list-style-type: none"> [RNO] ENSURE ADVs closed.
		<ul style="list-style-type: none"> [RNO] ENSURE SG Blowdown valves closed.
		<ul style="list-style-type: none"> <u>E-088</u> - HV-4054 <u>E-089</u> - HV-4053
		<ul style="list-style-type: none"> [RNO] ENSURE Main Steam to Reheater Valves closed.

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 5, 6, 7, & 8 </u> Page <u> 157 </u> of <u> 216 </u>		
Event Description: <u> SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close </u>		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> • DETERMINE SG pressures – less than 740 PSIA.
		<ul style="list-style-type: none"> • [RNO] ENSURE MSIS actuated.
	RO	DETERMINE Containment Isolation criteria NOT satisfied:
		<ul style="list-style-type: none"> • VERIFY Containment pressure < 1.5 PSIG.
		<ul style="list-style-type: none"> • VERIFY Containment Area Radiation Monitors energized AND NOT alarming or trending to alarm.
		<ul style="list-style-type: none"> • DETERMINE Secondary Plant Radiation Monitors energized AND alarming or trending to alarm.
	RO	VERIFY Containment Temperature and Pressure criteria satisfied:
		<ul style="list-style-type: none"> • VERIFY Containment average temperature < 120°F.
		<ul style="list-style-type: none"> • VERIFY Containment pressure < 1.5 PSIG.
+15 min	CRS	DIAGNOSE event in progress:
		<ul style="list-style-type: none"> • DETERMINE some Safety Function criteria are NOT met per Attachment 4, Worksheet.
		<ul style="list-style-type: none"> • [RNO] COMPLETE Attachment 1, Recovery Diagnostics.
		<ul style="list-style-type: none"> • [RNO] DIAGNOSE event as ESDE on SG E089 and a SGTR on SG E088.
		<ul style="list-style-type: none"> • DETERMINE that Reactor Trip Recovery is NOT diagnosed.
		<ul style="list-style-type: none"> • [RNO] DETERMINE one RCP in each loop stopped.
		<ul style="list-style-type: none"> • DIRECT initiating Steps 12 through 15.
	BOP	INITIATE Steps 12 through 15.
<u>Examiner Note:</u> When SG E089 reaches dryout conditions the crew should initiate FS-30, Establish Stable RCS Temperature during ESDE.		
	CRS	DIRECT performance of SO23-12-9, Functional Recovery.
		<ul style="list-style-type: none"> • RECORD time of EOI entry _____.

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	158	of	216
Event Description: SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close									
Time	Position	Applicant's Actions or Behavior							

	CRS	VERIFY Functional Recovery diagnosis:
		<ul style="list-style-type: none"> INITIATE SO23-12-10, Safety Function Status Checks.
		<ul style="list-style-type: none"> INITIATE Foldout Page.
		<ul style="list-style-type: none"> DIRECT performance of FS-7, Verify SI Throttle/Stop Criteria.
		<ul style="list-style-type: none"> DIRECT performance of Attachment 22, Non-Qualified Loads Restoration.
		<ul style="list-style-type: none"> DIRECT performance of FS-30, Stabilize RCS Temperature.
		<ul style="list-style-type: none"> DIRECT performance of Attachment 28, Isolation of SG with ESDE.
		<ul style="list-style-type: none"> INITIATE sampling of both Steam Generators for radioactivity and boron.
<u>M.O. Cue:</u> If directed to sample SGs, WAIT 10 minutes and then REPORT that E088 has elevated radiation levels and boron levels. If the SG sample valves are closed, REPORT that you are unable to establish sample flow.		
	CRS	INITIATE Administrative Actions:
		<ul style="list-style-type: none"> NOTIFY Shift Manger/Operations Leader of entry into SO23-12-9, Functional Recovery.
		<ul style="list-style-type: none"> ENSURE Emergency Plan is initiated.
		<ul style="list-style-type: none"> IMPLEMENT Placekeeper.
	RO	VERIFY ESF actuation.
		<ul style="list-style-type: none"> VERIFY SIAS actuation required.
		<ul style="list-style-type: none"> PZR pressure less than SIAS setpoint OR:
		<ul style="list-style-type: none"> Containment pressure > 3.4 PSIG OR:
		<ul style="list-style-type: none"> ENSURE the following actuated:
		<ul style="list-style-type: none"> SIAS / CCAS / CRIS
	RO/BOP	VERIFY SIAS, CCAS, CRIS actuated.
	CRS	RECORD time of SIAS _____.

Operating Test : <u> NRC </u> Scenario # <u> 2 </u> Event # <u> 5, 6, 7, & 8 </u> Page <u> 159 </u> of <u> 216 </u>		
Event Description: <u> SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close </u>		
Time	Position	Applicant's Actions or Behavior
	BOP	STOP unloaded Diesel Generators (SIAS Override STOP).
	BOP	PERFORM EOI SO23-12-11, Attachment 22, Non-Qualified Load Restoration.
<u>M.O. Cue:</u> When directed to restore non-qualified loads, WAIT 2 minutes, then EXECUTE ED85, Non-Qualified Loads Restoration. INFORM the Control Room that you have restored non-qualified loads.		
	RO	VERIFY RCP NPSH requirements of EOI SO23-12-11, Attachment 29.
	RO	ESTABLISH Optimum SI Alignment:
		<ul style="list-style-type: none"> • ESTABLISH two train operation: • All available Charging Pumps operating. • One HPSI and one LPSI per train operating. • All Cold Leg flow paths aligned. • VERIFY SI flow required: <ul style="list-style-type: none"> • SI flow indicated OR RCS pressure >1250 psia.
		OR
		<ul style="list-style-type: none"> • VERIFY FS-7, Verify SI Throttle/Stop criteria satisfied.
	CRS	DETERMINE NO Safety Function Recovery Attachments (FR-1 through FR-8) indicated by optimal EOIs.
	CRS	IMPLEMENT Precautionary Actions:
	RO	<ul style="list-style-type: none"> • VERIFY boration > 40 GPM.
	RO	<ul style="list-style-type: none"> • ENSURE one RCP in each loop stopped.
	CRS	DETERMINE Excess Steam Demand Event indicated.
	BOP	<ul style="list-style-type: none"> • [RNO] INITIATE EOI SO23-12-11, Attachment 28, Isolation of Steam Generator with ESDE.
	BOP	<ul style="list-style-type: none"> • [RNO] INITIATE FS-30, Establish Stable RCS Temperature during ESDE.

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	160	of	216
Event Description: SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close									
Time	Position	Applicant's Actions or Behavior							

	CRS	DETERMINE Steam Generator Tube Rupture indicated.
	RO	<ul style="list-style-type: none"> [RNO] INITIATE Attachment FR-6, Recovery-Containment Isolation Success Path CI-2, Steam Generator Isolation.
	CRS	VERIFY Loss of Feedwater NOT indicated.
<u>Examiner Note:</u> The following steps are for FS-30, Establish Stable RCS Temperature during ESDE.		
+20 min	BOP	DETERMINE SG least affected by ESDE, SG E088, NOT isolated for SGTR.
	CRS	<ul style="list-style-type: none"> [RNO] OBTAIN approval from the Shift Manager/Operations Leader to use Steam Generator E088.
	CRS	<ul style="list-style-type: none"> [RNO] NOTIFY Shift Manager/Operations Leader to monitor radiological release rates and applicable area dose rates.
	BOP	VERIFY most affected SG level E089 - less than 50% WR.
	BOP	PERFORM the following on least affected SG E088:
		<ul style="list-style-type: none"> TRANSFER ADV to Auto/Modulate.
		<ul style="list-style-type: none"> MAINTAIN least affected SG pressure 200 PSIA above most affected SG pressure.
	BOP	VERIFY SG dryout on most affected SG E089:
		<ul style="list-style-type: none"> RCS Tcold - stable or rising, OR
		<ul style="list-style-type: none"> SG pressure - 200 PSIA
<u>Examiner Note:</u> Tcold may still be decreasing at the time that SG E089 reaches dryout.		

Operating Test :	NRC	Scenario #	2	Event #	5, 6, 7, & 8	Page	161	of	216
Event Description: SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close									
Time	Position	Applicant's Actions or Behavior							

CRITICAL TASK STATEMENT		<p>With loss of heat removal from the affected SG, transfer the primary to secondary heat sink to the least affected SG. Actions shall include the following:</p> <ul style="list-style-type: none"> • Steaming of the least affected (non-ESDE) SG to maintain P_{sat} for lowest RCS T_c ; • Manipulation of feedwater controls to maintain SG level of 40% to 80% NR.
CRITICAL TASK	BOP	<p>STABILIZE least affected SG E088 pressure:</p> <ul style="list-style-type: none"> • VERIFY ADV on SG E088 in Auto/Modulate. • MAINTAIN P_{sat} for lowest RCS T_{cold} on SG E088. • STABILIZE AFW flow on SG E088.
	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 E088 to maintain level between 40% and 80% NR.
Examiner Note: The following steps are from EOI SO23-12-11, Attachment 28, Isolation of SG with ESDE.		
	CRS/BOP	DETERMINE E089 is the most affected SG.
	CRS	NOTIFY Shift Manager / Operations Leader of the SG most affected by the ESDE.
	BOP	DETERMINE SG least affected by ESDE available for heat removal is affected by SGTR.
	CRS	<ul style="list-style-type: none"> • [RNO] REQUEST Shift Manager/Operations Leader to evaluate radiological releases from SG E088.

Operating Test :	<u> NRC </u>	Scenario #	<u> 2 </u>	Event #	<u> 5, 6, 7, & 8 </u>	Page	<u> 162 </u>	of	<u> 216 </u>
Event Description: <u> SGTR on E088 / ESDE on E089 Outside Containment / SIAS / CCAS Failure / CCW NCL Valves Close </u>									
Time	Position	Applicant's Actions or Behavior							

CRITICAL TASK STATEMENT		Identify and isolate the most affected Steam Generator (ESDE).
CRITICAL TASK	BOP	ISOLATE SG E089. CLOSE/STOP the following components:
		• MSIV HV-8204
		• MSIV Bypass HV-8202
		• ADV HV-8421
		• MFIV HV-4052
		• AFW valves HV-4715, HV-4731
		• Steam to AFW P-140 HV-8200
		• SG Blowdown Isolation HV-4053
		• SG Water Sample Isolation HV-4057
		• Electric AFW Pump P-141
+30 min	BOP	ENSURE SG E089 ADV HV-8421 selected to MANUAL.
<i>When Steam Generator E089 is isolated, TERMINATE the scenario.</i>		

Facility:	SONGS 2 and 3	Scenario No.:	3	Op Test No.:	2008 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> • 30% power MOC - RCS Boron is 1035 ppm (by sample) • Train A Component Cooling Water Pump (P-025) in service • Train B Charging Pump (P-192) OOS • Train B Auxiliary Feedwater Pump (P-504) OOS • Train B Saltwater Cooling Pump (P-113) OOS • Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS • Fire Computer OOS 				
Turnover:	Boration and power descension in progress at 10% per hour.				
Critical Tasks:	<ul style="list-style-type: none"> • Establish Reactivity Control (≥ 2 FLCEAs Not Fully Inserted & No SIAS). • Reduce RCS T_{hot} below 530°F (SGTR). • Isolate the most affected Steam Generator (SGTR). 				
Event No.	Malf. No.	Event Type*	Event Description		
1 + 15 min		R (RO) N (BOP, CRS)	Boration and power descension at 10% per hour.		
2 + 25 min	CV16A	I (RO, CRS)	VCT Level Instrument (LT-0226) fails low.		
3 + 35 min	SG05B	I (BOP, CRS) TS (CRS)	Steam Generator E-088 Narrow Range Level Transmitter (LT-1123-2) fails high.		
4 + 45 min	SG06B	C (RO, CRS) TS (CRS)	Steam Generator tube leak on SG E-089 at 30 gpm.		
5 + 50 min	SG06B	M (ALL)	Steam Generator tube rupture on SG E-089 at 100 gpm.		
6 + 50 min	RD8802 RD8902	C (RO)	Two stuck CEAs; Emergency boration required.		
7 + 50 min	FW23	C (BOP)	Total loss of Condenser vacuum.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

SCENARIO SUMMARY NRC #3

The crew will assume the watch and commence a boration and power descension per SO23-5-1.4, Plant Shutdown to Hot Standby at 10% per hour.

Once the power change is underway, a Volume Control Tank (VCT) Level Transmitter (LT-0226) will fail low. The crew will secure VCT Makeup per the ARP and SO23-3-2.2, Makeup Operations. The Reactor Coolant System Makeup Control System will then be aligned for Manual Blended Makeup.

Once the Manual Blended Makeup Mode is selected, a narrow range level transmitter will fail high on Steam Generator E-088. The crew will diagnose a level transmitter failure per the ARP and Abnormal Operating Instruction (AOI) SO23-13-18, Reactor Protection System Failure/Loss of Vital Bus, and are required to bypass the affected Functional Units using SO23-3-2.12, Reactor Protective System Operation. The CRS will evaluate Technical Specifications.

The next event is a Steam Generator tube leak on E-089 at 30 gpm. The crew will perform actions per AOI SO23-13-14, Reactor Coolant System Leak. The CRS will evaluate Technical Specifications and determine that a Reactor trip is required.

When the Reactor is tripped, the Steam Generator tube leak will progress to a rupture of approximately 100 gpm. The crew will be unable to maintain Pressurizer level requiring a Reactor trip and entry into Emergency Operating Instruction (EOI) SO23-12-1, Standard Post Trip Actions (SPTAs).

Post-trip events include two rods stuck out of the core requiring emergency boration and a total loss of Condenser vacuum which involves placing the Atmospheric Dump Valves in service. A transition to SO23-12-4, Steam Generator Tube Rupture will be made.

The scenario is terminated when RCS T_{hot} is cooled below 530°F and the affected Steam Generator is isolated.

Risk Significance:

- Risk important components out of service: CHG P-192, AFW P-504, SWC P-113
- Risk significant core damage sequence: SGTR with loss of vacuum
- Risk significant operator actions: Establish Reactivity Control
Reduce RCS T_{hot} below 530°F
Isolate most affected Steam Generator

Scenario Event Description

NRC Scenario 3

SONGS

2008 Facility NRC Initial License Examination

Simulator Scenario Setup

Scenario 3

Machine Operator: EXECUTE IC #223 and NRC Scenario #3 SETUP file to align components.
HANG Control Board Tags on P-192, P-504, and P-113.
VERIFY Control Board Tags removed on P-191.
CHANGE Operator Aid Tags #029 (CVCS) and #005-4 (CVCS Ion Exchanger) to reflect the scenario boron concentration.
RESET CVCS Batch Counters to zero (0).
VERIFY both Pressurizer Spray Valves in AUTO.
PLACE procedures in progress on the RO desk:
- MARKED UP copy of SO23-5-1.4, Plant Shutdown to Hot Standby, open to Step 6.1.
- MARKED UP copy of SO23-10-2, Attachment for MSR Cooldown for Load Reduction / Turbine Shutdown.
- Copy of SO23-9-6, Feedwater Control System Operation.
- MARKED UP copy of SO23-5-1.7, Attachment 9.
- Copy of SO23-3-1.10 open to Section 6.2, Forcing Pressurizer Sprays.
PLACE the MOC copies of OPS Physics Summary Book on RO Desk and SO23-5-1.7, Attachment 8 on Control Board.
If Group Position(s) is (are) not correct, MOVE CEAs and then RETURN CEAs to Shift Turnover Sheet position (Group 6 @ 100 / PLCEAs @ 110).

Significant Control Room Annunciators in Alarm:

57B58 – EMERGENCY FEEDWATER SYS TRAIN B INOPERABLE
58A53 – CHARGING PUMP P192 OVERRIDE / NOT IN AUTO
56A30/40/50/60 – LOSS OF LOAD CHANNEL 1/2/3/4 TRIP DISABLED
53B48 – AIR EJECTOR STEAM SUPPLY PRESS LO
53A20 – MFWP MINI FLOW VALVE OPEN
99B46 – EXHAUST SPRAY WATER FLOW

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 1 </u>	Page	<u> 166 </u>	of	<u> 216 </u>
Event Description: <u> Boration and Power Descension in Progress at 10% / hr </u>									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When turnover is complete, PLACE Simulator in RUN.

+1 min	CRS	REFER to SO23-5-1.4, Section to Continue Load Reduction to 165 MWe Gross.
	CRS	INITIATE following the guidelines of SO23-5-1.4, Attachment 3.
	CRS	MAINTAIN the guidance of Attachment 3, Guidelines During Power Descension.
	RO	DETERMINE boration/CEA position requirements.
	CRS	CONTACT Reactor Engineering for ASI control recommendations.
<u>M.O. Cue:</u> If contacted as Reactor Engineering, DIRECT crew to maintain ASI at the initial equilibrium value.		
	RO	INITIATE ASI monitoring.
	RO	COMMENCE forcing Pressurizer Spray flow:
		<ul style="list-style-type: none"> • ENSURE both Spray Valve Controllers in AUTO. • PLACE PZR Proportional Heaters ON. • PLACE Backup Heaters in AUTO or ON as necessary to maintain desired Spray Valve position. • LOWER PIC-100, PZR pressure controller setpoint as required maintaining RCS pressure as directed by CRS.
	BOP	REDUCE Main Turbine load as necessary to maintain Tcold on program.
	RO	INITIATE boration in accordance with SO23-3-2.2, Makeup Operations.
+5 min	RO	DETERMINE the difference between the existing and the desired RCS boron concentration.

Operating Test : <u> NRC </u> Scenario # <u> 3 </u> Event # <u> 1 </u> Page <u> 167 </u> of <u> 216 </u>		
Event Description: <u> Boration and Power Descension in Progress at 10% / hr </u>		
Time	Position	Applicant's Actions or Behavior
	RO	DETERMINE amount of boric acid to be added.
	RO	COMMENCE periodically changing Boronometer setpoints to (+50, -25 ppm) of existing boron concentration.
	RO	POSITION FIC-0210Y, BAMU Flow Controller, to AUTOMATIC and set to the required flowrate (~3.2 gpm).
	RO	SET FQIS-0210Y, BAMU to VCT T-077, Borate Batching Counter, to the required volume.
	RO	SELECT the BAMU Pump associated with the BAMU Tank used.
	RO	BORATE to the Charging Pump suction:
		<ul style="list-style-type: none"> • VERIFY closed FV-9253, Blended Makeup to VCT isolation. • PLACE HV-9257, BAMU to Charging Pump Suction Block Valve, in AUTOMATIC.
	RO	SELECT HS-0210, Makeup Mode Selector, to BORATE.
+15 min	RO/BOP	MONITOR plant parameters.
<i>When power has been reduced 3-5%, or at Lead Evaluator's discretion, PROCEED to Event 2.</i>		

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 2 </u>	Page	<u> 168 </u>	of	<u> 216 </u>
Event Description: <u> VCT Level Transmitter Failure </u>									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: **When directed, EXECUTE Event 2.**
- CV16A, VCT Level Transmitter LT-0226 fails low.

Indications available:

58A04 - VCT LEVEL HI/LO
VCT Level Indicator LI-0226A lowering
VCT Auto Makeup initiation

+ 1 min	RO	REFER to Annunciator Response Procedures.
	RO	DETERMINE that VCT Auto Makeup has started.
	RO	CHECK VCT Level indicator LI-0227 on PCS and DETERMINE that level is normal (~51% and trending up due to auto makeup initiation).
	RO	RECOGNIZE that VCT level transmitter LI-0226 has failed low and INFORM the CRS ARP SO23-15-58.A04 entry required.
	RO	PLACE Makeup Mode Selector, HS-0210, to MANUAL.

Examiner Note: **When Makeup Control is placed in MANUAL, the following alarms will illuminate (on short time delay):**

		<ul style="list-style-type: none"> • 58A06 - BORIC ACID TO VCT FLOW HI/LO • 58A07 - DEMIN WATER TO VCT FLOW HI/LO
	CRS	DIRECT performance of SO23-3-2.2, Makeup Operations to ensure proper CVCS alignment is achieved.
+10 min	CRS	REQUEST I&C assistance.

When VCT Makeup is in Manual, or at Lead Evaluator's discretion, PROCEED to Event 3.

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 3 </u>	Page	<u> 169 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator E088 Narrow Range Level Instrument Fails High </u>									
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 3.
- SG05B, Steam Generator E088 Level Instrument (LT-1123-2) fails high.**

Indications Available:

52A01 - SG2 E088 LEVEL HI/LO

52A02 - FWCS SG2 E088 LEVEL DEVIATION

+1 min	BOP	REFER to Annunciator Response Procedures.
	BOP	IDENTIFY failed transmitter is Steam Generator E088 NR Level Transmitter Channel B, 2LT-1123-2.
	CRS	DIRECT performance of AOI SO23-13-18, Reactor Protection System Failure.
	CRS	IDENTIFY a Single PPS Channel failed.
	CRS	IDENTIFY Affected Functional Units for Channel B, using Attachment 5 of AOI SO23-13-18.
		• SG 2 Level - Low (RPS)
		• SG 2 Level - High (RPS)
		• SG 2 Level - High (DEFAS-2)
		• SG 2 ΔP (EFAS-2)
	CRS	DIRECT placing the affected Functional Unit in BYPASS per SO23-3-2.12, Section for Bypass Operation of Trip Channels.
	RO	CONTACT an outside operator to place the Affected Functional Units in Bypass per SO23-3-2.12, Reactor Protective System Operation.
<u>M.O. Cue:</u> When outside operator is contacted to bypass the associated trips, WAIT 3 minutes and then CALL when ready to begin. When directed, EXECUTE individual events for Bypassing RPS Trips.		

Operating Test :	NRC	Scenario #	3	Event #	3	Page	170	of	216
Event Description: Steam Generator E088 Narrow Range Level Instrument Fails High									
Time	Position	Applicant's Actions or Behavior							

M.O. Cue: When directed, EXECUTE the following Remote Functions:
 RP51 = OPEN (PPS Door Open Annunciator 56B46)
 RP53H = BYPASS (Low SG-2 Level Channel B)
 RP53K = BYPASS (High SG-2 Level Channel B)
 RP53V = BYPASS (High SG-2 DP EFAS-2 Channel B)
 Delete RP51 (PPS Door Open Annunciator 56B46)

	CRS	CONFIRM failure does NOT affect RPS/ESFAS matrix or logic.
	CRS	CONFIRM failure does affect Feedwater Digital Control System.
	BOP	<ul style="list-style-type: none"> • BYPASS 2LT-1123-2 per SO23-3-2.38, Section for Bypassing Selected Feedwater Control Signals.
+10 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> • LCO 3.3.1.A, RPS Instrumentation - Operating.
		<ul style="list-style-type: none"> • 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.
		<ul style="list-style-type: none"> • LCO 3.3.5.A, ESFAS Instrumentation.
		<ul style="list-style-type: none"> • 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.
		<ul style="list-style-type: none"> • LCO 3.3.12.A, Remote Shutdown System.
		<ul style="list-style-type: none"> • CONDITION A - One or more required Functions inoperable. • ACTION A.1 - Restore required Functions to OPERABLE status within 30 days.
<p><i>When Technical Specifications have been addressed, or at Lead Evaluator's discretion, PROCEED to Event 4.</i></p>		

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 4 </u>	Page	<u> 171 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Leak on E089 </u>									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: **When directed, EXECUTE Event 4.**
 - SG06B @ 0.083%, Steam Generator Tube Leak on E089 of ~30 gpm.

Indications available:

60A46 – SECONDARY RADIATION HI
63B02 – UNIT 2 CRITICAL PARAMETER PROBLEM

	RO/BOP	REFER to Annunciator Response Procedures.
	BOP	RECOGNIZE increasing radiation levels and INFORM the CRS AOI SO23-13-14 entry required.
+1 min	CRS	DIRECT performance of SO23-13-14, RCS Leak, Section for Primary to Secondary leakage.
		<ul style="list-style-type: none"> REQUEST Chemistry to confirm and quantify the Steam Generator tube leak by sampling the Condenser Air Ejector discharge.
<u>M.O. Cue:</u> When contacted as Chemistry, WAIT 5 minutes and REPORT that a frisk of the SG sample indicates high activity in SG E089. WAIT another 5 minutes, and then REPORT that high activity in SG E089 is verified.		
	CREW	DETERMINE Radiation Monitor status:
		<ul style="list-style-type: none"> Air Ejector High Range 7870 in alarm. Main Steam Line 7874B1 (E089) in alarm. SG Blowdown 6753 (E089) in alarm after a time delay.
	CRS	DETERMINE that high radiation is due to a SG Tube Leak on SG E089.
	CRS/RO	VERIFY PZR level is lowering.
	CRS/RO	VERIFY VCT level is being maintained within programmed band.
	CRS/RO	DETERMINE RCS leak is greater than 25 gpm.

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 4 </u>	Page	<u> 172 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Leak on E089 </u>									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: Crew may identify the leak at > 25 gpm and go to the RNO which requires a Reactor trip, otherwise, this will occur later in the AOI.

	CRS	If leak rate is confirmed > 25 gpm, DETERMINE a Reactor trip is required per SO23-13-14.
+5 min	CRS/RO	DETERMINE Pressurizer level NOT stable or rising.
	CRS/RO	VERIFY that the SG Tube Leak is large enough to be confirmed by:
		<ul style="list-style-type: none"> • A mismatch in Charging and Letdown indications, AND • Air Ejector, Steam Generator Blowdown, or Main Steam Line Rad Monitor indications.
	BOP	Manually INITIATE one Train of CRIS.
	CREW	CONFIRM leakage using all available indications.
	CRS	DETERMINE leak rate and action from Step 4.p table:
		<ul style="list-style-type: none"> • Leakage is > 720 GPD (1/2 gpm). • DIRECT performance of Attachment 3, Minimizing Contamination During a SG Tube Leak. • With power level < 35%, TRIP the Reactor.
	BOP	PERFORM Attachment 3, Minimizing Contamination During a SG Tube Leak.
		<ul style="list-style-type: none"> • PLACE Vacuum Pump P054 in service. • PLACE A-361, Air Ejector Unit in DIRECT. • ISOLATE Blowdown to E088. • PLACE LV-3245, Condenser Draw Off Valve to DISABLE. • NOTIFY Chemistry to sample Condenser Draw Off line. • PLACE Condenser Hotwell Overboarding System in MANUAL. • BYPASS the Full Flow Condensate Polishers.

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 4 </u>	Page	<u> 173 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Leak on E089 </u>									
Time	Position	Applicant's Actions or Behavior							

+15 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> • LCO 3.4.13.B, RCS Operational Leakage.
		<ul style="list-style-type: none"> • CONDITION B - Primary to secondary LEAKAGE not within limits. • ACTION B.1 - Be in MODE 3 in 6 hours. • ACTION B.2 - Be in MODE 5 in 36 hours.
<p><i>When Technical Specifications are addressed or Reactor trip is determined to be required, or at Lead Evaluator's discretion, PROCEED to Events 5, 6, and 7.</i></p>		

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 5, 6, & 7 </u>	Page	<u> 174 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Rupture / Two Stuck CEAs / Loss of Condenser Vacuum </u>									
Time	Position	Applicant's Actions or Behavior							

<u>Machine Operator:</u>		When directed, EXECUTE Events 5, 6, and 7. - SG06B @ 0.277%, SGTR on E089 @ ~100 gpm (upon Reactor trip). - RD8802, Stuck CEA #88. - RD8902, Stuck CEA #89. - FW23, Loss of Condenser vacuum @ 100%.
<u>Indications available:</u>		None
	CRS	DIRECT a Reactor trip and DIRECT crew to perform actions of SO23-12-1, Standard Post Trip Actions.
	RO/BOP	TRIP the Reactor and ENTER SO23-12-1, Standard Post Trip Actions.
	RO	VERIFY Reactor Trip:
		<ul style="list-style-type: none"> • 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		With failure of 2 or more Full Length CEAs to fully insert, perform an emergency boration (or some other alignment which adds boric acid from either the BAMU Tanks or RWST at 40 gpm or more).
CRITICAL TASK	RO	<ul style="list-style-type: none"> • [RNO] COMMENCE emergency boration at greater than 40 gpm.
	CRS	DETERMINE Reactivity Control criteria NOT satisfied.
	BOP	VERIFY Turbine Trip:
		<ul style="list-style-type: none"> • VERIFY Main Turbine tripped. • HP and LP Stop and Governor Valves closed. • VERIFY both Unit Output Breakers open. • VERIFY Main Turbine speed <2000 RPM or lowering.

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 5, 6, & 7 </u>	Page	<u> 175 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Rupture / Two Stuck CEAs / Loss of Condenser Vacuum </u>									
Time	Position	Applicant's Actions or Behavior							

	CRS	INITIATE Administrative Actions:
		<ul style="list-style-type: none"> ANNOUNCE Reactor trip via PA System.
		<ul style="list-style-type: none"> INITIATE Attachment 4, Worksheet.
		<ul style="list-style-type: none"> INITIATE Attachment 5, Administrative Actions.
	BOP	VERIFY Vital Auxiliaries functioning properly:
		<ul style="list-style-type: none"> VERIFY both 1E 4 kV Buses A04 and A06 energized.
		<ul style="list-style-type: none"> VERIFY both 1E 480 V Buses B04 and B06 energized.
		<ul style="list-style-type: none"> VERIFY all Class 1E DC Buses energized.
		<ul style="list-style-type: none"> VERIFY all Non-1E 4 kV Buses energized.
		<ul style="list-style-type: none"> VERIFY one CCW Train operating AND aligned to Non-Critical Loop and Letdown Heat Exchanger.
<u>M.O. Cue:</u> If directed to check Main Steam Safety Valve status, REPORT that all safety valves appear to be seated, with no steam coming from the MSIV roof.		
	RO	DETERMINE RCS Inventory Control criteria NOT satisfied:
		<ul style="list-style-type: none"> DETERMINE PZR level between 10% and 70% and NOT trending to between 30% and 60%.
		<ul style="list-style-type: none"> VERIFY Core Exit Saturation Margin $\geq 20^{\circ}\text{F}$:
		<ul style="list-style-type: none"> QSPDS page 611.
		<ul style="list-style-type: none"> CFMS page 311.
	RO	VERIFY RCS Pressure Control criteria satisfied:
		<ul style="list-style-type: none"> VERIFY PZR pressure (WR and NR) between 1740 PSIA and 2380 PSIA and controlled AND trending between 2025 PSIA and 2275 PSIA.
	RO	VERIFY Core Heat Removal criteria satisfied:
		<ul style="list-style-type: none"> VERIFY at least one RCP operating.
		<ul style="list-style-type: none"> VERIFY Core Loop $\Delta T < 10^{\circ}\text{F}$.
		<ul style="list-style-type: none"> VERIFY Core Exit Saturation Margin $\geq 20^{\circ}\text{F}$.
		<ul style="list-style-type: none"> QSPDS page 611.

Operating Test : <u> NRC </u> Scenario # <u> 3 </u> Event # <u> 5, 6, & 7 </u> Page <u> 176 </u> of <u> 216 </u>		
Event Description: <u> Steam Generator Tube Rupture / Two Stuck CEAs / Loss of Condenser Vacuum </u>		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> CFMS page 311.
	BOP	VERIFY RCS Heat Removal criteria satisfied: <ul style="list-style-type: none"> 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] If required, manually INITIATE EFAS. DETERMINE heat removal NOT adequate: <ul style="list-style-type: none"> [RNO] T_{cold} trending to between 545°F and 555°F.
	BOP	<ul style="list-style-type: none"> [RNO] OPERATE ADVs to maintain RCS T_{cold} between 545° and 555°F. VERIFY SG pressures approximately 1000 PSIA.
	RO	DETERMINE Containment Isolation criteria NOT satisfied: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> VERIFY Containment average temperature < 120°F. VERIFY Containment pressure < 1.5 PSIG.
+15 min	CRS	DIAGNOSE event in progress: <ul style="list-style-type: none"> 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 E089. DETERMINE that Reactor Trip Recovery is NOT diagnosed.
	RO	<ul style="list-style-type: none"> [RNO] ENSURE one RCP in each loop stopped. DIRECT initiating Steps 12 through 15.

Operating Test : <u> NRC </u> Scenario # <u> 3 </u> Event # <u> 5, 6, & 7 </u> Page <u> 177 </u> of <u> 216 </u>		
Event Description: <u> Steam Generator Tube Rupture / Two Stuck CEAs / Loss of Condenser Vacuum </u>		
Time	Position	Applicant's Actions or Behavior
	BOP	INITIATE Steps 12 through 15.
	CRS	DIRECT performance of SO23-12-4, Steam Generator Tube Rupture.
	CRS	RECORD time of EOI entry _____.
	CRS	VERIFY SGTR Diagnosis:
		<ul style="list-style-type: none"> INITIATE SO23-12-10, Safety Function Status Checks. INITIATE Foldout Page. DIRECT performance of FS-7, SI Throttle/Stop Criteria. DIRECT performance of SO23-12-11, Attachment 22, Non-Qualified Load Restoration. VERIFY SGTR diagnosis using Figure 1, Break Identification Chart. INITIATE sampling of both Steam Generators for radioactivity and boron.
<u>M.O. Cue:</u> If directed to sample SGs, WAIT 10 minutes and then REPORT that E089 has elevated radiation levels and boron levels. If the SG sample valves are closed, REPORT that you are unable to establish sample flow.		
	CRS	INITIATE Administrative actions:
		<ul style="list-style-type: none"> NOTIFY Shift Manager/Operations Leader of SO23-12-4, Steam Generator Tube Rupture initiation. ENSURE Emergency Plan is initiated. IMPLEMENT Placekeeper.
CRITICAL TASK STATEMENT		Reduce Reactor Coolant System Thot to less than 530°F within 30 minutes of optimal EOI entry. Elapsed Time: _____
CRITICAL TASK	CRS	DIRECT lowering RCS T _H to less than 530°F:
	BOP	<ul style="list-style-type: none"> VERIFY both SGs available for cooldown. ENSURE one RCP in each loop – stopped.

Operating Test : <u> NRC </u> Scenario # <u> 3 </u> Event # <u> 5, 6, & 7 </u> Page <u> 178 </u> of <u> 216 </u>		
Event Description: <u> Steam Generator Tube Rupture / Two Stuck CEAs / Loss of Condenser Vacuum </u>		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> INITIATE lowering T_H to less than 530°F using ADVs.
	RO	<ul style="list-style-type: none"> RESET SG Low Pressure Setpoints during controlled cooldown.
	RO	VERIFY ESF Actuation:
		<ul style="list-style-type: none"> DETERMINE SIAS actuation NOT required.
		<ul style="list-style-type: none"> If PZR pressure is controlled, RESET low Pressurizer pressure setpoint as controlled cooldown proceeds and GO to Step 7.
	CREW	IDENTIFY E089 as affected SG:
		<ul style="list-style-type: none"> EVALUATE SG radioactive release indications - rising.
		<ul style="list-style-type: none"> SG Blowdown monitors.
		<ul style="list-style-type: none"> SG sample results.
		<ul style="list-style-type: none"> Steam line monitors.
	BOP	<ul style="list-style-type: none"> EVALUATE indications on E089
		<ul style="list-style-type: none"> SG level - rising when not feeding.
		<ul style="list-style-type: none"> SG feedwater flowrate - significantly mismatched between SGs.
		<ul style="list-style-type: none"> Steam/feed flow prior to trip - NOT normal.
	BOP	<ul style="list-style-type: none"> OPERATE AFW to maintain Steam Generator E089 level > 40% AND RCS cooldown less than 100°F.
	CRS	<ul style="list-style-type: none"> NOTIFY Shift Manager/Operations Leader that E089 is affected SG.
	BOP	VERIFY Heat Removal by SG E088:
		<ul style="list-style-type: none"> DETERMINE AFW Pump 2P504 - NOT available.
		<ul style="list-style-type: none"> [RNO] ENSURE P-140 operating with valve HV-8201 OPEN and HV-8200 CLOSED.
		<ul style="list-style-type: none"> VERIFY SG E088 available for continued heat removal.
	CREW	ISOLATE the most affected Steam Generator (SGTR).
	RO	<ul style="list-style-type: none"> ENSURE RCS T_{hot} less than 530°F.

Operating Test :	<u> NRC </u>	Scenario #	<u> 3 </u>	Event #	<u> 5, 6, & 7 </u>	Page	<u> 179 </u>	of	<u> 216 </u>
Event Description: <u> Steam Generator Tube Rupture / Two Stuck CEAs / Loss of Condenser Vacuum </u>									
Time	Position	Applicant's Actions or Behavior							

CRITICAL TASK STATEMENT		Isolate the Most Affected Steam Generator (E089) within 30 minutes of optimal EOI entry. Elapsed Time: _____	
CRITICAL TASK	BOP	ISOLATE SG E089, CLOSE / STOP the following components:	
		MSIV	HV-8204
		MSIV Bypass	HV-8202
		ADV	HV-8421
		MFIV	HV-4052
		AFW Valves	HV-4731 and HV-4715
		Steam to AFW P-140	HV-8200
		SG Blowdown Isolation	HV-4053
		SG Water Sample Isolation	HV-4057
		Electric AFW Pump	P-141
	CRS	<ul style="list-style-type: none"> RECORD time of SG isolation _____. 	
	BOP	<ul style="list-style-type: none"> ENSURE ADV on SG E089 - selected to MANUAL. 	
+30 min	BOP	<ul style="list-style-type: none"> CONTACT outside operator to CLOSE Main Steam Drain Isolation valves. 	
When SG E089 is isolated, or at the Lead Evaluator's discretion, TERMINATE the scenario.			

Facility:	SONGS 2 and 3	Scenario No.:	4	Op Test No.:	2008 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> Reactor Critical at $1 \times 10^{-3}\%$ power MOC - RCS Boron is 1451 ppm (by sample) Train A Component Cooling Water Pump (P-025) in service Train B Saltwater Cooling Pump (P-113) OOS Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS Fire Computer OOS 				
Turnover:	Rod withdrawal and power increase to ~ 2% power.				
Critical Tasks:	<ul style="list-style-type: none"> Restore flow to the Non-Critical Loop (RCPs operating). Energize at least one 4.16 kV 1E Bus and associated 480 V 1E Bus. Establish minimum design Safety Injection flow rate. 				
Event No.	Malf. No.	Event Type*	Event Description		
1 + 15 min		R (RO) N (BOP, CRS)	Rod withdrawal and power increase to ~2% power.		
2 + 20 min	CV15	C (RO, CRS)	Letdown Purification Filter clogging at 90% (2 minute ramp).		
3 + 30 min	FW02B	C (BOP, CRS) TS (CRS)	Auxiliary Feedwater Pump (P-504) trip.		
4 + 40 min	RC10D	I (RO, CRS)	RCS Loop 2 Tcold (TE-0121Y) fails high.		
5 + 55 min	ED03A	C (BOP, CRS) TS (CRS)	Bus 2A04 Overcurrent lockout.		
6 + 55 min	PG24	M (ALL)	Loss of Offsite Power.		
7 + 55 min	EG08B	C (BOP)	Emergency Diesel Generator 2G003 mechanical failure. Station Blackout		
8 + 70 min	CV02A CV03A CV04A RC03	M (ALL)	Reactor Coolant Pump Seal failure @ 300 gpm. Small break Loss of Coolant Accident.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specifications					

SCENARIO SUMMARY NRC #4

The crew will assume the watch with the Reactor critical at $\sim 1 \times 10^{-3}\%$ power. The crew will raise power using CEA withdrawal per SO23-5-1.3.1, Plant Startup from Hot Standby to Minimum Load.

With the plant stable at 1% to 2% power, the Letdown Purification Filter will clog and slowly reduce Letdown flow. The crew will respond per the Annunciator Response Procedures (ARP) and the Letdown Purification Filter (F-020) will be bypassed. One Charging Pump will be secured and flow will be monitored until Pressurizer level returns to normal.

The next event is a trip of a running Auxiliary Feedwater Pump. The crew will regain control of feedwater per the ARP and place the Steam Driven Auxiliary Feedwater Pump (P-140) in service. The CRS will evaluate Technical Specifications.

When feedwater flow is restored, a Tcold instrument fails high. The failed instrument provides input to the Pressurizer Level Setpoint program. This will require crew actions per the ARP and Abnormal Operating Instruction (AOI) SO23-13-27, Pressurizer Pressure and Level Malfunction to control Pressurizer level with Letdown at minimum flow.

The next event is a bus fault and lockout on Bus 2A04. The crew will refer to AOI SO23-13-26, Loss of Power to an AC Bus. The BOP will place Train B Component Cooling Water in service to restore flow to the Non-Critical Loop. The CRS will evaluate Technical Specifications.

Once the decision to shutdown is made, a Loss of Offsite Power will occur. The Reactor will trip and the crew will perform Emergency Operating Instruction (EOI) SO23-12-1, Standard Post Trip Actions. Emergency Diesel Generator 2G003 will fail to start and the crew will diagnose a Station Blackout and transition to EOI SO23-12-8, Station Blackout.

Once the crew has commenced recovery actions in EOI SO23-12-8, Station Blackout, a Reactor Coolant Pump seal will fail. The crew will recognize the SBO and small break LOCA and enter EOI SO23-12-9, Functional Recovery when directed by the Shift Technical Advisor. The success path will require restoring offsite power to Bus 2A06 and initiating Safety Injection.

The scenario is terminated when Bus 2A06 is energized and a High Pressure Safety Injection Pump is discharging into the Reactor Coolant System.

Risk Significance:

- Risk important components out of service: SWC P-113
- Failure of risk important system prior to trip: Loss of Auxiliary Feedwater flow
- Risk significant core damage sequence: SBO with LOCA
- Risk significant operator actions:
 - Restore CCW Non-Critical Loop flow
 - Energize a vital AC Bus
 - Establish Safety Injection flow

Scenario Event Description

NRC Scenario 4

SONGS

2008 Facility NRC Initial License Examination

Simulator Scenario Setup

Scenario 4

Machine Operator: EXECUTE IC #224 and NRC Scenario #4 SETUP file to align components.
HANG Control Board Tags on P-113.
VERIFY Control Board Tags removed on P-191, P-192, and P-504.
CHANGE Operator Aid Tags #029 (CVCS) and #005-4 (CVCS Ion Exchanger) to reflect the scenario born concentration.
CHANGE Operator Aid Tag #005-9 (AFW T-120/121 alignment) to AUTO MAKEUP for both T-120 and T-121.
VERIFY both Pressurizer Spray Valves in AUTO.
ENSURE two (2) Charging Pumps running.
PLACE Channel X Pressurizer Pressure and Pressurizer Level in service.
VERIFY Pressurizer Level setpoint instrument IN2 in service.
PLACE procedures in progress on the RO desk:
- Copy of SO23-5-1.3.1 INITIALED through Step 6.4.5.
- MARKED UP copy of SO23-5-1.7, Attachment 9.
PLACE the MOC copies of OPS Physics Summary Book on RO Desk and SO23-5-1.7, Attachment 8 on Control Board.
If Group Position(s) is (are) not correct, MOVE CEAs and then RETURN CEAs to Shift Turnover Sheet position (Group 5 @ 140; Group 6 @ 40; PLCEAs @ 75).

Significant Control Room Annunciators in Alarm:

50A02 – COLSS ALARM

50A07 – SBCS DEMAND PRESENT

53A(B)03 – MFWP TURBINE K006 (K005) TRIP

56A30/40/50/60 – LOSS OF LOAD CHANNEL 1/2/3/4 TRIP DISABLED

56A47 – LOG POWER LEVEL HI BYPASS PERMISSIVE

63E10 – SCE CB TRIP

99A02 – EMERGENCY PUSHBUTTON TURBINE TRIP

99A24 – TURBINE TRIP RELAY TRIPPED

99B01 – GENERATOR TRIP

99B19 – VACUUM PROTECTION PLC TROUBLE

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 1 </u>	Page	<u> 183 </u>	of	<u> 216 </u>
Event Description: Rod Withdrawal and Power Increase to ~2% power									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: ENSURE all Simulator Scenario Setup actions are complete.

+1 min	CRS	DIRECT performance of SO23-5-1.3.1, Plant Startup from Hot Standup to Minimum Load.
--------	-----	---

Floor Cue: The startup rate based on Attachment 9 data will be ~ 0.5 DPM. In order to facilitate time requirements, REPORT as the Shift Manager to maintain this rate.

	RO	BYPASS the High Log Power Trip on all PPS Modules per SO23-3-2.12.
--	----	--

	RO	POSITION Mode Select Switch to MS (Manual Sequential).
--	----	--

	RO/CRS	When directed by CRS, WITHDRAW Control Rods as required.
--	--------	--

	RO	ESTABLISH a Startup Rate of ≤ 0.5 DPM.
--	----	---

M.O. Cue: If asked, REPORT long path recirculation is secured.

	RO	When CEA positioning is complete, PLACE Mode Select Switch to OFF.
--	----	--

	BOP	VERIFY proper operation of Steam Bypass Control System when the Point of Adding Heat is reached ($\sim 2E^{-1}\%$).
--	-----	---

+15 min	BOP	MAINTAIN Tcold within band by monitoring SBCS operation.
---------	-----	--

When power has been raised to ~2%, or at Lead Evaluator's discretion, PROCEED to Event 2.

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 2 </u>	Page	<u> 184 </u>	of	<u> 216 </u>
Event Description: <u>Letdown Purification Filter Clogging</u>									
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 2.
- CV15, Letdown Purification Filter clogging at 90% over 2 minute ramp.**

Indications available:

**61A55 - BACKFLUSHABLE FILTER DIFF PRESS HI (initial alarm @ 25 psid)
58A13 - PURIFICATION FILTER DIFF PRESS HI (subsequent alarm @ 30 psid)
Letdown flow decreasing**

+2 min	RO	REFER to Annunciator Response Procedures.
	RO	RECOGNIZE Letdown flow decreasing and INFORM the CRS ARP SO23-61.A.55 entry required.
	RO	OBSERVE minimum Charging flow and minimum Letdown flow.
	CRS/RO	DISPATCH an operator to the Radwaste Building to investigate.
<u>M.O. Cue:</u> If asked, WAIT one minute and then REPORT Purification Filter differential pressure gauge is 30 psid and rising.		
	RO	DETERMINE purification filter clogging is lowering Letdown flow.
		<ul style="list-style-type: none"> • STOP Charging Pumps to match Letdown flow. • MONITOR PZR level and maintain stable.
	CRS/RO	DIRECT Rad Waste operator to bypass the filter per SO23-3-2.1, Attachment for Bypass and Isolation of 2MF-020, CVCS Purification Filter and NOTIFY Maintenance to change out the disposable filter cartridge.
<u>M.O. Cue:</u> When directed to bypass the filter, DELETE malfunction CV15.		
+5 min	RO	RESTORE Charging flow to match Letdown flow.
<i>When plant conditions are stable, or at Lead Evaluator's discretion, PROCEED to Event 3.</i>		

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 3 </u>	Page	<u> 185 </u>	of	<u> 216 </u>
Event Description: Auxiliary Feedwater Pump P504 Trip									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: **When directed, EXECUTE Event 3.**
- FW02B, Auxiliary Feedwater Pump P504 trip.

Indications available:

52A54 - AUX FW PUMP P504 OC
SG E088 level lowering
No AFW flow indicated to Steam Generator E088

+30 secs	RO	REFER to Annunciator Response Procedures.
	BOP	RECOGNIZE AFW Pump P504 trip and INFORM the CRS ARP SO23-52.A54 entry required.
	CRS/BOP	RECOGNIZE SG E088 level is slowly decreasing.
	CRS	DIRECT placing Turbine Driven Auxiliary Feedwater Pump P140 in service.
	BOP	START Turbine Driven Auxiliary Feedwater Pump P140.
	BOP	MONITOR AFW to SG E088, to re-establish feedwater flow and restore E088 level to ~55% NR.
	CRS	DISPATCH an operator to the AFW Pump Room.

M.O. Cue: **If asked, REPORT that the P504 motor is hot to the touch.**

+10 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> • LCO 3.7.5.B, Auxiliary Feedwater System. • CONDITION B - One AFW train inoperable for reasons other than Condition A in MODE 1, 2, or 3; • ACTION B.1 - Restore AFW train to OPERABLE status within 72 hours.

When SG E088 level is restored, or at Lead Evaluator's discretion, PROCEED to Event 4.

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 4 </u>	Page	<u> 186 </u>	of	<u> 216 </u>
Event Description: <u> RCS Loop 2 Tcold Fails High </u>									
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 4.
- RC10D, Reactor Coolant System Loop 2 Tcold (TE-0121Y) fails high.**

Indications available:

50A23 - PZR LEVEL ERROR LO

50A18 - COLD LEG LOOP 2 TEMP HI

50A05 - T AVG HI

Letdown flow to minimum with Charging flow to maximum

+30 secs	RO	REFER to Annunciator Response Procedures.
	RO	OBSERVE maximum Charging flow and minimum Letdown flow.
	RO	DETERMINE Letdown and Charging systems are NOT responding as desired and perform the following:
		<ul style="list-style-type: none"> DEPRESS the A/M button on LIC-0110, PZR Level Controller, to place PZR level control in MANUAL.
		<ul style="list-style-type: none"> STOP Charging Pumps to match Letdown flow.
		<ul style="list-style-type: none"> ADJUST LIC-0110, PZR Level Controller, to match Letdown and Charging flows
		<ul style="list-style-type: none"> MONITOR PZR level and maintain stable
	RO	DETERMINE that PZR Level Loop 2 Tcold is cause of failure and INFORM the CRS AOI SO23-13-27 entry required.
	CRS	DIRECT performance of AOI SO23-13-27, Pressurizer Pressure and Level Malfunction, to transfer PZR Level Control to the OPERABLE Tcold instrument.
	RO	VERIFY level indicators LI-0110A1, LI-0110A2 and LI-0103 are reading approximately the same.
	RO	VERIFY Pressurizer level is NOT lowering due to a valid RCS leak.

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 4 </u>	Page	<u> 187 </u>	of	<u> 216 </u>
Event Description: <u> RCS Loop 2 Tcold Fails High </u>									
Time	Position	Applicant's Actions or Behavior							

	RO	TRANSFER Remote Pressurizer Level setpoint (IN2 to IN1):
		<ul style="list-style-type: none"> • ENSURE controller alarms are acknowledged.
		<ul style="list-style-type: none"> • SELECT (TAG) Page 2 and OBSERVE IN1 displayed.
		<ul style="list-style-type: none"> • NOTE the displayed PZR level.
		<ul style="list-style-type: none"> • DEPRESS SEL button to display IN2.
		<ul style="list-style-type: none"> • NOTE the displayed PZR level.
		<ul style="list-style-type: none"> • DETERMINE input IN1 is reading correctly.
		<ul style="list-style-type: none"> • DISPLAY current Pressurizer level remote setpoint.
		<ul style="list-style-type: none"> • SELECT IN1.
		<ul style="list-style-type: none"> • SELECT (TAG) page 1.
		<ul style="list-style-type: none"> • ADJUST LIC-0110 to MATCH actual level with setpoint by adjusting the output.
		<ul style="list-style-type: none"> • TRANSFER LIC-0110 to AUTO when level is within 2% of setpoint.
		<ul style="list-style-type: none"> • OBSERVE Letdown flow for oscillations.
		<ul style="list-style-type: none"> • RESTORE Pressurizer heaters to service.
		<ul style="list-style-type: none"> • OPERATE Charging Pumps as directed.
	CRS	INFORM Shift Manager to perform notifications as required.
	BOP	TRANSFER 2HS-8430, SBCS Quick Open Block Tavg Selector Switch to LOOP 1 position.
<i>When plant conditions are stable, or at Lead Evaluator's discretion, PROCEED to Event 5.</i>		

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 5 </u>	Page	<u> 188 </u>	of	<u> 216 </u>
Event Description: Bus 2A04 Overcurrent Trip and Lockout									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: **When directed, EXECUTE Event 5.**
 - ED03A, Bus 2A04 overcurrent trip and lockout.

Indications Available:

63B05 - 2A04 VOLTAGE LO
63B06 - 2B04 VOLTAGE LO
63B25 - 2A04 SUPPLY BREAKER 2A0418 OC

+30 sec	RO/BOP	REFER to Annunciator Response Procedures.
	RO/BOP	RECOGNIZE low Bus 2A04 voltage and INFORM the CRS AOI SO23-13-26 entry required.
	CRS	DIRECT performance of SO23-13-26, Loss of Power to an AC Bus.
	CRS	DIRECT aligning of Train B CCW and SWC.
	CRITICAL TASK STATEMENT	With loss of flow to the CCW Non-Critical Loop and prior to exceeding RCP operating limits, restore flow to the NCL from any available CCW train.
	BOP	START the Train B CCW Pump.
CRITICAL TASK		<ul style="list-style-type: none"> • TRANSFER the Non-Critical Loop to Train B. • TRANSFER the Letdown Heat Exchanger to Train B.
	RO	START Charging Pump P192 as required with Letdown isolated.
	CRS	DISPATCH an operator to VERIFY loss of the 1E 4 kV Bus is NOT due to a fire in the 1E Switchgear Room.
	RO/BOP	DETERMINE overcurrent annunciators are alarming on Bus 2A04.
	CRS	DIRECT initiation of SO23-6-9, 6.9 kV, 4 kV and 480V Bus and Feeder Faults to return Bus 2A04 to service.
	CRS	DIRECT initiation of Equipment Actions for Loss of the 1E 4 kV Bus 2A04.

Time	Position	Applicant's Actions or Behavior
Operating Test : <u> NRC </u> Scenario # <u> 4 </u> Event # <u> 5 </u> Page <u> 189 </u> of <u> 216 </u>		
Event Description: Bus 2A04 Overcurrent Trip and Lockout		
+5 min	BOP	STOP Diesel Generator 2G002 by placing in MAINTENANCE LOCKOUT.
	CRS	Within 1 hour, DIRECT performance of SO23-3-3.23, Attachment for AC Sources Verification, for both Units.
	RO	SELECT HS-0210, Makeup Mode Selector Switch to MANUAL and PLACE a Caution Tag at the switch to prevent inadvertent dilution.
	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> LCO 3.0.3 - Limiting Condition for Operation Applicability due to loss of two (2) 1E Battery Chargers.
		<ul style="list-style-type: none"> CONDITION - Two (2) 1E Battery Chargers INOPERABLE in MODE 1, 2, 3, or 4; ACTION - Within 1 hour, place the Unit in MODE 3 within 7 hours.
	CRS	DIRECT Bypassing Channel A DNBR and LPD trips.
<u>M.O. Cue:</u> When directed, EXECUTE the following Remote Functions: RP51 = OPEN (PPS Door Open Annunciator 56B46) RP52C = BYPASS (Channel A Hi Local Power) RP52D = BYPASS (Channel A Low DNBR) Delete RP51 (PPS Door Open Annunciator 56B46)		
	RO	VERIFY the Trip Channel Bypassed Annunciator alarms.
		<ul style="list-style-type: none"> 56A29 - PPS CHANNEL 1 TRIP BYPASSED
	CRS	DIRECT setting CEAC 2 INOP Flags in all CPCs by changing each CPC Addressable Constant Point ID 062 to 2.
+15 min	BOP	INITIATE Train B CRIS.
<i>When Technical Specifications have been addressed, or at Lead Evaluator's discretion, PROCEED to Events 6 and 7.</i>		

Operating Test :	NRC	Scenario #	4	Event #	6 and 7	Page	190	of	216
Event Description: Loss of Offsite Power / Loss of 2G003 / Station Blackout									
Time	Position	Applicant's Actions or Behavior							

<u>Machine Operator:</u> When directed, EXECUTE Events 6 and 7. - PG24, Loss of Offsite Power, - EG08B, 2G003 EDG Mechanical Failure.		
<u>Indications available:</u> Numerous Loss of Offsite Power Related Alarms		
	CRS	DIRECT performance of EOI SO23-12-1, Standard Post Trip Actions.
	RO	VERIFY Reactor Trip:
		<ul style="list-style-type: none"> 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:
		<ul style="list-style-type: none"> VERIFY Main Turbine tripped. 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:
		<ul style="list-style-type: none"> ANNOUNCE Reactor trip via PA System. INITIATE Attachment 4, Worksheet. INITIATE Attachment 5, Administrative Actions.
	BOP	DETERMINE Vital Auxiliaries are NOT functioning properly:
		<ul style="list-style-type: none"> DETERMINE both 1E 4 kV Buses deenergized. [RNO] DETERMINE that 2G003 is tripped and has a mechanical failure. [RNO] PLACE EDG G003 in Maintenance Lockout. [RNO] INITIATE Attachment 2, Diesel Generator Failure Follow-Up Actions for Bus 2A06.

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> DETERMINE both 1E 480 V Buses deenergized.
		<ul style="list-style-type: none"> [RNO] Verify both EDGs in Maintenance Lockout.
		<ul style="list-style-type: none"> VERIFY all Class 1E DC Buses energized.
		<ul style="list-style-type: none"> DETERMINE all Non-1E 4 kV Buses deenergized.
		<ul style="list-style-type: none"> [RNO] DETERMINE that all Circulating Water Pumps are off.
		<ul style="list-style-type: none"> [RNO] CLOSE MSIVs.
		<ul style="list-style-type: none"> [RNO] OPERATE ADVs at 1000 PSIA in Auto/Modulate.
		<ul style="list-style-type: none"> DETERMINE that CCW is NOT operating.
<p><u>M.O. Cue:</u> If directed to investigate 2G003, WAIT 3 minutes and REPORT that the diesel is NOT running and that there is a large amount of oil on the Diesel Room floor.</p>		
	RO	DETERMINE RCS Inventory Control criteria NOT satisfied:
		<ul style="list-style-type: none"> VERIFY that PZR level is slowly lowering.
		<ul style="list-style-type: none"> DETERMINE that PZR Level Control System is NOT operating.
		<ul style="list-style-type: none"> VERIFY Core Exit Saturation Margin $\geq 20^{\circ}\text{F}$:
		<ul style="list-style-type: none"> QSPDS page 611.
		<ul style="list-style-type: none"> CFMS page 311.
	RO	DETERMINE RCS Pressure Control criteria are NOT satisfied:
		<ul style="list-style-type: none"> DETERMINE PZR pressure (WR and NR) NOT between 1740 PSIA and 2380 PSIA AND NOT trending to between 2025 PSIA and 2275 PSIA.
		<ul style="list-style-type: none"> [RNO] DETERMINE PZR Pressure Control System is NOT restoring PZR pressure.
		<ul style="list-style-type: none"> [RNO] ENSURE Normal and Auxiliary Spray valves closed.
	RO	DETERMINE Core Heat Removal criteria NOT satisfied:
		<ul style="list-style-type: none"> DETERMINE no RCPs are operating.
		<ul style="list-style-type: none"> VERIFY Core Exit Saturation Margin $\geq 20^{\circ}\text{F}$.
		<ul style="list-style-type: none"> QSPDS page 611.
		<ul style="list-style-type: none"> CFMS page 311.

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 6 and 7 </u>	Page	<u> 192 </u>	of	<u> 216 </u>
Event Description: <u>Loss of Offsite Power / Loss of 2G003 / Station Blackout</u>									
Time	Position	Applicant's Actions or Behavior							

	BOP	VERIFY RCS Heat Removal criteria satisfied:
		<ul style="list-style-type: none"> • VERIFY both SGs level > 21% NR.
		<ul style="list-style-type: none"> • VERIFY both SGs level < 80% NR.
		<ul style="list-style-type: none"> • VERIFY Auxiliary feedwater available to restore both SGs level between 40% NR and 80% NR.
		<ul style="list-style-type: none"> • [RNO] If required, manually INITIATE EFAS.
		<ul style="list-style-type: none"> • VERIFY heat removal adequate:
		<ul style="list-style-type: none"> • DETERMINE T_{cold} NOT trending to between 545°F and 555°F.
		<ul style="list-style-type: none"> • [RNO] $T_{cold} < 545^{\circ}\text{F}$.
		<ul style="list-style-type: none"> • [RNO] ENSURE SBCS valves closed.
		<ul style="list-style-type: none"> • [RNO] ENSURE ADVs closed.
		<ul style="list-style-type: none"> • [RNO] ENSURE SG Blowdown valves closed.
		<ul style="list-style-type: none"> • <u>E-088</u> - HV-4054 <u>E-089</u> - HV-4053
		<ul style="list-style-type: none"> • [RNO] DETERMINE Main Steam to Reheater Valves closed.
		<ul style="list-style-type: none"> • DETERMINE SG pressures less than 1000 PSIA.
	RO	VERIFY Containment Isolation criteria satisfied:
		<ul style="list-style-type: none"> • VERIFY Containment pressure < 1.5 PSIG.
		<ul style="list-style-type: none"> • DETERMINE some Containment Area Radiation Monitors energized and NOT alarming or trending to alarm.
		<ul style="list-style-type: none"> • DETERMINE some Secondary Plant Radiation Monitors energized and NOT alarming or trending to alarm.
	RO	VERIFY Containment Temperature and Pressure criteria satisfied:
		<ul style="list-style-type: none"> • VERIFY Containment average temperature < 120°F.
		<ul style="list-style-type: none"> • VERIFY Containment pressure < 1.5 PSIG.

Operating Test :	NRC	Scenario #	4	Event #	6 and 7	Page	193	of	216
Event Description: Loss of Offsite Power / Loss of 2G003 / Station Blackout									
Time	Position	Applicant's Actions or Behavior							

+15 min	CRS	DIAGNOSE event in progress:
		<ul style="list-style-type: none"> DETERMINE some Safety Function criteria are NOT met per Attachment 4, Worksheet.
		<ul style="list-style-type: none"> [RNO] COMPLETE Attachment 1, Recovery Diagnostics.
		<ul style="list-style-type: none"> [RNO] DIAGNOSE Station Blackout.
		<ul style="list-style-type: none"> DETERMINE that Reactor Trip Recovery is NOT diagnosed.
		<ul style="list-style-type: none"> [RNO] DETERMINE all RCPs stopped.
		<ul style="list-style-type: none"> DIRECT initiating Steps 12 through 15.
	BOP	INITIATE Steps 12 through 15.
<u>M.O. Cue:</u> If GCC is contacted for grid status, REPORT that cause of grid loss is unknown and field crews are investigating. No estimate on time to restore a line.		
<u>M.O. Cue:</u> If Unit 3 status is requested, REPORT that Bus 3A04 is energized from EDG 3G002 and Bus 3A06 is energized from EDG 3G003.		
	CRS	DIRECT performance of EOI SO23-12-8, Station Blackout.
	CRS	RECORD time of EOI entry _____.
	CRS	VERIFY Station Blackout Diagnosis:
		<ul style="list-style-type: none"> INITIATE SO23-12-10, Safety Function Status Checks.
		<ul style="list-style-type: none"> INITIATE Foldout Page.
		<ul style="list-style-type: none"> VERIFY both 1E AC electrical power trains NOT energized.
<i>When EOI SO23-12-8 has been entered, or at Lead Evaluator's discretion, PROCEED to Event 8.</i>		

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 8 </u>	Page	<u> 194 </u>	of	<u> 216 </u>
Event Description: <u>Reactor Coolant Pump Seal Failure / Small Break LOCA</u>									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: **When directed, EXECUTE Event 8.**
 - CV02A, P001 Lower Seal Failure.
 - CV03A, P001 Middle Seal Failure.
 - CV04A, P001 Upper Seal Failure.
 - RC03, Small Break LOCA @ 300 gpm.

Indications available:

60A02 - CONTAINMENT HUMIDITY HI
 57C10 - CONTAINMENT RADIATION HI
 57C20 - RCS LEAKAGE DETECTION ACTIVITY HI
 57C43 - RCS LEAKAGE ABNORMAL/RECIRC SYS VV MISALIGNED
 Containment Sump inlet flow \geq 1 gpm on the CFMS
 Rapidly lowering Pressurizer level and pressure

Examiner Note: **The crew will continue in EOI SO23-12-8, Station Blackout, until the Safety Function Status Check re-diagnoses that there are 2 events in progress, and that EOI SO23-12-9, Functional Recovery, entry is required per EOI 12-10.**

Floor Cue: **REPORT as STA that the Safety Function Status Checks have been performed and there are 2 events in progress. SFSC requires entry into EOI SO23-12-9, Functional Recovery, Attachment FR-3, Recovery - RCS Inventory Control.**

+1 min	CRS	VERIFY Functional Recovery diagnosis:
		<ul style="list-style-type: none"> • INITIATE EOI SO23-12-10, Safety Function Status Checks. • INITIATE Foldout Page. • SI Throttle/Stop Criteria. • Monitor RCP Status. • Monitor Electrical Power. • Establish Secondary Plant Protection. • VERIFY both Class 1E AC power trains - NOT energized.
	CRS	DIRECT performance of EOI SO23-12-9, Functional Recovery
<u>M.O. Cue:</u> If GCC is contacted for grid status, REPORT that cause of grid loss is unknown and field crews are investigating. No estimate on time to restore a line.		
<u>M.O. Cue:</u> If Unit 3 status is requested, REPORT that Bus 3A04 is energized from EDG 3G002 and Bus 3A06 is energized from EDG 3G003.		

Operating Test :	NRC	Scenario #	4	Event #	8	Page	195	of	216
Event Description: Reactor Coolant Pump Seal Failure / Small Break LOCA									
Time	Position	Applicant's Actions or Behavior							

	CRS	DIRECT performance of EOI SO23-12-9, Functional Recovery.
	CRS	RECORD time of EOI entry _____.
<u>M.O. Cue:</u> When EOI SO23-12-9 is initiated, CALL as SDG&E GCC and REPORT that SONGS Switchyard appears to have several faults and will not be available until a crew can be dispatched to determine the problem.		
	CRS	VERIFY Functional Recovery diagnosis:
		<ul style="list-style-type: none"> INITIATE EOI SO23-12-10, Safety Function Status Checks.
		<ul style="list-style-type: none"> INITIATE Foldout Page.
		<ul style="list-style-type: none"> DIRECT performance of FS-3, Monitor Natural Circulation Established.
		<ul style="list-style-type: none"> DIRECT performance of EOI SO23-12-11, Attachment 19, Non-1E DC Load Reduction.
		<ul style="list-style-type: none"> DIRECT performance of EOI SO23-12-11, Attachment 20, Class1E Battery Load Reduction.
		<ul style="list-style-type: none"> DIRECT performance of FS-18, Secondary Plant Protection.
		<ul style="list-style-type: none"> DIRECT performance of EOI SO23-12-11, Attachment 24, Supply 1E 4 kV Bus with Opposite Unit Diesel.
		<ul style="list-style-type: none"> DIRECT performance of EOI SO23-12-11, Attachment 6, Diesel Generator Failure Follow-up Actions.
		<ul style="list-style-type: none"> DIRECT Chemistry to sample both SGs for radioactivity and boron.
<u>M.O. Cue:</u> If directed to sample SGs, WAIT 5 minutes and REPORT that E088 and E089 sample lines were frisked, and both have activity near background. If the SG sample valves are closed, REPORT that you are unable to establish sample flow.		
<u>M.O. Cue:</u> When directed to initiate Non-1E DC Load Reduction, ACKNOWLEDGE and STATE you will report when complete.		
<u>M.O. Cue:</u> When directed to initiate Class 1E Battery Load Reduction, ACKNOWLEDGE and STATE you will report when complete.		

Operating Test :	<u> NRC </u>	Scenario #	<u> 4 </u>	Event #	<u> 8 </u>	Page	<u> 196 </u>	of	<u> 216 </u>
Event Description: <u>Reactor Coolant Pump Seal Failure / Small Break LOCA</u>									
Time	Position	Applicant's Actions or Behavior							

Examiner Note: The following step is performed when the Reactor Operator initiates FS-3, Monitor Natural Circulation Established.

	RO	DETERMINE Natural Circulation conditions NOT established.
		COMMENCE RAISING Steam Generator level and RAISING steaming rate to establish Natural Circulation conditions.
	CRS	DIRECT performance of SO23-12-11, Attachment 24, Supplying 1E 4 kV Bus with Opposite Unit Diesel.
	CRS	DETERMINE Train B is available.
	CRS	OBTAIN approval of Shift Manager to cross connect Train B using 10 CFR 50.54(x) on both Units to supply 1E 4 kV Bus 2A06 with the opposite unit Diesel Generator.
	CRS/BOP	REQUEST Shift Manager initiates NRC notification within one hour regarding actions per this attachment.
	CRS/BOP	NOTIFY opposite Unit SRO that automatic sequencing of ESF loads onto opposite Unit 1E 4 kV Bus 3A06 will be blocked.
	BOP	VERIFY Bus 3A06 energized by 3G003 Diesel Generator.
	BOP	ENSURE 1E 4 kV Bus Tie breaker AUTO/MANUAL transfer switches selected to MANUAL.
		<ul style="list-style-type: none"> • 2A0619 (2HS-1639B2) and 3A0603 (3HS-1639B2).
	BOP	ENSURE 1E 4 kV Bus Tie breakers open.
		<ul style="list-style-type: none"> • 2A0619 and 3A0603.
	BOP	ENSURE 2G003 Diesel Generator selected to MAINTENANCE LOCKOUT.

Operating Test :	NRC	Scenario #	4	Event #	8	Page	197	of	216
Event Description: Reactor Coolant Pump Seal Failure / Small Break LOCA									
Time	Position	Applicant's Actions or Behavior							

	CRS	DIRECT performance of Train B Diesel Generator Cross-Tie Permissive switch alignment on 50' Elevation.
	BOP	CONTACT the PPEO and INITIATE Unit 2 Train A Diesel Generator Cross-Tie Permissive switch alignment on 50' Elevation.
		<ul style="list-style-type: none"> • VERIFY feeder faults NOT indicated by relay flags on: <ul style="list-style-type: none"> • 2A0616 – Unit Aux Transformer • 2A0618 – Reserve Aux Transformer • 2A0619 – 2A06 Bus Tie • 2A0613 – 2G003 EDG
<u>M.O. Cue:</u> When asked, REPORT no feeder faults on breakers.		
	BOP	DIRECT the PPEO to SELECT both Unit 2 Train B Diesel Generator Cross-Tie Permissive switches on Fire Isolation Panel 2L-413 to 50.54X.
		<ul style="list-style-type: none"> • 2HS-5054XA2 and 2HS-5054XB2
<u>M.O. Cue:</u> When directed, PERFORM remote functions EG62A and EG62B and REPORT that the Unit 2 50.54X switches have been aligned.		
	BOP	CONTACT the PPEO and INITIATE Unit 3 Train B Diesel Generator Cross-Tie Permissive switch alignment on 50' Elevation.
		<ul style="list-style-type: none"> • VERIFY feeder faults NOT indicated by relay flags on: <ul style="list-style-type: none"> • 3A0603 – 3A06 Bus Tie
<u>M.O. Cue:</u> When asked, REPORT no feeder faults on breakers.		
	BOP	DIRECT the PPEO to SELECT both Unit 3 Train B Diesel Generator Cross-Tie Permissive switches on Fire Isolation Panel 3L-413 to 50.54X.
		<ul style="list-style-type: none"> • 3HS-5054XA2 and 3HS-5054XB2
<u>M.O. Cue:</u> When directed, PERFORM remote functions EG62C and EG62D and REPORT that the Unit 3 50.54X switches have been aligned.		

Operating Test :	NRC	Scenario #	4	Event #	8	Page	198	of	216
Event Description: Reactor Coolant Pump Seal Failure / Small Break LOCA									
Time	Position	Applicant's Actions or Behavior							

	BOP	VERIFY 3G003 Diesel Generator loading less than 3.4 MW and stable.
	BOP	VERIFY Bus 2A06 NOT energized.
	BOP	VERIFY Unit 2 overcurrent/ground alarms reset.
		<ul style="list-style-type: none"> • 63C15 - 2A06 SUPPLY BKR 2A0616 OC
		<ul style="list-style-type: none"> • 63C25 - 2A06 SUPPLY BKR 2A0618 OC
	BOP	VERIFY 1E DC bus voltages 2D2 and 3D2 greater than 108 VDC.
<u>M.O. Cue:</u> When asked, REPORT 3D2 voltage at 129 VDC.		
	BOP	ESTABLISH final Train B configuration.
	BOP	ENSURE 1E 4 kV Bus 2A06 supply breakers open.
		<ul style="list-style-type: none"> • 2A0616 – Unit Aux Transformer
		<ul style="list-style-type: none"> • 2A0618 – Reserve Aux Transformer
		<ul style="list-style-type: none"> • 2A0613 – 2G003 EDG
	BOP	ENSURE 1E 4 kV Bus A06 tie breakers open.
		<ul style="list-style-type: none"> • 2A0619 – 2A06 Bus Tie
		<ul style="list-style-type: none"> • 3A0603 – 3A06 Bus Tie
	BOP	ENSURE 1E 4 kV Bus 2A06 load breakers open.
		<ul style="list-style-type: none"> • Emergency Chillers
		<ul style="list-style-type: none"> • Containment Spray Pumps
		<ul style="list-style-type: none"> • HPSI Pumps
		<ul style="list-style-type: none"> • LPSI Pumps
		<ul style="list-style-type: none"> • AFW Pumps
		<ul style="list-style-type: none"> • CCW Pumps

Operating Test : <u> NRC </u> Scenario # <u> 4 </u> Event # <u> 8 </u> Page <u> 199 </u> of <u> 216 </u>		
Event Description: <u>Reactor Coolant Pump Seal Failure / Small Break LOCA</u>		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> • SWC Pumps
	BOP	VERIFY Train B Diesel Generator Cross-Tie Permissive switches on both units are in the 50.54X position.
	BOP	CLOSE Unit 3 Bus Tie breaker 3A0603.
	BOP	VERIFY Unit 3 Diesel Generator 3G003 output breaker remains closed.
CRITICAL TASK STATEMENT		With a loss of 1E power, energize at least one 4 kV and the associated 480 VAC 1E bus before DC Bus D2 voltage drops to 107.3 VDC and DC Bus D4 drops to 106.5 VDC.
CRITICAL TASK	BOP	CLOSE Unit 2 Bus Tie breaker 2A0619.
	BOP	VERIFY Unit 2 1E buses 2A06 and 2B06 energized.
	BOP	START CCW Pump P-026 on Train B.
CRITICAL TASK STATEMENT		Within 15 minutes of SFSC Inventory Control completion following RCS pressure falling below 1400 psia, establish the required SI flow.
CRITICAL TASK	RO	ESTABLISH minimum design Safety Injection flowrate.
		<ul style="list-style-type: none"> • START Train B High Pressure Safety Injection Pump P019. • VERIFY Safety Injection Flow through Loop Safety Injection Flow Valves.
+40 min		<ul style="list-style-type: none"> • VERIFY Train B Charging Pump P192 running.
When power is restored to Bus 2A06 and Safety Injection flow is initiated, or at Lead Evaluator's discretion, TERMINATE the scenario.		

Facility:	SONGS 2 and 3	Scenario No.:	6	Op Test No.:	2008 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> • 71% power MOC - RCS Boron is 1027 ppm (by sample) • Train A Component Cooling Water Pump (P-025) in service • Train B Charging Pump (P-192) OOS • Train B Auxiliary Feedwater Pump (P-504) OOS • Train B Saltwater Cooling Pump (P-113) OOS • Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS • Fire Computer OOS 				
Turnover:	Maintain steady-state power conditions.				
Critical Tasks:	<ul style="list-style-type: none"> • Trip the Reactor following multiple CEA drop. • Restore feedwater flow to at least one Steam Generator. 				
Event No.	Malf. No.	Event Type*	Event Description		
1 + 10 min	RC16B	I (RO, CRS) TS (CRS)	Pressurizer Level Control Channel fails high (LT-0110-2)		
2 + 15 min	TP02B	C (BOP, CRS)	Turbine Plant Cooling Water Pump (P-120) trip with Turbine Plant Cooling Water Pump (P-119) auto start failure.		
3 + 25 min	RD8703	C (RO, CRS) TS (CRS)	Dropped Control Element Assembly #87.		
4 + 35 min		R (RO) N (BOP, CRS)	Downpower due to dropped Control Element Assembly.		
5 + 40 min			Severe weather (tornado warning).		
6 + 45 min	RD0103	C (RO)	Dropped Control Element Assembly #1.		
7 + 45 min	TU08 PG24	M (ALL)	Loss of Offsite Power. Loss of Main Feedwater.		
8 + 45 min	FW02A FW25	C (BOP)	Auxiliary Feedwater Pump P-141 shaft seizure. Auxiliary Feedwater Pump P-140 overspeed trip. Total Loss of Feedwater		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

SCENARIO SUMMARY NRC #6

The crew will assume the watch and maintain steady-state conditions per SO23-5-1.7, Power Operations.

After the crew has assumed the watch, a Pressurizer Level instrument fails high and will require crew actions per the Annunciator Response Procedures (ARP) and Abnormal Operating Instruction AOI SO23-13-27, Pressurizer Pressure and Level Malfunction. The CRS will evaluate Technical Specifications.

When Pressurizer level is restored to normal, Turbine Plant Cooling Water (TPCW) Pump P-120 will trip, and P-119 fails to automatically start. The BOP must manually start TPCW Pump P-119 in accordance with the ARP to prevent a potential trip on high stator cooling water temperature.

A dropped Control Element Assembly (CEA) follows the potential transformer failure. The crew will respond and stabilize the primary plant per the ARP and AOI SO23-13-13, Dropped or Misaligned CEA. The CRS will evaluate Technical Specifications. The CEA is not recoverable and a down power will be conducted per the AOI.

Once the down power is underway, the crew will receive a tornado warning from the National Weather Service and will enter AOI SO23-13-8, Severe Weather. The crew will be required to prepare for the tornado warning by performing actions inside and outside the Control Room. When a sufficient power reduction is made, a second CEA will drop into the core. This will require initiation of a manual Reactor Trip by the Reactor Operator.

When the Reactor and Turbine are tripped, a Loss of Offsite Power will occur. The crew will perform Emergency Operating Instruction (EOI) SO23-12-1, Standard Post Trip Actions (SPTAs). While performing the SPTAs, a total Loss of Feedwater will occur. This will necessitate a transition into SO23-12-6, Loss of Feedwater.

Event termination will occur when the overspeed trip on the Turbine Driven Auxiliary Feedwater Pump P-140 is reset and the Steam Generators are slowly refilled to establish Steam Generator level.

Risk Significance:

- Risk important components out of service: CHG P-192, AFW P-504, SWC P-113
- Risk significant core damage sequence: Two dropped CEAs without Reactor Trip
- Risk significant operator actions: Manually trip Reactor
Restore feedwater flow to at least one SG

Scenario Event Description

NRC Scenario 6

SONGS

2008 Facility NRC Initial License Examination

Simulator Scenario Setup

Scenario 6

Machine Operator: EXECUTE IC #226 and NRC Scenario #6 SETUP file to align components.
HANG Control Board Tags on P-192, P-504, and P-113.
VERIFY Control Board Tags removed on P-191.
CHANGE Operator Aid Tags #029 (CVCS) and #005-4 (CVCS Ion Exchanger) to reflect the scenario boron concentration.
VERIFY both Pressurizer Spray Valves in AUTO.
PLACE procedures in progress on the RO desk:
- Copy of SO32-5-1.7, Power Operations open to Section 6.4, Guidelines for Steady State Operation.
PLACE the MOC copies of OPS Physics Summary Book on RO Desk and SO23-5-1.7, Attachment 8 on Control Board.
If Group Position(s) is (are) not correct, MOVE CEAs and then RETURN CEAs to Shift Turnover Sheet position (Group 6 @ 140 / PLCEAs @ 115).

Control Room Annunciators in Alarm:

57B58 – EMERGENCY FEEDWATER SYS TRAIN B INOPERABLE
58A53 – CHARGING PUMP P192 OVERRIDE / NOT IN AUTO

Operating Test :	<u> NRC </u>	Scenario #	<u> 6 </u>	Event #	<u> 1 </u>	Page	<u> 203 </u>	of	<u> 216 </u>
Event Description: <u> Pressurizer Level Control Channel Y Fails High </u>									
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 1.
- RC16B, PZR Level Controlling Channel Y LT-0110-2 fails high.**

Indications available:

**50A22 – PZR LEVEL ERROR HI
50A12 – PZR LEVEL HI-HI
Letdown flow INCREASING**

+1 min	RO	REFER to Annunciator Response Procedures.
	RO	OBSERVE minimum Charging flow and maximum Letdown flow.
	RO	DETERMINE Letdown and Charging systems are NOT responding as desired and PERFORM the following:
		<ul style="list-style-type: none"> DEPRESS the A/M button on LIC-0110, PZR Level Controller, to place PZR level control in MANUAL.
		<ul style="list-style-type: none"> START Charging Pumps to match Letdown flow as closely as possible.
		<ul style="list-style-type: none"> ADJUST LIC-0110, PZR Level Controller, to match Letdown and Charging flows.
		<ul style="list-style-type: none"> SECURE PZR heaters as necessary to control RCS pressure.
		<ul style="list-style-type: none"> MONITOR PZR level and maintain stable.
	RO	DETERMINE that PZR Level Channel Y (LI-0110A2) is cause of failure and INFORM the CRS AOI 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	VERIFY Level Channel X (LI-0110X) is OPERABLE.
	RO	POSITION HS-0110, PZR Level Channel Select switch, to Channel X.
	RO	On LIC-0110 (page 1), MATCH actual level (middle column) with the Pressurizer Level setpoint (left column) by ADJUSTING the output (right column) to within 2%.

Operating Test :	<u> NRC </u>	Scenario #	<u> 6 </u>	Event #	<u> 1 </u>	Page	<u> 204 </u>	of	<u> 216 </u>
Event Description: <u> Pressurizer Level Control Channel Y Fails High </u>									
Time	Position	Applicant's Actions or Behavior							

	RO	TRANSFER LIC-0110 PZR Level Controller to AUTO by depressing the A/M pushbutton.
	RO	DEPRESS HS-0100C, PZR LOW-LOW Level Heater Cutout Channel selector, selecting OPERABLE Level Transmitter X.
	RO	RESET PZR heaters by depressing OFF, then AUTO.
	RO	RESTORE Backup Charging Pumps to AUTO.
<u>Examiner Note:</u> Crew may elect to switch the CFMS point display for PZR level from Channel Y to Channel X.		
+10 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> • 3.3.11.A, Post Accident Monitoring Instrumentation.
		<ul style="list-style-type: none"> • CONDITION A - One or more Functions with one required channel INOPERABLE. • ACTION A.1 - Restore required channel to OPERABLE status within 30 days.
		<ul style="list-style-type: none"> • 3.4.9.B, Pressurizer Heaters.
		<ul style="list-style-type: none"> • CONDITION B - One required group of Pressurizer Heaters INOPERABLE. • ACTION B - Restore required group of Pressurizer Heaters to OPERABLE status within 72 hours.
<i>When Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Event 2.</i>		

Operating Test :	NRC	Scenario #	6	Event #	2	Page	205	of	216
Event Description: TPCW Pump P-120 Trip With P-119 Auto Start Failure									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, EXECUTE Event 2.
 - TP02B, TPCW Pump P-120 overcurrent trip.
 - Remote Function 2HS-6940-CR64-S03 to prevent auto start of P-119.

Indications available:

99A31 – TPCW PUMP OC
 99A41 – ISO PHASE BUS HX FLOW LO
 99A51 – TPCW PUMP OOS / NOT IN AUTO
 99A12 – TPCW PRESS LO-LO
 99A17 – TPCW SURGE TANK OUTLET VALVE CLOSED
 99C52 – GENERATOR CASING GAS TROUBLE (in ~45 seconds with no action)
 99C05 – STATOR WATER TEMP HIGH PRETRIP (in ~1 minute with no action)
 99C04 – STATOR WATER TEMP HIGH TURBINE TRIP (in ~1.5 minutes with no action)
 TPCW P120 will trip and P119 remains in standby

+10 sec	BOP	REFER to Annunciator Response Procedures and REPORT that TPCW Pump P120 has tripped.
---------	-----	--

+1 min	BOP	DETERMINE Standby TPCW Pump has not started.
--------	-----	--

- Manually START TPCW Pump P119.

	CRS	CONTACT Maintenance to determine cause of failure.
--	-----	--

+5 min	CRS	DISPATCH PEO to check TPCW Pump and breaker.
--------	-----	--

M.O. Cue: If sent to check TPCW Pump P120 and breaker, REPORT that there is an overcurrent flag at the breaker, and the pump appears normal. If sent to check P119, REPORT that there is no apparent problem at the pump or breaker.

When TPCW P-119 is running and Stator Water Cooling alarms are clear, or at Lead Evaluator's discretion, PROCEED to Events 3 & 4.

Operating Test :	NRC	Scenario #	6	Event #	3 and 4	Page	206	of	216
Event Description: Dropped Control Element Assembly #87 / Downpower Due to Dropped CEA									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, EXECUTE Event 3.
- RD8703, Dropped Control Element Assembly #87.

Indications Available:

50A28 - CEA DEVIATION
50A38 - CEA GROUP DEVIATION
50A10 - CEDMCS CEA WITHDRAWAL PROHIBIT
56B36 - PPS CHANNEL 4 TROUBLE
56A03 - LOCAL POWER DENSITY HI CHANNEL TRIP
56A04 - DNBR LO CHANNEL TRIP
56A13 - LOCAL POWER DENSITY HI PRETRIP
50A02 - COLSS ALARM
CEA #87 Rod Bottom indication

+30 sec	RO	RECOGNIZE that Regulating Group B CEA #87 has dropped and INFORM the CRS AOI SO23-13-13 entry required.
	CRS	DIRECT performance of AOI SO23-13-13, Misaligned or Immovable Control Element Assembly.
	RO	VERIFY that no more than one CEA is misaligned > 7 inches.
	RO	ENSURE CEDMCS Mode Selector Switch in OFF.
	BOP	REDUCE Turbine load to restore RCS Tcold to the pre-CEA drop value and BLOCK load changes.
<u>M.O. Cue:</u> If sent as Radwaste PEO to investigate CEDMCS, WAIT 3 minutes and REPORT no observable problems. If sent as I&C to investigate, WAIT 5 minutes and REPORT that the CEA estimated repair time cannot be determined.		
	RO	VERIFY Reactor is critical.
	CRS	RECORD initial and stabilized reactor power for subsequent SDM calculation.
	CRS	Within 15 minutes, DIRECT monitoring of DNBR and LPD per SO23-3-3.6, Attachment for DNBR Margin and Linear Heat Rate Limit Monitoring.

Operating Test :	NRC	Scenario #	6	Event #	3 and 4	Page	207	of	216
Event Description: Dropped Control Element Assembly #87 / Downpower Due to Dropped CEA									
Time	Position	Applicant's Actions or Behavior							

<u>Floor Cue:</u> The Work Control Supervisor will complete the DNBR and LPD monitoring in accordance with SO23-3-3.6, Attachment 1.		
	CRS	DIRECT performance of Attachment 3, Misaligned CEA checklist.
	CRS	Within 15 minutes of discovery, DIRECT initiation of Reactor power reduction.
		<ul style="list-style-type: none"> For Non Group 6 Full Length CEA, REDUCE power 10% within 60 minutes.
<u>Examiner Note:</u> CRS should recognize that power reduction due to dropped CEA (~2%) satisfies the 15 minute requirement to initiate a power reduction. The remaining power reduction must be accomplished within 60 minutes.		
	BOP	COMMENCE lowering Turbine Generator load using CVOL while maintaining Tcold per SO23-5-1.7.
	CRS	DIRECT initiation of boration of the RCS per SO23-3-2.2 to achieve target power level.
	RO	COMMENCE attempting to control ASI near full power ESI.
<u>Floor Cue:</u> DIRECT CRS as the Shift Manager to commence the downpower.		
	CRS	REQUEST Reactor Engineering to report to the Control Room.
	CRS	INITIATE recovery of affected CEA per Attachment 1.

Operating Test :	NRC	Scenario #	6	Event #	3 and 4	Page	208	of	216
Event Description: Dropped Control Element Assembly #87 / Downpower Due to Dropped CEA									
Time	Position	Applicant's Actions or Behavior							

	RO	VERIFY CEA position indications agree:
		<ul style="list-style-type: none"> COMPARE affected CEA PIDs from CEAC No. 1 and 2 at CPC Operator Console.
		<ul style="list-style-type: none"> COMPARE affected CEA PIDs from CEAC No. 1 and 2 at Secondary Rod Position CRT.
		<ul style="list-style-type: none"> CHECK UEL and LEL lights.
	RO/CRS	VERIFY one CEA has not been misaligned >7 inches for an unknown duration.
+20 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> LCO 3.1.5.B, Control Element Assembly Alignment.
		<ul style="list-style-type: none"> CONDITION B - One Shutdown CEA trippable and misaligned from its group by >7 inches. ACTION B.1 - Initiate THERMAL POWER reduction in accordance with COLR requirements within 15 minutes. ACTION B.2 - Restore the misaligned CEA(s) to within 7 inches of its group within two (2) hours.
		<ul style="list-style-type: none"> LCO 3.1.6.A, Shutdown Control Element Assembly Insertion Limits.
		<ul style="list-style-type: none"> CONDITION A - One or more Shutdown CEA(s) not within limit. ACTION A.1 - Restore shutdown CEA(s) to within limit within two (2) hours.
<u>Examiner Note:</u> Azimuthal Power Tilt was measured at 0.09 during validation. This value may vary somewhat depending on the time T_q is observed. The Technical Specification call should be adjusted as appropriate.		
		<ul style="list-style-type: none"> LCO 3.2.3.B, Azimuthal Power Tilt.
		<ul style="list-style-type: none"> CONDITION B - Measured $T_q > 0.03$ and ≤ 0.10. ACTION B.1 - Adjust the T_q allowance in the CPCs to greater than or equal to the measured T_q within limit within two (2) hours.
<i>When a 3-5% power reduction is completed, or at Lead Evaluator's discretion, PROCEED to Event 5.</i>		

Operating Test :	<u> NRC </u>	Scenario #	<u> 6 </u>	Event #	<u> 5 </u>	Page	<u> 209 </u>	of	<u> 216 </u>
Event Description: <u> Severe Weather / Tornado Warning </u>									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, **CONTACT** the Control Room as the Operations Manager and **NOTIFY** them of a Tornado Warning (Class F1 with expected wind speed of 100 mph) issued by the National Weather Service for coastal areas from Carlsbad in San Diego County to San Juan Capistrano in Orange County.

Indications available:

None

+1 min	CRS	DIRECT performance of SO23-13-8, Severe Weather.
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	CRS	VERIFY the Severe Weather Condition with the National Weather Service.
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M.O. Cue: When asked, **REPORT** as the National Weather Service that a Tornado Warning condition is in effect.

	CRS	MAKE a PA announcement directing personnel to shelter.
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	CRS	DIRECT initiation of TGIS.
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	BOP	INITIATE TGIS (starts CREACUS in the ISOLATE Mode).
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	CRS	DIRECT closure of Control Room Lobby exterior doors (AC-201 and AC-201A).
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+5 min	RO/BOP	INITIATE Attachment 1 Tornado Watch actions if possible before onset of the tornado.
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When AOI actions are addressed, or at Lead Evaluator's discretion, PROCEED to Events 6, 7 and 8.

Operating Test :	NRC	Scenario #	6	Event #	6, 7 & 8	Page	210	of	216
Event Description: Loss of Offsite Power / Loss of Main Feedwater / Loss of Auxiliary Feedwater									
Time	Position	Applicant's Actions or Behavior							

Machine Operator: When directed, EXECUTE Events 6, 7, and 8.

- RD0103, Dropped CEA #1.
- TU08, Main Turbine trip.
- PG24, Loss of Offsite Power upon Turbine trip.
- FW02A, AFW Pump P141 shaft seizure.
- FW25, AFW Pump P140 overspeed trip (30 seconds post-start).
- PG57, Loss of SDGE Switchyard (+5 minutes post-trip).

Indications available:

Numerous Loss of Offsite Power related alarms

+ 10 secs	RO	RECOGNIZE second dropped CEA and manually INITIATE a Reactor trip.
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CRITICAL TASK STATEMENT

Within five (5) minutes of a second CEA dropping into the Core, trip the Reactor.

Elapsed Time: _____

CRITICAL TASK

RO/BOP

MANUALLY TRIP the Reactor.

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

VERIFY Turbine Trip:

- VERIFY Main Turbine tripped.
- HP and LP Stop and Governor Valves closed.
- VERIFY both Unit Output Breakers open.
- VERIFY Main Turbine speed <2000 RPM or lowering.

Operating Test :	<u> NRC </u>	Scenario #	<u> 6 </u>	Event #	<u> 6, 7 & 8 </u>	Page	<u> 211 </u>	of	<u> 216 </u>
Event Description: <u> Loss of Offsite Power / Loss of Main Feedwater / Loss of Auxiliary Feedwater </u>									
Time	Position	Applicant's Actions or Behavior							

	CRS	INITIATE Administrative Actions:
		<ul style="list-style-type: none"> ANNOUNCE Reactor trip via PA System.
		<ul style="list-style-type: none"> INITIATE Attachment 4, Worksheet.
		<ul style="list-style-type: none"> INITIATE Attachment 5, Administrative Actions.
	BOP	DETERMINE Vital Auxiliaries NOT functioning properly:
		<ul style="list-style-type: none"> VERIFY both 1E 4 kV Buses A04 and A06 energized.
		<ul style="list-style-type: none"> VERIFY both 1E 480 V Buses B04 and B06 energized.
		<ul style="list-style-type: none"> VERIFY all Class 1E DC Buses energized.
	BOP	<ul style="list-style-type: none"> DETERMINE all Non-1E 4 kV Buses deenergized.
		<ul style="list-style-type: none"> [RNO] DETERMINE that all Circulating Water Pumps are off.
		<ul style="list-style-type: none"> [RNO] ENSURE MSIVs - closed.
		<ul style="list-style-type: none"> [RNO] OPERATE ADVs to maintain 1000 PSIA.
	BOP	<ul style="list-style-type: none"> DETERMINE one CCW Train NOT operating.
		<ul style="list-style-type: none"> [RNO] START one (1) CCW Pump.
		<ul style="list-style-type: none"> [RNO] ALIGN CCW to Non-Critical Loop and Letdown Heat Exchanger.
	RO	VERIFY RCS Inventory Control criteria satisfied:
		<ul style="list-style-type: none"> VERIFY PZR level between 10% and 70% and NOT trending to between 30% and 60%.
		<ul style="list-style-type: none"> VERIFY Core Exit Saturation Margin $\geq 20^{\circ}\text{F}$:
		<ul style="list-style-type: none"> QSPDS page 611.
		<ul style="list-style-type: none"> CFMS page 311.
	RO	VERIFY RCS Pressure Control criteria satisfied:
		<ul style="list-style-type: none"> VERIFY PZR pressure (WR and NR) between 1740 PSIA and 2380 PSIA and controlled AND trending between 2025 PSIA and 2275 PSIA.

Operating Test :	NRC	Scenario #	6	Event #	6, 7 & 8	Page	212	of	216
Event Description: Loss of Offsite Power / Loss of Main Feedwater / Loss of Auxiliary Feedwater									
Time	Position	Applicant's Actions or Behavior							

	RO	DETERMINE Core Heat Removal criteria is NOT satisfied:
		<ul style="list-style-type: none"> • DETERMINE no RCPs are operating.
		<ul style="list-style-type: none"> • VERIFY Core Exit Saturation Margin $\geq 20^{\circ}\text{F}$.
		<ul style="list-style-type: none"> • QSPDS page 611.
		<ul style="list-style-type: none"> • CFMS page 311.
	BOP	DETERMINE RCS Heat Removal criteria NOT satisfied:
		<ul style="list-style-type: none"> • VERIFY both SGs level $> 21\%$ NR.
		<ul style="list-style-type: none"> • VERIFY both SGs level $< 80\%$ NR.
	BOP	<ul style="list-style-type: none"> • DETERMINE Main feedwater NOT available to restore both SGs level between 40% NR and 80% NR.
		<ul style="list-style-type: none"> • [RNO] Manually INITIATE EFAS.
		<ul style="list-style-type: none"> • VERIFY heat removal adequate:
		<ul style="list-style-type: none"> • T_{cold} trending to between 545°F and 555°F.
		<ul style="list-style-type: none"> • SG pressures approximately 1000 PSIA.
Examiner Note: Steam Driven Auxiliary Feedwater Pump 2P140 will trip on overspeed 30 seconds after start. Both Main Feedwater Pumps should already have tripped on low Condenser vacuum.		
	BOP	RECOGNIZE Aux Feedwater Pump P140 has tripped by observing alarm 52A53 - TURBINE AUX FW PUMP GOVERNOR OVERSPEED / OOS.
M.O. Cue: When contacted to investigate the status of 2P140, WAIT 3 minutes, and then REPORT that the linkage is in the trip position.		
M.O. Cue: When directed to reset the trip linkage for 2P140, WAIT 3 minutes and REPORT that a linkage pin is broken. REQUEST Maintenance assistance.		
	RO	VERIFY Containment Isolation criteria satisfied:
		<ul style="list-style-type: none"> • VERIFY Containment pressure < 1.5 PSIG.

Operating Test : <u> NRC </u> Scenario # <u> 6 </u> Event # <u> 6, 7 & 8 </u> Page <u> 213 </u> of <u> 216 </u>		
Event Description: <u> Loss of Offsite Power / Loss of Main Feedwater / Loss of Auxiliary Feedwater </u>		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> • VERIFY Containment Area Radiation Monitors energized and NOT alarming or trending to alarm.
		<ul style="list-style-type: none"> • VERIFY Secondary Plant Radiation Monitors energized and NOT alarming or trending to alarm.
	RO	VERIFY Containment Temperature and Pressure criteria satisfied:
		<ul style="list-style-type: none"> • VERIFY Containment average temperature < 120°F.
		<ul style="list-style-type: none"> • VERIFY Containment pressure < 1.5 PSIG.
+15 min	CRS	DIAGNOSE Event in Progress:
		<ul style="list-style-type: none"> • DETERMINE some Safety Function criteria are NOT met per Attachment 4, Worksheet.
		<ul style="list-style-type: none"> • [RNO] COMPLETE Attachment 1, Recovery Diagnostics.
		<ul style="list-style-type: none"> • [RNO] DIAGNOSE Loss of Feedwater.
		<ul style="list-style-type: none"> • DETERMINE that Reactor Trip Recovery is NOT diagnosed.
		<ul style="list-style-type: none"> • [RNO] DETERMINE all RCPs stopped.
		<ul style="list-style-type: none"> • DIRECT initiating Steps 12 through 15.
	BOP	INITIATE Steps 12 through 15.
<u>M.O. Cue:</u> If SC&E GCC is contacted for grid status, REPORT that cause of grid loss is unknown and field crews are investigating. No estimate on time to restore a line.		
	CRS	DIRECT performance of SO23-12-6, Loss of Feedwater.
		<ul style="list-style-type: none"> • Record time of EOI entry _____.
	CRS	VERIFY Loss of Feedwater diagnosis:
		<ul style="list-style-type: none"> • INITIATE SO23-12-10, Safety Function Status Checks.
		<ul style="list-style-type: none"> • INITIATE Foldout Page.
		<ul style="list-style-type: none"> • DIRECT performance of FS-3, Monitor Natural Circulation.
		<ul style="list-style-type: none"> • DIRECT performance of FS-11, Reset P-140 Overspeed Trip.
		<ul style="list-style-type: none"> • DIRECT performance of SO23-12-11, Attachment 19, Non-1E DC Load Reduction.

Operating Test : <u> NRC </u> Scenario # <u> 6 </u> Event # <u> 6, 7 & 8 </u> Page <u> 214 </u> of <u> 216 </u>		
Event Description: <u> Loss of Offsite Power / Loss of Main Feedwater / Loss of Auxiliary Feedwater </u>		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> DIRECT performance of SO23-12-11, Attachment 20, Class 1E Battery Load Reduction.
		<ul style="list-style-type: none"> DIRECT performance of SO23-12-11, Attachment 22, Non-Qualified Load Restoration.
		<ul style="list-style-type: none"> DIRECT performance of FS-18, Secondary Plant Protection.
		<ul style="list-style-type: none"> DIRECT performance of SO23-12-11, Attachment 8, Restoration of Offsite Power.
	RO/BOP	ENSURE EFAS-1 and EFAS-2 actuated.
	RO/BOP	<ul style="list-style-type: none"> VERIFY Loss of Feedwater diagnosis.
		<ul style="list-style-type: none"> Both SG levels < 40 % NR and total AFW flow < 400 gpm.
		<ul style="list-style-type: none"> Pressurizer level stable or rising.
		<ul style="list-style-type: none"> Pressurizer pressure stable or rising.
		<ul style="list-style-type: none"> Both Steam Generator pressures > 740 psia and stable or rising.
	CRS	INITIATE Administrative Actions.
		<ul style="list-style-type: none"> NOTIFY Shift Manger/Operations Leader of entry into SO23-12-6, Loss of Feedwater.
		<ul style="list-style-type: none"> ENSURE Emergency Plan is initiated.
		<ul style="list-style-type: none"> IMPLEMENT Placekeeper.
	RO	ENSURE all RCPs stopped.
	BOP	CLOSE SG Blowdown and Sample valves.
	CRS	IDENTIFY available equipment:
	BOP	<ul style="list-style-type: none"> VERIFY AFW Pump available with overspeed trip reset.
		<ul style="list-style-type: none"> DETERMINE AFW Pump NOT operating.
	BOP	DETERMINE that 2P140 is tripped on overspeed.
	BOP	OVERRIDE and CLOSE 2HV-4716.

Operating Test :	NRC	Scenario #	6	Event #	6, 7 & 8	Page	215	of	216
Event Description: Loss of Offsite Power / Loss of Main Feedwater / Loss of Auxiliary Feedwater									
Time	Position	Applicant's Actions or Behavior							

<u>M.O. Cue:</u> When directed to reset P140, DELETE malfunction FW25 then EXECUTE remote function FW52 to reset TDAFW Pump P140 overspeed trip, and REPORT the overspeed trip on P140 has been reset.		
	CRS	DETERMINE FS-11, Reset P140 Overspeed Trip, completed
	BOP	CLOSE AFW Pump Discharge valves 2HV-4705 and 2HV-4706.
<u>Examiner Note:</u> 2HV-4705 and 2HV-4706 may not close due to an EFAS signal being present. If this is the case, they will need an outside operator to close the manual discharge valve for 2P140 (not required at this power level).		
<u>M.O. Cue:</u> If required, EXECUTE remote function FW103 for closing P140 Throttle Valve MU122.		
	BOP	START AFW Pump P140.
	BOP	ENSURE at least one AFW to SG Isolation valve to each SG open.
		• E088 - either HV-4714 or HV-4730
		• E089 - either HV-4715 or HV-4731
<u>M.O. Cue:</u> If required, throttle OPEN AFW using remote function FW103, P140 Throttle Valve MU122. 25% open is approximately equal to 130 gpm per Steam Generator.		
CRITICAL TASK STATEMENT		Restore feedwater flow to at least one Steam Generator prior to complete loss of secondary inventory in both Steam Generators.
CRITICAL TASK	BOP	If SG levels are less than 40% NR, then THROTTLE 2HV-4705 and 2HV-4706 to maintain AFW flow between 130 and 150 GPM, and MAINTAIN reduced AFW flow for 5 minutes.
+30 min	BOP	RAISE total AFW flow to greater than 400 gpm.
<i>When feedwater is restored to both Steam Generators, or at Lead Evaluator's discretion, TERMINATE the scenario.</i>		

Operating Test : <u> NRC </u> Scenario # <u> 6 </u> Event # <u> 6, 7 & 8 </u> Page <u> 216 </u> of <u> 216 </u>		
Event Description: <u> Loss of Offsite Power / Loss of Main Feedwater / Loss of Auxiliary Feedwater </u>		
Time	Position	Applicant's Actions or Behavior