

Facility:	San Onofre	Scenario No.:	1	Op Test No.:	NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> <li>• 99.5% power MOC - RCS Boron is 883 ppm (by sample)</li> <li>• Train A Component Cooling Water Pump (P-025) in service</li> <li>• Train A Containment Spray Pump (P-012) OOS</li> <li>• Train A High Pressure Safety Injection Pump (P-017) OOS</li> <li>• Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS</li> </ul>				
Turnover:	Maintain steady-state power conditions.				
Critical Tasks:	<ul style="list-style-type: none"> <li>• Transfer the Non-Critical Loop (Train A Critical Loop rupture).</li> <li>• Trip any RCP not satisfying RCP operating limits.</li> <li>• Manually initiate MSIS (Auto actuation failure).</li> <li>• Stabilize RCS temperature/pressure following loss of heat removal from the faulted Steam Generator.</li> <li>• Isolate the most affected Steam Generator (ESDE).</li> </ul>				
Event No.	Malf. No.	Event Type*	Event Description		
1 + min	SEIS OBE FW25	TS (CRS)	Seismic event without Main Feedwater Pump trip. Auxiliary Feedwater Pump (P-140) trip		
2 + min	CH04A CH04C	I (RO, CRS) TS (CRS)	Containment Pressure Transmitters (PT-0352-1 & 3) fail high.		
3 + min	FC05A	I (BOP, CRS)	Steam Generator E-089 Master Controller Setpoint failure.		
4 + min	CV16A	I (RO, CRS)	VCT Level Instrument fails low (LT-0226).		
5 + min	CC03A	C (BOP, CRS) TS (CRS)	Rupture of Component Cooling Water line to the Shutdown Cooling Heat Exchanger.		
6 + min	MS03B	M (ALL)	Excess Steam Demand Event on Steam Generator (E-089) inside Containment.		
7 + min	RP01C	C (RO)	Train B High Pressure Safety Injection Pump (P-019) start failure.		
8 + min	RPS LP	I (BOP)	Main Steam Isolation Signal fails to actuate, manual actuation required.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specifications					

### **SCENARIO SUMMARY NRC #1**

The crew will assume the watch and maintain steady-state conditions per SO23-5-1.7, Power Operations. When turnover is complete, a seismic event will occur. The crew will respond per Abnormal Operating Instruction (AOI) SO23-13-3, Earthquake. The initial earthquake will cause trip and damage to the linkage of the Steam Driven Auxiliary Feedwater Pump. The CRS will evaluate Technical Specifications. When plant conditions are stable, two Containment Pressure Transmitters fail high. The crew will ensure that a Containment Spray Actuation Signal has not generated per the Annunciator Response Procedures (ARP). AOI SO23-13-18, Reactor Protection System Failure will require placing one channel in Bypass and the other channel in Trip. The CRS will evaluate Technical Specifications.

When actions of SO23-13-18 are complete, a Feedwater Master Controller Setpoint will fail to 58% level. The crew will regain control of feedwater per the ARP and/or AOI SO23-13-24, Feedwater Malfunctions. When the plant is stable, the VCT Level Transmitter (LT-226) will fail low. The crew will secure VCT makeup per the ARP and SO23-3-2.2, Makeup Operations. The RCS Makeup Control System will then be aligned for Manual Blended Makeup mode.

During aftershocks, a Train A Component Cooling Water header rupture is initiated. The crew will respond per AOI SO23-13-7, Loss of Component Cooling Water (CCW) / Saltwater Cooling (SWC). The crew will align Train B SWC & CCW and the ruptured header will be removed from service. The CRS will evaluate Technical Specifications.

The EOI entry point is caused by an Excess Steam Demand Event (ESDE) on Steam Generator E-089 inside Containment. The crew performs Emergency Operating Instruction (EOI) SO23-12-1, Standard Post Trip Actions and diagnoses an ESDE. The crew will transition to EOI SO23-12-5, Excess Steam Demand Event and perform necessary actions to stabilize RCS temperature. The Main Steam Isolation Signal (MSIS) fails to actuate and the BOP will be required to manually actuate MSIS. Additionally, the RO will be required to manually start Train B HPSI Pump P-019. The scenario is terminated when the crew stabilizes RCS temperature and pressure following pressure following loss of heat removal from the faulted Steam Generator.

#### Risk Significance:

- Risk important components out of service: CS P-012, HPSI P-017
- Failure of risk important system prior to trip: Loss of CCW Train due to rupture
- Risk significant core damage sequence: ESDE without MSIS
- Risk significant operator actions:
  - Transfer the Non-Critical Loop
  - Manually start HPSI Pump
  - Manually initiate MSIS
  - Stabilize RCS temp following ESDE

Scenario Event Description

NRC Scenario 1

SONGS

2007 Facility NRC Initial License Examination

Simulator Scenario Setup

Scenario 1

MACHINE OPERATOR'S INSTRUCTIONS

SETUP

**IC: Use IC #XXX and see attached Event File for NRC Scenario #1.**

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Event Description:		Seismic Event / AFW Pump Trip							
Time	Position	Applicant's Actions or Behavior							

**Machine Operator:** EXECUTE IC #XXX and NRC Scenario #1 SETUP file to align components.

ENSURE Control Board Tags are hung on P-012 and P-017.

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

ENSURE procedures in progress are on the RO desk:

- Copy of SO32-5-1.7, Power Operations open to Section 6.4, Guidelines for Steady State Power Operation.

**Control Room Annunciators in Alarm at 100%:**

**57A52 – CONTAINMENT SPRAY SYS TRAIN A INOPERABLE**

**Machine Operator:** When directed, EXECUTE Event 1.

- Seismic OBE without Main Feedwater Pump trip
- FW25, Auxiliary Feedwater Pump (P140) trip

**Indications Available:**

**61C21 – SEISMIC RECORDING SYSTEM ACTIVATED**  
**61C22 – OPERATING BASIS EARTHQUAKE DETECTED**  
**61C03 – SPENT FUEL POOL LEVEL HI/LO**  
**64A26(29) – CCW SURGE TANK TRAIN A(B) LEVEL HI/LO**  
**99B49 – TURBINE VIBRATION HI**  
**99A11 – TPCW SURGE TANK LEVEL HI/LO**  
**53A15 – MFWP TURBINE K006 VIBRATION HI PRETRIP**  
**53A30 – MFWP/TURBINE P062/K006 VIBRATION HI**  
**53B58 – CONDENSATE TANK T120 LEVEL HI/LO**  
**50A54 – CEDMCS MG OUTPUT CONTACTOR OPEN**  
**58A25(35) – BAMU TANK T072 (T071) LEVEL HI/LO**  
**57A(B)16 – RWST T006 (T005 ) LEVEL LO**  
**63B(C)50 – DIESEL GEN 2G002 (2G003 ) STORAGE TANK LEVEL HI/LO**

+1 min	CREW	REFER to Annunciator Response Procedures.
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	BOP	RECOGNIZE Operating Basis Earthquake and INFORM the CRS AOI SO23-13-3 entry required.
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	BOP	DETERMINE Steam Driven Auxiliary Feedwater Pump (P-140) tripped and REPORT to the CRS.
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Event Description:	Seismic Event / AFW Pump Trip								
Time	Position	Applicant's Actions or Behavior							

	CRS	DIRECT performance of SO23-13-3, Earthquake.
	CRS	DISPATCH an operator to the AFW Pump Room.
<b>M.O. Cue: Once dispatched, WAIT three (3) minutes and REPORT P140 linkage is damaged and pump is tripped.</b>		
<b>NOTE: Shift Manager will SHOW Seismic Panel indications to the CRS.</b>		
	CRS	VERIFY the following occurred:
		<ul style="list-style-type: none"> <li>Valid activation of any of the following alarms or Seismic Instrument Panel indications:</li> </ul>
		<ul style="list-style-type: none"> <li>2UA61C21, Seismic Recording System Activated alarm – illuminated.</li> </ul>
		<ul style="list-style-type: none"> <li>Strong Motion Acceleration System Activation (light indication on 2UA-8020, actuates at 0.019g)</li> </ul>
		<ul style="list-style-type: none"> <li>Event 2ZLH-8020G (light indication on 2XY-8020), AND</li> </ul>
		<ul style="list-style-type: none"> <li>Ground motion that is readily felt by a consensus of Control Room personnel.</li> </ul>
<b>Floor Cue: Shift Manager will REPORT there was ground motion.</b>		
	CRS	DETERMINE Operating Basis Earthquake occurred:
	BOP	<ul style="list-style-type: none"> <li>2UA61C22, Operating Basis Earthquake Acceleration alarm – ILLUMINATED (actuates at 0.33g), AND</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>OBE alarms (both white lamps: Containment Base OBE <u>AND</u> Containment Operating Level OBE) on Seismic Instrumentation Panel ILLUMINATED.</li> </ul>
	BOP	INITIATE Attachment 1 of SO23-13-3.

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Event Description:	Seismic Event / AFW Pump Trip								
Time	Position	Applicant's Actions or Behavior							

+ 10 min	CRS	EVALUATE Technical Specifications
		<ul style="list-style-type: none"> <li>LCO 3.7.5.B, Auxiliary Feedwater System.</li> </ul>
		<ul style="list-style-type: none"> <li>ACTION B - One AFW Train inoperable for reasons other than Condition A in MODE 1, 2, or 3; Restore AFW train to OPERABLE status within 72 hours.</li> </ul>
<b>M.O. Cue: When directed, CLEAR the Seismic alarms on Control Board Panel 61C in preparation for the aftershock.</b>		
<b><i>When SO23-13-3, Attachment 1 is initiated and Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Event 2.</i></b>		

Op Test No.:	<u>NRC</u>	Scenario #	<u>1</u>	Event #	<u>2</u>	Page	<u>7</u>	of	<u>68</u>
Event Description:		Containment Pressure Transmitter (PT-0352-1 & 3) Failures							
Time	Position	Applicant's Actions or Behavior							

**Machine Operator:** When directed, EXECUTE Event 2.  
 - CH04A, Cont. Pressure Transmitter (PT-0352-1) fails high  
 - CH04C, Cont. Pressure Transmitter (PT-0352-3) fails high

**Indications available:**

56A08 - CTMT PRESS HI HI ESFAS CHANNEL TRIP

56A18 - CTMT PRESS HI ESFAS PRETRIP

56B06 - PPS CHANNEL 1 TROUBLE

56B26 - PPS CHANNEL 3 TROUBLE

+ 1 min	RO	REFER to Annunciator Response Procedures.
	RO	RECOGNIZE Containment Pressure Channel failures and INFORM the CRS AOI SO23-13-18 entry required.
	CRS	DIRECT performance of AOI SO23-13-18, Reactor Protection System Failure/Loss of Vital Bus.
	RO	DETERMINE failure by observing instrumentation for the affected channels and alternate redundant indications monitoring the same parameter.
	RO	IDENTIFY Containment Pressure Channel PT-0352-1 and PT-0352-3 failures.
	RO	PLACE the one of the affected Functional Units in BYPASS and the other affected Functional Units in TRIP per SO23-3-2.12, Reactor Protection System.
<b>M.O. Cue:</b> When directed, EXECUTE the following Remote Functions:		
	RP51 = OPEN	(PPS Door Open Annunciator 56B46)
	RP5XX = BYPASS	( )
	RP5XX = TRIP	( )
	Delete RP51	(PPS Door Open Annunciator 56B46)

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Event Description:		Containment Pressure Transmitter (PT-0352-1 & 3) Failures							
Time	Position	Applicant's Actions or Behavior							

	RO	VERIFY the Trip Channel Bypassed Annunciator alarms.
		<ul style="list-style-type: none"> <li>56A29 - PPS CHANNEL 1 TRIP BYPASSED</li> <li>56A49 - PPS CHANNEL 3 TRIP BYPASSED</li> </ul>
	RO	LOG the bypass and the reason for the bypass in the Control Operator's Log.
	CRS	INITIATE a LCOAR or follow guidelines of SO123-0-A5.
+ 10 min	CRS	EVALUATE Technical Specifications
		<ul style="list-style-type: none"> <li>LCO 3.3.1.B, RPS Instrumentation - Operating.</li> <li>ACTION B - One or more functions with two automatic RPS trip channels inoperable; Place one Functional Unit in bypass and the other in trip within one (1) hour.</li> </ul>
<p><b><i>When one channel has been placed in BYPASS and the other channel in TRIP, or at Lead Evaluator's discretion, PROCEED to Event 3.</i></b></p>		



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Event Description:		Steam Generator E089 Master Controller Setpoint Failure							
Time	Position	Applicant's Actions or Behavior							

**Machine Operator:** When directed, EXECUTE Event 3.  
- FC05A, E089 Master Controller Setpoint failure to 58%

**Indications available:**

**52A07 - FWCS SG1 E089 LEVEL DEVIATION**

**52A13 - FWCS TROUBLE**

**53B23 - CONDENSATE FLOW BALANCE TROUBLE**

**SG E089 Feedwater Control Valve modulating closed then open**

**SG E089 level lowering**

+ 1 min	BOP	REFER to Annunciator Response Procedure.
	BOP	RECOGNIZE E089 Master Controller Setpoint at 58% and INFORM the CRS AOI SO23-13-24 entry required.
	CRS	DIRECT performance of AOI SO23-13-24, Feedwater Control System Malfunctions.
	CRS	DIRECT use of AOI SO23-13-24, Attachment 1.
	BOP	Using Attachment 1, DETERMINE that SG E089 level is low.
	BOP	DETERMINE that SG E089 Master Controller output is NOT rising.
	BOP	PLACE E089 Master Controller in MANUAL and RAISE output.
<b>Floor Cue: As the Shift Manager, DIRECT the crew to maintain SG levels at 68%.</b>		

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Event Description:		Steam Generator E089 Master Controller Setpoint Failure							
Time	Position	Applicant's Actions or Behavior							

	BOP	DETERMINE that SG E089 Feed Control Valve is opening.
	BOP	DETERMINE that Main Feedwater Pumps K-005 and K-006 speed is rising.
+ 10 min	BOP	VERIFY SG E089 level is stable at or near program level with SG E089 Master Controller in MANUAL.
<b><i>When SG level is restored, or at Lead Evaluator's discretion, PROCEED to Event 4.</i></b>		

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Event Description:

Time	Position	Applicant's Actions or Behavior
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**Machine Operator:**    **When directed, EXECUTE Event 4.**  
                                       **- 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	IDENTIFY that VCT level indicator LI-0226 has failed low.
	RO	PLACE Makeup Mode Selector, HS-0210, to MANUAL.
<p><b>NOTE:            When Makeup Control is placed in MANUAL, the following alarms will illuminate (on short time delay):</b></p>		
		<ul style="list-style-type: none"> <li>• 58A06 - BORIC ACID TO VCT FLOW HI/LO (100 sec TD)</li> </ul>
		<ul style="list-style-type: none"> <li>• 58A07 - DEMIN WATER TO VCT FLOW HI/LO (45 sec TD)</li> </ul>
	CRS	DIRECT performance of SO23-3-2.2, Makeup Operations to ensure proper CVCS alignment is achieved.
+10 min	CRS	REQUEST I&C assistance.
<p><b>When VCT Makeup is in Manual or at Lead Evaluator's discretion, PROCEED to Event 5.</b></p>		

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Event Description:		CCW Train A Header Rupture							
Time	Position	Applicant's Actions or Behavior							

**Machine Operator:** When directed, EXECUTE Event 5.  
- CC03A, CCW Train A rupture at SDC HX E004 @ 500 gpm.

**Indications available:**

**64A26 – CCW SURGE TANK TRAIN A LEVEL HI/LO (time delay of ~7 min)**

**64A07 – CCW PUMP TRAIN A DISCH PRESS LO**

**64A45 – CCW HX TRAIN A OUTLET PRESS LO**

**64A17 – CCW TRAIN A RETURN FLOW LO**

**56C58 – SAFETY EQPT BLDG SUMP LEVEL HI-HI (time delay of ~10 min)**

+30 sec	BOP	REFER to Annunciator Response Procedures.
	BOP	RECOGNIZE lowering surge tank level and CCW Pump discharge pressure and INFORM the CRS AOI SO23-13-7 entry required.
+1 min	CRS	DIRECT performance of AOI SO23-13-7, Loss of SWC/CCW.
	BOP	ISOLATE Radwaste by closing 2HV-6465, 3HV-6465, 2HV-6217, and 3HV-6217.
	CRS/BOP	DETERMINE that the leak is not isolated.
	CRS	DIRECT placing Train B CCW in service.
	BOP	START CCW Pump P-026 and VERIFY that SWC P-114 automatically starts.
+3 min	CRS	DIRECT transfer of the CCW Non-Critical Loop to Train B.
<b>Critical Task Statement</b>	<p><b>Within ten (10) minutes from 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.</b></p> <p><b>Elapsed Time: _____</b></p>	

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Event Description:		CCW Train A Header Rupture							
Time	Position	Applicant's Actions or Behavior							

<b>CRITICAL TASK</b>	BOP	TRANSFER the CCW Non-Critical Loop to Train B.
	CRS	DIRECT transfer of Letdown HX to Train B.
	BOP	TRANSFER Letdown HX to Train B.
	CRS/RO	DISPATCH PEO to investigate flooding alarms.
	CRS	DIRECT securing CCW Pump P-025.
	BOP	STOP CCW Pump P-025 and SWC Pump P-112.
<b>M.O. Cue:</b> If directed to rack out breaker for CCW Pump P-024, WAIT 3 minutes and EXECUTE remote functions CC57A (DC to P-024) and CC58A (P-024 Breaker). If directed to rack out breaker for CCW Pump P-025, WAIT 3 minutes and EXECUTE remote functions CC57B (DC to P-025) and CC58B (P-025 Breaker).		
	CRS/ BOP	DISPATCH PEO to close Loop A CCW Surge Tank Outlet, HV-6225.
<b>M.O. Cue:</b> If directed to close HV-6225, Loop A CCW Surge Tank Outlet, WAIT 3 minutes and EXECUTE remote function CC60.		
<b>M.O. Cue:</b> If contacted to report status of Unit 3 CCW Surge Tank Level, REPORT that Train A CCW Surge Tank level is stable and unchanged.		

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Event Description:		CCW Train A Header Rupture							
Time	Position	Applicant's Actions or Behavior							

+10 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> <li>LCO 3.7.7.A, Component Cooling Water System.</li> </ul>
		<ul style="list-style-type: none"> <li>ACTION A - Restore CCW Train to OPERABLE status within 72 hours.</li> </ul>
		<ul style="list-style-type: none"> <li>LCO 3.7.8.A, Saltwater Cooling System.</li> </ul>
		<ul style="list-style-type: none"> <li>ACTION A - Restore SWC Train to OPERABLE status within 72 hours.</li> </ul>
<p><b>NOTE:</b> The crew may decide to place CCW pumps P-024 and P-025 OOS, swap CCW Pump P-025 to Train B, and/or place Train A HPSI and CS Pumps OOS. Crew may remove DC Control Power for Train A HPSI and CS pumps to avoid damage due to lack of cooling water.</p>		
<p><b>M.O. Cues:</b> If directed to open the DC power supply breaker for the Train A ESF Pumps, <b>ACKNOWLEDGE</b> the order but do not perform (Time restriction).</p> <p>If directed to transfer Emergency Chiller E-336 to Unit 3, <b>ACKNOWLEDGE</b> the order but do not perform (Time restriction).</p> <p>If directed to transfer CCW Pump P-025 from Train A to Train B, <b>ACKNOWLEDGE</b> the order but do not perform (Time restriction).</p>		
	CRS	ENSURE ECCS is not required.
		<ul style="list-style-type: none"> <li>HPSI, LPSI, CS pumps are stopped.</li> </ul>
<p><b>When Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Events 6, 7, &amp; 8.</b></p>		

<b><u>Machine Operator:</u></b> When directed, EXECUTE Events 6, 7, and 8. - MS03B, ESDE on E089 inside Containment @ 1.2% - RPS LP, MSIS fails to actuate - RP01C, HPSI Pump P019 start failure		
<b><u>Indications available:</u></b> 60A02 – CONTAINMENT HUMIDITY HIGH 60A12 – REACTOR CAVITY TEMP HI 60A03 – CONTAINMENT / FHB TEMP HI 56A35 – CONTAINMENT PRESSURE HI PRETRIP 56A17 – CONTAINMENT PRESS HI ESFAS PRETRIP		
+30 secs	RO/BOP	RECOGNIZE that an uncontrolled cooldown is in progress and INFORM the CRS that a Reactor trip is required.
	CRS	DIRECT entry into SO23-12-1, Standard Post Trip Actions.
	RO	VERIFY Reactor Trip: <ul style="list-style-type: none"> <li>• VERIFY Reactor Trip Circuit Breakers (8) - open.</li> <li>• VERIFY Reactor Power lowering and Startup Rate - negative.</li> <li>• VERIFY maximum of one full length CEA - NOT fully inserted.</li> </ul>
	BOP	VERIFY Turbine Trip: <ul style="list-style-type: none"> <li>• VERIFY Main Turbine tripped. <ul style="list-style-type: none"> <li>○ HP and LP Stop and Governor valves - closed.</li> </ul> </li> <li>• VERIFY both Unit Output Breakers - open.</li> <li>• VERIFY Main Turbine speed &lt;2000 RPM or lowering.</li> </ul>

	CRS	INITIATE Administrative Actions:
		<ul style="list-style-type: none"> <li>ANNOUNCE Reactor trip via PA system.</li> </ul>
		<ul style="list-style-type: none"> <li>INITIATE Attachment 4, Worksheet.</li> </ul>
		<ul style="list-style-type: none"> <li>INITIATE Attachment 5, Administrative Actions.</li> </ul>
	BOP	VERIFY Vital Auxiliaries functioning properly:
		<ul style="list-style-type: none"> <li>VERIFY both 1E 4 kV Buses A04 and A06 - energized.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY both 1E 480 V Buses B04 and B06 - energized.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY all Class 1E DC Buses – energized.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY all 6.9 kV and Non-1E Buses – energized.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY one CCW Train - operating AND aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger.</li> </ul>
<p><b>M.O. Cue: 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.</b></p>		
	RO	DETERMINE RCS Inventory Control criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE PZR level NOT between 10% and 70% AND NOT trending to between 30% and 60%.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DETERMINE PZR Level Control System is NOT restoring PZR level.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Core Exit Saturation Margin <math>\geq 20^{\circ}\text{F}</math>:</li> </ul>
		<ul style="list-style-type: none"> <li>QSPDS page 611.</li> </ul>
		<ul style="list-style-type: none"> <li>CFMS page 311.</li> </ul>



	RO	DETERMINE RCS Pressure Control criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE PZR pressure (WR and NR) NOT between 1740 PSIA and 2380 PSIA AND NOT controlled AND NOT trending to between 2025 PSIA and 2275 PSIA.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DETERMINE PZR Pressure Control System is NOT restoring PZR pressure.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE Normal and Aux Spray valves - closed.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE SIAS, CCAS, and CRIS - actuated.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] If PZR pressure is &lt; 1430 PSIA, then ENSURE at least one RCP in each loop - stopped.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] If RCP NPSH requirements NOT satisfied, then ENSURE all RCPs - stopped.</li> </ul>
	RO	REPORT that HPSI Pump P-019 failed to start and START HPSI Pump P-019.
	RO	DETERMINE Core Heat Removal criteria is NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE no RCPs should be operating due to CIAS.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Core Exit Saturation Margin <math>\geq 20^{\circ}\text{F}</math>.</li> </ul>
		<ul style="list-style-type: none"> <li>QSPDS page 611.</li> </ul>
		<ul style="list-style-type: none"> <li>CFMS page 311.</li> </ul>
	BOP	DETERMINE RCS Heat Removal criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>VERIFY at least one SGs level between 21% and 80% NR.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE <math>T_C</math> less than <math>545^{\circ}\text{F}</math> and NOT controlled.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE heat removal NOT adequate:</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] <math>T_C</math> – less than <math>545^{\circ}\text{F}</math>.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE SBCS valves closed.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE ADVs closed.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE SG Blowdown valves closed.</li> </ul>
		<ul style="list-style-type: none"> <li><u>E-088</u> - HV-4054</li> <li><u>E-089</u> - HV-4053</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE Main Steam to Reheaters valves</li> </ul>

		closed.
		<ul style="list-style-type: none"> <li>HV-2703 or HV-2704; HV-2721; HV-2751</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE SG pressures – less than 740 PSIA.</li> </ul>
		<ul style="list-style-type: none"> <li>ENSURE MSIS actuated.</li> </ul>
<b>Critical Task Statement</b>		
<b>Actions are taken to isolate the SGs prior to either SG blowing dry. These actions may include either manual actuation of the MSIS signal, or manual closure of MSIS-actuated components.</b>		
<b>CRITICAL TASK</b>		Manually INITIATE MSIS.
	RO	DETERMINE Containment Isolation criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE Containment pressure – greater than 1.5 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DETERMINE Containment pressure &gt; 3.4 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE SIAS, CIAS, CCAS, and CRIS actuated.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE all RCPs stopped.</li> </ul>
<b>Critical Task Statement</b>		
<b>Within ten (10) minutes of a loss of CCW the affected RCP(s) will be stopped.</b>		
<b>Elapsed Time: _____</b>		
<b>CRITICAL TASK</b>	RO	<ul style="list-style-type: none"> <li>STOP all RCPs due to CIAS.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Containment Area Radiation Monitors energized AND NOT alarming or trending to alarm.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Secondary Plant Radiation Monitors energized AND NOT alarming or trending to alarm.</li> </ul>

	RO	DETERMINE Containment Temperature, Pressure and Combustible Gas Control criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>• DETERMINE Containment average temperature &gt; 120°F.</li> </ul>
		<ul style="list-style-type: none"> <li>• DETERMINE Containment pressure &gt; 1.5 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] ENSURE proper functioning of the Normal Containment Cooling.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] ENSURE at least one Containment Dome Air Circulator operating.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] DETERMINE Containment pressure &gt; 3.4 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] ENSURE all RCPs stopped.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] ENSURE all available Containment Emergency Cooling Units operating.</li> </ul>
		<ul style="list-style-type: none"> <li>• DETERMINE Containment pressure &gt; 14 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] ENSURE CSAS actuated.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] ENSURE all available Containment Spray Header flows &gt; 1600 GPM.</li> </ul>
+15 min	CRS	DIAGNOSE event in progress:
		<ul style="list-style-type: none"> <li>• DETERMINE all safety function criteria are NOT met per Attachment 4, Worksheet.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] COMPLETE Attachment 1, Recovery Diagnostics.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] DIAGNOSE event as ESDE on SG E089.</li> </ul>
		<ul style="list-style-type: none"> <li>• DETERMINE that Reactor Trip Recovery is NOT diagnosed.</li> </ul>
		<ul style="list-style-type: none"> <li>• [RNO] DETERMINE all RCPs stopped.</li> </ul>
		<ul style="list-style-type: none"> <li>• DIRECT initiating steps 12 through 15.</li> </ul>
	BOP	INITIATE steps 12 through 15.
<b>Examiner Note: When SG E089 reaches dryout conditions the crew should initiate FS-30, Establish Stable RCS Temperature during ESDE.</b>		
	CRS	DIRECT performance of SO23-12-5, Excess Steam Demand Event.

		<ul style="list-style-type: none"> <li>RECORD time of EOI entry.</li> </ul>
	CRS	VERIFY ESDE diagnosis.
		<ul style="list-style-type: none"> <li>INITIATE SO23-12-10, Safety Function Status Checks.</li> </ul>
		<ul style="list-style-type: none"> <li>INITIATE Foldout Page.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of FS-7, SI Throttle/Stop.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of FS-3, Monitor Natural Circulation.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of Attachment 22, Non-Qualified Loads Restoration.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of FS-30, Stabilize RCS Temperature.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of Attachment 28, Isolation of SG with ESDE.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY ESDE diagnosis using Figure 1, Break Identification Chart.</li> </ul>
		<ul style="list-style-type: none"> <li>INITIATE sampling of both Steam Generators for radioactivity and boron.</li> </ul>
<p><b>M.O. Cue: If directed to sample SGs, WAIT 10 minutes and then REPORT that E088 and E089 both have activity near background, and normal boron levels. If the SG sample valves are closed, REPORT that you are unable to establish sample flow.</b></p>		
	CRS	INITIATE Administrative Actions.
		<ul style="list-style-type: none"> <li>NOTIFY Shift Manger/Operations Leader of entry into SO23-12-5, Excess Steam Demand Event.</li> </ul>
		<ul style="list-style-type: none"> <li>ENSURE Emergency Plan is initiated.</li> </ul>
		<ul style="list-style-type: none"> <li>IMPLEMENT Placekeeper.</li> </ul>
	RO	VERIFY ESF actuation.
		<ul style="list-style-type: none"> <li>VERIFY SIAS actuation required.</li> </ul>
		<ul style="list-style-type: none"> <li>PZR pressure less than SIAS setpoint.</li> </ul>
		OR
		<ul style="list-style-type: none"> <li>Containment pressure &gt; 3.4 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>ENSURE the following actuated:</li> </ul>

		<ul style="list-style-type: none"> <li>SIAS / CCAS / CRIS</li> </ul>
	RO/BOP	VERIFY SIAS, CCAS, CRIS actuated.
	CRS	RECORD time of SIAS.
	BOP	STOP unloaded Diesel Generators.
	BOP	INITIATE SO23-12-11, Attachment 22, Non-Qualified Load Restoration.
<b>M.O. Cue: 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.</b>		
	BOP	VERIFY MSIS actuation required and ENSURE MSIS actuated.
		<ul style="list-style-type: none"> <li>SG pressure &lt; 740 PSIA.</li> </ul>
	RO	VERIFY CIAS actuation required and ENSURE CIAS actuated.
		<ul style="list-style-type: none"> <li>Containment pressure &gt; 3.4 psig.</li> <li>CFMS pages 342 and 343.</li> </ul>
	RO	VERIFY SIAS actuated.
	RO	ESTABLISH Optimum SI Alignment.
		<ul style="list-style-type: none"> <li>ESTABLISH two train operation: <ul style="list-style-type: none"> <li>All Charging Pumps operating.</li> <li>One HPSI and one LPSI per train operating.</li> <li>All Cold leg flow paths aligned.</li> <li>VERIFY SI flow required: <ul style="list-style-type: none"> <li>SI flow indicated OR RCS pressure &gt;1250 psia.</li> </ul> </li> </ul> </li> </ul>
		OR
		<ul style="list-style-type: none"> <li>VERIFY FS-7, Verify SI Throttle/Stop criteria satisfied.</li> </ul>

	BOP	CLOSE MSIVs and MSIV Bypasses:
		<ul style="list-style-type: none"> <li>ENSURE MSIVs - closed:</li> </ul>
		<ul style="list-style-type: none"> <li>HV-8205 for E088</li> </ul>
		<ul style="list-style-type: none"> <li>HV-8204 for E089</li> </ul>
		<ul style="list-style-type: none"> <li>ENSURE MSIV Bypasses - closed:</li> </ul>
		<ul style="list-style-type: none"> <li>HV-8203 for E088</li> </ul>
		<ul style="list-style-type: none"> <li>HV-8202 for E089</li> </ul>
	CREW	PREVENT Pressurized Thermal Shock.
		<ul style="list-style-type: none"> <li>INITIATE FS-30, Establish Stable RCS temperature during ESDE.</li> </ul>
<p><b>NOTE:</b> The following steps from FS-30 will be performed when conditions are met. Both the ESDE procedure and the ESDE Foldout Page direct performance of these steps.</p>		
+20 min	BOP	VERIFY SG least affected by ESDE, SG E088, NOT isolated for SGTR.
	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"> <li>TRANSFER ADV to Auto/Modulate.</li> </ul>
		<ul style="list-style-type: none"> <li>MAINTAIN least affected SG pressure 200 PSIA above most affected SG pressure.</li> </ul>
	BOP	VERIFY SG dryout on most affected SG E089:
		<ul style="list-style-type: none"> <li>RCS Tcold - stable or rising, OR</li> </ul>
		<ul style="list-style-type: none"> <li>SG pressure - 200 PSIA</li> </ul>

<b>Critical Task Statement</b>		<p><b>Within ten (10) minutes of 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:</b></p> <ul style="list-style-type: none"> <li>• <b>Steaming of the least affected (non-ESDE) SG to maintain <math>P_{sat}</math> for lowest RCS <math>T_c</math> ;</b></li> <li>• <b>Manipulation of feedwater controls to maintain SG level of 40% to 80% NR.</b></li> </ul>
<b>CRITICAL TASK</b>	BOP	<p>STABILIZE least affected SG E088 pressure:</p> <ul style="list-style-type: none"> <li>• VERIFY ADV on SG E088 in Auto/Modulate.</li> <li>• MAINTAIN <math>P_{sat}</math> for lowest RCS <math>T_c</math> on SG E088.</li> <li>• STABILIZE AFW flow on SG E088.</li> </ul>
	RO	<p>VERIFY RCS pressure is to the right of the Appendix E curve on Attachment 29, Post-Accident Pressure/Temperature Limits.</p>
	BOP	<p>OPERATE feedwater on SG E088 to maintain level between 40% and 80% NR.</p>
<b>Examiner Note:</b>		<b>The following steps are for EOI SO23-12-11, Attachment 28, Isolation of SG with ESDE.</b>
	BOP	<p>DETERMINE E089 is the most affected SG.</p>
	CRS	<p>NOTIFY Shift Manager / Operations Leader of the SG most affected by the ESDE.</p>
	BOP	<p>VERIFY SG least affected by ESDE available for heat removal and not affected by SGTR.</p>
<b>Critical Task Statement</b>		<b>Isolate the most affected Steam Generator (ESDE).</b>
<b>CRITICAL TASK</b>	BOP	<p>ISOLATE SG E089. CLOSE/STOP the following components:</p>

		<ul style="list-style-type: none"> <li>• MSIV HV-8204</li> </ul>
		<ul style="list-style-type: none"> <li>• MSIV Bypass HV-8202</li> </ul>
		<ul style="list-style-type: none"> <li>• ADV HV-8421</li> </ul>
		<ul style="list-style-type: none"> <li>• MFIV HV-4052</li> </ul>
		<ul style="list-style-type: none"> <li>• AFW valves HV-4715, HV-4731</li> </ul>
		<ul style="list-style-type: none"> <li>• Steam to AFW P-140 HV-8200</li> </ul>
		<ul style="list-style-type: none"> <li>• SG Blowdown Isolation HV-4053</li> </ul>
		<ul style="list-style-type: none"> <li>• SG Water Sample Isolation HV-4057</li> </ul>
		<ul style="list-style-type: none"> <li>• Electric AFW Pump P-141</li> </ul>
+30 min	BOP	ENSURE ADV on SG E089 selected to MANUAL.
<b><i>When Steam Generator E089 is isolated, TERMINATE the scenario.</i></b>		



Facility:	San Onofre	Scenario No.:	2	Op Test No.:	NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> <li>69% power - RCS Boron is 956 ppm (by sample)</li> <li>Train A Component Cooling Water Pump (P-025) in service</li> <li>Train A Containment Spray Pump (P-012) OOS</li> <li>Train A High Pressure Safety Injection Pump (P-017) OOS</li> <li>Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS</li> </ul>				
Turnover:	Dilution and power ascension in progress at 10% per hour.				
Critical Tasks:	<ul style="list-style-type: none"> <li>Restore flow to the CCW Non-Critical Loop (RCPs operating).</li> <li>Restore power to at least one 1E 4kV Bus.</li> <li>Establish Reactivity Control (<math>\geq 2</math> FLCEAs Not Fully Inserted &amp; No SIAS).</li> </ul>				
Event No.	Malf. No.	Event Type*	Event Description		
1 + min		R (RO) N (BOP, CRS)	Dilution and power ascension in progress at 10% per hour.		
2 + min	RC24A	I (RO, CRS) TS (CRS)	Pressurizer Spray Valve (PV-0100A) fails open.		
3 + min	CH01	I (BOP, CRS) TS (CRS)	Train A & B Toxic Gas Isolation Signals due to rail car chlorine tank rupture.		
4 + min	ED03A	C (ALL) TS (CRS)	Bus 2A04 Overcurrent lockout.		
5 + min	TU08 PG24 PG57	M (ALL)	Turbine trip. Loss of Offsite Power. Loss of SDG&E Switchyard.		
6 + min	RD8802 RD8902 RD9002 RD9102	C (RO)	Four fully stuck CEAs; Loss of Reactivity Control.		
7 + min	EG08B	C (BOP)	Emergency Diesel Generator (2G003) mechanical failure. Station Blackout.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

## SCENARIO SUMMARY NRC #2

The crew will assume the watch with a dilution and power ascension in progress per SO23-5-1.7, Power Operations.

When the power change is underway, the Pressurizer Spray Valve will fail to 80% open. The crew will respond and stabilize primary plant using Annunciator Response Procedures (ARP) and Abnormal Operating Instruction (AOI) SO23-13-27, Pressurizer Pressure and Level Malfunction. The CRS will evaluate Technical Specifications.

After the crew has removed power from the Pressurizer Spray Valve, a chlorine tank will rupture on a passing rail car and initiate Train A & B Toxic Gas Isolation Signals (TGIS). The crew will be required to complete the TGIS alignment due to relay failure per SO23-3-2.22, Engineered Safeguards Actuation System. The CRS will enter AOI SO23-13-1, Local Area Evacuation and also be required to evaluate Technical Specifications.

This is followed by a bus fault and lockout on 1E Bus 2A04. The crew will refer to AOI SO23-13-26, Loss of Power to an AC Bus. Actions include transferring the Non-Critical Loop to Train B and stopping and placing the Train A Emergency Diesel Generator in Maintenance Lockout. The CRS will evaluate Technical Specifications and determine that a plant shutdown is required.

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 (SPTAs). Emergency Diesel Generator 2G003 will trip while SPTAs are being performed (one minute post-trip). Four rods remain stuck out of the core requiring manual boration alignment on the part of the RO in preparation for Bus 2A06 power restoration.

- The crew diagnoses a Loss of Reactivity Control due to a Station Blackout and enters EOI SO23-12-9, Functional Recovery. The success path will require cross-tying power with Unit 3 and establishing a boration flowpath.
- 
- The scenario is terminated when Bus 2A06 is energized and boration at greater than 40 gpm is established.
- 

### Risk Significance:

- |   |                                      |
|---|--------------------------------------|
| • Risk important components out of service:       | CS P-012, HPSI P-017                 |
| • Failure of risk important system prior to trip: | Loss of Vital Inverters              |
| • Risk significant core damage sequence:          | SBO with Loss of Reactivity Control  |
| • Risk significant operator actions:              | Establish Non-Critical Loop CCW flow |
|   | Vital AC power restoration           |
|   | Establish boration flowpath          |

Scenario Event Description

NRC Scenario 2

SONGS

2007 Facility NRC Initial License Examination

Simulator Scenario Setup

Scenario 2

MACHINE OPERATOR'S INSTRUCTIONS

SETUP

**IC: Use IC #XXX and see attached Event File for NRC Scenario #2.**

Op Test No.:	<u>NRC</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>28</u>	of	<u>68</u>
Event Description:	Dilution and Power Ascension in Progress at 10%/hr								
Time	Position	Applicant's Actions or Behavior							

<b><u>Machine Operator:</u></b>		
EXECUTE IC #XXX and NRC Scenario #2 SETUP file to align components.		
ALIGN <u>both</u> Pressurizer Spray Valves to Automatic.		
ENSURE Control Board Tags are hung on P-012 and P-017.		
ENSURE Operator Aid Tags #029 (CVCS) and #005-4 (CVCS Ion Exchanger) reflect the scenario boron concentration.		
ENSURE procedures in progress are on the RO desk:		
- Copy of SO23-5-1.7 open to Step 6.3.14, 50-80% Reactor Power.		
- Copy of SO23-3-2.2 with Steps 6.6.1 through 6.6.5 checked off.		
- Copy of SO23-3-1.10 open to Section 6.2, Forcing Pressurizer Sprays.		
VERIFY that dilution is in progress then PLACE in FREEZE.		
<b><u>Control Room Annunciators in Alarm at 70%:</u></b>		
<b>57A52 – CONTAINMENT SPRAY SYS TRAIN A INOPERABLE</b>		
+1 min	CRS	DIRECT performance of SO23-5-1.7, Power Operations, SO23-3-2.2, Makeup Operations, and SO23-10-1, Main Turbine Operations.
	RO	VERIFY Batch Counter and Makeup Integrator settings.
	RO	VERIFY dilution valve alignment.
		<ul style="list-style-type: none"> <li>FV-9253 open and FIC-0210X in AUTO.</li> <li>HS-0210 selected to DILUTE.</li> </ul>
	RO	VERIFY Tcold changing as dilution progresses.

Op Test No.:	<u>NRC</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>29</u>	of	<u>68</u>
Event Description:		Dilution and Power Ascension in Progress at 10%/hr							
Time	Position	Applicant's Actions or Behavior							

+15 min	BOP	MAINTAIN Tcold within required band by raising Main Generator load using HS-2210, Main Turbine Speed Load Control to RAISE.
<b><i>When power has been raised 3 to 5%, or at Lead Evaluator's discretion, PROCEED to Event 2.</i></b>		

Op Test No.:	<u>NRC</u>	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>30</u>	of	<u>68</u>
Event Description:		Pressurizer Spray Valve Fails Open							
Time	Position	Applicant's Actions or Behavior							

**Machine Operator:** When directed, EXECUTE Event 2.  
- RC24A @ 80%, Pressurizer Spray Valve fails open

**Indications available:**

**50A14 – PZR PRESS HI/LO (+90 seconds from event initiation)**

**NOTE:** Because both Spray Valves will be open during the power ascension, PV-100A is failed 80% open. This is equivalent to a 40% open failure when not forcing sprays with all heaters energized.

+2 min	RO	REFER to Annunciator Response Procedures.
	RO	RECOGNIZE PZR Pressure Control failure and INFORM the CRS AOI SO23-13-27 entry required.
	CRS	DIRECT performance of SO23-13-27, Pressurizer Pressure and Level Malfunction.
	RO	START PZR Backup and Proportional Heaters.
	RO/CRS	DETERMINE Pressurizer Pressure channel is NOT between 2225 and 2275 psig.
	RO/CRS	DETERMINE Pressurizer Pressure is NOT stable.
	RO	OBSERVE PV-0100B, Pressurizer Spray Valve from Loop 1B, is failed ~60% open.
<b>M.O. Cue:</b> Closely MONITOR pressure and REDUCE malfunction RC24A to 60% once identified (this will allow pressure to stabilize and avoid a plant trip).		

Op Test No.:	<u>NRC</u>	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>31</u>	of	<u>68</u>
Event Description:		Pressurizer Spray Valve Fails Open							
Time	Position	Applicant's Actions or Behavior							

	CRS	DIRECT an ARO to fail closed PV-0100A, PZR Spray Valve, by removing the connector block at Cabinet L-138, SPEC 200 Power Supply Cabinet, Nest 2, Slot 10. (HC-0100A)
<b>M.O. Cue: REDUCE malfunction RC24A to 0% and REPORT to the Control Room that the connector block at Cabinet L-138, SPEC 200 Power Supply Cabinet, Nest 2, Slot 10 was removed.</b>		
	RO/CRS	DETERMINE Pressurizer pressure is recovering.
	RO	VERIFY the Pressurizer Pressure signal has not failed high.
	RO	VERIFY Pressurizer Pressure Control System is operating properly in automatic.
	RO	VERIFY Pressurizer Spray was not initiated with delta temperature > 180°F.
+10 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> <li>LCO 3.4.1.A, RCS DNB Limits is applicable.</li> <li>ACTION A - Restore Pressurizer pressure to within limit within two (2) hours.</li> </ul>
<b><i>When Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Event 3.</i></b>		

Op Test No.:	<u>NRC</u>	Scenario #	<u>2</u>	Event #	<u>3</u>	Page	<u>32</u>	of	<u>68</u>
Event Description: Toxic Gas Isolation Signal Due to Chlorine Tank Rupture									
Time	Position	Applicant's Actions or Behavior							

**Machine Operator:** When directed, EXECUTE Event 3.  
- CH01, Trains A & B Toxic Gas Isolation Signal

**Indications Available:**

**60B12 - TGIS - A ACTIVATION**

**60B20 - TGIS - B ACTIVATION**

+30 sec	BOP	REFER to Annunciator Response Procedures.
	BOP	RECOGNIZE TGIS actuation and INFORM the CRS ARP and AOI SO23-13-1 entry required.
<b>M.O. Cue: REPORT to the Control Room as the Security Shift Supervisor that a rail car chlorine tank has ruptured.</b>		
<b>Floor Cue: If asked, REPORT a faint smell of chlorine in the Control Room.</b>		
	CRS	DIRECT performance of SO23-13-1, Local Area Evacuation.
	CRS	EVALUATE necessity of Control Room personnel donning self-contained breathing apparatus.
	BOP	ENSURE secured 2/3MA-207, Control Room Emergency Vent Supply Unit Train A.
	BOP	ENSURE closed 2/3FV-9761, Control Room Emergency Vent Supply Train A.
	BOP	ENSURE secured 2/3MA-206, Control Room Emergency Vent Supply Unit Train B.
	BOP	ENSURE closed 2/3FV-9742, Control Room Emergency Vent Supply Train B.



Op Test No.:	<u>NRC</u>	Scenario #	<u>2</u>	Event #	<u>3</u>	Page	<u>33</u>	of	<u>68</u>
Event Description: Toxic Gas Isolation Signal Due to Chlorine Tank Rupture									
Time	Position	Applicant's Actions or Behavior							

	CRS	INITIATE a local area evacuation using public address system.
	CRS	NOTIFY Emergency Preparedness to provide assistance in isolating toxic gas source.
	CRS	DIRECT initiation of S023-3-2.22, Engineered Safety Features Actuation System Operation, Attachment for CRIS/TGIS Actuation Verification.
+3 min	BOP	PERFORM S023-3-2.22, Attachment for CRIS/TGIS Actuation Verification.
	BOP	DISPATCH an operator to ensure the Control Room Envelope Doors are closed.
	BOP	DETERMINE E-418, Control Room Emergency Air Conditioning Unit is not started and manually START unit.
	BOP	REPORT to the CRS that the Control Room Emergency Air Conditioning Unit was manually started.
	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> <li>LCO 3.7.11.A, Control Room Emergency Air Cleanup System (CREACUS).</li> </ul>
		<ul style="list-style-type: none"> <li>ACTION A - One CREACUS train inoperable; Restore CREACUS train to OPERABLE status within 14 days.</li> </ul>
<p><b><i>When Technical Specifications have been addressed, or at Lead Evaluator's discretion, PROCEED to Event 4.</i></b></p>		

Op Test No.:	<u>NRC</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>34</u>	of	<u>68</u>
Event Description:		Bus 2A04 Overcurrent Lockout							
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 4.  
- ED03A, Bus 2A04 overcurrent**

**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 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.
	<b>Critical Task Statement</b>	<b>Within ten (10) minutes from 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. Elapsed Time: _____</b>
+1 min	BOP	START the Train B CCW Pump.
<b>CRITICAL TASK</b>		<ul style="list-style-type: none"> <li>TRANSFER the Non-Critical Loop to Train B.</li> <li>TRANSFER the Letdown Heat Exchanger to Train B.</li> </ul>
	RO	START Charging Pump P-192.
	BOP	VERIFY loss of the 1E 4 kV Bus is NOT due to a fire in the 1E Switchgear Room.
	BOP	DETERMINE overcurrent annunciators are alarming on Bus 2A04.

Op Test No.:   NRC   Scenario #   2   Event #   4   Page   35   of   68  

Event Description: Bus 2A04 Overcurrent Lockout

Time	Position	Applicant's Actions or Behavior
	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.
+5 min	BOP	STOP G002 Diesel Generator 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"> <li>LCO 3.0.3, Due to loss of two 1E Battery Chargers.</li> </ul>
		<ul style="list-style-type: none"> <li>ACTION - Within 1 hour, place the Unit in MODE 3 within 6 hours.</li> </ul>
<p><b>M.O. Cue: When directed, EXECUTE the following Remote Functions:</b>            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)</p>		
	RO	VERIFY the Trip Channel Bypassed Annunciator alarms.
		<ul style="list-style-type: none"> <li>56A29 - PPS CHANNEL 1 TRIP BYPASSED</li> </ul>

Op Test No.:   NRC   Scenario #   2   Event #   4   Page   36   of   68  

Event Description: Bus 2A04 Overcurrent Lockout

Time	Position	Applicant's Actions or Behavior
------	----------	---------------------------------

	CRS	DIRECT Bypassing Channel A DNBR and LPD trips.
--	-----	--

+15 min	CRS	DIRECT setting CEAC 2 INOP Flags in all CPCs by changing each CPC Addressable Constant Point ID 062 to 2.
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***When Technical Specifications have been addressed, or at Lead Evaluator's discretion, PROCEED to Events 5, 6, and 7.***

<b><u>Machine Operator:</u></b> When directed, EXECUTE Events 5, 6, and 7.		
<ul style="list-style-type: none"> <li>- TU-08, Turbine Trip</li> <li>- PG24, Loss of Offsite Power</li> <li>- RD8802/8902/9002/9102, Stuck CEAs</li> <li>- EG08B, 2G003 EDG Mechanical Failure (+1 minute)</li> <li>- PG57, Loss of SDGE Switchyard (+5 minutes)</li> </ul>		
<b><u>Indications available:</u></b>		
<b>Numerous Loss of Offsite Power related alarms</b>		
+10 secs	RO/BOP	RECOGNIZE Reactor trip and Loss of Offsite Power and INFORM the CRS SO23-12-11 entry required.
	CRS	DIRECT performance of SO23-12-1, Standard Post Trip Actions.
	RO	VERIFY Reactor Trip: <ul style="list-style-type: none"> <li>• VERIFY Reactor Trip Circuit Breakers (8) - open.</li> <li>• VERIFY Reactor Power lowering and Startup Rate - negative.</li> <li>• VERIFY maximum of one full length CEA - NOT fully inserted.</li> </ul>
<b>NOTE: The following Critical Task cannot be performed until power is available later in the scenario.</b>		
<b>CRITICAL TASK</b>	RO	[RNO] When available, COMMENCE emergency boration at greater than 40 gpm.
	BOP	VERIFY Turbine Trip: <ul style="list-style-type: none"> <li>• VERIFY Main Turbine tripped. <ul style="list-style-type: none"> <li>○ HP and LP Stop and Governor valves - closed.</li> </ul> </li> <li>• VERIFY both Unit Output Breakers - open.</li> <li>• VERIFY Main Turbine speed &lt;2000 RPM or lowering.</li> </ul>
	CRS	INITIATE Administrative Actions: <ul style="list-style-type: none"> <li>• ANNOUNCE Reactor trip via PA System.</li> </ul>

		<ul style="list-style-type: none"> <li>INITIATE Attachment 4, Worksheet.</li> </ul>
		<ul style="list-style-type: none"> <li>INITIATE Attachment 5, Administrative Actions.</li> </ul>
	BOP	DETERMINE Vital Auxiliaries NOT functioning properly:
		<ul style="list-style-type: none"> <li>DETERMINE both 1E 4 kV Buses A04 and A06 de-energized.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] PLACE DG G003 in Maintenance Lockout.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] INITIATE Attachment 2, Diesel Generator Failure Follow-Up Actions for Bus 2A06.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE both 1E 480 V Buses B04 and B06 de-energized.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY all Class 1E DC Buses – energized.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE all 6.9 kV and Non-1E Buses de-energized.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE MSIVs - closed.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] OPERATE any ADVs to maintain 1000 PSIA.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE CCW Train NOT operating and NOT aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger.</li> </ul>
<p><b>M.O. Cue: If directed to investigate 2G003, WAIT 3 minutes and REPORT it is shutdown and there is a large amount of oil on the DG Room floor.</b></p>		
	RO	DETERMINE RCS Inventory Control criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE PZR level between 10% and 70% and NOT trending to between 30% and 60%.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Core Exit Saturation Margin – greater than or equal to 20°F:</li> </ul>
		<ul style="list-style-type: none"> <li>QSPDS page 611.</li> </ul>
		<ul style="list-style-type: none"> <li>CFMS page 311.</li> </ul>
	RO	DETERMINE RCS Pressure Control criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE PZR pressure (WR and NR) between 1740 PSIA and 2380 PSIA and NOT controlled AND trending to between 2025 PSIA and 2275 PSIA.</li> </ul>
	RO	DETERMINE Core Heat Removal criteria is NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE no RCPs are operating.</li> </ul>

		<ul style="list-style-type: none"> <li>• VERIFY Core Exit Saturation Margin <math>\geq 20^{\circ}\text{F}</math>.</li> </ul>
		<ul style="list-style-type: none"> <li>• QSPDS page 611.</li> </ul>
		<ul style="list-style-type: none"> <li>• CFMS page 311.</li> </ul>
	BOP	DETERMINE RCS Heat Removal criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>• VERIFY both SGs level – greater than 21% NR.</li> </ul>
		<ul style="list-style-type: none"> <li>• VERIFY both SGs level – less than 80% NR.</li> </ul>
		<ul style="list-style-type: none"> <li>• VERIFY Auxiliary feedwater available to restore both SGs level – between 40% NR and 80% NR.</li> </ul>
		<ul style="list-style-type: none"> <li>• VERIFY heat removal adequate:</li> </ul>
		<ul style="list-style-type: none"> <li>• <math>T_C</math> – less than <math>555^{\circ}\text{F}</math>.</li> </ul>
		<ul style="list-style-type: none"> <li>• SG pressures – approximately 1000 PSIA.</li> </ul>
	RO	VERIFY Containment Isolation criteria satisfied:
		<ul style="list-style-type: none"> <li>• VERIFY Containment pressure – less than 1.5 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>• DETERMINE some Containment Area Radiation Monitors energized and NOT alarming or trending to alarm.</li> </ul>
		<ul style="list-style-type: none"> <li>• DETERMINE some Secondary Plant Radiation Monitors energized and NOT alarming or trending to alarm.</li> </ul>

	RO	DETERMINE Containment Temperature, Pressure and Combustible Gas Control criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE Containment average temperature – greater than 120°F.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE proper functioning of Normal Containment Cooling.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Containment pressure – less than 1.5 PSIG.</li> </ul>
+15 min	CRS	DIAGNOSE Event in Progress:
		<ul style="list-style-type: none"> <li>DETERMINE all safety function criteria are NOT met per Attachment 4, Worksheet.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] COMPLETE Attachment 1, Recovery Diagnostics.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DIAGNOSE loss of Reactivity Control and Station Blackout.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE that Reactor Trip Recovery is NOT diagnosed.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DETERMINE all RCPs stopped.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT initiating steps 12 through 15.</li> </ul>
	ACO	INITIATE steps 12 through 15.
<p><b>M.O. Cue: If SC&amp;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.</b></p>		
<p><b>M.O. Cue: If Unit 3 status is requested, REPORT that Bus 3A06 is energized from EDG 3G003 and Bus 3A04 is energized from EDG 3G002.</b></p>		
	CRS	DIRECT performance of SO23-12-9, Functional Recovery.
<p><b>M.O. Cue: When SO23-12-9 is initiated, CALL as SDG&amp;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.</b></p>		
	CRS	VERIFY Functional Recovery diagnosis:



		<ul style="list-style-type: none"> <li>INITIATE SO23-12-10, Safety Function Status Checks.</li> </ul>
		<ul style="list-style-type: none"> <li>INITIATE Foldout Page.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of FS-3, Monitor Natural Circulation.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of SO23-12-11, Attachment 19, Non-1E DC Load Reduction.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of SO23-12-11, Attachment 20, Class1E Battery Load Reduction.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of FS-18, Secondary Plant Protection.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of SO23-12-11, Attachment 24, Supply 1E 4 kV Bus with Opposite Unit Diesel.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT performance of SO23-12-11, Attachment 6, Diesel Generator Failure Follow-up Actions.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT Chemistry to sample both SGs for radioactivity and boron.</li> </ul>
<p><b>M.O. Cue: If directed to sample SGs, WAIT 10 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.</b></p>		
<p><b>M.O. Cue: When directed to initiate Non-1E DC Load Reduction, ACKNOWLEDGE and STATE you will report when complete.</b></p>		
<p><b>M.O. Cue: When directed to initiate Class 1E Battery Load Reduction, ACKNOWLEDGE and STATE you will report when complete.</b></p>		
	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	REQUEST SM initiates NRC notification within one hour

		regarding actions per this attachment.
	CRS	NOTIFY opposite unit SRO that automatic sequencing of ESF loads onto opposite Unit 1E 4kV Bus 3A06 will be blocked.
	BOP	ENSURE 1E 4kV Bus Tie breaker AUTO/MANUAL transfer switches selected to MANUAL.
		<ul style="list-style-type: none"> <li>• 2A0619 (2HS-1639B2) and 3A0603 (3HS-1639B2).</li> </ul>
	BOP	ENSURE 1E 4kV Bus Tie breakers open.
		<ul style="list-style-type: none"> <li>• 2A0619 and 3A0603.</li> </ul>
	BOP	ENSURE 2G003 Diesel Generator selected to MAINTENANCE LOCKOUT.
	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"> <li>• VERIFY feeder faults NOT indicated by relay flags on:</li> </ul>
		<ul style="list-style-type: none"> <li>• 2A0616 – Unit Aux Transformer</li> </ul>
		<ul style="list-style-type: none"> <li>• 2A0618 – Reserve Aux Transformer</li> </ul>
		<ul style="list-style-type: none"> <li>• 2A0619 – 2A06 Bus Tie</li> </ul>
		<ul style="list-style-type: none"> <li>• 2A0613 – 2G003 EDG</li> </ul>
<b>M.O. Cue: When asked, REPORT no feeder faults on breakers.</b>		
	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"> <li>• 2HS-5054XA2 and 2HS-5054XB2</li> </ul>
<b>M.O. Cue: When directed, PERFORM remote functions EG62A and EG62B and REPORT that the Unit 2 50.54X switches have been aligned.</b>		
	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"> <li>• VERIFY feeder faults NOT indicated by relay flags on:</li> </ul>
		<ul style="list-style-type: none"> <li>• 3A0603 – 3A06 Bus Tie</li> </ul>
<b>M.O. Cue: When asked, REPORT no feeder faults on breakers.</b>		
	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"> <li>• 3HS-5054XA2 and 3HS-5054XB2</li> </ul>
<b>M.O. Cue: When directed PERFORM remote functions EG62C and EG62D and REPORT that the Unit 3 50.54X switches have been aligned.</b>		
	BOP	VERIFY 3G003 Diesel Generator loading less than 3.4 MW.

	BOP	VERIFY Bus 2A06 NOT energized.
	BOP	VERIFY Unit 2 overcurrent/ground alarms reset.
		<ul style="list-style-type: none"> <li>• 63C15 SUPPLY BKR A0616 OC</li> </ul>
		<ul style="list-style-type: none"> <li>• 63C25 SUPPLY BKR A0618 OC</li> </ul>
	BOP	VERIFY 1E DC bus voltages 2D2 and 3D2 greater than 108 VDC.
<b>M.O. Cue: When asked, REPORT 3D2 voltage at 129 VDC.</b>		
	BOP	ESTABLISH final Train B configuration.
	BOP	ENSURE 1E 4kV Bus 2A06 supply breakers open.
		<ul style="list-style-type: none"> <li>• 2A0616 – Unit Aux Transformer</li> </ul>
		<ul style="list-style-type: none"> <li>• 2A0618 – Reserve Aux Transformer</li> </ul>
		<ul style="list-style-type: none"> <li>• 2A0613 – 2G003 EDG</li> </ul>
	BOP	ENSURE 1E 4kV Bus A06 tie breakers open.
		<ul style="list-style-type: none"> <li>• 2A0619 – 2A06 Bus Tie</li> </ul>
		<ul style="list-style-type: none"> <li>• 3A0603 – 3A06 Bus Tie</li> </ul>
	BOP	ENSURE 1E 4kV Bus 2A06 load breakers open.
		<ul style="list-style-type: none"> <li>• Emergency Chillers</li> </ul>
		<ul style="list-style-type: none"> <li>• Containment Spray Pumps</li> </ul>
		<ul style="list-style-type: none"> <li>• HPSI Pumps</li> </ul>
		<ul style="list-style-type: none"> <li>• LPSI Pumps</li> </ul>
		<ul style="list-style-type: none"> <li>• AFW Pumps</li> </ul>
		<ul style="list-style-type: none"> <li>• CCW Pumps</li> </ul>
		<ul style="list-style-type: none"> <li>• SWC Pumps</li> </ul>
	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.
<b>Critical Task Statement</b>		<p><b>Restore power to at least one 1E 4kv Bus prior to any of the following:</b></p> <ul style="list-style-type: none"> <li>• <b>Loss of the affected EDG on mechanical fault due to operation with no cooling (i.e., no EDG auxiliaries), or</b></li> <li>• <b>Battery depletion and loss of associated 1E 125VDC Bus.</b></li> </ul>
<b>CRITICAL TASK</b>	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.

<b>Critical Task Statement</b>		<b>Within 10 minutes of Reactor trip 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).</b>
<b>CRITICAL TASK</b>	RO	Establish Reactivity Control ( $\geq 2$ FLCEAs Not Fully Inserted & No SIAS)
	RO	START Charging Pump P-192 on Train B and COMMENCE boration at >40 gpm.
		<ul style="list-style-type: none"> <li>• OPEN HV-9245 and HV-9240 Gravity Feed Valves.</li> </ul>
+35 min		<ul style="list-style-type: none"> <li>• CLOSE LV-227B VCT Outlet Block Valve.</li> </ul>
<p><b><i>When power is restored to Bus 2A06 and emergency boration is started, or at Lead Evaluator's discretion, TERMINATE the scenario.</i></b></p>		

Facility:	San Onofre	Scenario No.:	3	Op Test No.:	NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<ul style="list-style-type: none"> <li>Reactor Critical at 2.5x10E-4% power BOC - RCS Boron is 2038 ppm (by sample)</li> <li>Train A Component Cooling Water Pump (P-025) in service</li> <li>Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS</li> </ul>				
Turnover:	Power increase in progress to ~ 2% power; Mini-purge & PMW sampling in progress.				
Critical Tasks:	<ul style="list-style-type: none"> <li>Restore CCW Critical Loop flow.</li> <li>Trip any RCP not satisfying RCP operating limits.</li> <li>Manually initiate Containment Isolation Actuation Signal.</li> </ul>				
Event No.	Malf. No.	Event Type*	Event Description		
1 + min		R (RO) N (BOP, CRS)	Rod withdrawal and power increase in progress to ~2% power.		
2 + min	CV12	C (RO, CRS)	Inadvertent Reactor Coolant System dilution.		
3 + min	SG03C	TS (CRS)	Steam Generator Pressure Transmitter (PT-1023-3) fails low.		
4 + min	RPK624A	C (BOP, CRS) TS (CRS)	Emergency Feedwater Actuation Signal (EFAS-1) partial actuation.		
5 + min	RC18B	C (RO, CRS) TS (CRS)	Pressurizer Safety Valve (PSV-0201) leak less than Charging Pump capacity.		
6 + min	RC18A RC18B	M (ALL)	Pressurizer Safety Valves (PSV-0200 and PSV-0201) fail open.		
7 + min	CC06B CC06D	C (BOP)	Train A Component Cooling Water Pump (P-025) trip on SIAS. Train B Component Cooling Water Pump (P-026) trip on SIAS.		
8 + min	RPS LP	I (RO)	Containment Isolation Actuation System fails to actuate.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS) Technical Specifications					





Scenario Event Description

NRC Scenario 3

SONGS

2005 Facility NRC Initial License Examination

Simulator Scenario Setup

Scenario 3

MACHINE OPERATOR'S INSTRUCTIONS

SETUP

**IC: Use IC #XXX and see attached Event File for NRC Scenario #3.**

Op Test No.:	<u>  NRC  </u>	Scenario #	<u>  3  </u>	Event #	<u>  1  </u>	Page	<u>  50  </u>	of	<u>  68  </u>
Event Description:		Rod Withdrawal and Power Increase in Progress to ~2% power							
Time	Position	Applicant's Actions or Behavior							

**Machine Operator:** EXECUTE IC #XXX and NRC Scenario #3 SETUP file to align components.  
 ENSURE Operator Aid Tags #029 (CVCS) and #005-4 (CVCS Ion Exchanger) reflect the scenario born concentration.  
 ENSURE procedures in progress are on the RO desk:  
     - Copy of SO23-5-1.3.1 completed through Step 6.4.  
 ENSURE that Control Rods are in the appropriate position.  
 PLACE the MOC Operations Physics Summary Book on the RO Desk.

**Control Room Annunciators in Alarm at 3x10<sup>-4</sup>%:**  
 50A02 – COLSS ALARM  
 50A07 – SBSC DEMAND PRESENT  
 52A12(17) – FWCS SG2 E088 (SG1 E089) AUTO XFR TO MANUAL  
 53A03 – MFWP TURBINE K006 TRIP  
 53A27 – MFWP P062 DISCH PRESS LO  
 53A28 – MFWP P062 FLOW LO  
 53A47 – 3<sup>rd</sup> POINT HEATER DRAIN TANK LEVEL HI/LO  
 53B03 – MFWP TURBINE K005 TRIP  
 53B27 – MFWP P063 DISCH PRESS LO  
 53B28 – MFWP P063 FLOW LO  
 56A30/40/50/60 – LOSS OF LOAD CHANNEL 1/2/3/4 TRIP DISABLED  
 63E10 – SCE CB TRIP  
 99A02 – EMERGENCY PUSHBUTTON TURBINE TRIP  
 99A24 – TURBINE TRIP RELAY TRIPPED  
 99B01 – GENERATOR TRIP  
 99B19 – VACUUM PROTECTION PLC TROUBLE  
 99B41(42) – AVR CH A(B) FAULT

+1 min	CRS	DIRECT performance of SO23-5-1.3.1, Plant Startup from Hot Standup to Minimum Load.
	RO	REFER to LCS Figure 3.1.102-1 and commence maintaining the Control Rods in the proper sequence of overlap.
	RO	POSITION Group Select switch to the CEA Group 6.

Op Test No.:	<u>  NRC  </u>	Scenario #	<u>  3  </u>	Event #	<u>  1  </u>	Page	<u>  51  </u>	of	<u>  68  </u>
Event Description:		Rod Withdrawal and Power Increase in Progress to ~2% power							
Time	Position	Applicant's Actions or Behavior							

	RO	POSITION Mode Select Switch to MG (Manual Group) or MS (Manual Sequential).
	RO/CRS	When directed by the CRS, WITHDRAW Control Rods as required.
	RO	When CEA positioning is complete, PLACE the Mode Select Switch to OFF.
+15 min	BOP	MAINTAIN Tcold within required band by monitoring the Steam Bypass Control System operation.
<b><i>When power has been raised to ~2%, or at Lead Evaluator's discretion, PROCEED to Event 2.</i></b>		

Op Test No.:	<u>NRC</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>52</u>	of	<u>68</u>
Event Description: Inadvertent Reactor Coolant System Dilution									
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 2.  
- CV12, Inadvertent RCS dilution**

**Indications Available:**

**FQIS-0210, Blended Makeup Total Flow clicking  
VCT level rising  
FIC-0210X, Flow Controller indicates ~35 gpm  
FI-7171, PMW Flow indication @ 35 gpm**

+1 min	RO	DETERMINE an inadvertent dilution by observing FQIS-0210, Blended Makeup Total Flow clicking, FIC-0210X, Flow Controller indication, and FI-7171, PMW Flow indication.
	RO	INFORM CRS of inadvertent dilution and INFORM the CRS SO23-13-11, Emergency Boration of the RCS / Inadvertent Dilution or Boration entry required.
	CRS	DIRECT placing Makeup Mode Selector to MANUAL.
	RO	PLACE Makeup Mode Selector to MANUAL.
	CRS	DIRECT stopping Primary Makeup Water Pump.
	RO	STOP Primary Makeup Water Pump.
	RO	ENSURE Letdown Heat Exchanger Outlet Temperature is maintaining at 120°F with TIC-0223, CCW Temperature Controller in AUTO.
	RO	PLACE T-0224B, CVCS Ion Exchanger in BYPASS.
	RO	VERIFY Deborating Ion Exchange not in service.

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Event Description: Inadvertent Reactor Coolant System Dilution

Time	Position	Applicant's Actions or Behavior
	RO	ENSURE dilution flow paths isolated.
	RO	ENSURE FIC-0210X, PMW Flow Controller, and FIC-0210Y, BAMU Flow Controller, are set for correct blended makeup per SO23-3-2.2, Section to Establish Automatic Makeup Mode.
	RO	VERIFY RCS and VCT boron samples within 7 ppm.
<b>M.O. Cue: When directed to perform RCS and VCT boron samples, REPORT the VCT is 5 ppm less than the RCS.</b>		
+10 min	CRS	EVALUATE inadvertent dilution event terminated.
<b><i>When plant conditions have been restored to normal, or at Lead Evaluator's discretion, PROCEED to Event 3.</i></b>		

Op Test No.:	<u>NRC</u>	Scenario #	<u>3</u>	Event #	<u>3</u>	Page	<u>54</u>	of	<u>68</u>
Event Description: Steam Generator Pressure Transmitter Fails Low									
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 3.  
- SG03C, PT-1023-3, SG E088 Pressure Transmitter fails low**

**Indications Available:**

**52A13 - FWCS TROUBLE  
56A41 - SG2 E088 PRESS LO CHANNEL TRIP  
56A44 - SG1 E089 PRESS > SG2 E088 ESFAS CH TRIP  
56A51 - SG2 E088 PRESS LO PRETRIP  
56A54 - SG1 E089 PRESS > SG2 E088 PRETRIP  
56B26 - PPS CHANNEL 3 TROUBLE**

+30 sec	CO/ACO	REFER to Annunciator Response Procedures.
	ACO	RECOGNIZE Steam Generator E088 pressure instrument failed low and INFORM the CRS SO23-13-18, Reactor Protection System Failure entry required.
	CRS	REFER to Attachment 5 and DETERMINE PT-1023-3 is Functional Unit affected.
	CO	PLACE the affected Functional Unit in BYPASS per SO23-3-2.12, Section for Bypass Operation of Trip Channels.
	CO	VERIFY that the same bistable is not in bypass on any other Channel.
<b>M.O. Cue: When directed, EXECUTE remote functions RP51, 53G, 53I, 53U, and 54N to bypass Steam Generator PT-1023-3 trips, then DELETE remote function RP51.</b>		
<b>M.O. Cue: 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)</b>		
<b><u>Use above format for shaded area corrections</u></b>		
	CO	OBSERVE annunciator 56A49 - PPS CHANNEL 3 TRIP BYPASS goes into alarm.

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Event Description: Steam Generator Pressure Transmitter Fails Low

Time	Position	Applicant's Actions or Behavior
	CRS	CONFIRM failure does NOT affect RPS/ESFAS Matrix Logic, RPS/ESFAS Initiation Logic, RTCBs, RPS/ESFAS Manual Trip, or ESFAS Actuation Logic.
	CRS	CONFIRM failure affects the Feedwater Digital Control System.
	ACO	RECOGNIZE Steam Generator E089 level instrument failed low and INFORM the CRS SO23-3-2.38, Digital Control System Operation entry required.
	CRS	DIRECT performance of Section 6.6, Bypassing Selected Feedwater Control Signals.
	ACO	ACCESS the PCS Console for the Digital Feedwater Control System.
	ACO	ACCESS the <b>Selected Signals</b> screen for SG E088.
	ACO	VERIFY SG E088 Channel D signal is valid.
	ACO	SELECT BYPASS for the Channel C level instrument.
	ACO	VERIFY the Channel C level instrument indicates BYPASS.
	ACO	VERIFY the Channel D is not in BYPASS.
+5 min	ACO	VERIFY the Selected Signal output looks valid.

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Event Description: Steam Generator Pressure Transmitter Fails Low

Time	Position	Applicant's Actions or Behavior
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+10 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> <li>• 3.3.1.A, Reactor Protection System Instrumentation.</li> </ul>
		<ul style="list-style-type: none"> <li>• ACTION A - One or more functions with one automatic RPS trip channel inoperable; Place Channel in bypass or trip within one (1) hour.</li> </ul>
		<ul style="list-style-type: none"> <li>• 3.3.5.B, ESFAS Instrumentation.</li> </ul>
		<ul style="list-style-type: none"> <li>• ACTION B - One automatic trip channel inoperable for SG Pressure-Low or SG Pressure Difference-High for the EFAS function; Place Channel in bypass or trip within one (1) hour.</li> </ul>

***When the SG pressure instrument is bypassed, or at Lead Evaluator's discretion, PROCEED to Event 4.***



Op Test No.:	<u>NRC</u>	Scenario #	<u>3</u>	Event #	<u>4</u>	Page	<u>57</u>	of	<u>68</u>
Event Description:		EFAS-1 Partial Actuation							
Time	Position	Applicant's Actions or Behavior							

<b><u>Machine Operator:</u> When directed, EXECUTE Event 4. - RPK624A, Partial EFAS-1 Actuation</b>		
<b><u>Indications available:</u></b>		
<b>57A11 - ESFAS TRAIN A PARTIAL ACTUATION Increase in AFW flow due to AFW Valve 2HV-4713 failing open AFW Flow indication is off-scale high on Steam Generator E089 SG E089 level increase due to the Partial ESFAS</b>		
+1 min	RO/BOP	REFER to Annunciator Response Procedure.
	RO/BOP	REFER to Plant Monitoring System Alarm Page.
	RO/BOP	DETERMINE that a Partial ESFAS Actuation has occurred and INFORM the CRS.
	CRS	DIRECT BOP to override and close AFW Valves and/or STOP P-141.
	BOP	CLOSE AFW Valve HV-4731 and/or STOP P-141 by DEPRESSING the STOP pushbutton.
	CRS	DIRECT performance of SO23-3-2.22, Engineering Safety Features Actuation System Operation to determine valves that may have operated.
	CRS/RO	RESTORE feedwater flow as required.

Op Test No.:	<u>NRC</u>	Scenario #	<u>3</u>	Event #	<u>4</u>	Page	<u>58</u>	of	<u>68</u>
Event Description:		EFAS-1 Partial Actuation							
Time	Position	Applicant's Actions or Behavior							

**Note:** The crew may use any or all of the following procedures to aid in identifying the failed relay:

- SO23-3.2.22, ESFAS Operation, Attachment 14
- SO23-3-3.43, ESF Subgroup Relays Test, Attachment 3
- SO23-3.3.43.33, ESF Subgroup Relay K-624A Test, Section 6.5

+10 min	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> <li>• LCO 3.7.5.H, Auxiliary Feedwater System.</li> </ul>
		<ul style="list-style-type: none"> <li>• ACTION H - An automatic valve in any flow path incapable of closing upon receipt of a Main Steam Isolation Signal; Close the affected valve or its block valve within four (4) hours.</li> </ul>

***When feedwater flow is controlled, or at Lead Evaluator's discretion, PROCEED to Event 5.***

Op Test No.:	<u>NRC</u>	Scenario #	<u>3</u>	Event #	<u>5</u>	Page	<u>59</u>	of	<u>68</u>
Event Description:		Pressurizer Safety Valve Leak							
Time	Position	Applicant's Actions or Behavior							

**Machine Operator: When directed, EXECUTE Event 5.  
- RC18B @ 8%, PZR Safety Valve leak**

**Indications available:**

**57B17 - PZR RELIEF VALVE OPEN**

**Identified RCS leakrate  $\geq$  10 gpm**

**Charging flow > Letdown flow with plant conditions stable**

+1 min	RO	REFER to Annunciator Response Procedures.
	RO	RECOGNIZE RCS leak and INFORM the CRS AOI SO23-13-14 entry required.
	CRS	DIRECT performance of SO23-13-14, RCS Leak.
+3 min	RO	VERIFY Pressurizer level lowering.
	RO	ENSURE Charging Pumps start to maintain Pressurizer level.
	RO/BOP	DETERMINE RCS leakrate.
+5 min	RO	VERIFY VCT level is being maintained within programmed band.
	RO	OPERATE Blended Makeup System to maintain VCT level.
	RO	VERIFY Pressurizer level – NOT LOWERING.
	RO	VERIFY Pressurizer Level – STABLE or RISING.
	CREW	QUANTIFY RCS leakage by Charging and Letdown mismatch and REPORT leakage rate to the Shift Manager.

Op Test No.:	<u>NRC</u>	Scenario #	<u>3</u>	Event #	<u>5</u>	Page	<u>60</u>	of	<u>68</u>
Event Description:		Pressurizer Safety Valve Leak							
Time	Position	Applicant's Actions or Behavior							

	CRS	EVALUATE Technical Specifications.
		<ul style="list-style-type: none"> <li>• LCO 3.4.13.A, RCS Operational Leakage.</li> </ul>
		<ul style="list-style-type: none"> <li>▪ ACTION A - RCS leakage not within limits for reasons other than pressure boundary leakage; Reduce leakage to within limits within four (4) hours.</li> </ul>
	CREW	DETERMINE source of leak:
		<ul style="list-style-type: none"> <li>• INSPECT Charging and Letdown Systems.</li> </ul>
		<ul style="list-style-type: none"> <li>• INSPECT Penetration Building.</li> </ul>
		<ul style="list-style-type: none"> <li>• MONITOR Radiation Monitors.</li> </ul>
		<ul style="list-style-type: none"> <li>• SAMPLE Containment Atmosphere.</li> </ul>
	CREW	CONFIRM Radiation Monitors and Containment Atmosphere samples indicate RCS leak is in Containment.
	CREW	VERIFY that RCS Leakage exceeds ten (10) gpm and the source of the leakage is identified.
+10 min	CRS	DIRECT a Plant Shutdown to be in Hot Standby within 6 hours per SO23-5-1.7, Power Descension.
<p><b><i>When Technical Specifications are addressed, or at Lead Evaluator's discretion, PROCEED to Events 6, 7, and 8.</i></b></p>		

Op Test No.:	<u>NRC</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, and 8</u>	Page	<u>61</u>	of	<u>68</u>
Event Description:	ESDE on SG E089 Inside Containment / MSIS Fails to Actuate / HPSI Pump Start Failure								
Time	Position	Applicant's Actions or Behavior							

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

- RC18A @ 100%, PZR Safety Valve (PSV-0200) fails open
- RC18B @ 100%, PZR Safety Valve (PSV-0201) fails open
- CC06B, Component Cooling Water Pump (P-025) trip
- CC06D, Component Cooling Water Pump (P-026) trip
- RPS LP, CIAS fails to actuate

**Indications Available:**

50A01 - QUENCH TANK PRESS HI  
 50A11 - QUENCH TANK LEVEL HI/LO  
 50A21 - QUENCH TANK TEMP HI  
 50A31 - PZR RELIEF VALVE OUTLET TEMP HI

+30 sec	CREW	RECOGNIZE RCS pressure decreasing rapidly.
	CRS	VERIFY Reactor trip and DIRECT crew to perform actions of SO23-12-1, Standard Post Trip Actions.
	RO	VERIFY Reactor Trip: <ul style="list-style-type: none"> <li>• VERIFY Reactor Trip Circuit Breakers (8) - open.</li> <li>• VERIFY Reactor Power lowering and Startup Rate - negative.</li> <li>• VERIFY maximum of one full length CEA - NOT fully inserted.</li> </ul>
	BOP	VERIFY Turbine Trip: <ul style="list-style-type: none"> <li>• VERIFY Main Turbine tripped.           <ul style="list-style-type: none"> <li>○ HP and LP Stop and Governor valves - closed.</li> </ul> </li> <li>• VERIFY both Unit Output Breakers - open.</li> <li>• VERIFY Main Turbine speed &lt;2000 RPM or lowering.</li> </ul>
	CRS	INITIATE Administrative Actions: <ul style="list-style-type: none"> <li>• ANNOUNCE Reactor trip via PA System.</li> <li>• INITIATE Attachment 4, WORKSHEET.</li> </ul>

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Event Description:	ESDE on SG E089 Inside Containment / MSIS Fails to Actuate / HPSI Pump Start Failure								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> <li>INITIATE Attachment 5, ADMINISTRATIVE ACTIONS.</li> </ul>
	BOP	<p>VERIFY Vital Auxiliaries functioning properly:</p> <ul style="list-style-type: none"> <li>VERIFY both 1E 4 kV Buses A04 and A06 - energized.</li> <li>VERIFY both 1E 480 V Buses B04 and B06 - energized.</li> <li>VERIFY all Class 1E DC Buses – energized.</li> <li>VERIFY all 6.9 kV and Non-1E Buses – energized.</li> <li>DETERMINE no CCW Trains - operating AND aligned to Non-Critical Loop (NCL) and Letdown Heat Exchanger.</li> </ul>
<b>Critical Task Statement</b>		<b>Within five (5) minutes of initiating CCW supported ESFAS equipment operation without CCW flow, take action to restore CCW Critical Loop flow to at least one train of operating ESF pumps and Emergency Cooling Units.</b>
<b>CRITICAL TASK</b>	BOP	[RNO] DETERMINE no CCW Trains are operating and START CCW Pump P-024.
	RO	<p>DETERMINE RCS Inventory Control criteria NOT satisfied:</p> <ul style="list-style-type: none"> <li>DETERMINE PZR level NOT between 10% and 70% AND NOT trending to between 30% and 60%.</li> <li>VERIFY Core Exit Saturation Margin <math>\geq 20^{\circ}\text{F}</math>: <ul style="list-style-type: none"> <li>QSPDS page 611.</li> <li>CFMS page 311.</li> </ul> </li> </ul>
	RO	<p>DETERMINE RCS Pressure Control criteria NOT satisfied:</p> <ul style="list-style-type: none"> <li>DETERMINE PZR pressure (WR and NR) NOT between 1740 PSIA and 2380 PSIA AND NOT controlled AND NOT trending to between 2025 PSIA and 2275 PSIA.</li> <li>Is NOT trending to between 2025 psia and 2275 psia.</li> </ul>

Op Test No.:	<u>NRC</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, and 8</u>	Page	<u>63</u>	of	<u>68</u>
Event Description:		ESDE on SG E089 Inside Containment / MSIS Fails to Actuate / HPSI Pump Start Failure							
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> <li>If PZR pressure less than PZR pressure control system setpoint and lowering, then ENSURE Normal and Auxiliary Spray Valves - closed</li> </ul>
		<ul style="list-style-type: none"> <li>If PZR pressure (WR) is less than 1740 psia, ENSURE SIAS actuated.</li> </ul>
	CRS	RECORD time of SIAS.
<b>Critical Task Statement</b>		<p><b>Within ten (10) minutes of a loss of CCW the affected RCP(s) will be stopped.</b></p> <p>Elapsed Time: _____</p>
	RO	DETERMINE Core Heat Removal criteria is NOT satisfied:
<b>CRITICAL TASK</b>		<ul style="list-style-type: none"> <li>STOP all RCPs due to CIAS.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Core Exit Saturation Margin <math>\geq 20^{\circ}\text{F}</math>.</li> </ul>
		<ul style="list-style-type: none"> <li>QSPDS page 611.</li> </ul>
		<ul style="list-style-type: none"> <li>CFMS page 311.</li> </ul>
	BOP	DETERMINE RCS Heat Removal criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>VERIFY at least one SGs level between 21% and 80% NR.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE <math>T_C</math> less than <math>545^{\circ}\text{F}</math> and NOT controlled.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE heat removal NOT adequate:</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] <math>T_C</math> – less than <math>545^{\circ}\text{F}</math>.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE SBCS valves closed.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE ADVs closed.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE SG Blowdown valves closed.</li> </ul>
		<ul style="list-style-type: none"> <li><u>E-088</u> - HV-4054</li> <li><u>E-089</u> - HV-4053</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE Main Steam to Reheaters valves closed.</li> </ul>

Op Test No.:	<u>NRC</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, and 8</u>	Page	<u>64</u>	of	<u>68</u>
Event Description:		ESDE on SG E089 Inside Containment / MSIS Fails to Actuate / HPSI Pump Start Failure							
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> <li>HV-2703 or HV-2704; HV-2721; HV-2751</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY SG pressures – greater than 740 PSIA.</li> </ul>
	RO	DETERMINE Containment Isolation criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE Containment pressure – greater than 1.5 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DETERMINE Containment pressure &gt; 3.4 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE SIAS, CCAS, and CRIS actuated.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DETERMINE CIAS NOT actuated.</li> </ul>
	<b>Critical Task Statement</b>	<b>Within 5 minutes of automatic actuation failure, crew manually initiates Containment Isolation. Initiation may be accomplished by either manual actuation from the control boards, manual actuation or opening of trip path breakers from L034/L035, or operation of individual components to their CIAS actuated position.</b>
<b>CRITICAL TASK</b>	RO	Manually INITIATE Containment Isolation Actuation Signal.
	RO	<ul style="list-style-type: none"> <li>VERIFY Containment Area Radiation Monitors energized AND NOT alarming or trending to alarm.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Secondary Plant Radiation Monitors energized AND NOT alarming or trending to alarm.</li> </ul>
	CRS	RECORD time of SIAS, CIAS, CCAS, CRIS.
	RO	DETERMINE Containment Temperature, Pressure and Combustible Gas Control criteria NOT satisfied:
		<ul style="list-style-type: none"> <li>DETERMINE Containment average temperature &gt; 120°F.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE Containment pressure &gt; 1.5 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE proper functioning of the Normal Containment Cooling.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE at least one Containment Dome Air</li> </ul>



Op Test No.:	<u>NRC</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, and 8</u>	Page	<u>65</u>	of	<u>68</u>
Event Description:		ESDE on SG E089 Inside Containment / MSIS Fails to Actuate / HPSI Pump Start Failure							
Time	Position	Applicant's Actions or Behavior							

		Circulator operating.
		<ul style="list-style-type: none"> <li>[RNO] DETERMINE Containment pressure &gt; 3.4 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE all RCPs stopped.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] ENSURE all available Containment Emergency Cooling Units operating.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY Containment pressure &lt; 14 PSIG.</li> </ul>
	CRS	DIAGNOSE event in progress:
		<ul style="list-style-type: none"> <li>DETERMINE all safety function criteria are NOT met per Attachment 4, Worksheet.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] COMPLETE Attachment 1, Recovery Diagnostics.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DIAGNOSE event as LOCA inside Containment.</li> </ul>
		<ul style="list-style-type: none"> <li>DETERMINE that Reactor Trip Recovery is NOT diagnosed.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] DETERMINE all RCPs stopped.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT initiating steps 12 through 15.</li> </ul>
	BOP	INITIATE steps 12 through 15.
	CRS	DIRECT performance of SO23-12-3, LOCA.
		<ul style="list-style-type: none"> <li>RECORD time of EOI entry.</li> </ul>
+15 min	CRS	VERIFY LOCA diagnosis:
		<ul style="list-style-type: none"> <li>INITIATE SO23-12-10, LOCA Safety Function Status Checks.</li> </ul>
		<ul style="list-style-type: none"> <li>INITIATE Foldout Page.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT initiation of FS-7, HPSI Throttle/Stop.</li> </ul>
		<ul style="list-style-type: none"> <li>DIRECT initiation of Attachment 22, Non-Qualified Loads Restoration.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY LOCA diagnosis, using Figure 1, Break Identification Chart.</li> </ul>

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Event Description:	ESDE on SG E089 Inside Containment / MSIS Fails to Actuate / HPSI Pump Start Failure								
Time	Position	Applicant's Actions or Behavior							

		<ul style="list-style-type: none"> <li>INITIATE sampling of both Steam Generators for radioactivity and boron.</li> </ul>
<p><b>M.O. Cue: If directed to sample SGs, WAIT 10 minutes and then REPORT that E088 and E089 both have activity near background, and normal boron levels. If the SG sample valves are closed, REPORT unable to establish sample flow.</b></p>		
	CRS	INITIATE Administrative actions:
		<ul style="list-style-type: none"> <li>NOTIFY Shift Manager/Operations Leader of SO23-12-3, Loss of Coolant Accident initiation.</li> </ul>
		<ul style="list-style-type: none"> <li>ENSURE Emergency Plan is initiated.</li> </ul>
		<ul style="list-style-type: none"> <li>IMPLEMENT Placekeeper.</li> </ul>
	RO	VERIFY ESF actuation.
		<ul style="list-style-type: none"> <li>VERIFY SIAS actuation required.</li> </ul>
		<ul style="list-style-type: none"> <li>PZR pressure less than SIAS setpoint.</li> </ul>
		OR
		<ul style="list-style-type: none"> <li>Containment pressure &gt; 3.4 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>ENSURE the following actuated:</li> </ul>
		<ul style="list-style-type: none"> <li>SIAS / CCAS / CRIS</li> </ul>
	CRS	RECORD time of SIAS.
	BOP	STOP unloaded Diesel Generators.
	BOP	INITIATE SO23-12-11, Attachment 22, Non-Qualified Load Restoration.
<p><b>M.O. Cue: 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.</b></p>		

Op Test No.:	<u>NRC</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, and 8</u>	Page	<u>67</u>	of	<u>68</u>
Event Description:	ESDE on SG E089 Inside Containment / MSIS Fails to Actuate / HPSI Pump Start Failure								
Time	Position	Applicant's Actions or Behavior							

	RO	ESTABLISH Optimum SI Alignment:
		<ul style="list-style-type: none"> <li>ESTABLISH two train operation.</li> </ul>
		<ul style="list-style-type: none"> <li>All Charging Pumps operating.</li> </ul>
		<ul style="list-style-type: none"> <li>Two HPSI trains and two LPSI trains operating.</li> </ul>
		<ul style="list-style-type: none"> <li>All Cold leg flow paths aligned.</li> </ul>
		<ul style="list-style-type: none"> <li>VERIFY SI flow required:</li> </ul>
		<ul style="list-style-type: none"> <li>SI flow indicated.</li> </ul>
	RO	<ul style="list-style-type: none"> <li>DETERMINE FS-7, VERIFY SI Throttle/Stop Criteria is NOT satisfied.</li> </ul>
	RO	VERIFY PZR pressure:
		<ul style="list-style-type: none"> <li>DETERMINE RCP NPSH requirements of SO23-12-11, Attachment 29 NOT satisfied.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] VERIFY all RCPs stopped.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] INITIATE FS-3, Monitor Natural Circulation.</li> </ul>
	RO	VERIFY Letdown isolated.
	RO	VERIFY outside Containment radiation alarms - NOT alarming or trending to alarm.
	RO	VERIFY outside Containment sump levels - NOT abnormally rising.
	RO	VERIFY RCS sample valves, RCS and PZR head vents are closed.
	RO	VERIFY CCW parameters are normal.
	CRS/RO	DETERMINE PZR safety valves are NOT closed.

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Event Description: ESDE on SG E089 Inside Containment / MSIS Fails to Actuate / HPSI Pump Start Failure

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> <li>Request Shift Manager/Operations Leader evaluate lowering PZR pressure to aid in resetting the safety valves.</li> </ul>
		<ul style="list-style-type: none"> <li>[RNO] Maintain core exit saturation margin greater than or equal to 20°F.</li> </ul>
	CRS/RO	DETERMINE rate of RCS inventory and pressure loss greater than available charging pump capacity.
+30 min	CRS	DIRECT initiation of RCS cooldown.
<p><b><i>When the RCS cooldown is initiated, or at Lead Evaluator's discretion, TERMINATE the scenario.</i></b></p>		