

FINAL AS-ADMINISTERED SCENARIOS

FOR THE POINT BEACH INITIAL EXAMINATION - JAN/FEB 2002

DYNAMIC EXAM SCENARIO ID#: SES-2002301: #1

SIMULATOR SHIFT TURNOVER:

Per Scenario Outline.

SIMULATOR SCENARIO SET UP

STEP COUNTERS ON

INIT into IC

PBF-6802, Communicator Telephone Log, available

PBF-6801, Simulator Setup Checklist, completed

PBF-6806, Simulator Book Preparation Checklist, completed

PBF-6807, Simulator Scenario Briefing Sheet, completed

TI 9.0 Attachment 1 (Part 1), PBNP Simulator Security
Checklist, completed

SCENARIO GUIDE:

1. Initialize to a Unit 1 28% Power IC or saved specific SES IC.
2. Place a Danger Tag on P-38B Control Switch
3. Align G-02 EDG to 1A05 and 2A05 by placing breaker 1A52-60 to pullout, place breaker 1A52-66 to Auto (requires key).
4. Place G-01 Mode Selector switch to Local. Place Danger Tags on the G-01 Mode Selector switch, breaker 1A52-60 control switch, and breaker 1A52-73 control switch. C02 alarms will have to be acknowledged after going to RUN.
5. Ensure computer point FCV110B is removed from scan.
6. Ensure Component Cooling Water Pump 1P-11A is running (secure/start pumps as necessary).
7. Swap the 'B' MFRV Steam and Feed Flow channels from Blue to Yellow.
8. Ensure Containment Accident Fan 1W-1A1 is OFF and in standby.
9. Preload (or verify preloaded) the following simulator codes:

TIME	TAGNAME	VALUE	RAMP VALUE	RAMP TIME	DELAY TIME	SEVERITY VALUE	TRIGGER
Preload	BKR1AFW002 (P-38B)	6	-	-	0	-	-
Preload	BST1CCW010 (1PIC-639)	1	-	-	0	-	-
Preload	RLY1PPL078 (Train 'A' Auto SI)	1	-	-	0	-	-
Preload	RLY1PPL079 (Train 'B' Auto SI)	1	-	-	0	-	-
Preload	CFC code (get sim code)		-	-		-	-
Preload	VLV1SIS027 (1SI-852A)	4	-	-	0	-	-

POINT BEACH NUCLEAR PLANT
TRAINING SIMULATOR EXAM SCENARIO

Revision 0 DRAFT

The following events will be entered when requested by the lead examiner.

TIME	TAGNAME	VALUE	RAMP VALUE	RAMP TIME	DELAY TIME	SEVERITY VALUE	TRIGGER
Event 2	XMT1RCS023A (TE-401A)	-	As Found	10	0	650	-
Event 3	PMP1CCW001 (1P-11A)	2	-	-	0	-	-
Event 4	XMT1SGN017A (1PT-478)	-	As Found	10	0	1400	-
Event 5	MAL1RCS002B (Loop 'A' Cold Leg leak)	-	0	120	0	0.8	-
Event 6 (Note 1)	MAL1RCS002B (Loop 'A' Cold Leg Break)	-	As Found (0.8)	0	0	100	-
Event 7,8	LOA1SIS030 (1SI-897A)	-	As Found	60	0	0.0	-
(when requested by crew)	LOA1SIS031 (1SI-897B)	-	As Found	60	0	0.0	-

Note 1: Prior to Event 6, verify preloads active.

ANTICIPATED BOOTH COMMUNICATION/GUIDANCE:

Event 1: This event is a normal up-power. The AOs should be informed of the power escalation, with an acknowledgement by the communicator.

Event 2: This event is a failure of a T_{HOT} instrument high (TE-401A). Insert the failure at the request of the lead examiner. Possible communications may include a request to I&C for maintenance support, as well as informing the DCS and STA when the channel is removed from service. These communications will most likely be directed to the Instructor DSS. No specific response to the crew is required by the communicator or DSS, with the exception that an I&C Tech will have to be called in to investigate the failure.

Event 3: This event is a failure of the running CC pump with a failure to auto-start of the standby pump. Ensure the pre-load for the auto start failure is active, and insert the failure of 1P-11A at the request of the lead examiner. It is important that the insertion of this failure be coordinated such that the Unit 1 CO is most likely to respond to the failure and not the BOP operator (for position specific malfunction response counting numbers only). The crew should contact the PAB AO to investigate the tripped CC pump (1P-11A) as well as the status of 1P-11B once running. The AO should report back to the crew that the CC pump motor is very hot. If the breaker is checked, it has tripped on overcurrent. The running CC pump (1P-11B) is running normally if asked. A request to Chemistry for CCW sampling, and DCS notification will be fielded by the Instructor DSS. No specific response is necessary. The Instructor DSS will also be informed to implement the E-plan. This can be acknowledged, and later reported back (if desired) that no E-plan applicability was discovered for this event. Preparation of a tag series for 1P-11A may also be requested, and should be acknowledged.

Event 4: This event is a failure of S/G 'B' Pressure Transmitter PT-478. This failure should be inserted at the request of the lead examiner. This event will cause the 'B' S/G atmospheric valve to open. The 'B' Main Feed Reg Valve will be controlling on the Yellow channels, and therefore is not affected. No booth communications are anticipated for this event. It is intended only to observe the crew response to this failure, and not proceed through AOP-24 and 0-SOP-IC-001. This should be a short duration event.

Event 5,6: This event is a small RCS leak (≈ 35 gpm) inside containment, which turns into a large break LOCA. The small break failure should be inserted at the request of the lead examiner. AOP-1A will be entered due to the RCS leak. After the AOP has been exercised sufficiently, and at the request of the lead examiner, then insert the large break (verify pre-loads for events 7 and 8 are active prior to inserting the large break). No booth communications are expected for this event. Once the large break is inserted, then proceed to the next event (event 7, 8). A request for notification of the DCS and E-plan implementation will be fielded by the Instructor DSS.

Note: The initial RCS leak is fairly small (≈ 35 gpm) and a reactor trip will not be required by procedure, assuming charging flow is raised. However, the simulator operator must be ready to insert the LB LOCA (next event) if it appears that the crew is going to manually trip, SI, and CI. It is very important that the LB LOCA cause the automatic reactor trip.

Event 7,8: This event involves a failure of SI to auto-actuate, the failure of Containment Accident Fan 1W-1A1 to auto-start, and the failure of ISI-852A to auto-open following the LB LOCA and reactor trip. The PAB operator will be requested by the BOP operator to verify either valve SW-LW-61 or 62 is shut per EOP-0 Attachment A. Both valves should be indicated as being shut. A request will also be made to locally shut ISI-897A and B (SI Test Return Isolation AOVs). These valves should be closed one at a time (see page 3 for simulator codes) and reported back to the control room when complete. Also, the PAB AO will be requested to perform EOP-1.3 Attachment A, Local Alignment of Component Cooling Water. This order should be acknowledged, no follow-up is necessary as the scenario will end prior to being able to complete the Attachment.

Op-Test No: 2002301 Scenario No: 1 Event No: 1 Page 1 of 2

Event Description: **Perform Normal Up-Power (Reactivity Manipulation)**

Time	Position	Applicant's Actions or Behavior
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The normal up-power brief may be conducted in the classroom, prior to entering the simulator, at the discretion of the lead examiner to minimize the amount of time in the simulator.

	DOS	Brief crew on evolution, including discussion of OP-1C precautions and limitations, for commencing up-power.
	DOS	Determine magnitude and rate of load increase.
	DOS	Notify System Control Supervisor (WEPOG) per NP 2.1.5
	DOS/BOP	Notify Unit 1 Turbine Hall operator and PAB operator of up-power.
	BOP	Reduce PPCS constants for S/G Blowdown flow by 5 klb/hr.
	RO	If desired, place additional letdown orifice in service.
	BOP	Continue opening MSR Control Valve – this step is N/A since the MSR control valves are already full open.
	BOP	Ensure the Governor Valves are off the Valve Position Limiter.
	BOP	Move the VPL to the desired position (e.g. 100% value)
	BOP	Select the desired EH Control System mode of operation (Operator Auto – Impulse In should be selected as it provides the most linear load response).
	BOP	Shift to the selected rate.

Op-Test No: 2002301 Scenario No: 1 Event No: 1 Page 2 of 2

Event Description: **Perform Normal Up-Power (Reactivity Manipulation)**

Time	Position	Applicant's Actions or Behavior
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	RO/BOP	During the power increase, maintain controls in AUTO as practicable. <ul style="list-style-type: none">- Blender controls- Turbine controls
	RO	<ul style="list-style-type: none">- Control Delta Flux in accordance with limits in the COLR – N/A when less than 50% power.
	RO	Ensure rod insertion, sequence, and overlap limits are met per COLR (LCO 3.1.6)
	RO	Maintain T_{avg} within 1.5° F of T_{ref} . <ul style="list-style-type: none">- Dilution and/or rod steps will be required to maintain T_{avg}.
	RO	Adjust power range NIS as directed by 0-TS-RE-001, Power Level Determination (this step should not be required).
	BOP	Maintain/monitor the following items: <ul style="list-style-type: none">- Maintain VARS out while keeping the null meter zeroed.- Maintain the controller deviation for the Main Feed Regulating Valves nulled.- Maintain the controller setpoint for the LP Feedwater Heater Bypass Valve (CS-2273) at 25 psig below SG Feed Pump suction pressure.- Monitor FWH/MSR high level alarms to ensure the dump valves control level.- Monitor ice melt as necessary.

Once power has been raised 5% and/or at the discretion of the Lead Examiner, proceed to the next event (Event # 2).

Op-Test No: 2002301 Scenario No: 1 Event No: 2 Page 1 of 4

Event Description: **T_{HOT} Instrument (TE-401A) Fails High**

Time	Position	Applicant's Actions or Behavior
	RO	<p>Acknowledge and respond to receipt of annunciator ARB 1C04 1A 3-8, "Reactor Coolant Average Delta T Deviation" as well as numerous other annunciators on 1C04.</p> <p>Operator actions:</p> <ul style="list-style-type: none"> - Check for associated alarms - Check Delta-T and T_{AVG} indications - Identify failed instrument, notify DSS/DOS
	DOS	Order power escalation suspended and power stabilized (if not already done).
	RO/BOP	Refer to appropriate ARB(s).
	DOS	Enter AOP-24, "Response to Instrument Malfunctions"
	RO/DOS	Identify failure of TE-401A (T _{HOT} - Red Channel)
	RO/DOS	<p>Identify Failed Instrument and that it is a controlling channel.</p> <ul style="list-style-type: none"> - No control rod motion will occur due to control rods being in manual at low power - Auto charging pump placed in manual control due to incorrect PZR programmed level. - Manually calculates PZR Level Program setpoint.
	RO/DOS	Return affected parameter to desired value – charging pump speed controlled in manual to restore pressurizer level to manually calculated programmed value.

Op-Test No: 2002301 Scenario No: 1 Event No: 2 Page 2 of 4

Event Description: **T_{HOT} Instrument (TE-401A) Fails High**

Time	Position	Applicant's Actions or Behavior
	DOS	<p>Remove failed instrument channel from service per 0-SOP-IC-001 "Routine Maintenance Procedure Removal of Safeguards or Protection Sensor from Service".</p> <ul style="list-style-type: none"> - Obtain and implement 0-SOP-IC-001 - Review precautions and limitations with crew. - Conduct pre-job brief for removing TE-401A from service - Obtain DSS permission - Direct 0-SOP-IC-001 for removing TE-401A removal from service
	RO/DOS	Verify rod selector switch in Manual.
	BOP/DOS	Place the T _{AVG} defeat switch in DEFEAT RED (panel C-107).
	BOP/DOS	Place the Delta-T defeat switch in DEFEAT RED (panel C-108).
	RO/DOS	Place rod control switch in Auto, unless otherwise directed by DSS. Crew should realize that Rod Control should remain in Manual due to the startup – Instructor DSS will indicate such if necessary.
	BOP/DOS	<p>Place the following bistable trip switches to TRIP (panel C-111).</p> <ul style="list-style-type: none"> - Overpower Rod Stop - Overtemperature Rod Stop - Overpower Trip - Overtemperature Trip - High T_{AVG} - Low T_{AVG}

Op-Test No: 2002301 Scenario No: 1 Event No: 2 Page 3 of 4

Event Description: **T_{HOT} Instrument (TE-401A) Fails High**

Time	Position	Applicant's Actions or Behavior
	BOP/DOS	Remove from scan PPCS point IDs T401 and T405 (new PPCS points T-401 and T-405)
	DOS	Inform DSS that TE-401A has been removed from service. DCS and STA are also informed, DSS may be requested to do this notification.
	DOS	Return to AOP-24 to finish required actions.
	RO/DOS	Return controls to automatic if desired – a single running charging pump should be restored to automatic. Pump may be left in manual until controller wind-up dissipates. Note: If Auto Charging control is desired, manipulation of controller LC-428F in panel C-110 may be required to null the deviation with the desired charging pump controller.

Op-Test No: 2002301 Scenario No: 1 Event No: 2 Page 4 of 4

Event Description: **T_{HOT} Instrument (TE-401A) Fails High**

Time	Position	Applicant's Actions or Behavior
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	DOS	<p>Check TS applicability:</p> <p>DOS should determine that LCO 3.3.1 is not met.</p> <ul style="list-style-type: none">- Action Condition 'A' is entered immediately – Required Action is to enter the Condition referenced in Table 3.3.1-1 for the channel.- Condition 'D' is referenced from Table 3.3.1-1 Functions 5 and 6. Required Action is to place the channel in trip within 1 hour OR be in Mode 3 in 7 hours.- Channel is in trip per the SOP, TS requirements are met. <p>DOS should determine that LCO 3.3.2 is met.</p> <ul style="list-style-type: none">- Table 3.3.2-1 Function 4.d item 3 (T_{avg} – low) only requires 3 channels operable. There are 4 channels for this function, therefore the LCO is met.
	DOS	Exit AOP-24
At the discretion of the lead examiner, proceed to the next event (Event # 3)		

Op-Test No: 2002301 Scenario No: 1 Event No: 3 Page 1 of 2

Event Description: **Running CCW Pump Shaft Seizes with a Failure of the Standby Pump to AUTO Start**

Time	Position	Applicant's Actions or Behavior
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Critical Task: The standby CCW pump 1P-11B is started prior to exiting AOP-9B.

	BOP/RO	Respond to numerous Annunciator alarms on 1C03.
	RO/DOS	Recognize Motor Breaker Trip of 1P-11A (running CCW Pump) occurred and the Auto Pump (1P-11B) did not AUTO start.
	RO/DOS	Start 1P-11B (standby CCW Pump) – this pump should have started on low pressure but did not, it is expected that the pump be manually started to back up the Auto start that failed (also required to be started per ARB).
	DOS	Directs entry into AOP-9B, “Component Cooling System Malfunction”
	DOS/BOP	Check Component Cooling Pumps at least one running (1P-11B manually started)
	DOS/BOP	Check Surge Tank Level lowering (recognizes level is stable and proceeds to next step)
	DOS/BOP	Check Surge Tank Level greater than 10%
	DOS/BOP	Check Component Cooling System for In-leakage (recognizes surge tank level is not rising and proceeds to next step)
	DOS/RO	Check Reactor Trip - NOT REQUIRED - Check reactor critical - Check VCT high temperature alarm-CLEAR
	DOS/BOP	Check RHR Status-RHR not in service and proceeds to next step
	DOS	Request Chemistry analyze CCW (may request DSS to perform this step).

Op-Test No: 2002301 Scenario No: 1 Event No: 3 Page 2 of 2

Event Description: **Running CCW Pump Shaft Seizes with a Failure of the Standby Pump to AUTO Start**

Time	Position	Applicant's Actions or Behavior
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	DOS	Notify DCS and implement E-plan (may request DSS to perform these actions)
	DOS/BOP	May place 1P-11A in Pull-Out which clears Motor Breaker Trip annunciator.
	DOS	Check TS applicability: DOS should determine that LCO 3.7.7 is not met. - Action Condition 'A' is entered. Required Action is to restore the CC pump to operable status in 72 hours AND 144 hours from discovery of failure to meet the LCO.

At the discretion of the lead examiner, proceed to the next event (Event # 4)

Op-Test No: 2002301 Scenario No: 1 Event No: 4 Page 1 of 2

Event Description: **Controlling Steam Generator Pressure Channel (PT-478) Fails High**

Time	Position	Applicant's Actions or Behavior
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	BOP	Identify failure of PT-478 ('B' S/G Pressure BLUE Channel).
	RO	Acknowledge and respond to receipt of annunciator ARB 1C03 1E2 1-5, "Steam Generator B Level Setpoint Deviation" Operator Actions: - HC-466 'B' S/G Atmospheric Dump Valve taken to manual and shut. There will be no effect on the 'B' Main Feedwater Regulating Valve since it is controlling on the Yellow channel.
	RO	Monitors RCS temperature during transient to ensure compliance within limits of OP-1C.
	DOS	Directs entry into AOP-24, "Response to Instrument Malfunctions"

Technical Specification requirements for this failure are included on the following page.

It is not the intent to exercise AOP-24 again or perform another 0-SOP-IC-001, but rather evaluate the BOP identification and crews response to this failure. Once this is complete and plant is stabilized, and at the discretion of the lead examiner, proceed to the next event (Event #5).

Op-Test No: 2002301 Scenario No: 1 Event No: 4 Page 2 of 2

Event Description: **Controlling Steam Generator Pressure Channel (PT-478) Fails High**

Time	Position	Applicant's Actions or Behavior
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	DOS	<p>Technical Specification Requirements are included below for this failure.</p> <p>DOS should determine that LCO 3.3.1 is not met.</p> <ul style="list-style-type: none">- Action Condition 'A' is entered immediately – Required Action is to enter the Condition referenced in Table 3.3.1-1 for the channel.- Condition 'D' is referenced from Table 3.3.1-1 Functions 14-02. Required Action is to place the channel in trip within 1 hour OR be in Mode 3 in 7 hours. <p>DOS should determine that LCO 3.3.2 is not met.</p> <ul style="list-style-type: none">- Action Condition 'A' is entered immediately – Required Action is to enter the Condition referenced in Table 3.3.2-1 for the channel.- Condition 'D' is referenced from Table 3.3.2-1 Functions 1.e. Required Action is to place the channel in trip within 1 hour OR be in Mode 3 in 7 hours AND Mode 4 in 13 hours. <p>Note: All other affected Functions in Table 3.3.2-1 reference Function 1.e for required action. A list of these functions may be found in 0-SOP-IC-001. Therefore, these are all the TS actions that are required. LCO 3.3.3 is still met since only two channels are required operable. LCO 3.3.5 references LCO 3.3.2 Function 3, which once again references Function 1.e for required actions.</p>
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Op-Test No: 2002301 Scenario No: 1 Event No: 5, 6 Page 1 of 2

Event Description: **A small RCS leak develops in the 'A' RCS Loop, degrading to a large break loss of coolant accident and automatic reactor trip.**

Time	Position	Applicant's Actions or Behavior
	CREW	<p>Identify RCS leak. The following are some indications available which will enable the crew to identify that an RCS leak exists inside containment.</p> <ul style="list-style-type: none"> - Containment Sump 'A' level rising and associated alarm (BOP) - Containment humidity and pressure rising (BOP) - RMS alarms inside containment (RO/BOP) - Auto Charging Pump speed rising (RO) - Pressurizer level lowering (RO)
	DOS	AOP-1A "Reactor Coolant Leak" is entered based on the above indications.
	RO/DOS	<p>Check Safety Injection Not Required.</p> <ul style="list-style-type: none"> - Pressurizer level within 10% of program level - RCS subcooling greater than 30°.
	RO/DOS	<p>Check Reactor Trip Not Required</p> <ul style="list-style-type: none"> - Check reactor critical - Check charging pump suction aligned to the VCT.
	RO/DOS	<p>Check PZR Level – Stable At Or Trending To Program Level.</p> <ul style="list-style-type: none"> - Charging flow should be raised per this step - Letdown may be isolated per this continuous action step if pressurizer level continues to lower.
	RO/DOS	Check PZR Pressure – Stable At Or Trending To Desired Pressure
	RO/DOS	Check Reactor Makeup Control at the proper concentration, armed, and in auto.

Op-Test No: 2002301 Scenario No: 1 Event No: 5, 6 Page 2 of 2

Event Description: **A small RCS leak develops in the 'A' RCS Loop, degrading to a large break loss of coolant accident and automatic reactor trip.**

Time	Position	Applicant's Actions or Behavior
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	DOS	Notify DCS and implement Emergency Plan (this action will be requested of the DSS)
The remainder of the steps in AOP-1A are diagnostic steps and can be performed in any order.		
	CREW	Check Steam Generator Tubes Intact. – a review of available indications (rad monitors, S/G levels, etc.) should determine that all S/G tubes are intact and this is not the source of leakage.
	RO/DOS	Check RCP Seal Leakoff Normal <ul style="list-style-type: none"> - #1 Seal leakoffs checked stable on 1FR-175 and 1FR-177 recorders. - #2 Seal leakoffs checked normal by verifying no standpipe high level alarms <u>OR</u> RCDT level is normal.
	RO/DOS	Determine if Leak is on Letdown Line (if letdown is in service) <ul style="list-style-type: none"> - Check Low Pressure Letdown Relief Valve Temperature High alarm clear (1C04 1C 4-6). - Shut letdown isolation valves 1CV-200A, 200B, and 200C. - Shut Reactor Coolant Loop B Cold Leg Letdown Isolation Valve 1RC-427.
	CREW	Check leak isolated. <ul style="list-style-type: none"> - The crew should determine that the leak is not isolated and proceed with further actions.

The RCS leak in this case, is not able to be isolated. When this point is reached, and at discretion of the Lead Examiner, the Large Break will be inserted, proceed to the next event (Event #7 and 8).

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 1 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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Critical Task: Manually actuate at least one train of SI using manual initiation pushbuttons.

	DOS	Enters EOP-0, "Reactor Trip or Safety Injection" due to Automatic Reactor Trip.
	RO	Performs Immediate Actions of EOP-0 (Steps 1-4) and informs DOS they are ready for verification. <ul style="list-style-type: none">- Verify reactor trip.- Verify turbine trip- Verify safeguard buses energized- <i>Check if SI is actuated – SI will be required but will not be actuated. Manual SI actuation is required using the manual SI pushbuttons.</i>
	RO/DOS	Verify Reactor Trip <ul style="list-style-type: none">- Check reactor trip and bypass breakers OPEN- Check all rod bottom lights LIT- Check all rod position indicators ON BOTTOM- Check neutron flux LOWERING
	RO/DOS	Verify Turbine Trip <ul style="list-style-type: none">- Check both Turbine Stop Valves shut
	RO/DOS	Verify Safeguard buses energized <ul style="list-style-type: none">- Check at least one 4160 Vac safeguards bus energized (1A05 or 1A06)- Check at least one 480 Vac safeguards bus energized (1B03 or 1B04)

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 2 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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	RO/DOS	<p>Check if SI is actuated:</p> <ul style="list-style-type: none">- 1C04-1B 4-2, Manual Safety Injection- 1C04 1B 4-3, Containment- 1C04-1B 4-4, Pressurizer Low Pressure SI- 1C04-1B 4-5, Steam Line A Pressure Low-Low- 1C04-1B 4-6, Steam Line B Pressure Low-Low <p><i>SI should have been manually actuated during the RO immediate actions. If not, the verification of the immediate action steps will manually actuate SI when this step is reached.</i></p>
	DOS	<p>Review foldout page criteria with the crew</p> <ul style="list-style-type: none">- Determines that RCP trip criteria is met, both RCPs are tripped.- Adverse Containment Conditions is also applicable due to Containment Pressure > 10 psig.
	BOP/DOS	<p>EOP-0 Attachment A "Automatic Action Verification" directed to be completed by the BOP operator while continuing on with EOP-0. Specific steps for Attachment A are included at the end of this Event description.</p> <p>There are three items of significance during the performance of this attachment for these conditions.</p> <ul style="list-style-type: none">- Secure one train of Containment Spray to conserve RWST inventory.- Identification that Containment Accident Fan 1W-1A1 did not start and manually starting the fan.- Identification that 1SI-852A did not open and manually opening the valve.

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 3 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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	RO/DOS	<p>Verify Secondary Heat Sink:</p> <ul style="list-style-type: none"> - Level in at least one S/G > (51%) 29%. Adverse Containment numbers (51%) may apply. RNO directs AFW pumps be manually started and aligned as necessary to establish total AFW flow > 200 gpm. - Sufficient AFW flow will exist, a level band of 51% and 65% will apply if adverse, 29%-65% if not adverse.
	RO/DOS	<p>Verify RCP seal cooling</p> <ul style="list-style-type: none"> - Labyrinth seal delta-P > 20 inches, OR - Component cooling to RCP thermal barrier normal
	RO/DOS	<p>Verify RCS Temperature Control – temperature will be lowering quite rapidly due to the large break LOCA. The following actions are required per the RNO:</p> <ul style="list-style-type: none"> - Stop dumping steam - Reduce total feed flow, maintain > 200 gpm until level in at least one S/G is greater than (51%) 29%. - Shut both MSIVs (MSIVs should be shut) - Verify MSIV bypass valves shut (local action)
	RO/DOS	Check Pressurizer PORVs both shut.
	RO/DOS	Verify Normal and Auxiliary spray valves are shut.
	RO/DOS	Check if RCPs should remain running. RCPs should have been tripped per the foldout page criteria. If not, then the RCPs should both be tripped at this time.

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 4 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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	DOS	<p>Start Monitoring Critical Safety Function Status Trees</p> <p>The Instructor DSS will acknowledge this message and begin monitoring of the Status Trees.</p>
	CREW	<p>Verify Containment Sump Recirculation Not Required.</p> <ul style="list-style-type: none"> - Sump Recirculation is determined to be required due to RCS pressure less than (425 psig) 200 psig and RHR flow greater than 450 gpm. A transition to EOP-1.3 "Transfer To Containment Sump Recirculation" is required. <p>Note: If EOP-0 Attachment A is not complete, it should be completed in parallel with EOP-1.3</p>
	DOS	EOP-1.3 entered, foldout page items reviewed with crew.
	DOS	Caution and Notes reviewed prior to step 1 – significant item to recognize is that Critical Safety Function Status Trees are to be monitored for information only (up to and including step 28).
	BOP/DOS	Reset SI.
	BOP/DOS	<p>Check Containment Spray Pumps – Both Stopped</p> <p>One Containment Spray pump should be running at this time since one is secured in EOP-0 Attachment A. If the attachment has not gotten to the step to address containment spray, both pumps will be running. There is no impact on the procedure flowpath if both are still running.</p>
	RO/DOS	<p>Check if RHR pumps should remain running.</p> <ul style="list-style-type: none"> - The pumps are left running due to the low RCS pressure.
	CREW	<p>Check if Train 'B' injection flow should be stopped:</p> <ul style="list-style-type: none"> - 1P-15B SI pump is stopped - 1P-10B RHR pump is stopped.

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 5 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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	RO/DOS	Monitor Core Cooling (continuous action step). <ul style="list-style-type: none">- Maintain Core Exit thermocouples < 700° F- Maintain Narrow Range Vessel Level > (19 ft) 16 ft. (No RCPs running)
	DOS	Direct unnecessary personnel to evacuate the PAB
	RO/DOS	Isolate CC flow to containment: <ul style="list-style-type: none">- Check both RCPs stopped- Shut containment equipment CC supply header isolation valve 1CC-719
	RO/DOS	Isolate CC flow to the non-regenerative heat exchanger <ul style="list-style-type: none">- Check letdown isolated- Place non-regen HX letdown temperature controller (IHC-130) in manual and shut
	BOP/DOS	Check all 6 service water pumps running.
	BOP/DOS	Check service water supply ring header – continuous flowpath established.

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 6 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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Critical Task: Since a second CC pump is not available, opening a single RHR Heat Exchanger Shell-side Inlet valve is a critical step. Should both valves be open simultaneously, this condition shall not exist for greater than 5 minutes (Ref. P&L of I-SOP-CC-001).

	RO/DOS	<p>Establish CC flow to the RHR heat exchangers</p> <ul style="list-style-type: none"> - Ensure one CC pump is running (1P-11B is running, 1P-11A has previously tripped) - Open ONLY one RHR heat exchanger shell side inlet valve (1CC-738A or 1CC-738B)
	BOP/DOS	<p>Ensure both core deluge valves open (1SI-852A and 1SI-852B)</p> <p>Note: 1SI-852A did not auto open but should have already been opened manually per EOP-0 Attachment A.</p>
	BOP/DOS	<p>Align SI test lines for recirculation</p> <ul style="list-style-type: none"> - Check containment spray discharge valves, at least one open in each train (1SI-860A or B for Train A, 1SI-860C or D for Train B) - Locally shut SI test return isolation AOVs (1SI-897A and 1SI-897B)
	DOS	<p>Direct PAB operator to complete Attachment A, Local Alignment of Component Cooling Water, while continuing on with procedure.</p>
	BOP/DOS	<p>Align RHR sump suction valves</p> <ul style="list-style-type: none"> - Check at least one SI test return isolation AOV shut (1SI-897A or B) - Open both RHR Pump Suction from Containment Sump 'B' MOVs (1SI-851A or 1SI-851B) – interlocked with 1SI-897A and 1SI-897B

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 7 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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	CREW	<p>Check if Train 'B' should be aligned using the normal method</p> <ul style="list-style-type: none"> - Check train 'B' SI and RHR pumps – both stopped - Open train 'B' RHR heat exchanger outlet to SI pump suction (1SI-857B) - Shut train 'B' SI pump suction from RWST isolation valve (1SI-896B) - Shut train 'B' RHR heat exchanger outlet flow control valve (1RH-625)
	CREW	<p>Check if train 'B' pumps should be started</p> <ul style="list-style-type: none"> - Check 1SI-857B open - Check 1SI-896B shut - Start train 'B' RHR pump (1P-10B) - Start train 'B' SI pump (1P-15B) <p>Procedure will direct that the next step be skipped (aligning train 'B' via the alternate method) – proceed in procedure to "Adjust Train 'B' RHR flow".</p>
	CREW	<p>Adjust Train 'B' RHR flow</p> <ul style="list-style-type: none"> - Combined SI and RHR flows monitored and 1RH-625 adjusted to establish total train flow < 2200 gpm but as high as possible. <p>Note: A minimum flow value is not required so long as core cooling parameters are maintained.</p>
<p>When Train 'B' is restarted, Train 'A' will be secured and aligned for sump recirculation. The only additional alignment required to actually place Train 'B' on sump recirculation is to open 1SI-850B and close 1SI-856B. Three critical tasks have occurred, the scenario should be terminated at this point or per direction of the Lead Examiner.</p>		

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 8 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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Remainder of steps listed in this event section are those found in EOP-0 Attachment A, "Automatic Action Verification". The DOS should ensure that performance of this Attachment is continued by the BOP operator, and performed in parallel with EOP-1.3

	BOP	Verify feedwater isolation: <ul style="list-style-type: none">- Feedwater Regulating and Bypass Valves SHUT.- Both main feed pumps tripped.- MFP discharge MOVs - BOTH SHUT.
	BOP	Verify containment isolation: <ul style="list-style-type: none">- CI Panels A and B ALL LIGHTS LIT.- RS-SA-9 SHUT.- No other valves open under administrative control (DSS may be asked to verify this).
	BOP	Verify AFW Actuation: <ul style="list-style-type: none">- Check both motor driven AFW pumps running.- If both S/G levels are < (51%) 25%, then steam supply valves to turbine-driven AFW pump 1MS-2020 and 1MS-2019 are ensured open.
	BOP	Check both SI pumps running.
	BOP	Check both RHR pumps running.
	BOP	Check only one CCW pump running.

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 9 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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	BOP	<p>Verify Service Water Alignment:</p> <ul style="list-style-type: none"> - 6 service water pumps running. - Service water isolation valves all shut. - Direct AO to locally check SW-LW-61, SW-LW-62 shut.
	BOP	<p>Verify Containment Accident Cooling Units Running</p> <ul style="list-style-type: none"> - All accident fans running – 1W-1A1 identified as not running and manually started. - 1SW-2907 & 2908 OPEN. - Unit 1 Containment Recirc Coolers Water Flow Low Alarm CLEAR.
	BOP	<p>Check Control Room Fans Armed:</p> <ul style="list-style-type: none"> - W-14A & W-13B2 WHITE LIGHT OFF.
	BOP	<p>Check Control Room Ventilation IN ACCIDENT MODE:</p> <ul style="list-style-type: none"> - At least one control room recirc fan RUNNING - Control room damper solenoid valve PURPLE LIGHT LIT
	BOP	<p>Check if Main Steam Lines Can Remain Open, checks both MSIVs SHUT.</p>
	BOP	<p>Verify proper SI valve alignment:</p> <ul style="list-style-type: none"> - Unit 1 SI active status panel ALL LIGHTS LIT - Unit 1 SI-Spray Ready status panel NO LIGHTS LIT <p>Note: Valve 1SI-852A should be identified as being shut at this time, and manually opened per the RNO.</p>

Op-Test No: 2002301 Scenario No: 1 Event No: 7, 8 Page 10 of 10

Event Description: **Large Break LOCA with failure of SI to auto-actuate, failure of Containment Accident Fan 1W-1A1 to auto-start, and failure of 1SI-852A to auto-open.**

Time	Position	Applicant's Actions or Behavior
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	BOP	Verify containment spray not required: <ul style="list-style-type: none">- Recognize containment pressure exceeded 25 psig and spray has actuated.- One train of Containment spray is secured to conserve RWST inventory.
	BOP	Verify SI and RHR Flow: <ul style="list-style-type: none">- Adequate flow is verified on each SI and RHR pump.
This ends the required steps of EOP-0 Attachment A		

DYNAMIC EXAM SCENARIO ID#: SES-2002301: #2

SIMULATOR SHIFT TURNOVER:

Per Scenario Outline.

SIMULATOR SCENARIO SET UP

STEP COUNTERS ON

INIT into IC

PBF-6802, Communicator Telephone Log, available

PBF-6801, Simulator Setup Checklist, completed

PBF-6806, Simulator Book Preparation Checklist, completed

PBF-6807, Simulator Scenario Briefing Sheet, completed

TI 9.0 Attachment 1 (Part 1), PBNP Simulator Security
Checklist, completed

SCENARIO GUIDE:

1. Initialize to IC-2 (Unit 1 @ 100%) or SES specific IC.
2. Place a Danger Tag on P-38B Control Switch
3. Align G-02 EDG to 1A05 and 2A05 by placing breaker 1A52-60 to pullout, place breaker 1A52-66 to Auto (requires key).
4. Place G-01 Mode Selector switch to Local. Place Danger Tags on the G-01 Mode Selector switch, breaker 1A52-60 control switch, and breaker 1A52-73 control switch. C02 alarms will have to be acknowledged after going to RUN.
5. Ensure computer point FCV110B is removed from scan.
6. Set Trigger 1 = JPPLSI(1)
7. Ensure Service Water Pump P-32A is running (secure/start pumps as necessary).
8. Swap the 'B' MFRV Steam and Feed Flow channels from Blue to Yellow.
9. Preload the following simulator codes:

TIME	TAGNAME	VALUE	RAMP VALUE	RAMP TIME	DELAY TIME	SEVERITY VALUE	TRIGGER
Preload	BKR1AFW002 (P-38B)	6	-	-	0	-	-
Preload	MAL1EHC007A (TT Manual Failure)	-	-	-	0	-	-
Preload	MAL1EHC007B (TT Auto Failure)	-	-	-	0	-	-
Preload	MAL1AFW001 (1P-29 Overspeed)	-	-	-	60	-	1
Preload	CNH1AFW001B (P-38A Discharge Valve Controller)	-	As Found (0)	0	30	0	1
Preload	PMP1AFW001 (P-38A)	2	-	-	45	-	1

The following events will be entered when requested by the lead examiner:

TIME	TAGNAME	VALUE	RAMP VALUE	RAMP TIME	DELAY TIME	SEVERITY VALUE	TRIGGER
Event 2	PMP1SWS001 (P-32A)	2	-	-	0	-	-
Event 3	XMT1RCS009A (LT-428)	-	100	15	0	-	-
Event 4 (Note 1)	MAL1CFW005A (Vacuum loss)	-		10	0	250 (Note 2)	-
Event 9	LOA1CFW083	ON	-	-	0	-	-
(if requested by crew)	LOA1CFW084 (Seal Water Pumps)	ON	-	-	0	-	-

Note 1: Prior to Event 4, verify all preloads active.

Note 2: Vacuum loss may be increased to a maximum of 350 scfm at the discretion of the lead examiner.

ANTICIPATED BOOTH COMMUNICATION/GUIDANCE:

Event 1: This is a normal down-power evolution. All AOs should be contacted to inform them of the down-power. The PAB AO will be specifically directed to monitor blowdown flows. If asked for blowdown flows, each S/G is at 20 klb/hr.

Event 2: This event is a failure of Service Water Pump P-32A. Following the SW Pump trip, the AO will be directed to check out P-32A in the Pump House. You will report, if asked, that the motor is very hot to the touch. There are no other signs of damage. If an AO is sent to the breaker, it has tripped on overcurrent. If asked to check out the service water pump that was started, report back that it appears to be running fine. An AO will also be asked to check power to the Zurn strainers during AOP-9A implementation. Report back that power is available.

Event 3: This event is a failure of pressurizer level transmitter LT-428 (fails high). There are no anticipated booth communications for this event. I&C assistance may be requested by the DOS as well as notification of the DCS and STA when the channel is removed from service. However, these communications will most likely be directed to the Instructor DSS. The DOS should be informed that I&C has been called in, and the DCS and STA are aware of plant conditions.

Event 4/5: This event involves a loss of condenser vacuum, leading to a reactor trip. All preloads should be verified active prior to initiating the vacuum loss. During the loss of condenser vacuum, the AO will be directed to perform Attachment A of AOP-5A. You should reference this procedure and report that a second set of A/Es has been placed in service (no action required). The AO will also be asked to perform Attachment B and will eventually report he is unable to find the cause of vacuum loss. If asked for a local condenser delta-P reading, the crew should be informed that it is reading 1.8" Hg (if Condenser Delta-P High alarm is in, the crew should be informed the reading is 2.2" Hg). If the crew is slow in noting the vacuum loss, and ONLY at the lead examiner discretion, you will call the control room as WEPOG and report that Unit 1 megawatts are lowering more than expected. The Instructor DSS will field crew requests for STA, DCS, Regulatory Services, and NRC resident support. If AO is asked the for air ejector flow on the electronic flow indicator, it is pegged high at 25 scfm.

Event 7/8: This event involves a failure of 1P-29 and P-38A following the reactor trip. The tripping of P-38A is due to the failing open of pressure control valve AF-4012. The crew will direct an AO to check out 1P-29. You will report the overspeed trip linkage is broken. If requested to investigate P-38A, report back that the breaker has tripped on overcurrent. If requested to investigate pressure control valve AF-4012, it should be reported that the valve is mechanically stuck open and cannot be closed. The crew may request some maintenance support. The Instructor DSS will acknowledge any requests for maintenance personnel.

Event 9: This event involves restoration of Main Feedwater as a S/G feed source per CSP-H.1. During the loss of heat sink the crew will continue to request information from the AOs with hopes of restoring Auxiliary Feedwater. Restoration of AF is NOT a success path. Attachment B of CSP-H.1 will be requested to be performed. It can be reported back that this Attachment is complete, no valve alignment problems noted, after sufficient time has elapsed for performing the attachment. The crew will request P-99A and B started. These pumps may be started on request, and reported back that this action has occurred. Once feedwater is restored the scenario will be terminated.

It is possible that the decision be made to implement the Bleed and Feed actions of CSP-H.1. This may occur due to a combination of reasons, which includes the status of the RCPs (core delta-T readings), as well as the failure of the pressurizer PORVs to actuate due to loss of air. Bleed and Feed actions are included near the end of this event section (start on page 4). Only one additional booth communication is expected should this path be chosen, which involves the verification of either SW-LW-61 or 62 shut during the performance of CSP-H.1 Attachment C. Both valves should be reported as being shut. When core cooling is established via Bleed and Feed, and at the discretion of the lead examiner, the scenario will be terminated.

Op-Test No: 2002301 Scenario No: 2 Event No: 1 Page 1 of 3

Event Description: **Perform Normal Down-Power (Reactivity Manipulation)**

Time	Position	Applicant's Actions or Behavior
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The normal down-power brief may be conducted in the classroom, prior to entering the simulator, at the discretion of the lead examiner to minimize the amount of time in the simulator.

	DOS	Brief crew on evolution, including discussion of OP-2A precautions and limitations, for commencing down-power.
	DOS	Determine magnitude and rate of load reduction.
	DOS	Notify System Control Supervisor (WEPOG) and Auxiliary Operators of down-power.
	DOS/BOP	Notify PAB operator to monitor blowdown flows per OI-14.
	BOP	Record VPL and Governor Valve #3 and #4 positions.
	RO/BOP	Set PPCS trends as desired.
	BOP	Reduce PPCS constants for S/G Blowdown flow by 5 klb/hr.
	RO	If desired, place additional letdown orifice in service. (Note: additional orifice will most likely NOT be placed in service due to the small load reduction.)
	RO	Estimate the amount of boron/rod motion needed for the desired load change per Rod 1.3. (Note: PPCS xenon program is not available for use in the simulator). 8 gallons of acid and 2 steps in on Control Bank D for each 1% power reduction is recommended in ROD 1.3 at the given burnup. The blender should be used to inject the desired amount of boron per OP-5B Attachment D.
	DOS	Record time of load change in Narrative Log.

Op-Test No: 2002301 Scenario No: 2 Event No: 1 Page 2 of 3

Event Description: **Perform Normal Down-Power (Reactivity Manipulation)**

Time	Position	Applicant's Actions or Behavior
	BOP	Ensure EH control in Operator Auto.
	BOP	<p>Transfer turbine control from the Valve Position Limiter (VPL) as follows:</p> <ol style="list-style-type: none"> Depress Reference Control (lower) pushbutton to set terminal load (SETTER) less than the indicated REFERENCE load. Set desired ramp rate using thumbwheel. (Note: Coming off the VPL may be accomplished at a faster than normal rate.) Depress the "GO" pushbutton and ensure REFERENCE display indicates a controlled reduction towards SETTER value at the selected rate. When the VPL light goes out (green status light), then depress the HOLD pushbutton. <p>Note: Transfer to IMP-IN mode per the next step may be performed prior to this step.</p>
	BOP	<p>Transfer turbine control to "IMP IN" if desired.</p> <p>(Note: IMP-IN provides the most linear load response and is the recommended mode of operation)</p>
	BOP	Depress the Reference Control (lower) pushbutton to set terminal load (SETTER) to the target value previously specified.
	BOP	Using thumbwheel, set the desired ramp rate previously specified.
	BOP	<p>Depress the "GO" pushbutton and ensure REFERENCE display indicates a controlled load reduction at the selected rate.</p> <p>Note: Prior to reducing load, the crew may wait to see an affect of the boration (RCS temperature drop).</p>

Op-Test No: 2002301 Scenario No: 2 Event No: 1 Page 3 of 3

Event Description: **Perform Normal Down-Power (Reactivity Manipulation)**

Time	Position	Applicant's Actions or Behavior
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	RO/BOP	Maintain controls in AUTO as practicable. <ul style="list-style-type: none">- Rod control (may be placed in Manual at DSS discretion)- Blender controls- Turbine controls
	RO	Control Delta Flux in accordance within limits of the COLR (LCO 3.2.3)
	RO	Maintain T_{avg} within 1.5° F of T_{ref} .
	BOP	<ul style="list-style-type: none">• Maintain 345 kV voltage per Section 9.0 of OP-2A• Maintain the controller deviation for the Main Feed Regulating Valves nulled.• Maintain the controller setpoint for the LP Feedwater Heater Bypass Valve (CS-2273) at 25 psig below SG Feed Pump suction pressure. Note: Adjusting Power Range NIS should not be required.
Once power has been lowered 5% and/or at the discretion of the Lead Examiner, proceed to the next event (Event # 2).		

Op-Test No: 2002301 Scenario No: 2 Event No: 2 Page 1 of 2

Event Description: **P-32A Service Water Pump Trips on overload**

Time	Position	Applicant's Actions or Behavior
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At discretion of Lead Examiner, insert Event # 2.

	BOP	<p>Acknowledges/responds to receipt of annunciators C01 A 3-5 and B 3-4.</p> <ul style="list-style-type: none"> - Identify P-32A has tripped (white light lit above control switch) - Recognize SW header pressure has dropped and is in alarm - Reference Alarm Response Book - Notify DOS - Carry out actions of AOP-9A as directed by the DOS. <p>Note: The BOP Operator may start an additional service water pump immediately upon recognizing that P-32A has tripped and Service Water Header pressure is low. Referencing of the ARB and AOP entry are expected for verification of these actions.</p>
	DOS	Entry into AOP-9A, "Service Water System Malfunction" based on ARB C01 A 3-5.
	DOS/BOP	Check Forebay Level > -11 feet on PPCS (point LT-3598, new PPCS L-3598) or recorder YR-5832.
	DOS/BOP	Check Traveling Screen Differential Level High Alarm clear (C01 A 4-5)
	DOS/BOP	<p>Check Service Water header Pressure Alarm clear (C01A 3-5) – DOS should answer this question as "NO" even if alarm is now clear (additional pump may have been already started) in order to verify proper operator response actions.</p> <ul style="list-style-type: none"> - Start a non-running SW pump to restore SW header pressure between 50 –90 psig (if a service water pump has already been started, then this step is merely verification of the action). - DOS proceeds to step 8 of AOP-9A

Op-Test No: 2002301 Scenario No: 2 Event No: 2 Page 2 of 2

Event Description: **P-32A Service Water Pump Trips on overload**

Time	Position	Applicant's Actions or Behavior
	DOS	<p>Requests DSS make notification to DCS, implement the Emergency Plan, and enter applicable ITS Action Conditions.(Note: the Instructor DSS will ask the DOS to assess ITS when time permits).</p> <ul style="list-style-type: none"> - Properly assesses ITS 3.7.8 LCO is not met. - Condition A and Required Action A.1 of ITS 3.7.8 are applicable (with one SW pump inoperable, there is a completion time of 7 days AND 14 days from discovery of failure to meet the LCO). Applies to both units.
	DOS/BOP	<p>Check supply header integrity</p> <ul style="list-style-type: none"> - North and south header pressures approximately equal - C01 A 3-5 Alarm clear - Area sump alarms clear
	DOS/BOP	<p>Check Zurn Strainer</p> <ul style="list-style-type: none"> - Power available - Strainer High DP alarms clear
	DOS/BOP	<p>Verify Service Water Header Valves Open</p> <ul style="list-style-type: none"> - SW-2890, 2869, 2891, 2870
	DOS/BOP	<p>Check Component Alarms Clear – high temperature, low flow.</p>
	DOS	<p>Returns to step 1 of AOP-9A</p> <p>Loops through the same procedure steps as above, except this time around, service water header pressure is OK and eventually exits AOP-9A at step 7.</p>
	DOS/BOP	<p>At DOS discretion, the control switch for P-32A may be placed in pullout to clear the Motor Breaker Trip annunciator.</p>

At the discretion of the lead examiner, proceed to the next event (Event # 3).

Op-Test No: 2002301 Scenario No: 2 Event No: 3 Page 1 of 3

Event Description: Pressurizer level transmitter LT-428 (controlling channel) fails high.

Time	Position	Applicant's Actions or Behavior
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At discretion of Lead Examiner, insert Event # 3.

	RO	<p>Recognize failure of pressurizer level transmitter LT-428 using the following indications:</p> <ul style="list-style-type: none"> - Annunciators (1C04 1C 2-3 "Pressurizer Level Setpoint Deviation", 1C04 1C 3-3 "Pressurizer High Level Channel Alert") - Comparison of LT-428 with other 2 level channels. - Auto charging pump speed lowering.
	DOS	Enter AOP-24 "Response To Instrument Malfunctions" when failure is recognized.
	DOS/RO	Identify the failed instrument – instrument identified as LI-428 (LT-428).
	DOS/RO	Check if failed instrument is a controlling channel. LT-428 is a controlling channel (charging).
	DOS/RO	<p>Establish manual control – RO will have to place the Auto charging pump in manual and manually adjust its speed.</p> <p>All pressurizer backup heaters will also energize. The heaters may be secured if desired, or sprays verified operating to control pressure.</p>
	DOS/RO	Return affected parameter to desired value – charging pump speed should be adjusted using manual control to return pressurizer level to setpoint.

Op-Test No: 2002301 Scenario No: 2 Event No: 3 Page 2 of 3

Event Description: Pressurizer level transmitter LT-428 (controlling channel) fails high.

Time	Position	Applicant's Actions or Behavior
	DOS	<p>Remove failed instrument channel from service per 0-SOP-IC-001 "Routine Maintenance Procedure Removal of Safeguards or Protection Sensor from Service".</p> <ul style="list-style-type: none"> - Obtain and implement 0-SOP-IC-001 - Review precautions and limitations with crew. - Conduct pre-job brief for removing LT-428 from service. - Obtain DSS permission. - Direct 0-SOP-IC-001 for removing LT-428 from service.
	DOS/RO	Place charging pump speed in Manual and adjust as necessary to maintain desire charging flow – this step of the SOP should have already been performed per AOP-24.
	DOS/BOP	Place pressurizer level defeat switch in "DEFEAT BLUE" (panel C-110).
	DOS/RO/BOP	<p>Place charging pump speed in Auto per the following:</p> <ul style="list-style-type: none"> - Place an operating charging pump speed controller in Manual-Balance. - Adjust LC-428F to null-out the selected charging pump controller (LC-428F is located in panel C-110) - After the charging pump controller has been nulled out, then place LC-428F in Auto. - Place one of the operating charging pump speed controllers in Auto.
	DOS/BOP	Place the high level bistable trip switch to TRIP (panel C-116).
	DOS/BOP	Remove from scan PPCS point ID LT428 (new PPCS L-428)

Op-Test No: 2002301 Scenario No: 2 Event No: 3 Page 3 of 3

Event Description: Pressurizer level transmitter LT-428 (controlling channel) fails high.

Time	Position	Applicant's Actions or Behavior
	DOS	Inform DSS that LT-428 has been removed from service. DCS and STA are also informed, DSS may be requested to do this notification.
	DOS	Return to AOP-24 to finish required actions.
	DOS	Return controls to automatic if desired – charging should already be returned to Auto. If the backup heaters were manually turned off, they should be returned to auto.
	DOS	Check ITS and TRM applicability: <ul style="list-style-type: none">- DOS should determine that LCO 3.3.1 is not met. Action Condition 'A' is entered immediately – Required Action is to enter the Condition referenced in Table 3.3.1-1 for the channel.- Condition 'K' is referenced from Table 3.3.1-1 Function 8. Required Action is to place the channel in trip within 1 hour OR reduce thermal power to < P-7.- Channel is in trip per the SOP, ITS requirements are met.- ITS LCO 3.3.3 (PAM) is met since only 2 channels of pressurizer level are required.
	DOS	Exit AOP-24
At the discretion of the lead examiner, proceed to the next event (Event # 4).		

Op-Test No: 2002301 Scenario No: 2 Event No: 4, 5 Page 1 of 4

Event Description: **Loss of Condenser Vacuum which degrades to Reactor/Turbine Trip Criteria.**

Time	Position	Applicant's Actions or Behavior
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	BOP/DOS	<p>Recognize Condenser Vacuum is lowering:</p> <ul style="list-style-type: none"> - Vacuum gauges on 1C-03 - Turbine MW electric are lowering - "Condenser Vacuum Low" Annunciator 1C03 1F 1-4
<p>At the discretion of the Lead examiner, it could be reported from WEPOG that MW electric are lowering more than expected at PBNP (1C03 1F 1-4 alarm setpoint is 27 inches vacuum) .</p>		
	DOS	<p>Entry into AOP-5A, "Loss of Condenser Vacuum" based on lowering vacuum and annunciator 1C03 1F 1-4.</p>
<p><i>Critical Task: A manual Reactor trip is directed prior to reaching the auto trip turbine setpoint of 22 inches vacuum. (Note: When a reactor trip is ordered, proceed to the next event.)</i></p>		
	DOS	<p>Reviews Foldout Page Criteria with RO/BOP which apply throughout the procedure:</p> <ul style="list-style-type: none"> - Condenser Pressure Criteria: Condenser pressure in both condenser sections within the limits of AOP- 5A Figure 1 or condenser differential pressure is greater than 2.5 inches Hg. <p><i>Note: Should the North or South condenser pressure meters go off-scale high (4" absolute) during this procedure, the DOS may make the decision to trip the reactor since clear indication in the control room is no longer available to monitor this criteria. Local indication is available for condenser differential pressure. Annunciator 1C03 1F 2-4 "Condenser Delta-P High" alarms at 2 inches Hg.</i></p>
	RO/DOS	<p>Maintain RCS $T_{AVG} > 540^{\circ} \text{ F}$, $T_{AVG} < 574^{\circ} \text{ F}$ and within 7° F of T_{REF}.</p> <ul style="list-style-type: none"> - If not, restore within 30, 120, and 120 minutes respectively.
	DOS/BOP	<p>Check condenser pressure in BOTH condenser sections within Figure 1 limits (continuous action).</p> <ul style="list-style-type: none"> - <i>If not, trip the reactor, go to EOP-0, stabilize plant with EOPs while continuing on with AOP-5A.</i>

Op-Test No: 2002301 Scenario No: 2 Event No: 4, 5 Page 2 of 4

Event Description: **Loss of Condenser Vacuum which degrades to Reactor/Turbine Trip Criteria.**

Time	Position	Applicant's Actions or Behavior
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	DOS	Ensures Turbine Hall AO contacted to determine Air Ejector flows.
	DOS/BOP	Place ALL available primary and secondary air ejectors in service per Attachment A - DOS or BOP directs AO to perform Attachment A steps.
	BOP/DOS	Use Priming A/E on condenser if desired. - DSS will respond that the priming air ejectors may be used at DOS discretion (use or non-use will have no effect).
	DOS	Notify plant personnel: - DCS - WEPOG - Regulatory Service Duty Person - NRC Resident Inspector The DOS will most likely task the DSS with these actions.

When a reactor trip is ordered due to the vacuum degradation, then proceed to the next event.

Note: Steps of AOP-17A (up to step 9) are listed on the following 2 pages but may or may not be performed depending on timing of DOS decision to trip the reactor.

Op-Test No: 2002301 Scenario No: 2 Event No: 4, 5 Page 3 of 4

Event Description: **Loss of Condenser Vacuum which degrades to Reactor/Turbine Trip Criteria.**

Time	Position	Applicant's Actions or Behavior
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	DOS	<p>Enter AOP-17A, "Rapid Power Reduction" to reduce load as necessary, while continuing in AOP-5A.</p> <p>Note: Further steps in AOP-5A primarily deal with verifying proper operation of the Circulating Water system – these specific steps are not listed here.</p>
	DOS	Determine desired power level or condition to be met (DOS may elect up to a 5%/min ramp rate and should base his decision to continue based on how fast vacuum degrades)
	DOS	Notify WEPOG of load reduction (or asks the DSS to perform this action).
	RO/DOS	Check Rod Control System in AUTO
	BOP/DOS	<p>Select rate reduction method and reduce load:</p> <ul style="list-style-type: none"> - Note that Operator Auto-Impulse In provides the most linear response - Select desired EHC system mode of operation - Select desired rate on load rate thumb-wheel - Select target end-point on reference control - Depress GO pushbutton
	RO/DOS	<p>Borate as necessary to maintain rods above the low-low insertion limit alarm (continuous action)</p> <ul style="list-style-type: none"> - Set boric acid flow totalizer (1YIC-110) to desired quantity - Set boric acid flow controller (1HC-110) to desired flowrate - Start second boric acid transfer pump if desired <p>Rod 1.3 provides guidance for amount of acid/rods required during a rapid load reduction.</p>

Op-Test No: 2002301 Scenario No: 2 Event No: 4, 5 Page 4 of 4

Event Description: **Loss of Condenser Vacuum which degrades to Reactor/Turbine Trip Criteria.**

Time	Position	Applicant's Actions or Behavior
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	RO/DOS	Check Pressurizer Pressure Stable at or trending to 2235 psig (continuous action)
	RO/DOS	Check Pressurizer Level Stable at or trending to program level (continuous action)
	BOP/DOS	Check steam generator level controlling in AUTO (continuous action)
	RO/DOS	- Maintain RCS T _{avg} > 540° F, < 574° F, and within 7° of T _{REF} .

Op-Test No: 2002301 Scenario No: 2 Event No: 6, 7, 8 Page 1 of 5

Event Description: **Reactor Trip (due to excessive condenser vacuum loss) with failure of Turbine to trip automatically and manually, leading to a Loss of Heat Sink due to Auxiliary Feedwater Pump failures.**

Time	Position	Applicant's Actions or Behavior
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	DOS	Direct a Manual Reactor Trip and entry into EOP-0, "Reactor Trip or Safety Injection" due to degrading condenser vacuum.
	RO	<p>Performs Immediate Actions of EOP-0 (Steps 1-4) and informs DOS they are ready for verification.</p> <ul style="list-style-type: none"> - Verify reactor trip. - <i>Verify turbine trip: determines turbine did not trip and is required to be tripped, depresses turbine trip pushbutton (also ineffective), manually runs back turbine, and places both EHC pumps in Pull-Out. Ensures MSIVs are shut if above actions are ineffective.</i> - Verify safeguard buses energized - Check if SI is actuated
	DOS/RO	<p>Verify Reactor Trip</p> <ul style="list-style-type: none"> - Check reactor trip and bypass breakers OPEN - Check all rod bottom lights LIT - Check all rod position indicators ON BOTTOM - Check neutron flux LOWERING
	DOS/RO	<p>Verify Turbine Trip</p> <ul style="list-style-type: none"> - <i>Inform DOS turbine did not automatically or manually trip, RNO actions verified to ensure steam flow is secured to turbine.</i>
	DOS/RO	<p>Verify Safeguard buses energized</p> <ul style="list-style-type: none"> - Check at least one 4160 Vac safeguards bus energized (1A05 or 1A06) - Check at least one 480 Vac safeguards bus energized (1B03 or 1B04)

Op-Test No: 2002301 Scenario No: 2 Event No: 6, 7, 8 Page 2 of 5

Event Description: **Reactor Trip (due to excessive condenser vacuum loss) with failure of Turbine to trip automatically and manually, leading to a Loss of Heat Sink due to Auxiliary Feedwater Pump failures.**

Time	Position	Applicant's Actions or Behavior
	DOS/RO	<p>Check if SI is actuated:</p> <ul style="list-style-type: none"> - 1C04-1B 4-2, Manual Safety Injection - 1C04 1B 4-3, Containment - 1C04-1B 4-4, Pressurizer Low Pressure SI - 1C04-1B 4-5, Steam Line A Pressure Low-Low - 1C04-1B 4-6, Steam Line B Pressure Low-Low <p>SI is actuated.</p>
	DOS	<p>Review foldout page criteria with the crew</p> <ul style="list-style-type: none"> - Determines none are currently applicable
	DOS	EOP-0 Attachment A "Automatic Action Verification" directed to be completed by the BOP operator while continuing on with EOP-0. The steps for Attachment A are included near the end of this event section.
	RO/DOS	<p>Verify Secondary Heat Sink:</p> <ul style="list-style-type: none"> - Level in at least one S/G > (51%) 29%. Level should be lower than 29% in both generators due to the turbine trip and AFW pump failures. - RNO directs pumps manually started and valves realigned as necessary to establish AFW flow \geq 200 gpm. <ul style="list-style-type: none"> - Status of the AFW system should be discussed/reviewed between crew members. - Local investigation of the AFW failures should be initiated. - A one-time attempt to re-start P-38A may be performed. - DOS determines that AFW flow > 200 gpm cannot be established and transitions to CSP-H.1, "Response to Loss of Secondary Heat Sink". STA is informed to start monitoring status trees.

Op-Test No: 2002301 Scenario No: 2 Event No: 6, 7, 8 Page 3 of 5

Event Description: **Reactor Trip (due to excessive condenser vacuum loss) with failure of Turbine to trip automatically and manually, leading to a Loss of Heat Sink due to Auxiliary Feedwater Pump failures.**

Time	Position	Applicant's Actions or Behavior
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Note: If a single S/G level is > 29 % in the previous step, the crew may continue on in EOP-0. If this occurs, the STA will commence monitoring Critical Safety Functions at step 12 of EOP-0 and will report a CSP-H.1 Red Path condition exists.

When transition to CSP-H.1 is made, proceed to next event.

Remainder of Steps listed in this event section are those found in EOP-0 Attachment A, "Automatic Action Verification". The DOS should ensure that performance of this Attachment is continued by the BOP operator, and performed in parallel with CSP-H.1.

	BOP	Verify feedwater isolation: <ul style="list-style-type: none"> - Feedwater Regulating and Bypass Valves SHUT. - Both main feed pumps tripped. - MFP discharge MOVs - BOTH SHUT.
	BOP	Verify containment isolation: <ul style="list-style-type: none"> - CI Panels A and B ALL LIGHTS LIT. - RS-SA-9 SHUT. - No other valves open under administrative control (DSS may be asked to verify this).
	BOP	Verify AFW Actuation: <ul style="list-style-type: none"> - Check both motor driven AFW pumps running (determines P-38B unavailable, P-38A has tripped). Transition to RNO. - IMS-2020 and IMS-2019 (steam supply valves to turbine driven AFW pump) are verified open. It should be recognized that 1P-29 has tripped on overspeed. - BOP may suggest a one-time attempt for re-start of P-38A (if not already performed). Any re-start attempt will be unsuccessful.
	BOP/DOS	Direct an AO to investigate AFW problems (turbine driven and motor driven pumps).

Event Description: **Reactor Trip (due to excessive condenser vacuum loss) with failure of Turbine to trip automatically and manually, leading to a Loss of Heat Sink due to Auxiliary Feedwater Pump failures.**

Time	Position	Applicant's Actions or Behavior
	BOP	Check both SI pumps running.
	BOP	Check both RHR pumps running.
	BOP	Check only one CCW pump running.
	BOP	Verify Service Water Alignment: <ul style="list-style-type: none"> - 6 service water pumps running. - Service water isolation valves shut. - Direct AO to locally check SW-LW-61, SW-LW-62 shut.
	BOP	Verify Containment Accident Cooling Units Running <ul style="list-style-type: none"> - All accident fans running. - 1SW-2907 & 2908 OPEN. - Unit 1 Containment Recirc Coolers Water Flow Low Alarm CLEAR.
	BOP	Check Control Room Fans Armed: <ul style="list-style-type: none"> - W-14A & W-13B2 WHITE LIGHT OFF (white light is off).
	BOP	Check Control Room Ventilation IN ACCIDENT MODE: <ul style="list-style-type: none"> - At least one control room recirc fan RUNNING - Control room damper solenoid valve PURPLE LIGHT LIT
	BOP	Check if Main Steam Lines Can Remain Open, checks both MSIVs SHUT.

Op-Test No: 2002301 Scenario No: 2 Event No: 6, 7, 8 Page 5 of 5

Event Description: **Reactor Trip (due to excessive condenser vacuum loss) with failure of Turbine to trip automatically and manually, leading to a Loss of Heat Sink due to Auxiliary Feedwater Pump failures.**

Time	Position	Applicant's Actions or Behavior
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	BOP	Verify proper SI valve alignment: <ul style="list-style-type: none">- Unit 1 SI active status panel ALL LIGHTS LIT- Unit 1 SI-Spray Ready status panel NO LIGHTS LIT
	BOP	Verify containment spray not required: <ul style="list-style-type: none">- Recognize containment pressure has remained < 25 psig
	BOP	Verify SI Flow: <ul style="list-style-type: none">- Check RCS pressure < 1400 psig. RCS should be greater than 1400 psig. This should end the attachment.- If RCS pressure is < 1400 psig, SI flow should be verified on 1FI-925/924.
Proceed to Next Event. (Recoverable Loss of Heat Sink)		

Op-Test No: 2002301 Scenario No: 2 Event No: 9 Page 1 of 5

Event Description: **Loss of Heat Sink.**

Time	Position	Applicant's Actions or Behavior
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Critical Task: Crew recognizes a loss of secondary heat sink, properly transitions to CSP-H.1, and restores feedwater to the S/G's to restore core cooling. (Note: This critical step is only applicable if the transition to Bleed & Feed is NOT made.)

	DOS	Enter CSP-H.1 and brief foldout page criteria, cautions and notes.
	RO/DOS	<p>Check if secondary heat sink is required.</p> <ul style="list-style-type: none"> - Check RCS pressure greater than any non-faulted S/G pressure - Check RCS hot leg temperature > 350° F
	CREW	<p>Check if RCS Bleed and Feed is required</p> <ul style="list-style-type: none"> - Wide range S/G level in BOTH S/Gs < (145 inches) 55 inches OR - RCS pressure > 2335 psig due to loss of secondary heat sink - If either condition satisfied go to step 27 of CSP-H.1 (continuous action per foldout page) <p>NOTE: Should the DOS determine that Bleed & Feed is required due to high pressure, proceed to page 4 of this event for Bleed and Feed actions.</p>
	RO/BOP	<p>Verify S/G Blowdown and Sample isolation</p> <ul style="list-style-type: none"> - Ensure all S/G blowdown isolations SHUT - Ensure sample isolations SHUT
	RO/BOP	<p>Check control room indications for cause of AFW failure</p> <ul style="list-style-type: none"> - Check all suction pressure trips and overspeed trips-NOT ACTUATED - Ensure power supply to both motor driven AFW pumps - Ensure turbine driven AFW pump steam supply valves - AT LEAST ONE OPEN - Ensure AFW valves-PROPERLY ALIGNED

Op-Test No: 2002301 Scenario No: 2 Event No: 9 Page 2 of 5

Event Description: **Loss of Heat Sink.**

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Check total feed flow to S/Gs > 200 gpm <ul style="list-style-type: none">- No AFW flow is available, transition to RNO.- Dispatch operator to locally align AFW valves per Attachment B.- Continue attempts to restore AFW from Control Room
	RO/DOS	Stop both RCPs.
	RO/BOP	Check condensate pumps –AT LEAST ONE RUNNING.
	RO/BOP	Maintain hotwell level > 5 inches (continuous action).
	RO/BOP	Check condensate and feedwater piping - INTACT.
	RO/BOP	Establish feedwater flow path <ul style="list-style-type: none">- Reset SI (all SI signals should now be clear, therefore the reset status lights will not illuminate)- Ensure both feedwater regulating valve (FRV) bypass controllers are in manual and shut.- Reset (FRV) bypasses.- Check FRV bypasses- at least one capable of being opened.
	RO/BOP	Check Main Feedwater Pumps – AT LEAST ONE RUNNING <ul style="list-style-type: none">- Direct AO to locally start 1P-99A and 1P-99B- Ensure main feed AC lube oil pumps running (1P-73A/73B)- Manually open low pressure feedwater heater bypass valve (1CS-2273)- Start one MFW Pump

Op-Test No: 2002301 Scenario No: 2 Event No: 9 Page 3 of 5

Event Description: **Loss of Heat Sink.**

Time	Position	Applicant's Actions or Behavior
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	RO/BOP	Check MFW Pump discharge MOV on running pump(s)- OPEN <ul style="list-style-type: none">- 1CS-2190 (for 1P-29A)- 1CS-2189 (for 1P-28B)
	RO/BOP	<i>Establish S/G levels</i> <ul style="list-style-type: none">- <i>Throttle open FRV bypasses to establish flow to S/Gs (1CS-480/481)</i>- <i>Verify flow to S/Gs</i>- <i>CET STABLE or TRENDING LOWER</i>- <i>LEVEL in at least one S/G TRENDING HIGHER</i>- <i>Maintain feedwater flow to restore at least one S/G level to > (51%) 29%</i>

Upon restoration of feedwater flow and at the discretion of the Lead Examiner, this scenario can be terminated.

Op-Test No: 2002301 Scenario No: 2 Event No: 9 Page 4 of 5

Event Description: **Loss of Heat Sink.**

Time	Position	Applicant's Actions or Behavior
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NOTE: The following steps are those steps required should the decision be made to transition to Bleed & Feed within CSP-H.1. This may occur due to a combination of reasons, including RCP status near the beginning of CSP-H.1 as well as the failure of any PORVs to actuate due to the loss of air.

Critical Task: Crew recognizes a loss of secondary heat sink, properly transitions to CSP-H.1, and restores core cooling by establishing Bleed and Feed. (Note: This critical step is only applicable if the transition to Bleed & Feed is made.)

	DOS	DOS reviews Caution with crew regarding the necessity to perform the steps for Bleed & Feed quickly to establish RCS heat removal.
	RO/DOS	Check RCPs – both stopped. - 1P-1A and 1P-1B RCPs checked stopped or stopped at this time.
	BOP/DOS	Lock in SI signal. - Manually actuate Unit 1 SI and CI. Trip all SI bistables - In 1C-111, SI bistable - In 1C-113, SI bistable - In 1C-116, SI bistable
	BOP/DOS	Verify Containment Isolation - Annunciator C01 B 2-5 Containment Isolation verified LIT.
	BOP/DOS	Verify RCS Feed Path At least one SI pump ensured running Verify proper SI valve alignment Check Unit 1 SI Active status panel – ALL LIGHTS LIT Check Unit 1 SI – Spray Ready status panel – NO LIGHTS LIT

Op-Test No: 2002301 Scenario No: 2 Event No: 9 Page 5 of 5

Event Description: **Loss of Heat Sink.**

Time	Position	Applicant's Actions or Behavior
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	DOS	Direct operator to perform Attachment C while continuing on. NOTE: The steps of Attachment C are very similar to that of EOP-0 Attachment A (SI/CI verification steps). There should be no items found requiring any action. These steps of this Attachment are NOT included.
	BOP/DOS	Reset SI Reset CI Reset 1B-03 and 1B-04 Non-Safeguards Equipment Lockouts.
	BOP/DOS	Check 4160 Vac Safeguards Buses 1A-05 and 1A-06 energized by off-site power.
	BOP/DOS	Reestablish Instrument Air To Containment: - Start a second IA compressor (rear of panel C01) - Check IA header pressure > 80 psig. - Open one and then the other IA isolation valve (1IA-3047 and 3048)
	RO/DOS	Establish RCS Bleed Path - Check power to PORV Block Valves available - Check both PORV Block Valves Open - Open BOTH Pressurizer PORVs (1RC-430 and 431C)
	RO/DOS	Verify adequate RCS Bleed Path - Check BOTH Pressurizer PORVs open - Check BOTH PORV Block Valves open

At this point, core cooling is established via the Bleed & Feed method. The scenario may be terminated at the discretion of the lead examiner.