

**INITIAL SUBMITTAL OF SCENARIOS**

**FOR THE POINT BEACH EXAMINATION - WEEKS OF OCTOBER 16 AND 23, 2000**

Facility : PBNP      Scenario No.: 1    OP-Test No.: 2000-1

Examiners: \_\_\_\_\_  
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Operators: \_\_\_\_\_  
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Initial Conditions: Unit 1 @ 100% Power, MOL, Equilibrium Xe, RCS Cb is 827 ppm. Unit 2 @ 100% Power, BOL. Today is Sunday (present clock time is real time). Normal shift complement with exception of 3<sup>rd</sup> SRO.

Turnover: G-01 is out of service for annual maintenance. It was taken OOS 2 days ago, and is expected to be returned to service in 3 days.

G-02 is aligned to 1AO5 and 2AO5 IAW OI-35A.

A Severe Thunderstorm Watch is in effect over the next 4 hours.

Event No.	Malf. No.	Event Type*	Event Description
1		I/ (RO)	Controlling Pressurizer Pressure Channel Fails High.
2		M/ (ALL)	Steam Generator Tube Leak ("B" S/G) Develops.
3		R/(RO) N/ (ALL)	Perform Technical Specification required down-power.
4		I/ (BOP)	Steam Flow Transmitter Fails High ("B" S/G).
5		M/ (ALL)	Steam Line Break outside Containment upstream of "B" S/G MSIV.
6		M/ (ALL)	Steam Generator Tube Leak increases into Design Basis Tube Rupture post trip ("B" S/G)
7		C/ (RO)	Failure of Train "A" SI to AUTO actuate requiring manual actuation.
8		C/ (RO)	"B" RHR Pump (1P-10B) Fails to Auto Start.
9		C/ (BOP)	P-32B, Service Water Pump Fails to AUTO Start

\* (N)ormal,      Reactivity,      (I)nstrument, (C)omponent, (M)ajor

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Event Description:

**Pressurizer Pressure Channel (PT-431) Fails High which causes spray valves to open and RCS pressure to rapidly drop.**

Time	Position	Applicant's Actions or Behavior
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	RO	Identify failure of PT-431 (PZR Pressure Blue Channel)
	RO	Acknowledge and respond to receipt of annunciator ARB 1C04 1C 1-2, "Pressurizer PRESSURE HIGH or LOW" and ARB 1C04 1C 3-2, "Pressurizer High Pressure Channel Alert" 1. Operator Actions: <ul style="list-style-type: none"> <li>- Check for associated alarms.</li> <li>- Check whether pressure is high or low</li> <li>- <i>Take manual control of pressurizer control system and correct the plant condition (shut spray valves)</i></li> <li>- Notify DSS/DOS</li> </ul>
	DOS	Direct entry into AOP-24, "Response to Instrument Malfunctions"
	RO/DOS	Return Affected Parameter(s) to desired value(s). <ul style="list-style-type: none"> <li>- Energize back-up heaters to restore plant pressure</li> </ul>
	RO/DOS	Identify Failed Instrument and that it is a controlling channel
	DOS	Direct entry into ICP 10.2, "Removal of Safeguards or Protection Sensor from Service". <ul style="list-style-type: none"> <li>- Obtain and implement ICP 10.2</li> <li>- Review precautions and limitations</li> <li>- Identify TS 15.3.5 (need to trip PT-431 bistables within 1 hour), 15.3.1.G (if RCS pressure was &lt; 1955 psig at rated power),</li> <li>- Conduct pre-job brief for removing PT-431 from service</li> <li>- Obtain DSS permission</li> <li>- Direct ICP 10.2 Attachment A for PT-431 removal from service</li> </ul>

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Event Description:

**Pressurizer Pressure Channel (PT-431) Fails High which causes spray valves to open and RCS pressure to rapidly drop.**

Time	Position	Applicant's Actions or Behavior
	RO/BOP/DOS	<p>Perform actions as directed by DOS from Attachment A for PT-431 removal.</p> <ul style="list-style-type: none"><li>- Place RC-430 and 431C in the close position (RO)</li><li>- Place HC-431K (pressurizer pressure controller) in MANUAL (RO)</li><li>- Place pressurizer pressure defeat switch in DEFEAT BLUE inside C-110 (BOP)</li><li>- Place HC-431K in AUTO, unless directed otherwise by DSS (RO)</li><li>- Place RC-430 and 431C in AUTO, unless directed otherwise by DSS (RO)</li><li>- Place the following bistables to TRIP inside C-116: (BOP)</li><li>- Verify alarms and trip status lights are proper (RO)</li></ul> <ol style="list-style-type: none"><li>1. High Pressure Trip</li><li>2. Low Pressure Trip</li><li>3. Safety Injection</li><li>4. Unblock Safety Injection</li><li>5. Over-temperature Trip</li><li>6. Over-temperature Rod Stop</li></ol> <ul style="list-style-type: none"><li>- Remove PT-431 from scan (BOP)</li></ul>
	DOS	Inform DSS PT-431 removed from service and that DCS and STA notifications need to be made
	DOS	Exits AOP-24

**Proceed to next Event at the Lead Examiners Discretion.**

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Event Description: **“B” Steam Generator develops a small tube leak. (leak rate rises to approximately 25 gpm)**

Time	Position	Applicant's Actions or Behavior
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	CREW	Acknowledge Unit 1 Air Ejector Gas Rad 1RE-215 in alert on PPCS
	RO/BOP	<p>Acknowledge and respond to receipt of annunciator ARB 1C20 C 2-2, “Unit 1 Steam Line “B” Radiation High”</p> <ul style="list-style-type: none"> <li>- Follow actions as specified in RMSASRB for steamline monitor 1RE-232 and air ejector monitor 1RE-215</li> <li>- Compare channel to available redundant information on 1RE-219, 1RE-222, 1RE-215, 1RE-225</li> <li>- Refer to AOP-1A, “RCS Leak” (Informs DOS)</li> <li>- Refer to TS 15.3.1.D.4 (informs DOS)</li> <li>- Notes PZR level lowering and charging pump speed rising</li> </ul>

**Note the ARB currently directs the operator to enter AOP-1A, “Reactor Coolant Leak”. The crew may opt to directly enter AOP-3, “Steam Generator Tube Leak”. In either case the up-front actions are the same and if AOP-1A is chosen, it will eventually direct the operators to AOP-3.**

	DOS	Direct entry into AOP-1A or AOP-3 and direct RO/BOP to perform steps of AOP-1A or AOP-3
	RO/DOS	<p>Check Safety Injection not required (continuous action)</p> <ul style="list-style-type: none"> <li>- PZR level within 10% of programmed level</li> <li>- RCS Subcooling &gt;30 F</li> </ul>
	RO/DOS	<p>Check Reactor Trip not required (continuous action)</p> <ul style="list-style-type: none"> <li>- Check reactor critical</li> <li>- Check charging pump suction aligned to the VCT</li> </ul>
	RO/BOP	Acknowledge and respond to receipt of annunciator ARB 1C20 C 4-2, “Unit 1 Air Ejector Radiation High

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Event Description: **"B" Steam Generator develops a small tube leak. (leak rate rises to approximately 25 gpm)**

Time	Position	Applicant's Actions or Behavior
	RO/DOS	Check PZR level STABLE at or trending to program level (continuous action) <ul style="list-style-type: none"> <li>- Start additional charging pumps and raise speed as necessary to maintain program band</li> <li>- If PZR level continues to lower, then isolate letdown</li> </ul>
	RO/DOS	Check PZR pressure STABLE at or trending to desired pressure
	RO/DOS	Check Reactor makeup control: <ul style="list-style-type: none"> <li>- Makeup set at proper boron concentration</li> <li>- Makeup armed and in auto</li> </ul>
	DOS	Notify DCS, STA, Chemistry, and implement emergency plan (asks DSS to perform these actions)
<b>Note the following step is applicable if the AOP-1A path is taken only.</b>		
	CREW	Check Steam Generator Tubes intact <ul style="list-style-type: none"> <li>- Secondary RMS- STABLE</li> <li>- Steam Generator chemistry samples- NORMAL</li> <li>- Main Steam Line radiation survey- NORMAL</li> <li>- S/G Levels – NORMAL for existing steam flow and feed flow</li> </ul>

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Event Description: **“B” Steam Generator develops a small tube leak. (leak rate rises to approximately 25 gpm)**

Time	Position	Applicant's Actions or Behavior
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	RO or BOP/DOS	<p>Identify leaking Steam Generator (any of the following) (“B” S/G) (continuous action)</p> <ul style="list-style-type: none"> <li>- S/G chemistry sample (boric acid, abnormal activity, Ph)</li> <li>- Main Steam Line Radiation Survey</li> <li>- Steam Line Monitors</li> <li>- Unexpected S/G level deviation alarms</li> <li>- S/G Level rising</li> <li>- Isolate S/G sample valves one at a time and check blowdown activity for trends</li> </ul>
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	RO/BOP	<p>Determine leak rate using: (any of the following)</p> <ul style="list-style-type: none"> <li>- PBF-2034 (S/G hand calculation)</li> <li>- OI-55, Primary leak rate calculation</li> <li>- Based on control room activities/manning/leak size, the crew may opt to estimate leak-rate using VCT/PZR/Charging/Letdown mismatch</li> </ul>
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***It is critical that the DOS recognizes TS implication of a S/G Tube leak in excess of 500 gpd and commences a plant shutdown.***

	DOS	Recognize TS 15.3.1.D.4 applies (S/G leak rate > 500 gpd)
	DOS	<p>Check if reactor shutdown required: (any of the following)</p> <ul style="list-style-type: none"> <li>- Confirmed primary to secondary leakage &gt;150gpd in either S/G</li> <li>- Confirmed primary to secondary leak rate of change &gt;60gpd within 1 hour period in either S/G</li> </ul>
	DOS	Initiates a controlled plant shutdown using AOP-17A, “Rapid Power Reduction” to place the plant in hot shutdown within 1 hour

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Event Description: **“B” Steam Generator develops a small tube leak. (leak rate rises to approximately 25 gpm)**

Time	Position	Applicant's Actions or Behavior
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**While performing AOP-17A required plant shutdown, AOP-3 actions to align systems to control spread of contamination may be performed as time permits. AOP-17A actions are covered in the next event.**

	DOS	Inform Chemistry that action level 2 for primary to secondary leakage has been entered (asks DSS to perform this action)
	DOS	Direct radiation protection to perform exposure and contamination evaluations (asks DSS to perform this action)
	DOS	Check leaking S/G identified (B S/G)
	RO/BOP	Adjust “B” atmospheric steam dump controller (1HC-478) to 1050 psig
	BOP	Isolate blowdown to “B” S/G - Shuts 1MS-2045/1MS-5959
	BOP	Shut affected S/G sample isolation valve (1MS-2084)
	BOP	Ensure condensate storage tank isolated from condenser hotwell - Ensure 1CS-2130 (reject valve) shut (verifies on 1C03) - Ensure 1CS-113 (reject bypass valve) shut (AO must check locally)
	BOP	Directs AO to locally align low pressure trap header to condenser - Check condenser available - Open 1MS-164 (LP trap header inlet to condenser valve) - Close 1MS-165 (LP trap header inlet to atmospheric blow-off tank)



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Event Description: **"B" Steam Generator develops a small tube leak. (leak rate rises to approximately 25 gpm)**

Time	Position	Applicant's Actions or Behavior
	BOP	Directs AO to locally isolate building heating steam supply <ul style="list-style-type: none"> <li>- Check Unit 2 available to supply heating steam</li> <li>- Place heating steam control valve selector switch to 9 o'clock (unlabeled) position</li> </ul>
	BOP	Locally shift A/E after condenser drains to hotwell <ul style="list-style-type: none"> <li>- Open 1FD-125 (A/E after condenser drain trap inlet)</li> <li>- Open 1FD-126 (A/E after condenser drain trap outlet)</li> <li>- Shut 1FD-124 (A/E after condenser drain bypass)</li> <li>- Shut 1FD-124A (A/E after condenser drain to funnel)</li> </ul>
	BOP	Directs AO to isolate turbine building sumps <ul style="list-style-type: none"> <li>- Open turbine building sump pump breakers (1B52-116H, 1B52-116K, 1B52-413B, and 1B52-413D)</li> <li>- Secure drains to turbine building sumps</li> </ul>
	BOP	Shuts known steam release paths to clean side <ul style="list-style-type: none"> <li>- Ensure 1MS-236 shut (MSIV bypass)</li> <li>- Locally ensure 1MS-120A/1MS-123A (S/G header bypass drain) shut</li> <li>- Locally ensure 1MS-229/1MS-239 (upstream drains to blowdown tank) shut</li> <li>- Locally ensure elbow drains are shut (1MS-10A,10B, 15A,15B)</li> </ul>
	BOP	Check radwaste steam aligned to Unit 2
	BOP/DOS	Check if 1P-29/Radwaste steam isolation valve from affected S/G can be shut

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Event Description: **"B" Steam Generator develops a small tube leak. (leak rate rises to approximately 25 gpm)**

Time	Position	Applicant's Actions or Behavior
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	DOS	Recognizes shutting IMS-237 places Unit 1 in TS LCO 15.3.4.A
	DOS	Check change in power level < 15%/hr. Directs chemistry to sample RCS for iodine within 2 to 6 hours of power change (or asks the DSS to perform this action)

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Event Description: **Perform Technical Specified Plant Shutdown (reactivity manipulation)**

Time	Position	Applicant's Actions or Behavior
	DOS	Enters AOP-17A and directs RO/BOP actions
	DOS	Determines desired power level or condition to be met ( DOS announces plant S/D required to hot shutdown within 1 hour at a specified ramp rate)
	DOS	Notifies System Control Supervisor 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"> <li>- Note that Operator Auto-Impulse In provides the most linear response</li> <li>- Select desired EHC system mode of operation</li> <li>- Select desired rate on load rate thumb-wheel</li> <li>- Select target end-point on reference control</li> <li>- Depress GO pushbutton</li> </ul>
	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"> <li>- Set boric acid flow totalizer (1YIC-110) to desired quantity</li> <li>- Set boric acid flow controller (1HC-110) to desired flowrate</li> <li>- Start second boric acid transfer pump if desired</li> </ul>
	RO/DOS	Check Pressurizer Pressure Stable at or trending to 1985 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)

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Event Description: **Perform Technical Specified Plant Shutdown (reactivity manipulation)**

Time	Position	Applicant's Actions or Behavior
	RO/DOS	Maintain RCS Tavg (continuous action) <ul style="list-style-type: none"><li>- Greater than 540 F</li><li>- Within 10 F of Tref</li></ul>
	DOS	Determine desired end point less than 50% turbine load <ul style="list-style-type: none"><li>- Determines desired end point is 60%</li><li>- Proceeds to step 28 as time permits</li></ul>
	RO/DOS	Check if boration should be stopped (continuous action) <ul style="list-style-type: none"><li>- Continue boration until Bank D rods are positioned to control axial flux near its target value (refer to OP-3A for target value)</li></ul>
	DOS	Contact chemistry to sample RCS for iodine within 2 to 6 hours following the power change (or asks the DSS to perform this action)
	DOS/BOP	If time permits, then transfer unit auxiliary loads to station auxiliary transformers
<b>Between 80 % &amp; 90 % power (or at the Lead Examiners discretion), proceed to the next event</b>		

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Event Description: **“B” S/G Steam Flow Transmitter (FT-474) Fails High**

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Acknowledge and respond to receipt of annunciator ARB 1C03 1E2 1-5, “Steam Generator B Level Setpoint Deviation, ARB 1C03 1D 3-11, “Steam Line B Isolation Channel Alert” and ARB 1C03 1E2 3-5, “Steam Generator B Feed Water Flow Channel Alert”</p> <p>Operator Actions:</p> <ul style="list-style-type: none"> <li>- Diagnose cause (FT-474 failing high)</li> <li>- May stabilize by recommending &amp; stopping or reducing load reduction.</li> <li>- Take manual control of “B” S/G Feed Regulating Valve (HC-476)</li> <li>- Check for associated alarms</li> <li>- Check RCS temperatures and secondary steam flows</li> <li>- (Note: that the operator may swap to the yellow channel which is directed by ICP-10.2)</li> </ul>
	DOS	<p>Ensure plant is stabilized</p> <ul style="list-style-type: none"> <li>- Ensure power reduction remains controlled (crew may stop load reduction or initiate reactor trip)</li> <li>- Ensure S/G Water Level Control is regained and level stabilized</li> </ul>
	DOS	<p>Directs entry into AOP-24, “Response to Instrument Malfunctions”.</p>
<p><b>It is not the intent to observe another ICP 10.2 for this scenario, so therefore at the discretion of the lead examiner and when the malfunction has been identified and plant has been stabilized, proceed to the next event.</b></p>		

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**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	BOP/RO/DOS	<p>Recognize plant conditions are rapidly deteriorating based on any or all of the following condition/parameters:</p> <ul style="list-style-type: none"> <li>- Lowering PZR Level</li> <li>- Rising steam flow "B" S/G (non-failed channel)</li> <li>- Lowering RCS temperature</li> <li>- Rising NI power level and control rods moving out excessively</li> </ul>
	DOS	<p>Directs a Manual Reactor Trip and entry into EOP-0, "Reactor Trip or Safety Injection"</p>
	RO	<p>Performs Immediate Actions of EOP-0 (Steps 1-4) and informs DOS they are complete</p> <ul style="list-style-type: none"> <li>- Verify reactor trip</li> <li>- Verify turbine trip</li> <li>- Verify safeguard buses energized</li> <li>- Check if SI is actuate, determines it is required, that "A" Train not actuated automatically and manually actuates both trains of SI/CI. Should also recognize that "B" RHR pump did not start but should not start the pump until IA's are complete.</li> </ul>
	DOS/RO	<p>Verify Reactor Trip</p> <ul style="list-style-type: none"> <li>- Check reactor trip and bypass breakers OPEN</li> <li>- Check all rod bottom lights LIT</li> <li>- Check all rod position indicators ON BOTTOM</li> <li>- Check neutron flux LOWERING</li> </ul>

**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	DOS/RO	Verify Turbine Trip  1. -Check turbine stop valves BOTH SHUT: (either method) - SL and SR SHUT - Annunciator 1C03 1E1 4-3, Turbine Stop valves Two CLOSED - Turbine Valves Closed bistable lights LIT
	DOS/RO	Verify Safeguard buses energized  - Check at least one 4160 Vac safeguards bus energized (1A05 or 1A06) - Check at least one 480 Vac safeguards bus energized (1B03 or 1B04)
	DOS/RO	Check if SI is actuated:  - 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  - Recognize A Train SI has not actuated and is required and verify RNO action to manually actuate SI and CI have been performed
	DOS	Reviews foldout page criteria with the crew

**Note that the DOS may elect to continue with AOP-3 actions as a secondary priority while continuing with EOPs. Also it is acceptable to start the SW pump after immediate actions and SI sequence is complete prior to procedure step**

***It is critical that feedwater is isolated to "B" S/G prior to transition out of EOP-0.***

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**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	DOS/RO	<i>Recognize faulted S/G Isolation Criteria applies and isolate feedwater to "B" S/G. Maintain &gt;200 gpm to "A" S/G until &gt; 29%</i>
	DOS/RO	<i>Recognize ruptured S/G isolation criteria continuously applies. If narrow range level in "B" S/G rises to 29%, then feedwater flow may be isolated. (note that feedwater was already isolated in previous step)</i>
	RO/BOP	Verify feedwater isolation: <ul style="list-style-type: none"> <li>- Feedwater Regulating and Bypass Valves SHUT</li> <li>- Both main feed pumps tripped</li> <li>- MFP discharge MOVs-BOTH SHUT</li> </ul>
	BOP/RO	Verify containment isolation: <ul style="list-style-type: none"> <li>- CI Panels A and B ALL LIGHTS LIT</li> <li>- 1CC-17 and RS-SA-9 SHUT</li> <li>- No valves open under administrative control</li> </ul>
	RO/BOP	Verify AFW Actuation: <ul style="list-style-type: none"> <li>- Both motor driven AFW pumps running</li> <li>- S/G levels Both &lt; 25%</li> <li>- Steam supply valves to turbine driven AFW pump OPEN</li> </ul>
	BOP/RO	Check both SI pumps running
	BOP/RO	Check both RHR pumps running: <ul style="list-style-type: none"> <li>- Recognizes 1P10B failed to start and manually starts RHR pump, unless previously started</li> </ul>
	BOP/RO	Checks only one CCW pump running



**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	BOP/RO	Verify Service Water Alignment: <ul style="list-style-type: none"> <li>- 6 service water pumps running. <b>Recognizes only 5 pumps running, informs DOS and manually starts P-32B. if not already performed</b></li> <li>- Service water isolation valves shut (SW-2930A/2930B, 2927A, 2927B, 2816, 4479, 4478, 2817)</li> <li>- Directs AO to locally check SW-LW-61, SW-LW-62 shut</li> </ul>
	BOP/RO	Verify Containment Accident Cooling Units Running <ul style="list-style-type: none"> <li>- All accident fans running</li> <li>- 1SW-2907 &amp; 2908 OPEN</li> <li>- Unit 1 Containment Recirc Coolers Water Flow Low Alarm CLEAR</li> </ul>
	BOP	Check Control Room Fans Armed: <ul style="list-style-type: none"> <li>- W-14A &amp; W-13B2 WHITE LIGHT OFF</li> </ul>
	BOP	Check Control Room Ventilation IN ACCIDENT MODE: <ul style="list-style-type: none"> <li>- At least one control room recirc fan RUNNING</li> <li>- Control room damper solenoid valve PURPLE LIGHT LIT</li> </ul>
	BOP/RO	Check if Main Steam Lines Can Remain Open, RO notes both MSIVs SHUT
	BOP/RO	Verify proper SI valve alignment: <ul style="list-style-type: none"> <li>- Unit 1 SI active status panel ALL LIGHTS LIT</li> <li>- Unit 1 SI-Spray Ready status panel NO LIGHTS LIT</li> </ul>
	RO/BOP	Verify containment spray not required: <ul style="list-style-type: none"> <li>- Check containment pressure recorder has remained less than 25 psig</li> </ul>

**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Verify SI Flow: <ul style="list-style-type: none"> <li>- RCS pressure &lt;1400 psig</li> <li>- If NO, proceed to RNO and next step</li> <li>- If Yes Check SI pumps flow indicated and than RCS pressure &lt; 200 psig and go to RNO and next step</li> </ul>
	RO/BOP	Verify Secondary Heat Sink: <ul style="list-style-type: none"> <li>- Level in at least one S/G &gt; 29%</li> <li>- Control pumps and align valves as necessary to maintain S/G level 29% to 65 %.</li> </ul>
	RO/BOP	Verify RCP Seal Cooling: <ul style="list-style-type: none"> <li>- Labyrinth seal DP &gt; 20 inches or</li> <li>- Component cooling to RCP thermal barrier-NORMAL</li> </ul>
	RO	Verify RCS Temperature Control: <ul style="list-style-type: none"> <li>- RCS wide range cold leg temperatures less than or equal to 547 AND STABLE</li> <li>- If not stable and trending lower, stop dumping steam and control auxiliary feedwater flow to maintain greater than or equal to 200 gpm until at least one S/G level &gt; 29%</li> </ul>
	RO	Check PORVs BOTH SHUT
	RO	Verify PZR spray valves-BOTH SHUT <ul style="list-style-type: none"> <li>- Normal spray valves SHUT</li> <li>- Auxiliary spray valve SHUT</li> </ul>

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**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	RO	Check if RCPs should remain running - Check RCS subcooling > 30 F
	DOS	Inform STA to commence monitoring critical safety functions per CSP-ST.0
	RO/BOP	Verify Containment sump recirculation not required: - RWST level greater than or equal to 60 % - RCS pressure > 200 psig
	CREW	Check secondary system in tact: - No S/G completely depressurized AND - No S/G trending lower in an uncontrolled manner - DOS transitions to EOP-2 based on "B" S/G being faulted
	DOS	Reads cautions, notes and reviews foldout page criteria
	RO	Check RCS wide range Hot Leg Temperatures STABLE: - Control feed and dump steam as necessary using "A" S/G to stabilize RCS hot leg temperatures
	RO/BOP	Isolate both Main Steam Lines
	RO/BOP	Check if any S/G in NOT faulted (determines "A" S/G is not faulted)
	RO/BOP/DOS	Identify faulted S/G (determines "B" S/G is faulted)
	RO/BOP	Reset Loss of Feedwater Turbine Trip

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**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	RO/BOP	<i>Isolate Feed to faulted S/G</i> <ul style="list-style-type: none"> <li>- <i>Ensure FRVs SHUT</i></li> <li>- <i>Ensure FRVs SHUT</i></li> <li>- <i>Place AF-4021 AND IAF-4000 in manual and SHUT</i></li> </ul>
<b>The crew should have concerns about radiation in the area where the AOs must be sent to isolate valves in the PAB. They may elect not to isolate minor secondary valves until better protection can be afforded</b>		
	RO/BOP	Isolate flow from faulted S/G <ul style="list-style-type: none"> <li>- Ensure 1MS-2015 SHUT (atmospheric dump)</li> <li>- SHUT 1MS-2019 (turbine driven AFW steam supply)</li> <li>- Ensure 1MS-5959/2045 SHUT (S/G Blowdown)</li> <li>- Locally shut 1MS-237 (1P-29 AFP/Radwaste steam isolation)</li> <li>- Locally shut 1MS-238 (main steam trap isolation)</li> </ul>
	BOP/RO	Check CST Level > 8 Ft
<b><i>It is critical that the crew identifies that "B" S/G is ruptured and transitions to EOP-3.</i></b>		
	CREW	<i>Check secondary system radiation normal (crew determines it is not normal and transitions to EOP-3)</i>
	DOS	Reads EOP-3 caution, notes and reviews foldout page criteria
	RO	Check if RCPs should remain running
	RO/BOP/DOS	Identify Ruptured S/G ("B" S/G identified as ruptured based on level rise, and abnormal radiation)

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**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Shut 1MS-2017 ("B" S/G MSIV)-(previously performed)
	RO/BOP	Reset Loss of Feedwater Turbine Trip (already performed in EOP-2)
	RO/BOP	Minimize Steam Dump from ruptured S/G <ul style="list-style-type: none"> <li>- Adjust 1HC-478 to 1050 psig (steam dump controller)</li> <li>- Check 1MS-2015 SHUT (atmospheric dump-already performed)</li> <li>- SHUT 1MS-2019 (steamer supply-already performed)</li> <li>- Ensure 1MS-236 (MSIV bypass shut-already performed)</li> </ul>
	RO/BOP	Isolate flow from ruptured S/G <ul style="list-style-type: none"> <li>- Ensure 1MS-5959, 2042 SHUT</li> <li>- Locally SHUT 1MS-237</li> <li>- Locally SHUT 1MS-238</li> </ul>
	RO/BOP	Check if feed flow to ruptured S/G should be stopped
	RO	Check PORVs and PORV Block valves: <ul style="list-style-type: none"> <li>- power available to BLOCK valves</li> <li>- Both PORVs SHUT</li> <li>- At least one PORV block valve OPEN</li> </ul>
	RO	Check PZR Safety valves SHUT
	RO/DOS	Check if secondary system intact

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**Steam Line Break Outside Containment (upstream "B" MSIV) which leads to a Design Basis SGTR on "B" S/G at trip. Several Post trip complications include Failure of "A" Train SI to AUTO actuate, Failure of 1P-10B "RHR" Pump to AUTO start and Failure of P-32B, "Service Water" pump to AUTO start. (Note event 7/8/9 are component failures)**

Time	Position	Applicant's Actions or Behavior
	BOP	Stabilize intact S/G level  - > 29%  - Control feed flow to maintain "A" S/G between 29% to 65%
	BOP	Reset SI
	BOP	Reset Containment Isolation
	BOP	Reset 1B03 and 1B04 non-safeguard equipment lockouts

**Once the first operator action is directed in EOP-3 and/or at the discretion of the lead examiner, this scenario will be terminated. Examinees will be asked to remain in the simulator until any evaluator follow-up questions are answered**

**NOTE: If RCS Cold Leg Temperature lowers to 315 F, CSP-P.1 (Integrity) transition is required. If this occurs, the scenario should be terminated at Lead Examiners discretion**