

Day 4 Thursday

Submitted: May 31, 2013

NRC 044

1259

Appendix D

Scenario Outline

Form ES-D-1

Facility: Vogtle Scenario No.: 3 Op-Test No.: 2012-301

Examiners: Mark Operators: Carla Smith
Phil [Redacted]
[Redacted] [Redacted]

Initial Conditions: The plant is at 100% power, MOL, steady state operations.
(Base IC # 14, snapped to IC # 183 for HL17 NRC Exam)

Equipment OOS: Safety Injection Pump "A" is tagged out for motor repair.

Turnover: Maintain 100% power. Containment mini-purge is in service for a Containment entry on the next shift.

Preloaded Malfunctions:

TU10B Main Turbine EHC Pump B Auto Start Failure

Overrides

HS-3009 OPEN (Panel Map B-Left, HS-3009 LP-1 MS SPLY to AFW TD PMP-1 to OPEN)

Event No.	Malf. No.	Event Type*	Event Description
T1	SG02D @ 100%	I-UO I-SS TS-SS	SG # 4 NR LT fails high (LT-554). LCO 3.3.1 Condition A LCO 3.3.1 Condition A, FU 13 Condition E LCO 3.3.2 Condition A LCO 3.3.2 Condition A, FU 5c Condition I LCO 3.3.2 FU 6b Condition D
T2	CV08 @ 25%	C-OATC C-SS TS-SS	CVCS Letdown Leak ORC (Aux. Building – Isolable).
3	N/A	N-OATC N-SS	Places Excess Letdown in service.
T4	PR02A @ 100%.	I-OATC I-SS TS-SS	Controlling PRZR Pressure channel PT-455 fails high. LCO 3.3.1 Condition A, FU 6 Condition E, LCO 3.3.1 FU 8a Condition M, LCO 3.3.1 FU 8b Condition E, LCO 3.3.2 Condition A, FU 1d Condition D, LCO 3.3.2 FU 8b Condition L (One hour action), LCO 3.4.1.a Condition A
T5	TU11	C-UO C-SS	Main Turbine EHC Pump A trips with failure of standby EHC pump to automatically start.

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 1

Event Description: SG # 4 controlling level channel LT-554 fails HIGH requiring UO to take manual control of SG # 4 MFRV to control SG levels, selects an unaffected level channel, and returns SG # 4 MFRV to Auto.

Time	Position	Applicant's Action or Behavior
1016.32	UO	<p>Diagnose the failure of SG # 4 controlling level channel LT-554.</p> <p>Symptoms / alarms:</p> <ul style="list-style-type: none"> ALB13-D06 STM GEN 4 HI / LO LVL DEVIATION ALB14-D01 STM GEN 4 HI-HI LEVEL ALERT. <p>Indications:</p> <ul style="list-style-type: none"> MFRV # 4 throttling shut Feed flow < steam flow on SG # 4
	SS / UO	<p>IMMEDIATE OPERATOR ACTIONS</p> <p>E1. ✓ Check Steam and feed flows – MATCHED ON ALL SGS.</p> <p>RNO</p> <p>E1. ✓ Take manual control of affected SG feed flow valves to restore NR level between 60% and 70%.</p> <p>[SG 4 MFRV 1-FIC-540 placed in manual and depresses UP arrow to raise FW flow]</p>
1017.46	SS	<p>✓ Enters AOP-18001-C, Section E for Failure of SG Level Instrumentation.</p>
1019.18	SS / UO	<p>SUBSEQUENT OPERATOR ACTIONS</p> <p>E2. ✓ Selects unaffected SG level channel for control. (Selects 1LT-549, Ch II on 1LS-549C)</p>
1022.05	UO	<p>E3. ✓ Return SG feed flow valves control to automatic.</p> <p>[SG # 4 MFRV 1-FIC-540 returned to auto]</p> <p>Cue to Simbooth: IF asked, the Shift Manager has given permission to place the MFRV in auto. ✓</p>

1020.12 A→S Reminded Carter to get permission
1022 A→S ARP Consistent w/ failure

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 2

Event Description: CVCS Letdown line break ORC that auto isolates the HELBA valves but requires OATC actions to isolate a Letdown leak to the PRT via relief.

Time	Position	Applicant's Action or Behavior
1033.37	S-U OATC UO	<p>Back panel</p> <p>Diagnose Letdown line break ORC and CVCS relief lifting to PRT: A→S LID Is. HV-8160 closed</p> <p>Symptoms / alarms:</p> <ul style="list-style-type: none"> 1. ALB63-E01 CVCS PIPE BREAK RM PROT ACTUATION 3. ALB61-C06 LVL A LEAK DETECTED (short time delay) 2. ALB07-C05 LP LTDN HX HI TEMP (short time delay) 5. ALB06-F01 CSFST TROUBLE (short time delay) <p>Indications:</p> <ul style="list-style-type: none"> • Both temperature indicators for room RA09 reading high. • Letdown flow lowering to 0 in 1LI-132C and 1LI-132A.
1035.27		<p>Enters AOP 18007-C, Section A, TOTAL LOSS OF LETDOWN FLOW.</p>
	OATC	<p>A1. Isolate letdown relief flowpath by performing the following:</p> <p>a. Close letdown orifice isolation valves:</p> <ul style="list-style-type: none"> ✓ • HV-8149A ✓ • HV-8149B ✓ • HV-8149C <p>b. Close letdown isolation valves:</p> <ul style="list-style-type: none"> ✓ • LV-459 • LV-460

1035.25 CSFST Alarm

1036.40 AUTO UCT^{Auto} started (no response from operator on SRO)

R: Don't have to announce. Not an expectation

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 2

Event Description: CVCS Letdown line break ORC that auto isolates the HELBA valves but requires OATC actions to isolate a Letdown leak to the PRT via relief.

Time	Position	Applicant's Action or Behavior
	OATC	A2. Adjust HC-182 and FIC-121 as necessary to establish the following: <i>1037.30 A→U Rise dry as I low Seal flow</i> <ul style="list-style-type: none">• Seal injection flow to all RCPs – 8 to 13 GPM. <p>-AND-</p> <ul style="list-style-type: none">• Charging flow – APPROXIMATELY 10 GPM GREATER THAN TOTAL SEAL INJECTION FLOW. <i>S→A Adjust flow to ↓ setpoint (no response)</i> <i>Later he said "outstanding"</i>
	OATC	A3. Check pipe break protection valves – OPEN. <ul style="list-style-type: none">✓ • HV-15214 (NO)✓ • HV-8160 (NO) RNO
	UO	A3. Perform the following: <ul style="list-style-type: none">a. Check affected unit room temperatures. <i>16PF</i> UNIT 1 <ul style="list-style-type: none">• R-A07• R-A08• R-A09 (high room temperature for both trains) <ul style="list-style-type: none">✓ b. IF affected room temperatures are greater than 135°F, THEN investigate reason for high temperature in rooms before opening affected valves and restoring letdown. <i>1040.5</i>

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 2

Event Description: CVCS Letdown line break ORC that auto isolates the HELBA valves but requires OATC actions to isolate a Letdown leak to the PRT via relief.

Time	Position	Applicant's Action or Behavior
	OATC	<p>NOTE to Simbooth: IF, personnel dispatched to check out RA09, report back the following:</p> <p>Room appears to be full of steam and the submarine door at the entrance is very hot to the touch. HP will not allow us to attempt to enter the room.</p>
	OATC	<p>✓ A4. Check instrument air to containment – ESTABLISHED. (YES)</p>
	OATC	<p>A5. Check CVCS letdown to BTRS flowpath.</p> <p>✓ a. Check TV-0381B BTRS Demin Inlet Temperature Control – OPEN. (HS-10351 DILUTE or OFF lights lit.) (OFF LIT)</p> <p>✓ b. Check HV-8115 LETDOWN DIVERT TO BTRS – OPEN. (YES)</p>
	OATC	<p>A6. Identify and correct cause for loss of letdown.</p> <p>✓ a. Check for letdown path valve failures or mispositions. (NO)</p> <p>b. Check instrumentation:</p> <p>✓ • PI-131A</p> <p>✓ • TI-130</p> <p>✓ c. Check PIC-131.</p> <p>✓ d. Check HV-8152.</p> <p>✓ e. Check for other causes.</p>

1042.15 Hi Location for Pen Record

1044.36 Mln stopped A → S Mln op as req'd (Did not say anything when started)

Appendix D	Required Operator Actions	Form ES-D-2
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Op-Test No.: 2012-301 **Scenario No.:** 3

Event No.: 2

Event Description: CVCS Letdown line break ORC that auto isolates the HELBA valves but requires OATC actions to isolate a Letdown leak to the PRT via relief.

Time	Position	Applicant's Action or Behavior
1059.45 HO	OATC UO	A9. Initiate the Continuous Actions Page. <input checked="" type="checkbox"/>
1100.06	OATC UO	A10. Verify PRZR level – TRENDING TO PROGRAM. (YES) 67.6% ↓ Note to examiner: The OATC should be able to turn PRZR level to a down trend with Excess Letdown in service.

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 3

Event Description: The OATC places Excess letdown in service per direction of the SS to maintain PRZR level after letdown is isolated to stop the RCS leak. The OATC will use SOP 13008-1, to place excess letdown in service.

Time	Position	Applicant's Action or Behavior
	OATC	Section 4.1 of 13008-1 is selected.
	OATC 1047.29	<p>NOTE: Independent Verifications performed within Section 4.1 are documented on Checklist 1.</p> <p>4.1.1 <input checked="" type="checkbox"/> Verify Reactor power is maintained \leq 3622.6 MWT while Excess Letdown is in service and LEFM is in service. IF LEFM is NOT in service, maintain power \leq 3562 MWT per guidance of 12004-C.</p>
	OATC <input checked="" type="checkbox"/>	4.1.2 Verify that a CVCS Charging Pump is running.
	OATC <input checked="" type="checkbox"/>	4.1.3 Verify CLOSED RX HEAD VENT TO EXCESS LETDOWN ISOLATION 1-HV-8098.
	OATC <input checked="" type="checkbox"/>	4.1.4 Verify flow controller EXCESS LETDOWN, 1HC-123 is set to closed (0% demand).
	OATC 1048	<p>4.1.5 Verify OPEN RCPs Seal Leakoff Isolation valves:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 1-HV-8100 RCPS SEAL LEAKOFF ORC ISOLATION <input checked="" type="checkbox"/> 1-HV-8112 RCPS SEAL LEAKOFF IRC ISOLATION

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Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 3

Event Description: The OATC places Excess letdown in service per direction of the SS to maintain PRZR level after letdown is isolated to stop the RCS leak. The OATC will use SOP 13008-1, to place excess letdown in service.

Time	Position	Applicant's Action or Behavior
	OATC	4.1.6 <input checked="" type="checkbox"/> Verify EXCESS LETDOWN TO VCT, 1HS-8143 is in the OPEN VCT position.
	OATC	4.1.7 <input checked="" type="checkbox"/> Verify Reactor power is maintained ≤ 3622.6 MWT while Excess Letdown is in service and LEFM is in service. <u>IF</u> LEFM is <u>NOT</u> in service, maintain power ≤ 3562 MWT per guidance of 12004-C.
	OATC <i>1049.15</i>	4.1.8 Open EXCESS LETDOWN LINE Isolation Valves: <input checked="" type="checkbox"/> • 1-HV-8153 EXCESS LETDOWN LINE ISO VLV <input checked="" type="checkbox"/> • 1-HV-8154 EXCESS LETDOWN LINE ISO VLV
	OATC	4.1.9 Record the following: <ul style="list-style-type: none"> • <input checked="" type="checkbox"/> Pressure on indicator EXCESS LETDOWN HX OUTLET, 1PI-124. <i>25#</i> <i>1050.22</i> • <input checked="" type="checkbox"/> Temperature on indicator EXCESS LETDOWN HX OUTLET, 1TI-122. <i>100 97.5°F ?</i> <p>Note to examiner: ALB63-A06 FILTERS BACKFLUSH PNL ALARM will illuminate shortly after placing Excess Letdown in service.</p>

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 3

Event Description: The OATC places Excess letdown in service per direction of the SS to maintain PRZR level after letdown is isolated to stop the RCS leak. The OATC will use SOP 13008-1, to place excess letdown in service.

Time	Position	Applicant's Action or Behavior
	OATC	<p>4.1.10 <u>WHILE</u> establishing excess letdown, perform the following:</p> <ul style="list-style-type: none"> • Monitor pressure rise on pressure indicator EXCESS LETDOWN HX OUTLET, 1PI-124 and verify it remains less than 50 pounds above pressure recorded in Step 4.1.8. <i>75#</i> • Monitor temperature rise on temperature indicator EXCESS LETDOWN HX OUTLET, 1TI-122 and verify it remains less than 165 degrees.
	OATC <i>1051.36</i>	<p>4.1.11 Slowly adjust output flow controller EXCESS LETDOWN 1HC-123 to establish maximum allowable flow (estimated to be approximately 30 gpm).</p> <p><i>Backpres. Filter</i> <i>Did NOT Receive Alarms</i> <i>R: Yes,</i></p> <p><i>What alarm was received?</i> <i>Was it expected?</i></p>
	OATC	<p>4.1.12 Perform the following as required to maintain desired pressurizer level:</p> <ul style="list-style-type: none"> • Adjust charging using CHARGING LINE CONTROL, 1FIC-121. • Adjust seal injection using SEAL FLOW CONTROL, 1HC-182. <p><i>1055.18 CSFS Alarm Clear</i> <i>1160 → 1059.35 PER W/ trend but do Prog.</i></p>

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 4

Event Description: PRZR Pressure channel PT-455 fails high resulting in PRZR PORV 455A and both PRZR Sprays fully opening. The OATC will have to take manual action to prevent a Reactor trip and SI.

Time	Position	Applicant's Action or Behavior
1101.01	OATC	<p>Diagnose the high failure of PRZR Pressure channel PT-455. <i>S -> Silence that alarm (Poor Communication)</i></p> <p>Symptoms / alarms: <i>1102 A -> S Entered DDB T.S. & exited</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> ALB11-B03 PRZR HI PRESS <input checked="" type="checkbox"/> ALB11-C01 PRZR CONTROL HI LEVEL DEV AND HEATERS ON <input checked="" type="checkbox"/> ALB11-C03 PRZR HI PRESS CHANNEL ALERT <input checked="" type="checkbox"/> ALB12-D03 PRZR PRESS LO PORV BLOCK <input checked="" type="checkbox"/> ALB12-E04 PV-0455A OPEN SIGNAL <input type="checkbox"/> ALB06-F06 CSFST TROUBLE <p>Indications:</p> <ul style="list-style-type: none"> • PRZR Pressure channel PT-455 off scale high. • PRZR Pressure channels PT-456, 457, and 458 rapidly lowering. • Both PRZR Sprays full open.
	OATC	<p><u>AOP 18001-C, Section C IMMEDIATE ACTIONS</u></p> <p><input checked="" type="checkbox"/> C1. Check RCS pressure - STABLE OR RISING. (NO) <i>Yes 2235↑</i></p> <p>RNO: <i>S -> A at the time of failure</i></p> <p>C1. Perform the following:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Close spray valves. <input checked="" type="checkbox"/> Close affected PRZR PORV. <input checked="" type="checkbox"/> Operate PRZR heaters as necessary.
1102.51	SS <i>Update</i>	<p>Enters AOP 18001-C, Section C and verifies immediate operator actions properly completed.</p>

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 4

Event Description: PRZR Pressure channel PT-455 fails high resulting in PRZR PORV 455A and both PRZR Sprays fully opening. The OATC will have to take manual action to prevent a Reactor trip and SI.

Time	Position	Applicant's Action or Behavior
	OATC	<p><i>Read caution (setpoint) to [redacted] (No response)</i></p> <p>C2. Check controlling channel – OPERATING PROPERLY. (NO) <i>A→S Turning heaters off. S→A should not have been</i> RNO: <i>A→S Meter @ 100% S→A OK</i></p> <p>C2. Perform the following: <i>R: Not Sure</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> a. Place HS-455A in close. <input checked="" type="checkbox"/> b. Place PRZR spray valve controllers in manual.
<i>1104.57</i>	OATC UO	C3. <input checked="" type="checkbox"/> Initiate the Continuous Actions Page.
	OATC	C4. <input checked="" type="checkbox"/> Control PRZR pressure using heaters <u>and</u> sprays – BETWEEN 2220 AND 2250 PSIG.
<i>1106.01</i>	OATC	<p>C5. Check PIC-455A Pressurizer Master Pressure Controller – IN AUTO WITH OUTPUT SIGNAL APPROXIMATELY <u>25%</u>. (NO) <i>100%</i></p> <p>RNO:</p> <p>C5. <input checked="" type="checkbox"/> Place PIC-455A in manual and adjust controller output to approximately 25%. <i>Asked for PEEK from Fred</i></p>
	OATC	C6. <input checked="" type="checkbox"/> Check affected channel selected on PS-455F PRZR PRESS CNTL SELECT. (YES)

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 4

Event Description: PRZR Pressure channel PT-455 fails high resulting in PRZR PORV 455A and both PRZR Sprays fully opening. The OATC will have to take manual action to prevent a Reactor trip and SI.

Time	Position	Applicant's Action or Behavior										
	OATC	<p>C7. Select unaffected channels on PS-455F:</p> <table border="1"> <thead> <tr> <th>Failed Channel</th> <th>Select</th> </tr> </thead> <tbody> <tr> <td>✓ P455</td> <td>CH457 / 456</td> </tr> <tr> <td>P456</td> <td>CH455 / 458</td> </tr> <tr> <td>P457</td> <td>CH455 / 456</td> </tr> <tr> <td>P458</td> <td>CH455 / 456</td> </tr> </tbody> </table>	Failed Channel	Select	✓ P455	CH457 / 456	P456	CH455 / 458	P457	CH455 / 456	P458	CH455 / 456
Failed Channel	Select											
✓ P455	CH457 / 456											
P456	CH455 / 458											
P457	CH455 / 456											
P458	CH455 / 456											
	OATC	<p>C8. Perform the following:</p> <p>✓ a. Check PRZR pressure – STABLE AT APPROXIMATELY 2235 PSIG.</p> <p>b. Place PRZR heaters in AUTO.</p> <p>① ✓ c. Place PRZR spray valve controllers in AUTO. S → ? I don't think ht's are op. properly</p> <p>RNO:</p> <p>a. Adjust PRZR pressure to approximately 2235 psig using PRZR heaters and sprays.</p> <p>Cue to Simbooth: IF asked, the Shift Manager has given permission to place the PRZR pressure control system in auto.</p>										
1115.02	OATC	<p>C9. ✓ Place PORVs in AUTO and verify proper operation.</p>										
1115.42	OATC	<p>C10. ✓ Return PRZR pressure Master Controller to AUTO.</p>										

HT's be returned to AUTO?
Why are u cycling ht's!

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301 **Scenario No.:** 3

Event No.: 4

Event Description: PRZR Pressure channel PT-455 fails high resulting in PRZR PORV 455A and both PRZR Sprays fully opening. The OATC will have to take manual action to prevent a Reactor trip and SI.

Time	Position	Applicant's Action or Behavior
116.21	OATC	C11. Select same channel on PS-455G PRZR PRESS REC SEL as selected on PS-455F. ✓ 457
116.54	OATC	C12. Check P-11 status light on BPLB indicates correctly for plant condition within one hour. ✓ OFF
	OATC	C13. Notify I&C to initiate repairs. SS will call typically call the SSS to perform the following: <ul style="list-style-type: none"> • Notify Operations Duty Manager of the AOP entry • Write a Condition Report • Notify I&C
	OATC	C14. Bypass the affected instrument channel using 13509 C, BYPASS TEST INSTRUMENTATION (BTI) PANEL OPERATION, if desired. NOTE: SS is NOT expected to bypass failed channel.

1120.16 A → S CSFST Also Record (no acknowledgment) ★
 ↳ RS was aware that SCM

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Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 4

Event Description: PRZR Pressure channel PT-455 fails high resulting in PRZR PORV 455A and both PRZR Sprays fully opening. The OATC will have to take manual action to prevent a Reactor trip and SI.

Time	Position	Applicant's Action or Behavior																											
	SS	<p>C15. Trip the affected channel bistables and place the associated MASTER TEST switches in TEST position per TABLE C1 within 72 hours. (TS 3.3.1 & 3.3.2)</p> <p>NOTE: SS expected to leave bistables untripped during allowed out of service time to facilitate troubleshooting by I&C.</p>																											
	SS	<p>C16. Initiate the applicable actions of: <i>Cycling HTRs Manually</i></p> <ul style="list-style-type: none"> • TS 3.3.1 Reactor Trip <i>1124.27 Bristed</i> <table border="0" style="margin-left: 20px;"> <thead> <tr> <th style="text-decoration: underline;">Function</th> <th style="text-decoration: underline;">Condition</th> <th></th> </tr> </thead> <tbody> <tr> <td>LCO 3.3.1</td> <td>A</td> <td><i>Did not end</i></td> </tr> <tr> <td>✓ 6 OTΔT</td> <td>E</td> <td><i>Bnd</i></td> </tr> <tr> <td>✓ 8a Low PRZR pressure</td> <td>M</td> <td><i>A → S Fob?</i></td> </tr> <tr> <td>✓ 8b High PRZR pressure</td> <td>E</td> <td></td> </tr> </tbody> </table> • TS 3.3.2 ESFAS <table border="0" style="margin-left: 20px;"> <thead> <tr> <th style="text-decoration: underline;">Function</th> <th style="text-decoration: underline;">Condition</th> <th></th> </tr> </thead> <tbody> <tr> <td>LCO 3.3.2</td> <td>A</td> <td></td> </tr> <tr> <td>1d SI low PRZR pressure</td> <td>D</td> <td></td> </tr> <tr> <td>✓ 8b P-11 Interlock</td> <td>L (one hour action)</td> <td></td> </tr> </tbody> </table> • TS 3.4.1.a DNB <ul style="list-style-type: none"> ✓ RCS pressure < 2199 psig B (Momentary) <p style="text-align: right;"><i>Seal flaw < 8 gpm?</i></p>	Function	Condition		LCO 3.3.1	A	<i>Did not end</i>	✓ 6 OTΔT	E	<i>Bnd</i>	✓ 8a Low PRZR pressure	M	<i>A → S Fob?</i>	✓ 8b High PRZR pressure	E		Function	Condition		LCO 3.3.2	A		1d SI low PRZR pressure	D		✓ 8b P-11 Interlock	L (one hour action)	
Function	Condition																												
LCO 3.3.1	A	<i>Did not end</i>																											
✓ 6 OTΔT	E	<i>Bnd</i>																											
✓ 8a Low PRZR pressure	M	<i>A → S Fob?</i>																											
✓ 8b High PRZR pressure	E																												
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Op-Test No.: 2012-301 **Scenario No.: 3**

Event No.: 4

Event Description: PRZR Pressure channel PT-455 fails high resulting in PRZR PORV 455A and both PRZR Sprays fully opening. The OATC will have to take manual action to prevent a Reactor trip and SI.

Time	Position	Applicant's Action or Behavior
1125.26	SS ✓	<p>C17. Check repairs and surveillances - COMPLETE.</p> <p>RNO:</p> <p>C17. Perform the following:</p> <ul style="list-style-type: none"> a. WHEN repairs and surveillances are complete, THEN perform step C18. b. Return to procedure and step in effect. <p>END OF EVENT 4, proceed to EVENT 5.</p>

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301 **Scenario No.:** 3

Event No.: 5

Event Description: Main Turbine EHC pump 1 trips and the standby pump fails to automatically start on low pressure. The UO will refer to ARP-17033-1 for corrective actions. The standby pump will be manually started to prevent a turbine trip on low EHC pressure.

Time	Position	Applicant's Action or Behavior
1131.08	UO	Diagnoses trip of EHC pump: <u>Alarms:</u> ✓ ALB33-B07 480V SWGR 1NB02 TROUBLE ALB20-D05 HYD FLUID LO PRESS (after several minutes) <i>S→U Pull D05 ARP</i> <u>Indications:</u> EHC pump 1 (HS-6539): Red – OFF Amber – ON Green – ON EHC pressure (PI-6338) <1600 psig and lowering. EHC Pump 1 amps (II-40073) drop to 0 amps. <i>1131.57 S→A Dispatch Ao to investigate</i>
	UO	Refers to ARP 17033-1 for Window B07. (480V SWGR 1NB02 TROUBLE)

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Op-Test No.: 2012-301 **Scenario No.:** 3

Event No.: 5

Event Description: Main Turbine EHC pump 1 trips and the standby pump fails to automatically start on low pressure. The UO will refer to ARP-17033-1 for corrective actions. The standby pump will be manually started to prevent a turbine trip on low EHC pressure.

Time	Position	Applicant's Action or Behavior
	UO	<p><u>ARP 17033-1 WINDOW B07</u></p> <p>1.0 <u>PROBABLE CAUSE</u></p> <ol style="list-style-type: none"> 1. One of the breakers on Switchgear 1NB02 tripped due to a fault. 2. Bus ground fault. 3. Potential transformer/fuse failure. 4. Loss of bus voltage from Switchgear 1NA04. 5. Transformer 1NB02X winding high temperature. 6. Loss of 125V DC control power from Panel 1ND21. 7. Loss of power to transformer temperature monitor. <p>2.0 <u>AUTOMATIC ACTIONS</u></p> <p>NONE</p>

1132.54 S-U Start STBY Pump

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 5

Event Description: Main Turbine EHC pump 1 trips and the standby pump fails to automatically start on low pressure. The UO will refer to ARP-17033-1 for corrective actions. The standby pump will be manually started to prevent a turbine trip on low EHC pressure.

Time	Position	Applicant's Action or Behavior
	UO	<p>4.0 <u>SUBSEQUENT OPERATOR ACTIONS (continued)</u></p> <p>6. Initiate maintenance as required to correct cause of the alarm.</p> <p>5.0 <u>COMPENSATORY OPERATOR ACTIONS</u></p> <p>1134.17 S/O/S → 1. Initiate maintenance to correct problem (i.e., restore alarm). <i>& check STBY start feature</i></p> <p>2. IF after three days the alarm has NOT been restored, initiate a Temporary Modification per 00307-C, "Temporary Modifications" to clear the bad input(s). Record this action required on Figure 5 of 10018-C, "Annunciator Control."</p> <p><i>why did you question the STBY start feature?</i></p>

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 6

Event Description: SG 1 develops a 15 GPM tube leak requiring entry into AOP 18009-C. With SGTL > 5 gpm a rapid shutdown using AOP 18013-C is required. This event will be used for the required reactivity manipulation.

Time	Position	Applicant's Action or Behavior
1136.02	CREW	<p>Diagnose SG Tube Leakage:</p> <p><u>ALARMS:</u></p> <ul style="list-style-type: none"> ✓ ALB05-B03 INTMD RADIATION ALARM ✓ ALB05-C03 HIGH RADIATION RE-0724 – Primary to secondary leakage monitor (IPC) ✓ RE-0810 – SJAE low range monitor (IPC) ✓ RE-12839C – SJAE monitor (IPC) <p><u>INDICATIONS:</u></p> <p>Charging flow increases if in auto. (expect manual control) PRZR level slowly lowers.</p>
1137.44	SS <i>update</i>	Enters AOP 18009-C, Steam Generator Tube Leak and directs actions of OATC / UO listed in the following steps. (Crew Update)
	OATC / UO	1. ✓ Initiate continuous actions page.
	OATC	<p>2. Maintains PRZR level by:</p> <ul style="list-style-type: none"> ✓ a. Adjusting charging flow. ✓ b. Check PRZR level stable or rising. <p>RNOB.1) Isolating letdown (only necessary if at 120 GPM. letdown)</p> <p>RNOB.2) Start additional charging pump. (will not be necessary)</p> <p>RNOB.3) <u>IF</u> PRZR level can <u>NOT</u> be maintained greater than 9%, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Trip the Reactor. b. <u>WHEN</u> Reactor trip verified, <u>THEN</u> actuate SI. c. Go to 19000 C, E 0 REACTOR TRIP OR SAFETY INJECTION.

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 6

Event Description: SG 1 develops a 15 GPM tube leak requiring entry into AOP 18009-C. With SGTL > 5 gpm a rapid shutdown using AOP 18013-C is required. This event will be used for the required reactivity manipulation.

Time	Position	Applicant's Action or Behavior																												
	SS UO	<p>3. Try to identify affected SG:</p> <p>✓ a. Direct Chemistry attempt to identify the leaking SG by initiating 31120-C.</p> <p>✓ b. Check SG level indications stable or rising with relatively lower feed flow rate. (will not be able to see this)</p> <p>1142.51</p>																												
1144.38	OATC	<p>4. ✓ Verifies VCT level maintained with automatic makeup control</p>																												
	OATC / SS 1146.43	<p>5. ✓ Check leak rate < 5 GPM as determined by CVCS flow balance. [charging – (letdown + seal leak off)]</p> <p>(Leak rate will be ~15 GPM)</p> <p>✓ RNO a. Initiate 18013-C, Rapid Power Reduction.</p> <p>RNO b. Be in mode 3 within 1 hour.</p> <p>RNO c. Go to step 11.</p>																												
1146.51	SS Update	<p>Initiates a unit shutdown per AOP-18013-C, Rapid Down Power.</p> <table border="1"> <thead> <tr> <th>Entry</th> <th>Condition</th> <th>Target</th> <th>Approx. Time @ 3-5%/min</th> </tr> </thead> <tbody> <tr> <td>17015-D05 17015-E01</td> <td>MFPT High Vibrations</td> <td><70% RTP</td> <td>5-8 minutes</td> </tr> <tr> <td>17019-B04 18025-C</td> <td>Condenser Low Vacuum or Circ Water Pump Trip or Loss of Utility Water</td> <td>Vacuum >22.42" Hg and STABLE or RISING</td> <td></td> </tr> <tr> <td>18009-C</td> <td>SG Tube Leak (≥75 gpd with an ROC ≥30 gpd/hr)</td> <td><50% RTP within 1 hour</td> <td>10-17 minutes</td> </tr> <tr> <td>18009-C</td> <td>SG Tube Leak (≥5 gpm)</td> <td>20% RTP within 1 hour & trip reactor</td> <td>16-27 minutes</td> </tr> <tr> <td>18039-C</td> <td>Confirmed Loose Part</td> <td>20% RTP quickly</td> <td>16-27 minutes</td> </tr> <tr> <td></td> <td>SS determination based on plant conditions</td> <td>As determined by the SS</td> <td></td> </tr> </tbody> </table>	Entry	Condition	Target	Approx. Time @ 3-5%/min	17015-D05 17015-E01	MFPT High Vibrations	<70% RTP	5-8 minutes	17019-B04 18025-C	Condenser Low Vacuum or Circ Water Pump Trip or Loss of Utility Water	Vacuum >22.42" Hg and STABLE or RISING		18009-C	SG Tube Leak (≥75 gpd with an ROC ≥30 gpd/hr)	<50% RTP within 1 hour	10-17 minutes	18009-C	SG Tube Leak (≥5 gpm)	20% RTP within 1 hour & trip reactor	16-27 minutes	18039-C	Confirmed Loose Part	20% RTP quickly	16-27 minutes		SS determination based on plant conditions	As determined by the SS	
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Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 6

Event Description: SG 1 develops a 15 GPM tube leak requiring entry into AOP 18009-C. With SGTL > 5 gpm a rapid shutdown using AOP 18013-C is required. This event will be used for the required reactivity manipulation.

114845 Control SM for S/D

Time	Position	Applicant's Action or Behavior
	<p>SS</p> <p><i>S → A</i></p>	<p>1. Performs SHUTDOWN BRIEFING</p> <p>METHOD</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Auto rod control should be used. <input checked="" type="checkbox"/> Reduce Turbine Load at approximately 3% RTP per minute (approx 36 MWe) up to 5% RTP (approx 60 MWe). <i>S → U Start for 50 MWe/min</i> <input checked="" type="checkbox"/> Borate considering the calculations from the reactivity briefing sheet and BEACON. <i>Frequent Borate 300 gal shots for total of 1000 gal. A → S 300 gal (Did not say the total)</i> <input checked="" type="checkbox"/> Maintain AFD within the doghouse. <input checked="" type="checkbox"/> SS (or SRO designee) - Maintain supervisory oversight. <input checked="" type="checkbox"/> <u>All rod withdrawals</u> will be approved by the SS. <input checked="" type="checkbox"/> Approval for each reactivity manipulation is not necessary as long as manipulations are made within the boundaries established in this briefing (i.e. turbine load adjustment up to 60 MWe, etc.). <input checked="" type="checkbox"/> A crew update should be performed at approximately every 100 MWe power change. <input checked="" type="checkbox"/> If manpower is available, peer checks should be used for all reactivity changes. <p>OPERATIONAL LIMITS</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Maintain TAVG within ±6°F of TREF. If TAVG/TREF mismatch >6°F and <i>not</i> trending toward a matched condition <u>or</u> if TAVG ≤ 551°F, then trip the reactor. <i>NA</i> <input type="checkbox"/> If load reduction due to a loss of vacuum, every effort should be made to maintain the steam dumps closed. (Permissive C-9 ≥ 24.92" Hg). <p>INDUSTRY OE</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shift supervision must maintain effective oversight and exercise conservative decision making. <input checked="" type="checkbox"/> Correction of significant RCS TAVG deviations should only be via secondary plant control <u>manipulations and not</u> primary plant control manipulations. (i.e., do <u>not</u> withdraw control rods or dilute). <p><i>S → [redacted] Do NOT W/D Rods or Dilute (no feedback)?</i></p>

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 6

Event Description: SG 1 develops a 15 GPM tube leak requiring entry into AOP 18009-C. With SGTL > 5 gpm a rapid shutdown using AOP 18013-C is required. This event will be used for the required reactivity manipulation.

Time	Position	Applicant's Action or Behavior
	OATC	2. Verify rods in AUTO.
	UO	3. Reduce Turbine Load at the desired rate up to 5%/min (60 MWE/min). <i>not to exceed 60 MWE</i>
	OATC	4. Borate as necessary by initiating 13009, CVCS REACTOR MAKEUP CONTROL SYSTEM. Note to examiner: Boration steps from 13009 start on page # 32. IF, crew Emergency Borates, steps from 13009 start on page # 38.
1154.35	OATC / UO	5. Initiate the Continuous Actions Page. <i>U → A starting to ↓ Turb Load A → U wait S → A we are told</i>
	OATC / UO	6. Check desired ramp rate - LESS THAN OR EQUAL TO 5%/MIN.
	OATC	7. Maintain Tav _g within 6°F of Tref: <ul style="list-style-type: none"> ✓ a. Monitor Tav_g/Tref deviation (UT-0495). ✓ b. Verify rods inserting as required. ✓ c. Energize Pressurizer back-up heaters as necessary. <i>A → S Placed in AUTO S → A Take them to ON</i>
	OATC / UO	8. Maintain reactor power and turbine power – MATCHED. <ul style="list-style-type: none"> ✓ a. Balance reactor power with secondary power reduction using boration and control rods. ✓ b. Check rate of reactor power reduction ADEQUATE FOR PLANT CONDITIONS. ✓ c. Check RCS Tav_g GREATER THAN 551°F (TS 3.4.2). ✓ d. Check RCS Tav_g - WITHIN 6°F OF TREF.

1158.15 U → U_g at 100 MWE

1158.56 A → S started 1st Boration

1158.41 A → U Med to shutdown
 > 2°F Turb Tref

What is the Turb?

R₁ ~40°F At that time

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 6

Event Description: SG 1 develops a 15 GPM tube leak requiring entry into AOP 18009-C. With SGTL > 5 gpm a rapid shutdown using AOP 18013-C is required. This event will be used for the required reactivity manipulation.

Time	Position	Applicant's Action or Behavior
	OATC	9. ✓ Maintain PRZR Pressure AT 2235 PSIG.
	OATC	10. ✓ Maintain PRZR Level AT PROGRAM.
	UO	11. ✓ Maintain SG Level – BETWEEN 60% AND 70%.
	SS	12. ✓ Notify the System Operator that a load reduction is in progress.
	SS	13. ✓ Notify SM to make the following notifications as appropriate: Plant Management Notifications using 10000-C, CONDUCT OF OPERATIONS. 91001-C, EMERGENCY CLASSIFICATION AND IMPLEMENTING INSTRUCTIONS. 00152, FEDERAL AND STATE REPORTING REQUIREMENTS. Chemistry Technical Specification sampling for load reductions greater than 15% using 35110 C, CHEMISTRY CONTROL OF THE REACTOR COOLANT SYSTEM. QC to perform a NOPT inspection using 84008, RPV ALLOY 600 MATERIAL INSPECTIONS AND REPORTS for reactor shutdowns.
	NOTE	Event will continue until adequate power maneuver completed as determined by the NRC Chief Examiner, at that point, the SGTR will occur and the crew will trip the plant IAW 18009-C, step 3.b RNO. END OF EVENT 6, proceed to EVENT 7.

1200.58 CSFST Alarm (NOT Ann.) kept alarm
1202.33 U→S Lut Load #1 SG

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 6 Rapid Power Reduction boration steps

Event Description: Rapid Power Reduction boration steps from 13009.

Time	Position	Applicant's Action or Behavior
	OATC	<p>4.2 BORATION</p> <p style="text-align: right;"><i>1000 gal makeup</i></p> <p>4.2.1 Determine the existing RCS boron concentration from Boron Meter 1-AI-40134 OR by sample analysis.</p> <p>4.2.2 To determine the number of gallons of boric acid required to borate the RCS, perform the following.</p> <p>IF borating to required boron for a xenon free cool down, obtain the maximum boron concentration for the cool down range from the PTDB Tab 1.3.4-T1 and T2.</p> <p>OR</p> <p>IF borating to a desired boron concentration, determine the desired change in boron concentration by subtracting the existing concentration from the desired concentration.</p> <p>THEN</p> <p>Determine the amount of boric acid necessary to accomplish the desired change in boron concentration using PTDB Tab 2.3 and correct the obtained value using PTDB Tab 2.1.</p> <p>Note to examiner: The OATC may also use a Beacon Book calculation to obtain a boron addition target for the Rapid Power Reduction. For a power reduction to 70%, this will be a boron addition of 230 gallons at 30 gpm.</p>
	OATC	<p>✓ 4.2.3 Place VCT MAKEUP CONTROL 1-HS-40001B in STOP.</p>
<i>1155.50</i>	OATC	<p>✓ 4.2.4 Place VCT MAKEUP MODE SELECT 1-HS-40001A in BOR.</p>

1155.55 INT RAD Man Record

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301 **Scenario No.: 3**

Event No.: 6 Rapid Power Reduction boration steps

Event Description: Rapid Power Reduction boration steps from 13009.

Time	Position	Applicant's Action or Behavior
		<p style="text-align: center;">NOTE</p> <p>If necessary, boric acid flow may be adjusted using 1-FIC-0110 with SS concurrence. Changes to pot setting should be logged in the Control Room Log and restored at completion of activity.</p> <p style="text-align: center;"><i>A → S ? 3.28 S → A Change to 7 A → S 7.50</i></p>
	OATC	<p>4.2.5 Adjust potentiometer on Boric Acid Blender Flow Controller 1-FIC-0110 as desired and verify in AUTO.</p>
		<p style="text-align: center;">CAUTION</p> <p>Digital counter setting on BORIC ACID TO BLENDER integrator 1-FQI-0110 reads in tenth-gallon increments.</p>
	OATC	<p>4.2.6 Set BORIC ACID TO BLENDER integrator 1-FQI-0110 to the desired amount of Boric Acid.</p>

step in at 7.50

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: A DBA SGTR will occur on SG # 1 with complications. The TDAFW steam supply from SG # 1 will not close requiring the crew to trip the TDAFW pump using the Trip and Throttle Valve. In addition, after depressurizing the RCS with PRZR spray to refill the PRZR and lower break flow, a PRZR spray will not close requiring the crew to stop RCP # 4.

1203.38 [redacted] adjustment Seal Flow ↓ to maintain PRZR lvl. 1205.45 DNB in PRZR

Time	Position	Applicant's Action or Behavior
		<i>1204.31 Isolated LD 1204.48 Started CCP B</i>
	CREW	<i>1206.08 S→A Trip & SI</i> Performs Immediate Operator Actions per 19000-C, E-0 Reactor Trip or Safety Injection.
<i>1207.14</i>	SS	Makes a page announcement of Reactor Trip.
	OATC	1. Check Reactor Trip: (YES) <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Rod Bottom Lights – LIT <input checked="" type="checkbox"/> Reactor Trip and Bypass Breakers – OPEN <input checked="" type="checkbox"/> Neutron Flux – LOWERING
	UO	2. Check Turbine Trip: (YES) <ul style="list-style-type: none"> <input checked="" type="checkbox"/> All Turbine Stop Valves – CLOSED
	UO	3. Check Power to AC Emergency Buses. (YES) a. AC Emergency Busses – AT LEAST ONE ENERGIZED. <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 4160 AC 1E Busses b. AC Emergency Busses – ALL ENERGIZED. <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 4160V AC 1E Busses <input checked="" type="checkbox"/> 480V AC 1E Busses
	OATC	4. Check if SI is actuated. (YES) <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Any SI annunciators – LIT <input checked="" type="checkbox"/> SI ACTUATED BPLP window – LIT
	SS	Go to Step 6.

1207.45 S→U Isol. RCP to SG # 1

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: A DBA SGTR will occur on SG # 1 with complications. The TDAFW steam supply from SG # 1 will not close requiring the crew to trip the TDAFW pump using the Trip and Throttle Valve. In addition, after depressurizing the RCS with PRZR spray to refill the PRZR and lower break flow, a PRZR spray will not close requiring the crew to stop RCP # 4.

Time	Position	Applicant's Action or Behavior
12:08.40	SS CREW	6. <input checked="" type="checkbox"/> Initiate the Foldout Page.
	SS OATC UO	7. Perform the following: <input checked="" type="checkbox"/> • OATC Initial Actions Page (Note to examiner, start page 43) <input checked="" type="checkbox"/> • UO Initial Actions Page (Note to examiner, start page 46) NOTE: SS initiates step 8 after OATC/UO Initial Actions completed.

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: A DBA SGTR will occur on SG # 1 with complications. The TDAFW steam supply from SG # 1 will not close requiring the crew to trip the TDAFW pump using the Trip and Throttle Valve. In addition, after depressurizing the RCS with PRZR spray to refill the PRZR and lower break flow, a PRZR spray will not close requiring the crew to stop RCP # 4.

Time	Position	Applicant's Action or Behavior
1207.35	CREW OATC	<p>8. Initiate the Continuous Actions Page.</p> <p>9. Check RCS temperature stable at or trending to 557°F. <i>544°F ↑</i></p> <p>-OR-</p> <p>Without RCP(s) running – RCS WR COLD LEG TEMPERATURES. RNO (IF needed)</p> <p>9. IF temperature is less than 557°F and lowering, THEN perform the following as necessary:</p> <p>a. Stop dumping steam.</p> <p>b. Perform the following as appropriate:</p> <p>___ IF at least one SG NR level greater than 10% (32% ADVERSE), THEN lower total feed flow.</p> <p>-OR-</p> <p>___ IF all SG NR levels less than 10% (32% ADVERSE), THEN lower total feed flow to NOT less than 570 gpm.</p> <p>c. If cooldown continues, THEN close MSIVs and BSIVs.</p> <p>d. If temperature greater than 557°F and rising, THEN dump steam.</p>

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: A DBA SGTR will occur on SG # 1 with complications. The TDAFW steam supply from SG # 1 will not close requiring the crew to trip the TDAFW pump using the Trip and Throttle Valve. In addition, after depressurizing the RCS with PRZR spray to refill the PRZR and lower break flow, a PRZR spray will not close requiring the crew to stop RCP # 4.

Time	Position	Applicant's Action or Behavior
	OATC	<p>CAUTION: A PRZR PORV Block Valve which was closed to isolate an excessively leaking or open PRZR PORV should not be opened unless used to prevent challenging the PRZR Safeties.</p> <p>10. Check PRZR PORVs, Block Valves, and Spray Valves:</p> <ul style="list-style-type: none"> ✓ a. PRZR PORVs – CLOSED AND IN AUTO. (YES) ✓ b. Normal PRZR Spray Valves – CLOSED. (YES) ✓ c. Power to at least one Block Valve – AVAILABLE. (YES) ✓ d. PRZR PORV Block Valves – AT LEAST ONE OPEN. (NO) <p>RNO</p> <ul style="list-style-type: none"> ✓ d. Verify open at least one PRZR PORV Block Valve when PRZR pressure is greater than 2185 psig.
1215.20	OATC	<p>11. Check if RCPs should be stopped:</p> <ul style="list-style-type: none"> ✓ a. ECCS Pumps – AT LEAST ONE RUNNING: (YES) <ul style="list-style-type: none"> • CCP or SI Pump ✓ b. RCS pressure – LESS THAN 1375 PSIG. (NO) 1960[±] ↑ <p>RNO</p> <ul style="list-style-type: none"> b. Go to Step 12. <p>Note to examiner: It is expected RCP pressure will be above 1375 psig at this time.</p>

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: A DBA SGTR will occur on SG # 1 with complications. The TDAFW steam supply from SG # 1 will not close requiring the crew to trip the TDAFW pump using the Trip and Throttle Valve. In addition, after depressurizing the RCS with PRZR spray to refill the PRZR and lower break flow, a PRZR spray will not close requiring the crew to stop RCP # 4.

Time	Position	Applicant's Action or Behavior
	UO	12. Check SGs secondary pressure boundaries: a. SG Pressures: <input checked="" type="checkbox"/> Any lowering in an uncontrolled manner. (NO) <i>1000#</i> -OR- <input type="checkbox"/> Any completely depressurized. (NO) RNO a. Go to Step 13.

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: A DBA SGTR will occur on SG # 1 with complications. The TDAFW steam supply from SG # 1 will not close requiring the crew to trip the TDAFW pump using the Trip and Throttle Valve. In addition, after depressurizing the RCS with PRZR spray to refill the PRZR and lower break flow, a PRZR spray will not close requiring the crew to stop RCP # 4.

Time	Position	Applicant's Action or Behavior
	UO	<p>✓ 13. Check SG Tubes intact:</p> <ul style="list-style-type: none"> ✓ a. Direct Chemistry to take periodic activity samples of all SGs one at a time. <i>Start with 1 & check to see if any prerrip criteria</i> ✓ b. Secondary Radiation – NORMAL. (NO) <ul style="list-style-type: none"> • MAIN STEAM LINE MONITORS • RE-13120 (SG1) • RE-13121 (SG2) • RE-13122 (SG3) • RE-13119 (SG4) • CNDSR AIR EJCTR/STM RAD MONITORS: <ul style="list-style-type: none"> • RE-12839 • RE-12839D (if on scale) • RE-12839E (if on scale) • STM GEN LIQ PROCESS RAD: <ul style="list-style-type: none"> • RE-0019 (Sample) • RE-0021 (Blowdown) • SG sample radiation: <p>RNO</p> <p>b. Go to 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE.</p> <p>Note to examiner: 19030-C, E-3 SGTR actions are on following attachment.</p>

*S to RCT
1217.13*

1217.44 S to Update 19030

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301 **Scenario No.: 3**

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
	CREW	1. Initiate the following: <ul style="list-style-type: none"> ✓ • Continuous Actions and Foldout Page. ✓ • Critical Safety Function Status Trees per 19200-C, F-O CRITICAL SAFETY FUNCITON STATUS TREE.
	SS	2. Initiate NMP-EP-110, EMERGENCY CLASSIFICATION DETERMINATION AND INITIAL ACTION.
	OATC	3. Maintain Seal Injection flow to all RCPs – 8 to 13 GPM.
	OATC 1219.33	4. Check if RCPs should be stopped: <ul style="list-style-type: none"> a. ECCS Pumps – AT LEAST ONE RUNNING: (YES) ___ CCP or Sip Pump b. RCS pressure – LESS THAN 1375 PSIG. (NO) RNO b. IF RCS pressure lowers to less than 1375 psig prior to initiation of RCS cooldown in Step 17. THEN stop all RCPs and return to Step in effect. Go to Step 5.

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
	UO <i>1220.01</i>	5. Identify ruptured SG(s) by any of the following conditions. <input checked="" type="checkbox"/> Unexpected rise in any SG NR level. <i>SG NR ↑, no AFW flow</i> High radiation from any SG sample. High radiation from any SG steamline. High radiation from any SG blowdown line. Note to examiner: SG # 1 level will be rising with AFW flow throttled. However, this is a hard call for the candidate until the TDAFW steam supply is isolated in later steps since steam is being supplied to the TDAFW pump causing the level rise to NOT be as pronounced.
		<input checked="" type="checkbox"/> CAUTION: At least one SG should be maintained available for RCS cooldown. <i>No Feed Response from Operators</i>
	UO Critical <i>1221.00</i>	6. Isolate ruptured SG(s): <input checked="" type="checkbox"/> a. Adjust ruptured SG ARV(s) controller setpoint to 1160 psig (pot setting 7.73) <input checked="" type="checkbox"/> b. Check ruptured SG ARV(s) – CLOSED. <input checked="" type="checkbox"/> ___ PV-3000 (SG 1) <input type="checkbox"/> ___ PV-3010 (SG 2) <input type="checkbox"/> ___ PV-3020 (SG 3) <input type="checkbox"/> ___ PV-3030 (SG 4)

1221 AOS 1st Part CSFS All green

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
		<p>CAUTION: If TDAFW Pump is the only available AFW pump, maintain at least one steam supply OPEN. <i>u/s Under Stand Caution</i></p>
	<p>UO</p> <p><i>1222.44</i></p> <p>Critical</p> <p><i>1223.24</i></p>	<p>7. Close affected TDAFW Pump Steam supply valve(s):</p> <p>HV-3009 (SG 1) LP-1 MS SPLY TO AUX FW TD PMP-1.</p> <p>HV-3019 (SG 2) LP-2 MS SPLY TO AUX FW TD PMP-1.</p> <p>✓ Note to examiner: HV-3009 will NOT close.</p> <p>RNO</p> <p>7. IF at least one MDAFW Pump running, ✓ THEN trip the TDAFW Pump by closing PV-15129 using HS-15111. ✓</p>
	<p>UO</p> <p>Critical</p>	<p>8. Verify SG Blowdown Isolation Valves – CLOSED WITH HANDSWITCHES IN CLOSE POSTION.</p> <p>Note to examiner: HV-7603A.</p>
	<p>OATC</p> <p>Critical</p> <p><i>1225.13</i></p>	<p>9. Isolate flow from the ruptured SG(s) by closing its Main Steamline isolation and Bypass Valves. <i>SG #1</i></p> <p>Note to examiner: HV-3006A / B, HV-13006A / B.</p>

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
		<p>CAUTIONS: <i>Read ✓</i> <i>Case Understood ✓</i></p> <ul style="list-style-type: none"> This procedure should be performed in a timely manner to assure that break flow in the ruptured SG(s) is terminated before water enters the SGs main steam piping. Any ruptured SG that is also faulted, should remain isolated during subsequent recovery actions unless needed for RCS cooldown or SG activity sample.
<i>1220-41</i>	<i>UO</i> <i>ATC</i> Critical	<p>10. Check ruptured SG(s) level:</p> <ul style="list-style-type: none"> <i>✓</i> a. SG NR level – GREATER THAN 10% (32% ADVERSE). (YES) <i>56% 53% ↑</i> <i>✓</i> b. Step feed flow to ruptured SG(s). <p><i>✓</i> Close the TDAFW and MDAFW valves to SG # 1. <i>Already</i></p> <p>(Note to examiner: 1HS-5122A and 1HS-5139A)</p>
	UO	<p><i>✓</i> 11. Check ruptured SG(s) pressure – GREATER THAN 290 PSIG. (YES) <i>1100 #</i></p>
		<p><i>✓</i> NOTE: When the low steamline pressure SI/SLI is blocked, main steamline isolation will occur <i>type "IF"</i> if the high steam pressure rate setpoint is exceeded. <i>Read ✓ Response (No)</i></p>

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: 2012-301 **Scenario No.:** 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
	UO	12. Check if low steamline pressure SI/SLI should be blocked:
	OATC	<ul style="list-style-type: none"> ✓ a. Steam dumps – AVAILABLE. (YES) ✓ b. PRZR pressure – LESS THAN 2000 PSIG. (YES) 2007[#] ↓ c. High steam pressure rate alarms – CLEAR. (YES) d. Block low steam line pressure SI/SLI using the following: <ul style="list-style-type: none"> • HS-40068 • HS-40069
	UO	
	UO	
	UO	13. Align steam Dumps for RCS cooldown:
	UO	<ul style="list-style-type: none"> a. IF Steam Dumps are in T AVG mode, (YES) THEN <ul style="list-style-type: none"> 1) Match demand on SG Header Pressure Controller PIC-507 and SD demand meter UI-500. 2) Transfer Steam Dumps to STM PRESS mode using HS-500C. b. RCS temperature – GREATER THAN 550°F. c. As RCS cooldown is initiated, hold HS-0500A and HS-0500B in the BYPASS INTERLOCK position until RCS temperature is less than 550°F.
	UO	
	UO	14. Raise intact SG levels prior to maximum rate cooldown.

1229 I looked
↑ it was ↑

Sum I.D. these values

1232. So u Director go to Block based on ATC input on RCS pres. RCS Pres. > 2000

2nd time through? ATC performed.

1232.19

1235.04

U → Crew/234 Thru AT ARD 1.4m @ 1160 e pres. setpoint

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
	UO	<p>17. Initiate RCS cooldown: 518°F</p> <p>a. Dump steam to Condenser from intact SG(s) at maximum rate using Steam Dumps by slowly raising demand on PIC-507.</p> <p><i>1237.30 S→A Got P11 Blk SE, Get Bypass, e 550°F</i></p>
	OATC	<p>18. Check if RCS cooldown should be stopped:</p> <p>a. Core Exit TCs – LESS THAN REQUIRED TEMPERATURE. (NOT AT THIS TIME) <i>518°F NO; 532°F ↓</i></p> <p>RNO</p> <p>a. WHEN core exits are less than required, THEN perform steps 18.b and 18.c.</p> <p>Note to examiner: This will take several minutes to reach CET target temperate of either 518 or 506.</p>
<i>1240.04</i>	UO	<p><input checked="" type="checkbox"/> b. Stop RCS cooldown.</p> <p><input checked="" type="checkbox"/> c. Maintain Core Exit TCs – LESS THAN REQUIRED TEMPERATURE.</p> <p>Note to examiner: The UO will use steam dumps to maintain.</p>

8537 sec

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
	UO 1240.01 1240.01 1240.21	<p>✓ 19. Check intact SG levels:</p> <p>✓ a. NR level – AT LEAST ONE GREATER THAN 10%. (32% ADVERSE) (YES) 760%</p> <p>✓ b. Maintain NR levels between 10% (32% ADVERSE) and 65%.</p> <p>✓ c. NR level – ANY RISING IN AN UNCONTROLLED MANNER. (NO)</p> <p>RNO</p> <p>c. Go to Step 20.</p>
	OATC	<p>20. Check PRZR PORVs and Block Valves:</p> <p>✓ a. Power to PRZR PORV Block Valves – AVAILABLE. (YES)</p> <p>✓ b. PRZR PORVs – CLOSED. (YES)</p> <p>✓ c. PRZR PORV Block Valves – AT LEAST ONE OPEN. (NO)</p> <p>RNO</p> <p>c. IF Block Valve NOT closed to isolate an excessively leaking or open PRZR PORV, AND WHEN PRZR pressure is greater than 2185 psig, THEN verify open at least one PRZR PORV Block Valve.</p>

Step 4b

1242.56

~~Did not need
this step +~~
Informed crew that
SR0
Rec trip criteria does not
apply (missed before) ★

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
		<p>CAUTIONS: <i>Read ✓ No Responded ✓</i></p> <p>✓ If offsite power is lost after SI reset, action is required to restart the following ESF equipment if plant conditions require their operation.</p> <ul style="list-style-type: none"> • RHR Pumps • SI Pumps • Post-LOCA Cavity Purge Units • Containment Coolers in low speed (Started in high speed on a UV signal) • ESF Chilled Water Pumps (If CRI is reset)
1243.14	OATC ✓	21. Reset SI.
		<p>CAUTION: <i>Read ✓ No Response</i></p> <p>Repositioning Phase A Isolation Valves may cause radiation problems throughout the plant.</p>
	OATC ✓	22. Reset Containment Isolation Phase A.

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
	UO <i>1244.09</i>	<p>23. Establish Instrument Air to Containment.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> a. Instrument Air pressure – GREATER THAN 100 PSIG. (YES) <input checked="" type="checkbox"/> b. Open INSTR AIR CNMT ISO VLV HV-9378. (YES) <i>Did NOT announce expected alarm</i> <input checked="" type="checkbox"/> c. Verify PRZR Spray Valves operating as required. (YES) <p><i>I.A. Cont. Sply Line Break Panel 1006</i></p>
	OATC	<p>24. Check if RHR Pumps should be stopped:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> a. RHR Pumps – ANY RUNNING WITH SUCTION ALIGNED TO RWST. (YES) <input checked="" type="checkbox"/> b. RCS pressure – GREATER THAN 300 PSIG. (YES) <i>1621#9</i> <input checked="" type="checkbox"/> c. Stop RHR Pumps.
	OATC <i>1245.49</i>	<p>25. IF RCS pressure lowers in an uncontrolled manner to less than 300 psig. THEN restart RHR Pumps.</p>

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 7

Event Description: **DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE**

Time	Position	Applicant's Action or Behavior
	OATC	<p>26. Check if RCS cooldown should be stopped.</p> <p><input checked="" type="checkbox"/> a. Core Exit TCs – LESS THAN REQUIRED TEMPERATURE. (YES, depending on how fast crew is, if NO, the crew will wait until < 518 or 506 and stop the cooldown per the RNO of this step) <i>512°F</i></p> <p><input checked="" type="checkbox"/> b. Stop RCS cooldown.</p> <p><input checked="" type="checkbox"/> c. Maintain Core Exit TCs – LESS THAN REQUIRED TEMPERATURE.</p>
		<p>CAUTION: <i>Read ✓ Response (Don't)</i></p> <p>Ruptured SG pressure and RCS subcooling should begin to rise as RCS pressure recovers after the cooldown is stopped.</p>
	UO	<p><input checked="" type="checkbox"/> 27. Check ruptured SG(s) pressure – STABLE OR RISING. (YES) <i>1160*</i></p>
	OATC	<p>28. Check RCS Subcooling – GREATER THAN 44°F. (58°F ADVERSE) (YES) <i>99°F ↑</i></p>
	OATC	<p>29. Check all of the following:</p> <p><input checked="" type="checkbox"/> RCS pressure – GREATER THAN RUPTURED SG(s) PRESSURE. (YES) <i>1671 ↑ 1160</i></p> <p><input checked="" type="checkbox"/> PRZR level – LESS THAN 75% (52% ADVERSE). (YES) <i>02</i></p> <p><input checked="" type="checkbox"/> 30. Check Normal PRZR Spray – AVAILABLE. (YES)</p>

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: 2012-301 Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
1252.02	OATC Critical	<p>31. Depressurize RCS using Normal PRZR Spray to refill PRZR.</p> <p><input checked="" type="checkbox"/> a. Spray PRZR with maximum available spray.</p> <p>Note to examiner: OATC must fully open BOTH spray valves to satisfy the critical step.</p> <p><input checked="" type="checkbox"/> b. Normal PRZR Spray – EFFECTIVE AT REDUCING RCS PRESSURE. (YES)</p> <p>c. Go to Step 37.</p>
	OATC Critical Critical Critical	<p>37. Check if ANY of the following conditions are satisfied.</p> <p>BOTH of the following:</p> <p>1) RCS pressure – LESS THAN RUPTURED SG(s) PRESSURE.</p> <p>1257.10 2) PRZR level – GREATER THAN 9%. (37% ADVERSE)</p> <p>-OR-</p> <p>RCS Subcooling – LESS THAN 24oF (38°F ADVERSE)</p> <p>-OR-</p> <p>PRZR level – GREATER THAN 75% (52% ADVERSE)</p> <p>Note to examiner: Due to the nature of a DBA SGTR at Vogtle, it will be very close on whether it is BOTH RCP pressure & PRZR level as highlighted above OR PRZR level > 75% only. The OATC will close the spray valves based on the 1st parameter obtained.</p>

1249.03 Brief for RCS Debrief (Did she End Brief?)

Op-Test No.: 2012-301

Scenario No.: 3

Event No.: 7

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE

Time	Position	Applicant's Action or Behavior
	<p>OATC</p> <p>Critical</p>	<p>38. Terminate RCS depressurization:</p> <ul style="list-style-type: none"> ✓ a. Verify Normal PRZR Spray valve(s) – CLOSED. (NO) <p>RNO</p> <ul style="list-style-type: none"> ✓ a. IF a Normal Spray valve can NOT be closed, THEN stop RCP 4. 1258.10 ✓ IF PRZR pressure continues lowering uncontrollably, THEN stop RCP 1. <p>Note to examiner: It is expected that RCS pressure will be rising after stopping RCP # 4. If NOT, then stopping RCP # 1 will also be a critical step.</p> <ul style="list-style-type: none"> ✓ b. Verify PRZR PORV(s) CLOSED. (YES) ✓ c. Block COPS. ✓ d. Check Auxiliary Spray – IN SERVICE (NO) <p>RNO</p> <ul style="list-style-type: none"> d. Go to step 39.
1259	OATC	<p>✓ 39. Check RCS pressure – RISING. (YES)</p>
		<p style="text-align: center;">CAUTION</p> <p>ECCS FLOW SHOULD BE TERMINATED when termination criteria are satisfied to prevent overfilling of the ruptured SGs.</p>