

FINAL SUBMITTAL

**WATTS BAR EXAM
50-390, 391/2001-301**

**JANUARY 29 - FEBRUARY 6,
2001**

**FINAL AS GIVEN
OPERATOR ACTIONS**

**F.1.g - FORM ES-D-2
OPERATOR ACTIONS**

Facility: WATTS BAR Scenario No.: 1 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: The reactor is operating at approximately 90% power, BOL.

Turnover: Raise reactor power to 100% and stabilize. Raising power has been approved by the Load Dispatcher. 1A-A Auxiliary Feedwater Pump, 1A-A Containment Spray Pump, and 1A-A D/G out of service for maintenance. The train week is 'A'.

Event No.	Malf. No.	Event Type*	Event Description
-	-	-	Set up simulator to IC-148.
1	-	R - RO N - BOP	Raise reactor power from 90% to 100% and stabilize.
2	rx02e	I - RO	Loop 1 Tcold RTD fails high; requires channel to be defeated.
3	th09	C - All	Failed fuel; requires crew to establish maximum letdown.
4	rx09c	I - BOP	#3 S/G steam flow channel fails high; requires S/G #3 level control to be placed in MANUAL and select alternate channel.
5	th05c	C - All	#3 S/G tube leak.
6	rc08d	C - RO	Loop 1 Pressurizer spray valve fails open; requires reactor trip and stopping #1 RCP.
7a	th05c	M - All	#3 S/G tube ruptures; increase in leakage occurs at reactor trip.
7b	si09b	C - RO	BIT outlet valve, 1-FCV-63-25, fails to open upon SI signal; requires valve to manually opened.
8	ms03n	M - All	#3 S/G safety valve fails open; occurs after implementation of E-3.

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

TITLE: SGT/SGTR with Ruptured Steam Generator Faulted Outside Containment.

REVISION: 2

DATE: 1/16/01

PROGRAM: WBN Operator Training - Initial License

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Nuclear Training Revision/Usage Log				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	Initial Issue	11/14/00	ALL	
1	Revised to separate event 8 from 7 and 9.	01/05/01	ALL	
2	Revised based on NRC Exam Team input which deleted manual rod control on setup, corrected typos and added detail where requested in the evaluation guides. Events were also renumbered per Team input.	1/16/01	ALL	

PROGRAM: WBN Operator Training

SUBJECT: Simulator Examination Guide

TITLE: SGTL/SGTR with Ruptured Steam Generator Faulted Outside Containment.

LENGTH: ~1 Hour

REFERENCES:

1. Technical Specifications
2. SPP 10.0 (Rev 1), "Plant Operations"
3. OPDP-1 (Rev 0), "Conduct of Operations"
4. GO-4 (Rev 16), "Normal Power Operation"
5. AOI-2 (Rev 22), "Malfunction Of Reactor Control System"
6. AOI-28 (Rev 12), "High Activity In Reactor Coolant"
7. AOI-33 (Rev 20), "Steam Generator Tube Leak"
8. AOI-18 (Rev 18), "Malfunction Of Pressurizer Pressure Control System"
9. E-0 (Rev 16), "Reactor Trip Or Safety Injection"
10. ES-0.1 (Rev 11), "Reactor Trip Response"
11. E-3 (Rev 13), "Steam Generator Tube Rupture"
12. ECA-3.1 (Rev 7), "SGTR And LOCA - Subcooled Recovery"
13. FR-0 (Rev 9), "Status Trees"
14. EPIP-1 (Rev 15), "Emergency Plan Classification Flowchart"

SCENARIO OBJECTIVES:

1. Evaluate the candidates ability to use E-0 and E-3 in response to Steam Generator Tube Rupture.
2. Evaluate the candidates ability to use ECA-3.1 in response to ruptured and faulted steam generator.
3. Evaluate the candidates ability to use normal and abnormal procedures and control the plant during normal and transient conditions.

SCENARIO SUMMARY:

Initial conditions:

- 90% power, Cb = 1175 ppm, 1500 MWD/MTU. Pre-conditioned Power Level is 100%.
- Power ascension to 100% in progress, GO-4 section 5.1 step 36 in progress. Raising power has been approved by the Load dispatcher.
- MDAFW pump 1A-A, 1A-A Containment Spray Pump and 1A-A D/G out of service for maintenance.
- The Train Week is "A".

Scenario Events and Sequence:

- Set up simulator to IC-148
- 1. Raise reactor power from 90% to 100% power and stabilize.
- 2. Loop 1 Tcold RTD fails high, requiring operators to place rod control into manual and to defeat the failed channel.
- 3. Failed fuel; requires crew to establish maximum letdown flow, and address Technical Specification.
- 4. #3 S/G steam flow channel fails high, requiring S/G #3 level control to be placed into manual and selection of alternate channel. Level control will then be returned to automatic.
- 5. #3 S/G will develop a tube leak.
- 6. Loop 1 Pressurizer Spray Valve fails open requiring a reactor trip and stopping of #1 RCP.
- 7. #3 S/G tube leakage increases after reactor trip and ruptures.
- 8. #3 S/G safety valve fails open after crew has transitioned to E-3. This will lead to transition to ECA-3.1.
- 9. BIT outlet valve, 1-FCV-63-25, fails to open upon SI signal; requires valve to be manually opened.

EVENT 1 - Raise reactor power from 90% to 100% power and stabilize.

The crew continues power ascension from 90% power in accordance with General Operating Instruction, GO-4.

Malfunctions required: None

Objectives:

- Evaluates the candidates use of GOs to continue power escalation from 90% power.
- Evaluates the candidates ability to conduct operations associated with power escalation from 90% power including turbine load increase and corresponding increasing reactor power.

Success Path:

- Conduct power escalation from 90% power.

EVENT 2 - Loop 1 Tcold RTD fails high.

Loop 1 Tcold RTD fails HIGH, which causes Auctioneered High Tavg to increase. Control rod will begin insertion. Charging should be unaffected due to slow controller action. Steam Dump "D" solenoids energize. Operators should respond using AOI-2.

Malfunctions required: 1

- rx02e, Cold Leg RTD Fails

Objectives:

- Evaluate the candidates ability to implement AOI-2 Loop 1 Tcold RTD Fails High.
- Evaluates candidates ability to access control board indications to determine event in progress.

Success Path:

- Crew implements AOI-2, section 3.2, to respond to Loop 1 Tcold RTD failure, places rod control to manual, defeats Loop 1 ΔT and Loop Tavg.

EVENT 3 - Failed Fuel

Failed Fuel initiates at a .00001 severity. This requires the applicants to perform a plant shutdown per Technical Specifications and Abnormal Operating Instruction, increase flow through the CVCS Mixed Bed and place the Cation Bed in service.

Malfunctions required: 1

- **imf th09 0.00001** Failed Fuel

Objectives:

- Evaluate the candidates' ability to recognize conditions for entry and to implement AOI-28 in response to report from chem lab.
- Evaluate the candidate's ability to maximize letdown.
- Evaluate the candidate's ability to evaluate Technical Specifications and determine the need to enter the appropriate actions.

Success Path:

- Recognize entry conditions and implement AOI-28 to respond to failed fuel.
- Maximize charging/letdown flows to increase purification of RCS.
- Determine the correct actions to enter for the appropriate LCOs.

EVENT 4 - #3 S/G Steam Flow Channel Fails High

Main steam flow transmitter, 1-PT-1-21A fails high which causes SG #3 Main Reg Valve to raise feedwater flow to #3 S/G requiring the operator to take manual control of the feed reg valve.

This failure will cause increased flow and #3 SG level will begin to rise until the operator takes manual control and restores flow.

Malfunctions required: 1

- rx09c, Main steam header pressure transmitter, 1-PT-1-21A fails high.

Objectives:

- Evaluate the candidates ability to implement AOI-16 when main steam flow transmitter fails high.
- Evaluates candidates ability to manually control Main Feedwater Regulating valve.

Success Path:

- Crew implements AOI-16, section 3.6, to respond to the Main Steam Flow Transmitter circuit failure, takes manual control of the #3 Main Feedwater Regulating Valve and restores normal level in #3 S/G.

EVENT 5 - #3 S/G Tube Leak

Malfunctions required: 1

- th05c, S/G Tube Failure

Objectives:

- Evaluate the candidate's ability to diagnose a SG tube leak and respond in accordance with AOI-33, "Steam Generator Tube Leak".
- Evaluate the candidate's ability to determine if normal charging can keep up with the leak and determine if manual reactor trip and safety injection.

Success Path:

- Crew diagnoses a SG tube leak and correctly implements AOI-33.

EVENT 6 - LOOP 1 Pressurizer Spray Valve Fails Open

Malfunctions required: 1

- rc08d, Loop 1 Pressurizer Spray Valve Fail to Position.

Objectives:

- Crew implements AOI-18, to respond to the lowering of RCS pressure due to spray valve failure.
- Evaluate the candidate's ability to recognize conditions requiring manual trip of reactor due to impending low pressure in the RCS.
- Candidates ability of the need to take post trip action to stop Loop 1 RCP to stop pressurizer pressure reduction.

Success Path:

- Crew diagnoses uncontrolled RCS pressure reduction and implement AOI-18.
- Crew recognizes that a reactor trip will be required, initiates manual trip of reactor, and stops Loop 1 RCP.
- Crew implements E-0 and transitions to ES-0.1.

EVENT 7a - #3 S/G tube ruptures

Malfunctions: 1

- th05c 40 10: SG #3 Tube rupture.

Objectives:

- Evaluate the candidate's ability to diagnose a SG tube rupture and respond in accordance with E-3, SG "Tube Rupture".

Success path;

- Crew implements E-3 to identify and isolate the ruptured SG, then begin cooldown.

EVENT 7b - BIT Outlet Valve 1-FCV-63-25 Fails to Open Upon SI Signal

Malfunctions: 1

- si09b, Failure of Individual SI signal

Objectives:

- Evaluate the candidate's ability to recognize a failure of BIT Outlet Valve 1-FCV-63-25 to OPEN on SI.

Success Path:

- Recognize that BIT Outlet Valve failed to OPEN and manually opens the valve.

EVENT 8 - #3 S/G safety valve fails OPEN

Malfunctions: 1

- ms03n 75, S/G #3 1-515 Main Steam Safety Valve

Objectives:

- Evaluate the candidate's ability to recognize #3 SG safety valve failure open.
- Evaluate the candidate's ability to implement ECA-3.1, SGTR and LOCA Subcooled Recovery.

Success Path:

- Crew responds to a failed open safety valve on #3 SG and implements ECA-3.1.

CONSOLE OPERATORS INSTRUCTIONS

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
Sim Setup	rst 148, switch check, select RUN	90 % RTP, BOL, C _b =1175 ppm, 2000 MWD/MTU, Bank D at 198 steps.
0	Turn audible simulator fault alarm to "off" (down position)	Prevents unnecessarily alerting crew of a simulator problem that may not effect simulator dynamics.
0	Place "A" Train Week" sign on control board	
0	Place 1 HS-3-118A in PTL and tag 1 HS-3-118A and 1-HS-3-355.	Simulates 1A-A MDAFWP OOS for maintenance.
0	Place 1-HS-57-46a in PTL and hang HO tag	1A-A DG OOS.
0	Place 1-HS-72-27A in PTL and hang HO tag	1A-A CS pump OOS.
0	mrf csr03 off	Remove power of 1A-A CS pump
0	Close CS pump 1A-A Suction 1-HS-72-22A and hang HO tag.	Part of tagout of 1A-A CS pump
0	ior zlohs3355[1] off	Simulates 1-FCV-3-355, 1A-A MDAFWP Recirc, tagged closed.
0	ior zlohs3118a[1] off	Simulates 1A-A MDAFWP hand switch light out.

CONSOLE OPERATORS INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
0	imf eg03a ior zlohs5746a[1] off ior zlohs5746[1] off ior an:ov:07c026 on ior an:ov:07c040 on ior an:ov:07c028 on ior an:ov:07c031 off	1A-A DG OOS. DG bkr feeding SD bd HS light OFF DG bkr feeding SD bd HS light OFF Ann window 195-A ON Ann window 195-C ON Ann window 197-A ON Ann window 200-A OFF
0	Insert the following overrides and then place HO TAGs on respective valve hand switches: ior zlohs7222a[1] off ior zlohs7244a[1] off ior zlohs7239a[1] off	1-HS-72-22A green light off 1-HS-72-44A green light off 1-HS-72-39A green light off
0	imf si09b	Failure of BIT Outlet Valve to Open on SI.
0	imf si08l	Failure of 1B-B CCS Pump to auto start on SI.
0	imf rx02e (e1) 100	Loop 1 Tcold RTD fails high.
0	imf th09 (e2) 0.00001	Failed Fuel
0	imf rx09c (e3) 100	#3 S/G Main Steam Flow Transmitter, 1-LT-1-21A fails high.
0	th05c (e4) 2	SG# 3 SG tube leak (approx. 46 gpm)
0	imf rc08d (e5) 15	PZR spray valve fails to 15 % open.
0	imf ms03n (e6) 75	#3 S/G Main Steam Safety Valve fails 75 % open.

CONSOLE OPERATORS INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
After crew assumes shift:		
When requested		<p>ROLE PLAY: As STA, acknowledge request.</p> <p>ROLE PLAY: As TB AUO, acknowledge request, then report that heater level and MSR drain tanks are within normal ranges.</p>
When directed by the evaluator for Event 2.	imf itrigger	Loop 1 Tcold RTD Fails High.
		<p>ROLE PLAY: As Work Control, when contacted inform crew that as soon work package is issued MIG will initiate repairs.</p>
When directed by the evaluator for Event 3.	imf itrigger2	<p>Failed Fuel</p> <p>ROLE PLAY: Chemistry reports RCS Dose Equivalent I-131 at 80 μCi/gm. Sample has been confirmed.</p>
When contacted		<p>ROLE PLAY: As Chemistry acknowledge request to perform isotopic analysis of the RCS per CM-3.01.</p>
When contacted		<p>ROLE PLAY: Acknowledge request, then recommend placing CATION Demin in service at 75 gpm.</p>

CONSOLE OPERATORS INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
When contacted		ROLE PLAY: As AUO, acknowledge request to place Cation Demin in service at 75 gpm per SOI-62.04 Section 8.2.
When contacted		ROLE PLAY: As Chemistry Acknowledge request to monitor demin outlets for effectiveness.
When contacted concerning chemistry results.		ROLE PLAY: As Chemistry, that analysis is not complete..
When directed by the evaluator for Event 4.	imf itrigger3	#3 SG Main Steam Flow Channel Failure High.
		ROLE PLAY: As Work Control, when contacted inform crew that as soon work package is issued MIG will initiate repairs.
When directed by the evaluator for Event 5.	imf itrigger4	~46 gpm SG tube leak on #3 S/G.
		ROLE PLAY: (~10min after contacted) Chemistry identifies higher activity levels #3 SG and estimate leak at 40 gpm. ROLE PLAY: If requested as OPS Mgmt and request plant shutdown due to gross failed fuel and SGTL.
When directed by the evaluator for Event 6.	imf itrigger5	Fails Loop 1 PZR Spray valve 15% open.

CONSOLE OPERATORS INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
At reactor trip increase tube leak Event 7.	mmf th05c 40 10:	Increases #3 S/G tube leak from 46 to 900 gpm ramped over 10 minutes.
When directed by the evaluator for Event 8.	imf ittrigger6	Fails #3 Main Steam Safety Valve 1-515 to 75%.
		<i>ROLE PLAY: (When dispatched) AUO, reports steam flow from a safety valve on the North valve vault roof.</i>
When contacted	mrf si14 on	Restore power to 1-FCV-63-1.

APPENDIX A INFORMATION TO EVALUATORS

1. Assign Crew Positions: (Assign positions based on evaluation requirements for personnel.)

US - Unit Supervisor
OAC - Operator at Controls
CRO - Control Room Operator
2. Review the Shift Briefing Information with the operating crew. Provide the US with a copy of Appendix B, Shift Briefing Information.
3. Provide a copy of Appendix C to the STA during beginning of shift briefing.
4. Allow the crew to familiarize themselves with current control panel condition (up to 10 minutes).
5. Ensure recorders are inking and recording and ICS is active and updating. Note any deficiencies during shift briefing.
6. If not previously done, review any major differences between plant and simulator.
7. Review CONSOLE OPERATORS INSTRUCTION for INITIATING CUES.

OP Test No: _____ Scenario No.: <u>1</u> Event No.: <u>1</u> Page <u>1</u> of <u>1</u>			
Event Description: Crew will continue power ascension from 90% power using GO-4.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	Walks control boards down in preparation for increasing power and initiates load increase to 95%	
	STA	Hands dilution calculation to US.	
	US	Directs OAC/CRO to initiate power increase.	
	OAC	Dilutes RCS or withdraws control rods to initiate power increase.	
	CRO	Adjusts Turbine load to maintain T-avg on program. <ul style="list-style-type: none"> • Set VPL @ 100% • Determines and sets in load rate, • uses reference control button to set • depresses go to raise turbine load. 	
	OAC	Compares Tavg, ΔT and NIS to verify indications are consistent with expected values.	
	CREW	Contacts Reactor Engineering/ STA to perform 1-SI-92-1, NIS Daily Comparison.	
	CREW	Ensure Feedwater Heater and MSR drain tank level controllers are maintaining levels within normal ranges.	Cue Console Operator for Loop 1 Tcold failure high (Event 2)

OP Test No: _____ Scenario No.: 1 Event No.: 2 Page 1 of 2

Event Description: LOOP 1 Tcold RTD fails high.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	<p>Recognize failure of LOOP 1 Tcold RTD and verbalizes rod motion with no runback in progress. Places rod control in manual while informing crew of failure.</p> <p>Indications:</p> <ul style="list-style-type: none"> • Loop 1 Tavg rises • Loop 1 ΔT drops <p>Alarms:</p> <ul style="list-style-type: none"> • Protection Set Trouble • EAGLE PROC CH-I RTD Failure • Prot Set I Channel Failure 	
	US	Implements AOI-2 section 3.2 and directs crew actions.	
	OAC	Places control rods in MANUAL and verifies rod motion has stopped. Ensures Tavg and Tref within 3°F.	
	OAC	Checks Loop Tavg channels and identifies the failure as a loop 1 Tavg channel.	
	OAC	<p>Defeats failed Tavg and ΔT channels by selecting respective failed channel and pulling switch out.</p> <ul style="list-style-type: none"> • ΔT Channel Defeat (1-XS-68-2D) • T-avg Channel Defeat (1-XS-68-2M) 	
	OAC	Ensures OT ΔT recorder selected to an operable channel.	

OP Test No: _____ Scenario No.: 1 Event No.: 2 Page 2 of 2

Event Description: LOOP 1 Tcold RTD fails high.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Places control rods in Auto.	
	US	Notifies Maintenance to implement IMI-160 for Loop 1 Tavg Channel.	
	OAC	Checks Auct Tavg NORMAL on 1-TR-68-2B.	
	OAC	Checks NIS power range channels NORMAL.	
	CRO	Checks turbine impulse pressure channel (1-PI-1-73) NORMAL and Tref and Auct Tavg NORMAL on 1-TR-68-2B.	
	OAC/CRO	Monitors core power distribution parameters: <ul style="list-style-type: none"> • Power range channels • ΔFlux Indicators • T-avg • Loop ΔT • Incore TCs • Feed flow/Steam flow 	
	US/OAC	Notifies Work Control to have the instrument repaired.	
	US	Refers to Tech Specs and enters LCOs 3.3.1.6 & .7 Cond W, 3.3.1.13b Cond V, LCO 3.3.2.6b Cond N.	
	US	Returns to instruction in effect.	Cue Console Operator for Fuel Failure (Event 3)

OP Test No: _____ Scenario No.: 1 Event No.: 3 Page 1 of 2

Event Description: Failed Fuel

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Determine RCS activity is high based on Chemistry report 80 $\mu\text{Ci/gm}$ and refers to AOI-28	
	US	Directs CRO to monitor area radiation monitors and recorder 1-RR-90-1.	
	US	Notifies Chemistry to perform Isotopic Analysis of the RCS per CM-3.01.	
	CRO	Monitors area radiation monitor levels and recorder 1-RR-90-1 levels and keeps crew informed.	
	US	Checks with Chem lab to confirm high RCS activity.	
	US	Reference T/S. 3.4.16, RCS Specific Activity and Appendix "A" of AOI-28: <ul style="list-style-type: none"> DE I-131 NOT within acceptable region of Fig. 3.4.16-1 and Appendix "A". Action C requires power reduction to place plant in Mode 3 with RCS temp <500°F within the next 6 hours. 	Chemistry sample shows Dose Equivalent I-131 @ 80 $\mu\text{Ci/gm}$
	US	Directs SM to evaluate REP using EPIP-1.	
	OAC	Place CVCS Mixed Bed Demin in service at 120 gpm.	Note: Operator opens 45 gpm orifice and increases charging flow.

OP Test No: _____ Scenario No.: <u>1</u> Event No.: <u>3</u> Page <u>2</u> of <u>2</u>			
Event Description:		Failed Fuel	
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Checks with Chemistry to determine if Cation demin should be placed in service.	
	OAC	Directs AUO to place Cation demin in service.	
	US	Requests Chemistry to monitor demin outlets to determine cleanup effectiveness.	
	US	Determines that plant conditions require the plant to be placed in Mode 3 at less than or equal to 500 °F.	Cue Console Operator for #3 SG Steam Flow Channels failure high (Event 4)

OP Test No: _____ Scenario No.: 1 Event No.: 4 Page 1 of 2

Event Description: #3 S/G Steam Flow Channel Fails High 1-PI-1-21A fail High.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Recognize flow transmitter failure and inform crew. <ul style="list-style-type: none"> SG #3 Stm-FW Flow Mismatch SG Level Deviation 	
	US	Implement AOI-16, Section 3.6 and directs the actions of the crew.	
	CRO	Takes manual control of #3 SG Main Reg Valve controller, Return FW flow to match steam flow, Ensures SG level returning to normal.	
	CRO	Check S/G levels not on bypass reg valve control	
	CRO	Determines manual anti-water hammer actions are not required.	
	OAC	Checks power range N41 through N44 NORMAL.	
	CRO	Checks controlling steam flow channel NOT NORMAL . Selects 1-PI-1-21B steam flow channel, and selects 1-FI-3-90B feed flow channel.	Feed flow transmitter selection made to minimize effect on SG level if loss of voltage to channel occurs.
	CRO	Checks controlling FW flow channels NORMAL.	
	CRO	Checks press compensation channel(s) Normal.	

OP Test No: _____ Scenario No.: <u>1</u> Event No.: <u>4</u> Page <u>2</u> of <u>2</u>			
Event Description: #3 S/G Steam Flow Channel Fails High 1-PI-1-21A fail High.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Checks zero error and returns #3 SG main reg controller to AUTO.	
	US	Notifies Work Control to have failed flow transmitter repaired.	
	US	Returns to instruction in effect.	Cue Console Operator for #3 SG Tube Leak (Event 5)

OP Test No: _____ Scenario No.: 1 Event No.: 5 Page 1 of 2

Event SG #3 tube leak.
Description:

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	<p>Recognize SG tube leak by indications and alarms:</p> <p>Indications:</p> <ul style="list-style-type: none"> Increasing vacuum pump exhaust and SG blowdown radiation Decreasing PZR level, increased charging. Decreasing PZR pressure Reduced feedwater flow to #3 SG <p>Alarms:</p> <ul style="list-style-type: none"> VAC PMP EXH 1-RM-119 HI RAD PZR PRESS LO BACKUP HTRS ON PZR LEVEL HI/LO 	
	US	Implements AOI-33 and directs crew actions.	
	OAC	Establishes maximum charging flow. Opens 1-FCV-62-93 and -89 and controls charging flow to maintain PZR level 27% - 64%.	
	CRO	Places dumpback to CST in MANUAL and closes 1-LCV-2-3 using 1-LIC-2-3.	
	CRO	Monitors condenser level 1-LR-2-12 on scale.	
	US	<ul style="list-style-type: none"> Notifies Radcon and Chemistry to survey secondary plant and sample SGs for high activity. Makes plant announcement to warn personnel. 	

OP Test No: _____ Scenario No.: <u>1</u> Event No.: <u>5</u> Page <u>2</u> of <u>2</u>			
Event Description: SG #3 tube leak.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Checks condensate DI bypassed.	
	US	Directs crew to initiate a plant shutdown and refers to AOI-39.	
	OAC/CRO	Begin plant shutdown.	
	OAC	Borates RCS per AOI-39	
	CREW	Identifies leaking SG as #3 by indications or notification by Radcon or Chemistry.	
	CRO	Close SG #3 blowdown isolation valves.	Cue Console Operator for Loop 1 PZR Spray Valve Failure Open (Event 6)

OP Test No: _____ Scenario No.: 1 Event No.: 6 Page 1 of 1

Event Description: Loop 1 Pressurizer Spray Valve Fails Open

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	Recognize from alarms and indications that PZR pressure is dropping.	
	US	Implements AOI-18 and directs crew actions.	
	OAC	Determines that all PZR pressure channels are dropping. Determines PZR spray valve 68-340D is open.	
	OAC	Attempts to close pressurizer spray valve 1-PIC-68-340D manually. Determines valve will not close.	
	OAC	Ensures all pressurizer heaters energized.	
	US	Determines that pressurizer pressure cannot be maintained above 1970 psig and directs: <ul style="list-style-type: none"> • Trip Reactor • Ensure Loop #1 RCP Alt. Bkr. In MANUAL. • Stops Loop #1 RCP • GOES TO E-0. 	CRITICAL
	OAC	Manually trip reactor then ensure Loop 1 RCP alternate breaker is in Manual (pushed in) then stops Loop 1 RCP.	

OP Test No: _____ Scenario No.: <u>1</u> Event No.: <u>7a, 7b</u> Page <u>1</u> of <u>4</u>			
Event Description: <u>#3 S/G Tube Rupture, BIT Outlet Valve Failing To Open On SI.</u>			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	May determine that the SGTL leak has worsened and loss of PZR level is imminent or PZR pressure is approaching SI setpoint.	Console operator to modify SGTR (increase leak size) after reactor trip.
	US	May direct manual Safety Injection.	
	US	Implements E-0 and directs crew actions.	
	OAC	Ensures reactor trip and safety injection.	
	CRO	<ul style="list-style-type: none"> Ensures turbine trip. Ensures shutdown boards energized. 	
	CREW	Checks SI actuated.	
	CRO	Ensures AFW pump operation: <ul style="list-style-type: none"> 1B-B AFW pump & TD AFW pump running AFW LCVs in AUTO 	
	CRO	Ensures MFW isolation: <ul style="list-style-type: none"> MFW isolation valves closed MFW bypass isolations closed MFW reg and bypass reg valves closed MFWPT A and B tripped Standby MFWP stopped Cond demin pumps tripped Cond booster pumps tripped 	

OP Test No: _____ Scenario No.: <u>1</u> Event No.: <u>7a, 7b</u> Page <u>2</u> of <u>4</u>			
Event #3 S/G Tube Rupture, BIT Outlet Valve Failing To Open On SI. Description:			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Evaluates support systems using Appendix A of E-0. • Manually starts 1B-B CCS Pump.	
	US	Announces reactor trip and SI.	
	OAC	<ul style="list-style-type: none"> Monitors ECCS actuation by checking pumps running and alignments. Manually OPEN BIT outlet valve 1-FCV-63-25. Ensures cntmt isolations by checking Phase A, and CVI on status panels. Checks cntmt pressure < 2.8 psig 	Event 7b
	CRO	Ensures secondary heat sink by checking AFW flow > 410 gpm or SG levels > 10% NR.	
	OAC	<ul style="list-style-type: none"> Monitors Tavg stable or trending 557°F. Checks excess letdown valves closed. Checks PZR PORVs closed Checks PZR safety valves closed by tailpipe temp or acoustic monitor. Checks PZR sprays closed. Determines that RCPs should be on 	
	CRO	<ul style="list-style-type: none"> Checks SG pressures controlled or increasing Determines that secondary radiation is NOT normal. 	

OP Test No: _____ Scenario No.: 1 Event No.: 7a, 7b Page 3 of 4

Event Description: **#3 S/G Tube Rupture, BIT Outlet Valve Failing To Open On SI.**

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Transitions to E-3 and directs crew actions.	
	US	Refers to EPIP-1 or notifies the SM.	
	OAC	Determines that RCPs should remain in service. If RCS pressure \leq 1500 psig, then RCPs are stopped.	
	CREW	Identifies #3 SG as ruptured.	
	CRO	Controls #3 SG level: <ul style="list-style-type: none"> • Isolates AFW (may have been done previously) • Ensures MFW isolated to #3 SG • Controls #3 SG > 10% NR. • Checks TD AFW pump being supplied from SG#1. 	
	CRO	Ensures SG #3 blowdown isolated. (may have been performed previously)	
	CRO	Ensure #3 SG PORV set at 89% and in P-AUTO (may have been performed previously)	
	CRO	Closes #3 SG Main Steam Isolation Valve (MSIV).	CRITICAL

OP Test No: _____ Scenario No.: 1 Event No.: 7a, 7b Page 4 of 4

Event Description: **#3 S/G Tube Rupture, BIT Outlet Valve Failing To Open On SI.**

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	<ul style="list-style-type: none"> Places dumpback to CST, 1-LIC-2-3, in manual and closed (may have been performed previously) Maintains condenser level on scale Checks Condensate DI bypassed by checking 1-FCV-14-3 open. 	
	US	<ul style="list-style-type: none"> Ensure Radcon dispatched to survey secondary plant Notifies Chemistry to sample SGs Notifies plant personnel of potential releases 	Cue console operator for next event (safety valve failure). EVENT 8

OP Test No: _____ Scenario No.: <u>1</u> Event No.: <u>8</u> Page <u>1</u> of <u>4</u>			
Event Description: #3 S/G Main Steam Safety Valve Fails Open.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Monitors PZR PORVs closed and at least one PORV block valve OPEN. Check PZR safeties closed.	
	CRO	Check SG press controlled or increasing. Identify steam flow from the ruptured SG. Check SG PORV and MSIV closed and dispatch an AUO to locate the steam leak. Inform Crew.	
	US	Determines transition to E-2 is NOT required since actions to isolate #3 S/G have already been accomplished and continues in E-3.	
	CRO	Monitors CST and SG levels.	
	CRO	Monitors AC busses supplied by offsite power.	
	OAC	Resets SI and Phase A	
	CRO	Ensures cntmt air in service by checking pressure > 75 psig and isolation valves open. <ul style="list-style-type: none"> • 1-FCV-32-80 • 1-FCV-32-102 • 1-FCV-32-110 	

OP Test No: _____ Scenario No.: 1 Event No.: 8 Page 2 of 4

Event Description: **#3 S/G Main Steam Safety Valve Fails Open.**

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Determines RHR pumps should be stopped. (restart RHR pumps if RCS pressure drops to 150 psig or less.)	
	CRO	Ensures #3 SG isolated from intact SGs and pressure > 275 psig.	
	US/CRO	Determines target incore temp using table and pressure in #3 SG.	
	CREW	Initiates cooldown to target temperature.	CRITICAL
	CRO	Opens condenser steam dumps $\leq 25\%$ or SG #1, #2, and #4 PORVs if MSIVs are closed to begin cooldown.	
	OAC	Blocks PZR low pressure SI and low steam press SI when RCS < 1970 psig.	
	CRO	Controls steam dumps or SG #1, #2, #4 PORV to maintain RCS temp \leq target temperature.	
	CRO	Determines #3 SG pressure is decreasing and is less than 250 psig above the pressure of the intact SGs.	
	US	Transitions to ECA-3.1.	
	US	Implements ECA-3.1 and directs crew actions.	

OP Test No: _____ Scenario No.: 1 Event No.: 8 Page 3 of 4

Event #3 S/G Main Steam Safety Valve Fails Open.
Description:

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Dispatches personnel to restore power to RHR suction valve from RWST. (Appendix A of ECA-3.1)	
	OAC	Resets SI, Phase A. (May have been reset earlier).	
	CRO	Ensures cntmt air in service by checking pressure > 75 psig and isolation valves open. (may have been performed earlier). <ul style="list-style-type: none"> • 1-FCV-32-80 • 1-FCV-32-102 • 1-FCV-32-110 	
	CRO	Monitors all AC busses ENERGIZED by offsite power.	
	OAC	Checks RHR pumps off and in A-Auto. (restart RHR pumps if RCS pressure drops to 150 psig or less.)	
	OAC	Determines Containment Spray is not required.	
	CRO	Does NOT feed #3 S/G when level < 10% narrow range.	
	US	Notifies Chemistry of event status and plant conditions.	
	CRO/US	Evaluates plant equipment status using Appendix D of ECA-3.1.	

OP Test No: _____ Scenario No.: 1 Event No.: 8 Page 4 of 4

Event #3 S/G Main Steam Safety Valve Fails Open.
Description:

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Checks S/G pressure and determines that pressure is controlled.	
	CRO	Monitors CST volume greater than 200,000 gal.	
	CRO	Monitor and controls intact S/G levels > 10% and less than 50%.	
	US	Contacts Chemistry to monitor RCS boron concentration. Contacts STA to calculate shutdown margin.	
	US	Initiates RCS cooldown to cold shutdown: Determines 100° F/hr cooldown has been exceeded and maintain temperature.	
		TERMINATE THE EXERCISE WHEN THE CREW DETERMINES THAT SOAK IS REQUIRED.	

APPENDIX B

SHIFT TURNOVER CHECKLIST

Page 1 of 1

SHIFT TURNOVER CHECKLIST			
Page <u>1</u> of <u>1</u>			
<input type="checkbox"/> SM <input checked="" type="checkbox"/> US/MCR <input type="checkbox"/> UO <input type="checkbox"/> AUO <input type="checkbox"/> STA(STA Function)	Unit Unit Station	<u>1</u> <u>N/A</u> <u>WBN</u>	
Part 1 - Completed by off-going shift/Reviewed by on-coming shift:			
<ul style="list-style-type: none"> • Abnormal equipment lineup/conditions: <ul style="list-style-type: none"> 1) 1A-A DG is OOS to replace the air start motors (OOS for 6 hrs, ETR 12 hrs). LCO 3.8.1 Action B for past 6 hours 66 hours remain. 2) 1A-A AFW Pump is OOS for motor lead repair (OOS 1 hr, ETR 4 hrs) LCO 3.7.5 Action B for past hour 71 hours remain. 3) 1A-A CS Pump is OOS for oil change (OOS 1hr, ETR 2 hrs) LCO 3.6.6 Action A for the past hour 71 hours remain. • SI/Test in progress/planned: (including need for new brief) None in progress - see schedule <hr/><hr/><hr/><hr/> • Major Activities/Procedures in progress/planned: <ul style="list-style-type: none"> 1) Power ascension to 100% from 90% in progress, GO-4 Section 5.1 Step 36 in progress. Raising power has been approved by Load Dispatcher. RCS Boron 1175 ppm. Continue power ascension. PCP 100%. 2) Mechanical Maint. Is replacing the air start motors on 1A-A DG 3) Electrical Maint. Is repairing the motor leads on 1A-A AFW Pump. 4) Mechanical Maint. Working on 1A-A CS Pump (Oil Change). • Radiological changes in plant during shift: None <hr/><hr/><hr/><hr/> 			
Part 2 - Performed by on-coming shift			
<input type="checkbox"/> A review of the Operating Log since last held shift or 3 days, whichever is less (N/A for AUOs) <input type="checkbox"/> A review of the Rounds sheets/Abnormal readings (AUOs only) Review the following programs for changes since last shift turnover: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Standing Orders <input type="checkbox"/> Immediate required reading </div> <div> <input type="checkbox"/> LCO(s) in actions (N/A for AUOs) <input type="checkbox"/> TACF (N/A for AUOs) </div> </div>			
Part 3 - Performed by both off-going and on-coming shift			
<input type="checkbox"/> A walkdown of the MCR control boards (N/A for AUOs) <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div>Relief Time: _____</div> <div>Relief Date: _____</div> </div>			

APPENDIX C

STA CALCULATIONS

Page 1 of 1

Current plant conditions:

- 2000 MWD/MTU
- Boron concentration 1175 ppm.
- Control Bank D at 198 steps.
- Reactor Power at 90%.

Amount of primary water required to increase reactor power to 100%, and withdraw control rods to 215 steps.

- Power defect from 90 to 100% power = 165 pcm
- Rod bite left to 215 steps = 50 pcm.
- Amount of reactivity to be added by primary water = 115 pcm.
- Differential boron worth at 1175 ppm = 6.8 pcm/ppm
- PPM change required = $115 / 6.8 = 17$ ppm.
- Gallons of primary water required for 17 ppm change = 903 gallons.

STA CALCULATIONS (Answer Key)

Page 1 of 1

Current plant conditions:

- 2000 MWD/MTU
- Boron concentration 1175 ppm.
- Control Bank D at 198 steps.
- Reactor Power at 90%.

Amount of primary water required to increase reactor power to 100%, and withdraw control rods to 215 steps.

- BOL Power defect from 90 to 100% power = 165 pcm
(from NUPOP Figure 7-9)
- Rod bite left to 215 steps = 50 pcm
(from NUPOP Figure 6-23)
- Amount of reactivity to be added by primary water = 115 pcm
- Differential boron worth at 1175 ppm = 6.8 pcm/ppm
(from NUPOP Figure 6-22)
- PPM change required = $115 / 6.8 = 17$ ppm.
- Gallons of primary water required for 17 ppm change = 903 gallons
(from TI-59, boron tables, for 588 degrees and 1180 ppm)
(532 + 265 + 106 = 903 gallons)

Facility: <u>WATTS BAR</u>	Scenario No.: <u>2</u>	Op-Test No.: _____	
Examiners: _____ Operators: _____ _____ _____			
<p><u>Initial Conditions:</u> Reactor is operating at 8 - 10 % with standby MFW pump in service and on bypass reg valves. Power ascension in progress to 13 - 15% power to place the first turbine driven Main Feedwater pump in service.</p> <p><u>Turnover:</u> Raise power to 13 - 15% power then place the first turbine driven Main Feedwater pump in service. After the feed pump has been placed in service resume power ascension to 20 - 25% power to swap to main feed reg valves. The train week is 'A'. 1A-A Auxiliary Feedwater Pump, 1A-A Containment Spray Pump, and 1A-A D/G out of service for maintenance.</p>			
Event No.	Malfunction No.	Event Type*	Event Description
-	-	-	Set up simulator in IC-149.
1	ni07b	I - RO I - BOP	Power Range Channel II fails high; requires S/G #2 & #3 level control to be placed and controlled in MANUAL.
2a	-	R - RO	Raise reactor power to 13 - 15%.
2b	-	N - BOP	Place 1A Turbine Driven Main Feedwater pump in service.
3	rx05a	I - RO	PZR level channel I fails low; requires manual control of charging and isolates letdown which must be reestablished.
4	cc06a cc03b	C - BOP	1A CCS overcurrent trip - 1B CCS Pump fails to auto start; requires manual start of the 1B CCS pump.
5a	rd02	C - RO	Continuous control rod insertion (requires manual reactor trip).
5b	rp55b	C - BOP	Failure of 1B AFW Pump to auto start; requires manual start of pump.
6a	th02b	M - All	Loop 2 Cold Leg LOCA after transition to ES-0.1
6b	si09I	C - RO	Failure of Auto Phase A; requires manual actuation
6c	cs04b	C - RO	Failure of "B" Train Contmt Spray Valve to auto open on ØB. Failure of "B" Train Contmt Spray Valve to auto open on ØB.
7	rh01a	C - RO	1A-A RHR Pump trips during swapover to Containment Sump.

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

TITLE: Power Escalation from 8%, Place MFP In Service, Continuous Rod
Insertion, Cold Leg LOCA, Containment Sump Recirculation.

REVISION: 2

DATE: 1/16/01

PROGRAM: WBN Operator Training - Initial License

PREPARED BY: Albert V. White / 01/16/01
(Operations Instructor) (Date)

VALIDATION /
BY: _____
(Operations Instructor) (Date)

REVIEWED BY: _____ /
(Lead Operations Instructor) (Date)

APPROVED BY: _____ /
(Operations Training Manager) (Date)

CONCURRED: _____ /
(Operations Superintendent) (Date)

Nuclear Training Revision/Usage Log				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	Initial Issue	11/16/00	ALL	
1	Separated events 1 and 2, and identified events 8 and 11 in comments column. Revised Cntmt Spray steps in ES-1.3.	01/05/01	ALL	
2	Revised based on NRC Exam Team input which corrected typos and added detail where requested in the evaluation guides. Events were also renumbered per Team input.	1/16/01	ALL	

PROGRAM: WBN Operator Training

SUBJECT: Simulator Examination Guide

TITLE: Power Escalation from 8%, Place MFP In Service, Continuous Rod Insertion, Cold Leg LOCA, Containment Sump Recirculation.

LENGTH: ~1 Hour

REFERENCES:

1. Technical Specifications
2. SPP 10.0 (Rev 1), "Plant Operations"
3. OPDP-1 (Rev 0), "Conduct of Operations"
4. GO-3 (Rev 6), "Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power"
5. SOI-2&3.01 (Rev 52), "Condensate And Feedwater System"
6. AOI-4 (Rev 20), "Nuclear Instrumentation Malfunctions"
7. AOI-15 (Rev 18), "Loss Of Component Cooling Water (CCS)"
8. AOI-2 (Rev 22), "Malfunction Of Reactor Control System"
7. E-0 (Rev 13), "Reactor Trip or Safety Injection"
8. ES-0.1 (Rev 11), "Reactor Trip Response"
9. E-1, (Rev 10), "Loss Of Reactor Or Secondary Coolant"
10. FR-0 (Rev 9), Status Trees
11. FR-Z.1 (Rev 7), High Containment Pressure
12. FR-P.1 (Rev 8), Pressurized Thermal Shock
13. ES-1.3 (Rev 9), Transfer To Containment Sump
14. EPIP-1 (Rev 15), Emergency Plan Classification Flowchart

SCENARIO OBJECTIVES:

1. Evaluate the candidates in their use of Abnormal Operating Instructions to address various failures or transients.
2. Evaluate the candidates use of E-O to respond to manual reactor trip and subsequent transition to ES-0.1 'Reactor Trip Response'.
3. Evaluate the candidates in their transition back to E-0 and use of E-1 in response to a Cold Leg LOCA
4. Evaluate the candidates in their use of ES-1.3 to place ECCS in Sump Recirculation.

SCENARIO SUMMARY:

Initial conditions:

- Reactor is operating at 8 - 10% with Standby MFW pump in service on Bypass regulating valves, Cb = 914 ppm, 1500 MWD/MTU.
- Power Ascension in progress to 13 - 15% power to place the first turbine driven Main Feedwater pump in service.
- After the feed pump has been placed in service resume power ascension to 20-25% power to swap to main reg valves.
- The Train Week is "A".
- MDAFW pump 1A-A, 1A-A Containment Spray Pump and 1A-A D/G out of service for maintenance.

Scenario Events and Sequence:

- Set up simulator to IC-149
- 1. Power Range Channel II fails high; requires S/G #2 level control to be placed and controlled in MANUAL.
- 2. Raise reactor power to 13 -15%.
- 3. Place 1A Turbine Driven Main Feedwater pump in service.
- 4. PZR level channel I fails low; requires manual control of charging and isolates letdown which must be reestablished.
- 5. 1A CCS overcurrent trip - 1B CCS pump fails tom auto start; requires manual start of the 1B CCS pump.
- 6. Continuous control rod insertion (requires manual reactor trip).
- 7. Loop 2 Cold Leg LOCA after transition to ES-0.1.
- 8. Failure of Auto Phase A Train A; requires manual actuation.
- 9. Failure of 1B-B AFW Pump to auto start; requires manual start of pump.
- 10. 1A RHR pump trips during swapper to Containment Sump.
- 11. Failure of "B" Train Cntmt Spray Valve to auto open on ØB.

EVENT 1 - Power Range Channel II fails high

Power Range Channel N-42 fails HIGH causing auctioneered high NI to rise, causing increased FW flow to all four steam generators and program level on SG #3 and #4 to increase.

Malfunctions required: 1

- ni07b, Power Range Channel II Failure

Objectives:

- Evaluates the CREW use of AOI-4 during bypass reg valve operation.
- Evaluates the candidate's ability to control feedwater to steam generators utilizing bypass reg valve controllers.

Success Path:

Implement AOI-4, taking appropriate FW reg controllers to manual, defeat power range channel N-42, return bypass reg valve controllers to automatic. Continue to control SGs #2 and #3 NI Bias controls in manual during subsequent load increase.

EVENT 2a - Raise Power to 13 - 15 %

Increase reactor power from 8 to 10% to 13 to 15%

Malfunctions required: NONE

Objectives:

- Evaluates the CREW use of GO-3 during bypass reg valve operation.
- Evaluates the candidate's ability to control feedwater to steam generators utilizing bypass reg valve controllers and manual control of SGs 2 & 3 NIS Bias Controllers.

Success Path:

Maintain NIS Bias controllers for S/Gs 2 & 3 matched with NIS Bias controllers for S/Gs 1 & 4 as reactor power is increased.

EVENT 2b - Place 1A Turbine Driven Feedwater Pump In Service

1A Main Feedwater Pump turbine is started up and standby Main feedwater Pump is shutdown and placed in standby.

Malfunctions required: NONE

Objectives:

- Evaluates the CREW use of GO-3 for placing the first Main Feedwater Pump Turbine in service and shutting down the standby feedwater pump.
- Evaluates the candidate's ability to startup a main feedwater pump turbine and shutdown standby main feedwater pump without causing large fluctuations in Steam Generator Levels.

Success Path:

Startup 1A Main Feedwater Pump Turbine per SOI- 2 & 3.01, shutdown standby main feedwater pump and place in standby per SOI-2 & 3.01. Make preparations for starting Main Turbine roll.

EVENT 3 - PZR LEVEL CHANNEL I FAILS LOW

Controlling PZR level transmitter, 1-LT-68-339, fails low which affects automatic level control, turns off PZR heaters, and isolates letdown. This requires the candidates to take manual control of PZR level and restore heaters and letdown.

Malfunctions required: 1

- rx05a, PZR level transmitter, 1-LT-68-339 (channel I) fails low.

Objectives:

- Evaluate the candidates' ability to recognize conditions for entry and to implement AOI-20 in response to PZR level transmitter, 1-LT-68-339 (channel I) failing low.
- Evaluate the candidate's ability to manually control PZR level.
- Evaluate the candidate's ability to stabilize the plant and restore PZR heaters and letdown to service.
- Evaluate the candidate's ability to evaluate Technical Specifications and determine the need to enter the appropriate actions.

Success Path:

- Recognize entry conditions and implement AOI-20 to respond to the level transmitter failure.
- Take manual control of PZR level and restore to program.
- Successfully restore PZR heaters and letdown.
- Determine the correct actions to enter for the appropriate LCOs.

EVENT 4 - 1A CCS Overcurrent Trip.

CCS pump 1A-A trips, CCS pump 1B-B fails to start on low pressure.

Malfunctions required: 2

- cc06a, CCS pump 1A-A trip
- cc03b, CCS pump 1B-B fails to start on low pressure

Objectives:

- Evaluate the candidate's response to a CCS pump trip and their ability recognize entry and implement AOI-15.
- Evaluate the candidate's ability to restore "A" train CCS.
- Evaluate the candidate's ability to evaluate Technical Specifications and determine the need to enter the appropriate actions.

Success Path:

- Recognize CCS pump 1A-A trip and that 1B-B fails to start on low system header pressure.
- Recognize entry conditions and implement AOI-15 for the CCS pump trip.
- Manually start 1B-B CCS pump and restore "A" train CCS.
- Evaluate and enter appropriate Technical Specifications.

EVENT 5a - CONTINUOUS ROD INSERTION

Malfunctions required: 1

- rd02, Continuous Rod Insertion

Objectives

- Evaluate the candidate's ability to verify control rods malfunction during startup

Success Path:

- Recognize continuous rod insertion without demand for movement (rod control in manual), initiate manual reactor trip and transition to E-0.

EVENT 5b - FAILURE OF 1B-B AFW PUMP TO AUTO START

Malfunctions required: 1

- rp55b Failure of 1B-B AFW Pump to auto start.

Objectives:

- Evaluate the candidate's ability to recognize a failure of Start signal for 1B-B AFW Pump, and start the pump manually.

Success Path:

- Crew diagnoses failure of 1B-B AFW pump to start, and then get the pump started manually.

EVENT 6a - LOOP 2 Cold Leg LOCA

Malfunctions required: 1

- th02b LOCA Cold Leg Loop 2

Objectives:

- Evaluate the candidate's ability to diagnose a large break LOCA, transition back to E-0 from ES-0.1 and then correctly implement E-1, Loss of Reactor or Secondary Coolant.
- Evaluate the candidate's ability to respond to high containment pressure in accordance with FR-Z.1, High Containment Pressure, when required by the Status Trees.

- Evaluate the candidate's ability to recognize conditions requiring transfer of RHR to the containment sump and transition to E-1.3, "Transfer to RHR Containment Sump".

Success Path:

- Crew diagnoses large break LOCA, transitions to E-0 and correctly implements E-1.
- Crew responds to containment high pressure in accordance with FR-Z.1.
- Crew recognizes RWST level < 34% and containment sump > 11% and transitions to E-1.3.

EVENT 6b - PHASE A CONTAINMENT ISOLATION FAILS TO ACTUATE

Malfunctions required: 1

- si09I Failure Phase A Train A Contmt Isolation Signal

Objectives:

- Evaluate the candidate's ability to recognize a failure of Phase A to actuate and initiates manual Phase A.

Success Path:

- Crew diagnoses failure of Phase A to actuate and initiates manual Phase A

EVENT 6c - Failure of "B" Train Contmt Spray Valve to auto open on ØB.

Malfunctions: 1

- cs04b, Failure of Containment Spray Valve to actuate on High-High containment pressure.

Objectives:

- Evaluate the candidate's ability to respond to failure of "B" Train Containment Spray valve failure to open on ØB actuation.

Success Path:

- Crew recognizes that "B" Train Containment Spray Valves has failed to open and opens valve from the control board.

EVENT 7 - 1A-A RHR PUMP TRIP

Malfunctions: 1

- rh01a

Objectives:

- Evaluate the candidate's ability to respond to loss of 1A-A during Sump Swapover Sequence per ES-1.3.

Success Path:

- Crew continues with Sump Swapover in accordance with ES-1.3.

CONSOLE OPERATORS INSTRUCTIONS

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
Sim Setup	rst 149, switch check, select RUN NOTE: IC 149 has been setup for this scenario. Continue with set up if IC 149 is unavailable.	8-10 % RTP, BOL, C _b =1585 ppm, 1500 MWD/MTU
0	Turn audible simulator fault alarm to "off" (down position)	Prevents unnecessarily alerting crew of a simulator problem that may not effect simulator dynamics.
0	Place "A" Train Week" sign on control board	
0	Place 1 HS-3-118A in PTL and tag 1 HS-3-118A and 1-HS-3-355.	Simulates 1A-A MDAFWP OOS for maintenance.
0	Place 1-HS-57-46a in PTL and hang HO tag	1A-A DG OOS.
0	Place 1-HS-72-27A in PTL and hang HO tag	1A-A CS pump OOS.
0	mrf csr03 off	Remove power of 1A-A CS pump
0	Close CS pump 1A-A Suction 1-HS-72-22A and hang HO tag.	Part of tagout of 1A-A CS pump
0	ior zlohs3355[1] off	Simulates 1-FCV-3-355, 1A-A MDAFWP Recirc, tagged closed.
0	ior zlohs3118a[1] off	Simulates 1A-A MDAFWP handswitch light out.

CONSOLE OPERATORS INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
0	imf eg03a ior zlohs5746a[1] off ior zlohs5746[1] off ior an:ov:07c026 on ior an:ov:07c040 on ior an:ov:07c028 on ior an:ov:07c031 off	1A-A DG OOS. DG bkr feeding SD bd HS light OFF DG bkr feeding SD bd HS light OFF Ann window 195-A ON Ann window 195-C ON Ann window 197-A ON Ann window 200-A OFF
0	Insert the following overrides and then place HO TAGs on respective valve hand switches: ior zlohs7222a[1] off ior zlohs7244a[1] off ior zlohs7239a[1] off	1-HS-72-22A green light off 1-HS-72-44A green light off 1-HS-72-39A green light off
0	Imf cc03b	Prevents automatic start of CCS pump 1B-B.
0	imf cs04b	Failure of Cntmt Spray Valve 1-FCV-72-2 to auto open on ØB.
0	imf si10m	Failure of 1A-A EGTS Fan to auto start on SI.
0	imf ni07b (e1) 120	Power Range Channel II fails High.
0	imf rx05a (e2) 0	PZR Level transmitter, 1-LT-68-339, fails low.
0	Imf cc06a (e3)	CCS pump 1A-A trip.
0	imf rd02 (e4) 10	Continuous Control Rod Insertion.
0	imf si09I	Containment Phase A Train A Auto Isolation Failure

CONSOLE OPERATORS INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
0	imf rp55b	Auxiliary Feedwater Pump 1B-B Auto Start Inhibit
0	imf th02b (e5) 35 5:	Cold Leg LOCA Loop 2 over 5 minute ramp (large break LOCA on loop 2 cold leg)
0	imf rh01a (e6)	1A-A RHR Pump Trip
When requested by evaluator for EVENT 1	imf itrigger	Power Range Channel II fails High.
		ROLE PLAY: As Work Control, when contacted inform crew that as soon work package is issued MIG will come to control room before tripping bistables and then will initiate repairs for Power range channel N-42.
When requested:	mrf fwr21 close	ROLE PLAY: As AUO, acknowledge request to close standby MFP discharge isolation valve 1-FCV-3-205. Wait 2 minutes, then report that 1-FCV-3-205 is closed.
When requested:	mrf fwr21 open	ROLE PLAY: As AUO, acknowledge request to open standby MFP discharge isolation valve 1-FCV-3-205. Wait 1 minute, then report that 1-FCV-3-205 is open.
When requested by evaluator for EVENT 3	imf itrigger2	PZR Level transmitter, 1-LT-68-339, fails low.

CONSOLE OPERATORS INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
		ROLE PLAY: As Work Control, when contacted inform the crew that as soon work package is issued MIG will initiate repairs.
When requested by evaluator for EVENT 4	Imf itrigger3	CCS pump 1A-A trip.
		<p>ROLE PLAY: As CB AUO, if requested to investigate, report the breaker indicates Amptector actuated.</p> <p>ROLEPLAY: As AB AUO, if requested to investigate, report a distinct odor of overheated insulation in the area.</p> <p>ROLE PLAY: As Work Control or FIN crew, when contacted that as soon work package is complete, Electrical Maintenance will initiate repairs.</p>
When requested by evaluator for EVENT 5	imf itrigger4	Continuous Rod Insertion
When requested by evaluator for EVENT 6	imf itrigger 5	RCS LOCA Cold Leg Loop 2 ramps in over 5 minutes.
When requested		ROLE PLAY: As AUO, when contacted to open Ice Condenser ACBs using Appendix A of FR-Z.1, acknowledge request, wait 2 minutes, then report that Ice Condenser ACBs are open per Appendix A of FR-Z.1.

CONSOLE OPERATORS INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
When requested		ROLE PLAY: As AUO, when contacted to check low analyzer temp lights NOT LIT, acknowledge request, wait 2 minutes, then report that Low temp lights on H2 Analyzers are NOT LIT.
When requested	mrf sir01 on mrf sir14 on mrf sir06 on	ROLE PLAY: As AUO, when requested to perform Appendices A, B, C, and D of E-1. Acknowledge requests, wait 2-4 minutes, then report that Appendices A, B, C, and D of E-1 have been completed.
When requested by evaluator for EVENT 7	lmf itrigger6	1A-A RHR pump trip.
		<p>ROLE PLAY: As CB AUO, if requested to investigate, report the breaker indicates instantaneous overcurrent actuated.</p> <p>ROLE PLAY: As AB AUO, if requested to investigate, report a distinct odor of overheated insulation in the area.</p> <p>ROLE PLAY: As Work Control or FIN crew, when contacted that as soon work package is complete, Electrical Maintenance will initiate repairs.</p>

APPENDIX A INFORMATION TO EVALUATORS

1. Assign Crew Positions: (Assign positions based on evaluation requirements for personnel.) Log the positions on Appendix C.

US - Unit Supervisor
OAC - Operator at Controls
CRO - Control Room Operator

2. Review the Shift Briefing Information with the operating crew. Provide the US with a copy of Appendix B, Shift Briefing Information.
3. Allow the crew to familiarize themselves with current control panel condition (up to 10 minutes).
4. Ensure recorders are inking and recording and ICS is active and updating. Note any deficiencies during shift briefing.
5. If not previously done, review any major differences between plant and simulator.
6. Review CONSOLE OPERATORS INSTRUCTION for INITIATING CUES.

OP Test No: _____ Scenario No.: _____ Event No.: 1 Page 1 of 2

Event Description: Power Range Channel N-42 Failure High

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	Walks down control boards.	Cue Console Operator for NI PR Channel N-42 failure high EVENT 1
	OAC	<p>Recognize failure of Power Range Channel N-42 and informs crew of failure.</p> <p>Indications:</p> <ul style="list-style-type: none"> • Power Range N-42 rising • Loop 1 ΔT lowers <p>Alarms</p> <ul style="list-style-type: none"> • Power Range Overpower Rod WD Stop • Power Range Channel Deviation • Power Range Flux High 	
	US	Implements AOI-4 section 3.4 and directs crew actions.	
	OAC	Checks control rods in MANUAL and verifies no rod motion.	
	OAC	Determines that N-42 has failed high	
	CRO	Places Bypass FW Reg valves for S/G 2 and S/G 3 into MANUAL, returns S/G level to program.	Note: Operator may also place Bypass Reg valves for S/G 1 and 4 to manual.
	CRO	Places NIS bias controllers for S/Gs 2 and 3 into manual and adjusts their output to match S/Gs 1 and 4, returns all Bypass Reg Valve to AUTO.	

OP Test No: _____ Scenario No.: _____ Event No.: 1 Page 2 of 2

Event Description: Power Range Channel N-42 Failure High

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Maintain T-avg and T-ref within 3°F. Determines that Tavg/Tref is not within 3°F due to turbine not tied to grid.	
	OAC	Ensures 1-NR-145 recording an operable power range channel. Ensures 1-XS-68-2B, for ΔT recorder is selected to operable power range channel.	
	OAC	Defeats affected PRM Functions: <ul style="list-style-type: none"> • Defeats upper & lower detector current comparator for N-42. • Bypasses rod stop for N-42. • Bypasses power mismatch circuit for N-42. • Defeats comparator channel comparator for N-42. • Resets positive rate trip for N-42. 	
	US	Contacts Work Control and requests Instrument Maintenance to trip failed channel bistables, and initiate repairs on N-42.	
	US	Refers to Tech Specs due to NI failure and enters LCOs 3.3.1.2a Condition D, LCO 3.3.1.3.a Condition E, LCO 3.3.1.6 Condition W, LCO 3.3.1.16 c & d Condition S, LCO 3.3.1.16.e Condition R.	
	US	Contacts Operations Duty Manager and Rx Engineering of power range channel N-42	
	US	Returns to GO-3	

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>2a, 2b</u> Page <u>1</u> of <u>1</u>			
Event Description:		Raise power to 13% to 15% and start 1A Main Feedwater Pump Turbine	
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Initiates action to increase power to 13-15%.	
	OAC	Withdraws control rods or dilutes in increase power.	
	CRO	Refers to SOI-2 & 3.01 for starting 1A MFP.	
	CREW	Stabilize power between 13% and 15% in preparation for rolling the turbine.	
	CRO	Places one MFWP in operation per SOI-2&3.01.	Event 2b
	CRO	Shutdown the Standby MFP per SOI-2&3.01.	
	US	Directs CRO to Place 1A MFP speed controller to auto.	
			Cue Console Operator for pwr level transmitter failure Event 3

OP Test No: _____ Scenario No.: 2 Event No.: 3 Page 1 of 3

Event Description: Controlling PZR level transmitter 1-LT-68-339 fails low.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Recognize PZR level channel I failure and informs crew. <ul style="list-style-type: none"> Channel I level indication fails low. PZR level alarms. <ul style="list-style-type: none"> PZR LEVEL HI/LO [92-A] PZR LEVEL LO-HTRS OFF & LETDOWN CLOSED [92-C] 	
	OAC	Recognizes letdown isolation and may isolate charging. (1-HS-62-90A & 1-HS-62-91A).	
	US	Implement AOI-20 and directs the actions of the crew.	
	OAC	Checks PZR level program signal NORMAL, recorder 1-LR-68-339. (green pen)	
	OAC	Determines that 1-XS-68-339E is selected to FAILED channel.	
	OAC	Determines that channel I, 1-LT-68-339 failure is low.	
	OAC	Places 1-HIC-62-93A in Manual, and closes 1-FCV-62-89.	
	OAC	Maintains RCP seal flow between 8 and 13 gpm with 1-HIC-62-93A.	
	OAC	Selects operable channel for controlling channel using 1-XS-68-339E (selects LI-68-335 B320). Ensure operable channel selected for recording with 1-XS-68-339B. (Channel 339 not selected.)	

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>3</u> Page <u>2</u> of <u>3</u>			
Event Description:		Controlling PZR level transmitter 1-LT-68-339 fails low.	
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	<p>Establishes normal charging and letdown per attachment 1 of AOI-20</p> <ul style="list-style-type: none"> • Closes 1-FCV-62-89. • Ensures Charging Pump running • Opens/check open 1-FCV-62-90 and 1-FCV-62-91. • Ensures 1-FCV-62-85 or -86 open • Adjusts 1-FCV-62-93 to maintain 8-13 gpm seal flow. • Ensure letdown isolation valves OPEN 1-FCV-62-69A, 1-FCV-62-70A and 1-FCV-62-77A. • Place Letdown Hx temperature control valve (1-HIC-62-78A) in MANUAL at 25% open. • Places letdown pressure control (1-HIC-62-81A) in MANUAL at 25% open. • Establish charging flow 75 gpm or greater & 8-13 gpm seal injection flow to each RCP. • Establish letdown by opening letdown orifices as needed. 1-FCV-62-73 Or 74, or 72 or 76. • Adjust letdown pressure (1-HIC-62-81A) to ~320psig and place in AUTO. • Place temperature control valve in AUTO. (1-HIC-62-78A • Returns PZR level to program • Return charging flow (1-HIC-62-93A to AUTO 	

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>3</u> Page <u>3</u> of <u>3</u>			
Event Description:		Controlling PZR level transmitter 1-LT-68-339 fails low.	
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	With charging 1-FCV-62-93 in MANUAL, restores PZR level to PROGRAM, ensures control on program, places PZR heaters back in service and then returns charging flow controller to AUTO.	
	US	Notifies work control to remove failed channel from service.	
	US	Evaluates Tech Specs and enters LCOs 3.3.1.9 Condition X and 3.3.3 Condition A.	Cue Console Operator for trip if 1A-A CCS pump EVENT 4

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>4</u> Page <u>1</u> of <u>2</u>			
Event Description: 1A-A CCS Pump Overcurrent trip with failure of 1B-B CCS pump to auto start.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Recognizes trip of 1A-A CCS Pump. <ul style="list-style-type: none"> • Low flow alarms on CCS panel • All three lights lit on pump handswitch. 	
	CRO	May recognize auto start failure and starts 1B-B CCS Pump. Places 1A-A CCS Pump in Pull-To-Lock.	
	OAC	Responds to control board alarms and may bypass CVCS mixed bed demin due to high temperature on letdown.	
	US	Implements AOI-15, section 3.2 and directs actions.	
	CRO	Checks any CCS pump TRIPPED or running pump NOT pumping forward. Ensures at least one A train pump running. Manually starts 1B-B CCS Pump (may have been performed earlier) Checks any Train B header supply pump running and pumping forward.	
	CRO	Places any non-operable or tripped CCS pump in STOP/PULL-TO-LOCK. (1A-A CCS pump placed in P-T-L).	
	CRO	Check TWO U-1 Train A header supply pumps. Only 1B-B CCS pump is running. Ensures either CCS from RHR HX A, 1-FCV-70-156 or SFP HX A supply 0-FCV-70-197 is closed to avoid excessive flow.	

OP Test No: _____ Scenario No.: <u> 2 </u> Event No.: <u> 4 </u> Page <u> 2 </u> of <u> 2 </u>			
Event Description: 1A-A CCS Pump Overcurrent trip with failure of 1B-B CCS pump to auto start.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Checks flows returning to normal and surge tank level 57% - 85%.	
	CRO	Resets alarms and verifies that both CCS trains are operating normally using Appendix A.	
	US/CRO	Dispatches personnel to check pump and relay targets.	
	CRO	Checks only one CCS pump running per train and one TBBP running. Stops one TBBP and returns handswitch to A-P Auto.	
	US	Evaluates Tech Specs and enters LCO 3.7.7. action A.1.	
	US	Notifies Work Control to initiate repairs on tripped pump.	Cue Console Operator for continuous rod insertion EVENT 5

OP Test No: _____ Scenario No.: 2 Event No.: 5a, 5b Page 1 of 2

Event Continuous Rod Insertion and Failure of 1B-B AFW to Auto Start
Description:

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Identify rod insertion with rods in MANUAL and inform crew. Advocate a reactor trip.	
	US	Implement AOI-2 and direct crew actions (may not actually reference AOI).	
	US	Direct a manual reactor trip.	
	OAC	Initiate a Manual Reactor Trip.	
	US	Implement E-0 and direct crew actions.	
	CRO/OAC	Perform immediate actions of E-0.	
	OAC	Ensures reactor trip.	
	CRO	Ensures turbine trip.	
	CRO	Ensures 6.9kV shutdown boards energized.	
	OAC	Checks SI not actuated and not required.	
	US	Transitions to ES-0.1	
	CREW	Implements Status Tree monitoring.	
	OAC	Monitors RCS temperature stable or trending to 557°F.	
	CRO	Ensures AFW pump operation. Identifies failure of AFW 1B-B to start and informs crew: <ul style="list-style-type: none"> manually starts 1B-B AFW pump. checks AFW LCV in AUTO. 	Event 5b

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>5a, 5b</u> Page <u>2</u> of <u>2</u>			
Event Description: Continuous Rod Insertion and Failure of 1B-B AFW to Auto Start			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Ensures MFW isolation: <ul style="list-style-type: none"> • MFW isolation valves closed • MFW bypass isolations closed • MFW reg and bypass reg valves closed • MFWPT A and B tripped • Standby MFWP stopped • Cond demin pumps tripped • Cond booster pumps tripped 	
	OAC	Verifies all control rods fully inserted	
	US	Announces reactor trip over PA system	
	CRO	Monitors CST volume greater than 200,000 gal.	Cue Console Operator for cold leg LOCA EVENT 6

OP Test No: _____ Scenario No.: 2 Event No.: 6a, 6b, 6c Page 1 of 7

Event Loop 2 Cold Leg LOCA with Failure Of Auto A Train Phase A Cntmt
Description: Isolation and B Train Cntmt Spray Valve.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	Determines major transient in progress based on Alarms and Indications.	
	OAC	Announces Auto SI on Low PZR Pressure (May manual SI)	
	US	May direct manual SI prior to auto actuation.	
	US	Returns to E-0 and directs crew actions.	
	CRO/OAC	Perform immediate actions of E-0.	
	OAC	Ensures reactor trip.	
	CRO	Ensures turbine trip.	
	CRO	Ensures 6.9kV shutdown boards energized.	
	OAC	Checks SI actuated.	
	OAC	Remove RCPs from service based on RCS pressure <1500 psig or on ØB.	
	CRO	Ensures AFW pump operation and MFW isolation. 1B-B AFW Pump was manually started.	
	CRO	Evaluate SI support systems using E-0, Appendix A. • Manually starts 1A-A EGTS Fan	

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>6a, 6b, 6c</u> Page <u>2</u> of <u>7</u>			
Event Loop 2 Cold Leg LOCA with Failure Of Auto A Train Phase A Cntmt Description: Isolation and B Train Cntmt Spray Valve.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Announces reactor trip/safety injection over PA system	
	OAC	Monitor ECCS operation checking pumps running and alignments: <ul style="list-style-type: none"> • Charging pumps running • Charging pump alignment • RHR pumps running • SI pumps running • BIT alignment 	
	OAC	Ensures CNTMT isolation. Identifies failure of Phase A Train A to actuate and informs crew and manually actuates Phase A Train A Cntmt Isolation. (May have been performed earlier).	Event 6b
	OAC	Determines that 1-FCV-72-2 CNTMT Spray Valve has failed to Auto Open, informs crew and opens valve . Verifies Phase B has been completed: <ul style="list-style-type: none"> • Ensure Cntmt Spray pump B running. • Ensure Cntmt Spray Flow B Train • Ensures Phase B isolation complete • Verifies RCPs stopped • Ensures MSIVs closed • Places/checks steam dump controls in OFF • Monitors air return fan start 10 minutes after Phase B initiation. 	Event 6c Critical Task: Bolded item.
	US	Implements FR-Z.1 if cntmt press greater than 2.8 psig when status trees are monitored.	Evaluator: Go to page 35 for FR-Z.1 steps then return.

OP Test No: _____ Scenario No.: 2 Event No.: 6a, 6b, 6c Page 3 of 7

Event Loop 2 Cold Leg LOCA with Failure Of Auto A Train Phase A Cntmt
Description: Isolation and B Train Cntmt Spray Valve.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Ensure secondary heat sink available. • AFW flow • SG level	
	OAC	Monitors RCS temperature stable or trending to 557°F.	
	OAC	Checks excess letdown valves closed (1-FCV-62-54 and 1-FCV-62-55).	
	OAC	Check PZR safety valves, PORVs and PZR spray valves closed.	
	OAC	Determines RCP should not remain in service due to phase B or RCS pressure \leq 1500 psig. (May have been stopped earlier.	
	CRO	Check S/G pressures controlled or increasing.	
	CRO	Checks secondary side radiation normal.	
	OAC	Check containment conditions and informs crew they are abnormal. • Cntmt temp, press, radiation will all indicate abnormal.	
	US	Transitions to E-1 and directs crew actions until RWST level decreases to less than 34%.	
	OAC	Checks RCPs off.	

OP Test No: _____ Scenario No.: 2 Event No.: 6a, 6b, 6c Page 4 of 7

Event Loop 2 Cold Leg LOCA with Failure Of Auto A Train Phase A Cntmt
Description: Isolation and B Train Cntmt Spray Valve.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Refers to EPIP-1 or notifies the SM.	
	US	Implements FR-P.1 when RCS cooldown identified by Status Trees.	
	OAC	Checks RCS pressure \leq 150 psig	
	OAC	Verifies RHR is injecting to RCS.	
	US	Transition back to E-1 from FR-P.1 when it is determined that RCS pressure is <150 psig and RHR is injecting.	
	CRO	Checks S/G pressure and determines that pressure are not indicative of a faulted S/G.	
	CRO	Checks secondary side radiation normal.	
	CRO	Monitors CST level >200,000 gallons.	
	CRO	Monitor intact SG levels. • At least one SG NR > 10%[25%ADV] • NR SG level < 50% and controlled.	
	CRO	Places Hydrogen analyzers in service to monitor concentration.	
	OAC	Checks PZR PORVs closed and at least one block valve open.	
	OAC	When Cntmt pressure is < 2.0 psig: Reset Cntmt Spray signal, stops Cntmt Spray pump 1B-B, and closes discharge valve 1-FCV-72-2.	

OP Test No: _____ Scenario No.: 2 Event No.: 6a, 6b, 6c Page 5 of 7

Event Loop 2 Cold Leg LOCA with Failure Of Auto A Train Phase A Cntmt
Description: Isolation and B Train Cntmt Spray Valve.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC/CRO	Ensures pocket sump pumps stopped (1-HS-77-410 & 1-HS-77-411).	
	CREW	Determines SI cannot be terminated and continues ECCS flow.	
	OAC	Resets SI.	
	US/OAC	Determines RHR pumps should not be stopped.	
		<i>NOTE: Crew may transition to ES-1.3 when RWST/CNTMT sump conditions warrant. This may happen at some point during the following steps</i>	
	CRO	Determines shutdown board alignment.	
	CRO	Initiates BOP realignment using AOI-17. (may be done as conditions permit)	
	OAC	Determines RCS pressure decreasing or stable.	
	CRO	Checks SG pressures.	
	CRO/OAC	Dispatches AUO to perform 480V board breaker alignment. (App.A-D)	
	CRO	Determines if hydrogen igniters should be energized. Energizes igniters if conditions permit.	
	OAC	Ensures RHR available for cntmt sump recirculation. Determines 1B-B RHR pump is available.	

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>6a, 6b, 6c</u> Page <u>6</u> of <u>7</u>			
Event Loop 2 Cold Leg LOCA with Failure Of Auto A Train Phase A Cntmt Description: Isolation and B Train Cntmt Spray Valve.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO/OAC	Begins evaluation of plant equipment using E-1 Appendix E.	
	CRO	Checks Auxiliary Building radiation.	
	US	Notifies Chemistry of event status and plant conditions.	
	OAC	Determines that RHR is injecting to RCS	
	OAC	Prepares for switchover to containment sump.	
	CREW	Determines that auto swapover to cntmt sump has initiated or RWST level < 34%.	
	US	Implements ES-1.3, "Transfer to containment Sump".	
	OAC	Checks both RHR pumps running.	
	CRO	Establish CCS to RHR heat exchangers. <ul style="list-style-type: none"> • Opens 1-FCV-70-156 • Checks open 1-FCV-70-153 • Closes 0-FCV-70-197 • Checks CCS flows & Surge Tank Levels. 	
	OAC	Check RWST level <34% and Cntmt sump level ≥16.1%.	

OP Test No: _____ Scenario No.: 2 Event No.: 6a, 6b, 6c Page 7 of 7

Event Loop 2 Cold Leg LOCA with Failure Of Auto A Train Phase A Cntmt
Description: Isolation and B Train Cntmt Spray Valve.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Ensure auto switchover complete: <ul style="list-style-type: none"> Checks that 1-FCV-63-72 and 1-FCV-63-73 are open. Checks that 1-FCV-74-3 and 1-FCV-74-21 are closed. 	
	OAC	Monitors RWST level greater than 8%.	
	OAC	Determine cntmt spray can be stopped: (may have been performed earlier) <ul style="list-style-type: none"> Resets Cntmt spray signal. Stops CS pump 1B-B. Closes FCV-72-2 	
	OAC	Perform transfer to RHR cntmt sump: <ul style="list-style-type: none"> (#1) Isolates SIP mini-flow. (1-FCV-63-3, 1-FCV-63-175, 1-FCV-63-4) (#2) Isolates RHR crossties. (1-FCV-74-33, 1-FCV-74-35) (#3) Aligns CCP and SIP supply from RHR. (1-FCV-63-6, 1-FCV-63-7, 1-FCV-63-177) (#4) Aligns RHR discharge to CCP and SIP suction. (1-FCV-63-8, 1-FCV-63-11) (#5) Resets SI. (#6) Isolates CCP suction from RWST. (1-LCV-62-135 and 1-LCV-62-136 with HSs pushed in.) (#7) Isolates SIP suction from RWST. (1-FCV-63-5) (#8) Isolates RHR suction from RWST. (1-FCV-63-1). 	<p>Critical Task</p> <p>Monitors respective ECCS flows and motor amps as respective RWST suction valves are closed.</p> <p>Cue Console Operator for trip of 1A-A RHR pump EVENT 7</p>

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>7</u> Page <u>1</u> of <u>1</u>			
Event Description: Trip of 1A-A RHR pump			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Identifies 1A-A RHR pump trip. Places handswitch in PTL. Dispatches AUOs to investigate.	
	US	Contacts TSC to evaluate starting CS pumps to pump RWST to Cntmt sump. Checks Cntmt Sump level is > 8%, determines to wait on TSC feedback on pumping RWST to CNTMT Sump. Goes to step 28.	
	US	Record time for determination of time for hot leg recirc.	
		TERMINATE THE EXERCISE	

OP Test No: _____ Scenario No.: <u>2</u> Event No.: <u>6a, 6b, 6c</u> Page <u>1</u> of <u>1</u>			
Event Description: Evaluation Guide for Implementation of FR-Z.1.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Implements FR-Z.1 if cntmt press greater than 2.8 psig when status trees are monitored.	
	CRO/OAC	Implement actions of FR-Z.1 as directed: <ul style="list-style-type: none"> • Ensures Cntmt Spray operation. Opens 1-FCV-72-2 (may have been performed earlier), prior to exiting FR-Z.1. • Ensures Cntmt isolation. • Ensures MSIVs closed. • Places Steam Dump Controls to OFF • Ensures RCPs stopped. • Ensures EGTS and ABGTS running. • Ensures Cntmt air return fans auto start 10 min after ØB. 	Note: 1A-A CS has HO TAG Event 6c Critical Task: Bolded item.
	CRO/OAC	FR-Z.1 actions continued: <ul style="list-style-type: none"> • Checks S/G pressures controlled and all greater than 120 psig. • Directs opening ice condenser AHU ACBs per Appendix A FR-Z.1. • Places H₂ analyzers and H₂ igniters in service. • Determines RHRS should not be placed in service at this time. • Determines hydrogen concentration does not require placing H₂ recombiners in service 	
	US	Transition back to E-0 upon completion of FR-Z.1.	

APPENDIX B

SHIFT TURNOVER CHECKLIST

Page 1 of 1

SHIFT TURNOVER CHECKLIST							
Page <u>1</u> of <u>1</u>							
<input type="checkbox"/> SM <input checked="" type="checkbox"/> US/MCR <input type="checkbox"/> UO <input type="checkbox"/> AUO <input type="checkbox"/> STA(STA Function)	Unit Unit Station	<u>1</u> <u>N/A</u> <u>WBN</u>					
Part 1 - Completed by off-going shift/Reviewed by on-coming shift:							
<ul style="list-style-type: none"> • Abnormal equipment lineup/conditions: <ul style="list-style-type: none"> 1) 1A-A DG is OOS to replace the air start motors (OOS for 6 hrs, ETR 12 hrs). LCO 3.8.1 Action B for past 6 hours 66 hours remain. 2) 1A-A AFW Pump is OOS for motor lead repair (OOS 1 hr, ETR 4 hrs) LCO 3.7.5 Action B for past hour 71 hours remain. 3) 1A-A CS Pump is OOS for oil change (OOS 1hr, ETR 2 hrs) LCO 3.6.6 Action A for the past hour 71 hours remain. • SI/Test in progress/planned: (including need for new brief) None in progress - see schedule <hr/><hr/><hr/> • Major Activities/Procedures in progress/planned: <ul style="list-style-type: none"> 1) Power ascension to 100% in progress, GO-3 Section 5.2 Step 7 in progress. Raise power to 13-15% to place 1A MFP in service. A hot start is being performed per SOI-2&3.01 Section 5.10 has been completed through 35e. Continue power ascension. Boron 1585 ppm. PCP 100% 2) Mechanical Maint. Is replacing the air start motors on 1A-A DG 3) Electrical Maint. Is repairing the motor leads on 1A-A AFW Pump. 4) Mechanical Maint. Working on 1A-A CS Pump (Oil Change). • Radiological changes in plant during shift: None <hr/><hr/><hr/> 							
Part 2 - Performed by on-coming shift							
<input type="checkbox"/> A review of the Operating Log since last held shift or 3 days, whichever is less (N/A for AUOs) <input type="checkbox"/> A review of the Rounds sheets/Abnormal readings (AUOs only) Review the following programs for changes since last shift turnover: <table style="width: 100%; margin-top: 5px;"> <tr> <td><input type="checkbox"/> Standing Orders</td> <td><input type="checkbox"/> LCO(s) in actions (N/A for AUOs)</td> </tr> <tr> <td><input type="checkbox"/> Immediate required reading</td> <td><input type="checkbox"/> TACF (N/A for AUOs)</td> </tr> </table>				<input type="checkbox"/> Standing Orders	<input type="checkbox"/> LCO(s) in actions (N/A for AUOs)	<input type="checkbox"/> Immediate required reading	<input type="checkbox"/> TACF (N/A for AUOs)
<input type="checkbox"/> Standing Orders	<input type="checkbox"/> LCO(s) in actions (N/A for AUOs)						
<input type="checkbox"/> Immediate required reading	<input type="checkbox"/> TACF (N/A for AUOs)						
Part 3 - Performed by both off-going and on-coming shift							
<input type="checkbox"/> A walkdown of the MCR control boards (N/A for AUOs) Relief Time: _____ Relief Date: _____							

Facility: <u>WATTS BAR</u>	Scenario No.: <u>3</u>	Op-Test No.: _____	
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
<p><u>Initial Conditions:</u> Reactor operating at 75% power, BOL, with power ascension to 95% in progress.</p> <p><u>Turnover:</u> Raise power from 75% to 95% power. Raising power has been approved by the Load Dispatcher. 1A-A Auxiliary Feedwater Pump, 1A-A Containment Spray, and 1A-A D/G out of service for maintenance. The train week is 'A'. Rod control is in MANUAL to allow Instrument Maintenance to work in the logic cabinet.</p>			
Event No.	Malfunction No.	Event Type*	Event Description
-	-	-	Set up simulator to IC-150.
1	-	R - RO N - BOP	Raise power from 75% to 95% power.
2	rw01a	C - BOP	A-A ERCW Pump trips.
3	rx07a	I - RO	Pressurizer pressure transmitter, 1-PT-68-340, fails high.
4	rx20	I - BOP	Main Steam header pressure transmitter, 1- PT-1-33, fails low.
5	cv01a	C - RO	1A-A CCP trips.
6a	ms01c	M - All	#3 S/G Main Steam line break inside containment; ramps in over 3 minutes.
6b	cs01b	C - RO	1B-B Containment Spray pump trips; results in loss of Containment Spray.
6c	fw22b	C - BOP	1B-B Auxiliary Feedwater (AFW) pump airborne.
6d	fwr32	C - BOP	Unable to isolate AFW to the #3 S/G from the MCR.
6e	rc07a	C - RO	Pressurizer PORV fails open at reactor trip.

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

TITLE: Load increase from 75% with Loss of ERCW, Steam Line Break Inside Containment

REVISION: 2

DATE: 1/15/01

PROGRAM: WBN Operator Training - Initial License

PREPARED BY:	Albert V. White	/	01/15/01
	(Operations Instructor)		(Date)
VALIDATION BY:		/	
	(Operations Instructor)		(Date)
REVIEWED BY:		/	
	(Lead Operations Instructor)		(Date)
APPROVED BY:		/	
	(Operations Training Manager)		(Date)
CONCURRED:		/	
	(Operations Superintendent)		(Date)

Nuclear Training Revision/Usage Log				
REVISION NUMBER	DESCRIPTION OF REVISION	DATE	PAGES AFFECTED	REVIEWED BY
0	Initial Issue	11/13/00	ALL	
1	Identified events 6, 7, 8, 9, 10 in the body so as to make it easier to follow the scenario flow.	1/05/01	24-29	
2	Revised based on NRC Exam Team input which deleted manual rod control on setup, corrected typos and added detail where requested in the evaluation guides. Events were also renumbered per Team input.	1/15/01	ALL	

PROGRAM: WBN Operator Training

SUBJECT: Simulator Examination Guide

TITLE: Load increase from 75% with Loss of ERCW, Steam Line Break
Inside Containment

LENGTH: ~1 Hour

REFERENCES:

1. Technical Specifications
2. SPP 10.0 (Rev 1), "Plant Operations"
3. OPDP-1 (Rev 0), "Conduct of Operations"
4. GO-4 (Rev 16), "Normal Power Operation"
5. AOI-13 (Rev 21), "Loss Of Essential Raw Cooling Water"
6. AOI-18 (Rev 18), "Malfunction of Pressurizer Pressure Control System."
7. AOI-16 (Rev 21), "Loss of Normal Feedwater"
6. AOI-38 (Rev 5) "Main Steam or Feedwater Line Leak"
7. E-0 (Rev 16), "Reactor Trip or Safety Injection"
8. E-2 (Rev 9) "Faulted Steam Generator Isolation"
9. E-1 (Rev 10), "Loss Of Reactor Or Secondary Coolant"
10. FR-Z.1 (Rev 7), "High Containment Pressure."
11. ES-1.1 (Rev 9) "SI Termination"
12. EPIP-1 (Rev 15), Emergency Plan Classification Flowchart

SCENARIO OBJECTIVES:

1. Evaluate the candidates in their use of various Abnormal Operating Instructions to address various failures or transients.
2. Evaluate the candidates in their use of AOI-38 and E-0 in response to a Main Steam Line break inside containment.
3. Evaluate the candidates in their use of FR-Z.1 in response to High Containment Pressure.
4. Evaluate the candidates ability to Utilize ES-1.1 to terminate SI and stabilize plant following SG #3 dryout.

SCENARIO SUMMARY:

Initial conditions:

- Reactor is operating at 75% power, Cb =1214 ppm, 1500 MWD/MTU.
- Power Ascension to 95% in progress. , GO-4 section 5.1 step 34 in progress. Raising power has been approved by the Load dispatcher.
- MDAFW pump 1A-A, 1A-A Containment Spray Pump and 1A-A D/G out of service for maintenance. Rod Control is in MANUAL to allow Instrument Maintenance to work in the logic cabinet.

Scenario Events and Sequence:

- Set up simulator to IC-150
- 1. Raise power from 75% to 95% power.
- 2. A-A ECRW Pump trips.
- 3. Pressurizer pressure transmitter, 1-PT-68-340, fails high.
- 4. Main Steam header pressure transmitter 1-PT-1-33 fails low.
- 5. Centrifugal Charging Pump 1A-A trips.
- 6. #3 S/G Main Steam line break inside containment; ramps in over 3 minutes.
- 7. 1B-B Containment Spray pump trips; resulting in loss of Containment Spray.
- 8. 1B-B Auxiliary Feedwater (AFW) pump airborne.
- 9. Unable to isolate AFW to the #3 S/G from the MCR.
- 10. Pressurizer PORV fails open at reactor trip.

EVENT 1 - Raise reactor power from 75% to 95% power and stabilize.

The crew continues power ascension from 75% power in accordance with General Operating Instruction, GO-4.

Malfunctions required: None

Objectives:

- Evaluates the candidates use of GOs to continue power escalation from 75% power.
- Evaluates the candidates ability to conduct operations associated with power escalation from 90% power including turbine load increase and corresponding increasing reactor power.

Success Path:

- Conduct power escalation from 75% power.

EVENT 2 - A-A ERCW Pump Trips

A-A ERCW pump trips which lowers "A" Train ERCW pressure and flows resulting in numerous alarms on back panels.

Objectives:

- Evaluates the candidate's ability to respond to a failure outside the horse shoe.
- Evaluates operators ability assess board indications and execute AOI-13.

Malfunctions required: 1

- rw01a, A-A ERCW pump trip.

Success Path:

- Crew restores "A" Train ERCW pressure and flow by starting B-A ERCW pump and placing applicable emergency power selector switch to B-A ERCW pump.

EVENT 3 - PZR PRESSURE TRANSMITTER FAILS LOW

Controlling PZR pressure transmitter, 1-PT-68-340, fails high.

Malfunctions required: 1

- rx07A, PZR pressure transmitter 1-PT-68-340 fails high.

Objectives:

- Evaluates the candidate's ability to respond to a failure of the controlling PZR pressure transmitter high.
- Evaluates candidate's ability to manually control PZR pressure.
- Evaluates the candidate's ability to evaluate Technical Specifications associated with the failure.

Success Path:

- Candidates implement AOI-18 to respond to the PZR pressure transmitter failure.
- Takes manual control of PZR pressure control and stabilizes the plant.
- Determines correct Technical Specifications LCO actions.

EVENT 4 - MAIN STEAM HEADER PRESSURE TRANSMITTER 1-PT-1-33
Fails LOW

Main steam header pressure transmitter, 1-PT-1-33 fails low which causes Main FW pump speed to lower which requires the operator to take manual control. This failure will cause lowered feedwater flow and SG levels will begin to lower until the operator takes manual control and restores flow.

Malfunctions required: 1

- rx20, Main Steam Header Pressure Transmitter 1-PT-1-33 failure to position.

Objectives:

- Evaluate the candidates ability to implement AOI-16 when main steam pressure transmitter fails low.
- Evaluates candidates ability to manually control Main FW pump speed.

Success path:

- Crew implements AOI-16, section 3.7, to respond to the Main Feedwater Pump control circuit failure, takes manual control of the pumps and stabilizes the plant.

EVENT 5 - 1A-A CCP Trips

Trip of Centrifugal Charging Pump (CCP) results in loss of charging and may result in crew removing letdown from service. Requires placing CCP 1B-B in service and entering applicable LCO actions.

Malfunctions required - 1

- cv01a, CCP 1A-A trips

Objectives:

- Evaluate the candidate's ability trip of CCP 1A-A and take actions to place CCP 1B-B in service.
- Evaluate the candidate's ability to determine appropriate Technical Specifications LCO actions.

Success Path:

- Start 1B-B CCP and restore normal charging and letdown.
- Recognize conditions for Technical Specifications LCO entry and ensure appropriate actions met.

EVENT 6a - #3 S/G MAIN STEAM LINE BREAK INSIDE CONTAINMENT

Main Feedwater line break on common header downstream of high pressure heaters.

Malfunctions required - 1

- ms01c, #3 S/G Steam Line Break inside containment

Objectives:

- Evaluate the candidate's response to a Main Steam line break and their ability recognize entry conditions and implement AOI-38, "Main Steam or Feedwater Line Leak".

Success Path:

- Recognize Main Steam line break.
- Recognize entry conditions and implement AOI-38.
- Recognize imminent SI due to containment pressure rise initiate reactor trip or respond to automatic reactor trip and SI.

EVENT 6b - 1B-B Containment Spray Pump Trips

1B-B Containment Spray pump trips 3 minutes after Containment Phase B actuation resulting in total loss of containment spray.

Malfunctions required: 1

- cs01b, 1B-B CS pump trips

Objectives:

- Evaluate crews response to total loss of containment spray with steam line break inside containment.

Success Path:

- Candidates monitor containment pressure conditions and ensure containment air return fans start 9 minutes after Phase B.

EVENT 6c - MDAFW PUMP 1B-B AIR BOUND

AFW pump 1B-B airbound upon start. Operators should initiate venting the pump to restore it to service.

Malfunctions: 1

- fw22b, 1B-B AFW pump airbound.

Objectives:

- Evaluate the candidate's ability to recognize MDAFWP 1B-B malfunction on startup.

Success Path:

- Candidates recognizes that MDAFWP 1B-B air bound upon startup
CRO stops MDAFWP 1B-B

EVENT 6d - Unable to isolate AFW to #3 S/G from the main control room.

AFW flow continues to the faulted S/G until candidates dispatch AUO to locally isolate LCV.

Malfunctions required - fwr32 valve gag for 1-LCV-3-172.

Objectives:

- Evaluate the candidate's ability to isolate AFW flow to faulted S/G per E-2.

Success Path:

- Candidates dispatch AUO to locally isolate 1-LCV-3-172.
- Candidates continue AFW flow to SGs 1, 2, 4.

EVENT 6e - Pressurizer PORV fails open at Reactor Trip

PORV 68-334 fails open at reactor trip.

Malfunctions required - rc07a PORV 68-334 fail to position.

Objectives:

- Evaluate the candidate's ability to recognize failure of PORV open during major steam line break inside containment.

Success Path:

- Candidates close PZR PORV block valve for failed open PORV.

CONSOLE OPERATOR INSTRUCTIONS

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
Sim Setup	rst 150, switch check, select RUN	75 % RTP, 1500 EFPD, C _b =1214 ppm, 1500 MWD/MTU
0	Turn audible simulator fault alarm to "off" (down position)	Prevents unnecessarily alerting crew of a simulator problem that may not effect simulator dynamics.
0	Place "A" Train Week" sign on control board	
0	Place 1 HS-3-118A in PTL and tag 1 HS-3-118A and 1-HS-3-355.	Simulates 1A-A MDAFWP OOS for maintenance.
0	Place 1-HS-57-46a in PTL and hang HO tag	1A-A DG OOS.
0	Place 1-HS-72-27A in PTL and hang HO tag	1A-A CS pump OOS.
0	Place Rod Control in MANUAL.	Simulates turnover information that IM's working in LOGIC Cabinet.
0	mrf csr03 off	Remove power of 1A-A CS pump
0	Close CS pump 1A-A Suction 1-HS-72-22A and hang HO tag.	Part of tagout of 1A-A CS pump
0	ior zlohs3355[1] off	Simulates 1-FCV-3-355, 1A-A MDAFWP Recirc, tagged closed.
0	ior zlohs3118a[1] off	Simulates 1A-A MDAFWP handswitch light out.

CONSOLE OPERATOR INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
0	imf eg03a ior zlohs5746a[1] off ior zlohs5746[1] off ior an:ov:07c026 on ior an:ov:07c040 on ior an:ov:07c028 on ior an:ov:07c031 off	1A-A DG OOS. DG bkr feeding SD bd HS light OFF DG bkr feeding SD bd HS light OFF Ann window 195-A ON Ann window 195-C ON Ann window 197-A ON Ann window 200-A OFF
0	Insert the following overrides and then place HO TAGs on respective valve hand switches: ior zlohs7222a[1] off ior zlohs7244a[1] off ior zlohs7239a[1] off	1-HS-72-22A green light off 1-HS-72-44A green light off 1-HS-72-39A green light off
At Rx Trip	imf fw22b (e19)	1B-B AFW Pump is steambound. ROLE PLAY: As AUO, when asked to investigate, report that the pump is steam-bound and you are attempting to vent it at this time.
0	imf rc07a (e19) 100	PZR PORV 1-PCV-68-334 fails open at reactor trip.
0	imf si08j	1B-B D/G fails to auto start on SI.
0	imf rw01a (e1)	1A-A ERCW pump trip.
0	imf rx07a (e2) 100	PZR pressure transmitter, 1-PT-68-340, fails high.
	imf rx20 (e3) 0	Main steam PT 1-33 fails low and causes MFPT speed to decrease.

CONSOLE OPERATOR INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
0	imf cv01a (e4)	Centrifugal Charging Pump 1A trip.
0	imf ms01c (e5) 3 3:00	MSL break inside containment on #3 SG ramps to 3% over 3 minutes.
15 sec after the ØB	imf cs01b (e13 15)	15 seconds after ØB the 1B-B CS pump trips.
After crew assumes shift:		
When contacted		ROLE PLAY: As AUO, report that 1-LCV-106A is controlling properly.
When directed by the evaluator for EVENT 2	imf itrigger	<p>1A-A ERCW pump trip.</p> <p>ROLE PLAY: As AUO, when contacted, ERCW 1A-A pump has tripped on IOC.</p> <p>ROLE PLAY: As AUO, acknowledge request to close 1A-A ERCW discharge valve, after ≈ 5 minutes, report that discharge valve for 1A-A ERCW pump is closed and there is no damage evident at the pump.</p>
~5 minutes		ROLE PLAY: As Work Control, when contacted inform crew that as soon work package is issued MIG will initiate repairs.
When directed by the evaluator for EVENT 3	imf itrigger2	Pressurizer Pressure transmitter, 1-PT-68-340, fails high.
		ROLE PLAY: As Work Control, when contacted inform the crew that as soon work package is issued MIG will initiate repairs.

CONSOLE OPERATOR INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
When directed by the evaluator for EVENT 4	imf itrigger3	Main steam PT 1-33 fails low
		ROLE PLAY: As Work Control, when contacted, inform the MCR that the failed 1-PT-1-33 will be added to the work list for the IMs.
When directed by the evaluator for EVENT 5.	imf itrigger4	Centrifugal Charging Pump 1A-A trips.
		ROLEPLAY: As AUO, ~ 2 minutes after requested to check the pump status, report that it tripped on instantaneous overcurrent. ROLE PLAY: As Work Control, when contacted inform the crew that as soon work package is issued Electrical Maintenance will initiate repairs.
When directed by the evaluator for EVENT 6.	imf itrigger5	Main Steam line break #3 S/G inside Containment.
Manually insert at reactor trip	mrf fwr32 100	Local Valve Gag for 1-LCV-3-172.
Manually modify steam leak size after reactor is tripped	mmf ms01c 60 10:00	Increase Steam leak to 60% over 10 minute ramp.

CONSOLE OPERATOR INSTRUCTIONS
(Continued)

ELAPSED TIME	IC/MF/RF/OR	DESCRIPTION
When requested		ROLEPLAY: As Aux Bldg or support AUO, ~ 2 minutes after requested to inspect 1B-B AFW pump locally, report that the pump casing is very hot to the touch.
5 min after being requested to manually close 1-LCV-3-172, but not before Status Trees implemented.	mrf fwr32 (Set to 0)	Closes 1-LCV-3-172.
15 seconds after ØB	Auto Initiated 15 seconds after ØB	1B-B Containment Spray Pump Trip
2 minutes after being requested to investigate.		ROLE PLAY: As an AUO, when asked to investigate, report the pump tripped on IOC.

APPENDIX A INFORMATION TO EVALUATORS

1. Assign Crew Positions: (Assign positions based on evaluation requirements for personnel.) Log the positions on Appendix C.

US - Unit Supervisor
OAC - Operator at Controls
CRO - Control Room Operator

2. Review the Shift Briefing Information with the operating crew. Provide the US with a copy of Appendix B, Shift Briefing Information.
3. Allow the crew to familiarize themselves with current control panel condition (up to 10 minutes).
4. Ensure recorders are inking and recording and ICS is active and updating. Note any deficiencies during shift briefing.
5. If not previously done, review any major differences between plant and simulator.
6. Review CONSOLE OPERATORS INSTRUCTION for INITIATING CUES.

OP Test No: _____ Scenario No.: 3 Event No.: 1 Page 1 of 1

Event Description: Raise power from 75% to 95%.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	Walks control boards down in preparation for increasing power.	
	US	Makes appropriate notifications (may not perform since load increase in progress): <ul style="list-style-type: none"> • Radcon • Chemistry • Cond DI operator • Load coordinator 	
	CRO	Initiates load increase: <ul style="list-style-type: none"> • Determines and sets in load rate • Uses reference control button to set in desired load in setter • Depresses go to begin load increase • Monitors generator megawatts increasing 	
	OAC	Monitors primary plant parameters: <ul style="list-style-type: none"> • Tavg following Tref program • ΔT and NIS for correct power distribution. 	
			Cue Console Operator for ERCW pump A-A trip EVENT 2

OP Test No: _____ Scenario No.: 3 Event No.: 2 Page 1 of 2

Event Description: A-A ERCW Pump trips

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Respond to motor trip out and alarms. May Start B-A ERCW Pump. Indications: <ul style="list-style-type: none"> • VCT divert, 1-LCV-62-118 in the DIVERT position. • Numerous ERCW alarms Alarms: <ul style="list-style-type: none"> • ERCW PMP MOTOR OVERLOAD • ERCW HDR A SUP PRESS LO 	
	US	Implement AOI-13 section 3.2 and directs the actions of the crew.	
	CRO	Starts B-A ERCW pump <ul style="list-style-type: none"> • Checks pumps amps normal • Checks hdr press and flows return to normal. 	
	CRO	Places A-A ERCW pump handswitch in PULL-TO-LOCK.	
	CRO	Dispatch AUO to the pump and to the shutdown board.	
	CRO	Request AUO to locally close A-A ERCW pump discharge valve.	
	CRO	Selects B-A ERCW pump with emergency power selector switch.	
	US	Initiates repairs.	

OP Test No: _____ Scenario No.: <u> 3 </u> Event No.: <u> 2 </u> Page <u> 2 </u> of <u> 2 </u>			
Event Description: A-A ERCW Pump trips			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Refers to Tech Spec 3.7.8 and determines no action is required.	
			Que Console Operator for PZR Pressure Ch 1 failure high EVENT 3

OP Test No: _____ Scenario No.: <u>3</u> Event No.: <u>3</u> Page <u>1</u> of <u>2</u>			
Event Description:		Pressurizer pressure transmitter, 1-PT-68-340, fails high.	
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Recognize PZR pressure channel I (1-PT-68-340) failure and informs crew. May place PZR Master Controller in MANUAL and lower demand to close spray valves and turn PZR heaters on. <ul style="list-style-type: none"> • Channel I level indication fails high. • PZR pressure HIGH alarms. • PZR Spray Valves Open. 	
	US	Implement AOI-18 and directs the actions of the crew.	
	OAC	Checks PZR pressure lowering and places PZR Master controller 1-PIC-68-340A in MANUAL and RESTORES pressure to normal.	
	OAC	Checks 1-XS-68-340D and determines that the switch is selected to the failed pressure channel. (PT-68-340 & 334)	
	OAC	Places 1-XS-68-340D to the "334 B323" position.	
	OAC	Ensures that 1-XS-68-340B selected to an operable channel for recording.	
	OAC	Places PZR Master Controller 1-PIC-68-340A to AUTO.	
	US	Notifies work control to remove failed channel from service.	

OP Test No: _____ Scenario No.: <u>3</u> Event No.: <u>3</u> Page <u>2</u> of <u>2</u>			
Event Description: Pressurizer pressure transmitter, 1-PT-68-340, fails high.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Evaluates Tech Specs and enters LCOs 3.3.1.6 Condition W , 3.3.1.8a Condition X, 3.3.1.8b Condition W, and LCOs 3.3.2.1.d Condition D, 3.3.2.8.b Condition L.	
	US	Initiates repairs to failed instrument.	
			Cue Console Operator for main steam pressure transmitter 1-33 failure low EVENT 4

OP Test No: _____ Scenario No.: 3 Event No.: 4 Page 1 of 2

Event Description: Main Steam header pressure transmitter, 1-PT-1-33, fails low.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Respond to annunciators and recognize failure of PT 1-33. Informs crew of failure. May raise pump speed. Indications: <ul style="list-style-type: none"> • Feedwater flow lowering • S/G levels lowering Alarms: <ul style="list-style-type: none"> • S/G LEVEL DEVIATION 	
	US	Implements AOI-16, section 3.7 and directs action of the CRO.	
	CRO	Places main feed pump speed controller (master) in MANUAL. (May increase pump speed to increase discharge pressure).	
	OAC	Checks rod control in MANUAL.	
	OAC	Ensure T _{avg} -T _{ref} are within 3°F.	
	CRO	Adjusts speed control to maintain Feed Pump discharge pressure on PROGRAM and return S/G levels to PROGRAM.	
	CRO	Checks Steam Dump mode in T _{avg} position.	
	US	Notifies Work Control to initiate repairs.	
	OAC	If desired to place control rods in auto, Then ensure T _{avg} and T _{ref} within 1° and place control rods to auto. (Leaves rod control in manual)	NOTE: Auto rod control out of service due to work in logic cabinet. Cue Console Operator for CCP-1A-A TRIP EVENT 5

OP Test No: _____ Scenario No.: 3 Event No.: 5 Page 1 of 3

Event Description: Centrifugal Charging Pump (CCP) 1A-A trips.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Recognizes trip of 1A-A CCP Pump by alarms and indications, then informs the crew. Indications: <ul style="list-style-type: none"> • Motor tripout buzzer • White light on handswitch • Charging flow decreases Alarms: <ul style="list-style-type: none"> • MOTOR TRIPOUT • PZR LEVEL HI/LO • CHG FLOW HI/LOW 	
	US/CRO	Dispatches personnel to check pump and relay targets.	
	OAC	Places CCP 1A-A handswitch in PULL-TO-LOCK. May take actions to: <ul style="list-style-type: none"> • Isolate letdown. • Isolate charging. 	
	US	Implements AOI-20 and directs crew actions.	
	OAC	Determines PZR level program normal (green pen).	
	OAC	Determines control and backup channel NOT failed and PZR level decreasing.	
	OAC	Determines no charging pump running.	
	OAC	Performs or verifies isolation of letdown. <ul style="list-style-type: none"> • Close letdown orifices • Close 1-FCV-62-69A • Close 1-FCV-62-70A 	

OP Test No: _____ Scenario No.: 3 Event No.: 5 Page 2 of 3

Event Description: Centrifugal Charging Pump (CCP) 1A-A trips.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	<p>Refers to AOI-20, Attachment 1 to start 1B-B CCP and restore letdown and charging.</p> <ul style="list-style-type: none"> • Closes 1-FCV-62-89 (1-FIC-62-89A) • Starts 1B-B CCP • Opens/check open 1-FCV-62-90 and 1-FCV-62-91. • Ensures 1-FCV-62-85 or -86 open • Adjusts 1-FCV-62-93 to maintain 8-13 gpm seal flow (1-FIC-62-93A) • Opens letdown isolation valves 1-FCV-62-69A and 1-FCV-62-70A. • Place Letdown Hx temperature control valve in MANUAL at 25% open. (1-HIC-62-78A) • Places letdown pressure control in MANUAL at 25% open. (1-HIC-62-81A). • Establish charging flow 75 gpm or greater & 8-13 gpm seal injection flow to each RCP. • Establish letdown by opening letdown orifices as needed. (1-FCV-62-73 or 74, or 72 or 76.) • Adjust letdown pressure to ~320psig and place in AUTO. (1-HIC-62-81A) • Place temperature control valve in AUTO (1-HIC-62-78A) • Returns PZR level to program • Return charging flow to AUTO (1-HIC-62-93A) 	

OP Test No: _____ Scenario No.: <u>3</u> Event No.: <u>5</u> Page <u>3</u> of <u>3</u>			
Event Description: Centrifugal Charging Pump (CCP) 1A-A trips.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	Notifies work control to initiate pump repairs.	
	US	Refers to Tech Specs and Tech Req <ul style="list-style-type: none"> • Enters LCO 3.5.2 condition A • Enters TR 3.1.4 condition A 	
			Cue Console Operator for steam leak EVENT 6

OP Test No: _____ Scenario No.: 3 Event No.: 6a, 6b, 6c, Page 1 of 10 6d, 6e			
Event #3 S/G Main Steam line break in inside containment, 1B-B AFW Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	Determines that a cooldown transient is in progress by Tavg lowering and/or reactor power rising with simultaneous lowering in PZR level and pressure. May also observe rising steam flow, hotwell level lowering and rising hotwell makeup flow and rising containment pressure. Indications: <ul style="list-style-type: none"> • Decreasing SG levels • Increasing hotwell makeup • Decreasing MFW pump suction pressure • Decreasing SG #3 Steam Flow Alarms <ul style="list-style-type: none"> • RCS LOOSE PARTS DETECTED • ICE COND INLET DOOR OPEN • CNTMT MOISTURE HI • LWR CNTMT TEMP HI 	
	US	Implements AOI-38 and directs crew actions.	
	CRO	Checks SG PORVs and steam dump valves closed.	
	OAC	May identify rising containment pressure and humidity and informs crew.	

OP Test No: _____ Scenario No.: 3 Event No.: 6a, 6b, 6c, Page 2 of 10
6d, 6e

Event #3 S/G Main Steam line break in inside containment, 1B-B AFW
Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Ensures Tavg and Tref within 3°F. Observes Tavg indications and Tavg/Tref recorder.	
	CREW	Determines leak rate greater than 3% or containment pressure is approaching SI setpoint. <ul style="list-style-type: none"> • Compare turbine load to reactor power. • Observe steam and FW flow • Hotwell makeup greater than 950 gpm 	
	US	Directs reactor trip and closure of MSIVs. May direct manual Safety Injection.	
	OAC	Initiates manual reactor trip/ safety injection.	
	CRO	Closes MSIVs as directed by US.	
	US	Implements E-0 and directs crew actions.	
	CREW	Performs immediate actions of E-0.	
	OAC	Ensures reactor trip and safety injection.	
	CRO	<ul style="list-style-type: none"> • Ensures turbine trip. • Ensures shutdown boards energized. 	

OP Test No: _____ Scenario No.: 3 Event No.: 6a, 6b, 6c, Page 3 of 10 6d, 6e _____			
Event #3 S/G Main Steam line break in inside containment, 1B-B AFW Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	US	May determine Containment Pressure is greater than 2.8 psig.	
	OAC	Identifies ØB and informs crew <ul style="list-style-type: none"> • Checks CS actuated and 1B-B CS pump running. • Ensures ØB isolation • Stops RCPs • Checks MSIVs and bypasses closed. 	
	CRO	Identifies that 1B-B AFWP is running but not pumping . Informs crew, then stops pump with concurrence of US. Dispatches personnel to investigate why pump isn't pumping.	Event 6c
	CRO	Ensures MFW isolation: <ul style="list-style-type: none"> • MFW isolation valves closed • MFW bypass isolations closed • MFW reg and bypass reg valves closed • MFWPT A and B tripped • Standby MFWP stopped • Cond demin pumps tripped • Cond booster pumps tripped 	
	CRO	Evaluate SI support systems using E-0, Appendix A. <ul style="list-style-type: none"> • Manually starts 1B-B D/G. 	

OP Test No: _____ Scenario No.: 3 Event No.: 6a, 6b, 6c, Page 4 of 10 6d, 6e _____			
Event #3 S/G Main Steam line break in inside containment, 1B-B AFW Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Informs crew of 1B-B CSP trip/loss of all containment spray. Dispatches operator to investigate.	Event 6b
	OAC	<ul style="list-style-type: none"> Monitors ECCS actuation by checking pumps running and alignments. Ensures cntmt isolations by checking Phase A, and CVI on status panels. Checks cntmt pressure < 2.8 psig 	
	OAC	Determines that CNTMT pressure > 2.8 psig. Verifies Phase B has been completed: <ul style="list-style-type: none"> Determines there are no Cntmt Spray pumps running. There is no Cntmt Spray Flow B Train Ensures Phase B isolation complete Verifies RCPs stopped Ensures MSIVs closed Places/checks steam dump controls in OFF Monitors air return fan start 10 minutes after Phase B initiation. 	
	OAC	Recognizes PZR PORV open, informs crew and attempts to close PORV and then closes block valve prior to transition from E-0.	Event 6e CRITICAL

OP Test No: _____	Scenario No.: 3	Event No.: 6a, 6b, 6c, 6d, 6e	Page 5 of 10
<p>Event #3 S/G Main Steam line break in inside containment, 1B-B AFW</p> <p>Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.</p>			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Ensure secondary heat sink available. <ul style="list-style-type: none"> AFW flow SG level 	
	US	May direct isolation of AFW flow to #3 S/G on completion of Step 12 E-0.	
	OAC	Determines RCS temperature dropping below 557°F. <ul style="list-style-type: none"> Checks steam dumps closed Check steam dump controls in OFF. 	
	OAC	Checks excess letdown valves closed (1-FCV-62-54 and 1-FCV-62-55).	
	OAC	Check PZR safety valves, PORVs and PZR spray valves closed. Determines that PZR PORV 68-334 has failed open and closes associated block valve. (May have been performed earlier)	
	OAC	Determines RCP should not remain in service due to phase B or RCS pressure ≤ 1500 psig. (May have been stopped earlier).	
	CRO	Determines #3 S/G pressure decreasing in uncontrolled manner.	
	US	Transitions to E-2 and direct crew actions.	

OP Test No: _____ Scenario No.: 3 Event No.: 6a, 6b, 6c, Page 6 of 10 6d, 6e _____			
Event #3 S/G Main Steam line break in inside containment, 1B-B AFW Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CREW	Commences monitoring of Status Trees	
	CRO	Verifies MSIVs and bypasses closed. Verifies steam dump controls are OFF.	
	CRO	Verifies at least 1 intact S/G available.	
	CREW	Determines #3 S/G as the faulted S/G.	
	CREW	May identify ORANGE path FR-Z.1.	
	US	Implements FR-Z.1 if cntmt press greater than 2.8 psig when status trees are monitored.	Evaluator Go to page 35 for FR-Z.1 steps then return.
	US	Transitions back to E-2 and directs crew actions.	
	CRO	Isolates #3 S/G: <ul style="list-style-type: none"> • Isolates AFW to #3 S/G • Ensures MFW isolated to #3 S/G • Ensures #3 S/G PORV closed • Ensures #3 S/G Blowdown isolated • Ensures TD AFW supplied from intact S/G. 	CRITICAL
	CRO	Identifies failure of 1-FCV-3-172 to close, notifies crew, and dispatches an operator to close valve locally. (May have been performed earlier)	Event 6d CRITICAL

OP Test No: _____ Scenario No.: 3 Event No.: 6a, 6b, 6c, Page 7 of 10
6d, 6e

Event #3 S/G Main Steam line break in inside containment, 1B-B AFW
Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	CRO	Monitors CST level >200,000 gallons.	
	US	Directs CRO to control RCS temp stable with intact S/G PORV operation when faulted S/G is blown down.	
	US	Transitions to E-1 and directs crew actions.	
	OAC	Checks RCPs off.	
	US	Refers to EPIP-1 or notifies the SM.	
	CRO	Checks S/G pressure is controlled and Faulted SG has completed or will soon complete blowdown.	
	CRO	Checks secondary side radiation normal. May contact Chem Lab and Radcon since MSIVs closed.	
	CRO	Monitors CST level >200,000 gallons.	
	CRO	Monitor intact SG levels. • At least one SG NR > 10%[25%ADV] • NR SG level < 50% and controlled.	
	CRO	Places Hydrogen analyzers in service to monitor concentration.	

OP Test No:	Scenario No.: 3	Event No.: 6a, 6b, 6c, 6d, 6e	Page 8 of 10
<p>Event #3 S/G Main Steam line break in inside containment, 1B-B AFW Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.</p>			
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	Checks PZR PORVs closed and at least one block valve open.	Note: PORV 334 had failed open, its associated block valve should be closed by CREW.
	OAC	When Cntmt pressure is < 2.0 psig: Reset Cntmt Spray signal, and closes discharge valve 1-FCV-72-2.	
	OAC/CRO	Ensures pocket sump pumps stopped (1-HS-77-410 & 1-HS-77-411).	
	US	Determines that SI can be terminated and transitions to ES-1.1 and directs crew actions.	
	OAC	<ul style="list-style-type: none"> Resets SI, Phase A, Phase B Places Cntmt Air in service by opening 1-FCV-32-80, -102, -110. 	
	OAC	Determines RCS pressure stable or increasing.	
	OAC	<ul style="list-style-type: none"> Closes RCP seal flow control 1-FCV-62-89. Open Charging FCVs 1-FCV-62-90 and 1-FCV-62-91. Ensures Charging FCV 1-FCV-62-85 or -86 Open. Opens RCP seal return FCVs 1-FCV-62-61 and -63. Closes BIT Outlet valves 	

OP Test No: _____ Scenario No.: 3 Event No.: 6a, 6b, 6c, Page 9 of 10
6d, 6e

Event #3 S/G Main Steam line break in inside containment, 1B-B AFW
Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.

Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)
	OAC	<ul style="list-style-type: none"> Closes BIT outlet valves 1-FCV-63-25 and 1-FCV-63-26. Stops SI pumps and places then in A-AUTO Stops RHR pumps and places then in A-AUTO. 	
	OAC	Controls charging flow to stabilize PZR level. (1-FCV-62-89 and 1-FCV-62-93). Seal injection flow controlled to 8 and 13 for each RCP.	
	OAC	<ul style="list-style-type: none"> Stops SI pumps and places then in A-AUTO Stops RHR pumps and places then in A-AUTO. 	
	OAC	<p>Determines ECCS injection is NOT required.</p> <p>Determines Cntmt Spray NOT required and has has been reset with associated spray valve closed.</p>	
	OAC	Establishes letdown	
	OAC	Aligns charging pump suctions to VCT	
	CRO	Stabilizes RCS temperature with intact S/G PORVs.	
		TERMINATE THE EXERCISE	

OP Test No: _____		Scenario No.: 3	Event No.: 6a, 6b, 6c, 6d, 6e	Page 10 of 10
<p>Event #3 S/G Main Steam line break in inside containment, 1B-B AFW Description: pump airborne, Pressurizer PORV fails open at trip, Unable to isolate AFW flow to #3 S/G from the control room.</p>				
Time	Position	Expected Actions/Behavior	Comment (SAT/UNSAT)	
	US	Implements FR-Z.1 if cntmt press greater than 2.8 psig when status trees are monitored.		
	CRO/OAC	Implement actions of FR-Z.1 as directed: <ul style="list-style-type: none"> • Ensures Cntmt Spray operation. No CS pumps are available. • Ensures Cntmt isolation. • Ensures MSIVs closed. • Places Steam Dump Controls to OFF • Ensures RCPs stopped. • Ensures EGTS and ABGTS running. • Ensures Cntmt air return fans auto start 10 min after ØB. 	Note: 1A-A CS has HO TAG and 1B-B CS pump has tripped.	
	CRO/OAC	FR-Z.1 actions continued: <ul style="list-style-type: none"> • Determines S/G #3 is dropping uncontrolled. • Directs opening ice condenser AHU ACBs per Appendix A FR-Z.1. • Places H₂ analyzers and H₂ igniters in service. • Determines RHRS should not be placed in service at this time. • Determines hydrogen concentration does not require placing H₂ recombiners in service 		
	US	Transition back to E-2 upon completion of FR-Z.1. (or E-1 depending on when/if FR-Z.1 is implemented).		

APPENDIX B

SHIFT TURNOVER CHECKLIST Page 1 of 1

SHIFT TURNOVER CHECKLIST							
Page <u>1</u> of <u>1</u>							
<input type="checkbox"/> SM <input checked="" type="checkbox"/> US/MCR <input type="checkbox"/> UO <input type="checkbox"/> AUO <input type="checkbox"/> STA(STA Function)	Unit Unit Station	<u>1</u> <u>N/A</u> <u>WBN</u>					
Part 1 - Completed by off-going shift/Reviewed by on-coming shift:							
<ul style="list-style-type: none"> • Abnormal equipment lineup/conditions: <ul style="list-style-type: none"> 1) 1A-A DG is OOS to replace the air start motors (OOS for 6 hrs, ETR 12 hrs). LCO 3.8.1 Action B for past 6 hours 66 hours remain. 2) 1A-A AFW Pump is OOS for motor lead repair (OOS 1 hr, ETR 4 hrs) LCO 3.7.5 Action B for past hour 71 hours remain. 3) 1A-A CS Pump is OOS for oil change (OOS 1hr, ETR 2 hrs) LCO 3.6.6 Action A for the past hour 71 hours remain. • SI/Test in progress/planned: (including need for new brief) None in progress - see schedule <hr/><hr/><hr/> • Major Activities/Procedures in progress/planned: <ul style="list-style-type: none"> 1) Current power level 75%. Power ascension in progress, GO-4 Section 5.1 Step 35 in progress. Raising power has been approved by Load Dispatcher. RCS Boron 1214 ppm. Continue power ascension. PCP 100%. 2) Mechanical Maint. Is replacing the air start motors on 1A-A DG 3) Electrical Maint. Is repairing the motor leads on 1A-A AFW Pump. 4) Rod control is in MANUAL to allow Instrument Maintenance to work in the logic cabinet. 5) Mechanical Maint. Working on 1A-A CS Pump (Oil Change). • Radiological changes in plant during shift: None <hr/><hr/><hr/> 							
Part 2 - Performed by on-coming shift							
<input type="checkbox"/> A review of the Operating Log since last held shift or 3 days, whichever is less (N/A for AUOs) <input type="checkbox"/> A review of the Rounds sheets/Abnormal readings (AUOs only) Review the following programs for changes since last shift turnover: <table style="width: 100%; margin-top: 5px;"> <tr> <td><input type="checkbox"/> Standing Orders</td> <td><input type="checkbox"/> LCO(s) in actions (N/A for AUOs)</td> </tr> <tr> <td><input type="checkbox"/> Immediate required reading</td> <td><input type="checkbox"/> TACF (N/A for AUOs)</td> </tr> </table>				<input type="checkbox"/> Standing Orders	<input type="checkbox"/> LCO(s) in actions (N/A for AUOs)	<input type="checkbox"/> Immediate required reading	<input type="checkbox"/> TACF (N/A for AUOs)
<input type="checkbox"/> Standing Orders	<input type="checkbox"/> LCO(s) in actions (N/A for AUOs)						
<input type="checkbox"/> Immediate required reading	<input type="checkbox"/> TACF (N/A for AUOs)						
Part 3 - Performed by both off-going and on-coming shift							
<input type="checkbox"/> A walkdown of the MCR control boards (N/A for AUOs) Relief Time: _____ Relief Date: _____							