Simbooth - TNT

target ZERO Every day, every job, safely.	NUCLEAR SAFETY FOCUS TARGET ZERO
Protected Train: ☒ Alpha ☐ Bravo	**EOOS:** ☒ Green ☐ Yellow ☐ Orange ☐ Red
Plant Conditions:	100 % power BOL.
Major Activities:	Maintain power operations per UOP 12004-C section 4.3 for power operation.
Active LCOs:	☐ LCO 3.5.2 Condition A is in effect due to SIP A tagged out.
OOS/ Degraded CR Instruments:	☐ None
Narrative Status:	☐ Containment mini-purge is in service for a planned Containment Entry on next shift. ☐ SIP A is tagged out for motor repair, expected return to service time is 24 hours with 48 hours left on a shutdown LCO of 72 hours. ☐ The remnants of Hurricane Maya are passing through, severe weather and thunderstorms will be in the area for the next 8 hours. The Severe Weather Checklist is in effect.

Scenario #6

Grp #1

Carla - SS

SIMULATOR REACTIVITY BRIEFING SHEET

Shift: **Day** Date: **Today** Burnup: **500** MWD/MTU Core Life: **BOL**

MINIMUM SHIFT REACTIVITY INFORMATION TO BE BRIEFED

Power: **100** Rod Motion: **Rods in automatic**

Current Temperature Control Strategy: **boration**

Currently Making Up: **6** gallons every **Every two hours**

The desired Tavg operating band is 585.2 ± 0.05°F

CVCS makeup boric acid flow per 100 gallon makeup (FI-110A): **11.9** gallons/100
CVCS makeup pot setting (FIC-110): **2.96**

BTRS Strategy: **None**
AFD Strategy: **Maintain on target ± 3 AFD units**

Reactivity System Components Degraded/OOS:

None

Activities Expected That May Affect Core Reactivity (Reactivity Focus Items):

None

CURRENT CORE REACTIVIITY PARAMETERS

Boron worth: **7.7** pcm/ppm PCM per 1% power change: **14.9** pcm/%

Current MTC values HFP: **-13.7** pcm/°F HZP: **-1.8** pcm/°F

Current BAST C_b: **7,000** ppm Current RCS C_b: **830** ppm

Boration required per	degree °F:	**18**	gallons
	1% power change:	**19**	gallons
	10% power change:	**192**	gallons
	30% power change:	**576**	gallons
Dilution required per	degree °F:	**132**	gallons
	1% power change:	**143**	gallons

Boration required for stuck rods (154 ppm/rod): **3,141** gallons for 2 stuck rods
4,775 gallons for 3 stuck rods

**If more than 3 rods are stuck, begin emergency boration and calculate gallons for actual number of stuck rods.*

Human Performance Tools

Peer Check	Three-Way Communication	Self-Verification (STAR)
Pre-Job Briefing	Phonetic Alphabet	Timeout
Procedure Use (placekeeping)	One Minute Matters (situational awareness)	

Valid for Cycle 17, PTDB Tab 1.0 revision 28.0 and Tab 16.0 revision 18.0

scenario 6

C:\DATA\HL-17 EXAMS\HL-17 NRC EXAM\NRC SCENARIOS\Reactivity Briefing sheets\Simulator reactivity briefing scenario 6 sheet

S6 G1

Appendix D **Scenario Outline** **Form ES-D-1**

Facility: Vogtle Scenario No.: 6 Op-Test No.: 2012-301

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is at 100% power, BOL, steady state operations, control rods in automatic. (Base IC # 10, snapped to IC # 186 for HL17 NRC Exam)

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

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

Preloaded Malfunctions:

AC03B - ACCW Pump-2 Hand switch Auto Contact Failure

AF05A, B, C Failure of all AFW pumps to automatically start

ES01- Failure of Automatic Reactor Trip

ES02 - Failure of Manual Reactor Trip

TU18 - Auto Turbine Trip Failure

Overrides

Note to Simbooth: Place Containment Mini-Purge in service.

Event No.	Malf. No.	Event Type*	Event Description
T1 • 0740	AC02A	C-UO C-SS	ACCW Pump # 1 locked rotor with failure of the standby ACCW pump to automatically start.
T2 • 0757	RC08A @ 100%	I-OATC I-SS TS-SS	RCP Loop 1 HL NR RTD fails high resulting in inward rod motion. **LCO 3.3.1, Condition A, FU 6, 7 Condition E and LCO 3.3.2 Condition A, FU 5b Condition I**
T3 • 0822	RM-006	TS-SS	Cnmt Bldg Oper Lev Rad – hi Range, RE-006 fails to 100%. **LCO 3.3.3 Condition A, FU 14, Condition B**

Event No.	Malf. No.	Event Type*	**Event Description**
T4 •	PR03A (56.5-0%) Ramp 600 sec	I-OATC I-SS TS-SS	Controlling PRZR level channel LT-459 fails low over 10 minutes resulting in FIC-0121 raising charging flow. **LCO 3.3.1 Condition A, FU 9, Condition M** **INFO LCO 3.3.3 FU 6** **LCO 3.3.4 Condition A, FU 8**
T5 •	FW14 @100% Ramp 60 Seconds	I-UO I-SS	FW pressure transmitter PT-508 fails slowly high resulting in MFPT speed reducing and lowering FW flows and SG levels.
6 ★	N/A	R-OATC N-UO R-SS	Power reduction due to MFPT B high vibrations.
T7 •	EL06A	M-ALL	Loss of 13.8kV bus 1NAA resulting in loss of 2 RCPs and 2 Condensate Pumps, 1 circulating water pump - ATWT.
T8	RD07 with 69 sec delay	C-OATC C-SS **Critical**	ATWT – Auto rod motion fails after ~ 1 minute.
9 •	Preload	C-UO C-SS **Critical**	Turbine Auto Trip failure requiring Manual Trip.
10 •	Preload	C-UO C-SS **Critical**	MDAFW and TDAFW pumps fail to automatically start.
T11 •	MS06D @50%	CREW	Main Steam Safety for Loop # 4 fails 50% open requiring an eventual transition to E-2 to attempt to isolate the faulted SG # 4.

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

Event 1:

ACCW pump # 1 will trip due to a locked rotor and ACCW pump # 2 will fail to automatically start.

Verifiable Actions:

UO – Starts standby ACCW pump # 2.

Technical Specifications:

None

Event 2:

RCS Loop 1 NR HL RTD fails high resulting in inward rod motion.

Verifiable Actions:

OATC – Performs IOA of 18001-C section B and verifies rods are in manual.

OATC – Selects affected loop # 3 on both the Tavg and Delta T defeat switches.

OATC – Withdraws rods to match Tavg – Tref.

Technical Specifications:

LCO 3.3.1 Reactor Trip System (RTS) Instrumentation Condition A

LCO 3.3.1 Reactor Trip System (RTS) Instrumentation FU 6 Condition E

LCO 3.3.1 Reactor Trip System (RTS) Instrumentation FU 7 Condition E

LCO 3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation Condition A

LCO 3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation FU 5b Condition I

Event 3:

Containment High Range Radiation monitor RE-006 fails high.

Verifiable Actions:

None, this is a Technical Specification call for the SS.

Technical Specifications:

LCO 3.3.3 Post Accident Monitoring (PAM) Instrumentation Condition A

LCO 3.3.3 Post Accident Monitoring (PAM) Instrumentation, FU 14, Condition B

Event 4:

Controlling Pressurizer level channel PT-459 fails high over 10 minutes resulting in a reduction in charging flow as FIC-0121 throttles closed.

Verifiable Actions:

OATC – Manually controls charging flow using FIC-0121 OR manually isolates letdown if flashing of letdown occurs.

Technical Specifications:

LCO 3.3.1 Reactor Trip System (RTS) Instrumentation Condition A

LCO 3.3.1 Reactor Trip System (RTS) Instrumentation, FU 9, Condition M

INFO LCO 3.3.3 Post Accident Monitoring Instrumentation, FU 6

LCO 3.3.4 Remote Shutdown System, Condition A

Event 5:

Feed water pressure transmitter PT-508 fails high resulting in lowering MFPT speed, lowering FW flow to all SGs, and all SG levels lowering.

Verifiable Actions:

UO – Performs IOAs of 18016-C, Section E and takes manual control of the FW valves and MFPT speed controls to control SG levels between 60 to 70%.

Technical Specifications:

None

Event 6:

A power reduction will commence due to MFPT B high vibration.

Verifiable Actions:

OATC – Borates and adjusts control rods to maintain Tavg – Tref matched and AFD on target.

UO – Lowers turbine load for power reduction.

Technical Specifications:

None

Event 7, 8, 9, 10:

A loss of 13.8 kV bus 1NAA occurs. This results in a loss of 2 RCPs, the two running condensate pumps, and trip of both MFPTs. An ATWT will occur with failure of manual or automatic trip. Main Steam Safety Valve for Loop # 4 will fail open requiring an eventual transition to 19020-C to attempt to isolate the faulted SG # 4.

Verifiable Actions:

OATC – Manually inserts control rods upon failure of automatic inward rod motion.

UO – Manually trips the turbine.

UO – Manually starts all AFW pumps.

CRITICAL TASKS:

1) Manually inserts control rods per IOAs of 19211-C to reduce reactor power during an ATWT with a coincident loss of heat sink to protect core integrity.

2) Manually trip the turbine no later than step 2 RNO of 19211-C to conserve SG levels for adequate heat removal.

3) Starts MDAFW pumps and/or the TDAFW pump no later than step 3 RNO of 19211-C to Establish > 570 gpm AFE flow to maintain SG inventory for adequate heat removal.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 1

Event Description: **ACCW Pump # 1 will trip with ACCW Pump # 2 failing to automatically start. The UO will manually start ACCW Pump # 2.**

Time	Position	Applicant's Action or Behavior
	OATC	Diagnose the trip of ACCW Pump # 1 with ACCW Pump # 2 failing to automatically start. Symptoms / alarms: • ALB04-A02 ACCW KO HDR PRESS • ALB04-B02 ACCW RX COOLANT DRN TK HX LO FLOW • ALB04-C02 ACCW EXCESS LTDN HX LO FLOW • ALB04-D02 ACCW RTN HDR FROM RCP LO FLOW • ALB04-A03 ACCW RCP 1 CLR LO FLOW • ALB04-B03 ACCW RCP 2 CLR LO FLOW • ALB04-C03 ACCW RCP 3 CLR LO FLOW • ALB04-D03 ACCW RCP 4 CLR LO FLOW • ALB07-D03 LTDN HX OUT HI TEMP • ALB07-F04 LTDN HX HI TEMP DEMIN DIVERT • ALB36-A01 4160V SWGR 1AA02 TROUBLE Indications: • ACCW Pump # 1 green and amber light lit. • High temperature on any heat exchanger serviced by ACCW. • FV-129 Divert (amber light lit) bypassing CVCS demins.
	OATC	**NOTES:** • ACCW pumps are removed from the 4.16KV Class 1E buses following simultaneous loss of offsite power and safety injection. • ACCW flow to the Seal Water Heat Exchanger is not required if RCS temperature remains less than 135°F.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 1

Event Description: **ACCW Pump # 1 will trip with ACCW Pump # 2 failing to automatically start. The UO will manually start ACCW Pump # 2.**

Time	Position	Applicant's Action or Behavior
	SS	Enters 18022-C, LOSS OF AUXILIARY COMPONENT COOLING WATER.
	UO	1. Check ACCW pumps – AT LEAST ONE RUNNING. **(NO)** RNO 1. Perform the following. **a.** Start an ACCW pump. **(YES)** b. IF an ACCW pump can NOT be started, THEN perform the following: **(N/A)** **1)** Trip the Reactor. **(N/A)** 2) WHEN Reactor is verified tripped, THEN stop all RCPs. **(N/A)** 3) Initiate 19000-C, E-0 REACTOR TRIP OR SAFETY INJECTION. **(N/A)** 4) Go to Step 3.
	UO	2. Check ACCW SPLY HDR PRESS PI-1977 – GREATER THAN 135 PSIG. **(YES)**
	UO	3. Check if ACCW flow exists through the letdown heat exchanger. • TV-130 – OPEN. (YES) • ALB07-D03 LTDN HX OUT HI TEMP – EXTINGUISHED **(YES)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 1

Event Description: **ACCW Pump # 1 will trip with ACCW Pump # 2 failing to automatically start. The UO will manually start ACCW Pump # 2.**

Time	Position	Applicant's Action or Behavior
	OATC UO	4. Initiate the Continuous Actions Page.
	UO	5. Check ACCW Surge Tank Level (IC L2700) – GREATER THAN 20% AND STABLE OR RISING. **(YES)**
	UO	6. Check if RCPs should be stopped: **(NO, all parameters are met)** a. Check the following RCP parameters. (using plant computer): • Motor bearing (upper or lower radial or thrust) – GREATER THAN 195°F. • Motor stator winding – GREATER THAN 311°F. • Seal water inlet – GREATER THAN 230°F. • Loss of ACCW – GREATER THAN 10 MINUTES. RNO a. Perform the following: 1) IF any parameter limit is exceeded, THEN perform Step 6.b. 2) Go to Step 7.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 1

Event Description: **ACCW Pump # 1 will trip with ACCW Pump # 2 failing to automatically start. The UO will manually start ACCW Pump # 2.**

Time	Position	Applicant's Action or Behavior
	UO	7. Check RCP thermal barrier outlet valves – OPEN. **(YES)** • HV-19051 ACCW RCP-1 THERMAL BARRIER RTN VLV • HV-19053 ACCW RCP-2 THERMAL BARRIER RTN VLV • HV-19055 ACCW RCP-3 THERMAL BARRIER RTN VLV • HV-19057 ACCW RCP-4 THERMAL BARRIER RTN VLV • HV-2041 ACCW RCPS THERMAL BARRIER RTN VLV
	UO	8. Check ACCW heat exchangers outlet temperature (IPC T2701) – LESS THAN 120°F. **(YES)**
	UO	9. Check ACCW containment isolation valves – OPEN. **(YES)** • HV-1979 ACCW SPLY HDR ORC ISO VLV • HV-1978 ACCW SPLY HDR IRC ISO VLV • HV-1974 ACCW RTN HDR IRC ISO VLV • HV-1975 ACCW RTN HDR ORC ISO VLV

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 1

Event Description: ACCW Pump # 1 will trip with ACCW Pump # 2 failing to automatically start. The UO will manually start ACCW Pump # 2.

Time	Position	Applicant's Action or Behavior
	UO	10. Check if ACCW is restored to service. a. Components cooled by ACCW – TEMPERATURES RETURNING TO NORMAL. **(YES)** b. Restore charging and letdown using 13006, CHEMICAL AND VOLUME CONTROL SYSTEM. **(N/A)** c. Return to procedure and step in effect.
		END OF EVENT 1, proceed to EVENT 2.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 2

Event Description: RCS NR Temperature Instrument TE-411A Fails High (Thot) on loop # 1. This will require the OATC to perform IOAs by placing rods in MANUAL.

The crew will then enter AOP-18001 section B "Failure of RCS Narrow Range Temperature Instrumentation" to complete the corrective actions for this failure.

Time	Position	Applicant's Action or Behavior
	OATC	Diagnose NR Temperature Instrument Failure: (Loop 1 T_{HOT} TE-41A fails high) Symptoms / alarms: ALB12-A03 RC LOOP Delta T/AUCT Delta T HI-LO DEV ALB12-A04 RC LOOP TAVG/AUCT TAVG HI-LO DEV ALB12-A05 TAVG TREF DEVIATION ALB12-A06 OVERTEMP ΔT ALERT ALB12-B04 AUCT TAVG HIGH ALB12-B06 OVERPOWER ΔT ALERT ALB06-F01 CSFST TROUBLE ALB10-C03 OVERPOWER ΔT ROD BLOCK AND RUNBACK ALERT ALB10-E03 OVERTEMP ΔT ROD BLOCK AND RUNBACK ALERT Indications: • Loop 1 Tavg / ΔT indications deviating from other loops. • 1FIC-0121 Charging Flow Controller raising to maximum demand. • Rapid inward Control Rod motion.
	OATC SS	***18001-C Section B*** **IMMEDIATE OPERATOR ACTION** B1. Place ROD BANK SELECTOR SWITCH in MAN position. Verifies immediate operator action step B1 with OATC.
	SS	Enters AOP 18001-C, Section B.
	OATC	**Subsequent Actions** B2. Restore TAVG to program band.
	OATC	B3. Select affected loop on TS-412T TAVG DEFEAT SEL. ***Defeats 412***

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 2

Event Description: RCS NR Temperature Instrument TE-411A Fails High (Thot) on loop # 1. This will require the OATC to perform IOAs by placing rods in MANUAL.

The crew will then enter AOP-18001 section B "Failure of RCS Narrow Range Temperature Instrumentation" to complete the corrective actions for this failure.

Time	Position	Applicant's Action or Behavior
		Cue to Simbooth: IF asked, the Shift Manager has given permission to place the charging flow controller in auto. B4. Select affected loop on TS-411F DELTA T DEFEAT SEL. **Defeats *411***
	OATC	B5. Place ROD BANK SELECTOR SWITCH in AUTO position, if desired.
	SS	B6. Notify I & C to initiate repairs. Calls SS to perform the following: • Notify Operations Duty of AOP entry • Write a Condition Report • Notify Maintenance of the failure
	SS	B7. Bypass the affected instrument channel using 13509-C, BYPASS TEST INSTRUMENTATION (BTI) PANEL OPERATION, if desired. ***NOTE: Expect the SS will NOT bypass the channel.***
	SS	B8. Trip the affected channel bistables and place the associated MASTER TEST switches in TEST position per TABLE B1 within 72 hours. (TS 3.3.1 & 3.3.2) ***NOTE: The SS is expected to leave bistables untripped during the allowed out of service time to facilitate I&C trouble shooting of the failed channel.***

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 2

Event Description: RCS NR Temperature Instrument TE-411A Fails High (Thot) on loop # 1. This will require the OATC to perform IOAs by placing rods in MANUAL.

The crew will then enter AOP-18001 section B "Failure of RCS Narrow Range Temperature Instrumentation" to complete the corrective actions for this failure.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>SS</td><td>B9. Initiate the applicable actions of:
• TS 3.3.1
• TS 3.3.2</td></tr>
<tr><td></td><td>SS</td><td>
LCO 3.3.1 Function 6, 7 Condition E OTΔT Trip, OPΔT
<table>
<tr><th>CONDITION</th><th>REQUIRED ACTION</th><th>COMPLETION TIME</th></tr>
<tr><td>A. One or more Functions with one or more channels inoperable.</td><td>A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s).</td><td>Immediately</td></tr>
<tr><td>E. One channel Inoperable.</td><td>E.1 Place channel in trip.
OR
E.2 Be in MODE 3.</td><td>72 hours

78 hours</td></tr>
</table>
LCO 3.3.2 Function 5b. Condition I FWI
<table>
<tr><th>CONDITION</th><th>REQUIRED ACTION</th><th>COMPLETION TIME</th></tr>
<tr><td>A. One or more Functions with one or more required channels inoperable.</td><td>A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).</td><td>Immediately</td></tr>
<tr><td>I. One channel Inoperable.</td><td>I.1 Place channel in trip.
OR
I.2 Be in MODE 3.</td><td>72 hours

78 hours</td></tr>
</table>
</td></tr>
<tr><td></td><td>OATC / UO</td><td>B10. Initiate the Continuous Actions Page.</td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 2

Event Description: RCS NR Temperature Instrument TE-411A Fails High (Thot) on loop # 1. This will require the OATC to perform IOAs by placing rods in MANUAL.

The crew will then enter AOP-18001 section B "Failure of RCS Narrow Range Temperature Instrumentation" to complete the corrective actions for this failure.

Time	Position	Applicant's Action or Behavior
	SS	*B11. Check repairs and surveillances – COMPLETE. ***(NO)***
		RNO
		*B11. Perform the following:
		a. WHEN repairs and surveillances are complete, THEN perform Step B12.
		b. Return to procedure and step in effect.
		END OF EVENT 2.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 3

Event Description: Containment Rad Monitor RE-006 Fails High.

Time	Position	Applicant's Action or Behavior
	OATC UO SS	Alarm/Indications ALB05-B03 INTMD RADIATION ALARM ALB05-C03 HIGH RADIATION ALARM Safety Related Display Consol (SRDC)-RE-006, Intermediate & High Alarm IPC RE-006 Step Change to High Rad
	UO OATC	**17005-1 B03 INTMD RADIATION ALARM** PROBABLE CAUSE An alert condition on one or more of the Radiation Monitor Channels. AUTOMATIC ACTIONS NONE INITIAL OPERATOR ACTIONS NONE SUBSEQUENT OPERATOR ACTIONS 1. Check the Safety Related Display Console (QRM2), the RMS Communications Console (QRM1) and the Plant Computer to determine the monitor in alarm and Go To 17100-1, "Annunciator Response Procedure For The Process And Effluent Radiation Monitor System (RMS)" or 17102-1, "Annunciator Response Procedure For The Safety Related Display Control QRM2" as appropriate. **Note to examiner:** The Communications Console (COMS) QRM1 is NOT modeled in the Vogtle simulator.
	OATC UO	**17005-1 C03 HIGH RADIATION ALARM** PROBABLE CAUSE A high alarm on one or more of the Radiation Monitor Channels. AUTOMATIC ACTIONS None for RE-006.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 3

Event Description: Containment Rad Monitor RE-006 Fails High.

Time	Position	Applicant's Action or Behavior
		INITIAL OPERATOR ACTIONS NONE SUBSEQUENT OPERATOR ACTIONS 1. Check the Safety Related Display Console (QRM2), the RMS Communications Console (QRM1) and the Plant Computer to determine the monitor in alarm and Go To 17100-1, "Annunciator Response Procedure For The Process And Effluent Radiation Monitor System (RMS)" or 17102-1, "Annunciator Response Procedure For The Safety Related Display Console QRM2" as appropriate **Note to examiner**: The Communications Console (COMS) QRM1 is NOT modeled in the Vogtle simulator.
	UO	17102-1 RE-0006 (RED LAMP LIT) (HIGH)
	UO SS	PROBABLE CAUSE High radiation in Containment. AUTOMATIC ACTIONS NONE INITIAL OPERATOR ACTIONS 1. Initiate evacuation of Containment IF the alarm is due to unexpected or unexplained radiation increases, OR IF appropriate HP controls are NOT in place for the radiological conditions indicated. 2. IF the alarm is due to expected radiation increases from preplanned evolutions AND appropriate HP controls are in place, THEN request HP and Chemistry to investigate the cause of alarm and sample Containment atmosphere. if required, initiate evacuation of Containment.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 3

Event Description: Containment Rad Monitor RE-006 Fails High.

Time	Position	Applicant's Action or Behavior
		SUBSEQUENT OPERATOR ACTIONS 1. If required, verify that the Containment has been evacuated and all personnel accounted for. 2. Refer to NMP-EP-110, "Emergency Classification and Implementing Instructions." 3. Notify Chemistry to independently determine radiation level on the operating deck in the Containment. 4. IF sampling and analysis determine that channel has malfunctioned: a. Comply with Technical Specifications LCO 3.3.3. b. Request Chemistry to deactivate the channel. COMPENSATORY OPERATOR ACTIONS NONE
	SS	Initiate the applicable actions of: • TS: 3.3.3 Post Accident Monitoring (PAM) Instrumentation Condition B One required channel inoperable.
	SS	**LCO 3.3.3 PAMS FU 14 CONDITION B**
	SS	CONDITION / REQUIRED ACTION / COMPLETION TIME B. One required Channel inoperable. / B.1 Restore the channel To OPERABLE status. / 30 days
		End of Event 3.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 4

Event Description: PRZR level channel LT-459 will slowly fail low over ~ 10 minutes. The OATC will take manual control of FIC-0121 to stabilize charging flow and PRZR level, swap control channels, return charging flow to automatic.

Time	Position	Applicant's Action or Behavior
	OATC	Diagnose PRZR LT-459 is slowly failing low affecting charging flow: Symptoms / alarms: ALB11-D01 PRZR LO LEVEL DEVIATION ALB08-F06 RCP SEAL WATER INJ LO FLOW (may come in after swapping controlling PRZR LT channels) Indications: • PRZR LT-459 drifting low over time. • Charging flow FIC-0121 rising to maximum as indicated PRZR program level is high relative to LT-459. • PRZR level on other 2 channels rising.
	SS	Enters AOP 18001-C, Section D, FAILURE OF PRZR LEVEL INSTRUMENTATION.
	OATC UO	D1. Initiate the Continuous Actions Page.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 4

Event Description: PRZR level channel LT-459 will slowly fail low over ~ 10 minutes. The OATC will take manual control of FIC-0121 to stabilize charging flow and PRZR level, swap control channels, return charging flow to automatic.

Time	Position	Applicant's Action or Behavior
	OATC	D2. Check PRZR level – TRENDING TO PROGRAM LEVEL. (NO) RNO D2. IF PRZR level instrument fails high, THEN perform the following as necessary: __ Adjust charging to prevent letdown from flashing. -OR- __ Isolate letdown. IF PRZR level instrument fails low, THEN maintain charging flow approximately 10 gpm greater than total seal injection flow. **Note to examiner**: If the crew blindly follows the step for maintaining charging flow ~ 10 gpm greater than total seal injection flow, they will probably flash letdown. The crew will need to manually control charging flow to control PRZR level.
	OATC	D3. Maintain Seal Injection flow to all RCPs – 8 TO 13 GPM.
	OATC	D4. Select an unaffected channel on LS-459D PRZR LVL CNTL SELECT. **(selects 461 / 460)**
	OATC	D5. Select same channel on LS-459E PRZR LVL REC SEL as selected on LS-459D. **(selects 461)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 4

Event Description: PRZR level channel LT-459 will slowly fail low over ~ 10 minutes. The OATC will take manual control of FIC-0121 to stabilize charging flow and PRZR level, swap control channels, return charging flow to automatic.

Time	Position	Applicant's Action or Behavior
	OATC	D6. Restore letdown flow by initiating 13006, CHEMICAL AND VOLUME CONTROL SYSTEM, if required. **(N/A)**
	OATC	D7. Check if PRZR heaters should be restored to service. (NO) PRZR level controlling channel – FAILED LOW. RNO D7. Go to Step D9. **Note to examiner:** The channel fails low over 10 minutes, the crew will have plenty of time to adjust charging and defeat the failed channel prior to letdown isolation. Swapping channels in time will prevent the letdown isolation.
	OATC	D9. Return PRZR level control to AUTO. **Cue to Simbooth**: IF asked, the Shift Manager has given permission to place the PRZR level control system in auto.
	OATC	D10. Check PRZR level is maintained at program by auto control. RNO D10. Maintain PRZR level at program using manual control.
	SS	D11. Notify I & C to initiate repairs.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 4

Event Description: PRZR level channel LT-459 will slowly fail low over ~ 10 minutes. The OATC will take manual control of FIC-0121 to stabilize charging flow and PRZR level, swap control channels, return charging flow to automatic.

Time	Position	Applicant's Action or Behavior
	SS	D12. Bypass the affected instrument channel using 13509-C, BYPASS TEST INSTRUMENTATION (BTI) PANEL OPERATION, if desired. **Note to examiner:** The SS will **not** BTI the channel at this time. I & C will request to leave the channel in the normal state until they have an opportunity to troubleshoot.
	OATC	D13. Trip affected channel bistable and place associated MASTER TEST switch in TEST position per TABLE D1 within 72 hours. (TS 3.3.1)
	UO	TABLE D1 **CAUTIONS** • Only one channel should be tripped. • The bistable input is placed in the tripped state by positioning the selector switch on the specified test card to TEST. • The bistable input identified by the switch number should agree with the location specified by CAB, CARD, and B/S before tripping a bistable input. If a discrepancy exists, CAB-CARD-B/S should be used, not switch number. • Bypassing another channel for Surveillance Testing with a channel inoperable is permitted provided the inoperable channel is in the tripped condition and the channel being tested is not bypassed for more than 12 hours.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 4

Event Description: PRZR level channel LT-459 will slowly fail low over ~ 10 minutes. The OATC will take manual control of FIC-0121 to stabilize charging flow and PRZR level, swap control channels, return charging flow to automatic.

Time	Position	Applicant's Action or Behavior
	UO	SSPS INPUT / CAB / FRAME /CARD / B/S / SWITCH LT-459 Failure (Channel 1) High Level Reactor Trip MASTER TEST SWITCH / 1 / 8/47 8/73 / 1 / LS-459A 7 END OF TABLE D1
	SS	D14. Initiate the applicable actions of Technical Specification 3.3.1.
	SS	Tech Spec 3.3.1 FUNCTION / APPLICALBE MODES / REQUIRED CHANNELS / CONDITIONS 9. Pressurizer Water Level - High / 1(f) / 3 / M (f) Above the P-7 (Low Power Reactor Trips Block) interlock. Table 3.3.4-1 (Page 1 of 1) Remote Shutdown System Instrumentation and Controls Tech Spec 3.3.4 FUNCTION / INSTRUMENT OR CONTROL PARAMETER / REQUIRED NUMBER OF CHANNELS MONITORING INSTRUMENATION 8. Pressurizer Level / 2 CONDITION / REQUIRED ACTION / COMPLETION TIME A. One or more required Function inoperable. / A.1 Restore required Function to OPERABLE status. / 30 days. B. Required Action and associated Completion Time not met. / B.1 Be in MODE 3 AND B.2 Be in MODE 4 / 6 hours 12 hours

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 4

Event Description: PRZR level channel LT-459 will slowly fail low over ~ 10 minutes. The OATC will take manual control of FIC-0121 to stabilize charging flow and PRZR level, swap control channels, return charging flow to automatic.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>SS</td><td>Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation
Tech Spec 3.3.3
<table><tr><th>FUNCTION</th><th>REQUIRED CHANNELS</th><th>CONDITIONS</th></tr><tr><td>6. Pressurizer Level</td><td>2</td><td>B, G, H, J</td></tr></table>
Note to examiner: Tech Spec 3.3.3 Function 6 is an INFO LCO.</td></tr>
<tr><td></td><td>SS</td><td>D15. Check repairs and surveillances – COMPLETE.

RNO

D15. Perform the following:

a. WHEN repairs and surveillances are complete, THEN perform step D16.

b. Return to procedure and step in effect.</td></tr>
<tr><td></td><td></td><td>END OF EVENT 4, proceed to EVENT 5.</td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 5

Event Description: FW flow transmitter FT-508 fails slowly high over time. This will result in MFPT speed lowering and FW flow less than steam flow. The UO will have to take manual control of MFPT Master Speed controller to control FW flow.

Time	Position	Applicant's Action or Behavior
	UO	Diagnose PT-508 failing high: Symptoms / alarms: ALB13-A06 STM GEN 1 HI/LO LVL DEVIATION ALB13-B06 STM GEN 2 HI/LO LVL DEVIATION ALB13-C06 STM GEN 3 HI/LO LVL DEVIATION ALB13-D06 STM GEN 4 HI/LO LVL DEVIATION ALB06-F01 CSFST TROUBLE Indications: • PT-508 pressure slowly rising. • MFPT speeds slowly lowering. • Steam flow / feed flow mismatches on all SGs.
	OATC	**IMMEDIATE OPERATOR ACTIONS** E1. Check steam and feed flows – MATCHED ON ALL SGs. **(NO)** RNO E1. Take manual control of the following as necessary to restore NR level between 60% and 70%. • SG feed flow valves. **(Note: Not expected to use valves)** • MFP(s) speed. **(Note: Expected to raise MFPT speed)**
	SS	Enters 18016-C CONDENSATE AND FEEDWATER MALFUNCTION Section E, FAILURE OF MFP SPEED CONTROL.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 5

Event Description: FW flow transmitter FT-508 fails slowly high over time. This will result in MFPT speed lowering and FW flow less than steam flow. The UO will have to take manual control of MFPT Master Speed controller to control FW flow.

Time	Position	Applicant's Action or Behavior
	UO OATC	E2. Initiate the Continuous Actions Page.
	UO	E3. Maintain SG NR levels – GREATER THAN 41% and LESS THAN 79%. **(YES)**
	UO	E4. Check SIC-509A, B, and C MFPT SPEED CONTROL – OPERATING PROPERLY. • ALB15-C05 MFPT LOSS OF FW SIGNAL – EXTINGUISHED. • Controller(s) maintaining stable MFPT speed. **(NO)** • Controller(s) maintaining MFP discharge pressure/SG pressure differential – BETWEEN 100 AND 225 PSI. **(NO)** RNO

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 5

Event Description: FW flow transmitter FT-508 fails slowly high over time. This will result in MFPT speed lowering and FW flow less than steam flow. The UO will have to take manual control of MFPT Master Speed controller to control FW flow.

Time	Position	Applicant's Action or Behavior
	UO	E4 RNO continued. E4. Perform one of the following: __ Adjust MFPT speed as necessary to maintain MFP discharge pressure/SG pressure differential between 100 and 225 psi. -OR- Transfer control to the GE Pot by performing the following: __a. Adjust SC-3151(3152) MFPT A(B) SPEED CHANGER to obtain zero deviation on SI-3153 (3154). __ b. Transfer control by placing MFPT-A(B) MOTOR SPEED CHANGER HS-3151 (3152) in MANUAL. __c. Adjust SC-3151(3152) to maintain MFP discharge pressure /SG pressure differential between 100 and 225 psig.
	UO	E5. Check PT-507 – OPERATING PROPERLY. **(YES)**
	UO	E6. Notify I & C to initiate repairs.
	UO	E7. Return feed flow controls to AUTO as necessary. **(NO)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 5

Event Description: FW flow transmitter FT-508 fails slowly high over time. This will result in MFPT speed lowering and FW flow less than steam flow. The UO will have to take manual control of MFPT Master Speed controller to control FW flow.

Time	Position	Applicant's Action or Behavior
	SS	E8. Check repairs and surveillances – COMPLETE. **(NO)** RNO E8. Perform the following: a. WHEN repairs and surveillances are complete, THEN perform Step E9. b. Return to procedure and step in effect.
		END OF EVENT 5, proceed to EVENT 6.

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 6, actions per ARP 17015-05

Event Description: MFPT B turbine vibration will rise to > 6 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>UO</td><td>Diagnose vibration problems with MFPT B.

Symptoms / alarms:

• ALB15-D05 MFPT B HI VIB

Indications:

• MFPT B Turbine and pump vibrations rising on IPC points.</td></tr>
<tr><td></td><td>CREW</td><td>ALB15-D05

NOTE

Turbine and pump vibration may be monitored at the Bentley Nevada cabinet near MFP B or on the following Plant Computer points.

<table>
<tr><th></th><th>IPC</th><th>Bentley Nevada</th></tr>
<tr><td>1B MFPT H.P. Bearing Vibration:</td><td>"X". X0221
"Y". X0251</td><td>"X". 1XIS-5310X
"Y". 1XIS-5310Y</td></tr>
<tr><td>1B MFPT L.P. Bearing Vibration:</td><td>"X". X0222
"Y". X0252</td><td>"X". 1XIS-5311X
"Y". 1XIS-5311Y</td></tr>
<tr><td>1B MFP INBD Bearing Vibration:</td><td>"X". X0259
"Y". X0262</td><td>"X". 1XIS-4922X
"Y". 1XIS-4922Y</td></tr>
<tr><td>1B MFP OUTBD Bearing Vibration:</td><td>"X". X0261
"Y" X0262</td><td>"X". 1XIS-4923X
"Y". 1XIS-4923Y</td></tr>
</table>
</td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6, actions per ARP 17015-05

Event Description: MFPT B turbine vibration will rise to > 6 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	UO	**1.0 PROBABLE CAUSE** 1. Bearing malfunction due to loss of oil or improper cooling. 2. Bowed shaft.
	UO	**2.0 AUTOMATIC ACTIONS** NONE
	UO	**3.0 INITIAL OPERATION ACTIONS** NONE

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6, actions per ARP 17015-05

Event Description: MFPT B turbine vibration will rise to > 6 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	UO	**4.0 SUBSEQUENT OPERATOR ACTIONS** NOTE: A handheld vibration instrument may be used to determine levels locally. 1. Dispatch an operator to MFPT B to investigate. 2. On the Plant Computer, perform the following: a. Select the ATSI CRT Trend Display and print out a trend of the desired current Turbine parameters to determine the alarm condition. NOTES • Elevated or fluctuating bearing drain temperatures may be an indication of bearing loading and can indicate a bearing is failing. • Engineering and Maintenance should be promptly notified if any bearing drain temperatures are elevated. • Bearing oil temperatures should be maintained between 110°F and 125°F. b. Monitor lube oil and bearing oil temperatures of pump and turbine. 3. IF MFP TURBINE bearing vibration rises to 5 mils or greater, immediately reduce power and trip MFPT B per the following: • 18013-C "Rapid Power Reduction." • 18016-C "Condensate And Feedwater Malfunction."

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6, actions per ARP 17015-05

Event Description: MFPT B turbine vibration will rise to > 6 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	UO	**4.0 SUBSEQUENT OPERATOR ACTIONS (continued)** 4. IF MFP TURBINE bearing vibration rises to 5 mils or greater, request Engineering and Maintenance to initiate local vibration monitoring and recommended compensatory actions identified in Step 7. 5. IF MFP PUMP bearing vibration rises to 5.5 mils or greater, reduce power and stop MFPT B per 12004-C, "Power Operation (Mode 1)." 6. IF MFP PUMP bearing rises to 6 mils or greater, rapidly reduce power and stop MFP B per 18013-C "Rapid Power Reduction." 7. IF MFP Turbine/Pump vibrations are elevated AND with Engineering concurrence, perform the following to reduce vibrations: a. Monitor lube oil and bearing oil temperatures on Plant Computer and maintain bearing oil temperatures between 110°F and 125°F by adjusting cooling water flow.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6, actions per ARP 17015-05

Event Description: MFPT B turbine vibration will rise to > 6 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	UO	**4.0 SUBSEQUENT OPERATOR ACTIONS (continued)** **CAUTIONS:** • Raising the speed of MFP A will lower the speed on the MFP B. MFP A should not exceed 5900 rpm and MFP B speed should not drop below 5100 rpm. • A bias potentiometer setpoint should not be lowered to less than 5.0. Having a setpoint of less than 5.0 will lower the maximum speed of the affected MFP. b. Reduce speed of MFP B by increasing MFP A speed as follows: (1) Slowing increase speed on MFP A by increasing the bias potentiometer on 1SIC-509B (if in auto) or by increasing speed demand on 1SIC-509B (if in manual). Allow speed on MFP B to decrease (if SIC-509C is in auto) or decrease speed demand (if SIC-509C is in manual). (2) Continue to lower speed on MFP B until the vibration alarm clears or 5100 rpm is reached.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6, actions per ARP 17015-05

Event Description: MFPT B turbine vibration will rise to > 6 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	UO	**4.0 SUBSEQUENT OPERATOR ACTIONS (continued)** NOTES: • Operational experience shows that pumps usually run with less vibration at higher seal water temperatures. • Optimal seal water temperatures are between 140°F and 160°F with Inboard/Outboard temperature difference less than 5°F. • Maintenance I & C support may be required for adjustment of MFP seal water temperature controls. c. Adjust the MFP B seal water controls to reduce vibrations as follows: (1) Establish constant communications with Control Room. (2) Select the setpoint display screen on 1-TIC-5237A and 1-TIC-5237B. **CAUTION:** Setpoint changes should be made in increments no greater than 0.4 degrees. (3) Use the up and down arrows to select the required temperature setpoint. (4) Press setpoint key on 1-TIC-5237A and 1-TIC-5237B WHEN temperature adjustment is completed. (5) Monitor SGFP Turbine and Pump vibrations.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6, actions per ARP 17015-05

Event Description: MFPT B turbine vibration will rise to > 6 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	UO	**4.0 SUBSEQUENT OPERATOR ACTIONS (continued)** NOTE Turbine and pump vibration may be monitored at the Bentley Nevada cabinet near MFP B or on the following Plant Computer points. 1B MFPT H.P. Bearing Vibration: IPC "X". X0221 "Y". X0251; Bentley Nevada "X". 1XIS-5310X "Y". 1XIS-5310Y 1B MFPT L.P. Bearing Vibration: IPC "X". X0222 "Y". X0252; Bentley Nevada "X". 1XIS-5311X "Y". 1XIS-5311Y 1B MFP INBD Bearing Vibration: IPC "X". X0259 "Y". X0262; Bentley Nevada "X". 1XIS-4922X "Y". 1XIS-4922Y 1B MFP OUTBD Bearing Vibration: IPC "X". X0261 "Y" X0262; Bentley Nevada "X". 1XIS-4923X "Y". 1XIS-4923Y
	UO	(6) IF further temperature adjustment is required to reduce vibration, repeat steps 2 through 5. (7) WHEN temperature adjustment is no longer required, ensure 1-T-V5237A and 1`-TV-5237B are controlling as required. d. Adjust the MFPT B Seal Water Supply Bypass 1-1305-U4-628 and 1-1305-U4-629 IF required. (1) Install caution tags on valves stating the following or equivalent: **"MFP seal water bypass valves throttled to reduce vibration on MFP B"**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6, actions per ARP 17015-05

Event Description: MFPT B turbine vibration will rise to > 6 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	UO	**4.0 SUBSEQUENT OPERATOR ACTIONS (continued)** 8. Scan ALB15 and ALB16 for associated alarms and take appropriate actions.

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 6

Event Description: MFPT B turbine vibration will rise to > 5 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>SS</td><td>18013-C, RAPID POWER REDUCTION actions.
<table><tr><td>Entry</td><td>Condition</td><td>Target</td><td>Approx. Time @ 3-5% min</td></tr><tr><td>17015-D05
17015-E01</td><td>MFPT High Vibrations</td><td><70% RTP</td><td>6 – 10 minutes</td></tr></table>1. Perform SHUTDOWN BRIEFING.</td></tr>
<tr><td></td><td>SS</td><td><u>SHUTDOWN BRIEFING</u>
<u>METHOD</u>
• Auto rod control should be used.
• Reduce Turbine Load at approximately 3% RTP per minute (approx 36 MWe) up to 5% RTP (approx 60 MWe).
• Borate AFD within the doghouse.
• SS (or SRO designee) – Maintain supervisory oversight.
• All rod withdrawals will be approved by the SS.
• Approval for each reactivity is not necessary as long as manipulations are made within the boundaries established in this briefing (i.e. turbine load adjustment up to 60 MWe, etc.
• A crew update should be performed at approximately every 100 MWe power change.
• If manpower is available, peer checks should be used for all reactivity changes.
<u>OPERATIONAL LIMITS</u>
• Maintain Tavg within ± 6°F of Tref. IF TAVG/TREF mismatch >6°F and not trending toward a matched condition or if Tavg ≤ 551°F, then trip the reactor.
• If load reduction due to a loss of vacuum, every effort should be made to maintain the steam dumps closed. (Permissive C-9 ≥24.92" Hg).
<u>INDUSTRY OE</u>
• Shift supervision must maintain effective oversight and exercise conservative decision making.
• Correction of significant RCS Tavg deviations should only be via secondary plant control manipulations and not primary plant control manipulations (i.e., do not withdraw control rods or dilute).</td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6

Event Description: MFPT B turbine vibration will rise to > 5 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	OATC	2. Verify rods in AUTO.
	UO	3. Reduce Turbine Load at the desired rate up to 5% min. (60 MWe/min).
	OATC	4. Borate as necessary by initiating 13009, CVCS REACTOR MAKEUP CONTROL SYSTEM. **Note to examiner**: Step from 13009-C for boration are at the end of this event starting on page # 36
	OATC	5. Initiate the Continuous Actions Page.
	OATC	6. Check desired ramp rate – LESS THAN OR EQUAL TO 5%/MIN.

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 6

Event Description: MFPT B turbine vibration will rise to > 5 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	OATC	7. Maintain Tavg within 6oF of Tref: a. Monitor Tavg/Tref deviation (UT-0495). b. Verify rods inserting as required. c. Energize Pressurizer back-up heaters as necessary.
	OATC	8. Maintain reactor power and turbine power – MATCHED. a. Balance reactor power with secondary power reduction using boration and control rods. b. Check rate of power reduction – ADEQUATE FOR PLANT CONDITIONS. c. Check RCS Tavg – GREATER THAN 551°F (TS 3.4.2). d. Check RCS Tavg – WITHIN 6oF OF TREF.
	OATC	9. Maintain PRZR Pressure – AT 2235 PSIG.
	OATC	10. Maintain PRZR Level at – PROGRAM.
	OATC	11. Maintain SG Level – BETWEEN 60% AND 70%.
	OATC	12. Notify the System Operator that a load reduction is in progress.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6

Event Description: MFPT B turbine vibration will rise to > 5 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	SS	1. Notify SM to make the following notifications as appropriate:
		__Plant Management Notifications using 10000-C, CONDUCT OF OPERATIONS.
		__NMP-EP-110, EMERGENCY CLASSIFICATION DETERMINATION AND INITIAL ACTION.
		__00152, FEDERAL AND STATE REPORTING REQUIREMENTS.
		__Chemistry Technical Specification sampling for load reductions greater than 15% using 35110-C, CHEMISTRY CONTROL OF THE REACTOR COOLANT SYSTEM.
		__QC to perform a NOPT inspection using 84008, RPV ALLOY 600 MATERIAL INSPECTIONS AND REPORTS for reactor shutdowns.
	UO	NOTE Attempts should be made to keep steam dumps closed if power reduction is required for Condenser problem.
	UO	14. Check Steam Dumps – CLOSED.
	UO	15. Check Turb/Gen to remain online. **(YES)**

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 6

Event Description: MFPT B turbine vibration will rise to > 5 mils requiring entry into 18013-C Rapid Power Reduction and trip of MFPT B.

Time	Position	Applicant's Action or Behavior
	SS	16. Check desired plant conditions achieved. Adequate load reduction. -OR- Plant conditions no longer required shutdown. RNO 16. WHEN desired plant conditions are achieved, THEN Go to Step 17.
	UO	17. Perform the following: a. Stabilize power level. b. Place rods in MANUAL and match Tavg with Tref. c. Maintain stable plant conditions. d. Go to 12004-C, POWER OPERATION (MODE 1) Section 4.2 and perform actions from the starting power level to ending power level.
	UO	**IF NOT ENDED PREVIOUSLY, END OF EVENT 6, proceed to EVENT 7, the main event.**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6 Rapid Power Reduction boration steps.

Event Description: Rapid Power Reduction boration steps from 13009.

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

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6 Rapid Power Reduction boration steps.

Event Description: Rapid Power Reduction boration steps from 13009.

Time	Position	Applicant's Action or Behavior
		NOTE If necessary, boric acid flow may be adjusted using 1-FIC-0110 with SS concurrence. Changes to pot setting should be logged in the Control Room Log and restored at completion of activity.
	OATC	4.2.5 Adjust potentiometer on Boric Acid Blender Flow Controller 1-FIC-0110 as desired and verify in AUTO.
		CAUTION Digital counter setting on BORIC ACID TO BLENDER integrator 1-FQI-0110 reads in tenth-gallon increments.
	OATC	4.2.6 Set BORIC ACID TO BLENDER integrator 1-FQI-0110 to the desired amount of Boric Acid.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6 Rapid Power Reduction boration steps.

Event Description: Rapid Power Reduction boration steps from 13009.

Time	Position	Applicant's Action or Behavior
	OATC	4.2.7 Verify the following: • BA TO BLENDER 1-HS-0110A is in AUTO. • BLENDER OUTLET TO CHARGING PUMPS SUCT 1-HS-0110B is in AUTO. • One Boric Acid Transfer Pump in AUTO or START. • RX MU WTR TO BA BLENDER 1-FV-0111A is closed with 1HS-0111A in AUTO. • BLENDER OUTLET TO VCT 1-FV-0111B is closed with 1HS-0111B in AUTO. NOTES • Boration can be manually stopped at any time by placing 1-HS-40001B in STOP. • VCT pressure, 1-PI-115 should be maintained between 20 and 45 psig.
	OATC	4.2.8 Place VCT MAKEUP CONTROL 1-HS-40001B in START and perform the following: • Verify Boric Acid Transfer Pump is running. • Verify 1-FV-0110B is open. • Verify 1-FV—0110A throttles open to provide desired flow on 1-FI-0110A. • Monitor BORIC ACID TO BLENDER integrator 1-FQI-0110.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6 Rapid Power Reduction boration steps.

Event Description: Rapid Power Reduction boration steps from 13009.

Time	Position	Applicant's Action or Behavior
	OATC	4.2.9 WHEN 1-FQI-0110 BORIC ACID TO BLENDER integrator reaches its setpoint, verify boration stops and the following valves close. • 1-FV-0110A, BA TO BLENDER • 1-FV-0110B, BLENDER OUTLET TO CHARGING PUMPS SUCT
	OATC	4.2.10 Flush approximately 15 gallons of Reactor Makeup Water through 1-FV-0110B by performing the flowing: a. Place VCT MAKEUP MODE SELECT 1-HS-40001A to ALT DIL. b. Set TOTAL MAKEUP integrator 1-FQI-0111 for 13 to 15 gallons. c. Place BLENDER OUTLET TO VCT 1-HS-0111B in CLOSE. d. Place VCT MAKEUP CONTROL 1-HS-40001B in START. e. Verify flow is indicated on 1-FI-0110B. f. WHEN TOTAL MAKEUP integrator 1-FQI reaches the desired setpoint, verify the following valves close: • 1-FV-0111A, RX MU WTR TO BA BLENDER • 1-FV-0110B, BLENDER OUTLET TO CHARGING PUMPS SUCT

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6 Rapid Power Reduction boration steps.

Event Description: Rapid Power Reduction boration steps from 13009.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>OATC</td><td>4.2.11 Verify 1-FIC-0110 potentiometer is set to setting recorded prior to boration (or as directed by SS).</td></tr>
<tr><td></td><td>OATC</td><td>4.2.12 Align Reactor Makeup Control system for automatic operation as follows:
<table>
<tr><th></th><th>COMPONENT</th><th>NAME</th><th>POSITION</th></tr>
<tr><td>a.</td><td>1-HS-110B</td><td>BLENDER OUTLET TO VCT</td><td>AUTO</td></tr>
<tr><td>b.</td><td>1HS-40001A</td><td>VCT MAKEUP MODE SELECT</td><td>AUTO</td></tr>
<tr><td>c.</td><td>1-HS-40001B</td><td>VCT MAKEUP CONTROL</td><td>START</td></tr>
</table></td></tr>
<tr><td></td><td>OATC</td><td>4.2.13 IF BA TRANSFER PUMP was placed in START at Step 4.2.7, return to AUTO or as directed by SS.</td></tr>
<tr><td></td><td>OATC</td><td>4.2.14 Monitor RCS Tavg, source range count rate, and Reactor Power as applicable.</td></tr>
<tr><td></td><td>OATC</td><td>4.2.15 Operate the Pressurizer Back-up Heaters as necessary to equalize boron concentration between the RCS and the Pressurizer.</td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 6 Rapid Power Reduction boration steps.

Event Description: Rapid Power Reduction boration steps from 13009.

Time	Position	Applicant's Action or Behavior
	OATC	4.2.16 Verify desired boration through sample analysis or from Boron Concentration Meter 1-1208-T6-006. (1-AI-40134).
		Return to EVENT 6, Rapid Power Reduction, page # 32

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

Event No.: 6, 13615-1 Steps for Shutdown of MFPT B at power (section 4.3.3).

Event Description: Rapid Power Reduction Shutdown MFPT B steps.

Time	Position	Applicant's Action or Behavior
	UO	4.3.3 Shutdown of MFPT-B At Power NOTE: When removing a Main Feed Pump from service Tech Spec LCO 3.3.2 FU 6d. condition J should be entered when pump is no longer feeding forward until pump is tripped at Step 4.3.1.5 .
	SS	Enters LCO 3.3.2 FU 6d, Condition J
	UO	4.3.3.1 When directed to shut down the first MFPT per the controlling Unit Operating Procedure (UOP), perform the following: a. Verify MFPT-A is in AUTO. b. Observe that the load shifts from MFP-B to MFP-A while performing the following: (1) Place MFPT-B Speed Controller, 1-SIC-509C, in MAN. (2) Slowly adjust 1-SIC-509C to minimum speed.
	UO	4.3.3.2 Transfer Speed Control from 1-SIC-509C to Motor Speed Changer Potentiometer, 1-SC-3152, as follows: a. Monitor MFPT-B auto/man Transfer Deviation on 1-SI-3154. b. Slowly adjust 1-SC-3152 to obtain zero deviation on 1-SI-3154. c. Transfer control by placing MFPT-B Motor Speed Changer, 1-HS-3152 in MAN.

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

Event No.: 6, 13615-1 Steps for Shutdown of MFPT B at power (section 4.3.3).

Event Description: Rapid Power Reduction Shutdown MFPT B steps.

Time	Position	Applicant's Action or Behavior
	UO	4.3.3.3 Slowly lower MFPT-B speed (1-SI-5317) to between 1200 and 1250 rpm by adjusting Motor Speed Changer Potentiometer 1-SC-3152.
	UO	4.3.3.4 Open the MFPT-B drains: • MFPT-B HPSV Above Seat Drain 1-HV-3106, using 1-HS-3106 • MFPT-B HPSV Below Seat Drain 1-HV-3108, using 1-HS-3108. • MFPT-B LPSV Above Seat Drain 1-HV-3118, using 1-HS-3118 • MFPT-B LPSV Below Seat Drain 1-HV-3122, using 1-HS-3122 • MFPT-B First Stage Drain 1-HV-3120, using 1-HS-3120.
	UO	4.3.3.5 Trip MFPT-B using 1-HS-3170.
	UO	4.3.3.6 Observe HPSV 1-XV-5369 and LPSV 1-XV-5367 close.
	UO	4.3.3.7 Set Motor Speed Changer Potentiometer, 1-SC-3152, to zero (fully counterclockwise).
	UO	4.3.3.8 Verify MFP B Discharge valve, 1-HV-5209, closed.

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

Event No.: 6, 13615-1 Steps for Shutdown of MFPT B at power (section 4.3.3).

Event Description: Rapid Power Reduction Shutdown MFPT B steps.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>UO</td><td>4.3.3.9 Open MFP A and B Casing Warmup Isolations.

• 1-1305-U4-592
• 1-1305-U4-579</td></tr>
<tr><td></td><td>UO</td><td>NOTE: Opening the links in the following step will prevent an auto start of the third Condensate pump on Low MFP Suction Pressure.

4.3.3.10 If the MFP-B suction valve, 1-1305-U4-033, will be closed, open the following links, and caution tag the MFP-B Trip/Reset 1-HS-3170.

<table>
<tr><th>PUMP</th><th>PANEL</th><th>TERMINAL BOARD</th><th>LINK(S)</th></tr>
<tr><td>MFP-B</td><td>1NCPR13</td><td>TB-A</td><td>14</td></tr>
<tr><td>MFP-B</td><td>1NCPR13</td><td>TB-A</td><td>15</td></tr>
</table>

MFP-B Trip/Reset switch, 1-HS-3170</td></tr>
<tr><td></td><td>UO</td><td>4.3.3.11 If MFPT-B is being removed from service and tagged out for maintenance, proceed to Section 4.3.4.</td></tr>
<tr><td></td><td>UO</td><td>4.3.3.12 This step is NOT APPLICABLE at this time.</td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior
	CREW	Recognizes ATWT condition by various first outs, electrical board and other QMCB annunciators. (too various to list)
	OATC	**IMMEDIATE OPERATOR ACTIONS** 1. Check Reactor Trip. **(NO)** • Rod Bottom Lights – LIT **(NO)** • Reactor Trip and Bypass Breakers – OPEN. **(NO)** • Neutron Flux – LOWERING. **(NO)** RNO 1. Trip Reactor using both Reactor trip handswitches. IF Reactor NOT tripped, THEN go to 19211-C, FR-S.1 RESPONSE TO NUCLEAR POWER GENERATION / ATWT.
	SS	Transitions to 19211-C, FR-S.1 RESPONSE TO NUCLEAR POWER GENERATION / ATWT.
		NOTE This Functional Restoration Procedure should NOT be implemented if both 4160V AC emergency buses are de-energized, 19100-C should be entered. **CAUTION** RCPs should not be tripped with Reactor power greater than 5%.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior
	OATC ***Critical***	**IMMEDIATE OPERATOR ACTIONS** 1. Verify Reactor trip: • Rod Bottom Lights – LIT. **(NO)** • Reactor Trip and Bypass Breakers – OPEN. **(NO)** • Neutron Flux – LOWERING. **(NO)** RNO 1. Trip Reactor using both Reactor trip handswithes. IF Reactor NOT tripped, **THEN Insert Control Rods.** **Note to examiner:** Control rods will initiate inserting at 72 step per minute when the UO trips the Main Turbine, however, after ~ 1 minute, auto rod motion will fail and the OATC will have to insert rods manually at 48 steps per minute. **Manual Insertion of Control rods is CRITICAL.**
	UO ***Critical***	**IMMEDIATE OPERATOR ACTIONS** 2. **Verify Turbine trip:** **a. All Turbine Stop Valves – CLOSED.** **Note to examiner**: The Turbine will not automatically trip, it will only trip when performed manually by the UO.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior
	UO	3. Check AFW Pumps – RUNNING: **(NO)** • MDAFW pumps **(NO)** • TDAFW Pump, if required. **(NO)** RNO
	Critical	**Start Pumps.**
	Critical	**Open Steam Supply valve HV-5106.**
		Note to examiner: The TDAFW pump is required to be started as at least 2 SG levels will be < 10% NR.
	UO	4. Emergency borate the RCS: a. Start at least one Boric Acid Transfer Pump. b. Verify a Charging Pump is running. c. Open EMERGENCY BORATE valve HV-8104.
		Note to examiner: The UO will be asked to perform this step.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior
	UO	Step 4 continued. d. Verify charging flow – GREATER THAN 42 GPM. **(may not)** e. Verify boric acid flow – GREATER THAN 30 GPM. **Note to examiner:** Due to high RCS pressure during the ATWT, it may be necessary to take control of FIC-0121 to raise charging flow to > 42 gpm. f. Check RCS pressure – LESS THAN 2335 PSIG. **(YES)** RNO **(just in case)** f. Check PRZR PORVs and Block Valves open. IF valves NOT open, THEN reduce RCS pressure to less than 2135 psig by performing the following: 1) Arm COPS. 2) Open PRZR PORVs and Block Valves as necessary.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior
	OATC	5. Check Containment Ventilation Isolation: a. Dampers and Valves – CLOSED. • CVI MLB indication. (may be)
	UO	RNO **(just in case)** a. Perform the following: 1) Close Dampers and Valves. 2) Start Piping Pen Units. **Note to examiner:** If SI has occurred, the RNO will be unnecessary, if SI has NOT occurred, the UO will perform the RNO steps at the HVAC panel. **CVI dampers / valves are listed on page # 54 & 55.**
	OATC UO	6. Initiate the following: • Continuous Action Page. • NMP-EP-110, EMERGENCY CLASSIFICATION DETERMINATION AND INTIAL ACTION.
	OATC	7. Check for SI: a. SI signal EXISTS OR ACTUATED. **(NO)** **b.** Initiate ATTACHMENT A. **(If, YES)** **Note to examiner:** ATTACHMENT A included at end of this event, in the event an SI has actuated.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior
	OATC	8. Check the following trips have occurred: a. Reactor trip. **(NO)** RNO a. Locally trip the Reactor trip and Bypass breakers. IF the trip breakers will NOT open, THEN tri the Control Rod Drive MG Set output breakers at the Reactor Trip Switchgear. **Note to examiner:** The crew is expected to call someone to perform this action: The Simbooth Operator will open the trip breakers two minutes after receiving the request. b. Turbine Trip. **(YES)**
	OATC	9. Check Reactor power: a. LESS THAN 5%. **(NO)** b. IR SUR – LESS THAN 0 DPM. **(NO)** c. Go to Step 24. **Note to examiner**: This step is a continuous action, when the trip breakers open, the crew should go to step 24 to exit this procedure.
	UO	10. Check Main Generator Output Breakers – OPEN. **(YES)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior
	UO	11. Check SG levels: a. NR level- AT LEAST ONE GREATER THAN 10%. (32% ADVERSE) RNO a. Verify total feed flow greater than 1260 gpm. IF NOT, THEN start pumps and align valves as necessary. IF all SG(s) NR levels less than 10% (32% ADVERSE) THEN maintain total feed flow greater than 1260 gpm. b. Maintain NR levels between 10% (32% ADVERSE) and 65%.
	UO	Check CST level – GREATER THAN 15%. **(YES)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior
	OATC	13. Verify all dilution paths – ISOLATED. • RX MU WTR TO BA BLENDER, FV-111A – CLOSED. • Dispatch operator to verify CVCS RX MU WTR TO CCP A ISO, 1208-U4-183 – LOCKED CLOSED. UNIT 1 (AB-A47) UNIT 2 (AB-A82) RNO 13. Dispatch operator to close: • CVCS RX M/U WTR SUPPLY TO CVCS ISO, 1208-U4-177. UNIT 1 (AB-A47) UNIT 2 (AB-A82)
		Note to examiner: The Simbooth Operator will open the trip breakers as requested after 2 minutes or after step 13, whichever comes first. This is to ensure scenario progresses as expected.
	OATC	24. Maintain emergency boration to provide adequate shutdown margin for subsequent conditions.
	SS	25. Initiate Critical Safety Function Status Tress per 19200-C, F-O CRITICAL SAFETY FUNCTION STATUS TREE.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: **ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.**

Time	Position	Applicant's Action or Behavior
	SS	26. Return to procedure and step in effect.
		Note to examiner: The actions for E-0 are on the following pages.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.

Time	Position	Applicant's Action or Behavior

VALVE #	DESCRIPTION	LOCATION
HV-12975	CNMT AIR RAD MON SPLY ISO IRC	QPCP
HV-12976	CNMT AIR RAD MON SPLY ISO ORC	QPCP
HV-12977	CNMT AIR RAD MON RTN ISO ORC	QPCP
HV-12978	CNMT AIR RAD MON RTN ISO IRC	QPCP
HV-2626A	CTB NORM PURGE SPLY IRC ISO VLV- MAIN (Normally de-energized shut)	QHVC (C31)
HV-2626B	CTB NORM PURGE SPLY IRC ISO VLV-MINI	QHVC ((C32)
HV-2627A	CTB NORM PURGE SPLY ORC ISO VLV- MAIN (Normally de-energized shut)	QHVC (D31)
HV-2627B	CTB NORM PURGE SPLY ORC ISO VLV-MINI	QHVC (D32)
HV-2628A	CTB NORM PURGE EXH IRC ISO VLV- MAIN (Normally de-energized shut)	QHVC (A33)
HV-2628B	CTB NORM PURGE EXH IRC ISO VLV-MINI	QHVC ((A34)
HV-2629A	CTB NORM PURGE EXH ORC ISO VLV- MAIN (Normally de-energized shut)	QHVC (B33)
HV-2629B	CTB MINI PURGE EXH ORC ISO VLV-MINI	QHVC (B34)
HV-2624A	CTB POST LOCA PURGE EXH IRC ISO VLV	QHVC (A35)
HV-2624B	CTB POST LOCA PURGE EXH IRC ISO VLV	QHVC (B35)

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: **ATWT with failure of auto rod motion, Turbine auto trip, auto start of all AFW pumps, and faulted Steam Generator(s) as Safeties lift and fail to reseat when the Turbine trips.**

Time	Position	Applicant's Action or Behavior

HV-12604	PIPING PEN RM OUTLET ISO DMPR	QHVC (C22)
HV-12605	PIPING PEN RM INLET ISO DMPT	QHVC (B22)
HV-12606	PIPING PEN RM INLET ISO DMPR	QHVC (B23)
HV-12607	PIPING PEN RM OUTLET ISO DMPR	QHVC (C23)
HV-12596	RECYCLE HOLD-UP TK-1 ISO VENT VLV	QHVC (E22)
HV-12597	RECYCLE HOLD-UP TK-1 ISO VENT VLV	QHVC (E23)
HS-2548	PIPING PEN RM FLTR & EXH FAN 1	QHVC (A22)
HV-2549	PIPING PEN RM FLTR & EXH FAN 2	QHVC (A23)

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	CREW SS	Performs Immediate Operator Actions per 19000-C, E-0 Reactor Trip or Safety Injection. Makes a page announcement of Reactor Trip.
	OATC	1. Check Reactor Trip: **(YES)** • Rod Bottom Lights – LIT • Reactor Trip and Bypass Breakers – OPEN • Neutron Flux – LOWERING
	UO	2. Check Turbine Trip: **(YES)** • All Turbine Stop Valves – CLOSED
	UO	3. Check Power to AC Emergency Buses. **(YES)** a. AC Emergency Busses – AT LEAST ONE ENERGIZED. • 4160 AC 1E Busses b. AC Emergency Busses – ALL ENERGIZED. • 4160V AC 1E Busses • 480V AC 1E Busses

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	OATC	4. Check if SI is actuated. **(YES)** • Any SI annunciators – LIT • SI ACTUATED BPLP window – LIT
	SS	Go to Step 6.
	SS CREW	6. Initiate the Foldout Page.
	SS	7. Perform the following:
	OATC	• OATC Initial Actions Page
	UO	• UO Initial Actions Page
		NOTE: SS initiates step 8 after OATC/UO Initial Actions completed.

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	OATC	**PERFORMS OATC INITIAL ACTIONS** 1. Check both trains of ECCS equipment – ALIGNING FOR INJECTION PHASE: **(YES)** • MLB indication
	OATC	2. Check Containment Isolation Phase A – ACTUATED. **(YES)** • CIA MLB indication
	OATC	3. Check ECCS Pumps and NCP status: a. CCPs RUNNING. **(YES)** b. SI Pumps – RUNNING. **(YES)** **Note to Examiner**: SIP A is tagged out. c. RHR pumps – RUNNING. **(YES)** d. NCP – TRIPPED. **(YES)**
	OATC	4. Verify CCW Pumps – ONLY TWO RUNNING EACH TRAIN.

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	OATC	**PERFORMS OATC INITIAL ACTIONS** 5. Verify proper NSCW system operation: **(YES)** a. NSCW Pumps – ONLY TWO RUNNING EACH TRAIN. b. NSCW TOWER RTN HDR BYPASS BASIN hand switches – IN AUTO: • HS-1668A • HS-1669A
	OATC UO	6. Verify Containment Cooling Units: **(YES)** a. ALL RUNNING IN LOW SPEED. • MLB indication b. NSCW Cooler isolation valves – OPEN. **(YES)** • MLB indication
	OATC	7. Check Containment Ventilation Isolation. a. Dampers and Valves – CLOSED. **(YES)**

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	OATC	**PERFORMS OATC INITIAL ACTIONS** 8. Check Containment pressure – REMAINED LESS THAN 21 PSIG. **(YES)**
	OATC	9. Check ECCS flows: a. BIT flow. **(YES)** b. RCS pressure – LESS THAN 1625 PSIG. **(YES)** c. SI Pump flow. (YES) d. RCS pressure – LESS THAN 300 PSIG. **(NO)** RNO d. Go to Step 10.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	OATC	**PERFORMS OATC INITIAL ACTIONS** 10. Check ECCS Valve alignment – PROPER INJECTION LINEUP INDICATED ON MLBs. **(YES)**
	OATC	11. Check ACCW Pumps – AT LEAST ONE RUNNING. **(YES)**
	OATC	12. Adjust Seal Injection flow to all RCPs 8 TO 13 GPM.
	OATC	13. Dispatch Operator to ensure one train of SPENT FUEL POOL COOLING in service per 13719, SPENT FUEL POOL COOLING AND PURIFICATION SYSTEM. **END OF OATC INITIAL OPERATOR ACTIONS,** return to E-0 Step 8.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	UO	**UO INITIAL ACTIONS** 1. Check AFW Pumps – RUNNING. **(YES)** • MDAFW Pumps • TDAFW Pump, if required.
	UO	2. Check NR level in at least one SG – GREATER THAN 10% (32% ADVERSE) RNO 2. Establish AFW flow greater than 570 gpm by starting pumps and aligning valves as necessary.
	UO	3. Check if main steamlines should be isolated: **(YES)** a. Check for one or more of the following conditions: Any steamline pressure – LESS THAN OR EQUAL TO 585 PSIG. Containment pressure – GREATER THAN 14.5 PSIG. Low Steam Pressure SI/SLI – BLOCKED AND High Steam Pressure Rate – ONE TWO OR MORE CHANNELS OF ANY STEAMLINE. b. Verify Main Steamline Isolation and Bypass Valves – CLOSED. **(YES)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	UO	**UO INITIAL ACTIONS** 4. Verify FW Isolation Valves closed: **(YES)** • MFIVs • BFIVs • MFRVs • BFRVs
	UO	5. Verify SG Blowdown isolated. **(YES)** • Place SG Blowdown isolation Valve handswitches HS-7603A, B, C, and D in the CLOSE position. **Note to examiner:** The UO will place the HS-7603A valves in the hard closed position. • SG Sample Isolation Valves – CLOSED. **(YES)**
	UO	6. Verify Diesel Generators – RUNNING. **(YES)**
	UO	7. Throttle total AFW flow as necessary to maintain SG NR levels between 10% (32% ADVERSE) and 65%.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	UO	8. Verify both MFPs – TRIPPED. **(YES)**
	UO	9. Check Main Generator Output Breakers – OPEN. **(YES)** **END OF UO INITIAL ACTIONS, return to step 8 of E-0.**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	OATC UO	**19000-C, E-0 actions beginning with step 8.** 8. Initiate the Continuous Actions Page.
	OATC	9. Check RCS temperature stable at or trending to 557°F. **(NO)** RNO 9. IF temperature is less than 557oF and lowering, **(it is)** THEN perform the following as necessary: a. Stop dumping steam. b. Perform the following as appropriate: IF at least one SG NR level greater than 10% (32% ADVERSE), THEN lower total feed flow. -OR- If all SG NR levels less than 10% (32% ADVERSE), THEN lower total feed flow to NOT less than 570 gpm. c. If cooldown continues, THEN close MSIVs and BSIVs. d. If temperature greater than 557oF and rising, THEN dump steam.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	OATC	**CAUTION:** A PRZR PORV Block Valve which was closed to isolate an excessively leaking or open PRZR PORV should not be opened unless used to prevent challenging the PRZR Safeties. 10. Check PRZR PORVs, Block Valves, and Spray Valves: a. PRZR PORVs – CLOSED AND IN AUTO. **(YES)** b. Normal PRZR Spray Valves – CLOSED **(YES)** c. Power to at least one Block Valve – AVAILABLE. **(YES)** d. PRZR PORV Block Valves – AT LEAST ONE OPEN. **(NO)** RNO d. Verify open at least one PRZR PORV Block Valve when PRZR pressure is greater than 2185 psig.
	UO	11. Check if RCPs should be stopped. a. ECCS Pumps – AT LEAST ONE RUNNING: **(YES)** • CCP or SI Pump b. RCS pressure – LESS THAN 1375 PSIG. **(NO)** RNO b. Go to Step 12.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 Faulted SG (Code Safety Open on SG # 4)

Event Description: During the ATWT, SG Safeties will lift on all SG(s), however, safety valve Loop # 4 will fail to reseat. These are the actions for E-0.

Time	Position	Applicant's Action or Behavior
	UO	12. Check SGs secondary pressure boundaries: a. SG Pressures: Any lowering in an uncontrolled manner. **(YES)** -OR- Any completely depressurized. b. Go to 19020-C, E-2 FAULTED STEAM GENERATOR ISOLATION.
	SS	Transitions to 19020-C, E-2 FAULTED STEAM GENERATOR ISOLATION

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 (E-2 Actions)

Event Description: 19020-C E-2 actions for Faulted Steam Generator.

Time	Position	Applicant's Action or Behavior
	CREW SS	1. Initiate critical safety function status trees per 19200-C, F-O CRITICAL SAFETY FUNCTION STATUS TREE. 2. Initiate NMP-EP-110, EMERGENCY CLASSIFICATION DETERMINATION AND INITIAL ACTION. **Note to examiner:** The SS will call the Simbooth to have the Shift Manager implement NMP-EP-110.
	OATC	**CAUTION**: At least one SG should be available for RCS cooldown.
	UO	3. Verify Main Steamline Isolation and Bypass Valves – CLOSED. **(YES)**
	UO	4. Check SGs secondary pressure boundaries: **a.** Identify intact SG(s): **(# 1, 2, and 3 are intact)** • SG pressures – ANY STABLE OR RISING **(YES)** b. Identify faulted SG(s) ANY SG PRESSURE LOWERING IN AN UNCONTROLLED MANNER. **(YES, SG # 4)** -OR- ANY SG COMPLETELY DEPRESSURIZED. **(maybe by now, SG # 4)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 (E-2 Actions)

Event Description: 19020-C E-2 actions for Faulted Steam Generator.

Time	Position	Applicant's Action or Behavior
	UO	5. Isolate Main Feedwater to the faulted SG(s): • Close affected MFIVs: HV-5227 (SG 1) HV-5228 (SG 2) HV-5229 (SG 3) **HV-5230 (SG 4)** • Close affected BFIVs: HV-15196 (SG 1) HV- 15197 (SG 2) HV- 15198 (SG 3) **HV- 15199 (SG 4)**
	UO ***Critical*** ***Critical***	6. Isolate Auxiliary Feedwater to the faulted SG(s): • Close affected MDAFW Pump Throttle Valves: HV-5139 – SG 1 FROM MDAFW PMP-A HV-5132 – SG 2 FROM MDAFW PMP-B HV-5134 – SG 3 FROM MDAFW PMP-B **HV-5137 – SG 4 FROM MDAFW PMP-A** • Close affected TDAFW Pump Throttle Valves: HV-5122 – SG 1 FROM TDAFW HV-5125 – SG 2 FROM TDAFW HV-5127 – SG 3 FROM TDAFW **HV-5120 – SG 4 FROM TDAFW** **Note to examiner:** The valves bolded above are critical at this time IF not already previously closed.
	UO	7. Check at least one MDAFW Pump – RUNNING AND CAPABLE OF FEEDING SG(s) NEEDED FOR RCS COOLDOWN. **(YES)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 (E-2 Actions)

Event Description: 19020-C E-2 actions for Faulted Steam Generator.

Time	Position	Applicant's Action or Behavior
	UO	8. Close affected TDAFW Pump Steam Supply Valve(s): HV-3009 (SG 1) LP-1 MS SPLY TO AUX FW TD PMP-1 HV-3019 (SG-2) LP-2 MS SPLY TO AUX FW TD PMP-1 **Note to examiner:** This step is N/A.
	UO	9. Verify affected SG ARV(s) – CLOSED: PV-3000 (SG 1) PV-3010 (SG 2) PV-3020 (SG 3) **PV-3030 (SG 4)**
	UO	10. Align SGBD valves: • Place SG Blowdown Isolation Valve handswitches in CLOSE position. • Close sample valves. HV-9451 (SG 1) HV-9452 (SG 2) HV-9453 (SG 3) HV-9454 (SG 4)
	UO	11. Verify faulted SG(s) remains isolated during subsequent recovery actions unless needed for RCS cooldown or SG activity sampling.
	UO	12. Check CST level – GREATER THAN 15%. **(YES)**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7 (E-2 Actions)

Event Description: 19020-C E-2 actions for Faulted Steam Generator.

Time	Position	Applicant's Action or Behavior
	UO	13. Initiate checking if SG Tubes intact: a. Direct Chemistry to take periodic activity samples of all SGs one at a time. **b.** Secondary radiation – NORMAL. **(YES)** • MAIN STM LINE MONITORS • RE-13120 (SG 1) • RE-13121 (SG 2) • RE-13122 (SG 3) • RE-13119 (SG 4) • CNDSR AIR EJCTR/STM RAD MONITORS: • RE-12839C • RE-12839D (if on scale) • RE-12839E (if on scale) • STM GEN LIQ PROCESS RAD: • RE-0019 (Sample) • RE-0021 (Blowdown) • SG sample radiation. **c.** Check SG levels – ANY RISING IN AN UNCONTROLLED MANNER. **(NO)** RNO c. Go to Step 14.

Op-Test No.: 2012-301 **Scenario No.: 6**

Event No.: 7 (E-2 Actions)

Event Description: 19020-C E-2 actions for Faulted Steam Generator.

Time	Position	Applicant's Action or Behavior
	OATC	14. Check if ECCS flow should be reduced: a. RCS Subcooling – GREATER THAN 24°F. (38°F ADVERSE) **(YES)** b. Secondary Heat Sink: **(YES)** Total feed flow to intact SGs – GREATER THAN 570 GPM. -OR- Narrow range level in at least one intact SG – GREATER THAN 10%. (32% ADVERSE) c. RCS pressure – STABLE or RISING **(YES)** d. PRZR level – GREATER THAN 9%. (37% ADVERSE) **(YES)** e. Go to 19011-C, ES-1.1 SI TERMINATION.
		END OF SCENARIO if desired, freeze the simulator if NRC Chief Examiner concurs. **IF the NRC Chief would like to see more, steps for SI termination are attached through step 5a.**

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: **Steps for 19011-C, ES-1.1 SI Termination through step 5b.**

Time	Position	Applicant's Action or Behavior
	SS	Enters 19011-C, ES-1.1 SI Termination.
	OATC UO	1. Initiate the following: • Continuous Actions and Foldout Page. • Critical Safety Function Status Trees per 19200-C, F-O CRITICAL SAFETY FUNCTION STATUS TREE.
	SS	2. Initiate NMP-EP-110, EMERGENCY CLASSIFICATION AND DETERMINATION AND INITIAL ACTION.
	CREW	**CAUTIONS** If offsite power is lost after SI reset, action is required to restart the following equipment if plant conditions require their operation. • RHR Pumps • SI Pumps • Post-LOCA Cavity Purge Units • Containment Coolers in low speed (started in high speed on a UV signal) • ESF Chilled Water Pumps (If CRI is reset)
	OATC	3. Reset SI.
	OATC	4. Verify only one CCP – RUNNING. **Note to examiner**: It is expected both CCPs will be running, usually the crew will stop CCP A.

Op-Test No.: 2012-301 **Scenario No.:** 6

Event No.: 7

Event Description: Steps for 19011-C, ES-1.1 SI Termination through step 5b.

Time	Position	Applicant's Action or Behavior
	UO	5. Check SGs secondary pressure boundaries: a. Any SG – FAULTED. **(YES, # 4)** b. Faulted SG – COMPLETELY DEPRESSURIZED. (NO) RNO b. Do NOT continue with this procedure until faulted SG(s) – COMPLETELY DEPRESSURIZED. Return to Step 5a. Note to examiner: It is expected SG # 4 will still be showing steam flow at this time, this will be the end of the scenario.
		END OF EVENT 7, END OF THE SCENARIO.

#7 Organizational Learning is Embraced

NUCLEAR SAFETY FOCUS
TARGET ZERO

C+T ←

target ZERO — Every day, every job, safely.

Protected Train:

☒ Alpha

☐ Bravo

EOOS:

☒ Green

☐ Yellow

☐ Orange

☐ Red

Plant Conditions:	100 % power BOL.
Major Activities:	Maintain power operations per UOP 12004-C section 4.3 for power operation.
	ition A is in effect due to SIP A tagged out.
	ni-purge is in service for a planned ntry on next shift. out for motor repair, expected return to 24 hours with 48 hours left on a shutdown 's. of Hurricane Maya are passing through, r and thunderstorms will be in the area for the next 8 hours. The Severe Weather Checklist is in effect.

SIPA — LOSF

DG1B 005

DY1B — ESF Chiller.

NSCW1B—005

SIMULATOR REACTIVITY BRIEFING SHEET

Shift: **Day** Date: **Today** Burnup: **500** MWD/MTU Core Life: **BOL**

MINIMUM SHIFT REACTIVITY INFORMATION TO BE BRIEFED

Power: **100** Rod Motion: **Rods in automatic**

Current Temperature Control Strategy: **boration**

Currently Making Up: **6** gallons every **Every two hours**

The desired Tavg operating band is 585.2 ± 0.05°F

CVCS makeup boric acid flow per 100 gallon makeup (FI-110A): **11.9** gallons/100
CVCS makeup pot setting (FIC-110): **2.96**

BTRS Strategy: **None**
AFD Strategy: **Maintain on target ± 3 AFD units**

Reactivity System Components Degraded/OOS:

None

Activities Expected That May Affect Core Reactivity (Reactivity Focus Items):

None

CURRENT CORE REACTIVIITY PARAMETERS

Boron worth: **7.7** pcm/ppm PCM per 1% power change: **14.9** pcm/%

Current MTC values HFP: **-13.7** pcm/°F HZP: **-1.8** pcm/°F

Current BAST C_b: **7,000** ppm Current RCS C_b: **830** ppm

Boration required per
- degree °F: **18** gallons
- 1% power change: **19** gallons
- 10% power change: **192** gallons
- 30% power change: **576** gallons

Dilution required per
- degree °F: **132** gallons
- 1% power change: **143** gallons

Boration required for stuck rods (154 ppm/rod): **3,141** gallons for 2 stuck rods; **4,775** gallons for 3 stuck rods

**If more than 3 rods are stuck, begin emergency boration and calculate gallons for actual number of stuck rods.*

Human Performance Tools

Peer Check	Three-Way Communication	Self-Verification (STAR)
Pre-Job Briefing	Phonetic Alphabet	Timeout
Procedure Use (placekeeping)	One Minute Matters (situational awareness)	

Valid for Cycle 17, PTDB Tab 1.0 revision 28.0 and Tab 16.0 revision 18.0

SIP B 120 12/6 [illegible]
-> A & C 120 gpm Cetdn 531 [B]

741

RCP Trends for degraded conditions

1801 3

Auto Rod Control 576 gal

AFD Dog House 13009

Withdrawals approach SS 300 gal Duration

Tave ±6 F of Tref

SOF -> Trip

0737 – crew brief
0740 – Shift
0741 ACCW #1.

Contact
ACCW #2 ← Did
Park position

0757 ΔT 411A.
TAVG 4112
That 4

584.8. – ~~584.9~~.
583.5.

CBD 213.
216
219
222.

228 → 0815
All Rods out

TS. NR Temp. ~~OTΔT~~

3.3.1
Fu 6 OTΔT – E 72 – trip
M3 – 78 hr

Fu 7 OPΔT – E.

3.3.2.
56 ↓ Tavg. I. 72 – trip
or
M3 78.

0824 – RE006. Failed High
3.3.3 Fu 14. 2 chanl. B.G.#.J

3,4 N/A

(Cont)

Cond B - 30 days Restore channel.

Prob not Cond G 5.68 immediately

*0833 - LI 459.FL (slowly)

TS. P2R level Failure.

→ 3.3.1 P2R water level (High) (w/P-7) cond M
Fu 9

Cond M - 72 hrs → trip
or
78 hrs → ↓ to <P-7

3.3.3. Fu 6. 2 Chan / Cond 30 days
info. BGHI info.

3.3.4 Fu 8. 2 chan.

Cond A 30 days

0854 PI 50% FH
FW Flow.

FIC-121. ← Not operating properly
@ Ø854

0914 - High vib >6 mils
300# psi ARP go to 18013.

<7Ø%

854 MWe.

---

9 Ø926.

~~ΔT 83% → 94%.~~

77% - ΔT's

75% →

903 MWe.

~~850~~ MWe

855 stable.

0915 18013 50 MWE/min Max 60 MWE

Update 100 MWE 1200

Maintain ± 6°F Tavg/Tref

<551°F Tavg

Carla-SS [redacted]-OATC [redacted]-LO

0740 ACCW pump #1 trip

0742 operator dispatched to ACCW pump #1

0756 exited 18022-C

0757 NR temp. failure

0810 called for temp instr. failure

0816 Consulting TS for temp instr.

0822 RE-006 failure

0829 chemistry notified to de-activate IRE-006

0831 LT-0459 failing low 18001-C entry, sect. D

0841 Pressurizer level called to S&T

0853 PT-508 fails high slowly 18016-C, sect. E.

0910 MFP 'B' vibrations 6.5 Hi beam by 9 on LP bearings local indication

0915 enter 18013-C

0947 ATWT

0950 all AFW pumps started

0953 E-plan initiated

0955 operator dispatched to RTBs

1004 SFP cooling in service call