[redacted] ~ Sim Operator

target ZERO Every day, every job, safely.	NUCLEAR SAFETY FOCUS TARGET ZERO
Protected Train: ☒ Alpha ☐ Bravo	**EOOS:** ☒ Green ☐ Yellow ☐ Orange ☐ Red
Plant Conditions:	29 % power BOL.
Major Activities:	Initiate power ascent UOP 12004-C section 4.1 for Power Ascent at a rate not to exceed 8% per hour. Step 4.1.40 has been performed. Step 4.1.41 is the next procedure plateau.
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. ☐ MFPT B will be placed in service at 55% power per UOP step 4.1.45. ☐ 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. ☐ Power Range high level trip bistables are set at 90%.

SIMULATOR REACTIVITY BRIEFING SHEET

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

MINIMUM SHIFT REACTIVITY INFORMATION TO BE BRIEFED

Power: **29** Rod Motion: **Rods in manual**

Current Temperature Control Strategy: **Boration**

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

The desired Tavg operating band is 563.5 ± 0.05°F

CVCS makeup boric acid flow per 100 gallon makeup (FI-110A): **15.0** gallons/100
CVCS makeup pot setting (FIC-110): **3.76**

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):

Power Ascent at less than or equal to 8% per hour.

CURRENT CORE REACTIVIITY PARAMETERS

Boron worth: **7.6** pcm/ppm PCM per 1% power change: **13.9** 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: **1,053** ppm

Boration required per	degree °F:	**19**	gallons
	1% power change:	**19**	gallons
	10% power change:	**188**	gallons
	30% power change:	**563**	gallons
Dilution required per	degree °F:	**105**	gallons
	1% power change:	**106**	gallons

Boration required for stuck rods (154 ppm/rod): **3,262** gallons for 2 stuck rods
4,961 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 7

[redacted] - Sim Operator

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

Facility: Vogtle Scenario No.: 7 Op-Test No.: 2012-301

Examiners: _____ Operators: _____

_____ _____

_____ _____

- Initial Conditions: The plant is at 29% power, BOL, steady state operations, control rods in manual. (Base IC # 36, snapped to IC # 187 for HL17 NRC Exam)
- Equipment OOS: Safety Injection Pump "A" is tagged out for motor repair.
- Turnover: The plant is at 29% power, Containment mini-purge is in service for a Containment entry on the next shift, raise power at < 8% per hour.

Preloaded Malfunctions:

- **ES19A – Block CVI Actuation Train A**
- **ES19B - Block CVI Actuation Train B**
- **ES10 - Train A Main Steam Line Isol Auto Actuation Failure**
- **ES11 - Train B Main Steam line Isol Auto Actuation Failure**
- **SI08A - RWST Sludge Mixing Valve 10957 Failure**
- **SI08B - RWST Sludge Mixing Valve 10958 Failure**
- **RD17D - (K-14) @ 36 steps**
- **RD17H - (D-4) @ 24 steps**
- **RD17L - (G-13) @ 30 steps**
- **PR12B PORV 456 Block Valve 8000B Auto Closure Failure**

Overrides

- **HV-8104 Emergency Borate valve shut.**
- **Note to Simbooth:** Place Containment Mini-Purge in service.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R-OATC R-SS N-UO	Raises power in accordance with UOP-12004-C.
T2	SG05D @100%	C-UO C-SS	SG # 4 Steam Flow indicator fails high.

0724

0743

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

Event No.	Malf. No.	Event Type*	Event Description
T3	CV04	I-OATC I-SS	Loss of Cooling to Letdown Heat Exchanger (TE-0130 fails low)
T4	new malf (9)	TS-SS	NSCW Cooling Tower Fan # 1 on Train A trips with ambient wet-bulb temperature > 63°F **LCO 3.7.9 Ultimate Heat Sink (UHS) Condition B**
T5	PR02B @100%	I-OATC I-SS TS-SS	PRZR PT-456 fails high resulting in PORV 456 failing open and block valve HV-8000B failure to auto close. **LCO 3.3.1 Condition A, FU 6 Condition E, LCO 3.3.1 FU 8a Condition M, LCO 3.3.1 FU 8b Condition E LCO 3.3.2 Condition A, FU 1d Condition D, LCO 3.3.2 FU 8b Condition L, LCO 3.4.1 Condition A**
T6	RF TK02 95-88% 1200 sec ramp	C-UO C-SS TS-SS	RWST sludge mixing line pipe break with auto closure failure. **LCO 3.5.4 Condition B and Condition D (1 hour action) TR 13.1.7 Condition D (Immediate TR action)**
T7	FW04C	C-OATC	MFRV # 3 fails shut, requiring reactor trip, 3 stuck rods.
10	Preload	C-OATC C-SS	Emergency borate due to 3 stuck rods with failure of HV-8104 to open.
T8	SG01C @45%	M-ALL	Ruptured Faulted SG IRC with failure of CVI to occur.
T9	FW06C @40%	M-ALL	Ruptured Faulted SG IRC with failure of CVI to occur.
11	Preload	C-UO C-SS **Critical**	CVI actuation failure requiring manual alignment.
12	Preload	C-UO C-SS **Critical**	Main Steam Line Auto Actuation Failure

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

0754 0811 0818 0849 0918 0932 0950

FREEZE 1008

Event 1:

Raise reactor power in accordance with UOP-12004-C.

Verifiable Actions:

OATC – Adjust RCS boron concentration and use control rods to raise reactor power.

UO – Raises turbine load to raise power.

Technical Specifications:

None

Event 2:

Steam Generator # 4 controlling steam flow FI-542 will fail low resulting in a reduction in FW flow.

Verifiable Actions:

UO – Takes manual control of the SG # 4 feed flow valves and MFP(s) speed to control SG NR levels between 60 and 70%.

UO – Selects an unaffected channel for control.

UO – Returns MFP(s) speed controls to auto.

UO – Return SG feed flow valves to auto.

Technical Specifications:

None

Event 3:

The temperature instrument TE-0130 will fail low causing TV-0130 temperature control valve to the Letdown Heat Exchanger to close causing temperature to rise. An automatic divert of CVCS Letdown around the CVCS demins on high temperature will occur (TV-0129). Letdown will be diverted straight to the VCT.

Verifiable Actions:

OATC – Verifies TV-0130 is open to control cooling water flow to the Letdown Heat Exchanger.

OATC – Realigns TV-0129 through the demins. (if high temperature divert occurred)

Technical Specifications:

None

Event 4:

NSCW Train A Cooling Tower Fan # 1 trips with wet bulb temperature > 63°F

Verifiable Actions:

None, Technical Specification call by the SS.

Technical Specifications:

LCO 3.7.9 Ultimate Heat Sink (UHS) Condition B

Event 5:

PRZR pressure channel PT-456 fails high resulting in PORV 456 failing open and lowering RCS pressure with failure of the block valve to automatically close.

Verifiable Actions:

OATC – Manually closes PORV 456 per IOAs of18001-C, Primary Instrument Malfunction, energizes PRZR heaters, places spray valves to shut.

OATC – Selects controlling channel to 455 / 458 on PS-455F PRZR PRESS CNTL SELECT.

OATC – Places PRZR heaters and spray in AUTO.

OATC – Places PORV in AUTO.

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 8a, Condition M

LCO 3.3.1 Reactor Trip System (RTS) Instrumentation FU 8b, Condition E

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

LCO 3.3.2 Engineered Safety Features Actuation System (ESFAS) Instrumentation FU1d, Condition D

LCO 3.3.2 Engineered Safety Features Actuation System (ESFAS) Instrumentation FU8b, Condition L

LCO 3.4.1 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits

Event 6:

An RWST leak occurs with failure of RWST sludge mixing pump valves to automatically close.

Verifiable Actions:

UO – Manually closes RWST Sludge Mixing Isolation Valves (HV-10957 / HV-10958) to isolate the RWST leak to preserve RWST inventory.

Technical Specifications:

LCO 3.5.4 Refueling Water Storage Tank (RWST) Condition B and Condition D (1 hour action)

TR 13.1.7 Borated Water Sources – Operating Condition D (Immediate TR action)

Event 7, 10:

Main Feed regulating valve to SG # 3 will fail shut requiring a manual reactor trip by the crew. Following the trip, 3 control rods will be stuck partially out requiring an emergency boration. HV-8104 Emergency Boration valve will not open from the QMCB.

Verifiable Actions:

OATC – Initiates an emergency boration of the RCS from the RWST through the Normal Charging flow path by opening 1FV-110A and 1FV-110B and adjusting charging flow to obtain the required boration flow rate of 30 gpm and required charging flow rate of 42 gpm.

Event 8, 11, 12:

SGTR on SG # 3 post reactor trip. Steam Generator # 3 will develop a DBA SGTR over time after the emergency boration has been completed by the OATC. This will require an SI by the crew. The diagnosis of the SGTR is complicated by the MFRV # 3 failing closed earlier in the scenario and SG # 3 level will be low relative to the other 3 SGs. The crew will be alerted by the SJAE / SPE rad monitor (RE-12839) and be required to use SG level rise and balancing of AFW flow to diagnose the ruptured SG.

Verifiable Actions:

UO – Balances / isolates AFW flows to determine the ruptured SG # 3.

OATC – Manually actuates SI due to lowering PRZR level and RCS pressure in order to maintain RCS inventory.

Technical Specifications:

None

Event 9:

Main feed water line break IRC on the ruptured SG # 3.

Verifiable Actions:

UO – The UO will manually isolate the main steam lines.

CRITICAL TASKS:

1) Manually isolate the Main Steam lines no later than step # 3 of 19020-C to limit blow down due to SG # 3 fault to one SG. This limits the Containment pressure rise and challenge to the Containment barrier.

2) Manually closes at least one CVI damper in each flow path to prevent a radiation release flow path from the RCS via SG # 3 to the environment. CVI isolation must be performed no later than the Initial Operator Actions of 19000-C.

3) Manually isolate SG # 3 to limit blow down to one SG limiting CNMT pressure rise and Challenge to the Containment. This also limits RCS cool down and possible PTS condition by closing the following valves. These will be done no later than the procedurally directed steps of 19020-C.

- **MSIVs and Bypasses**
- **MFIVs**
- **BFIVs**
- **HV-5134 SG 3 from MDAFW PMP-B**
- **HV-5127 SG 3 from TDAFW PMP**
- **PV-3020 SG 3 ARV**
- **SGBD sample valves**
- **SGBD valves**

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 1

Event Description: Reactor Power Ascension from 29% RTP and higher, UOP 12004-C, step 4.1.41 is the next plateau.

Time	Position	Applicant's Action or Behavior
	OATC	Uses 13009-1, "CVCS Reactor Makeup Control System" Section 4.7 "Frequent Dilutions While Controlling Reactor Power", as necessary to maintain Tavg matched with Tref during power ascension.
	UO	Increases turbine load in increments of 15 Mwe to 30 Mwe using load increase pushbutton at direction of OATC. Monitors Generator Output.
	OATC	**13009-1, Section 4.7:** NOTES • This section can be used during power changes when necessary to frequently dilute the RCS for temperature control. The use of this section shall be authorized by the SS. • Frequent dilutions can raise VCT level to the point where VCT pressure reaches 40 psig. 1-LIC-0185 may be adjusted to allow divert to the RHT at a lower level to limit VCT pressure increase. **4.7 FREQUENT DILUTIONS WHILE CONTROLLING REACTOR POWER** 4.7.1 Determine the amount of Reactor Makeup Water necessary to accomplish the power change or accommodate the expected impact of Xenon. (Uses Reactivity Briefing Sheet to Determine # gallons - Dilution) _____ Gals H_2O **NOTE: EACH OATC WILL USE NUMBER HE/SHE IS COMFORTABLE WITH. (100 –1000 Gallons)**
	OATC	4.7.2 Verify the Reactor Makeup System is aligned for automatic operation.
	OATC	4.7.3 Start one Reactor Makeup Water Pump: RX MU WTR PMP-1 1-HS-7762 RX MU WTR PMP-2 1-HS-7763

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 1

Event Description: Reactor Power Ascension from 29% RTP and higher, UOP 12004-C, step 4.1.41 is the next plateau.

Time	Position	Applicant's Action or Behavior
	OATC	4.7.4 Place VCT MAKEUP CONTROL 1-HS-40001B in STOP.
	OATC	4.7.5 As directed by the SS, place VCT MAKEUP MODE SELECT 1-HS-40001A in either the ALT DIL or DIL position.
	OATC	4.7.6 As directed by the SS, lower pot setting on 1-LIC-0185, to limit VCT pressure increase. Initial Pot Setting:_____ New Pot Setting:_____
	OATC	4.7.7 Set TOTAL MAKEUP Integrator 1-FQI-0111 for the desired amount of Reactor M/U Water. _____ Gals H_2O
	OATC	NOTE If VCT MAKEUP MODE SELECT 1-HS-40001A was placed in the DIL position in Step 4.7.5, Step 4.7.8 may be marked N/A. 4.7.8 If required, close 1-FV-0110B as necessary to raise or maintain RCS hydrogen concentration. ***(N/A)*** **Note to examiner:** If ALT DIL selected, FV-110B will be closed.
	SS / OATC	4.7.9 At SS direction, dilution flow may be adjusted to desired flow using 1-FIC-0111. (record in AUTO LOG). Initial Pot Setting: _____ New Pot Setting: _____ ***NOTE: EXPECTED NOT TO CHANGE DESIRED FLOW:***
	OATC	4.7.10 Place VCT MAKEUP CONTROL 1-HS-40001B in START and verify flow is indicated on 1-FI-0110B.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 1

Event Description: Reactor Power Ascension from 29% RTP and higher, UOP 12004-C, step 4.1.41 is the next plateau.

Time	Position	Applicant's Action or Behavior
	OATC	4.7.11 WHEN TOTAL MAKEUP Integrator 1-FQI-0111 reaches its setpoint, verify dilution stops and the following valves close: • 1-FV-0111A RX MU WTR TO BA BLENDER • 1-FV-0111B BLENDER OUTLET TO VCT • 1-FV-0110B BLENDER OUTLET TO CHARGING PUMPS SUCT
	OATC	4.7.12 Operate the Pressurizer Back-up Heaters as necessary to equalize C_b between the RCS and the Pressurizer.
	OATC	4.7.13 Monitor RCS temperature, Control Bank position, or power levels as applicable.
		CAUTION If frequent dilutions are to be continued past the end of the shift, step 4.7.14 should be marked N/A and this section completed to include realignment to the normal configuration. The new on coming shift can then initiate the section from the beginning to continue frequent dilution.
	OATC	4.7.14 **Repeat** Steps 4.7.10 through 4.7.13 as necessary to continue power ramp and/or compensate for Xenon. ***NOTE: OATC WILL LEAVE CVCS MAKEUP SYSTEM ALIGNED PER 4.7 FOR FREQUENT DILUTIONS WHILE CONTROLLING REACTOR POWER DURING POWER ASCENSION.***

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 1

Event Description: Reactor Power Ascension from 29% RTP and higher, UOP 12004-C, step 4.1.41 is the next plateau.

Time	Position	Applicant's Action or Behavior
	**	**NOTE: EVENT 2 IS INITIATED WHILE OATC AND UO ARE PERFORMING ACTIONS IN EVENT 2 FOR POWER ASCENSION AT EXAMINERS DISCRETION.**

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 2

Event Description: **SG # 4 Steam Flow channel FI-542 fails high.**

Time	Position	Applicant's Action or Behavior
	UO	Diagnose SG Loop # 4 Flow FI-542 has failed high. Symptoms / alarms: ALB13-D01 STM GEN 4 FLOW MISMATCH Indications: • FI-542 reading off scale high. • Steam flow indication on FI-542 reading higher than feed flow.
	UO	**IMMEDIATE OPERATOR ACTIONS** G1. Check steam and feed flows – MATCHED ON ALL SGs. **(NO)** RNO G1. Take manual control of the following as necessary to restore NR level between 60% and 70%. • Affected SG feed flow valves. (UO throttles closed loop 4 MFRV) • MFP(s) speed. (reduces MFPT speed using the Master Controller) **Note to examiners:** It is expected the operator will take manual control of MFRV # 4 and the MFPT Master Controller. Steam flow failing high will result in the MFRV # 4 opening and the MFPT Master Controller speeding up the feed pumps. The operator will control SG # 4 levels and MFP speed with these controllers.
	SS	Enters AOP 18001-C, SYSTEMS INSTRUMENTATION MALFUNCTION, section G for FAILURE OF STEAM GENERATOR FLOW INSTRUMENTATION.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 2

Event Description: SG # 4 Steam Flow channel FI-542 fails high.

Time	Position	Applicant's Action or Behavior
	UO	**SUBSEQUENT OPERATOR ACTIONS** G2. Select an unaffected control channel. **Note to examiner:** The UO will select F543 on 1FS-542C selector switch.
	UO	G3. Return MFP(s) speed controls to AUTO. **Cue to Simbooth:** IF asked, the Shift Manager has given permission to place the MFRV and MFPT speed controllers in auto.
	UO	G4. Return SG feed flow valves to AUTO. **Cue to Simbooth:** IF asked, the Shift Manager has given permission to place the MFRV and MFPT speed controllers in auto.
	UO OATC	G5. Initiate the Continuous Actions Page.
	UO	G6. Check SG level control maintains NR level – AT 65%.
	SS	G7. Notify I & C to initiate repairs.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 2

Event Description: SG # 4 Steam Flow channel FI-542 fails high.

Time	Position	Applicant's Action or Behavior
	SS	G8. Check repairs and surveillances – COMPLETE. **(NO)** RNO G8. Perform the following: a. WHEN repairs and surveillances are complete, THEN perform step G9. b. Return to procedure and step in effect. **Note to examiner**: There are no Technical Specification actions for this malfunction.
		END OF EVENT 2, proceed to EVENT 3.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 3

Event Description: TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.

Time	Position	Applicant's Action or Behavior
	OATC	Diagnose TE-0130 has failed low. Symptoms / alarms: ALB07-F04 LTDN HX HI TEMP DEMIN DIVERT ALB07-B04 (VOLUME CONTROL TANK OUTLET TEMP HI (delayed, or may not come in) Indications: • TE-0130 reading down scale low. • TE-0130 red UP arrow – LIT. (indicates attempting to raise letdown temperature). • Amber light on 1HS-129 LETDOWN TO DEMIN / VCT – LIT.
	OATC	**ALB07-F04 response actions:** **AUTOMATIC ACTIONS:** Letdown flow is diverted away from the Mixed Bed Demineralizers directly to the Reactor Coolant Filter.
	OATC	**INITIAL OPERATOR ACTIONS** 1. Check letdown temperature on 1-TI-0130 on the QMCB. **(failed)** 2. IF necessary, initiate 18007-C, "Chemical Volume Control System Malfunction". **(not necessary, letdown is not lost)** 3. Check for ACCW normal operation. **(TV-0130 not normal)**

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 3

Event Description: TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.

Time	Position	Applicant's Action or Behavior
	OATC	**SUBSEQUENT OPERATOR ACTION** 1. Attempt to balance charging and letdown flow. 2. WHEN letdown temperature is restored, return 1-TV-0129 to the DEMIN position. 3. IF instrument or equipment failure has occurred, initiate maintenance as required. **COMPENSATORY OPERATOR ACTIONS** NONE **Note to examiner:** The OATC can control cooling flow to the VCT using TV-0130. For 120 gpm letdown flow, this is normally set to 51% (note dry erase board on SS throne). It is expected the OATC will take manual control of TV-0130 to control cooling flow. **End of 17007-F04 actions.**
	OATC	**ALB07-B04 actions (LTDN HX HI TEMP DEMIN DIVERT)** **PROBABLE CAUSE** 1. Low Auxiliary Component Cooling Water (ACCW) flow through the Letdown Heat Exchanger. 2. Low ACCW flow through the Excess Letdown Heat Exchanger or Seal Water Heat Exchanger if aligned to the Volume Control Tank (VCT).

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 3

Event Description: **TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.**

Time	Position	Applicant's Action or Behavior
	OATC	**AUTOMATIC ACTIONS** NONE **INITIAL OPERATOR ACTIONS** Check normal operation of ACCW and, if necessary, initiate 18022-C, "Loss of Auxiliary Component Cooling Water".
	OATC	**SUBSEQUENT OPERATOR ACTIONS** NOTE Seal water injection flow to the Reactor Coolant Pumps (RCPs) should be maintained less than 130°F. 1. Monitor VCT outlet temperature using 1-TI-0116 on the QMCB. 2. Check letdown flow using 1-FI-0132 and temperature using 1-TI-0130 on the QMCB. 3. Adjust the charging or letdown flow if necessary to reduce the letdown temperature. 4. Return to normal operation as soon as possible per 13006-1, "CVCS Startup and Normal Operation." 5. IF equipment failure is indicated, initiate maintenance as required. **COMPENSATORY OPERATOR ACTIONS** NONE – **End of 17007-B04 actions.**

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 3

Event Description: TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.

Time	Position	Applicant's Action or Behavior
	SS	**AOP-18022-C, LOSS OF AUXILIARY COMPONENT COOLING WATER symptoms and steps.** Symptoms / alarms: • High temperature on any heat exchanger serviced by ACCW. **Note to examiner**: The SS may look at 18022-C due to the reference from ALB07-B04 if received.
	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 is less than 150°F and Seal Water Heat Exchanger Return Temperature remains less than 135°F.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 3

Event Description: **TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.**

Time	Position	Applicant's Action or Behavior
	OATC	1. Check ACCW pumps – AT LEAST ONE RUNNING. (YES) 2. Check ACCW SPLY HDR PRESS PI-1977 – GREATER THAN 135 PSIG. (YES) 3. Check if ACCW flow exists through the letdown heat exchanger. **(YES)** • TV-0130 OPEN. • ALB07-D03 LTDN HX OUT HI TEMP – EXTINGUISHED.
	OATC UO	4. Initiate the Continuous Actions Page.
	OATC	5. Check ACCW Surge Tank Level (IPC L2700) – GREATER THAN 20% AND STABLE OR RISING. **(YES)**

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 3

Event Description: TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.

Time	Position	Applicant's Action or Behavior
	OATC	6. Check if RCPs should be stopped: 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. **Note to examiner:** All parameters listed are met, the RCPs do NOT require stopping. 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.:** 7

Event No.: 3

Event Description: **TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.**

Time	Position	Applicant's Action or Behavior
	OATC	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 **Note to examiner**: All the above listed valves are open as required.
	OATC	8. Check ACCW heat exchangers outlet temperature (IPC T2701) - LESS THAN 120°F. **(YES)**
	OATC	9. Check ACCW containment isolation valves – OPEN. **(YES)** • HV-1979 ACCW SPLY HDR ORC ISO VLV • HV-1978 ACCW SPLY HDR IRC ISOL VLV • HV-1974 ACCW RTN HDR IRC ISO VLV • HV-1975 ACCW RTN HDR ORC ISO VLV **Note to examiner**: All the above listed valves are open as required.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 3

Event Description: TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.

Time	Position	Applicant's Action or Behavior
	OATC	10. Check if ACCW is restored to service. a. Components cooled by ACCW – TERMPERATURES RETURNING TO NORMAL. **(YES)** b. Restore charging and letdown using 13006, CHEMICAL AND VOLUME CONTROL SYSTEM. **(N/A)**
	SS	c. Return to procedure and step in effect.
		END OF EVENT 3, proceed to EVENT 4.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 4

Event Description: **Trip of NSCW Train A Cooling Tower Fan # 1, wet bulb temperature will be > 63°F requiring a Tech Spec LCO entry.**

Time	Position	Applicant's Action or Behavior
	CREW	Diagnose trip of NSCW Train A Tower Fan # 1. Symptoms / alarms: ALB36-B02 480V SWGR 1AB15 TROUBLE Indications: • Green and amber light on NSCW CT Fan # 1 – LIT **Note to examiner:** The fan green and amber light will be the only indication in the control room the fan has tripped and is not readily in their peripheral vision area. IF, they don't see the light and dispatch someone to AB15 to investigate, the Simbooth Operator will report back after several minutes that **"breaker 1AB15-05 is tripped for NSCW FAN-1".**
	UO	**ALB36-B02 actions.** **PROBABLE CAUSE** 3. One of the breakers on Switchgear 1AB15 tripped due to a fault. **AUTOMATIC ACTIONS** NONE **INITIAL OPERATOR ACTIONS** NONE

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 4

Event Description: Trip of NSCW Train A Cooling Tower Fan # 1, wet bulb temperature will be > 63°F requiring a Tech Spec LCO entry.

Time	Position	Applicant's Action or Behavior
	UO	**ALB36-B02 actions continued.** **SUBSEQUENT OPERATOR ACTIONS** 1. N/A due to not a loss of bus voltage. 2. Dispatch an operator to Switchgear 1AB15 to check for: a. Existing relay targets. b. Other abnormal conditions. c. Transformer winding high temperatures (refer to 13429-1 to check max temperature indication). **Note to examiner**. The Simbooth Operator will report back after several minutes that **"breaker 1AB15-05 is tripped for NSCW FAN-1".** **Note to examiner**: Steps 3, 4, 5, and 6 of ARP are N/A for this event.
	UO	7. IF alarm is in due to overcurrent trip of Breakers 1AB15-05, 06, 08, OR 13, (NSCW TRAIN A Cooling Tower Fans), THEN the Breaker TRIP/RESET pushbutton must be depressed and the applicable fan QMCB Handswitch must be placed in STOP THEN released to clear the alarm and amber light on associated fan handswitch. **Note to examiner**: If requested, the ABO will report the TRIP/RESET pushbutton does NOT appear to be resetting.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 4

Event Description: Trip of NSCW Train A Cooling Tower Fan # 1, wet bulb temperature will be > 63°F requiring a Tech Spec LCO entry.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>SS</td><td><u>COMPENSATORY OPERATOR ACTIONS</u>

1. Initiate maintenance to correct problem (i.e., restore alarm).

2. IF after three days the alarm has NOT been restored, intiate a Temporary Modification per 00307-C, "Temporary Modifications" to clear the bad input(s). Record this action required on Figure 5 of 10018-C, "Annunciator Control".</td></tr>
<tr><td></td><td>SS</td><td>Technical Specifications:

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE. With ambient wet-bulb temperature > 63°F, four fans and four spray cells per train shall be OPERABLE. With ambient wet-bulb temperature ≤ 63°F, three fans and four spray cells per train shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS
<table>
<tr><th>CONDITION</th><th>REQUIRED ACTION</th><th>COMPLETION TIME</th></tr>
<tr><td>B. One NSCW cooling tower with one or more required fans and/or spray cells inoperable.</td><td>B.1 Restore fan(s) and spray cell(s) to OPERABLE status.</td><td>72 hours</td></tr>
<tr><td>D. Required Action and associated Completion Time not met.

OR

UHS inoperable for reasons other then Conditions A, B, or C</td><td>D.1 Be in MODE 3

AND

D.2 Be in MODE 5</td><td>6 hours

36 hours.</td></tr>
</table></td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 4

Event Description: **Trip of NSCW Train A Cooling Tower Fan # 1, wet bulb temperature will be > 63°F requiring a Tech Spec LCO entry.**

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>SS</td><td>Technical Specification 3.7.9 UHS continued.

SURVEILLANCE REQUIREMENTS
<table><tr><th>SURVEILLANCE</th><th>FREQUENCY</th></tr><tr><td>SR 3.7.9.5 Verify ambient wet-bulb temperature ≤ 63°F when one NSCWE town fan is out-of-service and daily high temperature (dry bulb) is forecasted to be > 48°F.</td><td>In accordance with the Surveillance Frequency Control Program</td></tr></table>
Note to examiner: IF asked to perform the wet bulb surveillance, the Simbooth Operator will report back after several minutes that ambient wet-bulb temperature is 78°F. This will ensure that LCO entry is required.

The SS may request someone to perform OSP-14150-C, Wet Bulb Temperature With Psychrometer". This takes ~ 5 – 10 minutes, report back the temperature as stated about (78°F).</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.:** 7

Event No.: 5

Event Description: PRZR pressure channel PI-456 will fail high with the PORB Block Valve HV-8000B failing to close in automatic on low RCS pressure of 2185 psig. The OATC will be required to manually close PORV 456 or HV-8000B to prevent a Reactor trip.

Time	Position	Applicant's Action or Behavior
	OATC	Diagnose the high failure of PRZR Pressure channel PT-456. Symptoms / alarms: • ALB11-B03 PRZR HI PRESS • ALB11-C03 PRZR HI PRESS CHANNEL ALERT • ALB12-D03 PRZR PRESS LO PORV BLOCK • ALB12-E01 PRZR RELIEF DISCH HI TEMP • ALB12-F04 PV-0456A OPEN SIGNAL Indications: • PRZR Pressure channel PT-456 offscale high. • PRZR Pressure channels PT-455, 457, and 458 rapidly lowering. • Both PRZR Sprays fully shut. • All PRZR heaters on.
	OATC	**AOP 18001-C, Section C IMMEDIATE ACTIONS** C1. Check RCS pressure - STABLE OR RISING. **(NO)** RNO: C1. Perform the following: • Close spray valves. • Close affected PRZR PORV. • Operate PRZR heaters as necessary.
	CREW	Enters AOP 18001-C, Section C and verifies immediate operator actions properly completed.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 5

Event Description: PRZR pressure channel PI-456 will fail high with the PORB Block Valve HV-8000B failing to close in automatic on low RCS pressure of 2185 psig. The OATC will be required to manually close PORV 456 or HV-8000B to prevent a Reactor trip.

Time	Position	Applicant's Action or Behavior
	OATC	C2. Check controlling channel – OPERATING PROPERLY. **(YES)**
	OATC	C3. Initiate the Continuous Actions Page.
	OATC	C4. Control PRZR pressure using heaters and sprays – BETWEEN 2220 AND 2250 PSIG.
	OATC	C5. Check PIC-455A Pressurizer Master Pressure Controller – IN AUTO WITH OUTPUT SIGNAL APPROXIMATELY 25%. **(NO)** RNO: C5. Place PIC-455A in manual and adjust controller output to approximately 25%.
	OATC	C6. Check affected channel selected on PS-455F PRZR PRESS CNTL SELECT. **(YES)**

Op-Test No.: 2012-301 **Scenario No.: 7**

Event No.: 5

Event Description: PRZR pressure channel PI-456 will fail high with the PORB Block Valve HV-8000B failing to close in automatic on low RCS pressure of 2185 psig. The OATC will be required to manually close PORV 456 or HV-8000B to prevent a Reactor trip.

Time	Position	Applicant's Action or Behavior
	OATC	C7. Select unaffected channels on PS-455F: Failed Channel / Select P455 / CH457 / 456 ***P456*** / ***CH455 / 458*** P457 / CH455 / 456 P458 / CH455 / 456
	OATC	C8. Perform the following: a. Check PRZR pressure – STABLE AT APPROXIMATELY 2235 PSIG. b. Place PRZR heaters in AUTO. c. Place PRZR spray valve controllers in AUTO. RNO: a. Adjust PRZR pressure to approximately 2235 psig using PRZR heaters and sprays.
	OATC	C9. Place PORVs in AUTO and verify proper operation.
	OATC	C10. Return PRZR pressure Master Controller to AUTO.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 5

Event Description: **PRZR pressure channel PI-456 will fail high with the PORB Block Valve HV-8000B failing to close in automatic on low RCS pressure of 2185 psig. The OATC will be required to manually close PORV 456 or HV-8000B to prevent a Reactor trip.**

Time	Position	Applicant's Action or Behavior
	OATC	C11. Select same channel on PS-455G PRZR PRESS REC SEL as selected on PS-455F. ***455***
	OATC	C12. Check P-11 status light on BPLB indicates correctly for plant condition within one hour. ***OFF***
	SS	C13. Notify I&C to initiate repairs. SS will call typically call the SSS to perform the following: • Notify Operations Duty Manager of the AOP entry • Write a Condition Report • Notify I&C
	SS	C14. Bypass the affected instrument channel using 13509 C, BYPASS TEST INSTRUMENTATION (BTI) PANEL OPERATION, if desired. **NOTE: SS is NOT expected to bypass failed channel.**

Op-Test No.: 2012-301 **Scenario No.: 7**

Event No.: 5

Event Description: PRZR pressure channel PI-456 will fail high with the PORB Block Valve HV-8000B failing to close in automatic on low RCS pressure of 2185 psig. The OATC will be required to manually close PORV 456 or HV-8000B to prevent a Reactor trip.

Time	Position	Applicant's Action or Behavior
	SS	C15. Trip the affected channel bistables and place the associated MASTER TEST switches in TEST position per TABLE C1 within 72 hours.. (TS 3.3.1 & 3.3.2) **NOTE: SS expected to leave bistables untripped during allowed out of service time to facilitate troubleshooting by I&C.**
	SS	C16. Initiate the applicable actions of: • TS 3.3.1 Reactor Trip Function — Condition 6 OTΔT — E 8a Low PRZR pressure — M 8b High PRZR pressure — E • TS 3.3.2 ESFAS Function — Condition 1d SI low PRZR pressure — D 8b P-11 Interlock — L **(one hour action)** • TS 3.4.1.a DNB RCS pressure < 2199 psig B (Momentary) **Note to examiner:** The SS may look at Tech Specs for the Block Valve HV-8000B which did not close in automatic. There is no Tech Spec requirement for the Block Valve to work in automatic. Manual operation only is required per Tech Spec Bases of 3.4.11.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 5

Event Description: PRZR pressure channel PI-456 will fail high with the PORB Block Valve HV-8000B failing to close in automatic on low RCS pressure of 2185 psig. The OATC will be required to manually close PORV 456 or HV-8000B to prevent a Reactor trip.

Time	Position	Applicant's Action or Behavior
	SS	C17. Check repairs and surveillances - COMPLETE. RNO: C17. Perform the following: a. WHEN repairs and surveillances are complete, THEN perform step C18. b. Return to procedure and step in effect. **END OF EVENT 5, proceed to EVENT 6.**

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 6

Event Description: **The RWST will develop a leak resulting in lowering RWST level below the Tech Spec limit. After receipt of a QMCB annunciators, the UO will find the RWST Sludge Mixing Isolation Valves have failed to automatically close. The UO will close the valves on the QPCP and the leak will be terminated.**

Time	Position	Applicant's Action or Behavior
	OATC	Diagnose RWST level is actually lowering on all channels. Symptoms / alarms: ALB06-E04 RWST LO LEVEL Indications: • RWST level lowering on LI-0990, 0991, 0992, and 0993 to less than 95%..
	OATC	**ALB06-E04 actions.** **PROBABLE CAUSE** 1. Filling of Accumulators. 2. Adding water to the Spent Fuel Pool. 3. Safety Injection (SI) actuation. 4. System leakage.
	UO	**AUTOMATIC ACTIONS** RWST Sludge Mixing Isolation Valves 1-HV-10957 (Train B, 1-LT-0991) an 1-HV-10958 (Train A, 1-LT-0990) close. **Note to examiner:** These valves are located on the QPCP and will NOT close for this event. The UO will have to manually close the valves to isolate the leak.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 6

Event Description: The RWST will develop a leak resulting in lowering RWST level below the Tech Spec limit. After receipt of a QMCB annunciators, the UO will find the RWST Sludge Mixing Isolation Valves have failed to automatically close. The UO will close the valves on the QPCP and the leak will be terminated.

Time	Position	Applicant's Action or Behavior
	OATC UO	**ALB06-E04 actions continued.** **INTIAL OPERATOR ACTIONS** NONE
	UO	**SUBSEQUENT OPERATOR ACTIONS** 1. IF in Modes 1, 2, 3, or 4, and SI is not in progress, stop any operation that could be removing water from the RWST. 2. IF a system leak is indicated, dispatch personnel to locate and isolate the leak. **Note to examiner.** The UO closing either HV-10957 or HV-10958 will isolate the leak for this event. 3. Restore RWST level to normal per 13701-1, "Boric Acid System".
	SS	4. Refer to Technical Specification LCO 3.5.4 and TR 13.1.7. **COMPENSATORY OPERATOR ACTIONS** NONE

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 6

Event Description: **The RWST will develop a leak resulting in lowering RWST level below the Tech Spec limit. After receipt of a QMCB annunciators, the UO will find the RWST Sludge Mixing Isolation Valves have failed to automatically close. The UO will close the valves on the QPCP and the leak will be terminated.**

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>SS</td><td>
3.5.4 Refueling Water Storage Tank (RWST).

LCO 3.5.4 The RWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS
<table>
<tr><th>CONDITION</th><th>REQUIRED ACTION</th><th>COMPLETION TIME</th></tr>
<tr><td>B. One or more sludge mixing pump isolation valves inoperable.</td><td>B.1 Restore the valve(s) to OPERABLE status.</td><td>24 hours</td></tr>
<tr><td>D. RWST inoperable for reasons other than Condition A or B.</td><td>D.1 Restore RWST to OPERABLE status.</td><td>1 hour</td></tr>
<tr><td>E. Required Action and associated Completion Time of Condition A or D not met.</td><td>E.1 Be in MODe 3.
AND
E.2 Be in MODE 5</td><td>6 hours

36 hours.</td></tr>
</table>

Note to examiner: Closing the RWST sludge mixing isolations HV-10957 and HV-10958 satisfies Condition B.
</td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 6

Event Description: **The RWST will develop a leak resulting in lowering RWST level below the Tech Spec limit. After receipt of a QMCB annunciators, the UO will find the RWST Sludge Mixing Isolation Valves have failed to automatically close. The UO will close the valves on the QPCP and the leak will be terminated.**

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>SS</td><td>TR 13.1.7 Borated Water Sources – Operating.

TR 13.1.7 The following borated water source(s) shall be OPERABLE as required by TR-13.1.3:

a. Boric acid storage tank.

b. The refueling water storage tank (RWST).

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS
<table>
<tr><th>CONDITION</th><th>REQUIRED ACTION</th><th>COMPLETION TIME</th></tr>
<tr><td>D. RWST inoperable.</td><td>D.1 Enter applicable Conditions of RWST Technical Specification 3.5.4.</td><td>Immediately.</td></tr>
</table></td></tr>
<tr><td></td><td></td><td>END OF EVENT 6, proceed to EVENT 7, the main event.</td></tr>
</table>

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	UO	Diagnose MFRV Loop # 3 has failed shut. Symptoms / alarms: ALB13-C01 STM GEN 3 FLOW MISMATCH ALB13-C06 STM GEN 3 HI/LO LVL DEVIATION (short delay) ALB13-C03 STM GEN 3 LO LEVEL (a little longer delay) ALB13-C05 STM GEN 3 LO-LO LVL ALERT (auto trip set point) Indications: • Feed flow reading 0 gpm for SG # 3 (1FI-530A / 531A). • Level lowering rapidly on SG # 3 (1LI-538, 539, 537, & 553). • MFRV # 3 green light only lit on ZLB-004. • MFRV # 3 demand at 100% and red up arrow lit on 1FIC-530.
	SS	Enters 18016-C CONDENSATE AND FEEDWATER MALFUNCTION section D MAIN FEEDWATER VALVE MALFUNCTION.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	UO	**IMMEDIATE OPERATOR ACTIONS** D1. Check proper operation of BFRVs and MFRVs. RNO D1. Perform the following: • Control SG levels using the following as necessary. MFRVs BFRVs • IF SG levels cannot be maintained greater than 41%. -OR- Less than 79%, THEN perform the following: 1) Trip the reactor. 2) Go to 19000-C, E-0 REACTOR TRIP OR SAFETY INJECTION. **Note to examiner**: At > 29% power, the BFRV will NOT be able to maintain SG levels and the Reactor will be tripped manually by the OATC or will trip automatically on SG # 3 LO-LO LEVEL.
	OATC	D1 RNO – Manually trips the Reactor due to impending loss of level in SG # 3.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	CREW	Transitions to 19000-C, E-0 REACTOR TRIP OR SAFETY INJECTION.
	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.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	UO	4. Check if SI is actuated. **(NO)** • Any SI annunciators – LIT • SI ACTUATED BPLP window – LIT RNO 4. Check if SI is required. **(NO)** IF one or more of the following conditions has occurred. • PRZR pressure has less than or equal to 1870 psig. • Steam line pressure less than or equal to 585 psig. • Containment pressure greater than or equal to 3.8 psig. • Automatic alignment of ECCS equipment to injection phase. THEN actuate SI and go to Step 6.
	UO SS	5. Perform the following to limit RCS cooldown: a. Check NR level in at least one SG greater than 10%. RNO a. Maintain AFW flow greater than 570 gpm and go to 19001-C, ES-0.1 REACTOR TRIP RESPONSE. b. Reduce AFW flow. c. Go to 19001-C, ES-0.1 REACTOR TRIP RESPONSE.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	CREW	Transitions to 19001-C, ES-0.1 REACTOR TRIP RESPONSE.
	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.
	CREW	2. IF SI actuation occurs during this procedure, THEN go to 19000-C, E-0 REACTOR TRIP OR SAFETY INJECTION.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	UO	3. Limit RCS cooldown: a. Verify AFW flow to SGs. b. Trip both MFPs. c. Check SGs NR level – AT LEAST ONE GREATER THAN 10%.
	OATC	4. Check RCS temperature stable at or trending to 557°F. With RCP(s) running – RCS AVERAGE TEMPERATURE. -OR- Without RCP(s) running – RCS WR COLD LEG TEMPERATURES.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.

Time	Position	Applicant's Action or Behavior
	UO	5. Check FW status: a. Average RCS temperature – LESS THAN 564°F. **(YES)** **b.** Verify FW isolation valves closed. **(YES)** • MFIVs • BFIVs • MFRVs • BFRVs
	UO	6. Check total feed flow capability to SGs – GREATER THAN 570 GPM AVAILABLE. **(YES)**
	OATC	7. Check all Rods – FULLY INSERTED. **(NO, 3 are stuck out)** RNO 7. IF two or more Rods NOT fully inserted, THEN EMERGENCY BORATE 154 ppm for each Rod not fully inserted by initiating 13009, CVCS REACTOR MAKEUP CONTROL SYSTEM. Verify adequate shutdown margin as required by Technical Specification SR 3.1.1.1. **Note to examiner:** Once OATC initiates emergency boration flow, a DBA SGTR will occur on SG # 3. E. Boration steps are on page # 39 of this event.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	UO	8. Check Main Generator Output Breakers – OPEN. **(YES)**
	SS	9. Perform the following: a. Check 18009-C, STEAM GENERATOR TUBE LEAK – IN EFFECT. RNO a. Go to Step 9.d. d. Check other AOPs – IN EFFECT. **(NO)** e. Initiate actions of AOPs in conjunction with remaining actions of this procedure.
	UO	10. Check PRZR level control: a. Instrument Air – AVAILABLE. **(YES)**
		Note to examiner: The DBA SGTR will have initiated by now. The crew will actuate SI and go to E-0 on lowering PRZR level and pressure.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	OATC	4.9 EMERGENCY BORATION NOTE Table 1 provides a convenient tool for checking Emergency Boration flow path alternatives. **Note to examiner**: The path through HV-8104 is the preferred path. The next preferred path is the next section in the procedure, etc.
	OATC	4.9.1 Emergency Boration Through 1-HV-8104.
	OATC	4.9.1.1 Start one (1) Boric Acid Transfer Pump. 4.9.1.2 Verify a Charging Pump is running. 4.9.1.3 Open EMERGENCY BORATE valve 1-HV-8104. **Note to examiner:** 1-HV-8104 will NOT open, the candidate should proceed to section 4.9.2 Emergency Boration Through The Normal Charging Flow Path.
	OATC	4.9.2 Emergency Boration Through The Normal Charging Flow Path.
	OATC	4.9.2.1 Start one (1) Boric Acid Transfer Pump.
	OATC	4.9.2.2 Verify a Charging Pump is running.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: **Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.**

Time	Position	Applicant's Action or Behavior
	OATC	4.9.2.3 Open the following valves: • 1-FV-0110A, BA TO BLENDER • 1-FV-0110B, BLENDER OUTLET TO CHARGING PUMPS SUCT
		NOTE The following step assumes that with 12 gpm of seal return, 30 gpm will be supplied to the RCS.
	OATC	4.9.2.4 Place 1-FIC-0121 in MANUAL.
	OATC	4.9.2.5 Adjust 1-FIC-0121 to maintain flow greater than 42 gpm.
	OATC	4.9.2.6 Verify Emergency Boration flow 1-FI-0110A is greater than 30 gpm.
	OATC	4.9.2.7 IF flow is less than 30 gpm, start the second Boric Acid Transfer Pump.
	OATC	4.9.2.8 Operate the Pressurizer Backup Heaters as necessary to equalize boron concentration between the RCS and the Pressurizer.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 7

Event Description: Main Feed Regulating Valve for loop # 3 fails shut requiring a Reactor trip. When the Reactor trips, 3 rods will stick out requiring an Emergency Boration by the OATC.

Time	Position	Applicant's Action or Behavior
	OATC	4.9.2.9 Check plant conditions are consistent with RCS boration: RCS Tavg may be dropping. NIS may be dropping.
		END OF EVENT 7, proceed to EVENT 8, the MAIN EVENT.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

Time	Position	Applicant's Action or Behavior
	OATC	Actuates SI due to inability to maintain PRZR level > 9% per Foldout Page of 19001-C, ES-0.1 REACTOR TRIP RESPONSE.
	CREW	Performs Immediate Operator Actions per 19000-C, E-0 Reactor Trip or Safety Injection.
	SS	Makes a page announcement of Reactor Trip and Safety Injection.
	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.:** 7

Event No.: 8

Event Description: **DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.**

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 OATC UO	7. Perform the following: • OATC Initial Actions Page • UO Initial Actions Page **NOTE:** SS initiates step 8 after OATC/UO Initial Actions completed.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: **DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.**

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. **(YES)**

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

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: a. ALL RUNNING IN LOW SPEED. **(YES)** • MLB indication b. NSCW Cooler isolation valves – OPEN. **(YES)** • MLB indication

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: **DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.**

Time	Position	Applicant's Action or Behavior
		PERFORMS OATC INITIAL ACTIONS
	OATC	7. Check Containment Ventilation Isolation. a. Dampers and Valves – CLOSED. **(NO)** • CVI MLB indication
	Critical	**a. Perform the following:** **1) Close Dampers and Valves.** **2) Start Piping Pen Units.** **Note to examiner**. CVI dampers on pages 57 and 58.
	OATC	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. **(NO)** RNO d. Go to Step 10.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

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.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

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.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

Time	Position	Applicant's Action or Behavior
	UO	**UO INITIAL ACTIONS** 3. Check if main steamlines should be isolated: **(NO)** 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. RNO a. Go to Step 4.
	UO	4. Verify FW Isolation Valves closed: **(YES)** • MFIVs • BFIVs • MFRVs • BFRVs

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

Time	Position	Applicant's Action or Behavior
	UO	**UO INITIAL ACTIONS** 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%. **Note to examiner:** IF the UO suspects a SGTR into SG # 3, he may request to isolate AFW flow to SG # 3 to assist in determining which SG is ruptured.
	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.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

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 557°F 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 557°F and rising, THEN dump steam.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: **DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.**

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. **Note to examiner**: PORV "B" must be manually cycled to control at 2185 psig.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

Time	Position	Applicant's Action or Behavior
	OATC	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 a. Go to Step 12.
	UO	12. Check SGs secondary pressure boundaries: a. SG Pressures: Any lowering in an uncontrolled manner. **(NO)** -OR- Any completely depressurized. RNO a. Go to Step 13.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

Time	Position	Applicant's Action or Behavior
	UO	13. Check SG Tubes intact: a. Direct Chemistry to take periodic activity samples of all SGs one at a time. b. Secondary radiation – NORMAL. **(YES, possible to see on a couple of rad monitor trends but none will be in alert)** • 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) • STEM GEN LIQ PROCESS RAD: • RE-0019 (Sample) • RE-0021 (Blowdown) • SG sample radiation. c. Check SG levels – ANY RISING IN AN UNCONTROLLED MANNER. **(YES)** d. Go to 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

Time	Position	Applicant's Action or Behavior
		NOTE to Simbooth: Report back in 20 minutes that SG # 3 shows activity in the samples IF REQUESTED previously.
	SS	SS transitions to 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE.
		NOTE to Simbooth: Once SS has transitioned to E-3, enter the fault on SG # 3.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

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.:** 7

Event No.: 8

Event Description: DBA SGTR on SG # 3 followed by a FW Line Break after transition to 19030-C, E-3 Steam Generator Tube Rupture. Based on the Foldout Page of 19030-C, the crew will transition back to 19020-C to isolate the faulted steam generator, then back to 19030-C and eventually transition to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

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.:** 7

Event No.: 8

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE to be followed by a Feedline Break IRC.

Time	Position	Applicant's Action or Behavior
	CREW	1. Initiate the following: • Continuous Actions and Foldout Page. • Critical Safety Function Status Trees per 19200-C, F-O CRITICAL SAFETY FUNCITON STATUS TREE.
	SS	2. Initiate NMP-EP-110, EMERGENCY CLASSIFICATION DETERMINATION AND INITIAL ACTION.
	OATC	3. Maintain Seal Injection flow to all RCPs – 8 to 13 GPM.
	OATC	4. Check if RCPs should be stopped: a. ECCS Pumps – AT LEAST ONE RUNNING: **(YES)** __ CCP or Sip Pump b. RCS pressure – LESS THAN 1375 PSIG. **(NO)** RNO b. IF RCS pressure lowers to less than 1375 psig prior to initiation of RCS cooldown in Step 17. THEN stop all RCPs and return to Step in effect. Go to Step 5.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: **DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE to be followed by a Feedline Break IRC.**

Time	Position	Applicant's Action or Behavior
	UO	5. Identify ruptured SG(s) by any of the following conditions. **Unexpected rise in any SG NR level.** High radiation from any SG sample. High radiation from any SG steamline. High radiation from any SG blowdown line. **Note to examiner:** SG # 3 level will be rising with AFW flow throttled. **Note to examiner**: Once SG # 3 has been identified, the Simbooth Operator will insert a DBA Feedwater line break on SG # 3 that will require a transition back to 19020-C, E-2 FAULTED STEAM GENERATOR ISOLATION and then back to 19030-C. **IF identified earlier in E-0, the Simbooth operator will initiate the FW line break as soon as E-3 is entered.**
	UO OATC	Recognize rising steam flow on SGs 1, 2, and 4 and lowering RCS pressure.
	SS	Transitions to 19020-C, E-2 FAULTED STEAM GENERATOR ISOLATION based on Foldout Page Criteria.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8 (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 **Critical**	3. Verify Main Steamline Isolation and Bypass Valves – CLOSED. **(NO)** **Note to examiner:** Auto actuation of the Main Steamline and Bypasses is defeated. **The UO will have to manually actuate SLI to satisfy the critical step.**
	UO	4. Check SGs secondary pressure boundaries:\ **a.** Identify intact SG(s): **(# 1, 2, and 4 are intact)** • SG pressures – ANY STABLE OR RISING. **(YES)** b. Identify faulted SG(s). ANY SG PRESSURE LOWERING IN AN UNCONTROLLED MANNER. **(YES, SG # 3)** -OR- ANY SG COMPLETELY DEPRESSURIZED. **(maybe by now, SG # 3)**

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8 (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 3 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 3 FROM TDAFW **Note to examiner:** The valves bolded above are critical at this time IF not already previously closed.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8 (E-2 Actions)

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

Time	Position	Applicant's Action or Behavior
	UO	7. Check at least one MDAFW Pump – RUNNING AND CAPABLE OF FEEDING SG(s) NEEDED FOR RCS COOLDOWN. **(YES)**
	UO	8. Close affected TDAFW Pump Steam Supply Valve(s): **(N/A)** 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
	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.:** 7

Event No.: 8 (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. **(NO)** • 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. **(YES)**
	SS	d. Go to 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE.
	SS	Transitions back to 19030-C, E-3 STEAM GENERTOR TUBE RUPTURE.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE after return from 19020-C, E-2 FAULTED STEAM GENERATOR ISOLATION following feed line break.

Time	Position	Applicant's Action or Behavior
	CREW	1. Initiate the following: • Continuous Actions and Foldout Page. • Critical Safety Function Status Trees per 19200-C, F-O CRITICAL SAFETY FUNCITON STATUS TREE.
	SS	2. Initiate NMP-EP-110, EMERGENCY CLASSIFICATION DETERMINATION AND INITIAL ACTION.
	OATC	3. Maintain Seal Injection flow to all RCPs – 8 to 13 GPM.
	OATC	4. Check if RCPs should be stopped: a. ECCS Pumps – AT LEAST ONE RUNNING: **(YES)** __ CCP or Sip Pump b. RCS pressure – LESS THAN 1375 PSIG. **(YES)** c. Stop all RCPs.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: **DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE after return from 19020-C, E-2 FAULTED STEAM GENERATOR ISOLATION following feed line break.**

Time	Position	Applicant's Action or Behavior
	UO	5. Identify ruptured SG(s) by any of the following conditions. **Unexpected rise in any SG NR level.** High radiation from any SG sample. High radiation from any SG steamline. High radiation from any SG blowdown line. **Note to examiner:** SG # 3 will have been previously identified.
		CAUTION: At least one SG should be maintained available for RCS cooldown.
	UO	6. Isolate ruptured SG(s): a. Adjust ruptured SG ARV(s) controller setpoint to 1160 psig (pot setting 7.73) b. Check ruptured SG ARV(s) – CLOSED. __ PV-3000 (SG 1) __ PV-3010 (SG 2) __ PV-3020 (SG 3) __ PV-3030 (SG 4)

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: **DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE after return from 19020-C, E-2 FAULTED STEAM GENERATOR ISOLATION following feed line break.**

Time	Position	Applicant's Action or Behavior
		CAUTION: If TDAFW Pump is the only available AFW pump, maintain at least one steam supply OPEN.
	UO	7. Close affected TDAFW Pump Steam supply valve(s): **(N/A)** 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.
	UO	8. Verify SG Blowdown Isolation Valves – CLOSED WITH HANDSWITCHES IN CLOSE POSTION.
	OATC	9. Isolate flow from the ruptured SG(s) by closing its Main Steamline isolation and Bypass Valves.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 8

Event Description: DBA SGTR actions from 19030-C, E-3 STEAM GENERATOR TUBE RUPTURE after return from 19020-C, E-2 FAULTED STEAM GENERATOR ISOLATION following feed line break.

Time	Position	Applicant's Action or Behavior
		CAUTIONS: • This procedure should be performed in a timely manner to assure that break flow in the ruptured SG(s) is terminated before water enters the SGs main steam piping. • Any ruptured SG that is also faulted, should remain isolated during subsequent recovery actions unless needed for RCS cooldown or SG activity sample.
	UO	10. Check ruptured SG(s) level: a. SG NR level – GREATER THAN 10% (32% ADVERSE). **(NO)** b. Stop feed flow to ruptured SG(s). **Note to examiner**: AFW flow should remain isolated to SG # 3 due to the CAUTIONS above.
	UO SS	11. Check ruptured SG(s) pressure – GREATER THAN 290 PSIG. **(NO)** RNO 11. Go to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT SUBCOOLED RECOVERY DESIRED.
		END OF EVENT 8, END OF THE SCENARIO.

HV 5000B

after Cue #7 → scenario runs as written 2, 3, 4, 5, 6, 7

Carla – OATC [redacted] – SS [redacted] – LO

0724 Took shift
0743 SG #4 steam flow failure
0749 called C&T
0754 TE-130 fails low
0801 called C&T
0804 manual control of TV-130
0811 NSCW Fan #1 (train A trip)
0812 Dispatched operator for wet-bulb temps 78F
0818 PORV-456 opens due to PT-456 failure
0849 inserted RWST leak
0857 called C&T for RWST sludge mixing valves
0918 MFRV #3 fails shut
0920 Reactor trip
0932 SG #3 tube rupture
0937 SI actuated
0938 Dispatch operator to ensure 1371 one SFT in service
0947 called chemistry for samples
0950 faulted SG #3 (feed break)
1003 Called HP
1005 Activity reported to plant from chemistry

1%-10MIN.

2%-15Min

9% High Flux Spot.

SIPA-005

SIMULATOR REACTIVITY BRIEFING SHEET

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

MINIMUM SHIFT REACTIVITY INFORMATION TO BE BRIEFED

Power: **29** Rod Motion: **Rods in manual**

Current Temperature Control Strategy: **Boration**

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

The desired Tavg operating band is 563.5 ± 0.05°F

CVCS makeup boric acid flow per 100 gallon makeup (FI-110A): **15.0** gallons/100
CVCS makeup pot setting (FIC-110): **3.76**

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):

Power Ascent at less than or equal to 8% per hour.

CURRENT CORE REACTIVIITY PARAMETERS

Boron worth: **7.6** pcm/ppm PCM per 1% power change: **13.9** 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: **1,053** ppm

Boration required per	degree °F:	**19**	gallons
	1% power change:	**19**	gallons
	10% power change:	**188**	gallons
	30% power change:	**563**	gallons
Dilution required per	degree °F:	**105**	gallons
	1% power change:	**106**	gallons

Boration required for stuck rods (154 ppm/rod): **3,262** gallons for 2 stuck rods
4,961 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 7

8% per hour

28.8% | 2255 | 32.35 | 2246 | 572

0728 - Start ↑ power (29%).

0751 30% (304).

Pord.
456-
2335
2315
psig

Z82 MWC
Hom C : A

~~0744~~ #4 S/G
FI 542 A failed ↑ Stm flow

~~0755~~ TI 130 de failure

~~0812~~ #1 FAN A NSCW tripped

Entered 3.7.9 W/ 63 F ?
- Cond A 72 hr LCO

0818 DNB LCO 3.4.1

0821 Exit LCO 3.4.1

0818 PI 456 failed ↑
HV-8000 failed to close 2 psi
→ PORV 456 → Manual Closed
Per TS 3.4 Cond C

0831 P-11 verified

0818 Entered:
3.3.1 fun 8a Cond M 72 (Low Pzr P)
fun 9b Cond E 72 (Hi Pzr P)
3.3.2 fun 1d Cond D 72 Pzr low SI
fun 8b Cond hr P-11
OT ΔT 3.3.1 func 6 Cond E 72 hr Trip

0855 RWST lvl 73%
LCO 3.5.4 Cond D
Need to restore lvl 0955
- Isolated Sludge mixing

0920 Rcvs for lvl
HV-8104

POWER OPERATION (Mode 1)

PROCEDURE LEVEL OF USE CLASSIFICATION PER NMP-AP-003	
CATEGORY	**SECTIONS**
Continuous:	**ALL except sections 4.3.1, 4.3.2, and 4.3.3**
Reference:	**4.3.1, 4.3.2, and 4.3.3**
Information:	**NONE**

TABLE OF CONTENTS

UNIT NO. 1 DATE 3/27/2012

CONTINUOUS USE

1.0 PURPOSE

This procedure provides instructions for taking the unit from Mode 2 (Reactor Startup) to Mode 1 (Power Operation) at 100% power, and back to Mode 2. In addition instructions are provided for power operation. The sections of this procedure are: (1986308067, 1986308069, and 1986308198)

4.1	Power Ascent
4.2	Power Descent
4.3	Power Operation
4.3.1	RCS Control Systems
4.3.2	AFD Control
4.3.3	Power Level Monitoring
4.3.4	End-of-Life Coastdown
4.3.5	PRZR Manual Pressure Control for Testing, Sampling and Cb Adjustments.
4.3.6	Manual Operation Of BFRV To Maintain MFRV Controller At A Specified Demand Position
4.3.7	Venting The Pressurizer Using The Przr Steam Space Sample Line
4.3.8	Removing The Pressurizer Proportional Heater From Service
4.3.9	Restoration of Proportional heaters to service

2.0 PRECAUTIONS AND LIMITATIONS

2.1 PRECAUTIONS

2.1.1 Avoid operation of the Main Turbine below 100 MWe for prolonged periods (>60 min). Low load operation will cause increased rates of moisture erosion of the latter stage buckets and may cause exhaust hood overheating and/or differential expansion problems. These parameters must be closely monitored during low load operation.

2.1.2 While operating at power the RCS Hydrogen concentration should be maintained as specified by the Chemistry Department.

2.1.3 The boron concentration in the Pressurizer should not be different from the RCS by more than 50 ppm. Pressurizer Backup Heaters may be energized as necessary to equalize the boron concentration. (1985303668, 19873112462)

2.1.4 The average core thermal power level over any one hour shall not exceed 3625.6 MWt (3622.6 MWt if excess letdown is in service). Anytime the 1 hour average exceeds these limits, a Condition Report shall be generated to document the excursion and subsequent actions taken.

2.1.5 If steam back leakage into Main Feed Water is suspected during operation of MFIVs as evidenced by water hammer, then the Main Feed Water Isolation valve to the affected Steam Generator should be immediately closed. (1985303297, 1991321521)

2.1.6 Core reactivity should be carefully controlled. If the reactor is driven below the Point of Adding Heat due to a significant negative reactivity insertion, the reactor should be placed in a stable shutdown condition.

2.1.7 Make notifications per 10029-C, "NERC/SERC Standards For Generator Operators" for any of the following:

The Southern Control Area Operator and the Transmission Control Center should be notified anytime the Turbine Generator is on-line with the Power System Stabilizer (PSS) NOT in-service enabled.
(COI display shows: 52G Breaker = CLOSED and PSS = DISABLED)

When transferring to MANUAL control (COI selection: Regulator Control = Manual) with output breaker(s) closed.

When AUTO control is returned to service (COI selection: Regulator Control = Auto) notify Control Centers via GENCOMM and follow-up phone call.

2.1.8 Anytime the Power System Stabilizers (PSS) on both Units are out of service, and a system transmission line is out of service, Turbine load on both units should be reduced per 13830, "Main Generator Operation", Table 1.

2.1.9 With the Reactor critical while below the Point of Adding Heat (POAH), power can be unstable and change rapidly. The OATC should devote full attention on monitoring and controlling reactor power in this situation. If conditions occur that result in power decreasing to below the POAH and the reactor is determined to be sub-critical, then shutdown to Mode 3 should be completed and restart performed per 12003-C "Reactor Startup."

2.1.10 When operating at equal to or less than 10% reactor power, consideration should be given to assigning an extra operator to assist with control room activities so the OATC can devote full attention to monitoring and controlling reactor power.

2.1.11 When it is anticipated that operation at equal to or less than 10% reactor power for greater than 12 hours will be required, JIT training should be considered for the control room teams.

2.2 LIMITATIONS

2.2.1 All power increases above 30% power shall be performed in accordance with 87073-C, "Limitations and Conditions for Fuel Operation." (1997335153)

2.2.2 The Axial Flux Difference (AFD) shall be maintained within the limits specified in the COLR. (TS LCO 3.2.3)

2.2.3 In Modes 1 and 2, the control banks shall be within the insertion, sequence and overlap limits specified in the COLR. (TS 3.1.6). (1985303130)

2.2.4 In Modes 1 and 2, all shutdown and control rods shall be operable with their individual indicated rod positions within ±12 steps of their group step counter demand position. (TS LCO 3.1.4) (1985303130)

2.2.5 In Modes 1 and 2, shutdown margin shall be greater than or equal to the limit specified in the COLR. (TR 13.1.1) (1985303126, 1985303130)

2.2.6 Power reduction may cause Quadrant Power Tilt Ratio (QPTR) to rise above 1.02. The value of QPTR is dependent upon the amount of power reduction and the time at reduced power. Power may be raised and/or remain above 50% with QPTR greater than 1.02 within the limitations of TS LCO 3.2.4.

2.2.7 In Mode 1, the following RCS DNB parameter limits shall be maintained at all times: (TS LCO 3.4.1)

a. Pressurizer pressure greater than or equal to 2199 psig, (not applicable during a thermal power ramp change of greater than 5% RTP per minute or a thermal power step change greater than 10% RTP).

b. RCS average temperature less than or equal to 592.5°F.

2.2.8 Power indicated on Power Range (PR) Nuclear Instruments should remain at least 8% RTP below the lowest setpoint of operable PR high level trip bistables.

2.2.9 When a calorimetric is performed per 14030, "Nuclear Instrument Calorimetric Calibration" at part power (power <50%), AND any PR indication is adjusted in the downward direction, the PR high level trip bistable setpoints shall be adjusted as follows:

a. Between 50% and ≥20% power -- setpoint adjusted to ≤90%.

b. Below 20% power -- setpoint adjusted to ≤50%.

2.2.10 Initial Calorimetric performance is required within 12 hours after exceeding 15% power (TRS 3.3.1.2).

3.0 INITIAL CONDITIONS

3.1 The reactor is critical and power stabilized at or above the Point of Adding Heat but less than 5%.

3.2 Tave is being controlled at 557°F ±2°F with steam dumps in steam pressure mode or the Steam Generator Atmospheric Relief Valves. Steam dump is the preferred method of heat removal. (1985303667)

3.3 The Chemistry department reports that RCS, Feed, Condensate and SG chemistry is satisfactory for the power ascent.

3.4 CVCS Letdown Purification should be in progress. (1985205274)

3.5 SG levels are being maintained at 65% ±5% using the Auxiliary Feed Water System or a Main Feed Water Pump.

3.6 The Main Turbine is on the Turning Gear and shell/chest warming is in progress or completed per 13800, "Main Turbine Operation."

3.7 Preparations for Generator/Exciter startup are in progress or completed per 13830, "Main Generator Operation."

3.8 Pressurizer pressure is being maintained at 2235 ±15 psig.

3.9 Pressurizer level is being maintained 20% to 40% with normal charging and letdown in service. (1985303208)

3.10 If this power ascent is being performed following a refueling outage, the PR high level trip bistables (NC306) for channels N41, N42, N43 and N44 are set at 50% in accordance with 88019-C "Power Ascension After Refueling."

3.11 If this power ascent is being performed after a plant shutdown for reasons other than refueling, AND the last NI calibration was performed with reactor power ≥50%, no reduction in PR trip setpoint is required.

3.12 If this power ascent is being performed after a plant shutdown for reasons other than refueling, AND a calorimetric was performed while between 20% and 50% power, AND the PR indications were adjusted downward, the PR high level trip bistables (NC306) for channels N41, N42, N43 and N44 are set at 90%.

3.13 If this power ascent is being performed after a plant shutdown for reasons other than refueling, AND a calorimetric was performed while less than 20% power, AND the PR indications were adjusted downward, the PR high level trip bistables (NC306) for channels N41, N42, N43 and N44 are set at 50%.

INITIALS

4.0 INSTRUCTIONS

NOTE

Asterisk (*) steps beside INITIALS spaces indicates steps that generate additional documents.

4.1 POWER ASCENT

NOTE

If the Reactor is being maintained at power in Mode 1 per Step 4.2.18, go to Step 4.1.18 for Turbine Generator startup and power ascent.

4.1.1 **Obtain** from the Control Room Mode Change Binder AND the Surveillance Tracking Coordinator all deferred (NOT performed) surveillance tests required for Mode 1 entry. GCW

a. **Schedule** AND **perform** those applicable test procedures PRIOR to Mode 1 entry. GCW

CAUTION

Reactor Power shall remain less than 5% as read on the highest reading PR NIS or highest reading Loop ΔT, until all Mode 1 entry requirements have been met.

4.1.2 Slowly **raise** Reactor Power to 4%. GCW

4.1.3 **Place** Heater Drain Pumps on Hot Water Flush per 16611, "Secondary Side Flushing." GCW

4.1.4 IF NOT previously performed, **initiate** placing Low Pressure Feed Water Heaters in service per 13617, " Feed Water Heater Extraction, Vent And Drain System." GCW

4.1.5 **Initiate** preparations for Main Generator Startup AND synchronization per 13830, "Main Generator Operation." GCW

INITIALS

4.1.6 **Prepare** for MFP startup as follows:

a. **Verify** each MFP Control Cabinet is powered from its preferred power supply per 11432, "120V AC Non 1E Instrument Distribution System Alignment." GCW

b. **Contact** Chemistry AND **verify** that Condensate AND Feed Water chemistry is acceptable for feeding Steam Generators. GCW

c. **Restore** Hotwell Level Control to NORMAL by performing the following:

(1) **Contact** Chemistry and **verify** that Hotwell chemistry is acceptable for reject to CSTs. GCW

(2) **Remove** the CONDENSATE DUMP TO CST LV-4415A INLET or OUTLET Caution Tag AND **restore** to normal alignment 1(2)LV-4415A AND 1(2)-1305-U4-042 or 1(2)1305-U4-043 as applicable. GCW

d. **Coordinate** with I&C and **stroke** the MFRV(s) AND BFRV(s) with an I&C Technician AND an operator observing valve operation to verify smooth stroking AND proper operation. GCW

e. **Notify** Chemistry AND **secure** feed water heating using auxiliary steam per 13615, "Condensate and Feed Water System." GCW

f. **Shift** from Long Cycle to Short Cycle Recirculation per 13615 "Condensate and Feedwater Systems." GCW

g. **Perform** the Feed Water Flow path Verification per 13615, "Condensate And Feed Water System" Checklist 1. GCW *

INITIALS

4.1.7 At approximately 4% reactor power, **place** a Main Feed Pump in service as follows:

a. **Verify** the Main Feed Regulating Valve (MFRV) AND the Bypass Feed Regulating Valve (BFRV) Controllers are in manual with the valves CLOSED. GCW

NOTE

Maintain Tavg at approximately no load Tavg with rod motion when changing steam demands.

b. **Verify** two condensate pumps are in service per 13615 "Condensate And Feed Water System." GCW

NOTES

Performing Step c. below will have the following effect:

- FV-4486 will remain in MANUAL at the flow selected by the operator. High and low flow overrides are defeated.
- FV-5200 and FV-5201 will modulate between 25% and 100% open to control MFP mini-flow. Full closure of the valves is defeated

c. IF NOT previously performed during the last shutdown, At SS direction, **block** the SJAE Mini-flow Valve, FV-4486, AND Main Feed Water Pump Mini-flow Valves FV-5200 AND FV-5201 valve trip signals by **placing** the Enable/Disable Switch in QPCG Cabinet 3, Card Frame 5, Card 55 (C3-555) to DISABLE and **install** caution tags. GCW

d. At SS direction, **fail open** the running MFP mini-flow valve, FV-5200 (FV-5201) by **isolating** and **caution tagging** instrument air to the valve. GCW

e. **Start** a Main Feed Pump (MFP), per 13615, "Condensate And Feed Water System." GCW

INITIALS

f **Restore** AFWAS circuitry from MFPT(s) trip to MDAFW pumps by performing the following:

(1) **Verify** at least one MFPT reset. GCW

(2) **Remove** Caution tags AND **align** the following hand switches as follows:

UNIT 1: Train A: 1-HS-5344 in NORMAL (Aux Relay Pnl 1NCPAR2) GCW / TNT IV

Train B: 1-HS-5345 in NORMAL (Aux Relay Pnl 1NCPAR4) GCW / TNT IV

UNIT 2: Train A: 2-HS-5344 in NORMAL (Aux Relay Pnl 2NCPAR2) GCW / TNT IV

Train B: 2-HS-5345 in NORMAL (Aux Relay Pnl 2NCPAR4) GCW / TNT IV

(3) **Verify** Annunciator ALB16F05, AFW AUTO START MFPT TRIP RLY CNTRL PWR LOSS, RESET. GCW

g. **Verify** the Main Feed Water Isolation Valves are CLOSED. (1985303297, 1985304988, 1991321521) GCW

NOTES

- BFRVs may leakby as the BFIV opens, SG levels should be monitored and AFW flow adjusted to maintain SG levels constant.
- The following step should be completed prior to continuing with Step 4.1.8.

h. **Open** the Bypass Feed Isolation Valve for all SGs one at a time. (1985303297, 1985305760, 1985304988, 1991321521)

- SG 1 HV-15196 GCW
- SG 2 HV-15197 GCW
- SG 3 HV-15198 GCW
- SG 4 HV-15199 GCW

INITIALS

4.1.8 **Transfer** from Auxiliary Feed Water to Main Feed Water, one Steam Generator at a time, by performing the following: (1985303296)

NOTE

Total feed flow (AFW plus BFRV flow) can be monitored via IPC points UF-5404, UF-5424, UF-5444, UF-5464.

CAUTION

During AFW forward flow operations of less than 150 gpm, correct mini-flow valve positions must be maintained. The mini-flow should be checked frequently.

a. **Verify** MFPT Delta P is maintained between 100 and 150 psid:

- SG 1 **GCW**
- SG 2 **GCW**
- SG 3 **GCW**
- SG 4 **GCW**

b. **Stabilize** the SG NR level between 60% and 70%, AND **note** total feed flow:

- SG 1 Feed Flow **1.7 mpph** **GCW**
- SG 2 Feed Flow **1.7 mpph** **GCW**
- SG 3 Feed Flow **1.7 mpph** **GCW**
- SG 4 Feed Flow **1.7 mpph** **GCW**

INITIALS

c. Slowly **open** the BFRV AND **verify** a slight increase in feedwater flow:

- SG 1 LV-5243 GCW
- SG 2 LV-5244 GCW
- SG 3 LV-5245 GCW
- SG 4 LV-5242 GCW

d. **Close** the Auxiliary Feed Water Supply Valve:

- SG 1 HV-5139 GCW
- SG 2 HV-5132 GCW
- SG 3 HV-5134 GCW
- SG 4 HV-5137 GCW

e. **Adjust** the BFRV to re-establish total feed flow as noted in Step b.:

- SG 1 LV-5243 GCW
- SG 2 LV-5244 GCW
- SG 3 LV-5245 GCW
- SG 4 LV-5242 GCW

f. **Stabilize** SG level and THEN **place** the BFRV controller in automatic: (1985306829)

- SG 1 LIC-550 GCW
- SG 2 LIC-560 GCW
- SG 3 LIC-570 GCW
- SG 4 LIC-580 GCW

INITIALS

g. **Initial** for SG just swapped and **repeat** Steps a. through f. for the remaining Steam Generators:

- SG 1 **GCW**
- SG 2 **GCW**
- SG 3 **GCW**
- SG 4 **GCW**

h. **Check** the MFPT is feeding forward with the idle MFPT tripped, and **exit** LCO 3.3.2 Function 6d, AFW auto actuation capability from the trip of two main feed pumps.

> NOTE
> The Auxiliary Feed Water System must be placed in standby readiness prior to exceeding 5% Rated Thermal Power (Mode 1 entry).

i. **Stop** the AFW pumps AND **Initiate** placing the system in Standby readiness per 13610, "Auxiliary Feed Water System." (1984301714, 1984301715) **GCW** *

j. **Notify** Chemistry that feeding via a MFP has commenced. **GCW**

4.1.9 **Coordinate** with Chemistry to:

> NOTE
> 12004-C, Section 4.3.7 covers operation of Pressurizer Steam Space Sampling.

a. **Verify** that the Pressurizer Steam space sample is in service. **GCW**

b. **Initiate** actions to place N-16 radiation monitor RE-0724 in service. **GCW**

INITIALS

4.1.10 IF NOT in service, **establish** Steam Generator Blowdown per 13605, "Steam Generator Blowdown Processing System." GCW

a. **Notify** Chemistry WHEN SG Blowdown is in service. GCW

NOTE

During startup, SGBD flow should be maintained as high as plant conditions will allow to facilitate secondary cleanup and avoid chemistry holds on power ascension.

b. During the power ascent, per 13605, **control** Steam Generator Blowdown Condensate Cooling return temperature by **adjusting** the setpoints on the Steam Generator Blowdown Temperature Control Valves Controllers, TIC-1191, 1192, 1193, and 1194:

4.1.11 **Energize** at least one bank of Pressurizer Backup Heaters AND **maintain** on until Reactor Power is at least 30%. GCW

4.1.12 **Complete** the following logs and **verify** the requirements therein are met for entry into Mode 1:

a. 14000, "Operations Shift And Daily Surveillance Logs." 3/27/2012/ 0600 (Date time) GCW *

b. 14225, "Operations Weekly Surveillance Logs": 3/27/2012/0630 (Date time) GCW *

c. 14228, "Operations Monthly Surveillance Logs": 3/27/2012/0645 (Date time) GCW *

d. 14915, "Special Conditions Surveillance Logs." GCW *

e. **Initiate** Mode 1 log sheet readings per 14000, "Operations Shift And Daily Surveillance Logs." GCW

INITIALS

4.1.13 The following have been reviewed and have NO impact on entering Mode 1 except for items described on Checklist 1:

a. Modifications:

- MDCs & Temporary Modifications: (Engineering Systems Department) GCW
- DCPs: (Plant Modifications & Maint. Support Dept.) GCW

b. Equipment Clearance Log GCW

c. LCO Book (LCO Status Binder) GCW

d. Unit Caution Tag Log GCW

e. Out of Position Component Log GCW

f. Safety Related Locked Valve Log GCW

g. Outstanding Work Orders (Work Planning) GCW

h. Surveillances (Mode Change Binder AND Surveillance Tracking Coordinator) GCW

i. Repositioned Doors per 00310-C GCW

j. **Confirm** with Chemistry that SG, Feed AND Condensate chemistry is acceptable for operation above 5% power. GCW

k. **Confirm** with the HP Foreman that temporary shielding required to be removed for Mode 1 entry has been removed. GCW

l. **Verify** Checklist 1 is complete. GCW

m. **Review** Condition Reports to determine Mode restraints. GCW

n. **Review** CR queue to determine IF any new condition reports would prevent Mode change. GCW

INITIALS

o. Outage management has reviewed the outage schedule AND determined that NO impacts to mode change exist. **GCW**

Outage Management Representative

N/A
(Signature)

p. Engineering review of 00309-C, Control of Unattended Temporary Material In Containment In Modes 1-4 has been completed for Mode 1 entry and any restrictions are known and resolved. **GCW**

q. **Notify** SM that conditions are met to change status from Mode 2 to Mode 1. (SM to document authorization to change modes on Checklist 1.) **GCW**

4.1.14 PRIOR to exceeding 5% reactor power, as read on the highest reading PR NIS OR highest reading Loop ΔT, **verify** the AFW has been aligned for Standby per Checklist 2 of 13610, "Auxiliary Feed Water System." (1984301714, 1984301715) **GCW** *

4.1.15 **Initiate raising** reactor power to between 16% and 20%. **GCW**

a. **Maintain** the following plant conditions during the power increase while continuing with the secondary plant startup:

(1) Tave within 2°F of program Tave using the steam dumps in steam pressure mode.

(2) Steam Generator levels between 60% and 70% NR.

(3) Pressurizer pressure 2235 ±15 psig.

(4) Pressurizer level within 5% of program with normal charging AND letdown in service.

NOTE

The Tave/Tref Deviation alarm, ALB12A05, provides actions to maintain Tave above 551°F, the minimum temperature for criticality.

b. **Monitor** "Tave/Tref Deviation" alarm, ALB12A05, during the remainder of the startup AND **take** corrective action as directed to **maintain** Tave on program. (TS SR 3.4.2.1)

INITIALS

4.1.16 WHEN reactor power reaches 5%, as determined by the higher of the Average PR NIS (UV0049) OR Average Loop DT (UV0485),

a. **Log** Mode 1 entry into the Unit Control Logbook. GCW

b. **Notify** Chemistry of the Mode Change. GCW

4.1.17 At approximately 10% reactor power, **perform** the following: (1984300047, 1984300048, 1984301810, 1985303275, 1985303277)

a. **Observe** the following BPLP permissive Lights:

(1) LO POWER TRIP BLK'D P7 extinguished. GCW

(2) PR PERMISSIVE P10 illuminated. GCW

b. **Block** Channel A AND B IR Low power reactor trips using HS-40032 (Ch A) AND HS-40033 (Ch B). GCW

c. **Verify** the following BPLP permissive lights illuminated:

(1) IR TRAIN A TRIP BLK'D. GCW

(2) IR TRAIN B TRIP BLK'D. GCW

d. **Block** Channel A AND B Power Range low power reactor trips using HS-40034 (Ch A) and HS-40035 (Ch B). GCW

e. **Verify** the following BPLP permissive lights illuminated:

(1) PR LO SETTINGS TRAIN A BLK'D. GCW

(2) PR LO SETTINGS TRAIN B BLK'D. GCW

4.1.18 **Prepare** the Unit Auxiliary Transformers (UATs) AND Main Transformers for operation per 13416, "Unit Auxiliary Transformer And Main Power Transformer Preparation For Operation." GCW

4.1.19 **Verify** Main Turbine Warming is complete per 13800, "Main Turbine Operation" AND **continue** with preparations for Main Turbine Roll. GCW

INITIALS

4.1.20 **Verify** Generator/Exciter preparation for startup is complete per 13830, "Main Generator Operation." GCW

4.1.21 IF NOT previously performed, **stop** Sparging Steam to the Condenser per 13615, Condensate And Feed Water Systems." GCW

4.1.22 Each time reactor power change exceeds 15% in a one-hour period, **notify** Chemistry to perform the following samples: (1988314683, 1988315234)

a. RCS iodine sample per TS SR 3.4.16.2. (Required between 2 AND 6 hours after reactor power changes greater than OR equal to 15% in a one hour period)

b. Gaseous release path samples per ODCM Table 3-3.

c. **Record** the time of the change AND the person contacted in the control Room Log.

4.1.23 IF recent trends of I-131 concentrations OR other radiochemistry data indicate that failed fuel rods exist OR IF directed by Reactor Engineering, **perform** the following for operation with failed fuel:

a. **Perform** Power increases per 87073-C, "Limitations And Conditions For Fuel Operation." (1997335153) N/A

b. **Establish** AND **maintain** as high a letdown flow as can be tolerated by plant conditions per 13006, "Chemical Volume And Control System." (1985305274) N/A

c. **Notify** Chemistry of any power change that exceeds 15% to start sampling per 35110-C, "Chemistry Control of the Reactor Coolant System." (1988314683, 1988315234) N/A

INITIALS

4.1.24 At approximately 14% reactor power, **perform** the following: (1984300156, 1984300157)

a. **Control** the Axial Flux Difference (AFD) near the Target Value. **Refer To** Section 4.3.2 for AFD control strategy AND guidelines, (1985303130, 1984301405, 19856303129, 1985304319) GCW

b. **Configure** recorder NR-45:

(1) **Verify** all power range channels indicating properly on recorder NR-45. GCW

(2) **Verify** all power differential channels indicating properly on recorder NR-45. GCW

CAUTION

Closing FV-4486 will change feedwater flow and could result in a feedwater transient.

4.1.25 At approximately 15% Reactor Power, **perform** the following:

a. **Reduce** the demand on FIC-4486 until 0% demand OR 12,000 gpm total condensate flow is attained. THEN **continue** with the power ascension. GCW

b. **Review** Limitation 2.2.10 and write an Info LCO to track completion of SR 3.3.1.2 concerning requirement to perform initial calorimetric calculation within 12 hours of exceeding 15% power (TRS 3.3.1.2). GCW

INITIALS

4.1.26 BETWEEN 16% AND 20% Reactor Power, **swap** to the MFRVs as follows:

NOTES

- MFRVs may leak by as the MFIV opens, SG levels should be monitored and feedwater flow adjusted to maintain SG levels.
- All four MFIVs should be open prior to continuing with MFRV swaps.

a. **Open** the Main Feed Water Isolation Valves for all SGs one at a time: (1985306829, 1984301705)

- SG 1 HV-5227 GCW
- SG 2 HV-5228 GCW
- SG 3 HV-5229 GCW
- SG 4 HV-5230 GCW

NOTES

- The transfer of BFRV/MFRV should be accomplished one at a time with the MFRV controlling in automatic prior to proceeding to the next BFRV/MFRV swap.
- Total feed flow can be monitored via IPC points UF-5404, UF-5424, UF-5444, and UF-5464.

b. **Transfer** the Steam Generator Level Control to the Main Feed Regulating Valves one Steam Generator at a time: (198430155; 1985304455)

(1) **Verify** MFPT Delta P is maintained between 100 and 150 psid:

- SG 1 GCW
- SG 2 GCW
- SG 3 GCW
- SG 4 GCW

INITIALS

(2) **Stabilize** the Steam Generator NR level between 63% AND 67% and **note** the feedwater flow:

- SG 1 Feed Flow 3.7 mpph GCW
- SG 2 Feed Flow 3.7 mpph GCW
- SG 3 Feed Flow 3.7 mpph GCW
- SG 4 Feed Flow 3.7 mpph GCW

(3) **Verify** the BFRV Level Controller AND MFRV Flow Controller are in MANUAL:

	BFRV	MFRV	
• SG 1	LIC-550	FIC-510	GCW
• SG 2	LIC-560	FIC-520	GCW
• SG 3	LIC-570	FIC-530	GCW
• SG 4	LIC-580	FIC-540	GCW

(4) **Slowly open** the MFRV AND **verify** a slight increase in feedwater flow:

- SG 1 FV-510 GCW
- SG 2 FV-520 GCW
- SG 3 FV-530 GCW
- SG 4 FV-540 GCW

INITIALS

(5) **Close** the BFRV while maintaining SG feed flow constant by OPENING the MFRV: (1984200158)

	BFRV	MFRV	
• SG 1	LV-5243	FV-510	GCW
• SG 2	LV-5244	FV-520	GCW
• SG 3	LV-5245	FV-530	GCW
• SG 4	LV-5242	FV-540	GCW

(6) WHEN SG level is within program band, **place** the MFRV in AUTOMATIC:

• SG 1	FV-510	GCW
• SG 2	FV-520	GCW
• SG 3	FV-530	GCW
• SG 4	FV-540	GCW

(7) **Initial** for SG just swapped AND **repeat** steps (1) thru (6) for the remaining SG(s):

• SG 1	GCW
• SG 2	GCW
• SG 3	GCW
• SG 4	GCW

INITIALS

CAUTION

During power ascent, as feedwater flow is increased, Condensate Demineralizer flow must be periodically monitored and adjusted to prevent inadvertent opening of the Condensate Demineralizer bypass valve on high dP. Inadvertent valve opening may cause fuel condition power rate limits to be exceeded. Ref: 87073-C.

4.1.27 **Continue** with the Unit power ramp by concurrently,

a. **Raising** REACTOR POWER to 25%, AND **GCW**

NOTE

Manual adjustment of the steam dumps may be necessary during turbine rolling in order to maintain constant steam pressure.

b. **Rolling** the Main Turbine to operating speed per 13800, "Main Turbine Operation." **GCW**

4.1.28 At 25% REACTOR POWER **verify** the RPS bistable trips for Intermediate Range AND Power Range High Flux Trips activate by **observing** the PR HI Q Low AND IR HI Q status lights illuminate at TSLB-4. **GCW**

4.1.29 WHEN the Main Turbine reaches 1800 rpm **adjust** the hydrogen analyzer per 13810, "Generator Gas System." **GCW**

NOTE

Tech Spec SR 3.3.1.14 and SR 3.3.1.16 can be also be satisfied by observation of energized QMCB, TSLB-2, Status Lights (TSLB-2) TURB STP VLV CLOSED and TURB, AUTO STOP lights as documented in 12006-C, section A4.3 or 12006-C, Attachment 2 step 1.1.4, following the last reactor shutdown or trip, if the observation is performed within 31 days of rolling the turbine.

4.1.30 IF NOT performed in the previous 31 days, **complete** 14901, "Turbine Trip Reactor Trip Actuating Device Operational Test." (1984302000, 1995330331)

14901:_____/_____ **N/A***
Date Time

INITIALS

CAUTION

Avoid operation of the Main Turbine below 100 MWe for prolonged periods (>60 in). Low load operation will cause increased rates of moisture erosion of the latter stage buckets and may cause exhaust hood overheating and/or differential expansion problems. These parameters must be closely monitored during low load operation.

4.1.31 **Notify** Shift Supervisor (SS) AND **obtain** System Operators approval to **synchronize** the generator onto the power grid. GCW

NOTE

Manual adjustment of the steam dumps may be necessary during turbine synchronization and loading in order to maintain constant steam pressure.

4.1.32 **Establish** field excitation AND **synchronize** the main generator to the power grid AND **assume** 60 to 80 MWe load, per 13830, "Main Generator Operation." GCW

4.1.33 **Raise** Turbine load as needed per 13800, "Main Turbine Operation." Coordinate power changes with System Operator.

4.1.34 WHEN TURBINE POWER reaches approximately 10%, **verify** BPLP status light, "LO TURB IMP PRESS PERMISSIVE P-13" extinguished. GCW

4.1.35 At approximately 15% TURBINE POWER, **initiate** placing the MSRs in service per 13800, "Main Turbine Operation." GCW

INITIALS

4.1.36 BETWEEN 20% AND 25% TURBINE POWER:

a. **Verify** all Feedwater Heater Level Controls are aligned as required for plant conditions per 13617, "Feedwater Heater Extraction, Vent & Drain System." GCW

b. **Complete** Heater Drain Pumps Hot Water Flush per 16611, "Secondary Side Flushing" AND **place** Heater Drain Pumps on recirculation per 13617, "Feed Water Heater Extraction, Vent and Drain System." GCW

c. **Verify** On Ex-2100 COI Power System Stabilizer is Active. (At approximately 270 MWE) GCW

d. **Check** the Generator Core Monitor is in service with all testing completed per 13810, "Generator Gas System." GCW

(1) IF the core monitor is NOT in service before greater than 30% turbine power, the power ascent may continue AND a Condition Report should be written. GCW _

NOTE

Above 30% REACTOR POWER and during power ascent, the IPC should be setup to trend RTP using the one-hour scale. This will aid in maintaining RTP within the limitations of 87073-C "Limitations And Conditions For Fuel Operation."

4.1.37 PRIOR to exceeding 30% REACTOR POWER, **verify** that SG blow down, Feed Water, AND Condensate Chemistry is acceptable for operation above 30% power by obtaining concurrence from Chemistry Department. GCW

INITIALS

4.1.38 BETWEEN 28 AND 32% REACTOR POWER, **perform** the following:

NOTES

- Control Valve stroke permissive does not exist below 20% power (based on EHC cabinet first stage pressure). The power permissive is met when LED DS1 on card 1L3-A001 (located in slot E09 in the 2nd EHC cabinet from the left) is not lit.
- Permissive for CV#4 will not be met until turbine power is 75%.

a. **Stroke** each Turbine Stop, Control AND Combined Intermediate Valve five times in succession per 14540, "Main Turbine Valves Stroke Test", to **remove** any entrained air in the EHC Header. **Stroke** CIVs in the order of 4, 5, 6, 3, 2, 1.

GCW *

NOTE

Heater Drain Pumps will not feed forward until Feed Pump suction pressure indicates less than 550 to 650 psig.

b. **Obtain** concurrence from Chemistry Department that drains are acceptable for introduction into SG(s) THEN **initiate** feeding forward with Heater Drain Pumps per 13617, "Feed Water Heater Extraction, Vent And Drain System."

GCW

INITIALS

CAUTION

The MFP individual and master speed controllers are extremely sensitive to adjustments. The following step should be performed slowly to prevent initiating a Feed Water transient.

c. **Transfer** MFPT Speed Control to AUTO, (1985206829)

(1) **Adjust** MFPT Master Speed Controller SIC-509A in MANUAL to match MFPT A(B) Speed Controller SIC-509B(509C). GCW

(2) **Place** MFPT A(B) Speed Controller SIC-509B(509C) in AUTO. GCW

(3) **Slowly adjust** the Master Speed Controller SIC-509A to **establish** a MFP Delta P between 60 AND 110 psid (approximately equal to program ΔP) GCW

(4) **Place** Master Speed Controller SIC-509A in AUTO. GCW

INITIALS

CAUTIONS

- During performance of the following step, actions by operators in the field should be closely coordinated with the Control Room to ensure prompt action is taken to mitigate any SGWLC or MFP mini-flow valve induced feedwater transients.
- With FIC-4486 disabled the MFP mini-flow valves will not fully close when instrument air is restored, travel will be limited to 25% open.

d. **Restore** instrument air to the MFPT mini-flow valve, FV-5200 (FV-5201). GCW

e. **Restore** SJAE Mini-flow to normal alignment as follows:

(1) **Verify** FV-4486 SJAE Mini-flow is CLOSED. GCW

(2) **Adjust** SJAE Mini-flow Controller FIC-4486 potentiometer to 0.00. GCW

CAUTION

The performance of the following step will allow the MFP mini-flow valves to stroke fully closed. The SGWLC system should be monitored and prompt action taken to mitigate any MFP mini-flow valve induced feedwater transient.

(3) **Restore** SJAE Mini-flow Valve, FV-4486 to normal alignment by placing the Enable/Disable Switch in QPCG Cabinet 3, Card Frame 5, Card 55 (C3-555) to ENABLE. GCW

NOTE

If the Unit will be held at approximately 30% reactor power, the steam dumps should remain in the steam pressure mode until reactor power is increased.

f. **Transfer** Steam Dumps to Tavg Mode per 13601, "Main Steam System." GCW

INITIALS

g. **Place** the Steam Generator Atmospheric Relief Valves in standby alignment by performing the following:

(1) **Adjust** SG1 ARV PIC-3000A Pot Set to 7.47 AND **place** controller in AUTO. **GCW**

(2) **Adjust** SG2 ARV PIC-3010A Pot Set to 7.47 AND **place** controller in AUTO. **GCW**

(3) **Adjust** SG3 ARV PIC-3020A Pot Set to 7.47 AND **place** controller in AUTO. **GCW**

(4) **Adjust** SG4 ARV PIC-3030A Pot Set to 7.47 AND **place** controller in AUTO. **GCW**

h. **Transfer** sealing steam supply from Auxiliary Steam to Main Steam per 13825, "Turbine Steam Seal System." **GCW**

i. **Transfer** the SJAE Steam Supply from the Auxiliary Steam System to the Main Steam System per 13620, "Condenser Air Ejector System." **GCW**

j. **Perform** calorimetric calibration of Nuclear Instrumentation per 14030, "Nuclear Instrument Calorimetric Calibration."

14030: **3/27/12** / **0600** **GCW** *
Date Time

CAUTION

Power ascension can continue while the PR setpoints are being reset in the following step. However, while the power range trip setpoints are being adjusted, do not allow power to exceed 42% RTP, until at least three channels have been completed.

k. IF set at 50%, **notify** I&C to **adjust** the PR high level trip bistables (NC306) for channels N41, N42, N43 and N44 to 90%.

Les Noblet /**3/27/12** / **0630** **GCW**
Person Contacted Date Time

INITIALS

l. IF HDT High Level Dump Valves, LV-4333 AND/OR LV-4334 are in MANUAL, **restore** HDT Level Control to NORMAL per 13617, "Feedwater Heater Extraction, Vent and Drain System". GCW

m. IF necessary, **adjust** SGBD Condensate Return Temperatures for the present power level per Step 4.1.10b. GCW

n. IF in service, **shut down** Feed Water preheating using the 5th Stage Feed Water heaters per 13615, "Condensate and Feed Water System." GCW

o. **Start up** AND **test** the second Main Feed Pump per 13615, "Condensate And Feed Water System" up through and including performance of 14993, "Steam Generator Feed Pump Turbine Lube Oil System Test." AND 14992, "MFPT Trip Mechanism Test." GCW

4.1.39 BETWEEN 30 AND 50% Reactor Power, **perform** the following:

a. At SS direction, **transfer** the 13.8kV busses per 13420, "13.8kV AC Electrical Distribution System." GCW

b. At SS direction, **transfer** the 4160V AC busses per 13425 A/B/C, "4160V AC Non 1E Electrical Distribution System." GCW

c. **Verify** I&C has **reset** the PR high level trip bistables (NC306) for at least 3 of the 4 power range channels, per Step 4.1.38.k, PRIOR to exceeding 42% reactor power. GCW

d. **Check** PREFERRED LINE lamp is lit, on the EHC STATIC TRANSFER SWITCH 1615-D3-001 in CB Rooms A-78(U1) AND A-80 (U2). IF PREFERRED LINE lamp is NOT lit, **notify** System Engineer. GCW

4.1.40 IF NOT required, **isolate** the Auxiliary Steam header per 13761-C, "Auxiliary Steam System." GCW

INITIALS

4.1.41 At approximately 40% Turbine Power:

- **Verify** C20 present (automatically unblocks AMSAC-ATWAS Mitigation System Actuation Circuitry) by **observing** permissive light AMSAC BYPASSED LO TURBINE LOAD extinguished. _____
- TURB TRIP/RX-TRIP BLOCKED P-9 extinguishes. _____

4.1.42 PRIOR to reaching 50% power, perform the following: _____

a. **Verify** both Circulating Water Pumps running AND IF required, **start** the second Circulating Water Pump per 13724, "Circulating Water System." _____

b. **Verify** two Condensate Pumps are in service per 13615, "Condensate And Feed Water System" and **place** the third in standby. _____

c. **Raise** Turbine-Generator gas pressure to between 65 psig AND 75 psig per 13810, "Generator Gas System." _____

d. **Verify** the following annunciators are reset:

(1) PWR RANGE UP DET HI FLX DEV (ALB10D02). _____

(2) PWR RANGE LWR DET HI FLX DEV (ALB10E02). _____

(3) IF either of the above annunciators is in alarm, **perform** a QPTR calculation per 14915, Data Sheet 7. (Otherwise mark this step N/A)

14915, DS 7:_____/_____ _____ *
Date Time

4.1.43 At approximately 48% Reactor Power, **verify** 1 LP LO FL TRIP BLKD P-8 extinguishes. _____

4.1.44 At approximately 50% Reactor Power, **verify** Axial flux difference is within limits. **Refer To** Section 4.3.2 for AFD control strategy AND guidelines. _____

INITIALS

4.1.45 PRIOR to reaching 55% power, **start** the second Main Feed Pump, from standby per 13615, "Condensate And Feed Water System." _____

4.1.46 At approximately 75% turbine power AND CV#4 position at 5%, **stroke** CV #4 five times in succession per 14540-1, "Main Turbine Valves Stroke Test", to remove any entrained air in the EHC Header. _____

4.1.47 BETWEEN 78 AND 82% Reactor Power, **perform** calorimetric calibration of Nuclear Instrumentation per 14030, "Nuclear Instrument Calorimetric Calibration."

14030: _____/_____ _____*
Date Time

CAUTION

Power ascension can continue while the PR setpoints are being reset in the following step. However, while the power range trip setpoints are being adjusted, do not allow power to exceed 82% RTP until at least three channels have been completed.

4.1.48 IF set at 90%, **notify** I&C to **adjust** the PR high level trip bistables (NC306) for channels N41, N42, N43 and N44 to 109%.

_____/_____/_____ _____
Person Contacted Date Time

4.1.49 **Verify** I&C has **reset** the PR high level trip bistables (NC306) for at least 3 of the 4 power range channels, per Step 4.1.47, PRIOR to reaching 82% reactor power. _____

INITIALS

NOTE

Extended operation at less than 85% power may require a slow return to full power in order to stay within the limits of the Heat Flux Hot Channel Factor ($F_Q(Z)$) Technical Specification LCO 3.2.1.

4.1.50 IF this is a power ascent following a period of de-rated operation at less than 85% for two weeks OR more, **obtain** Reactor Engineering concurrence PRIOR to raising power above 90%. _____

NOTES

- When above 95% reactor power, Tavg should be maintained within 0.5°F of Tref to minimize the effects of temperature on Power Range NIS indication.
- When operating above 95% reactor power, selecting the lower reading of the two pressurizer pressure controlling channels will permit pressurizer pressure to be controlled on the high side of the normal band. When operating in this configuration, the risk of Axial Offset Anomaly should be minimized.

4.1.51 **Verify** the lower of Pressurizer Pressure Channel PT-0455 OR PT-0457 is selected for control on PS-455F. _____

4.1.52 **Verify** the channel selected in 4.1.51 is selected on PS-455G. _____

4.1.53 BETWEEN 96% AND 98% Reactor Power, **perform** calorimetric calibration of Nuclear Instrumentation per 14030, "Nuclear Instrument Calorimetric Calibration."

14030: _____/_____ _____*
Date Time

4.1.54 Continue to **raise** power to 100% based on indication in Step 4.3.3. _____

4.1.55 **Verify** SGBD Condensate Cooling return temperature has been adjusted to 350°F per Step 4.1.10.b. _____

INITIALS

4.1.56 **Verify** outside containment verification portion of 11867, "Safety Related Locked Valve Verification Checklist" has been completed PRIOR to attaining full power. _____*

4.1.57 As soon as power has stabilized at full power (capability less than OR equal to 100% RTP), **perform** a Calorimetric per 14030, "Nuclear Instrument Calorimetric Calibration."

14030: _____/_____ _____*
Date Time

4.1.58 At 6 hour intervals for the next 12 hours, **perform** 14030, "Nuclear Instrument Calorimetric Calibration."

14030: _____/_____ _____*
Date Time

14030: _____/_____ _____*
Date Time

4.1.59 IF required, **adjust** Shutdown and Control Rod Banks to the specified ARO position per 13502, "Control Rod Drive And Position Indication System." _____

4.1.60 As directed by the SS, **place** ROD BANK SELECTOR SWITCH in AUTO. ____/____
IV

4.1.61 **Adjust** TV-6800 per 13820 STATOR COOLING SYSTEM. _____

4.1.62 IF End-of-Life Coastdown strategy is to be implemented, THEN **Refer To** Section 4.3.4. _____

> NOTE
> 12004-C Section 4.3.7 covers operation of Pressurizer Steam Space Sampling.

4.1.63 IF Pressurizer Steam Space Sampling is still in service, **request** chemistry to determine per 35515 when it may be removed from service. _____

target ZERO
Every day, every job, safely.

NUCLEAR SAFETY FOCUS
TARGET ZERO

Protected Train:
- ☒ Alpha
- ☐ Bravo

EOOS:
- ☒ Green
- ☐ Yellow
- ☐ Orange
- ☐ Red

Plant Conditions:	29 % power BOL.
Major Activities:	Initiate power ascent UOP 12004-C section 4.1 for Power Ascent at a rate not to exceed 8% per hour. Step 4.1.40 has been performed. Step 4.1.41 is the next procedure plateau.
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. ☐ MFPT B will be placed in service at 55% power per UOP step 4.1.45. ☐ 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. ☐ Power Range high level trip bistables are set at 90%.