

Simulation Facility	<u>Byron</u>	Scenario No.:	Operating Test No. 2010 ILT NRC
Examiners:	_____	10-1	Examination
	_____	Applicant:	_____
	_____		SRO
			RO
			BOP

Initial Conditions: IC-152, 95.5% power, steady state, equilibrium xenon, BOL

Turnover: Unit 1 is at 95% power per Load Dispatcher orders, steady state, equilibrium xenon, BOL CB D is at 221 steps and boron concentration is 819 ppm. Online risk is green. Crew is to start the 1D CD/CB pump and secure the 1B CD/CB pump for maintenance work on the 1B CD/CB pump. Leave the pump in standby while the C/O is being prepared. Alarm 1-1-B7 came in 30 minutes ago and Chemistry is taking samples.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP, SRO)	Swap running CD/CB pumps for maintenance
2	MF CV07A 80 60	C (RO, SRO)	RCP Seal Injection Filter Clogged
3	IOR ZDI0CW03PA TRIP	C (BOP, SRO)	CW Makeup Pump Trip
4	MF RX13A 100	I (RO, SRO) TS (SRO)	Pzr LT-459A Fail High (controlling channel)
5	IMF FW02A	C (BOP, SRO)	1B TDFP Trip with 1A MFP available for manual start
6	Cue from Chemistry	R (RO, SRO) TS (SRO)	High Secondary Chemistry requiring unit ramp offline
7	MF MS07D 4 240	M (ALL)	1D Steam Line Break inside CNMT
8	(Preloaded) MF CS01A RF CS04 OVER RF CS05 OVER	C (SRO/ BOP)	CS Pumps Auto Start Failure, Manual Start required; 1A CS pump fail to start.

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

SCENARIO OVERVIEW

Unit 1 is at 95% power per Load Dispatcher orders, steady state, equilibrium xenon, BOL CB D is at 221 steps and boron concentration is 819 ppm. Online risk is green. Crew is to start the 1D CD/CB pump and secure the 1B CD/CB pump for maintenance work on the 1B CD/CB pump. Leave the pump in standby while the C/O is being prepared. Alarm 1-1-B7 came in 30 minutes ago and Chemistry is taking samples.

After completing shift turnover and relief, the crew will start the 1D CD/CB pump and secure the 1B CD/CB pump for maintenance on the 1B CD/CB pump, using BOP CD/CB-1, CD/CB Pump Operation After System Startup.

After the CD/CB pump swap is complete, the annunciator for RCP Seal Injection High DP will alarm. BOP CV-10, CV Filter Operations will be utilized to swap Seal Injection Filters. The crew may enter 1BOA RCP-2, Loss of Seal Cooling, which directs the use of BOP CV-10 to swap filters.

After normal seal injection flow is restored and the plant stabilized, 0A CW Makeup Pump will spuriously trip. The crew will refer to BAR 0-38-A11 and start the standby 0B CW Makeup Pump per BOP CW-9, Circulating Makeup Pump Start-up. The crew may also enter 0BOA Sec-11, Inadequate Circulating Water Makeup.

After the 0B CW Makeup pump has been started, Pressurizer level transmitter 1LT-459A, the controlling channel, fails high. The RO will take manual control of either the master Pzr level controller or 1CV121 to raise charging. The crew will enter 1BOA Inst-2, and there is a high level bistable to be tripped.

After the actions for the Pzr control malfunction are completed, 1B TDFP spuriously trips, causing a reduction in feedwater flow. The crew will enter 1BOA Sec-1 and start the 1A MFP.

After 1BOA Sec-1 is exited, Chemistry Department will call with confirmed sample results of the U-1 Condenser. Sodium concentration is 300 ppb, which is above the Action Level 3 threshold of 250 ppb. The crew will enter 1BOA Sec-2, Abnormal Secondary Chemistry and initiate a ramp offline to be completed within 6 hours.

After the ramp has been initiated, a 4 Mlb/hour fault develops and ramps in over 240 seconds in the 1B Steam Line inside Containment. The crew will trip or verify a trip of the reactor, initiate or verify Main Steam Line isolation, and initiate or verify Safety Injection. The crew will enter 1BEP-0, Reactor Trip or Safety Injection, transition to 1BEP-2, Faulted Steam Generator Isolation, then transition to 1BEP ES-1.1, SI Termination.

The Containment Spray pumps will not automatically start, requiring the crew to manually actuate Containment Spray. Only the 1B CS pump will start.

Completion criterion is transition to 1BEP ES-1.1, SI Termination. The lead evaluator may end the scenario at the transition, or after SI has been terminated.

Critical Tasks

1. Manually actuate at least the minimum required complement of containment cooling equipment before an extreme (red-path) challenge develops to the containment CSF.
(ERG Critical Task number – E-0--E) (K/A: 026000A4.01 – IR: 4.5/4.3)
2. Isolate the faulted SG before transition out of E-2.
(ERG Critical Task number – E-2--A) (K/A: APE040AA1.10 – IR: 4.1/4.1)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC 152, 95% power, MOL, steady state, equilibrium xenon.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- **IMF PN1422 ON** to turn on Annunciator Secondary Sampling Panel/Sink Trouble (1-1-B7)
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Status, HMI 1 is TR 1, and HMI 2 is TR 2. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- From the Expert Command Window type: **cae caep\N10-1SETUP.cae** (If from thumb drive or CD, run **cae (DRIVE LETTER):\cae\N10-1SETUP.cae**)

Event 1: CD/CB Pump Swap

As EO, perform the local actions of BOP CD/CB-1 to report the 1D CD/CB pump has oil flow and > 6 PSIG Lube Oil Pressure (after the MCR starts the aux oil pumps), proper gland water flow, the pump has been vented and the suction and discharge valves are open.

Event 2: RCP Seal Injection Filter clogged

IMF CV07A 80 60

As EO, report 1A Seal Injection filter DP at 35 PSID (High alarm setting is 29 PSID).
When directed, swap to the 1B filter IAW BOP CV-10. Open 1CV8384B by **MRF CV42 100** and close 1CV8384A by **MRF CV41 0**.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 3: 0A CW Makeup Pump trip

IOR ZAO0IICS03PC 365

IOR ZDI0CW03PA TRIP

AFTER pump stops, DOR ZDI0CW03PA2

As EO, acknowledge order to investigate cause of pump trip. Report you are at the RSH doing rounds, and that the overcurrent target flag is up.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event4: Respond to Pressurizer Level Channel Failure

IMF RX13A 100

As WEC or Extra NSO, acknowledge request to trip bistables.

To trip bistables, MRF RP20 OPEN to open Protection Cabinet 1, MRF RX029 TRIP for LB459A

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge entry into Tech Spec LCOAR

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 5: 1B TDFP Trip

IMF FW02A

As EO, if asked to investigate the cause of the pump trip, report no visible cause, but there is scaffold material piled on the floor by the local control panel, and that you (the EO) will talk to the carpenters.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 6: High Secondary Chemistry

As Chemistry, call the Unit desk at 2208 and report confirmed sample results of the U-1 Condenser. Sodium concentration is 300 ppb, which is above the Action Level 3 threshold of 250 ppb.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Grant permission to ramp the unit offline and begin the ramp as soon as possible. Sign the BGP flowchart at the Unit desk. IF the candidate asks whether to use the "normal" or "rapid reduction" flow, ask for their recommendation and concur with that decision.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

As Chemistry, report Chemistry Dept is co-ordinating with the Field Supervisor to maximize secondary cleanup. Chemistry Department is taking actions per CY-AP-120-201, looking for a likely condenser tube leak.

Event 7: 1D Steam Line Break inside Containment

IMF MS07D 4 240 to cause a 4 MLB/hr steam line break on the 1D Steam Line inside CNMT.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

After transition to 1BEP-2, Acknowledge request for STA and begin monitoring BSTs.

Event 8: CS Pump Failure to automatically start

Scenario No: NRC 10-1		Event No: 1
Event Description: CD/CB Pump Swap		
Time	Position	Applicant's Actions or Behavior
	CUE	<ul style="list-style-type: none"> From turnover, swap CD/CB pumps per BOP CD/CB-1, CD/CB Pump Operation After System Startup
	US	<ul style="list-style-type: none"> Direct BOP to perform BOP CD/CB-1
	BOP	<ul style="list-style-type: none"> Refer to BOP CD/CB-1. Place Standby Pump Selector in OFF Verify with EO to ensure proper oil levels Start 1D CD/CB pump Lube Oil pump. <ul style="list-style-type: none"> Verify with EO to ensure proper oil pressure > 6 PSIG Check OIL PRESS UP light is LIT Verify with EO to ensure proper oil flow and gland water is cut in Verify/locally open 1CD037D, Suction Valve Verify/ locally open 1CD041D, Discharge Valve Verify/locally open 1CD099D, Suction Valve Verify/ locally open 1CB002D, Discharge Isol Valve Locally vent the 1D CD/CB pump Open 1CB113D, 1D CD/CB pump Recirc Valve <ul style="list-style-type: none"> Make page announcement for pump start Start 1D CD/CB pump at 1PM03J. Place 1CB113D C/S in AUTO. Locally verify speed reducer oil pressure (is 20-35 PSIG) Shutdown 1D CD/CB pump Lube Oil pump Locally ensure lube oil pressure > 6 PSIG Locally throttle WS cooling valves for 1D CD/CB pump <ul style="list-style-type: none"> Monitor pump parameters on process computer Refer to BOP CD/CB-2 Start the 1B CD/CB pump Lube Oil pump Verify 1B CD/CB pump Lube Oil pump RUN LIGHTS are LIT <ul style="list-style-type: none"> Verify/ Place Standby Pump Selector in OFF Place 1CB113B C/S in OPEN. Make page announcement for pump shutdown Shutdown 1B CD/CB pump Place 1CB113B C/S in CLOSE.

Comments: _____

Scenario No:	NRC 10-1	Event No.	1
Event Description: CD/CB Pump Swap			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> ○ Verify/Place Standby Pump Selector in B ● Stop Lube Oil pump 5 minutes after CD/CB shutdown ○ Locally throttle WS cooling valves for 1B CD/CB pump ● Inform US the pump swap is complete. 	
	RO	<ul style="list-style-type: none"> ● Monitor primary and secondary panels while BOP performing BOP CD/CB-1 and 2. ● Provide support as requested to BOP. 	
	US	<ul style="list-style-type: none"> ● Acknowledge report. ○ Notify SM BOP CD/CB-1 is complete. 	
EVALUATOR NOTE: When pump swap is complete, insert the next event.			

Comments: _____

Scenario No:	NRC 10-1	Event No.	2
Event Description: RCP Seal Injection Filter Clogged			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator RCP Seal Inj Filter High DP (1-7-A2) LIT Seal injection flows lowering 	
	RO	<ul style="list-style-type: none"> Adjust 1CV182 to maintain at least 8 GPM seal injection flow per RCP 	
	CREW	<ul style="list-style-type: none"> Dispatch EO to check 1A Seal Injection filter DP Dispatch EO to swap seal injection filters using BOP CV-10, CV Filter Operations 	
		Evaluator Note: The crew may enter 1BOA RCP-2 for the loss of seal cooling. This will direct swapping filters using BOP CV-10. Actions of 1BOA RCP-2 follow in italics.	
	US	<ul style="list-style-type: none"> <i>Implement 1BOA RCP-2, Loss of Seal Cooling</i> <i>Notify SM of procedure entry, requests IR and EAL evaluation</i> 	
	RO	<ul style="list-style-type: none"> <i>Verify RCP seal cooling is met with RCP temperatures within limits</i> <i>Restore Seal Injection</i> <ul style="list-style-type: none"> <i>Dispatch EO to swap seal injection filters using BOP CV-10, CV Filter Operations</i> <i>Control seal injection flow with 1CV182 and 1CV121 to 8 – 13 GPM per RCP</i> 	
	BOP	<ul style="list-style-type: none"> Assist in monitoring primary plant while RO controls seal injection flow. Provide assistance in diagnosis and BAR response. 	
	US	<ul style="list-style-type: none"> Direct initiation of or initiate 1BOSR 5.5.1-1, RCS Controlled Leakage Monthly Surveillance after standby filter is placed on line. 	
		EVALUATOR NOTE: After the actions for the seal filter malfunction are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-1	Event No:	3
Event Description: 0A CW Makeup Pump Trip			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator CW Makeup Pump Trip (0-38-A11) is LIT 0A CW Makeup pump disagreement light LIT 	
	US	<ul style="list-style-type: none"> Direct operator to respond to alarm 	
	BOP	<ul style="list-style-type: none"> Refer to BAR for 0-38-A11 Start the standby CW Makeup Pump using BOP CW-9 Dispatch EO to RSH to investigate the cause of the trip and take actions to secure the tripped 0A CW makeup pump. 	
	RO	<ul style="list-style-type: none"> Monitor primary and secondary parameters while BOP is involved in the pump trip 	
		EVALUATOR'S NOTE: The crew will refer to or enter 0BOA Sec-11 for inadequate makeup flow. Actions of 0BOA Sec-11 follow in italics.	
	US	<ul style="list-style-type: none"> <i>Enter 0BOA Sec-11</i> <i>Notify SM of procedure entry and request EAL evaluation</i> 	
	BOP	<ul style="list-style-type: none"> <i>Check at least 2 pumps-NOT running</i> <i>Using BOP CW-9:</i> <ul style="list-style-type: none"> <i>Direct EO to perform local actions by procedure or direct the EO's actions</i> <ul style="list-style-type: none"> <i>F.1 blowdown oil cooler cooling line</i> <i>F.2 Verify open suction valve</i> <i>F.3 Verify open recirc valve</i> <i>F.4 Verify closed discharge valve</i> <i>F.8 Throttle open 0CW217B</i> <i>Start 0B CW Makeup pump</i> <i>Direct EO to lineup oil cooling water</i> <i>Throttle open 0CW220</i> <i>Verify 0B CW MU discharge valve 0CW216B opens</i> <i>Verify 0B CW MU recirc valve closes</i> <i>Verify open 0B CW MU Pump discharge isolation valve 0CW217B</i> <i>Throttle open 0CW278B, recirc valve locally</i> <i>Verify pump current of 300 to 343 amps</i> <i>Adjust 0CW220</i> <i>Direct EO to Locally check motor and bearing temperatures</i> <i>Check outside air temperature > 40°F</i> <i>Dispatch operator to investigate cause of trip</i> <i>Verify adequate Makeup capability</i> 	
		EVALUATOR NOTE: After the actions to control CW makeup pump trip are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-1	Event No:	4
Event Description: Pressurizer level channel 1LT-459 failed high			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator PZR LEVEL HIGH RX TRIP STPT ALERT (1-12-A3) is LIT Annunciator PZR LEVEL HIGH CONT DEV HTRS ON (1-12-C3) is LIT 1LI-459A indicates 100% level Charging flow lowering 	
	CREW	<ul style="list-style-type: none"> Refer to BARS. Identify entry conditions for 1BOA INST-2, "OPERATION WITH A FAILED INSTRUMENT CHANNEL". 	
	US	<ul style="list-style-type: none"> Notify SM of plant status and procedure entry. Request evaluation of Emergency Plan conditions. Implement 1BOA INST-2 "OPERATION WITH A FAILED INSTRUMENT CHANNEL", Attachment C "PRESSURIZER LEVEL CHANNEL FAILURE" and direct operator actions of 1BOA INST-2 	
	RO	<ul style="list-style-type: none"> Perform the following at 1PM05J: <ul style="list-style-type: none"> Place 1FK-121, CV pumps flow control valve, <u>OR</u> 1LK-459, PZR master level controller, in manual. Raise demand on 1FK-121 <u>OR</u> 1LK-459 in conjunction with controlling demand on 1CV182 to raise charging flow. Operate 1FK-121 <u>OR</u> 1LK-459 in manual to minimize PZR level drop and maintain 8-13 gpm RCP seal injection flow. Select an operable PZR level channel for control Select an operable PZR level channel to the recorder Place 1FK-121, CV pumps flow control valve, <u>OR</u> 1LK-459, PZR master level controller, as appropriate, in automatic. 	
	US	<ul style="list-style-type: none"> Perform pre-job brief per HU-AA-1211 for bistable tripping. Complete 1BOL 3.1, Attachment B, "INSTRUMENT CONDITION TRACKING LOG". 	
	Extra NSO/RO	<ul style="list-style-type: none"> Locally trip bistable for 1LT-459 / RO verifies correct bistable operation. <ul style="list-style-type: none"> LB459A 	
	US	<ul style="list-style-type: none"> Determine TS 3.3.1 conditions A and K are applicable. Determine TS 3.3.3 and 3.3.4 are NOT applicable – minimum channels operable requirement is met. Contact SM to perform risk assessment, initiate IR, and contact maintenance to investigate/correct instrument failure. 	
	BOP	<ul style="list-style-type: none"> Monitor secondary systems Assist RO with annunciator response 	
		EVALUATOR NOTE: After the instrument failure has been addressed and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No: NRC 10-1		Event No: 5
Event Description: 1B TDFP trip with 1A MFP available		
Time	Position	Applicant's Actions or Behavior
	CUE	<ul style="list-style-type: none"> • Annunciator FW Pump 1B Trip (1-16-B2) is LIT • Annunciators SG 1A-D Flow Mismatch FW Flow Low (1-16-A:D4) are LIT • Annunciator FW Pump Discharge Flow High (1-16-D2) is LIT <ul style="list-style-type: none"> ○ Auto start of standby CD/CB pump with associated alarms LIT • SG levels lowering
		EVALUATOR'S NOTE: If NO action is taken, a reactor trip on Low-2 SG level will occur in about 2 minutes.
		EVALUATOR'S NOTE: The crew may elect to runback the turbine if difficulty is experienced when starting the 1A MFP. Those actions are listed <i>in italics below</i>.
	US	<ul style="list-style-type: none"> • Enter 1BOA Sec-1, Secondary Pump Trip, Attachment A for FW Pump trip <ul style="list-style-type: none"> ○ Direct BOP to close 1FW012B ○ Direct RO/BOP to monitor SG levels for Reactor Trip criteria • Notify SM of plant status, procedure entry, request IR and maintenance notification and EAL evaluation
	BOP	<ul style="list-style-type: none"> • Close 1FW012B • Check Turbine load > 700 MW • Check at least 1 FW pump running • Restore feed flow <ul style="list-style-type: none"> • Check 1A MFP is available • Start 1A MFP aux oil pump • Verify 1FW016 in Manual at 20% • Start 1A MFP • Check 1A MFP discharge flow > 3 MLB/hr • Start the standby CD/CB pump aux oil pump • Start the standby CD/CB pump • Check feed flow > steam flow and adjust 1FW016 as needed.
	RO	<ul style="list-style-type: none"> ○ Monitor RCS Tave and reactivity effects caused by secondary feedflow changes. ○ Assist BOP with BAR response
		EVALUATOR'S NOTE: Listed below are the actions to runback the turbine if the crew chooses to perform that step.
	<i>BOP</i>	<ul style="list-style-type: none"> • <i>Reduce Turbine load by pushing Runback Pushbutton or Runback Box on OWS panel G-5512</i> • <i>Check Turbine load dropping</i>
	<i>RO</i>	<ul style="list-style-type: none"> • <i>Verify rod control in AUTO</i> • <i>Initiate boration according to Runback Placard or Rema</i>
	<i>BOP</i>	<ul style="list-style-type: none"> • <i>Start the standby CD/CB pump aux oil pump</i> • <i>Start the standby CD/CB pump</i>

Comments: _____

Scenario No: NRC 10-1		Event No: 5
Event Description: 1B TDFP trip with 1A MFP available		
Time	Position	Applicant's Actions or Behavior
	CREW	<ul style="list-style-type: none"> • Check FW Pump NPSH Low alarm is LIT (If not, bypass the steps below and go to Check Feed Flow Restored). <ul style="list-style-type: none"> ○ Check CP Bypass valves OPEN ○ Check standby CD/CB pump running ○ Verify HD pump discharge valves RESPONDING ○ Check CB pump recirc valves in AUTO ○ Check CD pumps recirc valve CLOSED ○ Check GS Condenser bypass valves OPEN
	BOP	<ul style="list-style-type: none"> • Check Feed Flow restored • Feed flow > steam flow • SG levels at or trending to normal • Turbine Runback NOT lit • FW Pump Discharge Flow High alarm NOT lit ○ Momentarily place each FWRV in MANUAL to remove integrated error signal
	RO/BOP	<ul style="list-style-type: none"> • Check Plant Status <ul style="list-style-type: none"> ○ PDMS INOPERABLE alarm (1-10-E8) is NOT lit ○ 1BOL 3.h NOT implemented ○ PDMS Limit Exceeded alarm (1-10-D7) is NOT lit ○ Control DI near target ○ Rod bank RIL alarm (1-10-B6) is NOT lit ○ C-7 NOT lit
	CREW	<ul style="list-style-type: none"> • Restore Plant Conditions <ul style="list-style-type: none"> • Adjust RCS boron concentration as necessary • Balance FW pump flows as necessary • Verify FW pump recirc valves on running FW pumps in - MODULATE • Verify valve controls for running equipment in - AUTO: <ul style="list-style-type: none"> ○ HD pump discharge ○ CB pump recircs ○ CD pumps recirc ○ GS condenser bypasses ○ Review start-up procedure for 1A MFP ○ Shutdown unnecessary CD/CB pump per BOP CD/CB-2, CONDENSATE/CONDENSATE BOOSTER SYSTEM SHUTDOWN ○ Complete shutdown of tripped FW pump per BOP FW-2, SHUTDOWN OF A TURBINE DRIVEN MAIN FEEDWATER PUMP ○ Adjust SG blowdown flows and calorimetric inputs as necessary
	CREW	<ul style="list-style-type: none"> • Verify DEHC feedback loop in service

Comments: _____

Scenario No:	NRC 10-1	Event No:	5
Event Description: 1B TDFP trip with 1A MFP available			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Notify Chemistry to monitor secondary chemistry <ul style="list-style-type: none"> ○ Complete applicable section(s) of 1BGP 100-4 (if runback performed) • Check Reactor power change > 15% in one hour. If so: <ul style="list-style-type: none"> ○ Notify Chemistry and RP to perform the power change surveillances 	
		EVALUATOR NOTE: After the actions for the feed pump trip are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-1	Event No:	6
Event Description: High Secondary Chemistry requiring Ramp Offline			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator Secondary Sampling Panel/Sink Trouble (1-1-B7) is LIT Chemistry department reports that Sodium is at 300 ppb, Action Level 3 	
	US	<ul style="list-style-type: none"> Enter 1BOA Sec-2 Notify SM of plant status and procedure entry. Request evaluation of Emergency Plan conditions. Initiate Secondary cleanup Maximize CP usage and SG blowdown as Chemistry directs Determine required action for Action Level 3 Direct Unit shutdown to MODE 3 within 6 hours 	
	BOP	<ul style="list-style-type: none"> Check CSTs NOT cross-tied 	
	US	<ul style="list-style-type: none"> Notify Chemistry to perform TS 3.4.16 sampling as required Determine source of water for MODE 3 Initiate 1BGP 100-4 flowchart for shutdown Notify SM of required shutdown 	
		<p>EVALUATOR'S NOTE: Either the normal (1BGP 100-4T1) or rapid reduction (1BGP 100-4T1.1) flowchart may be used at the SM discretion. The examiner will ask the US for a recommendation and concur with the decision.</p>	
	RO	<ul style="list-style-type: none"> Calculate reactivity change for shutdown using Rema 	
	US	<ul style="list-style-type: none"> Implement 1BGP 100-4T1 for a normal ramp or 4T1.1 for a rapid reduction <ul style="list-style-type: none"> Instruct RO and BOP to review P, P, L & A of 1BGP 100-4. Direct RO to borate in accordance with ReMa (Initial boration of 240 gal to 80%, rod position at 178 steps at 80% for a ramp rate of 5 MW/minute) Direct BOP to ramp in accordance with 1BGP 100-4T1 (or 4T1.1) and supplied Rema 	
	RO	<ul style="list-style-type: none"> Set up boration IAW ReMa and BOP CV-6 Initiate boration using BOP CV-6 or BOP CV-6T1 checklist <ul style="list-style-type: none"> Select STOP on RMCS Makeup Control Switch Select BORATE on RMCS Mode Select Switch Enter desired boration amount in BA totalizer Turn ON RMCS Makeup Control Switch Verify 1CV110B OPEN Verify 1CV110A MODULATING Verify 1AB03P STARTS Verify proper AB flow on 1FR110 Coordinate boration with start of unit ramp by BOP 	
	BOP	<ul style="list-style-type: none"> Set up DEH for ramp IAW 1BGP 100-4T1 (or 4T1.1) 	

Comments: _____

Scenario No:	NRC 10-1	Event No.	6
Event Description: High Secondary Chemistry requiring Ramp Offline			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Enter desired ramp rate (from Rema) in the RATE window • Press ENTER • Enter desired MW output (from Rema) in the REF DEMAND window • Press ENTER • Press GO/HOLD • Press GO and verify load lowers • Coordinate ramp with boration by RO. 	
		EVALUATOR NOTE: After the ramp has been initiated and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No: NRC 10-1		Event No: 7 & 8
Event Description: 1D Steam Line Break inside Containment		
Time	Position	Applicant's Actions or Behavior
	CUE	<ul style="list-style-type: none"> Annunciator CNMT Drain Leak Det Flow High Alarm (1-1-A2) is LIT Annunciator CNMT Press High Alarm (0-33-D6) is LIT
	CREW	<ul style="list-style-type: none"> Identify entry conditions for 1BEP-0, "REACTOR TRIP OR SAFETY INJECTION"
	US	<ul style="list-style-type: none"> Order U-1 Reactor trip Notify SM of plant status and procedure entry Request evaluation of Emergency Plan conditions Enter/Implement 1BEP-0 and direct operators to perform the immediate actions of 1BEP-0
	RO	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> Step 1: Verify reactor trip <ul style="list-style-type: none"> Rod bottom lights - ALL LIT Reactor trip & Bypass breakers - OPEN Neutron flux – DROPPING
	BOP	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> Step 2: Verify Turbine Trip <ul style="list-style-type: none"> All Turbine throttle valves - CLOSED All Turbine governor valves - CLOSED Step 3: Verify power to 4KV busses <ul style="list-style-type: none"> ESF Buses – BOTH ENERGIZED (141 & 142)
		EVALUATOR'S NOTE: The crew may decide to actuate Main Steam Line Isolation after completion of Immediate Actions
	CREW	<ul style="list-style-type: none"> Manually actuate MSLI and verify MSIV and bypass valves are CLOSED
		EVALUATOR'S NOTE: The crew may decide to actuate Safety Injection before actuation pressures are reached. SI will automatically actuate about 90 seconds after the malfunction is inserted.
	CREW	<ul style="list-style-type: none"> Step 4: Check SI Status <ul style="list-style-type: none"> SI First OUT annunciator - LIT SI ACTUATED Permissive Light - LIT SI Equipment – AUTOMATICALLY ACTUATED <ul style="list-style-type: none"> Either SI pumps - RUNNING Either CV pump to cold leg isolation valve OPEN – 1SI8801A/B Recognize SI Actuated Manually actuate SI from 1PM05J and 1PM06J

Comments: _____

Scenario No:	NRC 10-1	Event No:	7 & 8
Event Description: 1D Steam Line Break inside Containment			
Time	Position	Applicant's Actions or Behavior	
		EVALUATOR'S NOTE: Action to trip the RCPs should be initiated within 10 minutes of the RCP Phase B Isolation	
	RO	<ul style="list-style-type: none"> • Determine RCP trip required <ul style="list-style-type: none"> • Phase B Isolation actuated <ul style="list-style-type: none"> ○ RCS pressure < 1425 psig & High head SI flow (1FI-917) > 100 gpm • Trip ALL RCPs 	
	US	<ul style="list-style-type: none"> • Step 5: Direct BOP to perform Attachment B of 1BEP-0 	
		EVALUATOR NOTE: US and RO will continue in 1BEP-0 while BOP is performing Attachment B:	
	BOP	<ul style="list-style-type: none"> • Perform 1BEP-0 Attachment B • Verify FW isolated at 1PM04J: <ul style="list-style-type: none"> • FW pumps – TRIPPED. • Isolation monitor lights – LIT. • FW pumps discharge valves - CLOSED (or going closed) 1FW002A-C. • Verify DGs running at 1PM01J: <ul style="list-style-type: none"> • DGs – BOTH DGs running • 1SX169A & B OPEN. • Dispatch operator locally to check operation • Verify Generator Trip at 1PM01J: <ul style="list-style-type: none"> • OCB 3-4 and 4-5 open. • PMG output breaker open. 	
	BOP	<ul style="list-style-type: none"> • Verify Control Room ventilation aligned for emergency operations at 0PM02J: <ul style="list-style-type: none"> • VC Rad Monitors – LESS THAN HIGH ALARM SETPOINT. • Operating VC train equipment – RUNNING. <ul style="list-style-type: none"> • Supply fan • Return fan • M/U fan • Chilled water pump • Chiller • Operating VC train dampers – ALIGNED. <ul style="list-style-type: none"> • M/U fan outlet damper – NOT FULLY CLOSED. • VC train M/U filter light – LIT. • Operating VC train Charcoal Absorber aligned <ul style="list-style-type: none"> • Bypass damper - CLOSED • Inlet damper - OPEN • Outlet damper - OPEN • Control Room pressure greater than +0.125 inches water on 0PDI-VC038. • Verify Auxiliary Building ventilation aligned at 0PM02J: 	

Comments: _____

Scenario No: NRC 10-1		Event No: 7 & 8
Event Description: 1D Steam Line Break inside Containment		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> • Two inaccessible filter plenums aligned. <ul style="list-style-type: none"> • Plenum A or B or C: <ul style="list-style-type: none"> • Fan - RUNNING • Flow Control damper - OPEN • Bypass Isolation damper - CLOSED • Plenum A or B or C: <ul style="list-style-type: none"> • Fan - RUNNING • Flow Control damper - OPEN • Bypass Isolation damper - CLOSED • Verify FHB ventilation aligned at 0PM02J: <ul style="list-style-type: none"> • Fan - RUNNING • Inlet Isolation damper - OPEN • Flow Control damper - OPEN • Bypass Isolation damper – CLOSED
		EVALUATOR NOTE: The remaining steps of Attachment B may be designated to be performed by WEC personnel or the Field Supervisor and extra operators.
		<ul style="list-style-type: none"> ○ Trip all running HD Pumps ○ Shutdown FW pump as necessary using BOP FW-2 for a TDFP or BOP FW-8 for the MDFP ○ Shutdown unnecessary CD/CB Pumps using BOP CD/CB-2 ○ Align SX MDCT per BOP SX-T2 <ul style="list-style-type: none"> ○ Maintain SX Basin level > 80% ○ Align NDCT <ul style="list-style-type: none"> ○ Verify CW intake bay level within band ○ Dispatch operator to locally verify NDCT basin level acceptable ○ Align NDCT per BOP CW-25 ○ Shutdown all unnecessary CW pumps per BOP CW-2 ○ Notify US that Attachment B is complete
	RO/ BOP	<ul style="list-style-type: none"> • Step 6: Verify ECCS pumps running <ul style="list-style-type: none"> • Both CV pumps – RUNNING • Both RH pumps – RUNNING • Both SI pumps – RUNNING
	BOP/ RO	<ul style="list-style-type: none"> • Perform the following at 1PM06J: <ul style="list-style-type: none"> • Step 7: Verify RCFCs running in Accident Mode: <ul style="list-style-type: none"> • Group 2 RCFC Accident Mode lights – All LIT. • Step 8: Verify Phase A isolation: <ul style="list-style-type: none"> • Group 3 Cnmt Isol monitor lights – ALL LIT. • Step 9: Verify Cnmt Vent isolation:

Comments: _____

Scenario No: NRC 10-1		Event No: 7 & 8
Event Description: 1D Steam Line Break inside Containment		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> Group 6 Cnmt Vent Isol monitor lights – ALL LIT.
	BOP/RO	<ul style="list-style-type: none"> Step 10: Verify AF system: <ul style="list-style-type: none"> AF pumps – BOTH AF pumps RUNNING. AF isolation valves – 1AF13A-H OPEN. AF flow control valves – 1AF005A-H THROTTLED. Step 11: Verify CC pumps – BOTH RUNNING. Step 12: Verify SX pumps – BOTH RUNNING. Step 13: Check if Main Steamline Isolation –required: <ul style="list-style-type: none"> 1D SG pressure < 640 psig (at 1PM04J) CNMT pressure > 8.2 psig. Verify MSIV and Bypass Valves – CLOSED
		EVALUATOR'S NOTE: CS may have an actuation signal at this time. If it has not, the crew must return to this step to verify proper alignment when CNMT pressure exceeds 20 psig. CS will NOT automatically actuate and must be manually actuated.
	BOP/RO [CT] E-0--E	<ul style="list-style-type: none"> Step 14: Check if CS is required. CNMT pressure has risen > 20 psig. Group 6 CS monitor lights – NOT ALL LIT. <ul style="list-style-type: none"> Manually actuate CS and Phase B Isolation Check CS valve alignment – Listed valves are all open 1B CS pump is running Group 6 phase B lights – ALL LIT except CS PUMP A RUNNING light is NOT LIT Verify/Stop ALL RCPs (at 1PM04J). CS eductor suction flows - > 15 gpm CS eductor additive flows - > 5 gpm Align SX Towers <ul style="list-style-type: none"> All 8 Riser valves OPEN All 4 Bypass valves CLOSED All 8 fans running in HIGH speed
	CREW	<ul style="list-style-type: none"> Recognize and announce ADVERSE CNMT
	BOP/RO	<ul style="list-style-type: none"> Step 15: Verify Total AF flow: <ul style="list-style-type: none"> AF flow > 500 gpm S/G NR levels – NOT rising in an uncontrolled manner
	RO/BOP	<ul style="list-style-type: none"> Step 16: Verify ECCS valve alignment <ul style="list-style-type: none"> Determine Group 2 Cold Leg Injection monitor lights required for injection - All lit
	RO/	<ul style="list-style-type: none"> Step 17: Verify ECCS flow

Comments: _____

Scenario No: NRC 10-1		Event No: 7 & 8
Event Description: 1D Steam Line Break inside Containment		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • High Head SI flow >100 gpm (1FI-917) • RCS pressure < 1700 psig <ul style="list-style-type: none"> • BOTH SI pump discharge flows > 200 gpm • RCS pressure > 325 psig
	RO	<ul style="list-style-type: none"> • Step 18: Check PZR PORVs and SPRAY VALVES at 1PM05J: <ul style="list-style-type: none"> • 1RY455 & 1RY456 CLOSED • PORV isol valves – 1RY8000A & 1RY8000B BOTH ENERGIZED • PORV relief path – Both PORVs in AUTO, Both isolation valves – OPEN. • Normal PZR Spray Valves CLOSED
	RO	<ul style="list-style-type: none"> • Step 19: Maintain RCS temperature control at 1PM05J: <ul style="list-style-type: none"> • Check RCP's – NONE RUNNING. • Verify RCS cold leg temperature stable at or trending to 557°F. • Throttle AF maintaining >500 GPM until SG minimum level is met <ul style="list-style-type: none"> ○ AF flow to 1D SG may be throttled to 0 GPM • MSIVs closed
	RO	<ul style="list-style-type: none"> • Step 20: Check status of RCPs at 1PM05J: <ul style="list-style-type: none"> ○ All RCP's – NONE RUNNING. ○ Any RCPs still running – TRIP All RCPs IF Phase B isolation occurred or RCS pressure trip criteria is met
	BOP/ RO	<ul style="list-style-type: none"> • Step 21: Check if SG secondary pressure boundaries are intact at 1PM04J: <ul style="list-style-type: none"> • Check pressure in all SGs: <ul style="list-style-type: none"> • 1D SG dropping in an uncontrolled manner.
	CREW	<ul style="list-style-type: none"> • Transition to 1BEP-2, 'FAULTED STEAM GENERATOR ISOLATION'
	US	<ul style="list-style-type: none"> • Notify SM of plant status and procedure entry. • Request evaluation of Emergency Plan conditions. • Request STA evaluation of status trees. • Enter/Implement 1BEP-2 and direct operator actions of 1BEP-2 to establish the following conditions.
	RO/ BOP	<ul style="list-style-type: none"> • Check MS isolation at 1PM06J: <ul style="list-style-type: none"> • All MSIVs and bypass valves – CLOSED
	BOP	<ul style="list-style-type: none"> • Check if any SG secondary pressure boundary is intact at 1PM04J: <ul style="list-style-type: none"> • 1A, 1B, & 1C SG pressures stable.
	CREW	<ul style="list-style-type: none"> • Identify faulted SG at 1PM04J:

Comments: _____

Scenario No:	NRC 10-1	Event No.	7 & 8
Event Description: 1D Steam Line Break inside Containment			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • 1D SG pressure decreasing in an uncontrolled manner. 	

Comments: _____

RO/ BOP [CT] E-2--A	<ul style="list-style-type: none"> Isolate 1D Steam Generator at completion of step 4 of 1BEP-2: <ul style="list-style-type: none"> Verify/close 1AF013D & H at 1PM06J Bottom row of FW isolation monitor lights – lit. 1MS018D closed. 1SD002C & D closed. 1SD005B closed.
BOP	<ul style="list-style-type: none"> Monitor AF pump suction pressure. Annunciator AF PUMP SX SUCTION VLVS ARMED (1-3-E7) – NOT LIT.
CREW	<ul style="list-style-type: none"> Determine 1D S/G tubes are intact: <ul style="list-style-type: none"> Reset Phase A isolation Open 1SD005A-D Request Chemistry Dept samples all SG for activity Check there are NO RM-11 or HMI Rad Monitor ALERT/HI RAD Alarms. <ul style="list-style-type: none"> 1PR08J SG Blowdown. 1PR27J SJAE/GS. 1AR 22/23D 1D Main steam Line.
CREW	<ul style="list-style-type: none"> Check if ECCS flow should be reduced <ul style="list-style-type: none"> RCS subcooling –ACCEPTABLE Secondary heat sink-total feed flow to INTACT SGs > 500 GPM or NR level in at least 1 SG > 10% (31% Adverse CNMT) RCS pressure – stable or rising Pzr level - > 12% (28% Adverse CNMT) Determine transition to 1BEP ES-1.1, SI TERMINATION
CREW	<ul style="list-style-type: none"> Transition to 1BEP ES-1.1, SI TERMINATION
	EVALUATOR NOTE: The scenario can be terminated after the transition to 1BEP ES-1.1 is announced or at lead examiner's discretion.
US	<ul style="list-style-type: none"> Notify SM of plant status and procedure entry. Request evaluation of Emergency Plan conditions. Enter/Implement 1BEP ES-1.1 and direct operator actions of 1BEP ES-1.1
RO/ BOP	<ul style="list-style-type: none"> Reset SI <ul style="list-style-type: none"> Depress both SI reset PB Verify SI Actuated light – NOT LIT Very Auto SI Blocked light - LIT
RO/ BOP	<ul style="list-style-type: none"> Reset Cnmt Isolation <ul style="list-style-type: none"> Reset Phase A
BOP	<ul style="list-style-type: none"> Establish IA to CNMT <ul style="list-style-type: none"> Check SACs – ANY Running

Comments: _____

		<ul style="list-style-type: none"> • Open 1IA065 and 1IA066
	RO/ BOP	<ul style="list-style-type: none"> • Realign CV Pump • Stop one CV pump
	CREW	<ul style="list-style-type: none"> • Check RCS pressure – Stable or rising
	RO/ BOP	<ul style="list-style-type: none"> • Terminate High-head SI <ul style="list-style-type: none"> • Reset SI recirc sump isolation valves – 1SI8811A & B and 1CV8110 & 1CV8111 • Reset CV pump miniflow valves – 1CV8114 and 1CV8116 • Verify CV pump miniflow valves – OPEN • Close CV injection valves – 1SI8801A & B
	RO/ BOP	<ul style="list-style-type: none"> • Establish Charging Flow <ul style="list-style-type: none"> • Place 1CV182 at 0% demand • Open CNMT isolation valves 1CV8105 and 1CV8106 • Set seal injection flow to 8-13 GPM per RCP
	RO/ BOP	<ul style="list-style-type: none"> • Control Charging flow to maintain Pzr level stable
	RO/ BOP	<ul style="list-style-type: none"> • Check if SI pumps should be stopped <ul style="list-style-type: none"> • RCS pressure – Stable or rising and > 1700 PSIG • Stop BOTH SI pumps and place in standby
		<ul style="list-style-type: none"> • Step 10: Check if RH pumps should be stopped <ul style="list-style-type: none"> • Reset SI <ul style="list-style-type: none"> • Depress BOTH SI Reset Pushbuttons at 1PM06J • Verify SI ACTUATED BP light NOT lit at 1PM05J • Verify AUTO SI BLOCKED BP light NOT lit at 1PM05J • RCS pressure > 325 psig & stable • Stop both RH pumps and place in standby
		EVALUATOR NOTE: The scenario can be terminated after the transition to 1BEP ES-1.1 is announced or at lead examiner’s discretion.

Comments: _____

Simulation Facility	<u>Byron</u>	Scenario No.:	Operating Test No. 2010 ILT NRC
Examiners:	_____	10-2	Examination
	_____	Applicant:	_____
	_____		_____
			SRO
			RO
			BOP
Initial Conditions:	IC-151		
Turnover:	Unit 1 is at 12% power, BOL, ready to synchronize Main Generator. Online risk is green. CBD @ 147 steps, and boron concentration is 1300 ppm. 1BGP 100-3, step F.27 is the next step to perform. Steam dump demand must be raised to 25% to 35% as directed by step 23.o. The offgoing shift has just diluted 100 gallons. 1A MDFP is OOS for maintenance.		

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO, SRO)	Power ascension
2		N (BOP, SRO)	Synchronize Main Generator to grid
3	IOR ZD11CV8149B CLS	C (RO, SRO)	75 GPM LD Isolation Valve 1CV8149B Fail Closed
4	MF RX06D 0	I (BOP, SRO) TS (SRO)	1A SG LT-556 Fail Low (controlling channel)
5	MF RX13A 100	I (RO, SRO) TS (SRO)	Pzr 1LT-459A Fail High (controlling channel)
6	MF FW22C	C (BOP, SRO)	1C CD/CB Pump Trip with manual start required
7	MF TH03A 400	M (ALL)	1A SGTR (normal cooldown and depressurization)
8	MF RP04A, RP04B	C (SRO/BOP)	Automatic Phase A Isolation Actuation Failure (manual required)

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

SCENARIO OVERVIEW

Unit 1 is at 12% power, BOL, ready to synchronize Main Generator. Online risk is green. CBD @ 147 steps, and boron concentration is 1300 ppm. 1BGP 100-3, step F.27 is the next step to perform. Steam dump demand must be raised to 25% to 35% as directed by step 23.o. The offgoing shift has just diluted 100 gallons. 1A MDFP is OOS for maintenance.

After completing shift turnover and relief, the crew will continue 1BGP 100-3, step F.27 to synchronize the main generator to the grid. The RO will dilute or withdraw control rods to raise steam dump demand from current demand to 25% to 35% IAW 1BGP 100-3.

After power has been raised and the synchronization is complete, 1CV8149B, 75 GPM Letdown valve spuriously closes. The crew will restore letdown using BOP CV-17, Establishing and Securing Normal and RH Letdown Flow.

After letdown is restored, 1LT-556, the 1A SG NR level controlling channel, fails low. The BOP will take manual control of the FWRV to lower feedwater flow, and the crew will enter 1BOA Inst-2, Operation with a Failed Instrument Channel. There is a low SG level bistable to be tripped as part of the BOA.

After the actions for 1LT-556 are completed, Pressurizer level transmitter 1LT-459A, the controlling channel, fails high. The RO will take manual control of either the master Pzr level controller or 1CV121 to raise charging. The crew will re-enter 1BOA Inst-2, and there is a high level bistable to be tripped.

After BOA actions are completed, 1C CD/CB pump trips. The crew will enter 1BOA Sec-1, Secondary Pump Trip and start the standby pump.

After 1BOA Sec-1 is exited, 1A SG develops a 400 gpm tube rupture. The crew will trip the reactor, and actuate safety injection. The crew will enter 1BEP-0, Reactor Trip or Safety Injection, and transition to 1BEP-3, Steam Generator Tube Rupture. Automatic Phase A isolation will fail, and the crew will manually actuate Phase A. The crew will perform a cooldown using the main steam dumps, and depressurize using normal Pzr spray.

Completion criterion is RCS depressurization to match ruptured SG pressure, and SI termination in 1BEP-3. The lead evaluator may end the scenario when pressures have been matched, or after SI has been terminated.

Critical Tasks

1. Close containment isolation valves such that at least one valve is closed on each critical phase-A penetration before the end of the scenario
(ERG Critical Task number – E-0--0) (K/A number – 103000A2.03. importance – 3.5/3.8)
2. Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs
(ERG Critical Task number - E-3--A) (K/A number – EPE038EA1.32. importance – 4.6/4.7)
3. Establish/maintain an RCS temperature so that transition from E-3 does not occur because the RCS temperature is in either of the following conditions:
 - Too high to maintain minimum required subcooling
OR
 - Below the RCS temperature that causes an extreme (red-path) or a severe (orange-path) challenge to the subcriticality and/or the integrity CSF
(ERG Critical Task number - E-3--B) (K/A number – EPE038EA1.36. importance – 4.3/4.5)
4. Depressurize RCS to meet SI termination criteria before plant-specific criteria exceeded.
(ERG Critical Task number - E-3--C) (K/A number –EPE038EA1.05. importance – 4.1/4.3)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC151, 14% power, BOL, ready to synchronize main generator.
- Shutdown 1CD/CB pump if necessary so that only 2 CD/CB pumps are running.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Summary, HMI 1 is TR 1, and HMI 2 is TR 2. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Set main generator VPL to 25% on Graphic 5501.
- Adjust incoming voltage about 2 – 4 volts > running voltage.
- Adjust generator speed so that synchroscope is running slowly in the fast direction.
- Dilute 100 Gallons. Provide a boration/dilution log with 100 Gallons Dilution for Temperature Control to the oncoming crew. Provide 1BGP 100-3T1 initialed up to step 27.
- Place C/O tags on the 1A MDFP C/S, its aux oil pump C/S, discharge valve C/S, and recirc valve C/S.
- From the Expert Command Window type: **cae caep\N10-2SETUP.cae** (If from thumb drive or CD, run **cae (DRIVE LETTER):\cae\N10-2SETUP.cae**)

Event 1: Power ascension

As EO, perform the local actions of 1BGP 100-3 as directed by the crew.

Event 2: Synchronize Main Generator to grid

As EO, perform the local actions of 1BGP 100-3 as directed by the crew.

Event 3: 75 GPM LD Isolation Valve 1CV8149B failed closed

IOR ZDI1CV8149B CLS

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 4: 1A SG LT-556 failed low

IMF RX06D 0

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 5: Pzr LT-459A failed high

IMF RX13A 100

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 6: 1C CD/CB pump trip with manual start required

IMF FW22C

As EO, if asked to investigate the cause of the pump trip, report an overcurrent trip.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 7: 1A SGTR

IMF TH03A 400

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

After transition to 1BEP-3, Acknowledge request for STA and begin monitoring BSTs.

Event 8: Automatic Phase A Isolation actuation failure (Manual required)

Verify in Preload: IMF RP04A, RP04B

Scenario No:	NRC 10-2	Event No:	1
Event Description: Power Ascension			
Time	Position	Applicant's Actions or Behavior	
	US	<ul style="list-style-type: none"> • Direct power ascension per 1BGP 100-3 • Placekeep procedure appropriately • Approve reactivity changes for RO 	
	RO	<ul style="list-style-type: none"> • Raise reactor power appropriately to raise steam dump demand to 25% to 35% to support generator synchronization. <ul style="list-style-type: none"> ○ Dilute as necessary <ul style="list-style-type: none"> • Turn OFF RMCS Makeup CS • Select DILUTE on the RMCS Mode Select Switch • Enter the desired dilution amount in the PW Flow Totalizer • Turn ON RMCS Makeup CS ○ Turn on Pzr Backup heaters as needed ○ Withdraw control rods as necessary <ul style="list-style-type: none"> • Select MANUAL • Withdraw control rods to desired height 	
	BOP/RO	<ul style="list-style-type: none"> • When steam dumps are closed, transfer control to Tave Mode • Place 1PK-507 to MANUAL and adjust to 0% • Place Mode switch to RESET then to Tave • Ensure C-7 is OFF • Place 1PK-507 in AUTO 	
		EVALUATOR NOTE: After the ramp has continued to the lead examiners satisfaction, insert the next event.	

Comments: _____

Scenario No:	NRC 10-2	Event No.	2
Event Description: Synchronize Main Generator to grid			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> ○ From turnover, synchronize the Main Generator to the grid and continue with 1BGP 100-3 at Step 27. 	
	US	<ul style="list-style-type: none"> ● Direct BOP and RO to perform 1BGP 100-3 ● Hold a reactivity and pre-job brief before beginning the synchronization 	
	BOP	<ul style="list-style-type: none"> ● Refer to BOP 1BGP 100-3, step 27 ○ Turn on 1 synch switch for either BT 3-4 or 4-5 ○ Adjust Generator voltage about 4 volts > grid voltage ○ Adjust Generator speed to obtain synch rotation slowly in the FAST direction ● Close selected output breaker ● Raise turbine power as necessary using graphic 5501 ● Adjust MVARs to about 100 MVAR OUT ● Turn off Synch switch ● Turn on remaining Synch switch ● Close remaining output breaker ● Turn off Synch switch ● Match CS targets for OPM03J BT breakers 	
	BOP/RO	<ul style="list-style-type: none"> ○ Adjust Feedwater Flow as needed ● Verify TGTMS graphics are displayed ● Set VPL to 120% <ul style="list-style-type: none"> ● Select LIMITERS ● Select VPL up arrow until 120% is reached ● Select EXIT ● Place 2 SJAE in service ● Transfer Gland Sealing Steam to the unit 	
	RO	<ul style="list-style-type: none"> ● Monitor primary and secondary panels while BOP is synchronizing the generator ● Provide support as requested to BOP. ● Control rod position and dilute as required to maintain temperature and power. 	
	BOP	<ul style="list-style-type: none"> ● Continue with 1BGP 100-3 ● Initial flowchart 	
	US	<ul style="list-style-type: none"> ● Acknowledge reports ● Placekeep procedure steps appropriately 	

Comments: _____

Scenario No:	NRC 10-2	Event No.	3
Event Description: 1CV8149B Failed Closed			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Letdown flow has lowered to 45 GPM Charging flow and seal injection flows are lowering Annunciator RCP SEAL WATER INJ FLOW LOW (1-7-B2) is LIT Annunciator CHG LINE FLOW HIGH LOW (1-9-D3) is LIT Pressurizer level is higher than program 	
	US	<ul style="list-style-type: none"> Direct RO actions to restore letdown per BOP CV-9, BOP CV-17, or 1BOA ESP-2 	
		EVALUATOR'S NOTE: The crew may restore 120 GPM letdown using BOP CV-9, BOP CV-17, or 1BOA ESP-2.	
		EVALUATOR'S NOTE: The steps of BOP CV-9 follow.	
	RO	<ul style="list-style-type: none"> Enter BOP CV-9, Letdown Orifice Operation Throttle 1CV121 to raise charging flow to approximately 100 GPM Place 1CV131 Controller to MANUAL with letdown pressure at ~180 PSIG <ul style="list-style-type: none"> Place 1CC130A Controller to MANUAL & adjust as needed. Open 1CV8149C Adjust 1CV131 to control letdown pressure at 370 PSIG and place in AUTO when pressure stabilizes Ensure 1CC130 is maintaining temperature at 105° to 115° and place in AUTO Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO 	
		EVALUATOR'S NOTE: The crew may restore 120 GPM letdown by opening 1CV8149C, or may isolate letdown and then restore 120 GPM letdown. <i>The actions if the crew isolates letdown first are in italics.</i>	
	RO	<ul style="list-style-type: none"> <i>Close 1CV8149A and place CS for 1CV8149B to CLOSE</i> <i>Close 1CV459 and 1CV460</i> <ul style="list-style-type: none"> <i>Minimize charging flow using 1CV121</i> 	
		EVALUATOR'S NOTE: The steps of BOP CV-17 follow.	
	RO	<ul style="list-style-type: none"> Enter BOP CV-17. Establishing and Securing Normal and RH Letdown Flow Verify/Close 1CV8149A-C Verify/Open 1CC9452A Verify/Open 1CC9452B Place 1CC130A Controller to MANUAL at 60% demand Place 1CV131 Controller to MANUAL at 40% demand Verify/Open 1CV8401A Verify 1TK-0381A is in MANUAL at 0% demand Verify/Open 1CV8152 and 1CV8160 Verify/Open 1CV8389A 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	3
Event Description: 1CV8149B Failed Closed			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Verify/Open 1CV459 and 1CV460 • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump • Throttle 1CV121 to raise charging flow to 100 GPM • Open 1CV8149A and 1CV8149C • Adjust 1CV131 to control letdown pressure at 370 PSIG and place in AUTO • Ensure 1CC130 is maintaining temperature at 105° to 115° and place in AUTO • Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump 	
		EVALUATOR'S NOTE: The steps of 1BOA ESP-2 follow.	
	RO	<ul style="list-style-type: none"> • Enter 1BOA ESP-2, Re-establishing CV Flow • Verify/Close 1CV8149A-C • Verify/Close 1CV459 and 1CV460 • Verify 1CV8401A is OPEN • Verify 1CV8324A & B are OPEN • Verify 1CV8152 and 1CV8160 are OPEN • Verify BTRS MODE SELECTOR SWITCH is OFF • Place 1CV131 Controller to MANUAL at 40% demand • Place 1CC130A Controller to MANUAL at 60% demand • Verify 1CV8105 and 1CV8106 are OPEN • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump • Throttle 1CV121 to raise charging flow to 100 GPM • Open 1CV8152 and 1CV8160 <ul style="list-style-type: none"> ○ Open 1CV8149A • Open 1CV8149C • Adjust 1CV131 to control letdown pressure at 360 PSIG and place in AUTO • Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO • Ensure 1CC130 is maintaining temperature at 90° to 115° and place in AUTO • Verify 1PR06J is in service 	
	BOP/RO	<ul style="list-style-type: none"> ○ Control 1CV182 and 1CV121 as necessary to maintain seal injection flow at 8-13 GPM per pump 	
	BOP	<ul style="list-style-type: none"> ○ Monitor Primary and Secondary panels ○ Assist RO with balancing charging and seal injection flow ○ Followup with BAR response 	
	US	<ul style="list-style-type: none"> • Notify SM/WEC of failure, request IR 	

Comments: _____

Scenario No:	NRC 10-2	Event No.	3
Event Description: 1CV8149B Failed Closed			
Time	Position	Applicant's Actions or Behavior	
		EVALUATOR NOTE: After the actions to restore letdown are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No: NRC 10-2		Event No: 4
Event Description: 1A SG LT-556 Fail Low		
Time	Position	Applicant's Actions or Behavior
	CUE	<ul style="list-style-type: none"> • Annunciator SG 1A LVL LOW-2 RX TRIP ALERT (1-17-A5) is LIT • Annunciator SG 1A LEVEL DEVIATION HIGH LOW (1-17-A9) is LIT • 1LI-556 indicates 0% level • 1A SG feedwater flow rising
	CREW	<ul style="list-style-type: none"> ○ Refer to BARS. • Identify entry conditions for 1BOA INST-2, "OPERATION WITH A FAILED INSTRUMENT CHANNEL".
	US	<ul style="list-style-type: none"> • Notify SM of plant status and procedure entry. • Request evaluation of Emergency Plan conditions. • Implement 1BOA INST-2 "OPERATION WITH A FAILED INSTRUMENT CHANNEL", Attachment E "NARROW RANGE SG LEVEL CHANNEL" and direct operator actions of 1BOA INST-2
	BOP	<ul style="list-style-type: none"> • Control 1A Feed Reg Bypass Valve in MANUAL • Lower 1A SG FW flow to match steam flow • Select an operable SG level channel • Re-establish automatic level control
	US	<ul style="list-style-type: none"> • Perform pre-job brief per HU-AA-1211 for bistable tripping. ○ Complete 1BOL 3.1, Attachment B, "INSTRUMENT CONDITION TRACKING LOG".
	Extra NSO/ BOP	<ul style="list-style-type: none"> • Locally trip bistables for 1LT-556 / BOP verifies correct bistable operation. <ul style="list-style-type: none"> • LB556B • LB556C • Locally place AMS SW1 in TEST/BYPASS • Locally place AMS Operating Bypass SW12 to LSGA and SW11 to TEST-TRIP
	US	<ul style="list-style-type: none"> • Determine TS 3.3.1 conditions A and E and TS 3.3.2 conditions A and D are applicable. • Determine TS 3.3.3 and 3.3.4 are NOT applicable – minimum channels operable requirement is met. • Contact SM to perform risk assessment, initiate IR, and contact maintenance to investigate/correct instrument failure.
	RO	<ul style="list-style-type: none"> • Monitor primary for effects of feedwater transient • Assist BOP with annunciator response
		EVALUATOR NOTE: After the instrument failure has been addressed and with lead examiners concurrence, insert the next event.

Comments: _____

Scenario No:	NRC 10-2	Event No:	5
Event Description: Pzr LT-459A Failed High			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator PZR LEVEL HIGH RX TRIP STPT ALERT (1-12-A3) is LIT • Annunciator PZR LEVEL HIGH CONT DEV HTRS ON (1-12-C3) is LIT • 1LI-459A indicates 100% level • Charging flow lowering 	
	CREW	<ul style="list-style-type: none"> ○ Refer to BARs. • Identify entry conditions for 1BOA INST-2, "OPERATION WITH A FAILED INSTRUMENT CHANNEL". 	
	US	<ul style="list-style-type: none"> • Notify SM of plant status and procedure entry. • Request evaluation of Emergency Plan conditions. • Implement 1BOA INST-2 "OPERATION WITH A FAILED INSTRUMENT CHANNEL", Attachment C "PRESSURIZER LEVEL CHANNEL FAILURE" and direct operator actions of 1BOA INST-2 	
	RO	<ul style="list-style-type: none"> • Perform the following at 1PM05J: <ul style="list-style-type: none"> • Place 1FK-121, CV pumps flow control valve, <u>OR</u> 1LK-459, PZR master level controller, in manual. • Raise demand on 1FK-121 <u>OR</u> 1LK-459 in conjunction with controlling demand on 1CV182 to raise charging flow. • Operate 1FK-121 <u>OR</u> 1LK-459 in manual to minimize PZR level drop and maintain 8-13 gpm RCP seal injection flow. • Select an operable Pzr level channel for control • Select an operable Pzr level channel to the recorder • Check Pzr level > 17% • Check Letdown established • Check Pzr heaters normal • Place 1FK-121, CV pumps flow control valve, <u>OR</u> 1LK-459, PZR master level controller, as appropriate, in automatic. 	
	US	<ul style="list-style-type: none"> • Perform pre-job brief per HU-AA-1211 for bistable tripping. ○ Complete 1BOL 3.1, Attachment B, "INSTRUMENT CONDITION TRACKING LOG". 	
	Extra NSO/RO	<ul style="list-style-type: none"> • Locally trip bistable for 1LT-459 / RO verifies correct bistable operation. <ul style="list-style-type: none"> • LB459A 	
	US	<ul style="list-style-type: none"> • Determine TS 3.3.1 conditions A and K are applicable. • Determine TS 3.3.3 and 3.3.4 are NOT applicable – minimum channels operable requirement is met. • Contact SM to perform risk assessment, initiate IR, and contact maintenance to investigate/correct instrument failure. 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	5
Event Description: Pzr LT-459A Failed High			
Time	Position	Applicant's Actions or Behavior	
	BOP	<ul style="list-style-type: none"> • Monitor secondary systems • Assist RO with annunciator response 	
		EVALUATOR NOTE: After the instrument failure has been addressed and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-2	Event No.	6
Event Description:	1C CD/CB Pump Trip with manual start required		
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator CD/CB PUMP TRIP (1-17-A9) is LIT 	
	US	<ul style="list-style-type: none"> Enter and direct actions of 1BOA Sec-1, Secondary Pump Trip Notify SM of procedure entry and request EAL evaluation 	
	BOP	<ul style="list-style-type: none"> Check turbine load: NOT > 700 MW Start a Standby CD/CB pump and check CD/CB flow restored Check FW pumps not cavitating Close 1CB113C Check FW pump discharge flow: NOT oscillating 	
	RO	<ul style="list-style-type: none"> Monitor RCS Tave and reactivity effects caused by secondary feedflow changes. Assist BOP with BAR response 	
	RO/BO P	<ul style="list-style-type: none"> Check Plant Status <ul style="list-style-type: none"> PDMS INOPERABLE alarm (1-10-D8) IS lit 1BOL 3.h IS implemented Control DI near target Rod bank RIL alarm (1-10-B6) NOT lit Turbine RB Light (OWS graphic 5501) is NOT lit C-7 (BP 4.6) NOT lit 	
	US	<ul style="list-style-type: none"> IF RCS pressure lowers to less than 2209 PSIG, evaluate DNB TS 3.4.1 	
	CREW	<ul style="list-style-type: none"> Restore Plant Conditions <ul style="list-style-type: none"> Adjust RCS boron concentration as necessary Verify controls for running equipment in - AUTO: <ul style="list-style-type: none"> TDFP HD pump discharge CB pump recirc CD pumps recirc GS condenser bypasses Complete shutdown of tripped CD/CB pump per BOP CD/CB-2, CONDENSATE/CONDENSATE BOOSTER SYSTEM SHUTDOWN Adjust SG blowdown flows and calorimetric inputs as necessary Verify DEHC feedback loop in service Notify Chemistry to monitor secondary chemistry <ul style="list-style-type: none"> Complete applicable section(s) of 1BGP 100-4 (if runback performed) Check Reactor power change > 15% in one hour. If so: <ul style="list-style-type: none"> Notify Chemistry and RP to perform the power change surveillances 	
		<p>EVALUATOR NOTE: After the actions for the CD/CB pump trip are complete and with lead examiners concurrence, insert the next event.</p>	

Comments: _____

Comments: _____

Scenario No:	NRC 10-2	Event No.	7 & 8
Event Description: 1A Steam Generator Tube Rupture & Automatic Phase A Actuation Failure			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> ALERT/ALARM on 1A Main Steam Line detectors 4AA122 and 4AA123 1A SG FW flow lowering Pzr level lowering 	
		EVALUATOR'S NOTE: The crew may initially enter 1BOA SEC-8, "Steam Generator Tube Leak." The actions are listed <i>in italics below</i>.	
	CREW	<ul style="list-style-type: none"> <i>Identify entry conditions for 1BOA Sec-8, "Steam Generator Tube Leak"</i> 	
	US	<ul style="list-style-type: none"> <i>Direct the actions of 1BOA SEC-8</i> 	
	RO	<ul style="list-style-type: none"> <i>Throttle open 1CV121 and 1CV182 attempting to maintain Pzr level</i> <i>Lower letdown flow to 75 GPM</i> <i>Report that Pzr level can NOT be maintained >17%.</i> 	
	US	<ul style="list-style-type: none"> <i>Order crew to trip the reactor, verify the reactor trip, and actuate SI.</i> 	
	CREW	<ul style="list-style-type: none"> Identify entry conditions for 1BEP-0, "REACTOR TRIP OR SAFETY INJECTION" 	
	US	<ul style="list-style-type: none"> Order U-1 Reactor trip Notify SM of plant status and procedure entry Request evaluation of Emergency Plan conditions Enter/Implement 1BEP-0 and direct operator actions of 1BEP-0 	
	RO	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> Step 1: Verify reactor trip <ul style="list-style-type: none"> Rod bottom lights - ALL LIT Reactor trip & Bypass breakers - OPEN Neutron flux – DROPPING 	
	BOP	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> Step 2: Verify Turbine Trip <ul style="list-style-type: none"> All Turbine throttle valves - CLOSED All Turbine governor valves - CLOSED Step 3: Verify power to 4KV busses <ul style="list-style-type: none"> ESF Buses – BOTH ENERGIZED (141 & 142) 	
	US	<ul style="list-style-type: none"> Direct manual SI actuation 	
	RO/BOP	<ul style="list-style-type: none"> Manually actuate SI 	
	CREW	<ul style="list-style-type: none"> Step 4: Check SI Status 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	7 & 8
Event Description: 1A Steam Generator Tube Rupture & Automatic Phase A Actuation Failure			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> ○ SI First OUT annunciator -NOT LIT ○ SI ACTUATED Permissive Light - LIT ○ SI Equipment – AUTOMATICALLY ACTUATED <ul style="list-style-type: none"> ○ Either SI pumps - RUNNING ○ Either CV pump to cold leg isolation valve OPEN – 1SI8801A/B ● Recognize SI Actuated ● Manually actuate SI from 1PM05J and 1PM06J 	
	US	<ul style="list-style-type: none"> ● Step 5: Direct BOP to perform Attachment B of 1BEP-0 	
EVALUATOR NOTE: US and RO will continue in 1BEP-0 while BOP is performing Attachment B:			
	BOP	<ul style="list-style-type: none"> ● Perform 1BEP-0 Attachment B ● Verify FW isolated at 1PM04J: <ul style="list-style-type: none"> ● FW pumps – TRIPPED. ● Isolation monitor lights – LIT. ● FW pumps discharge valves - CLOSED (or going closed) 1FW002A-C. ● Verify DGs running at 1PM01J: <ul style="list-style-type: none"> ● DGs – BOTH DGs running ● 1SX169A & B OPEN. ● Dispatch operator locally to check operation ● Verify Generator Trip at 1PM01J: <ul style="list-style-type: none"> ● OCB 3-4 and 4-5 open. ● PMG output breaker open. 	
	BOP	<ul style="list-style-type: none"> ● Verify Control Room ventilation aligned for emergency operations at 0PM02J: <ul style="list-style-type: none"> ● VC Rad Monitors – LESS THAN HIGH ALARM SETPOINT. ● Operating VC train equipment – RUNNING. <ul style="list-style-type: none"> ● Supply fan ● Return fan ● M/U fan ● Chilled water pump ● Chiller ● Operating VC train dampers – ALIGNED. <ul style="list-style-type: none"> ● M/U fan outlet damper – NOT FULLY CLOSED. ● VC train M/U filter light – LIT. ● Operating VC train Charcoal Absorber aligned <ul style="list-style-type: none"> ● Bypass damper - CLOSED ● Inlet damper - OPEN ● Outlet damper - OPEN ● Control Room pressure greater than +0.125 inches water on 0PDI-VC038. 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	7 & 8
Event Description: 1A Steam Generator Tube Rupture & Automatic Phase A Actuation Failure			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Verify Auxiliary Building ventilation aligned at 0PM02J: <ul style="list-style-type: none"> • Two inaccessible filter plenums aligned. <ul style="list-style-type: none"> • Plenum A or B or C: <ul style="list-style-type: none"> • Fan - RUNNING • Flow Control damper - OPEN • Bypass Isolation damper - CLOSED • Plenum A or B or C: <ul style="list-style-type: none"> • Fan - RUNNING • Flow Control damper - OPEN • Bypass Isolation damper - CLOSED • Verify FHB ventilation aligned at 0PM02J: <ul style="list-style-type: none"> • Fan - RUNNING • Inlet Isolation damper - OPEN • Flow Control damper - OPEN • Bypass Isolation damper – CLOSED 	
		EVALUATOR NOTE: The remaining steps of Attachment B may be designated to be performed by WEC personnel or the Field Supervisor and extra operators.	
		<ul style="list-style-type: none"> ○ Trip all running HD Pumps ○ Shutdown FW pump as necessary using BOP FW-2 for a TDFP or BOP FW-8 for the MDFP ○ Shutdown unnecessary CD/CB Pumps using BOP CD/CB-2 ○ Align SX MDCT per BOP SX-T2 <ul style="list-style-type: none"> ○ Maintain SX Basin level > 80% ○ Align NDCT <ul style="list-style-type: none"> ○ Verify CW intake bay level within band ○ Dispatch operator to locally verify NDCT basin level acceptable ○ Align NDCT per BOP CW-25 ○ Shutdown all unnecessary CW pumps per BOP CW-2 ○ Notify US that Attachment B is complete 	
	RO/ BOP	<ul style="list-style-type: none"> • Step 6: Verify ECCS pumps running <ul style="list-style-type: none"> • Both CV pumps – RUNNING • Both RH pumps – RUNNING • Both SI pumps – RUNNING 	
	BOP/ RO	<ul style="list-style-type: none"> • Perform the following at 1PM06J: <ul style="list-style-type: none"> • Step 7: Verify RCFCs running in Accident Mode: <ul style="list-style-type: none"> • Group 2 RCFC Accident Mode lights – ALL LIT. • Step 8: Verify Phase A isolation: <ul style="list-style-type: none"> • Group 3 Cnmt Isol monitor lights – NOT all LIT. 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	7 & 8
Event Description: 1A Steam Generator Tube Rupture & Automatic Phase A Actuation Failure			
Time	Position	Applicant's Actions or Behavior	

Comments: _____

CREW [CT] E-0--O		<ul style="list-style-type: none"> • Manually actuate Phase A Isolation <ul style="list-style-type: none"> • Group 3 Cnmt Isol monitor lights – ALL LIT
BOP/ RO		<ul style="list-style-type: none"> • Step 9: Verify Cnmt Vent isolation: <ul style="list-style-type: none"> • Group 6 Cnmt Vent Isol monitor lights – ALL LIT. • Step 10: Verify AF system: <ul style="list-style-type: none"> • AF pumps – BOTH AF pumps RUNNING. • AF isolation valves – 1AF13A-H OPEN. • AF flow control valves – 1AF005A-H THROTTLED. • Step 11: Verify CC pumps – BOTH RUNNING. • Step 12: Verify SX pumps – BOTH RUNNING. • Step 13: Check if Main Steamline Isolation – NOT required: <ul style="list-style-type: none"> ○ All SG pressure > 640 psig (at 1PM04J) ○ CNMT pressure < 8.2 psig. • Step 14: Check if CS is required. <ul style="list-style-type: none"> • CNMT pressure has NOT risen > 20 psig.
BOP/ RO		<ul style="list-style-type: none"> • Step 15: Verify Total AF flow: <ul style="list-style-type: none"> • AF flow > 500 gpm • S/G NR levels – 1A SG level rising in an uncontrolled manner • CLOSE 1AF013A and 1AF013E
RO/ BOP		<ul style="list-style-type: none"> • Step 16: Verify ECCS valve alignment <ul style="list-style-type: none"> • Determine Group 2 Cold Leg Injection monitor lights required for injection - All lit
RO/ BOP		<ul style="list-style-type: none"> • Step 17: Verify ECCS flow <ul style="list-style-type: none"> • High Head SI flow >100 gpm (1FI-917) • RCS pressure > 1700 psig
RO		<ul style="list-style-type: none"> • Step 18: Check PZR PORVs and SPRAY VALVES at 1PM05J: <ul style="list-style-type: none"> • 1RY455 & 1RY456 CLOSED • PORV isol valves – 1RY8000A & 1RY8000B BOTH ENERGIZED • PORV relief path – Both PORVs in AUTO, Both isolation valves – OPEN. • Normal PZR Spray Valves CLOSED
RO		<ul style="list-style-type: none"> • Step 19: Maintain RCS temperature control at 1PM05J: <ul style="list-style-type: none"> • Check RCP's – ALL RUNNING. • Verify RCS average temperature stable at or trending to 557°F. • Throttle AF maintaining >500 GPM until SG minimum level is met
RO		<ul style="list-style-type: none"> • Step 20: Check status of RCPs at 1PM05J: <ul style="list-style-type: none"> • All RCP's – ALL RUNNING.

Comments: _____

		<ul style="list-style-type: none"> High head flow 1FI-917 > 100 GPM and RCS Pressure > 1425 PSIG
	BOP/ RO	<ul style="list-style-type: none"> Step 21: Check if SG secondary pressure boundaries are intact at 1PM04J: <ul style="list-style-type: none"> Check pressure in all SGs: <ul style="list-style-type: none"> NO SG dropping in an uncontrolled manner.
	BOP/ RO	<ul style="list-style-type: none"> Step 22: Check S/G tubes are NOT intact at RM-11 console: <ul style="list-style-type: none"> 1PR08J SG Blowdown 1PR27J SJAE/GS – IN ALERT/ALARM 1AR22/23A Main steam Lines – Trending up or in ALERT/ALARM
	CREW	Transition to 1BEP-3, Steam Generator Tube Rupture
	US	Implement 1BEP-3 "STEAM GENERATOR TUBE RUPTURE" and direct operator actions. <ul style="list-style-type: none"> Notifies SM of BEP entry Requests Emergency Plan evaluation
	RO	Check status of RCPs and determine all running <ul style="list-style-type: none"> If any running, Check trip criteria NOT satisfied <ul style="list-style-type: none"> HHSI flow >100 gpm OR SI flow > 200 gpm AND RCS pressure > 1425 psig
	CREW	Identify ruptured SG <ul style="list-style-type: none"> Unexpected rise in NR level Main steamline rad monitor <ul style="list-style-type: none"> 1RT-AR022 Grid 1 4AA122 1RT-AR023 Grid 1 4AA123 High activity for any SG sample <ul style="list-style-type: none"> Reset CNMT isol Phase A Notify Chem to locally sample Open SG blowdown sample valves at Chem request Identify 1A SG ruptured
	BOP/ RO [CT] E-3—A (critical steps are bold)	Isolate flow from ruptured SG by verifying <ul style="list-style-type: none"> SG PORV MS018A in AUTO Check SG PORV MS018A closed <ul style="list-style-type: none"> Verify closed when SG pressure < 1115 psig Verify SG blowdown valves closed unless open for sampling <ul style="list-style-type: none"> 1SD002A 1SD002B Close MSIV and MSIV bypass valves for 1A SG Check PORVs on intact SGs available for RCS cooldown Check ruptured SG level

Comments: _____

		<ul style="list-style-type: none"> Narrow Range >10% Verify/Close AF isol valves (should have been closed earlier in 1BEP-0) <ul style="list-style-type: none"> 1AF013A 1AF013E
	BOP	<ul style="list-style-type: none"> Check ruptured SG pressure <ul style="list-style-type: none"> Ruptured SG pressure greater than 320 psig
	Crew	<ul style="list-style-type: none"> Initiate RCS cooldown Determine required CETC from table (step 6a)
	RO/ BOP	<ul style="list-style-type: none"> Check Pzr Pressure - >1930 # When < 1930#, block Steamline Isol SI
	BOP [CT] E-3--B	<ul style="list-style-type: none"> Dump steam to condenser from intact SGs at maximum rate using steam dumps or SG PORVs <ul style="list-style-type: none"> Check steam dumps available <ul style="list-style-type: none"> Place MS controller in Manual, reduce demand to 0 Select Steam Pressure Mode Adjust MS controller to initiate cooldown When necessary, bypass P-12 interlock using Bypass Interlock Switches A & B Dump steam at maximum rate using SG PORVs
	Crew	<ul style="list-style-type: none"> Check average of 10 highest CETC - < required temperature from step 6a
	Crew	<ul style="list-style-type: none"> Continue with step 7; come back to step 6f when cooldown target temperature is achieved.
	BOP	<ul style="list-style-type: none"> Check intact SG levels > 10% Control FF to maintain NR levels 30 – 50%
	RO	<ul style="list-style-type: none"> Check Pzr PORVs and isolation valves <ul style="list-style-type: none"> PORV isolation valves energized PORVs closed PORV isolation valves both open
	RO/ BOP	<ul style="list-style-type: none"> Reset SI <ul style="list-style-type: none"> Verify SI actuated permissive light NOT LIT Verify Auto SI blocked light LIT
	RO/ BOP	Reset Phase A isolation
	Crew	<ul style="list-style-type: none"> Verify all AC busses energized by offsite power
	BOP	<ul style="list-style-type: none"> Establish IA to containment <ul style="list-style-type: none"> Check SACs- any running Open 1IA065 and 1IA066
	CREW	<ul style="list-style-type: none"> Check if RH pumps should be stopped <ul style="list-style-type: none"> Any RH pump running and aligned to RWST RCS pressure >325# Stop both RH pumps
	CREW	<ul style="list-style-type: none"> Check if RCS Cooldown should be stopped

Comments: _____

		<ul style="list-style-type: none"> • Ave of 10 highest CETC < required temperature in Step 6 • When met, stop cooldown and maintain temperature < required temperature
	CREW	<ul style="list-style-type: none"> • Check ruptured SG pressure – stable for plant conditions
	CREW	<ul style="list-style-type: none"> • Check RCS subcooling – acceptable per figure 1BEP 3-2 and Attachment A
	RO/ BOP	<ul style="list-style-type: none"> • Depressurize RCS • Normal Spray –available
	RO [CT] E-3--C	<ul style="list-style-type: none"> • Depressurize RCS using maximum available spray until <ul style="list-style-type: none"> ○ RCS Pressure < Ruptured SG pressure and Pzr level > 12% ○ Pzr level > 69% ○ RCS subcooling NOT acceptable • Close spray valves
	CREW	<ul style="list-style-type: none"> • Check if ECCS flow should be terminated • RCS subcooling – Acceptable • Secondary heat sink <ul style="list-style-type: none"> ○ > 500 FF to SG – available ○ At least 1 intact SG > 10% NR • RCS pressure – rising • Pzr level > 12%
	RO/ BOP	<ul style="list-style-type: none"> • Stop both SI pumps and 1 CV pump
		EVALUATOR NOTE: When the CREW determines SI should be terminated, conclude the scenario.

Comments: _____

Simulation Facility	<u>Byron</u>	Scenario No.:	Operating Test No. 2010 ILT NRC
Examiners:	_____	10-2	Examination
	_____	Applicant:	_____
	_____		SRO
			RO
			BOP
Initial Conditions:	IC-151		
Turnover:	Unit 1 is at 12% power, BOL, ready to synchronize Main Generator. Online risk is green. CBD @ 147 steps, and boron concentration is 1300 ppm. 1BGP 100-3, step F.27 is the next step to perform. Steam dump demand must be raised to 25% to 35% as directed by step 23.o. The offgoing shift has just diluted 100 gallons. 1A MDFP is OOS for maintenance.		

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO, SRO)	Power ascension
2		N (BOP, SRO)	Synchronize Main Generator to grid
3	IOR ZD11CV8149B CLS	C (RO, SRO)	75 GPM LD Isolation Valve 1CV8149B Fail Closed
4	MF RX06D 0	I (BOP, SRO) TS (SRO)	1A SG LT-556 Fail Low (controlling channel)
5	MF RX13A 100	I (RO, SRO) TS (SRO)	Pzr 1LT-459A Fail High (controlling channel)
6	MF FW22G	C (BOP, SRO)	4C GD/GB Pump Trip with manual start required
7	MF TH03A 400	M (ALL)	1A SGTR (normal cooldown and depressurization)
8	MF RP04A, RP04B	C (SRO/BOP)	Automatic Phase A Isolation Actuation Failure (manual required)

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

Deleted Event 6, not required for evaluation, did not affect scenario, interest of saving exam time.

SCENARIO OVERVIEW

Unit 1 is at 12% power, BOL, ready to synchronize Main Generator. Online risk is green. CBD @ 147 steps, and boron concentration is 1300 ppm. 1BGP 100-3, step F.27 is the next step to perform. Steam dump demand must be raised to 25% to 35% as directed by step 23.o. The offgoing shift has just diluted 100 gallons. 1A MDFP is OOS for maintenance.

After completing shift turnover and relief, the crew will continue 1BGP 100-3, step F.27 to synchronize the main generator to the grid. The RO will dilute or withdraw control rods to raise steam dump demand from current demand to 25% to 35% IAW 1BGP 100-3.

After power has been raised and the synchronization is complete, 1CV8149B, 75 GPM Letdown valve spuriously closes. The crew will restore letdown using BOP CV-17, Establishing and Securing Normal and RH Letdown Flow.

After letdown is restored, 1LT-556, the 1A SG NR level controlling channel, fails low. The BOP will take manual control of the FWRV to lower feedwater flow, and the crew will enter 1BOA Inst-2, Operation with a Failed Instrument Channel. There is a low SG level bistable to be tripped as part of the BOA.

After the actions for 1LT-556 are completed, Pressurizer level transmitter 1LT-459A, the controlling channel, fails high. The RO will take manual control of either the master Pzr level controller or 1CV121 to raise charging. The crew will re-enter 1BOA Inst-2, and there is a high level bistable to be tripped.

After BOA actions are completed, 1C CD/CB pump trips. The crew will enter 1BOA Sec-1, Secondary Pump Trip and start the standby pump.

After 1BOA Sec-1 is exited, 1A SG develops a 400 gpm tube rupture. The crew will trip the reactor, and actuate safety injection. The crew will enter 1BEP-0, Reactor Trip or Safety Injection, and transition to 1BEP-3, Steam Generator Tube Rupture. Automatic Phase A isolation will fail, and the crew will manually actuate Phase A. The crew will perform a cooldown using the main steam dumps, and depressurize using normal Pzr spray.

Completion criterion is RCS depressurization to match ruptured SG pressure, and SI termination in 1BEP-3. The lead evaluator may end the scenario when pressures have been matched, or after SI has been terminated.

Critical Tasks

1. Close containment isolation valves such that at least one valve is closed on each critical phase-A penetration before the end of the scenario
(ERG Critical Task number – E-0--0) (K/A number – 103000A2.03. importance – 3.5/3.8)
2. Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs
(ERG Critical Task number - E-3--A) (K/A number – EPE038EA1.32. importance – 4.6/4.7)
3. Establish/maintain an RCS temperature so that transition from E-3 does not occur because the RCS temperature is in either of the following conditions:
 - Too high to maintain minimum required subcooling
OR
 - Below the RCS temperature that causes an extreme (red-path) or a severe (orange-path) challenge to the subcriticality and/or the integrity CSF
(ERG Critical Task number - E-3--B) (K/A number – EPE038EA1.36. importance – 4.3/4.5)
4. Depressurize RCS to meet SI termination criteria before plant-specific criteria exceeded.
(ERG Critical Task number - E-3--C) (K/A number –EPE038EA1.05. importance – 4.1/4.3)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC151, 14% power, BOL, ready to synchronize main generator.
- Shutdown 1CD/CB pump if necessary so that only 2 CD/CB pumps are running.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Summary, HMI 1 is TR 1, and HMI 2 is TR 2. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Set main generator VPL to 25% on Graphic 5501.
- Adjust incoming voltage about 2 – 4 volts > running voltage.
- Adjust generator speed so that synchroscope is running slowly in the fast direction.
- Dilute 100 Gallons. Provide a boration/dilution log with 100 Gallons Dilution for Temperature Control to the oncoming crew. Provide 1BGP 100-3T1 initialed up to step 27.
- Place C/O tags on the 1A MDFP C/S, its aux oil pump C/S, discharge valve C/S, and recirc valve C/S.
- From the Expert Command Window type: **cae caep\N10-2SETUP.cae** (If from thumb drive or CD, run **cae (DRIVE LETTER):\cae\N10-2SETUP.cae**)

Event 1: Power ascension

As EO, perform the local actions of 1BGP 100-3 as directed by the crew.

Event 2: Synchronize Main Generator to grid

As EO, perform the local actions of 1BGP 100-3 as directed by the crew.

Event 3: 75 GPM LD Isolation Valve 1CV8149B failed closed

IOR ZDI1CV8149B CLS

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 4: 1A SG LT-556 failed low

IMF RX06D 0

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 5: Pzr LT-459A failed high

IMF RX13A 100

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 6: 1C CD/CB pump trip with manual start required

IMF FW22C

As EO, if asked to investigate the cause of the pump trip, report an overcurrent trip.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 7: 1A SGTR

IMF TH03A 400

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

After transition to 1BEP-3, Acknowledge request for STA and begin monitoring BSTs.

Event 8: Automatic Phase A Isolation actuation failure (Manual required)

Verify in Preload: IMF RP04A, RP04B

Scenario No:	NRC 10-2	Event No.	1
Event Description: Power Ascension			
Time	Position	Applicant's Actions or Behavior	
	US	<ul style="list-style-type: none"> • Direct power ascension per 1BGP 100-3 • Placekeep procedure appropriately • Approve reactivity changes for RO 	
	RO	<ul style="list-style-type: none"> • Raise reactor power appropriately to raise steam dump demand to 25% to 35% to support generator synchronization. <ul style="list-style-type: none"> ○ Dilute as necessary <ul style="list-style-type: none"> • Turn OFF RMCS Makeup CS • Select DILUTE on the RMCS Mode Select Switch • Enter the desired dilution amount in the PW Flow Totalizer • Turn ON RMCS Makeup CS ○ Turn on Pzr Backup heaters as needed ○ Withdraw control rods as necessary <ul style="list-style-type: none"> • Select MANUAL • Withdraw control rods to desired height 	
	BOP/RO	<ul style="list-style-type: none"> • When steam dumps are closed, transfer control to Tave Mode • Place 1PK-507 to MANUAL and adjust to 0% • Place Mode switch to RESET then to Tave • Ensure C-7 is OFF • Place 1PK-507 in AUTO 	
		<p>EVALUATOR NOTE: After the ramp has continued to the lead examiners satisfaction, insert the next event.</p>	

Comments: _____

Scenario No:	NRC 10-2	Event No.	2
Event Description: Synchronize Main Generator to grid			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> ○ From turnover, synchronize the Main Generator to the grid and continue with 1BGP 100-3 at Step 27. 	
	US	<ul style="list-style-type: none"> ● Direct BOP and RO to perform 1BGP 100-3 ● Hold a reactivity and pre-job brief before beginning the synchronization 	
	BOP	<ul style="list-style-type: none"> ● Refer to BOP 1BGP 100-3, step 27 ○ Turn on 1 synch switch for either BT 3-4 or 4-5 ○ Adjust Generator voltage about 4 volts > grid voltage ○ Adjust Generator speed to obtain synch rotation slowly in the FAST direction ● Close selected output breaker ● Raise turbine power as necessary using graphic 5501 ● Adjust MVARs to about 100 MVAR OUT ● Turn off Synch switch ● Turn on remaining Synch switch ● Close remaining output breaker ● Turn off Synch switch ● Match CS targets for OPM03J BT breakers 	
	BOP/RO	<ul style="list-style-type: none"> ○ Adjust Feedwater Flow as needed ● Verify TGTMS graphics are displayed ● Set VPL to 120% <ul style="list-style-type: none"> ● Select LIMITERS ● Select VPL up arrow until 120% is reached ● Select EXIT ● Place 2 SJAE in service ● Transfer Gland Sealing Steam to the unit 	
	RO	<ul style="list-style-type: none"> ● Monitor primary and secondary panels while BOP is synchronizing the generator ● Provide support as requested to BOP. ● Control rod position and dilute as required to maintain temperature and power. 	
	BOP	<ul style="list-style-type: none"> ● Continue with 1BGP 100-3 ● Initial flowchart 	
	US	<ul style="list-style-type: none"> ● Acknowledge reports ● Placekeep procedure steps appropriately 	

Comments: _____

Scenario No:	NRC 10-2	Event No.	3
Event Description: 1CV8149B Failed Closed			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Letdown flow has lowered to 45 GPM Charging flow and seal injection flows are lowering Annunciator RCP SEAL WATER INJ FLOW LOW (1-7-B2) is LIT Annunciator CHG LINE FLOW HIGH LOW (1-9-D3) is LIT Pressurizer level is higher than program 	
	US	<ul style="list-style-type: none"> Direct RO actions to restore letdown per BOP CV-9, BOP CV-17, or 1BOA ESP-2 	
		EVALUATOR'S NOTE: The crew may restore 120 GPM letdown using BOP CV-9, BOP CV-17, or 1BOA ESP-2.	
		EVALUATOR'S NOTE: The steps of BOP CV-9 follow.	
	RO	<ul style="list-style-type: none"> Enter BOP CV-9, Letdown Orifice Operation Throttle 1CV121 to raise charging flow to approximately 100 GPM Place 1CV131 Controller to MANUAL with letdown pressure at ~180 PSIG <ul style="list-style-type: none"> Place 1CC130A Controller to MANUAL & adjust as needed. Open 1CV8149C Adjust 1CV131 to control letdown pressure at 370 PSIG and place in AUTO when pressure stabilizes Ensure 1CC130 is maintaining temperature at 105° to 115° and place in AUTO Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO 	
		EVALUATOR'S NOTE: The crew may restore 120 GPM letdown by opening 1CV8149C, or may isolate letdown and then restore 120 GPM letdown. <i>The actions if the crew isolates letdown first are in italics.</i>	
	RO	<ul style="list-style-type: none"> <i>Close 1CV8149A and place CS for 1CV8149B to CLOSE</i> <i>Close 1CV459 and 1CV460</i> <ul style="list-style-type: none"> <i>Minimize charging flow using 1CV121</i> 	
		EVALUATOR'S NOTE: The steps of BOP CV-17 follow.	
	RO	<ul style="list-style-type: none"> Enter BOP CV-17. Establishing and Securing Normal and RH Letdown Flow Verify/Close 1CV8149A-C Verify/Open 1CC9452A Verify/Open 1CC9452B Place 1CC130A Controller to MANUAL at 60% demand Place 1CV131 Controller to MANUAL at 40% demand Verify/Open 1CV8401A Verify 1TK-0381A is in MANUAL at 0% demand Verify/Open 1CV8152 and 1CV8160 Verify/Open 1CV8389A 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	3
Event Description: 1CV8149B Failed Closed			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Verify/Open 1CV459 and 1CV460 • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump • Throttle 1CV121 to raise charging flow to 100 GPM • Open 1CV8149A and 1CV8149C • Adjust 1CV131 to control letdown pressure at 370 PSIG and place in AUTO • Ensure 1CC130 is maintaining temperature at 105° to 115° and place in AUTO • Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump 	
		EVALUATOR'S NOTE: The steps of 1BOA ESP-2 follow.	
	RO	<ul style="list-style-type: none"> • Enter 1BOA ESP-2, Re-establishing CV Flow • Verify/Close 1CV8149A-C • Verify/Close 1CV459 and 1CV460 • Verify 1CV8401A is OPEN • Verify 1CV8324A & B are OPEN • Verify 1CV8152 and 1CV8160 are OPEN • Verify BTRS MODE SELECTOR SWITCH is OFF • Place 1CV131 Controller to MANUAL at 40% demand • Place 1CC130A Controller to MANUAL at 60% demand • Verify 1CV8105 and 1CV8106 are OPEN • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump • Throttle 1CV121 to raise charging flow to 100 GPM • Open 1CV8152 and 1CV8160 <ul style="list-style-type: none"> ○ Open 1CV8149A • Open 1CV8149C • Adjust 1CV131 to control letdown pressure at 360 PSIG and place in AUTO • Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO • Ensure 1CC130 is maintaining temperature at 90° to 115° and place in AUTO • Verify 1PR06J is in service 	
	BOP/RO	<ul style="list-style-type: none"> ○ Control 1CV182 and 1CV121 as necessary to maintain seal injection flow at 8-13 GPM per pump 	
	BOP	<ul style="list-style-type: none"> ○ Monitor Primary and Secondary panels ○ Assist RO with balancing charging and seal injection flow ○ Followup with BAR response 	
	US	<ul style="list-style-type: none"> • Notify SM/WEC of failure, request IR 	

Comments: _____

Scenario No:	NRC 10-2	Event No.	3
Event Description: 1CV8149B Failed Closed			
Time	Position	Applicant's Actions or Behavior	
		EVALUATOR NOTE: After the actions to restore letdown are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No: NRC 10-2		Event No: 4
Event Description: 1A SG LT-556 Fail Low		
Time	Position	Applicant's Actions or Behavior
	CUE	<ul style="list-style-type: none"> • Annunciator SG 1A LVL LOW-2 RX TRIP ALERT (1-17-A5) is LIT • Annunciator SG 1A LEVEL DEVIATION HIGH LOW (1-17-A9) is LIT • 1LI-556 indicates 0% level • 1A SG feedwater flow rising
	CREW	<ul style="list-style-type: none"> ○ Refer to BARS. • Identify entry conditions for 1BOA INST-2, "OPERATION WITH A FAILED INSTRUMENT CHANNEL".
	US	<ul style="list-style-type: none"> • Notify SM of plant status and procedure entry. • Request evaluation of Emergency Plan conditions. • Implement 1BOA INST-2 "OPERATION WITH A FAILED INSTRUMENT CHANNEL", Attachment E "NARROW RANGE SG LEVEL CHANNEL" and direct operator actions of 1BOA INST-2
	BOP	<ul style="list-style-type: none"> • Control 1A Feed Reg Bypass Valve in MANUAL • Lower 1A SG FW flow to match steam flow • Select an operable SG level channel • Re-establish automatic level control
	US	<ul style="list-style-type: none"> • Perform pre-job brief per HU-AA-1211 for bistable tripping. ○ Complete 1BOL 3.1, Attachment B, "INSTRUMENT CONDITION TRACKING LOG".
	Extra NSO/ BOP	<ul style="list-style-type: none"> • Locally trip bistables for 1LT-556 / BOP verifies correct bistable operation. <ul style="list-style-type: none"> • LB556B • LB556C • Locally place AMS SW1 in TEST/BYPASS • Locally place AMS Operating Bypass SW12 to LSGA and SW11 to TEST-TRIP
	US	<ul style="list-style-type: none"> • Determine TS 3.3.1 conditions A and E and TS 3.3.2 conditions A and D are applicable. • Determine TS 3.3.3 and 3.3.4 are NOT applicable – minimum channels operable requirement is met. • Contact SM to perform risk assessment, initiate IR, and contact maintenance to investigate/correct instrument failure.
	RO	<ul style="list-style-type: none"> • Monitor primary for effects of feedwater transient • Assist BOP with annunciator response
EVALUATOR NOTE: After the instrument failure has been addressed and with lead examiners concurrence, insert the next event.		

Comments: _____

Scenario No:	NRC 10-2	Event No:	5
Event Description: Pzr LT-459A Failed High			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator PZR LEVEL HIGH RX TRIP STPT ALERT (1-12-A3) is LIT • Annunciator PZR LEVEL HIGH CONT DEV HTRS ON (1-12-C3) is LIT • 1LI-459A indicates 100% level • Charging flow lowering 	
	CREW	<ul style="list-style-type: none"> ○ Refer to BARs. • Identify entry conditions for 1BOA INST-2, "OPERATION WITH A FAILED INSTRUMENT CHANNEL". 	
	US	<ul style="list-style-type: none"> • Notify SM of plant status and procedure entry. • Request evaluation of Emergency Plan conditions. • Implement 1BOA INST-2 "OPERATION WITH A FAILED INSTRUMENT CHANNEL", Attachment C "PRESSURIZER LEVEL CHANNEL FAILURE" and direct operator actions of 1BOA INST-2 	
	RO	<ul style="list-style-type: none"> • Perform the following at 1PM05J: <ul style="list-style-type: none"> • Place 1FK-121, CV pumps flow control valve, <u>OR</u> 1LK-459, PZR master level controller, in manual. • Raise demand on 1FK-121 <u>OR</u> 1LK-459 in conjunction with controlling demand on 1CV182 to raise charging flow. • Operate 1FK-121 <u>OR</u> 1LK-459 in manual to minimize PZR level drop and maintain 8-13 gpm RCP seal injection flow. • Select an operable Pzr level channel for control • Select an operable Pzr level channel to the recorder • Check Pzr level > 17% • Check Letdown established • Check Pzr heaters normal • Place 1FK-121, CV pumps flow control valve, <u>OR</u> 1LK-459, PZR master level controller, as appropriate, in automatic. 	
	US	<ul style="list-style-type: none"> • Perform pre-job brief per HU-AA-1211 for bistable tripping. ○ Complete 1BOL 3.1, Attachment B, "INSTRUMENT CONDITION TRACKING LOG". 	
	Extra NSO/RO	<ul style="list-style-type: none"> • Locally trip bistable for 1LT-459 / RO verifies correct bistable operation. <ul style="list-style-type: none"> • LB459A 	
	US	<ul style="list-style-type: none"> • Determine TS 3.3.1 conditions A and K are applicable. • Determine TS 3.3.3 and 3.3.4 are NOT applicable – minimum channels operable requirement is met. • Contact SM to perform risk assessment, initiate IR, and contact maintenance to investigate/correct instrument failure. 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	5
Event Description: Pzr LT-459A Failed High			
Time	Position	Applicant's Actions or Behavior	
	BOP	<ul style="list-style-type: none"> • Monitor secondary systems • Assist RO with annunciator response 	
		EVALUATOR NOTE: After the instrument failure has been addressed and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-2	Event No.	6
Event Description:	1C CD/CB Pump Trip with manual start required		
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator CD/CB PUMP TRIP (1-17-A9) is LIT 	
	US	<ul style="list-style-type: none"> Enter and direct actions of 1BOA Sec-1, Secondary Pump Trip Notify SM of procedure entry and request EAL evaluation 	
	BOP	<ul style="list-style-type: none"> Check turbine load: NOT > 700 MW Start a Standby CD/CB pump and check CD/CB flow restored Check FW pumps not cavitating Close 1CB113C Check FW pump discharge flow: NOT oscillating 	
	RO	<ul style="list-style-type: none"> Monitor RCS Tave and reactivity effects caused by secondary feedflow changes. Assist BOP with BAR response 	
	RO/BO P	<ul style="list-style-type: none"> Check Plant Status <ul style="list-style-type: none"> PDMS INOPERABLE alarm (1-10-D8) IS lit 1BOL 3.h IS implemented Control DI near target Rod bank RIL alarm (1-10-B6) NOT lit Turbine RB Light (OWS graphic 5501) is NOT lit C-7 (BP 4.6) NOT lit 	
	US	<ul style="list-style-type: none"> IF RCS pressure lowers to less than 2209 PSIG, evaluate DNB TS 3.4.1 	
	CREW	<ul style="list-style-type: none"> Restore Plant Conditions <ul style="list-style-type: none"> Adjust RCS boron concentration as necessary Verify controls for running equipment in - AUTO: <ul style="list-style-type: none"> TDFP HD pump discharge CB pump recirc CD pumps recirc GS condenser bypasses Complete shutdown of tripped CD/CB pump per BOP CD/CB-2, CONDENSATE/CONDENSATE BOOSTER SYSTEM SHUTDOWN Adjust SG blowdown flows and calorimetric inputs as necessary Verify DEHC feedback loop in service Notify Chemistry to monitor secondary chemistry <ul style="list-style-type: none"> Complete applicable section(s) of 1BGP 100-4 (if runback performed) Check Reactor power change > 15% in one hour. If so: <ul style="list-style-type: none"> Notify Chemistry and RP to perform the power change surveillances 	
		<p>EVALUATOR NOTE: After the actions for the CD/CB pump trip are complete and with lead examiners concurrence, insert the next event.</p>	

Comments: _____

Comments: _____

Scenario No:	NRC 10-2	Event No.	7 & 8
Event Description: 1A Steam Generator Tube Rupture & Automatic Phase A Actuation Failure			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> ALERT/ALARM on 1A Main Steam Line detectors 4AA122 and 4AA123 1A SG FW flow lowering Pzr level lowering 	
		EVALUATOR'S NOTE: The crew may initially enter 1BOA SEC-8, "Steam Generator Tube Leak." The actions are listed <i>in italics below</i>.	
	CREW	<ul style="list-style-type: none"> <i>Identify entry conditions for 1BOA Sec-8, "Steam Generator Tube Leak"</i> 	
	US	<ul style="list-style-type: none"> <i>Direct the actions of 1BOA SEC-8</i> 	
	RO	<ul style="list-style-type: none"> <i>Throttle open 1CV121 and 1CV182 attempting to maintain Pzr level</i> <i>Lower letdown flow to 75 GPM</i> <i>Report that Pzr level can NOT be maintained >17%.</i> 	
	US	<ul style="list-style-type: none"> <i>Order crew to trip the reactor, verify the reactor trip, and actuate SI.</i> 	
	CREW	<ul style="list-style-type: none"> Identify entry conditions for 1BEP-0, "REACTOR TRIP OR SAFETY INJECTION" 	
	US	<ul style="list-style-type: none"> Order U-1 Reactor trip Notify SM of plant status and procedure entry Request evaluation of Emergency Plan conditions Enter/Implement 1BEP-0 and direct operator actions of 1BEP-0 	
	RO	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> Step 1: Verify reactor trip <ul style="list-style-type: none"> Rod bottom lights - ALL LIT Reactor trip & Bypass breakers - OPEN Neutron flux – DROPPING 	
	BOP	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> Step 2: Verify Turbine Trip <ul style="list-style-type: none"> All Turbine throttle valves - CLOSED All Turbine governor valves - CLOSED Step 3: Verify power to 4KV busses <ul style="list-style-type: none"> ESF Buses – BOTH ENERGIZED (141 & 142) 	
	US	<ul style="list-style-type: none"> Direct manual SI actuation 	
	RO/BOP	<ul style="list-style-type: none"> Manually actuate SI 	
	CREW	<ul style="list-style-type: none"> Step 4: Check SI Status 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	7 & 8
Event Description: 1A Steam Generator Tube Rupture & Automatic Phase A Actuation Failure			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> ○ SI First OUT annunciator -NOT LIT ○ SI ACTUATED Permissive Light - LIT ○ SI Equipment – AUTOMATICALLY ACTUATED <ul style="list-style-type: none"> ○ Either SI pumps - RUNNING ○ Either CV pump to cold leg isolation valve OPEN – 1SI8801A/B ● Recognize SI Actuated ● Manually actuate SI from 1PM05J and 1PM06J 	
	US	<ul style="list-style-type: none"> ● Step 5: Direct BOP to perform Attachment B of 1BEP-0 	
EVALUATOR NOTE: US and RO will continue in 1BEP-0 while BOP is performing Attachment B:			
	BOP	<ul style="list-style-type: none"> ● Perform 1BEP-0 Attachment B ● Verify FW isolated at 1PM04J: <ul style="list-style-type: none"> ● FW pumps – TRIPPED. ● Isolation monitor lights – LIT. ● FW pumps discharge valves - CLOSED (or going closed) 1FW002A-C. ● Verify DGs running at 1PM01J: <ul style="list-style-type: none"> ● DGs – BOTH DGs running ● 1SX169A & B OPEN. ● Dispatch operator locally to check operation ● Verify Generator Trip at 1PM01J: <ul style="list-style-type: none"> ● OCB 3-4 and 4-5 open. ● PMG output breaker open. 	
	BOP	<ul style="list-style-type: none"> ● Verify Control Room ventilation aligned for emergency operations at 0PM02J: <ul style="list-style-type: none"> ● VC Rad Monitors – LESS THAN HIGH ALARM SETPOINT. ● Operating VC train equipment – RUNNING. <ul style="list-style-type: none"> ● Supply fan ● Return fan ● M/U fan ● Chilled water pump ● Chiller ● Operating VC train dampers – ALIGNED. <ul style="list-style-type: none"> ● M/U fan outlet damper – NOT FULLY CLOSED. ● VC train M/U filter light – LIT. ● Operating VC train Charcoal Absorber aligned <ul style="list-style-type: none"> ● Bypass damper - CLOSED ● Inlet damper - OPEN ● Outlet damper - OPEN ● Control Room pressure greater than +0.125 inches water on 0PDI-VC038. 	

Comments: _____

Scenario No:	NRC 10-2	Event No:	7 & 8
Event Description: 1A Steam Generator Tube Rupture & Automatic Phase A Actuation Failure			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Verify Auxiliary Building ventilation aligned at 0PM02J: <ul style="list-style-type: none"> • Two inaccessible filter plenums aligned. <ul style="list-style-type: none"> • Plenum A or B or C: <ul style="list-style-type: none"> • Fan - RUNNING • Flow Control damper - OPEN • Bypass Isolation damper - CLOSED • Plenum A or B or C: <ul style="list-style-type: none"> • Fan - RUNNING • Flow Control damper - OPEN • Bypass Isolation damper - CLOSED • Verify FHB ventilation aligned at 0PM02J: <ul style="list-style-type: none"> • Fan - RUNNING • Inlet Isolation damper - OPEN • Flow Control damper - OPEN • Bypass Isolation damper – CLOSED 	
		EVALUATOR NOTE: The remaining steps of Attachment B may be designated to be performed by WEC personnel or the Field Supervisor and extra operators.	
		<ul style="list-style-type: none"> ○ Trip all running HD Pumps ○ Shutdown FW pump as necessary using BOP FW-2 for a TDFP or BOP FW-8 for the MDFP ○ Shutdown unnecessary CD/CB Pumps using BOP CD/CB-2 ○ Align SX MDCT per BOP SX-T2 <ul style="list-style-type: none"> ○ Maintain SX Basin level > 80% ○ Align NDCT <ul style="list-style-type: none"> ○ Verify CW intake bay level within band ○ Dispatch operator to locally verify NDCT basin level acceptable ○ Align NDCT per BOP CW-25 ○ Shutdown all unnecessary CW pumps per BOP CW-2 ○ Notify US that Attachment B is complete 	
	RO/ BOP	<ul style="list-style-type: none"> • Step 6: Verify ECCS pumps running <ul style="list-style-type: none"> • Both CV pumps – RUNNING • Both RH pumps – RUNNING • Both SI pumps – RUNNING 	
	BOP/ RO	<ul style="list-style-type: none"> • Perform the following at 1PM06J: <ul style="list-style-type: none"> • Step 7: Verify RCFCs running in Accident Mode: <ul style="list-style-type: none"> • Group 2 RCFC Accident Mode lights – ALL LIT. • Step 8: Verify Phase A isolation: <ul style="list-style-type: none"> • Group 3 Cnmt Isol monitor lights – NOT all LIT. 	

Comments: _____

Scenario No:	NRC 10-2	Event No.	7 & 8
Event Description: 1A Steam Generator Tube Rupture & Automatic Phase A Actuation Failure			
Time	Position	Applicant's Actions or Behavior	

Comments: _____

CREW [CT] E-0--O		<ul style="list-style-type: none"> • Manually actuate Phase A Isolation <ul style="list-style-type: none"> • Group 3 Cnmt Isol monitor lights – ALL LIT
BOP/ RO		<ul style="list-style-type: none"> • Step 9: Verify Cnmt Vent isolation: <ul style="list-style-type: none"> • Group 6 Cnmt Vent Isol monitor lights – ALL LIT. • Step 10: Verify AF system: <ul style="list-style-type: none"> • AF pumps – BOTH AF pumps RUNNING. • AF isolation valves – 1AF13A-H OPEN. • AF flow control valves – 1AF005A-H THROTTLED. • Step 11: Verify CC pumps – BOTH RUNNING. • Step 12: Verify SX pumps – BOTH RUNNING. • Step 13: Check if Main Steamline Isolation – NOT required: <ul style="list-style-type: none"> ○ All SG pressure > 640 psig (at 1PM04J) ○ CNMT pressure < 8.2 psig. • Step 14: Check if CS is required. <ul style="list-style-type: none"> • CNMT pressure has NOT risen > 20 psig.
BOP/ RO		<ul style="list-style-type: none"> • Step 15: Verify Total AF flow: <ul style="list-style-type: none"> • AF flow > 500 gpm • S/G NR levels – 1A SG level rising in an uncontrolled manner • CLOSE 1AF013A and 1AF013E
RO/ BOP		<ul style="list-style-type: none"> • Step 16: Verify ECCS valve alignment <ul style="list-style-type: none"> • Determine Group 2 Cold Leg Injection monitor lights required for injection - All lit
RO/ BOP		<ul style="list-style-type: none"> • Step 17: Verify ECCS flow <ul style="list-style-type: none"> • High Head SI flow >100 gpm (1FI-917) • RCS pressure > 1700 psig
RO		<ul style="list-style-type: none"> • Step 18: Check PZR PORVs and SPRAY VALVES at 1PM05J: <ul style="list-style-type: none"> • 1RY455 & 1RY456 CLOSED • PORV isol valves – 1RY8000A & 1RY8000B BOTH ENERGIZED • PORV relief path – Both PORVs in AUTO, Both isolation valves – OPEN. • Normal PZR Spray Valves CLOSED
RO		<ul style="list-style-type: none"> • Step 19: Maintain RCS temperature control at 1PM05J: <ul style="list-style-type: none"> • Check RCP's – ALL RUNNING. • Verify RCS average temperature stable at or trending to 557°F. • Throttle AF maintaining >500 GPM until SG minimum level is met
RO		<ul style="list-style-type: none"> • Step 20: Check status of RCPs at 1PM05J: <ul style="list-style-type: none"> • All RCP's – ALL RUNNING.

Comments: _____

		<ul style="list-style-type: none"> High head flow 1FI-917 > 100 GPM and RCS Pressure > 1425 PSIG
	BOP/ RO	<ul style="list-style-type: none"> Step 21: Check if SG secondary pressure boundaries are intact at 1PM04J: <ul style="list-style-type: none"> Check pressure in all SGs: <ul style="list-style-type: none"> NO SG dropping in an uncontrolled manner.
	BOP/ RO	<ul style="list-style-type: none"> Step 22: Check S/G tubes are NOT intact at RM-11 console: <ul style="list-style-type: none"> 1PR08J SG Blowdown 1PR27J SJAE/GS – IN ALERT/ALARM 1AR22/23A Main steam Lines – Trending up or in ALERT/ALARM
	CREW	Transition to 1BEP-3, Steam Generator Tube Rupture
	US	Implement 1BEP-3 "STEAM GENERATOR TUBE RUPTURE" and direct operator actions. <ul style="list-style-type: none"> Notifies SM of BEP entry Requests Emergency Plan evaluation
	RO	Check status of RCPs and determine all running <ul style="list-style-type: none"> If any running, Check trip criteria NOT satisfied <ul style="list-style-type: none"> HHSI flow >100 gpm OR SI flow > 200 gpm AND RCS pressure > 1425 psig
	CREW	Identify ruptured SG <ul style="list-style-type: none"> Unexpected rise in NR level Main steamline rad monitor <ul style="list-style-type: none"> 1RT-AR022 Grid 1 4AA122 1RT-AR023 Grid 1 4AA123 High activity for any SG sample <ul style="list-style-type: none"> Reset CNMT isol Phase A Notify Chem to locally sample Open SG blowdown sample valves at Chem request Identify 1A SG ruptured
	BOP/ RO [CT] E-3—A (critical steps are bold)	Isolate flow from ruptured SG by verifying <ul style="list-style-type: none"> SG PORV MS018A in AUTO Check SG PORV MS018A closed <ul style="list-style-type: none"> Verify closed when SG pressure < 1115 psig Verify SG blowdown valves closed unless open for sampling <ul style="list-style-type: none"> 1SD002A 1SD002B Close MSIV and MSIV bypass valves for 1A SG Check PORVs on intact SGs available for RCS cooldown Check ruptured SG level

Comments: _____

		<ul style="list-style-type: none"> Narrow Range >10% Verify/Close AF isol valves (should have been closed earlier in 1BEP-0) <ul style="list-style-type: none"> 1AF013A 1AF013E
	BOP	<ul style="list-style-type: none"> Check ruptured SG pressure <ul style="list-style-type: none"> Ruptured SG pressure greater than 320 psig
	Crew	<ul style="list-style-type: none"> Initiate RCS cooldown Determine required CETC from table (step 6a)
	RO/ BOP	<ul style="list-style-type: none"> Check Pzr Pressure - >1930 # When < 1930#, block Steamline Isol SI
	BOP [CT] E-3--B	<ul style="list-style-type: none"> Dump steam to condenser from intact SGs at maximum rate using steam dumps or SG PORVs <ul style="list-style-type: none"> Check steam dumps available <ul style="list-style-type: none"> Place MS controller in Manual, reduce demand to 0 Select Steam Pressure Mode Adjust MS controller to initiate cooldown When necessary, bypass P-12 interlock using Bypass Interlock Switches A & B Dump steam at maximum rate using SG PORVs
	Crew	<ul style="list-style-type: none"> Check average of 10 highest CETC - < required temperature from step 6a
	Crew	<ul style="list-style-type: none"> Continue with step 7; come back to step 6f when cooldown target temperature is achieved.
	BOP	<ul style="list-style-type: none"> Check intact SG levels > 10% Control FF to maintain NR levels 30 – 50%
	RO	<ul style="list-style-type: none"> Check Pzr PORVs and isolation valves <ul style="list-style-type: none"> PORV isolation valves energized PORVs closed PORV isolation valves both open
	RO/ BOP	<ul style="list-style-type: none"> Reset SI <ul style="list-style-type: none"> Verify SI actuated permissive light NOT LIT Verify Auto SI blocked light LIT
	RO/ BOP	Reset Phase A isolation
	Crew	<ul style="list-style-type: none"> Verify all AC busses energized by offsite power
	BOP	<ul style="list-style-type: none"> Establish IA to containment <ul style="list-style-type: none"> Check SACs- any running Open 1IA065 and 1IA066
	CREW	<ul style="list-style-type: none"> Check if RH pumps should be stopped <ul style="list-style-type: none"> Any RH pump running and aligned to RWST RCS pressure >325# Stop both RH pumps
	CREW	<ul style="list-style-type: none"> Check if RCS Cooldown should be stopped

Comments: _____

		<ul style="list-style-type: none"> • Ave of 10 highest CETC < required temperature in Step 6 • When met, stop cooldown and maintain temperature < required temperature
	CREW	<ul style="list-style-type: none"> • Check ruptured SG pressure – stable for plant conditions
	CREW	<ul style="list-style-type: none"> • Check RCS subcooling – acceptable per figure 1BEP 3-2 and Attachment A
	RO/ BOP	<ul style="list-style-type: none"> • Depressurize RCS • Normal Spray –available
	RO [CT] E-3--C	<ul style="list-style-type: none"> • Depressurize RCS using maximum available spray until <ul style="list-style-type: none"> ○ RCS Pressure < Ruptured SG pressure and Pzr level > 12% ○ Pzr level > 69% ○ RCS subcooling NOT acceptable • Close spray valves
	CREW	<ul style="list-style-type: none"> • Check if ECCS flow should be terminated • RCS subcooling – Acceptable • Secondary heat sink <ul style="list-style-type: none"> ○ > 500 FF to SG – available ○ At least 1 intact SG > 10% NR • RCS pressure – rising • Pzr level > 12%
	RO/ BOP	<ul style="list-style-type: none"> • Stop both SI pumps and 1 CV pump
		EVALUATOR NOTE: When the CREW determines SI should be terminated, conclude the scenario.

Comments: _____

Simulation Facility	<u>Byron</u>	Scenario No.:	Operating Test No. 2010 ILT NRC
Examiners:	_____	10-3	Examination
	_____	Applicant:	_____
	_____		SRO
			RO
			BOP
Initial Conditions:	IC-16, 55% power, steady state, MOL		
Turnover:	Unit 1 is at 55% power, steady state, MOL, CB D is @ 141 steps and boron concentration is 998 ppm.. Online risk is green. Crew is to switch Bus 156 from SAT to UAT following ACB 1561 maintenance. 1A MDFP is OOS for maintenance.		

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP,SRO)	Switch Bus 156 Electrical Lineup
2	MF TU01D 6 Ramp TU01D to 9 over 1200 seconds	C (BOP,SRO) R (RO)	Turbine High Vibration requiring ramp down
3	MF RX18A 630	I (RO, SRO) TS (SRO)	1A TCOLD RTD Fail High
4	MF CC05 100	C (BOP, SRO)	CC system leak with auto makeup failure
5	MF CV16 0	I (RO, SRO)	VCT Level Channel LT-112 Fail Low
6	MF CH08 60 120	TS (SRO)	CNMT Pressure 1PT-936 Fail High
7	MF RP02A RP02B TH16C	M (ALL)	ATWS 1C RCP Trip with Rx Trip Breakers Fail To Open

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

SCENARIO OVERVIEW

Unit 1 is at 55% power, steady state, MOL, CB D is @ 141 steps and boron concentration is 998 ppm.. Online risk is green. Crew is to switch Bus 156 from SAT to UAT following ACB 1561 maintenance. 1A MDFP is OOS for maintenance.

After completing shift turnover and relief, the crew is directed to switch Bus 156 from SAT to UAT following ACB 1561 maintenance using 1BGP 100-3, Step F.43 for reference.

After the electrical lineup is swapped, the turbine will experience high vibration. The crew will enter 1BOA TG-1, Turbine High Vibration, Eccentricity, or Differential Expansion. Vibration will be high enough to require ramping down to clear it, but not so high as to require a plant trip.

After a ramp has begun, 1A Tcold RTD fails high, requiring entry to 1BOA Inst-2, Operation with a Failed Instrument Channel.

After 1BOA Inst-2 is exited, a 100 GPM leak will develop in the CC system. The crew will enter 1BOA Pri-6, Component Cooling Malfunction. Automatic makeup will maintain CC surge tank level. An EO will locate the leak downstream of 1CC9437B and report the local isolation valve 1CC9511 (P&ID M-66, sheet 1A, C3). The crew will control and direct the isolation of the leak. Isolation will disable the use of the Excess Letdown HXs.

After the CC leak has been isolated, VCT Level channel 1LT-112 fails low. RMCS auto makeup will start, and the crew will have to place the Makeup Mode Select switch to Off. Any required makeup will have to be done in Manual.

After the level channel failure has been addressed, CNMT pressure channel 1PT-936 fails high. This has no immediate required actions, but the US will be responsible to evaluate Tech Specs. Crew will enter 1BOA Inst-2, Operation with a Failed Instrument Channel to address the failure.

After the CNMT pressure channel failure has been addressed, the 1C RCP trips. When the crew attempts to trip the reactor, the trip breakers will fail to open. The crew will enter 1BFR S.1, ATWS. At step 16, the crew will be directed to return to 1BEP-0, Reactor Trip or Safety Injection.

Completion criterion is transition to 1BEP-0, Reactor Trip or Safety Injection. The lead evaluator may end the scenario at the transition.

Critical Tasks

1. Isolate the main turbine from the SGs before plant- and scenario-specific criteria are exceeded. (ERG Critical Task number – FR-S.1--A) (K/A: EPE029EA1.13 – IR: 4.1/3.9)
2. Start AFW pumps before plant- and scenario-specific criteria are exceeded. (ERG Critical Task number – FR-S.1 -- B) (K/A: EPE029EA1.15 – IR: 4.1/3.9)
3. Insert negative reactivity into the core by at least one of the following methods before completing the immediate-action steps of FR-S.1:
 - De-energize the control rod drive MG sets
 - Insert RCCAs
 - Establish emergency boration flow to the RCS(ERG Critical Task number – FR-S.1 -- C) (K/A: EPE029EA1.12 – IR: 4.1/4.0)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC 16, 55% power, BOL, steady state.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Summary, HMI 1 is TR 1, and HMI 2 is TR 2. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Place C/O tags on the 1A MDFP C/S, its aux oil pump C/S, discharge valve C/S, and recirc valve C/S.
- Place Bus 156 on SAT.
- From the Expert Command Window type: **cae caep\N10-3SETUP.cae** (If from thumb drive or CD, run **cae (DRIVE LETTER):\cae\N10-3SETUP.cae**)

Event 1: Switch Bus 156 Electrical Lineup

Event 2: Turbine High Vibration requiring ramp down

IMF TU01D 9 1200 6

Ramp TU01D to 9 over 1200 seconds from an initial severity of 6

As EO, report local indication of turbine vibration.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

After crew has begun ramp, with lead examiner's concurrence, **Ramp TU01D to 2 over 180 seconds, then** delete the vibration malfunction before inserting the next malfunction.

Event 3: 1A Tcold RTD Failed High

IMF RX18A 630

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge entry into TS 3.3.1

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

As WEC or Extra NSO, acknowledge request to trip bistables.

To open protection cabinet 1, MRF RP20 OPEN

To trip bistables:

OPDT trip: MRF RX013 TRIP

OPDT RB: MRF RX014 TRIP

OTDT Trip: MRF RX135 TRIP

OTDT RB: MRF RX136 TRIP

Low Tave: MRF RX016 TRIP

Lo-Lo Tave: MRF RX015 TRIP

To close protection cabinet 1: MRF RP20 CLOSE

Event 4: CC System Leak requiring manual makeup

Insert after previous event is stabilized. It takes about 5 minutes to leak down to the low level alarm setpoint.

MRF CC17 OFF in preset (will auto delete)

MRF CC19 OFF in preset (will auto delete)

IMF CC05 100

AS EO, report the leak downstream of 1CC9437B and report the local isolation valve 1CC9511

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

When requested to close 1CC9511, DMF CC05 and report as EO 1CC9511 is shut and leak is stopped.

Event 5: VCT Level Channel 1LT-112 Failed Low

IMF CV16 0

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 6: CNMT Pressure 1PT-936 Failed High

IMF CH08C 60 120

As WEC or Extra NSO, acknowledge request to trip bistables.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.
Acknowledge entry to TS 3.3.2.

Event 7: ATWS – 1C RCP trip with Rx Trip Breakers Fail to Open

IMF RP02A and RP02B (in preload)

IMF TH16C to trip 1C RCP

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

After transition to 1BFR-S.1, Acknowledge request for STA and begin monitoring BSTs.

As EO, acknowledge request for local trip of Reactor Trip Breakers. After crew has gone past step 7 of 1BFR S.1, **DMF RP02A and RP02B**, and **MRF RP01 and RP02 OPEN**

Scenario No:	NRC 10-3	Event No.	1
Event Description: Switch Bus 156 Electrical Lineup			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> (From Turnover) Realign Bus 156 to UAT following maintenance on ACB 1561 	
	US	<ul style="list-style-type: none"> Refer to 1BGP 100-3 Step F. 43 <ul style="list-style-type: none"> Direct BOP to switch Bus 156 to the UAT per step F.43 	
	BOP	<ul style="list-style-type: none"> Switch Bus 156 Electrical Lineup <ul style="list-style-type: none"> Turn on synchroscope for Bus 156 Close 1561 Open 1562 Turn off synchroscope 	
	RO	<ul style="list-style-type: none"> Monitor primary and secondary panels Control Tave with control rods or dilution as needed 	
EVALUATOR NOTE: When electrical swap is complete, insert the next event.			

Comments: _____

Scenario No:	NRC 10-3	Event No.	2
Event Description: Turbine High Vibration Requiring Ramp Down			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator TURBINE SUPERVSRY ALARM STPT EXCEEDED (1-18-B16) is LIT Graphic 5508 Turbine bearings 3, 4 and 5 vibration rising 	
	US	<ul style="list-style-type: none"> Enter 1BOA TG-1, Turbine High Vibration, Eccentricity, or Differential Expansion Notify SM of procedure entry and request EAL evaluation and IR 	
	BOP	<ul style="list-style-type: none"> Check Turbine Speed at 1800 RPM Monitor Turbine Supervisory Trip Setpoint – NOT exceeded Check Supervisory Alarm Setpoint – EXCEEDED <ul style="list-style-type: none"> Bearing 4 vibration > 7 mils and rising Verify adjacent indications – ABNORMAL <ul style="list-style-type: none"> Bearings 3 and 5 vibration – rising Check bearing vibration - rising 	
		<p>EVALUATOR'S NOTE: Either the normal (1BGP 100-4T1) or rapid reduction (1BGP 100-4T1.1) flowchart may be used. If asked, the examiner will ask the US for a recommendation and concur with the decision.</p>	
	US	<ul style="list-style-type: none"> Notify SM of requirement to lower turbine load; crew may elect to ramp using 1BGP 100-4 or the load swing instruction sheet 1BGP 100-4T2 or 4T3 to lower load. Implement 1BGP 100-4T2 or 4T3, load swing instruction sheet <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Implement 1BGP 100-4T1 for a normal ramp or 4T1.1 for a rapid reduction <ul style="list-style-type: none"> Instruct RO and BOP to review P, P, L & A of 1BGP 100-4. Direct RO to borate in accordance with ReMa (boration amount and rod position must be commiserate with the selected ramp amount, ramp rate and Rema) Direct BOP to ramp in accordance with 1BGP 100-4T1 (or 4T1.1) and supplied Rema 	
	RO	<ul style="list-style-type: none"> Calculate reactivity change for shutdown using Rema 	
	RO	<ul style="list-style-type: none"> Set up boration IAW ReMa and BOP CV-6 Initiate boration using BOP CV-6 or BOP CV-6T1 checklist <ul style="list-style-type: none"> Select STOP on RMCS Makeup Control Switch Select BORATE on RMCS Mode Select Switch Enter desired boration amount in BA totalizer Turn ON RMCS Makeup Control Switch Verify 1CV110B OPEN Verify 1CV110A MODULATING Verify 1AB03P STARTS Verify proper AB flow on 1FR110 Coordinate boration with start of unit ramp by BOP 	
	BOP	<ul style="list-style-type: none"> Set up DEH for ramp IAW 1BGP 100-4T1 (or 4T1.1) <ul style="list-style-type: none"> Enter desired ramp rate (from Rema) in the RATE window 	

Comments: _____

Scenario No:	NRC 10-3	Event No.	2
Event Description: Turbine High Vibration Requiring Ramp Down			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Press ENTER • Enter desired MW output (from Rema) in the REF DEMAND window • Press ENTER • Press GO/HOLD • Press GO and verify load lowers • Initiate ramp • Coordinate ramp with boration by RO. 	
		EVALUATOR NOTE: After the ramp has been initiated and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-3	Event No.	3
Event Description: 1A Tcold RTD Failed High			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator TAVE CONT DEV HIGH (1-14-D1) is LIT • Annunciator AUCT TAVE HIGH (1-14-E2) is LIT • Annunciator PZR LEVEL CONT DEV LOW (1-12-B4) is LIT 	
	CREW	<ul style="list-style-type: none"> • Identify instrument failure 	
	US	<ul style="list-style-type: none"> • Enter 1BOA Inst-2, Operation with a Failed Instrument Channel • Notify SM of procedure entry, request EAL evaluation and IR <ul style="list-style-type: none"> ○ Order ramp in HOLD 	
	RO	<ul style="list-style-type: none"> • Verify/Place Rod Bank Select Switch in MANUAL • Manually defeat 1A Tave channel • Manually defeat 1A ΔT channel • Select operable RTD for the ΔT recorder • Check if Rod Control can be placed in AUTO <ul style="list-style-type: none"> • Check C-5 NOT LIT <ul style="list-style-type: none"> ○ May place rods in AUTO if Tave within 1° of Tref • Check Pzr level trending to normal <ul style="list-style-type: none"> • May take manual control of Master Pzr level controller or 1CV121 	
	BOP	<ul style="list-style-type: none"> • Assist RO with BAR response <ul style="list-style-type: none"> ○ Place ramp in HOLD 	
	US	<ul style="list-style-type: none"> • Contact the WEC to brief, or personally brief an extra NSO to trip bistables • Direct the crew to coordinate bistable tripping with extra NSO 	
	CREW	<ul style="list-style-type: none"> • Verify no previously tripped bistables will cause a reactor or turbine trip <ul style="list-style-type: none"> ○ Mark bistables to be tripped with dots 	
	CREW	<ul style="list-style-type: none"> • Coordinate with extra NSO to trip Loop A bistables • Defeat T0402 in PDMS input 	
	US	<ul style="list-style-type: none"> • Determines TS 3.3.1 condition A & E is applicable 	
		<p>EVALUATOR NOTE: After the actions for the instrument failure are complete and with lead examiners concurrence, insert the next event.</p>	

Comments: _____

Scenario No:	NRC 10-3	Event No.	4
Event Description:	CC System Leak		
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator CC SURGE TANK LEVEL HIGH LOW (1-2-A5) is LIT 	
	US	<ul style="list-style-type: none"> Enter 1BOA Pri-6 Notify SM of procedure entry, request EAL evaluation and IR 	
	CREW	<ul style="list-style-type: none"> Dispatch EO to locate leak 	
	BOP	<ul style="list-style-type: none"> Check CC surge tank level > 13% Check CC surge tank level – NOT stable Check CC surge tank level < 50% Identify water makeup valves FAIL to OPEN appropriately Open 1CC182 and/or 1CC183 <ul style="list-style-type: none"> Notify US of failure of auto makeup to actuate 	
	CREW	<ul style="list-style-type: none"> Check VCT level – NOT rising Locate and isolate outleakage 	
	CREW	<ul style="list-style-type: none"> Receive report from EO that the leak is downstream of 1CC9437B with 1CC9511 as the local isolation valve 	
	CREW	<ul style="list-style-type: none"> Investigate with P&ID M-66, sheet 1A, C3 to identify location of leak 	
	CREW	<ul style="list-style-type: none"> Directs EO to close 1CC9511 to isolate the leak Checks CC surge tank level – stable AND surge tank makeup valves – closed 	
		<ul style="list-style-type: none"> EVALUATOR'S NOTE: At this point, the leak is secured. All steps after this are done simply for procedural compliance. 	
	BOP	<ul style="list-style-type: none"> Checks CC pumps – at least one running Check annunciator CC PUMP DSCH PRESS LOW (1-2-B5) – NOT lit Check annunciator CC PUMP SUCT TEMP HIGH (1-2-D5) – NOT lit Check CC HX outlet temperature < 120°F Check CC HX outlet temperature < 105°F Check unit in MODE 1 with RCPs in operation Check CC flow to RCPs normal with NONE of the alarms lit: <ul style="list-style-type: none"> RCP THERM BARR CC WTR FLOW LOW RCP BRNG CC WTR FLOW LOW RCP THERM BARR CC WTR TEMP HIGH RCP THERM BARR CC WTR FLOW HIGH LOW RCP BRNG CC WTR TEMP HIGH Check CC HX outlet rad monitor trends – NORMAL Check 1CC685 – OPEN Check RCP temperatures <ul style="list-style-type: none"> Motor bearing <195°F 	

Comments: _____

Scenario No:	NRC 10-3	Event No.	4
Event Description:	CC System Leak		
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Lower radial bearing <225°F • Seal outlet <235°F • Check letdown in service • Annunciator LTDWN HX OUTLET TEMP HIGH – NOT lit • Annunciator LTDWN TEMP HIGH – NOT lit • Check CC surge tank level – 50% to 65% 	
		<p>EVALUATOR NOTE: After the actions for the CC leak are complete and with lead examiners concurrence, insert the next event.</p>	

Comments: _____

Scenario No:	NRC 10-3	Event No.	5
Event Description: VCT Level Channel 1LT-112 Failed Low			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator VCT LEVEL HIGH-HIGH LOW is LIT • VCT Level 1LI-112 indicates ZERO • Automatic RMCS makeup in operation 	
	CREW	<ul style="list-style-type: none"> • Refer to BAR 1-9-A2 • Determine 1LT-112 is failed LOW 	
	RO	<ul style="list-style-type: none"> • Place RMCS makeup switch in OFF • Monitor VCT level <ul style="list-style-type: none"> ○ Makeup to VCT in MANUAL if required 	
	US	<ul style="list-style-type: none"> • Notify SM of failure, request IR 	
	BOP	<ul style="list-style-type: none"> • Monitor primary and secondary panels • Assist with BAR response 	
EVALUATOR NOTE: After the actions for the VCT level failure are complete and with lead examiners concurrence, insert the next event.			

Comments: _____

Scenario No:	NRC 10-3	Event No.	6
Event Description: CNMT Pressure 1PT-936 Failed High			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator CNMT PRESS HI-3 (1-3-B4) is LIT • Annunciator CNMT PRESS HI-2 (1-3-C4) is LIT • Annunciator CNMT PRESS HIGH (1-3-D4) is LIT • Indicator 1CPI-CS936 indicates 60 PSIG 	
	US	<ul style="list-style-type: none"> • Enter 1BOA Inst-2, Operation with a Failed Instrument Channel, Att J • Notify SM of procedure entry, request EAL evaluation and IR 	
	US	<ul style="list-style-type: none"> • Notify WEC to, or perform brief of extra NSO to trip bistables • Direct crew to coordinate tripping bistables with extra NSO 	
	CREW	<ul style="list-style-type: none"> ○ Identify and flag bistables to be tripped and bypassed 	
	US	<ul style="list-style-type: none"> • Enter TS 3.3.2, conditions A, D & E 	
		<p>EVALUATOR NOTE: After the actions for the failed pressure channel are complete and with lead examiners concurrence, insert the next event.</p>	

Comments: _____

Scenario No:	NRC 10-3	Event No.	7
Event Description: 1C RCP Trip with ATWS			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> The following annunciators are LIT: RCP TRIP (1-13-E3) RCP 1C BRKR OPEN OR FLOW LOW ALERT (1-13-C3) 	
	CREW	<ul style="list-style-type: none"> Identify entry conditions for 1BEP-0, "REACTOR TRIP OR SAFETY INJECTION" Attempt to manually trip the Reactor from 1PM05J and 1PM06J 	
		EVALUATOR NOTE: The crew may dispatch an operator to open the reactor trip breakers before reaching step 6.	
	US	<ul style="list-style-type: none"> Enters 1BEP-0, "REACTOR TRIP OR SAFETY INJECTION" Transition to 1BFR S.1, "ATWS" Notify SM of procedure entry Request EAL evaluation and STA to monitor BSTs 	
	CREW [CT] FR-S.1-- A	<ul style="list-style-type: none"> Manually trip the Turbine 	
	CREW [CT] FR-S.1-- B	<ul style="list-style-type: none"> Manually start both AF pumps 	
	RO/BOP [CT] FR-S.1-- C	<ul style="list-style-type: none"> Verify/ensure Control Rods inserting in Manual or Auto at least 48 steps per minute Check at least 1 CV pump running Initiate emergency boration by <ul style="list-style-type: none"> Open 1CV8104 Start boric acid transfer pump Check emergency boration and charging flows > 30 GPM 	
	RO/BOP	<ul style="list-style-type: none"> Check Pzr pressure < 2335 PSIG Verify Group 6 CVI monitor lights LIT 	
	CREW	<ul style="list-style-type: none"> Check if Reactor Trip has occurred <ul style="list-style-type: none"> Dispatch EO to locally open Rx Trip Breakers Check Turbine Trip occurred 	
		EVALUATOR NOTE: Depending on timeframe, the crew may go to either step 8 or step 16 at this point. Steps 8-15 are in <i>italics</i>.	
	CREW	<ul style="list-style-type: none"> <i>Check if Reactor is subcritical</i> <ul style="list-style-type: none"> <i>PR channels <5%</i> 	

Comments: _____

Scenario No:	NRC 10-3	Event No.	7
Event Description: 1C RCP Trip with ATWS			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> IR channels – negative SUR 	
	CREW	<ul style="list-style-type: none"> Check SG NR levels ≥ 1 SG >10% Control feed flow to maintain SG NR level 10% - 50% Check 1SD005A-H closed Check 1CV111A & B closed Verify BTRS MODE SELECTOR SWITCH is OFF Dispatch operator to verify dilution paths are isolated Check for RCS temperature NOT dropping uncontrollably Check for any SG pressure NOT dropping uncontrollably 	
		<ul style="list-style-type: none"> EVALUATOR NOTE: If RCS is cooling down or SG are depressurizing, the crew will perform steps 11-13 	
	CREW	<ul style="list-style-type: none"> Step 11: Check/close MSIVs and bypass valves closed Step 12: Check SG pressure NOT dropping uncontrollably or depressurized 	
	CREW	<ul style="list-style-type: none"> Step 14: Check CETC < 1200°F Step 15: Verify reactor subcritical <ul style="list-style-type: none"> PR channels < 5% IR channels – negative SUR 	
	Crew	<ul style="list-style-type: none"> Return to procedure and step in effect 	
	US	<ul style="list-style-type: none"> Announces transition to 1BEP-0, Reactor Trip or Safety Injection 	
		EVALUATOR NOTE: The scenario can be terminated after the transition to 1BEP-0 is announced or at lead examiner's discretion.	

Comments: _____

Simulation Facility	<u>Byron</u>	Scenario No.:	Operating Test No. 2010 ILT NRC
Examiners:	_____	10-4	Examination
	_____	Applicant:	_____
	_____		SRO
			RO
			BOP

Initial Conditions: IC-152, 95.5% power, steady state, equilibrium xenon, BOL

Turnover: Unit 1 is at 95% power per Load Dispatcher orders, steady state, equilibrium xenon, BOL CB D is at 221 steps and boron concentration is 819 ppm. Online risk is green. 1A MFP is OOS for maintenance. Perform stroke time test on 1AF013E per 1BOSR 0.5.-2.AF.1-1.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP,SRO)	1AF013E Stroke Time test
2	MF RX18N 650	I (RO, SRO) TS (SRO)	1B THOT RTD Fail High
3	IOR ZAI1SK509C 20 120	C (BOP, SRO)	1C Main Feed Pump Speed Controller Fail Low
4	MF CV01A	C (RO, SRO) TS (SRO)	Centrifugal Charging Pump Trip
5	MF FW02B	C (BOP, SRO) R (RO)	1C MFP Trip with turbine runback required
6	MF RX24C	M (ALL)	1D OTDT Channel Fail Low resulting in Reactor Trip
7	MF FW03, FW43, FW44	M (SRO/ BOP)	AF Pumps Start Failure in Auto and Manual Result in Loss of Heat Sink; Start-Up Feedwater Pump Failure to start

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

SCENARIO OVERVIEW

Unit 1 is at 95% power per Load Dispatcher orders, steady state, equilibrium xenon, BOL. Online risk is green. 1A MFP is OOS for maintenance. Perform stroke time test on 1AF013E per 1BOSR 0.5.-2.AF.1-1.

After completing shift turnover, perform the stroke time test on 1AF013E.

After valve test is complete, 1B Thot RTD fails high. 1BOA Inst-2, Operation with a Failed Instrument Channel will be entered, and Tech Spec 3.3.1 will be entered, and bistables will be tripped.

After the RTD failure is addressed, 1C Main Feed Pump Speed Controller fails low. The feedwater DP will lower, causing feed flow to lower to all steam generators. The crew will take manual control of 1C TDFP speed control and raise pump speed to restore normal feedwater flow. The controller will be operated in manual for the remainder of the scenario.

After the speed controller failure is addressed, 1A CV pump trips. The RO will verify suction path and start the 1B CV pump to restore charging flow.

After the pump trip is addressed, the 1C MFP will trip. The crew will enter 1BOA Sec-1, Secondary Pump Trip and runback the main turbine generator.

After the plant has been stabilized and SG levels restored to normal, 1D OTDT channel fails low, causing a reactor trip in conjunction with the earlier failed RTD.

The crew will trip or verify a trip of the reactor, and will enter 1BEP-0, Reactor Trip or Safety Injection. The crew will transition to 1BEP ES-0.1, Reactor Trip Response, and transition to 1BFR H.1, Loss of Secondary Heat Sink upon implementation of BSTs.

The Auxiliary Feedwater Pumps will fail to start. The crew will cross-tie auxiliary feedwater from Unit 2A Auxiliary Feedwater Pump. The Startup Feedwater Pump will fail to start if a manual start is attempted in 1BEP ES-0.1 or 1BFR H.1.

Completion criterion is transition back to 1BEP ES-0.1 after restoration of feedwater to the Unit 1 SGs. The lead evaluator may end the scenario at the transition or at discretion.

Critical Tasks

1. Establish feedwater flow into at least one SG before RCS bleed and feed is required
(ERG Critical Task number – FR-H.1 -- A) (K/A: 061000A2.09 – IR: “TBD”/”TBD”)
(Note that at Byron, AF has a PRA for Key Equipment Contribution to Core Damage Frequency of 11.55%, 3rd behind SX and FP)

2. Establish the minimum required feedwater flow rate to the SGs before SG dryout
(ERG Critical Task number - FR-H.1 -- E) (K/A: WE05EA1.3 – IR: 3.8/4.2)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC 152, 95% power, BOL, steady state, equilibrium xenon.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Summary, HMI 1 is TR 1, and HMI 2 is TR 2. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Place C/O tags on the 1A MDFP C/S, its aux oil pump C/S, discharge valve C/S, and recirc valve C/S.
- From the Expert Command Window type: **cae caep\N10-4SETUP.cae** (If from thumb drive or CD, run **cae (DRIVE LETTER):\cae\N10-4SETUP.cae**)

Event 1: 1AF005E stroke time test

Event 2: Respond to 1B Thot RTD Channel Failure

IMF RX18N 650

As WEC or Extra NSO, acknowledge request to trip bistables.

To trip bistables, **MRF RP21 OPEN** to open Protection Cabinet 1PA02J

MRF RX017 TRIP for TB421C

MRF RX137 TRIP for TB421D

MRF RX018 TRIP for TB421G

MRF RX138 TRIP for TB421H

MRF RX019 TRIP for TB422D

MRF RX020 TRIP for TB422B

MRF RP21 CLOSE to close the protection cabinet

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge entry into TS 3.3.1, Conditions A & E

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 3: 1C TDFP Speed Controller Failure

IOR ZAI1SK509C 20 120

As EO, if asked to investigate the cause of the failure, report there are no visible problems at the 1C TDFP

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 4: 1A CV Pump Trip

IMF CV01A

As EO, report overcurrent trip on 1A CV pump, and 1B CV pump is running normally after the start.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 5: 1C MFP Trip

IMF FW02B

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 6: 1D OTDT Failure and Reactor Trip

IMF RX24C 65 (Check Loop C DT and set to <3% above it so C-3 Rod Stop alarm comes in, but not the trip.)

After the US evaluates TS 3.3.1, **MMF RX24C 0**

As SM Acknowledge procedure entry and request for Emergency Plan evaluations, and STA to monitor BSTs, and begin to monitor BSTs.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 7: Loss of Heat Sink

IN PRELOAD: IMF FW03, FW43, FW44

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As EO, realign AF crosstie as directed by MCR.

MRF FW299 START (to run the 2A AFP)

MRF FW300 100 (to open 1AF036 and 2AF036 crosstie valves)

MRF FW301 0 (to close 1A AFP recirc)

Scenario No:	NRC 10-4	Event No.	1
Event Description: 1AF013A Stroke Time Test			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> From turnover, perform 1BOSR 0.5.-2.AF.1-1 for 1AF013A 	
	US	<ul style="list-style-type: none"> Direct BOP to perform 1BOSR 0.5.-2.AF.1-1 for 1AF013A 	
	BOP	<ul style="list-style-type: none"> Refer to 1BOSR 0.5.-2.AF.1-1 Record "As Found" condition of 1AF013E as OPEN Verify 1AF013E OPEN Hold 1AF013E C/S to CLOSE After noting stroke time of valve, OPEN 1AF013E Complete the Acceptance Criteria Data Sheet <ul style="list-style-type: none"> Record the actual stroke time Notify SM of completion of BOSR 	
	RO	<ul style="list-style-type: none"> Assist BOP with procedure using stopwatch for valve timing Monitor primary and secondary panels 	
EVALUATOR NOTE: When valve stroke is complete, insert the next event.			

Comments: _____

Scenario No:	NRC 10-4	Event No.	2
Event Description: 1B Thot RTD Failed High			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator TAVE CONT DEV HIGH (1-14-D1) is LIT • Annunciator AUCTION TAVE HIGH (1-14-E2) is LIT 	
	CREW	<ul style="list-style-type: none"> • Identify instrument failure 	
	US	<ul style="list-style-type: none"> • Enter 1BOA Inst-2, Operation with a Failed Instrument Channel • Notify SM of procedure entry, request EAL evaluation and IR 	
	RO	<ul style="list-style-type: none"> • Verify/Place Rod Bank Select Switch in MANUAL • Manually defeat 1B Tave channel • Manually defeat 1B ΔT channel • Verify operable RTD for the ΔT recorder <ul style="list-style-type: none"> ○ Restore Tave to within 1°F of Tref prior to placing Rod Control in AUTO <ul style="list-style-type: none"> ○ Rod position adjustment ○ RCS dilution ○ Turbine load adjustment • Check Pzr level trending to normal <ul style="list-style-type: none"> ○ May take manual control of Master Pzr level controller of 1CV121 	
	BOP	<ul style="list-style-type: none"> • Assist RO with BAR response 	
	US	<ul style="list-style-type: none"> • Contact the WEC to brief, or personally brief an extra NSO to trip bistables • Direct the crew to coordinate bistable tripping with extra NSO 	
	CREW	<ul style="list-style-type: none"> • Verify no previously tripped bistables will cause a reactor or turbine trip <ul style="list-style-type: none"> ○ Mark bistables to be tripped with dots 	
	CREW	<ul style="list-style-type: none"> • Coordinate with extra NSO to trip Loop B bistables 	
	US	<ul style="list-style-type: none"> • Determines TS 3.3.1 conditions A & E are applicable 	
		<p>EVALUATOR NOTE: After the actions for the instrument failure are complete and with lead examiners concurrence, insert the next event.</p>	

Comments: _____

Scenario No:	NRC 10-4	Event No.	3
Event Description: 1C TDFP Speed Controller Failed Low			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> ○ Annunciators SG 1A-D Flow Mismatch FW Flow Low (1-16-A:D4) are LIT ○ Annunciator FW Pump Discharge Flow High (1-16-D2) is LIT ○ Auto start of standby CD/CB pump with associated alarms LIT ● SG levels lowering 	
	CREW	<ul style="list-style-type: none"> ● Identify lowering speed of 1C TDFP ● Identify raising speed of 1B TDFP 	
	US	<ul style="list-style-type: none"> ● Direct manual control of 1C TDFP 	
	BOP	<ul style="list-style-type: none"> ● Place 1SK-509C in MANUAL and raise demand 	
		EVALUATOR'S NOTE: CREW may take manual control and lower 1B TDFP flow until they realize 1C TDFP speed is lowering	
	RO	<ul style="list-style-type: none"> ○ Monitor RCS Tave and reactivity effects caused by secondary feedflow changes. ○ Assist BOP with BAR response 	
	BOP	<ul style="list-style-type: none"> ● Check Feed Flow restored ● Feed flow > steam flow ● SG levels at or trending to normal ● Turbine Runback NOT lit ● FW Pump Discharge Flow High alarm NOT lit 	
		EVALUATOR NOTE: After the actions for the feed pump failure are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-4	Event No:	4
Event Description:	1A CV Pump Trip		
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator CHG PUMP TRIP (1-9-A3) is LIT • Annunciator CHG LINE FLOW HIGH LOW (1-9-D3) is LIT • 1PR06J loss of flow alarm 	
	US	<ul style="list-style-type: none"> ○ Direct use of BAR 1-9-A3 ○ Direct letdown isolation 	
	RO	<ul style="list-style-type: none"> • Close 1CV8149A and 1CV8149B, Orifice Isol Valves • Close 1CV459 and 1CV460, Letdown Isol Valves 	
	RO	<ul style="list-style-type: none"> ○ Verify available suction path with no gas binding concerns <ul style="list-style-type: none"> ○ VCT level is adequate ○ 1CV112B and 1CV112C are open ○ Check computer group TR28 • Verify 1CV8110 and 1CV8116 are open • Adjust 1CV121 to 10% open • Start 1B CV pump • Adjust charging flow to approximately 70 GPM 	
		<p>EVALUATOR NOTE: The crew may re-establish letdown using BOP CV-17 or 1BOA ESP-2. The steps for BOP CV-17 follow in italics. The steps for 1BOA ESP-2 follow after that.</p>	
	CREW	<ul style="list-style-type: none"> • <i>Enter BOP CV-17. Establishing and Securing Normal and RH Letdown Flow</i> • <i>Verify/Close 1CV8148A-C</i> • <i>Verify/Open 1CC9452A</i> • <i>Verify/Open 1CC9452B</i> • <i>Place 1CC130A Controller to MANUAL at 60% demand</i> • <i>Place 1CV131 Controller to MANUAL at 40% demand</i> • <i>Verify/Open 1CV8401A</i> • <i>Verify 1TK-0381A is in MANUAL at 0% demand</i> • <i>Verify/Open 1CV8152 and 1CV8160</i> • <i>Verify/Open 1CV8389A</i> • <i>Verify/Open 1CV459 and 1CV460</i> • <i>Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump</i> • <i>Throttle 1CV121 to raise charging flow to 100 GPM</i> • <i>Open 1CV8149A and 1CV8149C</i> • <i>Adjust 1CV131 to control letdown pressure at 370 PSIG and place in AUTO</i> • <i>Ensure 1CC130 is maintaining temperature at 105° to 115° and place in AUTO</i> • <i>Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO</i> • <i>Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump</i> 	

Comments: _____

Scenario No:	NRC 10-4	Event No:	4
Event Description:	1A CV Pump Trip		
Time	Position	Applicant's Actions or Behavior	
		EVALUATOR NOTE: The steps for 1BOA ESP-2 follow below.	
	CREW	<ul style="list-style-type: none"> • Enter 1BOA ESP-2, Re-establishing CV Letdown • Verify/Close 1CV8149A-C and 1CV459 and 1CV460 • Verify/Open 1CV8401A • Verify/Open 1CV8324A • Verify/Open 1CV8389A • Verify/Open 1CV8152 and 1CV8160 • Verify BTRS Mode Selector Switch is OFF • Place 1CV131 Controller to MANUAL at 40% demand • Place 1CC130A Controller to MANUAL at 60% demand • Verify/Open 1CV8105 and 1CV8106 • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump • Throttle 1CV121 to raise charging flow to 100 GPM • Open 1CV459 and 1CV460 • Open 1CV8149A and 1CV8149B/C • Adjust 1CV131 to control letdown pressure at 360 PSIG and place in AUTO • Ensure 1CC130 is maintaining temperature at 105° to 115° and place in AUTO • Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump • Verify 1PR06J is in service 	
	CREW	<ul style="list-style-type: none"> ○ Dispatch EO to check 1A CV pump breaker ○ Dispatch EO to check 1B CV pump after start for normal operation 	
	BOP	<ul style="list-style-type: none"> • Assist in monitoring primary plant while RO starts 1B CV pump • Provide assistance in diagnosis and BAR response. 	
	US	<ul style="list-style-type: none"> • Notify SM of pump trip and request IR • Evaluate TS 3.5.2 Condition A 	
		EVALUATOR NOTE: After the actions for the pump trip are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-4	Event No.	5
Event Description: 1C MFP Trip with Turbine Runback Required			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator FW Pump 1D Trip (1-16-C1) is LIT • Annunciators SG 1A-D Flow Mismatch FW Flow Low (1-16-A:D4) are LIT • Annunciator FW Pump Discharge Flow High (1-16-D2) is LIT <ul style="list-style-type: none"> ○ Auto start of standby CD/CB pump with associated alarms LIT • SG levels lowering 	
		EVALUATOR'S NOTE; If NO action is taken, a reactor trip on Low-2 SG level will occur in about 2 minutes.	
	US	<ul style="list-style-type: none"> • Enter 1BOA Sec-1, Secondary Pump Trip, Attachment A for FW Pump trip <ul style="list-style-type: none"> ○ Direct BOP to close 1FW012C, Recirc Valve ○ Direct RO/BOP to monitor SG levels for Reactor Trip criteria • Notify SM of plant status, procedure entry, request IR and maintenance notification and EAL evaluation 	
	BOP	<ul style="list-style-type: none"> • Close 1FW012C • Check Turbine load > 700 MW • Check at least 1 FW pump running 	
	BOP	<ul style="list-style-type: none"> • Reduce Turbine load by pushing Runback Pushbutton or Runback Box on OWS panel G-5512 • Check Turbine load dropping 	
	RO	<ul style="list-style-type: none"> • Verify rod control in AUTO • Initiate boration according to Runback Placard or Rema 	
	BOP	<ul style="list-style-type: none"> • Start the standby CD/CB pump aux oil pump • Start the standby CD/CB pump 	
	RO	<ul style="list-style-type: none"> ○ Monitor RCS Tave and reactivity effects caused by secondary feedflow changes. ○ Assist BOP with BAR response 	
	CREW	<ul style="list-style-type: none"> • Check FW Pump NPSH Low alarm is LIT (If not, bypass the steps below and go to Check Feed Flow Restored). <ul style="list-style-type: none"> ○ Check CP Bypass valves OPEN ○ Check standby CD/CB pump running ○ Verify HD pump discharge valves RESPONDING ○ Check CB pump recirc valves in AUTO ○ Check CD pumps recirc valve CLOSED ○ Check GS Condenser bypass valves OPEN 	
	BOP	<ul style="list-style-type: none"> • Check Feed Flow restored • Feed flow > steam flow • SG levels at or trending to normal • Turbine Runback NOT lit • FW Pump Discharge Flow High alarm NOT lit 	

Comments: _____

	RO/BOP	<ul style="list-style-type: none"> • Check Plant Status <ul style="list-style-type: none"> ○ PDMS INOPERABLE alarm NOT lit ○ 1BOL 3.h NOT implemented ○ PDMS Limit Exceeded alarm NOT lit ○ Control DI near target ○ Rod bank RIL alarm NOT lit ○ C-7 NOT lit
	CREW	<ul style="list-style-type: none"> • Restore Plant Conditions <ul style="list-style-type: none"> • Adjust RCS boron concentration as necessary • Balance FW pump flows as necessary • Verify FW pump recirc valves on running FW pumps in - MODULATE • Verify valve controls for running equipment in - AUTO: <ul style="list-style-type: none"> ○ HD pump discharge ○ CB pump recircs ○ CD pumps recirc ○ GS condenser bypasses • Shutdown unnecessary CD/CB pump per BOP CD/CB-2, CONDENSATE/CONDENSATE BOOSTER SYSTEM SHUTDOWN • Complete shutdown of tripped FW pump per BOP FW-8, SHUTDOWN OF A MOTOR DRIVEN MAIN FEEDWATER PUMP • Adjust SG blowdown flows and calorimetric inputs as necessary
	CREW	<ul style="list-style-type: none"> • Verify DEHC feedback loop in service • Notify Chemistry to monitor secondary chemistry <ul style="list-style-type: none"> ○ Complete applicable section(s) of 1BGP 100-4 (if runback performed) • Check Reactor power change > 15% in one hour. If so: <ul style="list-style-type: none"> ○ Notify Chemistry and RP to perform the power change surveillances
		<p>EVALUATOR NOTE: After the actions for the feed pump trip are complete and with lead examiners concurrence, insert the next event.</p>

Comments: _____

Scenario No:	NRC 10-4	Event No:	6 & 7
Event Description: 1D OTDT Channel Failed Low & Loss of Heat Sink			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator OTDT HIGH ROD STOP ALERT C-3 (1-10-C5) is LIT 1C OTDT channel failing low 	
	CREW	<ul style="list-style-type: none"> Note failure of 1D OTDT channel 	
		EVALUATOR'S NOTE: Since it is an instrument failure, the US may not order a manual reactor trip.	
	US	<ul style="list-style-type: none"> Order manual reactor trip in anticipation of automatic trip 	
	CUE	<ul style="list-style-type: none"> Annunciator OTDT REACTOR TRIP (1-11-B4) is LIT Reactor Trip Breakers are open 	
	CREW	<ul style="list-style-type: none"> Identify entry conditions for 1BEP-0, "REACTOR TRIP OR SAFETY INJECTION" 	
	US	<ul style="list-style-type: none"> Order U-1 Reactor trip Notify SM of plant status and procedure entry Request evaluation of Emergency Plan conditions Enter/Implement 1BEP-0 and direct operator actions of 1BEP-0 	
	RO	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> Step 1: Verify reactor trip <ul style="list-style-type: none"> Rod bottom lights - ALL LIT Reactor trip & Bypass breakers - OPEN Neutron flux – DROPPING 	
	BOP	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> Step 2: Verify Turbine Trip <ul style="list-style-type: none"> All Turbine throttle valves - CLOSED All Turbine governor valves - CLOSED Step 3: Verify power to 4KV busses <ul style="list-style-type: none"> ESF Buses – BOTH ENERGIZED (141 & 142) 	
	CREW	<ul style="list-style-type: none"> Step 4: Check SI Status <ul style="list-style-type: none"> SI First OUT annunciator – NOT LIT SI ACTUATED Permissive Light – NOT LIT SI Equipment – AUTOMATICALLY ACTUATED <ul style="list-style-type: none"> Either SI pumps – NOT RUNNING Either CV pump to cold leg isolation valve NOT OPEN – 1SI8801A/B Recognize SI is NOT Actuated Check if SI Required <ul style="list-style-type: none"> Pzr Pressure – NOT < 1829 # Steamline Pressure – NOT < 640# CNMT Pressure – NOT > 3.4# Recognize SI is NOT required 	

Comments: _____

	US	<ul style="list-style-type: none"> • Transition to 1BEP ES-0.1, Reactor Trip Response • Direct STA to monitor BST • Notify SM of procedure entry • Request evaluation of Emergency Plan conditions • Direct the actions of 1BEP ES-0.1
	RO	<ul style="list-style-type: none"> • Step 1: Check RCS temperatures • Maintain RCS temperature at 557°F
	BOP	<ul style="list-style-type: none"> • Control feed flow >500 gpm until ≥ 1 SG level is > 10%
	RO	<ul style="list-style-type: none"> • Step 2: Check Shutdown Reactivity <ul style="list-style-type: none"> • All rod bottom lights LIT • Step 3: Control charging to control Pzr Level at normal level • Step 4: Check Pzr pressure trending to normal pressure
	BOP	<ul style="list-style-type: none"> • Step 5: Check FW status • If RCS < 564°F, verify FW isolation complete and trip running MF pumps • Check SG feed flow – NOT > 500 GPM
		EVALUATORS NOTE: The sim booth communicator will act as the STA and monitor status trees. When NR level in all SGs is < 10%, the crew will be notified to implement 1BFR-H.1
		EVALUATORS NOTE: The crew may pursue any of 3 different methods of restoring feedwater flow per 1BEP ES-0.1 Step 5 RNO. They are listed in RNO order below
	CREW	<ul style="list-style-type: none"> • Attempt to manually start AF pumps. • NEITHER AF pump will start from MCR
	CREW	<ul style="list-style-type: none"> • Implement Attachment C to restore FW • Check Bus 159 - energized • Check at least 2 CD/CB pumps – running with recirc valves in AUTO • Check FW recirc valves 1FW012A/B/C – closed • Place FW Reg valves, Bypass Reg valves and tempering valves in MANUAL at Zero demand • Reset FW isolation <ul style="list-style-type: none"> • Press both FW ISOL reset PB • Press both FW ISOL AUX RELAY PB • Check FW ISOL AUX RELAY lights – NOT lit • Start SUFP Aux Oil Pump • Open 1FW059 • Place 1FW076 in MODULATE • Start SUFP – Fails to start <ul style="list-style-type: none"> • Close 1FW059 and 1FW076 • Stop the SUFP Aux Oil Pump
	CREW	<ul style="list-style-type: none"> • Locally start AF pump(s) per 1BOA Elec-5, Local Emergency Control of Safe Shutdown Equipment, Att A for the 1A AFP and Att D for the 1B AFP • EO to report 1A AFP breaker will not close locally

Comments: _____

		<ul style="list-style-type: none"> EO to report 1B AFP will not start locally from 383 or 364
	US	<ul style="list-style-type: none"> Implement 1BFR-H.1, Loss of Secondary Heat Sink Notify SM of procedure transition and request EAL evaluation
	CREW	<ul style="list-style-type: none"> Check RCS pressure > SG pressure Check RCS temperature > 350°F Check at least 1 CV pump running Check if Bleed and Feed is required <ul style="list-style-type: none"> WR level in 3 SG – less than 27% is NOT met Pzr Pressure NOT > 2335 PSIG Monitor for Bleed & Feed criteria
	CREW	<ul style="list-style-type: none"> Establish AF to at least 1 SG Verify/Close 1SD002A-H and 1SD005A-D – closed Review Att B before initiating feed flow Check AF PUMP SX SUCT VLVS ARMED (1-3-E7) is NOT lit Check 1AF004A & B – OPEN Check AF pumps – NEITHER running <ul style="list-style-type: none"> Dispatch operator to start one pump per 1BOA Elec-5 EO reports unable to start either AF pump locally Check 1AF013A-H – OPEN Check total AF flow - NOT > 500 GPM Stop all RCPs
	CREW [CT] FR-H.1-- E	<ul style="list-style-type: none"> Cross-tie A-Train AF from Unit 2 Check both U-2 AFP – available Direct U-2 operator to close 2AF013A-D Direct EO to unlock and open 1AF036 and 2AF036 Direct U-2 operator to start 2A AFP
	CREW [CT] FR-H.1-- E	<ul style="list-style-type: none"> Check U-1 AF flow > 500 GPM Maintain feed flow to restore SG NR level >10% Direct EO to close 1AF009, 1A AFP recirc isolation valve Direct EO to open 0CD117, CST Crosstie Valve
	US	<ul style="list-style-type: none"> Direct transition to 1BEP ES-0.1
		EVALUATOR NOTE: The scenario can be terminated after the transition to 1BEP ES-0.1 is announced or at lead examiner's discretion.

Comments: _____

Simulation Facility	<u>Byron</u>	Scenario No.:	Operating Test No. 2010 ILT NRC
Examiners:		10-4	Examination
	_____	Applicant:	_____
	_____		SRO
	_____		RO
			BOP

Initial Conditions: IC-152, 95.5% power, steady state, equilibrium xenon, BOL

Turnover: Unit 1 is at 95% power per Load Dispatcher orders, steady state, equilibrium xenon, BOL CB D is at 221 steps and boron concentration is 819 ppm. Online risk is green. 1A MFP is OOS for maintenance. Perform stroke time test on 1AF013E per 1BOSR 0.5.-2.AF.1-1.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP, SRO)	1AF013E Stroke Time test
2	MF RX18N 650	I (RO, SRO) TS (SRO)	1B THOT RTD Fail High
3	1OR ZAI1SK509C 20 120	C (BOP, SRO)	1C Main Feed Pump Speed Controller Fail Low
4	MF CV01A	C (RO, SRO) TS (SRO)	Centrifugal Charging Pump Trip
5	MF FW02B	C (BOP, SRO) R (RO)	1C MFP Trip with turbine runback required
6	MF RX24C	M (ALL)	1D OTDT Channel Fail Low resulting in Reactor Trip
7	MF FW03, FW43, FW44	M (SRO/ BOP)	AF Pumps Start Failure in Auto and Manual Result in Loss of Heat Sink; Start-Up Feedwater Pump Failure to start

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

Event 3 deleted, not required for evaluation, interest of conserving exam time.

SCENARIO OVERVIEW

Unit 1 is at 95% power per Load Dispatcher orders, steady state, equilibrium xenon, BOL. Online risk is green. 1A MFP is OOS for maintenance. Perform stroke time test on 1AF013E per 1BOSR 0.5.-2.AF.1-1.

After completing shift turnover, perform the stroke time test on 1AF013E.

After valve test is complete, 1B Thot RTD fails high. 1BOA Inst-2, Operation with a Failed Instrument Channel will be entered, and Tech Spec 3.3.1 will be entered, and bistables will be tripped.

After the RTD failure is addressed, 1C Main Feed Pump Speed Controller fails low. The feedwater DP will lower, causing feed flow to lower to all steam generators. The crew will take manual control of 1C TDFP speed control and raise pump speed to restore normal feedwater flow. The controller will be operated in manual for the remainder of the scenario.

After the speed controller failure is addressed, 1A CV pump trips. The RO will verify suction path and start the 1B CV pump to restore charging flow.

After the pump trip is addressed, the 1C MFP will trip. The crew will enter 1BOA Sec-1, Secondary Pump Trip and runback the main turbine generator.

After the plant has been stabilized and SG levels restored to normal, 1D OTDT channel fails low, causing a reactor trip in conjunction with the earlier failed RTD.

The crew will trip or verify a trip of the reactor, and will enter 1BEP-0, Reactor Trip or Safety Injection. The crew will transition to 1BEP ES-0.1, Reactor Trip Response, and transition to 1BFR H.1, Loss of Secondary Heat Sink upon implementation of BSTs.

The Auxiliary Feedwater Pumps will fail to start. The crew will cross-tie auxiliary feedwater from Unit 2A Auxiliary Feedwater Pump. The Startup Feedwater Pump will fail to start if a manual start is attempted in 1BEP ES-0.1 or 1BFR H.1.

Completion criterion is transition back to 1BEP ES-0.1 after restoration of feedwater to the Unit 1 SGs. The lead evaluator may end the scenario at the transition or at discretion.

Critical Tasks

1. Establish feedwater flow into at least one SG before RCS bleed and feed is required
(ERG Critical Task number – FR-H.1 -- A) (K/A: 061000A2.09 – IR: “TBD”/”TBD”)
(Note that at Byron, AF has a PRA for Key Equipment Contribution to Core Damage Frequency of 11.55%, 3rd behind SX and FP)
2. Establish the minimum required feedwater flow rate to the SGs before SG dryout
(ERG Critical Task number - FR-H.1 -- E) (K/A: WE05EA1.3 – IR: 3.8/4.2)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC 152, 95% power, BOL, steady state, equilibrium xenon.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Summary, HMI 1 is TR 1, and HMI 2 is TR 2. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Place C/O tags on the 1A MDFP C/S, its aux oil pump C/S, discharge valve C/S, and recirc valve C/S.
- From the Expert Command Window type: **cae caep\N10-4SETUP.cae** (If from thumb drive or CD, run **cae (DRIVE LETTER):\cae\N10-4SETUP.cae**)

Event 1: 1AF005E stroke time test

Event 2: Respond to 1B Thot RTD Channel Failure

IMF RX18N 650

As WEC or Extra NSO, acknowledge request to trip bistables.

To trip bistables, **MRF RP21 OPEN** to open Protection Cabinet 1PA02J

MRF RX017 TRIP for TB421C

MRF RX137 TRIP for TB421D

MRF RX018 TRIP for TB421G

MRF RX138 TRIP for TB421H

MRF RX019 TRIP for TB422D

MRF RX020 TRIP for TB422B

MRF RP21 CLOSE to close the protection cabinet

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge entry into TS 3.3.1, Conditions A & E

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 3: 1C TDFP Speed Controller Failure

IOR ZAI1SK509C 20 120

As EO, if asked to investigate the cause of the failure, report there are no visible problems at the 1C TDFP

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 4: 1A CV Pump Trip

IMF CV01A

As EO, report overcurrent trip on 1A CV pump, and 1B CV pump is running normally after the start.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 5: 1C MFP Trip

IMF FW02B

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 6: 1D OTDT Failure and Reactor Trip

IMF RX24C 65 (Check Loop C DT and set to <3% above it so C-3 Rod Stop alarm comes in, but not the trip.)

After the US evaluates TS 3.3.1, **MMF RX24C 0**

As SM Acknowledge procedure entry and request for Emergency Plan evaluations, and STA to monitor BSTs, and begin to monitor BSTs.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 7: Loss of Heat Sink

IN PRELOAD: IMF FW03, FW43, FW44

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As EO, realign AF crosstie as directed by MCR.

MRF FW299 START (to run the 2A AFP)

MRF FW300 100 (to open 1AF036 and 2AF036 crosstie valves)

MRF FW301 0 (to close 1A AFP recirc)

Scenario No:	NRC 10-4	Event No.	1
Event Description: 1AF013A Stroke Time Test			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> From turnover, perform 1BOSR 0.5.-2.AF.1-1 for 1AF013A 	
	US	<ul style="list-style-type: none"> Direct BOP to perform 1BOSR 0.5.-2.AF.1-1 for 1AF013A 	
	BOP	<ul style="list-style-type: none"> Refer to 1BOSR 0.5.-2.AF.1-1 Record "As Found" condition of 1AF013E as OPEN Verify 1AF013E OPEN Hold 1AF013E C/S to CLOSE After noting stroke time of valve, OPEN 1AF013E Complete the Acceptance Criteria Data Sheet <ul style="list-style-type: none"> Record the actual stroke time Notify SM of completion of BOSR 	
	RO	<ul style="list-style-type: none"> Assist BOP with procedure using stopwatch for valve timing Monitor primary and secondary panels 	
EVALUATOR NOTE: When valve stroke is complete, insert the next event.			

Comments: _____

Scenario No:	NRC 10-4	Event No.	2
Event Description: 1B Thot RTD Failed High			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator TAVE CONT DEV HIGH (1-14-D1) is LIT Annunciator AUCT TAVE HIGH (1-14-E2) is LIT 	
	CREW	<ul style="list-style-type: none"> Identify instrument failure 	
	US	<ul style="list-style-type: none"> Enter 1BOA Inst-2, Operation with a Failed Instrument Channel Notify SM of procedure entry, request EAL evaluation and IR 	
	RO	<ul style="list-style-type: none"> Verify/Place Rod Bank Select Switch in MANUAL Manually defeat 1B Tave channel Manually defeat 1B ΔT channel Verify operable RTD for the ΔT recorder <ul style="list-style-type: none"> Restore Tave to within 1°F of Tref prior to placing Rod Control in AUTO <ul style="list-style-type: none"> Rod position adjustment RCS dilution Turbine load adjustment Check Pzr level trending to normal <ul style="list-style-type: none"> May take manual control of Master Pzr level controller of 1CV121 	
	BOP	<ul style="list-style-type: none"> Assist RO with BAR response 	
	US	<ul style="list-style-type: none"> Contact the WEC to brief, or personally brief an extra NSO to trip bistables Direct the crew to coordinate bistable tripping with extra NSO 	
	CREW	<ul style="list-style-type: none"> Verify no previously tripped bistables will cause a reactor or turbine trip <ul style="list-style-type: none"> Mark bistables to be tripped with dots 	
	CREW	<ul style="list-style-type: none"> Coordinate with extra NSO to trip Loop B bistables 	
	US	<ul style="list-style-type: none"> Determines TS 3.3.1 conditions A & E are applicable 	
		<p>EVALUATOR NOTE: After the actions for the instrument failure are complete and with lead examiners concurrence, insert the next event.</p>	

Comments: _____

Scenario No:	NRC 10-4	Event No.	3
Event Description: 1C TDFP Speed Controller Failed Low			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> ○ Annunciators SG 1A-D Flow Mismatch FW Flow Low (1-16-A:D4) are LIT ○ Annunciator FW Pump Discharge Flow High (1-16-D2) is LIT ○ Auto start of standby CD/CB pump with associated alarms LIT ● SG levels lowering 	
	CREW	<ul style="list-style-type: none"> ● Identify lowering speed of 1C TDFP ● Identify raising speed of 1B TDFP 	
	US	<ul style="list-style-type: none"> ● Direct manual control of 1C TDFP 	
	BOP	<ul style="list-style-type: none"> ● Place 1SK-509C in MANUAL and raise demand 	
		EVALUATOR'S NOTE: CREW may take manual control and lower 1B TDFP flow until they realize 1C TDFP speed is lowering	
	RO	<ul style="list-style-type: none"> ○ Monitor RCS Tave and reactivity effects caused by secondary feedflow changes. ○ Assist BOP with BAR response 	
	BOP	<ul style="list-style-type: none"> ● Check Feed Flow restored ● Feed flow > steam flow ● SG levels at or trending to normal ● Turbine Runback NOT lit ● FW Pump Discharge Flow High alarm NOT lit 	
		EVALUATOR NOTE: After the actions for the feed pump failure are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-4	Event No:	4
Event Description:	1A CV Pump Trip		
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator CHG PUMP TRIP (1-9-A3) is LIT • Annunciator CHG LINE FLOW HIGH LOW (1-9-D3) is LIT • 1PR06J loss of flow alarm 	
	US	<ul style="list-style-type: none"> ○ Direct use of BAR 1-9-A3 ○ Direct letdown isolation 	
	RO	<ul style="list-style-type: none"> • Close 1CV8149A and 1CV8149B, Orifice Isol Valves • Close 1CV459 and 1CV460, Letdown Isol Valves 	
	RO	<ul style="list-style-type: none"> ○ Verify available suction path with no gas binding concerns <ul style="list-style-type: none"> ○ VCT level is adequate ○ 1CV112B and 1CV112C are open ○ Check computer group TR28 • Verify 1CV8110 and 1CV8116 are open • Adjust 1CV121 to 10% open • Start 1B CV pump • Adjust charging flow to approximately 70 GPM 	
		<p>EVALUATOR NOTE: The crew may re-establish letdown using BOP CV-17 or 1BOA ESP-2. The steps for BOP CV-17 follow in italics. The steps for 1BOA ESP-2 follow after that.</p>	
	CREW	<ul style="list-style-type: none"> • <i>Enter BOP CV-17. Establishing and Securing Normal and RH Letdown Flow</i> • <i>Verify/Close 1CV8148A-C</i> • <i>Verify/Open 1CC9452A</i> • <i>Verify/Open 1CC9452B</i> • <i>Place 1CC130A Controller to MANUAL at 60% demand</i> • <i>Place 1CV131 Controller to MANUAL at 40% demand</i> • <i>Verify/Open 1CV8401A</i> • <i>Verify 1TK-0381A is in MANUAL at 0% demand</i> • <i>Verify/Open 1CV8152 and 1CV8160</i> • <i>Verify/Open 1CV8389A</i> • <i>Verify/Open 1CV459 and 1CV460</i> • <i>Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump</i> • <i>Throttle 1CV121 to raise charging flow to 100 GPM</i> • <i>Open 1CV8149A and 1CV8149C</i> • <i>Adjust 1CV131 to control letdown pressure at 370 PSIG and place in AUTO</i> • <i>Ensure 1CC130 is maintaining temperature at 105° to 115° and place in AUTO</i> • <i>Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO</i> • <i>Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump</i> 	

Comments: _____

Scenario No:	NRC 10-4	Event No:	4
Event Description:	1A CV Pump Trip		
Time	Position	Applicant's Actions or Behavior	
		EVALUATOR NOTE: The steps for 1BOA ESP-2 follow below.	
	CREW	<ul style="list-style-type: none"> • Enter 1BOA ESP-2, Re-establishing CV Letdown • Verify/Close 1CV8149A-C and 1CV459 and 1CV460 • Verify/Open 1CV8401A • Verify/Open 1CV8324A • Verify/Open 1CV8389A • Verify/Open 1CV8152 and 1CV8160 • Verify BTRS Mode Selector Switch is OFF • Place 1CV131 Controller to MANUAL at 40% demand • Place 1CC130A Controller to MANUAL at 60% demand • Verify/Open 1CV8105 and 1CV8106 • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump • Throttle 1CV121 to raise charging flow to 100 GPM • Open 1CV459 and 1CV460 • Open 1CV8149A and 1CV8149B/C • Adjust 1CV131 to control letdown pressure at 360 PSIG and place in AUTO • Ensure 1CC130 is maintaining temperature at 105° to 115° and place in AUTO • Adjust 1CV121 to match charging and letdown flow and restore Pzr level to Program Level and place in AUTO • Throttle 1CV182 to maintain seal injection flow at 8-13 GPM per pump • Verify 1PR06J is in service 	
	CREW	<ul style="list-style-type: none"> ○ Dispatch EO to check 1A CV pump breaker ○ Dispatch EO to check 1B CV pump after start for normal operation 	
	BOP	<ul style="list-style-type: none"> • Assist in monitoring primary plant while RO starts 1B CV pump • Provide assistance in diagnosis and BAR response. 	
	US	<ul style="list-style-type: none"> • Notify SM of pump trip and request IR • Evaluate TS 3.5.2 Condition A 	
		EVALUATOR NOTE: After the actions for the pump trip are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-4	Event No.	5
Event Description: 1C MFP Trip with Turbine Runback Required			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator FW Pump 1D Trip (1-16-C1) is LIT • Annunciators SG 1A-D Flow Mismatch FW Flow Low (1-16-A:D4) are LIT • Annunciator FW Pump Discharge Flow High (1-16-D2) is LIT <ul style="list-style-type: none"> ○ Auto start of standby CD/CB pump with associated alarms LIT • SG levels lowering 	
		EVALUATOR'S NOTE; If NO action is taken, a reactor trip on Low-2 SG level will occur in about 2 minutes.	
	US	<ul style="list-style-type: none"> • Enter 1BOA Sec-1, Secondary Pump Trip, Attachment A for FW Pump trip <ul style="list-style-type: none"> ○ Direct BOP to close 1FW012C, Recirc Valve ○ Direct RO/BOP to monitor SG levels for Reactor Trip criteria • Notify SM of plant status, procedure entry, request IR and maintenance notification and EAL evaluation 	
	BOP	<ul style="list-style-type: none"> • Close 1FW012C • Check Turbine load > 700 MW • Check at least 1 FW pump running 	
	BOP	<ul style="list-style-type: none"> • Reduce Turbine load by pushing Runback Pushbutton or Runback Box on OWS panel G-5512 • Check Turbine load dropping 	
	RO	<ul style="list-style-type: none"> • Verify rod control in AUTO • Initiate boration according to Runback Placard or Rema 	
	BOP	<ul style="list-style-type: none"> • Start the standby CD/CB pump aux oil pump • Start the standby CD/CB pump 	
	RO	<ul style="list-style-type: none"> ○ Monitor RCS Tave and reactivity effects caused by secondary feedflow changes. ○ Assist BOP with BAR response 	
	CREW	<ul style="list-style-type: none"> • Check FW Pump NPSH Low alarm is LIT (If not, bypass the steps below and go to Check Feed Flow Restored). <ul style="list-style-type: none"> ○ Check CP Bypass valves OPEN ○ Check standby CD/CB pump running ○ Verify HD pump discharge valves RESPONDING ○ Check CB pump recirc valves in AUTO ○ Check CD pumps recirc valve CLOSED ○ Check GS Condenser bypass valves OPEN 	
	BOP	<ul style="list-style-type: none"> • Check Feed Flow restored • Feed flow > steam flow • SG levels at or trending to normal • Turbine Runback NOT lit • FW Pump Discharge Flow High alarm NOT lit 	

Comments: _____

	RO/BOP	<ul style="list-style-type: none"> • Check Plant Status <ul style="list-style-type: none"> ○ PDMS INOPERABLE alarm NOT lit ○ 1BOL 3.h NOT implemented ○ PDMS Limit Exceeded alarm NOT lit ○ Control DI near target ○ Rod bank RIL alarm NOT lit ○ C-7 NOT lit
	CREW	<ul style="list-style-type: none"> • Restore Plant Conditions <ul style="list-style-type: none"> • Adjust RCS boron concentration as necessary • Balance FW pump flows as necessary • Verify FW pump recirc valves on running FW pumps in - MODULATE • Verify valve controls for running equipment in - AUTO: <ul style="list-style-type: none"> ○ HD pump discharge ○ CB pump recircs ○ CD pumps recirc ○ GS condenser bypasses • Shutdown unnecessary CD/CB pump per BOP CD/CB-2, CONDENSATE/CONDENSATE BOOSTER SYSTEM SHUTDOWN • Complete shutdown of tripped FW pump per BOP FW-8, SHUTDOWN OF A MOTOR DRIVEN MAIN FEEDWATER PUMP • Adjust SG blowdown flows and calorimetric inputs as necessary
	CREW	<ul style="list-style-type: none"> • Verify DEHC feedback loop in service • Notify Chemistry to monitor secondary chemistry <ul style="list-style-type: none"> ○ Complete applicable section(s) of 1BGP 100-4 (if runback performed) • Check Reactor power change > 15% in one hour. If so: <ul style="list-style-type: none"> ○ Notify Chemistry and RP to perform the power change surveillances
		<p>EVALUATOR NOTE: After the actions for the feed pump trip are complete and with lead examiners concurrence, insert the next event.</p>

Comments: _____

Scenario No:	NRC 10-4	Event No:	6 & 7
Event Description: 1D OTDT Channel Failed Low & Loss of Heat Sink			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Annunciator OTDT HIGH ROD STOP ALERT C-3 (1-10-C5) is LIT • 1C OTDT channel failing low 	
	CREW	<ul style="list-style-type: none"> ○ Note failure of 1D OTDT channel 	
		EVALUATOR'S NOTE: Since it is an instrument failure, the US may not order a manual reactor trip.	
	US	<ul style="list-style-type: none"> ○ Order manual reactor trip in anticipation of automatic trip 	
	CUE	<ul style="list-style-type: none"> • Annunciator OTDT REACTOR TRIP (1-11-B4) is LIT • Reactor Trip Breakers are open 	
	CREW	<ul style="list-style-type: none"> • Identify entry conditions for 1BEP-0, "REACTOR TRIP OR SAFETY INJECTION" 	
	US	<ul style="list-style-type: none"> • Order U-1 Reactor trip • Notify SM of plant status and procedure entry • Request evaluation of Emergency Plan conditions • Enter/Implement 1BEP-0 and direct operator actions of 1BEP-0 	
	RO	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> • Step 1: Verify reactor trip <ul style="list-style-type: none"> • Rod bottom lights - ALL LIT • Reactor trip & Bypass breakers - OPEN • Neutron flux – DROPPING 	
	BOP	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> • Step 2: Verify Turbine Trip <ul style="list-style-type: none"> • All Turbine throttle valves - CLOSED • All Turbine governor valves - CLOSED • Step 3: Verify power to 4KV busses <ul style="list-style-type: none"> • ESF Buses – BOTH ENERGIZED (141 & 142) 	
	CREW	<ul style="list-style-type: none"> • Step 4: Check SI Status <ul style="list-style-type: none"> ○ SI First OUT annunciator – NOT LIT ○ SI ACTUATED Permissive Light – NOT LIT ○ SI Equipment – AUTOMATICALLY ACTUATED <ul style="list-style-type: none"> ○ Either SI pumps – NOT RUNNING ○ Either CV pump to cold leg isolation valve NOT OPEN – 1SI8801A/B • Recognize SI is NOT Actuated • Check if SI Required <ul style="list-style-type: none"> • Pzr Pressure – NOT < 1829 # • Steamline Pressure – NOT < 640# • CNMT Pressure – NOT > 3.4# • Recognize SI is NOT required 	

Comments: _____

	US	<ul style="list-style-type: none"> • Transition to 1BEP ES-0.1, Reactor Trip Response • Direct STA to monitor BST • Notify SM of procedure entry • Request evaluation of Emergency Plan conditions • Direct the actions of 1BEP ES-0.1
	RO	<ul style="list-style-type: none"> • Step 1: Check RCS temperatures • Maintain RCS temperature at 557°F
	BOP	<ul style="list-style-type: none"> • Control feed flow >500 gpm until ≥ 1 SG level is > 10%
	RO	<ul style="list-style-type: none"> • Step 2: Check Shutdown Reactivity <ul style="list-style-type: none"> • All rod bottom lights LIT • Step 3: Control charging to control Pzr Level at normal level • Step 4: Check Pzr pressure trending to normal pressure
	BOP	<ul style="list-style-type: none"> • Step 5: Check FW status • If RCS < 564°F, verify FW isolation complete and trip running MF pumps • Check SG feed flow – NOT > 500 GPM
		EVALUATORS NOTE: The sim booth communicator will act as the STA and monitor status trees. When NR level in all SGs is < 10%, the crew will be notified to implement 1BFR-H.1
		EVALUATORS NOTE: The crew may pursue any of 3 different methods of restoring feedwater flow per 1BEP ES-0.1 Step 5 RNO. They are listed in RNO order below
	CREW	<ul style="list-style-type: none"> • Attempt to manually start AF pumps. • NEITHER AF pump will start from MCR
	CREW	<ul style="list-style-type: none"> • Implement Attachment C to restore FW • Check Bus 159 - energized • Check at least 2 CD/CB pumps – running with recirc valves in AUTO • Check FW recirc valves 1FW012A/B/C – closed • Place FW Reg valves, Bypass Reg valves and tempering valves in MANUAL at Zero demand • Reset FW isolation <ul style="list-style-type: none"> • Press both FW ISOL reset PB • Press both FW ISOL AUX RELAY PB • Check FW ISOL AUX RELAY lights – NOT lit • Start SUFP Aux Oil Pump • Open 1FW059 • Place 1FW076 in MODULATE • Start SUFP – Fails to start <ul style="list-style-type: none"> • Close 1FW059 and 1FW076 • Stop the SUFP Aux Oil Pump
	CREW	<ul style="list-style-type: none"> • Locally start AF pump(s) per 1BOA Elec-5, Local Emergency Control of Safe Shutdown Equipment, Att A for the 1A AFP and Att D for the 1B AFP • EO to report 1A AFP breaker will not close locally

Comments: _____

		<ul style="list-style-type: none"> EO to report 1B AFP will not start locally from 383 or 364
	US	<ul style="list-style-type: none"> Implement 1BFR-H.1, Loss of Secondary Heat Sink Notify SM of procedure transition and request EAL evaluation
	CREW	<ul style="list-style-type: none"> Check RCS pressure > SG pressure Check RCS temperature > 350°F Check at least 1 CV pump running Check if Bleed and Feed is required <ul style="list-style-type: none"> WR level in 3 SG – less than 27% is NOT met Pzr Pressure NOT > 2335 PSIG Monitor for Bleed & Feed criteria
	CREW	<ul style="list-style-type: none"> Establish AF to at least 1 SG Verify/Close 1SD002A-H and 1SD005A-D – closed Review Att B before initiating feed flow Check AF PUMP SX SUCT VLVS ARMED (1-3-E7) is NOT lit Check 1AF004A & B – OPEN Check AF pumps – NEITHER running <ul style="list-style-type: none"> Dispatch operator to start one pump per 1BOA Elec-5 EO reports unable to start either AF pump locally Check 1AF013A-H – OPEN Check total AF flow - NOT > 500 GPM Stop all RCPs
	CREW [CT] FR-H.1-- E	<ul style="list-style-type: none"> Cross-tie A-Train AF from Unit 2 Check both U-2 AFP – available Direct U-2 operator to close 2AF013A-D Direct EO to unlock and open 1AF036 and 2AF036 Direct U-2 operator to start 2A AFP
	CREW [CT] FR-H.1-- E	<ul style="list-style-type: none"> Check U-1 AF flow > 500 GPM Maintain feed flow to restore SG NR level >10% Direct EO to close 1AF009, 1A AFP recirc isolation valve Direct EO to open 0CD117, CST Crosstie Valve
	US	<ul style="list-style-type: none"> Direct transition to 1BEP ES-0.1
		EVALUATOR NOTE: The scenario can be terminated after the transition to 1BEP ES-0.1 is announced or at lead examiner's discretion.

Comments: _____

Simulation Facility	<u>Byron</u>	Scenario No.:	Operating Test No. 2010 ILT NRC
Examiners:	_____	10-5	Examination
	_____	Applicant:	_____
	_____		SRO
			RO
			BOP
Initial Conditions:	IC 20: 100%, steady state, equilibrium xenon, EOL, CBD @ 221 steps, and boron concentration is 124 ppm		
Turnover:	Unit 1 is at 100% power, steady state, equilibrium xenon, EOL. Online risk is green. Crew is to switch from the 1B Letdown Heat Exchanger to the 1A Letdown Heat Exchanger. No flush of the 1A LD HX is needed since the 1B LD HX was swapped last shift to allow an inspection of the 1A LD HX. 1A MDFP is OOS for maintenance.		

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP, SRO)	Swap Inservice Letdown Heat Exchangers
2	MF RX21A 1700	I (RO, SRO) TS (SRO)	1PT-455 Pzr Pressure Channel Fail Low
3	MF TH08A 10	R (RO, SRO) TS (SRO)	High RCS Activity requiring ramp down
4	MF PA0154 ON IOR zao0iisx032 95	C (BOP, SRO)	0B SX MDCT Fan High Vibration requiring a Fan Trip
5	MF RX06P 100	I (BOP, SRO) TS (SRO)	1D SG LT 559 Fail High
6	MF TH06A 50	C (RO, SRO)	Primary Leak @ 50 GPM
7	MF TH06A 1000 MF TH06A 540000	M (ALL)	LB LOCA leading to BEP ES 1.3
8	IOR SI24, SI25 OVER	C (SRO/RO)	Both 1SI8801 Fail to Auto Open, Manual Open required

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

Events 1,4 and 5 deleted, not required for evaluation, did not affect scenario, interest of saving exam time.

SCENARIO OVERVIEW

Unit 1 is at 100% power, steady state, equilibrium xenon, EOL. Online risk is green. Crew is to switch from the 1B Letdown Heat Exchanger to the 1A Letdown Heat Exchanger. No flush of the 1A LD HX is needed since the 1B LD HX was swapped last shift to allow an inspection of the 1A LD HX. 1A MDFP is OOS for maintenance.

After completing shift turnover and relief, the crew switches from the 1B Letdown Heat Exchanger to the 1A Letdown Heat Exchanger using BOP CV-22, Operation of Letdown or Regen Heat Exchangers.

After the heat exchanger swap is complete, Pressurizer Pressure channel 1PT-455 fails low, causing Pzr backup heaters to turn on and spray valves to close. Pressure will rise, challenging a PORV setpoint if no action is taken. The operator will take manual control of the master pressure controller or the spray valve controllers and heaters. 1BOA Inst-2, Operation with a Failed Instrument Channel will be entered, and Tech Spec 3.3.1 and 3.3.2 will be entered.

After the pressure channel has been addressed, RCS activity will rise, causing 1RT-PR006 to go into High Alarm. Chemistry will confirm the rise when contacted. 1BOA Pri-4, Abnormal Primary Chemistry will be entered. Chemistry reports that DE I-131 is 80 micro-Ci/gram. Station Reactor Engineer will provide operational guidance to place Unit 1 in MODE 3 within 6 hours, and state that the NDO concurs with this direction. The crew will use the rema to calculate the ramp and begin to ramp the unit down using 1BGP 100-4T1.1, Rapid Power Reduction Flowchart.

After the ramp has begun, 0B SX MDCT Fan High Vibration will alarm and amps will go high, requiring the 0B SX fan be tripped IAW BAR 0-37-E6 directions. The crew will evaluate SX temperature and decide whether to start 0C or 0D Fan. If sent to the SX Tower for a local inspection, the EO will report the fan gearbox is leaking oil. The US will refer to TS 3.7.9 and determine the LCO is satisfied.

After the SX fan vibration has been addressed, controlling channel 1D SG level transmitter 1LT-559 fails high, resulting in 1D FWRV to close, lowering 1D SG level. The operator will take manual control of 1FW540 to restore feedwater flow. The crew will enter 1BOA Inst-2, and TS 3.3.1 for the failed channel.

After the SG level channel has been addressed, the RCS begins to leak at 50 GPM. The crew will enter 1BOA Pri-1, Excessive Primary Plant Leakage to raise charging flow and secure letdown. The crew will determine the leak is not isolable at step 8.

After the crew has determined the leak cannot be isolated, it will rapidly increase in magnitude. The crew will trip or verify a trip of the reactor and initiate or verify Safety Injection. The crew will enter 1BEP-0, Reactor Trip or Safety Injection, transition to 1BEP-1, Loss of Reactor or Secondary Coolant, and 1BEP ES-1.3, Transfer to Cold Leg Recirculation.

Neither 1SI8801 will automatically open, requiring manual operation of at least one of the valves.

Completion criterion is completion of the first 6 steps of 1BEP ES-1.3 to establish cold leg recirculation. The lead evaluator may end the scenario at the completion of the step.

Critical Tasks

1. Establish flow from at least one high-head ECCS pump before transition out of E-0 (ERG Critical Task number – E-0 -- I) (K/A: 006000A4.07 – IR: 4.4/4.4)
2. Transfer to cold leg recirculation and establish ECCS recirculation flow that at least meets the assumptions of the plant-specific LOCA analyses (ERG Critical Task number – ES-1.3 -- A) (K/A: EPE011EA1.11 – IR: 4.2/4.2)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC 20, 100% power, EOL, steady state, equilibrium xenon.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Summary, HMI 1 is TR 1, and HMI 2 is TR 2. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Place C/O tags on the 1A MDFP C/S, its aux oil pump C/S, discharge valve C/S, and recirc valve C/S.
- From the Expert Command Window type: **cae caep\N10-5SETUP.cae** (If from thumb drive or CD, run **cae (DRIVE LETTER):\cae\N10-5SETUP.cae**)

Event 1: Letdown Heat Exchanger swap

As EO, perform the local actions of BOP CV-22, Operation of Letdown or Regen Heat Exchangers. Report the heat exchanger is filled and vented. When asked report local CC flow (from 1PL095J, 1FI-644A) is 200 GPM.

To open 1CC9452A, **MRF CC37 100**

To close 1CC9452C, **MRF CC39 0**

As SM, direct the crew to align 1A LD HX without flushing to the HUT.

Event 2: Respond to Pressurizer Pressure Channel Failure

IMF RX21A 1700

As WEC or Extra NSO, acknowledge request to trip bistables.

To trip bistables, **MRF RP20 OPEN** to open Protection Cabinet 1, and

MRF RX032 TRIP to trip PB455A - C1-153 BS-1.

MRF RX034 TRIP to trip PB455C - C1-153 BS-4.

MRF RX035 TRIP to trip PB455D - C1-153 BS-3.

MRF RX033 TRIP to trip PB455B - C1-153 BS-2.

MRF RX013 TRIP to trip TB411C - C1-124 BS-3.

MRF RX135 TRIP to trip TB411D - C1-124 BS-4.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge entry into TS 3.3.1, Condition

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 3: High RCS Activity requiring ramp down

IMF TH08A 10

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

As Chemistry, report the sample results of DE I-131 is 80 micro-Ci/gram.

As Station Reactor Engineer, recommend ramping the unit to MODE 3 within 6 hours.

As SM Grant permission to ramp the unit offline. Sign the BGP flowchart at the Unit desk. IF the candidate asks whether to use the "normal" or "rapid reduction" flow, ask for their recommendation and concur with that decision.

Event 4: 0B SX MDCT Fan High Vibration

IMF PA0154 ON

IOR zao0iisx032 95

AS EO, report 0B SX fan is vibrating excessively, and the fan gearbox is leaking.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 5: 1D SG Level Transmitter Failed High

IMF RX06P 100

As WEC or Extra NSO, acknowledge request to trip bistables.

To trip bistables, **MRF RP20 OPEN** to open Protection Cabinet 1, **MRF RX127 TRIP** for LB559A

To align AMS, **MRF RX148 TRIP** and **MRF RP91 TEST-TRIP**

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge entry into TS

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 6: Primary Leak at 50 GPM

IMF TH06A 50

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

As SM Acknowledge entry into TS

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 7: LB LOCA leading to 1BEP ES-1.3

IMF TH06A 1000

AFTER crew opens 1SI8801A/B, **MMF TH06A 540000 (on trigger)**. **IF** the crew goes past 1BEP-0, step 17 **WITHOUT** opening 1SI8801A/B, **THEN WITH** the lead examiner's concurrence, **MMF TH06A 540000**.

As SM Acknowledge procedure entry and request for Emergency Plan evaluations.

After transition to 1BEP-1, Acknowledge request for STA and begin monitoring BSTs.

Event 8: 1SS8801 Failure to open

Verify in Preload: MRF SI24, SI25 OVER

Scenario No: NRC 10-5		Event No: 1
Event Description: Letdown Heat Exchanger Swap		
Time	Position	Applicant's Actions or Behavior
	CUE	<ul style="list-style-type: none"> From turnover, swap from 1B Letdown HX to 1A LD HX per BOP CV-22, Operation of Letdown or Regen Heat Exchangers.
	US	<ul style="list-style-type: none"> Direct BOP to perform BOP CV-22, Operation of Letdown or Regen Heat Exchangers.
	BOP	<ul style="list-style-type: none"> Refer to BOP CV-22 Direct EO to open 1CC9452B step F.2.a Verify 1CC130A/B is throttled open step F.2.b <ul style="list-style-type: none"> Direct EO to vent the 1A LD HX step F.2.c & d Direct EO to open 1CC9452A step F.2.e Direct EO to locally verify CC flow to 1B LD HX step F.2.f Direct EO to verify open 1CV8467A step F.2.g Contact SM for guidance to flush 1A LD HX Open 1CV8401A step F.2.k Close 1CV8401B step F.2.l Direct EO to close 1CC9452C step F.2.o Place 1CC130A/B to AUTO step F.2.p
	RO	<ul style="list-style-type: none"> Monitor primary and secondary panels while BOP performing BOP CV-22 Provide support as requested to BOP.
	US	<ul style="list-style-type: none"> Notify Rad Prot and Chemistry of change in CVCS lineup Acknowledge report.
EVALUATOR NOTE: When HX swap is complete, insert the next event.		

Comments: _____

Scenario NRC 10-5		Event 2
No:		No.
Event Description: Pressurizer Pressure channel 1PT-455 failed low		
Time	Position	Applicant's Actions or Behavior
	CUE	<ul style="list-style-type: none"> Annunciator PZR PRESS LOW (1-12-B1) LIT Annunciator PZR PRESS LOW RX TRIP STPT ALERT (1-12-A1) LIT Annunciator PZR PRESS CONT DEV HTRS ON (1-12-C1) LIT
	RO	<ul style="list-style-type: none"> Identify 1PT-455 has failed LOW Identify heaters are on and spray valves are shut Report failure to US. Perform the following at 1PM05J: <ul style="list-style-type: none"> Take manual control of Master Pressure Controller or Spray Valve Controllers
	CREW	<ul style="list-style-type: none"> Refer to BARS. Identify entry conditions for 1BOA INST-2, "OPERATION WITH A FAILED INSTRUMENT CHANNEL".
	BOP	<ul style="list-style-type: none"> Refer to BARS Monitor secondary panels Assist RO as requested
	US	<ul style="list-style-type: none"> Enter/Implement "1BOA INST-2, "OPERATION WITH A FAILED INSTRUMENT CHANNEL", Attachment B, "PRESSURIZER PRESSURE CHANNEL FAILURE" and direct operator actions of 1BOA INST-2 to establish the following conditions Notify SM of plant status and procedure entry. Request evaluation of Emergency Plan conditions.
	RO	<ul style="list-style-type: none"> Check PZR pressure at 1PM05J: <ul style="list-style-type: none"> PZR pressure – normal on 1PI-456, 457, & 458. <ul style="list-style-type: none"> Manually restore PZR pressure using 1PK-455A. Select operable PZR pressure control channel <ul style="list-style-type: none"> Place 1PK-455A in manual and restore PZR pressure to normal. Place PZR pressure control select C/S to CH-457/CH-458.
	CREW	<ul style="list-style-type: none"> Discuss change in logic operation of PZR PORVs
	RO	<ul style="list-style-type: none"> Check PZR PORVS, spray valves, and heaters at 1PM05J: <ul style="list-style-type: none"> PZR PORVs closed. PZR spray valves normal for plant conditions. PZR heaters normal for plant conditions. Check PZR pressure control in auto at 1PM05J: <ul style="list-style-type: none"> Check the following components in AUTO: <ul style="list-style-type: none"> PZR PORV 1RY455A PZR PORV 1RY456 PZR spray valve 1RY455B PZR spray valve 1RY455C Master PZR pressure controller 1PK-455A. <ul style="list-style-type: none"> If 1PK-455A is in manual from initial response, place in AUTO. Select operable recorders at 1PM05J: <ul style="list-style-type: none"> Place PZR pressure select switch to CH-456, CH-457, or CH-458. Place loop ΔT recorder select switch to 1B, 1C, or 1D.

Comments: _____

Scenario No:	NRC 10-5	Event No:	2
Event Description: Pressurizer Pressure channel 1PT-455 failed low			
Time	Position	Applicant's Actions or Behavior	
	US	<ul style="list-style-type: none"> • Perform pre-job brief per HU-AA-1211 for bistable tripping. ○ Complete 1BOL 3.3.1, Attachment A, "INSTRUMENT CONDITION TRACKING LOG". 	
		EVALUATOR NOTE: It is not necessary for the bistables to be tripped to make the upcoming events work properly.	
	Extra NSO/RO	<ul style="list-style-type: none"> • Locally trip bistable for 1PT-455/RO verifies correct bistable operation at 1PM05J. <ul style="list-style-type: none"> • PB455A - C1-153 BS-1. • PB455C - C1-153 BS-4. • PB455D - C1-153 BS-3. • PB455B - C1-153 BS-2. • PB411C - C1-124 BS-3. • PB411D - C1-124 BS-4. 	
	RO	<ul style="list-style-type: none"> • Check P11 interlock at 1PM05J: <ul style="list-style-type: none"> • RCS pressure >1930 – P11 NOT LIT. 	
	US	<ul style="list-style-type: none"> • Determine TS 3.3.1, conditions A, E, and K, 3.3.2, conditions A and D, and 3.3.4, condition A are applicable. • Contact SM to perform risk assessment, initiate IR, and contact maintenance to investigate/correct instrument failure. 	
		EVALUATOR NOTE: After the actions for the pressurizer pressure channel failure are complete and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-5	Event No:	3
Event Description: High RCS Activity			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Radiation Monitor 1RT-PR006 in High Alarm 	
	CREW	<ul style="list-style-type: none"> Respond to BAR RM11-1-1PR06J Refer to 1BOA Pri-4, "Abnormal Primary Chemistry" Notify Chemistry to sample RCS for increased activity Notify Rad Protection to perform BRP 5820-13, "Response to High Radiation Monitor Alarms" 	
	US	<ul style="list-style-type: none"> Enter 1BOA Pri-4, "Abnormal Primary Chemistry" Notify SM of plant status and procedure entry. Request evaluation of Emergency Plan conditions. 	
	CREW	<ul style="list-style-type: none"> Notify Chemistry to calculate decontamination factor of letdown demineralizer. Notify Chemistry sample for DE I-131 and gross radioactivity Notify Rad Protection to monitor Aux Building radiation levels Contact Station Reactor Engineer for operational guidance <ul style="list-style-type: none"> Make page announcement and / or radio notification of personnel of high radiation areas May place AB Charcoal Booster Fans 0VA03CB and 0VA03CF in service 	
	US	<ul style="list-style-type: none"> Chemistry report that DE I-131 is 80 micro-Ci/gram Evaluate TS 3.4.16 condition C is not met Determine plant must be in MODE 3 within 6 hours 	
		<p>EVALUATOR'S NOTE: Either the normal (1BGP 100-4T1) or rapid reduction (1BGP 100-4T1.1) flowchart may be used at the SM discretion. The examiner will ask the US for a recommendation and concur with the decision.</p>	
	RO	<ul style="list-style-type: none"> Calculate reactivity change for shutdown using Rema 	
	US	<ul style="list-style-type: none"> Implement 1BGP 100-4T1 for a normal ramp or 4T1.1 for a rapid reduction <ul style="list-style-type: none"> Instruct RO and BOP to review P, P, L & A of 1BGP 100-4. Direct RO to borate in accordance with ReMa Direct BOP to ramp in accordance with 1BGP 100-4T1 (or 4T1.1) and supplied Rema <ul style="list-style-type: none"> To take the unit to 80% power: ~258 gal of boron and CB D moved to ~169 steps 	
	RO	<ul style="list-style-type: none"> Set up boration IAW ReMa and BOP CV-6 Initiate boration using BOP CV-6 or BOP CV-6T1 checklist <ul style="list-style-type: none"> Select STOP on RMCS Makeup Control Switch Select BORATE on RMCS Mode Select Switch Enter desired boration amount in BA totalizer Turn ON RMCS Makeup Control Switch Verify 1CV110B OPEN Verify 1CV110A MODULATING Verify 1AB03P STARTS Verify proper AB flow on 1FR110 Coordinate boration with start of unit ramp by BOP 	
	BOP	<ul style="list-style-type: none"> Set up DEH for ramp IAW 1BGP 100-4T1 (or 4T1.1) <ul style="list-style-type: none"> Enter desired ramp rate (from Rema) in the RATE window Press ENTER Enter desired MW output (from Rema) in the REF DEMAND window 	

Comments: _____

Scenario No:	NRC 10-5	Event No.	3
Event Description: High RCS Activity			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Press ENTER • Press GO/HOLD • Press GO and verify load lowers • Initiate ramp • Coordinate ramp with boration by RO. 	
		EVALUATOR NOTE: The crew may place the ramp in HOLD during subsequent events.	
		EVALUATOR NOTE: After the ramp has been initiated and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-5	Event No:	4
Event Description: 0B SX MDCT Fan High Vibration requiring a Fan Trip			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> Annunciator SX CLG TWR FAN VIBRATION HIGH (0-37-E6) is LIT 0B SX High Speed Fan Amps indicate High in Red Band 	
	BOP	<ul style="list-style-type: none"> Refer to BAR 0-37-E6 Monitor amps NOT normal Manually trip 0B SX Fan <ul style="list-style-type: none"> Monitor SX system temperature and provide recommendation to US as to need for 2 SX fans Dispatch EO to inspect fan and motor and check breaker for relay targets 	
		<p>EVALUATOR'S NOTES: BOP SX-1 for SX PUMP operation requires at least 2 riser valves or 1 bypass valve open per SX pump. The crew must maintain 2 risers open.</p> <p>The crew may not start another fan until SX temperatures rise enough to determine a second fan is required.</p>	
	US	<ul style="list-style-type: none"> Direct BOP to start an alternate SX Fan Evaluate TS 3.7.9; >6 fans are OPERABLE, so LCOAR entry is not required Notify SM to evaluate online risk and create IR 	
	BOP	<ul style="list-style-type: none"> Start 0C or 0D SX fan in High Speed Close 0SX163B, 0B SX Fan Riser Valve if another riser is opened. 	
	RO	<ul style="list-style-type: none"> Monitor primary and secondary panels Assist with notifications 	
		<p>EVALUATOR NOTE: After the actions for the fan trip are complete and with lead examiners concurrence, insert the next event.</p>	

Comments: _____

Scenario No: NRC 10-5		Event No: 5
Event Description: 1D SG 1LT-559 Fail High		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> Annunciator SG 1D LVL HI-2 TURB TRIP P-14 ALERT 1-15-D8 is LIT Annunciator SG 1D LEVEL DEVIATION HIGH LOW is LIT 1LI-559 indicates 100% 1D SG lowering feedwater flow
	CREW	<ul style="list-style-type: none"> Refer to BARs. Identify entry conditions for 1BOA INST-2, "OPERATION WITH A FAILED INSTRUMENT CHANNEL".
	US	<ul style="list-style-type: none"> Notify SM of plant status and procedure entry. Request evaluation of Emergency Plan conditions. Implement 1BOA INST-2 "OPERATION WITH A FAILED INSTRUMENT CHANNEL", Attachment E "NARROW RANGE SG LEVEL CHANNEL" and direct operator actions of 1BOA INST-2
	BOP	<ul style="list-style-type: none"> Control 1D Feed Reg Bypass Valve in MANUAL Raise 1D SG FW flow to match steam flow Select an operable SG level channel Re-establish automatic level control
	US	<ul style="list-style-type: none"> Perform pre-job brief per HU-AA-1211 for bistable tripping. Complete 1BOL 3.1, Attachment B, "INSTRUMENT CONDITION TRACKING LOG".
	Extra NSO/ BOP	<ul style="list-style-type: none"> Locally trip bistables for 1LT-559 / BOP verifies correct bistable operation. <ul style="list-style-type: none"> LB559B LB559C Locally place AMS SW1 in TEST/BYPASS Locally place AMS Operating Bypass SW12 to LSGD and SW11 to TEST-TRIP
	US	<ul style="list-style-type: none"> Determine TS 3.3.1 conditions A and E and TS 3.3.2 conditions A and D are applicable. Determine TS 3.3.3 and 3.3.4 are NOT applicable – minimum channels operable requirement is met. Contact SM to perform risk assessment, initiate IR, and contact maintenance to investigate/correct instrument failure.
	RO	<ul style="list-style-type: none"> Monitor primary for effects of feedwater transient Assist BOP with annunciator response
		EVALUATOR NOTE: After the actions for the level channel failure are complete and with lead examiners concurrence, insert the next event.

Comments: _____

Scenario NRC 10-5		Event No. 6
Event Description: Primary Leak of 50 GPM		
Time	Position	Applicant's Actions or Behavior
	CUE	<ul style="list-style-type: none"> • Annunciator CNMT DRAIN LEAK DETECT FLOW HIGH (1-1-A2) is LIT • Annunciator CNMT VENT ISOL (1-1-C5) is LIT • Lowering VCT level • Automatic RMCS makeup • Increased charging flow • Lowering Pzr level
	RO	<ul style="list-style-type: none"> • Raise charging flow • Report leak
	CREW	<ul style="list-style-type: none"> ○ Refer to BAR 1-1-A2
	US	<ul style="list-style-type: none"> • Enter 1BOA Pri-1, "Excessive Primary Plant Leakage" • Notify SM of plant status and procedure entry. • Request evaluation of Emergency Plan conditions.
	RO	<ul style="list-style-type: none"> • Check CV pump – running • Throttle 1CV121 and 1CV182 to raise charging flow • Isolate letdown <ul style="list-style-type: none"> • Close 1CV8149A-C • Close 1CV459 and 1CV460
	CREW	<ul style="list-style-type: none"> • Check Unit in MODE 1 • Check Pzr pressure – NOT < 2220 PSIG • Monitor Pzr level – Stable or rising • Check if any individual seal injection flow – NOT abnormally high • Check letdown – isolated <ul style="list-style-type: none"> • Normal LD • Excess LD • Verify leak is not downstream of 1CV121 <ul style="list-style-type: none"> • Close 1CV8324B • Maintain 1CV182 – at least 20% open • Check seal injection flow – 10 to 15 GPM (per pump) and throttle as needed • Check charging flow – approximately equal to total seal injection flow
	CREW	<ul style="list-style-type: none"> • Determine leak is NOT isolable – Pzr level is dropping • Reopen 1CV8324A • Throttle 1CV121 and 1CV182 to maintain Pzr level stable
	CREW	<ul style="list-style-type: none"> • Check Secondary Radiation – Normal for plant conditions • Check RX VESSEL FLNG LEAKOFF TEMP HIGH (1-14-E5) is NOT LIT • Check PRT parameters – NOT rising • Check leakage into CNMT – indicated by alarm and flow recorder • Check CNMT parameters <ul style="list-style-type: none"> ○ CNMT INTERNAL PRESS HIGH – (may be lit) <ul style="list-style-type: none"> • CNMT pressure –rising • CNMT temperature –rising

Comments: _____

Scenario No:	NRC 10-5	Event No.	6
Event Description: Primary Leak of 50 GPM			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • CNMT dewpoint temperature –rising ○ Start RCFCs as necessary to maintain CNMT <1 PSIG and <120°F 	
	CREW	<ul style="list-style-type: none"> • Monitor VCT level with makeup – adequate to maintain VCT level • Check normal charging flowpath established • Control charging flow and seal injection flow • Control Pzr Pressure as necessary • Check letdown – NOT in service and IS intact and available • Check Pzr level > 17% 	
	US	<ul style="list-style-type: none"> ○ Evaluate TS 3.4.13 by directing RCS leakrate calculation 	
		EVALUATOR NOTE: After leak has been determined to be NOT isolable and with lead examiners concurrence, insert the next event.	

Comments: _____

Scenario No:	NRC 10-5	Event No.	7 & 8
Event Description: Large Break LOCA with failure of 1SI8801's to automatically open			
Time	Position	Applicant's Actions or Behavior	
	CUE	<ul style="list-style-type: none"> • Pzr level is dropping • Annunciator CNMT PRESS HIGH (0-33-D6) is LIT ○ Automatic reactor trip and/or safety injection actuation 	
	CREW	<ul style="list-style-type: none"> • Notify US of lowering Pzr level and inability to maintain level 	
	US	<ul style="list-style-type: none"> • Direct manual reactor trip or respond to automatic reactor trip and safety injection actuation • Enter 1BEP-0, "Reactor Trip or Safety Injection" and direct operator actions of 1BEP-0 • Notify SM of procedure entry and request EAL evaluation 	
	RO	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> • Step 1: Verify reactor trip <ul style="list-style-type: none"> • Rod bottom lights - ALL LIT • Reactor trip & Bypass breakers - OPEN • Neutron flux – DROPPING 	
	BOP	Perform immediate operator actions of 1BEP-0: <ul style="list-style-type: none"> • Step 2: Verify Turbine Trip <ul style="list-style-type: none"> • All Turbine throttle valves - CLOSED • All Turbine governor valves - CLOSED • Step 3: Verify power to 4KV busses <ul style="list-style-type: none"> • ESF Buses – BOTH ENERGIZED (141 & 142) 	
	CREW	<ul style="list-style-type: none"> • Step 4: Check SI Status <ul style="list-style-type: none"> ○ SI First OUT annunciator - LIT ○ SI ACTUATED Permissive Light - LIT ○ SI Equipment – AUTOMATICALLY ACTUATED <ul style="list-style-type: none"> ○ Either SI pumps - RUNNING ○ Either CV pump to cold leg isolation valve OPEN – 1SI8801A/B • Recognize SI Actuated • Manually actuate SI from 1PM05J and 1PM06J 	
		EVALUATOR NOTE: Action to trip the RCPs should be initiated within 5 minutes of meeting the RCP trip criteria.	
	RO	<ul style="list-style-type: none"> • Determine RCP trip required <ul style="list-style-type: none"> • RCS pressure < 1425 psig & High head SI flow (1FI-917) > 100 gpm or SI pump flow > 200 gpm • Trip ALL RCPs 	
	US	<ul style="list-style-type: none"> • Step 5: Direct BOP to perform Attachment B of 1BEP-0 	
		EVALUATOR NOTE: US and RO will continue in 1BEP-0 while BOP is performing Attachment B:	
		EVALUATOR NOTE: The crew may identify 1SI8801A & B are not open and may open them before step 16. AFTER the crew opens 1SI8801A & B, the LOCA will increase in size to a large break.	
	BOP	<ul style="list-style-type: none"> • Perform 1BEP-0 Attachment B • Verify FW isolated at 1PM04J: 	

Comments: _____

Scenario No:	NRC 10-5	Event No:	7 & 8
Event Description: Large Break LOCA with failure of 1SI8801's to automatically open			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • FW pumps – TRIPPED. • Isolation monitor lights – LIT. • FW pumps discharge valves - CLOSED (or going closed) 1FW002A-C. • Verify DGs running at 1PM01J: <ul style="list-style-type: none"> • DGs – BOTH DGs running • 1SX169A & B OPEN. • Dispatch operator locally to check operation • Verify Generator Trip at 1PM01J: <ul style="list-style-type: none"> • OCB 3-4 and 4-5 open. • PMG output breaker open. 	
	BOP	<ul style="list-style-type: none"> • Verify Control Room ventilation aligned for emergency operations at 0PM02J: <ul style="list-style-type: none"> • VC Rad Monitors – LESS THAN HIGH ALARM SETPOINT. • Operating VC train equipment – RUNNING. <ul style="list-style-type: none"> • Supply fan • Return fan • M/U fan • Chilled water pump • Chiller • Operating VC train dampers – ALIGNED. <ul style="list-style-type: none"> • M/U fan outlet damper – NOT FULLY CLOSED. • VC train M/U filter light – LIT. • Operating VC train Charcoal Absorber aligned <ul style="list-style-type: none"> • Bypass damper - CLOSED • Inlet damper - OPEN • Outlet damper - OPEN • Control Room pressure greater than +0.125 inches water on 0PDI-VC038. • Verify Auxiliary Building ventilation aligned at 0PM02J: <ul style="list-style-type: none"> • Two inaccessible filter plenums aligned. <ul style="list-style-type: none"> • Plenum A or B or C: <ul style="list-style-type: none"> • Fan - RUNNING • Flow Control damper - OPEN • Bypass Isolation damper - CLOSED • Plenum A or B or C: <ul style="list-style-type: none"> • Fan - RUNNING • Flow Control damper - OPEN • Bypass Isolation damper - CLOSED • Verify FHB ventilation aligned at 0PM02J: 	

Comments: _____

Scenario No:	NRC 10-5	Event No.	7 & 8
Event Description: Large Break LOCA with failure of 1SI8801's to automatically open			
Time	Position	Applicant's Actions or Behavior	
		<ul style="list-style-type: none"> • Fan - RUNNING • Inlet Isolation damper - OPEN • Flow Control damper - OPEN • Bypass Isolation damper – CLOSED 	
		EVALUATOR NOTE: The remaining steps of Attachment B may be designated to be performed by WEC personnel or the Field Supervisor and extra operators.	
		<ul style="list-style-type: none"> ○ Trip all running HD Pumps ○ Shutdown FW pump as necessary using BOP FW-2 for a TDFP or BOP FW-8 for the MDFP ○ Shutdown unnecessary CD/CB Pumps using BOP CD/CB-2 ○ Align SX MDCT per BOP SX-T2 <ul style="list-style-type: none"> ○ Maintain SX Basin level > 80% ○ Align NDCT <ul style="list-style-type: none"> ○ Verify CW intake bay level within band ○ Dispatch operator to locally verify NDCT basin level acceptable ○ Align NDCT per BOP CW-25 ○ Shutdown all unnecessary CW pumps per BOP CW-2 ○ Notify US that Attachment B is complete 	
	RO/ BOP	<ul style="list-style-type: none"> • Step 6: Verify ECCS pumps running <ul style="list-style-type: none"> • Both CV pumps – RUNNING • Both RH pumps – RUNNING • Both SI pumps – RUNNING 	
	BOP/ RO	<ul style="list-style-type: none"> • Perform the following at 1PM06J: <ul style="list-style-type: none"> • Step 7: Verify RCFCs running in Accident Mode: <ul style="list-style-type: none"> • Group 2 RCFC Accident Mode lights – 4 LIT. • Step 8: Verify Phase A isolation: <ul style="list-style-type: none"> • Group 3 Cnmt Isol monitor lights – ALL LIT. • Step 9: Verify Cnmt Vent isolation: <ul style="list-style-type: none"> • Group 6 Cnmt Vent Isol monitor lights – ALL LIT. ○ Verify MSIV and Bypass Valves – CLOSED 	
	BOP/ RO	<ul style="list-style-type: none"> • Step 10: Verify AF system: <ul style="list-style-type: none"> • AF pumps – BOTH AF pumps RUNNING. • AF isolation valves – 1AF13A-H OPEN. • AF flow control valves – 1AF005A-H THROTTLED. • Step 11: Verify CC pumps – BOTH RUNNING. • Step 12: Verify SX pumps – BOTH RUNNING. • Step 13: Check if Main Steamline Isolation –required: <ul style="list-style-type: none"> ○ NO SG pressure < 640 psig (at 1PM04J) ○ CNMT pressure > 8.2 psig. 	
		EVALUATOR'S NOTE: CS may have an actuation signal at this time. If it has not, the crew must return to this step to verify proper alignment when CNMT pressure exceeds 20 psig.	

Comments: _____

Scenario No:	NRC 10-5	Event No:	7 & 8
Event Description: Large Break LOCA with failure of 1SI8801's to automatically open			
Time	Position	Applicant's Actions or Behavior	
	BOP/RO	<ul style="list-style-type: none"> • Step 14: Check if CS is required. <ul style="list-style-type: none"> • CNMT pressure has risen > 20 psig. • Group 6 CS monitor lights – ALL LIT. • Group 6 phase B lights – ALL LIT. • Verify/Stop ALL RCPs (at 1PM04J). • CS eductor suction flow - > 15 gpm on 1FI-CS013 & 1FI-CS014. • CS eductor additive flow - > 5 gpm on 1FI-CS015 & 1FI-CS016 	
		EVALUATOR'S NOTE: Step 14.g.1) requires all 8 riser valves open, then 14.g.3) RNO has the operator close the riser valve on any fan not running in High speed. 0B SX Fan should not be in High speed, since it was manually tripped because of high vibration.	
	BOP	<ul style="list-style-type: none"> • Align SX Towers <ul style="list-style-type: none"> ○ 7 Riser valves OPEN ○ All 4 Bypass valves CLOSED ○ 7 fans running in HIGH speed (0B SX fan was manually tripped) 	
	CREW	<ul style="list-style-type: none"> • Recognize and announce ADVERSE CNMT 	
	BOP/RO	<ul style="list-style-type: none"> • Step 15: Verify Total AF flow: <ul style="list-style-type: none"> • AF flow > 500 gpm • S/G NR levels – NOT rising in an uncontrolled manner 	
		EVALUATOR NOTE: AFTER the crew opens 1SI8801A & B, or goes past step 16 without opening 1SI8801A or B, the LOCA will increase in size to a large break. IF the leak size hasn't been increased before reaching step 17, RCS pressure will be above 325 PSIG and RH flow lower than 1000 GPM at the check in step 17.	
	RO/BOP [CT] E-0-I	<ul style="list-style-type: none"> • Step 16: Verify ECCS valve alignment <ul style="list-style-type: none"> • Determine Group 2 Cold Leg Injection monitor lights required for injection – NOT All lit • Manually open 1SI8801A & B 	
		EVALUATOR'S NOTE: RCS pressure may still be above 325 PSIG at this point.	
	RO/BOP	<ul style="list-style-type: none"> • Step 17: Verify ECCS flow <ul style="list-style-type: none"> • High Head SI flow >100 gpm (1FI-917) • RCS pressure < 1700 psig <ul style="list-style-type: none"> • Both SI pump discharge flow > 200 gpm • RCS pressure < 325 psig • RH flow > 1000 GPM • Check 2 CV pumps - running 	
	RO	<ul style="list-style-type: none"> • Step 18: Check PZR PORVs and SPRAY VALVES at 1PM05J: <ul style="list-style-type: none"> • 1RY455 & 1RY456 CLOSED • PORV isol valves – 1RY8000A & 1RY8000B BOTH ENERGIZED • PORV relief path – Both PORVs in AUTO, Both isolation valves – OPEN. • Normal PZR Spray Valves CLOSED 	

Comments: _____

Scenario No:	NRC 10-5	Event No.	7 & 8
Event Description: Large Break LOCA with failure of 1SI8801's to automatically open			
Time	Position	Applicant's Actions or Behavior	
	RO	<ul style="list-style-type: none"> • Step 19: Maintain RCS temperature control at 1PM05J: <ul style="list-style-type: none"> • Check RCP's – NONE RUNNING. • Verify RCS average temperature stable at or trending to 557°F. • Throttle AF maintaining >500 GPM until SG minimum level is met • MSIVs closed 	
	RO	<ul style="list-style-type: none"> • Step 20: Check status of RCPs at 1PM05J: <ul style="list-style-type: none"> ○ All RCP's – NONE RUNNING. 	
	BOP/RO	<ul style="list-style-type: none"> • Step 21: Check if SG secondary pressure boundaries are intact at 1PM04J: <ul style="list-style-type: none"> • Check pressure in all SGs: <ul style="list-style-type: none"> • None dropping in an uncontrolled manner or completely depressurized 	
	BOP/RO	<ul style="list-style-type: none"> • Step 22: Check if SG tubes are intact <ul style="list-style-type: none"> • All secondary rad monitors – have remained less than alert alarm setpoint 	
	BOP/RO	<ul style="list-style-type: none"> • Check if RCS is intact <ul style="list-style-type: none"> ○ CNMT area rad monitors – NOT less than alert alarm setpoint ○ CNMT pressure – NOT less than 3.4 PSIG ○ CNMT floor drain sump level 	
	US	<ul style="list-style-type: none"> • Transition to 1BEP-1, "Loss of Reactor or Secondary Coolant" 	
		<p>EVALUATORS NOTE: The crew will transition to 1BEP ES-1.3 when RWST Lo-2 level (<46%) is reached. This may occur before or after step 13 of 1BEP-1 checking if transfer to cold leg recirc is required. The steps of 1BEP ES-1.3 are listed in <i>italics</i> after step 13 below.</p>	
	US	<ul style="list-style-type: none"> • Notify SM of plant status and procedure entry. • Request evaluation of Emergency Plan conditions. • Request STA evaluation of status trees. • Enter/Implement 1BEP-1 and direct operator actions of 1BEP-1 to establish the following conditions. 	
	RO	<ul style="list-style-type: none"> • Step 1: Check Status of RCPs: <ul style="list-style-type: none"> • RCPs – NONE RUNNING 	
	RO/ BOP	<ul style="list-style-type: none"> • Step 2: Check if SG secondary pressure boundaries are intact: <ul style="list-style-type: none"> • Check pressure in all SGs: <ul style="list-style-type: none"> • None dropping in an uncontrolled manner • None completely depressurized • Step 3: Check intact SG levels <ul style="list-style-type: none"> • SG levels maintained between 10% (31%) and 50% • SG NR levels – NOT rising in an uncontrolled manner • Step 4: Check secondary radiation normal. <ul style="list-style-type: none"> • Reset Phase A <ul style="list-style-type: none"> • Depress BOTH Phase A Reset Pushbuttons at 1PM06J • OPEN 1SD005A-D at 1PM11J • At RM-11 or HMI Check secondary rad trends on : <ul style="list-style-type: none"> • 1PR08J SG Blowdown • 1PR27J SJAE/GS 	

Comments: _____

Scenario No: NRC 10-5		Event No: 7 & 8
Event Description: Large Break LOCA with failure of 1SI8801's to automatically open		
Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> 1AR22/23A-D Main steam lines
	RO	<ul style="list-style-type: none"> Step 5: Check at least ONE PZR PORV relief path available: <ul style="list-style-type: none"> PORV isol valves – BOTH ENERGIZED PORV relief path – BOTH PORVs in AUTO, 1RY8000A & B – OPEN
	CREW	<ul style="list-style-type: none"> Step 6: Check if ECCS flow should be reduced <ul style="list-style-type: none"> RCS subcooling – NOT acceptable Step 7: Check if CS should be stopped <ul style="list-style-type: none"> Both CS pumps – BOTH RUNNING Reset CS signal Check Spray Add Tank Lo-2 lights – NOT lit CS termination criteria NOT met – for LOCA, operating time at least 8 hours Step 8: Check if RH pumps should be stopped <ul style="list-style-type: none"> Reset SI <ul style="list-style-type: none"> Depress BOTH SI Reset Pushbuttons at 1PM06J Verify SI ACTUATED BP light NOT lit at 1PM05J Verify AUTO SI BLOCKED BP light NOT lit at 1PM05J Check RCS pressure – NOT > 325 psig
	CREW	<ul style="list-style-type: none"> Step 10: Check if DGs should be stopped <ul style="list-style-type: none"> All busses powered from offsite power Stop DGs and place in standby
	CREW	<ul style="list-style-type: none"> Step 11: Initiate evaluation of plant status <ul style="list-style-type: none"> Check cold leg recirc capability – BOTH trains available Check AB rad trends normal Obtain samples Evaluate equipment for long term recovery Shutdown chiller on non-operating VC trains <ul style="list-style-type: none"> Start additional plant equipment as required
	CREW	<ul style="list-style-type: none"> Step 12: RCS pressure – NOT > 325 PSIG RH pump flow > 1000 GPM
	CREW	<ul style="list-style-type: none"> Step 13: Check if transfer to 1BEP ES-1.3 required <ul style="list-style-type: none"> RWST level – < 46% ECCS – aligned in injection mode Identify need to perform 1BEP ES-1.3
	US	<ul style="list-style-type: none"> Transition to 1BEP ES-1.3, "Cold Leg Recirculation" Notify SM of procedure entry and request EAL evaluation
	CREW	<ul style="list-style-type: none"> Check/Open 1CC9473 & B Check 2 CC Pumps – running Open 1CC9412A & B Check CC to RH HX flows - >5000GPM Check CNMT floor water level – at least 13 inches
	CREW[CT] ES-1.3 --	<ul style="list-style-type: none"> Place control switches for SVAG Valve 480V busses – CLOSE Check both RH pumps – running

Comments: _____

Scenario No:	NRC 10-5	Event No.	7 & 8
Event Description: Large Break LOCA with failure of 1SI8801's to automatically open			
Time	Position	Applicant's Actions or Behavior	
	A	<ul style="list-style-type: none"> • Check both 1SI8811A & B – OPEN • Close both 1SI8812A & B • Check any SI pump – running, or both 1SI8801A & B – OPEN 	
	<i>CREW</i>	<ul style="list-style-type: none"> • Align SI and CV pumps for cold leg recirc <ul style="list-style-type: none"> • Verify closed: 1CV8111, 1CV8114, 1CV8110, 1CV8116 • Close 1SI8813, 1SI8814, 1SI8920 • Close 1RH8716A & B • Open 1SI8807A & B, 1SI8924 • Check 1A RH Pump running • Open 1CV8804A • Check 1B RH Pump running • Open 1SI8804B • Start CV pumps and SI pumps as necessary 	
		EVALUATOR NOTE: The scenario can be terminated after the first 6 steps of 1BEP ES-1.3 are completed or at lead examiner's discretion.	

Comments: _____
