SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:	16-01 ESG-2 [AB.ROD-3, AB.RC-1, AB.LOAD-1, TRIP-1, LOCA-1, LOCA-3]
SCENARIO NUMBER:	16-01 ESG-2
EFFECTIVE DATE:	See Approval Dates
EXPECTED DURATION:	80 minutes
REVISION NUMBER:	01
PROGRAM:	[ ] **L.O. REQUAL**
	[X] **INITIAL LICENSE**
	[ ] **STA**
	[ ] **OTHER** _____

Revision Summary:

New issue for 16-01 ILOT NRC exam. Incorporated editorial comments from validation. **Rev. 01**: Incorporated NRC Prep week comments. Deleted malfunction for 22 CFCU trip and added 22 RC Loop Tavg channel fails high to balance out events for ATC. Added Tech Spec LCO times. Included the three parts of CT#2 in Attachment 5. Partial re-validation was performed on 12-13-17 to ensure proper simulator response and flow of scenario was not affected.

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APPROVED BY:	McHugh **Operations Training Manager**	12/15/17 **Date**
APPROVED BY:	MYERS **Facility Representative**	12/15/17 **Date**

I. OBJECTIVES

A. Given the indications of a reactor coolant system (RCS) malfunction or leak, perform actions as the nuclear control operator to RESPOND to the malfunctioning accordance with S2.OP-AB.RC-0001.

B. Given the indications of a reactor coolant system (RCS) malfunction or leak, DIRECT the response to the malfunction in accordance with S2.OP-AB.RC-0001.

C. Given the order or indications of a reactor trip, perform actions as the nuclear control operator to RESPOND to the reactor trip in accordance with 2-EOP-TRIP-1.

D. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with 2-EOP-TRIP-1.

E. Given the order or indications of a safety injection, perform actions as the nuclear control operator to RESPOND to the safety injection in accordance with the approved station procedures.

F. Given indication of a safety injection, DIRECT the response to the safety injection in accordance with the approved station procedures.

G. Given a safety injection has occurred and equipment has failed to start, START equipment that has failed to automatically start in accordance with station procedures

H. Given the order or indications of a loss of coolant accident (LOCA), complete actions as the nuclear control operator to PERFORM the immediate response to the LOCA in accordance with the approved station procedures.

I. Given indication of a loss of coolant accident (LOCA), DIRECT the immediate response to the LOCA in accordance with the approved station procedures.

J. Given the order or a loss of coolant accident (LOCA) and plant conditions to support cold leg recirculation, perform actions as the nuclear control operator to TRANSFER to cold leg recirculation in accordance with the approved station procedures.

II. MAJOR EVENTS

1. 21MS167 drifts from full open position
2. 22 RC Loop Tavg Channel Fails High
3. RCS leak inside Containment (35 gpm)
4. Large Break LOCA (LBLOCA)
5. Both trains of SI fail to auto actuate and one keyswitch fails to operate
6. 2B SEC fails to actuate on SI signal

III. SCENARIO SUMMARY

A. The crew will take the watch with the unit at 40% power, BOL. 23 condensate pump and all heater drain pumps are out of service due to plant power level. 22 SW pump C/T for pump packing replacement; 23B CW pump is C/T for traveling screen repair; 2A EDG is C/T for governor inspection and output breaker swap.

B. After the crew assumes the watch, 21MS167 will drift from the full open position and respond to **OHA G-34; 21-24 MS167 VALVES NOT FULL OPEN**. The crew will take actions IAW **OHA ARP S2.OP-AR.ZZ-0007,** and re-opens 21MS167.

C. After the 21MS167 malfunction has been addressed, 22 RC Loop Tavg Channel will fail high. The crew verify no turbine runback in progress and place Rod Control in Manual to stop rod motion. The crew will respond IAW **S2.OP-AB.ROD-0003**, Continuous Rod Motion. The crew will restore Tavg to program, remove the failed channel from service, and then restore Rod Control to Auto. The CRS will evaluate Technical Specifications. [**Tech Spec Exercised**]

D. After the 22 Tavg failure has been addressed, a 35 gpm RCS leak inside containment will occur. The crew will enter **S2.OP-AB.RC-0001**, Reactor Coolant System Leak, and diagnose the leak. The crew will transfer to a centrifugal charging pump, reduce letdown to a 45 gpm orifice, and estimate the leak rate. The CRS will evaluate Tech Specs. **[Tech Specs exercised]**

E. The CRS will determine a unit shutdown is required based on the RCS leak exceeding Tech Spec limits. The crew will initiate an orderly unit shutdown.

F. After the orderly unit shutdown has commenced, the RCS leak will worsen to a **large break LOCA**. The crew will diagnose deteriorating primary conditions. When it is determined that PZR level will be unable to be maintained >17% or leak exceeds makeup capability, the crew will take the CAS action in S2.OP-AB.RC-0001 to trip the reactor, confirm the trip, and initiate Safety Injection.

G. During performance of initiating Safety Injection (SI); the operator will be unable to manually actuate one train of SI using the keyswitch; the other train keyswitch will function and allow manual actuation of both trains of SI. **[CT#1]**

H. The crew will perform plant stabilization and diagnostics in **EOP-TRIP-1**, Reactor Trip or Safety Injection. While in EOP-TRIP-1, the 2B SEC will fail to actuate following SI actuation. The crew will manually start safeguards loads for 2B bus using Table A.

I. The crew will transition to **EOP-LOCA-1**, Loss of Reactor Coolant, when directed in EOP-TRIP-1.

J. The crew will perform actions in EOP-LOCA-1 until the RWST level low alarm actuates at 15.2 feet; then transition to **EOP-LOCA-3** to transfer to cold leg recirculation. **[CT#2]**

K. The scenario will be terminated when the transfer to cold leg recirculation is completed in EOP-LOCA-3.

IV. INITIAL CONDITIONS

____ IC-231

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
____ 1	VC1and VC4 C/T
____ 2	RCPs (SELF CHECK)
____ 3	RTBs (SELF CHECK)
____ 4	MS167s (SELF CHECK)
____ 5	500 KV SWYD (SELF CHECK)
____ 6	SGFP Trip (SELF CHECK)
____ 7	23 CV PP (SELF CHECK)
____ 8	**22 SW Pump C/T**
____ 9	**23B CW pump C/T**
___ 10	**2A EDG C/T**
___ 11	Complete Attachment 2 "Simulator Ready-for-Training/Examination Checklist."

Note: Tables with blue headings may be populated by external program, do not change column name without consulting Simulator Support group

EVENT TRIGGERS:

Initial	ET #	Description	
	1	EVENT ACTION:	kbd12an1 //21MS167 HYDRAULIC OPEN
		COMMAND:	DMF VL0420
		PURPOSE:	<update as needed>
	2	EVENT ACTION:	HWKA501DOA //W Var bind for ZDIPANEL(1615)
		COMMAND:	DOR ka701doa
		PURPOSE:	<update as needed>
	3	EVENT ACTION:	HWKA701DOA //W Var bind for ZDIPANEL(1669)
		COMMAND:	DOR ka501doa
		PURPOSE:	<update as needed>
	4	EVENT ACTION:	MONP254 <10. //CONTROL BANK C GROUP POSITION
		COMMAND:	
		PURPOSE:	<update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	RC0002 RCS LEAK INTO CONTAINMENT (equiv to 0-4 inches)	N/A	0	00:02:00	RT-3	35
_____ 02	RC0001D RCS RUPTURE OF RC LOOP 24	N/A	N/A	N/A	RT-4	
_____ 03	RP0274A AUTO SI FAILS TO ACT, TRN A	N/A	N/A	N/A	N/A	
_____ 04	RP0274B AUTO SI FAILS TO ACT, TRN B	N/A	N/A	N/A	N/A	
_____ 05	VL0420 21MS167 Fails to Position (0-100%)	N/A	N/A	N/A	RT-1	95
_____ 06	RC0014B 22 HOT LEG RTD AVG SUMMATOR FAILS	N/A	N/A	N/A	RT-2	650

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	DG02D DEENERGIZE "B" SEC CABINET	N/A	N/A	N/A	ET-4	YES
_____ 02	SW27D 22 SW PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 03	SW28D 22 SW PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 04	CW03B 23B CIRC WATER PUMP CONTROL PWR BKR 2CW5BD	N/A	N/A	N/A	N/A	OFF
_____ 05	DG10D 2A DIESEL GEN LOCKED OUT	N/A	N/A	N/A	N/A	YES
_____ 06	DG11D 2A DG BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 07	DG12D 2A DG BKR RACK OUT	N/A	N/A	N/A	N/A	TAGGED

OVERRIDES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
_____ 01	A701 B DI KA701DOA TRAIN 'B' - SI OPERATE KEYSWITCH	N/A	N/A	N/A	N/A	OFF
_____ 02	A501 B DI KA501DOA TRAIN 'A' - SI OPERATE KEYSWITCH	N/A	N/A	N/A	N/A	OFF

OTHER CONDITIONS:

	Description
_____ 1.	

V. SEQUENCE OF EVENTS

A. State shift job assignments.

B. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).

C. Inform the crew "The simulator is running. You may commence panel walkdowns at this time. CRS please inform me when your crew is ready to assume the shift".

D. Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
1. 21MS167 drifts from full open position			
Simulator Operator: Insert **RT-1** on direction from Lead Evaluator. **MALF: VL0420 21 MS167 fails to position (0-100%)** **Final = 95**			
Evaluator's Note: As soon as malfunction is entered OHA G-34 overhead alarm will come in.			
	PO announces unexpected OHA G-34, 21-24 MS167 VALVES NOT FULL OPEN, and refers to ARP.		
	PO reports CRT and board indication of 21MS167 not being full open.		
	CRS directs PO to open 21MS167 per OHA ARP.		
Simulator Operator: Ensure **ET-1** is TRUE when 21MS167 open PB is depressed. This deletes MALF VL0420.			
	PO depresses open PB and reports 21MS167 has fully opened.		
	CRS directs initiation of notification to		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	investigate and correct cause of the alarm.		
Evaluator's Note: Tech Spec 3.7.1.5 for MSIV operability is not applicable. MSIV drift is not uncommon and declaring the MSIV inoperable is not warranted. The operability concern would be related to its not being able to be fast close (steam assist).			
2. 22 RC Loop Tavg Channel Fails High			
Simulator Operator: Insert **RT-2** on direction from Lead Evaluator. **MALF: RC0014B LOOP 22 HOT LEG RTD AVG SUMMATOR FAILS HI/L** **Final = 650**			
	RO reports Tavg/Tref deviation and rods stepping in as not expected.		
	RO reports no turbine runback in progress and places rod control in manual.		
	RO reports 22 RC Tavg Loop has failed high.		
Evaluator's Note: RO may request to take manual control of Master Flow Controller prior to direction provided in S2.OP-AB.ROD-0003.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS concurs with rod control being placed in manual.		
	RO places rod control in manual and reports rod motion stopped.		
	CRS enters S2.OP-AB.ROD-0003, Continuous Rod Motion.		
	RO reports unexpected OHA alarms for E-8 and E-16 Rod Insertion Lo and Lo-Lo.		
	RO reports various 2CC2 console alarms in for: RC Loop Tavg Deviation, Tavg-Tref Deviation, RC Tavg Hi or Lo-Lo.		
	CRS confirms control rods are in manual and rod motion has stopped.		
	CRS directs RO to adjust rods in manual to maintain Tavg within 1.5 deg of program.		
	RO reports rod motion was in the inward direction and a NIS channel has NOT failed high.		
	CRS directs RO to stop any dilution in progress.		
	RO reports 22 RC Loop Tavg channel has failed High.		
	CRS directs RO to return PZR level to program IAW Attachment 2.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO places Charging System Master Flow Controller in manual if not previously performed.		
	RO adjusts charging flow to restore PZR level to program.		
	RO defeats 22 loop Reactor Coolant Differential Temperature and 22 loop Reactor Coolant Average Temperatures on 2CC2.		
	RO selects channel other than 22 loop for Reactor Coolant Differential Temperature and Reactor Coolant Average Temperature.		
	When PZR level has been restored to program, RO places Charging System Master Flow Controller in Auto.		
	RO reports control rods are above the rod insertion limit.		
	RO restores control rods to ARO position		
	RO places rod control in Auto after ensuring Tavg is within 1.5 degrees of Tref.		
	CRS enters TSAS(s) 3.3.1.1 Action 6 (6 hour LCO) and 3.3.2.1.b Action 19* (6 hour LCO).		
	CRS initiates S2.OP-SO.RPS-0002 to place 22 RC Loop Tavg in tripped condition.		
Proceed to next event after the			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Tavg channel has been defeated or at Lead Evaluators direction.			
3. RCS Leak Inside Containment			
Simulator Operator: Insert **RT-3** on direction from Lead Evaluator **MALF: RC0002 RCS Leak into Containment.** **Final Value: 35 (30-35 gpm)** **Ramp = 2 minutes**			
	RO reports that charging flow is rising and PZR level is lowering slowly.		
	Crew reports reading on 2R11A containment radiation monitor is rising or in warning/alarm.		
	RO reports unexpected OHA C-2, CNTMT SUMP PMP START, when it occurs.		
	CRS enters S2.OP-AB.RC-0001, Reactor Coolant System Leak.		
	CRS directs initiation of Attachment 1 CAS.		
	RO reports RCS temperature > 350°F and the Unit is in Mode 1.		
	RO reports PZR level is lowering.		
	CRS enters S2.OP-AB.RAD-0001, Abnormal Radiation after OHA A-6 unexpected annunciation.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports that NO centrifugal charging pumps are running.		
	RO transfers to a centrifugal charging pump IAW Step 3.14, and raises charging flow to stabilize PZR level.		
	PO reduces letdown flow to minimum by opening 2CV3, maintaining letdown pressure ~300 psig with 2CV18 in manual, then closing the open 75 gpm orifice and returning 2CV18 to auto.		
	RO stabilizes PZR level and estimates leak rate.		
	CRS initiates S2.OP-ST.RC-0008, Reactor Coolant System Water Inventory Balance.		
	CRS contacts Rad Pro for recommendation on CFCU operation.		
Role Play: If Rad Pro is contacted about CFCUs, state Rad Pro recommends placing 2 CFCU's in Low Speed and 2 CFCU's in High Speed.			
	PO places 2 CFCU's in Low Speed and 2 CFCU's in High Speed.		
	CRS initiates actions to locate and isolate the leak IAW Attachment 2.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS enters TSAS 3.4.7.2.b action b for RCS leakage (4 hour LCO) and 3.6.1.4 (1 hour LCO) for containment pressure IF it has reached 0.3 psig.		
4. Orderly Unit Shutdown due to RCS leak exceeding Tech Spec			
Role Play: After RCS leakage Tech Spec has been identified, **IF** CRS does not initiate a power reduction to bring the unit off-line, call Control Room as Operations Director and instruct the CRS to initiate a 30% per hour load reduction to 20% in preparation for taking Unit 2 offline to investigate and repair the RCS leak.			
Lead Evaluator may proceed to next event (LBLOCA) if observing unit shutdown is not necessary.			
	CRS determines that an orderly unit shutdown is required based on RCS leak exceeding TS limits.		
	CRS enters S2.OP-AB.LOAD-0001 (crew may also use S2.OP-IO.ZZ-0004).		
	RO develops reactivity plan for shutdown and initiates boration.		
	PO initiates turbine load reduction to 20% at specified rate from CRS.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Proceed to next event once the unit shutdown has commenced or at direction from Lead Evaluator.			
5. Large Break LOCA			
Simulator Operator: Insert **RT-4** at direction from Lead Evaluator. **MALF: RC0001D RCS LOOP RUPTURE OF RC LOOP 24**			
	RO reports the Reactor has tripped.		
	RO performs immediate actions for EOP-TRIP-1.		
	RO reports a demand for Safety Injection but SI did NOT Auto actuate.		
Simulator Operator: Ensure **ET-3** is TRUE if Train B SI keyswitch is operated OR **ET-2** TRUE if Train A keyswitch is operated. This deletes Overrides A501 Train A SI or A701 Train B SI.			
Simulator Operator: Ensure **ET-4** is TRUE following Rx Trip. This inserts REMOTE DG02D to deenergize the 2B SEC cabinet.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
6. SI fails to auto actuate and one train keyswitch fails to manually actuate.			
	RO reports that SI failed to Auto actuate and Manually initiates Safety Injection using keyswitch. RO reports that one train of SI failed to manually initiate and goes to other train keyswitch to initiate SI. RO reports SI initiated on both trains. [Critical Task #1]		
CT#1 (CT-2): Manually initiate SI before transition to EOPs; LOCA-1, FRTS-1, or TRIP-2. **SAT_____ UNSAT_____**			
	RO continues Immediate Actions of EOP-TRIP-1; - Trips the Main Turbine - Reports at least one 4KV Vital bus energized. - Reports SI initiated.		
	CRS enters EOP-TRIP-1.		
	CRS and RO perform immediate actions of EOP-TRIP-1.		
	CRS directs RO and PO to implement the		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CAS.		
	PO requests permission to throttle AFW flow to no less than 22E4 lbm/hr.		
	RO reports that SEC loading is NOT complete for energized vital buses.		
7. 2B SEC fails to actuate			
	RO reports that available equipment on 2B bus failed to start.		
	RO blocks 2B SEC.		
	RO resets 2B SEC.		
Role Play: The CRS may dispatch NEO to locally check the breaker for 2B SEC and then direct the breaker to be opened to ensure the SEC is deenergized. IF contacted, THEN, report back after 1 minute as the NEO that the instrument power breaker for the 2B SEC is in the tripped condition and the SEC looks to be deenergized.			
	CRS directs RO/PO in starting safeguards loads for 2B bus using Table A.		
	PO reports that 21 and 22 AFW pumps are running.		
	RO reports that NOT all valve groups in		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	Table B are in safeguards positions. PO reports that 2SW26 is NOT closed.		
	PO manually closes 2SW26.		
	PO reports that 21 and 22 CA330's are closed.		
	RO reports that containment pressure has NOT remained less than 15 psig.		
	CRS directs initiation of Phase B and Spray actuation, if not already auto initiated.		
	RO reports that both CS pumps started.		
	RO initiates Main Steam Isolation, if not already auto intiated. (Note: During validations MSLI Auto initiated post-trip)		
	RO stops all RCPs.		
	RO reports that all valve groups in Table D are in the safeguards positions.		
	PO reports that 2RP4 does NOT indicate high steam flow coincident with low steam pressure or low-low Tavg. MSLI previously initiated.		
	PO reports all 4KV vital buses are energized.		
	RO reports control room ventilation is in Accident Pressurized mode.		
	RO reports 2 switchgear supply and 1 exhaust fan are running.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports 2 CCW pumps running.		
	CRS reads CAS to RO to notify CRS when RWST level lo alarm actuates at 15.2 feet.		
	RO reports RHR is NOT aligned for Cold Leg Recirc		
	RO reports charging flow is > 100 gpm.		
	RO reports that RCS pressure is < 1540 psig (1660 psig adverse)		
	Per the CAS, IF RCS 1500 psig and BIT flow is established at this point, the RO closes the charging pump minflow valves.		
	RO reports that SI flow is > 100 gpm.		
	RO reports RCS pressure is < 300 psig (420 psig adverse).		
	RO reports that RHR flow is at least 300 gpm.		
	PO maintains total AFW flow greater than 22E4 lbm/hr until at least one SG NR level is >9% (15% Adverse), then maintains SG NR level 19-33%.		
	RO reports NO RCPs are running.		
	RO reports RCS Tcolds are NOT stable or tending to 547 F.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports that RCS Temperature is NOT > 547 F.		
	CRS directs PO to stop dumping steam.		
	PO maintains total AFW flow greater than 22E4 lbm/hr until at least one SG NR level is >9% (15% Adverse), then maintains SG NR level 19-33%.		
	RO reports that RCS temperature is NOT being controlled and that MSLI actuation has been previously initiated.		
	RO reports both RTBs are open.		
	RO reports both PZR PORVs are closed.		
	RO reports both PZR PORV stop valves are open.		
	RO reports NO RCPs are running.		
	RO maintains seal injection flow to all RCPs.		
	PO reports NO SG pressures are dropping in an uncontrolled manner or completely depressurized.		
	RO reports that NO SG NR levels are rising in an uncontrolled manner.		
	RO reports that 2R15, 2R19A-D, and 2R46A-D are NOT in warning or alarm.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO/PO reports ALL channels in Table F are in alarm or rising.		
	CRS transitions to EOP-LOCA-1, Loss of Reactor Coolant.		
	STA begins monitoring CFSTs.		
	STA reports RED path for Thermal Shock.		
	CRS transitions to 2-EOP-FRTS-1.		
EOP-FRTS-1 actions start here:			
	RO reports RCS pressure NOT greater than 300 psig (420 psig adverse).		
	RO reports that RHR flow is at least 300 gpm on 21 or 22 SJ49 cold leg injection meters.		
	Crew returns to procedure in effect which was EOP-LOCA-1.		
EOP-LOCA-1 actions start here:			
	CRS directs RO to maintain seal injection flow to all RCPs.		
	PO reports NO SG pressures are dropping in an uncontrolled manner or completely depressurized.		
	CRS directs PO to maintain AFW feed flow >		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	22E4 lbm/hr unitl one SG NR level is > 9% (15% adverse), then maintain NR levels between 19% and 33%.		
	RO reports that NO SG NR levels are rising in an uncontrolled manner.		
	RO reports that 2R15, 2R19A-D, and 2R46A-D are NOT in warning or alarm.		
	RO resets SI, Phase A and Phase B Isolation.		
	RO opens 21 and 22 CA330s.		
	PO resets each SECs and reports 2A and 2C SECs reset and 2B SEC is deenergized.		
	RO resets SGBD Sample Isolation Bypass and opens 21-24SS94s.		
	CRS directs chemistry to sample 21-24SGs for boron and activity.		
Evaluator's Note: During validations, around this time the crew received the RWST Low Level Alarm and transitioned to EOP-LOCA-3. IF so, **Mark time RWST Low Level Alarm actuated for CT#2:** **Time:** ____:____:____			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports both PZR PORVs are closed and Block Valves open.		
	RO reports RCS subcooling is NOT > 0°F.		
	RO reports both RHR pumps are NOT aligned to cold leg recirculation..		
	RO reports that RHR flow is > 300 gpm.		
	PO reports that all vital buses are energized from offsite power.		
	PO stops all EDGs one at a time until the DG is verified to be reset prior to stopping the next DG.		
Role Play: At this time only 2C EDG is running. **IF** contacted by crew to dispatch NEO to EDGs to reset each DG; then call back after 1 minute and report when you're ready to stop the diesel, THEN wait 1 minute and report that the shutdown EDG is reset. Use of S2.OP-SO.DG-0001, 0002, and 0003 section 5.11.1, Diesel Generator Shutdown Checks is used to align for auto start.			
	RO reports both RHR pumps and SJ44s available.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports that there are NO Aux Bldg radiation detectors in Table C in warning or alarm.		
	CRS consults with TSC about obtaining required RCS, SG and Cntmt samples and equipment availability to assist in long term recovery.		
	CRS dispatch operators to close 2CC37 and 2CC48.		
	PO reports 23 AFW pump is NOT needed and trips and stops 23 AFW pump.		
	CRS dispatches NEO to reset the 2MS52 trip valve when the 23 AFW pump auto start signals are cleared.		
	RO reports both RHR pumps are injecting to RCS and RCS pressure < 300 psig (420 psig adverse).		
Evaluator's Note: Depending on the pace of the crew, they may reach step 19 with the RWST low level alarm not actuated and return to step 16.			
	RO reports that RWST level low alarm has actuated		
	CRS transitions to EOP-LOCA-3 to transfer to Cold Leg Recircualtion.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
EOP-LOCA-3 actions start here:			
Evaluator mark time of RWST low level alarm: **Time: ____:____:____**			
	CRS does not implement any FRPs during LOCA-3 performance until step 16 is reached.		
	RO reports containment sump >62% lights lit and depresses open sump auto arm PBs for 21 and 22 SJ44.		
	PO removes lockouts for 2SJ67, 2SJ68, and 2SJ69.		
CT#2 (CT-36): Transfer to cold leg recirculation before RWST level drops below 1.2 feet.			
Evaluator's Note: This CT is broken down into <u>three (3) parts</u>.			
	RO reports 21 and 22 SJ44s are open.		
	RO reports that both RHR pumps are running.		
	RO closes 2SJ69. [Critical Task #2-Part 1]		
CT#2 (Part 1) – Initiate close on			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
2SJ69 in ≤3.7 minutes of RWST low level alarm. **Mark time of 2SJ69 closure initiation:** **Time: ____:____:____** **SAT____ UNSAT____**			
	PO reports SI and each SECs are reset.		
	RO reports that both CS pumps are running.		
	RO stops 22 CS pump. [Critical Task #2-Part 2]		
CT#2 (Part 2) – Stop one containment spray pump in ≤5.5 minutes from RWST low level alarm. **Time: ____:____:____** **SAT____ UNSAT____**			
	RO closes 21 and 22RH19s.		
	RO stops 23 Charging pump.		
	Using Table B, Crew selects flowpath for all 4KV vital buses are energized and **goes to Step 11** for Recirc Alignment.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports that there are NO vital buses energized by the DGs.		
	RO reports at least 3 SW pumps running, both CCHXs in service, and at least 2 CCW pumps running.		
	RO reports 21 and 22CC16s are open.		
	RO closes 2SJ67 and 2SJ68, and reports 2RH1 and 2RH2 are closed.		
	RO reports that 22 RHR is running.		
	RO opens 22SJ45.		
	RO reports that 21 RHR is running.		
	RO opens 21SJ45.		
	RO reports 21 and 22SJ113s are open.		
	RO reports 21 and 22 charging pumps running, and 21 and 22 SI pumps running.		
	PO removes lockout from 2SJ30.		
	RO closes 2SJ30, 2SJ1, and 2SJ2.		
	RO places 21RH29 and 22RH29 in manual and ensures closed (Step 15). [Critical Task #2-Part 3]		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
CT#2 (Part 3) – Complete transfer to cold leg recirc (LOCA-3 Step 15 is complete) in ≤11.2 minutes from RWST low level alarm. Time: _____:_____:_____ SAT_____ UNSAT_____			
Terminate scenario when CT#2 has been evaluated or at Lead Evaluators direction.			

VI. SCENARIO REFERENCES

A. Alarm Response Procedures (Various)
B. Technical Specifications
C. Emergency Plan (ECG)
D. OP-AA-101-111-1003, Use of Procedures
E. S2.OP-IO.ZZ-0004, Power Operation
F. S2.OP-AB.ROD-0003, Continuous Rod Motion
G. S2.OP-AB.RC-0001, Reactor Coolant System Leak
H. S2.OP-AB.LOAD-0001, Rapid Load Reduction
I. S2.OP-IO.ZZ-0004, Power Operation
J. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
K. 2-EOP-LOCA-1, Loss of Reactor Coolant
L. 2-EOP-LOCA-3, Transfer to Cold Leg Recirculation

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 40% RCS BORON: 1348 MWe 410

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED):

NA

REACTIVITY PARAMETERS

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

- 3.8.1.1.b, action b, for 2A EDG, expires in 60 hours.

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Power ascension on hold due to Main Turbine Valve Testing issues.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

- Unit 1 and Hope Creek at 100% power.
- No penalty minutes in the last 24 hrs.

PRIMARY:

- 2A EDG C/T for governor inspection and output breaker swap.

SECONDARY:

- Polisher in service
- Blowdown at 35K per loop aligned to flash tank/23 condenser
- 23 CN pump and all Heater Drain pumps out of service.

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

- 22 SW pump C/T for pump packing replacement.
- 23B CW pump C/T for traveling screen repair.

ATTACHMENT 2

SIMULATOR READY FOR TRAINING CHECKLIST

____ 1. Verify simulator is in "TRAIN" Load

____ 2. Simulator is in RUN

____ 3. Overhead Annunciator Horns ON

____ 4. All required computer terminals in operation

____ 5. Simulator clocks synchronized

____ 6. All tagged equipment properly secured and documented

____ 7. TSAS Status Board up-to-date

____ 8. Shift manning sheet available

____ 9. Procedures in progress open and signed-off to proper step

____ 10. All OHA lamps operating (OHA Test) and burned out lamps replaced

____ 11. Required chart recorders advanced and ON (proper paper installed)

____ 12. All printers have adequate paper AND functional ribbon

13. Required procedures clean

____ 14. Multiple color procedure pens available

____ 15. Required keys available

____ 16. Simulator cleared of unauthorized material/personnel

____ 17. All charts advanced to clean traces and chart recorders are on.

____ 18. Rod step counters correct (channel check) and reset as necessary

____ 19. Exam security set for simulator

____ 20. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter

____ with Baseline Data filled out

____ 21. Shift logs available if required

____ 22. Recording Media available (if applicable)

____ 23. Ensure ECG classification is correct

____ 24. Reference verification performed with required documents available

____ 25. Verify phones disconnected from plant after drill.

____ 26. Verify EGC paperwork is marked "Training Use Only" and is current revision.

____ 27. Ensure sufficient copies of ECG paperwork are available.

ATTACHMENT 3

CRITICAL TASK METHODOLOGY

In reviewing each proposed CT, the examination team assesses the task to ensure, that it is essential to safety. A task is essential to safety if, in the judgment of the examination team, the improper performance or omission of this task by a licensee will result in direct adverse consequences or in significant degradation in the mitigative capability of the plant.
The examination team determines if an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance. If incorrect performance of a task by an individual necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

I. Examples of CTs involving essential safety actions include those for which operation or correct performance prevents...

- degradation of any barrier to fission product release
- degraded emergency core cooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility license condition
- incorrect reactivity control (such as failure to initiate Emergency Boration or Standby Liquid Control, or manually insert control rods)
- a significant reduction of safety margin beyond that irreparably introduced by the scenario

II. Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to...

- effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.
- recognize a failure or an incorrect automatic actuation of an ESF system or component.
- take one or more actions that would prevent a challenge to plant safety.
- prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: **16-01 ESG-2** **REVIEWER:** Scott Dimele

Initials		Qualitative Attributes
SC	1.	The scenario has clearly stated objectives in the scenario.
SC	2.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue crew into expected events.
SC	3.	The scenario consists mostly of related events.
SC	4.	Each event description consists of: • the point in the scenario when it is to be initiated • the malfunction(s) that are entered to initiate the event • the symptoms/cues that will be visible to the crew • the expected operator actions (by shift position) • the event termination point
SC	5.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
SC	6.	The events are valid with regard to physics and thermodynamics.
SC	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
SC	8.	The simulator modeling is not altered.
SC	9.	All crew competencies can be evaluated.
SC	10.	The scenario has been validated.
SC	11.	If the sampling plan indicates that the scenario was used for training during the requalification cycle, evaluate the need to modify or replace the scenario.
SC	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

Minimum Quantitative Attributes (NUREG 1021, R11, Form ES-301-4)

Malfunction ID	Total Malfunctions	Malfunctions After EOP entry	Abnormal Events	Major Transient	EOPs used	Critical Task	Tech Specs exercised	Contingency EOPs
VL0420	1		1		TRIP-1 LOCA-1 LOCA-3	2		No
RC0014B	1		1				Yes	
RC0002	1		1				Yes	
RC0001D	1			1				
RP0274A RP0274B A701 A501	1	1						
DG02D	1	1						
Total Number of Events	**6**	**2**	**3**	1	**3**	**2**	**2**	**0**
Min Number of Events	5	1-2	2-4	1-2	1-2	≥2	2 per set	1 per set
Verified By								

Comments: See NRC-3 for Contigency EOP used (FRSM-1)

ATTACHMENT 5

ESG CRITICAL TASKS

16-01 ESG-2

CT#1 (CT-2): Manually actuate SI before transition to EOPs; LOCA-1, FRTS-1, or TRIP-2

CT#2 (CT-36): Transfer to cold leg recirculation before RWST level drops below 1.2 feet.

Note: This CT is broken down into three (3) parts:

1. Initiate close on 2SJ69 in ≤3.7 minutes of RWST low level alarm.
2. Stop one containment spray pump in ≤5.5 minutes from RWST low level alarm.
3. Complete transfer to cold leg recirc (LOCA-3 Step 15 is complete) in ≤11.2 minutes from RWST low level alarm.

Note to Evaluators: CT numbers in parentheses are the corresponding Westinghouse ERG Rev. 2- based Critical Task procedure WCAP-17711-NP

ATTACHMENT 6

ESG-PRA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

Y/N	Event	Y/N	Event
N	TRANSIENTS with PCS Unavailable	N	Loss of Service Water
N	Steam Generator Tube Rupture	N	Loss of CCW
N	Loss of Offsite Power	N	Loss of Control Air
N	Loss of Switchgear and Pen Area Ventilation	N	Station Black Out
Y	LOCA		

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	Y	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	N	Auxiliary Feed Pump
N	CVCS Letdown line Control and Isolation Valves	N	SBO Air Compressor

OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

Y/N	OPERATOR ACTION
N	Restore AC power during SBO
N	Connect to gas turbine
N	Trip Reactor and RCPs after loss of component cooling system
Y	Re-align RHR system for re-circulation
N	Un-isolate the available CCW Heat Exchanger
N	Isolate the CVCS letdown path and transfer charging suction to RWST
N	Cooldown the RCS and depressurize the system
N	Isolate the affected Steam Generator that has the tube rupture(s)
N	Early depressurize the RCS
N	Initiate feed and bleed

Complete this evaluation form for each ESG.