SIMULATOR EXAMINATION SCENARIO

SCENARIO TITLE: SGTR

SCENARIO NUMBER: J ILT NRC ESG-001

EFFECTIVE DATE: 8/19/2008

EXPECTED DURATION: 1.5 hours

REVISION NUMBER: 00

PROGRAM:

- [ ] **L.O. REQUAL**
- [X] **INITIAL LICENSE**
- [ ] **STA**
- [ ] **OTHER** _____

Revision Summary:

Rev 0: New Issue for J ILT NRC exam

PREPARED BY:	Ed Gallagher **(INSTRUCTOR)**	6/6/08 **(DATE)**
APPROVED BY:	**(OPERATIONS TRAINING MANAGER OR DESIGNEE)**	6/27/08 **(DATE)**
APPROVED BY:	**(OPERATIONS MANAGER OR DESIGNEE)**	6-29-08 **(DATE)**

I. OBJECTIVES

Enabling Objectives

A. Given the unit at power the crew will reduce power to remove a Condensate Pump from service, IAW approved station procedures.

B. Given the unit at power with a failure of a Pressurizer Level control channel, the crew will take action to stabilize PZR level and swap to a non-failed channel, IAW approved station procedures.

C. Given a SGTL, the crew will identify and isolate the leaking SG, IAW approved station procedures.

D. Given the unit with a SGTR, take actions to minimize off site dose and RCS leakage, IAW approved station procedures.

II. MAJOR EVENTS

A. Power Reduction to 85%

B. Oil Leak on 2B EDG

C. Failure of PZR level Channel 1

D. SGTL

E. SGTR on 23 SG with subsequent failure of 23MS10 to control pressure

III. SCENARIO SUMMARY

A. The crew will receive the unit at 100% power with all system in automatic. One major piece of equipment will be C/Ted, 22 AFW Pump.

B. Once the crew takes the watch they will reduce reactor power to 85% at 20% per hour to remove 21 Condensate pump from service due to an emergent motor vibration problem.

C. Once the power reduction to 85% is underway the control room will receive a call from the primary duty operator that 2B EDG has a major oil leak on the piping downstream of the lube oil heater discharge check valve. The crew will evaluate the leak location and declare 2B EDG inoperable and enter the appropriate TSAS.

D. After the TSAS has been evaluated for the 2B EDG, the controlling PZR level channel will fail low causing letdown isolation and increased charging flow. The crew will enter AB.CVC-0001, take manual control of charging and restore letdown.

E. When letdown has been restored a SGTL will occur on 23 SG. The CRS will enter AB.SG-0001 and direct the crew to perform actions to address the SGTL. During the SGTL, the SG tube will rupture. The CRS will direct a manual SI initiation.

F. The RO will manually initiate SI and commence the Immediate Actions of EOP-TRIP-1. The CRS will perform EOP-TRIP-1 and transition to EOP-SGTR-1. After the ruptured SG is isolated the 23MS10 will fail partially open in Automatic. The crew will take manual control of 23MS10.

G. The crew will perform actions of EOP-SGTR-1 to cool down and depressurize the RCS, and subsequently terminate SI flow.

IV. INITIAL CONDITIONS

____ Presnapped IC-241 from portable exam drive

MALFUNCTIONS:

SELF-CHECK	Description	Delay	Ramp	Trigger	Severity
____ 1.	PR0017A Pzr Lvl CH I (LT459) Fails H/L	NA	NA	RT-2	0
____ 2.	SG0078C 23 SG Tube Rupture	NA	3:00	RT-4	25
____ 3. *	CV0208A 21 CV pump Trip *	NA	NA	ET-3	Tripped
____ 4. *	CV0208B 22 CV pump Trip *	NA	NA	ET-3	Tripped

* See note on page 12

REMOTES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Condition
____ 1.	AF26D 22 AFW Pump Rack Out	NA	NA	NA	Tagged
____ 2.	AF25D 22 AFW Pump Bkr Cont Pwr	NA	NA	NA	Off
____ 3.	DG17D 2B DIESEL GEN ISOCH/DROOP SW	NA	NA	RT-1	Droop
____ 4.	DG19D 2B DIESEL GEN LOCKED OUT	NA	NA	RT-12	L/ Out
____ 5. *	DG03D DEENERGIZE "C" SEC CABINET *	NA	NA	ET-3	Yes
____ 6. *	DG02D DEENERGIZE "B" SEC CABINET *	NA	NA	ET-3	Yes
____ 7.	MS06A 23MS45 23 STM GEN STM SUP-23 AFP	NA	NA	Et-10	0
____ 8.	AF01D 23 AUX FP TRIP RESET	NA	NA	ET-11	Reset

* See note on page 12

OVERRIDES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Action
____ 1.	CD01 OVDI 2B DIESEL GEN-AUTO	NA	NA	NA	On
____ 2.	CD01 OVLO 2B DIESEL GEN-AUTO	NA	NA	NA	On
____ 3.	CD01 OVLO 2B DIESEL GEN-LOCAL MANUAL	NA	NA	NA	Off
____ 4.	CF15 OVAO 23MS10 SP	:20	NA	RT-5	1045
____ 5.	CF16 OVDI 23MS10 Press SP Decrease	:20	NA	RT-5	On
____ 6.	CF16 OVLO 23MS10 Press SP Decrease	:20	NA	RT-5	Off

EVENT TRIGGERS:

SELF-CHECK	ET#n	Discription	Command
____ 1.	ET-3	Monp254<10	

TAGGED EQUIPMENT:

	Description
____	1. RH1 and RH2
____	2. VC 1-4
____	3. RH 18's
____	4. RCPs (SELF CHECK)
____	5. RT (SELF CHECK)
____	6. MS 167s (SELF CHECK)
____	7. 500 KV SWYD (SELF CHECK).
____	8. 23 CV Pump (SELF CHECK)
____	9. 22 AFW Pump (C/T)

OTHER CONDITIONS:

	Description
____	1. Ensure Channel 1 Pressurizer Level selected for control

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.

E. Do not review objectives with crew

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
1. Power Reduction to 85%		
Reactivity plan per the turnover sheet	• CRS briefs crew on evolution	
IO.ZZ-0004 will be entered but no major action is required until 85% CRS may decide to perform power reduction IAW AB.LOAD-0001	• CRS implements S2.OP-IO.ZZ-0004 • CRS may review AB.CN for contingent actions for loss of a CN pump • CRS directs RO/PO to commence a power reduction to 85% at 20%/hr • PO sets-up DEHC for correct reduction and rate IAW S2.OP-SO.TRB-0002 • CRS directs RO to commence a boration at rate and gallon amount as determined during brief IAW S2.OP-SO.CVC-0006 • RO monitors reactor parameters to maintain Tavg within programmed value • PO monitors main turbine response and trends Main turbine parameters on plant computer • PO monitors SGFP suction pressure to ensure it remains greater than 320 psig • PO monitors condenser Delta T's	
Proceed to next event when the power reduction has proceeded to the satisfaction of the lead evaluator	• CREW reviews S2.OP-SO.CN-0001 to remove 21 Condensate pump from service	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
2. 2B EDG Lube Oil Leak		
Insert RT-1 (EDG trouble alarm) at direction of lead Evaluator	• PO reports console alarm for 2B EDG trouble	
After 2 mins report as primary NEO that alarm is for crankcase level low and that there is a significant oil leak on the flange of the oil heater outlet check valve 2DA36B	• CRS dispatches primary NEO to investigate trouble alarm	
Crew may decide to suspend load reduction if not completed until Diesel actions are complete	• Crew reviews print and determines that leak is not isolable	
Insert RT-12 when directed to secure the pre-lube pump and Lock Out Diesel	• CRS directs to NEO to secure the 2B pre-lube pump and lock out 2B EDG	
If crew requests EDG operator to reset local alarm then insert RT-11	• PO reports OHA J-12 and Aux Alarm when 2B EDG locked out	
	• CRS refers to TS and enters TSAS 3.8.1.1.b action b	
Report as WCC supv that 3RD NCO will perform line surveillance	• CRS requests 3rd NCO to perform Line surveillance	
Proceed to next event when TS determination is made	• CRS reviews OOS equipment and determines no additional equipment needs to be declared Inoperable.	
	• If stopped, CRS briefs re-commencing load reduction to remove CN pump	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
3. Pressurizer Level Channel 1 Fails Low		
Enter RT-2, PZR Lvl Channel 1 fails to 0		
	• RO responds to OHA E-36 "Pzr Htr Off Level LO" and reports that Pressurizer level Channel 1 has failed low, PZR heaters are off, and Letdown is isolated	
	• RO requests permission to take charging pump master flow controller to manual and stabilize PZR level	
	• CRS concurs with RO assessment and directs master flow controller placed in manual	
This may have been completed during EDG leak	• CRS may direct load reduction stopped and boration secured	
	• CRS enters S2.OP-AB.CVC-0001	
	• CRS directs PO to implement CAS	
	• RO reports charging pump is in service	
	• RO reports CV pump is not cavitating	
	• RO reports that controlling pressurizer level channel 1 is failed	
Flow may already be in manual	• RO adjust master flow controller to control PZR level	
	• RO selects channel 3 for controlling channel	
	• RO restores Pressurizer Heaters	
CRS may direct RO to restore letdown, but should then insure PO is monitoring reactor	• PO restores letdown	
	• CRS conducts brief and discusses	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	contingent actions. Also during brief informs crew that TSAS 3.3.1.1. act 6 is applicable.	
Auto make-up may occur due to letdown isolation	• CRS directs RO to restore PZR level to program and place master flow controller to AUTO when Pressurizer level is restored to program	
Proceed to next event when letdown is restored or at the direction of the lead evaluator	• CRS requests I&C assistance to remove failed channel from service	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
4. Tube Leak on 23 SG		
ENTER RT-4 23 SGTL, 25 GPM after letdown is restored as directed by Lead evaluator		
	• RO reports OHA A-6 "RMS HI Rad or Trouble" verifies on CRT 2R53C in alarm	
Crew may enter AB.RAD-0001 then transition to AB.SG-0001	• CRS directs monitoring of 2R19C and 2R15 to confirm status of SGTL	
	• PO informs CRS that 2R19C and 2R15 are rising as expected for tube leak	
	• PO acknowledges multiple re-flashes of A-6 for alarms on 2R15, 2R19C and 2R41d	
	• PO reports Blowdown is isolated	
	• CRS enters S2.OP-AB.SG-0001	
	• CRS directs RO to implement Attachment 1 CAS	
	• CRS requests SM implement ECG	
	• CRS directs NEO to de-energize turbine and polisher area sumps	
RO may initially report PZR level as stable due to slow ramp of SGTL and restoration of PZR level from loss of letdown	• RO reports PZR level lowering slowly	
	• CRS directs a swap to centrifugal charging pump	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
Sim Driver: **If 21 CV pump is started delete MALF:CV0208B and REM: DG02D from ET-3** **If 22 CV pump is started then delete MALF:CV028A and REM:DG03D from ET-3**	• RO places a centrifugal charging pump in service by performing the following: o Closing CV55 o Starts 21 or 22 CV Pump o Places 23 CV pump in manual and lowers speed o Adjust CV55 to maintain stable charging flow and seal injection flow o Stops 23 CV Pump o Places CV55 in automatic	
Due to small size of leak, PZR level can be stabilized and CRS may decide to not reduce letdown	• CRS directs letdown flow to minimum • RO reduces letdown to minimum	
At some point during performance of AB.SG-0001 the CRS may stop to have a brief and discuss actions and contingencies	• RO adjusts charging to stabilize Pressurizer level and estimate leak rate	
Leak rate is >75 gpd and has increased at >30 gpd/hr **Once shut down determination is made, when directed by the lead examiner, Modify SG0078B to 950 gpm no ramp** **Record Time: ____ : ____ : ____**	• CRS determines that Action level 3 is met and Unit must be less than 50% power in 1 hour and must be in Mode 3 in the next 2 hours	
Depending on timing of SGTR crew may isolate 23MS45 per AB.SG. Crew should then determine that a 6 hr to HSB TSAS exists	• RO informs CRS that leak rate has increased and PZR level is lowering rapidly • CRS briefs crew that leak is beyond capacity of makeup system and directs a Rx trip and SI	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
5. SGTR **ET-3 will enter on Reactor Trip to trip in-service CV pump and de-energize SEC for bus with remaining pump**	• RO trips reactor, confirms Rx trip and initiates SI	
	• RO performs I/As of EOP-TRIP-1	
	• CRS enters EOP-TRIP-1	
	• CRS confirms immediate actions	
	• RO announces reactor trip and request SM and STA report to control room	
CAS item to isolate 23 SG		
CT#1 (E-3 -A) Close 23AF11 and 21 within 10 min of identification of rupture and complete isolation of Ruptured Steam Generator **Time of Isolation: ____:____:____** SAT _____ UNSAT _____	• When Immediate Actions are complete PO requests permission to throttle AFW and isolate 23 SG by closing 23AF11 and 21	
Valves required for SG isolation 23MS167, 23MS18, 23MS7, 23GB4, 23MS45	• CRS directs isolation of 23 SG	
	• CREW continues with EOP-TRIP-1	
	• RO informs CRS that BIT flow is zero	
	• PO evaluates AFW status and SEC Loading and reports that 22 AFW Pump is unavailable and multiple equipment from C (or B depending on CV pump previously started) bus failed to load, and 21 (or 22) CV pump has tripped	
	• CRS directs B and C SECs blocked and	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	reset	
CRS may dispatch an operator to de-energize C(B) sec, if so after 2 min report as NEO that C(B) sec was discovered Tripped	• PO determines that C (B) SEC is de-energized and resets B (C)SEC	
	• RO attempts to start 21 (22) CV pump and informs CRS that it is tripped	
CT#2 (E-0 -- I): Establish flow from at least 1 high-head ECCS pump before transition from EOP-TRIP-1 SAT _____ UNSAT_____	• CRS directs C bus equipment started including: 22 CV pump, 22 SI pump, 23 and 25 CFCU in low speed, 2 ECAC, 21 Aux bldg supply fan, and 23 Aux bldg exh fan and directs 23SW20 closed	
If B SEC is used RO will start; 22 RHR, 22 and 24 CFCU, 21 CV pump, and attempt to start 22CV pump and close 2SW26	• RO determines containment pressure has remained less than 15 psig	
	• CRS conducts brief to discuss plant status and minimizes length due to time critical nature of SGTR	
	• PO verifies all Vital busses energized	
	• RO verifies CAV and Swgr vent status	
	• RO verifies 2 CC pumps running	
	• RO evaluates SI status as within limits, and BIT flow is restored.	
	• PO maintains AFW flow >22E4 lbm/hr until 1 SG is greater than 9% and then throttles to maintain 9-33%	
	• RO informs CRS that RCS temperature is stable at 547°F	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	• RO reports Reactor Trip Breakers are open	
	• RO reports both Pressurizer PORVs are closed, and block valves are open	
	• PO evaluates all steam generator pressure are stable or rising and no faulted steam generator exist	
	• CREW transitions to SGTR-1 based on 23 SG Level rising in an uncontrolled manner	
	• CREW identifies 23 SG as ruptured SG	
Depending on timing of AB this may have been accomplished in AB-SG	• PO adjusts 23MS10 setpoint to 1045 psig	
Insert RT-5 after 23MS167 is closed. RT-5: 23MS10 setpoint fails low	• PO closes 23MS7, 18, 167 and GB4	
	• PO informs CRS that 23MS10 is opening prior to SP is causing 23 SG to depressurize	
	• CRS directs PO to take manual control and close 23MS10	
With 23MS10 in manual PO will have to control pressure in 23SG to prevent lifting a SG safety valve. CRS should designate a band of pressure control for PO	• PO places 23MS10 in manual and closes the valve.	
If the 23MS45 was closed in the AB, then there is no need to trip the pump as the release path is isolated	• PO determines 23 AFW pump is not required to maintain feed flow since 21 AFW pump feeds 23/24 SGs and can provide sufficient AFW flow for cooldown	
PO maintains 22e4 AFW flow to 24 SG using 24AF21 unless 1 SG level is	• PO trips and stops 23 AFW pump	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
>9%		
CRS may request 23 AFW pump reset when 23MS45 is closed to allow feeding 21 and 22 SG, he also may request 21 and 22AF923 crossties opened. This will also require restoration of Control power to 22 AFW pump or manual control of AF21s	• CRS dispatches and NEO with RAD PRO to close 23MS45	
After 3 mins Insert RT-10 and inform CRS that 23MS45 is closed.	• CRS dispatches an operator to close 2SS333 • PO determines 23 SG is isolated from intact SGs and feed flow should remain isolated	
IF directed insert RT-11 to reset 23 AFW pump, CRS should brief operator that pump may start when reset if SG levels are not restored	• CRS directs 23AFW pump trip reset • RO reports PORVs closed and block valves open • PO determines no SG is faulted • CREW resets safeguards and opens 21 and 22CA330s • RO stops both RHR pumps • PO evaluates 23 SG as greater than 375 and not faulted • CRS dispatches operator to shift Gland seal supply to U1 • CREW determines target temperature is 503°F	
AFW status should not delay initiation of cooldown; all intact SGs should be used for cooldown.	• CREW commences rapid cooldown to target temperature	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	• PO selects bypass Tavg when RCS is <543°	
CT# 3 (E-3 -B): Establish/maintain an RCS temperature so that a transition from SGTR-1 does not occur SAT _____ UNSAT _____	• PO cools down at max rate using main steam dumps	
PO must set steam dumps to insure RCS temperature is maintained below target to insure Subcooling during subsequent depressurization	• PO stops cooldown when target temperature is reached and dumps steam to stabilize temp	
	• PO determines 23 SG press is stable	
	• RO reports subcooling >20°	
CT# 4 (E-3 --C): Depressurize RCS until Ruptured SG and RCS pressure are equal and PZR level is ≥ 11% with Subcooling >0, before water release from ruptured SGPORV or Safety valve SAT _____ UNSAT _____	• CREW terminates SI	
NOTE: 50 FSAR time criteria for SGTR mitigation is not applicable in this scenario due to multiple additional malfunctions (23MS10 Failure and SEC failure with Charging pump trip). This is not the design basis event.		
Evaluator Note: ECG Classification is ALERT IAW EAL 3.2.3.a. Upgrade to SAE based on failed MS10 should not be made as malfunctioning valve was isolable from the control room		
Terminate scenario when Depressurization is complete or at discretion of lead evaluator		

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments

VI. SCENARIO REFERENCES

A. Alarm Response Procedures (Various)

B. Technical Specifications

C. Emergency Plan (ECG)

D. SC.OP-AP.ZZ-0102(Q), Use of Procedures

E. S2.OP-SO.CN-0001 – Condensate System Operation

F. S2.OP-SO.CVC-0006 – Boron Concentration Control

G. S2.OP-IO.ZZ-0004 – Power Operation

H. S2.OP-AB.CVC-0001 – Loss of Charging

I. S2.OP-AB.SG-0001 – Steam Generator Tube Leak

J. 2-EOP-TRIP-1 - Reactor Trip or Safety Injection

K. 2-EOP-SGTR-1 – Steam Generator Tube Rupture

VII. ESG CRITICAL TASK RATIONAL

CT#1 (E-3 --A): Close 21AF11 and 21 within 10 min on identification of fault and complete isolation of Ruptured Steam Generator

Basis Failure to isolate the ruptured SG causes a loss of differential pressure between the ruptured SG and intact SGs. Upon loss of differential pressure the crew must transition to a contingency procedure that "necessitates the crew taking compensating action that complicates the event mitigation strategy..."

For feedwater, isolation must occur after ruptured SG level exceeds minimum indication (9%)...Any delay in the AFW isolation allows the ruptured SG level to increase as the AFW adds additional inventory along with the primary to secondary leakage. Too long a delay (>10 min) prevents the crew from depressurizing and terminating SI before excessive inventory seriously damages the SG as a fission product barrier.

CT#2 (E-0 -- I): Establish flow from at least 1 high-head ECCS pump before transition from EOP-TRIP-1

Basis Failure to manually start at least 1 high-head ECCS pump under the postulated conditions constitutes "mis-operation or incorrect crew performance which leads to degraded ECCS...Capacity

CT#3 (E-3 --B) Establish/maintain an RCS temperature so that a transition from SGTR-1 does not occur

Basis Failure to establish and maintain correct RCS temperature during a SGTR leads to a transition from SGTR-1 to a contingency procedure, which constitutes an incorrect performance that "necessitates the crew taking compensating action that complicates the event mitigation strategy..."

CT# 4 (E-3 --C) Depressurize RCS until Ruptured SG and RCS pressure are equal and PZR level is $\geq$11% with Subcooling >0, before water release from ruptured SG PORV or Safety valve

Basis Failure to stop reactor coolant leakage into a ruptured SG by depressurizing the RCS needlessly complicates mitigation of the event. It also constitutes a "significant reduction of safety margin beyond that irreparably introduced by the scenario

VIII. ESG - PSA RELATIONSHIP EVALUATION

S-ILT-2008 NRC ESG-1
SALEM ESG - PRA RELATIONSHIPS EVALUATION FORM

EVENTS LEADING TO CORE DAMAGE

Y/N	EVENT	Y/N	EVENT
N	TRANSIENTS with PCS Unavailable	N	Loss of Service Water
Y	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
N	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	N	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	Y	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
N	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
Y	Cooldown the RCS and depressurize the system
Y	Isolate the affected Steam generator which has the tube ruptures
Y	Early depressurize RCS
N	Initiate feed and bleed

Complete this evaluation form for each ESG.

UNIT TWO PLANT STATUS TODAY

MODE:	1	POWER:	100	RCS BORON:	731	MWe: 1200

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

N/A

REACTIVITY PARAMETERS

Core Burn-up 10,500 MWD/MTU

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

3.7.1.2.a action a. 22 AFW pump C/T for replacement of failed bearing

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

Shutdown to 85% at 20% per hour to support removal of 21 condensate pump from service, due to motor vibrations, RX engineering has been notified to prepare a reactivity plan. Operations manager has directed that load reduction be started using the preplanned Reactivity guidance.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

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

PRIMARY:

NONE

SECONDARY:

Heating steam is aligned to unit 1.

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

X. SIMULATOR ESG REVIEW/VALIDATION CHECKLIST

Note: Attach a separate copy of this form to each scenario reviewed. This form is used as guidance for the examination team as they conduct their review for the proposed scenarios.

EXAMINATION SCENARIO GUIDE (ESG) REVIEW/ VALIDATION

Note: This form is used as guidance for an examination team to conduct a review for the proposed exam scenario(s). Attach a separate copy of this form to each scenario reviewed.

SELF-CHECK **ESG-** "J" ILT NRC-ESG-001 **REVIEWER:** Ed Gallagher

____ 1. **THE SCENARIO HAS CLEARLY STATED OBJECTIVES IN THE SCENARIO.**

____ 2. The initial conditions are realistic, equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.

____ 3. 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), and
- The event termination point.

____ 4. The use of non-mechanistic failures (e.g. pipe break) should be limited to one or a credible preceding event has occurred.

____ 5. The events are valid with regard to physics and thermodynamics.

____ 6. Sequencing/timing of events is reasonable (e.g. the crew has time to respond to the malfunctions in an appropriate time frame and implements procedures and/or corrective actions).

____ 7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.

____ 8. If time compression techniques are used, scenario summary clearly so indicates.

____ 9. The simulator modeling is not altered.

____ 10. All crew competencies can be evaluated.

____ 11. Appropriate reference materials are available (SOERs, LERs, etc.).

____ 12. 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.

____ 13. Proper critical task methodology is used IAW NRC procedures.

____ 14. ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

SCENARIO: J ILT NRC-ESG-1 **REVIEWER:** Ed Gallagher

INITIAL		TARGET QUANTITATIVE ATTRIBUTES
EG	5	• Total malfunctions inserted: 5-8
EG	2	• Malfunctions that occur after EOP entry: 1-2
EG	2	• Abnormal Events: 2-4
EG	1	• Major Transients: 1-2
EG	1	• EOPs requiring substantive actions (not including TRIP-1): 1-2
EG	0	• EOP Contingency Procedures used: 0-2
EG	84	• Approximate scenario run time: 75-90 minutes
EG	50%	• EOP run time: 40-70% of scenario run time
EG	4	• Crew Critical Tasks: 2-3

COMMENTS:

ATTACHMENT 1
SIMULATOR READY-FOR-TRAINING CHECKLIST

_____ 1. Verify simulator is in correct load for training

_____ 2. All required computer terminals in operation

_____ 3. Simulator clocks synchronized

_____ 4. Required chart recorders advanced and ON (proper paper installed)

_____ 5. Rod step counters correct (channel check)

_____ 6. All tagged equipment properly secured and documented (TSAS Log filled out)

_____ 7. DL-10 log up-to-date

_____ 8. Required procedures clean

_____ 9. All OHA lamps operating (OHA Test)

_____ 10. All printers have adequate paper AND functional ribbon

_____ 11. Procedure pens available

_____ 12. Procedures in progress open and signed-off to proper step

_____ 13. Shift manning sheet available

_____ 14. SPDS reset

_____ 15. Reference verification performed with required documents available

_____ 16. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter with Baseline Data filled out

_____ 17. Required keys available

_____ 18. Video Tape (if applicable)

_____ 19. Ensure ECG Classification is correct - - 960502140 CRCA-03

_____ 20. Reset P-250 Rod Counters

ATTACHMENT 2
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

A. 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 3

ESG PRE-JOB BRIEF CHECKLIST

EXAMINATION SCENARIO GUIDE (ESG) Pre-Job Brief Checklist

Note: This checklist is to be completed by the Lead Examiner prior to evaluating an ESG. The Lead Examiner should lead a pre-job brief with all the examiners and simulator operators that includes, but is not limited to the following:

ESG: "J" ILT NRC-ESG-001 Lead Examiner: _____

____ 1.ESG overview and sequence of major events.

____ 2.Determine which optional events will be performed, if any.

____ 3.ESG summary of Critical Tasks.

____ 4.Assign examiners to observe specific watch standers.

____ 5.Assign examiner ownership for observing and documenting performance / non-performance of Critical Tasks.

____ 6.Review alternate path(s) identified by the ESG.

____ 7.Assign examiner to document data related to the performance of Critical Tasks.

____ 8.Determines what parameters will be recorded in "Data Collection."

Ensure SOE recorder is recording.

SIMULATOR EXAMINATION SCENARIO

SCENARIO TITLE: Large Break LOCA with loss of Recirc

SCENARIO NUMBER: J ILT NRC ESG-002

EFFECTIVE DATE: 8/19/2008

EXPECTED DURATION: 1.5 hours

REVISION NUMBER: 00

PROGRAM:

- [ ] **L.O. REQUAL**
- [X] **INITIAL LICENSE**
- [ ] **STA**
- [ ] **OTHER** _____

Revision Summary:

Rev 0: New Issue for J ILT NRC exam

PREPARED BY:	Ed Gallagher **(INSTRUCTOR)**	6/6/08 **(DATE)**
APPROVED BY:	**(OPERATIONS TRAINING MANAGER OR DESIGNEE)**	6/27/08 **(DATE)**
APPROVED BY:	**(OPERATIONS MANAGER OR DESIGNEE)**	6-29-08 **(DATE)**

I. OBJECTIVES

Enabling Objectives

A. Given the unit in hot standby (mode 3) during a reactor startup, DIRECT actions to startup the reactor to the Point Of Adding Heat (POAH) by control rods or dilution in accordance with the approved station procedures.

B. Given the unit in mode 3, the crew will perform a reactor startup to the POAH, in accordance with S2.OP-IO.ZZ-0003 (Q).

C. Given a failure of an intermediate range instrument, take corrective action for an intermediate range instrument failure IAW AB.NIS-0001.

D. Given indications of a loss or malfunction of a safety related electrical distribution system, DIRECT the response to the loss or malfunction in accordance with the approved station procedures.

E. Given the order or indications of a loss or malfunction of a safety related electrical distribution system, perform actions as the nuclear control operator to RESPOND to the loss or malfunction in accordance with the approved station procedures.

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

G. 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.

H. Given a loss of coolant accident (LOCA) and a loss of emergency recirculation, DIRECT actions to respond to the emergency recirculation loss in accordance with the approved station procedures.

I. Given the order or a loss of coolant accident (LOCA) with indication of a loss of emergency recirculation, perform actions as the nuclear control operator to RESPOND to the loss of emergency recirculation in accordance with the approved station procedures.

II. MAJOR EVENTS

A. Power Increase to POAH

B. Intermediate Range NI channel fails Low

C. D Vital Instrument Bus Fails causing loss of Rod Control

D. RCS leak progressing to LB LOCA

E. Loss of Emergency Recirculation

III. SCENARIO SUMMARY

A. The crew will receive the unit at 10 e-8 in the intermediate range with all systems in automatic. Orders to the shift are to raise power, place the Unit in Mode 1, and prepare for placing the turbine on line.

B. Once the crew takes the watch they will initiate a power increase at <1 decade per min.

C. Once the power increase is underway Intermediate Range N35 will fail low. Crew will remove the channel from service, review Tech Specs and determine power must be maintained <5%

D. After the TSAS has been evaluated for the N35, the crew will be told to stabilize power in the power range. As power is approaching the POAH D Vital instrument bus will deenergize. This will cause a loss of Rod Control, the steam dumps will fail closed and 21 and 24MS10 will have local control only. The Crew will decide that there is no positive control of the reactor and initiate a reactor trip.

E. When the Reactor trips 22AFW pump will trip, the PO will compensate by feeding 21 and 22 SG with the 23 AFW pump.

F. After the crew transitions to EOP-TRIP-2 a large RCS leak will develop, the crew will initiate a safety injection and return to TRIP-1. After the crew initiates an SI a DBA LOCA will occur. The crew will initiate Containment Spray.

G. The crew will perform actions of EOP-LOCA-1 and transition to LOCA-3 in LOCA-3 the Crew will determine that recirc is not available and will transition to LOCA-5. In LOCA-5 the crew will initiate makeup to the RWST and reduce ECCS flow. The scenario will end when major actions of LOCA-5 are complete.

IV. INITIAL CONDITIONS

____ Presnapped IC-242 from portable exam drive

MALFUNCTIONS:

SELF-CHECK	Description	Delay	Ramp	Trigger	Severity
____ 1.	NI0197A IR CH N35 NOISY	NA	NA	RT-1	10
____ 2.	NI0297A IR CH N35 FAILS HI/LO	:30	NA	RT-1	0
____ 3.	EL0150 LOSS OF 2D VITAL INSTRUMENT BUS	NA	NA	RT-2	NA
____ 4.	RC0002 RCS LEAK INTO CONTAINMENT	NA	1 min	RT-3	10000
____ 5.	RC0001B RCS RUPTURE OF RC LOOP 22	NA	NA	RT-4	NA
____ 6.	RH0026B 22 RHR PUMP TRIP	NA	3:00	ET-5	NA
____ 7.	AF0181 22 AUX FEEDWATER PUMP TRIP	NA	NA	NA	NA
____ 8.	RP0277A AUTO CNT SPRAY FAILS TR A	NA	NA	NA	NA
____ 9.	RP0277B AUTO CNT SPRAY FAILS TR B	NA	NA	NA	NA
____ 10.	VL0120 21SJ44 Fails to Position	NA	NA	NA	0
____ 11.	AN0490 SER 490 FAILS - :D40 SUBCOOLING	NA	NA	NA	NA
____ 12.	AN0491 SER 491 FAILS - :D48 SUBCOOLING	NA	NA	NA	NA
____ 13.	VC0173A 21 CNTMT FAN COIL UNIT TRIP	:10	NA	RT-4	NA

REMOTES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Condition
____ 1.	CV20A 2CV182 BLENDER ISO VLV		:20	RT-12	100
____ 2.	CV21A 2CV184 BLENDER DISC TO RWST	:45	:20	RT-12	100
____ 3.	CN23D FAIL OPEN 21BF32 - ISOLATE AIR	NA	NA	NA	ISOL

OVERRIDES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Action
____ 1.	AH03 OVLO RWST HEATER PUMP START	NA	NA	RT-11	ON
____ 2.	AH03 OVLO RWST HEATER PUMP STOP	NA	NA	RT-11	Off

EVENT TRIGGERS:

SELF-CHECK	ET#n	Discription	Command
____ 1.	ET-5	GAI09ALK<0.35	

TAGGED EQUIPMENT:

	Description
____ 1.	RH1 and RH2
____ 2.	VC 1-4
____ 3.	RH 18's
____ 4.	RCPs (SELF CHECK)
____ 5.	RT (SELF CHECK)
____ 6.	MS 167s (SELF CHECK)
____ 7.	500 KV SWYD (SELF CHECK).
____ 8.	23 CV Pump (SELF CHECK)

OTHER CONDITIONS:

	Description
____ 1.	NR45 Recorder selected to IR on Pen 1 and PR on Pen 2 N35 selected on Pen 1
____ 2.	IOP-3 Marked up to Step 5.4.1

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.

E. Do not review objectives with crew

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
1. Power Increase to POAH		
CREW will be provided with a IOP-3 marked up to step 5.4.1	• CRS briefs crew on evolution	
IF asked CRS will perform the duties of Reactivity SRO	• CRS implements S2.OP-IO.ZZ-0003	
	• CRS directs RO to commence a rod withdraw to establish a start-up rate of <1dpm	
	• PO monitors secondary plant for signs of nuclear heat and peer checks RO	
	• RO monitors reactor parameters for indication of IR to PR overlap	
	• RO monitors Delta T's for indications of POAH	
Proceed to next event when Start-up rate is established or at the direction of the Lead Evaluator		

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
2. Intermediate Range NI fails Low		
Enter RT-1, N35 erratic and then fails low **Sim Driver: Delete Malf NI0197A when Malf NI0297A becomes active (30 sec after RT-1)**	• RO reports N35 startup rate is erratic going from full scale hi to low	
Crew should decide to suspend power increase until IR NI is addressed	• RO reports that Intermediate range NI channel 1 has failed low • CRS directs RO to insert rods to stabilize Reactor Power • CRS enters S2.OP-AB.NIS-0001 • RO reports a power range NI has NOT failed • RO N35 has failed Low • CRS directs PO to remove failed channel from service IAW S2.OP-SO.RPS-0001. • PO reviews SO.RPS-0001 and discusses possibility of Rx Trip • At NI rack PO places N35 level trip bypass to bypass • RO verifies OHA for level trip bypass • PO removes Instrument power fuses for 2N35 • PO verifies proper bistables on 2RP4	
As SM inform CRS to stabilize Reactor power at 2% in the Power Range until 2N35 can be repaired	• CRS conducts brief and discusses contingent actions. Also during brief informs crew that TSAS 3.3.1.1. act 3 is applicable.	
Proceed to next event when startup rate is restored, at direction of Lead Evaluator		

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
3. Loss of D Vital Instrument Bus		
ENTER RT-2 Loss of D VIB		
	• RO reports multiple OHAs including B-27, 2D VTL INSTR BUS INVERT FAIL, also loss of indication for all CH 4 instruments.	
	• CRS directs RO to insert Rods to stabilize Reactor Power	
	• RO informs CRS that Rods do not respond	
	• CRS enters AB.115-0004	
	• PO monitors CAS	
	• RO defeats CH 4 inputs to Tavg and ΔTs	
	• CRS dispatches an operator to D VIB	
	• CRS directs maintenance to jumper power to level comparator for L/D isolation and PZR heater interlock	
With a power increase in progress and no rod control or steam dumps available, the crew may determine that a reactor trip is warranted. This decision may be made when the instrument bus fails or when the AB is entered and the ROD control problem revealed	• CRS determines that ROD control is not available in auto or manual and Steam Dumps are not available • PO determines only 22MS10 available in auto • CRS dispatches and operator to locally control 2CV56	
CRS may direct 22MS10 set at current Steam Dump setpoint	• RO reports 23 CV pump operating with no indication of charging flow and no letdown	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
Crew should determine charging flow is about 40 gpm by PZR level rising, VCT level lowering, and seal injection indication on 2 RCPs 2CV71 is failed closed forcing all charging to the RCP seals	• Crew determines charging flow is occurring • CRS dispatches maintenance to install jumper to allow restoration of PZR heaters	
If CRS decides not to trip the Reactor then insert RT-3 at the discretion of Evaluation Team, otherwise insert RT-3 at Reactor TRIP RT-3: 10000 gpm RCS leak 1 min ramp	• CRS directs a RX Trip	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
4. LOCA with loss of Recirc		

NOTE: If reactor is tripped prior to AB.115-0004 being implemented Crew may initiate Main Steam Line Isolation due to steam flow indications with only 1 MS10 valve available	• RO performs Immediate actions
	  • Trips reactor
	  • Confirms Rx Trip
	  • Verifies Turbine Tripped
	  • Verifies SI not required by RP-4, F/O OHA but RCS pressure is dropping	

	• Crew initiates Safety Injection due to lowering Pressurizer Pressure	
Note: Due to trip from low power level AFW may not receive auto start signal, pumps will be manually started in EOP-TRIP-1	• PO throttles AFW at completion of Immediate Actions and informs CRS that 22 AFW pump has tripped	
	• RO announces Rx Trip and Safety Injection	
	• RO/PO performs SEC loading verification	
	• PO ensures 21 and 23 AFW pumps are running and throttles AFW flow to maintain Steam Generator level >9% or >22E4 lbm/hr feed flow.	
	• PO verifies Safeguards Valve Alignment is correct	
	• RO closes 21/22CA330	
	• RO reports Containment Spray not required	
	• RO determines MSLI isolation is not required	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
EVALUATOR NOTE: This action should be taken when RCS pressure <1500 psig with BIT flow established IAW TRIP-1 CAS.	• CREW closes CV139 and CV140 when RCS pressure is below 1500 psig with BIT Flow	
CT #1 (E-1-C) Trip all RCPs prior to RCS inventory becoming depleted to critical inventory. (within 5 mins of RCS pressure < 1350 with ECCS flow) SAT UNSAT	• CREW secures RCPs when RCS pressure is < 1350 with ECCS flow established	
Insert RT-4 after RCPs are stopped MALF: RC0001B LB-LOCA, and 21CFCU Trip	• RO reports containment pressure has exceeded 15 psig and Containment Spray has not auto actuated	
CT#2 (E0-E) Manually actuate the minimum required complement of containment cooling before an extreme challenge develops to the containment CSF SAT UNSAT	• CRS directs RO to initiate Containment spray • RO reports 21 CFCU has tripped	
Minimum required 1CS pump and 3 CFCU or 2CS pumps and 0 CFCU, both CS pumps should be started	• PO verifies all 4KV vital busses energized	
	• RO reports Control Room Ventilation in Pressurized Mode	
	• RO reports proper Switchgear Room Ventilation lineup.	
	• RO reports 2 CCW pumps running	
Note: No flow indication for 21 SI pump is due to the loss of D VIB, flow can be verified by amp indication on the pump and proper valve alignment	• RO evaluates ECCS flow	
	• RO/PO verifies AFW flow >22E04	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	lbm/hr or SG level >9%. • Crew verifies RCS temperature control. • RO/PO verifies reactor trip breakers open. • RO verifies PORVs closed and Block Valves open	
If not stopped previously the RCPs should be stopped at this point	• CREW identifies PZR Sprays not available and RCPs secured. • PO verifies no faulted SGs • PO verifies no SGTRs exist.	
Note: Transition to FRCE is time dependant as the containment pressure is lowering once spray is established	• RO/PO perform LOCA evaluation • CRS transitions to LOCA-1. • CRS transitions to FRTS-1 determines pressure <420 and SJ49 injection flow is established then FRCE-1 based on purple path • CRS performs verifications of FRCE-1 then transitions back to LOCA-1 • PO verifies no faulted SGs. • PO maintains SG levels • PO verifies no ruptured SGs	

Transition to LOCA-3 may occur before safeguard reset depending on Crew pace through the EOPs	• RO/PO resets Safeguards:
	  • Resets SI;
	  • Resets Phase A;
	  • Resets Phase B;
	  • Opens 21 & 22CA330;
	  • Resets each SEC; and	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	• Resets 230V Control Centers	
	• Crew evaluates SI flow reduction criteria	
When RWST level reaches 16 ft 22RHR pump will trip (ET-5)	• CRS determines spray pumps and RHR pumps should not be stopped	
	• RO reports trip of 22 RHR pump	
	• PO stops unloaded diesels	
	• Crew determines recirc capability is available and no Aux bldg rad monitors in alarm	
	• CRS requests Chemistry sample the RCS for failed fuel and boron	
	• CRS dispatches operator to isolate CCW to the spent fuel pool	
	• CRS transitions to LOCA-3 when RWST reaches 15.2'	
	• RO reports containment sump level is >62% and permissive lights lit	
21SJ44 failed closed is pre-inserted	• RO depresses "sump auto armed" for 21 and 22SJ44 valves	
	• PO removes lockout for 2SJ67 68 and 69	
Once crew determines 21SJ44 did not open with 22 RHR pump tripped, CRS may transition to LOCA-5 immediately IAW CAS action or attempt to manually open the 21SJ44 IAW LOCA-3 step 5.2	• RO reports 21SJ44 valve did not open	
	• RO/PO reset SI and Emerg Loading unless completed in LOCA-1	
	• RO stops 21 RHR pump	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	• RO closes 2SJ69 • RO reports 22 RHR pump is tripped • RO initiates closed on 21RH4 • RO initiates open on 21SJ44 • RO reports 21SJ44 did not open • CRS transitions to LOCA-5	
	• Crew resets or verifies Safeguards are reset • Crew determines Containment sump is >62% and recirc is not available	

INSTRUCTOR NOTE: 3 mins after being called to start RWST Heater insert RT-11 and inform CRS RWST heater pump is I/S
 	
Boric Acid setpoint ≈27 gpm or may be set to max
 	
When called to open 2CV182 & 184 enter RT-12.
 	
REMOTE: CV20A = 100
CV21A = 100
 	
CRS should not wait for RWST makeup but should continue to SI flow reduction
	• RO initiates makeup to the RWST IAW S2.OP-SO.CVC-0006
	  • RO calls NEO to start RWST Heater Pump
	  • RO determines Boric Acid flow setpoint from REM figure or sets to maximum
	  • RO place Makeup Control Mode Select in Stop
	  • RO places 2CV179 & 2CV172 in Manual
	  • RO calls NEO to ensure 2BR170 closed, and Open 2CV182 & 2CV184
	  • RO starts 21 or 22 Primary Water pump
	  • RO start 21 or 22 Boric Acid pump in manual fast
	  • RO adjust 2CV172 flow to >27 gpm
	  • RO adjust 2CV179 to ≥50 gpm	

	• CRS requests RX engineering monitor Shutdown margin • PO commences cooldown at 100°/hr	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	using 22 and 23MS10s	
	• RO verifies all CFCUs running in low speed	
CT-3 (ECA-1.1 -- B): Make up to the RWST and minimize RWST outflow prior to Lo Lo (1.2 ft) level in RWST where ECCS pumps must be stopped. SAT UNSAT	• CRS determines no spray pumps are required and directs RO to stop 21 and 22 CS pumps	
Scenario can be terminated when ECCS has been reduced to single train (1CV and 1 SI pump), CS pump has been stopped and RWST make-up is in progress	• RO resets spray actuation stops the pumps and closes 21 and 22CS2s • CRS directs 1 charging and 1 SI pump stopped	

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-0003 – Hot Standby to Minimum Load

F. S2.OP-AB.NIS-0001 – Nuclear Instrumentation System Malfunction

G. S2.OP-AB.115-0004 – Loss of 2D 115V Vital Instrument Bus

H. 2-EOP-TRIP-1 - Reactor Trip or Safety Injection

I. 2-EOP-FRTS-1, Response to Imminent Pressurized Thermal Shock

J. 2-EOP-FRCE-1, Response to Excessive Containment Pressure

K. 2-EOP-LOCA-1, Loss of Reactor Coolant

L. 2-EOP-LOCA-3, Transfer to Cold Leg Recirculation

M. 2-EOP-LOCA-5, Loss of Emergency Recirculation

N. S2.OP-SO.CVC-0006, Boron Concentration Control

VII. ESG CRITICAL TASK RATIONAL

CT#1 (E-1-C) Trip all RCPs prior to RCS inventory becoming depleted to critical inventory. (within 5 mins of RCS pressure < 1350 with ECCS flow)

Basis Failure to trip the RCPs under the postulated plant conditions leads to core uncovery and to fuel cladding temperatures in excess of 2200°. Thus, failure to perform the task represents "mis-operation or incorrect crew performance which leads to the degradation of a barrier to fission product release.

WOG sponsored analysis to demonstrate that the operating crew would have sufficient time (from the point at which the criteria was met) to recognize the indications that the criteria are met and trip RCPs before the window for adverse consequence begins...The minimum response time for the operating crew is 5 minutes... if the RCPs are tripped within 5 minutes of the trip criteria being met, PCT remains below 220

CT#2 (E-0-E) Manually actuate the minimum required complement of containment cooling before an extreme challenge develops to the containment CSF

Basis Failure to manually actuate the minimum required complement of containment cooling under postulated conditions constitutes a "demonstrated inability by the crew to recognize a failure/incorrect auto actuation of an ESF system or component". Since the spray can be manually initiated from the control room, failure to manually actuate represents a "demonstrated inability of the crew to effectively manipulate ESF controls that would lead to violation of the facility license condition. Additionally, under the postulated conditions, failure to manually actuate results in a significant reduction of safety margin beyond that irreparably introduced by the scenario.

CT#3 (ECA-1.1 -- B): Make up to the RWST and minimize RWST outflow prior to Lo Lo level where ECCS pumps must be stopped

Basis Under the postulated plant conditions, failure to establish make up flow to the RWST and/or to minimize RWST outflow leads to or accelerates depletion of the RWST inventory to the point at which the ECCS pumps taking suction on the RWST must be stopped. Loss of pumped injection coincident with loss of emergency cooling Recirculation will lead to a severe or an extreme challenge to the core cooling CSF. Failure to perform the critical task causes these challenges to occur needlessly or, at best, prematurely. Thus failure to perform the critical task leads to "significant reduction in safety margin beyond that irreparably introduced by the scenario." It also represents "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plant safety"

VIII. ESG - PSA RELATIONSHIP EVALUATION

S-ILT-2008 NRC ESG-2
SALEM ESG - PRA RELATIONSHIPS EVALUATION FORM

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	N	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 which has the tube ruptures
N	Early depressurize RCS
N	Initiate feed and bleed

Complete this evaluation form for each ESG.

UNIT TWO PLANT STATUS
TODAY

MODE: 2 POWER: 0 RCS BORON: MWe: 0

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

N/A

REACTIVITY PARAMETERS

Core Burn-up 10,500 MWD/MTU, reactivity plan provided

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

Raise power into the power range and stabilize at 2-4% Reactor power in preparation for transition to Mode 1

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

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

PRIMARY:

NONE

SECONDARY:

Heating steam is aligned to unit 1.

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

X. SIMULATOR ESG REVIEW/VALIDATION CHECKLIST

Note: Attach a separate copy of this form to each scenario reviewed. This form is used as guidance for the examination team as they conduct their review for the proposed scenarios.

EXAMINATION SCENARIO GUIDE (ESG) REVIEW/ VALIDATION

Note: This form is used as guidance for an examination team to conduct a review for the proposed exam scenario(s). Attach a separate copy of this form to each scenario reviewed.

SELF-CHECK **ESG-** "J" ILT NRC-ESG-002 **REVIEWER:** Ed Gallagher

____ 1. **THE SCENARIO HAS CLEARLY STATED OBJECTIVES IN THE SCENARIO.**

____ 2. The initial conditions are realistic, equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.

____ 3. 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), and
- The event termination point.

____ 4. The use of non-mechanistic failures (e.g. pipe break) should be limited to one or a credible preceding event has occurred.

____ 5. The events are valid with regard to physics and thermodynamics.

____ 6. Sequencing/timing of events is reasonable (e.g. the crew has time to respond to the malfunctions in an appropriate time frame and implements procedures and/or corrective actions).

____ 7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.

____ 8. If time compression techniques are used, scenario summary clearly so indicates.

____ 9. The simulator modeling is not altered.

____ 10. All crew competencies can be evaluated.

____ 11. Appropriate reference materials are available (SOERs, LERs, etc.).

____ 12. 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.

____ 13. Proper critical task methodology is used IAW NRC procedures.

____ 14. ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

SCENARIO:

REVIEWER:

INITIAL		TARGET QUANTITATIVE ATTRIBUTES
EG	7	• Total malfunctions inserted: 5-8
EG	3	• Malfunctions that occur after EOP entry: 1-2
EG	2	• Abnormal Events: 2-4
EG	2	• Major Transients: 1-2
EG	2	• EOPs requiring substantive actions (not including TRIP-1): 1-2
EG	1	• EOP Contingency Procedures used: 0-2
EG	80	• Approximate scenario run time: 75-90 minutes
EG	65	• EOP run time: 40-70% of scenario run time
EG	3	• Crew Critical Tasks: 2-3

COMMENTS:

For events after EOP entry 2 malfunctions used to cause loss of recirc capability other is failure of auto containment spray

ATTACHMENT 1
SIMULATOR READY-FOR-TRAINING CHECKLIST

_____ 1. Verify simulator is in correct load for training

_____ 2. All required computer terminals in operation

_____ 3. Simulator clocks synchronized

_____ 4. Required chart recorders advanced and ON (proper paper installed)

_____ 5. Rod step counters correct (channel check)

_____ 6. All tagged equipment properly secured and documented (TSAS Log filled out)

_____ 7. DL-10 log up-to-date

_____ 8. Required procedures clean

_____ 9. All OHA lamps operating (OHA Test)

_____ 10. All printers have adequate paper AND functional ribbon

_____ 11. Procedure pens available

_____ 12. Procedures in progress open and signed-off to proper step

_____ 13. Shift manning sheet available

_____ 14. SPDS reset

_____ 15. Reference verification performed with required documents available

_____ 16. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter with Baseline Data filled out

_____ 17. Required keys available

_____ 18. Video Tape (if applicable)

_____ 19. Ensure ECG Classification is correct - - 960502140 CRCA-03

_____ 20. Reset P-250 Rod Counters

ATTACHMENT 2
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

A. 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 3

ESG PRE-JOB BRIEF CHECKLIST

EXAMINATION SCENARIO GUIDE (ESG) Pre-Job Brief Checklist

Note: This checklist is to be completed by the Lead Examiner prior to evaluating an ESG. The Lead Examiner should lead a pre-job brief with all the examiners and simulator operators that includes, but is not limited to the following:

ESG: "J" ILT NRC-ESG-002 Lead Examiner: _____

____ 1.ESG overview and sequence of major events.

____ 2.Determine which optional events will be performed, if any.

____ 3.ESG summary of Critical Tasks.

____ 4.Assign examiners to observe specific watch standers.

____ 5.Assign examiner ownership for observing and documenting performance / non-performance of Critical Tasks.

____ 6.Review alternate path(s) identified by the ESG.

____ 7.Assign examiner to document data related to the performance of Critical Tasks.

____ 8.Determines what parameters will be recorded in "Data Collection."

Ensure SOE recorder is recording.

SIMULATOR EXAMINATION SCENARIO

SCENARIO TITLE: ATWT, LOSC

SCENARIO NUMBER: J ILT NRC ESG-003

EFFECTIVE DATE: 8/19/2008

EXPECTED DURATION: 1.5 hours

REVISION NUMBER: 00

PROGRAM:

- [ ] **L.O. REQUAL**
- [X] **INITIAL LICENSE**
- [ ] **STA**
- [ ] **OTHER** _____

Revision Summary:

Rev 0: New Issue for J ILT NRC exam

PREPARED BY: Ed Gallagher **(INSTRUCTOR)** — 6/6/08 **(DATE)**

APPROVED BY: _____ **(OPERATIONS TRAINING MANAGER OR DESIGNEE)** — 6/27/08 **(DATE)**

APPROVED BY: _____ **(OPERATIONS MANAGER OR DESIGNEE)** — 6-29-08 **(DATE)**

I. OBJECTIVES

Enabling Objectives

A. Given the unit at 20% reactor power with the generator synchronized to the grid, the crew will perform a power increase to 100% at 10%/hr, IAW S2.OP-IO.ZZ-0004(Q).

B. Given a failure of the rod control system, which results in continuous rod motion, the crew will take corrective action, IAW S2.OP-AB.ROD-0003.

C. Given the unit at power and a trip of an operating main feedwater pump, take corrective action IAW AB.CN-0001

D. 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 the approved station procedures.

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

F. Given indication of a loss of secondary coolant, DIRECT the response to the loss of secondary coolant, in accordance with the approved station procedures.

II. MAJOR EVENTS

A. Power Increase from 80% power

B. Turbine Inlet Pressure PT505 fails High

C. SGFP trip with failure of auto runback circuit

D. Feedwater line rupture outside containment, ATWT with Trip from CR

E. Steam Generator Safety Valves fails open

III. SCENARIO SUMMARY

A. The crew will receive the unit at 80% Reactor Power with all systems in automatic. Orders to the shift are to raise power to 100% using reactivity plan provided

B. Once the crew takes the watch they will initiate a power increase at 2%/hour.

C. Once the power ascension is underway Turbine Inlet Pressure PT505 will fail high. Crew will take manual control of Rods and review Tech Specs for failed channel

D. After the TSAS has been evaluated for the PT505, an oil leak will develop on 21 SGFP, the crew will recognize the loss of flow from 21 SGFP and initiate a trip of 21 SGFP. Then crew will perform a manual runback IAW AB.CN-0001 when the auto runback does not occur.

E. Once the runback is complete a Feedwater line outside containment will rupture. As the secondary plant degrades the turbine will trip but the reactor will fail to auto trip The CRS will direct reactor trip and the RO will complete the trip by opening the 2E6D and 2G6D breakers.

F. As pressure increases from the ATWT, 3 safety valves on 24 SG will fail open and 2F 4KV group bus will fail to transfer to station Power. The crew will identify the steam flow and initiate a MSLI and SI.

G. The crew will perform actions of EOP-TRIP-1 and LOSC-1 to isolate the faulted SG

IV. INITIAL CONDITIONS

____ Presnapped IC-243 from portable exam drive

MALFUNCTIONS:

SELF-CHECK	Description	Delay	Ramp	Trigger	Severity
____ 1.	TU0055 Turb Inlet Press XMTR 505 FAIL	NA	NA	RT-1	100
____ 2.	EH0327 Turb Fails to Runback on SGFP	NA	NA	NA	NA
____ 3.	BF0105A 21 Stm Gen Feed Pmp Trip	NA	NA	RT-2	2500
____ 4.	BF0106 FW Common Disch Hdr Leak	NA	5:00	RT-3	10000
____ 5.	RP0058 Failure of Auto RX Trip	NA	NA	NA	NA
____ 6.	RP0059A Failure of Munual RX Trip	NA	NA	NA	NA
____ 7.	TU0066 MN Turb Inadvertantly Trips	NA	NA	RT-4	NA
____ 8.	MS0119P 24MS11 SG Safety Vlv Fails	:20	NA	RT-4	Open
____ 9.	MS0119Q 24MS12 SG Safety Vlv Fails	:20	NA	RT-4	Open
____ 10.	MS0119R 24MS13 SG SAFETY VLV FAILS	:20	NA	RT-4	Open
____ 11.	RP0279B Auto MSLI Fails to Act, Trn B	NA	NA	NA	NA
____ 12.	RP0279A Auto MSLI Fails to Act, Trn A	NA	NA	NA	NA
____ 13.	EL0143 LOSS OF 2F 4160V GROUP BUS	:30	NA	RT-4	NA
____ 14.	AN3739 AAS 739 FAILS - :25 TGA SUMP LEVE	2:00	NA	RT-3	2
____ 15.	AN3737 AAS 737 FAILS - :23 TGA SUMP LEVE	2:15	NA	RT-3	2
____ 16.	AN3738 AAS 738 FAILS - :24 TGA SUMP LEVE	2:40	NA	RT-3	2
____ 17.	AN3736 AAS 736 FAILS - :22 TGA SUMP LEVE	3:00	NA	RT-3	2
____ 18.	AN3735 AAS 735 FAILS - :21 TGA SUMP LEVE	3:15	NA	RT-3	2

REMOTES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Condition
____ 1.	NONE				

OVERRIDES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Action
____ 1.	B440 OVDI Reactor Trip Breaker 'A'-TRIP	NA	NA	NA	Off
____ 2.	B441 OVDI Reactor Trip Breaker 'B'-TRIP	NA	NA	NA	Off

EVENT TRIGGERS:

SELF-CHECK	ET#n	Discription	Command
____	1.	None	

TAGGED EQUIPMENT:

	Description
____	1. RH1 and RH2
____	2. VC 1-4
____	3. RH 18's
____	4. RCPs (SELF CHECK)
____	5. RT (SELF CHECK)
____	6. MS 167s (SELF CHECK)
____	7. 500 KV SWYD (SELF CHECK).
____	8. 23 CV Pump (SELF CHECK)

OTHER CONDITIONS:

	Description

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.

E. *Do not review objectives with crew*

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
1. Power Increase to 100%		
Reactivity plan per the turnover sheet	• CRS briefs crew on evolution	
	• CRS implements S2.OP-IO.ZZ-0004	
	• CRS directs PO to commence Turbine load increase at 2%/hour	
	• RO initiates a dilution per the reactivity plan provided	
	• PO monitors DEHC for indications of load increase	
	• RO monitors Tavg and Delta T and MWe for indications of load increase	
Proceed to next event at direction of lead evaluator; insure Rods have been returned to AUTO.		

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
2. Turbine Inlet Pressure PT505 fails High		
Enter RT-1, when rods are in auto PT505 fails High		
	• RO reports Tavg/Tref deviation and Rods stepping out Not expected for current load increase	
	• CRS directs RO to place Rods in manual and stop dilution	
	• CRS directs PO to hold Turbine load increase	
	• CRS enters S2.OP-AB.ROD-0003	
	• PO reports Turbine Inlet Pressure PT505 has failed High	
NOTE: Tavg/Tref recorder is no longer valid due to failed input to Tref. Actual Tave will be above program	• RO monitors Tavg for needed adjustments IAW attachment 1 and controls Tavg by manually inserting Rods	
Depending on how far rods withdrew during failure this alarm may not come in until rods are inserted to control Tavg	• RO acknowledges Tavg/Tref deviation and OHA G-3 DEHC and G-15 ADFCS trouble alarms due to PT505/PT506 mismatch	
	• RO informs CRS that Rod motion was in the outward direction.	
	• PO verifies PT505 failed High and places Steam Dumps in MS pressure control	
	• CRS refers to TSAS and requests I&C assistance to remove the channel from service	
	• CRS enters TSAS 3.3.2.1.b f/u 1.f action 19*	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
Proceed to next event when TSAS is determined or at direction of lead evaluator		
3. Trip of 21 SGFP **ENTER RT-2 Trip of 21 SGFP**		
	• PO announces console alarm for 21 SGFP: 'TURB OIL RSVR LVL HI/LO' followed by 'CONTROL OIL PRESSURE LOW'.	
After 2 mins report as NEO that there is an oil leak on a flanged connection at the governor actuator. Current oil level is about 24" from top of reservoir	• PO refers to Console ARP and sends NEO to investigate • Crew may attempt to makeup IAW SO.PL-0002 • Based on report from NEO, CRS may decide to reduce power to 50% IAW ARP for reservoir level. AB.LOAD may be entered Reactivity plan and contingencies should be discussed	
This will occur about 5 mins after RT-2 is inserted	• 21 SGFP speed dev OHA G-23 alarms • CRS directs 21 SGFP tripped • PO trips 21 SGFP • CRS enters AB.CN-0001 • RO/PO perform IA's of AB.CN-0001 • PO reports auto runback is NOT occurring and initiates runback to <66% power @15%/min • RO drives Rods in manual to control Tavg during downpower • PO initiates CAS when runback is in progress • RO/PO initiates boration	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
When runback is complete, and plant is stable, (BF19s have throttled to equalize SF/FF) or at the direction of the lead evaluator, initiate the Feed Line break by inserting RT-3.	• PO opens 21 thru 23 CN108 valves and monitors SG levels • PO opens 2CN47 and isolates blowdown	
4. Feedline Break/ATWT **The CREW should respond to the Alarms IAW the appropriate Alarm response Procedures.**	• As feed break size increases: - Feed Reg Valves will open farther. - Feed Flow to all S/Gs will lower. - S/G levels will begin to lower. - SGFP Speed will rise	
NOTE: CRS may order a Reactor Trip at any time due to the multiple malfunctions occurring.	• The PO should identify the transient as a loss of Feedwater flow.	
	• PO informs CRS that Aux alarms are TGA sumps overflowing • PO informs the CRS that the BF19s are full open and 22 SGFP is at max flow • The PO informs the CRS that SG levels are lowering rapidly	
Sim Driver insert RT-4 Turbine Trip when CRS briefs Reactor Trip but prior to trip initiation		
	• RO reports that the turbine has tripped and the Reactor did not "ATWT" • The CRS directs the RO to Trip the RX • The RO turns the Reactor Trip handle and informs the CRS that the Reactor did not trip • RO attempts to Trip Rx using breaker pushbuttons	
CT#1 (E-0 -- A): Manually Trip the Reactor from the Control Room before transition to FRSM-1	• RO opens 2E6D and 2G6D to de-energize Rod Drive MG sets	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
SAT _____ UNSAT _____		
	• RO confirms Reactor trip	
3 Mins after dispatched delete overrides on Rx Trip buttons and open breakers	• CRS dispatches NEO to open Reactor Trip breakers	
Note: 24 SG safety valves will open 20 seconds after turbine trip	• RO informs CRS that turbine is tripped and backs up turbine trip	
	• RO informs CRS that all Vital busses are energized	
	• RO verifies no SI has occurred but informs CRS that RCS pressure and temperature are lowering and an SI is required	
CT#2 (Part 1 MSLI) **(E-2 -- A): Isolate the faulted SG before transition out of E-2 (LOSC)** SAT _____ UNSAT _____	• CRS directs RO to initiate a MSLI and SI when steam flow is not isolated	
MSLI 21 thru 24 MS167s, MS18s and MS7s are closed	• RO initiates MSLI and informs CRS that steam flow is limited to 24 SG	
	• RO initiates SI based on continued steam flow	
	• CRS verifies Immediate actions	
CT#2 (Part 2 AFW isolation) **(E-2 -- A): Isolate the faulted SG before transition out of E-2 (LOSC)** SAT _____ UNSAT _____	• PO throttles AFW and isolates feed to 24SG based on TRIP-1 CAS	
AFW isolation 24AF11 And 24AF21 closed this should not be done until MSLI is complete		
23 SG should not be diagnosed as faulted or ruptured, variation in SG level and pressure are due to loss of 23 RCP with group bus	• PO informs CRS that F Group bus is de-energized	
	• PO verifies SEC loading and safeguard	

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
	valve alignment	
At some point the PO should recognize hotwell levels empty or CN pumps cavitating and pumps should be stopped	• RO verifies containment pressure has remained <15 psig	
	• RO verifies CAV and SWGR ventilation	
	• RO verifies ECCS flow • RO verifies PORV and PZR spray status	
	• PO reports 24 SG pressure dropping in an uncontrolled manner	
	• CRS transitions to LOSC-1	
	• PO verifies MSLI valves closed	
24BF19, BF40, BF13, AF11, AF21, MS167, MS18, MS7, GB4	• PO verifies FW, AFW, MS and GB valves for 24 SG are closed	
	• RO reset Phase A and opens SG sample valves	
Note: PO should adjust intact MS10s to current SG pressure and monitor for 24 SG dry-out at that point adjust intact MS10s to prevent RCS temperature from rising.	• CRS direct the PO to dump steam to stabilize RCS temperature	
	• CRS validates SGTR is not occurring and transitions to LOCA-1	
Scenario can be terminated when PO stabilizes RCS temperature at the discretion of the Lead Evaluator	• Crew resets safeguards and verifies SI flow reduction criteria	
	• CRS transitions to TRIP-3 for SI termination	
Evaluator Note: ECG Classification is 5.1.2.A for ATWT with trip		

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
completed from the control room		

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 – Continous Rod Motion

G. S2.OP-AB.CN-0001 – Main Feedwater/Condensate System Abnormality

H. 2-EOP-TRIP-1 - Reactor Trip or Safety Injection

I. 2-EOP-LOSC-1, Loss of Secondary Coolant

J. 2-EOP-LOCA-1, Loss of Reactor Coolant

VII. ESG CRITICAL TASK RATIONAL

CT#1 (E-0 -- A): Manually Trip the Reactor from the Control Room before transition to FRSM-1

Basis **Failure to manually trip the reactor causes a challenge to the subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an "incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy and demonstrates the inability of the crew to recognize a failure of the automatic actuation of the RPS"**

CT#2 (E-2 -- A): Isolate the faulted SG before transition out of E-2 (LOSC)

Basis **Failure to isolate a faulted SG that can be isolated causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Also, depending on the plant conditions, it could constitute a demonstrated inability of the crew to recognize the failure of an automatic actuation of an ESF system or component.**

VIII. ESG - PSA RELATIONSHIP EVALUATION

S-ILT-2008 NRC ESG-3
SALEM ESG - PRA RELATIONSHIPS EVALUATION FORM

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
N	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	N	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
N	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 which has the tube ruptures
N	Early depressurize RCS
N	Initiate feed and bleed

Complete this evaluation form for each ESG.

UNIT TWO PLANT STATUS TODAY

MODE:	1	POWER:	80	RCS BORON:	952	MWe: 970

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

N/A

REACTIVITY PARAMETERS

Core Burn-up 10,500 MWD/MTU, reactivity plan for power increase at 2%/hr is to dilute 40 gal every 15 minutes for a total of 1600 gal over 10 hours

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

Raise power to 100% IAW IOP-4 at 2% per Hour

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

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

PRIMARY:

NONE

SECONDARY:

Heating steam is aligned to unit 1.

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

X. SIMULATOR ESG REVIEW/VALIDATION CHECKLIST

Note: Attach a separate copy of this form to each scenario reviewed. This form is used as guidance for the examination team as they conduct their review for the proposed scenarios.

EXAMINATION SCENARIO GUIDE (ESG) REVIEW/ VALIDATION

Note: This form is used as guidance for an examination team to conduct a review for the proposed exam scenario(s). Attach a separate copy of this form to each scenario reviewed.

SELF-CHECK **ESG-** "J" ILT NRC-ESG-003 **REVIEWER:** Ed Gallagher

____ 1. **THE SCENARIO HAS CLEARLY STATED OBJECTIVES IN THE SCENARIO.**

____ 2. The initial conditions are realistic, equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.

____ 3. 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), and
- The event termination point.

____ 4. The use of non-mechanistic failures (e.g. pipe break) should be limited to one or a credible preceding event has occurred.

____ 5. The events are valid with regard to physics and thermodynamics.

____ 6. Sequencing/timing of events is reasonable (e.g. the crew has time to respond to the malfunctions in an appropriate time frame and implements procedures and/or corrective actions).

____ 7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.

____ 8. If time compression techniques are used, scenario summary clearly so indicates.

____ 9. The simulator modeling is not altered.

____ 10. All crew competencies can be evaluated.

____ 11. Appropriate reference materials are available (SOERs, LERs, etc.).

____ 12. 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.

____ 13. Proper critical task methodology is used IAW NRC procedures.

____ 14. ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

SCENARIO: "J" ILT NRC-ESG-003 **REVIEWER:** Ed Gallagher

INITIAL		TARGET QUANTITATIVE ATTRIBUTES
EG	8	• Total malfunctions inserted: 5-8
EG	3	• Malfunctions that occur after EOP entry: 1-2
EG	3	• Abnormal Events: 2-4
EG	2	• Major Transients: 1-2
EG	1	• EOPs requiring substantive actions (not including TRIP-1): 1-2
EG	0	• EOP Contingency Procedures used: 0-2
EG	65	• Approximate scenario run time: 75-90 minutes
EG	40%	• EOP run time: 40-70% of scenario run time
EG	2	• Crew Critical Tasks: 2-3

COMMENTS:

ATTACHMENT 1
SIMULATOR READY-FOR-TRAINING CHECKLIST

_____ 1. Verify simulator is in correct load for training

_____ 2. All required computer terminals in operation

_____ 3. Simulator clocks synchronized

_____ 4. Required chart recorders advanced and ON (proper paper installed)

_____ 5. Rod step counters correct (channel check)

_____ 6. All tagged equipment properly secured and documented (TSAS Log filled out)

_____ 7. DL-10 log up-to-date

_____ 8. Required procedures clean

_____ 9. All OHA lamps operating (OHA Test)

_____ 10. All printers have adequate paper AND functional ribbon

_____ 11. Procedure pens available

_____ 12. Procedures in progress open and signed-off to proper step

_____ 13. Shift manning sheet available

_____ 14. SPDS reset

_____ 15. Reference verification performed with required documents available

_____ 16. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter with Baseline Data filled out

_____ 17. Required keys available

_____ 18. Video Tape (if applicable)

_____ 19. Ensure ECG Classification is correct - - 960502140 CRCA-03

_____ 20. Reset P-250 Rod Counters

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CRITICAL TASK METHODOLOGY

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Ensure SOE recorder is recording.