

**SIMULATOR EXAMINATION SCENARIO**

SCENARIO TITLE: DBLOCA/Loss of CL Recirc.  
SCENARIO NUMBER: GOLF NRC ESG1  
EFFECTIVE DATE: Per Approval Signatures  
EXPECTED DURATION: 75-90 minutes  
REVISION NUMBER: DRAFT  
PROGRAM:  L.O. REQUAL  
 INITIAL LICENSE  
 STA  
 OTHER \_\_\_\_\_

Revision Summary

PREPARED BY:	<u>JK Lloyd/F. Kaminski</u> (DEVELOPER)	<u>7/3/02</u> (DATE)
REVIEWED BY:	<u>W. Detwiler per telcom</u> (EP REPRESENTATIVE)	<u>10-18-02</u> (DATE)
APPROVED BY:	<u>[Signature]</u> (TRAINING SUPERVISOR)	<u>10-25-02</u> (DATE)
APPROVED BY:	<u>S. Sauer per telcom</u> (OPS MANAGER OR DESIGNEE)	<u>10-18-02</u> (DATE)

**I OBJECTIVES****Enabling Objectives**

- A. Perform a power ascension IAW S2.OP-IO.ZZ-0004
- B. Take corrective action for a failed IRNIS detector IAW S2.OP-AB.NIS-0001
- C. Evaluate and implement required Technical Specifications
- D. Respond to failure of a PZR level channel IAW S2.OP-AR.ZZ-0012
- E. Respond to loss of a Circulating Water Pump Bus IAW S2.OP-AB.CW-0001
- F. Isolate steam flow to the main turbine IAW the immediate actions of TRIP-1
- G. Enter and execute the EOP network IAW SC.OP-AP.ZZ-0102
- H. Respond to a DBA LOCA IAW 2-EOP-TRIP-1 and 2-EOP-LOCA-1
- I. Take compensatory action for loss of both RHR Pumps IAW 2-EOP-LOCA-5

**II MAJOR EVENTS**

- A. Power ascension
- B. IRNIS Channel N35 fails.
- C. Controlling PZR level channel fails HI
- D. Loss of multiple Circulators/lowering condenser vacuum requires MANUAL Rx trip
- E. AUTO and MANUAL turbine trips fail
- F. Large break LOCA
- G. 21 SI Pump fails to start
- H. Loss of CL recirculation capability

**III SCENARIO SUMMARY**

The scenario begins with directions for power ascension at 5% per hour. 22 SI Pump is C/T for bearing replacement and 21B Circulator is C/T for screen repairs.

On cue from the Lead Evaluator, IRNIS channel N35 will fail high. The crew should respond IAW S2.OP-AB.NIS-0001, remove channel from service and implement the correct technical specification(s). Later in the scenario this failure will require the RO to manually re-instate the SRNIS detectors.

After the plant is stable, the controlling PZR level instrument fails high. The crew should respond IAW the console alarm procedure and select another channel for control.

Loss of Circulating Water Pump Bus Section 23 and/or lowering condenser vacuum will require a MANUAL reactor trip. The Main Turbine AUTO and MANUAL trips will fail resulting in a HI Steam Flow/LO-LO Tavg SI. The RO will have to manually initiate Main Steam Line Isolation (MSLI). The crew should perform actions IAW EOP-TRIP-1. 21 SI Pump and 21 RHR Pump fail to start on the SEC signal. The crew should manually start 21 SI Pump to ensure one full train of ECCS equipment but 21 RHR Pump will not start. During TRIP-1 implementation, the crew should recognize and respond to a DBA LOCA. Two functional restoration procedures may be entered (FRTS-1, FRCE-1) but operator actions are minimal.

At the appropriate point, the crew will transition from TRIP-1 to LOCA-1. 2B 4KV Vital Bus will trip on electrical fault during the execution of LOCA-1, resulting in loss of cold leg recirculation capability. The crew should transition to LOCA-5 at the appropriate step. The Lead Evaluator can terminate the scenario at any point after the CS flow reduction steps have been completed.

<b>IV INITIAL CONDITIONS</b>
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\_\_\_ IC-181 - EOL, 68 ppm, 820 MWe

**MALFUNCTIONS:**

<b>SELF-CHECK</b>	Description	Delay	Ramp	Trigger	Severity
___ 1.	SJ0184A 21 SIP fails to start on SEC	N/A	N/A	N/A	
___ 2.	RH0026A 21 RHR Pump trip	N/A	N/A	N/A	
___ 3.	RP0069 MT INT Vlv's failure	N/A	N/A	N/A	
___ 4.	RP0073 MT Trip failures	N/A	N/A	N/A	
___ 5.	RP0279A Train A AUTO MSLI fails	N/A	N/A	N/A	
___ 6.	RP0279B Train B AUTO MSLI fails	N/A	N/A	N/A	
___ 7.	NI0197A N35 IRNIS channel fails HI	N/A	N/A	RT-1	100
___ 8.	PR0017A PZR Level Ch I fails HI	N/A	N/A	RT-2	100
___ 9.	EL0053 Loss of CW Pump Bus Section 23	N/A	N/A	RT-3	
___ 10.	CN0086 Loss of Condenser Vacuum	N/A	3 min.	RT-3	90
___ 11.	RC0001A RCS loop 21 rupture	N/A	N/A	RT-4	
___ 12.	EL0145 Loss of 2B 4KV Vital Bus	N/A	N/A	RT-5	

**REMOTES:**

<b>SELF-CHECK</b>	Description	Delay	Ramp	Trigger	Condition
___ 1.	SJ17D: 22 SI Pump Control Power	N/A	N/A	N/A	OFF
___ 2.	SJ18D: 22 SI Pump Brkr racked out	N/A	N/A	N/A	Tagged

**OVERRIDES:**

<b>SELF-CHECK</b>	Description	Delay	Ramp	Trigger	Action
___ 1.	CM04 OVDI 21B CIRC START	N/A	N/A	N/A	OFF

TAGGED EQUIPMENT:

<b>SELF-CHECK</b>	Description
_____	1. RH1 and RH2 (C/T)
_____	2. VC 1-4 (C/T)
_____	3. RH 18's (C/T)
_____	4. RCPs (SELF CHECK)
_____	5. RT (SELF CHECK)
_____	6. MS 167s (SELF CHECK)
_____	7. 500 KV SWYD (SELF CHECK)
_____	8. SGFP TRIP (SELF CHECK)
_____	9. 22 ABV Supply Fan (C/T)
_____	10. 23 Charging Pump (C/T)
_____	<b>11. 22 SI Pump</b>
_____	<b>12. 21B Circulator</b>

OTHER CONDITIONS:

	Description
_____	1. Place plastic cover over 22 SI Pump
_____	2. Place plastic cover over 21B CW Pump

**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. OS please inform me when your crew is ready to assume the shift".
- D. Allow sufficient time for panel walk-downs. When informed by the OS that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
1. Power Ascension	<p><b>CRS</b> specifies rate of change</p> <p><b>CREW</b> notifies the Systems Operator and the Condensate Polishing Operator of the upcoming power ascension</p> <p><b>PO</b> raises Turbine load:</p> <ul style="list-style-type: none"> <li>• Initiates monitoring the Main Turbine Data display points on the Plant Computer</li> <li>• Clears Valve Position Limiter</li> <li>• Uses the REF ▲ and GO pushbuttons to attain desired load</li> </ul>	
Initiate the next event (RT-1) on cue from the Lead Evaluator	<p><b>RO</b> maintains <math>T_{AVG}/T_{REF}</math> and AFD within the target band using Auto Rod motion.</p>	
RT-1 IRNIS Channel N-35 fails MALF NI0297A; SEV=100	<p><b>RO</b> responds to:</p> <ul style="list-style-type: none"> <li>• Console indication</li> <li>• Bistable trip</li> <li>• E Window alarm</li> </ul> <p><b>CRS</b> enters AB.NIS-1</p> <p><b>RO</b> reports PRNIS has NOT failed</p> <p><b>PO</b> stops power change</p> <p><b>RO</b> reports IRNIS N-35 has failed high</p> <p><b>CREW</b> enters S2.OP-SO.RPS-0001 to remove channel from service</p> <p><b>RO</b> verifies N-35 not selected on recorder</p> <p><b>CRS</b> enters TSAS 3.3.1.1. act. 3</p> <p><b>PO</b> places Level Trip Switch in BYPASS at the N-35 drawer</p> <p><b>RO/PO</b> verifies proper bistable tripped</p> <p><b>PO</b> removes instrument fuses at N-35</p>	

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
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drawer

**Initiate next event (RT-2) on cue from the Lead Evaluator**

**RT-2: PZR Level Ch I Fails HI  
MALF PR0017A; SEV=100**

**CREW** responds to OHA E-36

**RO** diagnoses PZR level channel failure

**CREW** enters ARP for OHA E-36 and/or console alarm

**RO** takes MANUAL control of Master Flow Controller

**RO** selects an operable channel for Control, Alarm, and Recorder

**RO** restores PZR heaters to normal

**NOTE:** Bistables need not be tripped to continue the scenario.

**CRS** contacts I&C to remove PZR level channel from service IAW SO.RPS-0003

**Initiate RT-3 on cue from the Lead Evaluator**

**CRS** enters TSAS(s) 3.3.1.1 Action 6# and may review 3.3.3.7 (PAM -only two PZR Level Channels are required)

**RT-3: Loss of Circulator Bus  
Section 23  
MALF EL0053  
MALF CN0086, 90%, 3 min. ramp**

**CREW** responds to alarms and/or rising backpressure

**PO** reports loss of Bus Section 23 and all ALPHA Circulators

**CRS** enters AB.CW-0001

**PO/CRS** initiate Att. 1

**CRS** orders a MANUAL Reactor Trip due to rising backpressure

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p>Initiate RT-4: LBLOCA on cue from Lead Evaluator but not until 2A SEC is reset MALF RC0001A</p>	<p>RO trips reactor and performs immediate actions:</p> <ul style="list-style-type: none"> <li>• Trip reactor/confirmation</li> <li>• Trip turbine-notes turbine did not trip</li> <li>• Attempts turbine trip by bezel PB</li> <li>• Initiates MSLI</li> <li>• All 4KV busses energized</li> <li>• SI actuated</li> </ul> <p>RO verifies immediate actions</p> <p>CRS transitions back to TRIP-1</p> <p>RO/PO report 21 SI Pump and 21 RHR Pump failed to start</p> <p>PO blocks 2A SEC</p> <p>PO resets 2A SEC</p>	
<p>CT#1: Establish at least one full complement of injecting ECCS equipment before transitioning from TRIP-1 to LOCA-1</p> <p>SAT _____ UNSAT _____</p>	<p>RO starts 21 SI Pump</p> <p>RO reports 21 RHR Pump tripped</p> <p>RO stops RCP's IAW CAS</p> <p>RO closes CV139 and CV140 IAW CAS</p> <p>RO starts 21 CS pump</p> <p>PO throttles AFW flow</p> <p>PO should be directed or request permission to open the Mn Gen Brkr's (1-9 and 9-10)</p> <p>CRS transitions to FRTS-1</p>	

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

### Evaluator/Instructor Activity

### Expected Plant/Student Response

CRS exits FRTS-1 based on RHR flow

### Comments

**NOTE:** Depending on crew response time, the PURPLE PATH may clear before FR transition is permitted

CRS transitions to FRCE-1

**CREW** completes FRCE-1 and CRS transitions back to TRIP-1

**NOTE:** This will occur at the 15-20 minutes point after the reactor trip

**RO** manually reinstates SRNIS

**CREW** performs steps of TRIP-1 and transitions to LOCA-1 at Step 28

**NOTE:** Depending on crew response time, the RWST LO Level alarm may actuate before LOCA-1 is completed. In that case the crew would transition directly to LOCA-3

**RO/PO** perform SI reset actions

- Reset SI
- Reset Phase A
- Reset Phase B
- Open 21 and 22CA330
- Reset 2B and 2C SEC's
- Verify 230V Control Ctr's reset

**RO** opens 21-24SS94 (SG Sample Vlv's)

**RO** reports RCS subcooling not >0

**RT-5: Loss of 2B 4KV Vital Bus**

**RO** reports flow on RHR Flow Meters

Initiate RT-5 after all EDG's are stopped OR just after transition to LOCA-3  
MALF EL0145

**PO** stops all EDG's

**RO** reports no RHR Pumps available

**RO** closes 21&22CC16 (CCW to RHR HX)

**CRS** transitions to LOCA-5

**RO/PO** verify SI Reset actions

**CRS** sends NEO to Reset "B" SEC

**RO** initiates makeup to RWST

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

**Evaluator/Instructor Activity**

**Expected Plant/Student Response**

**Comments**

**RO** reports no train of emergency recirculation available

**PO** reports Steam Dumps not available

**PO** opens 21-24MS10

**NOTE:** Evaluators should check Table C against existing conditions

**CRS** reviews Table C and determines no CS Pump required

**RO** resets CS Actuation

**CT#2: Crew conserves RWST inventory by running only the required number of CS Pumps**

**RO** stops both CS Pumps

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

**RO** closes 21 and 22CS2

**CREW** maintains 22 CCP in service

**Terminate the scenario at Lead Evaluator discretion**

**VII 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-IO.ZZ-0004, Power Operation
- F. S2.OP-AB.NIS-0001, Nuclear Instrumentation Malfunction
- G. S2.OP-AB.COND-0001, Condenser Malfunction
- H. S2.OP-AB.CW-0001, Circulating Water System Malfunction
- I. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
- J. 2-EOP-FRTS-1, Response to Imminent PTS Conditions
- K. 2-EOP-FRCE-1, Response to Excessive Containment Pressure
- L. 2-EOP-LOCA-1, Loss of Reactor Coolant
- M. 2-EOP-LOCA-5, Loss of Emergency Recirculation

## VIII 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 mitigation 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.

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

- degradation of any barrier cooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility license to fission product release
- degraded emergency core loss 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).

**VIII ESG - CRITICAL TASKS**

- CT#1** – Start 21 SI Pump to establish at least one full train of injecting ECCS equipment prior to permanently exiting TRIP-1
- CT#2** – Stop both CS Pumps to minimize flow out of the RWST until emergency recirculation capability can be restored

**IX ESG - PSA RELATIONSHIP EVALUATION**

**SALEM ESG - PRA RELATIONSHIPS EVALUATION FORM**

**EVENTS LEADING TO CORE DAMAGE**

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

**COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY**

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

**OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE**

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

X

**UNIT TWO PLANT STATUS  
TODAY**

**MODE:** 1      **POWER:** 60%      **RCS**      1256      **MWe:** 630  
**BORON:**

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

NA

**REACTIVITY PARAMETERS**

Core Burnup: 4000 MWD/MTU

**MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:**

3.5.2.a (22 SI Pump) – 60 hours remaining. Bearing replacement, expected back in 12 hours.

**EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:**

Raise power at 5%/hr Reactor Engineering recommends diluting 130 gals/ percent power. Also recommends using control rods for first 5% power rise, OS agrees.

**ABNORMAL PLANT CONFIGURATIONS:**

RMS Channels R41A-D out of service, ODCM 3.3.3.9 in effect.

**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:**

21B Circulator is C/T for screen repairs

<b>SIMULATOR READY-FOR-TRAINING CHECKLIST</b>	
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 with Baseline Data is by Aux Alarm Typewriter
17.	Required keys available
18.	Video Tape (if applicable)
19.	Ensure ECG Classification is correct - - 960502140 CRCA-03
20.	Reset P-250 Rod Counters
21.	Verify phones are connected to simulator, not live to plant after a drill

**SIMULATOR EXAMINATION SCENARIO**

SCENARIO TITLE: SGTR  
 SCENARIO NUMBER: GOLF NRC ESG2  
 EFFECTIVE DATE: Per Approval Signatures  
 EXPECTED DURATION: 75-90 minutes  
 REVISION NUMBER: 0

PROGRAM:  L.O. REQUAL  
 INITIAL LICENSE  
 STA  
 OTHER \_\_\_\_\_

Revision Summary

PREPARED BY:	<u>JK Lloyd/F. Kaminski</u> (DEVELOPER)	<u>7/17/02</u> (DATE)
REVIEWED BY:	<u>W. Detwiler per telcom</u> (EP REPRESENTATIVE)	<u>10-18-02</u> (DATE)
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APPROVED BY:	<u>S. Sauer per telcom</u> (OPS MANAGER OR DESIGNEE)	<u>10-18-02</u> (DATE)

**I. OBJECTIVES****Enabling Objectives**

- A. Respond to a pressurizer pressure channel failure IAW S2.OP-AB.PZR-0001
- B. Apply technical specifications
- C. Respond to closure of the RCP Thermal Barrier HX Return Valve (2CC131) IAW the associated Alarm Response Procedure and S2.OP-AB.RCP-0001
- D. Respond to trip of a circulating water pump IAW S2.OP-AB.CW-0001
- E. Reduce power IAW S2.OP-IO.ZZ-0004 and/or S2.OP-AB.LOAD-0001
- F. Respond to trip of the operating charging pump
- G. Initiate a reactor trip IAW the S2.OP-AB.RCP-0001
- H. Respond to a 21 SG tube leak progressing to a SGTR IAW the EOP network and/or S2.OP-AB.SG-0001
- I. Take corrective action for failure of 2C SEC
- J. Take corrective action for failure of 21MS167

**II. MAJOR EVENTS**

- A. Pressurizer Pressure Channel I fails HI
- B. Instrument failure causes 2CC131, RCP Thermal Barrier HX Return Valve, to close
- C. Trip of 21B Circulator requires a power reduction
- D. Trip of the operating charging pump results in loss of RCP seal injection with no CCW to the thermal barriers
- E. MANUAL reactor trip and stop of all RCP's
- F. Progressing 21 SG Tube Leak results in MANUAL or AUTO SI
- G. 2C Safeguards Equipment Cabinet (SEC) fails to actuate
- H. 21 SG MSIV (21MS167) fails to close

### III. SCENARIO SUMMARY

The crew assumes the watch with directions to maintain 100% power. A power reduction is scheduled for later this shift to allow replacement of an electronic component in the 21 SGFP speed control system. The OS is expecting a call from the OM and will inform them when to start the power reduction. Both 21 AFW Pump and 21A Circulator are OOS for maintenance.

On cue from the Lead Evaluator the controlling PZR pressure channel fails high. The crew should respond IAW S2.OP-AB.PZR-0001. When PZR PRESS control is returned to AUTO and on cue from the Lead Evaluator, an RCP Thermal Barrier leak will cause a HI DISCHARGE FLOW alarm to actuate on the CCW section of the console. The crew will enter the alarm response procedure (ARP) and determine that the RCP Thermal Barrier HX CCW Return Valve (2CC131) should have closed. The RO should take manual control of 2CC131 and close it. Then the crew should enter S2.OP-AB.RCP-0001, RCP Malfunction.

On cue from the Lead Evaluator 21B Circulator breaker trips open. S2.OP-AB.CW-1 requires a power reduction because neither circulator is running on 21 Condenser. The crew should initiate a power reduction IAW S2.OP-IO.ZZ-0004 and/or S2.OP-AB.LOAD-0001.

On cue from the Lead Evaluator the operating charging pump trips, resulting in a loss of seal injection with no CCW flow through the thermal barrier HX's of all RCP's. The crew should initiate a manual reactor trip, stop all RCP's, enter EOP-TRIP-1 (TRIP-1) and then transition to TRIP-2. Coincident with the reactor trip, a progressive tube leak begins in 21 SG. The crew should recognize the tube leak, initiate a manual safety injection and then transition back to TRIP-1. 2C SEC fails to start loads when SI actuates. The crew should take the actions necessary to start 2C Vital Bus equipment. They will continue to the diagnostic section of TRIP-1 and transition to SGTR-1. The crew unsuccessfully attempts to close 21MS167 and therefore must close the other MS167's. The crew should trip the SDAFW Pump to terminate that release path.

The Lead Evaluator can terminate the scenario at any point after the SDAFW Pump is tripped.

#### IV. INITIAL CONDITIONS

\_\_\_ IC-182, 100% power

#### MALFUNCTIONS:

<b>SELF-CHECK</b>	Description	Delay	Ramp	Trigger	Severity
___ 1.	MS0092E: 21MS167 cannot be closed	N/A	N/A	N/A	N/A
___ 2.	CC0326 2CC131 Fails to Auto Close	N/A	N/A	N/A	N/A
___ 3.	PR0016A PP Ch I (PT455) fails HI	N/A	N/A	RT-1	2500
___ 4.	RC0013A 21 RCP Thermal Barrier fails.	N/A	N/A	RT-2	205
___ 5.	CW0114B 21B Circulating Water Pump trips	N/A	N/A	RT-3	10
___ 6.	CV0208A: 21 CCP breaker trips	N/A	N/A	RT-4	
___ 7.	SG0078A: 21 Steam Generator Tube Rupture	N/A	N/A	ET-1	650
___ 8.	RP318S2 22 Chg Pmp fails to start on SEC	N/A	N/A	N/A	N/A
___ 9.	RP318R2 21 SI Pmp fails to start on SEC	N/A	N/A	N/A	N/A
___ 10.	RP318B3 Prim SW Pmp 25 fails to start on SEC	N/A	N/A	N/A	N/A
___ 11.	RP318C3 ALT SW Pmp 25 fails to start on SEC	N/A	N/A	N/A	N/A
___ 12.	RP318D3 25 CFCU Low Speed fails to start on SEC	N/A	N/A	N/A	N/A
___ 13.	RP318D5 25 CFCU Low Speed fails to start on SEC	N/A	N/A	N/A	N/A
___ 14.	RP318M1 Emerg Cntrl Air Compr fails to start on SEC	N/A	N/A	N/A	N/A
___ 15.	RP318G1 21 Aux Bldg Supply Fan fails to start on SEC	N/A	N/A	N/A	N/A
___ 16.	RP318F3 23 Chiller fails to start on SEC	N/A	N/A	N/A	N/A
___ 17.	RP318G5 23 Aux Bldg Exhaust Fan fails to start on SEC	N/A	N/A	N/A	N/A

## REMOTES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Condition
___ 1.	AF21D 21 AFWP				TAGGED
___ 2.	AF20D 21 AFWP Control Power				OFF
___ 3.	PR34D PORV Stop Valve 2PR6 Tagged				TAGGED

## OVERRIDES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Action
___ 1.	CM02 OVDI 21A Circ Start	N/A	N/A	N/A	OFF

## TAGGED EQUIPMENT:

SELF-CHECK	Description
___ 1.	RH1 and RH2 (C/T)
___ 2.	VC 1-4 (C/T)
___ 3.	RH 18's (C/T)
___ 4.	RCPs (SELF CHECK)
___ 5.	RT (SELF CHECK)
___ 6.	MS 167s (SELF CHECK)
___ 7.	500 KV SWYD (SELF CHECK)
___ 8.	SGFP TRIP (SELF CHECK)
___ 9.	22 ABV Supply Fan (C/T)
___ 10.	23 Charging Pump (C/T)
___ 11.	<b>21A Circulator</b>
___ 12.	<b>21 Aux Feedwater Pump</b>

## OTHER CONDITIONS:

Description
___ 1. Ensure 21 CCP I/S
___ 2. Ensure PP Ch I selected for control

**V SEQUENCE OF EVENTS**

State shift job assignments:

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

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

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

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p>RT-1: Pressurizer Pressure Channel I fails high</p> <p>MALF: PR0016A, Severity: 2500</p>	<p><b>CREW</b> responds to indications/alarms</p> <ul style="list-style-type: none"> <li>• OHA D-8, RC PRESS HI</li> <li>• OHA E-42, 2PR1 1/2</li> <li>• RC PRESSURE DEVIATION HI console alarm</li> <li>• PS1 &amp; 2 full open</li> <li>• Actual PZR pressure lowering</li> </ul> <p><b>RO</b> responds to the transient:</p> <ul style="list-style-type: none"> <li>• Evaluates indications and determines PP Channel I failed</li> <li>• Obtains concurrence of the <b>CRS</b> and places the Master Pressure Controller in MANUAL</li> <li>• Closes both Spray Valves and energizes all PZR Heaters by depressing the PRESSURE INCREASE pushbutton</li> </ul> <p><b>CRS</b> enters AB.PZR-1, Pressurizer Pressure Malfunction.</p> <p><b>RO</b> selects PP Channel III to CONTROL</p> <p><b>RO</b> returns Master Pressure Controller to AUTO</p> <p><b>CRS</b> directs <b>RO</b> to place 2PR1 in MANUAL and close 2PR6</p>	
<p>RT-5: PR34D 2PR6 C/T</p>	<p><b>CRS</b> directs WCC or a NEO to remove power from 2PR6</p> <p><b>CRS</b> initiates actions of S2.OP-SO.RPS-0003. Placing PZR Channel in Tripped Condition</p> <p><b>CREW</b> notifies I&amp;C for assistance</p>	

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

**Evaluator/Instructor Activity**

**NOTE:** If pressure falls below 2205 psig, the DNB LCO (3.2.5) also applies

**Expected Plant/Student Response**

**CRS** reviews and enters Tech Specs.

- 3.3.1.1 Action 6
- 3.3.2.1 Action 19
- 3.4.5 Action b

**Comments**

**Initiate the next event after TSAS determination(s) and on cue from the Lead Evaluator**

**RT-2: RC0013A 21 RCP Thermal Barrier HX fails  
Severity 205**

**RO** responds to DISCHARGE FLOW HI bezel alarm

**CREW** enters ARP

**RO** places 2CC131 in MANUAL and closes

**CRS** enters AB.RCP-1

**RO/CRS** implement Attachment 1

**RO** monitors RCP parameters

**RO** reports seal water flow available to all RCP's

**CRS** initiates actions to send operators into CNMT for thermal barrier isolation activities

**Initiate the next event on cue from the Lead Evaluator**

**RT-3: CW0114B 21B Circulator trips**

**PO** responds to console alarm

**CREW** enters AB.CW-1

**CREW** implements Attachment 1

**PO** reports no indication of pipe rupture

**PO** reports 21A and 21B Circulators OOS

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p><b>NOTE:</b> At this point, a load reduction may not be required to maintain back pressure within limits</p>	<p><b>PO</b> reports four circulators I/S</p> <p><b>CRS</b> directs load reduction IAW Attachment 4</p>	
<p><b>NOTE:</b> CRS may direct entry into AB.LOAD-1</p>	<p><b>PO</b> reports no circulators running on 21 Condenser</p> <p><b>PO</b> reports 21 HD Pump running</p> <p><b>CRS</b> directs a power reduction to &lt;850 MWe at <math>\leq 5\%</math>/minute</p> <p><b>PO</b> initiates load reduction at specified rate</p> <p><b>RO</b> initiates boration, monitors Tav<sub>g</sub> and rod motion</p>	
<p><b>Initiate the next event on cue from the Lead Evaluator</b></p>		
<p><b>RT-4: CV0208A 21 CCP trips</b></p>	<p><b>RO/PO</b> responds to console alarm</p> <p><b>CREW</b> returns to AB.RCP-1 CAS (Att. 1)</p> <p><b>RO</b> reports no seal water or thermal barrier flow</p> <p><b>CRS</b> directs reactor trip</p>	
<p><b>ET-1: SG0078A SGTL on 21 SG, SEV=650 gpm</b></p>	<p><b>RO</b> initiates a MANUAL reactor trip</p> <p><b>RO</b> stops all four RCP's</p> <p><b>RO</b> completes IA's of TRIP-1 from memory:</p> <ul style="list-style-type: none"> <li>• Reactor trip</li> <li>• Reactor Trip confirmed</li> <li>• Trip Turbine</li> <li>• At least one vital bus energized</li> <li>• SI actuation (NO)</li> </ul> <p><b>CRS</b> enters TRIP-1</p> <p><b>CRS</b> transitions to TRIP-2</p>	

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
NOTE: Crew may report 21 SGTR symptoms at any point	RO makes page announcement	
	CRS directs OS to implement the ECG	
	PO stops both SGFPs	
	RO verifies Tavg trending to 547°F	
	RO verifies both reactor trip breakers open	
	PO verifies all rods inserted	
	PO closes 21-24BF22	
	RO verifies PZR level >17%	
	RO verifies Charging and Letdown in service	
	RO monitors PZR pressure status	
	RO/CREW notes SGTR symptoms	
	CRS directs RO to initiate a MANUAL SI based on TRIP-2 CAS	
	RO initiates a MANUAL SI	
	CRS transitions to TRIP-1	
	CRS reviews TRIP-1 immediate actions	
	RO makes page announcement	
	RO/PO verify SEC loading, reports incomplete loading on 2C 4KV Vital Bus	
	PO blocks 2C SEC	
	PO resets 2C SEC	

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p><b>CT#1: Start 22 CCP to provide high head injection prior to exiting TRIP-1</b></p> <p>SAT _____ UNSAT _____</p>	<p>RO/PO start TABLE A loads or verifies equipment running:</p> <ul style="list-style-type: none"> <li>• 240/480V Brkr</li> <li>• 22 CCP</li> <li>• 22 SIP</li> <li>• 25 or 26 SWP</li> <li>• 23 and 25 CFCU in LOW</li> <li>• 2 ECAC</li> <li>• 21 AUX BLDG SUP FAN</li> <li>• 23 AUX BLDG EXH FAN</li> <li>• 23 Chiller</li> </ul>	
	<p>PO reports 22 AFW Pump running</p>	
	<p>RO closes CV139 and CV140 when/if RCS pressure lowers &lt;1500 PSIG</p>	
	<p>PO verifies valves in Safeguards alignment</p>	
	<p>RO closes 21/22CA330</p>	
	<p>RO verifies CS not required</p>	
	<p>RO reports MSLI not required</p>	
	<p>RO reports two CCW Pumps operating</p>	
	<p>RO reports adequate ECCS flow</p>	
	<p>PO reports total AFW flow &gt;22E04 and may throttle to maintain level</p>	
	<p>RO reports both RTB's open</p>	
	<p>PO reports both PZR PORV's closed</p>	
	<p>RO reports no SG faulted</p>	
<p><b>CT#2: Close 21AF11 and 21AF21 within no later than 10 minutes after SGTR identification</b></p> <p>TIME:</p> <p>SAT _____ UNSAT _____</p>	<p>PO reports 21 SG rising in an uncontrolled manner</p>	

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
NOTE: May attempt MSLI for 21 Loop also.	CREW transitions to SGTR-1	
	PO sets 21MS10 to 1045 PSIG	
	PO Attempts to close 21MS167 and reports 21MS167 is not closed	
	PO closes: <ul style="list-style-type: none"> <li>• 22-24MS167's and MS18's</li> <li>• 21-24MS7</li> <li>• 21/22MS26</li> </ul>	
	CRS dispatches operators with RP support to close Table A valves	
	PO reports 21 SG ruptured	
	PO reports 23 AFW <u>NOT</u> the only source of AFW	
	PO lowers 23 AFW Pump speed to minimum	
<b>CT#3: Perform control room action to eliminate a release path by tripping 23 AFW Pump at the point the step is read</b>	PO trips 23 AFW Pump	
SAT _____ UNSAT _____		
<b>Terminate scenario at Lead Evaluator discretion</b>	CRS dispatches operator with RP support to close 21MS45	

**VII 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-AB.PZR-0001, Pressurizer Pressure Malfunction
- F. S2.OP-AB.RCP-0001, RCP Abnormality
- G. S2.OP-AB.CW-0001, Circulating Water System Malfunction
- H. S2.OP-AB.LOAD-0001, Rapid Load Reduction
- I. S2.OP-IO.ZZ-0004, Power Operation
- J. S2.OP-AB.SG-0001, SG Tube Leak
- K. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
- L. 2-EOP-TRIP-2, Reactor Trip Response
- M. 2-EOP-SGTR-1, Steam Generator Tube Rupture

## VIII 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 mitigation 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.

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

- degradation of any barriercooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility lice to fission product release
- degraded emergency core nse 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.

**VIII ESG - CRITICAL TASKS**

- CT#1:** Start 22 CCP to establish high head injection prior to exiting TRIP-1
- CT#2:** Close 21AF11 and 21AF21 no later than 10 minutes after the step "IS ANY SG LEVEL RISING IN AN UNCONTROLLED MANNER" is read to minimize the rate of SG level and pressure rise
- CT#3:** Perform control room action to eliminate a release path from the ruptured SG by tripping 23 AFW Pump at the required point of SGTR-1

## IX ESG - PSA RELATIONSHIP EVALUATION

## SALEM ESG - PRA RELATIONSHIPS EVALUATION FORM

## EVENTS LEADING TO CORE DAMAGE

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

## COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

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

## OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

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

Complete this evaluation form for each ESG.

X

**UNIT TWO PLANT STATUS  
TODAY**

**MODE:** 1    **POWER:** 100%    **RCS** 3 ppm    **MWe:** 1140  
**BORON:**

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

NA

**REACTIVITY PARAMETERS**

Core Burnup: 12500 MWD/MTU

**MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:**

Aux Feedwater 3.7.1.2A act a, expires in 60 hours

**EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:**

21 AFW Pump motor and pump disconnected

**ABNORMAL PLANT CONFIGURATIONS:**

RMS Channels R41A-D out of service, ODCM 3.3.3.9 in effect.

**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:**

21A Circulator tagged for repairs

<b>SIMULATOR READY-FOR-TRAINING CHECKLIST</b>	
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 with Baseline Data is by Aux Alarm Typewriter
17.	Required keys available
18.	Video Tape (if applicable)
19.	Ensure ECG Classification is correct - - 960502140 CRCA-03
20.	Reset P-250 Rod Counters
21.	Verify phones are connected to simulator, not live to plant after a drill

## SIMULATOR EXAMINATION SCENARIO GUIDELINE

SCENARIO TITLE: LOSS OF AFW  
SCENARIO NUMBER: GOLF NRC ESG3  
EFFECTIVE DATE: September 19, 2002  
EXPECTED DURATION: 75-90 minutes  
REVISION NUMBER: 0

PROGRAM:  L.O. REQUAL  
 INITIAL LICENSE  
 STA  
 OTHER \_\_\_\_\_

Revision Summary

PREPARED BY:	<u>JK Lloyd/F. Kaminski</u> (DEVELOPER)	<u>7/17/02</u> (DATE)
REVIEWED BY:	<u>W. Detwiler per telecon</u> (EP REPRESENTATIVE)	<u>10-17-02</u> (DATE)
APPROVED BY:	<u>[Signature]</u> (TRAINING SUPERVISOR)	<u>10-25-02</u> (DATE)
APPROVED BY:	<u>S. Sauer per telecon</u> (OPS MANAGER OR DESIGNEE)	<u>10-18-02</u> (DATE)

**I OBJECTIVES****Enabling Objectives**

- A. Reduce power IAW S2.OP-IO.ZZ-0004 and/or S2.OP-AB.LOAD-0001
- B. Respond to a CCW leak IAW S2.OP-AB.CC-0001
- C. Respond to failure of an RCS loop Tcold instrument IAW S2.OP-AB.ROD-0003
- D. Respond to failure of a VCT level channel IAW the console alarm response procedure (ARP)
- E. Apply technical specifications
- F. Respond to loss of 2B Vital Instrument Bus IAW S2.OP-AB.115-0002
- G. Initiate a manual reactor trip by opening breakers 2E6D and 2G6D
- H. Respond to a reactor trip IAW EOP-TRIP-1 and EOP-TRIP-2
- I. Maintain a heat sink IAW EOP-FRHS-1

**II MAJOR EVENTS**

- A. Power reduction
- B. Isolable CCW leak on 21 safeguards header
- C. 24 RCS Loop Tc hails high causing continuous rod motion
- D. VCT level channel LT-112 fails high
- E. Loss of 2B Vital Instrument Bus generates reactor trip demand
- F. MANUAL reactor trip
- G. Loss of condenser vacuum trips both SGFP's
- H. 23 AFW Pump (steam-driven) fails
- I. Loss of 2B 4KV Vital Bus results in no AFW
- J. Crew maintains a heat sink via condensate feed to SG's or RCS feed and bleed

### III SCENARIO SUMMARY

The crew will assume the watch with direction to maintain 100% power – awaiting an order from the OS to reduce power and begin turbine valve testing. Both 21 AFW Pump and 21A Circulator are OOS for maintenance.

Shortly after the crew assumes the watch, the System Operator will call with directions to rapidly reduce load to 1000 Mwe due to a transformer failure at the New Freedom Switching Station. When the plant is in a stable condition a leak develops in 21 CCW safeguards header. The crew should respond and isolate the leak IAW AB.CC-1, Component Cooling Abnormality.

When the CCW leak has been isolated, RCS loop 24 Tcold fails high. The crew should respond IAW AB.ROD-3, Continuous Rod Motion, remove the channel from service and return Rod Control to AUTO. While the associated bistables are being tripped LT-112, VCT level instrument fails high. The crew should respond IAW the related Alarm Response Procedure.

When the vacuum breaker 21AR65 fails open, this generates a turbine trip/reactor trip demand but the reactor does not trip automatically. The reactor will not trip until the RO opens 2E6D/2G6D during the EOP-TRIP-1 immediate actions. Coincident with the reactor trip the loss of condenser vacuum causes a trip of both SGFP's. The SDAFW Pump trips on overspeed when it attempts to start in response to the turbine/reactor trip.

Shortly after transitioning to EOP-TRIP-2, 2B 4KV Vital Bus trips on electrical fault resulting in loss of 22 AFW Pump. The crew should continue in EOP-TRIP-2 and transition to EOP-FRHS-1 when a RED PATH develops on the Heat Sink CFST.

The Lead Evaluator can terminate the scenario when feed has been established via a Condensate Pump or RCS Feed and Bleed has been initiated.

<b>IV INITIAL CONDITIONS</b>
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IC-183, 100% power, EOL

<b>MALFUNCTIONS:</b>
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<b>SELF-CHECK</b>	Description	Delay	Ramp	Trigger	Severity
___ 1.	RP0058 Failure of AUTO RX TRIP	N/A	N/A	N/A	N/A
___ 2.	RP0059A Failure of MAN RX TRIP	N/A	N/A	N/A	N/A
___ 3.	AF0183 23 AFWP OVSPD	N/A	N/A	N/A	N/A
___ 4.	RC0015D Loop 24 Tc RTD fails high	N/A	N/A	RT-2	630
___ 5.	CV0037 VCT Level transmitter LT-112 fails high	N/A	N/A	RT-3	100
___ 6.	VL0115 21AR65 Fails to Position (0-100%)	N/A	N/A	RT-4	100%
___ 7.	BF0105A 21 Stm Gen Feed Pump Trip	N/A	N/A	ET-1	3
___ 8.	BF0105B 22 Stm Gen Feed Pump Trip	N/A	N/A	ET-1	3
___ 9.	EL0145 Loss of 2B 4KV Vital Bus	N/A	N/A	RT-5	

REMOTES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Condition
___ 1.	AF21D 21 AFW Pump Brkr racked out	N/A	N/A	N/A	TAGGED
___ 2.	AF20D 21 AFWP Control Power	N/A	N/A	N/A	OFF
___ 3.	CC11A 2CC143 CCW Surge Tank Drain	N/A	N/A	RT-1	100
___ 4.	CC12A 2CC144 CCW Surge Tank Drain	N/A	N/A	RT-1	100

OVERRIDES:

SELF-CHECK	Description	Delay	Ramp	Trigger	Action
___ 1.	B440 OVDI: RTB A	N/A	N/A	N/A	OFF
___ 2.	B441 OVDI: RTB B	N/A	N/A	N/A	OFF
___ 3.	B441 OVDI 21A Circ Start	N/A	N/A	N/A	OFF

TAGGED EQUIPMENT:

SELF-CHECK	Description
___ 1.	RH1 and RH2 (C/T)
___ 2.	VC 1-4 (C/T)
___ 3.	RH 18's (C/T)
___ 4.	RCPs (SELF CHECK)
___ 5.	RT (SELF CHECK)
___ 6.	MS 167s (SELF CHECK)
___ 7.	500 KV SWYD (SELF CHECK)
___ 8.	SGFP TRIP (SELF CHECK)
___ 9.	22 ABV Supply Fan (C/T)
___ 10.	23 Charging Pump (C/T)
___ 11.	<b>21 AFW Pump</b>
___ 12.	<b>21A Circulator</b>

OTHER CONDITIONS:

Description
___ 1.

**V SEQUENCE OF EVENTS**

State shift job assignments:

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

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

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

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p>On CUE from the Lead Evaluator, <b>BOOTH OPERATOR: Call as Systems Operator - reduce power to 1000 MWe as quickly as possible due to a transformer failure at the New Freedom Switching Station.</b></p>	<p><b>CRS</b> specifies load reduction rate</p> <p><b>CREW</b> references IOP-4 and/or AB.LOAD-1</p> <p><b>PO</b> sets EHC controls</p> <p><b>PO</b> initiates load reduction</p> <p><b>RO</b> initiates boration</p> <p><b>RO</b> ensures rod motion tracks Tavg</p>	
<p><b>Initiate the next event (RT-1) on cue from the Lead Evaluator</b></p>	<p><b>RO</b> responds to console alarm</p> <p><b>CRS</b> enters ARP</p> <p><b>RO</b> opens 2DR107</p> <p><b>CRS</b> transitions to AB.CC-1</p> <p><b>RO</b> reports CCW Surge Tank level rising with M/U valve open</p> <p><b>CREW</b> contacts NEO(s) to look for CCW leaks</p>	
<p><b>RT-1 CCW Header leak REMOTE CC11A Severity 100 REMOTE CC12A Severity 100</b></p>	<p><b>CRS</b> refers to AB.CC-1 Att. 3 and directs leak isolation</p>	
<p>After approximately two minutes, report a vent valve on the CC header near the Waste Evaporator was found open, the vent has been closed</p>		

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity

Expected Plant/Student Response

Comments

Initiate the next event (RT-2) on cue from the Lead Evaluator

RT-2: Loop 24 Tc RTD fails high  
RC0015D Severity = 630

CRS refers to Technical Specifications

RO responds to:

- Console alarms
- OHA E-8&16
- Rods stepping in

RO determines no Turbine Runback in progress

RO gains CRS concurrence and places Rod Control in MANUAL

CRS enters AB.ROD-3

RO monitors and controls Tavg

CRS verifies rod motion was in the inward direction

RO verifies a NIS channel has not failed

RO stops RCS dilution

RO identifies Loop 24 Tcold failed high

RO returns PZR level to program by adjusting Master Flow Controller in MANUAL

RO defeats failed Tavg input by depressing the 24 Loop Deviation Defeat PB

RO selects Tavg Recorder to a valid loop

RO defeats failed  $\Delta T$  input to RIL Comparator by depressing the Deviation Defeat PB for 24 Loop

RO selects  $\Delta T$  Recorder to a valid loop

NOTE: Bistables do not need to be tripped to continue scenario

CRS contacts Maintenance to remove channel from service

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity

Expected Plant/Student Response

Comments

RO returns Master Flow Controller to AUTO

CRS verifies rods are above the RIL

RO restores Rod Control to AUTO

Initiate next event (RT-3) after TSAS determination and/or on cue from the Lead Evaluator

CRS/STA refers to TS.

- 3.3.1.1 Action 6 (OTΔT)
- 3.3.2.1 Action 19

RT-3: VCT Level transmitter LT-112 fails high  
MALF CV0037, Severity 100

RO responds to VCT HI/LO LEVEL console alarm

RO compares console level with computer indications and determines LT-112 is failed

CREW refers to the CC2 Console Alarm Response Procedure

CRS directs RO to select CV35 to MANUAL and align it to the VCT

Initiate next event (RT-4) on cue from the Lead Evaluator

CREW discusses related problems:

- MANUAL M/U required if VCT level lowers
- AUTO swap to RWST disabled

RT-4 Vacuum Breaker fails open  
MALF VL0115 Severity 100

CREW responds to multiple alarms

RO recognizes reactor trip demand

CRS directs MANUAL reactor trip

RO attempts both trip handles

RO attempts to open RTB's

RO opens 2E6D and 2G6D

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

### Evaluator/Instructor Activity

### Expected Plant/Student Response

### Comments

**RO** performs TRIP-1 Immediate actions

- Trip reactor/confirmation
- Trips turbine
- All 4KV busses energized
- SI not actuated

**CRS** enters TRIP-1 and reads Immediate actions

**CREW** transitions to TRIP-2

**RO** announces reactor trip

**CRS** informs OS to implement ECG

**NOTE:** PO should report 23 AFWP not running

**PO** reports AFW flow >22E04

**PO** reports both SGFP's tripped

**RT-5 Loss of 2B 4KV Vital Bus  
MALF EL0145**

**CREW** responds to alarms

**PO** reports loss of 2B 4KV Vital Bus

**CREW/PO** recognizes loss of 22 AFW Pump

**CRS** requests Maintenance assistance

**BOOTH OPERATOR:** After 2-3 minutes, report signs of serious mechanical failure – perhaps the overspeed trip mechanism failed

**CRS** dispatches NEO to check 23 AFW Pump

**CREW** performs TRIP-2 actions until a HS RED PATH develops

**CRS** transitions to FRHS-1

**RO/PO** report RCS pressure >Intact SG pressure

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p><b>EVALUATORS:</b> If Feed &amp; Bleed is required then go to Page 13 of this Scenario Guide</p>	<p><b>CRS</b> reviews RCS Bleed and Feed initiation criteria</p>	
<p><b>CT#1: Crew stops all RCP's prior to commencing selected SG depressurization</b></p> <p><b>SAT</b> _____ <b>UNSAT</b> _____</p>	<p><b>CRS</b> and <b>PO</b> continue efforts to restore AFW flow</p>	
	<p><b>RO</b> stops all RCP's</p>	
	<p><b>PO</b> reports Condensate System in operation</p>	
	<p><b>PO</b> reports SGFP's not available</p>	
	<p><b>RO</b> initiates SI</p>	
	<p><b>CRS</b> designates crew member to perform APPX-3</p>	
	<p><b>RO:</b></p> <ul style="list-style-type: none"> <li>• Resets SI</li> <li>• Resets Phase A Isolation</li> <li>• Resets Phase B Isolation</li> <li>• Opens 21 and 22CA330</li> <li>• Resets each SEC (sends NEO for B SEC)</li> <li>• Resets 230V Control Centers</li> </ul>	
	<p><b>RO</b> stops all running RHR and SI Pumps</p>	
	<p><b>RO</b> stops either 21 or 22 Charging Pump</p>	
	<p><b>CREW</b> selects SG to be depressurized</p>	
	<p><b>PO</b> fully opens selected MS10</p>	

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

### Evaluator/Instructor Activity

#### **BOOTH OPERATOR:**

Open the selected BF19 or BF40 using the associated MALF and failing to the requested position.

**BF19's: VL0446-0449**

**BF40's: VL0466-0469**

### Expected Plant/Student Response

**CREW** sends a NEO to open selected BF40 or 19

### Comments

**PO** opens selected BF13

**PO** releases associated BF22

**PO** opens 21 and 22CN48

**PO** closes 21 and 22CN32

**CT#2: Establish condensate flow into at least one SG**

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

**PO/STA** observe and verify selected SG level rising and/or CET temperatures lowering

**Lead Evaluator can terminate the scenario when condensate flow to SG is confirmed**

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p><b><i>FEED and BLEED Steps</i></b></p>		
<p><b>CT#1: Crew stops all RCP's prior to SI Initiation</b></p> <p>SAT ____ UNSAT ____</p>	<p>RO stops all RCP's</p> <p>RO initiates SI</p> <p>PO verifies Safeguards valves in SI position</p> <p>RO verifies 21 or 22 Charging Pp running and BIT flow established</p>	
<p><b>CT#2: Establish bleed path so the RCS depressurizes sufficiently for SI Pump injection to occur</b></p> <p>SAT ____ UNSAT ____</p>	<p>RO opens both PZR PORVs and PORV Stop valves</p> <p>RO/PO perform APPX-3</p> <p>RO/PO resets Safeguards if not performed</p> <p>RO maintains ECCS flow and PZR PORVs open</p>	
<p><b>Lead Evaluator can terminate the scenario any time after the PORV's are open and injection flow is confirmed</b></p>		

**VII 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-IO.ZZ-0004, Power Operation
- F. S2.OP-AB.LOAD-0001, Rapid Load Reduction
- G. S2.OP-AB.CC-0001, Component Cooling Abnormality
- H. S2.OP-AB.ROD-0003, Continuous Rod Motion
- I. S2.OP-AB.115-0002, Loss of 2B 115V Vital Instrument Bus
- J. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
- K. 2-EOP-TRIP-2, Reactor Trip Response
- L. 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink

## VIII 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 mitigation 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.

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

- degradation of any barrier cooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility lice to fission product release
- degraded emergency core nse 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.

**VIII ESG - CRITICAL TASKS**

**CRITICAL TASKS FOR FEEDING SG VIA CONDENSATE**

CT#1: Crew stops all RCP's to lower heat input prior to commencing selected SG de-pressurization

CT#2: Maintain a heat sink by establishing condensate flow into at least one SG prior to "SG dryout"

**CRITICAL TASKS IF BLEED AND FEED IS REQUIRED**

CT#1: Crew stops all RCP's to lower heat input prior to SI Initiation and lowering RCS pressure

CT#2: Establish RCS bleed path so the RCS depressurizes sufficiently for SI Pump injection to occur

**IX ESG - PSA RELATIONSHIP EVALUATION**

**SALEM ESG - PRA RELATIONSHIPS EVALUATION FORM**

**EVENTS LEADING TO CORE DAMAGE**

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

**COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY**

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

**OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE**

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

X

**UNIT TWO PLANT STATUS  
TODAY**

**MODE:** 1      **POWER:** 100%      **RCS BORON:** 1152 ppm      **MWe:** 1140

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

NA

**REACTIVITY PARAMETERS**

Core Burnup: 4000 MWD/MTU

**MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:**

21 AFW Pump, 60 hours remaining

**EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:**

None – awaiting orders to lower power for turbine valve testing.

**ABNORMAL PLANT CONFIGURATIONS:**

21 Auxiliary Feedwater Pump motor bearing replacement.

RMS Channels R41A-D out of service, ODCM 3.3.3.9 in effect.

**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:**

21B Circulator tagged for screen repairs

<b>SIMULATOR READY-FOR-TRAINING CHECKLIST</b>	
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 with Baseline Data is by Aux Alarm Typewriter
17.	Required keys available
18.	Video Tape (if applicable)
19.	Ensure ECG Classification is correct - - 960502140 CRCA-03
20.	Reset P-250 Rod Counters
21.	Verify phones are connected to simulator, not live to plant after a drill

### SIMULATOR EXAMINATION SCENARIO

SCENARIO TITLE: MANUAL Reactor Trip/SBLOCA

SCENARIO NUMBER: GOLF NRC ESG-Spare

EFFECTIVE DATE: Per Approval Signatures

EXPECTED DURATION: 75-90 minutes

REVISION NUMBER: DRAFT

PROGRAM:  L.O. REQUAL

INITIAL LICENSE

STA

OTHER \_\_\_\_\_

Revision Summary

PREPARED BY: J.K. Lloyd  
(DEVELOPER)

7/3/02  
(DATE)

REVIEWED BY: W. Detwiler per telcom  
(EP REPRESENTATIVE)

10-18-02  
(DATE)

APPROVED BY: W. Gallenp  
(TRAINING SUPERVISOR)

10-24-02  
(DATE)

APPROVED BY: S. Sama per telcom  
(OPS MANAGER OR DESIGNEE)

10-18-02  
(DATE)

**I. OBJECTIVES****Enabling Objectives**

- A. Perform a normal power reduction IAW S2.OP-IO.ZZ-0004
- B. Respond to failure of a PZR level channel IAW S2.OP-AR.ZZ-0012
- C. Respond to failure of Turbine First Stage Pressure Channel IAW S2.OP-AB.ROD-0003
- D. Evaluate and implement required Technical Specifications
- E. Respond to a leak in 2 SW Bay IAW S2.OP-AB.SW-0003
- F. TCAF closure of a turbine governor valve (TGV) IAW S2.OP-SO.TRB-0001 and S2.OP-AB.LOAD-0001
- G. Direct/initiate a reactor trip in response to a feedwater regulating valve failure
- H. Enter and execute the EOP network IAW SC.OP-AP.ZZ-0102(Q)
- I. Respond to a SBLOCA IAW 2-EOP-LOCA-1 and LOCA-2
- J. Restart ECCS loads following Blackout after SI Reset IAW 2-EOP-LOCA-2

**II MAJOR EVENTS**

- A. Power reduction to 60%
- B. Controlling PZR level channel fails low
- C. PT-505 failure
- D. SW Bay 2 leak
- E. TGV fails closed
- F. One BF19 fails closed during the rapid power reduction
- G. SBLOCA following the reactor trip
- H. Blackout following SI Reset

**III SCENARIO SUMMARY**

The scenario begins at 70% power with 22 SI Pump out of service for motor bearing replacement. The crew is directed to lower power to 60% at 10%/hour so that 21 SGFP can be removed from service for a control oil leak repair.

After the plant is stable, the controlling PZR level instrument fails low. The crew should respond IAW the console alarm procedure, select another channel and restore letdown.

On cue from the Lead Evaluator, PT-505, Turbine First Stage Pressure Detector will fail low, causing continuous rod insertion. The crew should respond IAW S2.OP-AB.ROD-0003, Continuous Rod Motion, place rod control in MANUAL, perform necessary operations to remove the channel from service and implement Technical Specifications.

After identification of the PT-505 related technical specifications, a leak will develop in #2 SW Bay. The crew should respond IAW S2.OP-AB.SW-0003, SW Bay Leak, shift the running SW Pumps, isolate the leak, and implement Technical Specifications.

On cue from the lead evaluator one turbine governor valve will fail closed. The CRS should refer to the load limitations specified in S2.OP-SO.TRB-0001, Turbine Generator Operation, and initiate a rapid load reduction to <30% power IAW S2.OP-AB.LOAD-0001, Rapid Load Reduction. During the load reduction the feedwater regulating valve on one of the SG's will fail closed. The CRS should direct a MANUAL reactor trip. Following the reactor trip a SBLOCA will ramp in and the crew should initiate a MANUAL SI. The path of EOP use is TRIP-1; TRIP-2; back to TRIP-1; LOCA-1; LOCA-2. In LOCA-2, the crew will begin a cooldown of the RCS. A loss of off-site power will occur during the cooldown, requiring the crew to re-start ECCS loads.

The Lead Evaluator can terminate the scenario after the ECCS loads have been re-started.

**IV INITIAL CONDITIONS**

IC-184

**MALFUNCTIONS:**

Self check	Description	Delay	Ramp	Trigger	Severity
1	PR0017A Pzr Lvl CH I (LT459) Fails H/L	N/A	N/A	RT-1	0
2	TU0055 1 <sup>st</sup> Stg Press Xmtr 505 Fails H/L	N/A	N/A	RT-2	0
3	SW0216A 21 SW Hdr Leak in SW Structure	N/A	2 min.	RT-3	10000
4	TU0081H 24MS29 Turb Cntrl Vlv fails cls.	N/A	N/A	RT-7	N/A
5	VL0447 22BF19 Fails to Position (0-100%)	N/A	N/A	RT-8	0
6	RC0002 RCS Leak into Containment	N/A	1 min.	RT-9	1750
7	CV0040 Fuel Element failure	N/A	N/A	RT-9	9
8	EL0134 Loss of all 500KV Offsite Power	N/A	N/A	RT-10	

**REMOTES:**

Self check	Description	Delay	Ramp	Trigger	Condition
1.	SJ18D	N/A	N/A	NONE	TAGGED
2	SJ17D	N/A	N/A	NONE	OFF
3	SW23D	N/A	N/A	RT-4	OFF
4	SW27D	N/A	N/A	RT-5	OFF
5	SW32D	N/A	N/A	RT-6	OFF

**OVERRIDES:**

Self check	Description	Delay	Ramp	Trigger	Action
1.	CM02 OVDI 21A Circ Start	N/A	N/A	N/A	OFF

**TAGGED EQUIPMENT:**

1.	RH1 and RH2 (C/T)
2.	VC1-4 (C/T)
3.	RH18's (C/T)
4.	RCP's (self check)
5.	RTB's (self check) and RTBB's (C/T)
6.	MS167's (self check)
7.	500 KV Swyd. (self check)
8.	SGFP Trip (self check)
9.	22 ABV Supply Fan (C/T)
10	23 CVC Pump (C/T)

**OTHER CONDITIONS:**

1.	None
----	------

**V SEQUENCE OF EVENTS**

- State shift job assignments:
- Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet)
- Inform the crew "The simulator is running. You may commence panel walkdowns at this time. OS please inform me when your crew is ready to assume the shift".
- Allow sufficient time for panel walk-downs. When informed by the OS that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
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1. Power reduction to 60% using normal plant procedures

**CRS** briefs crew and establishes rate of power reduction

**CREW** commences a power reduction IAW Step 5.3, S2.OP-IO.ZZ-0004

**CREW** notifies System Operator and Condensate Polishing Operator

**PO** initiates load reduction

- Initiates monitoring Main Turbine Data display points on the Plant Computer
- Uses Rate Thumbwheel, REF ▽ and GO pushbuttons to attain desired load

**RO** initiates boration

**Initiate next event (RT-1) on cue from Lead Evaluator**

**RO** maintains minimal  $T_{AVG}/T_{REF}$  mismatch and AFD within band

**PO** verifies SG Feed Pump suction pressure is being maintained >300 psig

**PO** monitors condenser temperatures using the plant computer

**RT-1: PZR Level Ch I Fails LO MALF PR0017A; SEV=0**

**CREW** responds to OHA E-36

**RO** diagnoses PZR level channel failure

**CREW** enters ARP for OHA E-36 and/or console alarm

**RO** takes MANUAL control of Master Flow Controller

**RO** selects an operable channel for Control, Alarm, and Recorder

**RO** restores PZR heaters to normal

## VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p><b>NOTE:</b> Bistables need not be tripped to continue the scenario.</p>	<p>RO restores letdown IAW S2.OP-SO.CVC-0001</p>	
<p><b>Initiate RT-2 on cue from the Lead Evaluator</b></p>	<p>CRS contacts I&amp;C to remove PZR level channel from service IAW SO.RPS-0003</p>	
<p><b>RT-2: First Stage Impulse Pressure Channel (PT-505) Failure MALF TU0055, Severity = 0</b></p>	<p>CRS enters TSAS(s) 3.3.1.1 Action 6# and may review 3.3.3.7 (PAM -only two PZR Level Channels are required)</p>	
	<p>RO determines rod insertion is unwarranted, gains <b>CRS</b> concurrence, places Rod Control in MANUAL</p>	
	<p>CRS enters AB.ROD-3</p>	
	<p>PO identifies PT-505 failed low and verifies alarms are consistent with the failure</p>	
	<p>Crew performs actions of AB.ROD-3:</p> <ul style="list-style-type: none"> <li>• RO places rod control in MANUAL</li> <li>• RO adjusts Tave to within 1.5°F of Tref</li> <li>• RO determines rods above RIL</li> <li>• PO verifies Steam Dump set at 1005 psig, verifies AUTO selected, then selects MS PRESS CONT</li> <li>• PO verifies SG levels being maintained 33-44%</li> </ul>	
	<p>CRS enters TS 3.3.2.1.b, Action 19</p>	
	<p>CRS directs initiation of SO.RPS-6, to remove failed channel from service</p>	

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

Evaluator/Instructor Activity	Expected Plant/Student Response	Comments
<p>Initiate next event (RT-3) after I&amp;C is contacted for B/S tripping OR on cue from the Lead Evaluator</p>	<p>CRS contacts I&amp;C for assistance with PT-505</p>	
<p>RT-3 - 2 SW Bay Leak MALF SW0216A; SEV=10000, RAMP=2 mins.</p>	<p>CRS communicates channel failure to OS and/or OM</p>	
<p>ROLE PLAY: Report water level rising in Bay 2 – Recommend stopping the pumps ASAP</p>	<p>Crew responds to OHA alarms and RO acknowledges standby pump start</p>	
	<p>RO/PO dispatches NEO to investigate</p>	
	<p>CRS enters AB.SW-1 or goes directly to AB.SW-3</p>	
	<p>CREW transitions to AB.SW-3</p>	
	<p>RO opens 21&amp;22SW23, NucHdr X-ties</p>	
	<p>RO closes 21&amp;22SW17, Pump Disch. X-ties</p>	
	<p>PO monitors AB.SW-3 CAS</p>	
<p>SIM OP: 125 VDC Control Power for Bay 2 Pumps: RT-4 REMOTE: SW23D RT-5 REMOTE: SW27D RT-6 REMOTE: SW32D</p>	<p>Crew isolates 2 SW Bay:</p> <ul style="list-style-type: none"> <li>• RO starts 24 SW Pump</li> <li>• RO stops 21&amp;23 SW Pumps</li> <li>• CRS directs NEO to open 125 VDC Control Power to 2 Bay SW Pumps</li> <li>• RO closes 21SW22, NucHdr Inlet</li> <li>• RO closes 21SW20, TurbHdr Supply</li> </ul>	
<p>ROLE PLAY: NEO reports level has stopped rising</p>	<p>CRS contacts maintenance to investigate</p>	
<p>Initiate next event (RT-7) after TS call and/or on cue from the Lead Evaluator RT-4 - TGV Fails Closed MALF TU0081H</p>	<p>CRS enters TSAS 3.7.4</p>	

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

<b>Evaluator/Instructor Activity</b>	<b>Expected Plant/Student Response</b>	<b>Comments</b>
<p data-bbox="81 651 617 798"><b>Role Play:</b> After 5 minutes, NEO reports EHC fluid leak on fittings of 24MS29. Leak is contained but cannot be repaired.</p>	<p data-bbox="633 262 1218 336"><b>RO/PO</b> respond to uncontrolled load change, RCS response</p> <p data-bbox="633 367 1218 409"><b>RO</b> controls Tavg with rods in MANUAL</p> <p data-bbox="633 441 1218 514"><b>PO</b> identifies 24MS29 CLOSED using EHC console indications</p> <p data-bbox="633 546 1218 619"><b>CRS</b> dispatches NEO to investigate cause of valve closure</p> <p data-bbox="633 651 1218 798"><b>CRS</b> reviews S2.OP-SO.TRB-0001 precautions and limitations. Determines load limitation of &lt;30% with failed governor valve</p> <p data-bbox="633 829 1218 903"><b>CRS</b> orders a turbine load reduction at 5%/minute IAW SO.TRB-1</p> <p data-bbox="633 934 1218 1008"><b>CRS</b> informs the Electric System Operator, OS and/or OM of load reduction</p> <p data-bbox="633 1039 1218 1113"><b>PO/RO</b> coordinate actions to reduce turbine load to &lt;30% power</p>	
<p data-bbox="81 1144 617 1291"><b>Initiate next event (RT-8) while load reduction is in progress</b> RT-5 22BF19 fails closed MALF VL0447</p>	<p data-bbox="633 1144 1218 1186"><b>CRS</b> enters AB.LOAD-1</p> <p data-bbox="633 1323 1218 1396"><b>PO</b> responds to alarms and/or notes change in BF19 position</p> <p data-bbox="633 1428 1218 1470"><b>PO</b> attempts to open 22BF19 in MANUAL</p> <p data-bbox="633 1501 1218 1543"><b>CRS</b> directs MANUAL Reactor Trip</p> <p data-bbox="633 1575 1218 1617"><b>RO</b> initiates a MANUAL Rx Trip</p> <p data-bbox="633 1648 1218 1856"><b>RO</b> completes IA's of TRIP-1 from memory:</p> <ul data-bbox="633 1680 1218 1856" style="list-style-type: none"> <li>• Reactor trip</li> <li>• Reactor Trip confirmed</li> <li>• Trip Turbine</li> <li>• At least one vital bus energized</li> <li>• SI actuation (NO)</li> </ul>	

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

<b>Evaluator/Instructor Activity</b>	<b>Expected Plant/Student Response</b>	<b>Comments</b>
--------------------------------------	--	-----------------

CRS enters TRIP-1

CRS transitions to TRIP-2

RO makes page announcement

CRS directs OS to implement the ECG

PO stops both SGFPs

Initiate next event (RT-9) after SGFP's are stopped or on cue from Lead Evaluator

RO verifies Tavg trending to 547°F

RT-9: SBLOCA  
MALF RC0002; SEV.=0-1750 gpm;  
RAMP=1 min.  
MALF CV0040; SEV 9

RO verifies both reactor trip breakers open

PO verifies all rods inserted

PO closes 21-24BF22

RO verifies PZR level >17%

RO verifies Charging and Letdown in service

RO monitors PZR pressure status

RO/CREW notes LOCA symptoms

CRS directs RO to initiate a MANUAL SI based on TRIP-2 CAS

RO initiates a MANUAL SI

CRS transitions to TRIP-1

RO performs TRIP-1 immediate actions

RO makes page announcement

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

<b>Evaluator/Instructor Activity</b> NOTE: 21, 22, 23 SW Pumps and 22 SI Pump all OOS, with control power removed	<b>Expected Plant/Student Response</b> RO/PO verify SEC loading	<b>Comments</b>
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RO monitors TRIP-1 CAS

**CT#1: Crew closes CV139 or CV140 IAW procedure CAS when pressure lowers <1500 psig**

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Crew closes CV139 and CV140 when CAS criteria is met

PO verifies 21 & 22 AFW Pumps running

PO verifies valves in Safeguards alignment

RO verifies 21/22CA330 closed

RO verifies CS not required

RO initiates MSLI

**CT#2: Crew stops all RCP's before exiting the procedure in effect when pressure lowers <1350 psig**

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

RO stops all RCPs when pressure lowers below 1350 psig

**CREW** transitions to LOCA-1@ Step 28

**CREW** performs SI Reset actions:

- Resets SI
- Resets Phase A Isolation
- Resets Phase B Isolation
- Opens 21 & 22 CA330, Containment Control Air Isolation
- Resets all SECs
- Verifies all 230V Control Centers reset

RO opens 21-24SS94, Bldn. Sample Vlvs.

RO stops RHR Pumps

**VI SCENARIO GUIDE SEQUENCE AND EXPECTED RESPONSE**

**Evaluator/Instructor Activity**

**Expected Plant/Student Response**

**Comments**

PO stops all EDG's

CRS transitions to LOCA-2

PO initiates 100°F/hr cooldown using MS10's

**Initiate next event (RT-10) after  
cooldown is in progress**

RO reports subcooling NOT >0°F

**RT-10 Loss of Off-Site Power  
MALF EL0134**

CRS may terminate the cooldown until ECCS loads are restored

**CT#3: Crew re-starts at least 21 SI  
Pump and 3 CFCU's in LOW Speed  
SAT \_\_\_\_\_ UNSAT \_\_\_\_\_**

CREW re-starts loads IAW Table A

**Lead Evaluator can terminate the  
scenario after actions to restart  
Table A loads have been completed**

**VII 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-IO.ZZ-0004, Power Operation
- F. S2.OP-SO.CVC-0001, Establishing Charging and Letdown
- G. S2.OP-SO.TRB-0001, Turbine Generator Operation
- H. S2.OP-AB.ROD-0003, Continuous Rod Motion
- I. S2.OP-AB.SW-0003, Service Water Bay Leak
- J. S2.OP-AB.LOAD-0001, Rapid Load Reduction
- K. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
- L. 2-EOP-TRIP-2, Reactor Trip Response
- M. 2-EOP-LOCA-1, Loss of Reactor Coolant
- N. 2-EOP-LOCA-2, Post-LOCA Cooldown and Depressurization

## VIII 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 mitigation 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.

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

- degradation of any barriercooling system (ECCS) or emergency power capacity
  - a violation of a safety limit
  - a violation of the facility lice to fission product release
  - degraded emergency core nse 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.

**VIII ESG - CRITICAL TASKS**

- CT#1:** Close at least one series CCP miniflow valve (CV139 or 140) when RCS pressure lowers <1500 psig to maximize injection flow during a SBLOCA before exiting the procedure in effect
- CT#2:** Stop all RCP's when RCS pressure lowers <1350 psig to minimize RCS mass loss during a small SBLOCA before exiting the procedure in effect
- CT#3:** Re-establish plant design basis conditions by starting at least one train of ECCS equipment after a loss of off-site power occurs with SI Reset

**IX ESG - PSA RELATIONSHIP EVALUATION**

**SALEM ESG - PRA RELATIONSHIPS EVALUATION FORM**

**EVENTS LEADING TO CORE DAMAGE**

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

**COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY**

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

**OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE**

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

Complete this evaluation form for each ESG.

X

**UNIT TWO PLANT STATUS  
TODAY**

**MODE:** 1      **POWER:** 70%      **RCS**      753      **MWe:** 800  
**BORON:**

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

NA

**REACTIVITY PARAMETERS**

Core Burnup: 8 GWD/MTU

**MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:**

3.5.2.a (22 SI Pump) – 60 hours remaining

**EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:**

Awaiting orders to reduce to 60% power this shift IAW S2.OP-IO.ZZ-0004. 21 SGFP will be taken OOS for a control oil leak repair.

**ABNORMAL PLANT CONFIGURATIONS:**

22 Safety Injection Pump out of service for maintenance activity.

RMS Channels R41A-D out of service, ODCM 3.3.3.9 in effect.

**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:**

21A Circulator tagged out of service for screen repairs

<b>SIMULATOR READY-FOR-TRAINING CHECKLIST</b>	
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 with Baseline Data is by Aux Alarm Typewriter
17.	Required keys available
18.	Video Tape (if applicable)
19.	Ensure ECG Classification is correct - - 960502140 CRCA-03
20.	Reset P-250 Rod Counters
21.	Verify phones are connected to simulator, not live to plant after a drill