# SIMULATOR
# EXAMINATION SCENARIO GUIDE

**SCENARIO TITLE:** ESG-1 [AB.CW-1, AB.CHEM-1, AB.PZR-1, TRIP-2, TRIP-1, LOCA-6, LOCA-1]

**SCENARIO NUMBER:** 17-01 NRC-1

**EFFECTIVE DATE:** See Approval Dates Below

**EXPECTED DURATION:** 90 minutes

**REVISION NUMBER:** 01

**PROGRAM:**

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

**Revision Summary:**

- New Issue for 17-01 NRC 2019 ILOT Exam. Incorporated validation comments. Deleted 21 RCP loop flow failure due to no Tech Spec call and added 21 SG NR Level Channel fails low for Tech Spec call. Changed trigger during condenser tube leak event to proceed to next event after CW is Emergency Tripped to keep the flow of scenario going. Changed initial conditions to place all PZR heaters on and adjusted steam dumps to reduce SG pressures to be below 1000 psi. Performed partial re-validation on changes on 6-22-18 using the same validation crew.
- Rev. 01 (12-4-18). Incorporated comments from NRC prep week. Added NRC ES-D-1 form to Attachment 4, Added Auto SI Block malfunctions, deleted and reinserted overrides to fix sim issue, reconfigured turbine oil pumps to manual and secured one EHC pump, corrected TS call for PZR pressure, inserted RCS leak after SGFPs are stopped, minor editorial comments.

| | | |
|---|---|---|
| **PREPARED BY:** | R. Chan<br>**Lead Regulatory Exam Author** | 12-4-18<br>**Date** |
| **APPROVED BY:** | McHugh<br>**Operations Training Manager** | 12/11/18<br>**Date** |
| **APPROVED BY:** | Myers<br>**Facility Representative** | 12/7/18<br>**Date** |

## SCAN OF SIGNED SCENARIO COVER SHEET

## I. OBJECTIVES

1. Given the order raise reactor power in accordance with approved station procedures.
2. Given the order or indications of PZR Pressure control system malfunction, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW S2.OP-AB.PZR-0001.
3. Given the order or indications of a PZR Pressure control system malfunction, DIRECT the response to the PZR Pressure control malfunction in accordance with S2-OP-AB.PZR-0001.
4. Given a condenser tube leak, take corrective action IAW S2.OP-AB.CHEM-0001.
5. Given the order or indications of Abnormal Secondary Plant Chemistry, DIRECT the response to the malfunction IAW S2.OP-AB.CHEM-0001.
6. Given the order or indications of Abnormal Secondary Plant Chemistry, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW S2.OP-AB.CHEM-0001.
7. 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.
8. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.
9. Given the order or indications of a reactor trip, perform actions as the shift technical advisor to RESPOND to the reactor trip in accordance with the approved station procedures.
10. Given the order or indications of a safety injection, perform actions as the nuclear control operator to RESPOND to the safety injection in accordance with the approved station procedures.
11. Given indication of a safety injection, DIRECT the response to the safety injection in accordance with the approved station procedures.
12. Given the order or indications of a safety injection, perform actions as the shift technical advisor to RESPOND to the safety injection in accordance with the approved station procedures.
13. Given the order or indications of a loss of coolant accident (LOCA-6) outside containment, complete actions as the nuclear control operator to PERFORM the immediate response to the LOCA in accordance with the approved station procedures.
14. Given indication of a loss of coolant accident (LOCA-6) outside of containment, DIRECT the immediate response to the LOCA in accordance with the approved station procedures.
15. Given the order or indications of a loss of coolant accident, perform the actions of the Shift Technical Advisor for a loss of coolant accident, IAW approved station procedures.
16. Given the order or a loss of coolant accident (LOCA-6) outside containment, perform actions to isolate the leak IAW approved station procedures.
17. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

## II. MAJOR EVENTS

1. Power Ascension and enter Mode 1 (5%)
2. PZR Pressure Channel 1 fails high
3. 21 SG Narrow Range Level fails low (TS only)
4. 21A Main Condenser tube leak
5. 22 RCP oil leak requiring Rx Trip
6. RHR Intersystem RCS Leak Outside Containment

## III. SCENARIO SUMMARY

1. The crew assumes the watch at 4% power, BOL. Control Rods in manual, 21 SGFP in service, 22 SW Pump C/T for strainer motor replacement. Power ascension to 10% in progress IAW S2.OP-IO.ZZ-0003 Hot Standby to Minimum Load.
2. After assuming the watch, the crew will commence power ascension and enter Mode 1 (5%) by withdrawing control rods and using steam dumps.
3. After the crew enters Mode 1, PZR Pressure Channel 1 will fail high. The crew will respond by placing Master Pressure Controller in Manual to raise PZR pressure to program. The CRS will enter **S2.OP-AB.PZR-0001**, Pressurize Pressure Malfunction, and take actions to swap to the other controlling channel and then placing MPC back to automatic. The CRS will evaluate Tech Specs and take actions to place 2PR1 in Manual and close the block valve. (TS call)
4. After the crew addresses the PZR pressure channel, OHA G-15, ADFCS TROUBLE and console alarm for 21 SG Protection Level Lo-Lo will be received. Crew determines no impact to plant operation and evaluates Tech Specs. (TS call only)
5. After the crew evaluates Tech Specs, 21A condenser will experience a tube leak. The CRS will enter **S2.OP-AB.CW-0001**, Circulating Water System Malfunction and/or **S2.OP-AB.CHEM-0001**, Abnormal Secondary Chemistry. The crew will recognize a tube leak from secondary chemistry parameters and remove 21A circulator from service.
6. After the crew addresses condenser tube leak, the crew will receive OHA for 22 RCP oil leak. The crew will identify elevated RCP motor bearing temperatures and enter **S2.OP-AB.RCP-0001**, RCP Abnormality. The crew will respond to motor bearing temperatures > 175 F and initiate action to TRIP the Reactor and stop 22 RCP.
7. The crew will enter **2-EOP-TRIP-1**, Reactor Trip or Safety Injection, then transition to **EOP-TRIP-2** based on no SI required. While in TRIP-2, an RHR intersystem RCS leak will occur on 22 RHR Heat Exchanger. PZR level and pressure will be lowering and the crew will take the CAS action to initiate SI and return to EOP-TRIP-1. One train of SI will fail to actuate and the operator will respond by initiating the other train of SI **[Critical Task #1]**.
8. While in TRIP-1, the crew will recognize that 22 Charging pump failed to start on SEC and will respond by manually starting 22 Charging pump. In addition, the crew will identify that two (2) Phase A valves (2CV116 & 2CV284) failed to close and will respond by manually closing them. The crew will recognize 2R41D Plant Vent radiation monitor in alarm, 22 RHR sump overflow

alarms and 24 SI accumulator pressure and levels lowering indicating RCS leak inside Auxiliary Building. The crew will transition to **EOP-LOCA-6**, LOCA outside Containment.

9. While in LOCA-6, the crew will isolate the RHR intersystem leak by closing the 22SJ49 and stopping 22 RHR pump **[Critical Task #2]**
10. After the RHR intersystem leak is isolated, the crew will transition to **EOP-LOCA-1** and determine SI Termination requirements are met to transition to **EOP-TRIP-3**.
11. The scenario can be terminated when the crew performs the determination for SI Termination in LOCA-1 or by direction from Lead Evaluator.

## IV. INITIAL CONDITIONS

____ **IC-256 (11-29-18)**

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

| *Initial* | Description |
|---|---|
| ____ 1 | VC1and VC4 C/T |
| ____ 2 | RCPs (SELF CHECK) |
| ____ 3 | RTBs (SELF CHECK) |
| ____ 4 | MS167s (SELF CHECK) |
| ____ 5 | 500 KV SWYD (SELF CHECK) |
| ____ 6 | SGFP Trip (SELF CHECK) |
| ____ 7 | 23 CV PP (SELF CHECK) |
| ____ 8 | **22 SW Pump C/T** |
| ____ 9 | **SG Blowdown aligned to 22 condenser (verify correct placement of placards)** |
| ___ 10 | **S2.OP-IO.ZZ-0003 marked up to Step 4.3.19** |
| ___ 11 | **S2.OP-SO.MS-0002 open to Attachment 3** |
| ___ 12 | **Ensure OHA's for A-30 and E-24 are cleared.** |
| ___ 13 | **Examination team determine appropriate Protected Equipment.** |
| ___ 14 | Complete Attachment 2 "Simulator Ready-for-Training/Examination Checklist." |

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

## EVENT TRIGGERS:

| Initial | ET # | Description | |
|---|---|---|---|
| | 1 | EVENT ACTION:<br>COMMAND:<br>PURPOSE: | hwka501doa //HW Var bind for ZDIPANEL(1615)<br>DOR ka701doa<br><update as needed> |
| | 2 | EVENT ACTION:<br>COMMAND:<br>PURPOSE: | hwka701doa //HW Var bind for ZDIPANEL(1669)<br>DOR ka501doa<br><update as needed> |
| | 3 | EVENT ACTION:<br>COMMAND:<br>PURPOSE: | kb116tcb //2CV116 SEAL W TO VCT CLOSE<br>DMF VL0045<br><update as needed> |
| | 4 | EVENT ACTION:<br>COMMAND:<br>PURPOSE: | kb117tcb //2CV284 SEAL W TO VCT CLOSE<br>DMF VL0046<br><update as needed> |

## MALFUNCTIONS:

| *SELF-CHECK* | Description | Delay Time | Initial Value | Ramp Time | Trigger | Severity |
|---|---|---|---|---|---|---|
| _____ 01 | PR0016A PZR PRESS CH I (PT455) FAILS H/L | N/A | N/A | N/A | RT-1 | 2500 |
| _____ 02 | CN0094A #21A CONDENSER TUBE LEAK | N/A | N/A | N/A | RT-3 | 50 |
| _____ 03 | SJ0312A CL LEG INJ LINE CHK VALVE 24SJ56 ( RCS SIDE ) LEAKS (use with SJ0312B) | N/A | N/A | N/A | RT-5 | 20 |
| _____ 04 | SJ0312B CL LEG INJ LINE CHK VALVE 24SJ43 ( RHR SIDE ) LEAKS | N/A | N/A | N/A | RT-5 | 10 |
| _____ 05 | RP318S2 22 CHRG PMP FAILS TO STRT ON SEC | N/A | N/A | N/A | N/A | |
| _____ 06 | VL0045 2CV116 Fails to Position ( 0-100% ) | N/A | N/A | N/A | N/A | 100 |
| _____ 07 | VL0046 2CV284 Fails to Position ( 0-100% ) | N/A | N/A | N/A | N/A | 100 |
| _____ 08 | VL0002 21BF32 Fails to Position ( 0-100% ) | N/A | N/A | N/A | N/A | 100 |
| _____ 09 | RH0299B 22 RHR LEAK BEFORE HX | N/A | N/A | N/A | RT-5 | 1000 |
| _____ 10 | RH0300B 22 RHR LEAK AFTER HX | N/A | N/A | N/A | RT-5 | 1000 |
| _____ 11 | RC0006B RC PUMP #22 LOSS OF LUBE OIL | N/A | N/A | N/A | RT-4 | |
| _____ 12 | SG0095A 21 SG LVL XMTR (519) CH II FAIL | N/A | 32 | 00:00:30 | RT-2 | 0 |
| _____ 13 | RP0274A AUTO SI FAILS TO ACT, TRN A | N/A | N/A | N/A | N/A | |
| _____ 14 | RP0274B AUTO SI FAILS TO ACT, TRN B | N/A | N/A | N/A | N/A | |

## REMOTES:

| *SELF-CHECK* | Description | Delay Time | Initial Value | Ramp Time | Trigger | Condition |
|---|---|---|---|---|---|---|
| _____ 01 | AF01D 23 AUX FP TRIP RESET | N/A | N/A | N/A | N/A | RESET |
| _____ 02 | SW27D 22 SW PUMP BKR CONTROL POWER | N/A | N/A | N/A | N/A | OFF |
| _____ 03 | SW28D 22 SW PUMP RACK OUT | N/A | N/A | N/A | N/A | TAGGED |
| _____ 04 | PR34D PORV STOP VALVE 2PR6 TAGGED | N/A | N/A | N/A | RT-10 | TAGGED |

## OVERRIDES:

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

## OTHER CONDITIONS:

| | Description |
|---|---|
| ____ 1. | None |

## V. SEQUENCE OF EVENTS

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

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | | | |
| **1. Power Ascension and enter Mode 1 (5%)** | | | |
| | | | |
| | CRS directs RO to withdraw control rods or raise demand on steam dumps to raise reactor power IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load. | | |
| | | | |
| **Evaluator's Note:** The crew may first place steam dumps to manual to raise demand to open dump valves more, then when Tavg lowers, withdraw rods in manual to raise Tavg. | | | |
| | | | |
| **Evaluator's Note:** When manually withdrawing control rods, the RO can refer to the "Hard Card" for S2.OP-SO.RCS-0001, Attachment 4, Manual Control Rod Motion. Three (3) step increments when withdrawing rods is expected. | | | |
| | | | |
| | RO reports reactor power is 5% and the unit is in Mode 1. | | |
| | | | |
| **Proceed onto next event after the crew enters Mode 1.** | | | |
| | | | |
| **2. PZR Pressure Channel 1 fails high** | | | |
| | | | |
| **Simulator Operator:** Insert RT-1 at the direction of Lead Evaluator.<br><br>**MALF: PR0016A PZR PRESS CH I (PT455) FAILS H/L**<br>**Final = 2500** | | | |
| | | | |
| | RO reports unexpected OHAs for D-8 RC PRESS HI and E-42 2PR1 1/2 TRIP | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | | | |
| | RO reports that PZR Pressure Channel 1 has failed high and RCS pressure is lowering. | | |
| | | | |
| | RO places Master Pressure Controller (MPC) in Manual | | |
| | | | |
| | **CRS enters S2.OP-AB.PZR-0001.** | | |
| | | | |
| | RO reports POPs is not in service. | | |
| | | | |
| | RO reports that the controlling PZR pressure channel I is failed. | | |
| | | | |
| | RO reports that MPC is in Manual | | |
| | | | |
| | CRS directs RO to adjust MPC demand IAW Attachment 2 to restore pressure to program. | | |
| | | | |
| | RO selects channel III for control | | |
| | | | |
| | RO places MPC to Auto | | |
| | | | |
| | CRS refers to Tech Specs | | |
| | | | |
| | CRS directs Maintenance support to remove the failed channel from service IAW S2.OP-SO.RPS-0003. | | |
| | | | |
| **Evaluator's Note**: The crew can perform some actions in S2.OP-SO.RPS-0003, but these actions are not necessary in order to continue on. | | | |
| | | | |
| **TS evaluation #1:** | | | |
| | | | |
| | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | **CRS enters TSAS for 3.3.3.1 action 6 (6 hour LCO), 3.3.2.1 action b.19 (6 hour LCO), 3.4.5 action b (1 hour LCO), and 3.2.5.b (2 hour LCO IF RCS pressure < 2200 psia (2185 psig)** | | |
| | | | |
| | CRS directs RO to place 2PR1 in Manual and to close 2PR6 Block Valve to comply with Tech Specs. | | |
| | | | |
| | CRS directs WCC to remove control power to 2PR6 to comply with 1 hour Tech Spec | | |
| | | | |
| **Simulator Operator**: Use REMOTE **RT-10 PR34D** set to Tagged to remove power to 2PR6 when requested. Location 78 Ft Elec Penn Area. | | | |
| | | | |
| Proceed on to next event when Tech Specs has been evaluated or by direction of Lead Evaluator. | | | |
| | | | |
| **3. 21 SG Narrow Range Level Channel II fails low (TS only)** | | | |
| | | | |
| **Simulator Operator:** Insert **RT-2** on direction from Lead Evaluator.<br><br>**MALF: SG0095A, 21 SG LVL XMTR (519) CH II FAIL**<br>**Value = 0**<br>**Ramp = 30 seconds** | | | |
| | | | |
| | RO reports unexpected OHA G-15 ADFCS TROUBLE and 21 SG Console Alarm for PROTECTION LEVEL LO-LO. | | |
| | | | |
| | RO reports that 21 SG NR Level Channel 2 has failed low. | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | | | |
| | PO reports 2PR4 bistable illuminated for SG Lo-Lo Level Loop 1 CH II. | | |
| | | | |
| | Crew refers to ARP for 2CC2 and OHA G15. | | |
| | | | |
| | PO checks digital feed water Engineering Work Station (EWS) at 2RP7 and reports that alarm list identifies 21 SG CH II level has failed low. | | |
| | | | |
| | Crew determines failed channel does not impact plant operation. | | |
| | | | |
| | PO reports ARP for 2CC2 directs removing channel from service IAW S2.OP-SO.RPS-0004. | | |
| | | | |
| **TS evaluation #2:** | | | |
| | | | |
| | **CRS evaluates Tech Specs and enters TSAS 3.3.1.1 Action 6 (6 hour LCO) and 3.3.2.1 Action b.19 (6 hour LCO).** | | |
| | | | |
| **Proceed onto next event after crew evaluates Tech Specs.** | | | |
| | | | |
| **4. 21A Condenser Tube Leak** | | | |
| | | | |
| **Simulator Operator**: Insert **RT-3** on direction from Lead Evaluator.<br><br>**MALF: CN0094A #21A Condenser Tube Leak Severity: 50** | | | |
| | | | |
| | RO reports unexpected Console Alarm for HOTWELL OUTLET CONDUCTIVITY HI. | | |
| | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | PO refers to ARP for 2CC1 and notifies CRS that entry into S2.OP-AB.CHEM-0001 is required. | | |
| | | | |
| **Evaluator's Note:** CPD Sodium Hi, CPD Cond Hi and Dissolved Oxygen Hi console alarms come in approx.1.5 minutes. | | | |
| | | | |
| | Crew checks secondary plant chemistry recorders on 2RP5 and determines 21A condenser is affected hotwell based on rising Conductivity and Dissolved Oxygen for 21A Condenser. | | |
| | | | |
| **Evaluator's Note:** The crew may enter AB.CHEM first. IF the crew enters AB.CW first then AB.CW will direct initiation of AB.CHEM.<br><br>Actions for AB.CW start on **page 17.** | | | |
| | | | |
| **S2.OP-AB.CHEM-0001 actions start here:** | | | |
| | | | |
| | **CRS enters S2.OP-AB.CHEM-0001, Abnormal Secondary Chemistry.** | | |
| | | | |
| | CRS directs initiation of AB.CHEM CAS. | | |
| | | | |
| | PO reports condensate polisher is in service. | | |
| | | | |
| | PO reports OHA G-19, CND POL AUTO SWAP in NOT in alarm. | | |
| | | | |
| | RO reports HOTWELL OUTLET CONDUCTIVITY HI console alarm is in and contacts Chemistry to determine source. | | |
| | | | |
| **Role Play:** When directed, call back in 1-2 minutes as Secondary Chemistry and report; ***grab samples confirm the source of the*** | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| ***condenser leak is from circ water. Chemistry Supervisor recommends removal of circulator from service.***<br><br>IF Crew request Chemistry recommendation for SG blowdown flow rate, then state; ***maintain 35K per loop and Chemistry will continue to evaluate.*** | | | |
| | | | |
| **Evaluator's Note:** At this point several console alarms are in for high sodium, conductivity and dissolved oxygen that the crew should recognize as a condenser tube leak in the condenser and refers to guidance in Attachments 1 and 2 of AB.CHEM to remove CW pump from service. | | | |
| | | | |
| **Emergency Trip of 21A CW Pump (AB.CHEM Attachments 1 and 2):** | | | |
| | | | |
| | PO reports that Attachment 1 CAS Step 1.0 is met for indications of a Condenser Tube Failure/Leak and Attachment 2 is applicable. | | |
| | | | |
| | PO reports that Attachment 2 conditions for Gross Condenser Tube Failure is met and states **EMERGENCY TRIP** of CW pump is required. | | |
| | | | |
| | CRS directs Emergency Trip of 21A CW pump. | | |
| | | | |
| | PO Emergency Trips 21A CW pump, but does not press the Stop PB until after 1 minute. (This allows the water to drain from the waterbox) | | |
| | | | |
| | PO reports that Condensate Polisher is not source of console | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | alarms. | | |
| | | | |
| | PO reports SGBD demin is not the source of console alarm. | | |
| | | | |
| | CRS contacts Chemistry to initiate sampling. | | |
| | | | |
| | RO reports DO HI console alarm is in. | | |
| | | | |
| | CRS refers to Attachment 4 "Chemistry Action Levels" to determine Chemistry Action Levels. | | |
| | | | |
| **Proceed onto to next event when either the 21A CW pump stop PB is depressed or CRS refers to Attachment 4 Chemistry Action Levels or by direction from Lead Evaluator.** | | | |
| | | | |
| **S2.OP-AB.CW-0001 starts here:** | | | |
| | | | |
| | **CRS enters S2.OP-AB.CW-0001, Circulating Water System Malfunction.** | | |
| | | | |
| | CRS directs initiation of AB.CW CAS. | | |
| | | | |
| | PO reports no indication of CW system piping rupture. | | |
| | | | |
| | PO reports all circulators in service. | | |
| | | | |
| | PO reports indication of a condenser tube leak in 21A condenser based on rising secondary chemistry recorder trends and 2CC1 alarms. | | |
| | | | |
| **Emergency Trip or Stop of 21A CW Pump:** | | | |
| | | | |
| | PO either initiates **STOP** on 21A circulator at step 3.27 **or** | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | initiates **EMERGENCY TRIP** based on CAS step 7.0 | | |
| | | | |
| **Proceed onto to next event when the 21A CW pump is out of service or as directed by Lead Evaluator.** | | | |
| | | | |
| | CRS initiates S2.OP-AB.CHEM-0001, Abnormal Secondary Chemistry, while continuing with AB.CW-0001. | | |
| | | | |
| | PO ensures CPS in service IAW S2.OP-SO.CN-0001. | | |
| | | | |
| **5. 22 RCP Oil Level Low** | | | |
| | | | |
| **Simulator Operator:** Insert **RT-4** at direction of Lead Evaluator.<br><br>**RC0006B: RC PUMP #22 LOSS OF LUBE OIL** | | | |
| | | | |
| | RO reports unexpected OHA D-13 for 22 RCP BRG OIL LVL LO | | |
| | | | |
| | PO reports alarm is for 22 RCP Upper Radial Bearing Oil Level Low | | |
| | | | |
| | PO refers to ARP and reports that RCP motor bearing temperatures are rising to or exceeds 175 F and directs entry into S2.OP-AB.RCP-0001. | | |
| | | | |
| | CRS enters **S2.OP-AB.RCP-0001** and implements Attachment 2 for stopping 22 RCP. | | |
| | | | |
| **Rx Trip and Stop 22 RCP:** | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | | | |
| | **CRS directs RO to trip the reactor, confirm the reactor trip, THEN stop 22 RCP.** | | |
| | | | |
| | RO trips the reactor and performs immediate actions of EOP-TRIP-1. | | |
| | | | |
| | **CRS enters EOP-TRIP-1, Reactor Trip or Safety Injection** | | |
| | | | |
| | RO and CRS review SI parameters and determine no SI is required. | | |
| | | | |
| **Evaluator's Note**: Based on the low power level when the Rx was tripped, the AFW pumps will have not Auto started due to adequate SG levels. The crew may decide now or when directed in EOP-TRIP-2 to manually start the AFW pumps. | | | |
| | | | |
| | PO request to manually start AFW pumps **or** wait until CRS directs starting them in EOP-TRIP-2. | | |
| | | | |
| | PO throttles AFW flow to > 22E4 lbm/hr | | |
| | | | |
| | **CRS transitions to EOP-TRIP-2, Reactor Trip Response** | | |
| | | | |
| | RO makes page announcement | | |
| | | | |
| | PO reports AFW flow > 22E4 lbm/hr **or** starts AFW pumps as necessary. | | |
| | | | |
| | PO stops 21 and 22 SGFPs | | |
| | | | |
| Proceed on to next event when SGFPs are | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| stopped or at Lead Evaluators direction | | | |
| | | | |
| **6. RHR Intersystem RCS Leak (LOCA outside Containment):** | | | |
| | | | |
| **Simulator Operator**: Insert **RT-5** at direction of Lead Evaluator<br><br>**MALF: SJ0312A CL LEG INJ LINE CHK VALVE 24SJ56 (RCS SIDE) LEAKS, Severity = 20**<br>**MALF: SJ0312B CL LEG INJ LINE CHK VALVE 24SJ43 (RHR SIDE) LEAKS, Severity = 10**<br>**MALF: RH0229B 22 RHR LEAK BEFORE HX, Severity = 1000**<br>**MALF: RH0300B 22 RHR LEAK AFTER HX, Severity = 1000** | | | |
| | | | |
| | RO reports unexpected console alarms for 24 SI Accumulator: Level HI-Lo and Press Hi-Lo | | |
| | | | |
| | RO reports that levels and pressure on 24 SI Accumulator are lowering | | |
| | | | |
| | RO reports PZR pressure and levels are lowering. | | |
| | | | |
| | RO reports unexpected OHA A-6 is in for 2R41D in Alarm | | |
| | | | |
| | RO reports OHA A-41 is for 23 and 24 RHR Sump Pump starts. | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | | | |
| | RO reports unexpected OHAs in for: C-34 22 RHR SUMP OVRFLO and E-36 PZR HTR OFF LVL LO | | |
| | | | |
| **Evaluator's Note**: The crew may respond to initial indications of an RCS leak by entering **S2.OP-AB.RC-0001** and THEN taking the actions of the CAS to initiate SI. | | | |
| | | | |
| | CRS directs RO to estimate RCS leak rate. | | |
| | | | |
| | RO reports that RCS leak rate is greater than Auto Makeup capability | | |
| | | | |
| | RO recommends initiating SI | | |
| | | | |
| | CRS directs RO to initiate SI | | |
| | | | |
| **One Train of SI fails to manually actuate by keyswitch:** | | | |
| | | | |
| | RO actuates one train of SI and reports that train of SI failed to manually initiate. | | |
| | | | |
| **Simulator Operator**: Ensure ET-1 or ET-2 is TRUE when the associated keyswitch is turned. This will allow the other train to actuate. | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| **ET-2: Train B keyswitch actuated.**<br><br>**ET-1: Train A keyswitch actuated** | | | |
| | | | |
| | **RO initiates other train of SI and reports SI initiated on both trains. [Critical Task #1]** | | |
| | | | |
| **Critical Task #1 (CT-2):** Manually actuate SI before transition out of TRIP-1.<br><br>**SAT:_____ UNSAT:_____** | | | |
| | | | |
| | **CRS returns to EOP-TRIP-1** | | |
| | | | |
| | RO and CRS reperform immediate actions of TRIP-1. | | |
| | | | |
| **22 Charging pump fails to start by 2C SEC:** | | | |
| | | | |
| | PO reports that SEC loading is not complete for 2B and 2C SEC | | |
| | | | |
| | PO reports that 22 Charging pump failed to start | | |
| | | | |
| | PO blocks and then resets 2C SEC | | |
| | | | |
| | **RO starts 22 Charging pump** | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| **2CV116 and 2CV284 fails to close on Phase A:** | | | |
| | | | |
| | | | |
| | PO reports NOT all valves are in the safeguard positions. | | |
| | | | |
| | PO reports that 2CV116 and 2CV284 did not close on Phase A signal. | | |
| | | | |
| **Simulator Operator**: Ensure **ET-3** or **ET-4** is TRUE when the associated Close PB is depressed for 2CV116 & 2CV284. This will delete the malfunction for the valves failing open.<br><br>**ET-3: 2CV116 Close PB**<br><br>**ET-4: 2CV284 Close PB**<br><br>**Note:** If the operator does not depress the close PB long enough the malfunction will not have enough time to delete and the valve will stay open. | | | |
| | | | |
| | **RO manually closes 2CV116 and 2CV284.** | | |
| | | | |
| | RO closes 21 and 22 CA330s | | |
| | | | |
| | RO reports containment pressure has remained less than 15 | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | psig | | |
| | | | |
| | PO reports 2RP4 does not indicate requirements to perform MSLI | | |
| | | | |
| | PO reports all 4KV vital buses are energized | | |
| | | | |
| | RO reports control room ventilation in AP mode. | | |
| | | | |
| | RO reports correct switchgear room ventilation and 2 CCW pumps running. | | |
| | | | |
| | RO reports correct ECCS injection flow for current RCS pressure. | | |
| | | | |
| **Evaluator's Note**: During validation Charging flow was approx. 318 gpm and RCS pressure was 1882 psig and lowering. | | | |
| | | | |
| | PO reports AFW flow and SG NR level status. | | |
| | | | |
| | RO reports 3 RCPs are running and RCS temperature trending to 547°F. | | |
| | | | |
| | RO reports both Rx Trip breakers are open | | |
| | | | |
| | RO reports both PZR PORVs are closed and only one (1) block valve is open (Note: 2PR6 closed previously to comply with Tech Specs) | | |
| | | | |
| | RO reports RCS pressure is not less than 1350 psig | | |
| | | | |
| | PO reports no indications of Faulted SGs | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | | | |
| | PO reports no indications of Ruptured SGs | | |
| | | | |
| | PO reports no Rad Monitors in Table F are in warning, alarm or rising | | |
| | | | |
| **Evaluator's Note**: If the crew transitions to LOCA-1 here, THEN the crew will evaluate transition to EOP-LOCA-6 at Step 16 of EOP-LOCA-1. | | | |
| | | | |
| | RO reports containment pressure < 4 psig | | |
| | | | |
| | RO reports containment sump level < 46% | | |
| | | | |
| | RO reports RCS subcooling > 0 F | | |
| | | | |
| | PO reports total AFW flow > 22E4 lbm/hr | | |
| | | | |
| | RO reports RCS pressure is NOT stable or rising | | |
| | | | |
| | CRS directs STA to initiate CFST | | |
| | | | |
| **Role Play**: IF asked about the status of Unit 1 Aux Bldg Rad Monitors report the following: ***1R3, 1R6A, and 1R20B are not in warning or alarm.*** | | | |
| | | | |
| | RO reports 2R41D is in alarm and no Unit 1 Aux Bldg Rad Monitors are in warning or alarm | | |
| | | | |
| | CRS dispatches field operator with RP support to investigate cause of high radiation in Aux Bldg | | |
| | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| **Role Play**: IF requested, after 5 minutes report the following: ***Rad Pro reports that the radiation dose rates are elevated on the 45 EL. Aux Bldg and steam is coming from the 22 RHR pit room. They do not recommend allowing access to the RHR rooms at this time.*** | | | |
| | | | |
| | Crew determines based on 2R41D in alarm, OHA alarms associated with 22 RHR sump pump starts and sump overflow, and lowering PZR pressure and levels that an RCS leak is indicated down on 22 RHR pump room. | | |
| | | | |
| | Crew determines that the cause of the Aux Bldg high radiation is due to a LOCA outside containment. | | |
| | | | |
| | **CRS transitions to EOP-LOCA-6, LOCA Outside Containment** | | |
| | | | |
| | STA verifies procedure transition. | | |
| | | | |
| | RO resets SI, Phase A and Phase B | | |
| | | | |
| | RO opens 21 and 22 CA330s | | |
| | | | |
| | PO resets each SEC and associated 230V control centers | | |
| | | | |
| RHR Suction Isolation: | | | |
| | | | |
| | | | |
| | RO reports 2RH1 and 2RH2 (Common Suction) are closed | | |
| | | | |
| | RO closes 21 and 22 RH19s (RHR discharge cross-connect) | | |
| | | | |
| | RO reports RCS pressure is NOT rising. | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | | | |
| RHR Hot Leg Injection Isolation: | | | |
| | | | |
| | RO reports 2RH26 (Hot Leg Injection) is closed | | |
| | | | |
| | RO reports RCS Pressure is NOT rising | | |
| | | | |
| RHR Cold Leg Injection Isolation: | | | |
| | | | |
| | RO reports 21RH29 is in AUTO | | |
| | | | |
| | PO removes lockout for 21SJ49 | | |
| | | | |
| | RO closes 21SJ49 (Cold Leg Isolation) | | |
| | | | |
| | RO reports RCS Pressure is NOT rising | | |
| | | | |
| | RO opens 21SJ49 | | |
| | | | |
| | RO reports 22RH29 is in AUTO | | |
| | | | |
| | PO removes lockout for 22SJ49 | | |
| | | | |
| | **RO closes 22SJ49 (Cold Leg Isolation) [Critical Task #2]** | | |
| | | | |
| | RO reports RCS Pressure is rising. | | |
| | | | |
| **Critical Task #2 (CT-32):** Isolate LOCA outside containment before transition out of LOCA-6.<br><br>**SAT:_____ UNSAT:_____** | | | |
| | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | RO stops 22 RHR pump | | |
| | | | |
| | **CRS transitions to EOP-LOCA-1** | | |
| | | | |
| | STA verifies procedure transition | | |
| | | | |
| | RO reports no indications of Faulted SGs | | |
| | | | |
| | RO reports no indications of Ruptured SGs | | |
| | | | |
| | RO reports SI, Phase A and B are reset | | |
| | | | |
| | PO reports all SECs are reset | | |
| | | | |
| | RO resets SG B/D sample isolation bypass | | |
| | | | |
| | RO opens 21 thru 24 SS94s | | |
| | | | |
| | CRS directs Chemistry to sample 21 thru 24 SGs for boron and activity | | |
| | | | |
| | RO reports both PZR PORVs are closed and one block valve is closed (2PR6 for Tech Spec compliance) | | |
| | | | |
| SI Flow Reduction Criteria:<br>(Note: this is a Continuous Action Step in LOCA-1) | | | |
| | | | |
| | RO reports RCS subcooling is > 0 F (approx. 53 F) | | |
| | | | |
| | PO reports AFW flow < 22 E4 lbm/hr | | |
| | | | |
| | PO reports at least one SG NR level > 9% (15% Adverse) | | |
| | | | |

| Evaluator/Instructor Activity | Expected Plant/Student Response | SBT LOG | Comment |
|---|---|---|---|
| | RO reports RCS Pressure is rising | | |
| | | | |
| **Evaluator's Note:** PZR level may not be > 11% at this time, **IF so**, THEN the crew should perform the action to stabilize RCS pressure using normal spray to allow the PZR to refill. | | | |
| | | | |
| | RO reports PZR level is > 11% (19% Adverse) | | |
| | | | |
| | **CRS transitions to EOP-TRIP-3, SI Termination** | | |
| | | | |
| | STA verifies procedure transition | | |
| | | | |
| **Terminate scenario when the Crew performs any of the following: transitions to EOP-TRIP-3 or performs RCS Pressure stabilization or at by direction from Lead Evaluator.** | | | |
| | | | |

## 7. 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-AB.CW-0001, Circulating Water System Malfunction
f. S2.OP-AB.CHEM-0001, Abnormal Secondary Chemistry
g. S2.OP-AB.LOAD-0001, Rapid Load Reduction
h. S2.OP-AB.PZR-0001, PZR Pressure Malfunction
i. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
j. 2-EOP-TRIP-2, Reactor Trip Response
k. 2-EOP-LOCA-1, Loss of Reactor Coolant
l. 2-EOP-LOCA-6, LOCA outside Containment

## ATTACHMENT 1
## UNIT TWO PLANT STATUS TODAY

MODE: 2 POWER: 4 RCS BORON: 1815 MWe 0

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

NA

REACTIVITY PARAMETERS

- Power ascension in progress following refueling outage IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load with Control Rods in Manual at D-123 steps.
- Reactor Engineering directs the use of control rods and steam dumps to raise reactor power to 10%.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Power ascension to 10% reactor power and enter Mode 1 IAW S2.OP-IO.ZZ-0003.
- Steam Dumps is in MS mode Auto. 21 SGFP in service with 22 SGFP in standby.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

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

PRIMARY:

SECONDARY:

- Polisher in service
- Blowdown is 35K per loop to 22 condenser.

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

- 22 SW pump C/T for strainer motor replacement.

## ATTACHMENT 2

## SIMULATOR READY FOR TRAINING CHECKLIST

____ 1. Verify simulator is in "TRAIN" Load

____ 2. Simulator is in RUN

____ 3. Overhead Annunciator Horns ON

____ 4. All required computer terminals in operation

____ 5. Simulator clocks synchronized

____ 6. All tagged equipment properly secured and documented

____ 7. TSAS Status Board up-to-date

____ 8. Shift manning sheet available

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

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

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

____ 12. All printers have adequate paper AND functional ribbon

____ 13. Required procedures clean

____ 14. Multiple color procedure pens available

____ 15. Required keys available

____ 16. Simulator cleared of unauthorized material/personnel

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

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

____ 19. Exam security set for simulator

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

____ With Baseline Data filled out

____ 21. Shift logs available if required

____ 22. Recording Media available (if applicable)

____ 23. Ensure ECG classification is correct

____ 24. Reference verification performed with required documents available

____ 25. Verify phones disconnected from plant after drill.

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

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

## ATTACHMENT 3

## CRITICAL TASK METHODOLOGY

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

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

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

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

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

## ATTACHMENT 4

## SIMULATOR SCENARIO REVIEW CHECKLIST

**SCENARIO IDENTIFIER:** 17-01 NRC-1 **REVIEWER:**

Initials Qualitative Attributes

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

## ATTACHMENT 4

## SIMULATOR SCENARIO REVIEW CHECKLIST

**Scenario No.: 1 (ESG-1)**

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Initial Conditions: IC-256: 4% power, BOL; 23 Charging Pump is running, 21 SGFP is in service with AFW pumps secured, power ascension in progress at 10% per hour with control rods in manual and steam dumps in MS mode in Auto. 22 SW pump C/T for strainer motor replacement.

Turnover: Crew is directed to continue raising Rx power to 10% and enter Mode 1 using Control Rods and Main Steam Dumps IAW S2.OP-IO.ZZ-0003.

Critical Tasks:

1. Manually actuate SI (see WOG CT-2).
2. Isolate LOCA outside containment (see WOG CT-32).

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | ALL (R) | Power ascension at 10% per hour and enter Mode 1 |
| 2 | PR0016A | RO (I)<br>SRO (I,TS) | PZR pressure controlling channel fails high (TS exercised) |
| 3 | SG0095A | SRO (TS) | 21 SG NR level fails low (TS only) |
| 4 | CN0094A | PO (C)<br>SRO (C) | 21A Main Condenser tube leak |
| 5 | RC0006B | RO (C)<br>SRO (C) | 22 RCP motor oil leak requiring manual reactor trip |
| 6 | SJ0312A<br>SJ0312B<br>RH0299B<br>RH0300B | ALL (M) | RHR intersystem RCS leak on 22 RHR heat exchanger during EOP-TRIP-2 |
| 7 | A701<br>A501 | RO (I)<br>SRO (I) | One train of SI fails to manually actuate. Operator can actuate the other train of SI from control room. |
| 8 | RP318S2 | RO (I)<br>SRO (I) | 22 Charging pump fails to start by 2C SEC. Operator can manually start from control room. |
| 9 | VL0045<br>VL0046 | RO (I)<br>SRO (I) | 2CV116 and 2CV284 fail to close on Phase A isolation. Operators can manually close from control room. |
| | | | |
| | | ABs | AB.PZR-1 → AB.CW-1 → AB.CHEM-1 → AB.RCP-1 |
| | | EOPs | TRIP-1 → TRIP-2 → TRIP-1 → LOCA-6 → LOCA-1 |

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

## ATTACHMENT 4

## SIMULATOR SCENARIO REVIEW CHECKLIST

**Scenario No.:** 1 (ESG-1)

| Target Quantitative Attributes per Scenario (See Section D.5.d) | Actual Attributes | Event No. |
|---|---|---|
| 1. Total malfunctions (5-8) | 7 | - |
| 2. Malfunctions after EOP entry (1-2) | 3 | 7,8,9 |
| 3. Abnormal events (2-4) | 3 | 2,4,5 |
| 4. Major transients (1-2) | 1 | 6 |
| 5. EOPs entered/requiring substantive actions (1-2) | 2 | LOCA-6<br>LOCA-1 |
| 6. Entry into a contingency EOP with substantive actions ( ≥ 1 per scenario set) | 0 | - |
| 7. Preidentified critical tasks (≥2) | 2 | CT-2, CT-32 |
| 8. Tech Specs exercised (≥ 2) | 2 | 2,3 |

**Note**: See 17-01 NRC-3 (FRSM-1) and 17-01 NRC-4 (FRHS-1) for Contingency EOPs used for the scenario set

# ATTACHMENT 5
# ESG CRITICAL TASKS

## 17-01 NRC-1

**CT #1: (CT-2)**

**Critical Task:** Manually actuate SI before transition out of EOP-TRIP-1.

**Basis:** See WOG Rev. 2

**CT #2: (CT-32)**

**Critical Task:** Isolate LOCA outside containment before transition out of EOP-LOCA-6.

**Basis:** See WOG Rev. 2

# ATTACHMENT 6

# ESG-PRA RELATIONSHIP EVALUATION

## EVENTS LEADING TO CORE DAMAGE

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

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

| Y/N | COMPONENT, SYSTEM, OR TRAIN | Y/N | COMPONENT, SYSTEM, OR TRAIN |
|---|---|---|---|
| N | Containment Sump Strainers | N | Gas Turbine |
| N | SSWS Valves to Turbine Generator Area | 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 that has the tube rupture(s) |
| N | Early depressurize the RCS |
| N | Initiate feed and bleed |