Facility: Indian Point 3 Scenario No.: 1 Op-Test No.: 1

Examiners: Alan Blamey(Don Jackson) Operators:
Joe D'Antonio

Initial Conditions: Plant is at 95% Power, MOL, 31 ABFP is Stop Tagged For Troubleshooting a Ground.

Turnover: Plant is at 95% Power, MOL, 31 ABFP is stop tagged and is 3 hours into its LCO

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | | I (RO, CRS) | Controlling Pressurizer Level Channel Fails High (AOP) |
| 2 | | R,C (CRS,, RO,BPO) | Condensate Pump Trip (AOP) |
| 3 | | C(CRS,RO,BPO) | Loss of Condenser Vacuum (AOP) |
| 4 | | M,C (CRS,RO) | Turbine Trip/ Failure of Auto Reactor Trip (ATWS) |
| 5 | | M(CRS,RO,BPO) | Steam Generator Tube Rupture On 32 S/G |
| 6 | | C (CRS,RO) | 32 MSIV Fails To Close |
| | | | |
| | | | |
| | | | |

**PROGRAM:** NRC Initial Licensed Operator Exam

**COURSE:** SIMULATOR

**TOPIC:** SIMULATOR EVALUATION

**LESSON:** Examination Scenario 1 (NEW) **LESSON NO.:** N/A

**APPROXIMATE TIME FOR EXAM:** 75 min. **REVISION:** 0

**INSTRUCTOR MATERIALS:**

1. Lesson Guide
2. Attachment 1, Simulator Exercise Summary
3. Attachment 2, Simulator Documentation Record
4. Attachment 3, Shift Turnover

**LESSON REFERENCES:**

**REMARKS:**

**SUBMITTED:** _____ **DATE:** _____

| **EXERCISE:** NRC Simulator Exam Scenario 1 | **SCENARIO** NRC 1 |
|---|---|

| | |
|---|---|
| Total Malfunctions (5-8/scenario): | |
| | Prior to EOP Entry: |
| | 1. Pressurizer Level Channel Failure<br>2. Condensate Pump Trip<br>3. Loss of Vacuum<br>4. Turbine Trip/Automatic Reactor Trip Failure |
| | After EOP Entry (1-2/scenario): |
| | 1. Steam Generator Tube Rupture<br>2. Fail 32 MSIV Open |
| Abnormal Events (2-4/scenario): | |
| 1. Pressurizer Level Channel Failure<br>2. Condensate Pump Trip<br>3. Loss of Vacuum | |
| Major Transients (1-2/scenario): | |
| 1. ATWS<br>2. SGTR | |
| EOPs entered/requiring substantive actions (1-2/scenario): | |
| 1. FR-S.1<br>2. E-3 | |
| EOP Contingencies requiring substantive action (0-2/scenario): | |
| 1. FR-S.1 | |
| Scenario run time (45-60 minutes, one scenario may approach 90 minutes): | |
| 75 minutes | |
| EOP run time (40-70% of run time): 70% | |

| **SIMULATOR SET-UP** | |
|---|---|
| 1. | Perform IC reset |
| 2. | Perform Simulator Check List |
| 3. | Initialize Simulator to 95% Power IC. |
| 4. | Pressurizer Level Controlling Channel Fails High |
| 5. | Loss of Condenser Vacuum |
| 6. | Main Turbine Trip- Spurious Low Vacuum Comes In Early |
| 7. | Block Automatic Reactor Trip on Main Turbine Trip: |
| 8. | Steam Generator Tube Rupture 32 S/G |
| 9. | Place 31 ABFP in PULLOUT and Stop Tag |
| 10. | Fail 32 MSIV OPEN |

## EXAMINER ACTIONS FOR SIMULATION

| EVENT | INIT CUE | CONSOLE ENTRY | SYMPTOMS / CUES / DESCRIPTION |
|---|---|---|---|
| A | Insert At Scenario Initialization | Tagged Out | Place 31 ABFP in Pullout and Stop Tag |
| B | Insert At Scenario Initialization | Malf 31B, 0, Insert | Failure of 32 MSIV to Close |
| C | Insert At Scenario Initialization | Malf RPS 002A,Insert<br>Malf RPS 002B, Insert<br>SWI-EPS-021D-Off<br>SWI-EPS-027D-Off<br>SWI-EPS-027G-Off<br>SWI-EPS-021G-Off | ATWS Setup |
| D | Lead Evaluator Direction | Malf-PRS-006B,100,Insert | Controlling Pressurizer Level Channel (LI-460) Fails High |
| E | Lead Evaluator Direction | Malf-CFW-005A,3600, Insert | 31 Condensate Pump Trip |
| F | Lead Evaluator Direction | Malf –CND-002A,30,Insert | Loss of Condenser Vacuum |
| G | Lead Evaluator Direction | Malf- TUR- 001, Insert<br>Malf- ATS 4A, Insert<br>Malf-ATS 4B, Insert<br>Trigger 1- off of JPP LP4(1) – LOA CFW 058,059,060 | Turbine Trip/Automatic Reactor Trip Failure/ Both MBFPs Trip At 2000 psig and lowering on ATWS |
| H | Entry Into E-0, After FR-S.1 | Malf-SGN 005B,15,Insert | SGTR (32 Steam Generator) |

| | | EVENT/EXPECTED OPERATOR RESPONSE: | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | A | **PRESSURIZER LEVEL CHANNEL (LI-460) FAILURE** | | | | | |
| ____ | 1. | Enters ONOP-RPC-1, "Instrument Failures" | | | X | | |
| ____ | 2. | Verify the following controls: Turbine Load, Rod Control, PRZR pressure control, PRZR level control- Notices NOT normal, MBFP speed, S/G levels | | | X | X | X |
| ____ | 3. | Takes RNO actions<br>**Perform:**<br>Places Charging Pump Speed Control in Manual, and Controls pressurizer level | | | X | X | |
| ____ | 4. | Checks RCS Instrumentation- RCS Loop Temps- Normal, delta T set points- Normal, RCS Loop Flow- Normal, Pressurizer Instrumentation- NOT Normal, enters Attachment 6, "Pressurizer Level Channel Failures" | | | X | X | |
| ____ | 5. | Operates PRZR heaters as necessary to maintain PRZR between 2205psig and 2260psig | | | | X | |
| ____ | 6. | Ensures Charging Pump speed controller is in MAN, controls PRZR level to maintain program level. | | | | X | |
| ____ | 7. | Place L/460A, LEVEL DEFEAT switch for the failed instrument to the required position<br>**Perform:**<br>Operates Level Defeat Switch In Cabinet B-6, L/460A to the DFT CH II Position | | | | | X |
| ____ | 8. | Transfer Charging Pump speed control back to AUTO per SOP-CVCS-2, "Charging Seal Water and Letdown Control"<br>**Perform:**<br>Transfers charging to AUTO | | | | X | |
| ____ | 9. | Reset Pressurizer Heaters, Modulating- AUTO, 1 Backup- ON, 2 Backups- AUTO | | | | X | |
| ____ | 10. | Place PRZR level recorder to an unaffected loop | | | | X | |
| ____ | 11. | Check redundant bistable lights for failed instrument are extinguished. | | | | | X |
| ____ | 13. | Reference Tech Specs for Instrumentation failure- 3.3.1 Function 8, Condition H- Place Channel in Trip in 6 hours or be less than P-7 in 12 Hours | | | X | | |

Comments:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | ***Lead Evaluator can move to next event once CRS recognizes a Tech Spec needs to be referenced, a follow up question post scenario can examine Tech Spec knowledge, in addition ensure that the charging pump speed controller is in Auto*** | | | | | |
| | | | | | | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| | B | **Condensate Pump Trip**<br><br>Perform actions of ONOP-FW-1, "Loss of Feed water" | | | | | |
| ____ | 1. | Check MBFPs- Both Running<br>**Checks:**<br>Both MBFPs are running | | | X | X | |
| ____ | 2. | Verify The Following Controls- MBFP Speed Control, S/G Levels<br>**Verifies:**<br>MBFP Speed Control- Stable<br>All S/G Levels- Stable | | | X | X | |
| ____ | 3. | Check Conditions Normal For the Following- Both MBFPs Running, Heater Drain Pumps Running, Condensate Pumps Running<br>**Checks:**<br>Heater Drain Pump was lost transitions to step #5 | | | X | X | |
| ____ | 4. | Check MBFP Suction Pressure- Check > 350psig<br>**Performs:**<br>MBFP suction pressure is <350psig, verifies start of condensate booster pump, Verify open CD-AOV-521 Polisher Bypass, Ensure CD-MOV-522 is fully open, Booster Pump Discharge | | | X | X | |
| ____ | 5. | Refer to Attachment 1 to determine load reduction required to maintain plant operation- 900Mwe<br>**Performs:**<br>Determines that a power reduction is required to approximately 900 Mwe, limited by MBFP suction pressure. | | | X | X | X |
| | ***6.*** | ***May Reference TS 3.4.1 DNB due to down power, if pressure goes <2205 psig-*** Applies if <5%/ min or <10% step change in power and pressure <2205 psig- Action restore in 2 hours. | | | X | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 7. | Reduce unit load in 100 Mwe increments to obtain- MBFP suction pressure > 350psig, Steam and feed flow matched, LI-1127, HDT Level <20 in.<br>**Performs:**<br>Commences Load Reduction | | | X | X | X |
| ____ | 8. | Crew may Borate rods out per SOP-CVCS-003. In addition they will perform a flush of the line after the boration<br>**Performs:**<br>Determine amount of Boron required from Reactivity Summary Sheet, Set YIC-110 for required Boron amount, Set FCV-110A to desired flow rate, Ensure BA X-fer pump is set to slow and Auto, Place RCS Makeup Mode Selector to "Borate", Place RCS Makeup Control switch to "Start", Flush with 20 gal of Water, Ensure BA X-fer pump in slow and Auto, Ensure 1 Primary Water Pump is running, Ensure non- running Pri Water Pp is in Trip-Pullout, Set FCV-110A to Manual, Set FCV-111A to Manual, Set FCV 111A to 20 Gal and set rate, Place RCS M/U Mode Switch to Manual, Place RCS Makeup Control switch to "Start", When Complete- Place M/U control to Stop, Return System to Auto with FCV- 110A and 111A set to proper blend. | | | X | X | |
| ____ | 9. | Determine cause of pump trip and initiate repair | | | X | X | |
| | | ***Commence Loss of Condenser Vacuum At The Examiner's Cue, As Power Is Being Stabilized*** | | | | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | C | **LOSS OF CONDENSER VACUUM** | | | | | |
| | 1. | Performs actions of ONOP-C-1, "Loss of Condenser Vacuum" | | | | | |
| ____ | 2. | Monitor Turbine to determine if it should remain on-line: Condenser Vacuum>25.5", Pressure Differential Between Condensers < 3"Hg., Turbine Exhaust Hood remains< 250 degrees F except for 1 time not to exceed 15 min.<br>**Checks:**<br>Determines Not Applicable | | | X | X | X |
| ____ | 3. | Stop any turbine accelerations or load increases<br>**Checks:**<br>No load change is in progress | | | X | X | |
| ____ | 4. | Verify Circulating Water Pumps are operating properly<br>**Checks:**<br>All Circ Water Pumps are in operation | | | X | | X |
| ____ | 5. | Direct the NPO to check the following:<br>• Verify SJAEs are operating properly<br>• Verify both MS-PCV-1132 and MS-PCV-1222 are operating properly<br>• Verify that the Gland Seal exhauster loop seal is intact<br>• Verify that there is adequate water box vacuum<br>• Verify that CD-FCV-1120 and CD-FCV-1113 are operating properly<br>**Checks:**<br>All above parameters are reported back as normal | | | X | | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ___ | 6. | Place Priming Jet Hoggers In Service IAW Att 1<br>**Performs:**<br>Assigns NPO This Step<br>Places Priming Jet Hoggers In Service IAW Att 1 | | | X | | X |
| ___ | 7. | Direct an NPO to verify that:<br>• HD-LCV-1133 is controlling level in the Gland Steam Condenser Drain Tanks<br>• MS-PCV-1211 and MS-PCV-1212 are maintaining Gland Sealing Steam Pressure > 3psig<br>• Condenser Flange Seal Water Head Tank level is normal<br>• Main Steam is the supply of steam to the hoggers and GS Steam<br>• Services are normal to the MBFPs<br>**Verifies:**<br>All items are normal except the Condenser Flange Seal Water Head Tank is empty<br>**Performs:**<br>Opens CT-139 | | | X | | X |
| ___ | 8. | Commence Turbine Load Reduction to maintain condenser vacuum<br>**Performs:**<br>Crew commences a load reduction | | | X | X | X |
| | | ***Insert Turbine Trip After an Observable Load Reduction or 10 Minutes Into Loss of Vacuum***<br>***Trip of Both MBFPs At RCS Pressure 2000psig and Lowering After ATWS. In Addition Fail The Main Condenser Fully as the MBFPs Trip*** | | | | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | **D** | **TURBINE TRIP/ ATWS** | | | | | |
| ____ | 1. | The RO / CRS recognizes a Reactor Trip Condition (Turbine Trip > P-8) and Initiates a Manual Reactor Trip | | | X | X | |
| | | ***Crew Recognizes and Takes Actions For A Failure of Automatic and Manual Reactor Trip (CT#1)*** | | | | | |
| ____ | 2. | The Reactor Fails to Trip Enters E-0, "Reactor Trip or Safety Injection"<br>**Performs:**<br>Attempts to manually trip the reactor<br>De-energizes 480V Buses 2A and 6A then re-energizes the bus after 5 seconds<br>Trips the Turbine<br>Enters FR-S.1, " Response to Nuclear Power Generation/ ATWS" | | | X | X | |
| ____ | 3. | Attempt Manual Reactor Trip<br>Insert Control Rods In Auto or Manual<br>Dispatches an NPO to Locally Trip the reactor via operator aid<br>**Performs:**<br>Attempts Manual Reactor Trip<br>Inserts Control Rods In Auto or Manual<br>Dispatches an NPO to Locally Trip the reactor via operator aid | | | X | X | |
| ____ | 4. | Verify the Turbine is Tripped<br>**Verifies:**<br>Main Turbine Stop Valves are Closed, the turbine is Tripped | | | X | X | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 5. | Check Auxiliary Feed is Running<br>**Checks:**<br>Both motor driven ABFPs are running<br>AFW total flow is > 730 gpm | | | X | | X |
| ____ | 6. | Initiate Emergency Boration of the RCS<br>**Performs:**<br>• Checks any Charging pump running<br>• Open CH-MOV-333<br>• Close HCV 104 and 105<br>• Start both boric acid pumps in fast speed<br>• Place operating charging pump in manual and raises speed<br>• Checks pressurizer pressure < 2235 psig | | | X | X | |
| | | ***Insert Local Reactor Trip*** | | | | | |
| ____ | 7. | Check if SI is Required or Initiated<br>**Checks:**<br>SI is not initiated or required | | | X | X | |
| ____ | 8. | Transitions to Step 15,<br>Verify the Reactor is Subcritical<br>• Power is < 5%<br>• SUR is 0 or Negative on IR Channels<br>• All rods are inserted to < 20 steps<br>**Checks:**<br>Reactor is Subcritical | | | X | X | |
| ____ | 9. | Secure Emergency Boration<br>• Verify CH-MOV-333 is Open<br>• Close CH-MOV-333<br>• Place both Boric Acid Pumps in Slow<br>• Open HCV-104 and 105<br>**Performs:**<br>All above Actions | | | X | X | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 10. | Verify RCP Seal Cooling<br>**Verifies:**<br>Seal Cooling Is Available<br>Seal Injection and Thermal Barrier Cooling In Service | | | X | | X |
| ____ | 11. | Check Charging Pump Status<br>**Verifies:**<br>• CCW Cooling available<br>• Charging Pump In Service<br>• Maintain Seal Injection 6-12 gpm | | | X | X | |
| ____ | 12. | Verify Adequate Shutdown Margin<br>**Verifies:**<br>All control rods < 20 steps<br>Direct Chemist to Sample RCS for Boron<br>Verify Boron Concentration is adequate | | | X | X | |
| | | ***Insert SGTR Upon Transfer to E-0*** | | | | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | E | **STEAM GENERATOR TUBE RUPTURE**<br><br>***Booth Operator: Insert 15% SGTR on 32 Steam Generator NO RAMP*** | | | | | |
| | | **E-0, REACTOR TRIP OR SAFETY INJECTION** | | | | | |
| ____ | 1. | Verify Reactor Trip<br><br>**Checks:**<br>Reactor Trip Breakers – OPEN<br>Neutron Flux – DECREASING<br>Rod Bottom Lights – LIT<br>Rod Position Indicators – AT ZERO<br><br>**Performs:**<br>MANUAL Reactor Trip is performed if not previously accomplished. | | | X | X | |
| ____ | 2. | Verify Turbine Trip<br><br>**Checks:**<br>Turbine Stop valves – CLOSED<br>Turbine Control valves – CLOSED | | | X | X | |
| | 3. | Verify that all 480V Buses are energized by Offsite Power<br>**Checks:**<br>Bus Status | | | X | X | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 4. | Check if SI is actuated<br><br>**Checks:**<br>SI annunciator – LIT<br>SI System pumps – RUNNING<br>**Perform:**<br>SI is Manually initiated if not already in service based on lowering pressurizer level, and pressure. | | | X | X | X |
| ____ | 5. | Verify total AFW flow is greater than 365gpm, and controls feed flow to maintain S/G NR levels between 9% and 50%<br>**Perform:**<br>Notes 31 ABFP is tagged | | | X | | X |
| ____ | 6. | BOP Operator performs RO-1 (BOP EOP Actions) | | | X | | X |
| ____ | 7. | Verify Feedwater Isolation- Both MBFPs- Tripped, MBFP Discharge Valves- Closed, Main and Bypass FRVs- Closed, S/G Blowdown Isolation Valves-Closed | | | X | X | |
| ____ | 8. | Verify SI Flow- Verifies RCS Pressure <1650psig, Checks for HHSI pump flow<br>**Verifies:**<br>Verifies SI flow adequate for pressure | | | X | | X |
| ____ | 9. | Verify Containment Spray is not required<br>**Checks:**<br>Verifies Containment Pressure is <22psig | | | X | | X |
| ____ | 10. | Check RCP Seal Cooling<br>**Checks:**<br>Checks RCP Bearing Flow Low Alarm, and Thermal Barrier Low Flow Alarm- Alarms are Clear | | | X | X | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|
| ____ | 11. Establish Charging flow<br>**Perform:** Checks RCS Pressure >325psig, verifies CCW cooling for Charging Pump, Checks HCV-142 Fully Open, CH-AOV-204B- Open, Opens CH-LCV-112B, and Closes CH-LCV-112C, Does Not Start Chg Pp Since CCW Is Available | | | X | X | |
| ____ | 12. Check RCS Tave<br>**Checks:** Verifies RCS Tave is stable at or trending to 547 degrees F, ensure S/G Atmospheric Reliefs are controlling Tave | | | X | X | |
| ____ | 13. Check if RCPs Should Be Stopped<br>**Checks:** Determines RCPs should not be stopped at this time | | | X | X | |
| ____ | 14. Check PRZR PORVs, Safety Valves, and Spray Valves<br>**Checks:** Determines all are closed and functioning properly, Tailpipe Temperatures Are Elevated Since PORVs Lifted During The ATWS. Acoustic Monitors Indicate PORVs and Safeties are Closed | | | X | X | |
| ____ | 15. Determine if S/Gs are Faulted:<br>**Checks:** No Fault is Indicated | | | X | X | |
| ____ | 16. Determine if S/G Tubes are Ruptured<br>**Perform:** Recognizes S/G Level response is not correct for 32 S/G- Transitions to E-3 "Steam Generator Tube Rupture", in addition R62B MSL Rad Monitor is 5x Normal | | | X | X | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | | **E-3, STEAM GENERATOR TUBE RUPTURE** | | | | | |
| ____ | 1. | Obtain correct procedure- E-3, "Steam Generator Tube Rupture" | | | | | |
| ____ | 2. | Check if RCPs Should be Stopped<br><br>**Checks:**<br>SI pumps running<br>RCS Subcooling <32F (73F)<br>Determines RCPs do not need to be stopped<br>**INSTRUCTOR NOTE:** This is a continuous action step | | | X | X | |
| ____ | 3. | Identify Ruptured SG(s)<br><br>**Checks:**<br>Unexpected rise in any SG narrow range level<br>High radiation from any SG sample<br>High radiation on and S/G Steamline | | | X | X | |
| ____ | 4. | Adjust ruptured SG Atmospheric steam dump controller maintain 1040 psig<br>**Perform:** Controller is adjusted so ADV lifts at 1040 psig by selecting Manual and turning dial to raise the setpoint. | | | X | X | |
| ____ | 5. | Check ruptured SG atmospheric steam dump valve – CLOSED<br><br>**Checks:**<br>SG Atmos verified closed | | | X | X | |
| ____ | 6. | Check that 32 and 33 S/Gs are intact<br>**Performs:**<br>Closes MS-41 | | | X | X | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 7. | Verify blowdown is isolated from 32 S/G<br>**Checks:** Verifies S/G blowdown isolation | | | X | | X |
| ____ | 8. | Dispatch NPO to locally isolate ruptured S/G<br>**Performs:** CRS dispatches NPO to complete the step | | | X | | X |
| ____ | 9. | Ensure ruptured S/G steam line valves are closed<br>**Performs:** Shuts 31,33,and 34 MSIVs and MSIV Bypass valves, Completes Att1, Alternate S/G Isolation Method, Uses intact S/G atmospheric dump valves to dump steam. | | | X | X | |
| ____ | 10. | Check ruptured S/G is isolated from at least one intact S/G<br>**Checks:** There is at least 1 S/G isolated from the ruptured S/G | | | X | X | |
| ____ | 11. | Check Ruptured SG(s) Level<br><br>**Checks:**<br>Narrow range level >9% (14%)<br><br>**Performs:**<br>Stops feed flow to 32 SG when NR level >9% (26%) | | | X | X | |
| ____ | | ***IDENTIFY AND ISOLATE A RUPTURED STEAM GENERATOR (CT #2)*** | | | | | |
| ____ | 12. | Check PRZR PORVs and Block Valves<br><br>**Checks:**<br>Power available to block valves<br>PORVs CLOSED<br>Block Valves - OPEN<br><br>**INSTRUCTOR NOTE:** This is a continuous action step | | | X | X | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 13. | Check if any SG is Faulted<br><br>**Checks:**<br>Any SG pressure decreasing in an uncontrolled manner or completely depressurized, No Steam Generator is faulted | | | X | | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 14. | Check Intact SG Levels<br><br>**Checks:**<br>Narrow Range SG level >9% (26%) or responding normally in all intact S/Gs<br><br>**Performs:**<br>Controls feed flow to maintain intact S/Gs between 9% (26%) and 50%<br><br>**INSTRUCTOR NOTE:** This is a continuous action step | | | X | X | |
| ____ | 15. | Reset SI<br>**Check:**<br>Steps 2-12 of RO-1 (BOP Actions) are complete<br>**Perform:**<br>Press both SI reset buttons on panel SBF-2<br>**Check:**<br>SI Actuated Light Off | | | X | | X |
| ____ | 16. | Reset Containment Isolation Phase A and B<br>**Perform:**<br>Place switches in close for 200A, 200B, 200C<br>Press Phase A Reset Buttons<br>Press Phase B Reset Buttons | | | X | | X |
| ____ | 17. | Establish Instrument Air to Containment<br><br>**Checks:**<br>Inst Air Low Press alarm clear on panel SJF<br>**Perform:**<br>Depress Inst Air reset button 28 on SMF<br>Open IA-PCV-1228 | | | X | | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 18. | Determine if RHR Pumps Should be stopped<br>**Perform:**<br>Stops Both RHR Pumps | | | X | | X |
| ____ | 19. | Check Ruptured Steam Generator Pressure is greater than 400psig<br>**Check:**<br>Ruptured S/G Pressure will be greater than 400psig | | | | X | |
| ____ | 20. | Initiate RCS Cool down to the RCS temperature based table in step 13<br>**Perform:**<br>Fully opens 31,33, and 34 S/G Atmospherics<br>Stops cool down at the required temperature and maintains CETs less than the required temperature from step 13 | | | X | X | |
| ____ | 21. | Check RCP Seal Cooling Established<br>**Checks:**<br>Checks Thermal Barrier Cooling and Seal Injection in Operation | | | X | X | X |
| ____ | 22. | Establish Charging Flow<br>**Performs:**<br>Chg Pump cooling available<br>Checks Open HCV-142<br>Opens CH-AOV-204B<br>Open CH-LCV-112B<br>Checks any Charging Pump Running<br>Adjusts Charging Pump Speed To Maximum | | | X | X | |
| ____ | 23. | Check Ruptured S/G Pressure stable or rising<br>**Checks:**<br>Ruptured S/G Pressure should be rising or at least 250 psig greater than S/G pressure | | | X | X | |
| ____ | 24. | Verify Subcooling > 60 degrees F | | | X | X | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 25. | Depressurize RCS Using Pressurizer Spray<br>**Performs:**<br>Increases PRZR Spray to maximum in manual<br>Stop Depressurization When:<br>RCS Pressure is less than S/G Pressure and PRZR level is > 14%<br>Or<br>PRZR level > 75%<br>Or<br>RCS Subcooling requirement is met | | | X | X | |
| | | **Cooldown and Depressurize RCS to minimize flow out of SGTR** ***(CT #3)*** | | | | | |
| | | **Terminate Scenario when Depressurization completed.** | | | | | |

***Brief BOP Surrogate To Control 32 S/G Level at 30% During SGTR Such That AFW Control Valves Are Closed and Informs The CRS That The AFW Control Valves are Closed.***

Comments:

____ 1.

Comments:

**Watch Crew Turnover Sheet:**

| | | | |
|---|---|---|---|
| **Date/Time:** | TODAY | **Condition:** | Power Ops |
| **RCS Temp:** | 566.7°F | **% Power:** | 95% |
| **RCS Press:** | 2235 psig | **MW Gross:** | 950 |
| **PZR Level:** | 45.7% | **River Water:** | 65 degrees F |
| **RCS Total Leakage:** | 0.2 gpm | **Boron Conc:** | 1180 ppm |
| **RCS Unidentified Leakage:** | 0.2 gpm | **Rod Position:** | Bank D 211 Steps |

| | |
|---|---|
| **Xenon:** | Equilibrium |
| **EFPD:** | 150 |
| **PZR Press Control:** | PI-455- Ch I |
| **PZR Level Control:** | LI-460- Ch II |
| **Service Water:** | 1,2,3 ESW Headers |

**Plant Equipment Status:**

1. 31 ABFP Stop Tagged for ground investigation.ITS LCO 3.7.5 Condition B in effect for 3 hours of 72 hour LCO.
2. MOV-535 is closed due to leakage past the PORV.
3. Power Reduced To 95% Due To Grid Instabilities.

Facility: Indian Point 3 Scenario No.: 2 Op-Test No.: 1

Examiners: Alan Blamey (Don Jackson) Operators:
Joe D'Antonio

Initial Conditions: Plant is at 2% Power,MOL

Turnover: Plant is at 2% Power, MOL, Raise Power To 7% To Enter Mode 1 In Preparation For Main Turbine Roll

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | | R (CRS,RO,BPO) | Continue Startup- Raise Power To 7% |
| 2 | | I (CRS,RO,) | Controlling Pressurizer Pressure Channel Fails High (AOP) |
| 3 | | C (CRS,RO,BPO) | Loss of 5A- 480 Volt Bus (AOP) |
| 4 | | C (CRS, RO) | 34 RCP High Vibration (AOP) |
| 5 | | C(CRS,RO) | 34 RCP Seal Leak and Failure (AOP) |
| 6 | | M( CRS,RO,BPO) | Small Break LOCA |
| 7 | | C (CRS,RO) | 32 HHSI Pp Fails To Start |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**PROGRAM:** NRC Initial Licensed Operator Exam

**COURSE:** SIMULATOR

**TOPIC:** SIMULATOR EVALUATION

**LESSON:** Examination Scenario 2 **LESSON NO.:** N/A

**APPROXIMATE TIME FOR EXAM:** 75 min. **REVISION:** 0

**INSTRUCTOR MATERIALS:**

1. Lesson Guide
2. Attachment 1, Simulator Exercise Summary
3. Attachment 2, Simulator Documentation Record
4. Attachment 3, Shift Turnover

**REMARKS:**

**SUBMITTED:** _____ **DATE:** _____

| **EXERCISE:** NRC Simulator Exam Scenario 2 | **SCENARIO:** NRC 2 |
|---|---|

| Total Malfunctions (5-8/scenario): | |
|---|---|
| | Prior to EOP Entry: |
| | 1. Controlling Pressurizer Pressure Channel Fails High<br>2. Loss of 5A 480 Volt Bus<br>3. 34 RCP High Vibration.<br>4. 34 RCP Seal Failure/ Small Break LOCA |
| | After EOP Entry (1-2/scenario): |
| | 1. 32 HHSI Pump Fails To Start |

| Abnormal Events (2-4/scenario): |
|---|
| 1. Controlling Pressurizer Pressure Channel Fails High<br>2. Loss of 5A 480 Volt Bus<br>3. High Vibration 34 RCP<br>4. 34 RCP Seal Failure |
| Major Transients (1-2/scenario): |
| 1. Small Break LOCA |
| EOPs entered/requiring substantive actions (1-2/scenario): |
| 1. E-1 |
| EOP Contingencies requiring substantive action (0-2/scenario): |
| N/A |
| Scenario run time (45-60 minutes, one scenario may approach 90 minutes): |
| 75 minutes |
| EOP run time (40-70% of run time): |
| 70% |

| **SIMULATOR SET-UP** | |
|---|---|
| 1. | Perform IC reset |
| 2. | Perform Simulator Check List |
| 3. | Sim Setup - 2% BOL- MBFP In Service |
| 4. | Additional RCS Leakage In Conjunction With RCP Seal Failure |
| 5. | Block Auto Start of 32 HHSI Pump |

## TIMELINE AND EXAMINER ACTIONS FOR SIMULATION

| EVENT | INIT CUE | CONSOLE ENTRY | SYMPTOMS / CUES / DESCRIPTION |
|---|---|---|---|
| A | Scenario Initialization | Malf- SIS 004B, 1, Insert | Block 32 HHSI Pump Auto Start |
| B | Examiner Directed | Malf- PRS 005A, 2500,100, Insert | Pressurizer Pressure Master Controller fails high. |
| C | Examiner Directed | Malf- EPS 005C, Insert | Loss of 5A 480 Volt Bus |
| D | Examiner Directed | Malf- RCS 007D, 11, Insert | 34 RCP High Vibration. |
| E | Examiner Directed | Malf- RCS 012D,100, Insert | 34 RCP Seal Failure (#1) |
| F | Examiner Directed | Malf- RCS 013D,100, Insert<br>Malf- RCS 014D,100, Insert<br>Malf- RCS 005D, 15, Insert | Small Break LOCA- Fail #1 Seal Until Seal Leak Off is Isolated, then Fail #2 and #3 Seals. In addition add 300 gpm addition to SBLOCA |

| **EXERCISE:** NRC Examination Scenario #2 | **SCENARIO:** NRC 2 |
|---|---|
| **ATTACHMENT 2 – SIMULATOR DOCUMENTATION RECORD** | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| | | **Normal Power Rise From 2% To 7% Power** | | | | | |
| | 1. | Pre-brief conducted and order given to raise power to 7% using control rod withdrawal | | | X | | |
| | 2. | Withdraw control rods to raise reactor power to 7%<br>**Performs:**<br>Withdraws control rods in 3 step increments<br>**Monitors:**<br>Rod position, Tave, Steam Dump Position, Feedwater Flow | | | X | X | |
| | | ***Insert Next Event After An Observable Power Change and Before 5% Power*** | | | | | |
| | A | **Controlling Pressurizer Pressure Channel (PI-455) Fails High**<br><br>Perform actions of ONOP-RPC-1, "Instrument Failures" | | | | | |
| ____ | 1. | Verify the following controls: Turbine Load- Stable, Rod Control Stable, PRZR Pressure Control- Normal, PRZR Level Control- Normal, MBFP Speed- Normal, S/G Levels- Normal<br><br>**Performs:**<br>Place Master Pressure Controller (PC-455K)in Manual By Placing Toggle On Controller To Manual Position, and Rotating Dial On Controller To Close Spray Valves. Control to restore pressure to 2235 psig. | | | X | X | |
| ____ | 2. | Check RCS Instrumentation: RCS Loop temperatures, RCS delta T set points, RCS coolant loop flow.<br>**Checks:**<br>All parameters are normal | | | X | X | |
| | 3. | Enters Technical Specification 3.4.1 for DNB Parameters, due to Pressure < 2205psig- Action: Restore RCS Pressure> 2205 psig in 2 hours. | | | X | | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 4. | Check PRZR instrumentation: PRZR Levels, PRZR Pressures<br><br>**Checks:**<br>PRZR Levels and Pressures, and determines that the controlling pressurizer pressure channel (PI-455) has failed high – Proceeds to Attachment 7 ONOP-RPC-1, "Instrument Failures" | | | X | X | |
| ____ | 5. | Ensure that the master pressure controller is in Manual and Control to maintain 2235 psig<br><br>**Perform:**<br>If master pressure controller is not already in Manual, it is placed in manual and pressure is controlled at 2235 psig | | | X | X | |
| ____ | 6. | Place P/455A ,"Press Defeat" switch for the failed instrument to the required position<br><br>**Performs:**<br>Places P/455A to the DFT Ch I/IV position in Rack B-6 | | | X | | X |
| ____ | 7. | Place delta T Defeat switch for the failed instrument to the required position<br><br>**Performs:**<br>Places delta T Defeat (3T/411A) switch to the DFT Ch I in Rack B-8 | | | X | | X |
| ____ | 8. | If steam dumps are armed, then reset the steam dumps and place in temp control.<br><br>**Checks:**<br>Steam dumps should not be armed, may request from Shift Manager to N/A the step. | | | X | X | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|
| ____ | 9. Place PC-455K, PRZR pressure Controller in Auto per SOP-RCS-2, "Pressurizer Pressure Control"<br>**CUE:** ***Step Requires Placing Variable Heater Control In Auto In Rack B-6, Control Does Not Exist In the Simulator- Cue That The Switch Is In Automatic***<br>**Performs:**<br>Places PC-455K in Automatic | | | X | X | |
| ____ | 10. If the failed instrument was selected to a Pressure or delta T recorder, select a functioning channel<br><br>**Performs:**<br>Selects recorders to functioning channels | | | X | X | |
| | 11. ***Examiner Note- May Proceed With Next Malfunction Any Time After PRZR Pressure Controller Placed In Auto*** | | | | | |
| ____ | 12. Ensure compliance with:<br>Technical Specification 3.3.1 Function 7a and 7b , Conditions E and H (Pressurizer High and Low Pressure Trips)- Action: Place Channel in Trip in 6 hours, or be in Mode 3 in 12 hours.<br>Technical Specification 3.3.2 Function 1d , Condition D (Low Pressure SI )- Action: Place Channel in Trip in 6 hours, Mode 3 in 12 hours, Mode 4 in 18 hours.<br>Technical Specification 3.3.1 Function5 Condition E (OT delta T ) Trip OT delta T Bistables in 6 hours.<br>Technical Specification 3.3.2 Function 7 (SI block permissive), Condition k, Verify Interlock in proper state in 1 hour.<br>***Perform As A Follow Up Question*** | | | X | | |

| **EXERCISE:** NRC Examination Scenario #2 | **SCENARIO:** NRC 2 |
|---|---|
| **ATTACHMENT 2 – SIMULATOR DOCUMENTATION RECORD** | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| | **B** | **Loss of 5A 480 Volt Bus**<br><br>Performs actions of ONOP-EL-7, "Loss of a 480 Volt Bus – Above Cold Shutdown" | | | | | |
| ____ | 1. | Check RCP Seal Cooling- Check if a Charging Pump is running, if not start a Charging Pump<br>**Verifies:**<br>31 Charging Pump is Lost<br>**Performs:**<br>Starts 32 Charging Pump, Maintains seal injection at 6-12 gpm, by raising Charging Flow on SC-141B | | | X | X | |
| ____ | 2. | Check Service Water Headers >60 psig- Checks Essential and Non-Essential headers and starts SW pumps as needed<br>**Verifies:**<br>Adequate SW pressure and starts an extra SW pump if pressure is in alarm | | | X | | X |
| ____ | 3. | Check Circulating Water Pump Status- Checks that all CW Pumps are running<br>**Checks:**<br>Circulating Water is unaffected, May ask shift manager to not take action to start other Circ Water pumps since only 3 are needed. | | | X | | X |
| ____ | 4. | Check that the in service boric acid pump is running<br>**Checks:**<br>In service boric acid pump is running, unaffected. | | | X | X | |
| ____ | 5. | Check EDG Status- Checks 33 EDG status<br>**Checks:**<br>33 EDG is running unloaded | | | X | | X |
| ____ | 6. | Check ABFP Status- Checks if any ABFP is running, maintains S/G level if necessary<br>**Checks:**<br>ABFPs are secured | | | X | | X |
| ____ | 7. | Checks any waste release in progress-<br>**Performs:**<br>No release is in progress, no action is needed | | | X | | X |
| | ***Note- May Get "CCW Surge Tank Level" Alarm Due To Pump Change*** | | | | | | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 8. | Checks Service Water Header Pressure between 60 psig and 97.5 psig in the essential and non- essential headers.<br>**Checks:**<br>SW header pressure is recovered since previous step. | | | X | | X |
| ____ | 9. | Check Component Cooling Water Status- Check for system alarms, check 3 CCW Pumps running, Verify RCP thermal barrier flow established.<br>**Performs:**<br>31 CCW pump will be lost, a 32 and 33 pumps will be running, need to verify thermal barrier cooling. | | | X | | X |
| ____ | 10. | Verify Seal Injection flow 6-12 gpm<br>**Verifies:**<br>Seal Injection Flow is unaffected | | | X | X | |
| ____ | 11. | Check IA Header Pressure > 90 psig<br>**Checks:**<br>IA Header pressure is unaffected | | | X | | X |
| | | **Cue:** ***May need a cue that an acrid smell is in the area of the 5A bus.*** | | | | | |
| ____ | 12. | Check 480 Volt Bus 5A De-energized<br>**Checks:**<br>5A 480 Volt Bus is dead | | | X | | X |
| ____ | 13. | Determine 33 EDG Status-<br>**Performs:**<br>Sends an operator to locally shutdown 33 EDG, Will Get" Safeguards Equip Locked Open" Annunciator | | | X | | X |
| ____ | 14. | Refer to Tech Specs- 3.8.1<br>**Verifies:**<br>Shutdown is required | | | X | | |
| ____ | 15. | Inspect 33 EDG for problem and Repair 5A 480 Volt Bus<br>**Performs:**<br>Initiates actions to repair bus | | | X | | |
| | | Ensure compliance with Technical Specification 3.8.9 A-Action: Restore in 8 Hours to meet LCO Action, or Mode 3 in 6 Hours, and Mode 5 in 36 Hours<br>***Examiner Note: Begin next event as Technical Specifications are being referenced.*** | | | X | | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| | **C** | **34 RCP High Vibration.** | | | | | |
| ____ | 1. | Determine Vibration amplitude and trend, Enter ONOP-RCS-5, "Reactor Coolant Pump Malfunctions"<br><br>**Perform:**<br>Implements ONOP-RCS-5 | | | X | | X |
| ____ | 2. | Determine if the affected RCP should be shutdown: Check RCP Seal D/P<br>• Check RCP Seal Return<br>• Check RCP Seal Inlet Temperature<br>• Check RCP Seal Outlet Temperature<br>• Check RCP Seal Cooling<br>• Check RCP Vibrations<br>• Check RCP Motor Winding Temperature<br>• Check RCP Upper and Lower motor bearing temperatures<br>• Check CCW supplies<br><br>**Checks:**<br>Determines 34 RCP Vibrations are in Alert, but does not meet trip criteria. | | | X | X | X |
| | | ***Begin #1 Seal Failure After Check of RCP Shutdown Triggers*** | | | | | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | **D** | **34 RCP #1 Seal Leak**<br><br>Response to indications of RCP seal leakage. | | | | | |
| ____ | 1. | Check RCP Seal Return Flow < 6gpm<br>**Performs:**<br>Recognizes Seal Return Flow is Failed High and delta P Failed Low, begins RNO Actions as described in the following steps | | | X | X | |
| ____ | 2. | Verify 34 RCP Seal Inlet Temperature is <225 degrees F and Stable, and 34 RCP Seal Outlet Temperature is <235 degrees F and Stable.<br>**Performs:**<br>Recognizes 34 RCP Seal Temperature Parameters are rising, performs RCP Emergency Shutdown as described below. | | | X | X | |
| ____ | 3. | Perform a Manual Reactor Trip and Stop 34 RCP<br>**Performs:**<br>Manually trips reactor, and Stops 34 RCP | | | X | X | X |
| ____ | 4. | Close RCP Seal Return Valve- CH-AOV-261D<br>**Performs:**<br>Closes CH-AOV-261D, 34 RCP Seal Return Valve ***after 1st 4 actions of E-0.*** | | | X | X | |
| ____ | 5. | Continue with E-0, "Reactor Trip or Safety Injection". | | | X | X | X |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | E | **Small Break LOCA** | | | | | |
| | | **Perform actions for E-0, Reactor Trip or Safety Injection** | | | | | |
| ____ | 1. | Verify Reactor Trip<br><br>**Checks:**<br>Reactor Trip Breakers – OPEN<br>Neutron Flux – DECREASING<br>Rod Bottom Lights – LIT<br>Rod Position Indicators - < 20 Steps | | | X | X | |
| ____ | 2. | Verify Turbine Trip<br><br>**Checks:**<br>Turbine Stop valves – CLOSED | | | X | X | |
| ____ | 3. | Verify 480V AC Buses- All Energized By Offsite Power<br>**Checks:**<br>All 480V AC Buses Energized By Offsite Power- Bus 5A has a fault, should sent an NPO or FSS to investigate fault. | | | X | | X |
| ____ | 4. | Determine If SI Is Actuated<br>**Checks:**<br>Any SI Annunciator Lit or SI Pumps Running, At this time SI should be running, or it will be manually initiated if it is not running via RNO. | | | X | X | |
| | | ***RCP Emergency Shutdown and Isolation of RCP Seal Return. (CT-1)*** | | | | | |
| | | ***Cue: Have Surrogate Go Slow In RO-1 So RO Will Start 32 HHSI Pump.*** | | | | | |
| | | ***Insert #2 and #3 RCP Seal Failures When Seal Return Isolated, and Insert 300 GPM SBLOCA*** | | | | | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| ____ | 5. | Verify total AFW flow- Greater than 365 GPM<br>**Checks:**<br>AFW flow is >365GPM<br>**Performs:**<br>Controls AFW Flow to raise S/G level to 9% (14%)- 50%.<br>Manually starts 31 and 33 ABFPs | | | X | | X |
| ____ | 6. | Direct BOP Operator to Perform RO-1- "BOP Actions During EOP Usage"<br>**Performs:**<br>BOP Performs RO-1 | | | X | | X |
| ____ | 7. | Verify Feedwater Isolation- Check MBFPs tripped, and MBFP discharge valves are closed, Main and Bypass FRVs closed, S/G Blowdown and Sampling is isolated<br>**Verifies:**<br>Verifies Feedwater is Isolated- Some indications out, due to loss of Bus 5A.<br>**Performs:**<br>Must manually shut MOV-2-31 locally, still open due to loss of power. | | | X | X | |
| ____ | 8. | Verify SI Flow- RCS Pressure <1650 psig (2000psig), HHSI Flow indicated, RCS Pressure <325 psig (650 psig)<br>**Verifies:**<br>Pressure is <1650 psig, but not <325 psig. HHSI flow is verified. Recognizes 32 HHSI Pump failed to start and successfully manually starts it. | | | X | X | |
| | 9. | ***Take Actions For Failure Of Automatic SI Equipment – Note- May Be Noticed In RO-1 (CT# 2)*** | | | | | |
| ____ | 10. | Verify Containment Spray is not required- Check that Containment Pressure has remained < 22 psig<br>**Verifies:**<br>Containment Spray is not required | | | X | X | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 11. | Check RCP Seal Cooling- Verify CCW flow to RCP thermal barrier, and RCP bearings by verifying alarms are clear for RCP cooling.<br>**Verifies:**<br>RCP Cooling alarms are clear | | | X | X | |
| ____ | 12. | Check RCS Average Temperature- Verify RCS Tave is stable at or trending to 547 degrees F<br>**Verifies:**<br>RCS Tave is lowering<br>**Performs:**<br>Stops Dumping Steam- Ensures PC-404 Is Controlling Steam Dumps Closed, Throttles AFW to minimum to restore S/G level via FCV-406 A,B,C,D, Closes MSIVs | | | X | X | X |
| ____ | 13. | Checks if RCPs should be stopped- Verify at least one HHSI pump is running, Verify Subcooling <32 degrees F (75 degrees F), Stop all RCPs<br>**Performs:**<br>Verifies conditions are met and stops all RCPs | | | X | X | |
| | 14. | ***TRIP RCP OPERATION DURING EMERGENCY AND ABNORMAL CONDITIONS (CT#3)*** | | | | | |
| ____ | 15. | Check Przr PORVs, Safety Valves, and Spray Valves- Checks Przr PORVs closed, Check Safety Valves Closed, Check Przr Spray Valves are Closed.<br>**Checks:**<br>Checks Przr PORVs, Safety, and Spray Valves Closed | | | X | X | |
| ____ | 16. | Determine if S/Gs are Faulted- Any S/G Pressure lowering in an uncontrolled manner or completely depressurized<br>**Checks:**<br>S/G is currently not faulted | | | X | X | |

| **EXERCISE:** NRC Examination Scenario #2 | **SCENARIO:** NRC 2 |
|---|---|
| **ATTACHMENT 2 – SIMULATOR DOCUMENTATION RECORD** | |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 17. | Determine if S/G Tubes are ruptured.- Checks S/G Level response, and abnormal radiation levels<br>**Checks:**<br>Determines a S/G Tube Rupture does not exist verifies R-15,R-19 A-D, and R-62 A-D not in alarm or rising | | | X | X | X |
| ____ | 18. | Determine if the RCS is intact- Containment Pressure, RCS Pressure, Sump, and Radiation Levels are normal<br>**Performs:**<br>Determines RCS is not intact, and Transfers to E-1, "Loss of Reactor or Secondary Coolant | | | X | X | X |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | F | **Perform actions of E-1, LOSS OF REACTOR OR SECONDARY COOLANT** | | | | | |
| ____ | 1. | Check if RCPs Should Be Stopped<br><br>**Checks:**<br>HHSI pumps running<br>RCS Subcooling<br><br>**Note: This step may be performed during E-0 while monitoring Foldout Page criteria. However, the critical task is met if performed at this step.** | | | X | X | X |
| ____ | | ***TRIP RCP OPERATION DURING EMERGENCY AND ABNORMAL CONDITIONS (CT#3)*** | | | | | |
| ____ | 2. | Determine if S/Gs are faulted- Checks any S/G Pressure lowering in an uncontrolled manner or completely depressurized.<br>**Checks:**<br>Any SG pressure decreasing in an uncontrolled manner or completely depressurized has been previously isolated | | | X | X | |
| ____ | 3. | Check Intact SG Levels<br><br>**Checks:**<br>Narrow Range SG level 9% (14%)- 50%<br><br>**Performs:**<br>Controls aux feed flow to maintain between 9% (14%) and 50% | | | X | X | |
| ____ | 4. | Reset SI- Check SI Auto action verification- Steps 2-12 of RO-1, "BOP Operator Actions During Use of EOPs"- Completed<br>**Checks:**<br>RO-1 Steps 2-12 Completed by BOP<br>**Performs:**<br>Presses Train 1 and 2 SI Reset Buttons, Checks that SI Actuated Light is Off | | | X | | X |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 5. | Reset Containment Isolation Phase A and Phase B- Closes L/D Orifice Isolation Valves, Resets Phase A, and Phase B<br>**Performs:**<br>Resets Phase A Using Reset Pushbuttons<br>Resets Phase B Using Reset Pushbuttons | | | X | | X |
| ____ | 6. | Check Secondary Radiation-<br>• Check if a Seismic Event has occurred<br>• Sample all S/Gs for activity<br>• Conduct radiation survey on Steamlines and B/D sample lines<br>• Reset S/G Sample valves<br>• Check radiation monitors and S/G Levels for indications of a S/G Tube Rupture<br>**Checks:**<br>Checks indications above and determines a S/G Tube Rupture is not in progress. | | | X | | X |
| ____ | 7. | Check Przr PORVs and Block Valves- Check Power Available To Block Valves, Check PORVs Closed, Check PORV Block Valves Open.<br>**Checks:**<br>Performs above checks, PORVs and Blocks in proper position and available. PORV Block Valve 536 is not energized due to active leakage in the plant modeled on the simulator. | | | X | X | |
| ____ | 8. | Establish Instrument Air To Containment- Verify IA Low Pressure Alarm Is Clear, Press Reset Instr Air Reset Pushbutton on Panel SMF, Open IA-PCV-1225, "Inst Air To Cont"<br>**Performs:**<br>Reset Inst Air and Open IA-PCV-1225 | | | X | | X |
| ____ | 9. | Check RCP Seal Cooling- Verify Seal Injection and Thermal Barrier Cooling in Service<br>**Verifies:**<br>Seal Injection and Thermal Barrier Cooling in Service | | | X | X | |

**EXERCISE:** NRC Examination Scenario #2 **SCENARIO:** NRC 2

**ATTACHMENT 2 – SIMULATOR DOCUMENTATION RECORD**

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|
| ____ | 10. Check CCW for Charging Pump Cooling Available-<br>**Checks:**<br>CCW Cooling is Available to Charging Pumps | | | X | X | |
| ____ | 11. Determine if Charging Flow has been established- Checks either Charging Pump Suction Open, Checks Normal Charging Isolation Valve Open, Check HCV-142 Fully Open, Check ANY Charging Pump Open.<br>**Performs:**<br>Starts 32 Charging Pump, Opens 112B, Locally closes 112C due to power being lost. | | | X | X | |
| ____ | 12. Determine if SI Should Be Terminated- Check RCS Subcooling, Heat Sink, RCS Pressure, Pressurizer Level<br>**Checks:**<br>Either Subcooling, RCS Pressure, or Pressurizer Level will not be met, such that SI can not be terminated. With Scenario Conditions, Subcooling Will Probably Not Be Met. | | | X | X | |
| ____ | 13. Determine if the Containment Spray Pump Should be Stopped- Check if any Spray Pump s running.<br>**Checks:**<br>No Spray Pump should be running, RNO sends to next step. | | | X | X | |
| ____ | 14. Determine if RHR Pumps Should be Stopped- Check if an RHR Pump is running, and if RCS Pressure is above 325 psig (650 psig) and stable or rising.<br>**Checks:**<br>RHR Pump is running, and pressure is adequate to stop RHR Pumps<br>**Performs:**<br>Stop RHR Pumps and place in Auto | | | X | | X |
| ____ | 15. Check RCS and S/G Pressures- Check S/G Pressures Stable or Rising. Check RCS Pressure Stable or Lowering<br>**Checks:**<br>Above checks are met | | | X | X | |

| TIME | | EVENT/EXPECTED OPERATOR RESPONSE: | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 16. | Determine if Diesel Generators Should be Stopped- 480V AC Buses are powered from Offsite Power, Stop EDGs<br>**Performs:**<br>Stops all EDGs | | | X | | X |
| ____ | 17. | Evaluate Plant Status- Initiate Att.1 ," Plant Equipment Status Evaluation"<br>**Performs:**<br>Initiates Att.1 ," Plant Equipment Status Evaluation" | | | X | X | |
| ____ | 18. | Check if RCS Cooldown and Depressurization is Required- Check RCS Pressure > 325 psig (650 psig)<br>**Performs:**<br>Conditions met, Implements ES-1.2, " Post LOCA Cooldown and Depressurization" | | | X | X | |
| | | **Terminate Scenario upon Transition to ES-1.2, or at the direction of the Lead Evaluator.** | | | | | |

***Brief Surrogate BPO To Go Slow In RO-1 So RO Will Start 32 HHSI Pump.***

**Watch Crew Turnover Sheet:**

| | | | |
|---|---|---|---|
| **Date/Time:** | TODAY | **Condition:** | Power Ops |
| **RCS Temp:** | 547.3°F | **% Power:** | 2% |
| **RCS Press:** | 2235 psig | **MW Gross:** | 0 MWe |
| **PZR Level:** | 23.1% | **River Water:** | 63°F |
| **RCS Total Leakage:** | 0.2 gpm | **Boron Conc:** | 1581ppm |
| **RCS Unidentified Leakage:** | 0.2 gpm | | |

| | |
|---|---|
| **Xenon:** | Xe Free- 3 Days Post Trip |
| **EFPD:** | 150 |
| **PZR Press Control:** | PT-455 Channel I |
| **PZR Level Control:** | LI-460 Channel II |
| **Service Water:** | 1,2,3 ESW |

**Plant Equipment Status:**

1. All Equipment is Operable
2. Currently Conducting A Plant Startup After A Short Forced Outage. In Procedure- POP 1.3 – "Plant Start Up From 0% to 45%" step 4.27.
3. Orders Are To Enter Mode 1 (All Required Permission Has Been Received), Raise Power To 7% In Preparation For Main Turbine Roll.
4. MOV-535 Is Closed Due To Leakage Past Its PORV.

Facility: Indian Point 3 Scenario No.: 3 Op-Test No.: 1

Examiners: Alan Blamey (Don Jackson) Operators:
Joe D'Antonio

Initial Conditions: Unit 3 is at 32% Power with a Shut Down in progress to meet the requirements of the AFW System LCO. 32 ABFP is Stopped Tagged due to a damaged trip throttle valve.

Turnover: Unit 3 is at 32% Power with with a Shut Down in progress to meet the requirements of the AFW System LCO. 32 ABFP is Stopped Tagged due to a damaged trip throttle valve. Orders for the shift are to hold briefly at 32% Power while 32 ABFP is being re-assessed. However, ensure plant is in mode 3 in 4 Hours if 32 ABFP is not made operable.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | | $I_{(CRS,RO,BOP)}$ | T avg Channel Summer Fails High (AOP) |
| 2 | | $C_{(CRS,RO)}$ | Loss of the Operating Charging Pump (AOP) |
| 3 | | $C_{(CRS,RO,BOP)}$ | Turbine Trip < P-8 (No Reactor Trip Expected) (AOP) |
| 4 | | $C_{(CRS,RO)}$ | Loss of Both MBFPs (Failed Instrument), Manual Reactor Trip |
| 5 | | $C_{(CRS,BPO)}$ | Failure of 31 ABFP |
| 6 | | $M_{(CRS,RO,BOP)}$ | Loss of All Feed, FR-H.1 |
| | | | |
| | | | |

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

**PROGRAM:** NRC Initial Licensed Operator Exam

**COURSE:** SIMULATOR

**TOPIC:** SIMULATOR EVALUATION

**LESSON:** Examination Scenario 3 (NEW) **LESSON NO.:** N/A

**APPROXIMATE TIME FOR EXAM:** 80 min. **REVISION:** 0

**INSTRUCTOR MATERIALS:**

1. Lesson Guide
2. Attachment 1, Simulator Exercise Summary
3. Attachment 2, Simulator Documentation Record
4. Attachment 3, Shift Turnover

**REMARKS:**

**SUBMITTED:** _____ **DATE:** _____

| | |
|---|---|
| Total Malfunctions (5-8/scenario): | |
| | Prior to EOP Entry: |
| | 1. Tavg Summer Fails High<br>2. Loss of the Operating Charging Pump<br>3. Turbine Trip < P-8<br>4. Loss of Both MBFPs, Manual Reactor Trip |
| | After EOP Entry (1-2/scenario): |
| | 1. 33 AFW Pump Motor Overload |
| Abnormal Events (2-4/scenario): | |
| 1. T avg Summer Fails High<br>2. Loss of the Operating Charging Pump<br>3. Turbine Trip < P-8<br>4. Loss of Both MBFPs | |
| Major Transients (1-2/scenario): | |
| 1. Loss of All Feedwater | |
| EOPs entered/requiring substantive actions (1-2/scenario): | |
| 1. FR-H.1- Loss of All Feed | |
| EOP Contingencies requiring substantive action (0-2/scenario): | |
| 1. FR-H.1- Loss of All Feed | |
| Scenario run time (45-60 minutes, one scenario may approach 90 minutes): | |
| 80 minutes | |
| EOP run time (40-70% of run time): 70% | |

| **SIMULATOR SET-UP** | |
|---|---|
| 1. | Perform IC reset |
| 2. | Perform Simulator Check List |
| 3. | Sim Setup - 32% BOL, Heater Drain Pumps OOS |
| 4. | 32 ABFP Stop Tagged Due To Damaged Trip Throttle Valve |
| 5. | Both MBFPs Trip When Rods are Taken To Manual After Turbine Trip |
| 6. | Loss of Bus 3A to Occur At Time of Reactor Trip |

## TIMELINE AND EXAMINER ACTIONS FOR SIMULATION

| EVENT | INIT CUE | CONSOLE ENTRY | SYMPTOMS / CUES / DESCRIPTION |
|---|---|---|---|
| A | Scenario Initialization | Tagged Out | 32 ABFP Stop Tagged Out of Service |
| B | Scenario Initialization | JPP LP4 (1)<br>Malf- EPS-005B, Trigger 1 | Failure of 480V Bus 3A At Reactor Trip |
| C | Examiner Directed | Malf- RCS 006A, 645, 100, Insert | T avg Summer Fails High |
| D | Examiner Directed | Malf- CVCS 005A, Insert | Loss of the Operating Charging Pump |
| E | Examiner Directed | Malf- TUR 001, Insert | Turbine Trip < P-8 |
| F | Examiner Directed | Malf- ATS 004A, Insert<br>Malf- ATS 004B, Insert | Both MBFPs Trip , Inserted When Rods Taken To Manual |
| G | Examiner Directed | Malf- CFW-001C,1,Insert | Loss of 33 ABFP on Motor Overload |

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| | A | **T avg Summer Fails High (PI-412 C)**<br><br>Perform actions of ONOP-RPC-1, "Instrument Failures" | | | | | |
| ____ | 1. | Verify the following controls: Turbine Load- Stable, Rod Control Stable, PRZR Pressure Control- Normal, PRZR Level Control- Normal, MBFP Speed- Normal, S/G Levels- Normal<br>**Performs:**<br>Places Rod Control in Manual<br>Places 31 Charging Pump Speed Control In Manual | | | X | X | |
| ____ | 2. | Check RCS Instrumentation: RCS Loop temperatures, RCS delta T set points, RCS coolant loop flow.<br>**Checks:**<br>RCS Loop Tave and T hot have failed high, goes to step 3 | | | X | X | |
| ____ | 3. | Performs the appropriate attachment per table<br>**Performs:**<br>Reviews table and selects Attachment 2 | | | X | X | |
| ____ | 4. | Ensure Rod Control is in Manual<br>**Performs:**<br>If not already in manual, places rod control in manual. | | | X | X | |
| ____ | 5. | Match reactor power and turbine load<br>**Performs:**<br>May slightly lower turbine load, or raise rods to balance reactor and turbine power | | | X | X | |
| ____<br>____ | 6. | Place charging pump speed control in Manual<br>**Performs:**<br>Places charging pump speed control in Manual | | | X | X | |
| ____ | 7. | Control charging to maintain PRZR level on program<br>**Performs:**<br>Controls charging per Graph RCS-2 | | | X | X | |
| ____ | 8. | Verify all redundant TRIP Status Lights for T hot are extinguished.<br>**Verifies:**<br>There are no redundant lights lit | | | X | | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|
| ____ | 9. Place the Delta T Defeat switch for the failed instrument to the defeat position for the channel<br>**Performs:**<br>Defeats Delta T for the failed channel. Places Switch In "3T/411A-DFT Ch1" Position In Cabinet B-8 | | | X | | X |
| ____ | 10. Place the T avg Defeat switch for the failed instrument to the required position<br>**Performs:**<br>Defeats the Tavg Input by placing the Defeat switch into the correct position. Places Switch in T412A in Loop A U-1" Position In Cabinet D-8 | | | X | | X |
| | 11. Crew May Reduce Turbine Load or Raise Controls Rods To Match Tave and Tref | | | X | X | |
| ____ | 12. If the Lo Power Rod Withdrawal Stop lamp is out then – Ensure 2 minutes have elapsed, establish AUTO rod control, ensure steam dumps are reset and in Temp Control<br>**Performs:**<br>Depending on power level the Lo Power Rod Stop is not lit. Operator takes action as described in the step above. | | | X | X | |
| ____ | 13. Restore automatic PRZR level control<br>**Performs:**<br>Returns PRZR level control to automatic | | | X | X | |
| | 14. Ensure compliance with Technical Specification 3.3.1, Function 5 (OT delta T), Condition E- Action: Place delta T Channel in Trip condition in 6 hours, and place unit in Mode 3 in 12 hours.<br>Technical Specification 3.3.1, Function 6 (OP delta T), Condition E, Place OP delta T channel in Trip condition in 6 hours, and place unit in Mode 3 in 12 hours.<br>Technical Specification 3.3.2, Function 1f (Low Tave, Hi Steam Flow SI), Condition D, Place channel in Trip condition in 6 hours.<br>Technical Specification 3.3.2, function 4d (MSL Isol), Condition D, Place channel in Trip condition in 6 hours. | | | X | | |
| ____ | 15. ***Insert Next Event When PRZR Level Control Is In Auto*** | | | | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| | B | **Loss of the 31 Charging Pump**<br><br>Perform actions of ONOP-CVCS-1, "Charging and Letdown Malfunctions" | | | | | |
| ____ | 1 | Check that Charging Flow is Established- Checks flow is indicated on FI-128B<br>**Verifies:**<br>Flow on FI-128B is "0"- recognizes Response Not Obtained actions for step 1 are required. | | | X | | X |
| ____ | 2 | Close Letdown Isolation Valves CH-LCV-459, and CH-LCV-460<br>**Performs:**<br>Closes letdown isolations. | | | X | | X |
| ____ | 3 | Check PRZR level > 19%<br>**Checks:**<br>Pressurizer Level is > 19% | | | X | X | |
| ____ | 4 | Check VCT Level > 5% and 9%<br>**Checks:**<br>VCT Level is > 5% and 9% | | | X | X | |
| ____ | 5 | Check that CH-LCV-112B, CH-LCV-112C, or CH-288 are open<br>**Checks:**<br>Charging is lined up for operation, CH-LCV-112C is open | | | X | | X |
| ____ | 6 | Start 1 Charging Pump- Take Pump speed control to manual and adjust to 10-15% (32 or 33 pump), Start 32 or 33 pump, Control charging to maintain RCP seal injection 6-12 gpm<br>**Performs:**<br>Starts 32 or 33 charging pump per the above instructions | | | X | X | |
| ____ | 7 | Check that there is not a charging or letdown line leak<br>**Checks:**<br>Monitors radiation and sump levels in the Aux Bldg | | | X | X | X |
| ____ | 8 | Check that charging flow is established—Checks flow on FI- 128B<br>**Verifies:**<br>Flow is indicated on FI-128B | | | X | | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 9 | Determine Letdown Status- check letdown flow at 0gpm, check that orifice valves are closed (Closes 200B), place PCV-135 in manual and 50% output, place TCV-130 in manual at 50% output, ensure open CH-AOV-201, CH-AOV-202, CH-LCV-459, CH-LCV-460, Check TCV-149 and CH-LCV-112A in AUTO, Open CH-AOV-200B, and verify L/D flow on FI-134<br>**Performs:**<br>Performs above steps in order to establish Letdown Flow | | | X | | X |
| ____ | 10 | Control Charging and Letdown- Adjust PCV-135 to maintain L/D pressure 225psig- 275 psig, adjust TCV-130 to maintain L/D temperature 100-130 degrees F, Maintain RCP seal injection 6-12 gpm, adjust charging and letdown to return Pressurizer Level to program<br>**Performs:**<br>Stabilizes charging and letdown as described above and restores PRZR level to program | | | X | | X |
| ____ | 11 | Check parameters that indicate Charging or Letdown leakage<br>**Checks:**<br>Checks for abnormal system level or radiation trends | | | X | X | X |
| ____ | 12 | Establish TCV-130, PCV-135, and Charging Pump Speed control in Automatic<br>**Performs:**<br>When conditions are stable, places controllers in AUTO | | | X | X | |
| | | ***Examiners Note: Begin Turbine Trip <P-8 when controllers are restored to automatic or 5 minutes after letdown is restored*** | | | | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| | **D** | **Turbine Trip < P-8**<br>Performs actions of ONOP-TG-4,"Turbine Trip Below P-8" | | | | | |
| ____ | 1. | Verify Reactor Power Less Than 35% (P-8 Lit)<br>**Verifies:**<br>Power is less than P-8 | | | X | X | |
| ____ | 2. | Place Rod Control In Manual<br>**Performs:**<br>Places rods into manual | | | X | X | |
| | | ***Insert Trip of Both MBFPs When Control Rods Taken To Manual*** | | | | | |
| ____ | 3. | Verify that all MSIVs are OPEN, Steam Dumps are Available, and that a MBFP is running<br>**Verifies:**<br>MSIVs are open, Steam Dumps are available and operating, MBFPs are tripped- Takes RNO action to Trip The Reactor | | | X | X | |
| ____ | | ***Trip Reactor On Loss of Running MBFPs (CT#1)*** | | | | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | E | **MBFP Trips / Manual Reactor Trip/ Loss of 3A 480 Volt Bus (*Bus Loss Linked To Reactor Trip*)**<br><br>Crew Enters E-0 , "Reactor Trip or Safety Injection" | | | | | |
| ____ | 1. | May or May Not Enter ONOP-FW-1, " Loss of Feedwater". Trips Reactor In Response To Loss of Both MBFPs<br>**Performs:**<br>Orders Reactor Trip and E-0 , "Reactor Trip or Safety Injection" entry. | | | X | X | |
| ____ | 2. | Verify Reactor Trip<br>**Checks:**<br>Reactor Trip AND Bypass Breakers – OPEN<br>Neutron Flux – DECREASING<br>Rod Bottom Lights – LIT<br>Rod Position Indicators - < 20 Steps | | | X | X | |
| ____ | 3. | Verify Turbine Trip<br>**Checks:**<br>Turbine Stop valves – CLOSED | | | X | | X |
| ____ | 4. | Verify 480V AC Buses- All energized by offsite power<br>**Verifies:**<br>Checks status of 480V Buses, recognizes that bus 3A is deenergized.<br>**Performs:**<br>Checks 345KV generator breakers 1 and 3 open<br>Attempt to restore Bus 3A per SOP-EL-1 and SOP-EL-5, however recognizes that Bus 3A has experienced a bus fault<br>***Report to Control Room if asked to investigate bus 3A, that the bus has been damaged and will not be recovered for at least 6 hours.*** | | | X | | X |
| | | ***Insert Loss of 33 ABFP Due To Motor Overload*** | | | | | |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 4. | Determine if SI is actuated, or is required per posted operator aid.<br>**Checks:**<br>Any SI annunciator lit<br>SI pumps running<br>SI has not actuated, and is not required per the operator aid | | | X | X | |
| ____ | 5. | Go to ES-0.1," Reactor Trip Response" | | | X | X | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | F | **Reactor Trip Response/ Loss of All Feed** | | | | | |
| | | Performs actions in ES-0.1, "Reactor Trip Response", and meets requirements to transition to FR-H.1 | | | | | |
| ____ | 1. | Check RCS Average Temperature- RCS Tave stable at or trending to 547 degrees F<br>**Checks:**<br>RCS Tave is stable at or trending to 547 degrees F. | | | X | X | |
| ____ | 2. | Check FW Status- Tave <547 degrees F, Check Main and Bypass FRVs closed, Verify total AFW flow > 365gpm, Check S/G Blowdown isolated, ensure both MBFPs tripped<br>**Checks:**<br>The above requirements are met except AFW flow, operator attempts to start 33 ABFP. | | | X | | X |
| ____ | 3. | Check if Emergency Boration is required- RCS temp > 500 degrees F, all control rods <20 steps<br>**Checks:**<br>Checks the above and determines that emergency boration is not required | | | X | X | |
| ____ | 4. | Crew recognizes loss of all feed and transitions to FR-H.1, "Response to Loss of Secondary Heatsink" – Crew will wait until all S/Gs are <9%. They will continue with ES-0.1 Action Steps Until Transition | | | X | X | X |
| ____ | 5. | Determine if a Secondary Heat Sink is Required- Checks if RCS Pressure is Greater than any non-faulted S/G Pressure, and that any Hot Leg temperature is > 350 degrees F.<br>**Checks:**<br>Determines that heat sink is required | | | X | | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 6. | Prepare to establish AFW flow- Check S/G blowdown isolated, Check CST level > 3ft., Check AFW Pp suction valves open,<br>**Checks:**<br>S/G Blowdown is isolated, CST level is > 3ft., and AFW suction valves are open | | | X | | X |
| ____ | 7. | Establish AFW Flow using motor driven pumps<br>**Performs:**<br>Recognizes that both motor driven pumps are not available and transitions to Attachment 2, "32 AFW Pump Operation" | | | X | | X |
| ____ | 8. | Determine 32 AFW Pump Status- Check if 32 AFW pump is running, Check alarm status of 32 AFW pump, transition to step 4.<br>**Performs:**<br>Recognizes that 32 AFW Pump is not available, and continues with Step 4 | | | X | | X |
| ____ | 9. | Stop all RCPs.<br>**Performs:**<br>Stops all RCPs | | | X | X | |
| | | ***Stops all RCPs To Limit Heat Input During Loss of Heat Sink(CT#2)*** | | | | | |
| ____ | 10. | Check all MSIVs Closed.<br>**Performs:**<br>Manually closes all MSIVs | | | X | X | |
| ____ | 11. | Try to establish FW flow to any S/G- Verify 6900V Bus 1,2, or 4 energized, Transition to Attachment 3<br>**Verifies:**<br>1,2, and 4 6900V buses are energized, transitions to Attachment 3 | | | X | | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 12. | Check that a Low Pressure source of water is available- Checks that a Condensate pump is running, and ensures that only 1 is running.<br>**Performs:**<br>Stops all but 1 Condensate Pump | | | X | | X |
| ____ | 13. | Block Automatic SI Actuation- Check that SI has not actuated, Place SI block key switches to Defeat for Train A and Train B<br>**Performs:**<br>Blocks SI for Train A and Train B | | | X | X | |
| ____ | 14. | Depressurize at least 1 S/G to less than 450 psig to establish feed flow- Manually dump steam from at least 1 S/G at the maximum rate<br>**Performs:**<br>Utilizes S/G Atmospheric to dump steam with 1 fully open dump valve. Should use 1 S/G Only. Valve Taken to Manual and Signal Is Adjusted To Fully Open. | | | X | X | |
| ____ | 15. | Dispatch NPO to MBFP Discharge valve breakers<br>**Performs:**<br>Sends an operator to MCC- 36A and MCC-36B | | | X | | X |
| ____ | 16. | Prepare to Align Flow path- Place FW isolation defeat key switches to Defeat.<br>**Performs:**<br>Places 1/FW1DA and 1FW1DB to defeat | | | X | | X |
| ____ | 17. | Reset SI- Verify SI has actuated<br>**Checks:**<br>SI is not actuated, goes to step 7. | | | X | | X |

Comments:

| TIME | EVENT/EXPECTED OPERATOR RESPONSE: | | SM | STA | CRS | RO | BOP |
|---|---|---|---|---|---|---|---|
| ____ | 18. | Establish initial feed water conditions- Ensure Bypass FW MOVs- Open, Ensure Main FW MOVs- Open, Crack Open Bypass FW FRVs, Place Main FW FRVs in Manual and Closed<br>**Performs:**<br>Performs the above alignment | | | X | X | |
| ____ | 19. | Align Feed water Header- Manually Close MBFP recirc, Open MBFP discharge valves, Open MBFP discharge valve breakers.<br>**Performs:**<br>Performs the above alignment | | | X | X | |
| ____ | 20. | Place Steam Flow and Feed Flow Recorders to Narrow<br>**Performs:**<br>Sets up recorders as described above to be able to see condensate flow to S/Gs | | | X | X | |
| ____ | 21. | Control Bypass feed water FRVs to rapidly restore at least 1 S/G level to greater than 9% | | | X | X | |
| | 22. | ***Establish Feed water Flow To At Least 1 S/G- (CT#3)*** | | | | | |
| | 23. | ***Terminate Scenario When Flow Established To At Least 1 S/G*** | | | | | |

Comments:

Comments:

**Watch Crew Turnover Sheet:**

| | | | |
|---|---|---|---|
| **Date/Time:** | TODAY | **Condition:** | Power Ops |
| **RCS Temp:** | 552.8°F | **% Power:** | 32% |
| **RCS Press:** | 2235 psig | **MW Gross:** | 270Mwe |
| **PZR Level:** | 29.8% | **River Water:** | 63°F |
| **RCS Total Leakage:** | 0.2 gpm | **Boron Conc:** | 1243ppm |
| **RCS Unidentified Leakage:** | 0.2 gpm | | |

| | |
|---|---|
| **Xenon:** | Increasing |
| **EFPD:** | 150 |
| **PZR Press Control:** | PT-455 Channel I |
| **PZR Level Control:** | LI-460 Channel II |
| **Service Water:** | 1,2,3 ESW |

**Plant Equipment Status:**

1. 32 ABFP Stop Tagged for repair of damaged trip throttle valve, In ITS LCO 3.7.5 Condition B. 72 Hour LCO in effect for 68 hours.
2. Holding at 32% To Reassess Shutdown LCO, and Restoration of 32 ABFP.
3. MOV-535 Is Closed Due To Leakage Past Its PORV.
4. Both Heater Drain Pumps Have Been Secured, During The Power Reduction.
5. In Procedure Step, POP-3.1, "Plant Shutdown From 45% Power", Step 4.1.12.