# Controlled Copy

**Scenarios 1, 2, 3 and 4**

# SECURE EXAM MATERIAL

**HLT 7 NRC Exam**

**If found unattended,**
**IMMEDIATELY notify:**

**Charlie Edmund, Anthony Ball, Ray Rutan**
**or Ed Jones at ext. 3123**

**Appendix D** **Scenario Outline** **Form ES-D-1**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-01 **Op-Test No.:** 2012-301

**Examiners:** _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions**. Unit 1 is at 70% RTP following a Refueling Outage.

**Turnover:** Unit 2 is at 87% RTP, increasing to 90% RTP. RHR Loop "2B" is in Torus Cooling following HPCI surveillance. Torus level will be lowered to 147.7 inches using RHR Loop "2B."

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | | N (BOP) | Lower Torus level to 147.7 inches using RHR Loop "2B." |
| 2 | N/A | R (ATC) | Using Recirc, increase Reactor power to 90%. |
| 3 | mfB31_39A<br>mfB31_45A<br>rfB31_29<br>mf60213160 | C (ATC)<br>TS (SRO) | Recirc Pump "A" seal leakage causes DW leakage.<br>Pump is secured and isolated. |
| 4 | ET-T46-11<br>ET-T46-12 | C (BOP)<br>TS (SRO) | Vent the Drywell. First SBGT started will fail to start, must use opposite train to vent the Drywell. |
| 5 | mfC32_90 | C (ATC) | FW Master Controller loses power/Time compression repair/return to service |
| 6 | mfN43_148A<br>mfN43_158B<br>loN43-S47A3<br>loN43-S47G1<br>loN43-S47R2<br>ET N43-01 | C (BOP) | Stator Cooling Pump '2B' (simulate sheared shaft)<br>Standby Stator Cooling pump 2A fails to start (manually started) |
| 7 | mfE41_249 | M (ALL) | Unisolable HPCI Steam leak in Reactor Building requiring a Reactor Manual scram. HPCI Group 3 signal failure. |
| 8 | | M (ALL) | Emergency Depress when Max Safe exceeded in more than one area. (Critical Task) |
| 9 | mfN21_99<br>mfE11_202B<br>mfE21_202A | C (BOP) | SULCV fails closed. RPV level will be controlled either by throttling open 2N21-F110, or by using Core Spray and/or RHR Systems. (Critical Task) |

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

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 1 

**Event Description:** Lower Torus level to 147.7 inches using the "B" loop of RHR.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 12 Min | SRO | • Directs the BOP to lower Torus water level to 147.7" using the "B" loop of RHR. |
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| | | *Simulator Operator – When requested, as Radwaste Operator, report Waste Surge Tank is at 2%.* |
| | BOP | • Enters 34SO-E11-010-2, Residual Heat Removal System at step 7.4.5.1.<br><br>• Notifies Radwaste to determine if Radwaste is capable of receiving the amount of water to be transferred<br>• Confirms RHR discharge water temperature is < 200°F, as read on 2T47-R627, point 3 (P650 panel).<br>• Opens 2E11-F049, RHR to Radwaste Valve<br>• Monitors Torus level on 2T48-R607A (B), 2H11-P602 (2H11-P654).<br>• Throttles OPEN, 2E11-F040, RHR to Radwaste Valve. |
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| | BOP | • Monitors Torus water level and once level has been lowered to approximately 147.7 inches secures the flow path.<br>• Closes 2E11-F040, RHR to Radwaste Valve.<br>• Closes 2E11-F049, RHR to Radwaste Valve.<br>• Reports to the SRO that Torus water level has been lowered to 147.7 inches. |
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| | | *Simulator Operator – Continue with the next event at the Chief Examiners request.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 2 Page 3 of 27

**Event Description:** Using Recirc, increase Reactor power to 90%.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | SRO | • Directs the ATC to increase Rx Power to 90% using Recirc. Power increases are not to exceed 10 MWe/min. |
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| | | *NOTE: May get the (603-202) "RBM Upscale" and (603-238) "Rod Out Block" alarm, if a peripheral control rod is not selected. This is expected and the operator may select a peripheral rod at this time.*<br><br>*May also get Alarm 650-135, "Heater Trouble" alarm. This is expected at this power level.* |
| | ATC | IAW 34SO-B31-001-2 (step 7.1.5) & 34GO-OPS-005-2, the ATC increases Recirc pump speed, not to exceed 10 MWE per minute by depressing the RAISE SLOW or RAISE MEDIUM pushbuttons on the Master (P603 panel) or Individual controls (P602 panel) until reactor power is 90%.<br><br>If using Individual Controls, pump speed increases will alternate between the "A" & "B" Recirc pumps to prevent excessive flow mismatches. |
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| | ATC | Notifies the SRO that reactor power has been increased to 90%. |
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| | | *Simulator Operator – Continue with the next event at the Chief Examiners request.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 3 Page 4 of 27

**Event Description:** Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 12 Min | | *Simulator Operator, with Chief Examiners Permission:*<br>• *Call control room BOP operator and tell them to stay on the phone until directed to hang up.*<br>• *ACTIVATE: (**RB-1**) to start Recirc Pump 2A seal leakage.* |
| | ATC | • Receives Annunciator, PUMP A SEAL STAGING FLOW HIGH/LOW, (602-122)<br>• Observes and compares 2B31-R603A, Seal A No. 1 pressure indicator, AND 2B31-R602A, Seal A No. 2 pressure indicator, to determine the Inner (#1) seal has failed (No. 1 pressure normal with No. 2 pressure > normal).<br>• Notifies SRO that the Inner (#1) Seal on Recirc A has failed<br>• Directs a System Operator to confirm seal water flow to Pump A is between 1.6 to 2.2 gpm locally (this indication not available in the Control Room).<br>• Assigns an extra operator perform 34SV-SUV-019-2, Surveillance Checks, to determine the magnitude of leakage.<br>• May monitor Drywell pressure. |
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| | | *Simulator Operator,*<br>• *After the ATC operator has started executing steps in the "Pump A Seal Staging Flow High/Low" ARP, THEN*<br>• *Instruct the BOP operator to hang up the phone.* |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 3 Page 5 of 27

**Event Description:** Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator;*<br><br>*At the direction of the Chief Examiner, press (**RB-2**) to ACTIVATE: mfB31_45A (15/20), Recirc A Outer Seal Failure* |
| | | ***(**IMPORTANT**)***<br><br>• *Ensure the **ATC responds** to the "Outer Seal A Leak Detection Flow High," (602-116) and performs the next set of actions (Trip and isolate the "2A" Recirc Pump).*<br>• *Ensure the BOP operator is the person assigned to vent the Drywell.* |
| | All | • Receives Annunciators:<br>• OUTER SEAL A LEAK DETECTION FLOW HIGH, (602-116)<br>• DRYWELL/TORUS RCDR R627 TEMP HIGH, (650-204)<br>• PANEL 2H11-P654 SYSTEM TROUBLE, (650-214)<br>• PANEL 2H11-P657 SYSTEM TROUBLE, (650-224)<br>• DRYWELL FLOOR DRAINS SUMP LEAK HIGH-HIGH, (602-408) |
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| | ATC | • Observes and compares 2B31-R603A, Seal A No. 1 pressure indicator AND 2B31-R602A, Seal A No. 2 pressure indicator, to determine the outer seal has now failed (No. 1 and No. 2 seal pressure decreases).<br>• Notifies SRO that the Outer (#2) Seal on "2A" Recirc has also failed.<br>• Has an extra operator perform 34SV-SUV-019-2, Surveillance Checks, to determine magnitude of leak.<br>• Monitors 2D11-R630, Fission Products Monitor recorder, to determine IF primary system coolant is leaking from seals.<br>• Monitors Drywell pressure.<br>• PANEL 2H11-P657 SYSTEM TROUBLE, (650-224)<br>• MULTIPOINT TEMPERATURE RCDR 2T47-R626 TEMPERATURE HIGH (657-025). |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 3 

**Event Description:** Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | All | • Receives the following alarms<br>  • PRIMARY CONTAINMENT PRESS HIGH, (603-115)<br>  • DRYWELL FLOOR DRAINS SUMP LEAK HIGH, (602-408) |
| | SRO | • Directs Operator to Check DW Leakage<br>• Directs the BOP to vent the DW with SBGT, when DW pressure approaches 0.65 psig. **(See Event 4 For SBGT Start)** |
| | | *Simulator Operator;*<br><br>*As the operator checking DW leakage, report:*<br>  • *DW Equipment drain leakage is stable at 1.7 gpm*<br>  • *Floor drain leakage has increased from 0.8 gpm to 12.1 gpm.* |
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| | SRO | • Directs operator to shutdown and isolate Recirc pump A<br>• Enters Tech Specs:<br>• 3.4 Reactor Coolant System<br>• 3.4.1 Recirculation Loops Operating<br><br>  • **Condition: 3.4.1.A,** Requirements of the LCO not met. (i.e. single loop operations)<br>  **Required Action:** Satisfy requirements of the LCO.<br>  **Completion time:** 24 hrs.<br><br>  • **Condition: 3.4.4.A,** Unidentified leakage not within limit OR total leakage not within limit.<br>  **Required Action:** Reduce leakage to within limits.<br>  **Completion time:** 4 hours.<br><br>  • **Condition 3.4.4.B**, Unidentified leakage increase not within limit.<br>  **Required Action:** Reduce leakage increase to within limits.<br>  **Completion time:** 4 hours.<br><br>• Notifies STA or Reactor Engineering that new limits apply for APLHGR, MCPR, LHGR, and APRMs Simulated Thermal power - New Setpoints are required within 24 hours. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 3 Page 7 of 27

**Event Description:** Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • Per (602-116) and 34SO-B31-001-2, Recirc System, Performs one of the following to secure the Reactor Recirc Pump:<br>• Either (actions for Immediate Shutdown)<br>• Place the ASD "A" control switch in Pull to Lock (P602)<br>• Depress the ASD "A" Shutdown pushbutton (P602)<br>• OR (Actions for Shutdown in a Timely Manner)<br>• Depress the ASD "A" Shutdown pushbutton (P602)<br>• Confirm ASD A speed ramps to ~370 RPM (2B31-R660) or 22% (2B31-R661)<br>• Confirm Recirc Pump A goes to 0 RPM (2B31-R660) or 22% (2B31-R661) and drive coasts to 0 gpm (2B31-R614 or R617)<br>• Confirm ASD A Start pushbutton illuminates<br>• Place ASD "A" control switch 2B31-S002A to Pull-To-Lock (P602)<br>• Closes 2B31-F031A, Reactor Recirc A Pump Disch Vlv<br>• Closes 2B31-F023A, Reactor Recirc A Pump Suction Vlv<br>• Dispatches SO to close Seal Injection To Pump A Header Isolation Valve, 2B31-F008A.<br>• Enters 34AB-B31-001-2 "Reactor Recirculation Pump(s) TRIP, Recirc Loops Flow mismatch, Or ASD Cell Bypass."<br>• Notify Plant Management and Load Dispatcher |
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| | ATC | • Receives and Acknowledges the following Annunciators:<br>• RECIRC LOOP A OUT OF SERVICE, (602-127)<br>• ASD "A" TRIP WARNING, (602-101)<br>• ASD "A" TROUBLE, (602-108)<br>• ASD "A" FATAL FAULT, (602-102)<br>• RBM DOWNSCALE, (603-211)<br>• ROD OUT BLOCK, (603-238)<br>• HEATER TROUBLE ALARM, (650-135) (may come in and clear) |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 3 Page 8 of 27

**Event Description:** Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator;*<br><br>*AFTER the suction and discharge valves are closed for the "2A" Recirc pump, an you are requested to close 2B31-F008, THEN:*<br><br>• *MODIFY mfB31_45A (Final: 100 Ramp: 1000),"Recirc A Outer Seal Failure."*<br><br>*AND THEN press (**RB-3**) to ACTIVATE:*<br><br>• *rfB31_29, Recirc mini purge B31-F016A closure (simulates B31-F008A being closed)*<br>• *mf60213160, "Outer Seal A Leak Detection Flow High – Annunciator Off (602-116)* |
| | | *Simulator Operator;*<br><br>*If another DW leakage check is requested, report:*<br><br>• *Drywell floor drain leakage has decreased to 1.8 gpm.* |
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| | | *Simulator Operator enters the next event at the Chief Examiner's request.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 4 Page 9 of 27

**Event Description:** Vent the Drywell. First SBGT started will fail to start, must use opposite train to vent the Drywell.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | | ***NOTE:*** *This event will begin when an operator is given direction to begin venting the Drywell due to the Recirc Pump seal leak in* ***Event 3****.* |
| | SRO | • When venting is required; Directs Operator to vent the drywell. |
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| | | ***NOTE:*** *EVENT TRIGGERS* ***T46-11*** *&* ***T46-12*** *will INSERT overrides to keep the first SBGT fan from starting and then remove the event trigger from the opposite SBGT train. The applicant will not be successful with the first SBGT train; however, the second SBGT train will work.* |
| | BOP | • Enters 34SO-T48-002-2, "Containment Atmosphere Dilution System" or uses placard to vent the Drywell.<br><br>• Enters 34SO-T46-001-2, "Standby Gas Treatment System" procedure or uses placard at the 2H11-P657 panel to start SBGT 2A or 2B.<br><br>• Opens 2T46-F001 (A or B) or 2T46-F003 (A or B).<br>• Places SBGT Fan (A or B) control switch to "RUN<br>• Receives alarm 2B (OR 2A) SBGT SWITCH NOT IN AUTO, (654-076) or (657-091)<br>• Determines that the first SBGT fan will not start<br>• At this time, may inform SRO that SBGT (A or B) cannot be started or may wait until other SBGT is in service (either is acceptable). |
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| | BOP (Placard) | • Vents with the opposite train of SBGT per 34SO-T46-001-2 SBGT System procedure or uses placard.<br>• Opens 2T46-F001 (A or B) or 2T46-F003 (A or B) for the subsequent train.<br>• Places SBGT Fan (A or B) control switch to "RUN."<br>• Receives alarm 2B (OR 2A) SBGT SWITCH NOT IN AUTO, (654-076) or (657-091)<br>• Confirms 2T46-F002 (A or B) OPENS<br>• Confirms SBGT Heater red light illuminates. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 4 Page 10 of 27

**Event Description:** Vent the Drywell. First SBGT started will fail to start, must use opposite train to vent the Drywell.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP (Placard) | • Opens 2T48-F334A or 2T48-F334B (both valves may be opened)<br>• Receives alarm DW VENT EXH BYPASS VLV OPEN, (654-002) or (657-008)<br>• Receives alarm DRWL/TORUS $N_2$ M/U 2 INCH ISOL VALVES OPEN, (654-035) or (657-042)<br>• Opens 2T48-F335A or 2T48-F335B (both valves may be opened)<br>• Opens 2T48-F336A or 2T48-F336B. (both valves may be opened)<br>• Monitors DW pressure<br>• Notifies SRO DW venting is in progress and of the SBGT failure (if not notified previously) |
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| | SRO | • Reviews TS 3.6.4.3, Standby Gas Treatment System<br>  • IAW TS 3.6.4.3 Condition B,<br>  • Declares SBGT fan A or B inoperable,<br>  • Must restore SBGT fan A or B to operable status within 7 days AND 30 days from discovery of failure to meet the LCO.<br>  • Direct that maintenance be contacted to determine problem with failed SBGT fan. |
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| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 5 Page 11 of 27

**Event Description:** FW Master Controller loses power/Time compression repair/return to service

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 23 Min | | *Simulator Operator, at direction of the Chief Examiner, ACTIVATE: (**RB-5**) malfunction mfC32_90, FW Master Controller R600 Internal Power Supply Failure.* |
| | ATC | • Receives FEEDWATER CONTROL SYSTEM TROUBLE, (603-132)<br>  • Determines the alarm source by scanning narrow range RWL, feedwater flow, steam flow indications AND RFPT/RWL controllers on 2H11-P603.<br>  • Determines 2C32-R600, FW Master Controller, has failed<br>  • Determines 2C32-R601A M/A Station PF lamp is flashing<br>  • 2C32-R601B M/A Station is in Manual<br>  • Places Reactor Level Mode Select Switch to MAN position.<br>  • Notifies SRO of failure of 2C32-R600, FW Master Controller. |
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| | | *Simulator Operator:*<br><br>*When contacted, as I & C, after 3 minutes, NOTIFY the SRO that a wiring harness going to 2C32-R600 had accidentally been bumped and became unplugged and that you reconnected the wiring harness. DELETE (**RB-5**) mfC32_90, FW Master Controller R600 Internal Power Supply Failure.*<br><br>*If asked why you were behind the panel, you were walking down a proposed DCR package for the upcoming Refueling Outage.* |
| | SRO | Directs the ATC to restore 2C32-R600 to normal alignment. |
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| | ATC | • FEEDWATER CONTROL SYSTEM TROUBLE, (603-132), clears<br>• Enters 34SO-N21-007-2, section 7.3.8.2, Recovery From Loss of Master Feedwater Control (Power OR Output Signal)<br><br>  • Confirms 2C32-R601A M/A Station (PF lamp FLASHING), has assumed the role of 2C32-R600, Master Controller, in Single Element mode (Feedwater Control Mode Select Switch indicating light EXTINGUISHED)<br>  • Places Feedwater Control Mode Select Switch in 1 ELEM position<br>  • Confirms/Places Reactor Level Mode Select Switch to manual |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 5 Page 12 of 27

**Event Description:** FW Master Controller loses power/Time compression repair/return to service

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • 2C32-R600 restoration:<br>• Confirm OR place 2C32-R600 in MANUAL mode.<br>• Adjust the output signal of 2C32-R600 to match the output of 2B RFPT M/A Station.<br>• Place 2B RFPT M/A Station from MANUAL to AUTO.<br>• Adjust setpoint of 2C32-R600 to agree with actual RWL.<br>• Place 2C32-R600 in AUTO and ADJUST setpoint as necessary to maintain desired RWL.<br>• Confirm OR place Reactor Level Mode Select Switch in AUTO position AND confirm its GREEN indicating light ILLUMINATES.<br>• Place Feedwater Control Mode Select Switch in 3 ELEM position AND confirm its GREEN indicating light ILLUMINATES. |
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| | ATC | • Places the 2A RFPT M/A station in MANUAL<br>• Slowly changes the RFPT 2A speed UNTIL the RFP flows MATCH<br>• Checks the input AND the output of RFP 2A M/A Station by depressing the PF key and reading the controller output (PF lamp LIT)<br>• Adjusts the manual output lever UNTIL the input and output are matched |
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| | ATC | • Places 2A RFPT M/A Station in automatic by depressing the 'A' pushbutton until it ILLUMINATES<br>• If required, adjusts RFP B (A) Speed Control Bias Setting to maintain RFPT 2B and 2A speed WITHIN 100 RPM<br>• Notifies the SRO that 2C32-R600 has been restored to automatic control. |
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| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 6 

**Event Description:** Stator Cooling Pump '2B' (simulate sheared shaft)
Standby Stator Cooling pump 2A fails to start (manually started)

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 8 Min | | *At the Chief Examiner's direction, Simulator operator, INSTRUCT the ATC operator by phone to stay on the line until told to hang up. THEN ENTER: (**RB-6**) to ACTIVATE: (mfN43_158B, mfN43_148A, loN43-S47A3 (Off), loN43-S47G1 (Off) & loN43-S47R2 (On).* |
| | BOP | • When Stator Water Cooling pump 2B is tripped, responds to the following alarms:<br>• GENERATOR INLET FLOW LOW, (651-201)<br>• GENERATOR INLET PRESS LOW, (651-202)<br>• GENERATOR OUTLET TEMP HIGH, (651-204)<br>• STATOR CLG TANK WATER LEVEL HIGH/LOW, (651-205)<br>• GENERATOR PROTECTION CIRCUIT ENERGIZED, (651-206)<br>• MAIN GENERATOR TEMPERATURE, (651-161)<br>• TURBINE TROUBLE, (650-105) |
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| | BOP | • Acknowledges the alarms and informs the SRO that the Stator Cooling system pressure and flow is low and that the "2A" Stator Cooling pump did not auto start. (*2A Stator Cooling may be started manually prior to recognizing failure to auto start.*) (There is not an obvious reason for the pressure and flow being low.) |
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| | | *The BOP may enter the following ARPs in any order:* |
| | BOP | • Enters 651-201, Generator Inlet Flow Low, and performs the following:<br>• Dispatches SO locally to 2N43-R303, Flow Indicator at 2N43-P001<br>• Manually starts the "2A" Stator Cooling pump<br>(May not pull procedure until after the pump has been started.)<br>• Monitors for increasing system flow by 651-201 clearing.<br>• Dispatches SO/Maint to investigate the cause of Generator Inlet Flow Low. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 6 

**Event Description:** Stator Cooling Pump '2B' (simulate sheared shaft)
Standby Stator Cooling pump 2A fails to start (manually started)

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *The BOP may NOT enter the following once the standby pump is started.* |
| | BOP | • Enters 651-202, Generator Inlet Press Low, and performs the following:<br>• Dispatches SO locally to 2N43-R301, Pressure Indicator at 2N43-P001<br>• Manually starts the "2A" Stator Cooling pump<br>(May not pull procedure until after the pump has been started.)<br>• Monitors for increasing system pressure by 651-202 clearing.<br>• Dispatches SO/Maint to investigate the cause of Generator Inlet Pressure Low. |
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| | | *The BOP may NOT enter the following once the standby pump is started.* |
| | BOP | • Enters GENERATOR OUTLET TEMP HIGH, (651-204) and performs the following:<br>• Monitors Stator Cooling Outlet temp on EHC Control System monitor on 2H11-P650 panel<br>• Dispatches SO/Maint to investigate GENERATOR OUTLET TEMP HIGH alarm. |
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| | | *The BOP may NOT enter the following once the standby pump is started.* |
| | BOP | • Enters STATOR CLG TANK WATER LEVEL HIGH/LOW, (651-202) and dispatches a SO locally to determine Tank level. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 6 Page 15 of 27

**Event Description:** Stator Cooling Pump '2B' (simulate sheared shaft)
Standby Stator Cooling pump 2A fails to start (manually started)

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *The BOP may NOT enter the following once the standby pump is started.* |
| | BOP | • Enters GENERATOR PROTECTION CIRCUIT ENERGIZED, (651-206) and performs the following:<br>  • Starts 2N43-C001A Stator Clg Wtr Pump 2A<br>  • IF a Main Turbine Bypass Valve begins opening, enters 34AB-C71-001-2, Scram Procedure, and SCRAM the reactor. (Not expected to be required) |
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| | SRO | • Directs the operator to place the Stator Cooling Pump "2B" pump to Trip. |
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| | | *Simulator Operator: ENSURE EVENT TRIGGER **ET-N43-01** is ACTIVATED, THEN; After 3 minutes of being sent to investigate the Stator Cooling system low flow and pressure AND after the BOP has started 2A Stator Cooling pump, report that the "2B" Stator Cooling pump motor is running, but the pump shaft is not turning.* |
| | BOP | • Places 2N43-C001B control switch to Trip position and reports this to the SRO. |
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| | | *Simulator Operator, at Chief Examiner's direction, starts the major event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 7 Page 16 of 27

**Event Description:** Unisolable HPCI Steam leak in the Reactor Building.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | | *At the Chief Examiner's direction, Simulator operator, ENTER (**RB-7**)* |
| | All | • Receives the following annunciators:<br>  • DRYWELL/TORUS RCDR R627 TEMP HIGH, (650-204)<br>  • MULTIPOINT TEMP RCDR 2T41-R620 TEMP HIGH, (654-004)<br>  • MULTIPOINT TEMP RCDR 2T41-R626 TEMP HIGH, (657-025)<br><br>• Receives the following ~45 seconds later:<br>  • LEAK DET DIFF TEMP HIGH, (601-321)<br>  • HPCI TURBINE TRIP SOLENOID ENERGIZED, (601-109)<br>  • HPCI ISOLATION TRIP LOGIC A INITIATED, (601-115)<br>  • HPCI ISOL TIMER INITIATED, (601-105)<br>  • HPCI ISOLATION TRIP LOGIC B INITIATED, (601-121) |
| | | |
| | | |
| | | |
| | SRO | • Orders BOP to evaluate leak detection alarms on 2H11-P601.<br>• Orders HPCI to be isolated.<br>• Orders BOP to evacuate the Reactor Building.<br>• May notify Maintenance for assistance in closing HPCI valves if ATC/BOP does not. |
| | | |
| | | |
| | | |
| | ATC/BOP | • Responds to HPCI alarms<br>• Observes HPCI Isolation valves have failed to close.<br>• Places 2E41-F002, HPCI Isolation valve switch to Close.<br>• Places 2E41-F003, HPCI Isolation valve switch to Close.<br>• Notifies SRO of HPCI valve failures.<br>• May notify Maintenance for assistance in closing HPCI valves if SRO does not. |
| | | |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 7 Page 17 of 27

**Event Description:** Unisolable HPCI Steam leak in the Reactor Building.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | • Respond to annunciator LEAK DET DIFF TEMP HIGH, (601-321).<br>• Addresses 2G31-R604 OR 2G31-R608 on 2H11-P614.<br>• Identifies the following points on R604 increasing:<br>  • 109, HPCI EMER AREA CLR is ~115°F<br>  • 110, HPCI VENT AIR DIFF is ~ 110°F<br>  • 113, TORUS NW WALL is ~ 95°F<br>  • 114, TORUS SE WALL is ~ 120°F<br>  • 115, TORUS VENT AIR DIFF is ~ 40°F<br>  • 116, TORUS VENT AIR DIFF is ~ 40°F<br>  • 117, HPCI PIPE PEN RM ~ 140°F<br>• Identifies the following points on R608 increasing:<br>  • 109, HPCI PMP RM is ~115°F<br>  • 110, HPCI EMER AREA CLR is ~ 110°F<br>  • 115, TORUS WEST WALL is ~ 95°F<br>  • 116, TORUS NE WALL is ~ 120°F<br>  • 117, TORUS VENT AIR DIFF is ~ 15°F<br>  • 118, TORUS VENT AIR DIFF is ~ 15°F<br>  • 121, HPCI PIPE PEN RM ~ 140°F<br>• Reports temperatures to the SRO. |
| | | |
| | | |
| | | |
| | SRO | • Enters the SC flow chart.<br>• Progresses down each path.<br>• Proceeds down the SC/T path, directing:<br>  • All available area coolers are operated<br>  • Operate the refueling floor ventilation<br>  • Operate the reactor building ventilation<br>  • Isolate all systems discharging into the area except those needed for ACC, shutdown the reactor, suppress a fire, maintain primary containment |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 7 Page 18 of 27

**Event Description:** Unisolable HPCI Steam leak in the Reactor Building.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | • Orders the reactor shutdown when any area exceeds Max Safe operating temperatures or delta temps since a primary system (HPCI) is discharging into Secondary Containment. (May direct this prior to Max Safe received). |
| | | |
| | | |
| | | |
| | SRO | • Assigns the ATC to perform RC-1.<br>• Assigns the BOP operator to perform RC-2 and RC-3.<br>• Enters 31EO-EOP-010-2, RC EOP flow chart if RWL decreases below 3 inches or if any area exceeds Max Safe.<br>• Directs RWL Band of 3 to 50 inches. |
| | | |
| | | |
| | | |
| | ATC | • Performs RC-1 consisting of:<br>  • Inserts a manual scram.<br>  • Places the mode switch to shutdown.<br>  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.<br>  • Notifies SRO of rod position check.<br>  • Places SDV isolation valve switch to "isolate" & confirms closed.<br>  • If not tripped, places the Recirc pumps at minimum speed.<br>  • Inserts SRMs and IRMs.<br>  • Shifts recorders to read IRMS, when required.<br>  • Ranges IRMS to bring reading on scale.<br>  • Notifies the SRO when the above actions are complete. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 7 Page 19 of 27

**Event Description:** Unisolable HPCI Steam leak in the Reactor Building.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | • Performs RC-2 actions consisting of:<br>  • Confirms proper Level Control response:<br>  • Checks ECCS Injection Systems (will not be in service if RWL >-35 inches)<br>  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value<br>  • If Set down does not auto function, manually reduces FW Master Controller setpoint to approximately 9 inches.<br>  • When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then:<br>  • Confirms/Opens 2N21-F125.<br>  • Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.<br>  • Closes 2N21-F110.<br>  • If RFPTs are no longer available, will transition to RCIC to control RWL. |
| | | |
| | | |
| | | |
| | BOP | • If necessary, starts RCIC for level control by performing the following at 2H11-P602 panel:<br>  • Depresses RCIC Manual Initiation P/B<br>  • Confirms/Opens 2E51-F046<br>  • Confirms/Starts Barom Cndsr Vac Pump<br>  • Confirms/Opens 2E51-F045<br>  • Confirms/Opens 2E51-F019<br>  • Confirms/Closes 2E51-F019 at flow > 79.3 gpm<br>  • Confirms/Opens 2E51-F013<br>  • Adjusts controller for desired flow and with SRO permission will raise RWL to 32 to 42 inches |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 7 Page 20 of 27

**Event Description:** Unisolable HPCI Steam leak in the Reactor Building.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | • Performs RC-3 consisting of:<br>  • Monitoring RPV pressure.<br>  • Confirms proper operation of pressure control system (TBV, LLS, etc.), at 2H11-P650 panel, by confirming TBVs are responding to control reactor pressure at the desired pressure setpoint.<br>  • Maintains RPV pressure between 1074 and 800 psig until a different band is directed.<br>  • Notifies SRO of pressure control system operation.<br>  • If SRO orders "Anticipate Emergency Depress, then the operator will perform the following:<br>  • At P650 HMI screen,<br>  • Selects "Control"<br>  • Selects "Bypass Valve"<br>  • Inserts "Ramp Rate" of 100 then OK<br>  • Inserts BPV position of 100 then OK<br>  • Ensures Bypass Valve Jack Status is Active (controlling)<br>  • Notifies SRO that Bypass Valves are opening |
| | | |
| | | |
| | | |
| | SRO | • May order a lower than 800 psig Reactor pressure band.<br>• May direct an operator to perform Rx Power, Level, and Pressure control, so that the other operator can address Secondary Containment parameters. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 8 Page 21 of 27

**Event Description:** Emergency Depress when Max Safe exceeded in more than one area.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • Provides periodic updates on temperature readings and delta temp readings to the SRO.<br>• Reports R604 points 115 & 116 are above Max Safe.<br>• Reports R608 points 109 & 110 are above Max Safe.<br>• When a second temperature or delta temp exceeds Max Safe levels, informs the SRO. |
| | | |
| | | |
| | | |
| | SRO | • May order a lower Reactor pressure band to reduce the driving head.<br>• Transitions to CP-1 and orders 7 ADS valves open for Emergency Depress. |
| | | |
| | | |
| | | |
| | ATC/BOP | • Places the switches for 7 ADS valves in the open position.<br>*(Critical Task – Open 7 SRVs when Max Safe exceeded in more than one area. Critical task is met when at least 5 SRVs have been opened).*<br>• The amber lights for the SRVs will not illuminate if pressure has been reduced to below approximately 300 psig. In this case the operator must use 2H11-P614 recorder indication to monitor tail pipe temperatures for the SRVs to verify the valves actually opened (Recorder 2B21-R614).<br>• Depending on Reactor Water Level prior to opening ADS valves, RWL may swell to above 60 inches, requiring the operator to enter 34AB-C32-001-2, Reactor Water Level Above 60 inches.<br>• Operator secures all injection other than CRD. |
| | | |
| | | |
| | | |
| | | *Simulator operator the next event will be activated as Reactor pressure decreases.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 9 Page 22 of 27

**Event Description:** SULCV fails closed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, At the Chief Examiner's direction AND AFTER the ADS valves have been opened (**Event 8**); when Reactor pressure is < 500 psig, ENSURE **ET-B21-5** INSERTS mfN21_99, SULCV fails closed.*<br><br>*Critical Task – Throttle open 2N21-F110 for vessel injection to maintain RWL greater than -185 inches.*<br><br>*If 2N21-F110 is NOT used, then a NEW Critical Task will be to align RHR/Core Spray systems for vessel injection to maintain RWL greater than -185 inches.*<br><br>*EITHER IS ACCEPTABLE.* |
| | BOP | • The BOP recognizes the SULCV has failed closed.<br><br>• Performs ONE or MORE of the following to inject water into the reactor.<br><br>  • Throttles open 2N21-F110, and injects water into the reactor (*Critical Task).* |
| | | • OR<br>• Starts a CS Pump. (*Critical Task)*<br>  • Confirm discharge pressure >265 psig.<br>  • Confirm 2E21-F031A (B) closes when flow >950 gpm.<br>  • Confirm a CS and RHR room cooler automatically starts.<br>  • When RPV pressure is <425 psig, throttles open 2E21-F005A (B). |
| | | OR<br>• Starts a RHR pump. (*Critical Task)*<br>  • When RPV pressure is <425 psig, throttles open 2E11-F015A (B).<br><br>• Reports SULCV problem to the SRO. |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 9 Page 23 of 27

**Event Description:** SULCV fails closed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *NOTE: The operator may place Torus Cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The A and/or B loop of RHR may be used depending on Torus temperature. The following steps are written assuming "B" loop and "B" pump is used. If/When "A" loop is used, substitute "A" for "B" for valves and if "B" pump is not used substitute "A", "C", or "D" for "B" pump.* |
| | ATC | • Enters 34SO-E11-010-2, Residual Heat Removal<br>• Places RHRSW in service<br>• Prelube RHRSW pump<br>• Overrides 2E11-F068B (A) Low Discharge Pressure Interlock<br>• Positions 2E11-F068B (A) to 45% OPEN<br>• Starts RHRSW pump B (A)<br>• Places 2E11-F068B (A) Low Discharge Pressure Interlock switch to normal position.<br>• Positions 2E11-F068B (A) to obtain < 4400 gpm AND < 450 psig |
| | | |
| | | |
| | | |
| | ATC | • IF desired to start a SECOND RHRSW pump,<br>• Throttles 2E11-F068B (A) to achieve max flow rate (not to exceed 4400 GPM).<br>• Opens 2E11-F068B (A) an additional 5%.<br>• Starts second RHRSW Pump.<br>• Positions 2E11-F068B (A) to obtain < 8800 gpm AND < 450 psig |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-01 **Event No.:** 9 

**Event Description:** SULCV fails closed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • Places RHR B (A) Loop in Torus cooling per the placard by performing the following steps:<br>• Opens 2E11-F048B (A)<br>• Closes 2E11-F047B (A).<br>• Opens 2E11-F003B (A).<br>• Starts RHR Loop B (A) pump<br>• Opens 2E11-F028B (A)<br>• Receives annunciator Auto Blowdown CS OR RHR Press<br>• Receives annunciator "SEC System Auto Initiation Signal Present."<br>• Throttles OPEN 2E11-F024B (A)<br>• Opens 2E11-F047B (A)<br>• Ensures RHR flow is < 11,500 GPM, THEN Closes 2E11-F048B<br>• Notifies the SRO that RHR "B" (A) loop is in service<br>• May place the second pump in service. |
| | | |
| | | |
| | | *With Chief Examiners Permission the Scenario will be terminated when reactor water is being controlled following the emergency depressurization with reactor pressure below 50 psig or as directed by the Chief Examiner.* |

**Appendix D** | **Scenario Outline** | **Form ES-D-1**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-01 **Op-Test No.:** 2012-301

**Examiners:** _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

| | |
|---|---|
| Initiating Conditions: | Unit 1 is at 70% RTP following a Refueling Outage. |
| Turnover | Unit 2 is at 87% RTP, increasing to 90% RTP. RHR Loop "2B" is in Torus Cooling following HPCI surveillance. Torus level will be lowered to 147.7 inches using RHR Loop "2B." |

Summary:

- **Event 1:** Normal; Lower Torus level to 147.7 inches using RHR Loop B.
- **Event 2:** Using Recirc to increase reactor power to 90%.
- **Event 3:** Component/TS; as the team finishes **Event 2**, the "2A" Reactor Recirculation pump seals will sequentially develop a failure that results in reactor coolant leaking into the Drywell (DW). Initially, only the Number 1 seal fails, followed a few minutes later by a Number 2 Seal failure. The ATC operator will trip and isolate the "2A" Reactor Recirc pump. The SRO will address TS for coolant leakage and single Recirc loop operation.
- **Event 4:** Component/TS; the Recirc pump seal leak (**Event 3**) causes DW pressure to increase. The team will receive a P603 alarm that will direct DW venting to be placed in service. BOP operator will attempt to start Standby Gas Treatment (SBGT). The first SBGT system the operator attempts to start will fail. The opposite SBGT train will then be started and DW venting will be aligned. The SRO will address TS for an inoperable train of SBGT.
- **Event 5:** Component; FW Master Controller loses power/Time compression repair/return to service.
- **Event 6:** Component; Stator Cooling Pump '2B' will experience a sheared shaft and the standby Stator Cooling pump will not automatically start. The operator will manually start the standby Stator Cooling pump to restore system flow/pressure to normal.
- **Event 7:** Major; Unisolable HPCI Steam leak in Reactor Building requiring a Reactor Manual scram.
- **Event 8:** Major; Since a HPCI Group 3 signal failure exists an Emergency Depress when > Max Safe in more than one area. **(Critical Task)**
- **Event 9:** SULCV fails closed. RPV level will be controlled either by throttling open 2N21-F110, or by using Core Spray and/or RHR Systems. **(Critical Task)**

**Critical Tasks**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-01 **Op-Test No.:** 2012-301

Critical Tasks

- Emergency Depress when > Max Safe in more than one area. **(Event 8)**
- SULCV fails closed. RPV level will be controlled either by throttling open 2N21-F110, or by using Core Spray and/or RHR Systems. **(Event 9)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 7 | 1. 2A Recirc pump seal failure **(Event 3)**<br>2. First SBGT system the operator attempts to start will fail. **(Event 4)**<br>3. FW Master Controller loses power/Time compression repair/return to service. **(Event 5)**<br>4. Stator Cooling Pump '2B' sheared shaft with standby failure to auto start **(Event 6)**<br>5. Unisolable Steam leak in Reactor Building. **(Event 7)**<br>6. HPCI Group 3 signal failure **(Event 8)**<br>7. SULCV fails closed. **(Event 9)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. HPCI Group 3 signal failure **(Event 8)**<br>2. SULCV fails closed. **(Event 9)** |
| 3. | Abnormal Events | 2-4 | 3 | 1. 2A Recirc pump seal failure **(Event 3)**<br>2. First SBGT system the operator attempts to start will fail. **(Event 4)**<br>3. Unisolable Steam leak in Reactor Building. **(Event 7)** |
| 4. | Major Transients | 1-2 | 2 | 1. Unisolable Steam leak in Reactor Building. **(Event 7)**<br>2. Emergency Depress when > Max Safe in more than one area. **(Event 8)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 2 | 1. SC/RR EOP Chart **(Event 7**<br>2. RC (Non-ATWS) **(Event 7)** |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 1 | 1. CP-1 **(Event 8)** |
| 7. | Critical Tasks | 2-3 | 2 | 1. Emergency Depress when > Max Safe in more than one area. **(Event 8)**<br>2. SULCV fails closed. RPV level will be controlled either by throttling open 2N21-F110, or by using Core Spray and/or RHR Systems. **(Event 9)** |

HLT 7 NRC DRAFT Operating Exam Scenario 1

# SHIFT TURNOVER

## UNIT 1 STATUS

| | |
|---|---|
| **Power:** | 100% RTP |
| **Activities in progress:** | None |

## UNIT 2 STATUS

| | |
|---|---|
| **Power:** | 87% RTP |
| **The following equipment is inoperable:** | NONE |
| **Scheduled evolutions:** | RHR Loop "2B" is in Torus Cooling following HPCI surveillance.<br><br>Lower Torus water level to 147.7 inches using RHR Loop "2B" IAW 34SO-E11-010-2 starting at step 7.4.5.<br><br>Increase Reactor power to 90% RTP after lowering Torus water level. |
| **Surveillances due this shift:** | |
| **Active clearances:** | NONE |
| **Rod Configuration:** | See Rod Withdrawal Sheets |

**Appendix D** **Scenario Outline** **Form ES-D-1**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-02 **Op-Test No.:** 2012-301

**Examiners:** _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions**. Unit 1 is at 100% RTP. Unit 2 is at 6% RTP increasing to 8% following a Refueling Outage.

**Turnover:** Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise. After surveillance, withdraw control rods to increase power to ~8% for preparation of transferring the Reactor Mode switch to Run. FWLC is in Single Element. Chest Warming is in progress.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | N (BOP) | Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise. |
| 2 | N/A | R (ATC) | Withdraw control rods to increase Reactor power to 8%. |
| 3 | rfC11_141 | TS (SRO) | The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement. |
| 4 | mf60311308 | C (ATC) | CRD 2A pump experiences a Suction Filter hi dP requiring swapping to standby pump. |
| 5 | mfP51_222C<br>loP51-C001BGl<br>loP51- C001BR2<br>diP51- C001B | C (BOP) | SSAC 2C Trips - 2B fails unloaded, 2A must be manually started. |
| 6 | mfG31_207B<br>svoG31070<br>mfG31_52 | C(ATC)<br>TS (SRO) | RWCU line breaks outside of Primary Containment. Must be manually isolated (Critical Task), with failure of outboard isolation valve to close. |
| 7 | mfN33_154 | C (BOP) | Turbine Gland Seal Reg Fails Closed (must be in chest warming) |
| 8 | mfS11_161 | M (ALL) | Loss of Offsite Power |
| 9 | mfR43_239A<br>mfR43_49B<br>mfR43_62C | C (ATC) | 2A EDG fails to auto tie, 1B EDG will not operate & 2C EDG will tie after resetting Shutdown<br>(Critical Task to energize at least one emergency bus) |
| 10 | rfE51_234<br>mfE41_107 | C (ATC) | HPCI F001 stuck closed and RCIC 2E51-F013 Fails to Auto Open requiring manual operation of 2E51-F013 to inject prior to RWL reaching -185" (Critical Task) |

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

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 1 Page 2 of 25

**Event Description:** Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | SRO | *Simulator Operator - Inform the SRO you will provide an extra operator to perform the restoration section of the procedure when it's required.*<br>• Directs the BOP to perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise. |
| | | |
| | | *The following switches are located on the 2H11-P654 panel.* |
| | BOP | • Obtains SROs permission to perform test starting at section 7.2<br>• Confirms Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001 (below indication for 2T45-F001) is in CLOSED<br>• Confirms the following valves are CLOSED:<br>  • 2T45-F005, RHR N-E Inbd Sump Isol<br>  • 2T45-F003, Torus N-E & S-E Inbd Sump Isol<br>  • 2T45-F001, HPCI Sump Isol<br>• Places the Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001, in AUTO, AND confirms the following valves OPEN:<br>  • 2T45-F005<br>  • 2T45-F003<br>  • 2T45-F001 |
| | | |
| | | |
| | BOP | • Places the Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001 in CLOSE, AND confirms the following valves CLOSE:<br>  • 2T45-F005, RHR N-E Inbd Sump Isol.<br>  • 2T45-F003, Torus N-E & S-E Inbd Sump Isol.<br>  • 2T45-F001, HPCI Sump Isol. |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 1 Page 3 of 25

**Event Description:** Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | • Per Section 7.3, confirms the Sump Isol switch for 2T45-F007 and 2T45-F006 (below indication for 2T45-F006) is in CLOSED<br>• Confirms the following valves are CLOSED:<br>• 2T45-F007, Torus N-W & S-W Inbd Sump Isol.<br>• 2T45-F006, RCIC Sump Isol.<br>• Places the Sump Isol switch for 2T45-F007 and 2T45-F006 in AUTO, AND confirms the following valves OPEN:<br>• 2T45-F007<br>• 2T45-F006<br>• Places the Sump Isol switch for 2T45-F007 and 2T45-F006 in CLOSE, AND confirms the following valves CLOSE:<br>• 2T45-F007, Torus N-W & S-W Inbd Sump Isol.<br>• 2T45-F006, RCIC Sump Isol. |
| | | |
| | | |
| | BOP | • Per Section 7.4, confirms the Sump Isol switch for 2T45-F004 and 2T45-F002, (below indication for 2T45-F002) is in CLOSED<br>• Confirms the following valves are CLOSED:<br>• 2T45-F004, RHR N-E Outbd Sump Isol.<br>• 2T45-F002, Torus N-E & S-E Outbd Sump Isol.<br>• Places the Sump Isol switch for 2T45-F004 and 2T45-F002 in AUTO, AND confirms the following valves OPEN:<br>• 2T45-F004<br>• 2T45-F002 |
| | | |
| | | |
| | BOP | • Places the Sump Isol switch for 2T45-F004 and 2T45-F002 in CLOSE, AND confirms the following valves CLOSE:<br>• 2T45-F004, RHR N-E Outbd Sump Isol.<br>• 2T45-F002, Torus N-E & S-E Outbd Sump Isol<br>• Notifies SRO the surveillance is complete and needs to be independently verified. |
| | | *Simulator Operator – Continue with the next event at the Chief Examiners request.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 2 Page 4 of 25

**Event Description:** Withdraw control rods to increase Reactor power to 8% RTP.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | SRO | Orders control rods withdrawn per the pull sequence. |
| | | |
| | | |
| | ATC | • Withdraws control rods to continue the power increase by:<br>• Selects the first control rod in the currently latched or next group per the pull sheet and RWM.<br>• First rod moved is 38-31 in step 25.<br>• Continuously withdraws the rod to the withdraw limit, releasing the switch one notch before the withdraw limit, unless the withdraw limit is 48.<br>• Continues withdrawing rods per the pull sheet.<br>• Monitors bypass valve position and ensure expected plant response from control withdrawal. |
| | | |
| | | |
| | | **NOTE:** May get RMCS/RWM ROD BLOCK or SYS TROUBLE, (603-239), annunciator. This is not abnormal when selecting rods in a different group. |
| | | |
| | | |
| | | ***NOTE:*** *Alarm, APRM DOWNSCALE, 603-229, may intermittently come in during the control rod withdrawal, due to the plant operating at the alarm setpoint of 5%. The crew may flag this alarm.* |
| | | |
| | | |
| | | *Simulator Operator enters the next event at the Chief Examiner's request* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 3 Page 5 of 25

**Event Description:** The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | | *Simulator Operator, at the Chief Examiner's direction, ENTERS (**RB-1**) rfC11_141, SDV Outboard Valves close*<br><br>*AND*<br><br>*3 minutes later ENSURES Event Trigger **C11-4** ACTIVATES mf60311307, SDV Not Drained, alarm.* |
| | ALL | • When the SDV NOT DRAINED, (603-119), alarm is received, recognizes that the SDV Outboard Valves have closed. (May recognize prior to alarm by scanning the control boards) |
| | | |
| | | |
| | | |
| | ATC | • Enters 603-119 and performs the following:<br>  • Determines that 2C11-F035A, 2C11-F035B and 2C11-F037 have closed.<br>  • Determines status of all Scram Valves (blue lights are not lit) on P603 display.<br>  • Determines status of SCRAM VLV PILOT AIR HDR PRESS HIGH/LOW, (603-131), (NOT LIT)<br>  • Determines if any Rod Drift lights on P603 (None).<br>  • Confirms Scram Disch Vol Isol Test Switch in Normal.<br>  • Dispatches SO to the CRD drives to check for leaking Scram Outlet Valves.<br>  • Dispatches SO/Maintenance to determine if an air leak exists on the SDV valve piping. |
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| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 3 Page 6 of 25

**Event Description:** The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, if a SO was sent to the solenoid power switches, 2 minutes later, REPORTS that the Power supply switches in the RPS M/G Set room for 2C11-F040 solenoids are turned to "ON".*<br><br>*Simulator Operator, wait 3 minutes, then REPORT as a SO that's been dispatched to check for air leaks, there is an air leak on the piping from 2C11-F040 on the 130' Rx. Bldg. It appears that the copper piping was bumped by someone or something, causing a crimp and small leak in the piping.* |
| | ATC | • Notifies the SRO that there is an air leak and crimped piping at 2C11-F040. |
| | | |
| | | |
| | | |
| | SRO | • Enters Tech spec 3.1.8 Condition A which requires the SDV line to be isolated within 7 days.<br><br>• May inform Maintenance to correct the associated air leak. |
| | | |
| | | *Simulator Operator enters the next event at the Chief Examiner's request.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 4 

**Event Description:** CRD 2A pump experiences a Suction Filter hi dP requiring swapping to standby pump.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | | *At the Chief Examiner's direction, Simulator Operator ENTERS (**RB-2**) mf60311308, CRD Pump A Suction Filter Diff Press Hi, alarm.* |
| | ATC | • Receives CRD PUMP A SUCTION FILTER DIFF PRESS HIGH, (603-120), alarm.<br>• Confirms CRD system flow is ≤ 59 gpm.<br>  • Dispatches SO locally to check 2C11-dPIS-N015A indicates higher than 9.0 psi |
| | | |
| | | |
| | | *Simulator Operator, AFTER 3 minutes from being dispatched, report to the SRO/ATC, as an SO, that 2C11-dPIS-N015A indicates 12.0 psi.*<br><br>*Simulator Operator, AFTER giving report to SRO/ATC, IF SRO directs shifting CRD suction filters INSTEAD of swapping CRD pumps, THEN as Shift Manager, DIRECT the SRO to swap CRD pumps.* |
| | SRO | • Dispatches Maintenance to investigate 2A CRD Suction Filter dP high.<br>• After SO report, directs ATC to shift CRD pumps IAW 34SO-C11-005-2. |
| | | |
| | | |
| | | ***NOTE:*** *The ATC may direct the CRD pump room coolers to be swapped or may elect to leave the 2T41-B001B cooler in service. Both are acceptable.* |
| | ATC | • IAW 34SO-C11-005-2, 7.1.3, Shifting CRD Pumps, performs the following:<br>  • Dispatches SO to confirm cooling water valves listed in step 7.1.3.1.2 are open.<br>  • Confirms a CRD Room Cooler is in operation per 34SO-T41-002-2, CRD Pump Room Ventilation System by performing the following:<br>  • Confirms 2T41-B001B is in Run (may direct BOP to confirm)<br>  • OR<br>  • Places control switch for 2T41-B001A, in Run (P657) (may direct BOP to perform).<br>  • Places 2T41-B001B, CRD Pump Room Cooler, in Off (P654) (may direct BOP to perform).<br>  • Places 2T41-B001B, CRD Pump Room Cooler, in Auto (P654) (may direct BOP to perform). |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 4 Page 8 of 25

**Event Description:** CRD 2A pump experiences a Suction Filter hi dP requiring swapping to standby pump.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, when dispatched to vent the 2B CRD pump, wait 3 minutes and notify the ATC the 2B CRD pump has been vented and the vent valves are closed.*<br><br>*Also ENSURE Event Trigger **C11-5** DELETES 2A CRD Suction Filter dP High alarm when 2A CRD pump is securred.* |
| | ATC | • Dispatches SO to confirm open the following valves and to vent the 2B CRD pump:<br>  • 2C11-F118B, CRD Pump 2B Suction Valve<br>  • 2C11-F114B, Suction Filter 2B Outlet Isolation<br>  • 2C11-F115B, Suction Filter 2B Inlet Isolation<br>• Starts 2C11-C001B, 2B CRD Pump, at P603.<br>• Confirms flow control valve responds properly by controlling system flow between 30 gpm to 50 gpm.<br>• Stops 2C11-C001A, 2A CRD Pump, at P603.<br>• Dispatches SO to confirm closed 2C11-F117, CRD Suction Crosstie.<br>• Confirms system parameters are in their normal ranges per NOTE in System Startup section of 34SO-C11-005-2. |
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| | | |
| | | *Simulator Operator enters the next event at the Chief Examiner's request.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 5 Page 9 of 25

**Event Description:** SSAC 2C Trips - 2B fails unloaded, 2A must be manually started.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 7 Min | | *Simulator Operator, at direction of the Chief Examiner, ACTIVATE: (**RB-3**) malfunction mfP51_222C. ENSURE Event Trigger **P51-3** ACTIVATES the following when the "B" air compressor "red" light is on:*<br><br>*loP51-C001BG1 to OFF,*<br>*loP51-C001BR2 to ON,*<br>*mfP51_C001B, **ET-P51-4**.*<br><br>*ONCE "2B"SSAC is placed in PTL, ENSURE Event Trigger **P51-4** DELETES: loP51-COO1BG1, loP51-C001BR2, and mfP51_C001B.* |
| | All | The following annunciators are received:<br>• PANEL 2H11-P700 SYSTEM TROUBLE, (650-225)<br>• AIR CMPSR 2C TRIPPED/SHUTDOWN, (700-233) |
| | | |
| | | |
| | BOP | • Acknowledges 2H11-P700 panel alarm on 2H11-P650<br>• Acknowledges AIR CMPSR 2C TRIPPED/SHUTDOWN, (700-233), on 2H11-P700 and notifies the SRO of the alarm.<br>• Confirms/starts "2B" SSAC on P650 panel.<br>• Determines air pressure is continuing to decrease<br>• Starts "2A" SSAC on P650 panel.<br>• Dispatches SO/Maintenance locally to investigate "2C" SSAC tripping and "2B" SSAC not maintaining air pressure.<br>• As time allows, contacts Health Physics after starting Standby SSACs.<br>• May receive CONTROL BLG SERVICE AIR PRESS LOW, (700-222). |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 5 Page 10 of 25

**Event Description:** SSAC 2C Trips - 2B fails unloaded, 2A must be manually started.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator: 2 minutes after being dispatched to investigate "2C" SSAC tripping and "2B" SSAC not maintaining air pressure,*<br><br>*INFORM the BOP;*<br><br>*"2C" SSAC has a low oil pressure shutdown indication*<br><br>*AND*<br><br>*IF "2B" SSAC IS STILL RUNNING that "2B" SSAC is running unloaded and you cannot locally get it to "LOAD".*<br><br>*OR*<br><br>*IF "2B" SSAC IS **NOT** RUNNING that "2B" SSAC is off and NOT in automatic mode locally (auto light not lit).* |
| | SRO | • Notifies SO/Maintenance (if BOP has not) to investigate "2C" SSAC tripping and "2B" SSAC not maintaining air pressure and initiates a condition report.<br>• Directs the BOP to start the 2A SSAC IAW AIR CMPSR 2C TRIPPED/SHUTDOWN, (700-233). |
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| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 6 Page 11 of 25

**Event Description:** RWCU line will break outside of Primary Containment.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | | *Simulator Operator, at the direction of the Chief Examiner, Call the BOP and request the value for Off Gas flow. When the BOP is at 2N62-P600, ACTIVATE malfunction mfG31_52. (**RB-4**)* |
| | ALL | • Recognize RWCU SYS LEAK, (602-421), annunciator |
| | | |
| | | |
| | | ***NOTE:** If 2G31-F004 is closed in a timely manner, the failure of the auto isolation may not be recognized.* |
| | ATC | • Responds to RWCU SYS LEAK, (602-421), annunciator<br>• Determines that an isolation is required, enters 34AB-G31-001-2 "RWCU System Isolation" and performs the following:<br>• Confirms automatic actions by:<br>• Tripping RWCU Pump "2B<br>• Places control switch for 2G31-F001 to close (will not Auto close)<br>• Places control switch 2G31-F004 to the close ***(Critical Task)***<br>• Contacts Chemistry to remove Autoclave and Mitigation Monitoring Systems from service.<br>• May notify SRO of possible SC-Secondary Containment Control Entry |
| | | |
| | | |
| | | |
| | ATC | • Notifies SRO of the failure of RWCU to isolate and that 2G31-F001 will not close.<br>• Suspects a leak has occurred and enters 34AB-T22-001-2 "Primary Coolant System Pipe Break Reactor Building".<br>• Notifies SRO of conductivity monitoring requirements of TRM T3.4.1.<br>• Informs ATC to monitor level and power. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 6 Page 12 of 25

**Event Description:** RWCU line will break outside of Primary Containment.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | • Dispatches SO to determine RWCU leak location.<br>• Dispatches SO/Maintenance to determine why:<br>  • 2G31-F001 and F004 did not auto close.<br>  • 2G31-F001 did not manually close.<br>• Enters TS for 2G31-F001.<br>• Determines that LCO 3.6.1.3.A.1 and A.2 applies and the RWCU Line must be isolated within 4 hours and verified closed every 31 days.<br>• Enters TRM for continuous conductivity monitoring<br>• Determines that TSR 3.4.1.1 requires 24 hour surveillance requirement if switch not placed in Reactor Water position on 2H11-P602 and confirms it is in the Reactor Water position.<br>• May contact Chemistry to remove Autoclave and Mitigation Monitoring Systems from service if not performed by operator.<br>• Reviews EOP SC for possible entry conditions. |
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| | | *Simulator Operator, at the direction of the Chief Examiner, proceeds to next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 7 Page 13 of 25

**Event Description:** Main Turbine Gland Seal Regulator valve fails closed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 5 Min | | *Simulator Operator: At the direction of the Chief Examiner, ENTER malfunction mfN33_154 (**RB-5**) INTERMITTENTLY every 5 seconds. **NOTE**: If the 2N33-F004 valve is not opened, it takes approximately 2.5 minutes for the turbine to trip on low vacuum.* |
| | ALL | Recognize STEAM SEAL PRESS LOW, (650-125), annunciator. |
| | | |
| | BOP | • Responds to STEAM SEAL PRESS LOW, (650-125), annunciator<br>• Confirms 2N33-R601A, Steam Seal Hdr Pressure Indicator, is below 1.5 psig, panel 2H11-P650.<br>• Confirms OPEN 2N33-F003, Steam Seal Main Steam Feed Vlv.<br>• Confirms CLOSED 2N33-F005, Unloading Bypass Vlv.<br>• Confirms CLOSED 2N33-F008, Aux Steam Feed Vlv.<br>• Throttles OPEN 2N33-F004, Steam Seal Feed Vlv Bypass, to bring steam seal pressure to between 2.5 PSIG and 4.5 PSIG. |
| | | *Simulator Operator, ENSURE **ET-N33-1** cycles through and finally inserts the malfunction. Simulator Operator: WHEN the operator has entered the 650-125-2, modify mf N33_154 to delay of 0 and modify key to **RB-9**.* |
| | | |
| | | |
| | BOP | • Sends an SO to the Steam Seal Feed Valve Controller to confirm > 20 # Air Inlet Pressure AND < 15 # Air Outlet Pressure.<br>• Acknowledges annunciators received:<br>• PRETREATMENT O/G RADIATION DOWNSCALE/INOP, (601-428)<br>• INLET FLOW TO STACK HIGH, (N62-020) with recorder 2N62-R604 indicating flow increasing.<br>• May isolate the following valves on 2N62-P600 if O/G pressure increases to > 6 psig on 2N62-R600 IAW 34SO-N61-001-2:<br>• 2N62-F085, Holdup Line Drain<br>• 2N62-F030A, Cndsr/Sep A Drain<br>• 2N62-F030A, Cndsr/Sep A Drain<br>• Reopens valves when pressure is <6 psig |
| | | |
| | | *Simulator Operator: If sent as the SO to check on Steam Seal Feed Valve Controller air pressure, wait 2 minutes and report air inlet is 2 psig and air outlet is 0.5 psig.* |
| | | *Simulator Operator, at the direction of the Chief Examiner, proceeds to next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 8 Page 14 of 25

**Event Description:** Loss Of Offsite Power

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 min | | *SIMULATOR OPERATOR, at the direction of the Chief Examiner, ACTIVATE (**RB-6**), mfS11_161, "Loss of Offsite Power".* |
| | ALL | Recognize a Loss Of Offsite Power and plant scram. |
| | | |
| | | |
| | | **NOTE:** The SRO may assign one operator to perform Scram procedure placards RC-1, RC-2 and RC-3. |
| | SRO | • Assigns the ATC to perform RC-1.<br>• Assigns the BOP operator to perform RC-2 and RC-3.<br>• If time allows assigns TC-1 to be performed.<br>• Enters the RC EOP flow chart, 31EO-EOP-010-2, once reactor water level decreases to 3,"or reactor pressure increases to 1074 psig.<br>• Directs EOP RC level control band of +3" to +50" |
| | | |
| | | |
| | | |
| | ATC | • Performs RC-1 consisting of:<br>  • Inserts a manual scram.<br>  • Places the mode switch to shutdown.<br>  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.<br>  • Notifies the SRO of rod position check.<br>  • Places SDV isolation valve switch to "isolate" & confirms closed.<br>  • Inserts SRMs and IRMs.<br>  • Shifts recorders to read IRMS, when required.<br>  • Ranges IRMS to bring reading on scale.<br>  • Notifies the SRO when the above actions are complete. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 8 Page 15 of 25

**Event Description:** Loss Of Offsite Power

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *NOTE: With a Loss of Offsite Power, the pertinent operator RC-2 actions are limited to checking ECCS.* |
| | BOP | • Checks ECCS Injection Systems and verifies no initiation signal present. |
| | | • Performs RC-3 consisting of:<br>  • Monitor RPV pressure.<br>  • Confirm proper operation of pressure control system (LLS and SRVs).<br>  • If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS.<br>  • Maintain RPV pressure between 1074 and 800 psig.<br>  • Notify SRO that LLS is the pressure control system. |
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| | | |
| | | |
| | | *Simulator operator the next event was inserted at the beginning of the scenario.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 9 Page 16 of 25

**Event Description:** 2A EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will not run & 2C EDG will tie after resetting Shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *NOTE: 2A EDG, 1B EDG & 2C EDG malfunctions were inserted at the beginning of the scenario.* |
| 15 min | SRO | • Directs ATC to address the plant electrical systems and enter the "Station Black" abnormal procedure, 34AB-R22-003-2, and "Diesel Generator Recovery" abnormal, 34AB-R43-001-2.<br>• Calls for maintenance support in restoring all emergency 4160 VAC buses. |
| | | |
| | | |
| | | |
| | | *The ATC may start first with any of the Diesel Generators.* |
| | ATC | • Confirms appropriate Diesel Generator response to the event and evaluates the emergency buses determining:<br>  • 2A EDG is running but did NOT energize 2E bus<br>  • 1B EDG did NOT start (Emergency Engine S/D), 2F bus is de-energized<br>  • 2C EDG did NOT start, (Emergency Engine S/D), 2G bus is de-energized<br>• Enters 34AB-R22-003-2, "Station Blackout" and "Diesel Generator Recovery," abnormal, 34AB-R43-001-2. |
| | | |
| | | |
| | | |
| | ATC | Reviews EDG "2A" annunciators and determines it started but did not tie. |
| | | IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG "2A" :<br>• Determines the EDG is running<br>  • Confirms the normal and alternate supply breakers are open.<br>  • Using Diesel Generator 2A Speed Adjust switch lowers frequency to 57 Hertz, and then raises to 60 Hertz<br>  • Reports to SRO that 2E Bus is now energized. (Critical Task to energize at least one emergency bus) |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 9 

**Event Description:** 2A EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will not run & 2C EDG will tie after resetting Shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | Reviews DG "1B" annunciators and determines a LUBE OIL PRESS LOW, (652-211) and EMERGENCY ENGINE SHUTDOWN, (652-229). |
| | | |
| | | |
| | | IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG "1B" :<br>• Determines the DG is not running<br>• Determines the Auto Start System Operative Light is NOT lit.<br>• Depresses the Shutdown Relay Pushbutton<br>• Determines the DG did NOT start.<br>• Sends an SO to locally start the DG<br>• Sends an SO/Maintenance to investigate DG failure |
| | | |
| | | |
| | ATC | Reviews DG "2C" annunciators and determines a LUBE OIL PRESS LOW, (652-311) and EMERGENCY ENGINE SHUTDOWN, (652-329). |
| | | IAW 34AB-R43-001-2, Diesel Generator Recovery, for DG "2C" :<br>• Determines the DG is not running<br>• Determines the Auto Start System Operative Light is NOT lit.<br>• Depresses the Shutdown Relay Pushbutton<br>• Determines the 2C DG has started<br>• Reports to SRO Bus 2G is now energized |
| | | |
| | | |
| | | |
| | | *SIMULATOR OPERATOR:*<br><br>*When called to investigate the EDGs, as the SO, wait two minutes and report:*<br>• *DG "1B" has a break on the oil pump discharge line*<br>• *DG 2C had a loose connector on its trip circuit and is now been tightened.* |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 9 Page 18 of 25

**Event Description:** 2A EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will not run & 2C EDG will tie after resetting Shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *The following can be performed in any order.* |
| | ATC/BOP | • As time allows, directs the SSS to perform the following:<br>  • 2A RPS MG Set - restarted<br>  • RPS Alternate Supply from 2B Essential Cabinet - restarted<br>  • 2A SSAC local breaker - reclosed<br>  • Division I Station Service Battery Chargers (may depress pushbuttons on P664 panel)<br>  • Vital AC Alternate supply returned to service<br>  • Restores RBCCW as follows:<br>  • Directs SO to close discharge valve 2P42-F005A, or F005C<br>  • Places RBCCW pump control switch to off and then to auto<br>  • Directs SO to slowly open discharge valve 2P42-F005A, or F005C<br>  • Starts second pump by taking control switch to off and then to run |
| | | |
| | | |
| | | *The following can be performed in any order.* |
| | ATC/BOP | • As time allows, directs the SSS to perform the following:<br>  • 2B RPS MG Set - restarted<br>  • RPS Alternate Supply from 2B Essential Cabinet - restarted<br>  • 2B SSAC local breaker - reclosed<br>  • Division II Station Service Battery Chargers (may depress pushbuttons on P664 panel)<br>  • Vital AC Battery Charger returned to service<br>  • Restores RBCCW as follows:<br>  • Directs SO to close discharge valve 2P42-F005B<br>  • Places RBCCW pump control switch to off and then to auto<br>  • Directs SO to slowly open discharge valve 2P42-F005B<br>  • Starts second pump by taking control switch to off and then to run |
| | | |
| | | |
| | SRO | • Enters the PC EOP flow chart.<br>• May direct operator to restart Drywell Chillers and Cooling Fans IAW EOP-100. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 9 Page 19 of 25

**Event Description:** 2A EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will not run & 2C EDG will tie after resetting Shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • If directed, restores drywell chillers per 31EO-EOP-100-2 section 3.7 by:<br>  • Verifies chilled water expansion tank is within normal level, (NO high/low alarms on 2H11-P700 panel or verify locally)<br>  • Verifies D/W temperature is <250°F, in the vicinity of 2T47-B007A / 2T47-B007B. SPDS points N001A and N010 can be used for 2T47-B007A and N001K and N002 can be used for 2T47-B007B. These points can be read directly from the SPDS Diagnostic Screen for Drywell temperature.<br>  • Notifies SSS to place switch for 2P64-C008A/2P64-C008B, Chilled Water pump, to RUN & then verify Chilled Water return temperature is <100°F.<br>  • Place 2P64-S3, LOCA Override Switch, to BYPASS on panel 2H11-P700.<br>  • Notifies SSS to:<br>  • Open link, Lower TB4-12 in 2R22-S005 Fr. 6, for 2P64-B006A<br>  • Open link, Upper TB1-11 in 2R22-S007 Fr. 7, for 2P64-B006B<br>  • Reset 86 lockout relays on drywell chiller breaker on 4160V buses "E" and "G" (2R22-S005 Fr. 11 and 2R22-S007 Fr. 11<br>  • Reset the POR relay for each chiller.<br>  • Monitors for chiller start by observing the red light on 2H11-P700 or input from the SSS. |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 9 Page 20 of 25

**Event Description:** 2A EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will not run & 2C EDG will tie after resetting Shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • If directed, restores the drywell coolers per 31EO-EOP-100-2 section 3.6 by:<br>• Verifies chilled water expansion tank is within normal level, (NO high/low alarms on 2H11-P700 panel or verify locally)<br>• Verifies D/W temperature is <250°F, in the vicinity of 2T47-B007A / 2T47-B007B.<br>• Notifies SSS to place switch for 2P64-C008A/2P64-C008B, Chilled Water pump, to RUN & then verify Chilled Water return temperature is <100°F.<br>• Places drywell cooling fans system A key-lock LOCA override switch to BYPASS on 2H11-P657.<br>• Places drywell cooling fans system B key-lock LOCA override switch to BYPASS on 2H11-P654.<br>• Observes the drywell cooler fans start by observing their red lights illuminating on 2H11-P654 and panel P657. |
| | | |
| | | |
| | SRO | • May direct operator to place Torus Cooling in service if Torus temperature exceeds 95°F. |
| | | |
| | | |
| | | *The operator may use either "A" or "B" loop of RHR.* |
| | BOP (Placard) | • Enters 34SO-E11-010-2, Residual Heat Removal or uses placard on 2H11-P601.<br>• Places RHRSW in service<br>• Prelubes RHRSW A(B) pump<br>• Overrides 2E11-F068A(B) Low Discharge Pressure Interlock<br>• Positions 2E11-F068A(B) to 45% OPEN<br>- RHR HX A(B) Diff Press Low 601-313 (601-215) alarms |
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| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 9 Page 21 of 25

**Event Description:** 2A EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will not run & 2C EDG will tie after resetting Shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP (Placard) | • Starts RHRSW pump A(B)<br>• Places 2E11-F068A (B) Low Discharge Pressure Interlock switch to normal position.<br>• Positions 2E11-F068A(B) to obtain < 4400 GPM AND < 450 PSIG<br>• RHR HX A(B) DIFF PRESS LOW, (601-313) (601-215), alarm clears |
| | | |
| | | |
| | BOP (Placard) | • Place RHR loop A(B) in Suppression Pool Cooling<br>• Does NOT position the 2/3 Core Height Permissive switch. (RWL will NOT be lowered to below 2/3 core height)<br>• Does NOT place the Containment Spray valve Control switch in the manual position. (LOCA signal is not present)<br>• Confirm open 2E11-F048A (B), HX Bypass Vlv.<br>• Close 2E11-F047A (B), Hx Inlet Vlv.<br>• Confirm open 2E11-F003A(B), HX Outlet Vlv<br>• Start "2A(B) RHR pump<br>- SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234) alarms<br>- AUTO BLOW DOWN CS OR RHR PRESS PERMISSIVE, (602-312), alarms<br>- RHR FLOW LOW, (601-222), alarms |
| | | |
| | | |
| | | • Open 2E11-F028A (B), Torus Spray or Test Vlv.<br>• Throttle open 2E11-F024A(B), Full Flow Test Line Vlv. and establish RHR flow of less than or equal to 7700 gpm (R603A(B))<br>- RHR Flow Low (601-222) alarm clears<br>• Open 2E11-F047A (B), Hx Inlet Vlv.<br>• Close 2E11-F048A (B), Hx Bypass Vlv.<br>• Reports to SRO that RHR has been placed in Suppression Pool Cooling mode. |
| | | |
| | | |
| | | *Simulator operator the next event was inserted at the beginning of the scenario.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-02 **Event No.:** 10 Page 22 of 25

**Event Description:** HPCI F001 stuck closed and RCIC 2E51-F013 Fails to Auto Open requiring manual operation of 2E51-F013 to inject prior to RWL reaching -185"

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *The malfunction for this event was in at the beginning of the scenario (rfE51_234 Final Value of BYPASS and mfE41_107).* |
| | BOP | • Starts RCIC for level control by performing the following at 2H11-P602 panel: |
| | | • Depresses RCIC Manual Initiation P/B<br>• Confirms/Opens 2E51-F046<br>• Confirms/Starts Barom Cndsr Vac Pump<br>• Confirms/Opens 2E51-F045<br>• Confirms/Opens 2E51-F019<br>• Confirms/Closes 2E51-F019 at flow > 79.3 gpm<br>• Realizes 2E51-F013 did not auto open<br>• Opens 2E51-F013 (Critical Task to maintain RWL >-185")<br>• Adjusts controller for desired flow and with SRO permission will raise RWL to 32 to 42 inches |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | *Termination criteria:*<br><br>*The scenario may be terminated, at the direction of the Chief Examiner, when RWL is being controlled with RCIC and at least ONE Emergency bus has been energized.* |

**Appendix D** **Scenario Outline** **Form ES-D-1**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-02 **Op-Test No.:** 2012-301

**Examiners:** _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

| Initiating Conditions: | Unit 2 is at 6% RTP increasing to 8% following a Refueling Outage. |
|---|---|
| Turnover | Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise. After surveillance, withdraw control rods to increase power to ~8% for preparation of transferring the Reactor Mode switch to Run. FWLC is in Single Element. Chest Warming is in progress. |

Summary:

- **Event 1**: Normal; The BOP will perform 34IT-T45-001-2, Reactor Bldg. Instrument Sump Isolation Valve Exercise surveillance. The surveillance consists of several isolation valves being cycled to ensure they can operate. The crew should complete the surveillance with no problems.

- **Event 2**: Component: The ATC will withdraw control rods to increase Reactor power to 8%.

- **Event 3**: TS; The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.

- **Event 4:** Component; The CRD 2A pump experiences a Suction Filter dP High requiring swapping to standby pump IAW System Operating procedure.

- **Event 5:** Component; SSAC 2C Trips - 2B fails unloaded, 2A manually started. The "2C" Station Service Air Compressor (SSAC) trips due to an equipment malfunction. "2B" SSAC auto starts but does not supply any air to the system because its loader system is malfunctioning. The crew will manually start "2A" SSAC, which does return the air system to normal pressures.

- **Event 6**: Component/TS; A RWCU line will break outside of Primary Containment. The inboard and outboard isolation valves fail to close automatically. The operator will take manual actions to isolate the leaking RWCU line. **(Critical Task)** The SRO addresses Tech Specs for inoperable Primary Containment Isolation Valves.

- **Event 7:** Component; Turbine Gland Seal Reg Fails Closed resulting in a degrading condenser vacuum. The BOP will operate the bypass valve to restore steam seals on the Main Turbine.

- **Event 8:** Major; The plant will experience a Loss of Offsite power with all 4160 V Emergency Buses initially de-energized;

- **Event 9:** Component; 2A EDG fails to auto tie to the emergency bus and must have its frequency lowered, then raised to force the 2A EDG output breaker to close. 2C EDG will tie after Shutdown is manually reset. **(Critical Task to energize at least one emergency bus)**

- **Event 10:** HPCI F001 stuck closed and RCIC 2E51-F013 Fails to Auto Open requiring manual operation of 2E51-F013 to inject prior to RWL reaching -185" **(Critical Task)**

**Critical Tasks**

**NRC DRAFT**

**Facility:** E. I Hatch **Scenario No.:** 7-02 **Op-Test No.:** 2012-301

Critical Tasks

- Manually isolate RWCU before exceeding maximum safe Secondary Containment Control EOP parameters (Temperatures, Radiation levels or SC water levels). **(Event 6)**
- 2A EDG fails to auto tie to the emergency bus and must have its frequency lowered, then raised to force the 2A EDG output breaker to close. 2C EDG will tie after resetting shutdown. **(Event 9)**
- HPCI F001 stuck closed and RCIC 2E51-F013 Fails to Auto Open requiring manual operation of 2E51-F013 to inject prior to RWL reaching -185". **(Event 10)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 8 | 1. Backup SDV valves will close **(Event 3)**<br>2. CRD 2A pump Suction Filter dP hi **(Event 4)**<br>3. SSAC 2C Trips - 2B fails unloaded **(Event 5)**<br>4. RWCU line breaks outside Pri. Cont. **(Event 6)**<br>5. Turbine Gland Seal Reg Fails Closed **(Event 7)**<br>6. Loss Of Offsite power **(Event 8)**<br>7. 2A EDG fails to auto tie, 1B EDG will not run & 2C EDG must be manually reset **(Event 9)**<br>8. RCIC F013 fails to auto open **(Event 10)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. 2A EDG fails to auto tie, 1B EDG will not run & 2C EDG must be manually reset **(Event 9)**<br>2. RCIC F013 fails to auto open **(Event 10)** |
| 3. | Abnormal Events | 2-4 | 2 | 1. RWCU line breaks outside Pri. Cont. **(Event 6)**<br>2. Turbine Gland Seal Reg Fails Closed **(Event 7)** |
| 4. | Major Transients | 1-2 | 1 | 1. Loss of Offsite power with all 4160 V Emergency Buses initially de-energized. **(Event 8)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 2 | 1. RC (Non-ATWS) **(Event 8)**<br>2. PC **(Event 8)** |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 1 | 1. CP-1 **(Event 10)** |
| 7. | Critical Tasks | 2-3 | 3 | 1. RWCU line breaks outside Pri. Cont. **(Event 6)**<br>2. Energize at least one emergency bus. **(Event 9)**<br>3. RCIC F013 fails to auto open **(Event 10)** |

# SHIFT TURNOVER

## UNIT 1 STATUS

| | |
|---|---|
| **Power:** | Unit 1 is at 100% RTP. |
| **Activities in progress:** | None |

## UNIT 2 STATUS

| | |
|---|---|
| **Power**: | Unit 2 is at 6% RTP increasing to 8% following a Refueling Outage. |
| **The following equipment is inoperable**: | None |
| **Scheduled evolutions**: | Pull control rods to increase power to ~8% for preparation of transferring the Reactor Mode switch to Run. |
| **Surveillances due this shift**: | 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise |
| **Active clearances**: | Normal Supply Breakers for 4160V A - D Station Service Buses |
| **Rod Configuration**: | See Rod Withdrawal Sheets |

**Appendix D** **Scenario Outline** **Form ES-D-1**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-03 **Op-Test No.:** 2012-301

**Examiners:** _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions.** Unit 1 is at 100% RTP. Unit 2 is at 75% RTP increasing to 80% via Recirc.

**Turnover:** IAW 34SO-N42-001-2, Hydrogen Seal Oil System, starting at step 7.3.3.2.5 return Hydrogen Seal Oil to a Normal lineup. Once completed, increase Reactor power to 80% RTP.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | | N (BOP) | Restoration To Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2. |
| 2 | N/A | R (ATC) | Increase Reactor power via Recirc to 80% RTP. |
| 3 | mf65702193<br>mf65702248<br>mf65702230 | C (BOP)<br>TS (SRO) | RCIC NW Diagonal Instrument sump Hi, Hi-Hi & Hi-Hi-Hi alarms; RCIC B004A CLR PSW leak requires swapping to Standby cooler. |
| 4 | mf65031541<br>mfN61_73 | C (ATC) | RFPT loop seal failure requiring manual opening of bypass valve to prevent Main Turbine trip on low vacuum. |
| 5 | mfE51_65<br>loE51_F010G1<br>loE51_F010R2<br>mf60231261<br>aoE51-R604 | I (BOP)<br>TS (SRO) | RCIC Torus Level Sensor Fails High; with failure of CST (valve overload). Time compression repair and re-alignment back to CST. |
| 6 | mfB31_41A | C (ATC) | Recirc Pump '2A' High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm will clear when 2A Recirc speed is reduced (~200 rpm). |
| 7 | mfC71_59<br>mfC11_211 | M (ALL) | Spurious Reactor scram/ATWS (Insert control rods Critical Task) |
| 8 | mfC41_240A<br>mfC41_240B | C (ALL) | SBLC first pump fails to inject, second pump works. (Critical Task) |
| 9 | mfC11_30A<br>mf60311334<br>ET C11-2 | C (ALL) | CRD pump trips due to low suction pressure instrument failure. Must start standby pump to insert control rods. |
| | | | |

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

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 1 Page 2 of 25

**Event Description:** Restoration To Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Mins | | *Simulator Operator, IF contacted as SO, report the following:*<br>• *Seal Oil Vacuum Pump Separator Tank oil level is between the High AND Low Oil Level on 2N42-LG-R306, Separator Tank Sight Glass*<br>• *2N42-F042, Vacuum Tank Inlet Valve, open*<br>• *Oil level in the Vacuum Tank is above the bottom of the lower observation window*<br>• *Seal Oil Vacuum Pump shaft has been manually rotated.* |
| | BOP | • Enters Restoration To Normal Hydrogen Seal Oil System Lineup at step 7.3.3.2.5<br>• Starts 2N42-C001, H2 Seal Oil Vacuum Pump, (2H11-P651).<br><br>*Simulator Operator, WHEN contacted as SO, 2N42-R302, Vacuum Tank Pressure, is 26.5 in. Hg and steady.*<br><br>• Confirms 2N42-R302, Vacuum Tank Pressure, stabilizes above 26 in. Hg. by contacting SO locally.<br>• Starts 2N42-C003, Recirc H2 Seal Oil Pump.<br>• Starts 2N42-C004, Main H2 Seal Oil Pump.<br>• Secure 2N42-C002, Emergency Seal Oil Pump, as follows:<br>  • Holds control switch for ESOP in OFF Pull To Lock position until pump stops as indicated by its extinguished red AND green lights<br>  • Alarm 651-216 clears (SO locally resets this)<br>  • AFTER pump stops, releases control switch.<br>  • Confirm its green light is illuminated. |
| | | |
| | | |
| | | *Simulator Operator, when contacted as SO, report the following:*<br>• *2N42-R300, Seal Oil Pump Disch Press, is 105 psig*<br>• *2N42-R301, Seal Oil / Machine Gas dP, pressure, is 8 psig above generator gas pressure.* |
| | BOP | • *Confirms the following by contacting SO locally:*<br>  • *2N42-R300, Seal Oil Pump Disch Press, is 100 - 110 psig*<br>  • *2N42-R301, Seal Oil / Machine Gas dP, pressure, is being maintained 7 - 9 psig above generator gas pressure.* |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 2 Page 3 of 25

**Event Description:** Increase Reactor power to 80% RTP using recirc.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | SRO | • Directs ATC to increase reactor power to 80% by increasing Recirc flow. Power increases are not to exceed 10 MWe/min. |
| | | |
| | | |
| | | *NOTE: May get the RBM UPSCALE, (603-202) and ROD OUT BLOCK, (603-238) alarm, if a peripheral control rod is not selected. This is expected and the operator may select a peripheral rod at this time.*<br><br>*May also get Alarm HEATER TROUBLE, (650-135), alarm. This is expected at this power level.* |
| | ATC | • IAW 34SO-B31-001-2 (step 7.1.5) & 34GO-OPS-005-2, the ATC increases Recirc pump speed, not to exceed 10 MWE per minute by depressing the RAISE SLOW or RAISE MEDIUM pushbuttons on the Master (P603 panel) or Individual controls (P602 panel) until reactor power is 80%.<br><br>• If using Individual Controls, pump speed increases will alternate between the "A" & "B" Recirc pumps to prevent excessive flow mismatches. |
| | | |
| | | |
| | | |
| | | |
| | ATC | Notifies the SRO that reactor power has been increased to 80%. |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 3 

**Event Description:** RCIC NW Diagonal Instrument sump Hi & Hi-Hi-Hi alarms; RCIC B004A CLR PSW leak requires swapping to Standby cooler.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Min | | *Simulator Operator at direction of the Chief Examiner's direction, ACTIVATE: (**RB-1**) malfunction mf65702193, mf65702248 and mf65702230 annunciators to ON. **ET T41-1** will remove malfunction after cooler is swapped.* |
| | ALL | • Receives alarms:<br>• PANEL 2H11-P657 SYSTEM TROUBLE, (650-224)<br>• RCIC N-W DIAG INSTR SUMP LVL HIGH-HIGH-HIGH, (657-014)<br>• RCIC N-W DIAG INSTR SUMP LVL HIGH, (657-051)<br>• RCIC N-W DIAG INSTR SUMP LVL HIGH-HIGH, (657-069) |
| | | |
| | | |
| | SRO | • Directs BOP to enter above annunciator response procedures. |
| | | |
| | | |
| | | ***NOTE:*** *Either ARP will be okay to use for proper actions to take.* |
| | BOP | • Enters 657-014 and performs the following:<br>• Notifies SSS to dispatch an SO to monitor the local water level indication on the level stick in the RCIC N-W Diagonal.<br>• Enters 34AB-T22-003-2, Secondary Containment Control.<br>• Panel 2H11-P654, places 2T45-F006, RCIC Sump Isol valve, in AUTO and confirm valve OPENS. |
| | | |
| | | |
| | BOP | • Enters 657-051 and performs the following:<br>• Notifies SSS to locate AND isolate the source of inleakage into the RCIC Compartment Instrument Sump.<br>• Panel 2H11-P654, places 2T45-F006, RCIC Sump Isol valve, in AUTO and confirm valve OPENS. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 3 Page 5 of 25

**Event Description:** RCIC NW Diagonal Instrument sump Hi & Hi-Hi-Hi alarms; RCIC B004A CLR PSW leak requires swapping to Standby cooler.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | • Enters 657-069 and performs the following:<br>  • Notifies SSS to locate AND isolate the source of inleakage into the RCIC Compartment Instrument Sump.<br>  • Panel 2H11-P654, places 2T45-F006, RCIC Sump Isol valve, in AUTO and confirm valve OPENS. |
| | | *Simulator Operator, four (4) minutes after an SO has been dispatched, reports there is one (1) inch of water on the floor in the RCIC Diagonal. The leak is coming from the RCIC B004A Room Cooler and is spraying water in the room.* |
| | | |
| | | |
| | SRO | • Directs BOP to shutdown RCIC B004A Room Cooler and start RCIC B004B Room Cooler<br>• Reviews TRM T3.7.2<br>• IAW T3.7.2 Condition C, determines the following:<br><br>Restore room cooler to Functional status within 30 days<br>OR<br>Obtain Corporate Nuclear Engineering and Licensing Department evaluation justifying extended Completion Time within 30 days. |
| | | |
| | | |
| | | *Simulator Operator ENSURES **ET T41-1** removes malfunction when the coolers are swapped.* |
| | BOP | • IAW 34SO-E51-001,<br>  • Places 2T41-B004B, RCIC Pump Rm Cooler, control switch to RUN.<br>  • Places 2T41-B004A, RCIC Pump Rm Cooler, control switch to AUTO or OFF.<br>• Notifies SRO 2T41-B004B is in service and 2T41-B004A is off.<br>• When 657-014 and 657-051 alarms clear, places 2T45-F006, RCIC Sump Isol valve, in close and confirms valve closes. |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 4 Page 6 of 25

**Event Description:** RFPT loop seal failure

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min. | | *SIMULATOR OPERATOR: At the direction of the Chief Examiner, ACTIVATE (**RB-2**)*<br>• *mf65031541 "RFP Loop Seal Level Low (Annunciator On)"*<br>• *mfN61_73 "Main Condenser Air In-leakage"*<br><br>***NOTE:** It takes approximately 28 minutes for vacuum to decrease to 25.9".* |
| | ATC | • Recognize RFP LOOP SEAL LEVEL LOW, (650-319), annunciator |
| | | |
| | | |
| | | |
| | ATC | • Respond to annunciator RFP LOOP SEAL LEVEL LOW, (650-319)<br>• Dispatches an SO to 2H21-P216 to confirm 2N22-F398, RFP Bracket Drain Loop Seal Fill Valve is open<br>• Monitors vacuum at 2H11-P650, on 2N21-R602<br>• Dispatches an SO to confirm seal water lineup and pressures. |
| | | |
| | | |
| | | |
| | BOP | • Monitors Inlet Flow to Stack on 2N62-P600<br>• Receives INLET FLOW TO STACK HIGH, (600-020)<br>• Monitors Inlet flow to Stack at 2N62-P600, on 2N21-R604 |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 4 Page 7 of 25

**Event Description:** RFPT loop seal failure

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *SIMULATOR OPERATOR: Wait 4 minutes from being dispatched, NOTIFY the ATC of **ONE** of the following **messages**:* |
| | | ***MESSAGE 1*** |
| | | *IF 2N22-F265 is still OPEN REPORT:*<br>• *Having difficulty locating 2N22-F398, RFP Bracket Drain Loop Seal Fill Valve but still attempting to locate.*<br>• *Seal water pressures are normal and/but the lineup check is not completed.*<br>• *No water is coming out of weep holes.* |
| | | ***MESSAGE 2*** |
| | | *IF 2N22-F265 has been CLOSED REPORT:*<br>• *2N22-F398, RFP Bracket Drain Loop Seal Fill Valve was closed and now is open*<br>• *Seal water pressures are normal and/but the lineup check is not completed.*<br>• *No water is coming out of weep holes.* |
| | | *SIMULATOR OPERATOR: **ENSURE** Event Trigger **ET-N21-2** deletes **mfN61_73** when one of the following occurs:*<br>• *Condenser vacuum drops to 25.9"*<br>• *2N21-F265 is closed*<br>*Then 45 seconds later, DELETES **mf65031541.*** |
| | ATC | • With seal water pressures normal, will be required to close 2N21-F265, RFP Loop Seal Outlet Isol Vlv after 5 minutes of alarm RFP LOOP SEAL LEVEL LOW, (650-319), being received.<br>• With vacuum degrading may close 2N21-F265 sooner to reverse degrading vacuum condition. |
| | | |
| | | |
| | ATC | • Opens 2N21-F265 when RFP LOOP SEAL LEVEL LOW, (650-319) clears. |
| | | |
| | | |
| | BOP | • Alarm INLET FLOW TO HOLDUP LINE HIGH, (600-020), clears when flow returns to normal. |
| | | *SIMULATOR OPERATOR; At Chief Examiners direction, proceed to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 5 Page 8 of 25

**Event Description:** RCIC Torus Level Sensor Fails High; with failure of CST valve indication position.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 20 Min | | *At the Chief Examiner's direction, Simulator Operator enters: (**RB-3**) mfE51_65 AND ENSURE EVENT TRIGGER **ET-E51-4** performs the following:*<br>*Turns off the lights for 2E51-F010*<br>*Overrides E51-R604 suction pressure to ~ 19.8 psig*<br>*Inserts malfunction mf60231261, RCIC Motor Overload, alarm*<br>*Inserts Event Triggers **E51-5 & 6*** |
| | All | • TORUS LEVEL HIGH RCIC, (602-230) and RCIC VALVES MOTOR OVERLOAD, (602-309), alarms are received on P601. |
| | | |
| | | |
| | SRO | • Directs an operator to enter 602-230 and 602-309 |
| | | |
| | | |
| | BOP | • Enters TORUS LEVEL HIGH RCIC, (602-230);<br>  • Determines that RCIC Suction has aligned to the Torus<br>  • Verifies 2E51-F003, 2E51-F031 and 2E51-F029 are open.<br>  • Verifies that 2E51-F010 is closed. (Cannot perform this step because 2E51-F010 has no light indication)<br>  • Determines that Torus level is not high and is stable.<br>  • Determines that RCIC should not have auto swapped to the Torus.<br>  • Determines RCIC suction pressure is ~20 psig.<br>• Notifies SRO that RCIC suction valve, 2E51-F010, has no light indication. |
| | | |
| | | |
| | BOP | • Enters 602-309<br>  • Determines that 2E51-F010 has no lights illuminated.<br>  • Dispatches operator/Maint to reset the thermal overload for 2E51-F010 (MCC 2R24-S021 Brkr # 2B) |
| | | |
| | | |
| | SRO | • Dispatches operator/Maint to reset the thermal overload for 2E51-F010 (MCC 2R24-S021 Brkr # 2B) (ATC may do this also)<br>• Directs operator to monitor suction pressure on RCIC. |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 5 Page 9 of 25

**Event Description:** RCIC Torus Level Sensor Fails High; with failure of CST valve indication position.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, If dispatched to ATTS panels, report all Torus level indicators are normal. Also, 3 minutes after Maintenance is sent to investigate, notify the control room that 2E51-LS-N062B, which feeds2E51-N662B, has failed upscale.* |
| | BOP | • Reports to the SRO that 2E51-LS-N062B has failed upscale |
| | | |
| | | |
| | SRO | • Enters Tech Specs 3.3.5.2, Condition D.2.1 & D.2.2, to place the channel in trip or align RCIC suction to the Suppression pool within 24 hours. |
| | | |
| | | |
| | | *Simulator Operator, after 2 minutes from being dispatched to the breaker, DELETE override loE51-F010G1 AND ENSURE* ***ET-E51-6*** *DELETES the following:*<br><br>*loE51-F010R2 and mf60231261.*<br><br>*As operator, notifies the control room that the breaker for 2E51-F010 has been reset.* |
| | | |
| | BOP | • Confirms 2E51-F010 has traveled full closed.<br>• Informs SRO that 2E51-F010 is full closed.<br>• Alarm RCIC VALVES MOTOR OVERLOAD, (602-309), clears |
| | | |
| | | |
| | | *At the Chief Examiner's direction, Simulator Operator, DELETE mfE51_65, then as I & C, report that it is now one hour later (time compression) and that 2E51-N062B repair and calibration is complete.* |
| | | • Alarm TORUS LEVEL HIGH RCIC, (602-230), clears. |
| | | |
| | | |
| | SRO | • Directs Operator to align RCIC to the CST. |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 5 

**Event Description:** RCIC Torus Level Sensor Fails High; with failure of CST valve indication position.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator operator ENSURE EVENT TRIGGER **ET-E51-5** modifies E51-R604 suction pressure to 28 psig and then deletes override.* |
| | BOP | • Enters 34SO-E51-001-2 step 7.3.7 to align RCIC to the CST.<br>  • Starts closing 2E51-F029 and 2E51-F031, then starts opening 2E51-F010 prior to 2E51-F029 and 2E51-F031 going full closed.<br>• When valves have completed stroking, notifies the SRO that RCIC is aligned to the CST. |
| | | |
| | | |
| | SRO | • As time allows, determines that the LCO for 2E51-N062B is met. |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 6 Page 11 of 25

**Event Description:** Recirc Pump '2A' High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm will clear when 2A Recirc speed is reduced.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 18 Min | | *Simulator Operator; at the Chief Examiner's direction, press (**RB-4**) to ACTIVATE mfB31_41A, Recirc Pump A High Vibration.* |
| | All | • Receives RECIRC PUMP A HIGH VIBRATION, (602-104), alarm. |
| | | |
| | | |
| | | |
| | ATC | • Enters 602-104 and performs the following:<br>  • Depresses the Hi vibration reset pushbutton and determines that the alarm does not clear.<br>  • Notifies the SRO that the vibration alarm did not clear.<br>  • Notifies the SRO that the ARP requires reducing Recirc flow and attempting to reset the alarm again. |
| | | |
| | | |
| | | |
| | SRO | • Directs the operator to reduce Rx power with Recirc per 34GO-OPS-005 and 34SO-B31-001-2, section 7.1.6 "Two Loop Operation From Rated To Minimum Speed", exceeding 10 MWE/minute if necessary.<br>• Reminds the operator that entry into the Immediate Exit Region of the Power to Flow map is allowed.<br>• Notifies Plant Management, Load Dispatcher, and Engineering of the Recirc Pump 2A high vibration condition. |
| | | |
| | | |
| | | |
| | ATC | • IAW 34SO-B31-001-2 (step 7.1.6) & 34GO-OPS-005-2, the ATC decreases Recirc pump speed by depressing the Slow, Medium or Fast LOWER pushbuttons. (may exceed 10 MWE per minute)<br>• Monitors power decrease by observing APRM and generator output indications. |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 6 Page 12 of 25

**Event Description:** Recirc Pump '2A' High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm will clear when 2A Recirc speed is reduced.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator; AFTER 2A Recirc Speed has been reduced to the point of ENTERING the Immediate Exit Region, DELETE mfB31_41A, Recirc Pump A High Vibration.* |
| | ATC | • Stops power reduction periodically and depresses the High vibration reset pushbutton. (The alarm will clear when Recirc Speed has been reduced to the point of ENTERING the Immediate Exit Region.)<br>• Notifies SRO that the vibration alarm is clear. |
| | | |
| | | |
| | | |
| | | ***NOTE:*** *A 15% power change may occur if the ATC reduces Recirc speed significantly before depressing the Vibration Reset pushbutton.*<br><br>*If a 15% power change occurs, notification is required IAW limitation 5.2.13, 34GO-OPS-005-2.* |
| | BOP/ATC | • If necessary, notifies chemistry of 15% power change in 1 hour IAW 34GO-OPS-005-2, "Power Changes", Step 5.2.13. |
| | | |
| | | |
| | | ***EXAMINER NOTE:*** *If entered, Log time when Region of Instabilities/Immediate Exit Region has been entered.* **Time:** _____ |
| | | |
| | | |
| | | ***NOTE:*** *HEATER TROUBLE ALARM, (650-135), may alarm due to plant conditions.* |
| | SRO | • Directs the ATC operator to stop the power reduction. |
| | | |
| | | |
| | | |
| | SRO | • Has the operator determine that the plant is in the Immediate Exit Region of the Power to Flow map. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 6 

**Event Description:** Recirc Pump '2A' High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm will clear when 2A Recirc speed is reduced.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • Notifies the SRO that the Region of Potential Instabilities/Immediate Exit Region of Power to Flow Map was entered.<br>• Acknowledges APRM Upscale (603-219) and Rod Out Block (603-238) annunciators, if required. |
| | | |
| | | |
| | SRO | • Performs the following: |
| | _____ TIME | • **Within 15 minutes** of entering the Immediate Exit Region of the Power to Flow map, directs operator to exit the region by inserting control rods. (*Time is stopped when CR movement brief is started*) |
| | _____ TIME | • Ensures the plant has **exited** the Immediate Exit Region of the Power to Flow map **within one hour**. (*Time is stopped when region is exited*) |
| | | • Has a control rod movement brief per 34GO-OPS-065-0<br>• Directs ATC operator to insert rods to exit the Power to Flow Map "Immediate Exit Region". |
| | | |
| | | |
| | | ***NOTE:*** *Advise the STA to recommend inserting the current rod group to its insert limit.* |
| | SRO | • Directs the operator to insert the rods to the insert limit after consulting with the STA. |
| | | |
| | | |
| | | *Simulator Operator*<br><br>*If the Team calls for the STA or Reactor Engineering, for rod movement recommendations:*<br><br>• *Respond as follows:*<br><br>• *"Use the Reactivity Manipulations Turnover."*<br><br>***NOTE:*** *RBM Downscale alarm may alarm during this movement due to the significant rod worth of these rods. It is allowed to flag the RBM Downscale and Rod Block alarm.* |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 6 

**Event Description:** Recirc Pump '2A' High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm will clear when 2A Recirc speed is reduced.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • Inserts control rods per 34GO-OPS-065-0, starting with control rod Group 52.<br>• During rod insertion, rod steps will be performed in reverse sequential order, starting at the highest numbered step. (** rod steps are not required to be performed sequentially, but must be positioned to their RWM insert limit prior to inserting lower numbered groups).<br>  • Selects Rod<br>  • Places Control Rod movement switch to the IN position<br>  • Verifies Rod moves using Rod display information and Rx and Generator power decreasing. |
| | | |
| | | |
| | ATC | • If required, adjust 2C11-F003 to get 220 – 280 psid drive water dp.<br>• Releases Rod movement switch so that the control rod stops 1 position before the insert limit unless the insert limit is 00.<br>• Initials Rod movement Sheet.<br>• Verifier, if available, Initials Rod movement sheet.<br>• Notifies the SRO when the region of potential instabilities is exited. |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 7 

**Event Description:** Spurious Reactor scram/ATWS

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Min | | *Simulator Operator, at the Chief Examiner's direction, ACTIVATE: (**RB-5**) malfunction mfC71_59, Spurious Reactor Scram.* |
| | SRO | • A "Spurious" Reactor Scram occurs.<br>  • Enters RC or RC-A EOP Flowcharts.<br>  • Directs ATC to perform RC-1 placard.<br>  • Directs BOP to perform RC-2 and RC-3 placards.<br>  • If time allows assigns TC-1 to be performed.<br>  • Enters the RCA EOP flow chart, 31EO-EOP-011-2, for a scram condition and reactor power above 5%.<br>  • Enters CP-3 EOP flow chart, 31EO-EOP-017-2, for ATWS level control. |
| | | |
| | | |
| | SRO | • Directs ATC to (or may observe):<br>  • Confirm the reactor Mode Switch in Shutdown.<br>  • Confirm ARI Initiation.<br>  • Confirm Recirc runback to minimum/tripped. |
| | | |
| | | |
| | ATC (Placard) | • Performs actions of placard RC-1 after Reactor SCRAM.<br>  • Manually SCRAMs the Reactor using the SCRAM pushbuttons.<br>  • Places Rx Mode Switch in S/D.<br>  • Initiates Alternate Rod Insertion (ARI) by rotating the button collars and depressing both ARI pushbuttons at the same time.<br>  • Uses the Full Core Display and Rod Worth Minimizer to determine that all control rods are NOT inserted past position 02.<br>  • Informs the SRO that all rods are NOT fully inserted (ATWS).<br>  • Inserts IRMs and SRMs.<br>  • Injects SBLC (power is above 5%, the ATC is directed to inject SBLC IAW the RC-1 placard) **GO TO EVENT 8** for first SBLC pump failure.<br>  • Places SDV Isol Vlv Switch to "ISOL" and verifies closed.<br>  • If not tripped, places Recirc to minimum speed (if power is above 5%, the ATC is directed to trip Recirc IAW the RC-1 placard). |
| | | |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 7 Page 16 of 25

**Event Description:** Spurious Reactor scram/ATWS

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | • Performs actions of placards RC-2 and RC-3 after Reactor SCRAM. |
| | BOP (Placard) | • Performs RC-2 actions consisting of:<br>  • Confirms proper Level Control response:<br>  • Checks ECCS Injection Systems<br>  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value<br>  • When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then:<br>  • Opens 2N21-F125.<br>  • Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.<br>  • Closes 2N21-F110.<br>  • Will control RWL at 9 inches. |
| | | |
| | | |
| | BOP (Placard) | • Performs RC-3 consisting of:<br>  • Monitor RPV pressure.<br>  • Confirm proper operation of pressure control system (TBV, LLS, etc.).<br>  • If necessary, allow RPV pressure to exceed 1074 psig then cycle any SRV to initiate LLS.<br>  • Maintain RPV pressure between 1074 and 800 psig.<br>  • Notify SRO of pressure control system operation. |
| | | |
| | | |
| | SRO | • Directs ATC or STA to report reactor power or observes reactor power on SPDS.<br>• Directs ATC to Reset ARI and insert control rods IAW 31EO-EOP-103-2. **GO TO EVENT 9** for control rod insertion. |
| | | |
| | | |
| | ATC/STA | • Reports power level to the SRO. |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 7 

**Event Description:** Spurious Reactor scram/ATWS

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | • Directs BOP to lower water level to below -60" and then maintain between -90 inches and -60 inches. |
| | | |
| | | |
| | BOP | • Performs one or more of the following, as necessary, to reduce injection and lower RWL to < -60 inches:<br>• Places HPCI Flow controller in Manual and lowers output to achieve a lowering RWL trend or trips HPCI.<br>• Lowers Feedwater flow as necessary to achieve a lowering RWL trend<br>• If required, places RCIC Flow controller in Manual and lowers output to achieve a lowering RWL trend. |
| | | |
| | | |
| | SRO | • When RPV level is below –60 inches, directs BOP to control RPV level within a level band.<br>Any band between –60 inches and –185 inches is acceptable.<br>(Typically –60" to –100" to maintain RPV level above –101")<br>• If RWL increases to >-60 inches and Rx power is >5%, the override will be re-addressed to once again, lower level to < -60. |
| | | |
| | | |
| | BOP | • Performs one or more of the following, as necessary, to control injection and maintain RWL in the established band:<br>1. Places HPCI Flow controller in Auto and adjusts output to maintain RWL band.<br>2. Adjusts Feedwater flow as necessary to maintain RWL band.<br>3. Places RCIC Flow controller in Auto and adjusts output to maintain RWL band. |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 7 Page 18 of 25

**Event Description:** Spurious Reactor scram/ATWS

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP/ATC | • As time allows, and when generator load goes below 80 MWe, the crew performs TC-1 to trip the Main Turbine.<br><br>• Manually Trip the Turbine.<br>• Confirm TSV's, TCV's, and CIV's have properly closed.<br>• Confirm the generator PCBs and EX2100 Control Tripped/Stopped.<br><br>• Confirms/Opens PCB 179740<br>• Confirms/Opens PCB 179750<br><br>• Confirms the 4160 VAC station service busses have transferred to their alternate supply.<br>• Confirms/Places TGM in auto.<br>  • Start TG Oil Pump<br>  • Motor Suction Pump<br>  • Lift Pumps<br>• Confirms Steam Seal & Condenser Vacuum systems proper operation.<br>• Closes the RSSV's (2N11-F004A and F004B).<br>• Notifies the SRO that TC-1 is complete. |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | *Simulator operator the next event was previously inserted from the beginning of the scenario.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 8 Page 19 of 25

**Event Description:** SBLC first pump fails to inject, second pump works.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator; ENSURE malfunctions ENSURE EVENT TRIGGERS THAT WILL PREVENT THE FIRST PUMP STARTING BUT NOT THE SECOND are inserted. They were inserted from the beginning.* |
| | ATC | • Injects SBLC (power >5%)<br>• Unlocks and places SBLC pump select switch in "Start Sys A" or "Start Sys B" position.<br>• Confirms Squib Valve Ready Lights are extinguished.<br>• Confirms SBLC Loss of Continuity to Squib Valve annunciator is alarmed.<br>• Recognizes that the selected SBLC pump DID NOT start.<br>• Places SBLC pump select switch in "Start Sys B" or "Start Sys A" position. (The pump not attempted first.)<br>• Confirms the selected second SBLC pump started.<br>• Confirms closed 2G31-F004 (RWCU Isolation Valve).<br>• Reports to SRO, SBLC is injecting IAW 34SO-C41-003-2 and the first pump selected failed to start. |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 9 Page 20 of 25

**Event Description:** CRD pump trips due to low suction pressure instrument failure. Must start standby pump to insert control rods.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Mins | | *Simulator Operator, if asked, STA will direct the ATC to start in the center of the core and spiral out in a "black and white" pattern.* |
| | ATC | • Enters 31EO-EOP-103-2, "EOP Control Rod Insertion Methods" section 3.7, "Driving Control Rods"<br>• Confirms ARI initiation signals are clear and then depresses ARI Reset pushbutton OR dispatches an operator to place ARI System Test switch, to TEST, on panel 2C11-P001<br>• Checks annunciator ARI INITIATED, clear<br>• Attempts to drive rods by:<br>  • Place Reactor Mode switch to REFUEL<br>  • Place Rod Worth Minimizer bypass switch to BYPASS<br>  • Obtain recommendations from STA<br>  • Verifies adequate CRD drive water pressure for driving rods and may operate 2C11-R600, CRD Flow Control, to achieve higher drive water dP<br>  • May start second CRD pump<br>  • Drive rods to at least 02 using the Emerg In or IN (Critical Task)<br>(***Critical Task*** – *Commence insertion of control rods within 20 minutes of reactor scram.* |
| | | |
| | | |
| | | |
| | | *Simulator Operator, when directed to jumper ALL automatic Scram signals,* ***DELETE*** *malfunction mfC71_59, Spurious Reactor Scram.* |
| | ATC | • Enters 31EO-EOP-103-2, "EOP Control Rod Insertion Methods" section 3.3, "Repeating Manual Scram"<br>• Bypasses scram discharge volume high level trip at 2H11-P603<br>• Dispatches operator to install jumpers to override all automatic scram signals<br>• Places Discharge Volume Isolation Test switch to Norm at 2H11-P603<br>• Resets Scram when notified that jumpers have been installed<br>• Confirms all SDV Vent and Drain Valves are open |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 9 

**Event Description:** CRD pump trips due to low suction pressure instrument failure. Must start standby pump to insert control rods.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, AFTER the ATC is inserting control rods AND at the Chief Examiner's direction, ENTERS (**RB-6**) malfunction mf60311334 CRD A Suction Pressure Low alarm. ENSURE Event Trigger **ET C11-2** ACTIVATES when CRD A Suction Pressure Low alarms.* |
| | ATC | • Recognizes the following occurs:<br>  • CRD PUMP A SUCTION PRESSURE LOW, (603-146), alarms<br>  • CRD PUMP 2A BREAKER TRIP, (603-128), alarms<br>  • CRD pump 2A is tripped<br>  • CRD HYD TEMP HIGH, (603-140), alarms<br>  • 603-148, (CRD ACCUMULATOR PRESS LOW OR LEVEL HIGH) alarms ~ 1.5 minutes later (will not alarm if CRD 2B is started expeditiously). |
| | | |
| | | |
| | SRO/ATC | • As time allows, dispatches SO/Maint to determine the cause of the low suction pressure condition for CRD pump 2A. |
| | | |
| | | |
| | SRO | • Directs the ATC to enter 34AB-C11-001-2, Loss of CRD, and start CRD pump 2B. |
| | | |
| | | |
| | ATC | • Enters 34AB-C11-001-2, Loss of CRD<br>  • Places 2C11-R600, CRD Flow Control, in Manual<br>  • Decreases 2C11-R600 output to zero<br>  • Manually starts CRD pump 2B<br>  • Alarm 603-139, Charging Water Pressure High, may come in and then clear after pump start<br>  • Increases system flow to ~50 gpm<br>  • Transfers 2C11-R600 to Automatic<br>  • As time allows, notifies SRO CRD pump 2B is in service |
| | | |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-03 **Event No.:** 9 Page 22 of 25

**Event Description:** CRD pump trips due to low suction pressure instrument failure. Must start standby pump to insert control rods.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | SRO/ATC | • As time allows, dispatches an SO to check CRD temperatures and Accumulator pressures locally. |
| | | |
| | | |
| | | *With Chief Examiners Permission the Scenario will be terminated when Reactor water level is controlled in band, CRD pump 2B has been started, SBLC injecting and control rods are being inserted or as directed by the Chief Examiner.* |

**Appendix D** **Scenario Outline** **Form ES-D-1**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-03 **Op-Test No.:** 2012-301

**Examiners:** _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

| Initiating Conditions: | Unit 1 is at 100% RTP. Unit 2 is at 75% RTP increasing to 80% via Recirc. |
|---|---|
| Turnover | IAW 34SO-N42-001-2, Hydrogen Seal Oil System, starting at step 7.3.3.2.5 return Hydrogen Seal Oil to a Normal lineup. Once completed, increase Reactor power to 80% RTP. |

Summary:

- **Event 1**: Normal: The BOP will return Hydrogen Seal Oil to a Normal lineup IAW the system operating procedure.
- **Event 2**: Reactivity; Increase Reactor power via Recirc to 80% RTP.
- **Event 3:** Component/TS/TRM; RCIC NW Diagonal Instrument sump hi & hi-hi-hi alarms; RCIC B004A CLR PSW leak which requires swapping to Standby cooler.
- **Event 4:** Component; RFPT loop seal failure requiring manual opening of bypass valve to prevent Main Turbine trip on low vacuum.
- **Event 5**: Instrument/TS; The RCIC Torus Level Sensor Fails High; with failure of CST (valve overload). Time compression repair and re-alignment back to CST.
- **Event 6:** Component/TS; Recirc Pump '2A' will experience high vibration requiring reducing reactor power in an attempt to clear the alarm. Alarm will clear when 2A Recirc speed is reduced (~200 rpm).
- **Event 7:** Major; A Spurious Turbine trip causing a Reactor scram and subsequent ATWS will occur. The SRO will direct/ensure the ATC inserts control rods within 20 minutes of the scram. **(Critical Task)**
- **Event 8:** Component; The first SBLC pump fails to start, second pump works injecting SBLC prior to the ATC leaving RC-1 **(Critical Task).**
- **Event 9**: Instrument; The 2A CRD pump will trip due to a low suction pressure instrument failure. The ATC will be required to manually start the standby CRD pump to insert control rods.

**Critical Tasks**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-03 **Op-Test No.:** 2012-301

Critical Tasks

- Begins inserting control rods within 20 minutes of scram. **(Event 7)**
- Injects SBLC prior to exiting RC-1 placard. **(Event 8)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 7 | 1. RCIC NW Diag. Instr. sump hi & hi-hi-hi alarms; RCIC B004A CLR PSW leak **(Event 3)**<br>2. RFPT loop seal failure **(Event 4)**<br>3. RCIC Torus Level Sensor Fails High; with CST valve overload **(Event 5)**<br>4. Recirc Pump '2A' will experience high vibration **(Event 6)**<br>5. Spurious Turbine trip causing a Reactor scram and subsequent ATWS **(Event 7)**<br>6. The first SBLC pump fails to start, second pump works injecting SBLC **(Event 8)**<br>7. 2A CRD pump will trip due to a low suction pressure instrument failure **(Event 9)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. The first SBLC pump fails to start, second pump works injecting SBLC **(Event 8)**<br>2. 2A CRD pump will trip due to a low suction pressure instrument failure **(Event 9)** |
| 3. | Abnormal Events | 2-4 | 2 | 1. RCIC NW Diag. Instr. sump hi & hi-hi-hi alarms; RCIC B004A CLR PSW leak **(Event 3)**<br>2. 2A CRD pump will trip due to a low suction pressure instrument failure **(Event 9)** |
| 4. | Major Transients | 1-2 | 1 | 1. Spurious Reactor scram/ATWS (Power/Level Control, insert control rods **(Event 7)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 2 | 1. SC/RR **(Event 3)**<br>2. RCA **(Event 7)** |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 1 | 1. CP-3 **(Event 7)** |
| 7. | Critical Tasks | 2-3 | 2 | 1. Begins inserting control rods within 20 minutes of scram **(Event 7)**<br>2. Injects SBLC prior to exiting RC-1 placard. **(Event 8)** |

HLT 7 NRC DRAFT Operating Exam Scenario 3

# SHIFT TURNOVER

## UNIT 1 STATUS

| | |
|---|---|
| **Power:** | 100% RTP |
| **Activities in progress:** | None |

## UNIT 2 STATUS

| | |
|---|---|
| **Power**: | Unit 2 is at 75% RTP increasing to 80% via Recirc. |
| **The following equipment is inoperable**: | |
| **Scheduled evolutions**: | IAW 34SO-N42-001-2, Hydrogen Seal Oil System, starting at step 7.3.3.2.5 return Hydrogen Seal Oil to a Normal lineup. Once completed, increase Reactor power to 80% RTP. |
| **Surveillances due this shift**: | None |
| **Active clearances**: | None |
| **Rod Configuration**: | See Rod Withdrawal Sheets |

**Appendix D** **Scenario Outline** **Form ES-D-1**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-04 **Op-Test No.:** 2012-301

**Examiners:** _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions.** Unit 1 is at 100% RTP. Unit 2 is operating at 75% power reducing to 70% making preparations for removing 2B Condensate and 2B Condensate Booster pumps from service.

**Turnover:** Reduce reactor power to 70% for removal of 2B Condensate and 2B Condensate Booster pumps from service. Both pumps will be left in Standby. 2B Condensate pump will be Danger Tagged next shift.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | | R (ATC) | Reduce reactor power to 70% for removing a 2B Condensate and 2B Condensate Booster pumps from service. |
| 2 | | N (BOP) | Remove 2B Condensate and 2B Condensate Booster pumps from service IAW 34SO-N21-007-2 step 7.2.2. |
| 3 | mfN21_88B | I (BOP) | Feedwater pump 2B cooling water controller failure. TC repair and return to auto. |
| 4 | mfB21_131 | I (ATC) TS (SRO) | ADS Inadvertent initiation/Inhibit used. (Critical Task) |
| 5 | mf65702215 | C (BOP) | RF Vent Filter 2T41-D007 high dP requiring swapping to D008 |
| 6 | mfE41_103 ET-E41-2 | C (ATC) TS (SRO) | HPCI Inadvertent Initiation with Aux Oil pump failure after HPCI is securred. |
| 7 | diN21-C001A diN21-C001B diN21-C001C diE51-F013 mfE51_109 | M (ALL) | Loss of High Pressure Feed requiring an Emergency Depress on low RWL. Loss of Condensate System, 2E51-F013 fails to open, RHR F015A & B fails to open. Small leak in DW. Emergency Depress before -185" RWL. (Critical Task) |
| 8 | svon37226 | C (ALL) | Bypass Valve #2 fails open, requiring MSIVs to be closed |
| 9 | mfE21_202A | C (ATC) | Core Spray Logic failure requiring manual actions for pumps/valves to inject. (Critical Task) |

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

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 1 

**Event Description:** Reduce reactor power to 70% for removing a 2B Condensate and 2B Condensate Booster pumps from service.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 8 Min. | SRO | • Directs ATC to decrease reactor power to 70% by decreasing Recirc flow. Power decreases should be made as recommended by the STA/Reactor Engineering at a rate not to exceed 10 MWe/min. |
| | | |
| | | |
| | | *NOTE: May get the RBM UPSCALE, (603-202) and ROD OUT BLOCK, (603-238), alarm, if a peripheral control rod is not selected. This is expected and the operator may select a peripheral rod at this time.*<br><br>*May also get Alarm 650-135, "Heater Trouble" alarm. This is expected at this power level.* |
| | ATC | • IAW 34SO-B31-001-2 (step 7.1.5) & 34GO-OPS-005-2, the ATC decreases Recirc pump speed, not to exceed 10 MWE per minute by depressing the LOWER SLOW or LOWER MEDIUM pushbuttons on the Master (P603 panel) or Individual controls (P602 panel) until reactor power is ~70%.<br><br>• If using Individual Controls, pump speed increases will alternate between the "A" & "B" Recirc pumps to prevent excessive flow mismatches.<br><br>• Monitors power decrease by observing APRM and generator output indications. |
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| | | *Simulator Operator – Continue with the next event at the Chief Examiners request.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 2 Page 3 of 27

**Event Description:** Remove 2B Condensate and 2B Condensate Booster pumps from service IAW 34SO-N21-007-2 step 7.2.2.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Min. | SRO | • Directs BOP to shutdown 2B Condensate Booster pump (CBP) and place in Standby and then shutdown 2B Condensate pump and place in Standby. |
| | | |
| | | |
| | | *Simulator Operator, as SO, reports that Hydrogen Injection is in the 2C CBP and the 2B CBP Oil Pump Mode Select Switch in Hand , 2H21-P242.* |
| | BOP | • Enters 34SO-N21-007-2 at step 7.2.2 and performs the following: |
| | | • Verifies that the Hydrogen injection system is in service via 2C CBP.<br>• Directs SO to:<br>  • Place 2B CBP Oil Pump Mode Select Switch in Hand, 2H21-P242. |
| | | |
| | | |
| | | |
| | BOP | • Directs SO to:<br>  • Throttle Close 2N21-F020B, 2B CBP Discharge Valve<br>  • Inform BOP just before 2N21-F020B has traveled fully closed (90 seconds travel time) |
| | | |
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| | | |
| | | *Simulator Operator, as SO, reports that the 2N21-F020B is almost closed, then ENTERS rfN21_61 with Final of Closed. We do not have throttle capability prior to securing pump.* |
| | BOP | • Trips 2B CBP by placing its switch to OFF, panel 2H11-P650.<br>• May ask SRO if it is desired to place the 2B CBP in standby.<br>• As directed by SRO, places 2B CBP control switch in Auto. |
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| | SRO | • May Direct BOP to place 2B CBP in Auto. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 2 Page 4 of 27

**Event Description:** Remove 2B Condensate and 2B Condensate Booster pumps from service IAW 34SO-N21-007-2 step 7.2.2.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, as SO, reports that the discharge valve is now full open for 2B CBP, oil pump is running and oil temp is being maintained at 95°F.* |
| | BOP | • Directs SO to:<br>  • Confirm 2B CBP is stopped,<br>  • Place 2B CBP Oil Pump Mode Select Switch in Auto, 2H21-P242 and confirm the pump is running.<br>  • Open 2N21-F020B, 2B CBP Discharge Valve and then place its Switch to the Mid Position.<br>  • Throttle 2P41-F364B, outlet valve as necessary to maintain the oil temperature between 50°F and 115°F.<br>• Informs SRO that 2B Condensate Booster Pump is in Standby. |
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| | BOP | • Confirms TWO CBP are in service<br>• Directs SO to:<br>  • Throttle Close 2N21-F003B, 2B Condensate Pump Discharge Valve, 2H21-P322.<br>  • Inform BOP just before 2N21-F003B has traveled fully closed (90 seconds travel time). |
| | | |
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| | | *Simulator Operator, as SO, reports that the 2N21-F003B is almost closed, ENTERS rfN21_58 with Final of Closed. We do not have throttle capability prior to securing pump.* |
| | BOP | • Trips 2B Condensate Pump by placing its switch to OFF, 2H11-P650.<br>• May ask SRO if it is desired to place the 2B Condensate Pump in standby.<br>• As directed by SRO, places 2B Condensate Pump control switch in Auto. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 2 Page 5 of 27

**Event Description:** Remove 2B Condensate and 2B Condensate Booster pumps from service IAW 34SO-N21-007-2 step 7.2.2.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, when requested, as SO, WAIT 3 minutes, then reports that the 2N21-F003B is full open.* |
| | BOP | • Directs SO to:<br>  • Open 2N21-F003B, 2B Condensate Pump Discharge Valve.<br>  • Inform BOP 2N21-F003B has traveled open (90 seconds travel time).<br>• Informs SRO that 2B Condensate Pump is in Standby. |
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| | SRO | • May Direct BOP to place 2B Condensate Pump in Auto. |
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| | | *Simulator Operator – Continue with the next event at the Chief Examiners request.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 3 Page 6 of 27

**Event Description:** 2B RFPT Cooling water controller failure. TC repair & return to Automatic.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 8 Min | | *At the Chief Examiner's direction, Simulator operator, INSTRUCT the ATC operator by phone to stay on the line until told to hang up, THEN ENTER: (**RB-1**) mfN21_88B, Feedwater Pump Lube Oil Cooling System Failure.* |
| | ALL | The following alarms will annunciate:<br>• RFPT 2B BRG OIL TEMP HIGH, (650-315)<br>• RFPT 2B BRG TEMP HIGH, (650-333)<br>• RFP/COND BRG METAL TEMP HIGH, (650-112), (approximately 1 minute later if 2B RFPT PSW TCV is not opened in a timely manner) |
| | | |
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| | | *NOTE: The BOP may immediately place the controller in manual in accordance with 31GO-OPS-021-0, Manipulation and Control of Equipment, responding to a failed controller.* |
| | BOP | • Addresses the high temp annunciator, pulling the ARP and dispatches BOP to confirm temperatures:<br>• BOP, at panel 2H11-P655, checks all temperature indicators on 2N32-R616 to determine actual oil temperatures.<br>• BOP, confirms that RFPT 2B Oil Temp controller, 2P41-R606, on panel 2H11-P650 is adjusted for 110 to 130°F. |
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| | BOP | • Recognizes the automatic function of the controller has failed, closing the cooling water valve.<br>• Places the controller in manual, depresses the open/increase pushbutton, opening the valve. Oil temperatures begin decreasing and the alarm extinguishes. |
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| | SRO | • Notifies maintenance of the 2P41-R606, RFPT temperature controller, problem. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 3 Page 7 of 27

**Event Description:** 2B RFPT Cooling water controller failure. TC repair & return to Automatic.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Delete mfN21_88B.*<br>*Simulator operator, after 5 minutes of being dispatched, uses time compression and reports the automatic function of the temperature controller has been repaired and may be returned to service.* |
| | SRO | • Directs the BOP to return 2P41-R606 to automatic operation. |
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| | BOP | • Depresses the automatic pushbutton on controller 2P41-R606.<br>• Verifies the controller responds correctly in automatic.<br>• Notifies the SRO the Lube Oil Temperature Controller has been returned to automatic. |
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| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 4 Page 8 of 27

**Event Description:** ADS Inadvertent initiation/Inhibit used.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Mins | | *At the Chief Examiner's direction, Simulator Operator, phone the BOP and instruct the BOP operator to stay on the line until told to hang up, THEN enters (**RB-2**) malfunction mfB21_131 Inadvertent ADS Initiation.* |
| | All | • Identifies ADS is about to initiate and observe the following alarms:<br>  • AUTO BLOW DOWN TIMERS INITIATED, (602-306)<br>  • AUTO BLOW DOWN RELAYS ENERGIZED, (602-318) |
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| | ATC | • Acknowledges the alarms and reports them to the SRO. |
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| | SRO | • May observe the ADS timer on SPDS begin counting down. |
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| | | ***NOTE:** The SRO may direct the ATC to inhibit ADS prior to pulling the 34AB-E10-001-2, "Inadvertent Initiation of ECCS/RCIC."* |
| | ATC | • Enters 34AB-E10-001-2<br>  • Monitors plant parameters to determine extent of ECCS/RCIC actuations.<br>  • At Shift Supervisor direction, inhibits ADS using 2B21C-S7A & S7B, ADS Auto Logic Inhibit Switches, on 2H11-P602. |
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| | SRO | • Directs ATC to inhibit ADS |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 4 Page 9 of 27

**Event Description:** ADS Inadvertent initiation/Inhibit used.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • If ADS Timer on SPDS is approaching "Zero" (0), the ATC may depress the ADS Logic Timer pushbuttons prior to inhibiting ADS.<br>• Places ADS Inhibit switches to INHIBIT prior to the valves opening to prevent exceeding >100°F cooldown rate. (Critical Task) |
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| | SRO | • Dispatches Maintenance to determine problem with ADS logic |
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| | SRO | • While determining the extent of ADS failures, enters TS 3.3.5.1-1 4.c and:<br>• Declares all ADS valves inoperable if the ADS instrumentation is not repaired in one hour IAW 3.3.5.1.G.<br>OR as a more conservative approach;<br>• Enters TS 3.5.1.E and declares ALL ADS valves inop immediately.<br>• With all ADS valves inop, be in Mode 3 in 12 hours and <150 psig Rx press in 36 hours. |
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| | | *Simulator Operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 5 Page 10 of 27

**Event Description:** RF Vent Filter 2T41-D007 high dP requiring swapping to D008.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 8 Min | | *Simulator Operator, at the direction of the Chief Examiner, ENTERS: (**RB-3**) malfunction mf65702215 RF D007 Filter Diff Pressure High alarm and override 2T41-R618P4. **ET-T41-2** will be used to clear alarms after filter swap.* |
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| | ALL | • On the 2H11-P650 panel alarm, PANEL 2H11-P657 SYSTEM TROUBLE, (650-224), is received. |
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| | | ***NOTE:** This failure will require entry into the SC EOP Flow Chart as well as two Abnormal procedures. The following sequence may be slightly out of order because of this.* |
| | | *If the operator enters 657-036 first, then the following actions will be addressed, otherwise skip to the next alarm.* |
| | BOP | • Acknowledges and enters, RF VENT FLTR 2T41-D007 DIFF PRESS HIGH, (657-036) and performs the following: |
| | | • Dispatches a SO to confirm the Refuel Floor Vent Filter differential pressure is > 7" WC as indicated on 2T41-dpi-R004A.<br>• Confirms Refueling Floor Exhaust Flow is < 30 KCFM as indicated by the purple pen on Rx Bldg/Refuel Floor HVAC Supply/Exhaust Flow Recorder, 2T41-R618. (Actual flow will be low, ~16,000)<br>• Confirms 2T41-F041B, Refuel Flr Vent Filter D008 Inlet Damper, is OPEN. |
| | | • Notifies OATC to record the following differential pressure in the Plant Operator's log:<br>  • 2T41-D007 Pre-Filter as indicated on 2T41-dpi-R015A<br>  • 2T41-D007 Carbon Filter as indicated on 2T41-dpi-R015B<br>  • 2T41-D004 HEPA Filter as indicated on 2T41-dpi-R015C<br>• Notifies SRO of above alarm. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 5 Page 11 of 27

**Event Description:** RF Vent Filter 2T41-D007 high dP requiring swapping to D008.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *If the operator enters 657-001 first, then the following actions will be addressed.* |
| | BOP | • Acknowledges, RF INSIDE TO OUTSIDE AIR DIFF PRESS LOW, (657-001), alarm and enters (657-001) and performs the following actions:<br>• Confirms Refueling Floor to outside air differential pressure, is greater than -0.06" WC, as indicated on 2T46-R604B, Sec Cnmt Diff Press B, black pen, 2H11-P700.<br>• Determines that the 2T41-C005A, 'RF Exhaust' fan Filter dP is high (+0). |
| | | • IF an abnormal radioactive release is occurring, OR has occurred, enters 34AB-D11-001-2, Radioactivity Release Control. (Should not enter this one but okay if they do)<br>• Informs the SRO that the 2T41-C005A, 'RF Exhaust' fan Filter dP is high and that RF Bldg dP is >0".<br>• Dispatches a SO/Maint to confirm 2R25-S064, BRKR 19 is closed.<br>• Enters 34AB-T22-002-2, 'Loss of Secondary Containment Integrity' and 34AB-T22-003-2, 'Secondary Containment Control', and notifies Management of the plant conditions. |
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| | | |
| | BOP | • Enters 34AB-T22-003-2, 'Secondary Containment Control'.<br>• Monitors Secondary Containment parameters.<br>• Notifies the SRO to enter 31EO-EOP-014-2, EOP Secondary Containment flowchart due to low RF dP.<br>• Dispatches a SO/Maint to investigate the low RF dP.<br>• Enters 34AB-T22-002-2, 'Loss of Secondary Containment Integrity'. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 5 Page 12 of 27

**Event Description:** RF Vent Filter 2T41-D007 high dP requiring swapping to D008.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | • Enters 34SO-T41-006-2 step 7.3.3 to remove 2T41-D007, Refueling Floor Vent Filter, from service and performs the following. |
| | | • Places 2T41-C005A, Refuel Flr Vent Exh Fan, control switch, in OFF.<br>• Confirms 2T41-C005B, Refuel Flr Vent Exh Fan, STARTS.<br>• Places 2T41-C005B, Refuel Flr Vent Exh Fan, control switch, in RUN.<br>• Confirms approximately 15 KCFM through 2T41-C002A Refueling Floor Supply Fan AND 2T41-C005B, Refueling Floor Exhaust Fan.<br>• Confirms 0.25 inches water negative pressure on the Refueling Floor as indicated on2T46-R604A AND 2T46-R604B, Sec Cnmt Diff Press A&B, on 2H11-P700.<br>• Closes 2T41-F041A, Refuel Flr Vent Filter D007 Inlet Damper.<br>• Notifies SRO Vent Filter D007 is out of service and 657-036 has cleared. |
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| | | |
| | | *Simulator Operator waits 2 minutes and reports to the SRO, as a SO, that Breaker 19 at 2R25-S064 is closed.* |
| | SRO | • Dispatches a SO/Maint to determine why the RF Fan D007 experienced a high dP.<br><br>• Enters 31EO-EOP-014-2, EOP Secondary Containment flowchart. |
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| | | *Simulator Operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 6 Page 13 of 27

**Event Description:** HPCI Inadvertent Initiation with Aux Oil pump failure after HPCI is securred.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Min | | *Simulator Operator*<br>• *NOTIFY THE BOP OPERATOR AND INFORM HIM TO REMAIN ON THE PHONE UNTIL DIRECTED TO HANG UP.*<br>• *Simulator Operator, at Chief Examiner's direction, ENTERS (**RB-6**) malfunction mfE41_103, HPCI auto start.* |
| | ALL | • Recognize and report HPCI has started from an invalid initiation signal. |
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| | ATC | • Verifies reactor water level and Drywell Pressure is normal.<br>Enters 34AB-E10-001-2, Inadvertent Initiation of ECCS/RCIC. |
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| | | |
| | ATC | • Secures HPCI as follows:<br>• Either, Places HPCI Controller in Manual and lowers output to prevent injection and then performs the following:<br>OR:<br>• Depresses and holds the HPCI Turbine Trip push-button.<br>• When HPCI turbine has stopped, places the HPCI Aux Oil Pump in Pull to Lock off.<br>• When the HPCI TURBINE BRG OIL PRESS LOW, (601-112), alarm is received, releases the HPCI Turbine Trip push-button. |
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| | | *Simulator Operator, ensure EVENT TRIGGER **ET-E41-2** ACTIVATES when the HPCI Aux Oil pump switch is placed to Pull-To-Lock. **ET-E41-2** removes light indication and prevents the pump from running.* |
| | ATC | • Notifies the SRO that the HPCI Aux Oil pump does not have light indication. |
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| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 6 Page 14 of 27

**Event Description:** HPCI Inadvertent Initiation with Aux Oil pump failure after HPCI is securred.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC/BOP | • IF injection occurs from HPCI, the following alarms occur:<br>• FEEDWATER CONTROL SYSTEM TROUBLE, (603-132)<br>• After HPCI is shutdown, returns Feedwater Control Mode select switch to 3-ELEM.<br><br>• APRM UPSCALE, (603-219), ROD OUT BLOCK, (603-238) and REACTOR VESSEL WATER LEVEL HIGH/LOW, (603-141) may come in and then clear. |
| | | |
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| | BOP/ATC | • IF injection occurs from HPCI and when injection from HPCI is terminated, the following alarms may be received: |
| | | • If RECIRC A FLOW LIMIT, (602-134), and (RECIRC B FLOW LIMIT, (602-234) alarms are received,<br>• Notifies SRO of Recirc A and B runback<br>• When directed, resets A flow limit by performing the following:<br>• Confirms initiating conditions have cleared<br>• Confirms plant conditions are stable<br>• Depresses "Recirc A Runback" Reset pushbutton, P602<br>• Verify Recirc A speed AND flow remain stable<br>• Informs SRO the runback has been reset<br><br>• When directed, resets B flow limit by performing the following:<br>• Confirms initiating conditions have cleared<br>• Confirms plant conditions are stable<br>• Depresses "Recirc B Runback" Reset pushbutton, P602<br>• Verify Recirc B speed AND flow remain stable<br>• Informs SRO the runback has been reset |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 6 

**Event Description:** HPCI Inadvertent Initiation with Aux Oil pump failure after HPCI is securred.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator - AFTER SRO declares HPCI inop per TS 3.5.1.C, as I & C tech called to resolve the HPCI problem, inform the SRO that the HPCI initiation logic appears to be causing the inadvertent start signal and that you will be investigating the problem further.* |
| | SRO | • Reviews TS 3.5.1, ECCS/RCIC.<br>• IAW TS 3.5.1 Condition C.1,<br>  • Declares HPCI inoperable,<br>  • Must verify within one hour that RCIC is operable by administrative means<br>  • Must restore HPCI to operable status within 14 days<br>• IAW TS 3.5.1 Condition F.1 to enter LCO 3.0.3 immediately<br>• Contacts Maintenance (if ATC has not done this) to investigate inadvertent HPCI start and HPCI Aux Oil pump breaker trip.<br>• If RECIRC A & B FLOW LIMITS, (602-134) & (602-234), are received, directs operator to reset IAW 34SO-B31-001-2. |
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| | | *Simulator Operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 7 Page 16 of 27

**Event Description:** Loss of High Pressure Feed requiring an Emergency Depress on low RWL.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 20 Min | | *At the Chief Examiner's direction, Simulator operator, ENTER (**RB-4**) which inserts malfunction diN21-C001A, C001B, C001C, diE51-F045 & mfE51_109. This will result in a loss of all Condensate Pumps and RCIC.* |
| | ALL | • Notices that ALL Condensate Pumps have tripped. |
| | SRO | • Assigns the ATC to perform RC-1.<br>• Assigns the BOP operator to perform RC-2 and RC-3.<br>• Enters 31EO-EOP-010-2, RC EOP flow chart if RWL decreases below 3 inches.<br>• Directs RWL Band of 3 to 50 inches. |
| | | |
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| | | |
| | ATC | • Performs RC-1 consisting of:<br>  • Inserts a manual scram.<br>  • Places the mode switch to shutdown.<br>  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.<br>  • Notifies SRO of rod position check.<br>  • Places SDV isolation valve switch to "isolate" & confirms closed.<br>  • If not tripped, places the Recirc pumps at minimum speed.<br>  • Inserts SRMs and IRMs.<br>  • Shifts recorders to read IRMS, when required.<br>  • Ranges IRMS to bring reading on scale.<br>  • Notifies the SRO when the above actions are complete. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 7 Page 17 of 27

**Event Description:** Loss of High Pressure Feed requiring an Emergency Depress on low RWL.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | • Performs RC-2 actions consisting of:<br>• Confirms proper Level Control response:<br>• Checks ECCS Injection Systems (will not be in service if RWL >-35 inches)<br>• Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value<br>• If Set down does not auto function, manually reduces FW Master Controller setpoint to approximately 9 inches.<br>• Places ALL Condensate & CBPs to Pull-to-Lock off<br>• May not complete RC-2 since all Condensate & Feedwater is lost.<br>• As time allows, confirms/Opens 2N21-F125.<br>• As time allows, confirms/places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.<br>• As time allows, confirms/closes 2N21-F110.<br>• Informs SRO of loss of Condensate & Feedwater. |
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| | BOP | • Performs RC-3 consisting of:<br>• Monitor RPV pressure.<br>• Confirm proper operation of pressure control system (LLS and SRVs).<br>• If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS.<br>• Maintain RPV pressure between 1074 and 800 psig.<br>• Notify SRO that LLS is the pressure control system.<br>• **(See Event 8 for Bypass Valve #2 fails open, requiring MSIVs to be closed).** |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 7 Page 18 of 27

**Event Description:** Loss of High Pressure Feed requiring an Emergency Depress on low RWL.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *The malfunction for this event was in at the beginning of the scenario (mfE51_61, RCIC Overspeed). Event Trigger ET-E51-9 will trip RCIC when speed is ~ 750 rpm.* |
| | BOP | • Attempts to manually start RCIC, if it has not auto started:<br>• Depresses RCIC Manual Initiation P/B<br>• Confirms 2E51-F046 opens<br>• Confirms Barom Cndsr Vac Pump started<br>• Confirms 2E51-F045 opens<br>• Confirms 2E51-F013 opens<br>• Observes rpm increasing and then RCIC tripping |
| | | |
| | | |
| | | *Simulator Operator, if dispatched to RCIC, wait 4 minutes and INFORM the BOP/SRO that the RCIC Overspeed trip will not be reset because the linkage is disconnected and laying on the floor. If requested, INFORM operator you will notify Maintenance.* |
| | BOP | • Recognize that RCIC tripped and responds to annunciator RCIC TURBINE TRIP, (602-301).<br>• Confirms RCIC Turbine Tripped per the following indications:<br>• 2E51-F524, Trip & Throttle Valve, indicates closed.<br>• Turbine Speed decreasing<br>• 2E52-F013, Pump Discharge Valve, indicates closed.<br>• 2E51-F019, Min Flow Valve, indicates closed.<br>• Recognizes that the 2E51-F524, Trip & Throttle Valve actuator will not run down and determines that RCIC has tripped on Overspeed.<br>• Dispatches SO to locally reset RCIC Overspeed condition. |
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**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 7 Page 19 of 27

**Event Description:** Loss of High Pressure Feed requiring an Emergency Depress on low RWL.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *NOTE: When RWL drops below -101 inches OR Main Condenser Vacuum decreases to 10 inches Mercury Vacuum, the MSIVs will close requiring the following actions to take place.* |
| | BOP | • Confirms all MSIVs close at -101 inches, if not previously closed.<br>• Manually initiates LLS when reactor pressure exceeds 1074 psig by cycling any SRV switch to open then closed<br>• Confirms LLS valves operate as required<br>• Monitors RPV water level as it trends down.<br>• Informs the SRO of water level reaching –155." |
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| | SRO | • Per CP-1<br>• Order BOP to Inhibit ADS (if not previously done)<br>• Orders BOP to start ALL RHR & Core Spray pumps.<br>• Orders Emergency Depressurization once water level decreases below –155" and prior to –185".<br>• Orders all available table 8 systems injecting until water level raises above –155".<br>• As time permits, directs Torus Cooling to be placed in service. |
| | | |
| | | |
| | | |
| | BOP | • Verifies ALL RHR & Core Spray pumps (P601) are running or starts by placing switches to start IAW placard. (**See Event 9 for Core Spray Logic Failure**) |
| | | |
| | | |
| | ATC | • Opens 7 ADS valves prior to RWL reaching -185" by: (Critical Task)<br>  • Placing switches for the ADS valves to OPEN.<br>  • Confirms ALL ADS valve red lights illuminate.<br>  • Confirms ALL ADS valve yellow lights illuminate.<br>  • Confirms Reactor pressure is decreasing.<br>  • Notifies the SRO that ALL ADS valves are open. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 7 

**Event Description:** Loss of High Pressure Feed requiring an Emergency Depress on low RWL.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *NOTE: The operator may place torus cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The A and/or B loop of RHR may be used depending on Torus temperature. The following steps are written assuming "B" loop and "B" pump is used. If/When "A" loop is used, substitute "A" for "B" for valves and if "B" pump is not used substitute "A", "C", or "D" for "B" pump.* |
| | ATC | • Enters 34SO-E11-010-2, Residual Heat Removal<br>  • Places RHRSW in service<br>  • Prelube RHRSW pump<br>  • Overrides 2E11-F068B (A) Low Discharge Pressure Interlock<br>  • Positions 2E11-F068B (A) to 45% OPEN<br>  • Starts RHRSW pump B (A)<br>  • Places 2E11-F068B (A) Low Discharge Pressure Interlock switch to normal position.<br>  • Positions 2E11-F068B (A) to obtain < 4400 gpm AND < 450 psig |
| | | |
| | | |
| | | |
| | ATC | • IF desired to start a SECOND RHRSW pump,<br>  • Throttles 2E11-F068B (A) to achieve max flow rate (not to exceed 4400 GPM).<br>  • Opens 2E11-F068B (A) an additional 5%.<br>  • Starts second RHRSW Pump.<br>  • Positions 2E11-F068B (A) to obtain < 8800 gpm AND < 450 psig |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 7 

**Event Description:** Loss of High Pressure Feed requiring an Emergency Depress on low RWL.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | ATC | • Places RHR B (A) Loop in Torus cooling per the placard by performing the following steps:<br>• Opens 2E11-F048B (A)<br>• Closes 2E11-F047B (A).<br>• Opens 2E11-F003B (A).<br>• Starts RHR Loop B (A) pump<br>• Opens 2E11-F028B (A)<br>• Receives annunciator AUTO BLOWDOWN CS OR RHR PRESS, (602-312)<br>• Receives annunciator SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234)<br>• Throttles OPEN 2E11-F024B (A)<br>• Opens 2E11-F047B (A)<br>• Ensures RHR flow is < 11,500 GPM, THEN Closes 2E11-F048B<br>• Notifies the SRO that RHR "B" (A) loop is in service<br>• May place the second pump in service. |
| | | |
| | | |
| | | |
| | | *Simulator operator the next event was inserted at the beginning of the scenario.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 8 Page 22 of 27

**Event Description:** Bypass Valve #2 fails open, requiring MSIVs to be closed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 5 Min | SRO | • Directs TC-1 to be performed |
| | | |
| | | |
| | | |
| | BOP/ATC | • As time allows, the crew performs TC-1:<br>• Manually trips the Turbine.<br>• Confirms TSV's, TCV's, and CIV's are closed.<br>• Discovers that Bypass valve #2 has failed open.<br>• Confirm/trips generator PCBs and EX2100 Control Stopped.<br>• Confirms 4160 VAC station service busses have transferred to alternate supply.<br>• Confirm/Places TGM in auto.<br>• Starts TG Oil Pump.<br>• Starts Motor Suction Pump.<br>• Confirm/Start Lift Pumps.<br>• Confirms Steam Seal & Condenser Vacuum systems proper operation.<br>• Closes RSSV's (2N11-F004A and F004B).<br>• Notifies SRO that TC-1 is complete. |
| | | |
| | | |
| | | |
| | | *Simulator Operator, ENSURE svoN37226 to a Final value of "1" is already inserted. It was inserted by Event Trigger* ***ET-C71-6*** *when the Rx Mode Switch was placed to Shutdown.* |
| | BOP | • Notifies the SRO that Bypass valve #2 has failed open.<br>• Notifies the SRO of the following:<br>• Both EHC pumps must be tripped<br>or<br>• MSIVs closed (*Critical Task prior to exceeding 380 psig to prevent >100 °F Reactor cooldown*) |
| | | |
| | | |
| | | |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 8 

**Event Description:** Bypass Valve #2 fails open, requiring MSIVs to be closed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | • Directs the operator to close the MSIVs. |
| | | |
| | | |
| | | |
| | BOP | • Places 2B21-F022A - D switches to close on Panel P602.<br>• Places 2B21-F028A - D switches to close on Panel P601.<br>• Notifies the SRO that the MSIVs are closed. |
| | | |
| | | |
| | | |
| | | *Simulator operator the next event was inserted at the beginning of the scenario.* |

**Op-Test No.:** 2012-301 **Scenario No.:** 7-04 **Event No.:** 9 Page 24 of 27

**Event Description:** Core Spray Logic failure requiring manual actions for pumps/valves to inject.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 5 Min | | *NOTE: mfE11_202B (LOCA Signal failure) inserted at beginning.* |
| | SRO | • Enters 31EO-EOP-015-2, CP-1 flow chart. |
| | | |
| | | |
| | | |
| | BOP | • At panel 2H11-P601, confirms the 4 RHR pumps are running and Core Spray pumps did NOT start. (May not notice if pumps were previously started per CP-1)<br>• Notifies SRO of CS pump logic failure and starts (*Critical Task*) the 2 CS pumps.<br>• May start D/G by placing "Start" switches to "Start" on P652 panel. |
| | | |
| | | |
| | | |
| | BOP | • Verifies / Opens RHR and Core Spray injection valves open once the Reactor Pressure Low 500 psig alarm illuminates.<br>• Notifies SRO of 2E11-F015A & B Injection Valves will not open<br>• Verifies injection from Core Spray begins as soon as reactor pressure decreases below the shut off head of the pumps.<br>• When water level is restored above Top OF Active Fuel throttles flow for CS per the SRO directions. |
| | | |
| | | |
| | | |
| | SRO | • As time allows, notifies Maintenance of 2E11-F015A & B Injection Valve failures. |
| | | |
| | | |
| | | |
| | | *With the Chief Examiners direction, the scenario should be terminated when the crew has emergency depressurized the reactor and re-established adequate core cooling with water level above TAF.* |

**Appendix D** **Scenario Outline** **Form ES-D-1**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-04 **Op-Test No.:** 2012-301

**Examiners:** _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

| | |
|---|---|
| Initiating Conditions: | Unit 1 is at 100% RTP. Unit 2 is operating at 75% power reducing to 70% making preparations for removing 2B Condensate and 2B Condensate Booster pumps from service. |
| Turnover | Reduce reactor power to 70% for removal of 2B Condensate and 2B Condensate Booster pumps from service. Both pumps will be left in Standby. 2B Condensate pump will be Danger Tagged next shift. |

Summary:

- **Event 1**: Reduce reactor power to 70% for removing a 2B Condensate and 2B Condensate Booster pumps from service.
- **Event 2**: Remove 2B Condensate and 2B Condensate Booster pumps from service IAW 34SO-N21-007-2 step 7.2.2.
- **Event 3**: Instrument; 2B RFPT Cooling water controller will fail requiring the BOP to maintain cooling water manually. Time Compression repair & return the controller to automatic.
- **Event 4:** Instrument/TS; The ADS System will experience an inadvertent initiation which will require the ATC to place the ADS Inhibit switches to INHIBIT prior to the valves opening to prevent exceeding >100°F cooldown rate. (**Critical Task**) ADS will be inop.
- **Event 5:** Component; RF Vent Filter 2T41-D007 high dP requiring swapping to D008.
- **Event 6**: Component/TS; HPCI Inadvertent Initiation with Aux Oil pump failure after HPCI is securred.
- **Event 7:** Major; Loss of High Pressure Feed requiring an Emergency Depress on low RWL. Loss of Condensate System, 2E51-F013 fails to open, RHR F015A & B fails to open. Small leak in DW. Emergency Depress before -185" RWL. (**Critical Task**)
- **Event 8:** Component; Bypass Valve #2 fails open, requiring MSIVs to be closed.
- **Event 9:** Core Spray Logic failure requiring manual actions to inject. (**Critical Task**)

**Critical Tasks**

# NRC DRAFT

**Facility:** E. I Hatch **Scenario No.:** 7-04 **Op-Test No.:** 2012-301

Critical Tasks

- The ADS System will experience an inadvertent initiation which will require the ATC to place the ADS Inhibit switches to INHIBIT prior to the valves opening to prevent exceeding >100°F cooldown rate. **(Event 4)**
- Emergency Depress before -185" RWL. **(Event 7)**
- Core Spray Logic failure requiring manual actions to inject. **(Event 9)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 7 | 1. Feedwater pump 2B cooling water controller failure. TC repair and return to auto. **(Event 3)**<br>2. ADS Inadvertent initiation. **(Event 4)**<br>3. RF Vent Filter 2T41-D007 high dP **(Event 5)**<br>4. HPCI Inadvertent Initiation with Aux Oil pump failure after HPCI is securred **(Event 6)**<br>5. Loss of High Pressure Feed, RHR F015A & B fails to open. Small leak in DW. **(Event 7)**<br>6. Bypass Valve #2 fails open **(Event 8)**<br>7. Core Spray Logic failure **(Event 9)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. Bypass Valve #2 fails open **(Event 8)**<br>2. Core Spray Logic failure **(Event 9)** |
| 3. | Abnormal Events | 2-4 | 3 | 1. ADS Inadvertent initiation. **(Event 4)**<br>2. RF Vent Filter 2T41-D007 high dP **(Event 5)**<br>3. HPCI Inadvertent Initiation with Aux Oil pump failure after HPCI is securred **(Event 6)** |
| 4. | Major Transients | 1-2 | 1 | 1. Loss of High Pressure Feed requiring an Emergency Depress on low RWL. Emergency Depress before -185" RWL. **(Event 7)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 2 | 1. RC (Non-ATWS) **(Event 5)**<br>2. PC **(Event 5)** |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 1 | 1. CP-1 **(Event 5)** |
| 7. | Critical Tasks | 2-3 | 2 | 1. Core Spray Logic failure **(Event 9)**<br>2. Emergency Depress before RWL reaches -185". **(Event 7)** |

HLT 7 NRC DRAFT Operating Exam Scenario 4

# SHIFT TURNOVER

## UNIT 1 STATUS

| | |
|---|---|
| **Power:** | 100% RTP |
| **Activities in progress:** | None |

## UNIT 2 STATUS

| | |
|---|---|
| **Power:** | 75% RTP |
| **The following equipment is inoperable:** | None |
| **Scheduled evolutions:** | Reduce reactor power to 70% for removal of 2B Condensate and 2B Condensate Booster pumps from service. Both pumps will be left in Standby. 2B Condensate pump will be Danger Tagged next shift. |
| **Surveillances due this shift:** | None |
| **Active clearances:** | None |
| **Rod Configuration:** | See Rod Withdrawal Sheets |