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

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** 6-01 **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions**. Unit 2 is operating at 5% RTP. 34GO-OPS-001-2, Plant Startup, is in progress for transferring the mode switch to Run. RWM is inop and bypassed. RAS written.

**Turnover:** Continue placing Torus Cooling in service, beginning at step 7.2.5.8 of 34SO-E11-010-2, in preparation for upcoming HPCI Surveillance. Once Torus Cooling is in service, withdraw control rods to increase Reactor power to 7% RTP.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | N (BOP) | Continue placing Torus Cooling in service at step 7.2.5.8. |
| 2 | N/A | R (ATC) | Withdraw control rods to increase Reactor power to 7%. |
| 3 | mf60121104 (ON) | C (BOP)<br>TS (SRO) | RHRSW pump overload – manually trip & swap pumps. |
| 4 | svoB21036<br>mf60211154<br>mfC12_26_22-27 | C (ATC)<br>TS (SRO) | One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn. |
| 5 | mf70022416 (ON) | C (BOP) | Instrument Air System Prefilter dP Hi – swap Prefilters. |
| 6 | mfE51_114<br>diE51A-S17<br>mf60231284 | C (ATC)<br>TS (SRO) | RCIC Inadvertent start with Trip pushbutton failure. |
| 7 | mf65702209<br>mf65702227<br>svoT48140(70/.75)<br>svoT48142(50/10)<br>svoT48143(50/10)<br>svoT48147(50/10)<br>svoT48148(50/10) | M (ALL) | Earthquake requiring scram prior to 98” in Torus. |
| 8 | svoT48140(70/2) | C (ALL) | Torus break size increases and HPCI is placed to PTL prior to 110” (Critical Task).<br>Emergency Depress prior to 98” (Critical Task). |
| 9 | mfB21_129A<br>mfB21_129E<br>mfB21_129L<br>svoN37225<br>svoN37226<br>svoN37227 | C (ATC) | 2 Main Turbine Bypass valves failed closed, 1 Main Turbine Bypass valve will only open 50%. ADS valves (3) fail to open when Emergency Depress is required (Critical Task) |
| * | (N)ormal, | (R)eactivity, | (I)nstrument, (C)omponent, (M)ajor |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 1 Page 3 of 30

**Event Description:** Continue placing Torus Cooling in service.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 mins | SRO | Orders BOP to continue placing Torus Cooling in service beginning at step 7.2.5.8 |
| | | *Simulator Operator, if asked, an SO has been dispatched locally awaiting the start of the RHR pump AND, if asked, a Page Announcement has been performed for the upcoming pump start.* |
| | BOP | • Starts RHR Pump B or D<br>• Dispatches an operator to locally check the RHR pump for seal leakage |
| | | *Simulator Operator – **as an SO in the RHR B pump diagonal; Inform the BOP that there is no seal leakage on RHR pump "B".*** |
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| | | |
| | BOP | The following expected alarms will be received as a result of starting the RHR pump. |
| | | • 650-234, SEC System Auto Initiation Signal Present<br>• 602-312, Auto Blowdown CS Or RHR Press Permissive<br>• 601-222, RHR Flow Low |
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| | | |
| | | • Opens 2E11-F028B<br>• Throttles Open 2E11-F024B to establish ≤ 7700 GPM flow on indicator 2E11-R603B or 2E11-R608B recorder. |
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| | | |
| | | • Opens 2E11-F047B, Hx Inlet Vlv<br>• Closes 2E11-F048B, Hx Bypass Valve<br>• Confirms 2E11-R600B-1 indicates >20 psid, if not throttles 2E11-F068B to maintain > 20 PSID<br>• Informs the SRO that RHR B pump is in Torus cooling |
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| | | |
| | | *Simulator Operator – Continue with the next event at the Chief Examiners request.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 2 Page 4 of 30

**Event Description:** Withdraw control rods to increase Reactor power to 7% RTP.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 min | SRO | Orders control rods withdrawn per the pull sequence. |
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| | 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 14-39 in step 22.<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 ensures expected plant response from control withdrawal. |
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| | | **NOTE:** May get "RMCS/RWM ROD BLOCK or SYS TROUBLE" annunciator. This is not abnormal when selecting rods in a different group. |
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| | | ***NOTE:*** *Rods need to be withdrawn until reactor power reaches 7%.* |
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| | | ***NOTE:*** *Alarm, 603-229, APRM Downscale, 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.* |
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| | | *Simulator Operator enters the next event at the Chief Examiner's request* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 3 Page 5 of 30

**Event Description:** RHRSW pump overload – manually trip & swap pumps.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Min | | *At the Chief Examiner's direction, Simulator Operator;*<br><br>***ENTERS (RB-1)*** *malfunction mf60121104 – Window 32 RHRSW PUMP B OVERLOAD (ANNUNCIATOR ON).*<br><br>***ENSURE*** *Event Trigger E11-10 deletes malfunction mf60121104, when RHRSW pump 2B switch is placed to stop.* |
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| | | |
| | All | • Annunciator 34AR-601-232-2, "**RHR SERV WTR PUMP B OVERLOAD"** alarms |
| | BOP | • Announces alarm to the SRO<br>• Enters ARP 34AR-601-232-2<br>• Determines that the 2B RHRSW pump is still running<br>• Informs the SRO that the 2B RHRSW pump failed to trip |
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| | SRO | • Directs the BOP to Trip the 2B RHRSW pump and place the 2D RHRSW pump is service |
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| | BOP | • Trips RHRSW Pump 2B And Verifies That The Green Light Illuminates<br>• Alarm 601-215, RHR HX B Diff Press Low, is received when the RHRSW pump is securred.<br>• Confirms 2E11-F068B, Hx B Disch Vlv, closes.<br>• Alarm 601-215 clears when the 2E11-F068B is closed. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 3 Page 6 of 30

**Event Description:** RHRSW pump overload – manually trip & swap pumps.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • Enters 34SO-E11-010-2, RHR System, OR may use Placard, to start 2D RHRSW Pump<br>• Determines That The System Does Not Require Filling<br>• Depresses the RHR Service Water Lube Valves Pushbutton For Pump Division 2 And waits for One Minute |
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| | BOP | • Bypasses The Low RHR Service Water Pressure Interlock On 2E11-F068B By Placing The Interlock Override Vlv 2E11-F068B Keylock Switch In The OVERRIDE Position.<br>• Throttles Open 2E11-F068B To 45% Open As Indicated On 2E11-R600B.<br>• Confirms:<br>  • 2E11-F068B Opens (RED light illuminates)<br>  • 601-215, RHR HX B DIFF PRESS LOW, annunciator illuminates<br>• Starts the 2D RHRSW Pump and has the ATC log the start<br>• Places 2E11-F068B Interlock Override Vlv keylock switch in the NORMAL position<br>• Throttles 2E11-F068B to 4400 GPM maximum, while maintaining RHRSW System pressure < 450 PSIG<br>• Confirms 2E11-R600B-1 indicates >20 psid, if not throttles 2E11-F068B to maintain > 20 PSID<br>• Notifies Maintenance (if SRO has not) to investigate RHRSW pump 2B. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 3 Page 7 of 30

**Event Description:** RHRSW pump overload – manually trip & swap pumps.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator:* ***When dispatched to check RHRSW B loop strainer dP, inform the BOP that the dP is 3 psid.*** |
| | BOP | • Dispatches SO to confirm that the in-service RHR Service Water strainer Dp is < 8 PSID, and logs Dp in the Control Room Log<br>• Informs the SRO that RHR B pump is in Torus cooling |
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| | SRO | • Enters Tech Specs LCO 3.7.1 and determines that a 30 day RAS is required IAW TS 3.7.1.A.<br>• Notifies Maintenance (if BOP has not) to investigate RHRSW pump 2B. |
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| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 4 

**Event Description:** One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 20 min | | *At the Chief Examiner's direction, Simulator operator, ENTER (**RB-2**) malfunctions mf60211154, mfC12_26_22-27 and SVOB21036 (final value of 1200 with ramp of 100000).* |
| | All | The following annunciators are received:<br><br>REACTOR VESSEL HIGH PRESSURE TRIP, 603-105<br>REACTOR AUTO SCRAM SYSTEM A TRIP, 603-117<br>CRD ACCUMULATOR PRESS LOW OR LEVEL HIGH, 603-148<br>RMCS / RWM ROD BLOCK OR SYSTEM TROUBLE, 603-239 (when control rod 22-27 is selected)<br>ROD DRIFT, 603-247<br>ECCS/RPS DIVISION I TROUBLE, 602-110 |
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| | ATC | • Determines that reactor pressure has not changed.<br>• Announces to SRO that a half-scram in the "A" channel has occurred due to an invalid high reactor pressure signal.<br>• Informs the SRO that control rod 22-27 has scrammed in. |
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| | | *Simulator Operator: When dispatched to check the ATTS panel reactor pressure instruments, report one minute later that 2B21-N678A has a red trip light and gross failure light illuminated.* |
| | SRO | • Dispatches personal to the ATTS panels to determine which reactor pressure instrument has tripped.<br>• Contacts maintenance to repair ATTS card 2B21-N078A.<br>• Contacts maintenance to check and replace the fuse in the RPS "B" channel for control rod 22-27. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 4 

**Event Description:** One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | *Simulator Operator:* ***Five minutes after being dispatched to repair the "B" RPS channel fuse for control rod 22-27,***<br><br>***DELETES*** *mfC12_26_22-27; this will cause the scram light for the rod to extinguish.*<br><br>*Using time compression, As maintenance report that control rod 22-27 had a fuse blown, which has been replaced.* |
| | SRO | Refers to the following Tech Specs:<br><br>LCO 3.3.1.1, Reactor Protection System (RPS) Instrumentation, and determines that 2B21-N678A requires entry into RAS 3.3.1.1.A to place the channel in trip or the "A" trip system in trip in 12 hours<br><br>LCO 3.1.6, Rod Pattern Control,<br>A.1, determines the associated control rod must be moved to the correct position within 8 hours<br>OR<br>A.2 declares associated control rod inoperable within 8 hours.<br><br>LCO TS 3.2, Power Distribution Limits, has STA confirm compliance Power Distribution Limits. IF thermal limits are not acceptable, the STA will consult with Reactor Engineering on further actions. |
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| | | *Simulator Operator:* ***After being dispatched to repair ATTS card 2B21-N678A AND AFTER the SRO has determined the Tech Spec RAS,***<br><br>***DELETE*** *svoB21036 and mf60211154,*<br><br>***THEN REPORT*** *to the SRO that time compression has been used and that 2B21-N678A has been repaired and returned to service.* |
| | | **NOTE**: The following annunciators and actions may not be taken in the same sequence as listed below. |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 4 Page 10 of 30

**Event Description:** One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • Addresses annunciator "Reactor Auto Scram System A Trip," 34AR-603-117-2.<br>• Confirm scram group A 1 2 3 4 lights for Trip System A on panel 2H11-P603 are extinguished.<br>• Determine the cause of the trip.<br>• Attempt to correct or bypass the cause of the trip.<br>• Using the Process Computer obtains an OD-7 and determines that control rod movement has occurred.<br>(May request STA to perform OD-7)<br>(May reset half scram before performing OD-7). |
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| | ATC | • Resets RPS Channel A using 2C71-S5, Reactor Scram Reset switch, on panel 2H11-P603, per step 5.2.3 of 34AR-603-117-2.<br>• Determines that section 4.7 of 34AB-C11-004-2 is required to be used to recover control rod 22-27.<br>• Notifies SRO to determine if Control Rod 22-27 being at position 00 violates BPWS rod pattern per Tech Spec 3.1.6.<br>• Notifies Rx Engineering or STA to check thermal limits if the SRO has not already contacted them. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 4 

**Event Description:** One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • Addresses annunciator "Rod Drift," 34AR-603-247-2<br>  • At panel 2H11-P603, confirms that one or more Rod Drift lights are illuminated on the full core display.<br>  • Selects the drifting rod and confirms that RPIS indicates the rod is not at an even reed switch position.<br>  • Notifies the Shift Supervisor and the STA<br>  • Refers to 34AB-C11-004-2, "Mis-positioned Control Rods," for recovery of drifting OR mis-positioned control rod.<br>  • When directed by the Shift Supervisor, resets the rod drift using the Rod Drift Alarm reset switch on Panel 2H11-P603. |
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| | ATC | • Refers to Attachment 1 of 34AB-C11-004-2 for the proper actions to take.<br>  • Are >4 rods mispositioned? NO<br>  • Is the reactor sub-critical? NO<br>  • Is reactor power < LPSP (21%)? YES<br>  • Action 1 (since not in compliance with BPWS)<br>  • Refer to Attachment 2 for restoration steps. |
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| | | *Simulator Operator: As the team gets to the point of needing attachment 2, provide the team with the marked up copy of attachment 2 of 34AB-C11-004-2*<br><br>*When contacted as Reactor Engineering with the following question from 34AB-C11-004-2, "Contact Reactor Engineering to determine what thermal limits were exceeded during the event AND what recovery actions are necessary." Answer NO thermal limits have been exceeded and the recovery method will be continuous withdrawal of the rod.* |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 4 

**Event Description:** One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | *The simulator operator will provide a marked up copy of attachment 2 (2 pages) of 34AB-C11-004-2.*<br><br>• Refers to Attachment 2 to recover the control rod.<br>  • Withdraws the control rod to position 48 using the Rod Movement switch and Rod Out Notch Override switch (RONOR).<br>  • Performs coupling check on control rod |
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| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 5 Page 13 of 30

**Event Description:** Instrument Air System Prefilter dP Hi – swap Prefilters

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 7 Mins | | *Simulator Operator at direction of the lead examiner, ACTIVATE: (**RB-3**) malfunction mf70022416 – Window 25 INSTRU AIR PREFLTR D103A DIFF PRESS HIGH (ANNUNCIATOR ON)* |
| | All | The following annunciators are received:<br>• 650-225, Panel 2H11-P700 System Trouble<br>• 700-225, INSTR AIR PREFLTR D103A DIFF PRESS HIGH |
| | | |
| | BOP | • Acknowledges 2H11-P700 panel alarm on 2H11-P650<br>• Acknowledges 700-225, INSTR AIR PREFLTR D103A DIFF PRESS HIGH, on 2H11-P700 and notifies the SRO of the alarm<br>• Dispatches an SO locally to determine Prefilter dP on 2P52-dPIS-N301A, look for air leaks on the filter and to verify that the instrument isolation valve is open. |
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| | | *Simulator Operator: After being dispatched to check Prefilter dP, inform the BOP that 2P52-dpis-N301A indicates 6 psid and that no air leaks exist.* |
| | SRO | • Notifies Maintenance (if BOP has not) to change out the Prefilter cartridge and initiates a condition report.<br>• Directs the BOP to swap Prefilters IAW 34AR-700-225-2. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 5 Page 14 of 30

**Event Description:** Instrument Air System Prefilter dP Hi – swap Prefilters

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | *Simulator Operator, **WHEN** the BOP swaps Air Filters, **DELETE**: (**RB-3**) malfunction mf70022416 – Window 25 INSTRU AIR PREFLTR D103A DIFF PRESS HIGH (ANNUNCIATOR ON).* |
| | BOP | At 2H11-P700:<br>• Places control switch for Turb Bldg Inst Air PreFltr/Afterfilter 2P52-D103B/2P52-D102B Inlet Isol, 2P52-F002B/2P52-F011B to ON.<br>• Places control switch for Turb Bldg Inst Air PreFltr/Afterfilter 2P52-D103A/2P52-D102A Inlet Isol, 2P52-F002A/2P52-F011A to OFF.<br>• Notifies the SRO that the Prefilter has been swapped from "B" to "A".<br>• 700-225 alarm clears. |
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| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 6 Page 15 of 30

**Event Description:** RCIC Inadvertent start with Trip pushbutton failure

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 6 min | | *Simulator Operator: At the direction of the Chief examiner, ACTIVATE: (**RB-4**) to ENTERS mfE51_114, diE51A-S17 to "off" and mf60231284 to "on".* |
| | All | • Receives SEC System Auto Initiation Signal Present Alarm<br>• Recognizes that RCIC has started. |
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| | ATC | • Determines RCIC has auto started and that RWL is normal. |
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| | SRO | • Tells operator that RWL is normal<br>• Directs operator to trip RCIC |
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| | ATC | • Attempts to Trip RCIC by depressing the RCIC Trip pushbutton and recognizes that the Trip pushbutton is failed.<br>• Notifies the SRO that the RCIC trip pushbutton has failed and Trips RCIC by ONE of the following methods:<br>  • Closes the Trip and Throttle valve, 2E51-F524 or<br>  • Closes Isolation valves 2E51-F008 and/or 2E51-F007 or<br>  • Places controller 2E51-R612 to Manual and reduces output to lower RCIC discharge pressure to below reactor pressure. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 6 Page 16 of 30

**Event Description:** RCIC Inadvertent start with Trip pushbutton failure

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • Enters 34AB-E10-001-2, Inadvertent Initiation of ECCS/RCIC<br>• Enters 34SO-E51-001-2, RCIC System<br>• Dispatches RO/Maintenance to determine cause of initiation signal and the cause of the Trip pushbutton failure.<br>• May attempt to reset the Initiation signal<br>• Will close 2E51-F524, Trip and Throttle Vlv, if not already closed.<br>• Notifies SRO that RCIC is shutdown. |
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| | SRO | • May have the operator run the Trip and Throttle Valve down to in case RCIC is needed later.<br>• Enters TS RAS for RCIC 3.5.3 Condition A, which requires verifying HPCI is operable within 1 hour and restoring RCIC in 14 days. |
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| | | ***NOTE:*** *It is intended that RCIC is left in its' current condition and not returned to standby. The operator can restart RCIC from its current condition during the major event, if desired.* |
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| | | *Simulator Operator, at Chief Examiner's direction, starts the major event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 7 Page 17 of 30

**Event Description:** Earthquake requiring scram prior to 98" in Torus

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***Simulator Operator, at Chief Examiners direction**, ACTIVATE (**RB-7**)*<br><br>*(Earthquake – malfunctions to (ON):*<br><br>*mf65702209 Window 30 SEISMIC PEAK SHOCK RECORDER HIGH G LEVEL & mf65702227 Window 48 SEISMIC INSTRUMENTATION TRIGGERED* |
| | | |
| | All | The following annunciators are received:<br>• 650-224, 2H11-P657 SYSTEM TROUBLE<br>• 657-030, SEISMIC PEAK SHOCK RECORDER HIGH G LEVEL<br>• 657-048, SEISMIC INSTRUMENTATION TRIGGERED |
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| | BOP | • Acknowledges 650-224, 2H11-P657 System Trouble, alarm on 2H11-P650 panel<br>• Communicates the alarm to the SRO |
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| | SRO | Dispatches the BOP to Panel 2H11-P657 |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 7 Page 18 of 30

**Event Description:** Earthquake requiring scram prior to 98" in Torus

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | Informs the SRO of the Seismic alarms and enters ARPs: 34AR-657-030-2 and 34AR-657-048-2 to perform the following actions:<br><br>**NOTE:** Actions for both ARPs are the same, except for checking the power supply. |
| | | • Dispatches Unit 1 RO to panel 1H11-P701 to check for further indication of a seismic event by monitoring Peak Shock Annunciator, 1L51-R620, for 12.7 Hz amber lights (> 0.08g, OBE) and 12.7 Hz red lights (> 0.15g, DBE) |
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| | | *Simulator Operator: After one minute,* ***Notifies Unit 2 Control Room that you were in the Reactor Building and felt the floor vibrating.*** |
| | BOP | • May have the Unit 1 RO check the following:<br>  • Peak Shock Annunciator, 1L51-VDC-R620, plugged in on panel 1H11-P701<br>  • BRKR 3 on 120/208V Essential AC Cab., 1R25-S065<br>• May have I & C refer to Seismic Instrumentation Earthquake Response Manual, SX-18271, for guidance in analyzing seismic data.<br>• Enters 34AB-Y22-002-0, Naturally occurring Phenomenon<br>• May inform the Shift Manager to evaluate an Emergency Classification |
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| | SRO | Directs the BOP to enter 34AB-Y22-002-0, Naturally occurring Phenomenon, if not already entered. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 7 Page 19 of 30

**Event Description:** Earthquake requiring scram prior to 98" in Torus

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | *Simulator Operator:* ***Immediately after being dispatched to check the Shock recorder on 1H11-P701 panel, inform the team that the following lights are illuminated:***<br>• *12.7 Hz **amber** lights (> 0.08g, OBE)*<br>*AND*<br>• *12.7 Hz **red** lights (> 0.15g, DBE)*<br><br>*(Immediately is appropriate since this indicator is on Unit 1, but right next to the Unit 2 SRO desk. It is not simulated in the Simulator since it is a Unit 1 only instrument.)* |
| | SRO | • Determines that all electrical power is available<br>• Directs the crew to enter 34GO-OPS-013-2, Normal Plant shutdown<br>• Contacts switchyard maintenance to assist in switchyard damage assessment<br>• Contacts Maintenance to inspect Independent Spent Fuel Storage Installation (ISFSI) for damage<br>• Within one hour , dispatches personnel to locally close or confirmed closed the following valves (if not performed by the BOP):<br>  • 1P11-F167, CST Sump to Radwaste Drain<br>  • 1P11-F3002, Condensate Transfer Pumps and Sample Sink Drain Line to Yard<br>  • 2P11-F051, Retaining Wall Drain<br>  • 2P11-F100, Transfer Pump Wall Drain<br>• Dispatches personnel to inspect the plant for damage<br>• May go ahead and scram the reactor since the reactor is at low power. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 7 Page 20 of 30

**Event Description:** Earthquake requiring scram prior to 98" in Torus

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | **NOTE:** These actions are redundant to the SROs and either can perform. |
| | BOP | • Enters 34AB-Y22-002-0 and performs the following actions:<br>• Determines that all electrical power is available<br>• Informs SRO of the requirement to enter 34GO-OPS-013-2, Normal Plant shutdown.<br>• Contacts switchyard maintenance to assist in switchyard damage assessment<br>• Contacts Maintenance to inspect Independent Spent Fuel Storage Installation (ISFSI) for damage<br>• Within one hour , dispatches personnel to locally close or confirmed closed the following valves (if not performed by the SRO):<br>  • 1P11-F167, CST Sump to Radwaste Drain<br>  • 1P11-F3002, Condensate Transfer Pumps and Sample Sink Drain Line to Yard<br>  • 2P11-F051, Retaining Wall Drain<br>  • 2P11-F100, Transfer Pump Wall Drain<br>• Dispatches personnel to inspect the plant for damage |
| | | |
| | | |
| | | |
| | ATC | • Enters 34GO-OPS-013-2 and starts making preparations for shutting down.<br>• As power is reduced, monitors reactor power.<br>• When directed, begins inserting control rods. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 7 Page 21 of 30

**Event Description:** Earthquake requiring scram prior to 98" in Torus

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | ***Simulator Operator, after 5 minutes and at Chief Examiners direction**, ACTIVATE (**RB-5**)*<br><br>*Torus leak at (3/4") 0.75"/min)*<br>*svoT48140 (70/.5), svoT48142 (50/10), svoT48143 (50/10), svoT48147 (50/10), svoT48148 (50/100)*<br><br>***LOOK ahead at Event 8.** This leak will be modified at 142 inches in the Torus and 3 SRVs failed closed.* |
| | ALL | The following annunciators are received:<br>• 650-224, PANEL 2H11-P657 SYSTEM TROUBLE<br>• 657-086, TORUS S-W AREA INSTR SUMP LVL HIGH<br>• 657-087, TORUS N-W AREA INSTR SUMP LVL HIGH<br>• 657-088, TORUS N-E AREA INSTR SUMP LVL HIGH<br>• 657-089, TORUS S-E AREA INSTR SUMP LVL HIGH<br>• 657-104, TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH<br>• 657-105, TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH<br>• 657-106, TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH<br>• 657-107, TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH<br>• 657-013, TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH<br>• 657-031, TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH<br>• 657-049, TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH<br>• 657-067, TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH |
| | | |
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| | | |
| | BOP | • Reports multiple alarms to SRO indicating a break in the Reactor Building.<br>• Directs SO/Maintenance to investigate the leak. |
| | | |
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| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 7 Page 22 of 30

**Event Description:** Earthquake requiring scram prior to 98" in Torus

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | |
| | | |
| | SRO | • Directs BOP to 2H11-P657 panel.<br>• When above alarms are reported, directs operator to monitor Torus water level and then if lowering, enter 34AB-T23-004-2, Torus Water Level. |
| | | |
| | | |
| | | |
| | | *Simulator Operator:* ***Four minutes after being dispatched to check for leaks in the torus section of the Reactor Building, report to the crew:***<br><br>*A leak has been identified on the "2A" Core Spray line between the Torus and the first Core Spray isolation valve.* |
| | All | • 602-235, TORUS WATER LEVEL HIGH/LOW, annunciates<br>• Recognizes that torus level is decreasing. |
| | | |
| | | |
| | | |
| | SRO | • Dispatches personnel to determine the location of the Torus leak.<br>• If not already directed, directs NPO to enter 34AB-T23-004-2, Torus Water Level, and to monitor Torus water level.<br>• Enters the PC EOP Flowchart when Torus level decreases to 146 inches.<br>• May determine that water will not be added to the torus until the cause of the low torus level is identified and controlled.<br>• Enter SC EOP flowchart for SC area water levels being high. |
| | | |
| | | |
| | | |
| | | |
| | BOP | • If NOT already performed, dispatches personnel to the Torus area AND the Reactor Building diagonals to determine the source of the water loss (if the leak location has not already been reported). |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 7 Page 23 of 30

**Event Description:** Earthquake requiring scram prior to 98" in Torus

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | |
| | SRO | • IAW the PC flowchart, prior to water level reaching 98 inches, determines that the reactor is required to be shutdown and enters the RC flowchart at point A.<br>• 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. |
| | | |
| | | |
| | | |
| | 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 SS 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.: 2011-301 Scenario No.: 6-01 Event No.: 7** Page 24 of 30

**Event Description:** Earthquake requiring scram prior to 98" in Torus

| 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<br>  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value (will not due to low power)<br>  • Set down does not auto function (low power), 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>  • 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 and with SRO permission will raise RWL to 32 to 42 inches. |
| | | |
| | | |
| | | |
| | BOP | 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. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 8 Page 25 of 30

**Event Description:** With Torus level decreasing, HPCI placed to PTL prior to 110" and Emergency Depress prior to 98"

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | *Simulator Operator: When Torus level reaches 142 inches,* ***NOTIFIES Unit 2 Control Room that you were in the Reactor Building and felt the floor vibrating again.*** <br><br> ***Simulator Operator, when Torus level decreases to 142 inches, MODIFY*** *the Torus leak rate to* ***2 inches/min*** *svoT48140 (70/2)* <br><br> ***Simulator Operator - Prior to the Emergency Depress, but after LLS has been initiated or Emergency depress has been anticipated using the bypass valves, ENTER****: (****RB-6****), malfunctions; mfB21_129A, mfB21_129E, and mfB21_129L (Failure of SRVs A, E, and L to Open) AND svoN37225 and svoN37226 (Failure of #1 & #2 BPVs) are set to 0 to fully close Bypass valves 1 & 2 AND svoN37227 #3 set to 50.* |
| | SRO | IAW PC flowchart, Prior to Torus level decreasing below 110 inches, direct the BOP to Place HPCI Aux Oil Pump to PTL OFF irrespective of adequate core cooling. |
| | | |
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| | | |
| | BOP | Places HPCI Aux Oil Pump to PTL OFF (Critical Task) and notifies the SRO |
| | | |
| | | |
| | | |
| | SRO | Prior to torus level reaching 98 inches, and if recognized in time, then Anticipates Emergency Depressurization<br>• Directs an operator to anticipate emergency depress using the bypass valves, irrespective of cooldown rate. |
| | | |
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| | | |

**Op-Test No.: 2011-301 Scenario No.: 6-01 Event No.: 8** Page 26 of 30

**Event Description:** With Torus level decreasing, HPCI placed to PTL prior to 110" and Emergency Depress prior to 98"

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP/ATC | Anticipates emergency depress by performing the following:<br>• On the DEHC panel<br>  • Select the Control > Bypass Valve screen.<br>  • Insert a ramp rate of 100, then press OK.<br>  • Insert a bypass valve position of 100, then press OK.<br>  • Checks that the Bypass Valve Jack status is active.<br>  • Recognizes that only 1 Bypass Valve opens.<br>  • Reports to the SRO that only 1 Bypass Valve opens. |
| | | |
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| | | |
| | SRO | Prior to torus level decreasing below 98 inches:<br>• Directs ATC to emergency depress the reactor by opening 7 ADS valves |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-01 **Event No.:** 9 Page 27 of 30

**Event Description:** ADS valves (3) fail to open when Emergency Depress is required

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***IF NOT ALREADY PERFORMED Simulator Operator - Prior to the Emergency Depress, but after LLS has been initiated or Emergency depress has been anticipated using the bypass valves, ENTER****: mfB21_129A, mfB21_129E, and mfB21_129L (Failure of SRVs A, E, and L to Open.) by* ***ACTIVATING (RB-6)****. Also* svoN37225 & svoN37226 are set to 0 to fully close Bypass valves *1 & 2 AND svoN37227 #3 set to 50.* |
| | ATC | • Places 7 ADS valves control switches to OPEN.<br>• Determines that three ADS valves did not open. (May initially only discover 2 failed valves, if one of the failed valves has lifted earlier in the scenario and the amber light is still lit, but SPDS will show ONLY 4 valves open.)<br>• Either informs SRO or continues opening SRVs until *7 SRVs are open, then notifies SRO of *7 SRVs open and failure of 3 SRVs to open. (*Critical Task)<br><br>****NOTE****: The critical task will be met when five SRVs have been opened.* |
| | | |
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| | | |
| | | ***NOTE****: If anticipate depress was performed and reactor pressure is below approximately 300psig, the SRV amber lights will not illuminate for SRV position confirmation. The operator can verify that the SRVs have opened by observing SRV tailpipe temperature increase.* |
| | SRO | • If the Operator notifies the SRO that 3 SRVs will not open and that only 4 are open, the SRO directs the operator to open 3 more SRVs or to Open SRVs until 7 are open.<br><br>**NOTE:** At low reactor pressure, the SRV amber lights may not illuminate and the SRO may direct all SRV switches to be placed in the OPEN position. |
| | | |
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| | | |
| | | *With Chief Examiners Permission the Scenario will be terminated when Reactor pressure is within 50 psig of Torus pressure or as directed by the Chief Examiner.* |

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

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** **6-01** **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

| | |
|---|---|
| Initiating Conditions: | Unit 2 is operating at 5% RTP. 34GO-OPS-001-2, Plant Startup, is in progress for transferring the mode switch to Run. |
| Turnover | Continue placing Torus Cooling in service, beginning at step 7.2.5.8 of 34SO-E11-010-2, in preparation for upcoming HPCI Surveillance. Once Torus Cooling is in service, withdraw control rods to increase Reactor power to 7% RTP. |

Summary:

- **Event 1**: 2A RHR Loop will be placed into service.
- **Event 2**: The ATC will withdraw control rods to increase Reactor power to 7%.
- **Event 3**: Component/TS; RHRSW pump overload requiring manually tripping & starting another RHRSW pump in the B Loop of RHR.
- **Event 4:** Component; One (1) Reactor Pressure ATTS trip unit causes a half scram and a control rod to scram in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.
- **Event 5:** Component; Instrument Air System Prefilter dP Hi – swap Prefilters. The operator will dispatch an SO locally to determine dP. Report back will require BOP swapping Prefilters to restore normal system flow/pressure. (OE)
- **Event 6**: Component/TS; RCIC will experience an inadvertent start with Trip pushbutton failing to trip RCIC. Operator will shutdown RCIC by either; closing T&TV, isolating steam to RCIC or placing flow controller in manual and lowering speed to prevent injection.
- **Event 7:** Major; The plant experiences an Earthquake causing Torus water level to start lowering.
- **Event 8:** Component; The Torus level decreasing rate worsens requiring the HPCI system to be placed to PTL to prevent Primary Containment damage. **(Critical Task)** This will require the RCIC or Feedwater Systems to be placed into service for reactor water level control. Torus water level will continue to decrease requiring the SS to direct the ATC operator to manually scram the reactor and open all ADS valves to Emergency Depressurize the RPV, prior to Torus level reaching 98 inches. **(Critical Task)**
- **Event 9:** Three (3) ADS valves fail to open when Emergency Depress is required. The ATC will open an additional (3) valves to establish seven (7) SRVs open. **(Critical Task)**

**Critical Tasks**

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** **6-01** **Op-Test No.:** 2011-301

Critical Tasks

- Remove HPCI System from service prior to Torus water level reaching 110" to preclude damage to Primary Containment. **(Event 8)**
- Scram and Emergency Depressurize the reactor prior to Torus water level reaching 98". **(Event 8)**
- Open 3 additional SRVs to establish 7 SRVs open to complete Emergency Depress (at least 1 more SRV opened to meet the Minimum Number for Emergency Depress of 5 open). **(Event 9)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 7 | 1. RHRSW pump overload **(Event 3)**<br>2. Reactor Pressure ATTS trip unit fails with a rod scramming in **(Event 4)**<br>3. Instrument Air System Prefilter dP Hi **(Event 5)**<br>4. RCIC Inadvertent start with Trip pushbutton failure **(Event 6)**<br>5. Earthquake **(Event 7)**<br>6. Torus break size increases **(Event 8)**<br>7. ADS valves (3) fail to open when Emergency Depress is required **(Event 9)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. Torus break size increases **(Event 8)**<br>2. ADS valves (3) fail to open when Emergency Depress is required **(Event 9)** |
| 3. | Abnormal Events | 2-4 | 3 | 1. RHRSW pump overload **(Event 3)**<br>2. Instrument Air System Prefilter dP Hi **(Event 5)**<br>3. RCIC Inadvertent start with Trip pushbutton failure **(Event 6)** |
| 4. | Major Transients | 1-2 | 1 | 1. Earthquake **(Event 7)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 2 | 1. RC EOP Flow Chart **(Event 7)**<br>2. PC EOP Flow Chart **(Event 7)** |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 1 | 1. CP 1 flow chart **(Event 9)** |
| 7. | Critical Tasks | 2-3 | 3 | 1. Place HPCI System prior to Torus water level reaching 110" **(Event 8)**<br>2. Scram and Emergency Depressurize the reactor prior to Torus water level 98". **(Event 8)**<br>3. Open a TOTAL of 5 SRVs for ED. **(Event 9)** |

# SHIFT TURNOVER

## UNIT 1 STATUS

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

## UNIT 2 STATUS

| | |
|---|---|
| **Power**: | Unit 2 is operating at 5% RTP. 34GO-OPS-001-2, Plant Startup, is in progress for transferring the mode switch to Run. RWM is inop and bypassed. RAS written. |
| **The following equipment is inoperable**: | None |
| **Scheduled evolutions**: | Continue placing Torus Cooling in service, beginning at step 7.2.5.8 of 34SO-E11-010-2, in preparation for upcoming HPCI Surveillance. Once Torus Cooling is in service, withdraw control rods (Step 22) to increase Reactor power to 7% RTP. |
| **Surveillances due this shift**: | None |
| **Active clearances**: | None |
| **Rod Configuration**: | See RWM |

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

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** 6-02 **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions**. Unit 2 is 75% RTP. HPCI is inop following a system outage and 2D LLS valve is inop for LLS Function only.

**Turnover:** Unisolate HPCI and place in Standby per step 7.1.40 of 34SO-E41-001-2. An extra SSS is currently preparing for a brief to perform the HPCI surveillance.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | N (BOP) | Unisolate HPCI and place in Standby starting at step 7.1.40. |
| 2 | aiC11-R600 | C (ATC) | CRD Flow Controller fails in Auto requiring manual operation to re-establish CRD flow. |
| 3 | mf60131136<br>aoE21R600A<br>loE21-F004AG1<br>loE21-F004AR2 | C (BOP)<br>TS (SRO) | 2A Loop of Core Spray experiences high discharge pressure (valve leakage). When 2E21-F004A is reopened, the valve breaker trips when control switch placed to open. |
| 4 | mfB21_130F | C (ATC)<br>TS (SRO) | 2F LLS SRV cycles open/close until fuses are pulled. (Critical Task) |
| 5 | mf65031532 | C (BOP) | RFPT 2B Bearing oil pressure low requiring manual tripping of RFPT which results in entering the Immediate Exit Region of the P/F Map. |
| 6 | N/A | R (ATC) | The ATC inserts control rods to exit the Region of Potential Instabilities. |
| 7 | mfG31_242 | M (ALL) | Leak in Drywell causes High Drywell pressure scram |
| 8 | mfE11_202B | C (BOP) | RHR LOCA logic failure – manual actions are required for proper RHR operation. (Critical Task) |
| 9 | diE11-F016A<br>diE11-F016B<br>ET-E11-4<br>ET-E11-5 | C (ATC) | RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray (Critical Task) |
| | | | |

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

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 1 Page 2 of 24

**Event Description:** Unisolate HPCI and place in Standby starting at step 7.1.40.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 mins | SRO | Directs BOP to unisolate HPCI and place in standby IAW 34SO-E41-001-2, HPCI System, starting at step 7.1.40. |
| | | |
| | | |
| | | ***NOTE:*** *The BOP will perform the following at 2H11-P601 panel.* |
| | BOP | • Confirms closed 2E41-F002, Inbd Steam Isol Valve<br>• Opens 2E41-F003, Outbd Steam Isol Valve<br>• Opens 2E41-F054, Drain Pot Trap Byp Valve<br>• Throttles open 2E41-F002<br>• Fully Opens 2E41-F002 when turbine steam inlet pressure (2E41-R602) is within 50 psig of reactor pressure on 2B21-R623A or B (P601 panel), then places control switch to stop position.<br>• 601-217, HPCI Isolation Vlv F002/F003 Not Fully Open will clear<br>• Closes 2E41-F054, Steam Line Drain Valve when annunciator 601-110, HPCI Turbine Inlet Drain Pot Level High is clear<br><br>**NOTE:** 601-110 may not alarm. |
| | | |
| | | |
| | | |
| | | *Simulator Operator enters the next event at the Chief Examiner's request.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 2 

**Event Description:** CRD Flow Controller fails in Auto requiring manual operation to re-establish CRD flow.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 min | | *At the Chief Examiner's direction, Simulator Operator ENTERS (**RB-1**) override, aiC11-R600 to final value of "0" with a 1000 ramp rate.* |
| | | |
| | ATC | • Receives 603-140, CRD Hyd Temp High, alarm.<br>• Determines that the CRD Flow Control Valve A has closed.<br>• Determines 2C11-R600, CRD Flow Controller, output is at minimum and has failed downscale.<br>• Notifies SRO that the CRD Flow Controller has failed downscale.<br>• Notifies I & C (if SRO does not) to investigate 2C11-R600. |
| | | |
| | | |
| | | |
| | ATV | • Enters:<br>  • 603-140, CRD Hyd Temp High<br>  • 34AB-C11-001-2, Loss Of CRD System<br>• Places 2C11-R600 controller in Manual.<br>• Increases output of controller until CRD flow is approximately 50 gpm. |
| | | |
| | | |
| | | |
| | SRO | • Dispatches a I & C to investigate to investigate 2C11-R600.<br>• Dispatches a SO to monitor CRD drive temperatures.<br>• Directs operator to perform actions of the ARP and 34AB-C11-001-2 |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 2 Page 4 of 24

**Event Description:** CRD Flow Controller fails in Auto requiring manual operation to re-establish CRD flow.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, after 5 minutes, report to the SRO, as I&C, that 2C11-R600 has a loose connection and you are requesting permission to re-connect. ONCE permission is granted, DELETE aiC11-R600 override.*<br><br>*When requested **and if the CRD Hyd Temp High alarm (603-140) is still illuminated**, Simulator Operator, as SO checking CRD Temps, reports that 2 CRD drives are >250°F. 30-11 at 260°F, 22-35 at 265°F and some others are slowly increasing.*<br><br>***If CRD Hyd Temp High alarm (603-140) is NOT illuminated**, Simulator Operator, as SO checking CRD Temps, reports that 2 CRD drives had been >250°F but are now below 250°F and trending down.* |
| | SRO | • Grants I& C permission to re-connect 2C11-R600<br>• Directs ATC to return 2C11-R600 to automatic operation. |
| | | |
| | | |
| | | |
| | ATC | • Returns CRD System to normal configuration by:<br>  • Manually adjusts 2C11-R600 to match setpoint<br>  • Places 2C11-R600 to Auto<br>  • Confirms system parameters are normal<br>  • Confirms 603-140, CRD Hyd Temp High, alarm is clear<br><br>• Reports to SRO that CRD flow controller has been restored to normal configuration. |
| | | |
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| | | *Simulator Operator enters the next event at the Chief Examiner's request.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 3 Page 5 of 24

**Event Description:** 2A Loop of Core Spray experiences high discharge pressure (valve leakage). When 2E21-F004A is reopened, the valve breaker trips when control switch placed to open.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *At the Chief Examiner's direction, Simulator Operator enters (**RB-2**) malfunction mf60131136 Window 28 Core Spray A Disch Pipe Press High (ON) and aoE21-R600A to 465 psig.* |
| | BOP | • Enters ARP 34AR-601-328-2<br>• Confirm validity of alarm using Disch Press indicator, 2E21-R600A (~465 psig)<br>• Confirm the following valves are CLOSED<br>  • 2E21-F037A, Testable Check Bypass Vlv<br>  • 2E21-F005A, Inbd Discharge Vlv<br>• Closes 2E21-F004A, Outbd Discharge Vlv<br>• Opens 2E21-F005A<br>• Closes 2E21-F005A, to reseat<br>• Places 2E21-F004A to open and alarm 601-316, Core Spray System I Valves Overload, is received.<br>• Notifies SRO of alarm 601-316 and that the lights for 2E21-F004A are extinguished. |
| | | |
| | | |
| | SRO | • Directs operator to enter 601-316 ARP<br>• Reviews TS 3.5.1 |
| | | |
| | | |
| | BOP | • Enters ARP 34AR-601-316-2<br>• Dispatches SO/Maint. to reset the thermal overload for 2E21-F004A at MCC 2R24-S011, Frame 13A |
| | | |
| | | |
| | | *Simulator Operator, wait 4 minutes, then as an SO, report that the breaker for 2E21-F004A will NOT reset.*<br><br>*If asked/directed to manually break 2E21-F004A off the closed seat, report this valve will NOT move with the handwheel.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 3 

**Event Description:** 2A Loop of Core Spray experiences high discharge pressure (valve leakage). When 2E21-F004A is reopened, the valve breaker trips when control switch placed to open.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | SRO | Enters TS 3.5.1, ECCS Operating, and determines:<br><br>TS 3.5.1.A requires the ECCS pump to restored to operable status in 7 days<br><br>and<br><br>TS 3.5.1.D requires either HPCI or the ECCS pump to be restored to operable status in 72 hours. |
| | | |
| | | |
| | | |
| | BOP | • May perform the following:<br>  • Slightly opens 2E21-F015A to lower CS Discharge pressure<br>  • Confirms 601-328 clears<br>  • When pressure is approximately 100 psig, closes 2E21-F015A.<br>  • If 601-303, Core Spray A Jockey Pump Sys Water Level Low, is received directs an SO to vent the "A" Loop of Core Spray IAW 34SV-SUV-017-2. |
| | | |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 4 Page 7 of 24

**Event Description:** SRV ADS valve cycles open/close until fuses are pulled.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Mins | | *At the Chief Examiner's direction, Simulator operator, INSTRUCT the BOP operator by phone to stay on the line until told to hang up, THEN ENTER* ***(RB-3)*** *malfunction mfB21_130F, 2F LLS valve intermittently cycling open and close. This SRV will cycle such that it is open for 15 seconds, then stays closed for 45 seconds, then repeats this cycle for 5 minutes or until fuses for SRV 2F are pulled.* |
| | ATC | • Receives Safety Blowdown pressure High 34AR-602-311-2 and Safety Blowdown Valves leaking 34AR-603-122-2 alarms |
| | | |
| | | |
| | SRO | Directs operator to enter 34AB-B21-003-2, Failure of Safety/Relief valves<br>• Enters a RAS for TS LCO 3.6.1.6.A for 2 or more LLS valves inop, which requires the unit to be in mode 3 in 12 hours and mode 4 in 36 hours.<br>• Directs operators to verify that the SRV 2F is closed, after the fuses are pulled. |
| | | |
| | | |
| | ATC | • Enters 34AB-B21-003-2<br>• Determines SRV 2F is cycling open then close<br>• Cycles the SRV 2F Control Switch several times<br>• Depresses the LLS Channel A / C Reset pushbutton (2B21-S15A)<br>• Depresses the LLS Channel B / D Reset pushbutton (2B21-S15B)<br>• Informs SRO that SRV 2F is cycling and the fuses will have to be pulled for the valve<br>• Notifies the SSS to pull the fuses for SRV 2F |
| | | |
| | | |
| | | *Simulator Operator, assuming that a request was made to pull fuses for SRV 2F, wait 4 minutes, then ENTER rfB21_305 to simulate pulling the fuses for SRV 2F.*<br><br>*Then, Notify the crew that the fuses have been pulled for SRV 2F.* |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 4 Page 8 of 24

**Event Description:** SRV ADS valve cycles open/close until fuses are pulled.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • Confirms that SRV 2F is closed by monitoring on or more of the following:<br>• SRV tailpipe temperature decrease (Directs BOP to P614 panel)<br>• Torus level stabilizing<br>• Torus Temp stabilizing<br>• Rx and Generator power returns to the pre-event level<br>• Resets the SRV leak detection by placing the Leak Detection Logic A Reset keylock switch and Leak Detection Logic B Reset keylock switch to Reset position and back to Normal position<br>• Confirm that the Amber SRV indicating lights have Extinguished<br>• Informs the SRO that SRV 2F is closed. |
| | | |
| | | |
| | | |
| | SRO/ATC | Informs the crew that operability of the suppression chamber-drywell vacuum breakers must be performed within 12 hours per 34SV-T48-002-2, Suppression Chamber To Drywell Vacuum Breaker System Operability.<br><br>Notifies Chemistry and initiates a CR to initiate increased monitoring of vessel moisture content carryover per 64CH-SAM-025-0. |
| | | |
| | | |
| | | *At this time, Torus temperature will still be below 95°F, therefore RHR is NOT required to be placed into Torus Cooling. The SRO may elect to place Torus Cooling in service, since steam was admitted to the Torus. The following steps are written if the SRO elects to place Torus Cooling in service.* |
| | | |
| | | **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 or B loop of RHR may be used. The following steps are written assuming "B" loop and "B" pump is used. If "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. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 4 

**Event Description:** SRV ADS valve cycles open/close until fuses are pulled.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • Enters 34SO-E11-010-2, Residual Heat Removal<br>  • Places RHRSW in service<br>  • Prelube RHRSW pump<br>  • Overrides 2E11-F068B Low Discharge Pressure Interlock<br>  • Positions 2E11-F068B to 45% OPEN<br>  • Starts RHRSW pump B<br>  • Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position.<br>  • Positions 2E11-F068B to obtain < 4400 gpm AND < 450 psig |
| | | |
| | | |
| | BOP | • IF desired to start a SECOND RHRSW pump,<br>  • Throttles 2E11-F068B to achieve max flow rate (not to exceed 4400 GPM).<br>  • Opens 2E11-F068B an additional 5%.<br>  • Starts second RHRSW Pump.<br>  • Positions 2E11-F068B to obtain < 8800 gpm AND < 450 psig |
| | | |
| | | |
| | BOP | • Places RHR B Loop in Torus cooling per the placard by performing the following steps:<br>  • Opens 2E11-F048B<br>  • Closes 2E11-F047B.<br>  • Opens 2E11-F003B.<br>  • Starts RHR Loop B pump<br>  • Opens 2E11-F028B<br>  • Receives annunciator Auto Blowdown CS OR RHR Press<br>  • Receives annunciator "SEC System Auto Initiation Signal Present."<br>  • Throttles OPEN 2E11-F024B<br>  • Opens 2E11-F047B<br>  • Ensures RHR flow is < 11,500 GPM, THEN Closes 2E11-F048B<br>  • Notifies the SRO that RHR "B" loop is in service<br>  • May place the second pump in service. |
| | | |
| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 5 Page 10 of 24

**Event Description:** RFPT 2A Bearing oil pressure low requiring manual tripping of RFPT

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator*<br><br>*Get the ATC on the phone and instruct to remain on the line until told to hang up, THEN at direction of the Chief Examiner, ACTIVATE: (**RB-4**) mf65031532 Window 10: RFPT 2A Hyd Oil Press Low (ON).* |
| | BOP | • Enters ARP 34AR-650-310-2<br>• Confirms at least one of the following pumps are running:<br>  • Either Main AC Oil Pump 2N34-C007A (ON) or 2N34-C007B (OFF)<br>  • Brg Emerg Oil Pump, 2N34-C009 (OFF)<br>• Starts second RFPT 2A Main AC Oil Pump 2N34-C007B<br>• Notifies SRO the alarm did NOT clear with second AC Oil pump running and to reduce power IAW 34GO-OPS-005-2.<br>• Dispatches SO locally to determine RFPT 2A oil pressures. |
| | | |
| | | |
| | | |
| | | *Simulator Operator, As the SO, wait 2 minutes after being dispatched OR prior to the crew starting a power reduction, **ONLY** report that 2A RFPT RFP bearing oil pressure is 1.5 psig and decreasing slowly.* |
| | SRO | • Directs BOP to trip 2A RFPT<br>OR<br>• Directs the ATC to reduce power in an attempt to lessen the plant transient and then directs BOP to trip the 2A RFPT.<br><br>• Directs BOP to verify #2 Speed Limiter Runback occurs |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 5 Page 11 of 24

**Event Description:** RFPT 2A Bearing oil pressure low requiring manual tripping of RFPT

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • With RFPT oil pressure < 4 psig,<br>  • Trips 2A RFPT<br>  • 650-325, RFPT 2A TRIP, alarms<br>  • 656-039, RFP C005A DISCH FLOW LOW, alarms<br>  • Verifies #2 Speed Limiter Runback occurs<br>  • OR the ATC reduces power in an attempt to lessen the plant transient and then the BOP trips the 2A RFPT.<br>  • Directs SO to close the following:<br>  • 2N38-F003A, Low Pressure Steam to RFPT 2A (2H21-P216)<br>  • 2N11-F002A, High Press Steam to RFPT 2A (2H21-P244)<br>  • 2N21-F161A and 2N21-F161D, Gland Seal Injection Inlet and Leakoff Intermediate Outlet Isolation Valves.<br>  • Closes 2N21-F107A, RFP 2A Suction (2H11-P650) |
| | | |
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| | | |
| | | *SIMULATOR OPERATOR; the next event will start with tripping of 2A RFPT.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 6 Page 12 of 24

**Event Description:** Inserting control rods to exit RPI

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Min. | ALL | Recognize annunciator "Recirc A(B) Flow Limit" |
| | | |
| | | |
| | ATC | Responds to annunciators 602-134 & 602-234, 'Recirc A & B Flow Limit'<br>• Confirms Recirc pump A (B) speed has runback to by observing percent speed or RPMs.<br>• Evaluate for Loop Flow Mismatch by observing there is NOT > 7.7 Mlbm/hr difference between the two loop flows.<br>• Determines which speed limiter is enforcing by observing #2 Speed Limiter (33% speed on the speed meter).<br>• Determines Region of Potential Instabilities is entered and requests STA's direction. Time:_____ |
| | | |
| | | |
| | | |
| | | *SIMULATOR OPERATOR: As the STA, when the operator asks for direction, instructs the operator to insert control rods to insert limits until Reactor Power is 30%.* |
| | SRO | • 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:_____<br>• Ensures the plant has exited the Immediate Exit Region of the Power to Flow map within **one hour**. Time:_____<br>• Performs/directs a control rod movement brief per 34GO-OPS-065-0<br>• As time allows, contacts Georgia Control Center (GCC).<br>• If asked, allows ATC to exceed 10 MWe per minute during inserting control rods. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 6 Page 13 of 24

**Event Description:** Inserting control rods to exit RPI

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *SIMULATOR OPERATOR: As the STA, when the SS directs crew entry into 34GO-OPS-005-2, Power Changes, calls the SS and informs him that you will perform the computer feedwater flow cross over corrections.*<br><br>*SIMULATOR OPERATOR: When contacted as the GCC, acknowledge the communication.*<br><br>*SIMULATOR OPERATOR: If requested, inform operator to drive control rods continuously to insert limits.* |
| | ATC | • Inserts control rods per 34GO-OPS-065-0, starting with control rod Group 54.<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.<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>  • If required, adjusts 2C11-F003 to get 220 – 280 psid drive water dP.<br>• Notifies the SRO when they are out of the region of potential instabilities. |
| | | |
| | | |
| | | |
| | | **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. |
| | | **Simulator Operator**<br><br>*At the direction of the Chief examiner, enter next malfunction to start the major event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 7 Page 14 of 24

**Event Description:** Leak in Drywell causes High Drywell pressure scram

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, at the direction of the Chief Examiner's, ACTIVATES: (**RB-5**), mfG31_242 RWCU Non-Isol Leak in Drywell, mfE11_202B RHR LOCA Signal Failure and Event Trigger **E11-4 & E11-5** for 2E11-F016A/B failing to open.* |
| | ALL | Recognizes increasing Containment Pressure from the following alarms:<br>• 603-106, Primary Cnmt High Pressure Trip<br>• 603-115, Primary Cnmt Pressure High<br>• 602-210, Drywell Pressure High |
| | | |
| | | |
| | | |
| | | **NOTE:** The SRO may direct the BOP to vent the Drywell, but there will NOT be time to complete the task before the LOCA signal is received. |
| | SRO | • With Drywell pressure increasing and alarms 603-115, Primary Containment Pressure High and 602-210, Drywell Pressure High, alarms being received, directs the ATC enter 34AB-C71-001-2, Scram Procedure, and Scram the reactor.<br>• Assigns the ATC to perform RC-1.<br>• Assigns the BOP operator to perform RC-2 and RC-3.<br>• Enters RC & PC EOP flow charts<br>• Assigns a RWL band between 3" and 50" |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 7 Page 15 of 24

**Event Description:** Leak in Drywell causes High Drywell pressure scram

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, WHEN the reactor is scrammed, MODIFIES mfG31_242 Final to 0.15 with a ramp of 1000.* |
| | 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. |
| | | |
| | | |
| | | |
| | BOP | • Performs RC-2 actions consisting of:<br>• Confirms proper Level Control response:<br>  • Checks ECCS Injection Systems and secure as necessary.<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, then manually reduces FW Master Controller setpoint to approximately 9 inches. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 7 Page 16 of 24

**Event Description:** Leak in Drywell causes High Drywell pressure scram

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • Controls HPCI operation for level control by performing one or more of the following:<br>  • Adjusts 2E41-R612, HPCI Flow Control, to the desired injection rate<br>  • Transfers the flow controller to manual and adjust its speed demand output to obtain the desired pump flow<br>  • Shutdown HPCI by:<br>  • Depresses and holds the HPCI Turbine Trip pushbutton<br>  • When HPCI turbine has stopped, places 2E41-C002-3, HPCI Aux Oil Pump, in Pull-To-Lock<br>  • When HPCI TURBINE BRG OIL PRESS LOW alarm is received, releases the HPCI Turbine Trip push-button. |
| | | |
| | | |
| | | |
| | BOP | • 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>  • May attempt to restart the CRD pumps<br>  • May attempt maximize CRD flow IAW 34SO-C11-005-2<br>  • Controls RWL with the HPCI/FW System. Notifies SS if RWL gets outside assigned band. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 7 

**Event Description:** Leak in Drywell causes High Drywell pressure scram

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Examiner Note: SRVs actuate in LLS at 1120 psig and then control pressure between 850 - 990 psig.* |
| | BOP | • Performs RC-3 consisting of:<br>  • Monitors RPV pressure.<br>  • If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS.<br>  • If necessary, verifies LLS actuates at 1120 psig<br>  • Maintains RPV pressure between 1074 and 800 psig.<br>  • Notifies SRO of pressure control system operation. |
| | | |
| | | |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 8 

**Event Description:** LOCA RHR signal failure – manual actions are required.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | SRO | • Enters 31EO-EOP-012-2, Primary Containment flow chart. |
| | | |
| | | |
| | BOP | • At panel 2H11-P601, Confirms the 4 RHR pumps did NOT auto start and ONLY 2 Core Spray pumps are running.<br>• Notifies SRO of RHR pump logic failure and starts (*Critical Task*) the 4 RHR pumps. |
| | | |
| | | |
| | SRO | • Per the PC flowchart, verifies Torus level is <285 inches and directs an operator to place Torus Sprays in service. |
| | | |
| | | |
| | ATC | • Sprays the Torus per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows:<br>  • Places Cnmt Spray Vlv Cntl switch in the Manual position. (not required, since LOCA signal failed, but procedurally okay)<br>  • Verifies RHR pump(s) in loop A (B) running.<br>  • Opens 2E11-F028A or B<br>  • Opens 2E11-F027A or B<br>  • Throttles Open 2E11-F027A(B)<br>  • Notifies SS that RHR is in Torus Sprays (The flow is only 700gpm, so it may be difficult to see flow indication from a distance.) |
| | | |
| | | |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 9 

**Event Description:** RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, confirm EVENT TRIGGER* ***(E11-4 or E11-5)*** *is activated when the operator positions 2E11-F016A or B to open.* |
| | SRO | • When Torus pressure exceeds 11 psig, verifies that Torus Level is <215 inches, in the safe area of Graph 8 (DWSIL) and Directs an operator to:<br>  • Place the DW cooling fans to Off<br>  • Shutdown Recirc pumps (if running)<br>  • Spray the DW |
| | | |
| | | |
| | | |
| | ATC | • Places the following DW cooling fans control switches in the OFF position:<br>  • 2T47-B007B, Drywell Cooling Top Head Area Unit<br>  • 2T47-B008B, Drywell Cooling Pedestal/Annular Area Unit<br>  • 2T47-B009B, Drywell Cooling Recirc Pump Area Unit<br>  • 2T47-C001B, Drywell Cooling Return Air Fan<br>  • 2T47-C002B, Drywell Cooling Return Air Fan<br>  • 2T47-B010B, Drywell Cooling EL 114 Unit<br>  • 2T47-B007A, Drywell Cooling Top Head Area Unit<br>  • 2T47-B008A, Drywell Cooling Pedestal/Annular Area Unit<br>  • 2T47-B009A ,Drywell Cooling Recirc Pump Area Unit<br>  • 2T47-C001A, Drywell Cooling Return Air Fan<br>  • 2T27-C002A, Drywell Cooling Return Air Fan<br>  • 2T47-B010A, Drywell Cooling EL 114 Unit<br>• Notifies the SRO that the fans are Off. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-02 **Event No.:** 9 Page 20 of 24

**Event Description:** RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • Sprays the Drywell per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows:<br>• Places Cnmt Spray Vlv Cntl switch in the Manual position. (not required, since LOCA signal failed, but procedurally okay)<br>• Starts RHR pump(s) in loop A (B), if not already running.<br>• Opens 2E11-F021A or B<br>• Opens 2E11-F016A or B (ONE WILL NOT OPEN AND OPERATOR TRANSITIONS TO THE OTHER LOOP)<br>• Informs SRO that the 2E11-F016A (or B) will not Open<br><br>• Opens 2E11-F021A or B<br>• Throttles Open 2E11-F016A(B) (*Critical Task*) to >5000 gpm<br>• Confirms Drywell pressure is reducing<br>• Notifies SRO that RHR is in Drywell Sprays |
| | | |
| | | |
| | | |
| | SRO | • As time allows, directs $H_2/O_2$ Analyzers placed in service IAW 34SO-P33-001-2. |
| | | |
| | | |
| | | |
| | ATC | • Places $H_2/O_2$ Analyzers in service IAW 34SO-P33-001-2 or "Placard" by performing the following at 2H11-P700 panel:<br>• Confirms closed 2P33-F605<br>• Places 2P33-S16, LOCA Override to 'Bypass"<br>• Places 2P33-S17, LOCA Override to 'Bypass"<br>• Confirms analyzers are running by either red analyzer lights illuminated or values indicated on the Primary Display of SPDS<br>• If analyzers red light is off, depresses Channel A and Channel B Reset pushbuttons on 2H11-P700 panel.<br>• Notifies SRO $H_2/O_2$ Analyzers are running. |
| | | |
| | | |
| | | *With Chief Examiners Permission, the scenario should be terminated when the crew has sprayed the Drywell with the other Loop of RHR.* |

**Op-Test No.: 2011-301 Scenario No.: 6-02 Event No.: 9** Page 21 of 24

**Event Description:** RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|

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

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** **6-02** **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

| | |
|---|---|
| Initiating Conditions: | Unit 2 is 75% RTP. HPCI is inop and 2D LLS valve is inop for LLS Function only. |
| Turnover | Unisolate HPCI and place in Standby per step 7.1.40 of 34SO-E41-001-2. An extra SSS is currently preparing for a brief to perform the HPCI surveillance. |

Summary:

- **Event 1**: Unisolate HPCI and place in Standby starting at step 7.1.40 of System Operating procedure.
- **Event 2**: Component; After HPCI is placed to Standby, the CRD Flow Controller fails closed causing a loss of normal CRD flow. The ATC will place the controller in manual and restore CRD flow.
- **Event 3**: Component/TS; 2A Loop of Core Spray experiences high discharge pressure (valve leakage). When 2E21-F004A control switch is placed to open, the valve breaker trips causing the 2A CS Loop to be inop.
- **Event 4:** Component; SRV 2F LLS valve cycles open and close until the fuses are pulled. **(Critical Task)**
- **Event 5:** Component; RFPT Bearing oil pressure low will be received. BOP will manually start the standby AC oil pump. Local report of oil leak and low oil pressure will require the RFPT to be manually tripped.
- **Event 6**: Reactivity; The ATC inserts control rods to exit the Region of Potential Instabilities.
- **Event 7:** Major; The plant experiences a Recirc pipe leak in Drywell causing a High Drywell pressure scram.
- **Event 8:** Component; RHR LOCA logic failure requiring manual actions to place RHR in service. **(Critical Task)**
- **Event 9:** When Torus pressure exceeds 11 psig, the operator will have to swap to the other loop of RHR to spray the Drywell, since one RHR DW spray valve will not open. The first DW spray valve attempted will not open but the other loop of RHR DW spray valve will work. **(Critical Task)**

**Critical Tasks**

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** 6-02 **Op-Test No.:** 2011-301

Critical Tasks

- SRV 2F LLS valve cycles open and close until the fuses are pulled. **(Event 4)**
- RHR LOCA logic failure requiring manual actions for proper RHR Loop operation, when any mode of RHR operation is desired. **(Event 8)**
- RHR 2E11-F016A/B stuck closed requiring the operator to swap to other loop of RHR to spray the DW. **(Event 9)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 7 | 1. CRD Flow Controller fails closed **(Event 2)**<br>2. Core Spray 2A Loop high discharge pressure & 2E21-F004A breaker trips **(Event 3)**<br>3. 2F LLS SRV cycles open/close **(Event 4)**<br>4. RFPT 2B Bearing oil pressure low **(Event 5)**<br>5. Leak in Drywell causes High Drywell pressure scram **(Event 7)**<br>6. RHR LOCA logic failure **(Event 8)**<br>7. RHR 2E11-F016A/B stuck closed **(Event 9)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. RHR LOCA logic failure **(Event 8)**<br>2. RHR 2E11-F016A/B stuck closed **(Event 9)** |
| 3. | Abnormal Events | 2-4 | 4 | 1. CRD Flow Controller fails closed **(Event 2)**<br>2. Core Spray 2A Loop high discharge pressure & 2E21-F004A breaker trips **(Event 3)**<br>3. 2F LLS SRV cycles open/close **(Event 4)**<br>4. RFPT 2B Bearing oil pressure low **(Event 5)** |
| 4. | Major Transients | 1-2 | 1 | 1. Leak in Drywell **(Event 7)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 2 | 1. RC EOP Flow Chart **(Event 7)**<br>2. PC EOP Flow Chart **(Event 7)** |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 0 | None |
| 7. | Critical Tasks | 2-3 | 3 | 1. SRV 2F LLS valve cycles open and close until the fuses are pulled. **(Event 4)**<br>2. RHR LOCA logic failure requiring manual actions for proper RHR Loop operation, when any mode of RHR operation is desired. **(Event 8)**<br>3. RHR 2E11-F016A/B stuck closed requiring the operator to swap to other loop of RHR to spray the DW. **(Event 9)** |

# SHIFT TURNOVER

## UNIT 1 STATUS

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

## UNIT 2 STATUS

| | |
|---|---|
| **Power**: | Unit 2 is 75% RTP. |
| **The following equipment is inoperable**: | HPCI due to system outage.<br>2D LLS valve is inop for LLS Function only. |
| **Scheduled evolutions**: | Unisolate HPCI and place in Standby per step 7.1.40 of 34SO-E41-001-2. An extra SSS is currently preparing for a brief to perform the HPCI surveillance. |
| **Surveillances due this shift**: | 34SV-E41-002-2, HPCI Pump Operability |
| **Active clearances**: | None |
| **Rod Configuration**: | See RWM |

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

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** 6-03 **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions**. Unit 2 is 67% RTP shutting down for an upcoming outage.

**Turnover:** Lower reactor power using Recirc Flow to remove 2A RFPT from service and leave rotating at approximately 1000 rpm.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | R (ATC) | Reduce reactor power to achieve <7 mlbm/hr for RFPT removal. |
| 2 | N/A | N (BOP) | Remove 2A RFPT from service. |
| 3 | mfC11_30A<br>mf60311334 | I (ATC) | CRD pump trips due to low suction pressure instrument failure. Must start standby pump to restore system flow & pressure. |
| 4 | mfB21_131 | I (ATC)<br>TS (SRO) | ADS Inadvertent initiation/Inhibit used. (Critical Task) |
| 5 | mfB21_229A | C (BOP)<br>TS (SRO) | Small leak on the "A" FW line in the DW requiring SBGT to vent DW. |
| 6 | mf65702234<br>mf65402051<br>ET-T46-XX | C (BOP)<br>TS (SRO) | Hi dP & Low flow on SBGT train requiring swapping to other SBGT. |
| 7 | mfB21_229A<br>diN21-F006A<br>mfC11_30A<br>mfC11_30B | M (ALL) | "A" FW line break increases in DW requiring a reactor shutdown. |
| 8 | diN21-F006A | C (BOP) | 2N21-F006A fails to close requiring all Cond/FW isolated (Critical Task) |
| 9 | diE51-F013<br>rfE51_234 | C (ATC) | RCIC F013 stuck closed (Loss of High pressure feed), OPEN 7 ADS Valves prior to RWL reaching -185" (Critical Task) |
| | | | |

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

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 1 Page 2 of 25

**Event Description:** Reduce reactor power to achieve <7 mlbm/hr for RFPT removal.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Mins | SRO | • Directs ATC to decrease reactor power to 60%, to achieve a Feedwater flow <7 mlbm/hr for RFPT removal, 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. |
| | | |
| | | |
| | ATC | • Decreases reactor power with Recirc flow IAW 34GO-OPS-005-2 and 34SO-B31-001-2 by depressing either the Master Recirc Flow Control Lower Medium/Lower Slow pushbuttons or the individual pump Speed Control Lower Medium/Lower Slow pushbuttons.<br>• Monitors power decrease by observing APRM and generator output indications.<br>• Monitors Total Feedwater flow to achieve Feedwater flow <7 mlbm/hr on 2C32-R604A, 2C32-R604B, and 2C32-R607.<br>• Notifies SRO when Feedwater flow is <7 mlbm/hr. |
| | | |
| | | |
| | ATC | • Complies with 34SO-B31-001-2 , Limitation 5.2.15, which states:<br><br>WHEN changing Recirc pumps speed while in Two Loop operation maintain pump speeds to limit recirculation loop jet pump mismatch within the following limits:<br><br>• <10% of rated core flow (7.7 E6 lbm/hr) WHEN operating < 70% of rated core flow;<br>AND<br>• <5% of rated core flow (3.85 E6 lbm/hr) WHEN operating at > 70% of rated core flow. |
| | | |
| | | |
| | | *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>*May also get Alarm 650-135, "Heater Trouble" alarm. This is expected at this power level.* |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 2 Page 3 of 25

**Event Description:** Remove 2A RFPT from service and leave at approximately 1000 rpm.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Mins | SRO | • Directs the BOP to remove the 2A RFPT from service IAW 34SO-N21-007-2, Section 7.2.1. |
| | | |
| | | |
| | BOP | • Confirms Feedwater Flow is less than 7 Mlbm / hr.<br>• Confirm RFPT 2A AND RFPT 2B are in Automatic control on 2C32-R600, Master Controller.<br>• Place 2C32-R601A, RFP A M/A Station, in Manual, by depressing the 'M' pushbutton until it illuminates, panel 2H11-P603.<br>• Slowly decrease RFPT 2A speed until RFP 2B is controlling reactor vessel level.<br>• 656-039, RFP A Low Flow, will alarm and is expected.<br>• Slowly decrease RFPT 2A speed until no speed decrease is observed and place the RFPT A TMR switch to SS and confirm SPEED SETTER yellow light illuminates.<br>• Slowly lower RFPT 2A Speed Setter switch until RFPT speed is at 1000 rpm, at 2H11-P650.<br>• Dispatches SO to confirm open OR opens RFPT 2A drain valves on Local panel 2H21-P244. |
| | | |
| | | |
| | | *Simulator Operator, if dispatched to confirm RFPT 2A drains, after 5 minutes, report all drain valves per step 7.2.1.7 are open.* |
| | | |
| | | |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, enters the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 3 Page 4 of 25

**Event Description:** CRD pump trips due to low suction pressure instrument failure. Must start standby pump to restore system flow & pressure.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Mins | | *At the Chief Examiner's direction, Simulator Operator enters (**RB-1**) malfunction mfC11_30A CRD Pump A Trip and mf60311334 CRD A Suction Pressure Low alarm.* |
| | ATC | • Recognizes the following occurs:<br>  • 603-146, CRD Pump A Suction Pressure Low, alarms<br>  • 603-128, CRD Pump 2A Breaker Trip, alarms<br>  • CRD pump 2A is tripped<br>  • 603-140, CRD HYD Temp High, alarms<br>  • 603-148, CRD Accumulator Press Low or Level High alarms ~ 1.5 minutes later (will not alarm if CRD 2B is started in an expeditiously). |
| | | |
| | | |
| | SRO/ATC | • 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 on pump start<br>  • Increases system flow to ~50 gpm<br>  • Transfers 2C11-R600 to Automatic<br>  • Notifies SRO CRD pump 2B is in service |
| | | |
| | | |
| | SRO/ATC | • Dispatches an SO to check CRD temperatures and Accumulator pressures locally. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 3 Page 5 of 25

**Event Description:** CRD pump trips due to low suction pressure instrument failure. Must start standby pump to restore system flow & pressure.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, if dispatched to check Accumulator pressures, wait until after CRD pump 2B is started AND ALL Accumulator alarms are clear, THEN report all accumulator pressure are > 980 psig.* |
| | SRO | May review TS 3.1.5 for inop accumulators and since all accumulator pressures are > 980 psig, does NOT declare any accumulators inop. |
| | | |
| | | |
| | | *Simulator Operator reports that:*<br>• *If the CRD High Temp Alarm is still lit, report that 1 CRD drive (26-35) is > 250°F*<br>• *If the CRD High Temp Alarm is NOT lit, report that all temps are < 250°F*<br>• *Suction pressure for CRD pump 2A is 22 psig and there is no apparent problem with the suction line-up or suction filter.* |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, proceeds to the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 4 Page 6 of 25

**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<br>  • Auto Blow down Relays Energized |
| | | |
| | | |
| | ATC | • Acknowledges the alarms and reports them to the SRO. |
| | | |
| | | |
| | SRO | • May observe the ADS timer on SPDS begin counting down. |
| | | |
| | | |
| | | **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. |
| | | |
| | | |
| | SRO | • Directs ATC to inhibit ADS |
| | | |
| | | |
| | ATC | • Places inhibit switches to inhibit. (Critical Task) |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 4 Page 7 of 25

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

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | SRO | • Dispatches Maintenance to determine problem with ADS logic |
| | | |
| | | |
| | 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. |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 5 Page 8 of 25

**Event Description:** Small leak on the "A" FW line in the DW requiring SBGT to vent DW

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Mins | | *Simulator Operator, at the direction of the lead examiner, ENTERS: (**RB-3**) malfunction mfB21_229A final value of 0.05 and ramp of 1000.* |
| | ALL | • Receives Annunciators:<br>  • 603-115, Primary Cnmt Pressure High<br>  • 657-025, Multipoint Temperature RCDR 2T47-R626 Temp High |
| | | |
| | | |
| | SRO | • Directs the BOP to:<br>  • Enter 657-025 ARP<br>  • Monitor Drywell pressure<br>  • Vent the DW with SBGT, when DW pressure approaches 0.65 psig<br>  • Enter 34AB-T23-002-2, Small Pipe Break Inside Primary Containment (may give this to the ATC since BOP will be at back panel)<br>  • Directs Operator Check DW Leakage per 34SV-SUV-019-2. |
| | | |
| | | |
| | | **NOTE:** The operator may place Drywell venting 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 2A or 2B SBGT Train may be used. The following steps are written assuming "2A" Train is used. If "2B" Train is used, substitute "2B" for "2A" for valves and the alarm numbers in parenthesis. |
| | BOP | • Confirms Temperature is elevated on 2T47-R626 recorder<br>• Enters 34SO-T48-002-2, "Containment Atmosphere Dilution System" or uses placard to vent the Drywell.<br>• Enters 34SO-T46-001-2, "Standby Gas Treatment System" procedure or uses placard at the 2H11-P657 panel to start SBGT 2A.<br>  • Opens 2T46-F001A (B) or 2T46-F003A (B)<br>  • Places 2A SBGT Fan control switch to "RUN"<br>  • Alarm 657-091 (654-076), SBGT 2A (2B) Switch Not In Auto, will be received<br>  • Confirms 2T46-F002A (B) OPENS<br>  • Confirms SBGT 2A (B) Heater red light illuminates |
| | | |
| | | |

**Op-Test No.: 2011-301 Scenario No.: 6-03 Event No.: 5** Page 9 of 25

**Event Description:** Small leak on the "A" FW line in the DW requiring SBGT to vent DW

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • Opens 2T48-F334A or 2T48-F334B (both valves may be opened)<br>• The following alarms will be received:<br>  • 657-008, Drywell Vent Exhaust Bypass Valves Open<br>  • 657-042, DRWL/Torus $N_2$ M/U 2 Inch Isol Valves Open<br>  • 654-017, Torus Vent Exhaust Bypass Valves Open<br>  • 654-035, DRWL/Torus $N_2$ M/U 2 Inch Isol Valves Open<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. |
| | | |
| | | |
| | SRO | • If 602-210, 'Drywell Press High' alarm is received, may direct the operator to fast vent the Drywell IAW 34SO-T48-002-2. |
| | | |
| | | |
| | BOP/ATC | • If directed, enters 34SO-T48-002-2, to fast vent and confirms the following alarms are NOT illuminated |
| | | • SBGT/DRYWELL AND TORUS RADIATION HIGH (601-402)<br>• FISSION PRODUCT PARTIC RADN HIGH/INOP (602-406)<br>• FISSION PRODUCT IODINE RADN HIGH/INOP (602-412)<br>• FISSION PRODUCT GAS HIGH/INOP (602-418)<br>• CONTAINMENT RADIATION HIGH/INOP (602-436) |
| | | • Opens 2T48-F319, Drywell Vent Vlv (2H11-P602).<br>• Opens 2T48-F320, Drywell Vent Vlv (2H11-P601).<br>• When Drywell pressure is < 0.5 psig on 2T48-R607A OR 2T48-R607B, close 2T48-F320, Drywell Vent Vlv.<br>• Closes 2T48-F319, Drywell Vent Vlv. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 5 Page 10 of 25

**Event Description:** Small leak on the "A" FW line in the DW requiring SBGT to vent DW

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC/BOP | • Enters 34AB-T23-002-2 and attempts to identify the location of the pipe break including:<br>• instrumentation lines<br>• RWCU<br>• Recirc Pump seals<br>• HPCI<br>• RCIC<br>• SRV Tailpipe Vacuum Breakers malfunctioning<br>• Feedwater line break indication<br>• Notifies SSS to perform 34SV-SUV-019-2, DW Leakage check. |
| | | |
| | | |
| | | *Simulator Operator, as the operator checking DW leakage, reports that DW Equipment drain leakage is stable at 1.7 gpm and that Floor drain leakage has increased from 0.8 gpm to 10.1 gpm.* |
| | SRO | • Enters Tech Specs 3.4.4, RCS Operational Leakage, Condition A to reduce leakage to within limits in 4 hours. |
| | | |
| | | |
| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 6 Page 11 of 25

**Event Description:** Hi dP on SBGT train requiring swapping to other SBGT

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, at the direction of the Chief Examiner, ENTERS: (**RB-4**) malfunction mf65702234 2A SBGT Filter Diff Pressure High alarm or mf6570402051.* ***THE MALFUNCTION WILL BE DECIDED BY WHICH SBGT FAN IS FIRST STARTED.*** |
| | | **NOTE:** The operator may start either 2A or 2B SBGT Train. The following steps are written assuming "2A" Train was used. If "2B" Train was used, substitute "2B" for "2A" for valves and the alarm numbers in parenthesis. |
| | ALL | • Alarms received:<br>  • 650-224, P657 System Trouble (650-214, P654 System Trouble)<br>  • 657-055, 2A SBGT Filter Diff Press High (654-046, 2B SBGT Filter Diff Press High) |
| | | |
| | | |
| | BOP | • Enters 657-055 (654-046)<br>  • Confirms Filter differential pressure > 5.7" WG as indicated on 2T46-R603A (B) (2H11-P700)<br>  • Notifies SRO of high differential pressure on SBGT 2A (2B)<br>  • Since Filter differential pressure is > 5.7" WG and continued SBGT operation is required, determines SBGT 2B (2A) fan is required to be started. (SRO may direct)<br>  • Enters 34SO-T46-001-2, "Standby Gas Treatment System" procedure or uses placard at the 2H11-P657 panel to start SBGT 2B (2A).<br>  • Opens 2T46-F001B (1A) or 2T46-F003B (3A)<br>  • Places 2B SBGT Fan control switch to "RUN"<br>  • Confirms 2T46-F002B (2A) OPENS<br>  • Confirms SBGT B (A) Heater red light illuminates. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 6 Page 12 of 25

**Event Description:** Hi dP on SBGT train requiring swapping to other SBGT

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • Secures SBGT 2A (2B)<br>• Confirm "SBGT AUTO SIGNAL PRESENT" annunciator is RESET<br>• Place SBGT 2A (2B) in the AUTO position<br>• Depress SBGT A (B) Fan/Htr Auto-Start Reset pushbutton<br>• Confirm Green HTR OFF light illuminates<br>• Confirm 2T46-F002A (2B) closes<br>• Confirm closed OR close 2T46-F003A (3B)<br>• Confirm closed OR close 2T46-F001A (1B)<br>• Confirm that annunciator P657-093 (P654-078) is NOT in the alarm condition<br>• As time permits, refers To 34SO-T46-001-2 AND place SBGT in Standby per subsection 7.1, Standby - Ready For Auto Start |
| | | |
| | | |
| | SRO | • Based on the alarms received and indications,<br>• Directs BOP to swap SBGT fans.<br>• Notifies Maintenance of high dP<br>• Addresses Tech Specs:<br>• 3.6.4.3, Standby Gas Treatment System Condition B, requires to;<br>Restore required SGT subsystem to operable status within 7 days AND 30 days from discovery of failure to meet the LCO. |
| | | |
| | | |
| | | **NOTE:** If time does not permit, the examiner may have to ask the SRO for the SBGT 2A Tech Spec after the scenario is over. |
| | | |
| | | |
| | | *At the direction of the Chief examiner, enter next malfunction to start the major event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 7 Page 13 of 25

**Event Description:** "A" FW line leak worsens in DW requiring shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, at Chief Examiners direction, MODIFY malfunction mfB21_229A to Final value of 60 with ramp of 1000. When the Main Turbine trips, ENSURES 4160 V Bus 2A & 2B fails to transfer along with Main Condenser Inleakage will be experienced.* |
| | ALL | • Recognizes rapidly increasing Containment Pressure from the following alarms:<br>  • 603-106, Primary Cnmt High Pressure Trip<br>  • 603-115, Primary Cnmt Pressure High<br>  • 602-210, Drywell Pressure High |
| | | |
| | | |
| | SRO | • Directs ATC to perform RC-1 placard<br>• Directs BOP to perform RC-2 & RC-3 placards<br>• Enters RC & PC EOP Flowchart<br>• Enters CP-1 when a loss of all high pressure feed systems occurs |
| | | |
| | | |
| | ATC (Placard) | • Performs RC-1 consisting of:<br>  • Inserts a manual scram using the SCRAM pushbuttons<br>  • Places the mode switch to shutdown.<br>  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.<br>  • Informs the SRO that all rods are fully inserted.<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 SRO when RC-1 complete. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 7 Page 14 of 25

**Event Description:** "A" FW line leak worsens in DW requiring shutdown.

| 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 and secure as necessary.<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, then manually reduces FW Master Controller setpoint to approximately 9 inches. |
| | | |
| | | |
| | BOP | • 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 | • Per the PC flowchart, verifies torus level is <285 inches and may direct ATC to spray the Torus if RHR is NOT needed for adequate core cooling. |
| | | |
| | | |
| | ATC | • Re-opens 2P41-F316s due to high temp on the Condensate Pumps/Booster pumps per 34AB-P41-001-2, Loss of PSW, Placard OR as directed by the SRO.<br>  • Places the "A" and "B" Isolation Override switches on the 2H11-P652 panel to Override<br>  • Fully opens 2P41-F316A or C and 2P41-F316B or D<br>  • Throttles 2P41-F316C or A and 2P41-F316D or B to open while monitoring PSW division 1 and 2 pressure on 2H11-P650 panel ensuring that PSW pressure remains above 80 psig. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 7 Page 15 of 25

**Event Description:** "A" FW line leak worsens in DW requiring shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • Sprays the Torus per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows:<br>• Places Cnmt Spray Vlv Cntl switch in the MANUAL position.<br>• Starts RHR pump(s) in loop A (B), if not already running.<br>• Opens 2E11-F028A or B<br>• Opens 2E11-F027A or B<br>• Throttles Open 2E11-F027A or B<br>• Notifies SRO that RHR is in Torus Sprays<br>(The flow is only 700gpm, so it may be difficult to see flow indication from a distance.) |
| | | |
| | | |
| | SRO | • Per the PC flowchart, may direct ATC to spray the Drywell if RHR is NOT needed for adequate core cooling.<br>• Confirms Torus pressure > 11 psig, verifies that Torus Level is <215 inches, in the safe area of Graph 8 (DWSIL) and then directs an operator to:<br>• Place the DW cooling fans to Off<br>• Shutdown Recirc pumps (if running)<br>• Spray the DW |
| | | |
| | | |
| | ATC | • If directed to spray the Drywell, places BOTH Recirc pumps to PTL Off on panel 2H11-P602.<br>• Places the following DW cooling fans control switches in the OFF position.<br>• 2H11-P654:<br>• 2T47-B007B<br>• 2T47-B008B<br>• 2T47-B009B<br>• 2T47-B0010B<br>• 2T47-C001B<br>• 2T47-C002B |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 7 Page 16 of 25

**Event Description:** "A" FW line leak worsens in DW requiring shutdown.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • 2H11-P657:<br>  • 2T47-B007A<br>  • 2T47-B008A<br>  • 2T47-B009A<br>  • 2T47-B0010A<br>  • 2T47-C001A<br>  • 2T47-C002A |
| | | |
| | | |
| | ATC | • Sprays the Drywell using 34SO-E11-010-2 placard at P601 panel.<br>  • Places Cnmt Spray (A or B) Vlv Cntl switch in the MANUAL position.<br>  • Starts RHR pump(s) in loop A (B), if not already running.<br>  • Opens 2E11-F021A or B<br>  • Opens 2E11-F016A or B and establishes flow > 5000 gpm on 2E11-R608A or B.<br>  • When directed, closes 2E11-F016A or B<br>  • Closes 2E11-F021A or B<br>  • Notifies SRO that DW spraying the Drywell is complete |
| | | |
| | | |
| | SRO | • Directs $H_2/O_2$ Analyzers placed in service IAW 34SO-P33-001-2. |
| | | |
| | | |
| | ATC | • Places $H_2/O_2$ Analyzers in service IAW 34SO-P33-001-2<br>• Confirms closed 2P33 F605, Panel Inlet from Torus<br>• Places 2P33 S16, LOCA Override, $H_2/O_2$ Analyzer Outbd Isol Vlvs to Bypass<br>• Places 2P33 S17, LOCA Override, $H_2/O_2$ Analyzer Inbd Isol Vlvs to Bypass<br>• Confirms the $H_2/O_2$ Analyzer Running red light for the A & B train are illuminated<br>• If either train red light does not illuminate, depresses Channel A or Channel B Reset pushbuttons on 2H11-P700 panel.<br>• Confirms analyzers are running.<br>• Notifies SRO $H_2/O_2$ Analyzers are running. |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 8 Page 17 of 25

**Event Description:** 2N21-F006A fails to close requiring all Cond/FW isolated

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *The malfunction for this event was in at the beginning of the scenario (diN21-F006A Final Value of OPEN).* |
| | BOP | • Discovers "A" FW line break<br>• Notifies SRO of "A" FW line break and attempts to close 2N21-F006A, "A" FW Isolation valve on P603 panel<br>• Notifies SRO that 2N21-F006A will NOT close<br>• Closes 2N21-F110, S/U Level Control Bypass Vlv (Critical Task)<br>• Closes 2N21-F125, S/U Level Control Isol Vlv (Critical Task) |
| | | |
| | | |
| | BOP | • Once 2N21-F110 & 2N21-F125 are closed performs either:<br>  • Trips RFPTs<br>  • Lowers RFPT speed to minimum<br>  • Places all Condensate Booster pumps switches in Pull-To-Lock OFF<br>  • Shutdown all Condensate pumps except ONE. |
| | | |
| | | |
| | SRO | • Directs the BOP to:<br>  • Close 2N21-F006A<br>  • Close 2N21-F110<br>  • Close 2N21-F125 |
| | | |
| | | |
| | BOP | • Controls HPCI operation for level control by performing one or more of the following **IF** "A" FW Line break has **NOT** been discovered: |
| | | • Adjusts 2E41-R612, HPCI Flow Control, to desired injection rate<br>• Transfers 2E41-R612 controller to manual and adjust its speed demand output to obtain the desired pump flow<br>• Shutdown HPCI by:<br>  • Depresses and holds the HPCI Turbine Trip pushbutton<br>  • When HPCI turbine has stopped, places 2E41-C002-3, HPCI Aux Oil Pump, in Pull-To-Lock<br>  • When HPCI TURBINE BRG OIL PRESS LOW alarm is received, releases the HPCI Turbine Trip push-button. |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 8 Page 18 of 25

**Event Description:** 2N21-F006A fails to close requiring all Cond/FW isolated

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • 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>• May attempt to restart the CRD pumps<br>• May attempt maximize CRD flow IAW 34SO-C11-005-2<br>• Attempts to controls RWL with the RCIC System. Notifies SRO if RWL gets outside assigned band. |
| | | |
| | | |
| | BOP | • **ONCE** "A" FW Line break has been discovered shuts down HPCI by either:<br>  • If NOT running, places 2E41-C002-3, HPCI Aux Oil Pump, in Pull-To-Lock<br><br>  • If running:<br>  • Depresses and holds the HPCI Turbine Trip pushbutton<br>  • When HPCI turbine has stopped, places 2E41-C002-3, HPCI Aux Oil Pump, in Pull-To-Lock<br>  • When HPCI TURBINE BRG OIL PRESS LOW alarm is received, releases the HPCI Turbine Trip push-button. |
| | | |
| | | |
| | ALL | • Recognizes 4160 V Bus 2A & 2B are de-energized.<br>• Notifies SRO<br>• Directs SO/Maintenance to investigate. |
| | | |
| | | |
| | | *Simulator Operator, when notified, waits 10 minutes and reports, as Maintenance, that investigations are ongoing and the buses cannot be returned to service at this time.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 9 Page 19 of 25

**Event Description:** RCIC F013 stuck closed (Loss of High Pressure Feed)

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *The malfunction for this event was in at the beginning of the scenario (diE51-F013 Final Value of CLOSE) and rfE51_234 to BYPASS.* |
| | BOP | • Attempts to manually start RCIC:<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>  • Attempts to open 2E51-F013<br>  • Informs SRO of 2E51-F013 failure to open |
| | | |
| | | |
| | | **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<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>• Discovers "2B" LLS SRV did not close and is still open<br>• Notifies SRO and enters 34AB-B21-003-2, Failure of SRVs and performs the following:<br>  • Cycles switch several times<br>  • Resets LLS Logic by depressing LLS Channel A / C Reset pushbutton (2B21-S15A) and LLS Channel B / D Reset pushbutton (2B21-S15B)<br>  • Notifies SSS to pull fuses for 2B SRV<br>• Monitors RPV water level as it trends down.<br>• Informs the SRO of water level reaching –155." |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 9 Page 20 of 25

**Event Description:** RCIC F013 stuck closed (Loss of High Pressure Feed)

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | 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. |
| | | |
| | | |
| | 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. |
| | | |
| | | |
| | BOP | • Verifies / Opens RHR and Core Spray injection valves open once the Reactor Pressure Low 500 psig alarm illuminates.<br>• Verifies injection from Core Spray and RHR pumps 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 C/S and RHR per the SRO directions. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 9 Page 21 of 25

**Event Description:** RCIC F013 stuck closed (Loss of High Pressure Feed)

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | **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.:** 2011-301 **Scenario No.:** 6-03 **Event No.:** 9 Page 22 of 25

**Event Description:** RCIC F013 stuck closed (Loss of High Pressure Feed)

| 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 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.:** **6-03** **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

| | |
|---|---|
| Initiating Conditions: | Unit 2 is 67% RTP shutting down for an upcoming outage. |
| Turnover | Lower reactor power to remove 2A RFPT from service and leave rotating at approximately 1000 rpm. |

Summary:

- **Event 1**: Reactivity: The ATC will reduce reactor power via Recirc to achieve <7 mlbm/hr for 2A RFPT removal from service.
- **Event 2**: Normal; After reactor power is reduced, the BOP will remove the 2A RFPT from service and leave rotating at approximately 1000 rpm.
- **Event 3**: 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 restore system flow & pressure.
- **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. **(Critical Task)** ADS will be inop.
- **Event 5:** Component/TS; Small leak on the "A" FW line in the DW requiring the BOP to place SBGT in service to vent DW. DW Floor drain leakage will be above TS limits.
- **Event 6**: Component/TS; The operating train of SBGT will experience a Hi dP condition requiring the BOP to swap to the other SBGT train. SBGT will be declared inop.
- **Event 7:** Major; The "A" FW line break increases in the DW causing a High Drywell pressure scram.
- **Event 8:** 2N21-F006A fails to close requiring the BOP to close 2N21-F125 and F110, isolating all Condensate/Feedwater. **(Critical Task)** This is critical since the Condensate/Feedwater system has the potential to pump ~189,000 gallons of Hotwell/CST water to the DW and then to the Torus via the broken FW line.
- **Event 9:** Component; RCIC F045 stuck closed and with HPCI pumping out the "A" FW line a Loss of High pressure feed occurs. The ATC will OPEN 7 ADS valves prior to RWL reaching -185 inches. **(Critical Task)**

**Critical Tasks**

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** 6-03 **Op-Test No.:** 2011-301

Critical Tasks

- The ADS System will experience an inadvertent initiation which will require the ATC to place the ADS Inhibit switches to INHIBIT. **(Event 4)**
- 2N21-F006A fails to close requiring the BOP to close 2N21-F125 and F110, isolating all Condensate/Feedwater, which prevents a potential of pumping ~189,000 gallons of water out the FW break into the DW and then to the Torus. **(Event 8)**
- Emergency Depress with 7 ADS valves prior to RWL reaching -185 inches. **(Event 9)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 7 | 1. CRD pump trips due to low suction pressure instrument failure **(Event 3)**<br>2. ADS Inadvertent initiation **(Event 4)**<br>3. Small leak on "A" FW line in the DW **(Event 5)**<br>4. Hi dP & Low flow on SBGT train **(Event 6)**<br>5. "A" FW line break increases in DW **(Event 7)**<br>6. 2N21-F006A fails to close requiring all Cond/FW isolated **(Event 8)**<br>7. RCIC F045 stuck closed (Loss of all HP feed) **(Event 9)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. 2N21-F006A fails to close **(Event 8)**<br>2. RCIC F045 failed (Loss HP feed) **(Event 9)** |
| 3. | Abnormal Events | 2-4 | 4 | 1. CRD pump trips due to low suction pressure instrument failure **(Event 3)**<br>2. ADS Inadvertent initiation **(Event 4)**<br>3. Small leak "A" FW line in the DW **(Event 5)**<br>4. Hi dP & Low flow on SBGT train **(Event 6)** |
| 4. | Major Transients | 1-2 | 1 | 1. "A" FW line break increases in DW **(Event 7)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 2 | 1. RC EOP Flow Chart **(Event 5)**<br>2. PC EOP Flow Chart **(Event 5)** |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 1 | 1. CP EOP Flow Chart **(Event 9)** |
| 7. | Critical Tasks | 2-3 | 3 | 1. The ADS System will experience an inadvertent initiation which will require the ATC to place the ADS Inhibit switches to INHIBIT. **(Event 4)**<br>2. 2N21-F006A fails to close requiring the BOP to close 2N21-F125 and F110, isolating all Condensate/Feedwater. **(Event 8)**<br>3. Emergency Depress with 7 ADS valves prior to RWL reaching -185 inches. **(Event 9)** |

# SHIFT TURNOVER

## UNIT 1 STATUS

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

## UNIT 2 STATUS

| | |
|---|---|
| **Power**: | Unit 2 is 67% RTP shutting down for an upcoming outage. |
| **The following equipment is inoperable**: | None |
| **Scheduled evolutions**: | Lower reactor power to remove 2A RFPT from service and leave rotating at approximately 1000 rpm. |
| **Surveillances due this shift**: | None |
| **Active clearances**: | None |
| **Rod Configuration**: | See RWM |

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

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** 6-04 **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions**. Unit 2 is 95% RTP.

**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.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | N (BOP) | Restoration To Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2. |
| 2 | mfE51_65<br>loE51_F010G1<br>loE51_F010R2<br>mf60231261<br>aoE51-R604 | I (ATC)<br>TS (SRO) | RCIC Torus Level Sensor Fails High, Time Compression repair and re-alignment of RCIC back to CST. |
| 3<br>4 | aoN40R600<br>mf65111604<br>mf651116045 | C (BOP)<br>R (ATC) | UAT 2B Hi temp/lower power/remove from service |
| 5 | mfC32_90 | C (ATC) | FW Master Controller loses power/Time compression repair/return to service |
| 6 | mfR25_221 | C (BOP)<br>TS (SRO) | Essential Bus 2B breaker tripped open, return to service |
| 7 | mfN30_12<br>mf2C11_211<br>mfE51_109 | M (ALL) | Spurious Reactor scram/ATWS (Power/Level Control, insert control rods Critical Tasks)<br>RCIC fails to auto start on low RWL (Critical Task) |
| 8 | mfS22_270A<br>mfS22_270B | C (ATC) | Main Generator PCBs fail to open |
| 9 | svoN37225 | C (ATC) | Lowering pressure set to <845 psig Rx pressure with one bypass valve failure |
| | | | |

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

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 1 Page 2 of 29

**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 |
|---|---|---|
| 5 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, $H_2$ 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 $H_2$ Seal Oil Pump.<br>• Starts 2N42-C004, Main $H_2$ 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>  • 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.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 2 Page 3 of 29

**Event Description:** RCIC Torus Level Sensor Fails High, Time Compression repair and re-alignment of RCIC back to CST.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 20 Min | | *At the Chief Examiner's direction, Simulator operator **ENTERS**: (**RB-3**) mfE51_65*<br><br>*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,* |
| | All | • The following alarms occur:<br>• "TORUS LEVEL HIGH RCIC", (602-230)<br>• "RCIC VALVES MOTOR OVERLOAD" (602-309) alarms when 2E51-F010 closes. |
| | | |
| | | |
| | SRO | • Directs an operator to enter 34AR-602-230-2 and 34AR-602-309-2 |
| | | |
| | | |
| | ATC | • Enters 34AR-602-230-2<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>• May dispatch an SO to confirm local indication at valve<br>• Determines that Torus level is not high and is stable.<br>• Determines that RCIC should not have auto swapped to the torus.<br>• Notifies SRO that RCIC suction valve, 2E51-F010, has no light indication. |
| | | |
| | | |
| | ATC | • Enters 34AR-602-309-2<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) |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 2 Page 4 of 29

**Event Description:** RCIC Torus Level Sensor Fails High, Time Compression repair and re-alignment of RCIC back to CST.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | 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. |
| | | |
| | | |
| | | *Simulator Operator, If dispatched to ATTS panels, report all Torus level indicators are normal. Also, 3 minutes after Maint is sent to investigate, notify the control room that 2E51-LS-N062B has failed upscale.* |
| | ATC | • Notifies SRO that 2E51-LS-N662B 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-6 DELETES the following:*<br>*loE51-F010R2 and mf60231261.*<br>*As operator, notifies the control room that the breaker for 2E51-F010 has been reset.* |
| | ATC | • Confirms 2E51-F010 has traveled full closed.<br>• Informs SRO that 2E51-F010 is full closed.<br>• Alarm 602-309, 'RCIC VALVES MOTOR OVERLOAD' 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 602-230, 'TORUS LEVEL HIGH RCIC' clears. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 2 

**Event Description:** RCIC Torus Level Sensor Fails High, Time Compression repair and re-alignment of RCIC back to CST.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | SRO | • Directs Operator to align RCIC to the CST |
| | | |
| | | |
| | | |
| | | *Simulator operator ENSURE EVENT TRIGGER **ET-E51-5** modifies E51-R604 suction pressure to 28 psig and then deletes override.* |
| | ATC | • 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 SS 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.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 3 Page 6 of 29

**Event Description:** UAT 2B Hi temp requiring the removal from service.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Min | | ***Simulator Operator*** *At Lead Examiner's direction,* ***ACTIVATE: (RB-1)***<br>• ***mf65111604,*** *Unit Aux Xfmr "2B" Misc Alarm (Annunciator On)*<br>***THEN, 2 minutes later ACTIVATE: (RB-2)***<br>• ***mf65111605,*** *Unit Aux Xfmr "2B" Winding Temp High (Annunciator On)* |
| | ALL | 651-116, "UNIT AUX XMFR 2B MISC ALARM", annunciates<br>Two minutes later, 651-117, "UNIT AUX XMFR 2B Winding Temp High", annunciates. |
| | BOP | • Responds to alarm "UNIT AUX XMFR 2B MISC ALARM", 651-116<br>• Notifies GCC of the alarm.<br>• Dispatches an operator to check the transformer local panel in the Low Voltage Switchyard, 2H21-P214.<br>• Responds to alarm "UNIT AUX XMFR 2B Winding Temp High", 651-117<br>• Notifies the SRO that per the ARPs Rx Power will need to be reduced if the winding temperature is increasing and to Transfer the loads to Startup Transformer (SUT) 2C, if the oil temperature is high. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 3 

**Event Description:** UAT 2B Hi temp requiring the removal from service.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | ***Simulator Operator***<br>• *Call the control room as the operator dispatched to the Unit 2B UAT and report that the 2B UAT oil temperature is 91°C and that the winding temperature is 106°C and slowly increasing.*<br>• *DO NOT PROMPT TO TRANSFER LOADS*<br>• *If more updates of temperature are required, increase temps 1°C EACH UPDATE, until load is reduced.*<br>• *When load is reduced temps will stabilize above the setpoints*<br>• *When the UAT is unloaded, temps will slowly decrease* |
| | | |
| | SRO | • Directs BOP operator to enter 34SO-R22-001-2 for transferring 4160VAC buses from Unit Aux Transformer (UAT) 2B to Start-Up transformer (SUT) 2C |
| | | |
| | | |
| | BOP | • Enters 34SO-R22-001-2<br>• Reviews the precautions and limitations section or the caution at step 7.3.6 of the procedure and determines that reactor power must be lowered to <2558 MWth.<br>• Notifies the SRO of the required power reduction |
| | | |
| | | |
| | SRO | • Directs the ATC to lower Rx power to (≈)2550 MWth |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 3 Page 8 of 29

**Event Description:** UAT 2B Hi temp requiring the removal from service.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | ***NOTE TO EXAMINERS:***<br>*The power reduction is performed in Event 4, then return here to complete this event.* |
| | SRO | • After Rx power has been reduced, orders the BOP operator to transfer 4160VAC buses 2A and 2B to the SUT 2C. |
| | | |
| | | |
| | BOP | Swapping of 2A 4160VAC from the UAT to the SUT<br><br>• Verifies reactor power ≤ 2558 MWth<br>• Confirms power is available to Startup Aux XFmr 2C as indicated by the potential lights on panel 2H11-P651<br>• Confirms OPEN ACBs 135544, 135564 and 135584 (2H11-P652) |
| | BOP | • Places 135434/135454 Station Svc Interlock Cutout switch in OFF-(DOWN)<br>• Places Sync Switch (SSW) ACB 135454 in ON<br>• Confirms the sources of power to 4160V Bus 2A are synchronized and voltage is normal on Start-Up Aux Transformer 2C |
| | | |
| | | |
| | BOP | • Closes ACB 135454, 4160V Bus 2A Alternate Supply, AND confirms that current increases from Startup Auxiliary Transformer 2C<br>• Trips ACB 135434, 4160V Bus 2A Normal Supply<br>• Places Sync Switch (SSW) ACB 135454 in OFF<br>• Places 135434/135454 Station Svc Interlock Cutout switch in NORMAL-(UP) |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 3 

**Event Description:** UAT 2B Hi temp requiring the removal from service.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | Swapping of 2B 4160VAC from the UAT to the SUT<br>• Verifies reactor power < 2558 MWth<br>• Confirms power is available to Startup Aux XFmr 2C as indicated by the potential lights on panel 2H11-P651<br>• Confirms OPEN ACBs 135544, 135564 and 135584 (2H11-P652) |
| | | • Places 135444/135464 Station Svc Interlock Cutout switch in OFF-(DOWN)<br>• Places Sync Switch (SSW) ACB 135464 in ON<br>• Confirms the sources of power to 4160V Bus 2B are synchronized and voltage is normal on Start-Up Aux Transformer 2C |
| | | • Closes ACB 135464, 4160V Bus 2B Alternate Supply, AND confirms that current increases from Startup Auxiliary Transformer 2C<br>• Trips ACB 135444, 4160V Bus 2B Normal Supply<br>• Places Sync Switch (SSW) ACB 135464 in OFF<br>• Places 135444/135464 Station Svc Interlock Cutout switch in NORMAL-(UP)<br>• Notifies the SRO that 4160 VAC 2A and 2B buses have been transferred from the UAT to SUT 2C. |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, PROCEEDS to the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 4 Page 10 of 29

**Event Description:** Reduce Reactor power to ~ 2550 MWth to remove UAT 2B from service.

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***NOTE:*** *This reactivity change will occur as a result of the need to reduce power to place the 2A and 2B 4160VAC buses on SAT 2C (Event 3).* |
| | | ***NOTE:***<br>*The SRO may direct the operator to exceed 10MWe/min.*<br>*It is allowable to enter the immediate exit region for protecting equipment, but in this particular event the power reduction should be completed prior to entering the immediate exit region.* |
| | ATC | • Reduces Rx power to <2558 MWth using Recirc per SRO direction in event #3 (approx 90% power).<br>• Enters the following procedures<br>• 34GO-OPS-005-2, "Power Changes"<br>• 34SO-B31-001-2, "Recirculation System" |
| | ATC | • Depresses either the Master Recirc Flow Control Lower Fast/Medium/Lower Slow pushbuttons or the individual pump Speed Control Lower Fast/Medium/Lower Slow pushbuttons.<br>• Monitors power decrease by observing APRM and generator output indications.<br>• Monitors the Power to Flow map to determine if the Immediate Exit Region is entered.<br>• Notifies the SRO of the proximity to the Immediate Exit region. |
| | | |
| | | |
| | | ***NOTE:*** *When Reactor power has been reduced to <2558 MWth return to Event 3 for removing loads from 2B UAT.* |
| | SRO | • If the plant is in the Immediate Exit Region, then:<br>• Conducts a rod movement briefing.<br>• Directs the ATC operator to insert control rods to exit the Immediate Exit Region. |
| | | |
| | | |
| | ATC | • Attends the rod movement briefing.<br>• Inserts control rods to exit the Immediate Exit Region IAW 34GO-OPS-065-2. |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, PROCEEDS to the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 5 Page 11 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 23 Mins | | ***Simulator Operator**, at direction of the Chief Examiner, ACTIVATE: **(RB-4)** malfunction mfC32_90.* |
| | ATC | • Enters 603-132, Feedwater Control System Trouble<br>  • Determines the alarm source by scanning narrow range RWL, feedwater flow, steam flow indications AND RFPT/RWL controllers on 2H11-P603.<br>  • Places Reactor Level Mode Select Switch to MAN position.<br>  • May toggle PF1 button on appropriate controller to ILLUMINATE PF4 light AND reset annunciator. (This action will remove all annunciator inputs from this controller). |
| | | |
| | | |
| | | ***Simulator Operator***<br><br>• *When contacted, as I & C, 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-4)***<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. |
| | | |
| | | |
| | ATC | • 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 |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 5 Page 12 of 29

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

| Time | 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. |
| | | |
| | | |
| | 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 |
| | | |
| | | |
| | 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. |
| | | |
| | | |
| | | *Simulator Operator, at the Chief Examiner's request, PROCEEDS to the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 6 

**Event Description:** Essential Bus 2B, breaker tripped open, return to service

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 20 Mins | | ***Simulator Operator**, at direction of the lead examiner, ACTIVATE: **(RB-5)** malfunction mfR25_221.* |
| | ALL | Various alarms indicating Essential Bus 2B has lost power. |
| | | |
| | | |
| | SRO | Directs BOP to enter 34AB-R24-001-2, Loss Of Essential AC Distribution Buses, for loss of Essential Bus 2B. |
| | | |
| | | |
| | BOP | • Enters 34AB-R24-001-2 & 34AB-R25-002-2, Loss of Instrument Buses.<br>• Confirms 600 V 2D is energized by potential lights illuminated at 2H11-P652.<br>• Dispatches SO/Maintenance to confirm close Essential Cabinet 2B (2R25-S037) Frame 7M Feeder Breaker at 600 Volt Bus 2D Control Panel 2H21-P246. |
| | | |
| | | |
| | SRO | Addresses TS 3.8.7, Distribution Systems – Operating and determines that Condition C exists and Essential Bus 2B must be returned to service in 8 hours.<br><br>When the Simulator Operator reports on local actions, directs the BOP to restore Essential Bus 2B and Instrument Bus 2B. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 6 Page 14 of 29

**Event Description:** Essential Bus 2B, breaker tripped open, return to service

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***Simulator Operator, Once Tech Specs have been addressed, Call*** *the control room, as a Systems Operator, and report that a Nuclear Technician was mopping the floor in 600 V Bus 2D room and had accidentally bumped a switch on Panel 2H21-P246. All other switches are in their Normal position.*<br><br>*When asked to reclose Frame 7M Feeder Breaker, DELETE* ***(RB-5)*** *malfunction mfR25_221.*<br><br>*If asked to check the breakers in Essential cabinet 2B, report all breakers are closed.*<br><br>***NOTE:*** *The following steps may be performed out of order, AFTER placing Group Isolation Reset Switch to the Group 1 and Group 2/5 positions, on P601.* |
| | BOP | Once Essential Bus 2B and Instrument Bus 2B are energized, restores Instrument Bus 2B loads, continues at step 4.7 and performs the following: |
| | | • Following confirmation of any group isolation(s), RESET isolation(s) by placing Group Isolation Reset Switch to the Group 1 and Group 2/5 positions, on P601.<br>• Opens the following Fission Product Monitoring isolation valves, panel P700:<br>  • 2D11-F052<br>  • 2D11-F053<br>  • 2D11-F072<br>• Opens 2B31-F020, Rx Wtr Sample Otbd Isol AOV, on P602. |
| | | |
| | | |
| | | ***IT IS NOT INTENDED FOR THE CREW TO RESTORE ALL OF THE LOADS ASSOCIATED WITH INSTRUMENT BUS 2B,*** *therefore, at the Chief Examiner's direction AND BEFORE operator addresses restarting Secondary Containment Ventilation, Simulator operator PROCEEDS to the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 6 

**Event Description:** Essential Bus 2B, breaker tripped open, return to service

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • Resets and return Rx Bldg. Ventilation to normal per 34SO-T41-005-2.<br>• Resets and return R/F Ventilation to normal per 34SO-T41-006-2<br>• Secures Standby Gas Treatment System and place in standby per 34SO-T46-001-2.<br>• Restores Drywell Equipment and Floor Drain Sumps per 34SO-G11-009-2.<br>• Returns Steam Packing Exhauster to service per 34SO-N33-001-2.<br>• Notifies Unit 1 NPO to restore Control Room ventilation to the desired mode of operation per 34SO-Z41-001-1.<br>• At SRO direction returns Rx Water Level Control to 3 element control per 34AR-603-132-2, Feedwater Control System Trouble.<br>• Restores the Drywell Cooling Fans to normal alignment per 34SO-T47-001-2. |
| | | |
| | | |
| | | ***IT IS NOT INTENDED FOR THE CREW TO RESTORE ALL OF THE LOADS ASSOCIATED WITH INSTRUMENT BUS 2B,*** *therefore, at the Chief Examiner's direction AND BEFORE operator addresses restarting Secondary Containment Ventilation, Simulator operator PROCEEDS to the next event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 Page 16 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***Simulator Operator**, at direction of the lead examiner, ACTIVATE: **(RB-6)** malfunction mfC71_59 and svoN37225.* |
| | SRO | Directs ATC to scram the reactor<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:<br>  • Confirm the reactor Mode Switch in Shutdown.<br>  • Confirm ARI Initiation.<br>  • Confirm Recirc runback to minimum/tripped. |
| | | |
| | | |
| | ATC (Placard) | • 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 SS that all rods are NOT fully inserted (ATWS).<br>• Inserts IRMs and SRMs.<br>• May inject SBLC depending on RWL/power level (if power is above 5%, the ATC is directed to inject SBLC IAW the RC-1 placard).<br>• Places SDV Isol Vlv Switch to “ISOL” and verifies closed.<br>• If not tripped, places Recirc to minimum speed. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 Page 17 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | 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 started and discharge pressure is increasing.<br>  • Confirms closed 2G31-F004 (RWCU Isolation Valve).<br>  • Reports to SRO SBLC is injecting from control room. |
| | | |
| | | |
| | ATC | • Reports to the SRO that:<br>  • The Reactor Mode Switch is in the Shutdown position.<br>  • ARI has been initiated (ATC may initiate ARI at this time).<br>  • Recirc is at minimum speed (if power is above 5%, the ATC is directed to trip Recirc IAW the RC-1 placard). |
| | | |
| | | |
| | 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><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 |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 Page 18 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | 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. |
| | | |
| | | |
| | ATC/STA | • Reports power level to the SRO. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 Page 19 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***NOTE:*** The SRO may proceed down the "power" or "level path first. *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 and before entering the unsafe region of the Heat Capacity Temperature Limit graph).* |
| | | |
| | | |
| | | ***Continuous Recheck: Simulator Operator, when the following conditions exist:***<br>***Scram is RESET,***<br>***RWL is controlled between -60 and -90 inches,***<br>***At least one loop of RHR is in Torus Cooling,***<br>***AND WITH CHIEF EXAMINERS DIRECTION,***<br>***DELETES mfC11_211.*** |
| | 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.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 Page 20 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | ***NOTE:*** *If mfC11_211 has NOT been deleted, then the operator will perform the following step multiple times. Check with Chief Examiner for DELETING this malfunction.* |
| | ATC | • When one of the following alarms clears, inserts a manual scram:<br>  • 603-101, "Scram Disch Vol High Level Trip"<br>  • 603-119, "Scram Disch Vol Not Drained"<br>• Notifies SRO that all rods are IN |
| | | |
| | | |
| | SRO | • Directs an operator to "INHIBIT ADS"<br>• Directs BOP or SSS to have MSIV closure on low RPV level overridden.<br>• Directs BOP to override 2P41-F316 isolation. |
| | | |
| | | |
| | ATC/BOP | • 2H11-P602, Places the following switches to INHIBIT:<br>  • ADS Channel A / C Auto Logic Inhibit switch (2B21C-S7A)<br>  • ADS Channel B / D Auto Logic Inhibit switch (2B21C-S7B)<br>• Places override switches for 2P41-F316 in the override switches to "Override." |
| | | |
| | | |
| | SRO | If water level is above -60" and power above 5% when the SRO addresses CP-3, directs the BOP to lower water level to maintain -90" to -60" using 31EO-EOP-113-2.<br><br>Directs STA to verify Isolations and ECCS initiations. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 Page 21 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • Reduces injection to control RWL -60 inches to -90 inches with Table 13 systems:<br><br>• Lowers Feedwater flow as necessary to achieve a lowering RWL trend.<br>• If HCPI was manually started, the operator will reduce controller output to lower RWL.<br>• If HCPI was in standby, places 2E41-C002-3, HPCI Aux. Oil Pump, in PULL-TO-LOCK. |
| | | |
| | | |
| | SRO | • If further reduction in RPV level is needed, Directs the BOP operator to control RPV level between -185" and -60" using Table 13 systems. Any band between –60 inches and –185 inches is acceptable.<br><br>(Typically –60" to –100" to maintain RPV level above –101")<br><br>• If RWL is subsequently allowed to increase to >-60 inches and Rx power is >5%, the override will be re-addressed to once again, lowering level to between -90" and -60". |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 Page 22 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | **NOTE:** Performing ONE or MORE of the following using Feedwater, HPCI or RCIC, will meet the Critical Task: (Critical Task is to Maintain RWL above -185 inches). |
| | BOP | • Use Feedwater system to control RPV water level in the assigned band. (Critical Task – Maintain RWL above -185 inches)<br>• Verify/Place RFPT controllers in Manual<br>• Raise RFPT speed to increase pressure to above RPV pressure<br>• Verify/Place the Startup Level Control Valve in Manual<br>• Open/Verify open 2N21-F125<br>• Throttle open 2N21-F111 (SULCV) OR<br>• Throttle open 2N21-F110<br>• If HPCI injection is attempted the operator: (Critical Task – Maintain RWL above -185 inches)<br>• Opens 2E41-F059, Lube Oil Clg Wtr Valve.<br>• Starts 2E41-C002-2, Barom Cndsr Vacuum Pump.<br>• Opens 2E41-F001, Turb Steam Supply Valve.<br>• Take 2E41-C002-3, Aux Oil Pump, control switch to the START position.<br>• Open 2E41-F006, Pump Discharge Valve.<br>• Confirm 2E41-F012, Min Flow Valve, CLOSES at flow > 790 gpm. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 Page 23 of 29

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | **NOTE:** RCIC has failed to auto start. |
| | BOP | • IF RCIC injection is attempted and RCIC is **NOT** tripped: (Critical Task – Maintain RWL above -185 inches)<br>  • Depresses RCIC Manual Initiation P/B<br>  • Confirms open 2E51-F046<br>  • Confirms Barom Cndsr Vac Pump starts<br>  • Confirms open 2E51-F045<br>  • Confirms open 2E51-F019<br>  • Confirms closed 2E51-F019 at flow > 79.3 gpm<br>  • Confirms open 2E51-F013<br>  • Adjusts controller for desired flow<br><br>• IF RCIC injection is attempted **AND** RCIC was manually tripped: (Critical Task – Maintain RWL above -185 inches)<br>  • Transfers 2E51-R612, Turbine Controller, to manual and adjust output to 50%.<br>  • Closes 2E51-F524, Trip & Throttle Valve.<br>  • Opens 2E51-F045, Stm to Turb Valve.<br>  • Opens 2E51-F046, Turb Clg Water Valve.<br>  • Starts 2E51-C002-2, Barom Cndsr Vac Pump.<br>  • Throttle opens 2E51-F524, Trip & Throttle Valve, AND concurrently opens 2E51-F013, Pump Discharge Valve<br>  • Confirms 2E51-F019, Min Flow Valve, Opens, AND subsequently closes, when system flow is > 79.3 gpm.<br>  • Continues to throttle 2E51-F524 Open, until turbine speed is limited by 2E51-R612, Turbine Controller, then:<br>  • Fully opens 2E51-F524, Trip & Throttle Valve.<br>  • Increases 2E51-R612, Turbine Controller, output to achieve 3000 to 4000 rpm.<br>  • Transfers 2E51-R612, Turbine Controller, to auto and adjust to desired flow rate. |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 7 

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

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | SRO | IF the following conditions exist:<br>• Reactor power >5%.<br>• RWL above TAF.<br>• Torus temperature is in the safe region of the BIIT curve.<br>• SRVs are open.<br><br>Then Addresses the override located at coordinate C2 on EOP Flowchart CP-3 to Terminate and Prevent injection to the RPV. |
| | | • Determines that RPV level can be maintained above -185 inches.<br>• Arrives at "Wait Until" (CP-3 at F-7) for Hot Shutdown Boron Weight. |
| | | |
| | | |
| | | |
| | | ***Simulator Operator***<br><br>*The malfunction for the next event is already inserted.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 8 

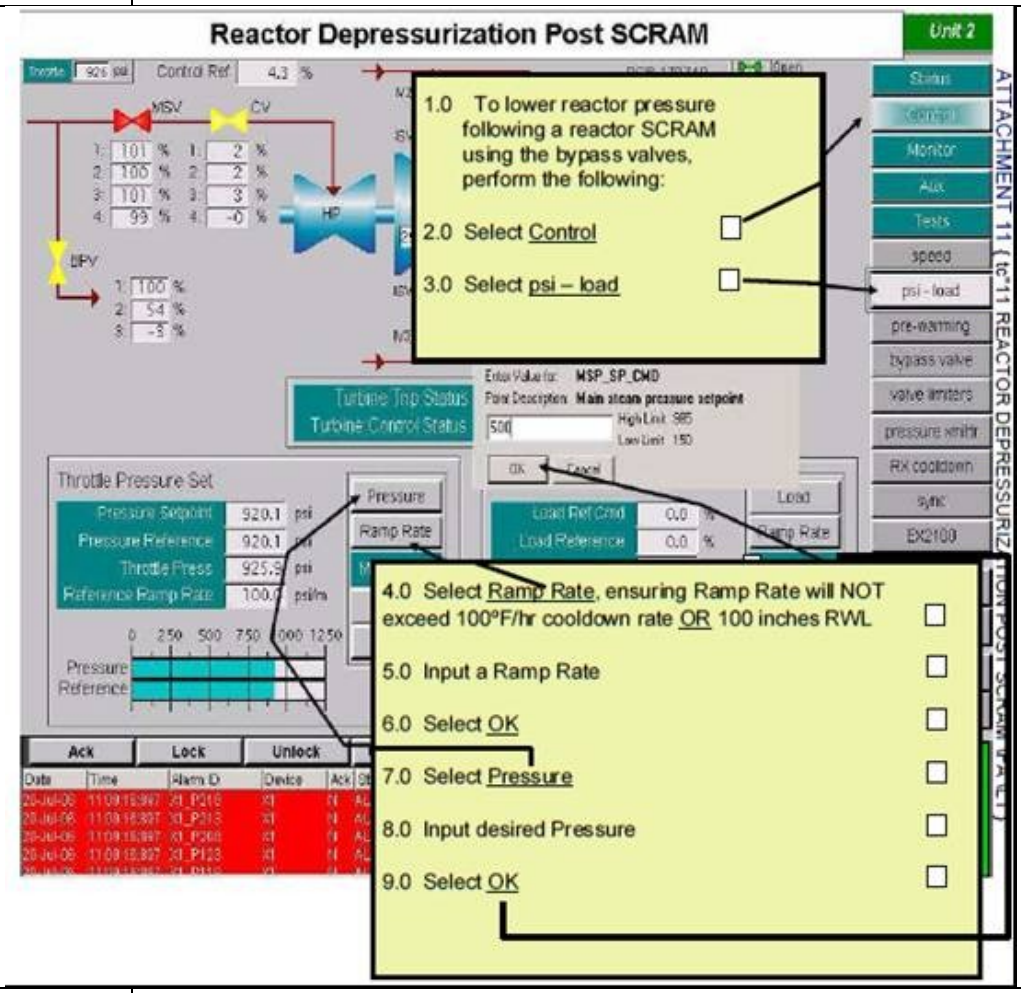
**Event Description:** Main Generator PCBs fail to open.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***Simulator Operator;*** *ENSURE malfunctions mfS22_270A and mfS22_270B are already inserted. They were inserted from the beginning.* |
| | 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 exciter field breaker tripped.<br><br>• Determines that the PCBs did NOT Open.<br>• Manually Opens PCB 179740<br>• Manually Opens PCB 179750<br><br>• Confirm the 4160 VAC station service busses have transferred to their alternate supply.<br>• Confirm/Place TGM in auto.<br>  ○ Start TG Oil Pump<br>  ○ Motor Suction Pump<br>  ○ Lift Pumps<br>• Confirm Steam Seal & Condenser Vacuum systems proper operation.<br>• Close the RSSV's (2N11-F004A and F004B).<br>• Notifies the SRO that TC-1 is complete and that the Main Generator Output PCBs had to be opened manually. |
| | | |
| | | |
| | | |
| | | ***Simulator Operator***<br><br>*The malfunction for the next event is already inserted.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-04 **Event No.:** 9 Page 26 of 29

**Event Description:** Lowering pressure set to <845 psig Rx pressure with one bypass valve failure.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***Simulator Operator:*** *Ensure svoN37225 to a Final value of "0" is already inserted. It was inserted from the beginning.* |
| | SRO | • Directs the BOP operator to lower reactor pressure to <845 psig. |
| | BOP | • Lowers the pressure setpoint to <845 psig using the DEHC system as described on the following graphic.<br>• Notifies the SRO that Bypass valve #1 did NOT open.<br>• Notifies the SRO that Pressure set has been reduced to <845 psig. |




| | | |
|---|---|---|
| | | ***Simulator:*** *Operator, with Chief Examiner's permission, the Scenario will be stopped when:*<br>• *Control rods are inserted,*<br>• *SRO transitions to RC,*<br>• *SBLC injection terminated*<br>• *SRO assigns a new water level band of +3' to +50".* |

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

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** **6-04** **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

| | |
|---|---|
| Initiating Conditions: | Unit 2 is 95% RTP. |
| Turnover | Return MSOP to service; remove ESOP IAW 34SO-N42-001-2. |

Summary:

- **Event 1**: Normal: The BOP will return Hydrogen Seal Oil to a Normal lineup IAW the system operating procedure.
- **Event 2**: Instrument/TS; RCIC Torus Level Sensor Fails High, Time Compression repair and re-alignment of RCIC back to CST.
- **Event 3/4:** Component/Reactivity; After the MSOP is in service, UAT 2B will experience a Hi temperature requiring the removal from service. The ATC will lower Reactor power in order to remove the UAT from service. Once power is <2558 MWt, the BOP will remove the UAT from service.
- **Event 5:** Component; The FW Master Controller will lose power causing the 2A RFPT M/A Station to assume automatic control while 2B RFPT M/A Station will default to manual. Time compression for repair and then the ATC will return Master Controller to service.
- **Event 6**: Component/TS; Essential Bus 2B supply breaker will trip open de-energizing Essential Bus 2B and subsequent loads. Once investigated the breaker will be reclosed and the BOP will return loads to service.
- **Event 7:** Major; A Spurious Turbine trip will cause a Reactor scram and subsequent ATWS. The SRO will direct the BOP to perform Power/Level Control to reduce the likelihood of oscillations **(Critical Task)** AND the ATC to insert control rods. **(Critical Task)** RWL will be maintained >-185" using manual actions of HPCI, RCIC & Feedwater Systems. **(Critical Task)**
- **Event 8:** Main Generator PCBs fail to open which requires manual open.
- **Event 9:** Component; One bypass valve fails when the ATC lowers pressure set to reduce Rx pressure to <845 psig.

**Critical Tasks**

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** **6-04** **Op-Test No.:** 2011-301

Critical Tasks

- The BOP will perform Power/Level Control to reduce the likelihood of oscillations. **(Event 7)**
- The ATC inserts control rods. **(Event 7)**
- Maintains RWL >-185" using Feedwater, HPCI or RCIC (Manual actions required). **(Event 9)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 7 | 1. RCIC Torus level sensor **(Event 2)**<br>2. UAT 2B Hi temp **(Event 3)**<br>3. FW Master Controller loses power **(Event 5)**<br>4. Essential Bus 2B breaker tripped open **(Event 6)**<br>5. Spurious Reactor Scram **(Event 7)**<br>6. Main Generator PCBs fail to open **(Event 8)**<br>7. One bypass valve failure **(Event 9)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. Main Generator PCBs fail to open **(Event 8)**<br>2. One bypass valve failure **(Event 9)** |
| 3. | Abnormal Events | 2-4 | 4 | 1. RCIC Torus level sensor **(Event 2)**<br>2. UAT 2B Hi temp **(Event 3)**<br>3. FW Master Controller loses power **(Event 5)**<br>4. Essential Bus 2B, breaker tripped open **(Event 6)** |
| 4. | Major Transients | 1-2 | 1 | 1. Spurious Reactor Scram/ATWS **(Event 7)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 1 | 1. RCA EOP **(Event 7)**<br>2. PC EOP **(Event 7)** |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 1 | 1. CP-3 EOP **(Event 7)** |
| 7. | Critical Tasks | 2-3 | 3 | 1. Power/Level Control **(Event 7)**<br>2. ATC inserts control rods **(Event 7)**<br>3. Maintains RWL >-185" **(Event 9)** |

# SHIFT TURNOVER

## UNIT 1 STATUS

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

## UNIT 2 STATUS

| | |
|---|---|
| **Power**: | Unit 2 is 95% RTP. |
| **The following equipment is inoperable**: | NONE |
| **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. |
| **Surveillances due this shift**: | None |
| **Active clearances**: | None |
| **Rod Configuration**: | See RWM |

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

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** **6-05** **Op-Test No.:** **2011-301**

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

_____ _____ **RO**

_____ _____ **BOP**

**Initial Conditions**. Unit 2 is 65% RTP.

**Turnover:** Torus water level has just been lowered to 147.5" using RHR pump "2B". Return RHR B Loop to Standby IAW 34SO-E11-010-2, RHR System, starting at step 7.4.5.2.12 and then Attachment 1. Increase power via Recirc to 70% in preparation of starting the third Condensate and Booster pump.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | R (ATC) | Raise Reactor power to 70%. |
| 2 | N/A | N (BOP) | Return RHR Loop "2B" to Standby. |
| 3 | mfN21_88B | I (ATC) | 2B RFPT Cooling water controller failure. TC repair & return to auto |
| 4 | mf65702193<br>mf65702230 | C (BOP)<br>TS (SRO) | RCIC NW Diagonal Instrument sump Hi & Hi-Hi-Hi alarms; RCIC B004A CLR PSW leak requires swapping to Standby cooler. |
| 5 | mfE41_103 | C (ATC)<br>TS (SRO) | HPCI Inadvertent Initiation (Critical Task) |
| 6 | mfC71_57B | C (BOP)<br>TS (SRO) | Degraded RPS 2B MG Set requiring 2B RPS to be transferred to Alternate |
| 7 | mfS11_161 | M (ALL) | Loss of Offsite Power, All emergency buses initially de-energized, RCIC fails to operate |
| 8 | mfR43_62A<br>mfR43_239C<br>mfR43_49B | C (ATC) | 2A EDG will tie after manually started,1B EDG will not operate & 2C EDG fails to auto tie (Critical Task to energize at least one emergency bus) |
| 9 | mfE41_106 | C (BOP) | HPCI flow controller output fails low requiring manual increase to obtain injection (Critical Task) |
| | | | |

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

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 1 Page 2 of 28

**Event Description:** Raise Reactor power to 70%

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 10 Mins | | *At Chief Examiner's request, Events 1 and 2 can be performed concurrently, since the ATC will be at the P603 panel and the BOP will be at P654 panel.* |
| | SRO | Directs ATC to increase reactor power to 70% by increasing Recirc flow. Power increases should be made as recommended by the STA/Reactor Engineering at a rate not to exceed 10 MWe/min. |
| | | |
| | | |
| | STA | Recommends to increase to 70% power via Recirc not to exceed 10 MWe/min. |
| | | |
| | | |
| | ATC | • Increases reactor power with Recirc flow IAW 34GO-OPS-005-2 and 34SO-B31-001-2 by depressing either the Master Recirc Flow Control raise pushbuttons or the individual pump Speed Control raise pushbuttons.<br>• Monitors power increase by observing APRM and generator output indications. |
| | | |
| | | |
| | ATC | • Complies with 34SO-B31-001-2 , Limitation 5.2.15, which states:<br><br>WHEN changing Recirc pumps speed while in Two Loop operation maintain pump speeds to limit recirculation loop jet pump mismatch within the following limits:<br><br>• <10% of rated core flow (7.7 E6 lbm/hr) WHEN operating < 70% of rated core flow;<br>AND<br>• <5% of rated core flow (3.85 E6 lbm/hr) WHEN operating at > 70% of rated core flow. |
| | | |
| | | |
| | | *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>*May also get Alarm 650-135, "Heater Trouble" alarm. This is expected at this power level.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 2 Page 3 of 28

**Event Description:** Return RHR Loop "2B" to Standby IAW 34SO-E11-010-2 step 7.4.5.2.12 and then Attachment 1.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Mins | | *At Chief Examiner's request, Events 1 and 2 can be performed concurrently, since the ATC will be at the P603 panel and the BOP will be at P602 & P601 panels.* |
| | SRO | • Directs the operator to return RHR Loop 2B to Standby. |
| | | |
| | | |
| | BOP | • Enters 34SO-E11-010-2, Section 7.4.5 at step 7.4.5.2.12:<br>• Stops RHR Pump 2B.<br>• The following alarms clear:<br>• 601-222, RHR Flow Low<br>• 602-312, Auto Blowdown CS or RHR Press Permissive<br>• Closes 2E11-F049, RHR to Radwaste Valve.<br>• Opens 2E11-F003B, Hx Outlet Vlv.<br>• Opens 2E11-F047B, Hx Inlet Vlv.<br>• Enters section 7.1, STANDBY, of same procedure. |
| | | |
| | | |
| | | **NOTE:** Step 7.1.1 is already signed-off. Att. 1 is used for Independent Verification and once the operator completes the "CHECKED" part, the SSS will be notified to finish. |
| | BOP | • Enters section 7.1 and Att. 1 and performs the following steps:<br>• 7.1.2 Confirms open 2E11-F065B, Torus Suction Vlv<br>• 7.1.3 Confirms open2E11-F065D, Torus Suction Vlv<br>• 7.1.4 Confirms open 2E11-F060B, RHR Injection Vlv<br>• 7.1.5 Confirms closed 2E11-F068B, Hx B Disch Vlv<br>• 7.1.6 Confirms the LOCA Seal In Reset light is extinguished<br>• 7.1.7 Confirms that the 2E11-F053B, Solenoid Control Switch, is in the closed position<br>• 7.1.8 Confirms 2E11-S18B, Cnmt Spray Vlv Cntl 2/3 Core Ht Permis control switch, is in the OFF position<br>• 7.1.9 Confirms 2E11-S19B, RHR System B Service Water Pump control switch, is in the AUTO position |
| | | |
| | | |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 2 Page 4 of 28

**Event Description:** Return RHR Loop "2B" to Standby IAW 34SO-E11-010-2 step 7.4.5.2.12 and then Attachment 1.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • 7.1.10 Confirms open 2E11-F017B, RHR Outbd Inj Vlv<br>• 7.1.11 Confirms closed 2E11-F015B, RHR Inbd Inj Vlv<br>• 7.1.12 Confirms open 2E11-F007B, Min Flow Vlv<br>• 7.1.13 Confirms closed 2E11-F016B, Cnmt Spray Outbd Vlv<br>• 7.1.14 Confirms closed 2E11-F021B, Cnmt Spray Inbd Vlv<br>• 7.1.15 Confirms open 2E11-F047B, Hx Inlet Vlv<br>• 7.1.16 Confirms open 2E11-F003B, Hx Outlet Vlv<br>• 7.1.17 Confirms open 2E11-F048B, Hx Bypass Vlv<br>• 7.1.19 Confirms closed 2E11-F028B, Torus Spray OR Test Vlv<br>• 7.1.20 Confirms closed 2E11-F027B, Torus Spray Vlv |
| | | |
| | | |
| | | **NOTE:** Step 7.1.23 is already signed-off. |
| | BOP | • 7.1.21 Confirms closed 2E11-F024B, Full Flow Test Line Vlv<br>• 7.1.22 Confirms 2E11-S17B, Containment Spray Vlv Control switch, is RESET, by observing the green reset flag on the control switch<br>• 7.1.24 Confirms closed 2E11-F011B, RHR Hx To Torus Vlv<br>• 7.1.25 Confirms closed 2E11-F073B, RHRSW Crosstie Vlv<br>• 7.1.26 Confirms closed 2E11-F122B, Check Vlv 2E11-F050B Bypass Vlv |
| | | |
| | | |
| | BOP | • 7.1.27 Confirms open 2E11-F004B, Torus Suction Vlv<br>• 7.1.28 Confirms closed 2E11-F006B, Shutdown Cooling Vlv<br>• 7.1.29 Confirms open 2E11-F004D, Torus Suction Vlv<br>• 7.1.30 Confirms closed 2E11-F006D, Shutdown Cooling Vlv<br>• 7.1.31 Confirms closed 2E11-F103B, Hx Vent Vlv<br>• 7.1.32 Confirms closed 2E11-F104B, Hx Vent Vlv<br>• 7.1.33 Confirms closed 2E11-F119B, Serv Wtr Crosstie Vlv<br>• 7.1.34 Confirms closed 2E11-F040, RHR To Radwaste Vlv (B Loop only) |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 2 Page 5 of 28

**Event Description:** Return RHR Loop "2B" to Standby IAW 34SO-E11-010-2 step 7.4.5.2.12 and then Attachment 1.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | | **NOTE:** Step 7.1.35, 7.1.38 & 7.1.41 are already signed-off. |
| | BOP | • 7.1.36 Confirms closed 2E11-F009, SDC Suction Vlv<br>• 7.1.37 Confirms closed 2E11-F049, RHR To Radwaste Vlv (B Loop only)<br>• 7.1.39 Confirms closed 2E11-F008, SDC Suction Vlv<br>• 7.1.40 Confirms closed 2E11-F075B, RHRSW To RHR Crosstie Vlv<br>• 7.1.42 Confirms RHR LOOP B JOCKEY PUMP SYS WATER LEVEL LOW, 601-219 annunciator is clear<br>• 7.1.43 Confirms 2E11-F068B, Interlock Override Vlv keylock switch is in the normal position AND the white override light is extinguished<br>• 7.1.44 Resets SEC Coolers per 34SO-T41-001-2. |
| | | |
| | | |
| | BOP | • IAW 34SO-T41-001-2,<br>  • Momentarily depresses Safeguard Equip Cooling Sys A Fans Reset, panel 2H11-P657<br>  • Momentarily depresses Safeguard Equip Cooling Sys B Fans Reset, panel 2H11-P654<br>  • Alarm 650-234, SEC System Auto Initiation Signal Present, clears<br>  • Completes Standby section of 34SO-E11-010-2 and notifies the SRO that Independent Verification is required to complete Attachment 1. |
| | | |
| | | |
| | SRO | Notifies SSS to obtain another operator to complete Attachment 1. |
| | | |
| | | |
| | | *Simulator Operator ENTERS the next event after power has been increased AND Attachment 1 "CHECKED" part is complete OR at the Chief Examiner's request.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 3 Page 6 of 28

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

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 8 Mins | | *At the Chief Examiner's direction, Simulator operator, INSTRUCT the BOP 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>• 34AR-650-315-2, "RFPT 2B Brg Oil Temp High"<br>• 34AR-650-333-2, "RFPT 2B BRG Temp High"<br>• 34AR-650-112-2, "RFP/COND BRG Metal Temp High" (approximately 1 minute later) |
| | | |
| | | |
| | ATC | **NOTE**: The ATC may immediately place the controller in manual in accordance with 31GO-OPS-021-0, Manipulation and Control of Equipment, responding to a failed controller.<br>• 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>• ATC, confirms that RFPT 2B Oil Temp controller, 2P41-R606, on panel 2H11-P650 is adjusted for 110 to 130°F. |
| | | |
| | | |
| | ATC | • 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. |
| | | |
| | | |
| | ALL | • If the condition exists for over 3 minutes alarm 34AR-650-332-2, "RFPT 2B EXCESSIVE VIBRATION," will illuminate. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 3 Page 7 of 28

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

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | ATC | • Confirm excessive vibration by observing 2N32-R600, Turbine Vibration and Eccentricity Recorder, points 13 and 14, on panel 2H11-P650 (DEPENDENT) OR 2H21-P536, TMR Workstation Mark V Control Panel.<br>• IF the RFPT vibration INCREASES to 6 mils, TRIP 2B RFPT. |
| | | |
| | | |
| | SRO | • Notifies maintenance of the 2P41-R606, RFPT temperature controller, problem. |
| | | |
| | | |
| | | ***Delete mfN21_88B***<br><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 ATC to return 2P41-R606 to automatic operation. |
| | | |
| | | |
| | ATC | • 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. |
| | | |
| | | |
| | | |
| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 4 Page 8 of 28

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

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Mins | | *At the Chief Examiner's direction, Simulator Operator enters* ***(RB-2)*** *malfunction* mf65702193 and mf65702230 *annunciators to ON.* ***ET T41-1*** *will remove malfunction after cooler is swapped.* |
| | ALL | Receives alarms:<br>• 650-224, Panel 2H11-P657 System Trouble<br>• 657-014, RCIC N-W Diag Instr Sump Lvl High High High<br>• 657-051, RCIC N-W Diag Instr Sump Lvl High |
| | | |
| | | |
| | 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.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 4 Page 9 of 28

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

| | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *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 onto several junction boxes 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 | • 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. |
| | | |
| | | |
| | BOP | • 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.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 5 Page 10 of 28

**Event Description:** HPCI Inadvertent Initiation

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Mins | | *Simulator Operator*<br>• *At direction of the Chief Examiner's, call the BOP operator and as the Lab request the Off Gas Inlet flow to the Stack reading at 2N62-P600 panel. (This is to get the BOP operator away allowing the ATC to have to respond to HPCI.)*<br>• *Simulator Operator, at Chief Examiner's direction, ENTERS* ***(RB-3)*** *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. |
| | | |
| | | |
| | ATC | • Secures HPCI as follows: (Critical Task)<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" alarm is received, releases the HPCI Turbine Trip push-button. |
| | | |
| | | |
| | ATC/BOP | • IF injection occurs from HPCI, the following alarms occur:<br>• 603-132, Feedwater Control System Trouble,<br>• After HPCI is shutdown, returns Feedwater Control Mode select switch to 3-ELEM.<br>• 603-219. APRM Upscale, 603-238, Rod Out Block and 603-141, Reactor Vessel Water Level High/Low, may come in and then clear |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 5 Page 11 of 28

**Event Description:** HPCI Inadvertent Initiation

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP/ATC | • When injection from HPCI is terminated, the following alarms may be received: |
| | | • If 602-134, Recirc A Flow Limit and 602-234, Recirc B Flow Limit 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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| | | |
| | | *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,<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>• Contacts Maintenance (if ATC has not done this) to investigate inadvertent HPCI start.<br><br>• If 602-134 & 602-234, Recirc A & B Flow Limits are received, directs operator to reset IAW 34SO-B31-001-2. |
| | | |
| | | |
| | | *Simulator operator proceeds to the next event at the Chief Examiner's direction.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 6 Page 12 of 28

**Event Description:** Degraded RPS 2B MG Set requiring 2B RPS to be transferred to Alternate

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 20 Mins | | *Simulator Operator*<br>• *At direction of the Chief Examiner's, call the ATC operator and request to stay on the phone until instructed to hang up. (This is to allow the BOP to respond.)*<br>• *Simulator Operator, at Chief Examiner's direction, NOTIFIES the SRO as an SO, that RPS 2B MG Set motor bearing is making an extremely loud squealing/grinding noise and is hot to the touch. (DO NOT RECOMMEND TRANSFERRING TO ALTERNATE POWER).*<br>• *Simulator Operator, at Chief Examiner's direction, the MAJOR event can be started at any point in the RPS Bus 2B restoration.*<br>***NOTE TO EXAMINER:** if RPS Bus 2B trips, the operator will transition to 34AB-C71-002-2, Loss Of RPS.* |
| | SRO | • Directs BOP to Transfer RPS Bus B from MG Set 2B to Alternate Power IAW 34SO-C71-001-2.<br>• Notifies Maintenance for assistance on 2B RPS MG Set<br>• IAW TS 3.4.5 Condition B, determines grab samples of Primary Containment Atmosphere must be analyzed once every 12 hours AND the Primary Containment Atmospheric Monitoring System must be restored to operable status in 30 days. |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 6 Page 13 of 28

**Event Description:** Degraded RPS 2B MG Set requiring 2B RPS to be transferred to Alternate

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | ***NOTE:*** *The crew may elect to perform the steps to prevent the Isolation of RWCU system.*<br><br>*Simulator Operator, if directed, ENTERS* ***(RB-9)****, overrides svoG31071 and loG310F004G1 and loG310F004R2 to OFF.* |
| | BOP | • IAW 34SO-C71-001-2, performs the following:<br>• Confirms NO scram/isolation signal present on RPS bus 2A.<br>• Confirms power available from alternate power source at panel 2H11-P610 (middle white light illuminated)<br>• May direct SO to open breaker for 2G31-F004 and remain there with communications established with the control room<br>• Transfers RPS Bus 2B to alternate power by placing the Power Source Select switch to the ALT B position.<br>• Resets the Scram Groups 1 & 4 AND 2 & 3 by operating the Reactor Scram Reset switch in GRP 1/4 AND GRP 2/3 directions, on panel 2H11-P603.<br>• Confirms all four B Scram Group Lights are illuminated, panel 2H11 P603 |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 6 Page 14 of 28

**Event Description:** Degraded RPS 2B MG Set requiring 2B RPS to be transferred to Alternate

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, if directed to close breaker for 2G31-F004, DELETES overrides IN THIS ORDER svoG31071, loG310F004G1 and loG310F004R2.* |
| | BOP | • Confirms proper valve isolations<br>• Resets the ventilation radiation monitors by depressing the reset pushbutton on each monitor<br>• Resets the Nuclear Steam Supply Shutoff outboard isolation logic by operating the Group Isolation Reset switch in both directions, panel 2H11-P601<br>• Resets the Drywell Sump Outboard Isolation Valves by depressing the Drywell Sump Outbrd Isolation Reset pushbutton, panel 2H11-P601<br>• Confirms outboard MSIV AC Logic AND MSIV DC logic white lights illuminated, panel 2H11-P601<br>• If open, directs SO to close breaker for 2G31-F004<br>• Confirms the following on 2D11-K603B & D, Main Steam Line Radiation Monitors:<br>  • In OPERATE mode,<br>  • the SELF-TEST STATUS = OK,<br>  • "TRIPS=" does NOT read INOP<br>• Momentarily places PCIS Reset and Test switch, 2C51D-S1, to reset, panel 2H11 P607. |
| | | |
| | | |
| | | *Simulator Operator, if after 5 minutes the crew has NOT swapped RPS Bus 2B to alternate supply and at Chief Examiner's direction, ENTERS* ***(RB-4)*** *mfC71_57B, Loss of Normal Power to RPS Bus 2B.* |
| | ALL | • Recognizes Loss of RPS 2B has occurred. |
| | | |
| | | |
| | SRO | • Directs BOP to enter 34AB-C71-002, Loss Of RPS. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 6 Page 15 of 28

**Event Description:** Degraded RPS 2B MG Set requiring 2B RPS to be transferred to Alternate

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • WHEN the RPS is restored, performs the following:<br>• Resets the scram<br>• Directs SO to reset Turbine Building high temperature switches<br>• Resets group isolations per 34AB-C71-001-2, Scram Procedure<br>• Resets radiation monitors<br>• Restores Drywell Equipment and Floor Drain Sumps per 34SO-G11-009-2<br>• Opens 2D11-F052 at panel 2H11-P700<br>• Opens 2D11-F053 at panel 2H11-P700<br>• Opens 2D11-F072 at panel 2H11-P700<br>• Restores Reactor Water Cleanup per 34SO-G31-003-2. |
| | | |
| | | |
| | | *Simulator Operator, if requested, report 2B Pump Casing Temperature is 450°F.* |
| | BOP | • As time allows, enters 34SO-G31-003-2, Attachment 5, Quick Recovery Of The RWCU Pump/System, and performs the following:<br>• Directs SO to determine Pump Casing Temp (Locally)<br>• Determines Pre-warming is NOT required<br>• Takes RWCU Pump control switch to STOP<br>• Throttles open 2G31-F044, Demin Bypass, until intermediate position is obtained<br>• Directs SO to remove RWCU F/Ds from service<br>• Performs step 7.0 and confirms 2G31-F004, Outboard Isolation, control switch, in close<br>• Resets the RWCU isolation (Gr Isol Reset)<br>• Directs SSS to install jumpers per Attachment 1 (Bypassing High Diff. Flow Isolation)<br>• Slowly pressurize the system, by throttling open 2G31-F004 |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 6 Page 16 of 28

**Event Description:** Degraded RPS 2B MG Set requiring 2B RPS to be transferred to Alternate

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | • Slowly pressurizes the system, by throttling open 2G31-F004<br>• WHEN system is pressurized, fully opens 2G31-F004<br>• Stations an operator to monitor the fault indicator light<br>• Takes 2G31-C001B, RWCU Pump, control switch to start<br>• Approximately 15 seconds after placing the control switch to start, confirm system pressure increases (2G31-R600), then throttles open 2G31-F044, Demin Bypass, to obtain a system flow rate of 75 - 100 gpm<br>• WHEN the Differential Temp between Regen Heat Exchanger Inlet AND Outlet (2G31-R607, N601 points 1 AND 4) is <200 *F, throttles open 2G31-F044, Demin Bypass, to obtain a system flow rate of 200 - 230 gpm<br>• Directs SO to refer to procedure steps 7.3.10 through 7.3.17 to locally monitor pump operation. |
| | | |
| | | |
| | | *Simulator Operator, at Chief Examiner's direction, the MAJOR event can be started at any point in the RPS Bus 2B restoration.* |
| | BOP | • Confirms all four B Scram Group Lights are illuminated on panel 2H11 P603.<br>• Confirms proper valve isolations per Attachment 3. (Parts of this may be performed by the SRO and ATC as well as the BOP).<br>• Resets the ventilation radiation monitors by depressing the reset pushbutton on each monitor, panel 2H11-P606.<br>• Resets the Nuclear Steam Supply Shutoff outboard isolation logic by operating the Group Isolation Reset switch in both directions, on panel 2H11-P601. |
| | | |
| | | |
| | | |
| | BOP | • Resets the Drywell Sump Outboard Isolation Valves by depressing the Drywell Sump Outboard Isolation Reset pushbutton, on panel 2H11-P601.<br>• Confirms the outboard MSIV AC Logic AND MSIV DC logic white lights are illuminated, panel 2H11-P601. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 6 Page 17 of 28

**Event Description:** Degraded RPS 2B MG Set requiring 2B RPS to be transferred to Alternate

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, at Chief Examiner's direction, the MAJOR event can be started at any point in the RPS Bus 2B restoration.* |
| | BOP | • Confirms the following on 2D11-K603B, Main Steam Line Radiation Monitor:<br>  • In OPERATE mode,<br>  • the SELF-TEST STATUS = OK,<br>  • "TRIPS=" does NOT read INOP.<br>• Confirms the following on 2D11-K603D, Main Steam Line Radiation Monitor:<br>  • In OPERATE mode,<br>  • the SELF-TEST STATUS = OK,<br>  • "TRIPS=" does NOT read INOP.<br>• Momentarily places the PCIS Reset and Test switch, 2C51D-S1, to RESET, panel 2H11 P607. |
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| | | *Simulator Operator, at Chief Examiner's direction, proceeds to the MAJOR event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 7 

**Event Description:** Loss of Offsite Power with all emergency buses initially de-energized. EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| 15 Mins | | *Simulator Operator, at Chief Examiners direction, ENTERS* ***(RB-5)*** *mfS11_161.* |
| | 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 SS 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 SS when the above actions are complete. |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 7 

**Event Description:** Loss of Offsite Power with all emergency buses initially de-energized. EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run.

| 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. |
| | | |
| | | |
| | 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. |
| | | |
| | | |
| | ATC | • Confirms appropriate Diesel Generator response to the event and evaluates the emergency buses determining<br>  • 2A EDG did NOT start, 2E bus is de-energized,<br>  • 1B EDG did NOT start, 2F bus is de-energized,<br>  • 2C EDG is running but did NOT energize 2G bus.<br><br>• Enters 34AB-R22-003-2, "Station Blackout" and "Diesel Generator Recovery," abnormal, 34AB-R43-001-2. |
| | | |
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**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 7 

**Event Description:** Loss of Offsite Power with all emergency buses initially de-energized. EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *The ATC may start first with any of the Diesel Generators.* |
| | ATC | • IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG 2A:<br>• Determines the EDG is NOT running<br>• Determines the Auto Start System Operative Light is lit.<br>• Places the EDG START/STOP Switch to START<br>• Determines the 2A EDG has started<br>• Reports to SRO that 2E Bus is now energized. (Critical Task to energize at least one emergency bus) |
| | | |
| | | |
| | ATC | Reviews EDG "1B" annunciators and determines a "Lube Oil Press Low" and "Emergency Engine Shutdown". |
| | | |
| | | • IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG "1B":<br>• Determines the EDG is not running<br>• Determines the Auto Start System Operative Light is NOT lit.<br>• Depresses the Shutdown Relay Pushbutton<br>• Determines the EDG did NOT start.<br>• Sends an SO to locally start the EDG<br>• Sends an SO/Maintenance to investigate EDG failure |
| | | |
| | | |
| | ATC | • IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG 2C:<br>• Determines the EDG is running<br>• Confirms the normal and alternate supply breakers are open.<br>• Using Diesel Generator 2C Speed Adjust switch lowers frequency to 57 Hertz, and then raises to 60 Hertz.<br>• Reports to SRO that 2G Bus is now energized. (Critical Task to energize at least one emergency bus) |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 7 Page 21 of 28

**Event Description:** Loss of Offsite Power with all emergency buses initially de-energized. EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *SIMULATOR OPERATOR: When called as the SO to investigate the EDGs, wait two minutes and report:*<br>• *EDG "1B" has a break on the oil pump discharge line* |
| | | *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 have been previously performed)<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 have been previously performed)<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 |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 7 

**Event Description:** Loss of Offsite Power with all emergency buses initially de-energized. EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | 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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| | | |
| | 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<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.: 2011-301 Scenario No.: 6-05 Event No.: 7** 

**Event Description:** Loss of Offsite Power with all emergency buses initially de-energized. EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run.

| 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. |
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| | | |
| | SRO | • May direct operator to place Torus Cooling in service if Torus temperature exceeds 95°F. |
| | | |
| | | |
| | BOP (Placard) | • Enters 34SO-E11-010-2, Residual Heat Removal or uses placard on 2H11-P601.<br>• Places RHRSW in service<br>• Prelubes RHRSW B pump<br>• Overrides 2E11-F068B Low Discharge Pressure Interlock<br>• Positions 2E11-F068B to 45% OPEN<br>- RHR HX B Diff Press Low (601-215) alarms |
| | | |
| | | |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 7 

**Event Description:** Loss of Offsite Power with all emergency buses initially de-energized. EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP (Placard) | • Starts RHRSW pump B<br>• Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position.<br>• Positions 2E11-F068B to obtain < 4400 GPM AND < 450 PSIG<br>• RHR HX B Diff Press Low (601-215) alarm clears |
| | | |
| | | |
| | BOP (Placard) | • Place RHR loop 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-F048B, HX Bypass Vlv.<br>• Close 2E11-F047B, Hx Inlet Vlv.<br>• Confirm open 2E11-F003A, HX Outlet Vlv<br>• Start "2B 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 (601-215) alarms |
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| | | |
| | | |
| | | • Open 2E11-F028B, Torus Spray or Test Vlv.<br>• Throttle open 2E11-F024B, Full Flow Test Line Vlv. and establish RHR flow of less than or equal to 7700 gpm (R603B)<br>- RHR Flow Low (601-215) alarm clears<br>• Open 2E11-F047B, Hx Inlet Vlv.<br>• Close 2E11-F048B, Hx Bypass Vlv.<br>• Reports to SS that RHR has been placed in Suppression Pool Cooling mode. |
| | | |
| | | |
| | | *Simulator Operator, the next event was already active during the Major Event.* |

**Op-Test No.:** 2011-301 **Scenario No.:** 6-05 **Event No.:** 9 

**Event Description:** HPCI flow controller output fails low requiring manual increase to obtain injection

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | *Simulator Operator, WHEN the operator starts HPCI Aux Oil Pump,* ***ENTERS (RB-6)****, malfunction mfE41_106.* |
| | BOP | • Allows HPCI to auto start at –35" or 1.85 psig DW pressure<br>OR<br>manually starts per 34SO-E41-001-2,<br>prior to emergency depressurization on low RWL.<br>• Opens 2E41-F059, Lube Oil Cooling Wtr Vlv.<br>• Starts 2E41-C002-2, Barometric Condenser Vacuum Pump.<br>• Opens 2E41-F001, Turbine Steam Supply Vlv.<br>• Starts 2E41-C002-3, Aux Oil Pump.<br>• Opens 2E41-F006, Pump Discharge Valve. |
| | | |
| | | |
| | | ***NOTE TO EXAMINER:*** *Prolonged operation with HPCI <2000 RPMs is to be avoided.* |
| | BOP | • Confirms the following valves OPENED:<br>  • Turbine Control Vlv<br>  • Turbine Stop Vlv<br>• Confirms the turbine does NOT come up to proper speed.<br>• Recognizes that HPCI flow controller has failed and places 2E41-R612, Flow Controller, in MANUAL and adjusts output to maintain RWL. (Critical Task)<br>• When flow increases to 790 GPM, confirms 2E41-F012, Min Flow Vlv, closed. |
| | | |
| | | |
| | | *Termination criteria:*<br><br>*The scenario may be terminated, at the direction of the Chief Examiner, when RWL is being controlled with HPCI 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.:** **6-05** **Op-Test No.:** 2011-301

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

_____ _____ **RO**

_____ _____ **BOP**

| | |
|---|---|
| Initiating Conditions: | Unit 2 is 65% RTP. |
| Turnover | Torus water level has just been lowered to 147.5" using RHR pump "2B". Return RHR B Loop to Standby IAW 34SO-E11-010-2, RHR System, starting at step 7.4.5.2.12 and then Attachment 1. Increase power via Recirc to 70% in preparation of starting the third Condensate and Booster pump. |

Summary:

- **Event 1**: Reactivity; The ATC will raise Reactor power to ~70% RTP.
- **Event 2**: Normal: Returns RHR B Loop to Standby IAW 34SO-E11-010-2, RHR System, starting at step 7.4.5.2.12 and then Attachment 1.
- **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:** Component; RCIC NW Diagonal Instrument sump hi & hi-hi-hi alarms; RCIC B004A CLR PSW leak which requires swapping to Standby cooler.
- **Event 5**: Component; HPCI will experience an inadvertent initiation requiring the ATC to shutdown HPCI. **(Critical Task)**
- **Event 6:** Component; An SO notifies the SRO of a degraded RPS 2B MG Set requiring the BOP to transfer 2B RPS bus to its Alternate supply.
- **Event 7:** Major; Loss of Offsite Power with all emergency buses initially de-energized, RCIC fails to operate.
- **Event 8:** Component; 2C EDG fails to auto tie to the emergency bus and must have its frequency lowered, then raised to force the 2C EDG output breaker to close. 2A EDG will tie after manually started. **(Critical Task to energize at least one emergency bus)**
- **Event 9:** HPCI flow controller output fails low requiring the BOP to manually increase speed to obtain HPCI injection. **(Critical Task)**

**Critical Tasks**

***NRC DRAFT***

**Facility:** E. I Hatch **Scenario No.:** 6-05 **Op-Test No.:** 2011-301

Critical Tasks

- HPCI will experience an inadvertent initiation requiring the ATC to shutdown HPCI. **(Event 5)**
- 2C EDG fails to auto tie to the emergency bus and must have its frequency lowered, then raised to force the 2C EDG output breaker to close. 2A EDG will tie after manually started. **(Event 8)**
- HPCI flow controller fails low requiring the BOP to manually increase speed to obtain HPCI injection to maintain RWL above TAF. **(Event 9)**

| | ES 301-4 Attributes | Required | Actual | Items |
|---|---|---|---|---|
| 1. | Total Malfunctions | 5-8 | 7 | 1. 2B RFPT Cooling water controller failure. **(Event 3)**<br>2. RCIC NW Diagonal PSW leak requiring swapping coolers. **(Event 4)**<br>3. HPCI Inadvertent Initiation **(Event 5)**<br>4. Degraded RPS 2B MG Set **(Event 6)**<br>5. Loss of Offsite Power, All emergency buses initially de-energized, RCIC fails. **(Event 7)**<br>6. 2A EDG fails to start, 2C EDG fails to auto tie **(Event 8)**<br>7. HPCI flow controller output fails low. **(Event 9)** |
| 2. | Malfunctions After EOP Entry | 1-2 | 2 | 1. 2A EDG fails to start, 2C EDG fails to auto tie **(Event 8)**<br>2. HPCI flow controller output fails low. **(Event 9)** |
| 3. | Abnormal Events | 2-4 | 4 | 1. HPCI Inadvertent Initiation **(Event 5)**<br>2. Degraded RPS 2B MG Set **(Event 6)**<br>3. 2A EDG fails to start, 2C EDG fails to auto tie **(Event 8)**<br>4. HPCI flow controller output fails low. **(Event 9)** |
| 4. | Major Transients | 1-2 | 1 | 1. Loss of Offsite Power, All emergency buses initially de-energized, RCIC fails. **(Event 7)** |
| 5. | EOPs entered, requiring substantive actions | 1-2 | 2 | 1. RC EOP<br>2. PC EOP |
| 6. | EOPs contingencies requiring substantive actions | 0-2 | 1 | 1. CP-1 EOP |
| 7. | Critical Tasks | 2-3 | 3 | 1. HPCI Inadvertent Initiation **(Event 5)**<br>2. Energize at least ONE Emergency Bus from its associated EDG **(Event 8)**<br>3. Manually operating HPCI flow controller to maintain RWL above TAF. **(Event 9)** |

# SHIFT TURNOVER

## UNIT 1 STATUS

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

## UNIT 2 STATUS

| | |
|---|---|
| **Power**: | Unit 2 is 65% RTP. |
| **The following equipment is inoperable**: | None |
| **Scheduled evolutions**: | Torus water level has just been lowered to 147.5" using RHR pump "2B". Return RHR B Loop to Standby IAW 34SO-E11-010-2, RHR System, starting at step 7.4.5.2.12 and then Attachment 1. Increase power via Recirc to 70% in preparation of starting the third Condensate and Booster pump. |
| **Surveillances due this shift**: | None |
| **Active clearances**: | None |
| **Rod Configuration**: | See RWM |