Facility: <u>Perry U1</u>      Scenario No.: <u>1</u>      Op-Test No.: <u>2004-01</u>

Examiners:    <u>D. McNeil  (D. Reeser - Cert)</u>     Operators: _____

            <u>M. Bielby</u>                         _____

            <u>R. Walton</u>                         _____

Initial Conditions: <u>Mode 2, Reactor Critical at the POAH, Hot reactor startup in progress</u> <u>(approx. 470°F and 500 psig), a RFPT is in service on low flow control.  MFP tagged out of</u> <u>service.</u>

Turnover: <u>Reactor startup is progress; reactor is critical at the point of adding heat. Temp</u> <u>~470 degrees F Rx pressure ~500 psig. Planned activities include continued heat-up and</u> <u>entry to Mode 1 per IOI-0002 (section 4.6)</u>

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | None | R(RO/ SRO) | Establish and maintain Heat-up rate.  (STE plot H/U rate) |
| 2 | None | N(BOP/ SRO) | Shift RFPT to Startup Level Controller |
| 3 | AN: H13P601 17A(33) | C(SRO) | RHR Pump B Low Discharge Pressure Condition  (Tech Spec) |
| 4 | CU02, MVO6 on 1G33F053 | C(RO/ SRO) | Small isolable RWCU leak; Containment Isolation valve fails to fully close. (Tech Spec) |
| 5 | 1B21N073C (G) set to 0 | C(BOP/ SRO) | Inadvertent HPCS Initiation  (Tech Spec) |
| 6 | MV04: 1P45F140 | C(BOP) | HPCS ESW Pump Discharge valve fails to open automatically. |
| 7 | TC04B | C(RO/ BOP/ SRO) | Short-circuit in Bypass Valve Jack control circuit results in depressurization above reactor capacity resulting in excessive cooldown.  Reduce steam loss, shutdown the reactor and isolate MSIVs. (SCRAM & Activities to minimize cooldown) |
| 8 | RD15 | C (RO/ SRO) | Several control rods fail to insert, shutdown criteria not met but reactor is sub-critical. |
| 9 | RD13 | C(RO/ SRO) | CRD Pump Suction Filter clogs and CRD pump trips preventing recharge of scram accumulators.  (Restores CRD after bypassing filters) |
| 10 | PC04 | M | Explosion in RHR C Pump Room.  SP Leak. |

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

Op-Test No.: <u>2004-01</u> Scenario No.: __1__ Event No.: __1__ Page _1_ of _1_

Event Description: _Establish and maintain plant heat-up rate._

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Short brief on continuing heat-up with emphasis on Control Rod Movement (FTI-B0002). <br><br> Reviews IOI-2 for upcoming activities. |
| | RO | Reviews FTI-B002 and SOI-C11(RCIS) in preparation for control rod movement. <br><br> Establishes and maintains desired heat-up rate ($\#$100°F) <br> &#9632; Withdraws control rods <br>   &#9642; Selects INDIVID DRIVE or GANG DRIVE mode as appropriate <br>   &#9642; Selects the appropriate control rod(s) in accordance with the Control Rod Movement Sheet (FTI-B0002-1) <br>   &#9642; Withdraws selected control rod(s) to the specified pos <br> &#9632; Adjusts Press Set as necessary to maintain BPV-1 20-80% open. |
| | BOP | Monitors plant parameters. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u> Event No.: <u>2</u>         Page <u>1</u> of <u>1</u>

Event Description: <u>Shift RFPT to Startup Level Controller</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Directs BOP to shift RFPT to Startup Level Controller in accordance with SOI-C34. |
| | RO | Monitors plant parameters. |
| | BOP | Shifts RFPT to Startup Level Controller in accordance with section 4.5 of SOI-C34.<br>❗ Verifies inservice RFPT is on MANUAL SPEED CONTROL DIAL and operation at > 4000 rpm.<br>❗ Verifies RFP A, B, and C FLOW CONTROL and STARTUP RX LEVEL CONTROL are in manual.<br>❗ Selects inservice RFPT with STARTUP FDW PUMP SELECT<br>❗ Adjusts STARTUP RX LEVEL CONTROL output to zero the RFP DEV METER.<br>❗ Places the inservice RFPT GOV MODE CONT to AUTO<br>❗ Adjusts STARTUP RX LEVEL CONTROL tape-set to null deviation<br>❗ PLACE the LOW FLOW RX LEVEL CONTROL in MANUAL.<br>❗ PLACE the STARTUP RX LEVEL CONTROL in AUTO.<br>❗ ADJUST the STARTUP RX LEVEL CONTROL tapeset to desired level. Normally at 196".<br>❗ MAINTAINS level constant, WHILE throttling open the Low Flow Rx Level Control Valve.<br>❗ JOGS OPEN FW Heater 6A&B Outlet Valves<br>❗ CLOSES the LOW FLOW CONTROL VALVE, 1N27-F175. |

Op-Test No.: <u>2004-01</u>  Scenario No.: __1__  Event No.: __3__          Page _1_ of _1_

Event Description: __RHR Pump B Low Discharge Pressure Condition__

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | Acknowledges announcement of RHR PUMP B DISCHARGE PRESSURE HI/LO alarm.<br><br>Refers to TS 3.5.1, ECCS – Operating.<br>❗ Declares RHR B INOPERABLE.<br>❗ Enters Action A – Restore to OPERABLE status within 7 days.<br><br>Initiates maintenance request to restore RHR B to OPERABLE status. |
| | RO | Continues heat-up and monitors plant parameters. |
| | BOP | Announces receipt of RHR PUMP B DISCHARGE PRESSURE HI/LO alarm.<br><br>Refers to ARI-H13-P601-0017-F3<br>❗ Dispatches PO to check operation of RHR B&C Water Leg Pump<br>❗ Determines that alarm is due to low pressure<br>  ▪ PO report from the field<br>  ▪ Pressure reading at back-panel 1H13-P618<br>    # Cue: 1E12-N053B reads approx 25 psig<br>    # Cue: 1E12-N053C reads approx 45 psig<br>❗ Refers to SOI-E12 to initiate one or more of the following (provide cues as appropriate for action initiated):<br>  ▪ Alternate Keep Fill (will clear alarm)<br>    # Cue: 1E12-N053B reads approx 45 psig<br>    # Cue: 1E12-N053C reads approx 45 psig<br>  ▪ RHR B High Point Vent<br>    # Cue: 1E12-N053B reads approx 28 psig<br>    # Cue: 1E12-N053C reads approx 45 psig<br>  ▪ RHR B Fill and Vent<br>    # Cue: 1E12-N053B reads approx 28 psig<br>    # Cue: 1E12-N053C reads approx 45 psig |

Op-Test No.: 2004-01  Scenario No.: __1__  Event No.: __4__        Page _1_ of _2_

Event Description: __Small isolable RWCU leak; Containment Isolation valve (G33-F053)__
__fails to fully close.__

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges announcement of RWCU AREAS LD TEMP and/or RWCU AREAS LD ❭ TEMP alarm(s).<br><br>Directs shutdown and isolation of RWCU system.<br><br>Refers to TS 3.6.1.3 Primary Containment Isolation Valves (PCIVs)<br>❗ Declares G33-F053 INOPERABLE.<br>❗ Enters Action A<br>   A.1  Isolate the affected penetration flow path with 4 hours; AND<br>   A.2  Verify the affected penetration flow path is isolated prior to entering MODE 2 or 3 from MODE 4 in not performed within the previous 92 days.<br>Initiates maintenance request to restore G33-F053 to OPERABLE status.<br><br>May enter ONI-D17, "High Radiation Levels Within Plant" |
| | RO | Announces one or both of the following alarms as applicable:<br>❗ RWCU AREAS LD TEMP P632<br>❗ RWCU AREAS LD ❭ TEMP P632<br><br>Refers to ARI-H13-P680-1-D4 &E4<br>❗ Directs BOP to verify proper operation of Containment Vessel Ventilation System (M11).<br><br>Shutdown and isolate RWCU in accordance with SOI-G33<br>❗ Stops RWCU pumps and shuts containment isolation valves.<br>❗ Identifies that G33-F053 did not close and lost power.<br>❗ Reports that RWCU System is isolated except for G33-F053.<br><br>If auto isolation setpoint is reached,<br>❗ Announces RWCU ISOL HX RM TEMP HI<br>❗ Refers to ARI-H13-P680-1-E3<br>❗ Verifies auto isolation |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>  1  </u> Event No.: <u>  4  </u> Page <u>  2  </u> of <u>  2  </u>

Event Description: <u> Small isolable RWCU leak; Containment Isolation valve (G33-F053) </u>
<u>fails to fully close.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|  | BOP | Checks EQUIPMENT AREA AMBIENT TEMP Recorder, 1E31-R608, and EQUIPMENT AREA DIFF TEMP Recorder, 1E31-R611, on panel P632 to determine location of high temperature. **AND/OR** Checks LD instruments on H13-P632(P634) ; E31-N700A(B) A2-3 (Temperature) E31-N700A(B) A1-3 (Differential Temperature) Reports that high temperature/differential temperature is in the RWCU heat exchanger room. Announces receipt of NS4 INBD ISOLATION OUT OF SERVICE ❗ refers to ARI-H13-P601-18-A3. ❗ checks valve matrix for deengized lights. (Alarm comes in after power loss to G33-F053). Verifies proper operation of Containment Vessel Ventilation System (M11) and Containment Vessel Chill Water System (P50). |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u> 1 </u>  Event No.: <u> 5/6 </u>      Page <u> 1 </u> of <u> 2 </u>

Event Description: <u>HPCS spurious initialtion with ESW C Discharge Valve failure to</u>
<u>open automatically (will open manually).</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges announcement of alarms by BOP<br><br>Enters ONI-E12-1, Inadvertent Initiation of ECCS/RCIC<br>  ❗ Ensures immediate operator actions completed<br>    ▪ Verifies HPCS initiation in NOT valid<br>    ▪ Takes HPCS Pump control switch to STOP<br>  ❗ When initiation signal is clear, directs reset of initiation logic<br>  ❗ When initiaion logic is reset, directs restoration of HPCS and EDG to standby readiness<br>  ❗ Notifies Reactor Engineer of injection<br>  ❗ Contacts Chemistry to evaluate if reactor water chemistry impact<br>  ❗ Directs SE to archive ICS data.<br>  ❗ Directs restoration of CST/Suppression Pool level(s)<br><br>Enters ONI-C51-1, Unplanned Change in Reactor Power or Reactivity<br>  ❗ RESTORE reactor power to # the pre-transient power level.<br>  ❗ Notify Reactor Engineering<br>  ❗ Refers to ONI-E12-1<br><br>Refers to TS 3.5.1, ECCS – Operating<br>  ❗ Declares HPCS INOPERABLE.<br>  ❗ Enters Action B<br>    B.1 Verify RCIC OPERABLE within 1 hour; AND<br>    B.2 Restore HPCS to OPERABLE status within 14 days.<br>  ❗ Enters Action C<br>    C.1 Restore either HPCS or RHR B to OPERABLE status within 72 hours.<br><br>Initiates maintenance request to restore HPCS to OPERABLE status. |
| | RO | Backs up verification of invalid HPCS initiation<br><br>Observes and reports power increase; Ranges IRMs as necessary.<br><br>IF directed, restores reactor power to # the pre-transient power level. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u> Event No.: <u>5/6</u> Page <u>2</u> of <u>2</u>

Event Description: <u>HPCS spurious initialtion with ESW C Discharge Valve failure to</u>
<u>open automatically (will open manually).</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | BOP | Announces receipt of the following alarms:<br>❗ DIESEL GEN START SIGNAL RECEIVED<br>❗ HPCS PUMP START SIGNAL RECEIVED<br>❗ HPCS RX LEVEL LO L2<br>❗ ESW TO DIESEL HEAT EXCHANGER FLOW LOW<br>❗ HPCS INJECTION VALVE CLOSED RX LEVEL HI L8<br><br>Peforms Immediate Operator actions for ONI-E12-1<br>❗ Verifies HPCS initiation in NOT valid<br>❗ Takes HPCS Pump control switch to STOP<br><br>Observes that HPCS ESW Pump Discharge Valve, P45-F140 is not open.<br>❗ Opens P45-F140 using control switch; AND/OR<br>❗ **IF** directed, then shuts down Div 3 EDG.<br><br>Refers to the following alarm response procedures:<br>❗ ARI-1H13-P601-16-A1<br>   ❞ Refers to SOI-E22B to verify proper operation of EDG<br>❗ ARI-1H13-P601-16-A5<br>   ❞ Refers to ONI-E12-1<br>❗ ARI-1H13-P601-16-C5<br>   ❞ Refers to ONI-E12-1<br>❗ ARI-1H13-P601-16-D1<br>   ❞ Refers to SOI-P45/49 to verify proper operation of ESW<br>   ❞ If flow cannot be restored, consider shutdown of EDG<br>❗ ARI-1H13-P601-16-F5<br>   ❞ Refers to ONI-E12-1<br><br>When directed, initiates actions to return HPCS and EDG to standby readiness. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u> Event No.: <u>7</u>       Page <u>1</u> of <u>2</u>

Event Description: <u>Bypass valve fails open resulting in excessive cooldown.</u>

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | Acknowledges reports from RO.<br><br>Enters ONI-C51, Unplanned Change In Reactor Power Or Reactivity<br><br>Enters ONI-C85-2, Pressure Regulator Failure Open<br><br>Directs RO to manually scram the Reactor by Arming and Depressing Manual Scram Pushbuttons:<br><br>Directs Evacuation of the Containment.<br><br>Directs Closure of the MSIVs.<br><br>Enter ONI-C71-1, Reactor Scram.<br><br>Enters PEI-B13, RPV CONTROL (NON-ATWS), Directs Startup of Hydrogen Analyzers, and transitions to PEI-B13, RPV CONTROL (ATWS) |
| | RO | Observes and reports decreasing reactor pressure.<br><br>Observes and reports 2<sup>nd</sup> bypass valve opening.<br><br>Attempts to close Bypass Valves.<br><br>Manually Scrams the Reactor and performs Immediate Operator Actions Per ONI-C71-1.<br>    ❗ Places Mode Switch in SHUTDOWN AND REMOVES key.<br>    ❗ Announces Mode Switch in SHUTDOWN and Control Rod Status<br>    ❗ Initiates ARI<br>    ❗ Announces ARI Initiated, Control Rod Status, and APRM Status<br>    ❗ Verify HST LVL CV MANUAL CONTROL, N21-S19, in OFF.<br>    ❗ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using Feedwater, RCIC, and/or HPCS as appropriate.<br>    ❗ Inform Unit Supervisor of systems being used for current level and pressure control. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>  1  </u>   Event No.: <u>  7  </u>        Page <u> 2 </u> of <u> 2 </u>

Event Description:  <u>Bypass valve fails open resulting in excessive cooldown.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      | BOP      | Closes the MSIVs when directed.<br><br>Performs Immediate Operator Actions Per ONI-C71-1.<br>❗ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using RCIC and/or HPCS as appropriate.<br>❗ If reactor pressure is not being maintained with the Bypass Valves, manually cycle SRV's in the order labeled on 1H13-P601 as necessary to maintain reactor pressure within the desired band.<br>❗ Inform Unit Supervisor of systems being used for current level and pressure control.<br>❗ If any SRV has lifted or any relief setpoint is being approached, evacuate the containment.<br>❗ If manpower is available, place the Hydrogen Analyzers in service per SOI-M51/56. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>1</u>  Event No.: <u>8/9</u>      Page <u>1</u> of <u>3</u>

Event Description: <u>Several control rods fail to insert, shutdown criteria not met but reactor</u> <u>is sub-critical.  CRD Pump Suction Filter clogs and CRD Pump trips preventing recharge of</u> <u>scram accumulators.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      | SRO      | Enters PEI-B13, RPV CONTROL (ATWS)<br>❗ RPV POWER CONTROL<br>  ▪ Directs insertion of IRMs and SRMs<br>  ▪ Directs insertion of Control Rods per PEI-SPIs 1.1-1.7<br>  ▪ If Suppression Pool Temperature cannot be maintained less than 110°F, direct injection of Boron and inhibiting of ADS. (This action is not expected)<br>❗ RPV LEVEL CONTROL<br>  ▪ Directs verification of required automatic actions<br>  ▪ Directs Inhibiting of ADS<br>  ▪ Directs Termination and Prevention of HPCS, LPCS, and LPCI per PEI-SPI 5.1 and 5.2<br>  ▪ Directs preparation of two or more injection systems per PEI-SPI 6.1-6.5.<br>  ▪ Gives direction to inject and maintain level within band of -25 to 215 inches<br>❗ RPV PRESSURE CONTROL<br>  ▪ Gives direction to stabilize pressure $\#$1000 psig (should not open MSIVs until bypass valves are closed)<br><br>Enters PEI-T23, CONTAINMENT CONTROL (may enter on Suppression Pool Temperature depending on SRV operations OR possibly DW Temperature/Pressure due loss of cooling from Terminatation & Prevention of ECCS injection.)<br>❗ SUPPRESSION POOL TEMPERATURE CONTROL<br>  ▪ Operate all available Suppression Pool Cooling<br>  ▪ Monitor Temperature for further actions.<br>❗ DRYWELL TEMPERATURE CONTROL<br>  ▪ Operate all available cooling<br>  ▪ Restore NCC to Drywell Coolers per PEI-SPI 2.1<br>❗ CONTAINMENT TEMPERATURE CONTROL<br>  ▪ Operate all available cooling<br>  ▪ Restore CVCW per PEI-SPI 2.2<br>❗ SUPPRESSION POOL LEVEL CONTROL<br>  ▪ Monitor Suppression Pool Level for further actions.<br>❗ DRYWELL AND CONTAINMENT PRESSURE CONTROL<br>  ▪ Monitor Drywell and Containment pressure for further actions. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>1</u>  Event No.: <u>8/9</u>       Page <u>2</u> of <u>3</u>

Event Description:  <u>Several control rods fail to insert, shutdown criteria not met but reactor</u> <u>is sub-critical.  CRD Pump Suction Filter clogs and CRD Pump trips preventing recharge of</u> <u>scram accumulators.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      | RO       | Inserts IRMs and SRMs <br><br> Inserts control rods using: <br><br> ❗ PEI-SPI 1.2 (SCRAM/RESET/SCRAM) and/or <br>    ▪ If scram cannot be reset due to plant conditions requests installation of RPS Jumpers per PEI-SPI 1.2 (and removal after SDV drains) <br>    ▪ If ARI cannot be reset due to plant conditions, request lifting of leads per PEI-SPI 1.2 (re-landing after SDV drains) <br><br> ❗ PEI-SPI 1.3 (Manual Rod Insertion) <br>    ▪ Requests bypass of LPSP <br>    ▪ Fully Opens CRD Flow Control Valve (Manual & 100% on C11-R600) <br>    ▪ Closes C11-F003 (Pressure Control Valve <br><br> Maintains RPV water level -25 to 215 inches using CD/FW (FBPs) <br><br> Announces receipt of CRD PUMP SUCTION FILTER DIFF PRESS HI alarm. <br> ❗ Refers to ARI-H13-P601-0022-H3 <br> ❗ Dispatches PO to bypass Suction Filters <br><br> Announces receipt of CRD PUMP A(B) TRIP SUCT PRESS LOW <br> ❗ Refers to ARI-H13-P601-0022-G2(G3) <br> ❗ Refers to SOI-C11 (CRDH), CRD Pump Trip Recovery <br> ❗ Recovers the CRD Pump. |

Op-Test No.: 2004-01  Scenario No.: __1__  Event No.: __8/9__      Page _3_ of _3_

Event Description: _Several control rods fail to insert, shutdown criteria not met but reactor_ _is sub-critical. CRD Pump Suction Filter clogs and CRD Pump trips preventing recharge of_ _scram accumulators._

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|  | BOP | Verifies required automatic initiations and isolations.<br><br>Inhibits ADS.<br><br>Terminates and Prevents Injection from HPCS, LPCS, and LPCI<br><br>  **!**  PEI-SPI 5.1, HPCS<br>     **"**  Holds control switch for E22-F004 in CLOSE<br>     **"**  Arm & Depress HPCS Initiation push-button<br>     **"**  Releases F004 c/s after ensuring F004 closed<br><br>  **!**  PEI-SPI 5.2, LPCS and LPCI<br>     **"**  **PLACE** BUS XH11 LOCA BYPASS keylock switch in BYPASS.<br>     **"**  Hold control switches for LPCS and LPCI injection valves in CLOSE<br>     **"**  Arm & Depress associated initiation push-buttons<br>     **"**  Release control switches after ensuring injection valves are closed.<br><br>Stabilizes pressure below 1000 psig using SRVs, RCIC, and/or MSL Drains.<br><br>When directed, initiates Suppression Pool Cooling (should use Hard Card).<br><br>When directed restores NCC to Drywell Coolers (PEI-SPI 2.1)<br><br>When Directed restores CVCW (PEI-SPI 2.2) |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u> Event No.: <u>10</u>      Page <u>1</u> of <u>2</u>

Event Description: <u>Explosion in RHR C Pump Room. Suppression Pool Leak.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges report of explosion. <br><br> Directs RO and BOP to monitor plant parameters to assess impact of explosion. <br><br> Acknowledges BOP announcement of alarms. <br><br> (Re-)Enters PEI-T23, Containment Control when Suppression Pool level drops to 17.8 ft. <br> ❗ SUPPRESSION POOL LEVEL CONTROL <br>   ‼ Gives direction to makeup to the Suppression Pool using available systems including SPMU per PEI-SPI 3.2. <br>   ‼ When level cannot be maintained above 14.25 ft., enters PEI-B13 RPV Control (ATWS) (Level Control Leg at **F** and Pressure Control Leg at **X**) <br> ❗ Monitors other Containment Control Parameters to assess need for other mitigating actions. <br><br> Enters PEI-B13, EMERGENCY DEPRESSURIZATION <br> ❗ Gives direction to Terminate and Prevent Injection except for Boron, CRC and RCIC <br> ❗ Verifies Suppression Pool level above 5.25 ft. <br> ❗ Directs opening of all ADS valves. <br> ❗ Directs SLOW recovery of RPV level when Reactor Pressure drops below 140 psig. |
| | RO | Continues with Control Rod insertion. <br><br> Monitors plant parameters to assess possible damage. <br><br> When directed, Term & Prevents injection from Condensate/Feedwater per PEI-SPI 5.3 <br><br> When directed, opens all 8 ADS valves. <br><br> As Directed, when Reactor Pressure drops below 140 psig, begins to slowly inject with Condensate/Feedwater (if available) to restore RPV water level above -25 inches. |

Op-Test No.: 2004-01  Scenario No.: __1__  Event No.: __10__          Page _2_ of _2_

Event Description:  Explosion in RHR C Pump Room.  Suppression Pool Leak.

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | BOP | Monitors plant parameters to assess possible damage. <br><br> Observes and reports drop in Suppression Pool Level. <br><br> Announces receipt of the following alarms: <br> ❗ RHR C PUMP ROOM SUMP LEVEL HIGH <br> ❗ SUPR POOL LEVEL A HI/LO <br> ❗ SUPR POOL LEVEL B HI/LO <br><br> Refers to the following alarm response instructions: <br> ❗ ARI-H13-P601-18-D3 <br> ▪ PEI-N11 Entry Condition <br> ▪ Dispatches PO to investigate <br> ▪ With approval from US, stops RHR Pumps C, Shuts suction valve (F105) and Injection Valve (F042C) <br> ❗ ARI-H13-P601-20-E2 <br> ▪ PEI-T23 Entry Condition <br> ▪ Refers to SOI-P11 for pool makeup actions <br> ❗ ARI-H13-P601-17-E1 <br> ▪ PEI-T23 Entry Condition <br> ▪ Refers to SOI-P11 for pool makeup actions <br><br> When directed, Initiates make up to the Suppression Pool <br><br> When directed, Term & Prevents injection from HPCS per PEI-SPI 5.1, and LPCS and LPCI per PEI-SPI 5.2 <br><br> When directed, opens all 8 ADS valves. <br><br> If Condensate/Feedwater is not available then AS DIRECTED, when Reactor Pressure drops below 140 psig, begins to slowing inject with RCIC and/or LPCI A(B)[Outside the Shroud Injection] to restore water level above -25 inches. |

Op-Test No.: <u>200X-0X</u> Scenario No.: <u>1</u> Event No.: <u>N/A</u>      Page <u>1</u> of <u>1</u>

Event Description: <u>Scenario Termination Criteria</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|---------------------------------|
|      |          | 1. Emergency Depressurization completed. |
|      |          | 2. RPV water level has been restored above -25 inches. |
|      |          | 3. All control rods inserted or candidates have demonstrated sufficient abiltiy to insert control rod as determined by Chief Examiner. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u> Event No.: <u>N/A</u> Page <u>1</u> of <u>1</u>

Event Description: <u>Critical Task No. 1: Prior to Emergency Depressurization, injection is</u> <u>Terminated and Prevented from all sources except Boron, RCIC and CRD.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|-------------------------------|
|      |          | 1. Safety Significance<br><br>If control rod insertion alone cannot ensure the reactor will remain shutdown under all conditions, then extra measures are taken to prevent power excursions which may result from positive reactivity additions due to the injection of cold, unborated water.<br><br>2. Cues<br><br>– Procedural Compliance<br><br>– Control Rod Positions<br><br>3. Measurable Performance Indicator<br><br>The operators perform the applicable steps of PEI-SPI 5.1, 5.2, and 5.3 prior to opening Safety Relief Valves to commence Emergency Depressurization.<br><br>4. Performance Feedback<br><br>No injection to the RPV is observed from Condensate/ Feedwater, HPCS, LPCS, and LPCI (A, B, and C). |

Op-Test No.: 2004-01 Scenario No.: __1__ Event No.: __N/A__ Page __1__ of __1__

Event Description: __Critical Task No. 2: Emergency Depressurizes the RPV when or before__ __Suppression Pool Level reaches 14.25 ft.__

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | | 1. Safety Significance<br><br>The RPV is not permitted to remain at pressure if suppression of steam discharged from the RPV to the suppression pool cannot be assured. Failure to ED at this time could lead to Containment failure.<br><br>2. Cues<br><br>– Procedural Compliance<br><br>– Decreasing Suppression Pool Level Trend<br><br>3. Measurable Performance Indicator<br><br>At or before 14.25 ft. in the Suppression Pool the operator opens at least 5 Safety Relief Valves (preferably all 8 Automatic Depressurization Valves)<br><br>4. Performance Feedback<br><br>Decreasing Reactor Pressure Trend |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u>   Event No.: <u>N/A</u>         Page <u>1</u> of <u>1</u>

Event Description:  <u>Critical Task No. 3: When Reactor Pressure drops below 140 psig,</u> <u>slowing increases injection from sources that inject outside the shroud and restores RPV</u> <u>water level above -25 inches.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | 1. Safety Significance<br><br>When RPV pressure drops below the Minimum Steam Cooling Pressure, injection into the RPV must be re-established to maintain adequate core cooling.<br><br>2. Cues<br><br>– Procedural Compliance<br><br>– Decreasing Reactor Pressure Trend<br><br>3. Measurable Performance Indicator<br><br>When Reactor Pressure is less that 140 psig, the operator begins to slowing inject with one or more of the following – Condensate/Feedwater, RCIC, CRD, or LPCI A(B) [thru SDC Return Line] – and restores RPV level above -25 inches.<br><br>4. Performance Feedback<br><br>RPV water level above -25 inches and rising. |

Facility: <u>Perry U1</u>  Scenario No.: <u>1a</u>  Op-Test No.: <u>2004-01</u>

Examiners:  <u>D. McNeil  (D. Reeser - Cert)</u>  Operators: _____
    <u>M. Bielby</u>  _____
    <u>R. Walton</u>  _____

Initial Conditions: <u>Mode 2, Reactor Critical at the POAH, Hot reactor startup in progress</u>
<u>(approx. 470/F and 500 psig), a RFPT is in service on low flow control.  MFP tagged out of</u>
<u>service.</u>

Turnover: <u>Reactor startup is progress; reactor is critical at the point of adding heat. Temp</u>
<u>~470 degrees F Rx pressure ~500 psig. Planned activities include continued heat-up and</u>
<u>entry to Mode 1 per IOI-0002 (section 4.6)</u>

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | None | R(RO/ SRO) | Establish and maintain Heat-up rate.  (STE plot H/U rate) |
| ~~2~~ | ~~None~~ | ~~N(BOP/ SRO)~~ | ~~Shift RFPT to Startup Level Controller~~ |
| 3 | AN: H13P601 17A(33) | C(SRO) | RHR Pump B Low Discharge Pressure Condition  (Tech Spec) |
| 4 | CU02, MVO6 on 1G33F053 | C(RO/ SRO) | Small isolable RWCU leak; Containment Isolation valve fails to fully close. (Tech Spec) |
| ~~5~~ | ~~1B21N073C (C) set to 0~~ | ~~C(BOP/ SRO)~~ | ~~Inadvertent HPCS Initiation  (Tech Spec)~~ |
| ~~6~~ | ~~MV04: 1P45F140~~ | ~~C(BOP)~~ | ~~HPCS ESW Pump Discharge valve fails to open automatically.~~ |
| 7 | TC04B | C(RO/ BOP/ SRO) | Short-circuit in Bypass Valve Jack control circuit results in depressurization above reactor capacity resulting in excessive cooldown.  Reduce steam loss, shutdown the reactor and isolate MSIVs. (SCRAM & Activities to minimize cooldown) |
| 8 | RD15 | C (RO/ SRO) | Several control rods fail to insert, shutdown criteria not met but reactor is sub-critical. |
| 9 | RD13 | C(RO/ SRO) | CRD Pump Suction Filter clogs and CRD pump trips preventing recharge of scram accumulators.  (Restores CRD after bypassing filters) |
| 10 | PC04 | M | Explosion in RHR C Pump Room.  SP Leak. |

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

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>1</u>   Event No.: <u>1</u>          Page <u>1</u> of <u>1</u>

Event Description: <u>Establish and maintain plant heat-up rate.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Short brief on continuing heat-up with emphasis on Control Rod Movement (FTI-B0002).<br><br>Reviews IOI-2 for upcoming activities. |
| | RO | Reviews FTI-B002 and SOI-C11(RCIS) in preparation for control rod movement.<br><br>Establishes and maintains desired heat-up rate (≠100°F)<br>❗ Withdraws control rods<br> ▪ Selects INDIVID DRIVE or GANG DRIVE mode as appropriate<br> ▪ Selects the appropriate control rod(s) in accordance with the Control Rod Movement Sheet (FTI-B0002-1)<br> ▪ Withdraws selected control rod(s) to the specified pos<br>❗ Adjusts Press Set as necessary to maintain BPV-1 20-80% open. |
| | BOP | Monitors plant parameters. |

Op-Test No.: _2004-01_ Scenario No.: ___1___ Event No.: ___2___       Page _1_ of _1_

Event Description: ~~Shift RFPT to Startup Level Controller~~

<div align="center">NOT USED</div>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|----------------------------------|
| | SRO | Directs BOP to shift RFPT to Startup Level Controller in accordance with SOI-C34. |
| | RO | Monitors plant parameters. |
| | BOP | Shifts RFPT to Startup Level Controller in accordance with section 4.5 of SOI-C34.<br>❗ Verifies inservice RFPT is on MANUAL SPEED CONTROL DIAL and operation at > 4000 rpm.<br>❗ Verifies RFP A, B, and C FLOW CONTROL and STARTUP RX LEVEL CONTROL are in manual.<br>❗ Selects inservice RFPT with STARTUP FDW PUMP SELECT<br>❗ Adjusts STARTUP RX LEVEL CONTROL output to zero the RFP DEV METER.<br>❗ Places the inservice RFPT GOV MODE CONT to AUTO<br>❗ Adjusts STARTUP RX LEVEL CONTROL tape-set to null deviation<br>❗ PLACE the LOW FLOW RX LEVEL CONTROL in MANUAL.<br>❗ PLACE the STARTUP RX LEVEL CONTROL in AUTO.<br>❗ ADJUST the STARTUP RX LEVEL CONTROL tapeset to desired level. Normally at 196".<br>❗ MAINTAINS level constant, WHILE throttling open the Low Flow Rx Level Control Valve.<br>❗ JOGS OPEN FW Heater 6A&B Outlet Valves<br>❗ CLOSES the LOW FLOW CONTROL VALVE, 1N27-F175. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>1</u>  Event No.: <u>3</u>        Page <u>1</u> of <u>1</u>

Event Description: <u>RHR Pump B Low Discharge Pressure Condition</u>

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | SRO | Acknowledges announcement of RHR PUMP B DISCHARGE PRESSURE HI/LO alarm.<br><br>Refers to TS 3.5.1, ECCS – Operating.<br>❗ Declares RHR B INOPERABLE.<br>❗ Enters Action A – Restore to OPERABLE status within 7 days.<br><br>Initiates maintenance request to restore RHR B to OPERABLE status. |
| | RO | Continues heat-up and monitors plant parameters. |
| | BOP | Announces receipt of RHR PUMP B DISCHARGE PRESSURE HI/LO alarm.<br><br>Refers to ARI-H13-P601-0017-F3<br>❗ Dispatches PO to check operation of RHR B&C Water Leg Pump<br>❗ Determines that alarm is due to low pressure<br>  ▪ PO report from the field<br>  ▪ Pressure reading at back-panel 1H13-P618<br>    # Cue: 1E12-N053B reads approx 25 psig<br>    # Cue: 1E12-N053C reads approx 45 psig<br>❗ Refers to SOI-E12 to initiate one or more of the following (provide cues as appropriate for action initiated):<br>  ▪ Alternate Keep Fill (will clear alarm)<br>    # Cue: 1E12-N053B reads approx 45 psig<br>    # Cue: 1E12-N053C reads approx 45 psig<br>  ▪ RHR B High Point Vent<br>    # Cue: 1E12-N053B reads approx 28 psig<br>    # Cue: 1E12-N053C reads approx 45 psig<br>  ▪ RHR B Fill and Vent<br>    # Cue: 1E12-N053B reads approx 28 psig<br>    # Cue: 1E12-N053C reads approx 45 psig |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u> Event No.: <u>4</u>  Page <u>1</u> of <u>2</u>

Event Description: <u>Small isolable RWCU leak; Containment Isolation valve (G33-F053)</u> <u>fails to fully close.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges announcement of RWCU AREAS LD TEMP and/or RWCU AREAS LD ❩ TEMP alarm(s).<br><br>Directs shutdown and isolation of RWCU system.<br><br>Refers to TS 3.6.1.3 Primary Containment Isolation Valves (PCIVs)<br>❗ Declares G33-F053 INOPERABLE.<br>❗ Enters Action A<br>   A.1 Isolate the affected penetration flow path with 4 hours; AND<br>   A.2 Verify the affected penetration flow path is isolated prior to entering MODE 2 or 3 from MODE 4 in not performed within the previous 92 days.<br>Initiates maintenance request to restore G33-F053 to OPERABLE status.<br><br>May enter ONI-D17, "High Radiation Levels Within Plant" |
| | RO | Announces one or both of the following alarms as applicable:<br>❗ RWCU AREAS LD TEMP P632<br>❗ RWCU AREAS LD ❩ TEMP P632<br><br>Refers to ARI-H13-P680-1-D4 &E4<br>❗ Directs BOP to verify proper operation of Containment Vessel Ventilation System (M11).<br><br>Shutdown and isolate RWCU in accordance with SOI-G33<br>❗ Stops RWCU pumps and shuts containment isolation valves.<br>❗ Identifies that G33-F053 did not close and lost power.<br>❗ Reports that RWCU System is isolated except for G33-F053.<br><br>If auto isolation setpoint is reached,<br>❗ Announces RWCU ISOL HX RM TEMP HI<br>❗ Refers to ARI-H13-P680-1-E3<br>❗ Verifies auto isolation |

| Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u> Event No.: <u>4</u> Page <u>2</u> of <u>2</u> |
|---|
| Event Description: <u>Small isolable RWCU leak; Containment Isolation valve (G33-F053)</u> <u>fails to fully close.</u> |
|  |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
|  | BOP | Checks EQUIPMENT AREA AMBIENT TEMP Recorder, 1E31-R608, and EQUIPMENT AREA DIFF TEMP Recorder, 1E31-R611, on panel P632 to determine location of high temperature. <br> **AND/OR** <br> Checks LD instruments on H13-P632(P634) ; <br>    E31-N700A(B) A2-3 (Temperature) <br>    E31-N700A(B) A1-3 (Differential Temperature) <br><br> Reports that high temperature/differential temperature is in the RWCU heat exchanger room. <br><br> Announces receipt of NS4 INBD ISOLATION OUT OF SERVICE <br> ❗ refers to ARI-H13-P601-18-A3. <br> ❗ checks valve matrix for deengized lights. (Alarm comes in after power loss to G33-F053). <br><br> Verifies proper operation of Containment Vessel Ventilation System (M11) and Containment Vessel Chill Water System (P50). |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>1</u>  Event No.: <u>5/6</u>      Page <u>1</u> of <u>2</u>

Event Description: ~~HPCS spurious initialtion with ESW C Discharge Valve failure to~~
~~open automatically (will open manually).~~

<div align="center">NOT USED</div>

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
|  | SRO | Acknowledges announcement of alarms by BOP<br><br>Enters ONI-E12-1, Inadvertent Initiation of ECCS/RCIC<br>  ❗ Ensures immediate operator actions completed<br>    ▪ Verifies HPCS initiation in NOT valid<br>    ▪ Takes HPCS Pump control switch to STOP<br>  ❗ When initiation signal is clear, directs reset of initiation logic<br>  ❗ When initiaion logic is reset, directs restoration of HPCS and EDG to standby readiness<br>  ❗ Notifies Reactor Engineer of injection<br>  ❗ Contacts Chemistry to evaluate if reactor water chemistry impact<br>  ❗ Directs SE to archive ICS data.<br>  ❗ Directs restoration of CST/Suppression Pool level(s)<br><br>Enters ONI-C51-1, Unplanned Change in Reactor Power or Reactivity<br>  ❗ RESTORE reactor power to # the pre-transient power level.<br>  ❗ Notify Reactor Engineering<br>  ❗ Refers to ONI-E12-1<br><br>Refers to TS 3.5.1, ECCS – Operating<br>  ❗ Declares HPCS INOPERABLE.<br>  ❗ Enters Action B<br>    B.1  Verify RCIC OPERABLE within 1 hour; AND<br>    B.2  Restore HPCS to OPERABLE status within 14 days.<br>  ❗ Enters Action C<br>    C.1  Restore either HPCS or RHR B to OPERABLE status within 72 hours.<br><br>Initiates maintenance request to restore HPCS to OPERABLE status. |
|  | RO | Backs up verification of invalid HPCS initiation<br><br>Observes and reports power increase; Ranges IRMs as necessary.<br><br>IF directed, restores reactor power to # the pre-transient power level. |

Op-Test No.: 2004-01  Scenario No.:   1   Event No.:   5/6      Page   2   of   2

Event Description:   ~~HPCS spurious initialtion with ESW C Discharge Valve failure to~~
~~open automatically (will open manually).~~
                                        NOT USED

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      | BOP | Announces receipt of the following alarms: |
|      |     | ❗ DIESEL GEN START SIGNAL RECEIVED |
|      |     | ❗ HPCS PUMP START SIGNAL RECEIVED |
|      |     | ❗ HPCS RX LEVEL LO L2 |
|      |     | ❗ ESW TO DIESEL HEAT EXCHANGER FLOW LOW |
|      |     | ❗ HPCS INJECTION VALVE CLOSED RX LEVEL HI L8 |
|      |     | |
|      |     | Peforms Immediate Operator actions for ONI-E12-1 |
|      |     | ❗ Verifies HPCS initiation in NOT valid |
|      |     | ❗ Takes HPCS Pump control switch to STOP |
|      |     | |
|      |     | Observes that HPCS ESW Pump Discharge Valve, P45-F140 is not open. |
|      |     | ❗ Opens P45-F140 using control switch; AND/OR |
|      |     | ❗ **IF** directed, then shuts down Div 3 EDG. |
|      |     | |
|      |     | Refers to the following alarm response procedures: |
|      |     | ❗ ARI-1H13-P601-16-A1 |
|      |     | ▪ Refers to SOI-E22B to verify proper operation of EDG |
|      |     | ❗ ARI-1H13-P601-16-A5 |
|      |     | ▪ Refers to ONI-E12-1 |
|      |     | ❗ ARI-1H13-P601-16-C5 |
|      |     | ▪ Refers to ONI-E12-1 |
|      |     | ❗ ARI-1H13-P601-16-D1 |
|      |     | ▪ Refers to SOI-P45/49 to verify proper operation of ESW |
|      |     | ▪ If flow cannot be restored, consider shutdown of EDG |
|      |     | ❗ ARI-1H13-P601-16-F5 |
|      |     | ▪ Refers to ONI-E12-1 |
|      |     | |
|      |     | When directed, initiates actions to return HPCS and EDG to standby readiness. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>1</u> Event No.: <u>7</u>       Page <u>1</u> of <u>2</u>

Event Description: <u>Bypass valve fails open resulting in excessive cooldown.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges reports from RO. |
| | | Enters ONI-C51, Unplanned Change In Reactor Power Or Reactivity |
| | | Enters ONI-C85-2, Pressure Regulator Failure Open |
| | | Directs RO to manually scram the Reactor by Arming and Depressing Manual Scram Pushbuttons: |
| | | Directs Evacuation of the Containment. |
| | | Directs Closure of the MSIVs. |
| | | Enter ONI-C71-1, Reactor Scram. |
| | | Enters PEI-B13, RPV CONTROL (NON-ATWS), Directs Startup of Hydrogen Analyzers, and transitions to PEI-B13, RPV CONTROL (ATWS) |
| | RO | Observes and reports decreasing reactor pressure. |
| | | Observes and reports 2<sup>nd</sup> bypass valve opening. |
| | | Attempts to close Bypass Valves. |
| | | Manually Scrams the Reactor and performs Immediate Operator Actions Per ONI-C71-1.<br>❗ Places Mode Switch in SHUTDOWN AND REMOVES key.<br>❗ Announces Mode Switch in SHUTDOWN and Control Rod Status<br>❗ Initiates ARI<br>❗ Announces ARI Initiated, Control Rod Status, and APRM Status<br>❗ Verify HST LVL CV MANUAL CONTROL, N21-S19, in OFF.<br>❗ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using Feedwater, RCIC, and/or HPCS as appropriate.<br>❗ Inform Unit Supervisor of systems being used for current level and pressure control. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>  1  </u>   Event No.: <u>  7  </u>          Page <u> 2 </u> of <u> 2 </u>

Event Description:  <u>Bypass valve fails open resulting in excessive cooldown.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      | BOP      | Closes the MSIVs when directed.<br><br>Performs Immediate Operator Actions Per ONI-C71-1.<br>❗ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using RCIC and/or HPCS as appropriate.<br>❗ If reactor pressure is not being maintained with the Bypass Valves, manually cycle SRV's in the order labeled on 1H13-P601 as necessary to maintain reactor pressure within the desired band.<br>❗ Inform Unit Supervisor of systems being used for current level and pressure control.<br>❗ If any SRV has lifted or any relief setpoint is being approached, evacuate the containment.<br>❗ If manpower is available, place the Hydrogen Analyzers in service per SOI-M51/56. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u> 1 </u> Event No.: <u> 8/9 </u>          Page <u> 1 </u> of <u> 3 </u>

Event Description: <u>Several control rods fail to insert, shutdown criteria not met but reactor</u> <u>is sub-critical.  CRD Pump Suction Filter clogs and CRD Pump trips preventing recharge of</u> <u>scram accumulators.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      | SRO      | Enters PEI-B13, RPV CONTROL (ATWS)<br>❗ RPV POWER CONTROL<br>  ▪ Directs insertion of IRMs and SRMs<br>  ▪ Directs insertion of Control Rods per PEI-SPIs 1.1-1.7<br>  ▪ If Suppression Pool Temperature cannot be maintained less than 110°F, direct injection of Boron and inhibiting of ADS. (This action is not expected)<br>❗ RPV LEVEL CONTROL<br>  ▪ Directs verification of required automatic actions<br>  ▪ Directs Inhibiting of ADS<br>  ▪ Directs Termination and Prevention of HPCS, LPCS, and LPCI per PEI-SPI 5.1 and 5.2<br>  ▪ Directs preparation of two or more injection systems per PEI-SPI 6.1-6.5.<br>  ▪ Gives direction to inject and maintain level within band of -25 to 215 inches<br>❗ RPV PRESSURE CONTROL<br>  ▪ Gives direction to stabilize pressure $\#1000$ psig (should not open MSIVs until bypass valves are closed)<br><br>Enters PEI-T23, CONTAINMENT CONTROL (may enter on Suppression Pool Temperature depending on SRV operations OR possibly DW Temperature/Pressure due loss of cooling from Terminatation & Prevention of ECCS injection.)<br>❗ SUPPRESSION POOL TEMPERATURE CONTROL<br>  ▪ Operate all available Suppression Pool Cooling<br>  ▪ Monitor Temperature for further actions.<br>❗ DRYWELL TEMPERATURE CONTROL<br>  ▪ Operate all available cooling<br>  ▪ Restore NCC to Drywell Coolers per PEI-SPI 2.1<br>❗ CONTAINMENT TEMPERATURE CONTROL<br>  ▪ Operate all available cooling<br>  ▪ Restore CVCW per PEI-SPI 2.2<br>❗ SUPPRESSION POOL LEVEL CONTROL<br>  ▪ Monitor Suppression Pool Level for further actions.<br>❗ DRYWELL AND CONTAINMENT PRESSURE CONTROL<br>  ▪ Monitor Drywell and Containment pressure for further actions. |

Op-Test No.: _2004-01_  Scenario No.: __1__  Event No.: __8/9__        Page _2_ of _3_

Event Description:  _Several control rods fail to insert, shutdown criteria not met but reactor_
_is sub-critical.  CRD Pump Suction Filter clogs and CRD Pump trips preventing recharge of_
_scram accumulators._

| Time | Position | Applicant's Actions or Behavior |
|------|----------|-------------------------------|
|      | RO       | Inserts IRMs and SRMs<br><br>Inserts control rods using:<br><br>❗ PEI-SPI 1.2 (SCRAM/RESET/SCRAM) and/or<br>    ▪ If scram cannot be reset due to plant conditions requests installation of RPS Jumpers per PEI-SPI 1.2 (and removal after SDV drains)<br>    ▪ If ARI cannot be reset due to plant conditions, request lifting of leads per PEI-SPI 1.2 (re-landing after SDV drains)<br><br>❗ PEI-SPI 1.3 (Manual Rod Insertion)<br>    ▪ Requests bypass of LPSP<br>    ▪ Fully Opens CRD Flow Control Valve (Manual & 100% on C11-R600)<br>    ▪ Closes C11-F003 (Pressure Control Valve<br><br>Maintains RPV water level -25 to 215 inches using CD/FW (FBPs)<br><br>Announces receipt of CRD PUMP SUCTION FILTER DIFF PRESS HI alarm.<br>  ❗ Refers to ARI-H13-P601-0022-H3<br>  ❗ Dispatches PO to bypass Suction Filters<br><br>Announces receipt of CRD PUMP A(B) TRIP SUCT PRESS LOW<br>  ❗ Refers to ARI-H13-P601-0022-G2(G3)<br>  ❗ Refers to SOI-C11 (CRDH), CRD Pump Trip Recovery<br>  ❗ Recovers the CRD Pump. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u> 1 </u>  Event No.: <u> 8/9 </u>  Page <u> 3 </u> of <u> 3 </u>

Event Description: <u>Several control rods fail to insert, shutdown criteria not met but reactor</u> <u>is sub-critical.  CRD Pump Suction Filter clogs and CRD Pump trips preventing recharge of</u> <u>scram accumulators.</u>

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
|  | BOP | Verifies required automatic initiations and isolations.<br><br>Inhibits ADS.<br><br>Terminates and Prevents Injection from HPCS, LPCS, and LPCI<br><br>   ❗ PEI-SPI 5.1, HPCS<br>       ▪ Holds control switch for E22-F004 in CLOSE<br>       ▪ Arm & Depress HPCS Initiation push-button<br>       ▪ Releases F004 c/s after ensuring F004 closed<br><br>   ❗ PEI-SPI 5.2, LPCS and LPCI<br>       ▪ **PLACE** BUS XH11 LOCA BYPASS keylock switch in BYPASS.<br>       ▪ Hold control switches for LPCS and LPCI injection valves in CLOSE<br>       ▪ Arm & Depress associated initiation push-buttons<br>       ▪ Release control switches after ensuring injection valves are closed.<br><br>Stabilizes pressure below 1000 psig using SRVs, RCIC, and/or MSL Drains.<br><br>When directed, initiates Suppression Pool Cooling (should use Hard Card).<br><br>When directed restores NCC to Drywell Coolers (PEI-SPI 2.1)<br><br>When Directed restores CVCW (PEI-SPI 2.2) |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>1</u>  Event No.: <u>10</u>  Page <u>1</u> of <u>2</u>

Event Description: <u>Explosion in RHR C Pump Room.  Suppression Pool Leak.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|----------------------------------|
| | SRO | Acknowledges report of explosion. <br><br> Directs RO and BOP to monitor plant parameters to assess impact of explosion. <br><br> Acknowledges BOP announcement of alarms. <br><br> (Re-)Enters PEI-T23, Containment Control when Suppression Pool level drops to 17.8 ft. <br> ❗ SUPPRESSION POOL LEVEL CONTROL <br>     ‼ Gives direction to makeup to the Suppression Pool using available systems including SPMU per PEI-SPI 3.2. <br>     ‼ When level cannot be maintained above 14.25 ft., enters PEI-B13 RPV Control (ATWS) (Level Control Leg at **F** and Pressure Control Leg at **X**) <br> ❗ Monitors other Containment Control Parameters to assess need for other mitigating actions. <br><br> Enters PEI-B13, EMERGENCY DEPRESSURIZATION <br> ❗ Gives direction to Terminate and Prevent Injection except for Boron, CRC and RCIC <br> ❗ Verifies Suppression Pool level above 5.25 ft. <br> ❗ Directs opening of all ADS valves. <br> ❗ Directs SLOW recovery of RPV level when Reactor Pressure drops below 140 psig. |
| | RO | Continues with Control Rod insertion. <br><br> Monitors plant parameters to assess possible damage. <br><br> When directed, Term & Prevents injection from Condensate/Feedwater per PEI-SPI 5.3 <br><br> When directed, opens all 8 ADS valves. <br><br> As Directed, when Reactor Pressure drops below 140 psig, begins to slowly inject with Condensate/Feedwater (if available) to restore RPV water level above -25 inches. |

Op-Test No.: 2004-01  Scenario No.: __1__  Event No.: __10__        Page _2_ of _2_

Event Description: _Explosion in RHR C Pump Room.  Suppression Pool Leak._

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | BOP | Monitors plant parameters to assess possible damage. <br><br> Observes and reports drop in Suppression Pool Level. <br><br> Announces receipt of the following alarms: <br> ❗ RHR C PUMP ROOM SUMP LEVEL HIGH <br> ❗ SUPR POOL LEVEL A HI/LO <br> ❗ SUPR POOL LEVEL B HI/LO <br><br> Refers to the following alarm response instructions: <br> ❗ ARI-H13-P601-18-D3 <br>    ▪ PEI-N11 Entry Condition <br>    ▪ Dispatches PO to investigate <br>    ▪ With approval from US, stops RHR Pumps C, Shuts suction valve (F105) and Injection Valve (F042C) <br> ❗ ARI-H13-P601-20-E2 <br>    ▪ PEI-T23 Entry Condition <br>    ▪ Refers to SOI-P11 for pool makeup actions <br> ❗ ARI-H13-P601-17-E1 <br>    ▪ PEI-T23 Entry Condition <br>    ▪ Refers to SOI-P11 for pool makeup actions <br><br> When directed, Initiates make up to the Suppression Pool <br><br> When directed, Term & Prevents injection from HPCS per PEI-SPI 5.1, and LPCS and LPCI per PEI-SPI 5.2 <br><br> When directed, opens all 8 ADS valves. <br><br> If Condensate/Feedwater is not available then AS DIRECTED, when Reactor Pressure drops below 140 psig, begins to slowing inject with RCIC and/or LPCI A(B)[Outside the Shroud Injection] to restore water level above -25 inches. |

Op-Test No.: <u>200X-0X</u> Scenario No.: __1__ Event No.: __N/A__        Page _1_ of _1_

Event Description: _Scenario Termination Criteria_

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | 1. Emergency Depressurization completed.<br><br>2. RPV water level has been restored above -25 inches.<br><br>3. All control rods inserted or candidates have demonstrated sufficient abiltiy to insert control rod as determined by Chief Examiner. |

Op-Test No.: <u>2004-01</u> Scenario No.: __1__ Event No.: __N/A__        Page _1_ of _1_

Event Description: <u>Critical Task No. 1: Prior to Emergency Depressurization, injection is</u> <u>Terminated and Prevented from all sources except Boron, RCIC and CRD.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | 1. Safety Significance<br><br>If control rod insertion alone cannot ensure the reactor will remain shutdown under all conditions, then extra measures are taken to prevent power excursions which may result from positive reactivity additions due to the injection of cold, unborated water.<br><br>2. Cues<br><br>  &ndash; Procedural Compliance<br><br>  &ndash; Control Rod Positions<br><br>3. Measurable Performance Indicator<br><br>The operators perform the applicable steps of PEI-SPI 5.1, 5.2, and 5.3 prior to opening Safety Relief Valves to commence Emergency Depressurization.<br><br>4. Performance Feedback<br><br>No injection to the RPV is observed from Condensate/ Feedwater, HPCS, LPCS, and LPCI (A, B, and C). |

Op-Test No.: 2004-01  Scenario No.:   1   Event No.:   N/A      Page  1  of  1 

Event Description:  Critical Task No. 2: Emergency Depressurizes the RPV when or before  Suppression Pool Level reaches 14.25 ft. 

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | 1. Safety Significance<br><br>The RPV is not permitted to remain at pressure if suppression of steam discharged from the RPV to the suppression pool cannot be assured.  Failure to ED at this time could lead to Containment failure.<br><br>2. Cues<br><br>&ndash;  Procedural Compliance<br><br>&ndash;  Decreasing Suppression Pool Level Trend<br><br>3. Measurable Performance Indicator<br><br>At or before 14.25 ft. in the Suppression Pool the operator opens at least 5 Safety Relief Valves (preferably all 8 Automatic Depressurization Valves)<br><br>4. Performance Feedback<br><br>Decreasing Reactor Pressure Trend |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>1</u>  Event No.: <u>N/A</u>          Page <u>1</u> of <u>1</u>

Event Description:  <u>Critical Task No. 3: When Reactor Pressure drops below 140 psig,</u>
<u>slowing increases injection from sources that inject outside the shroud and restores RPV</u>
<u>water level above -25 inches.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | 1.  Safety Significance<br><br>When RPV pressure drops below the Minimum Steam Cooling Pressure, injection into the RPV must be re-established to maintain adequate core cooling.<br><br>2.  Cues<br><br>  –  Procedural Compliance<br><br>  –  Decreasing Reactor Pressure Trend<br><br>3.  Measurable Performance Indicator<br><br>When Reactor Pressure is less that 140 psig, the operator begins to slowing inject with one or more of the following – Condensate/Feedwater, RCIC, CRD, or LPCI A(B) [thru SDC Return Line] – and restores RPV level above -25 inches.<br><br>4.  Performance Feedback<br><br>RPV water level above -25 inches and rising. |

Facility: _Perry U1_                    Scenario No.: __2__                    Op-Test No.: __2004301__

Examiners: __D. McNeil  (D. Reeser - Cert)__        Operators: _____
                   __M. Bielby__                                              _____
                   __R. Walton__                                              _____

Initial Conditions: Mode 1, 100% RTP EOC, RCIC Isolated, MFP tagged out of service.
Winter Weather Advisory in effect.  RPV Head inner Omega seal failed.

Turnover: Plant at 100% RTP, MFP tagged OOS for bearing replacement, and RCIC was isolated on the last shift due a steam leak on the FO45 valve.  The RPV Head inner seal failed several weeks ago and will be replaced at the next outage.  APRM D is bypassed for calibration and is expected to be returned to service this shift.  A Winter Weather Advisory is in effect. Plans are to reduce power to approx. 92% to perform Main Turbine Valve Exercise surveillance.

| Event No. | Malf. No. | Event Type* | Event Description |
|-----------|-----------|-------------|-------------------|
| 1 | None | R (RO/SRO) | Reduce power to 92% with RR Flow |
| 2 | NM08H | C (RO/SRO) | APRM H Flow Card fails to 50% (Tech Spec) |
| 3 | None | N (BOP/SRO) | Perform Main Turbine Valve Exercise |
| 4 | OBE, FW10, MV06 | C (BOP/SRO) | Earthquake exceeding OBE; CST rupture, HPCS Suppression Pool Suction Valve fails shut due to mechanical binding. (Tech Spec) |
| 5 | SSE, FW08B, TH03B, TH02A, MV02 on 1E22F023 | C (RO/SRO) | Earthquake exceeding SSE; RFPT B bearing oil line break; RPV Head Outer seal fails (Reactor coolant leak to DW); HPCS Test Valve to Suppression Pool (F023) fails open on pump start. |
| 6 | OBE/SSE, MC01A, MC03 | M | CW expansion joint rupture/loss of CW/loss of vacuum, Turbine Trip/ RFPT A Trips/Group 1 Isolation, Reactor Scram (No high pressure injection except CRD & SLC) |
|  |  |  |  |

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

| Op-Test No.: 2004-01  Scenario No.: __2__  Event No.: __1__                    Page _1_ of _1_ |
|---|
| Event Description: _Reduce power to 92% with RR Flow_ |
|  |
|  |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
|  | SRO | Conducts a short brief on the power reduction using Reactor Recirc flow.<br><br>Monitors power reduction and provides peer checks as needed. |
|  | RO | Reviews IOI-3, Power Changes, precautions and limitations, and Attachment 4, Power Maneuvering, prior to power decrease.<br><br>Decreases power to 92% using Reactor Recirc flow in accordance with Attachment 4 of IOI-3.<br>❗ Ensures Reactor Engineering contacted to determine if thermal limits considerations require control rods to be moved prior to reducing power using reactor recirculation flow.<br>❗ Reduces reactor power to approximately 92% RTP by decreasing Reactor Recirculation System flow.<br>▪ decreases flow using individual loop flow controllers<br>▪ monitors individual loop flows, total core flow, reactor power, and generator output.<br>❗ Maintains the turbine LOAD SET approximately 120 MWe above generator output to a maximum of 1450 MWe, by utilizing the turbine LOAD SELECTOR. |
|  | BOP | Monitors plant parameters during power reduction.<br><br>Reviews SVI-N31-T1151, Main Turbine Valve Exercise Test.<br><br>When directed, jogs OPEN HTR 4 START UP VENT TO CNDR for 1 to 2 seconds as required to maintain the dissolved oxygen concentration within specification. |

| | | |
|---|---|---|
| Op-Test No.: <u>2004-01</u>  Scenario No.: <u>2</u>  Event No.: <u>2</u>      Page <u>1</u> of <u>2</u> | | |
| Event Description: <u>APRM H Flow Card fails to 50%.</u> | | |

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges announcement of alarms. |
| | | Directs APRM back-panel indications checked. |
| | | May enter ONI-C51, Unplanned Change in Reactor Power or Reactivity |
| | | Refers to TS 3.3.1.1, RPS Instrumentation<br>❗ Declares APRM H INOPERABLE<br>❗ Enters Action A<br>   A.1  Place channel in trip within 12 hours<br>   OR<br>   A.2  Place associated trip system in trip within 12 hours |
| | | Refers to ORM 6.2.1, APRM Control Rod Block Instrumentation<br>❗ Declares APRM H INOPERABLE (No other action required by ORM since minimum operable channels still satisfied.) |
| | | Requests status of APRM D calibration. |
| | | ***NOTE TO EVALUATOR***<br><br>*If necessary cue the SRO to ensure the RO – NOT the BOP – performs the un-bypassing of APRM D and Bypassing of ARPM H.* |
| | | When APRM D declared OPERABLE, directs RO to un-bypass APRM D and then Bypass APRM H. |

Op-Test No.: 2004-01  Scenario No.: __2__  Event No.: __2__  Page _2_ of _2_

Event Description: APRM H Flow Card fails to 50%.

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | RO | Announces receipt of the following alarms:<br>❗ RPS NEUTRON MON TRIP<br>❗ 1/2 SCRAM B/D<br>❗ ROD WITHDRAWAL BLOCK<br>❗ OPRM TRIP ENABLE<br>❗ ROD BLOCK APRM UPSCALE<br>❗ APRM D/H UPSC INOP/TRIP OPRM D/H TRIP<br><br>Refers to the following Alarm Response Instructions:<br>❗ ARI-H13-P680-0005-B7<br>❗ ARI-H13-P680-0005-B9<br>❗ ARI-H13-P680-0005-E10<br>❗ ARI-H13-P680-0006-A2<br>❗ ARI-H13-P680-0006-C4<br>❗ ARI-H13-P680-0006-E5<br><br>Refers to Power/Flow map to ensure still operation within acceptable region.<br><br>Diagnoses and reports alarms are due to APRM H even though there is no change in power indication.<br><br>When directed, refers to SOI-C51(APRM) and then un-bypasses APRM D and bypasses APRM H in accordance with that procedure.<br>❗ Performs channel check before repositioning bypass joy stick.<br><br>When directed, resets ½ Scram per SOI-C71 (section 7.3). |
| | BOP | Checks APRM H back-panel (P672) indications and reports findings to SRO/RO<br>❗ Upscale Alarm (yellow light)<br>❗ Upscale Therm Trip (red light)<br>❗ Upscale Therm First (red light)<br>❗ IF flow channel is checked (selector switch to FLOW) observes flow at 25%.<br><br>Assists RO with ARI response. |

Op-Test No.: <u>2004-01</u>  Scenario No.: __2__  Event No.: __3__         Page __1__ of __1__

Event Description: _Perform Main Turbine Valve Exercise_

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|  | SRO | Grants permission to perform Main Turbine Valve Exercise Test in accordance with SVI-N31-T1151. |
|  | RO | Monitors plant parameters during performance of surveillance test. |
|  | BOP | Performs Main Turbine Valve Exercise Test in accordance with SVI-N31-T1151.<br>❗ Reviews procedure and obtains permission to perform (may have been done earlier)<br>❗ Adjusts ADFL setpoint to 110%<br>❗ Cycles each MSV and CIV<br>    ❝ Depresses associated test pushbutton<br>    ❝ Observes position indicator for valve close response<br>    ❝ Releases associated test pushbutton<br>    ❝ Records test results<br>    ❝ Waits for plant to stabilize before continuing |

Op-Test No.: <u>2004-01</u>  Scenario No.: __2__  Event No.: __4__       Page __1__ of __3__

Event Description: <u>Earthquake (OBE) resulting in loss of CST.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|---------------------------------|
|      |          | ***NOTE TO EVALUATOR*** |
|      |          | *After announcement of seismic alarms, announce to crew that ground motion was felt.* |
|      | SRO      | Acknowledges announcement of alarms. |
|      |          | Enters ONI-D51, Earthquake |
|      |          | ❗ Determines OBE levels have been exceeded. |
|      |          | ❗ Initiates Normal Reactor Shutdown. |
|      |          | ❗ Directs shutdown of all Under-drain pumps. |
|      |          | ❗ Directs BOP to start all ESW Loops (A, B, and HPCS) |
|      |          | ❗ Refers to EPI-A1 and declares an ALERT. |
|      |          | ❗ Directs MCR and plant personnel to evaluate plant parameters and inspect areas of the plant to assess impact of earthquake. |
|      |          | Declares seismic instrumentation INOPERABLE and refers to ORM 6.2.7, Seismic Monitoring Instrumentation |
|      |          | ❗ Restore within 30 days |
|      |          | Acknowledges report on HPCS Suction Valve failed shut. |
|      |          | Refers to TS 3.5.1 |
|      |          | ❗ Declares HPCS INOPERABLE |
|      |          | ❗ Enters Action D (RCIC not operable) |
|      |          | ▪ Hot Shutdown within 12 hours AND |
|      |          | ▪ Cold Shutdown within 36 hours |
|      |          | ❗ Initiates maintenance request on HPCS Suction Valve |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>2</u>  Event No.: <u>4</u>       Page <u>2</u> of <u>3</u>

Event Description: <u>Earthquake (OBE) resulting in loss of CST.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|  | RO | Announces receipt of the following alarms:<br>❗ SEISMIC ALARM P969<br>❗ SEISMIC MONITOR TRBL<br><br>Refers to the following Alarm Response Instructions:<br>❗ ARI-H13-P680-0008-B3<br>❗ ARI-H13-P680-0008-C3<br>  ▪ ONI-D51 entry condition<br>  ▪ Contact Responsible System Engineer<br>  ▪ Seismic Instruments Inoperable<br><br>Monitors plant parameters to assess impact of earthquake.<br><br>When directed, commences power reduction in accordance with IOI-3 and IOI-4 |
|  | BOP | Observes and reports the status of the red AND amber lights at the SEISMIC MONITORING ANNUNCIATOR on 1H13-P969.<br><br>Monitors plant parameters to assess impact of earthquake.<br><br>Observes and reports rapid drop in CST level.<br><br>Announces receipt of the following alarms<br>❗ CONDENSATE STORAGE TANK DIKE LVL HI<br>❗ CONDENSATE STORAGE TANK LEVEL LOW<br><br>Refers to the following Alarm Response Instructions:<br>❗ ARI-H13-P870-0002-F2<br>❗ ARI-H13-P870-0002-F4<br>  ▪ Secure all non-safety uses of CST<br>  ▪ Initiate makeup (this will not have any significant affect)<br>  ▪ Monitor CRD and Condensate Transfer pumps for loss of suction. |

| Op-Test No.: <u>2004-01</u> Scenario No.: <u>2</u> Event No.: <u>4</u> | Page <u>3</u> of <u>3</u> |
|---|---|

Event Description: <u>Earthquake (OBE) resulting in loss of CST.</u>

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | Refers to SOI-P45/49 and starts up all ESW Loops. <br> ❗ For each loop: <br> ❞ Starts associated ESWPH Ventilation Fan per SOI-M32 <br> ❞ Verifies RHR Hx Inlet and Outlet Isol Valves open <br> ❞ Takes pump control switch to start and observes <br> – Discharge Valve starts to open <br> – Pump starts when discharge valve approx. 5% open <br> – Discharge Valve fully opens <br> ❞ If ESW Inlet Temperature <34°F, opens de-icing valve. <br> ❗ Notifies Chemistry to obtain samples and Chlorinate as necessary. <br><br> Monitors plant parameters during power reduction. <br><br> **IF** directed to transfer HPCS suction to Suppression Pool, recognizes and reports failure of HPCS Suction Valve to open. <br> ❗ Dispatches PO to investigate breaker and valve locally. |

Op-Test No.: <u>2004-01</u>  Scenario No.: __2__  Event No.: __5__          Page _1_ of _2_

Event Description: <u>Second earthquake resulting in loss of RFPT B (oil leak) and failure of</u>
<u>the RPV Head outer omega seal.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|---------------------------------|
| | | ***NOTE TO EVALUATOR*** |
| | | *Announce to crew that ground motion was felt.* |
| | SRO | Re-enters ONI-D51, Earthquake |
| | | ❗ Directs MCR and plant personnel to re-evaluate plant parameters and inspect areas of the plant to assess impact of earthquake. |
| | | ❗ Continues with Normal Reactor Shutdown. |
| | | Acknowledges report on Feed Pump B alarms. |
| | | Directs power reduction to < 63% (capacity with one Feed Pump) |
| | | Enters ONI-N27 |
| | | ❗ Ensures IMMEDIATE ACTIONS are completed |
| | | ❗ If additional power reduction is required, directs RO to insert Cram Rods in accordance with FTI-B0002, Control Rod Movements. |
| | | ❗ Directs BOP operator to place RFP B FLOW CONTROL in MANUAL. |
| | | ❗ Directs BOP operator to shutdown the RFPT B Turning Gear in accordance with SOI-N27. |
| | | Directs RO to Manually Scram the Reactor (either due to FW transient or rising DW pressure) |
| | | Enters ONI-C71-1, Reactor Scram |
| | | Enters PEI-B13, RPV CONTROL (NON-ATWS) |
| | | ❗ ENTRY ACTIONS |
| | | ▪ Directs placing the Reactor Mode Switch in SHUTDOWN |
| | | ▪ Directs startup of the H2 Analyzers |
| | | ▪ Directs insertion of IRMs and SRMs |
| | | ❗ RPV LEVEL CONTROL |
| | | ▪ Directs verification of required automatic actions |
| | | ▪ Gives direction to restore and maintain level within band of 185 to 215 inches |
| | | ❗ RPV PRESSURE CONTROL |
| | | ▪ Gives direction to stabilize pressure #1000 psig |

Op-Test No.: 2004-01  Scenario No.: __2__  Event No.: __5__  Page _2_ of _2_

Event Description: Second earthquake resulting in loss of RFPT B (oil leak) and failure of the RPV Head outer omega seal.

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      | RO | Monitors plant parameters to assess impact of earthquake.<br><br>Announces receipt of the following alarms:<br>❗ RFP B BRG OIL PRESS LO<br>❗ RFPT B BEARING OIL PRESSURE LOW<br>❗ RFPT B HYD OIL PRESS LO<br>❗ RFPT B TRIP<br>Refers to the following Alarm Response Instructions:<br>❗ ARI-H13-P680-0003-A4<br>❗ ARI-H13-P870-0008-D1<br>❗ ARI-H13-P680-0003-B4<br>❗ ARI-H13-P680-0003-D7<br><br>ONI-N27 Actions<br>❗ Performs applicable Immediate Actions from memory<br>▪ Reduces core flow to reduce power below 63% or to just outside the edge of the IMMEDIATE EXIT region of the Power-to-Flow map.<br>❗ When directed, inserts Cram Rods in accordance with FTI-B0002, Control Rod Movements.<br><br>Observes and reports increasing DW Temperature and Pressure.<br><br>When directed, Manually scrams the reactor and performs immediate actions per ONI-C71-1<br>❗ Places Mode Switch in SHUTDOWN AND REMOVES key.<br>❗ Announces Mode Switch in SHUTDOWN and Control Rod Status<br>❗ Verify HST LVL CV MANUAL CONTROL, N21-S19, in OFF.<br>❗ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using Feedwater, RCIC, and/or HPCS as appropriate.<br>❗ Inform Unit Supervisor of systems being used for current level and pressure control. |

Op-Test No.: 2004-01  Scenario No.: __2__  Event No.: __5__          Page __3__ of __2__

Event Description: Second earthquake resulting in loss of RFPT B (oil leak) and failure of the RPV Head outer omega seal.

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | RO | PEI-B13, RPV CONTROL (NON-ATWS)<br>❗ Inserts IRMs and SRMs<br>❗ Uses FW to maintain level until RFPT trips on low vacuum or MSIVs are closed.<br>❗ Uses Bypass Valves to control Reactor Pressure until Bypass Valves close on low vacuum or MSIVs are closed |
| | BOP | Monitors plant parameters to assess impact of earthquake.<br><br>ONI-N27 Actions<br>❗ Places the tripped Feedwater Pump FLOW CONTROL in MANUAL.<br>❗ Shuts down the RFPT B Turning Gear in accordance with SOI-N27.<br><br>Announces receipt of the following alarms:<br>❗ DW UNIDENTIFIED RATE OF CHANGE HIGH<br>❗ DRYWELL AIR COOLERS DRAIN FLOW HI<br>❗ RX HEAD FLANGE SEAL LEAKAGE HIGH<br><br>Observes and reports increasing DW Temperature and Pressure.<br><br>Announces receipt of the following alarms:<br>❗ CNTMT / DW DIFF PRESS A HIGH<br>❗ CNTMT / DW DIFF PRESS B HIGH<br>❗ DRYWELL PRESS A HIGH<br>❗ DRYWELL PRESS B HIGH<br><br>(Continued on next page) |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>2</u> Event No.: <u>5</u>        Page <u>4</u> of <u>2</u>

Event Description: <u>Second earthquake resulting in loss of RFPT B (oil leak) and failure of</u>
<u>the RPV Head outer omega seal.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|---------------------------------|
|      | BOP      | Performs Immediate Operator Actions Per ONI-C71-1.<br>❗ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using HPCS as appropriate (If still lined up to CST, some injection may be available; with min flow failed open some water will be diverted to the Suppression Pool).<br>❗ If reactor pressure is not being maintained with the Bypass Valves, manually operate SRV's in the order labeled on 1H13-P601 as necessary to maintain reactor pressure within the desired band.<br>❗ Inform Unit Supervisor of systems being used for current level and pressure control.<br>❗ If manpower is available, place the Hydrogen Analyzers in service per SOI-M51/56.<br><br>PEI-B13, RPV CONTROL (NON-ATWS)<br>❗ Verifies automatic initiations and isolations |

Op-Test No.: __2004-01__ Scenario No.: __2__ Event No.: __6__      Page __1__ of __5__

Event Description: Third earthquake resulting in failure of a CW Expansion joint and subsequent loss of CW/loss of vacuum.

| Time | Position | Applicant's Actions or Behavior |
|------|----------|-------------------------------|
| | | ***NOTE TO EVALUATOR*** |
| | | *Announce to crew that ground motion was felt.* |
| | SRO | Re-enters ONI-D51, Earthquake <br> ❗ Directs MCR and plant personnel to re-evaluate plant parameters and inspect areas of the plant to assess impact of earthquake. <br><br> Acknowledges TURBINE BLDG BASEMENT WATER LEVEL HIGH alarm. <br><br> Upon confirmation of high water level in the Turb Bldg basement: <br> ❗ Directs BOP to trip all CW pumps. <br> ❗ Directs BOP isolate Condenser Waterboxes and Cooling Tower makeup. <br><br> Enters ONI-N62, Loss of Condenser Vacuum <br><br> Enters PEI-B13, RPV CONTROL (NON-ATWS) <br> ❗ RPV LEVEL CONTROL <br> ▪ When RFPs are no longer available, gives direction to maximize CRD in accordance with PEI-SPI 4.1. <br> ▪ Gives direction to inject with SLC (demin water) in accordance with PEI-SPI 4.5 <br> ▪ Ensures 2 or more injection sources (LPCI A, B, or C; LPCS) lined up and running. <br> ▪ When RPV level cannot be maintained above -25 inches, enters PEI-SPI B13, EMERGENCY DEPRESSURIZATION while continuing in RPV Level Control <br> ▪ Directs injection at maximum flow to restore RPV level to between 185 and 215 inches. <br> ❗ RPV PRESSURE CONTROL <br> ▪ Gives direction to perform a controlled depressurization of the RPV (< 100°F/hr) |
| | SRO | |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>2</u> Event No.: <u>6</u>      Page <u>2</u> of <u>5</u>

Event Description:<u> Third earthquake resulting in failure of a CW Expansion joint and </u>
<u>subsequent loss of CW/loss of vacuum.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | Enters PEI-T23, CONTAINMENT CONTROL<br>❗ DRYWELL TEMPERATURE CONTROL<br>    ▪ Gives direction to operate all available cooling<br>    ▪ Gives direction to restore NCC to Drywell<br>❗ DRYWELL AND CONTAINMENT PRESSURE CONTROL<br>    ▪ When Containment Pressure exceeds 2.25 psig, directs initiation of Containment Sprays<br>    ▪ Terminates Containment Sprays to when Containment Pressure cannot be maintained above 0 psig.<br>❗ SUPPRESSION POOL TEMPERATURE CONTROL<br>    ▪ When Suppression Pool Temperature cannot be maintained below 95°F, operates all RHR Loops not needed to maintain adequate core cooling in Suppression Pool Cooling (Both loops should be available)<br>❗ SUPPRESSION POOL LEVEL CONTROL<br>    ▪ Monitors Suppression Pool Level<br>❗ CONTAINMENT TEMPERATURE CONTROL<br>    ▪ Monitors Containment Temperature<br><br>PEI-SPI B13, EMERGENCY DEPRESSURIZATION<br>❗ Verifies Suppression Pool level above 5.25 ft.<br>❗ Directs opening of all ADS valves.<br>❗ Returns to RPV Control for level recovery and concurrently monitors decreasing Reactor Pressure trend |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>2</u>  Event No.: <u>6</u>      Page <u>3</u> of <u>5</u>

Event Description: <u>Third earthquake resulting in failure of a CW Expansion joint and</u>
<u>subsequent loss of CW/loss of vacuum.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | RO | Monitors plant parameters to assess impact of earthquake.<br><br>PEI-B13, RPV CONTROL (NON-ATWS)<br>❗ Uses FW to maintain level until RFPT trips on low vacuum or MSIVs are closed.<br>❗ Uses Bypass Valves to control Reactor Pressure until Bypass Valves close on low vacuum or MSIVs are closed.<br><br>Monitors plant parameters and assists BOP as directed. |
| | BOP(RO) | Monitors plant parameters to assess impact of earthquake.<br><br>Announces receipt of TURBINE BLDG BASEMENT WATER LEVEL HIGH alarm.<br><br>Refers to ARI-H13-P870-0003-H1<br>❗ Confirms high level using computer point 1N71BC011<br>❗ Informs SRO of Subsequent Actions(Reactor Sram/Trip CW Pumps)<br>❗ When directed, trips all CW Pumps<br>❗ When directed isolates Condenser waterboxes and Cooling Tower makeup.<br><br>PEI-B13, RPV CONTROL (NON-ATWS)<br>❗ RPV LEVEL CONTROL<br>  ▪ Attempts to maintain RPV Level with HPCS<br>  ▪ When directed, maximizes CRD Injections in accordance with PEI-SPI 4.1<br>  ▪ When directed, coordinates with field operators to inject demin water with SLC pumps in accordance with PEI-SPI 4.5.<br>  ▪ When directed, ensures 2 or more injection systems (LPCS; LPCI A, B, or C) lined up and running.<br>  ▪ When directed, opens all ADS valves.<br>  ▪ When directed, injects at maximum with operating injection systems |
| | BOP(RO) | ❗ RPV PRESSURE CONTROL |

Op-Test No.: <u>2004-01</u>  Scenario No.: __2__  Event No.: __6__          Page _4_ of _5_

Event Description: <u>Third earthquake resulting in failure of a CW Expansion joint and</u>
<u>subsequent loss of CW/loss of vacuum.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | ▪ Stabilizes RPV Pressure below 1000 psig using SRVs<br>▪ When directed, initiates controlled depressurization<br><br>PEI-T23, CONTAINMENT CONTROL<br>❗ DRYWELL TEMPERATURE CONTROL<br>   ▪ When directed, operates all available cooling<br>   ▪ When directed, restores NCC to Drywell per PEI-SPI 2.1<br>❗ DRYWELL AND CONTAINMENT PRESSURE CONTROL<br>   ▪ When directed, restores CVCW per PEI-SPI 2.2<br>   ▪ When directed, initiates Containment Sprays<br>   ▪ Terminates Containment Sprays to when Containment Pressure cannot be maintained above 0 psig.<br>❗ SUPPRESSION POOL TEMPERATURE CONTROL<br>   ▪ When directed, operates all RHR Loops not needed to maintain adequate core cooling in Suppression Pool Cooling (Both loops should be available) |

Op-Test No.: <u>2004-01</u> Scenario No.: __2__ Event No.: __N/A__ Page _1_ of _1_

Event Description: <u>Scenario Termination Criteria</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|---------------------------------|
|      |          | 1. Emergency Depressurization completed. |
|      |          | 2. RPV water level has been restored above -25 inches. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>  2  </u>  Event No.: <u>  N/A  </u>   Page <u> 1 </u> of <u> 1 </u>

Event Description: <u>Critical Task No. 1: Emergency Depressurizes the Reactor when RPV</u>
<u>level cannot be restored and maintained above -25 inches.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|---------------------------------|
| | | 1. Safety Significance<br><br>Emergency depressurization is not performed while RPV water level is above the top of the active fuel because:<br>❗ The core will remain adequately cooled as long as RPV water level remains above the Minimum Steam Cooling RPV Water Level.<br>❗ The time before RPV water decreases to the top of the active fuel can best be used to line up additional injection sources. If the decreasing RPV water level trend can be reversed, emergency depressurization may not be required.<br>The emergency depressurization requirement in this step is predicated upon three conditions:<br>❗ RPV water level has dropped at least to the top of the active fuel.<br>❗ At least one injection source is available.<br>❗ The available injection sources cannot restore and maintain RPV water level above the MSCRWL if a blowdown is not performed.<br><br><br>2. Cues<br><br> &ndash; Procedural Compliance<br><br> &ndash; Decreasing RPV Water Level Trend<br><br>3. Measurable Performance Indicator<br><br>At or before a RPV Water Level of -25 inches, at least 5 Safety Relief Valves (preferably all 8 Automatic Depressurization Valves)<br><br>4. Performance Feedback<br><br>Decreasing Reactor Pressure Trend |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>2</u> Event No.: <u>N/A</u>      Page <u>1</u> of <u>1</u>

Event Description: <u>Critical Task No. 2: After Emergency Depressurizing the RPV, water</u>
<u>level is restored and maintained above -25 inches.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | 1. Safety Significance<br><br>The core is expected to remain adequately cooled as long as RPV water level remains above the Minimum Steam Cooling RPV Water Level (-25").<br><br>2. Cues<br><br>  – Procedural Compliance<br><br>  – Decreasing RPV Water Level Trend<br><br>3. Measurable Performance Indicator<br><br>The operator maximizes injection flow from two or more injection sources and restores RPV Level above -25 inches.<br><br>4. Performance Feedback<br><br>RPV water level above -25 inches and rising. |

Facility: __Perry U1__      Scenario No.: __3__      Op-Test No.: __2004-01__

Examiners:    __D. McNeil  (D. Reeser - Cert)__    Operators: _____
          __M. Bielby__                          _____
          __R. Walton__                          _____

Initial Conditions: __Mode 1, 100% Power (IC-64; Control Rod Sequence A2/Step 62/Gangs__
__43 and 44 at Position 48).  IOI-3 through Section 4.5 completed.__

Turnover: __The plant is in Mode 1 at 100% power.  Plans for the shift are to: 1) run RCIC__
__(CST to CST) for testing per the RSE; 2) reduce power to 90% to support scram time__
__testing of control rod 14-43; and then 3) perform the scram time test of control rod 14-43 in__
__accordance with SVI-C11-T1006.  ESW A and ECC A are running to support the RCIC run.__
__The SE is performing D23-T1213.  RHR A is in Suppression Pool Cooling.__

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | None | N(BOP) | Startup and run RCIC, CST to CST. |
| 2 | None | R(SRO/RO) | Reduce reactor power to 90% using Reactor Recirculation Flow. |
| 3 | CP03: 0P41C001A | C(BOP) | Service Water Pump A flow degradation. |
| 4 | RD08A: rods 1443 and 4611 | R(SRO/RO) | Unplanned reactivity change during sram time testing (second control rod insertion with the tested control rod) |
| 5 | NM04A | I(SRO/RO) | APRM A fails upscale;AFDL runback. |
| 6 | TH15, RC07, MV01: 1E51F064, MV06: 1E51F063 | M | Unisolable steam leak in the RCIC room with significant fuel failure. |

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

Op-Test No.: <u>2004-01</u>  Scenario No.: __3__  Event No.: __1__        Page _1_ of _1_

Event Description: _ Startup and operate RCIC, CST to CST._

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|  | SRO | Conducts a short brief then grants permission for RCIC testing. |
|  | RO | Monitors plant parameters during startup of RCIC.<br><br>Reviews SVI-C11-T1006 (Sram Time Testing),  IOI-3, Power Changes, precautions and limitations, and Attachment 4, Power Maneuvering as time permits. |
|  | BOP | Reviews SOI-E51, Reactor Core Isolation Cooling System then starts up RCIC per section 4.5, "Manual Startup from Standby Readiness (CST to CST)<br>❗ Notifies Health Physics and Chemistry of impending run.<br>❗ Evacuates Containment and Annulus<br>❗ Opens 1E51-F059<br>❗ Stands Gland Seal Compressor<br>❗ Simultaneously opens 1E51-F045 and 1E51-F022<br>❗ Verifies Min Flow Valve shuts and drains shut<br>❗ Adjust RCIC flow to the desired flow (max of 700 gpm)<br>❗ Throttles 1E51-F022 to achieve a discharge pressure approx 100 psig above reactor pressure. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>  3  </u>  Event No.: <u>  2  </u>          Page <u> 1 </u> of <u> 1 </u>

Event Description:  <u>Reduce reactor power to 90% using Reactor Recirculation Flow.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Conducts a short brief on the power reduction using Reactor Recirc flow.<br><br>Monitors power reduction and provides peer checks as needed. |
| | RO | Reviews IOI-3, Power Changes, precautions and limitations, and Attachment 4, Power Maneuvering, prior to power decrease.<br><br>Decreases power to 90% using Reactor Recirc flow in accordance with Attachment 4 of IOI-3.<br>❗ Ensures Reactor Engineering contacted to determine if thermal limits considerations require control rods to be moved prior to reducing power using reactor recirculation flow.<br>❗ Reduces reactor power to approximately 92% RTP by decreasing Reactor Recirculation System flow.<br>　▪ decreases flow using individual loop flow controllers<br>　▪ monitors individual loop flows, total core flow, reactor power, and generator output.<br>❗ Maintains the turbine LOAD SET approximately 120 MWe above generator output to a maximum of 1450 MWe, by utilizing the turbine LOAD SELECTOR. |
| | BOP | Monitors plant parameters during power reduction.<br><br>Reviews SVI-C11-T1006 (Sram Time Testing)<br><br>When directed, jogs OPEN HTR 4 START UP VENT TO CNDR for 1 to 2 seconds as required to maintain the dissolved oxygen concentration within specification. |

| Op-Test No.: <u>2004-01</u>  Scenario No.: <u> 3 </u>  Event No.: <u> 3 </u>          Page <u> 1 </u> of <u> 1 </u> |
|---|
| Event Description: <u> Service Water Pump A flow degradation. </u> |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
|  | SRO | Acknowledges alarm announcements.<br><br>Notifies appropriate personnel of SW Pump A degradation; initiates maintenance request. |
|  | RO | Announces receipt of COMMON P970 ALARM<br><br>Monitors plant parameters and continues with power decrease if necessary. |
|  | BOP | Announces receipt of SW PUMP DISCH HEADER PRESSURE LOW<br><br>Refers to ARI-H13-P970-0001-B8<br>❗ Dispatches an operator to check for flooding in Unit 2 Turbine Power Complex<br>❗ Throttles (closed) NCC HX SW BYP VLV, P41-F400 until alarm clears or valve is shut.<br>❗ When alarm clears confirms proper ESW keep fill pressures.<br><br>Announces reflash of SW PUMP DISCH HEADER PRESSURE LOW<br>❗ Diagnoses degrading pressure on SW Pump A<br>❗ Refers to SOI-P40/41 to shift SW Pumps (section 5.1)<br>  ❞ Opens oncoming pump discharge valve to min flow position (blue light ON)<br>  ❞ Starts oncoming pump<br>  ❞ Fully opens oncoming pump discharge valve<br>  ❞ Closes off-going pump discharge valve to min flow position (blue light ON)<br>  ❞ Stops off-going pump<br>  ❞ Fully closes off-going pump discharge valve.<br>  ❞ Throttles NCC HX SW BYP VLV, P41-F400 as necessary to achieve discharge pressure of 55-60 psig.<br>  ❞ Notifies Chemistry of pump shift (chlorination) |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>3</u>  Event No.: <u>4</u>  Page <u>1</u> of <u>1</u>

Event Description:  <u>Unplanned reactivity change during Scram Time Testing of Control</u>
<u>Rod 14-43 resulting in failed fuel.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | May conduct a short brief on the upcoming scram time test. Acknowledges alarm announcements. Enters ONI-C51, Unplanned Change in Reactor Power or Reactivity. <br>❗ Directs STA to gather relevant ICS data to evaluate transient. <br>❗ Direct Reactor Engineering to determine if local/gross power limits or power distribution limits have been exceeded. |
| | RO | Finishes reviewing SVI-C11-T1006 prior to starting test. Reviews FTI-B0002, Att 4 – Special Maneuver Control Rod Movement Sheet. Performs SVI-C11-T1006 <br>❗ Selects control rod 14-43 <br>❗ Directs field operator to scram control rod 14-43 <br>❗ Announces receipt of ROD DRIFT and INST VOL NOT DRAINED alarms <br><br>Refers to alarm response instructions: <br>❗ ARI-H13-P680-0005-D7 <br>  ▪ Directs BOP to check SDV level at P618 and P629 <br>  ▪ Confirms that SDV vent and drain valves are open. <br>❗ ARI-H13-P680-0005-D10 <br>  ▪ Determines that control rod 46-11 inserted in addition to control rod 14-43 and reports same to US. <br>  ▪ Resets Rod Drift Alarm/Indication <br>  ▪ Contacts Reactor Engineering <br>  ▪ Requests official 3D, Periodic Logs to determine if core limits have been exceeded. |
| | BOP | Observes SDV levels at P618 (1C11N602A) and P629 (1C11N602B) and reports readings to RO(SRO). |

| Op-Test No.: <u>2004-01</u>  Scenario No.: <u>3</u>  Event No.: <u>5</u>          Page <u>1</u> of <u>2</u> |
|---|
| Event Description:  <u>APRM A fails upscale with AFDL runback.</u> |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
|  | SRO | Acknowledges announcement of alarms. |
|  |  | Directs APRM back-panel indications checked. |
|  |  | Enters ONI-C51, Unplanned Change in Reactor Power or Reactivity<br>❗ Directs STA to gather relevant ICS data to evaluate transient.<br>❗ Direct Reactor Engineering to determine if local/gross power limits or power distribution limits have been exceeded. |
|  |  | Refers to TS 3.3.1.1, RPS Instrumentation<br>❗ Declares APRM A INOPERABLE (No other action required since minimum operable channels per trip system is still satisfied.) |
|  |  | Refers to ORM 6.2.1, APRM Control Rod Block Instrumentation<br>❗ Declares APRM A INOPERABLE (No other action required since minimum operable channels still satisfied.) |
|  |  | ***NOTE TO EVALUATOR***<br><br>*If necessary cue the SRO to ensure the RO – NOT the BOP – performs the Bypassing of ARPM A.* |
|  |  | Directs RO to Bypass APRM A. |

Op-Test No.: <u>2004-01</u>  Scenario No.: __3__  Event No.: __5__      Page _2_ of _2_

Event Description: __APRM A fails upscale with AFDL runback.__

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|  | RO | Reports Receipt of the following alarms:<br>❗ 1/2 SCRAM A/C<br>❗ RPS NEUTRON MON TRIP<br>❗ ROD WITHDRAWAL BLOCK<br>❗ APRM A/E UPSC INOP/TRIP OPRM A/E TRIP<br>❗ AFDL IN CONTROL<br>    ▪ Determines that APRM A has failed upscale.<br>    ▪ Confirms power has not increased<br>    ▪ Arms and Depresses RR HPU A and B SHUTDOWN pushbuttons.<br><br>Refers to the following alarm response procedures:<br>❗ ARI-H13-P680-0005-A9<br>❗ ARI-H13-P680-0005-B7<br>❗ ARI-H13-P680-0005-E10<br>❗ ARI-H13-P680-0006-B5<br>❗ ARI-H13-P680-0004-E9<br>    ▪ Refer to SOI-B33 (section 7.20) to ensure HPU shutdown complete.<br><br>When directed, refers to SOI-C51(APRM) and bypasses APRM A in accordance with that procedure (section 7.1).<br><br>When directed, resets ½ Scram per SOI-C71 (section 7.3).<br><br>When directed, refers to SOI-B33 and coordinates with the BOP to restore HPUs to operation. |
|  | BOP | Checks APRM A back-panel (P669) indications and reports findings to SRO/RO<br><br>Assists RO with ARI response.<br><br>When directed, refers to SOI-B33 and coordinates with the RO to restore HPUs to operation. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>3</u>  Event No.: <u>6</u>       Page <u>1</u> of <u>3</u>

Event Description: <u>Unisolable RCIC steam line break in the RCIC room.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges reports on high rad alarms. |
| | | Enters the following Off Normal Instructions: |
| | | ❗ ONI-D17, High Radiation Levels Within the Plant |
| | |    ❞ Evacuates affected areas |
| | |    ❞ Notifies Chemistry and Radiation Protection |
| | | ❗ ONI-J11-1, Gross Fuel Cladding Failure |
| | |    ❞ Notifies Radiation Protection |
| | |    ❞ Notifies Chemistry |
| | |    ❞ Notifies Reactor Engineering |
| | |    ❞ Directs BOP to confirm that OG is in TREAT or ISOLATED |
| | | Acknowledges report from BOP on RCIC failure to isolate. |
| | | Enters ONI-NII, Pipe Break Outside Containment |
| | | ❗ Evacuate unnecessary personnel from affected areas |
| | | ❗ Attempt to isolate the leak |
| | | ❗ Dispatch personnel to assess the leakage. |
| | | ❗ Classify the event per EPI-A1, Emergency Action Levels |
| | | Enters PEI-N11, CONTAINMENT LEAKAGE CONTROL |
| | | ❗ Directs BOP to confirm operation of AEGT, IB HVAC, FHB HVAC, AX HVAC, and Steam Tunnel HVAC. |
| | | ❗ Initiates actions to isolate RCIC |
| | | ❗ Monitors parameters for Max Safe Oper Conditions |
| | | Enters PEI-B13 RPV (Non-ATWS) |
| | | ❗ ENTRY ACTIONS |
| | |    ❞ Directs placing the Reactor Mode Switch in SHUTDOWN |
| | |    ❞ Directs startup of the H2 Analyzers |
| | |    ❞ Directs insertion of IRMs and SRMs |
| | | ❗ RPV LEVEL CONTROL |
| | |    ❞ Directs verification of required automatic actions |
| | |    ❞ Gives direction to restore and maintain level within band of 185 to 215 inches |
| | | ❗ RPV PRESSURE CONTROL |
| | |    ❞ Gives direction to stabilize pressure #1000 psig |
| | |    ❞ Gives direction to perform a controlled depressurization of the RPV (< 100°F/hr) |
| | | Initiates actions to enter Steam Tunnel and manually close E51-F064 |

| | | |
|---|---|---|
| Op-Test No.: <u>2004-01</u>  Scenario No.: <u>  3  </u>  Event No.: <u>  6  </u>                Page <u> 2 </u> of <u> 3 </u> |
| Event Description:  <u>Unisolable RCIC steam line break in the RCIC room.</u> |
| |
| |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO | Announces receipt of the following alarms:<br>‼ PRM P604<br>‼ AREA RAD P803<br>‼ AIRBORNE RAD P804<br>‼ PARM P884<br><br>When directed, Manually scrams the reactor using Manual Scram pushbuttons and performs immediate actions per ONI-C71-1<br>‼ Places Mode Switch in SHUTDOWN AND REMOVES key.<br>‼ Announces Mode Switch in SHUTDOWN and Control Rod Status<br>‼ Verify HST LVL CV MANUAL CONTROL, N21-S19, in OFF.<br>‼ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using Feedwater and/or HPCS as appropriate.<br>‼ Inform Unit Supervisor of systems being used for current level and pressure control.<br><br>PEI-B13, RPV CONTROL (NON-ATWS)<br>‼ Inserts IRMs and SRMs<br>‼ Uses FW and/or HPCS to maintain level.<br>‼ Uses Bypass Valves to control Reactor Pressure. |
| | BOP | Investigates alarms at P604, P803, P804, and P884 and reports results to SRO.<br>‼ OG PRE-TREAT PRCS RAD MON RAD HIGH (P604-A1)<br>‼ OG PRE-TREAT PRCS RAD RCDR P600 (P604-A2)<br>‼ Numerous alarms on P803 (Containment and TB Areas)<br>‼ OG VENT PIPE (P804)<br>‼ ST PACK EXH GAS (P804)<br>‼ OFF-GAS VENT GAS (P884)<br><br>Announces receipt of MAIN STEAM LINE RADIATION HIGH alarm.<br><br>Proceeds to P672 to observe Main Steam Line Rad Monitor and reports back to SRO. |

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Op-Test No.: <u>2004-01</u>  Scenario No.: <u> 3 </u>  Event No.: <u> 6 </u>    Page <u> 3 </u> of <u> 3 </u>

Event Description: <u> Unisolable RCIC steam line break in the RCIC room.     </u>

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | Reports receipt of the following alarms:<br> ‼  RCIC OUT OF SERVICE<br> ‼  RCIC ISOL RCIC ROOM AMB TEMP HIGH<br> ‼  RCIC ROOM AMB TEMP HIGH P632<br> ‼  RCIC ROOM dT HI HI<br><br>Reports to SRO that a RCIC isolation signal has occurred but that RCIC did NOT isolate due to loss of power to E51-F063 and E51-F064.<br><br>Performs Immediate Operator Actions Per ONI-C71-1.<br> ‼  Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using HPCS as appropriate.<br> ‼  If reactor pressure is not being maintained with the Bypass Valves, manually operate SRV's in the order labeled on 1H13-P601 as necessary to maintain reactor pressure within the desired band.<br> ‼  Inform Unit Supervisor of systems being used for current level and pressure control.<br> ‼  If manpower is available, place the Hydrogen Analyzers in service per SOI-M51/56.<br><br>PEI-B13, RPV CONTROL (NON-ATWS)<br> ‼  Startup the Hydrogen Analyzers per SOI-M51/56.<br> ‼  Verifies automatic initiations and isolations<br><br>Dispatches PO to breakers for E51-F063 and F064 to restore power.<br><br>Dispatches PO to check leak status in RCIC room. |

Op-Test No.: <u>2001-01</u> Scenario No.: <u>  3  </u> Event No.: <u>  N/A  </u>        Page <u> 1 </u> of <u> 1 </u>

Event Description: <u> Scenario Termination Criteria                                    </u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      |          | 1.   Reactor is shutdown. |
|      |          | 2.   RPV water level is being maintained 185-215". |
|      |          | 3.   Controlled cooldown (< 100°F/Hr) in progress. |
|      |          | 4.   Action initiated to manually close E51-F064. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>2</u> Event No.: <u>N/A</u>        Page <u>1</u> of <u>1</u>

Event Description: <u>Critical Task No. 1: If a primary system is discharging into the secondary</u>
<u>containment and has not been isolated, then enter PEI-B13 and scram the reactor.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | | 1. Safety Significance<br><br>In the event a primary system is still discharging into the annulus or surrounding containment following previous direction to isolate all systems discharging into the affected area, action is directed to enter PEI-B13 RPV Control (Non-ATWS). Entering RPV Control assures that, if possible, the reactor is scrammed and shutdown by control rod insertion. A scram will reduce the energy level of the RPV to decay heat levels. This accommodates the parallel execution of RPV Control with Containment Leakage Control<br><br>2. Cues<br><br>    – RCIC Area Temperature<br><br>    – RCIC Radiation Levels<br><br>3. Measurable Performance Indicator<br><br>All control rods fully inserted and reactor power at decay heat power levels. Decreasing trend on SRMs and IRMs.<br><br>4. Performance Feedback<br><br>Decreasing trend on SRMs and IRMs. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>3</u> Event No.: <u>N/A</u> Page <u>1</u> of <u>1</u>

Event Description: <u>Critical Task No. 2: Except for systems necessary to shutdown the</u>
<u>reactor, assure adequate core cooling, or suppress a fire, isolate all systems discharging</u>
<u>into the affected area.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | | 1. Safety Significance <br><br> Protect equipment in the annulus and surrounding containment, limit radioactive release to the annulus and surrounding containment, and either maintain the annulus and surrounding containment integrity or limit radioactivity release from the annulus and surrounding containment. <br><br> 2. Cues <br><br> – Procedural Compliance <br><br> – Area temperature(s), radiation level(s), and/or water level(s) above PEI-N11 entry condition values. <br><br> 3. Measurable Performance Indicator <br><br> Actions have been taken to limit and isolate leakage, including controlled cooldown, power restoration to isolation valves, manual closure of the containment isolation valve(s). <br><br> 4. Performance Feedback <br><br> Area temperatures, radiation levels, and water levels stop rising and begin to lower. |

Facility: __Perry U1__      Scenario No.: __3a__      Op-Test No.: __2004-01__

Examiners:    __D. McNeil  (D. Reeser - Cert)__     Operators: _____
          __M. Bielby__                           _____
          __R. Walton__                           _____

Initial Conditions: __Mode 1, 100% Power (IC-64; Control Rod Sequence A2/Step 62/Gangs 43 and 44 at Position 48).  IOI-3 through Section 4.5 completed.__

Turnover: __The plant is in Mode 1 at 100% power.  Plans for the shift are to: 1) run RCIC (CST to CST) for testing per the RSE; 2) reduce power to 90% to support scram time testing of control rod 14-43; and then 3) perform the scram time test of control rod 14-43 in accordance with SVI-C11-T1006.  ESW A and ECC A are running to support the RCIC run. The SE is performing D23-T1213.  RHR A is in Suppression Pool Cooling.__

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | None | N(BOP) | Startup and run RCIC, CST to CST. |
| 2 | None | R(SRO/RO) | Reduce reactor power to 90% using Reactor Recirculation Flow. |
| 3 | CP03: 0P41C001A | C(BOP) | Service Water Pump A flow degradation. |
| 4 | RD08A: rods 1443 and 4611 | R(SRO/RO) | Unplanned reactivity change during sram time testing (second control rod insertion with the tested control rod) |
| 5 | NM04A | I(SRO/RO) | APRM A fails upscale;AFDL runback. |
| 6 | TH15, RC07, MV01: 1E51F064, MV06: 1E51F063 | M | Unisolable steam leak in the RCIC room with significant fuel failure. |

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

Op-Test No.: <u>2004-01</u> Scenario No.: <u>3</u> Event No.: <u>1</u> Page <u>1</u> of <u>1</u>

Event Description: <u>Startup and operate RCIC, CST to CST.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Conducts a short brief then grants permission for RCIC testing. |
| | RO | Monitors plant parameters during startup of RCIC. <br><br> Reviews SVI-C11-T1006 (Sram Time Testing), IOI-3, Power Changes, precautions and limitations, and Attachment 4, Power Maneuvering as time permits. |
| | BOP | Reviews SOI-E51, Reactor Core Isolation Cooling System then starts up RCIC per section 4.5, "Manual Startup from Standby Readiness (CST to CST) <br> ‼ Notifies Health Physics and Chemistry of impending run. <br> ‼ Evacuates Containment and Annulus <br> ‼ Opens 1E51-F059 <br> ‼ Stands Gland Seal Compressor <br> ‼ Simultaneously opens 1E51-F045 and 1E51-F022 <br> ‼ Verifies Min Flow Valve shuts and drains shut <br> ‼ Adjust RCIC flow to the desired flow (max of 700 gpm) <br> ‼ Throttles 1E51-F022 to achieve a discharge pressure approx 100 psig above reactor pressure. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>  3  </u>  Event No.: <u>  2  </u>       Page <u> 1 </u> of <u> 1 </u>

Event Description: <u> Reduce reactor power to 90% using Reactor Recirculation Flow. </u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|---------------------------------|
| | SRO | Conducts a short brief on the power reduction using Reactor Recirc flow.<br><br>Monitors power reduction and provides peer checks as needed. |
| | RO | Reviews IOI-3, Power Changes, precautions and limitations, and Attachment 4, Power Maneuvering, prior to power decrease.<br><br>Decreases power to 90% using Reactor Recirc flow in accordance with Attachment 4 of IOI-3.<br>❗ Ensures Reactor Engineering contacted to determine if thermal limits considerations require control rods to be moved prior to reducing power using reactor recirculation flow.<br>❗ Reduces reactor power to approximately 92% RTP by decreasing Reactor Recirculation System flow.<br>  ▪ decreases flow using individual loop flow controllers<br>  ▪ monitors individual loop flows, total core flow, reactor power, and generator output.<br>❗ Maintains the turbine LOAD SET approximately 120 MWe above generator output to a maximum of 1450 MWe, by utilizing the turbine LOAD SELECTOR. |
| | BOP | Monitors plant parameters during power reduction.<br><br>Reviews SVI-C11-T1006 (Sram Time Testing)<br><br>When directed, jogs OPEN HTR 4 START UP VENT TO CNDR for 1 to 2 seconds as required to maintain the dissolved oxygen concentration within specification. |

Op-Test No.: <u>2004-01</u>  Scenario No.: __3__  Event No.: __3__          Page _1_ of _1_

Event Description: __Service Water Pump A flow degradation.__

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges alarm announcements.<br><br>Notifies appropriate personnel of SW Pump A degradation; initiates maintenance request. |
| | RO | Announces receipt of COMMON P970 ALARM<br><br>Monitors plant parameters and continues with power decrease if necessary. |
| | BOP | Announces receipt of SW PUMP DISCH HEADER PRESSURE LOW<br><br>Refers to ARI-H13-P970-0001-B8<br>❗ Dispatches an operator to check for flooding in Unit 2 Turbine Power Complex<br>❗ Throttles (closed) NCC HX SW BYP VLV, P41-F400 until alarm clears or valve is shut.<br>❗ When alarm clears confirms proper ESW keep fill pressures.<br><br>Announces reflash of SW PUMP DISCH HEADER PRESSURE LOW<br>❗ Diagnoses degrading pressure on SW Pump A<br>❗ Refers to SOI-P40/41 to shift SW Pumps (section 5.1)<br>  ▪ Opens oncoming pump discharge valve to min flow position (blue light ON)<br>  ▪ Starts oncoming pump<br>  ▪ Fully opens oncoming pump discharge valve<br>  ▪ Closes off-going pump discharge valve to min flow position (blue light ON)<br>  ▪ Stops off-going pump<br>  ▪ Fully closes off-going pump discharge valve.<br>  ▪ Throttles NCC HX SW BYP VLV, P41-F400 as necessary to achieve discharge pressure of 55-60 psig.<br>  ▪ Notifies Chemistry of pump shift (chlorination) |

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Event Description:  <u>Unplanned reactivity change during Scram Time Testing of Control</u>
<u>Rod 14-43 resulting in failed fuel.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | May conduct a short brief on the upcoming scram time test. <br><br> Acknowledges alarm announcements. <br><br> Enters ONI-C51, Unplanned Change in Reactor Power or Reactivity. <br> ❗ Directs STA to gather relevant ICS data to evaluate transient. <br> ❗ Direct Reactor Engineering to determine if local/gross power limits or power distribution limits have been exceeded. |
| | RO | Finishes reviewing SVI-C11-T1006 prior to starting test. <br><br> Reviews FTI-B0002, Att 4 – Special Maneuver Control Rod Movement Sheet. <br><br> Performs SVI-C11-T1006 <br> ❗ Selects control rod 14-43 <br> ❗ Directs field operator to scram control rod 14-43 <br> ❗ Announces receipt of ROD DRIFT and INST VOL NOT DRAINED alarms <br><br> Refers to alarm response instructions: <br> ❗ ARI-H13-P680-0005-D7 <br>   ❝ Directs BOP to check SDV level at P618 and P629 <br>   ❝ Confirms that SDV vent and drain valves are open. <br> ❗ ARI-H13-P680-0005-D10 <br>   ❝ Determines that control rod 46-11 inserted in addition to control rod 14-43 and reports same to US. <br>   ❝ Resets Rod Drift Alarm/Indication <br>   ❝ Contacts Reactor Engineering <br>   ❝ Requests official 3D, Periodic Logs to determine if core limits have been exceeded. |
| | BOP | Observes SDV levels at P618 (1C11N602A) and P629 (1C11N602B) and reports readings to RO(SRO). |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>3</u> Event No.: <u>5</u>     Page <u>1</u> of <u>2</u>

Event Description: <u>APRM A fails upscale with AFDL runback.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges announcement of alarms. |
| | | Directs APRM back-panel indications checked. |
| | | Enters ONI-C51, Unplanned Change in Reactor Power or Reactivity |
| | | ❗ Directs STA to gather relevant ICS data to evaluate transient. |
| | | ❗ Direct Reactor Engineering to determine if local/gross power limits or power distribution limits have been exceeded. |
| | | Refers to TS 3.3.1.1, RPS Instrumentation |
| | | ❗ Declares APRM A INOPERABLE (No other action required since minimum operable channels per trip system is still satisfied.) |
| | | Refers to ORM 6.2.1, APRM Control Rod Block Instrumentation |
| | | ❗ Declares APRM A INOPERABLE (No other action required since minimum operable channels still satisfied.) |
| | | ***NOTE TO EVALUATOR*** |
| | | *If necessary cue the SRO to ensure the RO – NOT the BOP – performs the Bypassing of ARPM A.* |
| | | Directs RO to Bypass APRM A. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>  3  </u>  Event No.: <u>  5  </u>       Page <u> 2 </u> of <u> 2 </u>

Event Description: <u> APRM A fails upscale with AFDL runback. </u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | RO | Reports Receipt of the following alarms:<br>❗ 1/2 SCRAM A/C<br>❗ RPS NEUTRON MON TRIP<br>❗ ROD WITHDRAWAL BLOCK<br>❗ APRM A/E UPSC INOP/TRIP OPRM A/E TRIP<br>❗ AFDL IN CONTROL<br>    ❞ Determines that APRM A has failed upscale.<br>    ❞ Confirms power has not increased<br>    ❞ Arms and Depresses RR HPU A and B SHUTDOWN pushbuttons.<br><br>Refers to the following alarm response procedures:<br>❗ ARI-H13-P680-0005-A9<br>❗ ARI-H13-P680-0005-B7<br>❗ ARI-H13-P680-0005-E10<br>❗ ARI-H13-P680-0006-B5<br>❗ ARI-H13-P680-0004-E9<br>    ❞ Refer to SOI-B33 (section 7.20) to ensure HPU shutdown complete.<br><br>When directed, refers to SOI-C51(APRM) and bypasses APRM A in accordance with that procedure (section 7.1).<br><br>When directed, resets ½ Scram per SOI-C71 (section 7.3).<br><br>When directed, refers to SOI-B33 and coordinates with the BOP to restore HPUs to operation. |
| | BOP | Checks APRM A back-panel (P669) indications and reports findings to SRO/RO<br><br>Assists RO with ARI response.<br><br>When directed, refers to SOI-B33 and coordinates with the RO to restore HPUs to operation. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>3</u>   Event No.: <u>6</u>       Page <u>1</u> of <u>3</u>

Event Description: <u>Unisolable RCIC steam line break in the RCIC room.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | SRO | Acknowledges reports on high rad alarms. <br><br> Enters the following Off Normal Instructions: <br>   **!** ONI-D17, High Radiation Levels Within the Plant <br>      **"** Evacuates affected areas <br>      **"** Notifies Chemistry and Radiation Protection <br>   **!** ONI-J11-1, Gross Fuel Cladding Failure <br>      **"** Notifies Radiation Protection <br>      **"** Notifies Chemistry <br>      **"** Notifies Reactor Engineering <br>      **"** Directs BOP to confirm that OG is in TREAT or ISOLATED <br><br> Acknowledges report from BOP on RCIC failure to isolate. <br><br> Enters ONI-NII, Pipe Break Outside Containment <br>   **!** Evacuate unnecessary personnel from affected areas <br>   **!** Attempt to isolate the leak <br>   **!** Dispatch personnel to assess the leakage. <br>   **!** Classify the event per EPI-A1, Emergency Action Levels <br><br> Enters PEI-N11, CONTAINMENT LEAKAGE CONTROL <br>   **!** Directs BOP to confirm operation of AEGT, IB HVAC, FHB HVAC, AX HVAC, and Steam Tunnel HVAC. <br>   **!** Initiates actions to isolate RCIC <br>   **!** Monitors parameters for Max Safe Oper Conditions <br><br> Enters PEI-B13 RPV (Non-ATWS) <br>   **!** ENTRY ACTIONS <br>      **"** Directs placing the Reactor Mode Switch in SHUTDOWN <br>      **"** Directs startup of the H2 Analyzers <br>      **"** Directs insertion of IRMs and SRMs <br>   **!** RPV LEVEL CONTROL <br>      **"** Directs verification of required automatic actions <br>      **"** Gives direction to restore and maintain level within band of 185 to 215 inches <br>   **!** RPV PRESSURE CONTROL <br>      **"** Gives direction to stabilize pressure #1000 psig <br>      **"** Gives direction to perform a controlled depressurization of the RPV (< 100°F/hr) <br><br> Initiates actions to enter Steam Tunnel and manually close E51-F064 |

Op-Test No.: 2004-01  Scenario No.:  3  Event No.:  6  Page  2  of  3

Event Description:  Unisolable RCIC steam line break in the RCIC room.

| Time | Position | Applicant's Actions or Behavior |
|------|----------|-------------------------------|
|      | RO | Announces receipt of the following alarms:<br>❗ PRM P604<br>❗ AREA RAD P803<br>❗ AIRBORNE RAD P804<br>❗ PARM P884<br><br>When directed, Manually scrams the reactor using Manual Scram pushbuttons and performs immediate actions per ONI-C71-1<br>❗ Places Mode Switch in SHUTDOWN AND REMOVES key.<br>❗ Announces Mode Switch in SHUTDOWN and Control Rod Status<br>❗ Verify HST LVL CV MANUAL CONTROL, N21-S19, in OFF.<br>❗ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using Feedwater and/or HPCS as appropriate.<br>❗ Inform Unit Supervisor of systems being used for current level and pressure control.<br><br>PEI-B13, RPV CONTROL (NON-ATWS)<br>❗ Inserts IRMs and SRMs<br>❗ Uses FW and/or HPCS to maintain level.<br>❗ Uses Bypass Valves to control Reactor Pressure. |
|      | BOP | Investigates alarms at P604, P803, P804, and P884 and reports results to SRO.<br>❗ OG PRE-TREAT PRCS RAD MON RAD HIGH (P604-A1)<br>❗ OG PRE-TREAT PRCS RAD RCDR P600 (P604-A2)<br>❗ Numerous alarms on P803 (Containment and TB Areas)<br>❗ OG VENT PIPE (P804)<br>❗ ST PACK EXH GAS (P804)<br>❗ OFF-GAS VENT GAS (P884)<br><br>Announces receipt of MAIN STEAM LINE RADIATION HIGH alarm.<br><br>Proceeds to P672 to observe Main Steam Line Rad Monitor and reports back to SRO. |

Op-Test No.: <u>2004-01</u> Scenario No.: __3__ Event No.: __6__　　　　Page _3_ of _3_

Event Description: <u>Unisolable RCIC steam line break in the RCIC room.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
|      | BOP      | Reports receipt of the following alarms:<br>❗ RCIC OUT OF SERVICE<br>❗ RCIC ISOL RCIC ROOM AMB TEMP HIGH<br>❗ RCIC ROOM AMB TEMP HIGH P632<br>❗ RCIC ROOM dT HI HI<br><br>Reports to SRO that a RCIC isolation signal has occurred but that RCIC did NOT isolate due to loss of power to E51-F063 and E51-F064.<br><br>Performs Immediate Operator Actions Per ONI-C71-1.<br>❗ Verify the reactor water level stabilizes near 200 inches (178 inches if Setpoint Setdown is actuated) using HPCS as appropriate.<br>❗ If reactor pressure is not being maintained with the Bypass Valves, manually operate SRV's in the order labeled on 1H13-P601 as necessary to maintain reactor pressure within the desired band.<br>❗ Inform Unit Supervisor of systems being used for current level and pressure control.<br>❗ If manpower is available, place the Hydrogen Analyzers in service per SOI-M51/56.<br><br>PEI-B13, RPV CONTROL (NON-ATWS)<br>❗ Startup the Hydrogen Analyzers per SOI-M51/56.<br>❗ Verifies automatic initiations and isolations<br><br>Dispatches PO to breakers for E51-F063 and F064 to restore power.<br><br>Dispatches PO to check leak status in RCIC room. |

| | | |
|---|---|---|
| Op-Test No.: <u>2001-01</u>  Scenario No.: <u>3</u>  Event No.: <u>N/A</u>  Page <u>1</u> of <u>1</u> | | |
| Event Description: <u>Scenario Termination Criteria</u> | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | 1.   Reactor is shutdown. |
| | | 2.   RPV water level is being maintained 185-215". |
| | | 3.   Controlled cooldown (< 100°F/Hr) in progress. |
| | | 4.   Action initiated to manually close E51-F064. |

Op-Test No.: <u>2004-01</u> Scenario No.: <u>2</u> Event No.: <u>N/A</u> Page <u>1</u> of <u>1</u>

Event Description: <u>Critical Task No. 1: If a primary system is discharging into the secondary</u> <u>containment and has not been isolated, then enter PEI-B13 and scram the reactor.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|--------------------------------|
| | | 1. Safety Significance<br><br>In the event a primary system is still discharging into the annulus or surrounding containment following previous direction to isolate all systems discharging into the affected area, action is directed to enter PEI-B13 RPV Control (Non-ATWS). Entering RPV Control assures that, if possible, the reactor is scrammed and shutdown by control rod insertion. A scram will reduce the energy level of the RPV to decay heat levels. This accommodates the parallel execution of RPV Control with Containment Leakage Control<br><br>2. Cues<br><br>– RCIC Area Temperature<br><br>– RCIC Radiation Levels<br><br>3. Measurable Performance Indicator<br><br>All control rods fully inserted and reactor power at decay heat power levels. Decreasing trend on SRMs and IRMs.<br><br>4. Performance Feedback<br><br>Decreasing trend on SRMs and IRMs. |

Op-Test No.: <u>2004-01</u>  Scenario No.: <u>  3  </u>  Event No.: <u>  N/A  </u>         Page <u>  1  </u> of <u>  1  </u>

Event Description: <u>Critical Task No.  2: Except for systems necessary to shutdown the</u>
<u>reactor, assure adequate core cooling, or suppress a fire, isolate all systems discharging</u>
<u>into the affected area.</u>

| Time | Position | Applicant's Actions or Behavior |
|------|----------|---------------------------------|
|      |          | 1.  Safety Significance<br><br>Protect equipment in the annulus and surrounding containment, limit radioactive release to the annulus and surrounding containment, and either maintain the annulus and surrounding containment integrity or limit radioactivity release from the annulus and surrounding containment.<br><br>2.  Cues<br><br>  –  Procedural Compliance<br><br>  –  Area temperature(s), radiation level(s), and/or water level(s) above PEI-N11 entry condition values.<br><br>3.  Measurable Performance Indicator<br><br>Actions have been taken to limit and isolate leakage, including controlled cooldown, power restoration to isolation valves, manual closure of the containment isolation valve(s).<br><br>4.  Performance Feedback<br><br>Area temperatures, radiation levels, and water levels stop rising and begin to lower. |