

| Facility:  | HB ROBINSON | Scenario No.:            | 1  | Op Test No.: | <b>ILC-14</b> |
|--|-------------|--------------------------|--|--------------|---------------|
| Examiners:   | _____       | Operators:               | CRS -  |              |               |
|  | _____       |                          | RO -   |              |               |
|  | _____       |                          | BOP -  |              |               |
| Initial Conditions: <ul style="list-style-type: none"> <li>Mode 2 BOL, 150 MWD/MTU, 1564 PPM Boron.</li> <li>Reactor startup in progress IAW GP-003 at step 8.2.23. Shutdown Banks 'A &amp; B' are at 225 steps.</li> <li>No equipment is OOS</li> </ul>   |             |                          |  |              |               |
| Turnover: <ul style="list-style-type: none"> <li>Continue reactor startup</li> </ul>   |             |                          |  |              |               |
| Critical Task: <ul style="list-style-type: none"> <li>Start either 'A or B' Safety Injection Pumps to provide adequate core cooling.</li> <li>Open either SI-870 'A or B' to establish a flow path</li> <li>Manually isolate Excess Letdown</li> <li>Isolate 'C' S/ G prior to S/G overfill</li> </ul> |             |                          |  |              |               |
| Event No.  | Malf. No.   | Event Type*              | Event Description                                  |              |               |
| 1  |             | (R) RO, CRS<br>(N) BOP   | GP-003 reactor startup                             |              |               |
| 2  |             | (C) RO, CRS<br>(TS) CRS  | Control Bank 'B' rod K2 stuck                      |              |               |
| 3  |             | (C) BOP, CRS<br>(TS) CRS | South Service Water leak at intake                 |              |               |
| 4  |             | (C) BOP, CRS             | Loss of Condenser vacuum                           |              |               |
| 5  |             | (I) RO, CRS              | PT-145 fails Low / Place Excess Letdown in Service |              |               |
| 6  |             | (M) ALL                  | Control Bank 'B' rod K2 ejected                    |              |               |
| 7  |             | (M) ALL                  | 'C' S/G ruptures                                   |              |               |
| 8  |             | RO                       | 'A & B' SI Pumps fails to auto Start on SI         |              |               |
| 9  |             | RO                       | SI-870 'A & B' fail to auto open on SI             |              |               |
|  |             |                          |  |              |               |
|  |             |                          |  |              |               |
|  |             |                          |  |              |               |
|  |             |                          |  |              |               |
|  |             |                          |  |              |               |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor   |             |                          |  |              |               |

**ILC-14 NRC SCENARIO 1 SUMMARY DESCRIPTION**

The crew will assume the watch with the plant in mode 2 with reactor startup In progress. Shutdown banks 'A&B' are fully withdrawn. The crew will continue taking the reactor critical IAW GP-003, NORMAL PLANT STARTUP FROM HOT SHUTDOWN TO CRITICAL. The crew will withdraw control rods to obtain their first doubling. The crew will perform a 1/M plot and proceed to withdraw rods to obtain their second doubling.

On cue from the Chief Examiner, Control Bank 'B' rod K2 will not move. The crew will take actions IAW AOP-001, Malfunction of the Reactor Control System. The operator will perform immediate operator actions. The OAC will diagnose a stuck rod and the crew will transition to Section 'B', Immovable/Misaligned Rods. The crew will initiate boration of the RCS using OP-301 and borate to All Rods Out 1% Shutdown Boron Concentration to place the plant in mode 3 in preparation for tripping the rods. The CRS will review ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS. For rod alignment the CRS will determine bank demand positions less than 200 steps if rod K2 is within 7.5 inches of the average of the individual rod positions in the bank. Entry to this will depend on how long the crew takes to identify rod K2 is stuck. Also, The CRS will need to determine if the rod is OPERABLE (trippable). The actions of the AOP will satisfy ITS 3.1.4. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, the South Service Water Header will experience a break at the intake structure on the SW piping downstream of SW-6, SW Pump "B" Discharge Valve. The crew will take actions IAW AOP-022, Loss of Service Water, and will isolate the ruptured header and disable the service water pumps on the isolated header. This will result in the affected Emergency Diesel Generator being declared inoperable due to all the service water pumps supporting that EDG being disabled. The CRS will declare entry into ITS LCO 3.7.7, Condition A, due to one SW train inoperable. This LCO requires that the inoperable SW train be restored to operable status within 72 hours. The CRS will also declare entry into ITS LCO 3.8.1, Condition B, which requires the following: (1) Perform SR 3.8.1.1 for offsite circuit within 1 hour and once per 12 hours thereafter (OP-604, Section 8.4.9, Emergency Diesel Generator Inoperability), (2) Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable within 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s), (3) Determine Operable DG is not inoperable due to common cause failure within 24 hours and perform SR 3.8.1.2 for Operable DG within 96 hours and, (4) restore DG to Operable status within 7 days OR be in Mode 3 in 6 hours and Mode 5 in 36 hours. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, a partial loss of vacuum will be initiated. The crew will enter AOP-012, Partial Loss of Condenser Vacuum or Circulating Water Pump Trip. The crew will perform immediate operator actions and transition to Section 'A'. Vacuum will stabilize with two vacuum pumps running. Leak location has been identified and determined to be a minor repair. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, Pressure Transmitter PT-145 for Letdown Line Pressure will fail LOW, causing PCV-145 to close and isolate letdown flow. AOP-025, RTGB Instrument Failure, Section A will be implemented to isolate the letdown line, reduce charging flow and

place Excess Letdown in service. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, Control Bank 'B' rod K2 will be ejected. The crew will enter AOP-016, Excessive Primary Plant Leakage. PZR level and pressure will continue to lower and the crew will trip the reactor and enter EOP-E-0, REACTOR TRIP OR SAFETY INJECTION and perform immediate operator actions. During the Safety Injection both SI Pumps will fail to automatically start and will have to be manually started either by guidance in OMM-022 for automatic actions that should have taken place or IAW EOP-E-0 Attachment 1. SI-870 'A & B', BIT OUTLET VALVES will fail to automatically open and will have to be manually opened either by guidance in OMM-022 for automatic actions that should have taken place or IAW EOP-E-0 Attachment 1. EOP-E-0 step 16 will have the crew transition to EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT. EOP-E-1 step 17 will have the crew transition to EPP-8, POST LOCA COOLDOWN AND DEPRESSURIZATION. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, 'C' S/G will rupture. This will be initiated when the crew enters EPP-8. The S/G's should have feed water isolated to them at this time by closing V2-16A/B/C to maintain the S/G level control band. Foldout 'B' is in effect IAW EPP-8 and the crew will transition to EOP-E-3, STEAM GENERATOR TUBE RUPTURE. The crew will isolate 'C' S/G and cooldown and depressurize the RCS. The crew will stabilize from the cooldown but will not meet minimum subcooling and will be required to transition to EPP-17, SGTR WITH A LOSS OF REACTOR COOLANT. There are several transition points to EPP-17 based on subcooling, PZR level, and RCS pressure stable or rising. The crew may meet SI termination criteria based on their progress through the procedure, however, if SI is terminated they will not be able to maintain PZR level and will transition to EPP-17.

The Chief Examiner may terminate the scenario at any time after entry to EPP-17.

| Sat /<br>Unsat | Critical Task  | Critical Task Criteria  |
|----------------|--|---|
|                | Secure All RCP's due to EOP-E-0 Foldout Criteria                           | <p>STOP ALL RCPs within <u>6 minutes</u> of reaching the following RCP trip criteria:</p> <ul style="list-style-type: none"> <li>Both of the following satisfied: <ul style="list-style-type: none"> <li>SI Pumps – At least one running and capable of delivering flow</li> </ul> <p>AND</p> <li>RCS Subcooling based on Core Exit TCs – Less than 30° F (50° F)</li> </li></ul> |
|                | Start at least one Safety Injection Pump to provide adequate core cooling. | Start at least one SI Pump prior to completion of EOP-E-0 Attachment 1.   |
|                | Open either SI-870A or SI-870B to establish SI flow.                       | Open SI-870A OR SI-870B Prior to Completing EOP-E-0 Attachment 1.   |
|                | Manually isolate Excess Letdown  | Manually isolate Excess Letdown Prior to Completing EOP-E-0 Attachment 1.   |
|                | Isolate Ruptured "C" S/G   | Isolate "C" S/G Prior to Transition from EOP-E-3 at Step 5 of EOP-E-3.  |

**ILC-14 NRC SCENARIO 1 SIMULATOR SETUP****IC/SETUP:**

- IC-601, SCN 006\_ILC\_14\_NRC\_1.
- Status board is provided to crew is IC-8.

**PRE-LOADED EVENTS:**

The following events should occur on the reactor trip or triggered events following the reactor trip:

- Event 8: 'A & B' SI Pumps fail to Auto Start on SI.
- Event 9: SI-870 A & B fail to open on SI.

**EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:**

- Event 1: GP-003 Reactor Startup
- Event 2: Control Bank 'B' rod K2 stuck
- Event 3: South Service Water leak at intake
- Event 4: Loss of Condenser vacuum
- Event 5: PT-145 fails Low / Place Excess Letdown in Service
- Event 6: Control Bank 'B' rod K2 ejected
- Event 7: 'C' S/G ruptures

**EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:**

- GP-003
- AOP-001
- AOP-022
- AOP-012
- AOP-025, Section A
- AOP-016
- EOP-E-0
- EOP-E-1
- EPP-8
- EOP-E-3
- EPP-17

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Event Description: GP-003 Normal Plant Startup From Hot Shutdown to Critical

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

**EXAMINER'S NOTE:** The crew will assume the watch with the Shutdown Banks 'A & B' at 225 steps performing a plant startup in accordance with GP-003, Normal Plant Startup From Hot Shutdown to Critical. The crew should be given adequate time to brief the evolution prior to entering the simulator. The crew will start at Section 8.2, Step 8.2.23.

|               |     |  |
|---------------|-----|--|
| <b>GP-003</b> | CRS | Performs brief on Minimum of four inverse count rate ratio (1/M) data points are required on the approach to criticality.. |
|---------------|-----|--|

**NOTE:** A minimum of four inverse count rate ratio (1/M) data points are required on the approach to criticality. The data points should be taken each time the count rate approaches a value that is approximately twice the previous stable data point. This is referred to as "doubling". The first data point, Reference Count Rate (CR<sub>0</sub>), is obtained after Shutdown Bank "A" and Shutdown Bank "B" have been fully withdrawn.

The Audio Count Rate VOLUME AND AUDIO MULTIPLIER should be adjusted as the count rate rises to maintain a distinguishable audible count rate.

|               |     |   |
|---------------|-----|---|
| <b>GP-003</b> | BOP | <b>WHEN</b> Shutdown Bank "A" and Shutdown Bank "B" are fully withdrawn <b>AND</b> the count rate is stable, <b>THEN RECORD</b> the time and Reference Count Rate (CR <sub>0</sub> ) on Attachment 10.2, Inverse Count Rate Ratio (1/M) Data and Plot Form. |
|---------------|-----|---|

|               |     |   |
|---------------|-----|---|
| <b>GP-003</b> | CRS | Performs brief on step 8.2.24 through 8.2.27b being continuous action steps |
|---------------|-----|---|

**NOTE:** The following FOUR steps, Steps 8.2.24 through 8.2.27.b, are continuous actions steps which remain in effect until the actions have been performed or plant conditions render the steps not applicable.

### CAUTION

A minimum of one decade overlap between Source Range and Intermediate Range Channels is required prior to blocking the Source Range Reactor Trip signals.

|                    |            |   |   |         |   |      |   |    |    |
|--------------------|------------|---|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 1 | Page | 7 | of | 64 |
| Event Description: |            | GP-003 Normal Plant Startup From Hot Shutdown to Critical |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior                           |   |         |   |      |   |    |    |

  

|   |    |  |
|---|----|--|
| <b>GP-003</b>   | RO | <p><b>WHEN</b> Reactor power is indicating in the Intermediate Range, <b>THEN PERFORM</b> the following:</p> <ul style="list-style-type: none"> <li>a. <b>SELECT</b> the highest reading Intermediate Range Channel on the Comparator and Rate Drawer.</li> <li>b. <b>VERIFY</b> one decade overlap between the Source Range and Intermediate Range indication.</li> </ul> |
|   |    |  |
| <p><b>NOTE:</b> One Intermediate Range greater than 10<sup>-10</sup> amps is required to satisfy the P-6 Permissive.</p>  |    |  |
|   |    |  |
| <b>GP-003</b>   | RO | <p><b>WHEN</b> one Intermediate Range detector indicates greater than 10<sup>-10</sup> amps, <b>THEN VERIFY</b> the POWER ABOVE P-6 permissive light ILLUMINATES. (ITS SR 3.3.1.8)</p>   |
|   |    |  |
| <b>GP-003</b>   | RO | <p><b>WHEN</b> both Intermediate Range channels indicate greater than 10<sup>-10</sup> amps, <b>THEN BLOCK</b> the Source Range Reactor Trip by depressing the SOURCE RANGE LOGIC TRIP DEFEAT TRAIN "A" <b>AND</b> the SOURCE RANGE LOGIC TRIP DEFEAT TRAIN "B" pushbuttons on the RTGB</p>  |
|   |    |  |
| <b>GP-003</b>   | RO | <p><b>VERIFY</b> the following:</p> <ul style="list-style-type: none"> <li>a. All Source Range indication goes to zero.</li> <li>b. The SR DET LOSS OF DC Annunciator (APP-005-A1) ILLUMINATED.</li> </ul>   |
|   |    |  |
| <p><b>NOTE:</b> The approach to criticality should take approximately four doublings of the Indicated Reference Count Rate (CR<sub>0</sub>) under ideal conditions. The target count rate is intended to serve as a known stable reactivity state suitable for data taking and criticality predictions.</p> |    |  |

|                    |            |   |   |         |   |      |   |    |    |
|--------------------|------------|---|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 1 | Page | 8 | of | 64 |
| Event Description: |            | GP-003 Normal Plant Startup From Hot Shutdown to Critical |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior                           |   |         |   |      |   |    |    |

It is **NOT** necessary to attempt to stabilize at exactly double the previous count rate, therefore the use of a "target count rate" (as applied to each doubling of the count rate) is intended to allow the Operator to stabilize the core as close as is practical to the "doubling" count rate without excessive rod motion.

APP-005-F2, ROD BOTTOM ROD DROP, will extinguish when Control Bank "A" is above 20 steps.

INPO SOER 07-1, Recommendation #2, makes the following statement: "Reactivity changes during shift turnover or shift crew briefings are to be avoided." At RNP, this recommendation is implemented as follows:

1. Shift Turnover shall **NOT** be done unless the Reactor is stable **AND EITHER**

(A) Shutdown Bank rod withdrawal has **NOT** commenced,

**OR**

(B) All Shutdown Bank rod withdrawal is complete with NO Control Bank rod withdrawal commenced or in progress.

**OR**

2. The Reactor is stable at  $10^{-8}$  amps. (OPEX 260129, NCR 527680)

|  |    |   |
|--|----|---|
|  |    |   |
| <b>GP-003</b>  | RO | <b>WITHDRAW</b> control rods to achieve the target count rate determined in Attachment 10.2, Inverse Count Rate Ratio (1/M) Data and Plot Form, as follows:<br><br>a. <b>SELECT</b> "M" on the Rod Bank Selector switch.  |
|  |    |   |
| <b>NOTE:</b> During Rod Withdrawal, the Operator at the Controls (OAC) is manipulating the Rod Withdrawal and monitoring applicable parameters. Simultaneously, a licensed RO other than the assigned OAC will assist in performing the Attachment 10.3, Control Rod Withdrawal Checklist. |    |   |
|  |    |   |
| <b>GP-003</b>  | RO | <b>WITHDRAW</b> control rods to achieve the target count rate determined in Attachment 10.2, Inverse Count Rate Ratio (1/M) Data and Plot Form, as follows:<br><br>b. <b>WITHDRAW</b> Control Rods until count rate is approximately equal to the target count rate while performing the checks and verifications of Attachment |



|                    |            |   |   |         |   |      |   |    |    |
|--------------------|------------|---|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 1 | Page | 9 | of | 64 |
| Event Description: |            | GP-003 Normal Plant Startup From Hot Shutdown to Critical |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior                           |   |         |   |      |   |    |    |

|  |    |  |
|--|----|--|
|  |    | 10.3, Control Rod Withdrawal Checklist.  |
|  |    |  |
| GP-003   | RO | <p><b>WITHDRAW</b> control rods to achieve the target count rate determined in Attachment 10.2, Inverse Count Rate Ratio (1/M) Data and Plot Form, as follows:</p> <p>c. <b>VERIFY</b> the count rate stabilizes <b>AND</b> does <b>NOT</b> rise in an unexpected manner.</p> <p>d. <b>IF</b> criticality is indicated, <b>THEN GO TO</b> Section 8.3.</p> |
|  |    |  |
| <p><b>NOTE:</b> Each successive reactivity addition will require less rod motion and a longer time for the count rate to stabilize. The NR-45 trace should be closely monitored and cross-checked against available instrumentation to determine when count rate has stabilized following each successive rod pull to double counts.</p> |    |  |
|  |    |  |
| GP-003   | RO | <p><b>WHEN</b> rod motion has been stopped <b>AND</b> count rate is stable, <b>THEN RECORD</b> the required information on Attachment 10.2, Inverse Count Rate Ratio (1/M) Data and Plot Form.</p>   |
|  |    |  |
| GP-003   | RO | <p><b>WITHDRAW</b> control rods to achieve the new target count rate determined in Attachment 10.2, Inverse Count Rate Ratio (1/M) Data and Plot Form, as follows:</p>   |

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Event Description: Control Bank 'B' rod K2 stuck

| Time  | Position | Applicant's Actions or Behavior  |
|---|----------|--|
|   |          |  |
| <b>BOOTH OPERATOR: Prior to withdrawing rods for second double insert Event 2, Control Bank 'B' rod K2 stuck.</b> |          |  |
| <b>EVENT INDICATIONS:</b>   |          |  |
| <b>Control Bank B' rod K2 does not move during when demanded.</b>   |          |  |
|   |          |  |
| <b>AOP-001</b>  | RO       | <b>AOP-001, Malfunction of Reactor Control System</b><br><b>Immediate Action Step:</b><br>Check Unexpected Rod Motion in Progress – (NO)<br>Go to step 7   |
|   |          |  |
| <b>AOP-001</b>  | CRS      | Enters <b>AOP-001, Malfunction of Reactor Control System</b>   |
|   |          |  |
| <b>AOP-001</b>  | CRS      | Verifies immediate actions complete.   |
|   |          |  |
| <b>AOP-001</b>  | RO       | <b>Determine If Multiple Rods Have Dropped As Follows:</b><br>a. Analyze Indications For Multiple Rod Drop <ul style="list-style-type: none"> <li>● Prompt Drop - PRESENT</li> <li>● More than 1 Rod Bottom Light - ILLUMINATED</li> <li>● More Than 1 IRPI - INDICATES ON BOTTOM</li> </ul> b. Check Multiple Dropped Rods - PRESENT – (NO) |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 2 | Page | 11 | of | 64 |
| Event Description: |            | Control Bank 'B' rod K2 stuck   |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |   |
|----------------|-----|---|
| <b>AOP-001</b> | BOP | Make PA Announcement for Procedure Entry.   |
|                |     |   |
| <b>AOP-001</b> | RO  | Check Tav <sub>g</sub> – Trending to Tref ( <b>YES</b> )  |
|                |     |   |
| <b>AOP-001</b> | RO  | <p><b>Determine The Status Of Rods As Follows:</b></p> <ul style="list-style-type: none"> <li>a. Analyze the below indications for a dropped rod: <ul style="list-style-type: none"> <li>• APP- 005- A3, PR DROP<br/>ROD - ILLUMINATED</li> <li>• APP- 005- F2, ROD<br/>BOTTOM ROD DROP -<br/>ILLUMINATED</li> <li>• Rod Bottom Light for<br/>affected rod -<br/>ILLUMINATED</li> <li>• Indication of Prompt Drop -<br/>PRESENT</li> <li>• Quadrant Power Tilt<br/>indications - PRESENT <ul style="list-style-type: none"> <li>▪ APP- 005- F3, PR<br/>UPPER CH HI FLUX<br/>DEV/AUTO DEFEAT -<br/>ILLUMINATED</li> <li>▪ APP- 005- F4, PR<br/>LOWER CH HI FLUX<br/>DEV/AUTO DEFEAT -<br/>ILLUMINATED</li> <li>▪ APP- 005- C3, PR<br/>CHANNEL DEV -<br/>ILLUMINATED</li> </ul> </li> </ul> </li> </ul> |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 2 | Page | 12 | of | 64 |
| Event Description: |            | Control Bank 'B' rod K2 stuck   |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|   |    |   |
|---|----|---|
|   |    | <ul style="list-style-type: none"> <li>▪ Power Range Drawer Indications</li> </ul> <p>b. Check Dropped Rod - <b>PRESENT – (NO)</b></p>  |
| <p style="text-align: center;"><b><u>NOTE</u></b></p> <ul style="list-style-type: none"> <li>• <u>IF</u> there is any doubt as to IRPI failure OR actual rod misalignment, THEN assume rod misalignment is present.</li> <li>• Malfunctioning IRPI(s) may be identified by erratic or drifting IRPI indication when the associated Rod Bank is not being moved, or sudden large changes in IRPI indication with no corresponding change in nuclear power or motion of other rods in the associated bank.</li> </ul> <p>ERFIS Rod Position Indication may be used for IRPI indication below.</p> |    |   |
|   |    |   |
| <b>AOP-001</b>  | RO | <p><b>Determine The Status Of IRPI As Follows:</b></p> <p>a. Analyze the below indications for an IRPI problem:</p> <ul style="list-style-type: none"> <li>• IRPI Indication           <ul style="list-style-type: none"> <li>▪ Indicator drift with NO flux effects</li> <li>▪ Erratic indicator movement with NO flux effects</li> <li>▪ Indicator off- scale High OR Low with NO flux Effects</li> </ul> </li> <li>• Dropped Rod Indication with no flux changes           <ul style="list-style-type: none"> <li>▪ Rod Bottom Light for affected rod - ILLUMINATED</li> </ul> <p style="text-align: center;"><u>AND</u></p> </li> </ul> |

|  |          |   |
|--|----------|---|
| Op Test No.: <u>ILC-14 NRC</u> Scenario # <u>1</u> Event # <u>2</u> Page <u>13</u> of <u>64</u>  |          |   |
| Event Description: Control Bank 'B' rod K2 stuck   |          |   |
| Time   | Position | Applicant's Actions or Behavior   |
|  |          | <ul style="list-style-type: none"> <li>▪ APP- 005- A3, PR DROP<br/>ROD - EXTINGUISHED</li> <li>• Simultaneous loss of ALL<br/>IRPI Indication (Power<br/>Supply Failure) - PRESENT</li> <li>b. Check IRPI malfunction -<br/>PRESENT – (NO)</li> </ul>   |
|  |          |   |
| <b>AOP-001</b>   | RO       | <p><b>Determine The Status Of Rods As Follows:</b></p> <p>a. Analyze below indications of A Immovable <u>OR</u> Misaligned Rod</p> <ul style="list-style-type: none"> <li>• Rod - CAN <u>NOT</u> BE MOVED</li> <li>• APP- 005- E2, ROD CONT SYSTEM URGENT FAILURE - ILLUMINATED</li> <li>• Rod Indication - OUT OF ALIGNMENT WITH REMAINDER OF BANK</li> </ul> <p>b. Check Misaligned/Immovable Rod - PRESENT (YES)</p> |
|  |          |   |
| <b>AOP-001</b>   | CRS      | <b>Go To Section B, Immovable/Misaligned Rods</b>   |
|  |          |   |
| <b>AOP-001</b>   | RO       | <p>Check current plant status – Mode 1 (NO)</p> <p>RNO - Observe the NOTE prior to Step 49 and Go To Step 49.</p>   |
|  |          |   |
| <p><u>NOTE</u></p> <p>Trip of the stuck rod(s) (RNO step below) is <u>NOT</u> considered a Reactor Trip for entry into the EOP Network since the plant is already in Mode 3.</p> |          |   |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
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| Event Description: |            | Control Bank 'B' rod K2 stuck   |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |     |  |
|--|-----|--|
| <b>AOP-001</b>   | RO  | Check current plant status – Mode 2 ( <b>Yes</b> )   |
|  |     |  |
| <b>AOP-001</b>   | RO  | <b>Check Tavg - WITHIN - 1.5 TO +1.5°F OF TREF (YES)</b>   |
|  |     |  |
| <b>AOP-001</b>   | CRS | Stop Any Evolutions That Change Reactor Power Except As Called For By This procedure <ul style="list-style-type: none"> <li>• Steam demand changes</li> <li>• Boron concentration changes</li> </ul> |
|  |     |  |
| <b>AOP-001</b>   | RO  | Check APP- 005- E2, ROD CONT SYSTEM URGENT FAILURE - ILLUMINATED ( <b>NO</b> )<br><br>RNO – Go to step 59  |
|  |     |  |
| <p style="text-align: center;"><u><b>NOTE</b></u></p> <p style="text-align: center;">AOP- 007, TURBINE TRIP BELOW P- 8, is not applicable at this time.</p>  |     |  |
|  |     |  |
| <b>AOP-001</b>   | RO  | Check malfunctioning Rod Status – Stuck ( <b>YES</b> )   |
|  |     |  |
| <p style="text-align: center;"><u><b>NOTE</b></u></p> <p style="text-align: center;">Trip of the rod(s) (step below) is <u><b>NOT</b></u> considered a Reactor Trip for entry into the EOP Network since the plant is already in Mode 3.</p> |     |  |
|  |     |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 2 | Page | 15 | of | 64 |
| Event Description: |            | Control Bank 'B' rod K2 stuck   |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|         |     |   |
|---------|-----|---|
| AOP-001 | RO  | <b>Perform The Following.</b> <ol style="list-style-type: none"> <li>Initiate boration of the RCS using OP- 301, Chemical and Volume Control System (CVCS), RCS Boration Quick Checklist.</li> <li>Contact Reactor Engineering to determine All Rods Out 1% Shutdown Boron Concentration.</li> <li>Check Turbine - ROLLING (NO)</li> <li>RNO Go To Step 60.e.</li> <li><u>WHEN</u> the required 1% shutdown concentration has been achieved, <u>THEN</u> trip the Control Rods <u>AND</u> terminate boration</li> </ol> |
|         |     |   |
| AOP-001 | CRS | Implement The EALs  |
|         |     |   |
| AOP-001 | CRS | <b>Review Technical Specifications To Assure All Applicable LCO requirements Have Been Met:</b> <ul style="list-style-type: none"> <li>ITS 3.1.4 - Rod Alignment</li> <li>ITS 3.1.5 - Shutdown Bank RIL</li> <li>ITS 3.1.6 - Control Bank RIL and overlap</li> <li>ITS 3.1.7 - IRPI</li> <li>ITS 3.2.1 - Fq(Z)</li> <li>ITS 3.2.2 - FΔh</li> <li>ITS 3.2.3 - AFD</li> <li>ITS 3.2.4 - QPTR</li> </ul>   |
|         |     |   |

|                    |            |                                  |   |         |   |      |    |    |    |
|--------------------|------------|----------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                       | 1 | Event # | 3 | Page | 16 | of | 64 |
| Event Description: |            | Service Water Leak at the Intake |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|  |            |   |
|--|------------|---|
|  |            |   |
| <b>BOOTH OPERATOR: Insert Event #3 (South Service Water leak at intake) on cue from the Chief Examiner.</b>  |            |   |
| <b>EVENT INDICATIONS:</b><br><br><b>APP-008-E7, S SW HDR STRAINER PIT HI LVL</b><br><br><b>APP-008-E8, N SW HDR STRAINER PIT HI LEVEL</b><br><br><b>APP-008-F7, SOUTH SW HDR LO PRESS</b><br><br><b>APP-008-F8, NORTH SW HDR LO PRESS</b><br><br><b>SW Header Pressures on PI-1616 and PI-1684 reading 28 psig</b> |            |   |
|  |            |   |
| <p style="text-align: center;"><u>NOTE</u></p> <p style="text-align: center;">Step 1 is an immediate action step.</p>  |            |   |
|  |            |   |
| <b>AOP-022</b>   | <b>BOP</b> | <b>AOP-022, Loss of Service Water</b><br><b>Immediate Action Step:</b><br>Check The Following Alarms – EXTINGUISHED: <b>(NO)</b> <ul style="list-style-type: none"> <li>• APP-008-E7, S SW HDR STRAINER PIT HI LEVEL</li> <li>• APP-008-E8, N SW HDR STRAINER PIT HI LEVEL</li> </ul> |
|  |            |   |
| <b>AOP-022</b>   | <b>BOP</b> | Perform the following: <ol style="list-style-type: none"> <li>a. Close the following SW X-CONN Valves: <ul style="list-style-type: none"> <li>• V6-12B</li> <li>• V6-12C</li> </ul> </li> </ol>   |



|                    |            |                                  |   |         |   |      |    |    |    |
|--------------------|------------|----------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                       | 1 | Event # | 3 | Page | 17 | of | 64 |
| Event Description: |            | Service Water Leak at the Intake |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|   |     |   |
|---|-----|---|
|   |     | b. Go To Section F.   |
|   |     |   |
| <b>AOP-022</b>  | CRS | Enters AOP-022, Loss of Service Water   |
|   |     |   |
| <b>AOP-022</b>  | CRS | Verifies immediate actions complete   |
|   |     |   |
| <b>AOP-022</b>  | BOP | Verify PA Announcement For Procedure Entry Performed  |
|   |     |   |
| <b>AOP-022</b>  | BOP | Verify SW X-CONN Valves - CLOSED: <ul style="list-style-type: none"> <li>• V6-12B</li> <li>• V6-12C</li> </ul>      |
|   |     |   |
| <p style="text-align: center;"><u>NOTE</u></p> <p>The source of flooding in the Intake Structure may be Service Water, Fire Water, or Intake Structure leakage.</p>   |     |   |
|   |     |   |
| <b>AOP-022</b>  | BOP | Evaluate Control Room Indications AND Perform Local Inspections To Determine Source Of Flooding Prior To Continuing |
|   |     |   |
| <b>BOOTH OPERATOR:</b> If / When contacted by the Control Room to investigate leakage at the intake, wait 5 minutes and then report that there is water in both SW pits and there appears to be a pipe break at the discharge tee of "B" SWP. |     |   |
|   |     |   |

|                    |            |                                  |   |         |   |      |    |    |    |
|--------------------|------------|----------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                       | 1 | Event # | 3 | Page | 18 | of | 64 |
| Event Description: |            | Service Water Leak at the Intake |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|---|-----|---|
| <b>AOP-022</b>  | BOP | Check Source of Flooding – SERVICE WATER (YES)  |
|   |     |   |
| <b>AOP-022</b>  | BOP | Check Service Water Leak Location – ON SOUTH HEADER (YES)   |
|   |     |   |
| <b>AOP-022</b>  | BOP | Verify the following:<br>a. SW Pump C – Running<br>b. SW Pump D – Running<br>c. SW Pump A – Stopped<br>d. SW Pump B – Stopped   |
|   |     |   |
| <b>AOP-022</b>  | BOP | Evaluate SW Header Pressure Indications as follows:<br>Check South SW Header Pressure on PI-1684 – Lowering (YES) (0 psig)<br>Check North SW Header Pressure on PI-1616 – Stable <u>OR</u> Rising (YES) (46 psig) |
|   |     |   |
| <p style="text-align: center;"><u>NOTE</u></p> <p>With Service Water Pumps "A" <u>AND</u> "B" isolated, EDG "A" is inoperable. ITS 3.8.1 requires SR 3.8.1.1 to be performed within 1 hour.</p> |     |   |
|   |     |   |
| <b>AOP-022</b>  | BOP | Close V6-12A, SW SOUTH HDR ISO  |
|   |     |   |
| <p style="text-align: center;"><u>NOTE</u></p> <p>SW-851 and SW-857, SOUTH SW HEADER CHEMICAL INJECTION, are located above the South SW Strainer Pit on the South side.</p>                     |     |   |
|   |     |   |
| <b>AOP-022</b>  | BOP | Verify The Following Valves At The Intake Structure - CLOSED:<br><ul style="list-style-type: none"> <li>• SW-851</li> <li>• SW-857</li> </ul>   |

|                    |            |                                  |   |         |   |      |    |    |    |
|--------------------|------------|----------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                       | 1 | Event # | 3 | Page | 19 | of | 64 |
| Event Description: |            | Service Water Leak at the Intake |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|   |     |  |
|---|-----|--|
|   |     |  |
| <b>BOOTH OPERATOR: When dispatched, wait 2 minutes and report that SW-851 and SW-857 are closed. Valves are not modeled on Simulator.</b>                               |     |  |
|   |     |  |
| <u>CAUTION</u>  |     |  |
| Confined Space entry requirements must be observed to access the South SW Strainer Pit.   |     |  |
|   |     |  |
| <u>NOTE</u>   |     |  |
| SW-187, South HDR SUPPLY TO SCRIN WASH & CW PMP GLAND SEAL, is located in the South SW Strainer Pit.  |     |  |
|   |     |  |
| <b>AOP-022</b>  | BOP | Check Flooding Status - Stopped  |
|   |     |  |
| <b>BOOTH OPERATOR: When requested to check flooding status, wait 30 seconds and then report that the flooding has stopped.</b>  |     |  |
|   |     |  |
| <b>AOP-022</b>  | BOP | Check North SW Header Pressure On PI-1616 - GREATER THAN 40 PSIG ( <b>YES</b> , ~ 46 psig)   |
|   |     |  |
| <b>AOP-022</b>  | BOP | Remove Control Power Fuses From The Following Breakers At 480V Bus E-1: <ul style="list-style-type: none"> <li>SERVICE WATER PUMP A (CMPT-20B)</li> <li>SERVICE WATER PUMP B (CMPT-19C)</li> </ul> |
|   |     |  |
| <b>BOOTH OPERATOR: When dispatched to remove control power fuses, wait 5 minutes and then rack out breakers for SWP "A" and "B" IAW SCN file and report back to CR.</b> |     |  |
|   |     |  |

|                    |            |                                  |   |         |   |      |    |    |    |
|--------------------|------------|----------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                       | 1 | Event # | 3 | Page | 20 | of | 64 |
| Event Description: |            | Service Water Leak at the Intake |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

  

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| <b>AOP-022</b>   | BOP | Determine If A SW Booster Pump Should Be Started:<br>a. Check SW Booster Pumps – ALL STOPPED (NO)<br><br>RNO: Verify only ONE SW Booster Pump is running. (YES)<br>Go to Step 22.   |
| <b>AOP-022</b>   | BOP | Check Circulating Water Pump Status - ANY RUNNING ( <b>YES</b> )  |
| <b>AOP-022</b>   | BOP | Determine If Adequate Seal Water Is Available To Circulating Water Pumps As Follows: (YES to ALL) <ul style="list-style-type: none"> <li>APP-008-E4, CW PMP A SEAL WTR LOST - EXTINGUISHED</li> <li>APP-008-E5, CW PMP B SEAL WTR LOST - EXTINGUISHED</li> <li>APP-008-E6, CW PMP C SEAL WTR LOST - EXTINGUISHED</li> </ul> |
| <b><u>CAUTION</u></b><br><br>CCW temperature is limited to 105°F when any of the following equipment is in service: Post Accident Sampling Heat Exchanger, and Excess Letdown Heat Exchanger |     |   |
| <b>AOP-022</b>   | RO  | Determine Maximum Allowable CCW Temperature As Follows:<br>a. Check RCS temperature – LESS THAN <u>OR</u> EQUAL TO 350°F (NO)<br><br>RNO: Maintain CCW Heat Exchanger outlet temperature indicated on TI-607 less than or equal to 105°F.<br><br>Go To Step 29  |
| <b>AOP-022</b>   | BOP | Perform The Following<br><br>a. Inspect the area of the leak<br>b. Report findings to the Control Room<br>c. Identify and isolate the source of the SW leak   |
| <b>BOOTH OPERATOR:</b> If requested, report that the SW piping has a crack at “B” SWP Discharge Pipe Tee.  |     |   |

|                    |            |                                  |   |         |   |      |    |    |    |
|--------------------|------------|----------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                       | 1 | Event # | 3 | Page | 21 | of | 64 |
| Event Description: |            | Service Water Leak at the Intake |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|                |     |   |
| <b>AOP-022</b> | CRS | Contact Maintenance To Install Temporary Pumps To Dewater Service Water Pits  |
|                |     |   |
| <b>AOP-022</b> | CRS | Contact Engineering to perform the following: <ul style="list-style-type: none"> <li>Evaluate operability of equipment affected by flooding</li> <li>Provide corrective actions for flooding</li> </ul>   |
|                |     |   |
| <b>AOP-022</b> | CRS | Refer To Technical Specification 3.7.7, Service Water System (SWS) ITS 3.7.7, One SWS train inoperable. Restore SWS train to Operable status within 72 hours or be in MODE 3 in 6 hours AND be in MODE 5 in 36 hours.<br><br>ITS 3.8.1, One DG inoperable. Perform SR 3.8.1.1 for the offsite circuit within 1 hour AND Once per 12 hours thereafter. (OP-604 Section 8.4.9)<br>AND<br>Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable within 4 hours of discovery of Condition B concurrent with inoperability of redundant required feature(s). Since "A" MDAFW pump is OOS, then the Crew has four hours to declare "B" MDAFW pump OOS.<br>AND<br>Perform SR 3.8.1.2 for OPERABLE DG within 24 hours.<br>AND<br>Restore DG to OPERABLE status within 7 days AND 8 days from discovery of failure to meet LCO. |
|                |     |   |
| <b>AOP-022</b> | CRS | Implement the EALs  |
|                |     |   |
| <b>AOP-022</b> | CRS | Return to procedure and step in effect.   |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 4 | Page | 22 | of | 64 |
| Event Description: |            | Loss of Condenser Vacuum        |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|   |            |   |
|---|------------|---|
| <b>BOOTH OPERATOR: Insert Event #4 (Loss of Condenser Vacuum) on cue from the Chief Examiner.</b>   |            |   |
| <b>EVENT INDICATIONS:</b><br>PI-1310 Cond A Narrow Range inches HG ABS rising<br>PI-1312 Cond A WR inches HG ABS rising<br>PI-1311 Cond B Narrow Range inches HG ABS rising<br>PI-1313 Cond B WR inches HG ABS rising<br>APP-008-A5 Condenser Lo Vacuum illuminated |            |   |
| <p style="text-align: center;"><u>NOTE</u></p> <p style="text-align: center;">Steps 1 and 2 are Immediate Action steps.</p>   |            |   |
| <b>AOP-012</b>  | <b>BOP</b> | <b>AOP-012, Partial Loss of Condenser Vacuum or Circulating Water Pump Trip</b><br><br><b>Immediate Action Step</b><br><br>Check Circulating Water Pump - ANY TRIPPED<br><br>Go To Section A, Partial Loss of Condenser vacuum. |
| <b>AOP-012</b>  | <b>CRS</b> | Enters AOP-012, Partial Loss of Condenser Vacuum or Circulating Water Pump Trip   |
| <b>AOP-012</b>  | <b>CRS</b> | Verifies immediate actions complete.  |
| <b>AOP-012</b>  | <b>BOP</b> | Check Condenser Status – VACUUM PREVIOUSLY ESTABLISHED (YES)  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 4 | Page | 23 | of | 64 |
| Event Description: |            | Loss of Condenser Vacuum        |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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|--|-----|--|
|  |     |  |
| <b>AOP-012</b>   | BOP | Verify All Available Vacuum Pumps - RUNNING  |
|  |     |  |
| <b>AOP-012</b>   | BOP | Verify The Following VACUUM BREAKER Valves – CLOSED <ul style="list-style-type: none"> <li>• MS-70A</li> <li>• MS-70B</li> </ul>   |
|  |     |  |
| <b>AOP-012</b>   | BOP | Make PA announcement for procedure entry   |
|  |     |  |
| <b>AOP-012</b>   | RO  | Check plant conditions – in Modes 1 OR 2 (YES)   |
|  |     |  |
| <p style="text-align: center;"><u>NOTE</u></p> <p>The use of narrow range pressure ERFIS points CDP2500A and CDP2501A and wide range ERFIS points CDP2502A and CDP2503A may aid in observing condenser vacuum conditions. Narrow range pressure ERFIS points have a maximum range of 6" HG backpressure.</p> |     |  |
|  |     |  |
| <b>AOP-012</b>   | BOP | <p><b>Continuous Action Step</b></p> <p>Check Condenser Back Pressure On PI-1312 AND PI-1313 – APPROACHES RESTRICTED REGION OF ATTACHMENT 3, CONDENSER BACKPRESSURE LIMIT CURVE (NO – Turbine is not latched)</p> <p>Go To Step 9.</p> |
|  |     |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 4 | Page | 24 | of | 64 |
| Event Description: |            | Loss of Condenser Vacuum        |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |   |
|----------------|-----|---|
| <b>AOP-012</b> | BOP | <b>Continuous Action Step</b><br>Check Condenser Vacuum DEGRADING using the following: (NO – stabilized in hogging/jetting mode with vacuum pumps)<br><br><input type="checkbox"/> PI-1310<br><input type="checkbox"/> PI-1311<br><input type="checkbox"/> ERFIS-CDP2500A<br><input type="checkbox"/> ERFIS-CDP2510A<br><br>Go to step 11 |
|                |     |   |
| <b>AOP-012</b> | BOP | Check Condenser Nitrogen Addition – in service (NO)<br>Go to step 13  |
|                |     |   |
| <b>AOP-012</b> | BOP | Verify All Available Circulating Water Pumps - RUNNING  |
|                |     |   |
| <b>AOP-012</b> | BOP | Check APP-008-F3, EXH HOOD HI TEMP Alarm – ILLUMINATED (NO)<br><br>Go to step 17  |
|                |     |   |
| <b>AOP-012</b> | BOP | Check TURBINE GENERATOR SUPERVISORY RECORDER - ANY VIBRATION GREATER THAN 14.0 MILS (N) – Turbine is not latched)<br><br>Go to step 20  |
|                |     |   |
| <b>AOP-012</b> | BOP | Check Status of Auxiliary Boilers - IN SERVICE (YES)  |
|                |     |   |



|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 4 | Page | 25 | of | 64 |
| Event Description: |            | Loss of Condenser Vacuum        |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |   |
|----------------|-----|---|
| <b>AOP-012</b> | BOP | Check Auxiliary Boiler Status As Follows:<br>a. Check Auxiliary Boilers - TRIPPED/SHUTDOWN (NO)<br>Go to step 22  |
|                |     |   |
| <b>AOP-012</b> | BOP | Determine If Low Vacuum Due To Blowdown:<br>a. Check blowdown status – SPLIT BETWEEN FLASH TANK AND CONDENSER<br>b. Check blowdown – LOST (NO)<br>Go to step 23   |
|                |     |   |
| <b>AOP-012</b> | CRS | Check Cause Of Vacuum Loss – IDENTIFIED (NO)<br>Dispatch AO to locally perform Attachment 1 while continuing with this procedure.<br>Monitor Condenser Backpressure during the performance of Attachment and Coordinate with personnel performing the attachment. |
|                |     |   |
| <b>AOP-012</b> | BOP | Notify Chemistry personnel to monitor secondary chemistry to ensure compliance with CP-005, Secondary Chemistry Corrective Action Program.  |
|                |     |   |
| <b>AOP-012</b> | BOP | Dispatch AO to measure condenser in-leakage using OP-504, Condenser Air Removal, Measuring Condenser In-leakage.  |
|                |     |   |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 4 | Page | 26 | of | 64 |
| Event Description: |            | Loss of Condenser Vacuum        |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

**BOOTH OPERATOR: Notify the Control Room the Miscellaneous Drains Collecting Tank Level is low out of band and that you will be performing adjustment IAW Attachment 1.step 23 RNO.**

|         |     |  |
|---------|-----|--|
|         |     |  |
| AOP-012 | CRS | Implement the EAL's                    |
|         |     |  |
| AOP-012 | CRS | Check cause of vacuum loss found (YES) |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                                     | 1 | Event # | 5 | Page | 27 | of | 64 |
| Event Description: |            | PT-145, Letdown Pressure Transmitter Fails Low |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                |   |         |   |      |    |    |    |

|  |     |  |
|--|-----|--|
|  |     |  |
| <b>BOOTH OPERATOR: Insert event #5 (PT-145, Letdown Pressure Transmitter, fails low) on cue from the Chief Examiner.</b> |     |  |
| <b>EVENT INDICATIONS:</b>  |     |  |
| <b>APP-001-E6 – LP LTDN RELIEF HI TEMP</b>   |     |  |
| <b>APP-003-C3 – PRT HI PRESS</b>   |     |  |
|  |     |  |
| <b>AOP-025</b>   | RO  | References APP-001 and informs SRO of need to refer to AOP-025, RTGB Instrument Failure.                                       |
|  |     |  |
| <b>AOP-025</b>   | CRS | Enters AOP-025, RTGB Instrument Failure  |
|  |     |  |
| <b>AOP-025</b>   | RO  | Place LCV-460A&B In The CLOSE Position   |
|  |     |  |
| <b>AOP-025</b>   | RO  | Verify ONLY ONE Charging Pump is Running. (Lowers the speed on the Charging Pump in Manual and stops the pump.)                |
|  |     |  |
| <b>AOP-025</b>   | BOP | Place Excess Letdown in Service Using Attachment 2.  |
|  |     |  |
| Attachment 2   |     |  |
|  |     |  |
| <b>Att. 2</b>  | BOP | Verify Closed the following valves: <ul style="list-style-type: none"> <li>• LCV-460A&amp;B</li> <li>• CVC-200A/B/C</li> </ul> |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                                     | 1 | Event # | 5 | Page | 28 | of | 64 |
| Event Description: |            | PT-145, Letdown Pressure Transmitter Fails Low |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                |   |         |   |      |    |    |    |

|  |         |  |
|--|---------|--|
|  |         | <ul style="list-style-type: none"> <li>CVC-204A/B</li> </ul>   |
|  |         |  |
| Att. 2   | BOP     | Verify Open CC-739   |
|  |         |  |
| Att. 2   | BOP     | Position CVC-389 to the RCDT Position  |
|  |         |  |
| Att. 2   | BOP     | Open CVC-387, Excess Ltdn Stop   |
|  |         |  |
| Att. 2   | BOP     | Slowly Open HCV-137, Excess Ltdn Flow, not to exceed 195°F as indicated on TI-139, Excess Ltdn HX Outlet Temp.   |
|  |         |  |
| Att. 2   | BOP     | Notify the CRS that Excess Letdown is in service.  |
|  |         |  |
| Att. 2   | BOP     | Update the ERFS Calorimetric program to reflect Excess Letdown is in service.  |
|  |         |  |
| Att. 2   | BOP     | IF required to control Pzr Level, THEN contact Chemistry to perform the alignment for purging the PZR Liquid sample line with full flow to the VCT iaw CP-003. |
|  |         |  |
| <b>BOOTH OPERATOR: IF requested to align sample line for purge, wait 5 minutes and implement IAW SCN File.</b> |         |  |
|  |         |  |
| Att. 2   | BOP/CRS | IF PZR Liquid sample line is used to control PZR Level, THEN remove the calorimetric calculation from service and enter TRM 3.25                               |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                                     | 1 | Event # | 5 | Page | 29 | of | 64 |
| Event Description: |            | PT-145, Letdown Pressure Transmitter Fails Low |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                |   |         |   |      |    |    |    |

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| <b>Att. 2</b>  | BOP | <p>IF desired to align Excess Letdown to the VCT, THEN perform the following:</p> <ol style="list-style-type: none"> <li>Position CVC-389 to the VCT.</li> <li>Notify Rad. Control that Excess Letdown is in service through the Seal Water Filters and Heat Exchanger, which will result in RAISED radiation levels in those areas.</li> </ol>  |
|  |     |  |
| Attachment 2 complete  |     |  |
|  |     |  |
| <b>AOP-025</b>   | BOP | Step 4: Make PA Announcement for Procedure Entry.  |
|  |     |  |
| <b>AOP-025</b>   | RO  | <p>Check RCP Seal Injection Flow – Between 8 and 13 gpm. (NO)</p> <ul style="list-style-type: none"> <li>Locally throttle CVC-297A/B/C to obtain 8 to 13 gpm.</li> <li>If required to maintain minimum flow, then throttle HIC-121 while maintaining Charging Pump Discharge pressure less than 2500 psig.</li> <li>If the normal Seal Injection Range can NOT be maintained, then an expanded range of between 6 to 20 gpm may be used.</li> <li>Check ITS LCO 3.4.17 for applicability. (ITS 3.4.17 SR 3.4.17.1 requires that seal injection flow remain <math>\geq 6</math> gpm to each RCP)</li> <li></li> </ul> |
|  |     |  |
| <b>BOOTH OPERATOR: IF / WHEN requested, throttle CVC-297A/B/C as necessary using the P&amp;ID function to obtain requested seal injection flows.</b> |     |  |

|   |          |                                 |
|---|----------|---------------------------------|
| Op Test No.: <u>ILC-14 NRC</u> Scenario # <u>1</u> Event # <u>5</u> Page <u>30</u> of <u>64</u> |          |                                 |
| Event Description: PT-145, Letdown Pressure Transmitter Fails Low                               |          |                                 |
| Time  | Position | Applicant's Actions or Behavior |

|                |     |  |
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|                |     |  |
| <b>AOP-025</b> | CRS | Contact Plant Operations Staff to Expedite Repair of PT-145. |

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|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 31 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <b>BOOTH OPERATOR: Insert Event #6 Control Bank B Rod K2 Ejected) on cue from the Chief Examiner.</b>             |          |  |
| <b>EVENT INDICATIONS:</b>   |          |  |
| RR-1 Warning for R-11<br>APP-036-D8, Process Monitor HI Rad (R-11)<br>RCS Pressure Lowering<br>PZR Level Lowering |          |  |
|   |          |  |
| <b>EXAMINERS NOTE: The crew may determine to trip the reactor prior to implementing AOP-016</b>                   |          |  |
|   |          |  |
| <b>AOP-016</b>  | RO / CRS | <p><b>Continuous Action Step</b></p> <p>Determine If Reactor Trip Needed As Follows:</p> <ol style="list-style-type: none"> <li>Check RCS Pressure – GREATER THAN 1000 PSIG (YES)</li> <li>Check the following: <ul style="list-style-type: none"> <li>PZR level - less than 14% and lowering in an uncontrolled manner (NO)</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>RCS subcooling – less than 35° F (NO)</li> </ul> </li> <li>RNO - IF PZR level can NOT be maintained greater than 14% OR subcooling can NOT be maintained greater than 35° F THEN trip the reactor and go to EOP-E-0, Reactor Trip or Safety Injection.</li> </ol> <p>Go to step 2</p> |

|                    |            |   |   |         |         |      |    |    |    |
|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 32 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <b>AOP-016</b>  | BOP | Make a PA announcement for procedure entry   |
|   |     |  |
| <p style="text-align: center;"><u>CAUTION</u></p> <p>Charging Pump Discharge Pressure must be maintained less than 2500 psig to prevent lifting the Charging Pump Discharge Relief.</p> |     |  |
|   |     |  |
| <b>AOP-016</b>  | RO  | Control charging flow to maintain desired RCS level  |
|   |     |  |
| <b>AOP-016</b>  | RO  | <p><b>Continuous Action Step</b></p> <p>Check VCT level – less than 12.5 inches (NO)</p> <p>RNO - IF VCT level lowers to less than 12.5 inches, THEN observe the Note prior to step 5 and perform step 5</p> <p>Go to step 6</p> |
|   |     |  |
| <b>AOP-016</b>  | RO  | <p>Check charging pump status – less than two running (YES)</p> <p>RNO – Go to step 11</p>   |
|   |     |  |
| <b>AOP-016</b>  | RO  | Place running charging pump speed controller(s) in MAN AND adjust output to maximum  |
|   |     |  |
| <b>AOP-016</b>  | RO  | Check RCS level – lowering in an uncontrolled manner (YES)   |



|                    |            |   |   |         |         |      |    |    |    |
|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 33 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

|                |        |   |
|----------------|--------|---|
|                |        |   |
| <b>AOP-016</b> | RO     | Check any letdown – in service (YES)  |
|                |        |   |
| <b>AOP-016</b> | RO     | Verify all letdown flowpaths isolated as follows: <ul style="list-style-type: none"> <li>• LCV-460A&amp;B, LTDN line stop valves – closed</li> <li>• HIC-142, Purification flow controller – adjusted to 0%</li> <li>• HIC-137, Excess LTDN flow controller – adjusted to 0%</li> <li>• CVC-387, Excess LTDN stop - closed</li> </ul> |
|                |        |   |
| <b>AOP-016</b> | RO     | Check RCS level – lowering in an uncontrolled manner (YES)  |
|                |        |   |
| <b>AOP-016</b> | RO     | Check RCS pressure – greater than 1000 psig (YES)   |
|                |        |   |
| <b>AOP-016</b> | RO/CRS | Trip the reactor and go to EOP-E-0, Reactor Trip or Safety Injection  |
|                |        |   |

|                    |            |   |   |         |         |      |    |    |    |
|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 34 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

| EOP-E-0, Reactor Trip or Safety Injection |     |  |
|---|-----|--|
|   |     |  |
| <b>EOP-E-0</b>                            | RO  | <b>Immediate Action Steps</b><br>1. Check Reactor Trip: (YES) <ul style="list-style-type: none"> <li>Reactor trip and bypass breakers - OPEN</li> <li>Rod position indicators - AT ZERO</li> <li>Rod Bottom lights - ILLUMINATED</li> <li>Neutron flux - LOWERING</li> </ul> |
|   |     |  |
| <b>EOP-E-0</b>                            | BOP | <b>Immediate Action Steps</b><br>Check Turbine Trip: <ul style="list-style-type: none"> <li>a. Both turbine stop valves - Closed (YES)</li> <li>b. All MSR purge and shutoff valves – Closed (YES)</li> </ul>  |
|   |     |  |
| <b>EOP-E-0</b>                            | BOP | <b>Immediate Action Steps</b><br>Check Power to AC Emergency Busses: <ul style="list-style-type: none"> <li>a. E1 or E2 – At least one energized (YES)</li> <li>b. E1 and E2 – Both energized (YES)</li> </ul>   |
|   |     |  |

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|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 35 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <b>EOP-E-0</b>   | RO  | <b>Immediate Action Steps</b><br><br>Check SI Status:<br><br>a) Check if SI is actuated: <ul style="list-style-type: none"> <li>SI annunciators – ANY ILLUMINATED (YES)</li> <li>SI equipment – AUTO STARTED (YES)</li> </ul> b) Check BOTH trains of SI – ACTUATED <ul style="list-style-type: none"> <li>SI pumps – BOTH RUNNING (NO)</li> <li>RHR pumps – BOTH RUNNING (YES)</li> </ul> RNO: Manually actuate BOTH trains of SI by depressing BOTH SI pushbuttons (SI Pumps do not start – candidate may start pumps and open SI-870A & B once immediate actions have been verified) |
|  |     |   |
| <b>EOP-E-0</b>   | CRS | Verifies all immediate actions for EOP-E-0.   |
|  |     |   |
| <b>EXAMINER'S NOTE:</b> Crew may take early actions at this time to address items that did not function or operate as designed. <ul style="list-style-type: none"> <li>Manually start A and B SI Pumps</li> <li>Open SI-870 A and B</li> </ul> |     |   |
|  |     |   |
| <p style="text-align: center;"><u>NOTE</u></p> <p style="text-align: center;">FOLDOUT for EOP-E-0 is in effect</p>   |     |   |
|  |     |   |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 36 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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|--|-----|--|
| <b>Critical Task</b>   | CRS | <p>FOLDOUT for EOP-E-0 is in effect</p> <p><u>RCP Trip Criteria</u></p> <p>IF either condition listed below occurs, THEN trip all RCPs: (YES)</p> <ul style="list-style-type: none"> <li>Containment Isolation Phase B – ACTUATED (NO)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>BOTH of the following satisfied: <ul style="list-style-type: none"> <li>SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW (YES, "B" SI Pump is running)</li> </ul> </li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F] (NO)</li> </ul> |
|  |     |  |
| <b>CRITICAL TASK – STOP ALL RCPs within <u>6 minutes</u> of Reaching the RCP Trip Criteria of less than 50°F subcooling.</b> |     |  |
|  |     |  |
|  |     |  |
| <b>EOP-E-0</b>   | CRS | Perform Attachment 1, Auto Action Verification, While continuing with this procedure. (Should be assigned to BOP.) (Att. 1 steps are presented next followed by the remainder of EOP-E-0.)   |
|  |     |  |
| <p><b>Beginning of EOP-E-0 Attachment 1</b></p> <p>(Remainder of EOP-E-0 Follows this Section)</p>                           |     |  |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 37 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <u>CAUTION</u>  |     |   |
| If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment. |     |   |
| Att. 1<br><b>Critical Task</b>  | BOP | Check ECCS Pumps Running: <ul style="list-style-type: none"> <li>SI pumps - BOTH RUNNING (NO, Starts "A OR B" SI Pump)</li> <li>RHR pumps - BOTH RUNNING (YES)</li> </ul> |
|   |     |   |
| <b>CRITICAL TASK – START "A OR B" SI PUMP PRIOR TO ANNOUNCING COMPLETION OF EOP-E-0 ATTACHMENT 1</b>    |     |   |
|   |     |   |
| Att. 1<br><b>Critical Task</b>  | BOP | Check ECCS Valves - PROPER EMERGENCY ALIGNMENT (NO. open SI-870A OR B)  |
|   |     |   |
| Att. 1  | BOP | Check CCW Pumps - AT LEAST ONE RUNNING (YES)  |
|   |     |   |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 38 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| Att. 1<br><b>Critical Task</b>  | BOP | <p>Check Containment Isolation Phase A</p> <ul style="list-style-type: none"> <li>a. Phase A – Actuated (YES)</li> <li>b. Phase A valves – Closed (YES)</li> <li>c. Excess letdown – Isolated (NO) <ul style="list-style-type: none"> <li>• CVC-387 – Closed (NO)</li> <li>• HIC-137 – at 0% DEMAND (NO)</li> </ul> </li> <li>c. Manually close valve(s) as necessary</li> </ul> |
|   |     |  |
| <b>CRITICAL TASK – MANUALLY ISOLATE EXCESS LETDOWN PRIOR TO ANNOUNCING COMPLETION OF EOP-E-0 ATTACHMENT 1</b> |     |  |
|   |     |  |
| Att. 1  | BOP | <p>Check Feedwater Isolation:</p> <ul style="list-style-type: none"> <li>a) Main feed pumps – BOTH TRIPPED (YES)</li> <li>b) Main feedwater – ISOLATED <ul style="list-style-type: none"> <li>• FRVs – Closed (YES)</li> <li>• Feedwater reg bypass valves – Closed (YES)</li> <li>• Feedwater header section valves – Closed (YES)</li> </ul> </li> </ul>                       |
|   |     |  |
| Att. 1  | BOP | <p>Check if Main Steamlines Should Be Isolated:</p> <ul style="list-style-type: none"> <li>a) Main steamline isolation – REQUIRED (NO)</li> </ul> <p>Go to step 7</p>  |
|   |     |  |

|                    |            |   |   |         |         |      |    |    |    |
|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 39 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| Att. 1 | BOP | <p>Check Proper Service Water System Operation:</p> <ul style="list-style-type: none"> <li>a. SW pumps – All running (YES)</li> <li>b. SW booster pumps – Both running (YES)</li> <li>c. Both SW header low pressure alarms (APP-008-F7/F8) – Extinguished (NO)</li> <li>c. Perform the following: <ul style="list-style-type: none"> <li>1. RNO – Isolate SW to the Turbine Building: <ul style="list-style-type: none"> <li>○ Close V6-16C, SW turbine building isolation</li> <li>OR</li> <li>○ Close V6-16A and V6-16B, SW turbine building supply</li> </ul> </li> <li>2. WHEN this attachment is complete, THEN perform Supplement M, Component alignment for a loss of SW to the Turbine Building, as time permits.</li> </ul> </li> </ul> |
| Att. 1 | BOP | Check Both EDGs – Running (YES)   |
| Att. 1 | BOP | <p>Check ECCS Flow:</p> <ul style="list-style-type: none"> <li>a. RCS pressure – less than 1650 psig (NO)</li> <li>b. SI pumps- Flow Indicated (NO)</li> <li>c. RCS pressure – less than 275 psig. (NO)</li> <li>d. RHR – Flow Indicated (NO)</li> </ul>  |
| Att. 1 | BOP | Check CV Recirculation Fans – All Running (YES, all available)  |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 40 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| Att. 1 | BOP | Check IVSW - Actuated (YES) <ul style="list-style-type: none"> <li>PCV-1922A – Open (YES)</li> <li>PCV-1922B – Open (YES)</li> </ul>  |
|        |     |   |
| Att. 1 | BOP | Check CV ventilation isolation (YES) <ul style="list-style-type: none"> <li>a. CV ventilation isolation valves – CLOSED (YES)</li> </ul>  |
|        |     |   |
| Att. 1 | BOP | Check control room ventilation - aligned for pressurization mode (YES) <ul style="list-style-type: none"> <li>HVA-1A or HVA-1B – Running (YES)</li> <li>HVE-16 – Stopped (YES)</li> <li>HVE-19A or HVE-19B – Running (NO, starts HVE-19A or HVE-19B)</li> <li>Control Room HVAC outside air damper A or B – Open (YES)</li> <li>CR-D1A-SA – Closed (YES)</li> <li>CR-D1B-SB – Closed (YES)</li> </ul> |
|        |     |   |
| Att. 1 | BOP | Check DS Bus – Energized (YES)  |
|        |     |   |
| Att. 1 | BOP | Check Battery Chargers – Energized (YES)<br>APP-036-D1 – Extinguished (YES)<br>APP-036-D2 – Extinguished (YES)  |



|                    |            |   |   |         |         |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 41 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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|  |     |  |
| Att. 1   | BOP | Stop R-11/12 Sample Pump   |
|  |     |  |
| Att. 1   | BOP | Locally Reset and Load IACs as necessary (N/A)   |
|  |     |  |
| Att. 1   | BOP | Perform Crew Update to include the following: <ul style="list-style-type: none"> <li>• Attachment Completion</li> <li>• Manual Actions Taken (<b>Started "A and B" SI Pumps, opened SI-870A and B, closed HIC-137 and CVC-387</b>)</li> <li>• Failed Equipment status</li> <li>• SW status SW to Turbine Building isolated</li> <li>• Performing Supplement M</li> </ul> |
|  |     |  |
| End of EOP-E-0 Attachment 1  |     |  |
|  |     |  |
| <b>AOP-005 – Radiation Monitoring System (Concurrent AOP)</b><br><b>Attachment Number 12</b> |     |  |
|  |     |  |
| <b>AOP-005</b>   | BOP | Check R-11/R-12 Selector Switch – Selected to CV (YES)   |
|  |     |  |
| <b>AOP-005</b>   | BOP | Check RCS Temperature – Greater than 200°F (YES)   |
|  |     |  |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 42 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <b>AOP-005</b>  | BOP | Check Channel R-11/R-12 Low Flow Alarm – Illuminated (YES, pump off IAW Attachment 1 of EOP-E-0.)  |
|   |     |  |
| <b>AOP-005</b>  | BOP | Verify R-11/12 Vacuum Pump – stopped (YES)   |
|   |     |  |
| <b>AOP-005</b>  | BOP | Step 5: Check EOP Network Procedures – Implemented (YES)   |
|   |     |  |
| <b>AOP-005</b>  | BOP | Return to procedure and step in effect   |
|   |     |  |
| <b>End of AOP-005</b>   |     |  |
|   |     |  |
| <b>Supplement M, Component Alignment for Loss of SW to Turbine Building</b> |     |  |
|   |     |  |
|   | BOP | <p>Shutdown secondary as follows:</p> <ul style="list-style-type: none"> <li>a. Check S/Gs - ANY RUPTURED a. Go To Step 1.c</li> <li>c. Close all MSIVs AND MSIV Bypass Valves.</li> <li>d. Break vacuum to the Condenser as follows: <ul style="list-style-type: none"> <li>1) Depress AND hold the THINK Pushbutton.</li> <li>2) Open VACUUM BREAKER VALVES: <ul style="list-style-type: none"> <li><input type="checkbox"/> MS-70A</li> <li><input type="checkbox"/> MS-70B</li> </ul> </li> <li>3) WHEN the valves are open, THEN release the THINK pushbutton.</li> </ul> </li> </ul> |

|                    |            |   |   |         |         |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 43 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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|-------------------------|-----|--|
|                         |     | e. Verify the following equipment is stopped: <ul style="list-style-type: none"> <li><input type="checkbox"/> FW PUMP A</li> <li><input type="checkbox"/> FW PUMP B</li> <li><input type="checkbox"/> COND PUMP A</li> <li><input type="checkbox"/> COND PUMP B</li> <li><input type="checkbox"/> HEATER DRAIN PUMP A</li> <li><input type="checkbox"/> HEATER DRAIN PUMP B</li> <li><input type="checkbox"/> GOV FLUID PUMP A (Pull To Lock)</li> <li><input type="checkbox"/> GOV FLUID PUMP B (Pull To Lock)</li> <li><input type="checkbox"/> VACUUM PUMP A</li> <li><input type="checkbox"/> VACUUM PUMP B</li> </ul> |
|                         |     |  |
|                         | CRS | Return to procedure and step in effect   |
|                         |     |  |
| End Supplement M        |     |  |
|                         |     |  |
| Continuation of EOP-E-0 |     |  |
|                         |     |  |
| EOP-E-0                 | RO  | Check AFW Pumps – Running (MDAFW Pumps are running)<br>b. S/G levels – 2 less than 16 % (NO)   |
|                         |     |  |
| EOP-E-0                 | RO  | Check AFW Valves – Proper Emergency Alignment (YES) <ul style="list-style-type: none"> <li>• AFW header discharge valves – Full Open (YES)</li> <li>• AFW header section valves – Full Open (YES)</li> <li>• Steam driven AFW pump discharge valves – Full open if pump is running. (YES)</li> </ul>   |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 44 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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|   |    |  |
| EOP-E-0   | RO | <p>Check Total AFW Flow:</p> <ul style="list-style-type: none"> <li>Reset SI</li> <li>Control feed flow to maintain NON-faulted S/Gs narrow range level – Between 23% and 50%.</li> <li>Check total AFW flow- Greater than 300 gpm (YES)</li> </ul>  |
|   |    |  |
|   | RO | <p>Check CV Spray NOT Required:</p> <ol style="list-style-type: none"> <li>CV pressure – Has remained less than 10 psig. (YES)</li> <li>CV Spray – NOT actuated (YES)</li> </ol>   |
|   |    |  |
| EOP-E-0   | RO | <p>Check RCP Seal Cooling:</p> <ul style="list-style-type: none"> <li>CCW flow to RCP thermal barriers – Normal (YES) <ul style="list-style-type: none"> <li>APP-001-C1 / D1 – Extinguished (YES)</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Seal injection flow – Normal (YES) <ul style="list-style-type: none"> <li>Seal injection flow – Greater than 6 gpm per RCP</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Thermal barrier <math>\Delta</math>Ps – Greater than 5 inches water.</li> </ul> |
|   |    |  |
| <b>BOOTH OPERATOR: As requested, adjust CVC-297A,B,C as necessary to control RCP seal injection flow using the P&amp;ID function.</b> |    |  |
|   |    |  |

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|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 45 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <b>EOP-E-0</b> | RO | <p>Check RCS Temperature</p> <p>With NO RCPs running, RCS cold leg temperatures – Stable at or trending to 547°F (NO)</p> <p>RNO: IF temperature is less then 547°F AND lowering then perform the following: (YES)</p> <ul style="list-style-type: none"> <li>a. Stop dumping steam</li> <li>b. IF cooldown continues, THEN reduce total feed flow to minimum for decay heat removal: <ul style="list-style-type: none"> <li>○ Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% in at least one S/G.</li> </ul> </li> <li>c. IF cooldown continues, THEN close MSIVs and MSIV bypass valves. (MSIVs automatically closed due to Large Break LOCA)</li> </ul> |
|                |    |   |
| <b>EOP-E-0</b> | RO | <p>Check PZR PORVs and Spray Valves:</p> <ul style="list-style-type: none"> <li>a. PORVs – Closed (YES)</li> <li>b. Normal PZR spray valves – Closed (YES)</li> <li>c. Aux spray valve – Closed (YES)</li> </ul>  |
|                |    |   |

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|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 46 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <b>EOP-E-0</b> | RO  | <p>Check If RCPs should be stopped:</p> <ul style="list-style-type: none"> <li>a. RCPs – Any Running (YES)</li> <li>b. SI pumps – at least one running and capable of delivering flow (YES)</li> <li>c. RCS subcooling based on core exit TCs – less than 30°F (50°F) (NO)</li> </ul> <p>RNO: Go to Step 14</p> |
|                |     |   |
| <b>EOP-E-0</b> | BOP | <p>Step 14: Check if S/G Secondary Pressure Boundaries are Intact:</p> <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs <ul style="list-style-type: none"> <li>○ None lowering in an uncontrolled manner (YES)</li> <li>○ None Completely depressurized (YES)</li> </ul> </li> </ul>       |
|                |     |   |
| <b>EOP-E-0</b> | BOP | <p>Check if S/G Tubes are Intact:</p> <ul style="list-style-type: none"> <li>• Secondary radiation monitors – Have Remained Normal (YES)</li> <li>• R-15</li> <li>• R-19s</li> <li>• R-31s</li> <li>• S/G levels – None Rising in an Uncontrolled Manner. (YES)</li> </ul>                                      |
|                |     |   |

|                    |            |   |   |         |         |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 47 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| EOP-E-0  | RO  | <p>Check if RCS is Intact: (NO)</p> <ul style="list-style-type: none"> <li>• CV radiation – Normal (NO) <ul style="list-style-type: none"> <li>○ R-2</li> <li>○ R-32A/B</li> </ul> </li> <li>• CV pressure – Normal (NO)</li> <li>• CV sump level – Normal (NO)</li> </ul> <p>RNO: Reset SPDS and initiate monitoring of CSFSTs. Go to EOP-E-1, Loss of Reactor or Secondary Coolant, Step 1.</p>  |
|  |     |  |
| Beginning of EOP-E-1, Loss of Reactor or Secondary Coolant |     |  |
|  |     |  |
| EOP-E-1  | CRS | <p style="text-align: center;">NOTE</p> <p>FOLDOUT for EOP-E-1 is in effect. (This foldout criteria will apply later in the scenario)</p> <p><b><u>EOP-E-3 TRANSITION CRITERIA</u></b></p> <p><u>IF</u> any S/G level rises in an uncontrolled manner <u>OR</u> has abnormal radiation, <u>THEN</u> perform the following:</p> <p>a. Manually start SI and RHR pumps as necessary.</p> <p>b. Reset SPDS and Go To EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.</p> |
|  |     |  |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 48 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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|---|-----|---|
| <b>EOP-E-1</b>  | RO  | <p>Check If RCPs should be stopped:</p> <ul style="list-style-type: none"> <li>a. RCPs – Any Running (YES)</li> <li>b. SI pumps – at least one running and capable of delivering flow (YES)</li> <li>c. RCS subcooling based on core exit TCs – less than 30°F (50°F) (NO)</li> </ul> <p>Go to step 2</p> |
|   |     |   |
| <b>EOP-E-1</b>  | BOP | <p>Check if S/G Secondary Pressure Boundaries are Intact:</p> <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs <ul style="list-style-type: none"> <li>○ None lowering in an uncontrolled manner (YES)</li> <li>○ None Completely depressurized (YES)</li> </ul> </li> </ul>          |
|   |     |   |
| <b>EOP-E-1</b>  | BOP | <p><b>Continuous Action Step</b></p> <p>Check Intact S/G Levels:</p> <ul style="list-style-type: none"> <li>a. Narrow range levels – Greater than 23% (YES)</li> <li>b. Control feed flow to maintain narrow range levels – between 23% AND 50%</li> </ul>  |
|   |     |   |
| <p><u><b>CAUTION</b></u></p> <p>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.</p> |     |   |
|   |     |   |
| <b>EOP-E-1</b>  | RO  | Reset SI  |



|                    |            |   |   |         |         |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 49 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <b>EOP-E-1</b> | RO  | Reset Containment Isolation Phase A   |
|                |     |   |
| <b>EOP-E-1</b> | BOP | Check Secondary Radiation: <ul style="list-style-type: none"> <li>a. Secondary radiation monitors – Have remained normal (YES)               <ul style="list-style-type: none"> <li>o R-15, R-19s, R-31s</li> </ul> </li> <li>b. Perform the following:               <ul style="list-style-type: none"> <li>1) Request periodic activity samples of all S/Gs</li> <li>2) Secondary sample results – Normal (When results available)</li> </ul> </li> </ul> |
|                |     |   |
| <b>EOP-E-1</b> | RO  | Check PZR PORVs and Block Valves: <ul style="list-style-type: none"> <li>a. Power to block valves – Available (YES)</li> <li>b. PORVs – Closed (YES)</li> <li>c. Block valves – At least one open. (YES)</li> </ul>   |
|                |     |   |
| <b>EOP-E-1</b> | RO  | Establish Instrument Air to CV: <ul style="list-style-type: none"> <li>a. Check APP-002-F7 – Extinguished (YES)</li> <li>b. Reset IA PCV-1716</li> <li>c. Check IA PCV-1716 – OPEN (YES)</li> </ul>   |
|                |     |   |
| <b>EOP-E-1</b> | RO  | Check Power Supply to Charging Pumps – Offsite power available (YES)  |

|                    |            |   |   |         |         |      |    |    |    |
|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 50 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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|---|----|--|
|   |    |  |
| EOP-E-1   | RO | <p>Check if Charging Flow has been established:</p> <ul style="list-style-type: none"> <li>a. Charging pumps – At least one running. (YES)</li> <li>b. Establish desired charging flow: <ul style="list-style-type: none"> <li>○ Start additional pump(s) as necessary</li> <li>○ Adjust charging pump speed controllers as necessary to establish desired charging flow.</li> <li>○ Adjust HIC-121 as necessary to establish desired charging flow: <ul style="list-style-type: none"> <li>○ Maintain seal injection flow – Between 6 gpm and 20 gpm per RCP unless seal injection isolated.</li> </ul> </li> </ul> </li> </ul> |
|   |    |  |
| <b>BOOTH OPERATOR: If the crew starts additional charging pumps then insert event 7 for 'C' S/G rupture</b> |    |  |
|   |    |  |

|                    |            |   |   |         |         |      |    |    |    |
|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 51 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

|                |    |  |
|----------------|----|--|
| <b>EOP-E-1</b> | RO | <p>Check if SI flow should be terminated:</p> <ul style="list-style-type: none"> <li>a. RCS subcooling base on core exit TCs – Greater than 35°F (YES)</li> <li>b. Secondary heat sink: <ul style="list-style-type: none"> <li>• Total feed flow to intact S/G(s) – greater than 300</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>• Narrow range level in at least one intact S/G greater than 8%</li> </ul> </li> <li>c. RCS pressure: <ul style="list-style-type: none"> <li>• Pressure – greater than 1650 psig (NO)</li> <li>• Pressure – stable or rising (NO)</li> </ul> </li> </ul> <p>Go to step 12</p> |
|                |    |  |
| <b>EOP-E-1</b> | RO | <p><b>Continuous Action Step</b></p> <p>Step 12: Check if Containment Spray should be stopped:</p> <ul style="list-style-type: none"> <li>a. Spray pump – Any running (NO)</li> </ul> <p>RNO – Observe caution prior to step 13 and go to step 13</p>  |
|                |    |  |

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|--------------------|------------|---|---|---------|---------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 52 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

**CAUTION**

If RCS pressure lowers in an uncontrolled manner to less than 275 psig [350 psig], the RHR pumps must be manually restarted to supply water to the RCS.

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|  |    |  |
| <b>EOP-E-1</b>   | RO | <p><b>Continuous Action Step</b></p> <p>Step 13: Check if RHR Pumps Should be Stopped:</p> <p>a. Check RCS pressure:</p> <ul style="list-style-type: none"> <li>○ Pressure – Greater than 275 psig (YES)</li> <li>○ Pressure – stable or rising (NO)</li> </ul> <p>Go to step 14</p> |
|  |    |  |
|  | RO | <p>Check RCS And S/G Pressure:</p> <ul style="list-style-type: none"> <li>• Check pressure in all S/Gs - STABLE OR RISING (YES)</li> <li>• Check RCS pressure - STABLE OR LOWERING (YES)</li> </ul>  |
|  |    |  |
| <p><b>EXAMINERS NOTE: The crew may transition to EOP-E-3. This will be based on the crews progression through the procedure. If they remain in EOP-E-1 they will transition to EPP-8 which will then transition them to EOP-E-3.</b></p> |    |  |
|  |    |  |
| <b>EOP-E-1 Continued</b>   |    |  |
|  |    |  |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 1 | Event # | 6, 8, 9 | Page | 53 | of | 64 |
| Event Description: |            | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |   |         |         |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |         |      |    |    |    |

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| <b>EOP-E-1</b> | BOP | <p>Step 15: Check if Diesel Generators should be Stopped:</p> <ul style="list-style-type: none"> <li>a. AC emergency busses – Energized by Offsite Power (YES) <ul style="list-style-type: none"> <li>○ E-1</li> <li>○ E-2</li> </ul> </li> <li>b. EDG starting air annunciators – Extinguished (YES) <ul style="list-style-type: none"> <li>○ APP-010-B2 / B3</li> </ul> </li> <li>c. Stop unloaded EDGs</li> </ul>                |
|                |     |   |
| <b>EOP-E-1</b> | RO  | <p>Initiate Evaluation of Plant Status:</p> <ul style="list-style-type: none"> <li>a. Check Cold leg recirculation capability: <ul style="list-style-type: none"> <li>• Train A and Train B (Recirc capability available)</li> </ul> </li> </ul>  |
|                |     |   |
| <b>EOP-E-1</b> | BOP | <ul style="list-style-type: none"> <li>• Check Auxiliary building radiation – NORMAL (YES)</li> <li>• Contact Chemistry to obtain samples</li> <li>• Consult Plant Operations Staff for assessing additional sampling requirements for fuel damage as necessary</li> <li>• Evaluate plant equipment to support long term recovery as necessary</li> <li>• Start/align plant equipment to assist in recovery as necessary</li> </ul> |
|                |     |   |

|                    |                   |   |          |         |                |      |           |    |           |
|--------------------|-------------------|---|----------|---------|----------------|------|-----------|----|-----------|
| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #  | <u>1</u> | Event # | <u>6, 8, 9</u> | Page | <u>54</u> | of | <u>64</u> |
| Event Description: |                   | Control Bank 'B' Rod K2 Ejected, On the SI A&C SI Pumps Fail to Auto Start and SI-870 A&B Fail to Auto Open |          |         |                |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior   |          |         |                |      |           |    |           |

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|----------------|----|--|
| <b>EOP-E-1</b> | RO | Check If RCS Cooldown And Depressurization Is Required:<br><br>RCS pressure – greater than 275 psig (YES)<br><br>Reset SPDS and go to EPP-8, Post LOCA Cooldown and Depressurization, step 1 |
|----------------|----|--|

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|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 7 | Page | 55 | of | 64 |
| Event Description: |            | 'C' S/G Rupture                 |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |      |  |
|--|------|--|
|  |      |  |
| <b>BOOTH OPERATOR: Insert event 7 for 'C' S/G rupture if not done previously</b> |      |  |
|  |      |  |
| <b>Beginning of EPP-8, Post LOCA Cooldown and Depressurization</b>               |      |  |
|  |      |  |
| <b>EPP-8</b>   | CREW | <p>Open Foldout B</p> <p>EOP-E-3 TRANSITION CRITERIA</p> <p>IF EITHER condition below occurs, THEN Go To EOP-E-3, Steam Generator Tube Rupture, Step 1:</p> <ul style="list-style-type: none"> <li>Any S/G level rises in an uncontrolled manner. (YES)</li> <li>Any S/G has abnormal radiation levels.</li> </ul>                         |
|  |      |  |
| <b>Beginning of EOP-E-3, Steam Generator Tube Rupture</b>                        |      |  |
|  |      |  |
| <b>EOP-E-3</b>   | CRS  | <p style="text-align: center;"><u>NOTE</u></p> <ul style="list-style-type: none"> <li>FOLDOUT for EOP-E-3 is in effect.</li> <li>Chemistry should be available for sampling during this procedure.</li> <li>Step 1 RCP trip criteria applies until an operator controlled RCS cooldown is initiated.</li> </ul>                            |
|  |      |  |
| <b>EOP-E-3</b>   | RO   | <p><b>CONTINUOUS ACTION STEP</b></p> <p>Check If RCPs Should Be Stopped:</p> <ol style="list-style-type: none"> <li>RCPs - ANY RUNNING (YES)</li> <li>SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW (YES)</li> <li>RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F] (NO)</li> </ol> <p>RNO: Go to Step 2</p> |

|                                    |            |                                 |   |         |   |      |    |    |    |
|------------------------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:                       | ILC-14 NRC | Scenario #                      | 1 | Event # | 7 | Page | 56 | of | 64 |
| Event Description: 'C' S/G Rupture |            |                                 |   |         |   |      |    |    |    |
| Time                               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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|----------------|-----|---|
|                |     |   |
| <b>EOP-E-3</b> | BOP | Identify Ruptured S/G(s): ("B" S/G is ruptured) <ul style="list-style-type: none"> <li>• Unexpected rise in any S/G narrow range level (YES)<br/><u>OR</u></li> <li>• High radiation from any SG steamline (R-31s)<br/><u>OR</u></li> <li>• High radiation from any SG blowdown line (R-19s)<br/><u>OR</u></li> <li>• High radiation from any S/G sample:               <ul style="list-style-type: none"> <li>○ Contact Chemistry to sample all S/Gs for activity as necessary</li> </ul> </li> </ul>  |
|                |     |   |
| <b>EOP-E-3</b> | CRS | <u>CAUTION</u> <ul style="list-style-type: none"> <li>• If the steam driven AFW pump is the only available source of feed flow, steam supply to the steam driven AFW pump should be maintained from at least one S/G.</li> <li>• At least one S/G must be maintained available for RCS cooldown.</li> </ul>   |
|                |     |   |
| <b>EOP-E-3</b> | BOP | Isolate Flow From Ruptured S/G(s): <ol style="list-style-type: none"> <li>Adjust ruptured S/G(s) steam line PORV controller setpoint to 1060 psig</li> <li>Check ruptured S/G steam line PORV – (RV1-2) CLOSED (YES)</li> <li>Close steam driven AFW pump steam shutoff valve for ruptured S/G: (V1-8C)</li> <li>Locally close the following valve for ruptured S/G(s) while continuing with this procedure:               <ul style="list-style-type: none"> <li>• MS-38, SG "C" BYPASS DRN &amp; WARM-UP LINE TO AFW PUMP (pipe jungle above/right of V1-8C)</li> </ul> </li> <li>Check S/G blow down and blow down sample valves from ruptured S/G(s) – Closed               <ul style="list-style-type: none"> <li>• SG2 Blowdown</li> <li>• FCV-1932 A &amp; B</li> <li>• FCV-1935 A &amp; B SHUT</li> </ul> </li> <li>Check MSIV above and below seat drain valves for ruptured S/G – CLOSED (YES)</li> <li>Close ruptured S/G MSIV and MSIV bypass valve – V1-3C and MS-353C.</li> </ol> |



|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
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| Event Description: |            | 'C' S/G Rupture                 |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |     |   |
|--|-----|---|
|  |     |   |
| <b>BOOTH OPERATOR: When requested, wait 3 minutes and then close MS-38 IAW SCN file.</b>   |     |   |
|  |     |   |
| <b>EOP-E-3</b>   | CRS | <p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> <li>If any ruptured S/G is faulted, feed flow to that S/G should remain isolated during subsequent recovery actions unless needed for RCS cooldown.</li> <li>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.</li> </ul>  |
|  |     |   |
| <b>EOP-E-3</b>   | BOP | <p><b>Continuous Action Step</b><br/>Check Ruptured S/G Level:</p> <ol style="list-style-type: none"> <li>Narrow range level – Greater than 8%. (YES)</li> <li>Reset SI</li> <li>Stop feed flow to ruptured S/G: <ul style="list-style-type: none"> <li>Close steam driven AFW pump discharge valve: V2-14C</li> <li>Close AFW header discharge valve: V2-16C</li> </ul> </li> <li>Perform Att. 4, Deenergizing AFW Valves For Ruptured S/Gs</li> </ol> |
|  |     |   |
| <b>BOOTH OPERATOR: When requested, wait 3 minutes and then open the breakers for AFW valves as specified in Att. 4 IAW the SCN file.</b> |     |   |
|  |     |   |
| <b>CRITICAL TASK – ISOLATE S/G “C” PRIOR TO S/G OVERFILL</b>   |     |   |
|  |     |   |
| <b>EOP-E-3</b>   | CRS | <p style="text-align: center;"><u>CAUTION</u></p> <p>Major steam flow paths from the ruptured S/G(s) should be isolated before initiating RCS cooldown. This includes MSIVs and MSIV bypass valves, steam line PORV, and AFW pump steam shutoff valve.</p>  |
|  |     |   |
| <b>EOP-E-3</b>   | BOP | Check Ruptured S/G Pressure – Greater than 500 psig. (YES)  |
|  |     |   |

|                                    |            |                                 |   |         |   |      |    |    |    |
|------------------------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:                       | ILC-14 NRC | Scenario #                      | 1 | Event # | 7 | Page | 58 | of | 64 |
| Event Description: 'C' S/G Rupture |            |                                 |   |         |   |      |    |    |    |
| Time                               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |   |                                     |
|----------------|-----|---|-------------------------------------|
| <b>EOP-E-3</b> | CRS | <b>CAUTION</b><br>IF RCPs are not running, the following steps may cause a false CSF-4, Integrity Status Tree, indication for the ruptured loop. Disregard the ruptured loop T-cold indication until after performing Step 28.              |                                     |
|                |     |   |                                     |
| <b>EOP-E-3</b> | CRS | <b>NOTE</b><br>Main steamline isolation may occur if the high steam flow setpoint is exceeded. The cooldown should be continued using the steam line PORV(s) if MSIV closure occurs.  |                                     |
|                |     |   |                                     |
| <b>EOP-E-3</b> | BOP | Initiate RCS Cooldown:  |                                     |
|                |     | a. Determine required core exit temperature:  |                                     |
|                |     | Ruptured SG Pressure (PSIG)   | Required Core Exit Temperature (°F) |
|                |     | 1150 and above  | 508 [488]                           |
|                |     | 1100 to 1149  | 503 [483]                           |
|                |     | 1050 to 1099  | 497 [477]                           |
|                |     | 1000 to 1049  | 491 [471]                           |
|                |     | 950 to 999  | 485 [465]                           |
|                |     | 900 to 949  | 478 [458]                           |
|                |     | 850 to 899  | 472 [452]                           |
|                |     | 800 to 849  | 465 [445]                           |
|                |     | 750 to 799  | 458 [438]                           |
|                |     | 700 to 749  | 450 [430]                           |
|                |     | 650 to 699  | 442 [422]                           |
|                |     | 600 to 649  | 433 [413]                           |
|                |     | 550 to 599  | 424 [404]                           |
|                |     | 500 to 549  | 415 [395]                           |
|                |     | b. Dump steam to condenser from intact S/G(s) at maximum rate:<br>maximum rate from intact<br>1) Check condenser - AVAILABLE FROM INTACT S/G(s)<br>(NO)<br>RNO: Manually dump steam at maximum rate from intact S/G using steam line PORVs. |                                     |
|                |     | c. Core exit TCs – Less Than Required Temperature   |                                     |
|                |     | d. Stop RCS cooldown  |                                     |
|                |     | e. Maintain core exit TCs – LESS THAN REQUIRED TEMPERATURE  |                                     |
|                |     |   |                                     |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 7 | Page | 59 | of | 64 |
| Event Description: |            | 'C' S/G Rupture                 |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

**BOOTH OPERATOR: When cooldown has commenced modify the SBLOCA to 800 gpm.**

|                |     |   |
|----------------|-----|---|
|                |     |   |
| <b>EOP-E-3</b> | BOP | <b>Continuous Action Step</b><br>Check Intact S/G Levels <ol style="list-style-type: none"> <li>Narrow range levels – Greater than 8% (YES)</li> <li>Control feed flow to maintain narrow range levels – BETWEEN 21% and 50%.</li> </ol>  |
|                |     |   |
|                | CRS | <u><b>CAUTION</b></u><br>If any PZR PORV opens because of high PZR pressure, Step 8.b should be repeated after pressure lowers to less than 2335 psig.  |
|                |     |   |
| <b>EOP-E-3</b> | RO  | <b>Continuous Action Step</b><br>Check PZR PORVs And Block Valves: <ol style="list-style-type: none"> <li>Power to block valves – AVAILABLE (YES)</li> <li>PORVs – CLOSED (YES)</li> <li>Block valves – AT LEAST ON OPEN (YES)</li> </ol> |
|                |     |   |
| <b>EOP-E-3</b> | CRS | <u><b>CAUTION</b></u><br>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.  |
|                |     |   |
| <b>EOP-E-3</b> | RO  | Reset SI  |
|                |     |   |
| <b>EOP-E-3</b> | RO  | Reset Containment Isolation Phase A   |
|                |     |   |
| <b>EOP-E-3</b> | RO  | Establish Instrument Air To CV: <ol style="list-style-type: none"> <li>Check APP-002-F7 – EXTINGUISHED (YES)</li> <li>Reset IA PCV-1716, instrument air isolation to CV</li> <li>Check IA PCV-1716 – OPEN (YES)</li> </ol>                |

|                                    |            |                                 |   |         |   |      |    |    |    |
|------------------------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:                       | ILC-14 NRC | Scenario #                      | 1 | Event # | 7 | Page | 60 | of | 64 |
| Event Description: 'C' S/G Rupture |            |                                 |   |         |   |      |    |    |    |
| Time                               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |        |  |
|----------------|--------|--|
|                |        |  |
| <b>EOP-E-3</b> | CRS    | <p style="text-align: center;"><u>CAUTION</u></p> <p>If RCS pressure lowers in an uncontrolled manner to less than 275 psig [350 psig], the RHR pumps must be manually restarted to supply water to the RCS.</p>   |
|                |        |  |
| <b>EOP-E-3</b> | RO     | <p>Check If RHR Pumps Should Be Stopped:</p> <p>a. RCS pressure - GREATER THAN 275 PSIG [350 PSIG] (YES)</p> <p>b. Stop RHR pumps</p> <p>c. Monitor RCS pressure</p>   |
|                |        |  |
| <b>EOP-E-3</b> | RO     | <p>Establish Charging Flow:</p> <p>a. Charging pumps- AT LEAST ONE RUNNING (YES)</p> <p>b. Align charging pump suction to RWST</p> <p style="padding-left: 40px;">1) Open LCV-115B</p> <p style="padding-left: 40px;">2) Close LCV-115C</p> <p style="padding-left: 40px;">3) Place RCS makeup system switch to STOP</p> <p>c. Establish charging flow:</p> <ul style="list-style-type: none"> <li>• Start charging pump(s) as necessary to establish at least one running</li> <li>• Adjust charging pump speed controllers as necessary to establish maximum charging flow for running pump(s)</li> <li>• Adjust HIC-121, charging flow control valve, as necessary to establish desired charging flow: <ul style="list-style-type: none"> <li>○ Maintain seal injection flow - BETWEEN 6 GPM AND 20 GPM PER RCP UNLESS SEAL INJECTION ISOLATED</li> </ul> </li> </ul> |
|                |        |  |
| <b>EOP-E-3</b> | RO/BOP | <p>Check If RCS Cooldown Should Be Stopped:</p> <p>a. Check core exit TCs - LESS THAN REQUIRED TEMPERATURE FROM STEP 6 (YES)</p> <p>b. Stop RCS cooldown</p> <p>c. Maintain core exit TCs – LESS THAN REQUIRED TEMPERATURE</p>   |
|                |        |  |

|   |          |  |
|---|----------|--|
| Op Test No.: <u>ILC-14 NRC</u> Scenario # <u>1</u> Event # <u>7</u> Page <u>61</u> of <u>64</u> |          |  |
| Event Description: 'C' S/G Rupture  |          |  |
| Time  | Position | Applicant's Actions or Behavior  |
| <b>EOP-E-3</b>  | BOP      | Check Ruptured S/G Pressure – Stable or Rising (NO, depending on scenario timeline.)<br>(If answered NO) RNO: IF pressure continues to lower to within 250 psi above the pressure of the intact S/G(s) used for cooldown, THEN reset SPDS and Go To EPP-17, SGTR WITH LOSS OF REACTOR COOLANT:<br>SUBCOOLED RECOVERY, Step 1   |
| <b>EOP-E-3</b>  | RO       | Check RCS Subcooling Based on Core Exit TCs – Greater than 55°F (YES) (This may be less than 55°F at this time. It will depend on scenario timeline)<br>If less than 55°F Reset SPDS and go to EPP-17, SGTR WITH LOSS OF REACTOR COOLANT:<br>SUBCOOLED RECOVERY, Step 1  |
| <b>EOP-E-3</b>  | RO       | Depressurize RCS to Minimize Break Flow and Refill the PZR:<br>a. Normal PZR spray – AVAILABLE (YES)<br>b. Spray PZR with maximum available spray until any of the following conditions are satisfied:<br>• Both of the following:<br>1) RCS pressure – LESS THAN RUPTURED S/G PRESSURE<br>2) PZR level – GREATER THAN 14%<br><u>OR</u><br>• PZR level – GREATER THAN 73%<br><u>OR</u><br>• RCS subcooling based on core exit TCs – LESS THAN 35°F<br>c. Close spray valves when any condition above is satisfied<br>d. Observe CAUTION prior to Step 20 and Go to Step 20 |
| <b>EOP-E-3</b>  | CRS      | <u>CAUTION</u><br>SI must be terminated when termination criteria are satisfied to prevent overfilling the ruptured S/G(s).  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 7 | Page | 62 | of | 64 |
| Event Description: |            | 'C' S/G Rupture                 |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

  

|  |     |  |
|--|-----|--|
| <b>EOP-E-3</b>   | RO  | <p>Check if SI Flow Should be Terminated:</p> <ul style="list-style-type: none"> <li>a. RCS subcooling based on core exit TCs – GREATER THAN 35°F (YES)</li> <li>b. Secondary heat sink:               <ul style="list-style-type: none"> <li>• Total feed flow to S/Gs – AT LEAST 300 GPM AVAILABLE (YES)</li> <li style="text-align: center;"><u>OR</u></li> <li>• Narrow range level in at least one intact S/G – GREATER THAN 8% (YES)</li> </ul> </li> <li>c. RCS pressure – STABLE OR RISING (YES) (This may not be stable or rising at this time. It will depend on scenario timeline) If not then Reset SPDS and go to EPP-17, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY, Step 1</li> <li>d. PZR level – GREATER THAN 14% (YES)</li> </ul> |
|  |     |  |
| <b>EOP-E-3</b>   | RO  | Stop Both SI Pumps   |
|  |     |  |
| <b>EOP-E-3 Foldout</b><br><br><b>SI REINITIATION CRITERIA</b><br>IF either condition listed below occurs, THEN manually start SI and RHR pumps as necessary to restore RCS subcooling and PZR level:   |     |  |
| <input type="checkbox"/> RCS subcooling based on core exit TCs - LESS THAN 35°F [55°F]<br><div style="text-align: center;">OR</div> <input type="checkbox"/> PZR level - CANNOT BE MAINTAINED GREATER THAN 14% [37%] IF SI reinitiation occurs after SI termination at Step 21, THEN reset SPDS and Go To EPP-17, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY, Step 1. (Unable to maintain greater than 14% PZR level) |     |  |
|  |     |  |
|  | CRS | Reset SPDS and go to EPP-17, , SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY   |
|  |     |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 1 | Event # | 7 | Page | 63 | of | 64 |
| Event Description: |            | 'C' S/G Rupture                 |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

**The Lead Examiner may terminate the scenario any time after entry into EPP-17**

## **ILC-14 NRC SCENARIO 1 TURNOVER SHEET**

### **1. INITIAL CONDITIONS**

- a) Time in Core Life: BOL
- b) Reactor Power: 0% Mode 2
- c) Turbine Load: 0 MWe
- d) Boron Concentration: 1564 ppm
- e) Rod Height: 225 SDB 'B'
- f) RCS Pressure: 2235 psig
- g) PZR Level: 22.8 %
- h) Xenon: Equilibrium

### **2. TECHNICAL SPECIFICATION LCO ACTIONS STATEMENTS IN EFFECT**

| <u>T.S. #</u> | <u>Description</u> |
|---------------|--------------------|
|---------------|--------------------|

### **3. CLEARANCES IN EFFECT**

- a) None

### **4. CAUTION CAPS IN EFFECT**

- a) None

### **5. PROTECTED EQUIPMENT**

- a) None

### **6. DEGRADED EQUIPMENT**

- a) None

### **7. SWITCHYARD ACCESS**

- a) Unrestricted

### **8. PLANNED EVOLUTIONS**

- a) Continue Reactor Startup IAW GP-003

### **9. TURNOVER INFORMATION**

- a) High heat load has resulted in all planned maintenance being deferred to a later date.
- b) SGBD is split between the Flashtank and Condenser

### **10. REACTIVITY INFORMATION**

- a) Review the OST-947 BOL charts for BA and PW additions

### **11. RISK**

- a) GREEN



| Facility:  | HB ROBINSON  |                          | Scenario No.:  | 2           | Op Test No.: | <b>ILC-14</b> |
|--|--|--------------------------|--|-------------|--------------|---------------|
| Examiners:   | _____  |                          | Operators:   | CRS - _____ |              |               |
|  | _____  |                          |  | RO - _____  |              |               |
|  | _____  |                          |  | BOP - _____ |              |               |
| Initial Conditions:  | <ul style="list-style-type: none"> <li>75% RTP EOL, 17000 MWD/MTU, 124 ppm Boron</li> <li>SWBP "A" OOS for a seal replacement</li> </ul>                           |                          |  |             |              |               |
| Turnover:  | <ul style="list-style-type: none"> <li>Reduce power to 65% to support valve testing</li> </ul>   |                          |  |             |              |               |
| Critical Task:   | <ul style="list-style-type: none"> <li>Isolate S/G 'B' IAW EOP-E-2</li> <li>Start Service Water Pump "C" <b>OR</b> "D"</li> <li>Start CV Spray Pump "B"</li> </ul> |                          |  |             |              |               |
| Event No.  | Malf. No.  | Event Type*              | Event Description  |             |              |               |
| 1  |  | (R) RO, CRS<br>(N) BOP   | Reduce turbine load IAW OP-105 to 65%  |             |              |               |
| 2  |  | (I) RO, CRS<br>(TS) CRS  | IRPI failure   |             |              |               |
| 3  |  | (I) BOP, CRS<br>(TS) CRS | Feedwater Flow Transmitter FT-477 will fail high   |             |              |               |
| 4  |  | (I) RO, CRS              | PZR Pressure Transmitter PT-445 fails low  |             |              |               |
| 5  |  | (TS) CRS                 | A oil leak on EDG "A" will render the EDG inoperable   |             |              |               |
| 6  |  | (C) BOP, CRS             | Feedwater Regulating Valve FCV-478 fails open causing the reactor to be tripped  |             |              |               |
| 7  |  | (M) ALL                  | A fault inside Containment on S/G "B" will occur during the reactor trip   |             |              |               |
| 8  |  | (M) ALL                  | A loss of the SUT after the trip   |             |              |               |
| 9  |  | BOP                      | EDG "A" trips due to a lack of oil from its leak   |             |              |               |
| 10   |  | BOP                      | Service Water Pumps "C" and "D" fail to start on the SI Sequencer(CT to start Pump "C" OR "D" since only EDG "B" is available) |             |              |               |
| 11   |  | RO                       | CV Spray pump "B" does not automatically start   |             |              |               |
| 12   |  |                          |  |             |              |               |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor |  |                          |  |             |              |               |

**ILC-14 NRC SCENARIO 2 SUMMARY DESCRIPTION**

The crew will assume the watch with the plant at 75% steady state power. Operations Management has directed the plant power be reduced to 65% power to support valve testing.

The crew will reduce reactor power and turbine load IAW OP-105 to 65% to support valve testing.

On cue from the Chief Examiner, Control Bank 'C' Rod D6 will experience and IRPI failure. The crew will enter AOP-001 and diagnose this as an IRPI due to no prompt drop. Rod D6 is in close proximity to NI-44 and no effects of a dropped rod are seen. The crew will transition to Section 'D'. The CRS will need to apply ITS 3.1.7, Rod Position Indication. Once the Chief Examiner is satisfied, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, Feedwater flow channel FT-477 fails High, affecting the automatic operation of Feedwater Regulating Valve FCV-478 for S/G "A". The operator will have to take manual control of the FRV and restore the S/G to program level. The crew will perform the immediate actions for FT-477 failure IAW AOP-025, RTGB Instrument Failure, Section E. The crew will perform the necessary transfer to the controlling channel and restore the FRV to automatic operation. The failed feedwater flow transmitter will be removed from service IAW OWP-026, FWF-2. The CRS will review ITS Table 3.3.1-1 Item 14 and determine it does not apply. Once the FRV returned to automatic and the Chief Examiner is satisfied, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, PZR Pressure Transmitter PT-445 will fail Low, causing APP-003-D8 to alarm. Immediate actions of AOP-025, RTGB Instrument Failure, Section C will be performed by the crew. The CRS will verify that there are no applicable Tech Specs, PCV-456 is still operable because it can be manually opened and closed. Once the Chief Examiner is satisfied, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, The Inside Auxiliary Operator(IAO) will report a large oil leak on EDG "A". This will render the EDG inoperable and will cause it to trip later in the scenario. The CRS will also declare entry into ITS LCO 3.8.1, Condition B, which requires the following: (1) Perform SR 3.8.1.1 for offsite circuit within 1 hour and once per 12 hours thereafter (OP-604, Section 8.4.9, Emergency Diesel Generator Inoperability), (2) Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable within 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s), (3) Determine Operable DG is not inoperable due to common cause failure within 24 hours and perform SR 3.8.1.2 for Operable DG within 96 hours and, (4) restore DG to Operable status within 7 days OR be in Mode 3 in 6 hours and Mode 5 in 36 hours. Once the Chief Examiner is satisfied with the stability of the plant and ITS compliance he may cue the next event

On cue from the Chief Examiner, Feedwater Regulating Valve FCV-478 fails Open, this will lead to a reactor trip. The BOP will take manual control of FCV-478 to control S/G "A" water level, however, it will not work which will lead to the reactor being manually tripped. Upon the reactor trip, S/G "B" will become faulted in containment and the SUT will be lost.

Because of the Faulted S/G, a Safety Injection(SI) must be initiated. During the SI sequence, Service Water Pumps "C" and "D" will not start. The starting of these pumps is a Critical Task

because only EDG "B" will be running. EDG "A" will have tripped due to the oil leak from before. The crew will enter into EOP-E-0.

The Faulted S/G will cause CV pressure to rise above 10 psig which will cause an automatic CV Spray signal if the crew does not initiate one manually. Upon this CV Spray signal, CV Spray Pump "A" will not start. Critical Task to start 'A' CV Spray pump to avoid a potential loss of containment fission product barrier.

The crew will transition from EOP-E-0 to EOP-E-2 for a faulted S/G. S/G 'B' will be isolated and the crew will secure SI IAW EOP-E-2 or they may transition to EOP-E-1 before meeting SI termination criteria. EOP-E-1 will send the crew to EPP-7, SI Termination.

The chief examiner may terminate the scenario any time after SI is terminated.

| Sat /<br>Unsat | Critical Task  | Critical Task Criteria  |
|----------------|--|---|
|                | Start either 'C' or 'D' SW pump to provide cooling to 'B' EDG. | Start either 'C' OR 'D' SW Pump prior to announcing completion of EOP-E-0 Attachment 1.                                       |
|                | Manually start a CV Spray Pump                                 | Manually start a CV Spray Pump IAW EOP-E-0, prior to leaving EOP-E-0 Step 9.  |
|                | Isolate S/G 'B'  | Stop feeding the faulted S/G IAW EOP-E-0, prior to exiting EOP-E-0 Foldout, Step 2 AND within 10 min. of S/G fault condition. |

**ILC-14 NRC SCENARIO 2 SIMULATOR SETUP****IC/SETUP:**

- IC-602, SCN 006\_ILC\_14\_SIM\_NRC\_2
- Status board is provided to crew is from IC-22.

**PRE-LOADED EVENTS:**

The following events should occur on the reactor trip or triggered events following the reactor trip:

Event 7: A fault inside Containment on S/G "B" will occur during the reactor trip

Event 8: A loss of the SUT after the trip

Event 9: EDG "A" will trip 3 minutes after it starts from its oil leak.

Event 10: Service Water Pumps "C" and "D" fail to start on the SI Sequencer(CT to start • Pump "C" OR "D" since only EDG "B" is available)

Event 11: CV Spray pump "B" does not automatically start

•

**EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:**

- Event 1: Power Reduction to 65%
- Event 2: IRPI Failure in Control Bank "C" Rod D6
- Event 3: FW Flow Transmitter, FT-477 fails high
- Event 4: Pressurizer Pressure Transmitter, PT-445 Fails low
- Event 5: Large Oil Leak on EDG "A"
- Event 6: Feedwater Regulating Valve, FCV-478 Fails Open

**EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:**

- OP-105, Section 8.4.1 marked up through step 8.4.1.2.c
- AOP-001, MALFUNCTION OF REACTOR CONTROL SYSTEM
- AOP-025, RTGB INSTRUMENT FAILURE
- OWP-026, FWF-2
- EOP-E-0, REACTOR TRIP OR SAFETY INJECTION
- EOP-E-2, FAULTED S/G ISOLATION
- EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT
- EPP-7, SI TERMINATION

|                    |            |                                   |   |         |   |      |   |    |    |
|--------------------|------------|-----------------------------------|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                        | 2 | Event # | 1 | Page | 6 | of | 38 |
| Event Description: |            | Power Reduction to 65% IAW OP-105 |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |   |      |   |    |    |

**BOOTH OPERATOR: When directed, go to run on the simulator**

NOTE: Unloading of the unit should NOT exceed 5%/minute. Unloading of the unit can be stopped at any time by pressing the HOLD pushbutton. The HOLD lamp should illuminate, the GO lamp should extinguish, and unloading of the unit should be stopped. The SETTER should NOT be set to 0.0. If the Turbine is allowed to go to this setting without operator attention, all the governor valves could close and cause a turbine trip after a one minute time delay. During the load changes, GS-36, MANUAL GLAND SEAL DUMP may require throttling to maintain Gland Seal Pressure in the normal operating band of 3 to 6 psig.

**CAUTION**

Although it is preferred to observe the effects of the initial boric acid addition prior to lowering Turbine load, it may be necessary to commence a rapid power reduction before the observed effects of any boric acid additions. In these situations, with rod Control in AUTOMATIC, Rod Control will drive the Controlling Bank of Rods to maintain Tavg on Tref. This will cause the Reactor Flux profile to go in the negative direction.

**IF** Reactor Power is near 100% at the time the rapid power change is commenced, this may cause Reactor Flux to go outside the Operating Band while less than 90% Power (or less than 0.9 APL). **IF** this condition is established, APP-005-D6,  $\Delta$  Flux Warning / Status, and APP-005-E4,  $\Delta$  Flux Alarm, will both alarm.

**IF** a valid APP-005-E4 alarm is received while less than 90% Reactor Power (less than 0.9 APL), power reduction to less than 50% power will be required per ITS LCO 3.2.3. (NCR 306775)

|               |     |   |
|---------------|-----|---|
|               |     |   |
| <b>OP-105</b> | BOP | <p>IF EH Turbine Control is in OPER AUTO, THEN REDUCE turbine load as follows:</p> <p>(1) PLACE the EH Turbine Control in the desired position:</p> <ul style="list-style-type: none"> <li>IMP IN (preferred)</li> <li>IMP OUT (if required for plant conditions)</li> </ul> <p>(2) SET the desired load in the SETTER.</p> |

|                    |            |                                   |   |         |   |      |   |    |    |
|--------------------|------------|-----------------------------------|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                        | 2 | Event # | 1 | Page | 7 | of | 38 |
| Event Description: |            | Power Reduction to 65% IAW OP-105 |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |   |      |   |    |    |

|   |     |   |
|---|-----|---|
| <b>OP-015</b>   | BOP | (3) SELECT the desired Load Rate.<br>(4) DEPRESS the GO pushbutton.   |
|   |     |   |
| <b>NOTE:</b> The MSR Timer Valves are operated by manually rotating the "French Curve" cam on the MSR TIMER VALVE CONTROLLER. |     |   |
|   |     |   |
| <b>OP-105</b>   | BOP | VERIFY the toggle switch inside the MSR TIMER VALVE CONTROLLER is in the OFF position.<br>GRADUALLY CLOSE the MSR Timer Valves to limit the LPTurbine inlet steam temperature drop to 100°F/hr or less. |
|   |     |   |
| <b>OP-105</b>   | RO  | VERIFY proper programming of the following: <ul style="list-style-type: none"> <li>Tavg tracks within 5°F of Tref.</li> <li>PZR level tracks within 5% of reference level.</li> </ul>                   |
|   |     |   |

|                    |            |                                 |   |         |   |      |   |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 2 | Event # | 2 | Page | 8 | of | 38 |
| Event Description: |            | IRPI Failure on Rod D6          |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |   |    |    |

**BOOTH OPERATOR: When directed, insert Event 2, IRPI Failure, on cue from the Chief Examiner**

**EVENT INDICATIONS: Rod D6 will show on IRPI at a different height from all other control rods.**

|                |     |  |
|----------------|-----|--|
|                |     |  |
| <b>AOP-001</b> | RO  | <b>Immediate Action Step:</b><br>Check Unexpected Rod Motion- IN PROGRESS <b>(NO)</b>  |
|                |     |  |
| <b>AOP-001</b> | RO  | Determine If Multiple Rods Have Dropped As Follows:<br>a. Analyze Indications For Multiple Rod Drop <ul style="list-style-type: none"> <li>● Prompt Drop - PRESENT</li> <li>● More than 1 Rod Bottom Light - ILLUMINATED</li> <li>● More Than 1 IRPI - INDICATES ON BOTTOM</li> </ul> b. Check Multiple Dropped Rods - PRESENT (NO)<br>Go to step 10   |
|                |     |  |
| <b>AOP-001</b> | BOP | Make PA Announcement For Procedure Entry   |
|                |     |  |
| <b>AOP-001</b> | RO  | Check $T_{avg}$ - TRENDING TO $T_{ref}$<br><b>May or may NOT be depending on where they are at with the power reduction. IF they answer NO, they will restore Tavg to within <math>\pm 1.5^{\circ}\text{F}</math> IAW Attachment 1 of AOP-001</b>  |
|                |     |  |
| <b>AOP-001</b> | RO  | Determine The Status Of Rods As Follows:<br>a. Analyze the below indications for a dropped rod: <ul style="list-style-type: none"> <li>● APP-005-A3, PR DROP ROD - ILLUMINATED</li> <li>● APP-005-F2, ROD BOTTOM ROD DROP - ILLUMINATED</li> <li>● Rod Bottom Light for affected rod -ILLUMINATED</li> <li>● Indication of Prompt Drop - PRESENT</li> <li>● Quadrant Power Tilt indications - PRESENT <ul style="list-style-type: none"> <li>● APP-005-F3, PR UPPER CH HI FLUX DEV/AUTO</li> </ul> </li> </ul> |



|  |            |                                 |   |         |   |      |   |    |    |
|--|------------|---------------------------------|---|---------|---|------|---|----|----|
| Op Test No.:                                     | ILC-14 NRC | Scenario #                      | 2 | Event # | 2 | Page | 9 | of | 38 |
| Event Description: <b>IRPI Failure on Rod D6</b> |            |                                 |   |         |   |      |   |    |    |
| Time   | Position   | Applicant's Actions or Behavior |   |         |   |      |   |    |    |

|                |     |  |
|----------------|-----|--|
|                |     | <p>DEFEAT - ILLUMINATED</p> <ul style="list-style-type: none"> <li>• APP-005-F4, PR LOWER CH HI FLUX DEV/AUTO DEFEAT - ILLUMINATED</li> <li>• APP-005-C3, PR CHANNEL DEV - -ILLUMINATED</li> <li>• Power Range Drawer -Indications</li> </ul> <p>b. Check Dropped Rod - PRESENT (NO)</p> <p>Go to step 14</p>  |
|                |     |  |
| <b>AOP-001</b> | CRS | <p><u>NOTE:</u></p> <ul style="list-style-type: none"> <li>• IF there is any doubt as to IRPI failure OR actual rod misalignment, THEN assume rod misalignment is present.</li> <li>• Malfunctioning IRPI(s) may be identified by erratic or drifting IRPI indication when the associated Rod Bank is not being moved, or sudden large changes in IRPI indication with no corresponding change in nuclear power or motion of other rods in the associated bank.</li> <li>• ERFIS Rod Position Indication may be used for IRPI indication below.</li> </ul>   |
|                |     |  |
| <b>AOP-001</b> | RO  | <p>Determine The Status Of IRPI As Follows:</p> <p>a. Analyze the below indications for an IRPI problem:</p> <ul style="list-style-type: none"> <li>• IRPI Indication <ul style="list-style-type: none"> <li>• Indicator drift with NO flux effects</li> <li>• Erratic indicator movement with NO flux effects</li> <li>• Indicator off-scale High OR Low with NO flux effects</li> </ul> </li> <li>• Dropped Rod Indication with no flux changes <ul style="list-style-type: none"> <li>• Rod Bottom Light for affected rod - ILLUMINATED AND</li> <li>• APP- 005- A3, PR DROP ROD - EXTINGUISHED</li> </ul> </li> <li>• Simultaneous loss of ALL IRPI Indication (Power Supply Failure) - PRESENT</li> </ul> |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 2 | Event # | 2 | Page | 10 | of | 38 |
| Event Description: |            | IRPI Failure on Rod D6          |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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|--|-----|---|
|  |     | b. Check IRPI malfunction - PRESENT (YES)                       |
|  |     |   |
| <b>AOP-001</b>   | RO  | Go To Section D, Individual Rod Position Indication Malfunction |
|  |     |   |
| <p style="text-align: center;"><u>NOTE:</u></p> <ul style="list-style-type: none"> <li>On a loss of PP-61, all IRPI indication is lost except that a green LED will be illuminated on each rod indicator.</li> <li>On a loss of Instrument Bus 7 all IRPI indication is lost.</li> <li>PP-61 is located on the second floor of the Auxiliary Building near the entrance to the VCT Room.</li> <li>PP-61 is fed from MCC-15.</li> </ul> |     |   |
|  |     |   |
| <b>AOP-001</b>   | RO  | Check IRPI - ENERGIZED (YES)                                    |
|  |     |   |
| <b>AOP-001</b>   | RO  | Check Current Plant Status-Modes 1 OR 2 (YES)                   |
|  |     |   |
| <p style="text-align: center;"><u>NOTE:</u></p> <ul style="list-style-type: none"> <li>Voltage measurement may be used for determination of IRPI channel operability below. (0.015 volts per step)</li> <li>ERFIS Rod Position Indication may be used for determination of IRPI channel operability below.</li> </ul>  |     |   |
|  |     |   |
| <b>AOP-001</b>   | CRS | Implement ITS LCO 3.1.7   |

|                    |            |  |   |         |   |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #                                       | 2 | Event # | 3 | Page | 11 | of | 38 |
| Event Description: |            | Feedwater Flow Transmitter FT-477 will Fail High |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                  |   |         |   |      |    |    |    |

|   |      |   |
|---|------|---|
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| <b>BOOTH OPERATOR: Insert Event #3(Feedwater Flow Transmitter FT-477 failing high) on cue from the Chief Examiner.</b>  |      |   |
| <b>EVENT INDICATIONS:</b><br><br><b>FT-477 indicating high</b><br><br><b>FRV-478 closing</b><br><br><b>APP-006-A2</b><br><br><b>APP-006-A3</b><br><br><b>S/G 'A' level lowering</b><br><br><b>FI-477 rising</b> |      |   |
| <b>AOP-025</b>  | CRS  | AOP-025 Actions<br><br>Go to the Appropriate Section for the Failed Transmitter, Section E  |
|   |      |   |
| <b>AOP-025</b>  | BOP  | <b>Immediate Action Step:</b><br><br>Verify the Affected FRV In MAN <ul style="list-style-type: none"> <li>FCV-478 (FRV "A")</li> </ul>                   |
|   |      |   |
| <b>AOP-025</b>  | BOP  | <b>Immediate Action Step:</b><br><br>Restore Affected S/G Level to between 39% and 52%  |
|   |      |   |
| <b>AOP-025</b>  | CREW | <b>Continuous Action Step:</b><br><br>Check Reactor Trip Setpoint – Being Approached<br><br>RNO – IF a Reactor Trip Setpoint is approached, THEN trip the |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                                       | 2 | Event # | 3 | Page | 12 | of | 38 |
| Event Description: |            | Feedwater Flow Transmitter FT-477 will Fail High |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                  |   |         |   |      |    |    |    |

|                |          |  |  |                |          |        |        |  |  |
|----------------|----------|--|--|----------------|----------|--------|--------|--|--|
|                |          | Reactor and Go to EOP-E-0.   |  |                |          |        |        |  |  |
|                |          | Go to step 5   |  |                |          |        |        |  |  |
|                |          |  |  |                |          |        |        |  |  |
| AOP-025        | BOP      | Make PA Announcement For Procedure Entry   |  |                |          |        |        |  |  |
|                |          |  |  |                |          |        |        |  |  |
| AOP-025        | BOP      | Place the Affected S/G Feed Flow Selector Switch to the Alternate Channel Below: <ul style="list-style-type: none"><li>S/G “A” Feed Flow FR-488</li></ul> <table><tr><td>Failed Channel</td><td>Position</td></tr><tr><td>FT-477</td><td>Ch 476</td></tr><tr><td></td><td></td></tr></table> |  | Failed Channel | Position | FT-477 | Ch 476 |  |  |
| Failed Channel | Position |  |  |                |          |        |        |  |  |
| FT-477         | Ch 476   |  |  |                |          |        |        |  |  |
|                |          |  |  |                |          |        |        |  |  |
|                |          |  |  |                |          |        |        |  |  |
| AOP-025        | BOP      | <b>Continuous Action Step:</b><br>Restore Affected Controller To Automatic as Follows: <ul style="list-style-type: none"><li>Check S/G level within ±1% of Programmed Level</li><li>(When ±1%) Place the Affected Controller in Auto</li></ul>   |  |                |          |        |        |  |  |
|                |          |  |  |                |          |        |        |  |  |
| AOP-025        | BOP      | Remove the Affected Transmitter From Service using OWP-026 <table><tr><td>Channel</td><td>OWP</td></tr><tr><td>FT-477</td><td>FWF-2</td></tr></table>  |  | Channel        | OWP      | FT-477 | FWF-2  |  |  |
| Channel        | OWP      |  |  |                |          |        |        |  |  |
| FT-477         | FWF-2    |  |  |                |          |        |        |  |  |
|                |          |  |  |                |          |        |        |  |  |
| OWP-026 FWF-2  |          |  |  |                |          |        |        |  |  |
|                |          |  |  |                |          |        |        |  |  |
| OWP-26         | BOP      | FR-478 Feedwater Flow Selector Switch selected to 476  |  |                |          |        |        |  |  |
|                |          |  |  |                |          |        |        |  |  |
| OWP-26         | BOP      | Delete Input FT-477 From CALO Processing (FWF0404A)  |  |                |          |        |        |  |  |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                                       | 2 | Event # | 3 | Page | 13 | of | 38 |
| Event Description: |            | Feedwater Flow Transmitter FT-477 will Fail High |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                  |   |         |   |      |    |    |    |

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|--------------------|-----|---|
|                    |     |   |
| <b>End OWP-026</b> |     |   |
|                    |     |   |
| <b>AOP-025</b>     | CRS | Check the following ITS LCOs for applicability:<br><br><input type="checkbox"/> 3.3.1<br><br><input type="checkbox"/> 3.3.2 |
|                    |     |   |
| <b>AOP-025</b>     | CRS | Go To Procedure Main Body, Step 2   |
|                    |     |   |
| <b>AOP-025</b>     | CRS | Implement the EALs  |
|                    |     |   |
| <b>AOP-025</b>     | CRS | Return to Procedure and Step in Effect  |

|                    |            |   |   |         |   |      |    |    |    |
|--------------------|------------|---|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 4 | Page | 14 | of | 38 |
| Event Description: |            | PT-145, Letdown Pressure Transmitter, fails low / Place Excess Letdown in Service (AOP-025) |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |   |      |    |    |    |

**BOOTH OPERATOR: At the discretion of the Examiner, insert Event 4, Pressurizer Pressure Transmitter, PT-445 Fails Low.**

**EVENT INDICATIONS:**

**APP-003-D8 PZR CONTROL HI/LO PRESS**

|                |     |   |
|----------------|-----|---|
| <b>AOP-025</b> | CRS | AOP-025 Actions<br>Go to the Appropriate Section for the Failed Transmitter. Section C  |
| <b>AOP-025</b> | RO  | <b>Immediate Action Step:</b><br>Determine If PZR PORVs should be closed:<br>a) Check PZR Pressure Less Than 2335 PSIG (YES)<br>b) Verify Both PZR PORVs Closed |
| <b>AOP-025</b> | RO  | <b>Immediate Action Step:</b><br>Control the PZR Spray Valves AND PZR heaters to restore RCS Pressure to the desired control band.                              |
| <b>AOP-025</b> | BOP | Make PA announcement for Procedure Entry  |
| <b>AOP-025</b> | RO  | Check PT-444 – Failed Transmitter (NO)<br>Go to step 6  |
| <b>AOP-025</b> | RO  | Verify Selector Switch PM-444 - SELECTED TO THE OPERABLE CHANNEL<br>• REC 444   |
| <b>AOP-025</b> | CRS | Check the following ITS LCOs for applicability:<br>• 3.3.4<br>• 3.4.1   |

|                    |            |   |   |         |   |      |    |    |    |
|--------------------|------------|---|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 4 | Page | 15 | of | 38 |
| Event Description: |            | PT-145, Letdown Pressure Transmitter, fails low / Place Excess Letdown in Service (AOP-025) |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |   |      |    |    |    |

|  |     |  |
|--|-----|--|
|  |     |  |
|  | SRO | Go to Procedure Main Body, Step 2.   |
|  |     |  |
|  | SRO | Implement the EALs   |
|  |     |  |
|  | SRO | Return to Procedure and Step in Effect   |
|  |     |  |
| <b>BOOTH OPERATOR: When directed by Chief Examiner, call the Control Room as the IAO and report that there is a large oil leak on EDG "A". There is oil pooling up on the floor.</b> |     |  |
|  |     |  |
|  | CRS | <p>The CRS will also declare entry into ITS LCO 3.8.1, Condition B, which requires the following:</p> <p>(1) Perform SR 3.8.1.1 for offsite circuit within 1 hour and once per 12 hours thereafter (OP-604, Section 8.4.9, Emergency Diesel Generator Inoperability)</p> <p>(2) Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable within 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)</p> <p>(3) Determine Operable DG is not inoperable due to common cause failure within 24 hours and perform SR 3.8.1.2 for Operable DG within 96 hours and, (4) restore DG to Operable status within 7 days OR be in Mode 3 in 6 hours and Mode 5 in 36 hours.</p> |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 16 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

**BOOTH OPERATOR:** At the discretion of the Examiner, insert Event 6, FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "A" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.

**EVENT INDICATIONS:**  
 FCV-478 traveling open  
 S/G "A" level rising  
 S/G "A" Feed flow rising

|  |     |   |
|--|-----|---|
|  |     |   |
| <b>AOP-010</b>                                   | BOP | <b>Immediate Action Step:</b><br>Check Feedwater Regulating Valves - OPERATING PROPERLY (MANUAL OR AUTO):<br>FCV-478, FRV "A"<br><b>RNO:</b><br>a. Verify FRV for affected S/G(s) in manual control.<br>b. Attempt to stabilize S/G level using FRV and/or FRVBypass Valves by matching steam flow with feed flow.<br>c. Stop any load change in progress.<br>d. Restore affected S/G level to between 39% and 52%.<br>e. IF unable to control S/G level, THEN trip the Reactor AND Go To EOP-E-0, REACTOR TRIP or SAFETY INJECTION. <b>(The RO Should manually trip the reactor at this point)</b> |
|  |     |   |
| <b>EOP-E-0, Reactor Trip or Safety Injection</b> |     |   |
|  |     |   |
| <b>EOP-E-0</b>                                   | RO  | <b>Immediate Action Steps</b><br>Check Reactor tripped (YES)  |
|  |     |   |



|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 17 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|   |     |   |
|---|-----|---|
| <b>EOP-E-0</b>  | BOP | <b>Immediate Action Steps</b><br><br>Check Turbine Trip: <ul style="list-style-type: none"> <li>a. Both turbine stop valves - Closed (YES)</li> <li>b. All MSR purge and shutoff valves – Closed (YES)</li> </ul>   |
|   |     |   |
| <b>EOP-E-0</b>  | BOP | <b>Immediate Action Steps</b><br><br>Check Power to AC Emergency Busses: <ul style="list-style-type: none"> <li>a. E1 or E2 – At least one energized (YES)</li> <li>b. E1 and E2 – Both energized (YES)</li> </ul>  |
|   |     |   |
| <b>EOP-E-0</b>  | RO  | <b>Immediate Action Step:</b> <ul style="list-style-type: none"> <li>a. Check if SI is actuated:             <ul style="list-style-type: none"> <li>• SI annunciators - ANY ILLUMINATED<br/>OR</li> <li>• SI equipment - AUTO STARTED (YES)</li> </ul> </li> <li>b. Check BOTH trains of SI – ACTUATED (YES)             <ul style="list-style-type: none"> <li>• SI pumps - BOTH RUNNING</li> <li>• RHR pumps - BOTH RUNNING</li> <li>•</li> </ul> </li> </ul> |
|   |     |   |
| <b><u>NOTE</u></b><br><br>FOLDOUT for EOP-E-0 is in effect.   |     |   |
| <b>EXAMINER'S NOTE:</b> Crew may take early actions at this time to address items that did not function or operate as designed. <ul style="list-style-type: none"> <li>• Manually start Service Water Pumps "C" OR "D"</li> </ul> |     |   |

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|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 18 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

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|---|-----|---|
| <ul style="list-style-type: none"> <li>Manually start CV Spray Pump "B"</li> </ul>  |     |   |
| <b>CRITICAL TASK</b>  |     |   |
|   |     |   |
| <b>EOP-E-0</b>  | CRS | Verifies all immediate actions for EOP-E-0. Announce <b>Adverse numbers</b> are in effect due to CV Pressure Greater than <b>4 psig</b> .   |
|   |     |   |
| <b>EOP-E-0</b>  | BOP | Perform Attachment 1, Auto Action Verification, While Continuing With This Procedure  |
|   |     |   |
| <b>Beginning of EOP-E-0 Attachment 1</b><br>(Remainder of EOP-E-0 Follows this Section)                                   |     |   |
|   |     |   |
| <u>CAUTION</u><br>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment. |     |   |
|   |     |   |
| Att. 1  | BOP | Check ECCS Pumps Running: <ul style="list-style-type: none"> <li>SI pumps - BOTH RUNNING (Could be running if checked prior to loss of EDG 'A')</li> <li>RHR pumps - BOTH RUNNING (Could be running if checked prior to loss of EDG 'A')</li> </ul> |
|   |     |   |
| Att. 1  | BOP | Check ECCS Valves - PROPER EMERGENCY ALIGNMENT (YES)  |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 19 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

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|        |     |   |
| Att. 1 | BOP | Check CCW Pumps - AT LEAST ONE RUNNING (YES)  |
|        |     |   |
| Att. 1 | BOP | Check Containment Isolation Phase A <ul style="list-style-type: none"> <li>a. Phase A – Actuated (YES)</li> <li>b. Phase A valves – Closed (YES)</li> <li>c. Excess letdown – Isolated (YES)               <ul style="list-style-type: none"> <li>• CVC-387 – Closed (YES)</li> <li>• HIC-137 – at 0% DEMAND (YES)</li> </ul> </li> </ul>                         |
|        |     |   |
| Att. 1 | BOP | Check Feedwater Isolation: <ul style="list-style-type: none"> <li>a) Main feed pumps – BOTH TRIPPED (YES)</li> <li>b) Main feedwater – ISOLATED               <ul style="list-style-type: none"> <li>• FRVs – Closed (YES)</li> <li>• Feedwater reg bypass valves – Closed (YES)</li> <li>• Feedwater header section valves – Closed (YES)</li> </ul> </li> </ul> |
|        |     |   |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 20 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|                                       |     |  |
|---------------------------------------|-----|--|
| Att. 1                                | BOP | Check if Main Steamlines Should Be Isolated:<br><br>a) Main steamline isolation – REQUIRED (YES) <ul style="list-style-type: none"> <li>• Containment pressure – Greater than 10 psig (YES)</li> </ul> OR <ul style="list-style-type: none"> <li>• High steam flow with: (NO)               <ul style="list-style-type: none"> <li>○ S/G pressure – less than 614 psig</li> </ul> </li> </ul> OR <ul style="list-style-type: none"> <li>○ Tavg – less than 543°F</li> </ul> b) Check MSIVs and MSIV bypass valves – CLOSED (YES) |
|                                       |     |  |
| Att. 1<br><b><u>CRITICAL TASK</u></b> | BOP | Check Proper Service Water System Operation:<br><br>a. <b>SW pumps – All running (NO, Candidate must start Service Water Pumps "C" OR "D") Critical Task</b><br><br>b. SW booster pumps – Both running (NO, SW booster pump "A" is OOS)<br><br>c. Both SW header low pressure alarms (APP-008-F7/F8) – Extinguished ()   |
|                                       |     |  |
| Att. 1                                | BOP | Check Both EDGs – Running (NO, EDG "A" has tripped due to it's oil leak)   |
|                                       |     |  |
| Att. 1                                | BOP | Check ECCS Flow:   |

|                    |            |   |   |         |        |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 21 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

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|        |     | a. RCS pressure – less than 1700 psig (YES)<br>b. SI pumps- Flow Indicated (YES)<br>c. RCS pressure – less than 350 psig. (YES)<br>d. RHR – Flow Indicated (YES)  |
|        |     |   |
| Att. 1 | BOP | Check CV Recirculation Fans – All Running (NO, "A" Train does not have power)   |
|        |     |   |
| Att. 1 | BOP | Check IVSW - Actuated (YES) <ul style="list-style-type: none"> <li>• PCV-1922A – Open (YES)</li> <li>• PCV-1922B – Open (YES)</li> </ul>  |
|        |     |   |
| Att. 1 | BOP | Check CV ventilation isolation (YES) <ul style="list-style-type: none"> <li>a. CV ventilation isolation valves – CLOSED (YES)</li> </ul>  |
|        |     |   |
| Att. 1 | BOP | Check control room ventilation - aligned for pressurization mode (YES) <ul style="list-style-type: none"> <li>• HVA-1A or HVA-1B – Running (YES)</li> <li>• HVE-16 – Stopped (YES)</li> <li>• HVE-19A or HVE-19B – Running (NO, starts HVE-19A or HVE-19B)</li> <li>• Control Room HVAC outside air damper A or B – Open (YES)</li> </ul> |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 22 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

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|---|-----|---|
|   |     | <ul style="list-style-type: none"> <li>CR-D1A-SA – Closed (YES)</li> <li>CR-D1B-SB – Closed (YES)</li> </ul>  |
|   |     |   |
| Att. 1  | BOP | Check DS Bus – Energized (YES)  |
|   |     |   |
| Att. 1  | BOP | Check Battery Chargers – Energized (YES)<br>APP-036-D1 – Extinguished (YES)<br>APP-036-D2 – Extinguished (YES)  |
|   |     |   |
| Att. 1  | BOP | Stop R-11/12 Sample Pump  |
|   |     |   |
| Att. 1  | BOP | Locally Reset and Load IACs as necessary (Yes, 'A')   |
|   |     |   |
| <b>BOOTH OPERATOR: When requested, wait approximately 2 minutes and restore IAC "A" IAW the SCN File IF you have already been dispatched to restore MCC-5 from the DS Bus. If you have not restored MCC-5 via the DS Bus, you cannot reset IAC "A".</b> |     |   |
| Att. 1  | BOP | Perform Crew Update to include the following: <ul style="list-style-type: none"> <li>Attachment Completion</li> <li>Manual Actions Taken (<b>Started Service Water Pumps "C" AND "D" and started CV Spray Pump "B"</b>)</li> <li>Failed Equipment status (<b>EDG "A" is tripped</b>)</li> </ul> |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 23 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

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|---|-----|---|
|   |     | <ul style="list-style-type: none"> <li>SW status ("B" Train of Service water is operating, "A" train of Service water does not have power)</li> </ul>   |
|   |     |   |
| <b>Critical Task to start SW Pump 'C OR D'</b>  |     |   |
|   |     |   |
| <b>End of EOP-E-0 Attachment 1</b>  |     |   |
|   |     |   |
| <b>EOP-E-0<br/>ATT 3<br/>(Directed from<br/>EOP-E-0<br/>Foldout)</b>  | BOP | <b>IF MCC-5 is NOT energized, THEN perform the following:</b> <ol style="list-style-type: none"> <li>Verify DS bus is energized.</li> <li>Transfer power source to DS Bus using the posted instructions at the Kirk Key Interlocked Breakers.</li> <li>Locally reset and load instrument air compressor A (MCC-5 CMPT 7M).</li> </ol> |
|   |     |   |
| <b>BOOTH OPERATOR: When requested, wait 3 minutes and restore MCC-5 using the DS Bus IAW SCN file. When requested, wait approximately 2 minutes and restore IAC "A" IAW the SCN File IF not previously done with the Att 1.</b> |     |   |
|   |     |   |
| <b>EOP-E-0</b>  | RO  | Check AFW Pumps – Running <ol style="list-style-type: none"> <li>Motor driven AFW pumps – Both Running (YES)</li> <li>S/G levels – Two S/Gs less than 16% (NO)</li> <li>Steam Driven AFW pump steam shutoff valves – ALL OPEN (YES.)</li> </ol>   |
|   |     |   |
| <b>EOP-E-0</b>  | RO  | Check AFW Valves – Proper Emergency Alignment (YES)   |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 24 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

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|                                  |    | <ul style="list-style-type: none"> <li>• AFW header discharge valves – Full Open (YES)</li> <li>• AFW header section valves – Full Open (YES)</li> <li>• Steam driven AFW pump discharge valves – Full open if pump is running. (YES)</li> </ul>  |
|                                  |    |   |
| <b>EOP-E-0</b>                   | RO | Check Total AFW Flow: <ul style="list-style-type: none"> <li>• Reset SI</li> <li>• Control feed flow to maintain NON-faulted S/Gs narrow range level – Between 23% and 50%.</li> <li>• Check total AFW flow- Greater than 300 gpm (YES)</li> </ul>  |
|                                  |    |   |
| <b>EOP-E-0<br/>Critical Task</b> | RO | Check CV Spray NOT Required: <ol style="list-style-type: none"> <li>CV pressure – Has remained less than 10 psig. (NO)</li> <li>Perform the following:               <ol style="list-style-type: none"> <li>Check CV spray actuated.<br/>IF CV spray is NOT actuated, THEN manually actuate BOTH trains of CV spray.</li> <li>Verify the following:                   <ol style="list-style-type: none"> <li>Both CV spray pumps are running. (<b>Start CV Spray Pump 'B'</b>)</li> <li>CV spray pump discharge valves are open:                       <ul style="list-style-type: none"> <li>• SI-880A</li> <li>• SI-880B</li> <li>• SI-880C</li> <li>• SI-880D</li> </ul> </li> <li>CV spray additive tank discharge valves are open:                       <ul style="list-style-type: none"> <li>• SI-845A</li> <li>• SI-845B</li> </ul> </li> <li>Spray additive tank flow is approximately 12 gpm:</li> </ol> </li> </ol> </li> </ol> |



|                    |            |   |   |         |        |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 25 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

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|   |    | <ul style="list-style-type: none"> <li>Adjust SI-845C, SAT throttling valve, as necessary.</li> </ul> 3) Verify Containment Isolation Phase B valves are closed.<br>4) Stop all RCPs.<br>5) Observe CAUTION prior to Step 10 and Go To Step 10.   |
|   |    |   |
| <b>Critical Task to start CV Spray Pump 'B'</b>   |    |   |
|   |    |   |
| <b>EOP-E-0</b>  | RO | Check RCP Seal Cooling: <ul style="list-style-type: none"> <li>CCW flow to RCP thermal barriers – Normal (YES)               <ul style="list-style-type: none"> <li>APP-001-C1 / D1 – Extinguished (D1 may be Illuminated depending on what actions were taken earlier in the scenario)</li> </ul> </li> </ul> IF all charging pumps are stopped, THEN perform the following: <ol style="list-style-type: none"> <li>IF DS bus is energized, THEN start charging pump A at , minimum speed for seal injection.</li> </ol> |
|   |    |   |
| <b>BOOTH OPERATOR: As requested, adjust CVC-297A,B,C as necessary to control RCP seal injection flow using the P&amp;ID function.</b> |    |   |
|   |    |   |
| <b>EOP-E-0</b>  | RO | Check RCS Temperature<br><br>With NO RCPs running, RCS cold leg temperatures – Stable at or trending to 547°F (NO, Depending on scenario timeline the RCPs could still be running.)<br><br>RNO: IF temperature is less than 547°F AND lowering then perform the following: (YES) <ol style="list-style-type: none"> <li>Stop dumping steam.</li> <li>IF cooldown continues, THEN reduce total feed flow to minimum for decay heat</li> </ol>  |

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| Op Test No.:       | ILC-14 NRC | Scenario #   | 2 | Event # | 6 - 12 | Page | 26 | of | 38 |
| Event Description: |            | <p><b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b></p> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |        |      |    |    |    |

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|--|-----|--|
|  |     | <ul style="list-style-type: none"> <li>Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [23%] in at least one S/G.</li> </ul> <p>c. IF cooldown continues, THEN close MSIVs and MSIV bypass valves.</p>   |
|  |     |  |
| <b>EOP-E-0</b>   | RO  | <p>Check PZR PORVs and Spray Valves:</p> <ul style="list-style-type: none"> <li>a. PORVs – Closed (YES)</li> <li>b. Normal PZR spray valves – Closed (YES)</li> <li>c. Aux spray valve – Closed (YES)</li> </ul>   |
|  |     |  |
| <b>EOP-E-0</b>   | RO  | <p>Check If RCPs should be stopped:</p> <ul style="list-style-type: none"> <li>a. RCPs – Any Running (NO, stopped per FOLDOUT)</li> </ul> <p>RNO: Go to Step 14</p>  |
|  |     |  |
| <b>EOP-E-0</b>   | BOP | <p>Step 14: Check if S/G Secondary Pressure Boundaries are Intact:</p> <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs               <ul style="list-style-type: none"> <li>None lowering in an uncontrolled manner (NO)                   <ul style="list-style-type: none"> <li>a. Reset SPDS and initiate monitoring of Critical Safety Functions Status Trees.</li> </ul> </li> </ul> </li> </ul> <p>Go To EOP-E-2, Faulted Steam Generator Isolation, Step 1.</p> |
|  |     |  |
| <b>Beginning of EOP-E-2, Faulted Steam Generator Isolation</b> |     |  |
|  |     |  |

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|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 27 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

**CAUTION**

- At least one S/G must be maintained available for RCS cooldown.
- Any faulted S/G or secondary break should remain isolated during

|  |     |   |
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|  |     |   |
| <b>EOP-E-2</b>   | BOP | Check MSIVs and MSIV Bypass Valves for Faulted S/G – Closed <ul style="list-style-type: none"> <li>• S/G B:               <ul style="list-style-type: none"> <li>• V1-3B</li> <li>• MS-353B</li> </ul> </li> </ul>  |
| <b>EOP-E-2</b>   | BOP | Check if any S/G Secondary Pressure Boundary is Intact: <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs – Any stable or rising. (YES)</li> </ul>  |
| <b>EOP-E-2</b>   | BOP | Identify Faulted S/Gs: <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs:               <ul style="list-style-type: none"> <li>• Any S/G pressure lowering in an uncontrolled manner (YES, "B" S/G)</li> <li style="text-align: center;"><u>OR</u></li> <li>• Any S/G completely depressurized</li> </ul> </li> </ul> |
|  |     |   |
| <u><b>CAUTION</b></u>  |     |   |
| <ul style="list-style-type: none"> <li>• If the SDAFW pump is the only available source of feed flow, steam supply to the SDAFW pump should be maintained from at least one S/G.</li> <li>• If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.</li> </ul> |     |   |
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|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 28 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

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| <b><u>EOP-E-2</u></b><br><br><b><u>Critical Task</u></b>                            | BOP | Isolate Faulted S/Gs <ul style="list-style-type: none"> <li>a. Check main feedwater to faulted S/Gs – Isolated             <ul style="list-style-type: none"> <li>• S/G B valves – Closed                 <ul style="list-style-type: none"> <li>○ FCV-488</li> <li>○ FCV-489</li> <li>○ V2-6B</li> </ul> </li> </ul> </li> <li>b. Reset SI</li> <li>c. Isolate AFW flow to faulted S/Gs             <ul style="list-style-type: none"> <li>○ Close SDAFW pump discharge valve – V2-14B</li> <li>○ Close AFW header discharge valve – V2-16B</li> </ul> </li> <li>d. Check faulted S/Gs steam line PORV – Closed             <ul style="list-style-type: none"> <li>○ RV-2 (S/G C) (YES)</li> </ul> </li> <li>e. Close SDAFW pump steam shutoff valve for faulted S/G(s)             <ul style="list-style-type: none"> <li>○ V1-8B (S/G B)</li> </ul> </li> <li>f. Perform Attachment 1, Deenergizing AFW Valves for Faulted S/G.</li> <li>g. Locally close the following valve for faulted S/G as necessary while continuing with this procedure.             <ul style="list-style-type: none"> <li>○ S/G C:                 <ul style="list-style-type: none"> <li>▪ MS-29</li> </ul> </li> </ul> </li> <li>h. Check S/G blow down and blow down sample valves from faulted S/G – Closed             <ul style="list-style-type: none"> <li>○ S/G B:                 <ul style="list-style-type: none"> <li>▪ FCV-1931 A &amp; B - Shut</li> <li>▪ FCV-1934 A &amp; B - Shut</li> </ul> </li> </ul> </li> </ul> |
| <b>BOOTH OPERATOR: When requested close MS-29 IAW the SCN file after 4 minutes.</b> |     |   |
| <b>Critical Task to Isolate S/G 'B'</b>   |     |   |
| <b>EOP-E-2</b>  | BOP | Check CST Level – Greater than 10% (YES)  |
| <b>EOP-E-2</b>  | BOP | Check Secondary Radiation: <ul style="list-style-type: none"> <li>a. Request periodic activity samples of all S/Gs</li> </ul>   |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 29 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|   |     |   |
|---|-----|---|
|   |     | b. Unisolated secondary radiation monitors – Have remained normal (YES) <ul style="list-style-type: none"> <li>○ R-15, R-19s, R-31s</li> </ul> c. Secondary sample results – Normal (When results available.)   |
|   |     |   |
|   |     | Check If SI Flow Should Be Terminated:<br>a. RCS subcooling based on core exit TCs - GREATER THAN 35°F [55°F] (yes)<br>b. Secondary heat sink: <ul style="list-style-type: none"> <li>• Total feed flow to intact S/G(s) - AT LEAST 300 GPM (YES)</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• Narrow range level in at least one intact S/G - GREATER THAN 8% [23%] (YES)</li> </ul> c. RCS pressure: <ul style="list-style-type: none"> <li>• Pressure - GREATER THAN 1650 PSIG [1700 PSIG] (May be met depending on scenario timeline and crew progression. If not then perform RNO)</li> <li>• Pressure - STABLE OR RISING</li> </ul> Go to step 17 |
|   |     |   |
| <b>EOP-E-2</b>  | CRS | Reset SPDS and Go To EOP-E-1, Loss Of Reactor Or Secondary Coolant, Step 1  |
|   |     |   |
| <b>Beginning of EOP-E-1, Loss of Reactor or Secondary Coolant</b> |     |   |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 30 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|   |     |   |
|---|-----|---|
|   |     |   |
| <p><b><u>NOTE</u></b></p> <p>FOLDOUT for EOP-E-1 is in effect.</p> <p><b><u>SI TERMINATION CRITERIA</u></b></p> <p><u>IF</u> all conditions listed below occur, <u>THEN</u> reset SPDS and Go To EPP-7, SI TERMINATION, Step 1:</p> <ul style="list-style-type: none"> <li>RCS subcooling based on core exit TCs - GREATER THAN 35°F [55°F]</li> <li>Total feed flow to intact S/Gs - GREATER THAN 300 gpm</li> </ul> <p style="text-align: center;"><u>OR</u></p> <p>Narrow range level in at least one intact S/G - GREATER THAN 8% [23%]</p> <ul style="list-style-type: none"> <li>RCS pressure - GREATER THAN 1650 PSIG [1700 PSIG]</li> <li>RCS pressure - STABLE <u>OR</u> RISING</li> <li>PZR level - GREATER THAN 14% [37%]</li> </ul> <p>Termination criteria may be met at any time during EOP-E-1 and transition to EPP-7 would be performed. Scenario guide will proceed in EOP-E-1 until met.</p> |     |   |
|   |     |   |
| <b>EOP-E-1</b>  | RO  | Check If RCPs should be stopped:<br>b. RCPs – Any Running (NO)<br>RNO: Go to Step 2   |
|   |     |   |
| <b>EOP-E-1</b>  | BOP | Check if S/G Secondary Pressure Boundaries are Intact:<br>b. Check pressures in all S/Gs <ul style="list-style-type: none"> <li>None lowering in an uncontrolled manner (NO)</li> <li>None Completely depressurized (NO)</li> </ul> RNO: Check all faulted S/G(s) isolated (unless need for RCS cooldown) (YES) |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 31 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|   |     |   |
|---|-----|---|
|   |     |   |
| <b>EOP-E-1</b>  | BOP | Check Intact S/G Levels: <ol style="list-style-type: none"> <li>Narrow range levels – Greater than 23% (YES)</li> <li>Control feed flow to maintain narrow range levels – between 23% AND 50%</li> </ol>  |
|   |     |   |
| <b>CAUTION</b><br>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.                       |     |   |
|   |     |   |
| <b>EOP-E-1</b>  | RO  | Reset SI  |
|   |     |   |
| <b>EOP-E-1</b>  | RO  | Reset Containment Isolation Phase A   |
|   |     |   |
| <b>EOP-E-1</b>  | BOP | Check Secondary Radiation: <ol style="list-style-type: none"> <li>Secondary radiation monitors – Have remained normal (YES)               <ul style="list-style-type: none"> <li>o R-15, R-19s, R-31s</li> </ul> </li> <li>Perform the following:               <ol style="list-style-type: none"> <li>Request periodic activity samples of all S/Gs</li> <li>Secondary sample results – Normal (When results available)</li> </ol> </li> </ol> |
|   |     |   |
| <b>CAUTION</b><br>If any PZR PORV opens because of high PZR pressure, Step 7.b should be repeated after pressure lowers to less than 2335 psig. |     |   |
|   |     |   |
| <b>EOP-E-1</b>  | RO  | Check PZR PORVs and Block Valves: <ol style="list-style-type: none"> <li>Power to block valves – Available (YES)</li> <li>PORVs – Closed (YES)</li> <li>Block valves – At least one open. (YES)</li> </ol>  |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 32 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|                |     |   |
|----------------|-----|---|
|                |     |   |
| <b>EOP-E-1</b> | RO  | Establish Instrument Air to CV: <ul style="list-style-type: none"> <li>a. Check APP-002-F7 – Extinguished (YES)</li> <li>b. Reset IA PCV-1716</li> <li>c. Check IA PCV-1716 – OPEN (YES)</li> </ul>   |
|                |     |   |
| <b>EOP-E-1</b> | BOP | Check Power Supply to Charging Pumps – Offsite power available (NO)<br>RNO:<br>Check adequate diesel capacity to run charging pumps (108 KW each). (YES)  |
|                |     |   |
| <b>EOP-E-1</b> | RO  | Check if Charging Flow has been established: <ul style="list-style-type: none"> <li>a. Charging pumps – At least one running. (YES)</li> <li>b. Establish desired charging flow:               <ul style="list-style-type: none"> <li>o Start additional pump(s) as necessary</li> <li>o Adjust charging pump speed controllers as necessary to establish desired charging flow.</li> <li>o Adjust HIC-121 as necessary to establish desired charging flow:                   <ul style="list-style-type: none"> <li>o Maintain seal injection flow – Between 6 gpm and 20 gpm per RCP unless seal injection isolated.</li> </ul> </li> </ul> </li> </ul> |
|                |     |   |
| <b>EOP-E-1</b> | RO  | Check if SI flow should be terminated: <ul style="list-style-type: none"> <li>a. RCS subcooling base on core exit TCs – Greater than 35°F (YES)</li> <li>b. Secondary heat sink:               <ul style="list-style-type: none"> <li>o Total feed flow to intact S/Gs – At least 300 gpm (YES)</li> <li style="text-align: center;"><b>OR</b></li> <li>o Narrow range level in at least one intact S/G – Greater than 8% (YES)</li> </ul> </li> <li>c. RCS pressure:               <ul style="list-style-type: none"> <li>o Pressure – Greater than 1700 psig (YES)</li> <li>o Pressure – Stable or Rising (YES)</li> </ul> </li> </ul>                  |



|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 33 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|  |      |   |      |
|--|------|---|------|
|  |      | d. PZR level - GREATER THAN 14% [37%]   |      |
|  |      | e. Reset SPDS and Go To EPP-7, SI Termination, Step 1   |      |
|  |      |   |      |
| Begin EPP-7, SI Termination  |      |   |      |
|  |      |   |      |
| EPP-7  | CREW | Open Foldout I  |      |
|  |      |   |      |
| <div>CAUTION</div> <div>If only one SW Pump is running, it is subject to runout until the following step is completed.</div> |      |   |      |
|  |      |   |      |
| EPP-7  | BOP  | CHECK SW Header Pressure AND Transition To Steps Indicated By The Table Below:  |      |
|  |      | SW PRESSURE CONDITION   | Step |
|  |      | BETWEEN 40 PSIG AND 50 PSIG   | 5    |
|  |      |   |      |
| EPP-7  | CREW | Continuous Action Step<br>CHECK DC Busses A AND B - ENERGIZED (YES)   |      |
|  |      |   |      |
|  |      | CHECK All The Following EDG Cooling Annunciators – EXTINGUISHED (YES)<br><div>• APP-010-E2, EDG A LUBE OIL HI/LO TEMP</div> |      |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 34 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|   |     |  |
|---|-----|--|
|   |     | <ul style="list-style-type: none"> <li>APP-010-E3, EDG B LUBE OIL HI/LO TEMP</li> <li>APP-010-F2, EDG A COOL WTR HI/LO TEMP</li> <li>APP-010-F3, EDG B COOL WTR HI/LO TEMP</li> </ul>                |
|   |     |  |
| <u>CAUTION</u><br><br>A loss of DC power may occur if the DC Busses are at maximum load and the Battery Chargers are not restarted within 60 minutes of a loss of all AC power. |     |  |
|   |     |  |
| <b>EPP-7</b>  | BOP | CHECK Emergency Busses - ENERGIZED BY OFFSITE POWER (NO)   |
|   |     |  |
| <b>EPP-7</b>  | BOP | CHECK PZR Heaters - POWER AVAILABLE (NO)<br><br>RNO:<br><br>ENERGIZE 150 KW of PZR Heaters using EPP-21, Energizing Pressurizer Heaters From Emergency Busses, while continuing with this procedure. |
|   |     |  |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 35 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|       |     |  |
|-------|-----|--|
|       |     | <p>CHECK All Non-emergency AC Busses - ENERGIZED BY OFFSITE POWER (NO)</p> <p>RNO:</p> <p>PERFORM the following:</p> <p>a. VERIFY one of the following pumps are RUNNING:</p> <ul style="list-style-type: none"> <li>TURNING GEAR OIL PUMP OR</li> <li>EMERG OIL PUMP</li> </ul> <p>b. VERIFY one of the following pumps are RUNNING:</p> <ul style="list-style-type: none"> <li>SEAL OIL BACKUP PUMP OR</li> <li>AIR SIDE SEAL OIL BACKUP PUMP</li> </ul> <p>c. DETERMINE the cause of the loss of offsite power.</p> <ul style="list-style-type: none"> <li>IF due to a failure within the plant, THEN RESTORE power using OP-603, Electrical Distribution, after repairs are completed.</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>IF due to a failure of the Startup Transformer or Switchyard, THEN REQUEST Load Dispatcher notify substation maintenance crews to restore power from either the Normal or Spare Startup Transformer.</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>IF due to a loss of the grid, THEN REQUEST Load Dispatcher to restore the grid using SORMC-EOP-070, Restoration of Service Following a System Shutdown.</li> </ul> |
|       |     |  |
| EPP-7 | BOP | <p>DETERMINE If A SW Booster Pump Should Be Started:</p> <p>a. CHECK SW Booster Pumps - ALL STOPPED (NO)</p> <p>RNO:</p>   |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 36 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|              |     |   |
|--------------|-----|---|
|              |     | Go to step 11   |
|              |     |   |
| <b>EPP-7</b> | RO  | IF Offsite Power Is Lost After SI Reset, THEN Manually RESTART Safeguard Equipment  |
|              |     |   |
| <b>EPP-7</b> | RO  | RESET SAFETY INJECTION  |
|              |     |   |
| <b>EPP-7</b> | RO  | RESET CONTAINMENT ISOLATION PHASE A AND PHASE B   |
|              |     |   |
| <b>EPP-7</b> | BOP | RESET FEEDWATER ISOLATION Using ATTACHMENT 5, RESETTING FEEDWATER ISOLATION   |
|              |     |   |
| <b>EPP-7</b> | BOP | In The Computer Room, RESET The IVSW System As Follows: <ul style="list-style-type: none"> <li>• DEPRESS the IVSW RESET PCV-1922A Pushbutton in Relay Cabinet ARP-1</li> <li>• DEPRESS the IVSW RESET PCV-1922B Pushbutton in Relay Cabinet ARP-2</li> </ul>  |
|              |     |   |
| <b>EPP-7</b> | RO  | ESTABLISH Instrument Air To CV As Follows: <ol style="list-style-type: none"> <li>CHECK APP-002-F7, INSTR AIR HDR LO PRESS - EXTINGUISHED</li> <li>Momentarily PLACE IA PCV-1716, INSTRUMENT AIR ISO TO CV Switch, to RESET AND return to AUTO</li> <li>CHECK INST AIR VALVE TO CV PCV-1716 - OPEN</li> </ol> |

|                    |            |   |   |         |        |      |    |    |    |
|--------------------|------------|---|---|---------|--------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 2 | Event # | 6 - 12 | Page | 37 | of | 38 |
| Event Description: |            | <b>FRV FCV-478 fails open causing the reactor to be manually tripped. Upon the Reactor trip, S/G "B" will fault inside containment. The SUT will be lost after the trip. EDG "A" will trip 3 minutes after it starts from its oil leak. Service Water Pumps "C" and "D" will fail to automatically start. CV Spray Pump "B" will not automatically start.</b> |   |         |        |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |        |      |    |    |    |

|  |    |  |
|--|----|--|
|  |    |  |
| <b>EPP-7</b>   | RO | <p>ESTABLISH Charging Flow As Follows:</p> <p>a. CHECK Charging Pumps - ALL STOPPED (NO)</p> <p>RNO:</p> <p>Go to step 17.h</p> <p>VERIFY charging flow on FI-122A - GREATER THAN 35 GPM</p> |
|  |    |  |
| <b>EPP-7</b>   | RO | <p>VERIFY The Following:</p> <ul style="list-style-type: none"> <li>• SI PUMPS - ALL STOPPED</li> <li>• <input type="checkbox"/> RHR PUMPS - ALL STOPPED</li> </ul>                          |
|  |    |  |
| <b>The Lead Examiner may terminate the scenario anytime after SI is terminated</b> |    |  |

## **ILC-14 NRC SCENARIO 2 TURNOVER SHEET**

### **1. INITIAL CONDITIONS**

- a) Time in Core Life: EOL
- b) Reactor Power: 75%
- c) Turbine Load: 564 MWe
- d) Boron Concentration: 124ppm
- e) Rod Height: 168 CBD
- f) RCS Pressure: 2235 psig
- g) PZR Level: 44%
- h) Xenon: Equilibrium

### **2. TECHNICAL SPECIFICATION LCO ACTIONS STATEMENTS IN EFFECT**

| <u>T.S. #</u> | <u>Description</u> |
|---------------|--------------------|
|---------------|--------------------|

|       |             |
|-------|-------------|
| 3.7.7 | Condition A |
|-------|-------------|

### **3. CLEARANCES IN EFFECT**

- a) SWBP "A" OOS for seal replacement

### **4. CAUTION CAPS IN EFFECT**

- a) None

### **5. PROTECTED EQUIPMENT**

- a) None

### **6. DEGRADED EQUIPMENT**

- a) None

### **7. SWITCHYARD ACCESS**

- a) Unrestricted

### **8. PLANNED EVOLUTIONS**

- a) Reduce power to 65% to support valve testing

### **9. TURNOVER INFORMATION**

- a) None

### **10. REACTIVITY INFORMATION**

- a) Review the OST-947 BOL/MOL/EOL charts for BA and PW additions

### **11. RISK**

- a) GREEN

| Facility:   | HB ROBINSON |                                    | Scenario No.:  | 3     | Op Test No.: | <b>ILC-14</b> |
|---|-------------|------------------------------------|--|-------|--------------|---------------|
| Examiners:  | _____       |                                    | Operators:   | CRS - | _____        |               |
|   | _____       |                                    |  | RO -  | _____        |               |
|   | _____       |                                    |  | BOP - | _____        |               |
| Initial Conditions: • 100% MOL, 9000 MWD/MTU, 768 PPM Boron.  |             |                                    |  |       |              |               |
| Turnover: • Maintain power at current level.  |             |                                    |  |       |              |               |
| Critical Task: • Tripping the reactor using the left reactor trip pushbutton<br>• Isolate 'B' S/G<br>• Closing 'B' S/G PORV |             |                                    |  |       |              |               |
| Event No.   | Malf. No.   | Event Type*                        | Event Description  |       |              |               |
| 1   |             | (I) RO, CRS<br>(TS) CRS            | LT-115 fails high  |       |              |               |
| 2   |             | (I) BOP, CRS<br>(TS) CRS           | PT-447, Turbine First Stage Pressure Transmitter, fails Low                                      |       |              |               |
| 3   |             | (C) RO, CRS<br>(TS) CRS            | 'B' Charging Pump trip   |       |              |               |
| 4   |             | (C) BOP, CRS<br>(TS) CRS           | Tube leak 'B' S/G 2.0 gpm  |       |              |               |
| 5   |             | (R) RO, CRS<br>(N) BOP<br>(TS) CRS | Downpower due to Tube Leak 'B' S/G   |       |              |               |
| 6   |             | (C) BOP, CRS                       | FRV-498 fails high in automatic  |       |              |               |
| 7   |             | (C) BOP, CRS                       | Turbine Governor Valves fail closed  |       |              |               |
| 8   |             | (C) RO, CRS                        | Manual Reactor trip – First trip button does not work  |       |              |               |
| 9   |             | (M) ALL                            | 'B' S/G faulted outside Containment  |       |              |               |
| 10  |             | (M) ALL                            | Tube Rupture 'B' S/G   |       |              |               |
| 11  |             | RO                                 | Train 'A' of SI fails to auto actuate. Must perform manual actions to start and align equipment. |       |              |               |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor  |             |                                    |  |       |              |               |

**ILC-14 NRC SCENARIO 3 SUMMARY DESCRIPTION**

The crew will assume the watch with the plant at 100% RTP.

On cue from the Chief Examiner, VCT Level Transmitter LT-115 will fail high. This will cause LCV-115A to divert all letdown flow to the CVCS HUTs and will cause LC-112, VCT Level Controller, to go to full output. LT-115 edge meter on the RTGB will indicate high. This failure will result in an VCT lowering, however, with LT-115 failed high there will be no automatic makeup. With no operator action this would result in the loss of Charging Pump suction. AOP-003, Malfunction of Reactor Makeup Control, will be implemented and LCV-115A will be overridden to the VCT until the VCT level control can be restored on the alternate channel. This will require that the alternate channel (LT-112) be selected for all control functions of VCT level. Once AOP-003 actions are completed and when the Chief Examiner is satisfied with the crew actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, PT-447, Turbine First Stage Pressure Transmitter, fails low. The crew will perform the immediate actions of AOP-025, RTGB Instrument Failure, Section H, and verify S/Gs trending to 39% and place Rod Control in Manual. S/G levels will be restored to normal, alternate channel selected and feedwater regulating valves returned to automatic. Rod control will be returned to automatic once Tavg verified in the required band. PT-447 will then be removed from service in accordance with OWP-033, FSP-2. Failure of PT-447 will result in ITS Table 3.3.1-1, Item 17e, requirement to have 2 Turbine Impulse Pressure, P-7 inputs available for Reactor Protection System Interlocks to not be met. ITS LCO 3.3.1, Condition T, will be entered which requires that the P-7 interlock be verified in the required state for existing unit conditions within 1 hour OR be in Mode 3 in 7 hours. ITS Table 3.3.2-1, Items 1f, 1g, 4d, and 4e, requirement to have 2 High Steam Flow in Two Steam Lines for Safety Injection and Steam Line Isolation will not be met. ITS LCO 3.3.2, Condition D, will be entered which requires that the channel be placed in trip within 6 hours OR be in Mode 3 in 12 hours AND be in Mode 4 in 18 hours. ITS Table 3.3.6.1 Item 4 will also be reviewed and determined to be applicable due to affecting Safety Injection ESFAS Instrumentation associated with Containment Ventilation Isolation Instrumentation. Once the Chief Examiner is satisfied with the crew's actions and Tech Spec compliance, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, 'B' Charging Pump will trip. The crew will start a charging pump IAW APP-003-F5, CHG PMP MOTOR OVLD/TRIP. The CRS should reference ITS 3.4.17 and determine that the crew still has two operable charging pumps so condition 'A' does not apply. Condition 'E' for Seal injection to any RCP not within limit AND At least on charging pump OPERABLE does apply while no charging pumps were running. The crew may enter AOP-018, Reactor Coolant Pump Abnormal Conditions Section C for Loss of Seal Injection. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, 'B' S/G will develop an 2.0 gpm tube leak. The crew will enter AOP-035, S/G TUBE LEAK. The crew may first enter AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE. This procedure would direct entry to AOP-035. AOP-035 can be entered by confirmed R-24, MAIN STEAM LINE N-16 MONITORS, leakage greater than or equal to 30 gpd. This would need to be validated by other radiation monitors or sampling by chemistry as R-24 is not technically in service at this time and is only used for trending. The magnitude of the leak will be 2.0 gpm which equates to 2880 gpd. This will be seen on R-24B initially and R-15, CONDENSER AIR EJECTOR GAS will start to trend up shortly after. ITS 3.4.13 has a primary to secondary leakage limit of 75 gpd in any one S/G. IAW AOP-035 the crew will declare a



PSAL-3 event and initiate a downpower IAW AOP-038, Rapid Downpower. Be less than 50% power within 1 hour of declaring PSAL-3 and be in mode 3 within 3 hours of declaring PSAL-3. When the Chief Examiner is satisfied with the crew actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, FCV-498 will fail high in automatic. The crew will enter AOP-010, Main Feedwater/Condensate Malfunction. Operator will perform immediate actions and take FCV-498 to manual to control level. Also, the crew will stop the load change IAW immediate operator actions. They will restore level to program level band and recommence the unit downpower with FCV-498 in manual control. When the Chief Examiner is satisfied with the crew actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, The Turbine Governor valves fail closed. This will result in the crew initiating a manual reactor trip. The right trip button will not function but the left pushbutton will. Automatic reactor trip will not function if an automatic trip signal is received prior to initiation of the manual trip. On the reactor trip the 'B' S/G PORV will fail 30% open. The crew will enter EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, perform immediate operator actions and exit to EOP-ES-0.1, REACTOR TRIP RESPONSE.

At step 5 of EOP-ES-0.1 a 1000 gpm tube rupture will be initiated. The crew will return to EOP-E-0 and initiate safety injection. EOP-E-0 will direct entry to EOP-E-2, FAULTED STEAM GENERATOR ISOLATION. Step 4d checks the faulted S/G PORV closed and the RNO will direct locally isolating Instrument Air to the PORV. This will close the PORV and isolate the fault. Critical task due to impact on fission product barriers. Step 6 of EOP-E-2 will direct entry to EOP-E-3, STEAM GENERATOR TUBE RUPTURE. The crew will isolate 'B' S/G, cooldown and depressurize the RCS and terminate safety injection.

The Chief Examiner may terminate the scenario at any time after safety injection has been terminated.

| Sat /<br>Unsat | Critical Task             | Critical Task Criteria   |
|----------------|---------------------------|--|
|                | Manually trip the Reactor | Manually trip the reactor IAW EOP-E-0, prior to leaving step 1 of EOP-E-0.   |
|                | Stop feeding S/G 'B'      | Stop feeding the faulted S/G IAW EOP-E-0, prior to exiting EOP-E-0 Foldout, Step 2 AND within 10 min. of EOP-E-0 entry.      |
|                | Isolate S/G 'B'           | Isolate S/G 'B' (pathway from affected S/G to atmosphere is isolated-affected S/G MSIV closed within 30 of event initiation) |
|                | Close S/G 'B' PORV        | Close S/G 'B' PORV EOP-E-2 step 4d RNO. CT due to fission product barrier  |

**ILC-14 NRC SCENARIO 3 SIMULATOR SETUP****IC/SETUP:**

- IC-603, SCN 006\_ILC\_14\_SIM\_NRC\_3
- Status board is provided to crew is IC-13.

**PRE-LOADED EVENTS:**

The following events should occur on the reactor trip or triggered events following the reactor trip:

- Event 9: 'B' S/G faulted outside Containment
- Event 10: Tube Rupture 'B' S/G
- Event 11: Train 'A' of SI fails to auto actuate. Must perform manual actions to start and align equipment.

- 

**EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:**

- Event 1: LT-115 Fails High
- Event 2: PT-447 Fails Low
- Event 3: Charging Pump 'B' Trip
- Event 4: S/G 'B' Tube Leak
- Event 5: AOP-038 downpower
- Event 6: FRV-498 fails high in auto
- Event 7: Turbine Gov Valves fail closed
- Event 8: Rx trip. Auto trip and right pushbutton do not work

**EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:**

- AOP-003, Malfunction of Reactor Makeup Control
- AOP-025, RTGB Instrument Failure, Section H
- OWP-033, FSP-2
- APP-003-F5, CHG PMP MOTOR OVLD/TRIP
- AOP-035, S/G TUBE LEAK
- AOP-010, Main Feedwater/Condensate Malfunction
- EOP-E-0, REACTOR TRIP OR SAFETY INJECTION
- EOP-ES-0.1, REACTOR TRIP RESPONSE
- EOP-E-2, FAULTED STEAM GENERATOR ISOLATION
- EOP-E-3, STEAM GENERATOR TUBE RUPTURE

|                    |            |   |   |         |   |      |   |    |    |
|--------------------|------------|---|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                              | 3 | Event # | 1 | Page | 6 | of | 50 |
| Event Description: |            | LT-115 VCT Level Transmitter Fails High |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior         |   |         |   |      |   |    |    |

**BOOTH OPERATOR: When directed, insert Event 1, LT-115 fails high**
**EVENT INDICATIONS:**
**APP-003-E3**
**LI-115 Edge meter reads high**
**ERFIS indication for LI-115 High**
**ERFIS indication for LI-112 lowering**
**NOTE**

An oscillating level channel failure is a channel that is changing at a rate faster than the makeup system can change VCT level

|                |    |  |
|----------------|----|--|
|                |    |  |
| <b>AOP-003</b> | RO | <p>Check For Failure Of A Level Transmitter As Follows:</p> <ol style="list-style-type: none"> <li>Obtain a VCT level for LT-115 using ERFIS <ul style="list-style-type: none"> <li>PT ID CHL0115A</li> </ul> </li> <li>Obtain a VCT level for LT-112 using ERFIS <ul style="list-style-type: none"> <li>PT ID CHL0112A</li> </ul> </li> <li>Check VCT level indicators - OSCILLATING LEVEL DEVIATION OBSERVED (NO)</li> </ol> <p>Go to step 1.e</p> <ol style="list-style-type: none"> <li>Check VCT level deviation between LT-112 and LT-115 – GREATER THAN 8 INCHES (13%) (YES)</li> </ol> |
|                |    |  |
| <b>AOP-003</b> | RO | Check LT-115 – FAILED (YES)  |

|                    |            |   |   |         |   |      |   |    |    |
|--------------------|------------|---|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                              | 3 | Event # | 1 | Page | 7 | of | 50 |
| Event Description: |            | LT-115 VCT Level Transmitter Fails High |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior         |   |         |   |      |   |    |    |

|   |    |   |
|---|----|---|
|   |    |   |
| <b>CAUTION</b>  |    |   |
| With no operator action, LT-115 failed high will result in the loss of Charging Pump suction  |    |   |
|   |    |   |
| <b>Note</b>   |    |   |
| <ul style="list-style-type: none"> <li>The selection of LT-112 in the Hagan Rack will return indicated level to LI-115 on the RTGB</li> <li>The VCT Level Transmitter Selector Switch should be operated swiftly to prevent prolonged loss of level signal from both loops. Loss of both signals could cause LCV-115B to open.</li> </ul> |    |   |
|   |    |   |
| <b>Aop-003</b>  | RO | Stabilize The RCS Makeup System As Follows: <ol style="list-style-type: none"> <li>Check LT-115 - FAILED HIGH (YES)</li> <li>Place LCV-115A, VCT/HLDP TK DIV, Control Switch to VCT</li> <li>Obtain Hagan Racks Key number 10</li> <li>Place VCT Level Transmitter Selector Switch located in Hagan Rack #19, IN LT-112 POSITION</li> </ol> |
|   |    |   |
| <b>BOOTH OPERATOR: When requested swap to channel LT-112 in the Hagan room</b>  |    |   |
|   |    |   |
| <b>AOP-003</b>  | RO | e. Check LT-115 - FAILED HIGH   |
|   |    |   |
| <b>AOP-003</b>  | RO | f. Place the LCV-115A Control Switch to AUTO  |
|   |    |   |

|                    |            |   |   |         |   |      |   |    |    |
|--------------------|------------|---|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                              | 3 | Event # | 1 | Page | 8 | of | 50 |
| Event Description: |            | LT-115 VCT Level Transmitter Fails High |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior         |   |         |   |      |   |    |    |

|                |     |   |
|----------------|-----|---|
| <b>AOP-003</b> | CRS | g. Contact I&C to repair fail channel<br>Go to step 6 |
|----------------|-----|---|

|                    |            |  |   |         |   |      |   |    |    |
|--------------------|------------|--|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 2 | Page | 9 | of | 50 |
| Event Description: |            | PT-447, Turbine First Stage Pressure Transmitter Fails Low |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior                            |   |         |   |      |   |    |    |

|   |            |   |
|---|------------|---|
|   |            |   |
| <b>BOOTH OPERATOR: Insert Event #2, PT-447 Turbine First Stage Pressure Transmitter fails low, on cue from the Chief Examiner.</b>  |            |   |
| <b>EVENT INDICATIONS:</b><br><br><b>APP-003-D4</b><br><br><b>APP-005-F5</b><br><br><b>APP-006-A3</b><br><br><b>APP-006-B3</b><br><br><b>APP-006-C3</b><br><br><b>APP-006-D4</b><br><br><b>APP-006-E4</b><br><br><b>APP-006-F4</b><br><br><b>APP-006-F5</b><br><br><b>PI-447 lowering</b><br><br><b>Tref lowering</b><br><br><b>Rods stepping in</b> |            |   |
|   |            |   |
| <b>AOP-025</b>  | <b>BOP</b> | <b>Immediate Action Step</b><br><br>Check Turbine Load Reduction –<br>o IN PROGRESS (NO)<br>OR<br>o HAS OCCURRED (NO)<br><br>Go to step 3 |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 2 | Page | 10 | of | 50 |
| Event Description: |            | PT-447, Turbine First Stage Pressure Transmitter Fails Low |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                            |   |         |   |      |    |    |    |

|                |                 |   |                |                 |        |        |        |        |
|----------------|-----------------|---|----------------|-----------------|--------|--------|--------|--------|
|                |                 |   |                |                 |        |        |        |        |
| AOP-025        | BOP             | <b>Immediate Action Step</b><br>Check S/G Level Trend - CONTROLLING IN AUTO TO 39% (YES)  |                |                 |        |        |        |        |
|                |                 |   |                |                 |        |        |        |        |
| AOP-025        | RO              | <b>Immediate Action Step</b><br>Manually Control Reactor Power AND Tavg As Follows:<br>a. Place the Rod Control Selector Switch in Manual<br>b. Operate rods to maintain Reactor Power - LESS THAN 100%                           |                |                 |        |        |        |        |
|                |                 |   |                |                 |        |        |        |        |
| AOP-025        | BOP             | Make PA Announcement For Procedure Entry  |                |                 |        |        |        |        |
|                |                 |   |                |                 |        |        |        |        |
| AOP-025        | BOP             | Perform The Following:<br>a. Check S/G Level – STABILIZED AT BETWEEN 39% TO 52%<br>b. Verify All FRV Controllers In MAN (YES) <ul style="list-style-type: none"><li>FCV-478</li><li>FCV-488</li><li>FCV-498</li></ul>             |                |                 |        |        |        |        |
|                |                 |   |                |                 |        |        |        |        |
| AOP-025        | BOP             | Place The 1ST STAGE PRESSURE Selector Switch To The AlternateChannel Below: <table><tr><td>Failed Channel</td><td>Switch Position</td></tr><tr><td>PT-446</td><td>PT-447</td></tr><tr><td>PT-447</td><td>PT-446</td></tr></table> | Failed Channel | Switch Position | PT-446 | PT-447 | PT-447 | PT-446 |
| Failed Channel | Switch Position |   |                |                 |        |        |        |        |
| PT-446         | PT-447          |   |                |                 |        |        |        |        |
| PT-447         | PT-446          |   |                |                 |        |        |        |        |



|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 2 | Page | 11 | of | 50 |
| Event Description: |            | PT-447, Turbine First Stage Pressure Transmitter Fails Low |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                            |   |         |   |      |    |    |    |

|         |       |   |         |     |        |       |        |       |
|---------|-------|---|---------|-----|--------|-------|--------|-------|
|         |       |   |         |     |        |       |        |       |
| AOP-025 | BOP   | Restore Each S/G Level To Program Level Using FRVs OR Bypass Valves   |         |     |        |       |        |       |
|         |       |   |         |     |        |       |        |       |
| AOP-025 | BOP   | Restore Each S/G FRVs To Automatic As Follows:<br><br>a. Check S/G level - WITHIN +or -1% OF PROGRAMMED LEVEL (NO)<br>a. WHEN S/G level is within + or -1% of programmed level, THEN place the affected Controller in AUTO.<br><br>b. Place the affected Controller in AUTO       |         |     |        |       |        |       |
|         |       |   |         |     |        |       |        |       |
| AOP-025 | RO    | Restore Rod Control To Automatic As Follows:<br><br>a. Check Tav <sub>g</sub> - WITHIN -0.5 to +0.5°F OF Tref. (If not then)<br><br>Adjust rods to restore Tav <sub>g</sub> -0.5 to +0.5°F OF Tref. within -0.5 to +0.5°F of Tref.<br><br>b. Check AFD - WITHIN TARGET BAND (YES) |         |     |        |       |        |       |
|         |       |   |         |     |        |       |        |       |
| AOP-025 | RO    | Place the Rod Control Selector Switch in AUTO   |         |     |        |       |        |       |
|         |       |   |         |     |        |       |        |       |
| AOP-025 | BOP   | Remove The Affected Transmitter From Service Using OWP-033: <table><tr><td>Channel</td><td>OWP</td></tr><tr><td>PT-446</td><td>FSP-1</td></tr><tr><td>PT-447</td><td>FSP-2</td></tr></table>  | Channel | OWP | PT-446 | FSP-1 | PT-447 | FSP-2 |
| Channel | OWP   |   |         |     |        |       |        |       |
| PT-446  | FSP-1 |   |         |     |        |       |        |       |
| PT-447  | FSP-2 |   |         |     |        |       |        |       |
|         |       |   |         |     |        |       |        |       |
| OWP-033 | BOP   | Perform OWP-033, FSP-2 actions to remove channel from service.  |         |     |        |       |        |       |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 2 | Page | 12 | of | 50 |
| Event Description: |            | PT-447, Turbine First Stage Pressure Transmitter Fails Low |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                            |   |         |   |      |    |    |    |

  

|  |     |  |
|--|-----|--|
|  |     | <ul style="list-style-type: none"> <li>• Steam Dump Mode Selector Switch to Steam Pressure Control</li> <li>• 1<sup>st</sup> stage pressure selector switch 446/447 selected to 446</li> <li>• B/S 447-2 70% Turbine Load Limit – tripped</li> <li>• B/S 447-1 Permissive P-7 – tripped</li> <li>• B/S 475 Loop 1 Hi Stm Flow – tripped</li> <li>• B/S 485 Loop 2 Hi Stm Flow - tripped</li> <li>• B/S 495 Loop 3 Hi Stm Flow – tripped</li> <li>• AMSAC Bypass Switch POWER 2, Processor “A”</li> <li>• AMSAC Bypass Switch POWER 2, Processor “B”</li> </ul>   |
| <b>BOOTH OPERATOR: When requested apply SCN file for OWP-033</b> |     |  |
|  |     |  |
| <b>AOP-025</b>   | CRS | <p>ITS Table 3.3.1-1, Item 17e, requirement to have 2 Turbine Impulse Pressure, P-7 inputs available for Reactor Protection System Interlocks is determined not to be met.</p> <ul style="list-style-type: none"> <li>• ITS LCO 3.3.1, Condition T, will be entered which requires that the P-7 interlock be verified in the required state for existing unit conditions within 1 hour OR be in Mode 3 in 7 hours.</li> </ul> <p>ITS Table 3.3.2-1, Items 1f, 1g, 4d, and 4e, requirement to have 2 High Steam Flow in Two Steam Lines for Safety Injection and Steam Line Isolation will not be met.</p> <p>ITS LCO 3.3.2, Condition D, will be entered which requires that the channel be placed in trip within 6 hours OR be in Mode 3 in 12 hours AND be in Mode 4 in 18 hours.</p> <p>ITS Table 3.3.6.1 Item 4 will also be reviewed and determined to be applicable due to affecting Safety Injection ESFAS Instrumentation associated with Containment Ventilation Isolation Instrumentation.</p> |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 3 | Page | 13 | of | 50 |
| Event Description: |            | Charging Pump 'B' Trip          |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |    |   |
|--|----|---|
|  |    |   |
| <b>BOOTH OPERATOR: Insert Event #3, Charging Pump 'B' Trip, on cue from the Chief Examiner.</b>  |    |   |
| <b>EVENT INDICATIONS:</b><br><br><b>APP-001-B2</b><br><br><b>APP-001-B4</b><br><br><b>APP-001-B6</b><br><br><b>APP-001-D6</b><br><br><b>APP-001-E6</b><br><br><b>APP-003-F5 FR-124 Seal injection flows read zero</b><br><br><b>Charging Pump 'B' indicating light is dual</b> |    |   |
|  |    |   |
| <b>EXAMINERS NOTE: The crew may use APP-003-F5 to start another Charging Pump or they may use AOP-018. Below will be the flow path for either choice.</b>  |    |   |
|  |    |   |
| <b>APP-003</b>   | RO | <b>OBSERVATIONS</b><br><br>1. Charging Pump breaker indication<br><br>3. Monitor the following ERFIS Points for BOTH Emergency Bus Voltages. ELV3020A for E-1 and ELV3021A for E-2 (Voltage less than 440 Volts may indicate a single-phase open circuit condition) |
|  |    |   |
| <b>APP-003</b>   | RO | <b>ACTIONS</b><br><br>1. VERIFY at least one Charging Pump running supplying adequate RCP seal injection flow.<br><br>2. DISPATCH Operator to check the Charging Pump breaker(s):   |

|  |            |  |   |         |   |      |    |    |    |
|--|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:   | ILC-14 NRC | Scenario #   | 3 | Event # | 3 | Page | 14 | of | 50 |
| Event Description:   |            | Charging Pump 'B' Trip   |   |         |   |      |    |    |    |
| Time   | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |
|  |            | <p>1) "A" Charging Pump at 480V Bus DS</p> <p>2) "B" Charging Pump at 480V Bus E1</p> <p>3) "C" Charging Pump at 480V Bus E2</p> <p>3. DISPATCH Operator to check the Charging Pump(s).</p> <p>NOTE: If more than 15 minutes elapses without RCP Seal Cooling, then Seal Cooling must be isolated before starting CCW OR Charging to prevent Seal damage.</p> <p>4. IF Seal Injection is lost to any RCP, THEN REFER TO AOP-018.</p> <p>5. IF a single-phase open circuit condition is suspected THEN ENTER AOP-026, Grid Instability.</p> |   |         |   |      |    |    |    |
|  |            |  |   |         |   |      |    |    |    |
|  |            | <b>BOOTH OPERATOR: When requested to check the Charging Pump breaker and pump, wait 2 minutes and report that the pump has no abnormal indications and report that the breaker is warm to the touch and is tripped.</b>  |   |         |   |      |    |    |    |
|  |            |  |   |         |   |      |    |    |    |
| <b>AOP-018</b>   | BOP        | MAKE PA Announcement For Procedure Entry   |   |         |   |      |    |    |    |
|  |            |  |   |         |   |      |    |    |    |
| <b>NOTE</b> <ul style="list-style-type: none"> <li>The RCP malfunctions in the Table below are listed in order of priority</li> <li>This procedure is NOT applicable during implementation of EPP-1, Loss Of All AC OR any of its recovery procedures</li> </ul> |            |  |   |         |   |      |    |    |    |
|  |            |  |   |         |   |      |    |    |    |
| <b>AOP-018</b>   | RO         | EVALUATE Plant Conditions AND Go To The Appropriate Section For RCP Malfunction Not Yet Addressed:   |   |         |   |      |    |    |    |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 3 | Page | 15 | of | 50 |
| Event Description: |            | Charging Pump 'B' Trip          |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |           |   |             |         |                                   |           |                                    |           |                        |           |
|--|-----------|---|-------------|---------|-----------------------------------|-----------|------------------------------------|-----------|------------------------|-----------|
|  |           | <table><tr><td>Malfunction</td><td>Section</td></tr><tr><td>Reactor Coolant Pump Seal Failure</td><td>Section A</td></tr><tr><td>High Reactor Coolant Pmp Vibration</td><td>Section B</td></tr><tr><td>Loss of Seal Injection</td><td>Section C</td></tr></table> | Malfunction | Section | Reactor Coolant Pump Seal Failure | Section A | High Reactor Coolant Pmp Vibration | Section B | Loss of Seal Injection | Section C |
| Malfunction  | Section   |   |             |         |                                   |           |                                    |           |                        |           |
| Reactor Coolant Pump Seal Failure  | Section A |   |             |         |                                   |           |                                    |           |                        |           |
| High Reactor Coolant Pmp Vibration   | Section B |   |             |         |                                   |           |                                    |           |                        |           |
| Loss of Seal Injection   | Section C |   |             |         |                                   |           |                                    |           |                        |           |
|  |           |   |             |         |                                   |           |                                    |           |                        |           |
| AOP-018  | CRS       | Go to Section C   |             |         |                                   |           |                                    |           |                        |           |
|  |           |   |             |         |                                   |           |                                    |           |                        |           |
| AOP-018  | RO        | CHECK APP-001-D1, RCP THERM BAR COOL WTR LO FLOW alarm – ILLUMINATED (NO)<br><br>Go to step 11  |             |         |                                   |           |                                    |           |                        |           |
|  |           |   |             |         |                                   |           |                                    |           |                        |           |
| <b>NOTE</b> <ul style="list-style-type: none"><li>A rupture is a leak of sufficient magnitude to require stopping the Charging Pumps or reduces Charging Pump Discharge Pressure to less than RCS Pressure.</li><li>Charging System piping is any piping where a leak prevents the Charging Pumps from delivering flow to the Charging Line <u>OR</u> Seal Injection Line.</li></ul> |           |   |             |         |                                   |           |                                    |           |                        |           |
|  |           |   |             |         |                                   |           |                                    |           |                        |           |
| AOP-018  | RO        | DETERMINE If A Charging Pump Can Be Started:<br>a. CHECK Charging System Piping – RUPTURED (NO)<br><br>GO TO Step 12  |             |         |                                   |           |                                    |           |                        |           |
|  |           |   |             |         |                                   |           |                                    |           |                        |           |
| AOP-018  | RO        | CHECK SI - INITIATED (NO)   |             |         |                                   |           |                                    |           |                        |           |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 3 | Page | 16 | of | 50 |
| Event Description: |            | Charging Pump 'B' Trip          |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |    |  |
|----------------|----|--|
|                |    | GO TO Step 14  |
|                |    |  |
| <b>AOP-018</b> | RO | VERIFY At Least ONE Charging Pump - RUNNING  |
|                |    |  |
| <b>AOP-018</b> | RO | CHECK Seal Injection To RCPs <ul style="list-style-type: none"> <li>• ANY Seal Injection flow - LESS THAN 6 GPM (NO)</li> </ul> AND <ul style="list-style-type: none"> <li>• ANY Thermal Barrier Delta P - LESS THAN 5 inches (NO)</li> </ul> Go to step 47                                      |
|                |    |  |
| <b>AOP-018</b> | RO | ESTABLISH Charging Flow On FI-122A, CHARGING LINE FLOW GREATER THAN 35 GPM   |
|                |    |  |
| <b>AOP-018</b> | RO | CHECK Normal Letdown - IN SERVICE (YES)  |
|                |    |  |
| <b>AOP-018</b> | RO | CONTROL Charging And Letdown Flow To Maintain Pressurizer Level As Follows: <ul style="list-style-type: none"> <li>• Within <input type="checkbox"/> 5% Of Reference Level</li> </ul> OR <ul style="list-style-type: none"> <li>• o PZR level between 30% and 40% with RCP C stopped.</li> </ul> |
|                |    |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 3 | Page | 17 | of | 50 |
| Event Description: |            | Charging Pump 'B' Trip          |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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|----------------|-----|--|
| <b>AOP-018</b> | RO  | a. CHECK RCP Seal Injection - ALIGNED (YES)<br>b. CHECK RCP Seal Injection Flow - BETWEEN 8 GPM AND 13 GPM (YES)   |
|                |     |  |
| <b>AOP-018</b> | RO  | CHECK Seal Injection Flow - ESTABLISHED TO ALL RCPs (YES)  |
|                |     |  |
| <b>AOP-018</b> | CRS | ITS 3.4.17 Condition E will be entered for the time the Charging Pump was off and seal injection was less than 6 gpm. <ul style="list-style-type: none"> <li>Condition E.1 – Initiate action to restore seal injection to affected RCP(s) Immediately</li> </ul> |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 4 | Page | 18 | of | 50 |
| Event Description: |            | S/G 'B' Tube Leak (2.0 gpm)     |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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| <b>BOOTH OPERATOR: Insert Event #4, Tube leak on S/G 'B' (2.0 gpm), on cue from the Chief Examiner.</b>  |     |  |
| <b>EVENT INDICATIONS:</b><br><br><b>VCT level lowering</b><br><br><b>Charging flow rising, PZR level lowering, Auto-makeups</b><br><br><b>R-24 rising</b><br><br><b>R-15 rising</b><br><br><b>R-19B rising</b><br><br><b>RR-1 warning for R-15/19B</b> |     |  |
|  |     |  |
| <b>EXAMINERS NOTE: The crew may also enter AOP-005 for any alarming RMS channel and/or AOP-016, Excessive RCS Leakage.</b>   |     |  |
|  |     |  |
| <b>AOP-035</b>   | RO  | <b>Continuous Action Step:</b><br><br>Determine if Reactor Trip Needed as follows: (NO)<br>a. Check the following: <ul style="list-style-type: none"> <li>PZR Level – Less than 7% (NO)</li> <li><u>OR</u></li> <li>RCS Subcooling – LESS THAN 35°F (NO)</li> </ul> RNO:<br>a. <u>IF</u> PZR level can <u>NOT</u> be maintained greater than 7% <u>OR</u> Subcooling can <u>NOT</u> be maintained greater than 35°F, <u>THEN</u> trip the Reactor and Go to EOP-E-0.<br><br>Go to Step 2 |
|  |     |  |
| <b>AOP-035</b>   | BOP | Make PA Announcement For Entry into AOP-035.   |



|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 4 | Page | 19 | of | 50 |
| Event Description: |            | S/G 'B' Tube Leak (2.0 gpm)     |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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| <b>AOP-035</b> | RO  | <b>Continuous Action Step:</b><br>Check VCT Level – Less than 12.5 inches. (NO)<br>RNO:<br>IF VCT level lowers to less than 12.5 inches, then perform Step 4.<br>Go to Step 5.   |
|                |     |  |
| <b>AOP-035</b> | RO  | Check RCS Level lowering in an uncontrolled manner. (NO)<br>RNO: Go to Step 12.  |
|                |     |  |
| <b>AOP-035</b> | RO  | Control Charging Flow to Maintain Desired RCS Level  |
|                |     |  |
| <b>AOP-035</b> | RO  | <b>Continuous Action Step:</b><br>Check RCS leakage – Greater than running charging flow. (NO)<br>RNO: IF leakage exceeds Charging flow, Then go to step 6.<br>Go to Step 15.  |
|                |     |  |
| <b>AOP-035</b> | BOP | Notify Chemistry personnel to periodically sample all S/Gs for Activity and Boron concentration.   |
|                |     |  |
| <b>AOP-035</b> | BOP | Check Assistance To Open S/G Sample Valves- REQUESTED (NO)<br>RNO: <u>WHEN</u> assistance to open S/G Sample valves is requested, <u>THEN</u> observe the <u>NOTE</u> prior to Step 17 and perform Step 17.<br>Observe the <u>NOTE</u> prior to Step 18 and Go to Step 18. |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 4 | Page | 20 | of | 50 |
| Event Description: |            | S/G 'B' Tube Leak (2.0 gpm)     |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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| <b>AOP-035</b>   | BOP    | Determine Leak Rate Using At Least One Of The Following Methods: <ul style="list-style-type: none"> <li>• R-24 Recorder</li> <li>• Perform OST-051, Reactor Coolant System Leakage Evaluation</li> <li>• Perform a Charging versus Letdown balance</li> <li>• Notify Chemistry personnel to perform isotopic analysis of S/G samples for leak rate determination</li> <li>• Use R-15 to monitor for low level Primary-to-Secondary leakage using the OP-504, Condenser Air Removal section "Using R-15 to Monitor for Low Level Primary to Secondary Leakage"</li> <li>• Use CP-014 Conversion Factors to correlate R-15 to leakage</li> </ul> |
|  |        |  |
| <b>AOP-035</b>   | BOP    | Check Leak Rate Determination – Complete   |
|  |        |  |
| <b>NOTE</b> <ul style="list-style-type: none"> <li>• ITS LCO 3.4.13 provides a primary to secondary leakage limit of 75 gpd through any one S/G.</li> <li>• Total leakage is assumed to be coming from a single S/G when unable to determine leakage from the individual S/Gs.</li> <li>• Normally performed steps in GP-006-1 or AOP-038, Rapid Downpower, such as placing S/G Blowdown to the Flash Tank may require Release Permits.</li> </ul> |        |  |
|  |        |  |
| <b>AOP-035</b>   | RO/BOP | <b>Continuous Action Step:</b><br>Check Leak Rate – Greater than OR equal to 100 gpd for a single S/G. (YES, should be approximately 2880 gpd)   |
|  |        |  |
| <b>NOTE</b><br>It is important to perform GP-006-1 or AOP-038, Rapid Downpower, and AOP-035 concurrently to the extent possible in order to minimize secondary contamination.  |        |  |
|  |        |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 4 | Page | 21 | of | 50 |
| Event Description: |            | S/G 'B' Tube Leak (2.0 gpm)     |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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| <b>AOP-035</b> | RO  | Perform the following Power Reduction: <ul style="list-style-type: none"> <li>• Notify Chemistry that a PSAL-3 event has occurred.</li> <li>• Check Reactor in MODE 1 OR MODE 2. (YES)</li> <li>• Initiate Plant Shutdown to Mode 3 using GP-006-1 OR AOP-038 while continuing with this procedure.</li> <li>• Be less than 50% power within 1 hour of declaring PSAL-3.</li> <li>• Be in Mode 3 within 3 hours of declaring PSAL-3.</li> </ul>   |
|                |     |   |
| <b>AOP-035</b> | BOP | Identify Leaking S/G Using At Least One Of The Following Methods: <ul style="list-style-type: none"> <li>• Evaluate indications on R-24 Recorder</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>• Evaluate indications on RI-19A, RI-19B, and RI-19C, STM GEN BLOW DN Radiation Monitors</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>• Evaluate indications on R-31A, R-31B, and R-31C, STEAMLINE RADIATION MONITORs</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>• Chemistry analysis of S/G samples for boron and activity</li> </ul> |
|                |     |   |
| <b>AOP-035</b> | CRS | Implement the EALs  |
|                |     |   |
| <b>AOP-035</b> | CRS | Review Technical Specification LCOs<br><br>ITS 3.4.13, Condition B, Be in Mode 3 in 6 hours AND Be in Mode 5 in 36 hours.   |
|                |     |   |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 4 | Page | 22 | of | 50 |
| Event Description: |            | S/G 'B' Tube Leak (2.0 gpm)     |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

**EVALUATOR NOTE:** At the Lead Evaluator's discretion the crew can be allowed to enter and perform a portion of the Rapid Downpower. The next event may be inserted at any time once the applicable LCO has been entered and the shutdown requirement has been determined.

|   |        |   |
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| The following steps are from AOP-038, Rapid Downpower |        |   |
|   |        |   |
| <b>AOP-038</b>  | RO/BOP | NOTIFY Plant Personnel Of Procedure Entry Using The Plant Page System   |
|   |        |   |
| <b>AOP-038</b>  | RO     | DETERMINE Corrected Boration And Target Rod Height For Target Power Level Using Most Recently Performed OST-947, OPERATIONS REACTIVITY PLAN <ul style="list-style-type: none"> <li>• Target Load Reduction Rate _____ %/min</li> <li>• Target Power Level _____</li> <li>• Target Rod Height _____ Steps</li> <li>• Corrected Boration _____ Gallons</li> </ul> |
|   |        |   |
| <b>AOP-038</b>  | CRS    | PERFORM Brief Of Control Room Personnel To Include The Following: <ul style="list-style-type: none"> <li>• Reason for downpower</li> <li>• Target Power Level</li> <li>• Target Rod Height</li> <li>• Rate of load reduction</li> <li>• Amount of boric acid addition</li> </ul>  |
|   |        |   |
| <b>AOP-038</b>  | RO     | Check required Power Reduction Rate – Less than OR equal to 5%/minute. (YES)  |
|   |        |   |
| <b>AOP-038</b>  | RO     | ENERGIZE All Available PZR Heaters <ul style="list-style-type: none"> <li>• PZR HTR CONTROL GROUP</li> <li>• PZR HTR BACK-UP GROUP A</li> <li>• PZR HTR BACK-UP GROUP B</li> </ul>  |
|   |        |   |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 4 | Page | 23 | of | 50 |
| Event Description: |            | S/G 'B' Tube Leak (2.0 gpm)     |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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|--|--------|--|
| <b>AOP-038</b>   | RO     | Check Rod Control – IN AUTO (YES)  |
|  |        |  |
| <b>AOP-038</b>   | RO     | INITIATE Boration Using Attachment 1, RCS Boration, While Continuing With This Procedure   |
|  |        |  |
| <b>AOP-038</b>   | BOP    | INITIATE Turbine Load Reduction While Continuing With This Procedure <ol style="list-style-type: none"> <li>CHECK EH Turbine Control – IN OPER AUTO</li> <li>PREPARE For Turbine Load Reduction As Follows:               <ol style="list-style-type: none"> <li>CHECK IMP IN – ILLUMINATED</li> <li>SET desired load in the SETTER</li> <li>SELECT the desired Load Rate</li> </ol> </li> <li>DEPRESS the GO pushbutton to initiate Turbine Load reduction</li> </ol> |
|  |        |  |
| <b>AOP-038</b>   | BOP    | ADJUST Turbine Load To Control Tavg Within 5°F Of Tref Using One Of The Following: <ul style="list-style-type: none"> <li>ADJUST Load Rate</li> <li>OR</li> <li>DEPRESS GO and HOLD pushbuttons</li> </ul>   |
|  |        |  |
| <b>NOTE</b>  |        |  |
| Four hour NRC notification is only required if the Shutdown was required by ITS. |        |  |
|  |        |  |
| <b>AOP-038</b>   | RO/BOP | NOTIFY Plant Personnel Of Procedure Entry Using The Plant Page System  |
|  |        |  |
| <b>AOP-038</b>   | CRS    | Initiate Notification of the Rapid Downpower iaw AOP-038   |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 6 | Page | 24 | of | 50 |
| Event Description: |            | FRV-498 Fails Open              |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

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|  |            |  |
| <b>BOOTH OPERATOR: Insert Event #6, FRV-498 fails open, on cue from the Chief Examiner.</b>                                      |            |  |
| <b>EVENT INDICATIONS:</b>  |            |  |
| <b>FR-498 feedwater flow and S/G level rising</b><br><b>APP-006-C1, S/G FW &gt; STM Flow</b><br><b>APP-006-C3, S/G C LVL DEV</b> |            |  |
|  |            |  |
| <b>AOP-010</b>   | <b>BOP</b> | <b>Immediate Action Step</b><br>Check Feedwater Regulating Valves - OPERATING PROPERLY (MANUAL OR AUTO): <ul style="list-style-type: none"> <li>• FCV-478, FRV "A"</li> <li>• FCV-488, FRV "B"</li> <li>• FCV-498, FRV "C" (NO)</li> </ul> RNO<br>Perform the following: <ol style="list-style-type: none"> <li>Verify FRV for affected S/G(s) in manual control. (FCV-498 placed in manual)</li> <li>Attempt to stabilize S/G level using FRV and/or FRV Bypass Valves by matching steam flow with feed flow.</li> <li>Stop any load change in progress.</li> <li>Restore affected S/G level to between 39% and 52%.</li> </ol> |
|  |            |  |
| <b>AOP-010</b>   | <b>BOP</b> | Check Reactor Trip Setpoint - BEING APPROACHED (NO)<br>Go to step 4  |
|  |            |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 3 | Event # | 6 | Page | 25 | of | 50 |
| Event Description: |            | FRV-498 Fails Open              |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |   |
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| <b>AOP-010</b> | BOP | Make a PA announcement for procedure entry  |
|                |     |   |
| <b>AOP-010</b> | CRS | Go to the appropriate step from the table<br>Other – step 24  |
|                |     |   |
| <b>AOP-010</b> | BOP | <b>Continuous Action Step</b><br>Reduce Turbine Load At 1%/MIN To 5%/MIN To Match Feedwater Flow AND Steam Flows As Follows: (Steam and feed are matched) |
|                |     |   |
| <b>AOP-010</b> | BOP | Check S/G level – AT OR TRENDING TO PROGRAM (YES)   |
|                |     |   |
| <b>AOP-010</b> | RO  | Check Tavg – AT OR TRENDING TO Tref (YES)   |
|                |     |   |
| <b>AOP-010</b> | CRS | Contact maintenance to troubleshoot and correct the feedwater problem.  |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 26 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

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| <b>BOOTH OPERATOR: Insert Event #7, Turbine Governor Valves fail closed, on cue from the Chief Examiner.</b>   |           |  |
| <b>EVENT INDICATIONS:</b><br><br><b>Governor valve indicators lowering</b><br><br><b>Net MW's lowering</b><br><br><b>S/G levels lowering</b><br><br><b>PZR pressure rising</b><br><br><b>PZR level rising</b><br><br><b>Charging Pump speed lowering</b> |           |  |
|  |           |  |
| <b>EOP-E-0, Reactor Trip or Safety Injection</b>   |           |  |
|  |           |  |
| <b>EOP-E-0<br/>CRITICAL<br/>TASK</b>   | <b>RO</b> | <b>CRITICAL TASK</b><br><br><b>Immediate Action Steps</b><br><br>1. Check Reactor Trip: (YES) <ul style="list-style-type: none"> <li>Reactor trip and bypass breakers - OPEN</li> <li>Rod position indicators - AT ZERO</li> <li>Rod Bottom lights - ILLUMINATED</li> <li>Neutron flux - LOWERING</li> </ul> |



|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 27 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

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| <b>EOP-E-0</b>   | BOP | <b>Immediate Action Steps</b><br>Check Turbine Trip: <ol style="list-style-type: none"> <li>Both turbine stop valves - Closed (YES)</li> <li>All MSR purge and shutoff valves – Closed (YES)</li> </ol>   |
|  |     |   |
| <b>EOP-E-0</b>   | BOP | <b>Immediate Action Steps</b><br>Check Power to AC Emergency Busses: <ol style="list-style-type: none"> <li>E1 or E2 – At least one energized (YES)</li> <li>E1 and E2 – Both energized (YES)</li> </ol>  |
|  |     |   |
| <b>EXAMINERS NOTE: The crew may decide to initiate SI base on High Steam Flow Bistables being in from the OWP and Tavg lowering due to partially open S/G PORV. If they do then they will perform step B below. If they do not then they will transition to EOP-ES-0.1</b> |     |   |
|  |     |   |
| <b>EOP-E-0</b>   | RO  | <b>Immediate Action Steps</b><br>Check SI Status: <ol style="list-style-type: none"> <li>Check if SI is actuated:               <ul style="list-style-type: none"> <li>SI annunciators – ANY ILLUMINATED (NO)</li> <li>SI equipment – AUTO STARTED (NO)</li> </ul> </li> </ol> RNO<br>a. Check if SI is required: |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 28 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|   |     |  |
|---|-----|--|
|   |     | <ul style="list-style-type: none"> <li>PZR pressure less than 1715 psig</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>Containment pressure greater than 4 psig</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>Steam line <input type="checkbox"/> P bistables illuminated</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>High steam flow with low Tavg or low steam pressure bistables illuminated</li> </ul> <p>IF SI is required, THEN manually actuate BOTH trains of SI.</p> <p>IF SI is NOT required, THEN perform the following:</p> <p>1) Reset SPDS and initiate monitoring of Critical Safety Functions Status Trees.</p> <p>2) Go To EOP-ES-0.1, Reactor Trip Response, Step 1.</p> <p style="padding-left: 40px;">b) Check BOTH trains of SI – ACTUATED</p> <ul style="list-style-type: none"> <li>SI pumps – BOTH RUNNING (YES)</li> <li>RHR pumps – BOTH RUNNING (YES)</li> </ul> |
|   |     |  |
| <b>EOP-E-0</b>  | CRS | Verifies all immediate actions for EOP-E-0.  |
|   |     |  |
| <p><b>EXAMINER'S NOTE:</b> Crew may take early actions at this time to address items that did not function or operate as designed.</p> <ul style="list-style-type: none"> <li>Manually start A SI Pump</li> </ul> |     |  |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 29 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

- **Manually start A RHR Pump**
- **Manually start B SW Pump**
- **Align Phase A that did not reposition on Phase A due to SI Train A failure. (This can be done by Initiating CV isolation or manually)**

**BOOTH OPERATOR: If requested to realign Phase A valves as an AO ensure the control room has repositioned all valves that can be operated from the RTGB prior to initiating the SCN file. The SCN file will reposition all Phase A valves that did not change state.**

|                      |     |   |
|----------------------|-----|---|
|                      |     |   |
| <b>Critical Task</b> | CRS | <p>FOLDOUT for EOP-E-0 is in effect</p> <p>FAULTED S/G AFW ISOLATION CRITERIA<br/>IF both conditions listed below are met,</p> <ul style="list-style-type: none"> <li>• Any S/G pressure is lowering in an uncontrolled manner OR has completely depressurized (YES, S/G B lowering in an uncontrolled manner)</li> </ul> <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> <li>• Any S/G is NOT faulted THEN perform the following: (YES, A and C not faulted)</li> </ul> <p>a. Reset SI.</p> <p>b. Close steam driven AFW pump discharge valve for faulted S/G(s):</p> <ul style="list-style-type: none"> <li>• V2-14A (S/G A)</li> <li>• V2-14B (S/G B)</li> <li>• V2-14C (S/G C)</li> </ul> <p>c. Close AFW header discharge valve for faulted S/G(s):</p> <ul style="list-style-type: none"> <li>• V2-16A (S/G A)</li> </ul> |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 30 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|  |     |  |
|--|-----|--|
|  |     | <ul style="list-style-type: none"> <li>• V2-16B (S/G B)</li> <li>• V2-16C (S/G C)</li> <li>•</li> </ul> <p>d. Perform Attachment 2, Deenergizing AFW Valves For Faulted S/G(s).</p> <p>e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [23%] in at least one S/G.</p> |
|  |     |  |
| <b>CRITICAL TASK: Isolate AFW to faulted S/G by manual operator actions within 10 minutes of EOP-E-0 entry.</b>  |     |  |
|  |     |  |
| <b>BOOTH OPERATOR: When requested perform CAN file for Attachment 2 of EOP-E-0</b>   |     |  |
|  |     |  |
| <b>EOP-E-0</b>   | CRS | Perform Attachment 1, Auto Action Verification, While continuing with this procedure. (Should be assigned to BOP.) (Att. 1 steps are presented next followed by the remainder of EOP-E-0.)   |
|  |     |  |
| <p align="center"><b>Beginning of EOP-E-0 Attachment 1</b></p> <p align="center">(Remainder of EOP-E-0 Follows this Section)</p>                           |     |  |
|  |     |  |
| <p align="center"><u><b>CAUTION</b></u></p> <p>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.</p> |     |  |
|  |     |  |
| Att. 1   | BOP | Check ECCS Pumps Running:  |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 31 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

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|--|-----|---|
|  |     | <ul style="list-style-type: none"> <li>SI pumps - BOTH RUNNING (NO, Starts "A" SI Pump)</li> <li>RHR pumps - BOTH RUNNING (YES)</li> </ul>  |
|  |     |   |
| Att. 1   | BOP | Check ECCS Valves - PROPER EMERGENCY ALIGNMENT (NO. open SI-744B)   |
|  |     |   |
| Att. 1   | BOP | Check CCW Pumps - AT LEAST ONE RUNNING (YES)  |
|  |     |   |
| Att. 1   | BOP | Check Containment Isolation Phase A <ul style="list-style-type: none"> <li>a. Phase A – Actuated (YES)</li> <li>b. Phase A valves – Closed (NO, CVC-200A/204A, RC-550, FP-248/249/256/258, WDS-1721/22/23/28/86/87/89/&amp;94, and PCV-1922A)</li> <li>c. Excess letdown – Isolated (YES)               <ul style="list-style-type: none"> <li>• CVC-387 – Closed (YES)</li> <li>• HIC-137 – at 0% DEMAND (YES)</li> </ul> </li> <li>c. Manually close valve(s) as necessary</li> </ul> |
|  |     |   |
| <b>BOOTH OPERATOR: If requested to realign Phase A valves as an AO ensure the control room has repositioned all valves that can be operated from the RTGB prior to initiating the SCN file. The SCN file will reposition all Phase A valves that did not change state.</b> |     |   |
| <b>May not be required if the crew initiates CV Isolation using the RTGB pushbuttons</b>   |     |   |
|  |     |   |

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|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 32 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

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|--------|-----|--|
| Att. 1 | BOP | <p>Check Feedwater Isolation:</p> <ul style="list-style-type: none"> <li>a) Main feed pumps – BOTH TRIPPED (YES)</li> <li>b) Main feedwater – ISOLATED <ul style="list-style-type: none"> <li>• FRVs – Closed (YES)</li> <li>• Feedwater reg bypass valves – Closed (YES)</li> <li>• Feedwater header section valves – Closed (YES)</li> </ul> </li> </ul> |
|        |     |  |
| Att. 1 | BOP | <p>Check if Main Steamlines Should Be Isolated:</p> <ul style="list-style-type: none"> <li>a) Main steamline isolation – REQUIRED (YES, if received low Tav<sub>g</sub> Bistables due to Hi Stm Flow Bistables being in form the OWP for PT-477)</li> <li>b) Close MSIV's and MSIV Bypasses</li> </ul>   |
|        |     |  |
| Att. 1 | BOP | <p>Check Proper Service Water System Operation:</p> <ul style="list-style-type: none"> <li>a. SW pumps – All running (NO, SW Pump B did not auto start)</li> <li>b. SW booster pumps – Both running (YES) <ul style="list-style-type: none"> <li>○ Both SW header low pressure alarms (APP-008-F7/F8) – Extinguished (YES)</li> </ul> </li> </ul>          |
|        |     |  |
| Att. 1 | BOP | Check Both EDGs – Running (YES)  |
|        |     |  |
| Att. 1 | BOP | Check ECCS Flow:   |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 33 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

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|        |     | a. RCS pressure – less than 1650 psig (NO, but trending down)<br>b. SI pumps- Flow Indicated (NO)<br>c. RCS pressure – less than 275 psig. (NO)<br>d. RHR – Flow Indicated (NO)   |
|        |     |   |
| Att. 1 | BOP | Check CV Recirculation Fans – All Running (YES, all available)  |
|        |     |   |
| Att. 1 | BOP | Check IVSW - Actuated (YES) <ul style="list-style-type: none"> <li>PCV-1922A – Open (YES)</li> <li>PCV-1922B – Open (YES)</li> </ul>  |
|        |     |   |
| Att. 1 | BOP | Check CV ventilation isolation (YES) <ul style="list-style-type: none"> <li>CV ventilation isolation valves – CLOSED (YES)</li> </ul>   |
|        |     |   |
| Att. 1 | BOP | Check control room ventilation - aligned for pressurization mode (YES) <ul style="list-style-type: none"> <li>HVA-1A or HVA-1B – Running (YES)</li> <li>HVE-16 – Stopped (YES)</li> <li>HVE-19A or HVE-19B – Running (NO, starts HVE-19A or HVE-19B)</li> <li>Control Room HVAC outside air damper A or B – Open (YES)</li> <li>CR-D1A-SA – Closed (YES)</li> </ul> |

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|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 34 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|        |     |   |
|--------|-----|---|
|        |     | <ul style="list-style-type: none"> <li>CR-D1B-SB – Closed (YES)</li> </ul>  |
|        |     |   |
| Att. 1 | BOP | Check DS Bus – Energized (YES)  |
|        |     |   |
| Att. 1 | BOP | Check Battery Chargers – Energized (YES)<br>APP-036-D1 – Extinguished (YES)<br>APP-036-D2 – Extinguished (YES)  |
|        |     |   |
| Att. 1 | BOP | Stop R-11/12 Sample Pump  |
|        |     |   |
| Att. 1 | BOP | Locally Reset and Load IACs as necessary (N/A)  |
|        |     |   |
| Att. 1 | BOP | Perform Crew Update to include the following: <ul style="list-style-type: none"> <li>Attachment Completion</li> <li>Manual Actions Taken (<b>Started “A SI Pump, “B” RHR PUMP, “B” SW Pump. Aligned Phase A valves – CVC-200A/204A, RC-550, FP-248/249/256/258, WDS-1721/22/23/28/86/87/89/&amp;94, and PCV-1922A), and opened SI-744A</b></li> <li>Failed Equipment status</li> <li>SW status</li> </ul> |
|        |     |   |



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|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 35 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

| End of EOP-E-0 Attachment 1 |    |  |
|-----------------------------|----|--|
|                             |    |  |
| Continuation of EOP-E-0     |    |  |
|                             |    |  |
| <b>EOP-E-0</b>              | RO | Check AFW Pumps – Running (MDAFW Pumps are running)<br><br>b. S/G levels – 2 less than 16 % (May be less than at this point, however, the SDAFW Pump is running )  |
|                             |    |  |
| <b>EOP-E-0</b>              | RO | Check AFW Valves – Proper Emergency Alignment (YES) <ul style="list-style-type: none"> <li>• AFW header discharge valves – Full Open (YES)</li> <li>• AFW header section valves – Full Open (YES)</li> <li>• Steam driven AFW pump discharge valves – Full open if pump is running. (YES)</li> </ul> |
|                             |    |  |
| <b>EOP-E-0</b>              | RO | Check Total AFW Flow: <ul style="list-style-type: none"> <li>• Reset SI</li> <li>• Control feed flow to maintain NON-faulted S/Gs narrow range level – Between 8% and 50%.</li> <li>• Check total AFW flow- Greater than 300 gpm (YES)</li> </ul>  |
|                             |    |  |
| <b>EOP-E-0</b>              | RO | Check CV Spray NOT Required: <ul style="list-style-type: none"> <li>a. CV pressure – Has remained less than 10 psig. (YES)</li> </ul>  |

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|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 36 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|                |    |  |
|----------------|----|--|
|                |    | b. CV Spray – NOT actuated (YES)   |
|                |    |  |
| <b>EOP-E-0</b> | RO | <p>Check RCP Seal Cooling:</p> <ul style="list-style-type: none"> <li>CCW flow to RCP thermal barriers – Normal (YES) <ul style="list-style-type: none"> <li>APP-001-C1 / D1 – Extinguished (YES)</li> </ul> </li> <li>OR</li> <li>Seal injection flow – Normal (YES) <ul style="list-style-type: none"> <li>Seal injection flow – Greater than 6 gpm per RCP</li> </ul> </li> <li>OR</li> <li>Thermal barrier <math>\Delta</math>Ps – Greater than 5 inches water.</li> </ul>   |
|                |    |  |
| <b>EOP-E-0</b> | RO | <p>Check RCS Temperature</p> <p>With NO RCPs running, RCS cold leg temperatures – Stable at or trending to 547°F (NO)</p> <p>RNO: IF temperature is less than 547°F AND lowering then perform the following: (YES)</p> <ol style="list-style-type: none"> <li>Stop dumping steam</li> <li>IF cooldown continues, THEN reduce total feed flow to minimum for decay heat removal: <ul style="list-style-type: none"> <li>Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% in at least one S/G.</li> </ul> </li> <li>IF cooldown continues, THEN close MSIVs and MSIV</li> </ol> |

|                    |                   |  |          |         |             |      |           |    |           |
|--------------------|-------------------|--|----------|---------|-------------|------|-----------|----|-----------|
| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #   | <u>3</u> | Event # | <u>7-11</u> | Page | <u>37</u> | of | <u>50</u> |
| Event Description: |                   | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |          |         |             |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior  |          |         |             |      |           |    |           |

|                |     |  |
|----------------|-----|--|
|                |     | bypass valves. (MSIVs automatically closed due to Large Break LOCA)  |
|                |     |  |
| <b>EOP-E-0</b> | RO  | Check PZR PORVs and Spray Valves: <ol style="list-style-type: none"> <li>a. PORVs – Closed (YES)</li> <li>b. Normal PZR spray valves – Closed (YES)</li> <li>c. Aux spray valve – Closed (YES)</li> </ol>  |
|                |     |  |
| <b>EOP-E-0</b> | RO  | Check If RCPs should be stopped: <ol style="list-style-type: none"> <li>a. RCPs – Any Running (YES)</li> <li>b. SI pumps – at least one running and capable of delivering flow (YES)</li> <li>c. RCS subcooling based on core exit TCs – less than 30°F (50°F) (NO)</li> </ol> RNO: Go to Step 14  |
|                |     |  |
| <b>EOP-E-0</b> | BOP | Step 14: Check if S/G Secondary Pressure Boundaries are Intact: <ol style="list-style-type: none"> <li>a. Check pressures in all S/Gs               <ul style="list-style-type: none"> <li>• None lowering in an uncontrolled manner (NO)</li> <li>• None Completely depressurized (YES)</li> </ul> </li> </ol> RNO:<br><br>Reset SPDS and initiate monitoring of CSFSTs. Go to EOP-E-2, Faulted Steam Generator Isolation step 1. |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 38 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|   |     |   |
|---|-----|---|
|   |     |   |
| <b>Beginning of EOP-E-2</b>   |     |   |
|   |     |   |
| <b>CAUTION</b>  |     |   |
| <ul style="list-style-type: none"> <li>At least one S/g must be maintained available for RCS cooldown.</li> <li>Any faulted S/G or secondary break should remain isolated during</li> </ul> |     |   |
|   |     |   |
| <b>EOP-E-2</b>  | BOP | Check MSIVs and MSIV Bypass Valves for Faulted S/G – Closed <ul style="list-style-type: none"> <li>S/G C:               <ul style="list-style-type: none"> <li>V1-3B</li> <li>MS-353B</li> </ul> </li> </ul>  |
|   |     |   |
| <b>EOP-E-2</b>  | BOP | Check if any S/G Secondary Pressure Boundary is Intact: <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs – Any stable or rising. (YES)</li> </ul>  |
|   |     |   |
| <b>EOP-E-2</b>  | BOP | Identify Faulted S/Gs: <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs:               <ul style="list-style-type: none"> <li>Any S/G pressure lowering in an uncontrolled manner (YES, "B" S/G)</li> </ul> </li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>Any S/G completely depressurized</li> </ul> |
|   |     |   |
| <b>CAUTION</b>  |     |   |
| <ul style="list-style-type: none"> <li>If the SDAFW pump is the only available source of feed flow, steam supply to the SDAFW pump should be maintained from at least one S/G.</li> </ul>   |     |   |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 39 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

- If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

|                                  |            |  |
|----------------------------------|------------|--|
|                                  |            |  |
| <b>EOP-E-2<br/>Critical Task</b> | <b>BOP</b> | <p>Isolate Faulted S/G(s):</p> <p>a. Check main feedwater to faulted S/G(s) – ISOLATED (YES)</p> <ul style="list-style-type: none"> <li>S/G B valves - CLOSED: <ul style="list-style-type: none"> <li>FCV-488, feedwater reg valve</li> <li>FCV-489, feedwater reg bypass valve</li> <li>V2-6B, feedwater header section valve</li> </ul> </li> </ul> <p>b. Reset SI</p> <p>c. Isolate AFW flow to faulted S/G(s):</p> <ul style="list-style-type: none"> <li>Close steam driven AFW pump discharge valve: <ul style="list-style-type: none"> <li>V2-14B (S/G B)</li> </ul> </li> <li>Close AFW header discharge valve: <ul style="list-style-type: none"> <li>V2-16B (S/G B)</li> </ul> </li> </ul> <p>d. Check faulted S/G(s) steam line PORV – CLOSED (NO)</p> <ul style="list-style-type: none"> <li>RV1-2 (S/G B)</li> </ul> <p>RNO:</p> <p>d. Manually close PORV by adjusting pot to 0.0. (NO)</p> <p>IF affected PORV(s) can NOT be closed, THEN close BOTH instrument air isolation valves for the affected controller(s):<br/>(Secondary Control Panel behind PIC)</p> |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 40 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

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|--|--|--|
|  |  | <ul style="list-style-type: none"> <li>• PIC-487 (S/G B):             <ul style="list-style-type: none"> <li>▪ IA-3271, IA TO PIC-487 UPPER I/P</li> <li>▪ IA-3272, IA TO PIC-487 LOWER I/P</li> </ul> </li> <li>e. Close steam driven AFW pump steam shutoff valve for faulted S/G(s):             <ul style="list-style-type: none"> <li>• V1-8B (S/G B)</li> </ul> </li> <li>f. Perform Attachment 1, Deenergizing AFW Valves For Faulted S/G(s)</li> <li>g. Locally close the following valve for faulted S/G(s) as necessary while continuing with this procedure:             <ul style="list-style-type: none"> <li>• S/G B:             <ul style="list-style-type: none"> <li>• MS-29, SG "B" BYPASS DRN &amp; WARM-UP LINE TO AFW PUMP (pipe jungle above/right of V1-8B)</li> </ul> </li> </ul> </li> <li>h. Check S/G blowdown and blowdown sample valves from faulted S/G(s) – CLOSED             <ul style="list-style-type: none"> <li>• S/G B:             <ul style="list-style-type: none"> <li>• SG2 BLOWDOWN FCV-1931 A &amp; B FCV-1934 A &amp; B SHUT</li> </ul> </li> </ul> </li> </ul> |
|  |  |  |
| <b>BOOTH OPERATOR: When requested to close IA-3271 and IA-3272, acknowledge report. After 5 minutes report the valves closed and the PORV is closed.</b> |  |  |
|  |  |  |
| <b>CRITICAL TASK – Close S/G 'B' PORV. Critical due to EAL's for Loss of Containment. No longer lost.</b>  |  |  |
|  |  |  |
|  |  |  |
| <b>BOOTH OPERATOR: When requested open the breaker for V1-8B, V2-16B and V2-14B</b>  |  |  |

|                    |            |  |   |         |      |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 41 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

**IAW the SCN file after 4 minutes. Breakers for V2-16B and V2-14B may have been previously opened IAW EOP-E-0, Att. 2.**

**BOOTH OPERATOR: When requested close MS-29 IAW the SCN file after 4 minutes.**

**CRITICAL TASK – ISOLATE FAULTED “B” STEAM GENERATOR**

|                |     |  |
|----------------|-----|--|
| <b>EOP-E-2</b> | BOP | Check CST level greater than 10% (YES) |
|----------------|-----|--|

|                |     |   |
|----------------|-----|---|
| <b>EOP-E-2</b> | BOP | <p>Check Secondary Radiation:</p> <ul style="list-style-type: none"> <li>a. Request periodic activity samples of all S/Gs</li> <li>b. Unisolated secondary radiation monitors – Have remained normal (NO) <ul style="list-style-type: none"> <li>• R-15, R-19s, R-31s</li> </ul> </li> <li>c. Secondary sample results – Normal (When results available.)</li> </ul> <p>. Reset SPDS and Go To EOP-E-3, Steam Generator Tube Rupture, Step 1.</p> |
|----------------|-----|---|

**BEGINNING OF EOP-E-3**

**NOTE**

- FOLDOUT for EOP-E-3 is in effect.

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 42 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

- Chemistry should be available for sampling during this procedure.
- Step 1 RCP trip criteria applies until an operator controlled RCS cooldown is initiated.

|   |     |   |
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|   |     |   |
| <b>EOP-E-3</b>  | RO  | <p><b>CONTINUOUS ACTION STEP</b></p> <p>Check If RCPs Should Be Stopped:</p> <ul style="list-style-type: none"> <li>a. RCPs - ANY RUNNING (YES)</li> <li>b. SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW (YES)</li> <li>c. RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F] (NO)</li> </ul> <p>RNO: Go to Step 2</p>   |
|   |     |   |
| <b>EOP-E-3</b>  | BOP | <p>Identify Ruptured S/G(s): ("B" S/G is ruptured)</p> <ul style="list-style-type: none"> <li>• Unexpected rise in any S/G narrow range level<br/><u>OR</u></li> <li>• High radiation from any SG steamline (R-31s)<br/><u>OR</u></li> <li>• High radiation from any SG blowdown line (R-19s)<br/><u>OR</u></li> <li>• High radiation from any S/G sample: <ul style="list-style-type: none"> <li>• Contact Chemistry to sample all S/Gs for activity as necessary</li> </ul> </li> </ul> |
|   |     |   |
| <b>CAUTION</b>  |     |   |
| <ul style="list-style-type: none"> <li>• If the steam driven AFW pump is the only available source of feed flow, steam supply to</li> </ul> |     |   |



|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 43 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

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|--|-----|--|
| the steam driven AFW pump should be maintained from at least one S/G.  |     |  |
| <ul style="list-style-type: none"> <li>At least one S/G must be maintained available for RCS cooldown.</li> </ul>  |     |  |
|  |     |  |
| EOP-E-3  | BOP | <p>Isolate Flow From Ruptured S/G(s):</p> <ol style="list-style-type: none"> <li>Adjust ruptured S/G(s) steam line PORV controller setpoint to 1060 psig</li> <li>Check ruptured S/G steam line PORV – (RV1-2) CLOSED (YES)</li> <li>Close steam driven AFW pump steam shutoff valve for ruptured S/G: (V1-8B)</li> <li>Locally close the following valve for ruptured S/G(s) while continuing with this procedure: <ul style="list-style-type: none"> <li>MS-29, SG "B" BYPASS DRN &amp; WARM-UP LINE TO AFW PUMP (pipe jungle above/right of V1-8B)</li> </ul> </li> <li>Check S/G blow down and blow down sample valves from ruptured S/G(s) – Closed <ul style="list-style-type: none"> <li>SG2 Blowdown<br/>FCV-1931 A &amp; B<br/>FCV-1935 A &amp; B SHUT</li> </ul> </li> <li>Check MSIV above and below seat drain valves for ruptured S/G – CLOSED (YES)</li> <li>Close ruptured S/G MSIV and MSIV bypass valve – V1-3B and MS-353B.</li> </ol> |
|  |     |  |
| <b>BOOTH OPERATOR: When requested, wait 3 minutes and then close MS-29 IAW SCN file.</b>   |     |  |
|  |     |  |
| <p style="text-align: center;"><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>If any ruptured S/G is faulted, feed flow to that S/G should remain isolated during subsequent recovery actions unless needed for RCS cooldown.</li> <li>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.</li> </ul> |     |  |
|  |     |  |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 44 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|  |            |   |
|--|------------|---|
| <b>EOP-E-3</b>   | <b>BOP</b> | <b>Continuous Action Step</b><br><br>Check Ruptured S/G Level: <ul style="list-style-type: none"> <li>a. Narrow range level – Greater than 8%. (YES)</li> <li>b. Reset SI</li> <li>c. Stop feed flow to ruptured S/G:               <ul style="list-style-type: none"> <li>• Close steam driven AFW pump discharge valve: V2-14B</li> <li>• Close AFW header discharge valve: V2-16B</li> </ul> </li> <li>d. Perform Att. 4, Deenergizing AFW Valves For Ruptured S/Gs</li> </ul> |
|  |            |   |
| <b>BOOTH OPERATOR:</b> When requested, wait 3 minutes and then open the breakers for AFW valves as specified in Att. 4 IAW the SCN file.   |            |   |
|  |            |   |
| <b>CRITICAL TASK – ISOLATE S/G “B” PRIOR TO S/G OVERFILL</b>   |            |   |
|  |            |   |
| <b>CAUTION</b><br>Major steam flow paths from the ruptured S/G(s) should be isolated before initiating RCS cooldown. This includes MSIVs and MSIV bypass valves, steam line PORV, and AFW pump steam shutoff valve.            |            |   |
|  |            |   |
| <b>EOP-E-3</b>   | <b>BOP</b> | Check Ruptured S/G Pressure – Greater than 500 psig. (YES)  |
|  |            |   |
| <b>CAUTION</b><br>IF RCPs are not running, the following steps may cause a false CSF-4, Integrity Status Tree, indication for the ruptured loop. Disregard the ruptured loop T-cold indication until after performing Step 28. |            |   |
|  |            |   |
| <b>NOTE</b><br>Main steamline isolation may occur if the high steam flow setpoint is exceeded. The cooldown should be continued using the steam line PORV(s) if MSIV closure occurs.   |            |   |

|                    |            |  |   |         |      |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 45 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

| EOP-E-3  | BOP       | Initiate RCS Cooldown:<br>a. Determine required core exit temperature:   |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|--|-----------|--|-------------------------------------|-------------------------------------|----------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|
|  |           | <table><tr><th>Ruptured SG Pressure (PSIG)</th><th>Required Core Exit Temperature (°F)</th></tr><tr><td>1150 and above</td><td>508 [488]</td></tr><tr><td>1100 to 1149</td><td>503 [483]</td></tr><tr><td>1050 to 1099</td><td>497 [477]</td></tr><tr><td>1000 to 1049</td><td>491 [471]</td></tr><tr><td>950 to 999</td><td>485 [465]</td></tr><tr><td>900 to 949</td><td>478 [458]</td></tr><tr><td>850 to 899</td><td>472 [452]</td></tr><tr><td>800 to 849</td><td>465 [445]</td></tr><tr><td>750 to 799</td><td>458 [438]</td></tr><tr><td>700 to 749</td><td>450 [430]</td></tr><tr><td>650 to 699</td><td>442 [422]</td></tr><tr><td>600 to 649</td><td>433 [413]</td></tr><tr><td>550 to 599</td><td>424 [404]</td></tr><tr><td>500 to 549</td><td>415 [395]</td></tr></table> | Ruptured SG Pressure (PSIG)         | Required Core Exit Temperature (°F) | 1150 and above | 508 [488] | 1100 to 1149 | 503 [483] | 1050 to 1099 | 497 [477] | 1000 to 1049 | 491 [471] | 950 to 999 | 485 [465] | 900 to 949 | 478 [458] | 850 to 899 | 472 [452] | 800 to 849 | 465 [445] | 750 to 799 | 458 [438] | 700 to 749 | 450 [430] | 650 to 699 | 442 [422] | 600 to 649 | 433 [413] | 550 to 599 | 424 [404] | 500 to 549 | 415 [395] |
|  |           | Ruptured SG Pressure (PSIG)  | Required Core Exit Temperature (°F) |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 1150 and above   | 508 [488]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 1100 to 1149   | 503 [483]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 1050 to 1099   | 497 [477]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 1000 to 1049   | 491 [471]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 950 to 999   | 485 [465]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 900 to 949   | 478 [458]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 850 to 899   | 472 [452]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 800 to 849   | 465 [445]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 750 to 799   | 458 [438]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           | 700 to 749   | 450 [430]                           |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| 650 to 699   | 442 [422] |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| 600 to 649   | 433 [413] |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| 550 to 599   | 424 [404] |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| 500 to 549   | 415 [395] |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| b. Dump steam to condenser from intact S/G(s) at maximum rate:<br>maximum rate from intact<br>1) Check condenser - AVAILABLE FROM INTACT S/G(s)<br>(NO)<br><br>RNO: Manually dump steam at maximum rate from intact S/G<br>using steam line PORVs. |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| c. Core exit TCs – Less Than Required Temperature  |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| d. Stop RCS cooldown   |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| e. Maintain core exit TCs – LESS THAN REQUIRED<br>TEMPERATURE  |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
|  |           |  |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |
| EOP-E-3  | BOP       | Continuous Action Step   |                                     |                                     |                |           |              |           |              |           |              |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |            |           |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 46 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|  |    |   |
|--|----|---|
|  |    | <b>Check Intact S/G Levels</b> <ol style="list-style-type: none"> <li>Narrow range levels – Greater than 8% (YES)</li> <li>Control feed flow to maintain narrow range levels – BETWEEN 21% and 50%.</li> </ol>                            |
|  |    |   |
| <p style="text-align: center;"><b>CAUTION</b></p> <p>If any PZR PORV opens because of high PZR pressure, Step 8.b should be repeated after pressure lowers to less than 2335 psig.</p> |    |   |
|  |    |   |
| <b>EOP-E-3</b>   | RO | <b>Continuous Action Step</b><br>Check PZR PORVs And Block Valves: <ol style="list-style-type: none"> <li>Power to block valves – AVAILABLE (YES)</li> <li>PORVs – CLOSED (YES)</li> <li>Block valves – AT LEAST ON OPEN (YES)</li> </ol> |
|  |    |   |
| <p style="text-align: center;"><b>CAUTION</b></p> <p>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.</p>                       |    |   |
|  |    |   |
| <b>EOP-E-3</b>   | RO | Reset SI  |
|  |    |   |
| <b>EOP-E-3</b>   | RO | Reset Containment Isolation Phase A   |
|  |    |   |
| <b>EOP-E-3</b>   | RO | Establish Instrument Air To CV: <ol style="list-style-type: none"> <li>Check APP-002-F7 – EXTINGUISHED (YES)</li> <li>Reset IA PCV-1716, instrument air isolation to CV</li> <li>Check IA PCV-1716 – OPEN (YES)</li> </ol>                |
|  |    |   |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 47 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|   |        |   |
|---|--------|---|
| <b>CAUTION</b>  |        |   |
| If RCS pressure lowers in an uncontrolled manner to less than 275 psig [350 psig], the RHR pumps must be manually restarted to supply water to the RCS. |        |   |
|   |        |   |
| <b>EOP-E-3</b>  | RO     | Check If RHR Pumps Should Be Stopped:<br>a. RCS pressure - GREATER THAN 275 PSIG [350 PSIG] (YES)<br>b. Stop RHR pumps<br>c. Monitor RCS pressure   |
|   |        |   |
| <b>EOP-E-3</b>  | RO     | Establish Charging Flow:<br>a. Charging pumps- AT LEAST ONE RUNNING (YES)<br>b. Align charging pump suction to RWST <ol style="list-style-type: none"> <li>1) Open LCV-115B</li> <li>2) Close LCV-115C</li> <li>3) Place RCS makeup system switch to STOP</li> </ol> c. Establish charging flow: <ul style="list-style-type: none"> <li>• Start charging pump(s) as necessary to establish at least one running</li> <li>• Adjust charging pump speed controllers as necessary to establish maximum charging flow for running pump(s)</li> <li>• Adjust HIC-121, charging flow control valve, as necessary to establish desired charging flow:               <ul style="list-style-type: none"> <li>○ Maintain seal injection flow - BETWEEN 6 GPM AND 20 GPM PER RCP UNLESS SEAL INJECTION ISOLATED</li> </ul> </li> </ul> |
|   |        |   |
| <b>EOP-E-3</b>  | RO/BOP | Check If RCS Cooldown Should Be Stopped:<br>a. Check core exit TCs - LESS THAN REQUIRED TEMPERATURE FROM STEP 6 (YES)<br>b. Stop RCS cooldown<br>c. Maintain core exit TCs – LESS THAN REQUIRED TEMPERATURE   |
|   |        |   |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 48 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|   |     |  |
|---|-----|--|
| <b>EOP-E-3</b>  | BOP | Check Ruptured S/G Pressure – Stable or Rising (YES)   |
|   |     |  |
| <b>EOP-E-3</b>  | RO  | Check RCS Subcooling Based on Core Exit TCs – Greater than 55°F (YES)  |
|   |     |  |
| <b>EOP-E-3</b>  | RO  | <p>Depressurize RCS to Minimize Break Flow and Refill the PZR:</p> <ul style="list-style-type: none"> <li>a. Normal PZR spray – AVAILABLE (YES)</li> <li>b. Spray PZR with maximum available spray until any of the following conditions are satisfied: <ul style="list-style-type: none"> <li>• Both of the following: <ul style="list-style-type: none"> <li>1) RCS pressure – LESS THAN RUPTURED S/G PRESSURE</li> <li>2) PZR level – GREATER THAN 14%<br/><u>OR</u></li> </ul> </li> <li>• PZR level – GREATER THAN 73%<br/><u>OR</u></li> <li>• RCS subcooling based on core exit TCs – LESS THAN 35°F</li> </ul> </li> <li>c. Close spray valves when any condition above is satisfied</li> <li>d. Observe CAUTION prior to Step 20 and Go to Step 20</li> </ul> |
|   |     |  |
| <b>CAUTION</b>  |     |  |
| SI must be terminated when termination criteria are satisfied to prevent overfilling the ruptured S/G(s). |     |  |
|   |     |  |

|                    |            |  |   |         |      |      |    |    |    |
|--------------------|------------|--|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 3 | Event # | 7-11 | Page | 49 | of | 50 |
| Event Description: |            | Turbine Governor Valves Fail Closed Resulting in a Reactor Trip, Right Reactor Trip Pushbutton does not work. S/G 'B' Faults Outside of CV (PORV fails 30% open), Tube Rupture on S/G 'B', and Train 'A' SI Fails to Auto Actuate. |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |      |      |    |    |    |

|  |    |   |
|--|----|---|
| EOP-E-3  | RO | Check if SI Flow Should be Terminated: <ul style="list-style-type: none"> <li>a. RCS subcooling based on core exit TCs – GREATER THAN 35°F (YES)</li> <li>b. Secondary heat sink:               <ul style="list-style-type: none"> <li>• Total feed flow to S/Gs – AT LEAST 300 GPM AVAILABLE (YES)</li> <li style="text-align: center;"><u>OR</u></li> <li>• Narrow range level in at least one intact S/G – GREATER THAN 8% (YES)</li> </ul> </li> <li>c. RCS pressure – STABLE OR RISING (YES)</li> <li>d. PZR level – GREATER THAN 14% (YES)</li> </ul> |
|  |    |   |
| EOP-E-3  | RO | Stop Both SI Pumps  |
|  |    |   |
| <b>The Lead Examiner may terminate the scenario anytime after the SI pumps have been secured IAW EOP-E-3</b> |    |   |

### **ILC-14 NRC SCENARIO 3 TURNOVER SHEET**

**1. INITIAL CONDITIONS**

- a) Time in Core Life: MOL
- b) Reactor Power: 100%
- c) Turbine Load: 749 MWe
- d) Boron Concentration: 768 ppm
- e) Rod Height: 218 CBD
- f) RCS Pressure: 2235 psig
- g) PZR Level: 53%
- h) Xenon: Equilibrium

**2. TECHNICAL SPECIFICATION LCO ACTIONS STATEMENTS IN EFFECT**

| <u>T.S. #</u> | <u>Description</u> |
|---------------|--------------------|
|---------------|--------------------|

**3. CLEARANCES IN EFFECT**

- a) None

**4. CAUTION CAPS IN EFFECT**

- a) None

**5. PROTECTED EQUIPMENT**

- a) None

**6. DEGRADED EQUIPMENT**

- a) None

**7. SWITCHYARD ACCESS**

- a) Unrestricted

**8. PLANNED EVOLUTIONS**

- a) Maintain current power level

**9. TURNOVER INFORMATION**

- a) None

**10. REACTIVITY INFORMATION**

- a) Review the OST-947 BOL/MOL/EOL charts for BA and PW additions

**11. RISK**

- a) GREEN



| Facility:  | HB ROBINSON   |                          | Scenario No.:   | 4           | Op Test No.: | <b>ILC-14</b> |
|--|---|--------------------------|---|-------------|--------------|---------------|
| Examiners:   | _____   |                          | Operators:  | CRS - _____ |              |               |
|  | _____   |                          |   | RO - _____  |              |               |
|  | _____   |                          |   | BOP - _____ |              |               |
| Initial Conditions:  | <ul style="list-style-type: none"> <li>68% RTP EOL, 17400 MWD/MTU, 128 ppm Boron</li> </ul>   |                          |   |             |              |               |
| Turnover:  | <ul style="list-style-type: none"> <li>Maintain current power level</li> </ul>  |                          |   |             |              |               |
| Critical Task:   | <ul style="list-style-type: none"> <li>Tripping the turbine after the ATWS</li> <li>Inserting Control Rods during the ATWS</li> <li>Emergency Borating during the ATWS</li> <li>Isolate CV Phase A valves FP-248/249/256/258</li> <li>Isolate CV Phase B valve CVC-381</li> </ul> |                          |   |             |              |               |
| Event No.  | Malf. No.   | Event Type*              | Event Description   |             |              |               |
| 1  |   | (I) RO, CRS<br>(TS) CRS  | Loop 1 Thot fails Low                                     |             |              |               |
| 2  |   | (C) BOP, CRS<br>(TS) CRS | 'C' S/G PORV fails open                                   |             |              |               |
| 3  |   | (I) RO, CRS              | PC-444J has a pressure shift down                         |             |              |               |
| 4  |   | (C) BOP, CRS             | Main Feedwater Pump "B" trip                              |             |              |               |
| 5  |   | (R) RO, CRS<br>(N) BOP   | Load reduction to <60% RTP                                |             |              |               |
| 6  |   | (C) RO, CRS<br>(TS) CRS  | RCS leak inside Containment                               |             |              |               |
| 7  |   | (C) RO, CRS              | CCW Leak  |             |              |               |
| 8  |   | (M) ALL                  | Reactor does not trip(ATWS)                               |             |              |               |
| 9  |   | (M) ALL                  | LBLOCA  |             |              |               |
| 10   |   | BOP                      | Phase A valves FP-248/249/256/ and 258 fail to auto close |             |              |               |
| 11   |   | BOP                      | Phase B valve CVC-381 fails to auto close                 |             |              |               |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor |   |                          |   |             |              |               |

**ILC-14 NRC SCENARIO 4 SUMMARY DESCRIPTION**

The crew will assume the watch with the plant at 68% power. Maintaining current power level.

On cue from the Chief Examiner, Loop 1 Thot will fail low. The OAC will be alerted to this failure by APP-003-A4 alarming. The crew will respond IAW APP-003-A4 and remove the instrument from service using OWP-028, TDeltaT1. The CRS will enter LCO 3.3.1-1 items 5 & 6, Condition E for the failed instrument. Place channel in trip within 6 hours OR be in Mode 3 within 12 hours. LCO 3.3.2-1 Items 1.f, 4.d, Condition D. Place channel in trip within 6 hours OR be in Mode 3 within 12 hours AND be in Mode 4 within 18 hours. LCO 3.3.2-1 item 6b, Condition H. Verify interlock is in required stat for existing unit condition within 1 hour OR be in Mode 3 within 7 hours AND be in Mode 4 within 13 hours. LCO 3.3.6-1 Item 4. This Item refers to LCO 3.3.2. "ESFAS Instrumentation," Functions 1.a- f, for all initiation functions and requirements. Reference LCO 3.4.2 RCS Minimum temperature for Criticality. Crew determines all loop Tavg temperatures are greater than 530° F. When the Chief Examiner is satisfied with the crew actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, 'C' S/G PORV will fail open. The crew will enter AOP-025 Section I. The BOP will close the PORV by adjusting the controller potentiometer towards 0% demand (raises the setpoint). The PORV control will be transferred to local control using Attachment 3 and OWP-024 MS-4 will be implemented. The CRS will reference ITS 3.3.4, table B3.3.4-1 and determine that this specification is met by having the S/G safety valves operable. When the Chief Examiner is satisfied with the crew actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, PC-444J's pressure control band will shift causing pressure to not be kept in band(2220-2250 psig). The OAC will perform Immediate Actions of AOP-019, Malfunction of RCS Pressure Control. The OAC will take manual control of PC-444J and control pressure manually between 2220-2250psig. LCO 3.4.1 for RCS pressure <2223 psig (Standing Instruction 13-007) may be entered depending on how low pressure gets. Pressure will be controlled manually the rest of the scenario. When the Chief Examiner is satisfied with the crew actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, Main Feedwater Pump "B" will trip. The BOP will perform Immediate Actions of AOP-010, Main Feedwater/Condensate Malfunction. While performing the remaining actions of AOP-010 the crew will determine that Reactor Power is required to be lowered to less than 60% Reactor Power. The crew will perform the load reduction in accordance with AOP-010 and OP-301, RCS Boration Quick Checklist. Once the Chief Examiner is satisfied with the crew's actions to perform a controlled reduction in power and stabilize the plant, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, an RCS leak in Containment will occur. The leak will start out at 30 GPM and gradually ramp up to 50 GPM. The crew will enter AOP-016, Excessive Primary Plant Leakage, and take prescribed actions to mitigate the RCS leakage. ITS 3.4.13 RCS Operational Leakage, Condition A, will be entered due to unidentified leakage. Reduce leakage to within limits within 4 hours. Condition B requires that the plant be placed in Mode 3 in 6 hours and Mode 5 in 36 hours. Once the crew has determined the leak rate and the Chief Examiner is satisfied with the crews actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, a non-isolable CCW leak will occur. This will require the crew to enter AOP-014, Component Cooling Water System Malfunction. The crew will try to make up to the CCW Surge Tank, however, the makeup will not overcome the amount leaking out. CCW surge tank will lower to <5% in which they will have a continuous action step to return to and trip the reactor. Upon initiating the reactor trip, the reactor will not trip(ATWS) and the crew will enter EOP-E-0, Reactor Trip or Safety Injection, and then transition immediately to FRP-S.1, Response to Nuclear Power Generation/ATWS. A LBLOCA will occur when the crew completes FRP-S.1. The crew will continue on with FRP-S.1 until it transitions them back to EOP-E-0 and then transition to EOP-E-1, Loss of Reactor Coolant or Secondary Coolant. Upon the LBLOCA, Phase A valves FP-249/249/256 and 258 will fail to auto close and have to be closed manually. Phase B valve CVC-381 will fail to auto close and have to be closed manually. The crew will also enter FRP-P.1 due to the LBLOCA but will immediately exit due to the LOCA. AOP-014 is a concurrent AOP and an operator will be assigned to continue on with it once EOP-E-0 Attachment 1 is complete.

Because there is no CCW available (due to the leak from before) the crew will have to transition from EOP-E-1 to EPP-15, Loss of Emergency Coolant Recirculation.

The Chief Examiner may terminate the scenario at any time after the crew has initiated makeup to the RWST.

| Sat /<br>Unsat | Critical Task             | Critical Task Criteria  |
|----------------|---------------------------|---|
|                | Insert Control Rods       | Insert Control Rods IAW FRP-S.1 prior to exiting Step 1 of FRP-S.1  |
|                | Trip the Turbine          | Trip the Turbine IAW FRP-S.1 prior to exiting Step 2 of FRP-S.1   |
|                | Emergency Borate          | Establish Emergency Boration IAW FRP S.1 prior to exiting Step 4 of FRP S.1                                     |
|                | Isolate CV Phase A valves | Isolate CV Phase A valves FP-248/249/256/258 IAW EOP-E-0 prior to announcing to the crew that Att 1 is complete |
|                | Isolate CV Phase B valves | Isolate CV Phase B valve CVC-381 IAW EOP-E-0 prior to completing step 9   |

**ILC-14 NRC SCENARIO 4 SIMULATOR SETUP****IC/SETUP:**

- IC-604, SCN 006\_ILC\_14\_SIM\_NRC\_4
- Status board is provided to crew is IC-17.

**PRE-LOADED EVENTS:**

The following events should occur on the reactor trip or triggered events following the reactor trip:

- Event 8: Reactor does not trip(ATWS)
- Event 9: Large Break LOCA
- Event 10: Phase A valves FP-248/249/256/ and 258 fail to auto close
- Event 11 :Phase B valve CVC-381 fails to auto close

**EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:**

- Event 1: Loop 1 Thot fails low
- Event 2: S/G 'C' PORV fails open
- Event 3: PC-444J pressure shift down
- Event 4: MFP 'B' Trip
- Event 5: Load reduction to <60% power
- Event 6: RCS leak in CV
- Event 7: CCW leak

**EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:**

- OWP-028, TDeltaT1
- AOP-025, RTGB Instrument Failure, Section I
- OWP-024 MS-4
- AOP-019, Malfunction of RCS Pressure Control
- AOP-010, Main Feedwater/Condensate Malfunction
- OP-301, RCS Boration Quick Checklist
- AOP-016, Excessive Primary Plant Leakage
- AOP-014, Component Cooling Water System Malfunction
- EOP-E-0, Reactor Trip or Safety Injection
- FRP-S.1, Response to Nuclear Power Generation/ATWS
- FRP-P.1, Response to Imminent Pressurized Thermal Shock
- EOP-E-1, Loss of Reactor Coolant or Secondary Coolant
- EPP-15, Loss of Emergency Coolant Recirculation

|                    |            |   |   |         |   |      |   |    |    |
|--------------------|------------|---|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 4 | Event # | 1 | Page | 6 | of | 51 |
| Event Description: |            | Loop 1 Thot Fails Low. The crew will diagnose using APP-003 and remove the channel with OWP-028 |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |   |      |   |    |    |

**BOOTH OPERATOR: When directed, insert Event 1, Loop 1 Thot fails low**

**EVENT INDICATIONS:**

**APP-003-A4**

**APP-003-A6**

**App-003-B4**

|                |     |  |
|----------------|-----|--|
|                |     |  |
| <b>APP-003</b> | RO  | <p>OBSERVATIONS</p> <p>1. RCS Loop Th, Tc and deltaT</p> <p>ACTIONS</p> <p>2. IF an instrument has failed, THEN REMOVE the malfunctioning Channel from Service using OWP-028 (T delta T).</p>  |
|                |     |  |
| <b>APP-003</b> | RO  | Diagnosis Loop 1 Thot has failed low   |
|                |     |  |
| <b>OWP-028</b> | BOP | <p>Trip the following bistables:</p> <p>Bistable Switch B/S 412B-1 Rack #1</p> <p>Bistable Switch B/S 412B-2 Rack #1</p> <p>Bistable Switch B/S 412C-1 Rack #1</p> <p>Bistable Switch B/S 412C-2 Rack #1</p> <p>Bistable Light OT )T ROD STOP TC-412C2</p> <p>Bistable Light LO TAVG TC-412E</p> |
|                |     |  |

|                    |            |  |   |         |   |      |   |    |    |
|--------------------|------------|--|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 1 | Page | 7 | of | 51 |
| Event Description: |            | <b>Loop 1 Thot Fails Low. The crew will diagnose using APP-003 and remove the channel with OWP-028</b> |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |   |    |    |

|  |     |   |
|--|-----|---|
|  | CRS | <p>Enter LCO 3.3.1-1 items 5 &amp; 6, Condition E for the failed instrument.</p> <ul style="list-style-type: none"> <li>Place channel in trip within 6 hours OR be in Mode 3 within 12 hours.</li> </ul> <p>LCO 3.3.2-1 Items 1.f, 4.d, Condition D.</p> <ul style="list-style-type: none"> <li>Place channel in trip within 6 hours OR be in Mode 3 within 12 hours</li> </ul> <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> <li>be in Mode 4 within 18 hours.</li> </ul> <p>LCO 3.3.2-1 item 6b, Condition H.</p> <ul style="list-style-type: none"> <li>Verify interlock is in required stat for existing unit condition within 1 hour</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>be in Mode 3 within 7 hours</li> </ul> <p style="text-align: center;">AND</p> <p>be in Mode 4 within 13 hours.</p> <p>LCO 3.3.6-1 Item 4.</p> <ul style="list-style-type: none"> <li>This Item refers to LCO 3.3.2. "ESFAS Instrumentation," Functions 1.a- f, for all initiation functions and requirements. Reference LCO 3.4.2 RCS Minimum temperature for Criticality.</li> </ul> |
|--|-----|---|

Op Test No.: ILC-14 NRC Scenario # 4 Event # 2 Page 8 of 51

Event Description: **S/G 'C' PORV fails open. The crew will enter AOP-025.**

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

|   |     |  |
|---|-----|--|
|   |     |  |
| <b>BOOTH OPERATOR: Insert Event #2, S/G 'C' PORV fails open, on cue from the Chief Examiner.</b>  |     |  |
| <b>EVENT INDICATIONS:</b><br><br><b>Steam noise</b><br><br><b>Steam flow on 'C' S/G rising</b><br><br><b>Reactor power rising</b><br><br><b>Tavg lowering</b><br><br><b>PZR level lowering</b><br><br><b>Charging Pump speed rising</b> |     |  |
|   |     |  |
| <b>AOP-025</b>  | BOP | Determine IF Steam Line PORV(s) Should Be Closed<br><br>a. Check Affected S/G Pressure - LESS Than PORV Opening Setpoint. )YES)<br><br>b. Attempt To CLOSE The Affected Steam Line PORV From The RTGB By Adjusting The Affected PORV Controller (RV-1, RV-2 OR RV-3) Potentiometer Towards 0% Demand(Increases the Setpoint). (wiii not close) |
|   |     |  |
| <b>AOP-025</b>  | RO  | Check Reactor Power - LESS THAN OR EQUAL TO 100% (YES)   |
|   |     |  |
| <b>AOP-025</b>  | BOP | Make PA Announcement For Procedure Entry   |
|   |     |  |
| <b>AOP-025</b>  | BOP | Transfer The Affected Steam Line PORV Control (PIC-477 / PIC-487/ PIC-497) To The Local Controller using Attachment 3, Transfer Of   |



Op Test No.: ILC-14 NRC Scenario # 4 Event # 2 Page 9 of 51

Event Description: **S/G 'C' PORV fails open. The crew will enter AOP-025.**

| Time   | Position | Applicant's Actions or Behavior   |
|--|----------|---|
|  |          | Steam Line PORV Control To Local  |
|  |          |   |
| <b>BOOTH OPERATOR: When directed to transfer PORV to local control, wait 2 minutes and perform action. Report that action complete and no change in PORV position.</b> |          |   |
|  |          |   |
| <b>AOP-025</b>   | CRS      | Implement OWP-024, MS-4 For The Affected Steam Line PORV  |
|  |          |   |
| <b>OWP-024</b>   | BOP      | BOP directs an AO to perform<br>PIC-477 Manual Thumbwheel (White)<br>PORV RV-1 Switch<br>PIC-477 Transfer Switch (Orange)   |
|  |          |   |
|  | CRS      | Reference ITS 3.3.4, table B 3.3.4-1 Item 3d for operability requirements of S/G pressure instrumentation and controls for Remote Shutdown<br><br>LCO is met. S/G safety valves are operable. |

|                    |            |   |   |         |   |      |    |    |    |
|--------------------|------------|---|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 4 | Event # | 3 | Page | 10 | of | 51 |
| Event Description: |            | PC-444J Pressure Shifts Down, The crew will enter AOP-019 |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                           |   |         |   |      |    |    |    |

|   |     |  |
|---|-----|--|
|   |     |  |
| <b>BOOTH OPERATOR: Insert Event #3, PC-444J pressure shift down, on cue from the Chief Examiner.</b>            |     |  |
| <b>EVENT INDICATIONS:</b><br><br><b>RCS pressure lowering</b><br><br><b>APP-003-D8</b><br><br><b>APP-003-F3</b> |     |  |
|   |     |  |
| <b>AOP-019</b>  | RO  | <b>Immediate Action Step</b><br><br>CHECK Both LTOPP Arming Switches Selected To NORMAL (YES)  |
|   |     |  |
| <b>AOP-019</b>  | RO  | <b>Immediate Action Step</b><br><br>Determine If PZR PORVs Should Be Closed:<br>a. Check PZR pressure - LESS THAN 2335 PSIG (YES)<br>b. Verify Both PZR PORVs - CLOSED (YES) |
|   |     |  |
| <b>AOP-019</b>  | RO  | <b>Immediate Action Step</b><br><br>Control The Normal PZR Spray Valves AND PZR Heaters To Restore RCS Pressure To The Desired Control Band                                  |
|   |     |  |
| <b>AOP-019</b>  | BOP | Make PA Announcement For Procedure Entry   |
|   |     |  |

Op Test No.: ILC-14 NRC Scenario # 4 Event # 3 Page 11 of 51Event Description: **PC-444J Pressure Shifts Down, The crew will enter AOP-019**

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

|                |     |  |
|----------------|-----|--|
| <b>AOP-019</b> | RO  | <b>Continuous Action Step</b><br>Check PZR Pressure - UNDER OPERATOR CONTROL (YES)   |
|                |     |  |
| <b>AOP-019</b> | RO  | <b>Continuous Action Step</b><br>Check Pressurizer Pressure Transmitter PT- 444 OR PT- 445<br>- FAILED. (NO)<br><br>Go To Step 8   |
|                |     |  |
| <b>AOP-019</b> | RO  | Check PC- 444J, PZR PRESS - OPERATING PROPERLY IN AUTO (NO)<br><br>Perform the following:<br>a. Place PC- 444J, PZR PRESS, in MAN.<br><br>b. IF PC- 444J is operating properly in manual, THEN Go To Step 10. (YES)  |
|                |     |  |
| <b>AOP-019</b> | RO  | Operate PC- 444J As Follows:<br>a. Check PZR SPRAY VALVE Controllers - IN AUTO (YES)<br>b. Check PZR Heaters - IN NORMAL CONFIGURATION (YES)<br>c. Manually adjust PC- 444J to maintain PZR pressure.<br>d. Check PZR pressure - UNDER CONTROL (YES)<br>e. Go To Step 30 |
|                |     |  |
| <b>AOP-019</b> | CRS | Contact I&C To Make Repairs To The PZR Pressure Control System   |

Op Test No.: ILC-14 NRC Scenario # 4 Event # 3 Page 12 of 51Event Description: **PC-444J Pressure Shifts Down, The crew will enter AOP-019**

| Time           | Position | Applicant's Actions or Behavior   |
|----------------|----------|---|
|                |          |   |
| <b>AOP-019</b> | CRS      | <p>Refer To ITS For Applicable LCOs</p> <ul style="list-style-type: none"><li>• LCO 3.4.11, PZR PORV</li><li>• TRM 3.4, PZR Spray <math>\Delta T</math></li><li>• LCO 3.4.4 AND 3.4.5, RCS Loops</li><li>• LCO 3.4.1, RCS Pressure</li><li>• LCO 3.4.9, PZR Level</li></ul> |

|                    |  |                                 |   |         |   |      |    |    |    |
|--------------------|--|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC   | Scenario #                      | 4 | Event # | 4 | Page | 13 | of | 51 |
| Event Description: | <b>MFW Pump 'B' Trip. The crew will enter AOP-010 and reduce power to less than 60%.</b> |                                 |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |            |   |
|--|------------|---|
|  |            |   |
| <b>BOOTH OPERATOR: Insert Event #4, MFW Pump 'B' Trip, on cue from the Chief Examiner.</b> |            |   |
| <b>EVENT INDICATIONS:</b>  |            |   |
| <b>APP-007-A4</b>  |            |   |
| <b>MFW Pump Indicating lights off</b>  |            |   |
|  |            |   |
| <b>AOP-010</b>   | <b>BOP</b> | <b>Immediate Action Step</b><br><br>Check Feedwater Regulating Valves – OPERATING PROPERLY (MANUAL OR AUTO): (YES) <ul style="list-style-type: none"> <li>• FCV-478, FRV "A"</li> <li>• FCV-488, FRV "B"</li> <li>• FCV-498, FRV "C"</li> </ul>                               |
|  |            |   |
| <b>AOP-010</b>   | <b>RO</b>  | <b>Continuous Action Step</b><br><br><b>Immediate Action Step</b><br><br>Check Reactor Trip Setpoint - BEING APPROACHED (NO)<br><br>IF a Reactor Trip Setpoint is approached, THEN trip the Reactor and Go To EOP-E-0, REACTOR TRIP or SAFETY INJECTION.<br><br>Go To Step 4. |
|  |            |   |
| <b>AOP-010</b>   | <b>BOP</b> | Make PA Announcement For Procedure Entry  |
|  |            |   |

Op Test No.: ILC-14 NRC Scenario # 4 Event # 4 Page 14 of 51

Event Description: **MFW Pump 'B' Trip. The crew will enter AOP-010 and reduce power to less than 60%.**

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

|   |     |  |        |
|---|-----|--|--------|
| AOP-010   | CRS | Go To The Appropriate Step from The Table Below:   |        |
|   |     | Event  | Step   |
|   |     | MFW Pump trip  | Step 6 |
|   |     |  |        |
| AOP-010   | RO  | Check Reactor Power - LESS THAN 70% (YES)  |        |
|   |     |  |        |
| AOP-010   | RO  | Check Reactor Power - GREATER THAN 60% (YES)   |        |
|   |     |  |        |
| NOTE  |     |  |        |
| Rapid power reductions may result in the axial flux difference exceeding the operating band values and require a power reduction to less than 50% to comply with ITS 3.2.3 Condition C. |     |  |        |
|   |     |  |        |
| AOP-010   | BOP | Reduce Turbine Load At 1%/MIN To 5%/MIN To Achieve Less Than 60% Reactor Power As Follows:   |        |
|   |     | a. Verify Rods in AUTOMATIC (YES)<br>b. Check Turbine Control Mode - AUTOMATIC (YES)<br>1) Depress the IMP IN Pushbutton<br>2) Set The Desired Load In The SETTER<br>3) Set The Desired Load Rate<br>4) Depress the GO Pushbutton or the HOLD Pushbutton as Necessary to Reduce Turbine Load<br>c. Borate Per OP-301, RCS Boration Quick Checklist, as necessary to maintain AFD within the operating band |        |

|                    |                   |  |          |         |          |      |           |    |           |
|--------------------|-------------------|--|----------|---------|----------|------|-----------|----|-----------|
| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #   | <u>4</u> | Event # | <u>4</u> | Page | <u>15</u> | of | <u>51</u> |
| Event Description: |                   | <b>MFW Pump 'B' Trip. The crew will enter AOP-010 and reduce power to less than 60%.</b> |          |         |          |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior  |          |         |          |      |           |    |           |

|  |     |  |
|--|-----|--|
|  |     | Go to step 13  |
|  |     |  |
| <b>Evaluator Note: OP-301 Steps are located at the end of this section</b> |     |  |
|  |     |  |
| <b>AOP-010</b>   | BOP | Check Main Feed Pumps - AT LEAST ONE RUNNING (YES)<br>Go to step 38  |
|  |     |  |
| <b>AOP-010</b>   | BOP | Check S/G Level - AT OR TRENDING TO PROGRAM (YES)  |
|  |     |  |
| <b>AOP-010</b>   | RO  | Check Tavg - AT OR TRENDING TO Tref  |
|  |     |  |
| <b>AOP-010</b>   | CRS | Contact Maintenance To Troubleshoot And Correct The Feedwater Problem  |
|  |     |  |
| <b>AOP-010</b>   | CRS | Implement the EALs   |
|  |     |  |
| <b>AOP-010</b>   | BOP | Check current loading for the following pumps - LESS THAN MAXIMUM <ul style="list-style-type: none"> <li>o Main Feedwater Pump - 0.710KILOAMPS</li> <li>o Condensate Pumps - 370 AMPS</li> <li>o Heater Drain Pumps - 90 AMPS</li> </ul> |
|  |     |  |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 4 | Page | 16 | of | 51 |
| Event Description: |            | <b>MFW Pump 'B' Trip. The crew will enter AOP-010 and reduce power to less than 60%.</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

**BOOTH OPERATOR: When directed to check current loading, report Condensate pumps are 340 amps, HDP's are 70 amps, and MFP 'A' is 650 amps.**

|   |     |  |
|---|-----|--|
|   |     |  |
| <b>AOP-010</b>  | CRS | Determine Iodine Sampling Requirements As Follows:<br>a. Check Power Change - GREATER THAN 15% IN ONE HOUR<br>b. Implement ITS SR 3.4.16.2 c. NOTIFY E&C To Shutdown The RCS Zinc Injection System |
|   |     |  |
| <b>AOP-010</b>  | RO  | Check APP-005-B5, ROD BANKS A/B/C/D LO LIMIT - EXTINGUISHED (YES)  |
|   |     |  |
| <b>AOP-010</b>  | RO  | Monitor Axial Flux Difference To Ensure Compliance With ITS 3.2.3  |
|   |     |  |
| <b>AOP-010</b>  | CRS | Notify Load Dispatcher Of The Unit's Load Capability   |
|   |     |  |
| <b>NOTE</b>   |     |  |
| <b>OP-301, Section 8.2.8 Quick Boration Checklist (shaded area) is included in the following steps, but may be used following the commencement of the plant down power.</b> |     |  |
|   |     |  |
|   | RO  | <b>DETERMINE</b> the amount of Boric Acid to add to the RCS and <b>OBTAIN</b> an independent check of the volume required  |
|   |     |  |
|   | RO  | <b>OBTAIN</b> permission from the CRS <b>OR</b> the SM to borate.  |
|   |     |  |



Op Test No.: ILC-14 NRC Scenario # 4 Event # 4 Page 17 of 51

Event Description: **MFW Pump 'B' Trip. The crew will enter AOP-010 and reduce power to less than 60%.**

| Time | Position | Applicant's Actions or Behavior  |
|------|----------|--|
|      | RO       | <b>PLACE</b> the RCS MAKEUP MODE selector switch to BORATE.  |
|      |          |  |
|      | RO       | <b>SET</b> YIC-113, BORIC ACID TOTALIZER to desired quantity.  |
|      |          |  |
|      | RO       | <b>IF</b> desired, <b>THEN PLACE</b> FCV-113A, BORIC ACID FLOW, in MAN <b>AND</b> manually <b>ADJUST</b> controller FCV-113A using the UP and DOWN pushbuttons.  |
|      |          |  |
|      | RO       | Momentarily <b>PLACE</b> the RCS MAKEUP SYSTEM switch to START.  |
|      |          |  |
|      | RO       | <b>IF</b> any of the below conditions occur, <b>THEN</b> momentarily place the RCS MAKEUP SYSTEM switch in the STOP position: <ul style="list-style-type: none"> <li>• Rod Motion is blocked OR is in the wrong direction</li> <li>• <math>T_{AVG}</math> goes up</li> <li>• Boric Acid addition exceeds the desired value</li> </ul>                              |
|      |          |  |
|      | RO       | <b>WHEN</b> the desired amount of Boric Acid has been added, <b>THEN</b> verify the following: <ul style="list-style-type: none"> <li>• FCV-113A, BORIC ACID FLOW, closes.</li> <li>• FCV-113B, BLENDED MU TO CHG SUCT, closes.</li> <li>• <b>IF</b> in Auto, <b>THEN</b> the operating Boric Acid Pump stops.</li> <li>• The RCS MAKEUP SYSTEM is OFF.</li> </ul> |
|      |          |  |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 4 | Page | 18 | of | 51 |
| Event Description: |            | <b>MFW Pump 'B' Trip. The crew will enter AOP-010 and reduce power to less than 60%.</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|  |    |   |
|--|----|---|
|  | RO | <p><b>IF</b> desired, <b>THEN FLUSH</b> the Boric Acid flow path as follows:</p> <ul style="list-style-type: none"> <li>• <b>PLACE</b> the RCS MAKEUP MODE selector switch in the ALT DILUTE position.</li> <li>• <b>SET</b> YIC-114, PRIMARY WTR TOTALIZER to 15-20 gallons.</li> <li>• <b>PLACE</b> FCV-114B, BLENDED MU TO VCT to CLOSE.</li> <li>• Momentarily <b>PLACE</b> the RCS MAKEUP SYSTEM switch to the START position.</li> <li>• <b>IF</b> any of the below conditions occur, <b>THEN</b> momentarily place the RCS MAKEUP SYSTEM switch in the STOP position: <ul style="list-style-type: none"> <li>○ Unanticipated Rod Motion</li> <li>○ Primary Water addition reaches the desired value</li> </ul> </li> <li>• <b>WHEN</b> the desired amount of Primary Water has been added to the RCS, <b>THEN</b> verify the following: <ul style="list-style-type: none"> <li>○ FCV-114A closes.</li> <li>○ FCV-113B closes.</li> <li>○ <b>IF</b> in Auto, <b>THEN</b> the operating PW Pump stops.</li> <li>○ The RCS MAKEUP SYSTEM is OFF.</li> </ul> </li> </ul> |
|  |    |   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 4 | Page | 19 | of | 51 |
| Event Description: |            | <b>MFW Pump 'B' Trip. The crew will enter AOP-010 and reduce power to less than 60%.</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|  |    |   |
|--|----|---|
|  | RO | <p><b>RETURN</b> the RCS Makeup System to automatic as follows:</p> <ul style="list-style-type: none"> <li>• <b>VERIFY</b> FCV-114A is in AUTO.</li> <li>• <b>PLACE</b> FCV-114B to the AUTO position.</li> <li>• <b>PLACE</b> the RCS MAKEUP MODE switch in AUTO.</li> <li>• <b>VERIFY</b> FCV-113A is in AUTO.</li> <li>• Momentarily <b>PLACE</b> the RCS MAKEUP SYSTEM switch in the START position.</li> </ul> |
|  |    |   |
|  | RO | <p><b>RECORD</b>, in AUTO LOG, as indicated by PRIMARY WATER TOTALIZER, YIC-114 <b>AND</b> Boric Acid TOTALIZER, YIC-113 the total amount of Primary Water <b>AND</b> Boric Acid added during the boration.</p>   |
|  |    |   |
|  | RO | <p>MONITOR parameters for the expected change in reactivity <b>AND</b> inform the CRS OR the SM of the results of the boration.</p> <p>(END OP-301 Section 8.2.8)</p>   |

|  |            |                                 |   |         |   |      |    |    |    |
|--|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:   | ILC-14 NRC | Scenario #                      | 4 | Event # | 6 | Page | 20 | of | 51 |
| Event Description: <b>RCS leak inside of CV. The crew will enter AOP-016</b> |            |                                 |   |         |   |      |    |    |    |
| Time   | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|   |     |   |
|---|-----|---|
|   |     |   |
| <b>BOOTH OPERATOR: Insert Event #6, RCS Leak Inside CV, on cue from the Chief Examiner.</b>   |     |   |
| <b>EVENT INDICATIONS:</b><br><b>Charging Pump speed rising</b><br><b>R-11 indication rising</b><br><b>RR-1 alarm for R-11</b><br><b>VCT level lowering</b><br><b>CV parameters on ERFIS rising (CV Sump level, CV Pressure, and CV Temperature)</b> |     |   |
|   |     |   |
| <b>AOP-016</b>  | RO  | <b>Continuous Action Step</b><br>Check RCS Pressure – Greater than 1000 psig. (YES)<br><br>Check the following:<br>PZR Level – Less than 10% AND lowering in an uncontrolled manner (NO)<br><br>OR<br>RCS Subcooling – Less than 35°F (NO)<br>RNO:<br>IF PZR Level can NOT be maintained greater than 10% OR<br>Subcooling can NOT be maintained greater than 35°F, THEN trip the Reactor and Go to PATH-1. |
|   |     |   |
| <b>AOP-016</b>  | BOP | Make PA Announcement for Procedure Entry  |
|   |     |   |

Op Test No.: ILC-14 NRC Scenario # 4 Event # 6 Page 21 of 51

Event Description: **RCS leak inside of CV. The crew will enter AOP-016**

| Time           | Position | Applicant's Actions or Behavior   |
|----------------|----------|---|
| <b>AOP-016</b> | RO       | <b>Continuous Action Step</b><br>Check VCT Level - LESS THAN 12.5 INCHES (NO) <ul style="list-style-type: none"> <li>• IF VCT level lowers to less than 12.5 inches, THEN perform Step 5.</li> </ul> Go To Step 6 |
| <b>AOP-016</b> | RO       | Check Charging Pump Status –LESS THAN TWO RUNNING (NO) <ul style="list-style-type: none"> <li>• Go To Step 11.</li> </ul>   |
| <b>AOP-016</b> | RO       | Place running Charging Pump Speed Controllers in MAN AND adjust output to maximum   |
| <b>AOP-016</b> | RO       | Check RCS Level - LOWERING IN AN UNCONTROLLED MANNER (NO)   |
| <b>AOP-016</b> | RO       | Control Charging Flow To Maintain Desired RCS Level   |
| <b>AOP-016</b> | RO       | Monitor Leakage As Follows:<br>a. Check RCS Level - LOWERING IN AN UNCONTROLLED MANNER: (NO)<br>Go to step 22   |
| <b>AOP-016</b> | CRS      | Implement ITS LCO 3.4.13<br>RCS Operational Leakage, Condition A, will be entered due to unidentified leakage.  |

Op Test No.: ILC-14 NRC Scenario # 4 Event # 6 Page 22 of 51

Event Description: **RCS leak inside of CV. The crew will enter AOP-016**

| Time           | Position | Applicant's Actions or Behavior   |
|----------------|----------|---|
|                |          | <ul style="list-style-type: none"> <li>Reduce leakage to within limits within 4 hours.</li> </ul> <p>Condition B, Required Action and associated Completion Time of Condition A not met.</p> <ul style="list-style-type: none"> <li>Place the plant be placed in Mode 3 in 6 hours and Mode 5 in 36 hours.</li> </ul>   |
|                |          |   |
| <b>AOP-016</b> | BOP      | NOTIFY E&C To Shutdown The RCS Zinc Injection System  |
|                |          |   |
| <b>AOP-016</b> | BOP      | <p>Check For Primary-To-Secondary Leakage As Indicated By One Or More Of The Following:</p> <ul style="list-style-type: none"> <li>R-15, CONDENSER AIR EJECTOR GAS - RISING OR IN ALARM (NO)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>AOP-016RI-19A, B OR C, STM GEN BLOW DN - RISING OR IN ALARM (NO)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>R-31A, B OR C, STEAMLINE RADIATION MONITOR - RISING OR IN ALARM (NO)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Secondary chemistry sample results - INDICATE S/G TUBE LEAKAGE</li> </ul> <p>Go to step 26</p> |
|                |          |   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 6 | Page | 23 | of | 51 |
| Event Description: |            | RCS leak inside of CV. The crew will enter AOP-016 |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior                    |   |         |   |      |    |    |    |

**NOTE**

OST-051, Reactor Coolant System Leakage Evaluation, is the preferred method of leak rate determination if plant conditions permit.

|                |     |  |
|----------------|-----|--|
|                |     |  |
|                |     | <p>Initiate Leak Rate Determination Using One Or More Of The Following Methods:</p> <ul style="list-style-type: none"> <li>• OST-051, Reactor Coolant System Leakage Evaluation</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• OST-901, HVH Condensate Measuring System</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Charging versus letdown flow balance</li> </ul> |
|                |     |  |
| <b>AOP-016</b> | CRS | Implement The EALs   |
|                |     |  |
| <b>AOP-016</b> | BOP | <p>Check R-17, COMPONENT COOLING WATER RADIOACTIVE LIQUID - RISING OR IN ALARM (NO)</p> <p>Go to step 30</p>   |

|                    |            |   |   |         |     |      |    |    |    |
|--------------------|------------|---|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 4 | Event # | 7/8 | Page | 24 | of | 51 |
| Event Description: |            | CCW Leak in CV. Leak will lower CCW Surge Tank level to less than 5% which will require a reactor trip. The reactor will not trip and the crew will enter FRP-S.1 for an ATWS |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |     |      |    |    |    |

|   |     |  |                 |
|---|-----|--|-----------------|
|   |     |  |                 |
| <b>BOOTH OPERATOR: Insert Event #7, CCW leak, on cue from the Chief Examiner.</b>   |     |  |                 |
| <b>EVENT INDICATIONS:</b>   |     |  |                 |
| <b>APP-001A4</b>  |     |  |                 |
| <b>CCW Surge Tank level lowering (Indications on RTGB and ERFIS)</b>  |     |  |                 |
|   |     |  |                 |
| <b>AOP-014</b>  | CRS | Implement The EALs                                   |                 |
|   |     |  |                 |
| <b>AOP-014</b>  | BOP | Make PA Announcement For Procedure Entry             |                 |
|   |     |  |                 |
| <b>NOTE</b>   |     |  |                 |
| <ul style="list-style-type: none"> <li>A loss of inventory may be indicated by a report of leakage or lowering of surge tank level.</li> <li>CCW Pump discharge pressure less than 78 psig will cause an alarm.</li> <li>CCW low flow is defined as less than 2200 gal per pump</li> <li>CCW high temperature is defined as greater than 105°F or greater than 125°F if in Mode 3.</li> </ul> |     |  |                 |
|   |     |  |                 |
| <b>AOP-014</b>  | CRS | Go To Appropriate Section For Indicated Malfunction: |                 |
|   |     | Loss Of CCW Inventory                                | Go To Section A |



|                    |            |   |   |         |     |      |    |    |    |
|--------------------|------------|---|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 4 | Event # | 7/8 | Page | 25 | of | 51 |
| Event Description: |            | CCW Leak in CV. Leak will lower CCW Surge Tank level to less than 5% which will require a reactor trip. The reactor will not trip and the crew will enter FRP-S.1 for an ATWS |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |     |      |    |    |    |

|                |    |  |
|----------------|----|--|
|                |    |  |
| <b>AOP-014</b> | RO | <p><b>Continuous Action Step</b></p> <p>Determine If Pump Cavitation Is Occuring OR Imminent As Follows:</p> <ul style="list-style-type: none"> <li>o Check Surge Tank Level - LESS THAN 5% (NO, but lowering rapidly)</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>o Check CCW Pump Discharge Pressure (Local) AND Flow - WIDE OSCILLATIONS</li> </ul> <p>RNO:</p> <p>IF CCW Surge Tank level lowers to less than 5% OR CCW Pump Cavitation occurs, THEN Go To Step 2.</p> |
|                |    |  |
| <b>AOP-014</b> | RO | <p>Verify at the RTGB, Primary Water Makeup To CCW As Follows:</p> <p>a. Primary Water Pump - RUNNING b. CC-832, MAKEUP - OPEN</p>   |
|                |    |  |
| <b>AOP-014</b> | RO | <p>Check CCW Surge Tank level (LI-614B) - STABLE OR RISING (NO)</p> <p>Go to step 11</p>   |
|                |    |  |
| <b>AOP-014</b> | RO | Start A Second Primary Water Pump  |
|                |    |  |
| <b>AOP-014</b> | RO | <p>Check CCW Surge Tank level (LI-614B) – LOWERING (YES)</p> <p>Return to step 2</p>   |
|                |    |  |

|                    |            |   |   |         |     |      |    |    |    |
|--------------------|------------|---|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 4 | Event # | 7/8 | Page | 26 | of | 51 |
| Event Description: |            | CCW Leak in CV. Leak will lower CCW Surge Tank level to less than 5% which will require a reactor trip. The reactor will not trip and the crew will enter FRP-S.1 for an ATWS |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |     |      |    |    |    |

|  |        |  |
|--|--------|--|
| <b>AOP-014</b>                         | RO     | Check Reactor – CRITICAL (YES)   |
|  |        |  |
| <b>AOP-014</b>                         | RO     | Verify Reactor – TRIPPED (NO)  |
|  |        |  |
| <b>EOP-E-0</b>                         | RO     | <p>1. Check Reactor Trip: (NO)</p> <ul style="list-style-type: none"> <li>Reactor trip and bypass breakers - OPEN</li> <li>Rod position indicators - AT ZERO</li> <li>Rod Bottom lights - ILLUMINATED</li> <li>Neutron flux - LOWERING</li> </ul> <p>RNO:</p> <p>Manually trip reactor.</p> <p>IF reactor power is greater than or equal to 5% OR intermediate range SUR is positive, THEN Go To FRP-S.1, Response To NuclearPower Generation/ATWS, Step 1.</p>  |
|  |        |  |
| <b>FRP-S.1</b><br><b>Critical Task</b> | RO/CRS | <p><b>FRP S.1 Immediate Action:</b></p> <p>Check Reactor Trip as Follows:</p> <p>Reactor Trip Main AND BYP Breakers – Open (NO)</p> <ol style="list-style-type: none"> <li>Depress both Reactor Trip Pushbuttons</li> <li>IF Reactor Trip Breakers will NOT open, THEN perform the following: <ol style="list-style-type: none"> <li>Insert Control Rods</li> <li>Dispatch an Operator to the MG Set Room to trip the following breakers: <ul style="list-style-type: none"> <li>Reactor Trip Breakers A &amp; B</li> <li>Generator A &amp; B Circuit Breakers</li> </ul> </li> <li>Dispatch an Operator to 480V Busses 2B and 3 to trip the following breakers: <ul style="list-style-type: none"> <li>Rod Drive Motor Generator Set A &amp; B</li> </ul> </li> </ol> </li> </ol> |

|                    |            |   |   |         |     |      |    |    |    |
|--------------------|------------|---|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 4 | Event # | 7/8 | Page | 27 | of | 51 |
| Event Description: |            | CCW Leak in CV. Leak will lower CCW Surge Tank level to less than 5% which will require a reactor trip. The reactor will not trip and the crew will enter FRP-S.1 for an ATWS |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |     |      |    |    |    |

|  |         |  |
|--|---------|--|
|  |         |  |
| <b>FRP-S.1<br/>Critical Task</b>   | BOP/CRS | <b>Immediate Action:</b><br>Check Turbine Trip as Follows: <ul style="list-style-type: none"> <li>Both Turbine Stop Valves - Closed (NO)<br/><u>OR</u></li> <li>All Governor Valves – Closed (NO)               <ol style="list-style-type: none"> <li>Manually trip the Turbine by simultaneously depressing the THINK and TURBINE TRIP Pushbuttons. (YES)</li> <li>IF Turbine will NOT trip, THEN run back Turbine at maximum rate until the Governor Valves are closed.</li> <li>IF Turbine can NOT be run back, THEN verify CLOSED the following:                   <ul style="list-style-type: none"> <li>All MSIVs</li> <li>All MSIV BYPs</li> </ul> </li> </ol> </li> </ul> |
|  |         |  |
| <b>CRITICAL TASK: Ensure Control Rods Driving In and Turbine Manually Tripped.</b> |         |  |
|  |         |  |
| <b>FRP-S.1</b>   | BOP     | Verify All AFW Pumps – Running   |
|  |         |  |
| <b>FRP-S.1<br/>Critical Task</b>   | RO      | Initiate Emergency Boration of RCS as follows: <ol style="list-style-type: none"> <li>Verify Charging Flowpath established as follows:               <ol style="list-style-type: none"> <li>CVC-310B, Loop 2 Cold Leg CHG – Open</li> <li>HIC-121, Charging Flow Controller – Demand Signal at 0%</li> </ol> </li> <li>Verify Two Charging pumps – Running at full speed</li> <li>Verify Boric Acid pump aligned for Blend – Running</li> <li>Verify from the RTGB MOV-350, BA to Charging pump suction – Open</li> </ol>  |

|                    |            |   |   |         |     |      |    |    |    |
|--------------------|------------|---|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 4 | Event # | 7/8 | Page | 28 | of | 51 |
| Event Description: |            | CCW Leak in CV. Leak will lower CCW Surge Tank level to less than 5% which will require a reactor trip. The reactor will not trip and the crew will enter FRP-S.1 for an ATWS |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |     |      |    |    |    |

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|---|--------|---|
|   |        | e. Check flow on FI-110, Boric Acid bypass flow – Flow Indicated (YES)  |
|   |        | f. Verify Charging Flow to RCS on FI-122A (YES)   |
|   |        |   |
| <b>CRITICAL TASK: Initiate Emergency Boration</b> |        |   |
|   |        |   |
| <b>FRP-S.1</b>                                    | RO     | Check Containment Ventilation Isolation – Initiated (YES)   |
|   |        |   |
| <b>FRP-S.1</b>                                    | RO     | Continuous Action Step:<br>Check SI – Initiated (NO) <ul style="list-style-type: none"> <li>• IF an SI Signal occurs, THEN verify auto start of all SI equipment using Supplement L, while continuing with this procedure.</li> <li>• Go To Step 8</li> </ul> |
|   |        |   |
| <b>FRP-S.1</b>                                    | RO/BOP | Check IF the following Trips Have Occurred: <ul style="list-style-type: none"> <li>a. Reactor Trip (YES)</li> <li>b. Turbine Trip (YES)</li> </ul>  |
|   |        |   |
| <b>FRP-S.1</b>                                    | RO     | <b>Continuous Action Step:</b><br>Check if Reactor is Subcritical: <ul style="list-style-type: none"> <li>a. Check power range indication – Less Than 5% (YES)</li> <li>b. Check Intermediate Range Indication – Negative SUR (YES)</li> </ul>                |

|                    |            |   |   |         |     |      |    |    |    |
|--------------------|------------|---|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 4 | Event # | 7/8 | Page | 29 | of | 51 |
| Event Description: |            | CCW Leak in CV. Leak will lower CCW Surge Tank level to less than 5% which will require a reactor trip. The reactor will not trip and the crew will enter FRP-S.1 for an ATWS |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |     |      |    |    |    |

|                |     |  |
|----------------|-----|--|
|                |     | c. Go To Step 23   |
|                |     |  |
| <b>FRP-S.1</b> | RO  | <b>Continuous Action Step:</b><br>Check ARPI – Less than Two Rods Stuck Out (YES)  |
|                |     |  |
| <b>FRP-S.1</b> | RO  | Stop the RCS Boration <ul style="list-style-type: none"> <li>a. Verify closed MOV-350, BA to Charging pump suction</li> <li>b. Verify Control Switch for Boric Acid pump aligned for blend in Auto.</li> <li>c. Check Emergency Boration – Performed using MOV-350 flowpath (YES)</li> <li>d. Notify Engineering to Evaluate the Following to Determine if RCP Seal Inspection is Required:               <ul style="list-style-type: none"> <li>• RCP Bearing temperatures</li> <li>• No. 1 Seal Leakoff temperatures</li> <li>• No. 1 Seal Leakoff flowrates</li> </ul> </li> <li>e. Check Emergency Boration performed using RWST flowpath AND it is desired to align Charging pump suction to the VCT. (NO)               <ul style="list-style-type: none"> <li>• Go to Step 24.i</li> </ul> </li> <li>i. Reduce Charging pump speed as desired.</li> </ul> |
|                |     |  |
| <b>FRP-S.1</b> | BOP | Perform the following: <ul style="list-style-type: none"> <li>a. Reset SPDS</li> <li>b. Initiate Monitoring of Critical Safety Function Status Trees</li> <li>c. Return to procedure and Step in effect. <b>(Return to EOP-E-0)</b></li> </ul>   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 30 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|   |        |  |
| <b>BOOTH OPERATOR: Insert Event #9, LBLOCA, on cue from the Chief Examiner.</b>   |        |  |
|   |        |  |
| <b>EXAMINERS NOTE: CSFST will turn Red for Integrity due to the LBLOCA. The procedure steps for this are shown after EOP-E-0 Attachment 1</b> |        |  |
| <b>EOP-E-0</b>  | RO/BOP | <p><u>NOTE:</u> FOLDOUT for EOP-E-0 is in effect.</p> <p><u>RCP Trip Criteria</u><br/> IF either condition listed below occurs, THEN trip all RCPs: (YES)</p> <ul style="list-style-type: none"> <li>Containment Isolation Phase B – ACTUATED (YES)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>BOTH of the following satisfied: <ul style="list-style-type: none"> <li>SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW (YES, once SI-870A or B are opened.)</li> </ul> AND <ul style="list-style-type: none"> <li>RCS subcooling based on core exit TCs - LESS THAN 30°F [50°F] (YES, eventually)</li> </ul> </li> </ul> <p><u>Faulted S/G AFW Isolation Criteria</u><br/> IF both conditions listed below are met,</p> <ul style="list-style-type: none"> <li>Any S/G pressure is lowering in an uncontrolled manner</li> </ul> <p>OR has completely depressurized (NO)</p> <p>AND</p> <ul style="list-style-type: none"> <li>Any S/G is <u>NOT</u> faulted (NO)</li> </ul> <p><u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>Reset SI.</li> <li>Close steam driven AFW pump discharge valve for faulted S/G(s): <ul style="list-style-type: none"> <li>V2-14A (S/G A)</li> <li>V2-14B (S/G B)</li> <li>V2-14C (S/G C)</li> </ul> </li> <li>Close AFW header discharge valve for faulted S/G(s): <ul style="list-style-type: none"> <li>V2-16A (S/G A)</li> <li>V2-16B (S/G B)</li> <li>V2-16C (S/G C)</li> </ul> </li> <li>Perform Attachment 2, Deenergizing AFW Valves for</li> </ol> |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 31 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|--|-----|---|
|  |     | faulted S/G(s).<br>e. Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [23%] in at least one S/G.  |
|  |     |   |
| <b>Evaluator Note:</b>                   |     | <b>Crew may take early actions at this time to address items that did not function or operate as designed.</b> <ul style="list-style-type: none"> <li>Isolate CV Phase A valves FP-248/249/256/258</li> <li>Isolate CV Phase B valve CVC-381</li> </ul> |
|  |     |   |
| <b>EOP-E-0</b>                           | BOP | Perform Attachment 1, Auto Action Verification, While continuing with this procedure. (Should be assigned to BOP.) (Att. 1 steps are presented next followed by the remainder of EOP-E-0.)  |
|  |     |   |
| <b>Beginning of EOP-E-0 Attachment 1</b> |     |   |
|  |     |   |
| <b>Att. 1</b>                            | BOP | Check ECCS Pumps Running: <ul style="list-style-type: none"> <li>SI pumps - BOTH RUNNING (YES)</li> <li>RHR pumps - BOTH RUNNING (YES)</li> </ul>   |
|  |     |   |
| <b>Att. 1</b>                            | BOP | Check ECCS Valves - PROPER EMERGENCY ALIGNMENT (YES)  |
|  |     |   |
| <b>Att. 1</b>                            | BOP | Check CCW Pumps - AT LEAST ONE RUNNING (YES, however, there is no level. Pumps will be stopped and locked out in AOP-014)   |
|  |     |   |

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|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 32 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|---|-----|--|
| <b>Att. 1</b>   | BOP | <p>Check Containment Isolation Phase A</p> <p style="margin-left: 40px;">a. Phase A – Actuated (YES)</p> <p style="margin-left: 40px;">b. Phase A valves – Closed (NO, FP-248/249/256/ and 258 are open)</p> <p>RNO:</p> <p>Manually close valve(s) as necessary</p> <p style="margin-left: 40px;">c. Excess letdown – Isolated (YES)</p> <ul style="list-style-type: none"> <li>• CVC-387 – Closed (YES)</li> <li>• HIC-137 – at 0% DEMAND (YES)</li> </ul> |
|   |     |  |
| <b>CRITICAL TASK: Close Phase A Valves FP-248/249/256/258</b> |     |  |
|   |     |  |
| <b>Att. 1</b>   | BOP | <p>Check Feedwater Isolation:</p> <p>Main feed pumps – BOTH TRIPPED (YES)</p> <p>Main feedwater – ISOLATED</p> <p>FRVs – Closed (YES)</p> <p>Feedwater reg bypass valves – Closed (YES)</p> <p>Feedwater header section valves – Closed (YES)</p>  |
|   |     |  |
| <b>Att. 1</b>   | BOP | <p>Check if Main Steamlines Should Be Isolated:</p> <p style="margin-left: 40px;">a) Main steamline isolation – REQUIRED (YES)</p> <ul style="list-style-type: none"> <li>• Containment pressure – Greater than 10 psig (YES)</li> </ul> <p style="text-align: center;">OR</p>   |



|                    |                   |  |          |         |          |      |           |    |           |
|--------------------|-------------------|--|----------|---------|----------|------|-----------|----|-----------|
| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #   | <u>4</u> | Event # | <u>9</u> | Page | <u>33</u> | of | <u>51</u> |
| Event Description: |                   | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |          |         |          |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior  |          |         |          |      |           |    |           |

|               |     |   |
|---------------|-----|---|
|               |     | <ul style="list-style-type: none"> <li>• High steam flow with: (NO)               <ul style="list-style-type: none"> <li>○ S/G pressure – less than 614 psig</li> <li>OR</li> <li>○ Tavg – less than 543°F</li> </ul> </li> </ul> <p>Check MSIVs and MSIV bypass valves closed (YES)</p>  |
|               |     |   |
| <b>Att. 1</b> | BOP | Check Proper Service Water System Operation: <ul style="list-style-type: none"> <li>a. SW pumps – All running (YES)</li> <li>b. SW booster pumps – Both running (YES)</li> <li>c. Both SW header low pressure alarms (APP-008-F7/F8) – Extinguished (YES)</li> </ul>  |
|               |     |   |
| <b>Att. 1</b> | BOP | Check Both EDGs – Running (YES)   |
|               |     |   |
| <b>Att. 1</b> | BOP | Check ECCS Flow: <ul style="list-style-type: none"> <li>a. RCS pressure – less than 170 psig (YES)</li> <li>b. SI pumps- Flow Indicated (YES.)</li> <li>c. RCS pressure – less than 350 psig. (YES)</li> <li>d. RHR Pumps – flow indicated (YES, initially may not have flow. Pressure is lowering and flow will be established)</li> </ul> |
|               |     |   |
| <b>Att. 1</b> | BOP | Check CV Recirculation Fans – All Running (YES)   |
|               |     |   |
| <b>Att. 1</b> | BOP | Check IVSW - Actuated (YES) <ul style="list-style-type: none"> <li>• PCV-1922A – Open (YES)</li> <li>• PCV-1922B – Open (YES)</li> </ul>  |
|               |     |   |
| <b>Att. 1</b> | BOP | Check CV ventilation isolation (YES) <ul style="list-style-type: none"> <li>a. CV ventilation isolation valves – CLOSED (YES)</li> </ul>  |

|                    |                   |  |          |         |          |      |           |    |           |
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| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #   | <u>4</u> | Event # | <u>9</u> | Page | <u>34</u> | of | <u>51</u> |
| Event Description: |                   | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |          |         |          |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior  |          |         |          |      |           |    |           |

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|---------------|-----|---|
|               |     |   |
| <b>Att. 1</b> | BOP | Check control room ventilation - aligned for pressurization mode (YES) <ul style="list-style-type: none"> <li>• HVA-1A or HVA-1B – Running (YES)</li> <li>• HVE-16 – Stopped (YES)</li> <li>• HVE-19A or HVE-19B – Running (YES)</li> <li>• Control Room HVAC outside air damper A or B – Open (YES)</li> <li>• CR-D1A-SA – Closed (YES)</li> <li>• CR-D1B-SB – Closed (YES)</li> </ul> |
|               |     |   |
| <b>Att. 1</b> | BOP | Check DS Bus – Energized (YES)  |
|               |     |   |
| <b>Att. 1</b> | BOP | Check Battery Chargers – Energized (YES)<br>APP-036-D1 – Extinguished (YES)<br>APP-036-D2 – Extinguished (YES)  |
|               |     |   |
| <b>Att. 1</b> | BOP | Stop R-11/12 Sample Pump  |
|               |     |   |
| <b>Att. 1</b> | BOP | Locally Reset and Load IACs as necessary (N/A)  |
|               |     |   |
| <b>Att. 1</b> | BOP | Perform Crew Update to include the following: <ul style="list-style-type: none"> <li>• Attachment Completion</li> <li>• Manual Actions Taken (Opened FP-248/249/256/258 valves)</li> <li>• Failed Equipment status.</li> <li>• SW status.</li> </ul>  |
|               |     |   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 35 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|------------------------------------|--------|---|
| <b>End of EOP-E-0 Attachment 1</b> |        |   |
|                                    |        |   |
| <b>Beginning of FRP-P.1</b>        |        |   |
|                                    |        |   |
| <b>FRP-P.1</b>                     | BOP    | Check CST Level - LESS THAN 10% (NO)<br>Go to step 3  |
|                                    |        |   |
|                                    |        | Determine If RCS Cooldown Is Due To A Large Break LOCA As Follows:<br>a. Check both of the following conditions exist: <ul style="list-style-type: none"> <li>RCS pressure - LESS THAN 275 PSIG [350 PSIG] (YES)</li> </ul> AND <ul style="list-style-type: none"> <li>RHR flow on FI-605 - GREATER THAN 1200 GPM (YES)</li> </ul> b. Reset SPDS AND return to procedure and step in effect |
|                                    |        |   |
| <b>End of FRP-P.1</b>              |        |   |
|                                    |        |   |
| <b>Continuation of AOP-014</b>     |        |   |
|                                    |        |   |
| <b>AOP-014</b>                     | RO/BOP | Lockout CCW Pumps As Follows:<br>a. Place AND hold all CCW Pump switches in STOP position   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 36 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|   |     | b. Check APP-001-F5, CCW PMP LO PRESS - ILLUMINATED<br>c. Release CCW Pump Switches<br>d. Go To Step 13   |
|   |     |   |
| <b>AOP-014</b>  | BOP | Dispatch Operator To Perform Attachment 3, CCW Leak Search, While Continuing With Procedure   |
|   |     |   |
| <b>AOP-014</b>  | BOP | Determine If RHR Must Be Stopped As Follows:<br>a. Check CCW Pumps - ALL STOPPED (YES)<br>b. Check RHR Pump status - ANY PUMP RUNNING IN CORE COOLING MODE (NO)<br>RNO:<br>Observe the NOTE prior to Step 18 and Go To Step 18. |
|   |     |   |
| <p style="text-align: center;"><b>NOTE</b></p> <p>IF the location of the leak is known AND isolation is possible, THEN leak isolation may be commenced immediately.</p> |     |   |
|   |     |   |
| <b>AOP-014</b>  | BOP | Check CV For CCW Break Using Control Room Indications As Follows:<br>a. Monitor the following CV indications: <ul style="list-style-type: none"> <li>• ERFIS CV SUMP LEVEL</li> </ul>   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 37 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|                |     | <ul style="list-style-type: none"> <li>CV WATER LEVEL (White Sump Lights)</li> <li>LI-801, CHANNEL I CV WATER LEVEL</li> <li>LI-802, CHANNEL II CV WATER LEVEL</li> <li>RCP Abnormal Conditions</li> </ul> <p>b. Check CV - LOCATION OF CCW BREAK</p> <p>c. Inform personnel performing leak search that the leak location is in the CV</p>   |
|                |     |   |
| <b>AOP-014</b> | BOP | <p>Determine RCP Alarm Status:</p> <p>a. Check APP-001-B1, RCP BRG COOL WTR LO FLOW - ILLUMINATED (YES)</p> <p>b. Check ANY RCP BEARING HI TEMP Alarm - ILLUMINATED</p> <ul style="list-style-type: none"> <li>APP-001-B3</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>APP-001-D3</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>APP-001-F3</li> </ul> <p>Go to step 20</p> |
|                |     |   |
| <b>AOP-014</b> | BOP | <p>Check Reactor – CRITICAL (NO)</p> <p>Go to step 24</p>   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 38 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|                                |     |   |
|--------------------------------|-----|---|
|                                |     |   |
| <b>AOP-014</b>                 | BOP | <p>Close The Following Valves To Isolate CCW To The RCPs:</p> <ul style="list-style-type: none"> <li>• CC-716A, CCW TO RCP ISO</li> <li>• CC-716B, CCW TO RCP ISO</li> <li>• CC-730, BRG OUTLET ISO</li> <li>• CC-735, THERM BAR OUT ISO</li> <li>• FCV-626, THERM BAR FLOW CONT</li> </ul>   |
|                                |     |   |
|                                |     | <p>Determine If Charging Pump(s) Should Be Stopped As Follows:</p> <p>a. Check Charging Pumps - ANY PUMP RUNNING (YES)</p> <p>b. Check RCS temperature - GREATER THAN 150°F (YES)</p> <p>Establish Alternate Cooling To Charging Pumps As Follows:</p> <p>a. Stop ALL but one Charging Pump b. Raise the speed of the running Charging Pump to at least 75% Demand Signal</p> <p>c. Dispatch an operator to perform Attachment 1, Emergency Cooling To Charging Pumps</p> |
|                                |     |   |
| <b>Continuation of EOP-E-0</b> |     |   |
|                                |     |   |
| <b>EOP-E-0</b>                 | RO  | Check AFW Pumps – Running (YES, all started in FRP-S.1)   |
|                                |     |   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 39 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|   |    |  |
|---|----|--|
| <b>EOP-E-0</b>  | RO | Check AFW Valves – Proper Emergency Alignment (YES) <ul style="list-style-type: none"> <li>• AFW header discharge valves – Full Open</li> <li>• AFW header section valves – Full Open</li> <li>• Steam driven AFW pump discharge valves – Full open if pump is running.</li> </ul> |
|   |    |  |
| <b>Caution</b><br><br>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment. |    |  |
|   |    |  |
| <b>EOP-E-0</b>  | RO | Check Total AFW Flow: <ul style="list-style-type: none"> <li>• Reset SI</li> <li>• Control feed flow to maintain NON-faulted S/Gs narrow range level – Between 8% and 50%.</li> <li>• Check total AFW flow- Greater than 300 gpm (YES)</li> </ul>                                  |
|   |    |  |
| <b>EOP-E-0</b><br><b>Critical Task</b>  | RO | Check CV Spray NOT Required: <ul style="list-style-type: none"> <li>a. CV pressure – Has remained less than 10 psig. (NO)</li> </ul> RNO: <ul style="list-style-type: none"> <li>a. Perform the following:</li> </ul>  |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 40 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|  |    |   |
|--|----|---|
|  |    | 1) Check CV spray actuated. (YES)<br>2) Verify the following:<br>a) Both CV spray pumps are running.<br>b) CV spray pump discharge valves are open: <ul style="list-style-type: none"> <li>○ SI-880A</li> <li>○ SI-880B</li> <li>○ SI-880C</li> <li>○ SI-880D</li> </ul>  |
|  |    | c) CV spray additive tank discharge valves are open: <ul style="list-style-type: none"> <li>○ SI-845A</li> <li>○ SI-845B</li> </ul> d) Spray additive tank flow is approximately 12 gpm: <ul style="list-style-type: none"> <li>○ Adjust SI-845C, SAT throttling valve, as necessary.</li> </ul> 3) Verify Containment Isolation Phase B valves are closed. (NO, CVC-381 open)<br>4) Stop all RCPs.<br>5) Observe CAUTION prior to Step 10 and Go To Step 10. |
|  |    |   |
| <b>CRITICAL TASK: Close CVC-381. It did not close on the Phase B</b> |    |   |
|  |    |   |
| <b>EOP-E-0</b>   | RO | Check RCP Seal Cooling: <ul style="list-style-type: none"> <li>• CCW flow to RCP thermal barriers – Normal (NO)</li> </ul>  |



|                    |                   |  |          |         |          |      |           |    |           |
|--------------------|-------------------|--|----------|---------|----------|------|-----------|----|-----------|
| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #   | <u>4</u> | Event # | <u>9</u> | Page | <u>41</u> | of | <u>51</u> |
| Event Description: |                   | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |          |         |          |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior  |          |         |          |      |           |    |           |

|                |     |   |
|----------------|-----|---|
|                |     | <ul style="list-style-type: none"> <li>○ APP-001-C1 / D1 – Extinguished (NO)</li> <li>OR</li> <li>• Seal injection flow – Normal (YES) <ul style="list-style-type: none"> <li>○ Seal injection flow – Greater than 6 gpm per RCP</li> <li>OR</li> <li>○ Thermal barrier <math>\Delta</math>Ps – Greater than 5 inches water.</li> </ul> </li> </ul>   |
|                |     |   |
| <b>EOP-E-0</b> | RO  | Check RCS Temperature<br>With NO RCPs running, RCS cold leg temperatures – Stable at or trending to 547°F (NO)<br>RNO: IF temperature is less then 547°F AND lowering then perform the following: (YES) <ul style="list-style-type: none"> <li>a. Stop dumping steam</li> <li>b. IF cooldown continues, THEN reduce total feed flow to minimum for decay heat removal: <ul style="list-style-type: none"> <li>○ Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% [18%] in at least one S/G.</li> </ul> </li> <li>c. IF cooldown continues, THEN close MSIVs and MSIV bypass valves.</li> </ul> |
|                |     |   |
| <b>EOP-E-0</b> | RO  | Check PZR PORVs and Spray Valves: <ul style="list-style-type: none"> <li>a. PORVs – Closed (YES)</li> <li>b. Normal PZR spray valves – Closed (YES)</li> <li>c. Aux spray valve – Closed (YES)</li> </ul>   |
|                |     |   |
| <b>EOP-E-0</b> | RO  | Check If RCPs should be stopped: <ul style="list-style-type: none"> <li>a. RCPs – Any Running (NO, stopped per FOLDOUT)</li> </ul> RNO: Go to Step 14   |
|                |     |   |
| <b>EOP-E-0</b> | BOP | Check if S/G Secondary Pressure Boundaries are Intact: <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs <ul style="list-style-type: none"> <li>○ None lowering in an uncontrolled manner (YES)</li> <li>○ None Completely depressurized (YES)</li> </ul> </li> </ul>   |
|                |     |   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 42 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|   |     |   |
|---|-----|---|
|   |     | Check If S/G Tubes Are Intact: <ul style="list-style-type: none"> <li>• Secondary radiation monitors - HAVE REMAINED NORMAL (YES)             <ul style="list-style-type: none"> <li>• Condenser air ejector radiation (R-15)</li> <li>• S/G blowdown radiation (R-19s)</li> <li>• S/G steamline radiation (R-31s)</li> </ul> </li> <li>• S/G levels - NONE RISING IN AN UNCONTROLLED MANNER</li> </ul> RNO:<br>Reset SPDS and initiate monitoring of Critical Safety Functions Status Trees.<br><br>Go To EOP-E-1, Loss Of Reactor Or Secondary Coolant, Step 1. |
|   |     |   |
| <b>Beginning of EOP-E-1, Loss of Reactor or Secondary Coolant</b> |     |   |
|   |     |   |
| <b>NOTE</b><br><br>FOLDOUT for EOP-E-1 is in effect.              |     |   |
|   |     |   |
| <b>EOP-E-1</b>  | RO  | Check If RCPs should be stopped:<br>a. RCPs – Any Running (NO, stopped per EOP-E-0 FOLDOUT)<br>RNO: Go to Step 2  |
|   |     |   |
| <b>EOP-E-1</b>  | BOP | Check if S/G Secondary Pressure Boundaries are Intact:<br>a. Check pressures in all S/Gs <ul style="list-style-type: none"> <li>○ None lowering in an uncontrolled manner (YES)</li> <li>○ None Completely depressurized (YES)</li> </ul>   |
|   |     |   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 43 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|   |     |  |
|---|-----|--|
| <b>EOP-E-1</b>  | BOP | <b>Continuous Action Step</b><br>Check Intact S/G Levels:<br>a. Narrow range levels – Greater than 18% (YES)<br>b. Control feed flow to maintain narrow range levels – between 8% AND 50%  |
|   |     |  |
| <b>CAUTION</b><br>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment. |     |  |
|   |     |  |
| <b>EOP-E-1</b>  | RO  | Reset SI   |
|   |     |  |
| <b>EOP-E-1</b>  | RO  | Reset Containment Isolation Phase A  |
|   |     |  |
| <b>EOP-E-1</b>  | BOP | Check Secondary Radiation:<br>a. Secondary radiation monitors – Have remained normal (YES)<br>o R-15, R-19s, R-31s<br>b. Perform the following:<br>1) Request periodic activity samples of all S/Gs<br>2) Secondary sample results – Normal (When results available) |
|   |     |  |
| <b>EOP-E-1</b>  | RO  | Check PZR PORVs and Block Valves:<br>a. Power to block valves – Available (YES)<br>b. PORVs – Closed (YES)<br>c. Block valves – At least one open. (YES)   |
|   |     |  |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 44 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|                |    |   |
|----------------|----|---|
| <b>EOP-E-1</b> | RO | Establish Instrument Air to CV:<br>a. Check APP-002-F7 – Extinguished (YES)<br>b. Reset IA PCV-1716<br>c. Check IA PCV-1716 – OPEN (YES)  |
|                |    |   |
| <b>EOP-E-1</b> | RO | Check Power Supply to Charging Pumps – Offsite power available (YES)  |
|                |    |   |
| <b>EOP-E-1</b> | RO | Check if Charging Flow has been established:<br>a. Charging pumps – At least one running. (YES)<br>b. Establish desired charging flow: <ul style="list-style-type: none"> <li>○ Start additional pump(s) as necessary</li> <li>○ Adjust charging pump speed controllers as necessary to establish desired charging flow.</li> <li>○ Adjust HIC-121 as necessary to establish desired charging flow:               <ul style="list-style-type: none"> <li>○ Maintain seal injection flow – Between 6 gpm and 20 gpm per RCP unless seal injection isolated.</li> </ul> </li> </ul>             |
|                |    |   |
| <b>EOP-E-1</b> | RO | Check if SI flow should be terminated:<br>a. RCS subcooling base on core exit TCs – Greater than 55°F (NO, Go to Step 12.)<br>b.  |
|                |    |   |
| <b>EOP-E-1</b> | RO | <b>Continuous Action Step</b><br>Step 12: Check if Containment Spray should be stopped: <ul style="list-style-type: none"> <li>a. Spray pump – Any running (YES)</li> <li>b. Containment pressure – Less than 4 psig (YES)</li> <li>c. Reset containment spray signal: Place Containment Spray key switch to OVRD/RESET and return to NORMAL</li> <li>d. Reset containment isolation Phase B</li> <li>e. Stop containment spray pumps</li> <li>f. Close CV Spray Pump Discharge Valves: SI-880A / B / C / D</li> <li>g. Close CV Spray Additive Tank Discharge Valves: SI-845A / B</li> </ul> |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 45 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

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|---|-----|---|
|   |     |   |
| <u><b>CAUTION</b></u>   |     |   |
| If RCS pressure lowers in an uncontrolled manner to less than 275 psig [350 psig], the RHR pumps must be manually restarted to supply water to the RCS. |     |   |
|   |     |   |
| <b>EOP-E-1</b>  | RO  | <b>Continuous Action Step</b><br>Check if RHR Pumps Should be Stopped: <ol style="list-style-type: none"> <li>Check RCS pressure:               <ul style="list-style-type: none"> <li>Pressure – Greater than 350 psig (NO, go to step 15)</li> </ul> </li> </ol>  |
|   |     |   |
| <b>EOP-E-1</b>  | BOP | Step 15: Check if Diesel Generators should be Stopped: <ol style="list-style-type: none"> <li>AC emergency busses – Energized by Offsite Power (YES)               <ul style="list-style-type: none"> <li>E-1</li> <li>E-2</li> </ul> </li> <li>EDG starting air annunciators – Extinguished (YES)               <ul style="list-style-type: none"> <li>APP-010-B2 / B3</li> </ul> </li> <li>Stop unloaded EDGs</li> </ol>                              |
|   |     |   |
| <b>EOP-E-1</b>  | BOP | Initiate Evaluation of Plant Status: <ol style="list-style-type: none"> <li>Check Cold leg recirculation capability:               <ul style="list-style-type: none"> <li>Train A and Train B:</li> </ul> </li> </ol> Crew determines that they do not have any CCW Pumps<br>RNO:<br>IF at least one train of cold leg recirculation capability can NOT be verified, THEN reset SPDS and Go To EPP-15, Loss Of Emergency Coolant Recirculation, Step 1. |
|   |     |   |
| <b>Beginning of EPP-15</b>  |     |   |
|   |     |   |

|                    |                   |  |          |         |          |      |           |    |           |
|--------------------|-------------------|--|----------|---------|----------|------|-----------|----|-----------|
| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #   | <u>4</u> | Event # | <u>9</u> | Page | <u>46</u> | of | <u>51</u> |
| Event Description: |                   | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |          |         |          |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior  |          |         |          |      |           |    |           |

|               |      |  |
|---------------|------|--|
| <b>EPP-15</b> | CREW | Check Emergency Coolant Recirculation Capability – RESTORED (NO)<br><br>RNO:<br><br>Go to step 3   |
|               |      |  |
| <b>EPP-15</b> | RO   | Reset SPDS AND Initiate Monitoring Critical Safety Function Status Trees   |
|               |      |  |
| <b>EPP-15</b> | CREW | Foldout Pages Are Not Applicable During Performance Of This Procedure  |
|               |      |  |
| <b>EPP-15</b> | RO   | Check Suction Source To Any Of The Following Pumps - LOST (NO)<br><br>RNO:<br><br>Go to step 7 <ul style="list-style-type: none"> <li>• SI Pumps</li> <li>• RHR Pumps</li> <li>• CV Spray Pumps</li> </ul> |
|               |      |  |
| <b>EPP-15</b> | BOP  | Check Emergency Recirculation Equipment - AVAILABLE USING SUPPLEMENT D (NO) CCW Pumps are not available  |
|               |      |  |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 47 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|            |                      |   |                      |                      |                        |                      |       |          |  |   |
|------------|----------------------|---|----------------------|----------------------|------------------------|----------------------|-------|----------|--|---|
| EPP-15     | RO                   | Verify The Following CV RECIRC FANs - RUNNING <ul style="list-style-type: none"><li>HVH-1</li><li>HVH-2</li><li>HVH-3</li><li>HVH-4</li></ul>   |                      |                      |                        |                      |       |          |  |   |
|            |                      |   |                      |                      |                        |                      |       |          |  |   |
| EPP-15     | RO                   | <b>Continuous Action Step</b><br><br>Check RWST Level - LESS THAN 9% (NO)<br><br>RNO:<br><br>Go to step 11  |                      |                      |                        |                      |       |          |  |   |
|            |                      |   |                      |                      |                        |                      |       |          |  |   |
| EPP-15     | RO                   | Place The CONTAINMENT SPRAY Key Switch To The OVRD/RESET Position   |                      |                      |                        |                      |       |          |  |   |
|            |                      |   |                      |                      |                        |                      |       |          |  |   |
| EPP-15     | RO                   | Determine CV Spray Pump Requirements<br>a. Determine Number Of CV Spray Pumps Required Using the Following Table: <table><tr><td>RWST LEVEL</td><td>CONTAINMENT PRESSURE</td><td>CV RECIRC FANS RUNNING</td><td>SPRAY PUMPS REQUIRED</td></tr><tr><td>&gt; 27%</td><td>&lt; 4 psig</td><td></td><td>0</td></tr></table> | RWST LEVEL           | CONTAINMENT PRESSURE | CV RECIRC FANS RUNNING | SPRAY PUMPS REQUIRED | > 27% | < 4 psig |  | 0 |
| RWST LEVEL | CONTAINMENT PRESSURE | CV RECIRC FANS RUNNING  | SPRAY PUMPS REQUIRED |                      |                        |                      |       |          |  |   |
| > 27%      | < 4 psig             |   | 0                    |                      |                        |                      |       |          |  |   |
|            |                      |   |                      |                      |                        |                      |       |          |  |   |

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 48 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|   |     |   |
|---|-----|---|
| <b>EPP-15</b>   | RO  | Check CV Spray Pumps Running - EQUAL TO NUMBER REQUIRED (YES)   |
|   |     |   |
| <b>EPP-15</b>   | BOP | Makeup To RWST Using Supplement P While Continuing With This Procedure  |
|   |     |   |
| <b>Begin Supplement P, Emergency Makeup To The RWST</b>         |     |   |
|   |     |   |
|   |     | In the CCW Heat Exchanger Room, near the top of BAST "B", open the following valves: <ul style="list-style-type: none"> <li>• CVC-365A, BORIC ACID BLENDER TO RWST.</li> </ul> <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> <li>• CVC-365B, BORIC ACID BLENDER TO RWST.</li> </ul> |
|   |     |   |
| <b>BOOTH OPERATOR: Acknowledge request. No action necessary</b> |     |   |
|   |     |   |



|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 49 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|                     |    |   |
|---------------------|----|---|
| <b>Supplement P</b> | RO | <p>Set Makeup Control POTs as follows:</p> <ul style="list-style-type: none"> <li>a. FCV-113A, Boric Acid Flow Controller at 10 turns on the POT (9.25 gpm Boric Acid flow)</li> <li>b. FCV-114A, Primary Wtr Flow Dilute Mode Controller to 4.9 turns on the POT (75 gpm PW flow)</li> </ul> <p>RECORD RWST level, as indicated by LI-948 OR LI-969.</p> <p>Place the RCS Makeup Mode Selector Switch in the BORATE position.</p> <p>Set the total amount of Boric Acid to 5000 gal be used to blend to the RWST using the Boric Acid Totalizer, YIC-113 as follows:</p> <ul style="list-style-type: none"> <li>a. Depress BUTTON "A".</li> <li>b. Depress "CLR" BUTTON.</li> <li>c. Key in the 5000.0 gal.</li> <li>d. Depress the "ENT" BUTTON.</li> </ul> <p>Place the control switch for FCV-113B,BLENDED MU TO CHG SUCT in the CLOSED position.</p> <p>Place the control switch for FCV-114B, BLENDED MU TO VCT, in the CLOSED position.</p> <p>Start one of the available Primary Water Pumps.</p> <p>Place the RCS Makeup System Start/Stop switch in the START position.</p> <p>Place FCV-114A, PW TO BLENDER, in the OPEN position.</p> <p>PLACE the Primary Wtr Flow Dilute Mode Controller, FCV-114A, in MANUAL AND adjust the Primary Water flow rate to achieve 75 gpm.</p> |
|---------------------|----|---|

|                    |            |  |   |         |   |      |    |    |    |
|--------------------|------------|--|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #   | 4 | Event # | 9 | Page | 50 | of | 51 |
| Event Description: |            | <b>LBLOCA. Procedures used EOP-E-0, FRP-P.1 (will enter and immediately exit due to LBLOCA), AOP-014 is a concurrent AOP and will be given to the BOP to continue after EOP-E-0 Attachment 1 is complete, EOP-E-1, and then exit to EPP-15 due to no recirculation capability. Phase A valves FP-248/249/256/ and 258 fail to auto close and Phase B valve CVC-381 fails to auto close</b> |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior  |   |         |   |      |    |    |    |

|  |  |  |
|--|--|--|
|  |  | Adjust the POT for FCV-113A, Boric Acid Flow Controller, to achieve a flow rate of 9.25 gpm Boric Acid flow. |
|  |  |  |

**The Lead Examiner may terminate the scenario any time after makeup to the RWST is started.**

## **ILC-14 NRC SCENARIO 4 TURNOVER SHEET**

### **1. INITIAL CONDITIONS**

- a) Time in Core Life: EOL
- b) Reactor Power: 68%
- c) Turbine Load: 503 MWe
- d) Boron Concentration: 128 ppm
- e) Rod Height: 158 CBD
- f) RCS Pressure: 2235 psig
- g) RCS Level: 42 %
- h) Xenon: Equilibrium

### **2. TECHNICAL SPECIFICATION LCO ACTIONS STATEMENTS IN EFFECT**

| <u>T.S. #</u> | <u>Description</u> |
|---------------|--------------------|
|---------------|--------------------|

### **3. CLEARANCES IN EFFECT**

- a) None

### **4. CAUTION CAPS IN EFFECT**

- a) None

### **5. PROTECTED EQUIPMENT**

- a) None

### **6. DEGRADED EQUIPMENT**

- a) None

### **7. SWITCHYARD ACCESS**

- a) Unrestricted

### **8. PLANNED EVOLUTIONS**

- a) Maintain current power level

### **9. TURNOVER INFORMATION**

- a) None

### **10. REACTIVITY INFORMATION**

- a) Review the OST-947 BOL/MOL/EOL charts for BA and PW additions

### **11. RISK**

- a) GREEN

| Facility:  | HB ROBINSON   |                         | Scenario No.:                                  | 5     | Op Test No.: | <b>ILC-14</b> |
|--|---|-------------------------|--|-------|--------------|---------------|
| Examiners:   | _____   |                         | Operators:                                     | CRS - | _____        |               |
|  | _____   |                         |  | RO -  | _____        |               |
|  | _____   |                         |  | BOP - | _____        |               |
| Initial Conditions:  | <ul style="list-style-type: none"> <li>• 50% BOL, 150 MWD/MTU, 1337 PPM Boron</li> <li>• 'B' MFP OOS for shaft repair</li> </ul>  |                         |  |       |              |               |
| Turnover:  | <ul style="list-style-type: none"> <li>• Hold power at current value for 'B' MFP repair</li> </ul>  |                         |  |       |              |               |
| Critical Task:   | <ul style="list-style-type: none"> <li>• Close FRV's IAW EOP-E-0 Attachment 1 criteria</li> <li>• Close FW HDR Section Valves IAW EOP-E-0 Attachment 1 criteria</li> <li>• Stop 'A' MFP IAW EOP-E-0 Attachment 1 criteria</li> <li>• Reduce feed flow to all S/G's to 80-90 gpm IAW EPP-8 OR FRP-P.1</li> </ul> |                         |  |       |              |               |
| Event No.  | Malf. No.   | Event Type*             | Event Description                              |       |              |               |
| 1  |   | (C) BOP, CRS            | HVH-5A Trips with HVH-5B failure to Auto Start |       |              |               |
| 2  |   | (C) RO, CRS<br>(TS) CRS | RCP 'B' # 1 Seal Failure                       |       |              |               |
| 3  |   | (C) RO, CRS<br>(TS) CRS | HVH-1 Service Water leak in Containment        |       |              |               |
| 4  |   | (C) RO, CRS<br>(TS) CRS | Loss of IB- 3                                  |       |              |               |
| 5  |   | (C) BOP, CRS            | Steam leak 72" header                          |       |              |               |
| 6  |   | (N) BOP<br>(R) RO, CRS  | Down power AOP-038                             |       |              |               |
| 7  |   | (M) ALL                 | Steam break 72" header                         |       |              |               |
| 8  |   | BOP                     | FRV's fail to automatically close              |       |              |               |
| 9  |   | BOP                     | FW HDR Section Valves failed open              |       |              |               |
| 10   |   | BOP                     | 'A' MFP fails to Auto trip                     |       |              |               |
| 11   |   | BOP                     | MSIV's failed open                             |       |              |               |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor |   |                         |  |       |              |               |

**ILC-14 NRC SCENARIO 5 SUMMARY DESCRIPTION**

The crew will assume the watch with the plant at 50% RTP. They will maintain the current power level while repairs are being made to 'B' MFP. The motor breaker has been racked out and the pump has been isolated and cleared for maintenance.

On cue from the Chief Examiner, HVH-5A, CRDM Cooling Fan, trips and HVH-5B fails to Auto-Start. The operator will verify the standby fan starts by manually starting HVH-5B from the RTGB in accordance with APP-010-A6, HVH-5A/B AIR FLOW LOST/OVLD. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, RCP 'B' will experience a #1 Seal Failure. The crew will enter AOP-018, Reactor Coolant Pump Abnormal Conditions. The crew will perform Attachment 2, RCP #2 Seal Leak Rate Calculation, monitor RCP Seal parameters, and inform Engineering of seal leakage. CRS will review ITS 3.4.17, CVCS, 3.4.13, RCS Operational Leakage, 3.4.4/3.4.5/3.4.6, RCS Loops, and 3.6.3, CV Isolation Valves. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, HVH-1 will develop a Service Water leak in containment. The crew will diagnose this by a rise in Containment sump level. They will receive APP-002-A8, HVH-1 WTR OUTLET LO FLOW alarm. They will also receive APP-002-E2, HVH CONDENSATE COLL alarm. APP-002-E2 requires an operator to acknowledge the alarm on the CMS panel or ITS 3.4.15 will apply. APP-002-A8 has a caution that an HVH unit may be operated up to 15 minutes without cooling water to the fan motor without damage. The APP will stop the fan and isolate cooling water. ITS LCO 3.6.6 Condition 'C' applies and requires returning to operable within 7 days. The crew may refer to AOP-022 but this AOP does not address this event. When the Chief Examiner is satisfied with the crew actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, a loss of Instrument Bus #3 will occur due to the normal supply breaker on Inverter 'B' trips. The crew will perform the immediate actions for the loss of Instrument Bus #3 IAW AOP-024, LOSS OF INSTRUMENT BUS. Once the cause of the loss of Instrument Bus #3 is determined the bus will be re-energized from its alternate power supply, MCC-8. Various automatic controllers will be returned to auto control. Rod control and Turbine control will be placed back in auto. The CRS will identify that ITS LCO 3.8.7, Condition A, is in effect while the normal supply breaker to Instrument Bus #3 is open. This LCO requires that the AC Instrument Bus Power Source be restored to Operable status within 24 hours. Additionally, ITS LCO 3.8.9, Condition B, was in effect while Instrument Bus #3 was de-energized. This LCO requires that the AC instrument bus subsystem be restored to Operable status within 2 hours. ITS LCO 3.4.9, Condition A may be entered if pressurizer level is allowed to rise above 63.3%. The LCO requires that the plant be in Mode 3 with reactor trip breakers open within 6 hours and Mode 4 within 12 hours. ITS LCO 3.4.1, Condition A may be entered if pressurizer pressure is allowed to lower below 2223 psig (Standing Instruction 13-007). This LCO requires that pressurizer pressure be restored within 2 hours or be in Mode 2 in 6 hours. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, a steam leak will develop on the 72" header. The crew will commence a unit shutdown IAW GP-006-1, NORMAL PLANT SHUTDOWN FROM POWER OPERATION TO HOT SHUTDOWN OR AOP-038, RAPID DOWNPOWER. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, the plant will experience a fault on the 72 inch Main Steam Header. The crew will determine that a reactor trip is required and transition to EOP-E-0, REACTOR TRIP OR SAFETY INJECTION. An automatic safety injection signal will be initiated due to high steam line flow with low Tavg. A steam explosion on the 72" header has damaged the MSIV's and they will fail to automatically close and cannot be manually closed. On the safety injection the FRV's will fail to automatically close and EOP-E-0 Attachment 1 will direct these valves to be closed manually. EOP-E-0 will direct entry to EOP-E-2, FAULTED STEAM GENERATOR ISOLATION. Step 2 of EOP-E-2 will direct entry to EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS. EPP-16 will isolate all S/G's. The crew will throttle AFW flow to each S/G to 80-90 gpm. This will cause CSF for Heat Sink to turn red. The crew will enter FRP-H.1 and transition back to procedure and step in effect due to the red path being caused by operator action. The crew will transition to FRP-P.1, Response to Imminent Pressurized Thermal Shock. This procedure also throttles AFW flow to a minimum of 80 gpm to each S/G so if the crew transitions to FRP-P.1 prior to throttling flow in EPP-16 it will still get done.

The Chief Examiner may terminate the scenario at any time after the SI pumps have been secured in FRP-P.1.

| Sat /<br>Unsat | Critical Task  | Critical Task Criteria  |
|----------------|--|---|
|                | Manually trip MFP 'A'  | Manually trip Main Feed Pump 'A' IAW EOP-E-0, prior to exiting Step 5 of EOP-E-0, Attachment 1.   |
|                | Manually close Main FW Isolation Valves, The Feed Reg valves and the Header Section Valves | Close Main Feedwater Isolation Valves IAW EOP-E-0, prior to exiting Step 5 of EOP-E-0, Attachment 1. Main Feedwater Regulating Valves, Main Feedwater Regulating Bypass Valves, and Main Feedwater Header Section Valves. |
|                | Reduce Feed Flow to all S/G's to 80-90 gpm IAW EPP-8 OR FRP-P.1                            | Reduce Feed Flow to all S/G's prior to exiting step 6 of FRP-P.1  |

**ILC-14 NRC SCENARIO 5 SIMULATOR SETUP****IC/SETUP:**

- IC-605, SCN 006\_ILC\_14\_SIM\_NRC\_5
- Status board is provided to crew is IC-20.

**PRE-LOADED EVENTS:**

The following events should occur on the reactor trip or triggered events following the reactor trip:

- Event 7: Steam break 72" header
- Event 8: FRV's fail to automatically close
- Event 9: FW HDR Section Valves failed open
- Event 10: 'A' MFP fails to Auto trip
- Event 11: MSIV's failed open

**EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:**

- Event 1: HVH-5A Trips with HVH-5B failure to Auto Start
- Event 2: RCP 'B' #1 Seal Failure
- Event 3: HVH-1 SW Leak in CV
- Event 4: Loss of IB-3
- Event 5: 72" Header Leak
- Event 6: AOP-038 Down Power

**EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:**

- APP-010-A6, HVH-5A/B AIR FLOW LOST/OVLD
- AOP-018, Reactor Coolant Pump Abnormal Conditions
- APP-002-A8, HVH-1 WTR OUTLET LO FLOW
- APP-002-E2, HVH CONDENSATE COLL
- AOP-024, LOSS OF INSTRUMENT BUS
- GP-006-1, NORMAL PLANT SHUTDOWN FROM POWER OPERATION TO HOT SHUTDOWN
- AOP-038, RAPID DOWNPOWER
- EOP-E-0, REACTOR TRIP OR SAFETY INJECTION
- EOP-E-2, FAULTED STEAM GENERATOR ISOLATION
- EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS
- FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK
- FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK



|  |            |                                 |   |         |   |      |   |    |    |
|--|------------|---------------------------------|---|---------|---|------|---|----|----|
| Op Test No.:   | ILC-14 NRC | Scenario #                      | 5 | Event # | 1 | Page | 6 | of | 50 |
| Event Description: HVH-5B Trips with no Auto Start of HVH-5B |            |                                 |   |         |   |      |   |    |    |
| Time   | Position   | Applicant's Actions or Behavior |   |         |   |      |   |    |    |

**BOOTH OPERATOR: : Insert Event #1, HVH-5A trips with no auto start of HVH-5B.**

**EVENT INDICATIONS:**

APP-010-A6 HVH-5A/B AIR FLOW LOST/OVLD - Illuminated

APP-009-E7 480V GRD FAULT - Illuminated

|  |     |   |
|--|-----|---|
|  |     |   |
| <b>APP-010</b>   | BOP | <p>Reviews APP-010-A6</p> <p><b>CAUSES:</b> 1. HVH-5A/B supply breaker open / tripped.<br/>(MCC-5(5M) / MCC-5(4M)</p> <p>2. HVH-5A/B control power fuse blown.</p> <p>3. HVH-5A/B low flow with associated fan running.</p> <p>4. HVH-5A/B magnetic or thermal overload tripped.</p> <p>5. Single-phase open circuit condition.</p>   |
|  |     |   |
| <p align="center"><b>NOTE</b></p> <p>Voltage less than 440 Volts may indicate a single-phase open circuit.[C5]</p> |     |   |
|  |     |   |
| <b>APP-010</b>   | BOP | <p>1. EVALUATE CRDM indicating lights to determine affected fan:</p> <ul style="list-style-type: none"> <li>• HVH-5A, CRDM COOLING FAN</li> <li>• HVH-5B, CRDM COOLING FAN</li> </ul> <p>2. MONITOR the following ERFIS points to determine if a single-phase open circuit is present:</p> <ul style="list-style-type: none"> <li>• ERFIS point ELV3020A, BUS E1 VOLTAGE</li> <li>• ERFIS point ELV3021A, BUS E2 VOLTAGE</li> </ul> <p>3. <b>IF</b> a single-phase open circuit condition is suspected, <b>THEN GO TO</b> AOP-026, Grid Instability</p> |

|                    |            |   |   |         |   |      |   |    |    |
|--------------------|------------|---|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                                | 5 | Event # | 1 | Page | 7 | of | 50 |
| Event Description: |            | HVH-5B Trips with no Auto Start of HVH-5B |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior           |   |         |   |      |   |    |    |

|  |  |   |
|--|--|---|
|  |  | <p>4. <b>IF</b> a CRDM COOLING FAN has tripped, <b>THEN</b> VERIFY the Standby CRDM COOLING FAN is running</p> <p>5. DISPATCH Operator to evaluate affected CRDM COOLING FAN supply breaker status:</p> <ul style="list-style-type: none"><li>• Breaker MCC-5(5M), CONTROL ROD DRIVE MECHANISM COOLING FAN, HVH-5A</li><li>• Breaker MCC-6(4M), CONTROL ROD DRIVE MECHANISM COOLING FAN, HVH-5B</li></ul> |
|  |  |   |

**BOOTH OPERATOR:** When requested to inspect MCC-5 breaker for HVH-5A wait 3 minutes and report no abnormal indications at the breaker other than being tripped

|                    |            |                                 |   |         |   |      |   |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 2 | Page | 8 | of | 50 |
| Event Description: |            | RCP 'B' #1 Seal Failure         |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |   |    |    |

|  |        |  |
|--|--------|--|
|  |        |  |
| <b>BOOTH OPERATOR: : Insert Event #2, RCP 'B' #1 Seal Failure, cue from the Chief Examiner.</b>  |        |  |
|  |        |  |
| <b>EVENT INDICATIONS:</b><br><br>APP-001-D2 RCP #1 SEAL LEAKOFF HI FLOW – Illuminated<br><br>FR-154A WR Seal Leakoff Flow, 'A' rising, 'B&C' lowering<br><br>FR-124 Seal Injection Flow, 'A' rising  |        |  |
| <b>APP-001</b>   | RO     | Reviews APP-001-D2<br><br><b>CAUSE</b><br><br>1. Failure of RCP Number 1 Seal<br><br><b>ACTIONS</b><br><br>1. <b>IF</b> failure of a RCP Number 1 Seal has occurred, <b>THEN REFER TO</b> AOP-018. |
|  |        |  |
| <b>AOP-018</b>   | BOP    | MAKE PA Announcement For Procedure Entry   |
|  |        |  |
| <p style="text-align: center;"><b>NOTE</b></p> <p><input type="checkbox"/> <b>The RCP malfunctions in the Table below are listed in order of priority</b></p> <p><input type="checkbox"/> <b>This procedure is NOT applicable during implementation of EPP-1, Loss Of All AC OR any of its recovery procedures</b></p> |        |  |
|  |        |  |
|  | RO/CRS | EVALUATE Plant Conditions AND Go To The Appropriate Section For RCP Malfunction Not Yet Addressed:   |

|                    |            |                                 |   |         |   |      |   |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|---|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 2 | Page | 9 | of | 50 |
| Event Description: |            | RCP 'B' #1 Seal Failure         |   |         |   |      |   |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |   |    |    |

|  |     |  |           |
|--|-----|--|-----------|
| AOP-018  |     | MALFUNCTION  | SECTION   |
|  |     | Reactor Coolant Pump Seal Failure  | Section A |
|  |     | High Reactor Coolant Pump Vibration  | Section B |
|  |     | Loss of Seal Injection   | Section C |
|  |     |  |           |
| AOP-018  | RO  | <b>Continuous Action Step</b><br><br>CHECK Any RCP #1 Seal Leakoff Flow - GREATER THAN 5.7 GPM (NO)<br><br>GO TO Step 10   |           |
|  |     |  |           |
| AOP-018  | RO  | <b>Continuous Action Step</b><br><br>CHECK Indicated RCP #1 Seal Leakoff Flow - LESS THAN 0.8 GPM (NO)<br><br>OBSERVE the NOTE prior to Step 16 AND GO TO Step 16  |           |
|  |     |  |           |
| <b>NOTE</b>  |     |  |           |
| Attachment 2 leak rate calculations assume negligible #2 Seal leakage prior to event |     |  |           |
|  |     |  |           |
| AOP-018  | BOP | Determine total RCP #1 seal flow rate as follows:<br><br>a. PERFORM Attachment 2, RCP #2 Seal Leak Rate Calculation<br><br>b. ADD the indicated RCP #1 Seal Leakoff Flow to the calculated RCP #2 Seal Leakoff Flow from Attachment 2 for total RCP #1 Seal Leakoff Flow |           |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 2 | Page | 10 | of | 50 |
| Event Description: |            | RCP 'B' #1 Seal Failure         |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|   |                         | $\underline{5.27} + \underline{.14} = \underline{5.41}$   |                        |                         |                        |                        |   |    |
|---|-------------------------|---|------------------------|-------------------------|------------------------|------------------------|---|----|
|   |                         | INDICATED CALCULATED TOTAL  |                        |                         |                        |                        |   |    |
| <b>AOP-018 Attachment 2</b>   |                         |   |                        |                         |                        |                        |   |    |
|   |                         |   |                        |                         |                        |                        |   |    |
| <b>NOTE</b>   |                         |   |                        |                         |                        |                        |   |    |
| <input type="checkbox"/> RCDT level can be obtained from ERFIS point WDL5601A, ERFIS plot QP RCDT, or locally at LI-1003  |                         |   |                        |                         |                        |                        |   |    |
| <input type="checkbox"/> The initial leak rate determination calculation can be calculated with only 5 minute trend data. More data trending may be performed if desired. The same initial level may be used multiple times as long as the RCDT has not been pumped |                         |   |                        |                         |                        |                        |   |    |
|   |                         |   |                        |                         |                        |                        |   |    |
| <b>Att 2</b>  | RO                      | MONITOR RCDT level at 5 MINUTE intervals AND RECORD below   |                        |                         |                        |                        |   |    |
|   |                         | RECORD RCDT level below:  |                        |                         |                        |                        |   |    |
|   |                         | FORMULA FOR FLOW RATE CALCULATION IN STEP 3   |                        |                         |                        |                        |   |    |
|   |                         | <table border="1"> <tr> <th>Time<br/>(Start/Stop)</th> <th>RCDT level<br/>(%) start</th> <th>RCDT level<br/>(%) stop</th> <th>RCDT <math>\Delta</math><br/>level</th> </tr> <tr> <td style="text-align: center;">/</td> <td style="text-align: center;">30</td> <td style="text-align: center;">30.1</td> <td style="text-align: center;">0.1</td> </tr> </table> | Time<br>(Start/Stop)   | RCDT level<br>(%) start | RCDT level<br>(%) stop | RCDT $\Delta$<br>level | / | 30 |
| Time<br>(Start/Stop)  | RCDT level<br>(%) start | RCDT level<br>(%) stop  | RCDT $\Delta$<br>level |                         |                        |                        |   |    |
| /   | 30                      | 30.1  | 0.1                    |                         |                        |                        |   |    |
|   |                         |   |                        |                         |                        |                        |   |    |
|   | BOP                     | PERFORM the following to determine #2 Seal leak rate:<br>a. SUBTRACT the START LEVEL from the STOP LEVEL to obtain <input type="checkbox"/> LEVEL.  |                        |                         |                        |                        |   |    |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 2 | Page | 11 | of | 50 |
| Event Description: |            | RCP 'B' #1 Seal Failure         |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                         |              |  |  |
|-------------------------|--------------|--|--|
| <b>Att 2</b>            |              | $\frac{30.1}{30} - \frac{30}{30} = \frac{0.1}{30}$ <p>STOP LEVEL START LEVEL <input type="checkbox"/> LEVEL</p> <p>b. MULTIPLY <input type="checkbox"/> LEVEL by 3.5 to obtain gallons.</p> $\frac{0.1}{30} \times 3.5 = \frac{.35}{30}$ <p><input type="checkbox"/> LEVEL GALLONS</p> <p>c. DIVIDE GALLONS by elapsed time to obtain leak rate.</p> $\frac{.35}{30} \div \frac{5}{30} = \frac{.07}{30} \text{ gpm}$ <p>GALLONS TIME LEAK RATE</p> |  |
|                         |              |  |  |
|                         | <b>Att 2</b> | BOP  | NOTIFY the CRS of LEAK RATE value obtained in Step 3 |
|                         |              |  |  |
| <b>End Attachment 2</b> |              |  |  |
|                         |              |  |  |
| <b>AOP-018</b>          | RO           | <b>Continuous Action Step</b><br>CHECK Total RCP #1 Seal Flow - GREATER THAN 8.0 GPM (NO)<br>Go to step 19   |  |
|                         |              |  |  |
| <b>AOP-018</b>          | RO           | CHECK RCP #2 Seal Problem – Suspected (NO)<br>Go to step 24  |  |
|                         |              |  |  |
| <b>AOP-018</b>          | RO           | CHECK Affected RCP #1 Seal Leakoff Flow - LESS THAN 5 GPM (NO)<br>PERFORM The Following:   |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 2 | Page | 12 | of | 50 |
| Event Description: |            | RCP 'B' #1 Seal Failure         |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |   |
|----------------|-----|---|
|                |     | a. Closely MONITOR RCP Seal parameters.<br>b. NOTIFY Engineering of RCP Seal condition AND DIRECT them to contact Westinghouse for further instructions.<br>c. REVIEW OP-101, Reactor Coolant System and Reactor Coolant Pump Startup and Operation, Precautions and Limitations relating to RCP Number 1 Seal Leakoff Flow and take appropriate actions.<br>d. MAINTAIN Seal Injection flow between 8 gpm and 13 gpm.<br>e. GO TO Step 41. |
|                |     |   |
| <b>AOP-018</b> | RO  | IMPLEMENT The EALs  |
|                |     |   |
| <b>AOP-018</b> | CRS | REFER TO Technical Specifications For Any Applicable LCOs <ul style="list-style-type: none"> <li>• 3.4.17 - CVCS</li> <li>• 3.4.13 - RCS Operational Leakage</li> <li>• 3.4.4, 3.4.5, &amp; 3.4.6 – RCS Loops</li> <li>• 3.6.3 - CV Isolation Valves</li> </ul>   |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 3 | Page | 13 | of | 50 |
| Event Description: |            | HVH-1 Service Water Leak in CV  |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|   |    |  |
|---|----|--|
|   |    |  |
| <b>BOOTH OPERATOR: Insert Event #3, HVH-1 Service Water Leak in CV, on cue from the Chief Examiner.</b>   |    |  |
|   |    |  |
| <b>EVENT INDICATIONS:</b><br><br>APP-002-E2 HVH Condensate Coll<br><br>APP-002-A8 HVH-1 WTR Outlet Lo Flow<br><br>ERFIS indication of CV sump level rising  |    |  |
|   |    |  |
| <b>APP-002-E2</b>   | RO | Reviews APP-002-E2<br><br>CAUSES: 1. RCS leakage to CV atmosphere.<br>2. Steam leakage to CV atmosphere.<br>3. SW leakage in HVH unit housings. (YES)<br>4. Clogged HVH drain lines to sump.<br>5. Performance of OST-901 (expected alarm) |
|   |    |  |
| <p style="text-align: center;"><b>NOTE</b></p> <p>When an alarm is received on the local Condensate Collection Panel and is acknowledged, another alarm from a different HVH Unit will cause the RTGB annunciator to reflash.</p> <p>Per ITS 3.4.15 Basis, operability of CMS includes the HVH condensate collection alarm function on the RTGB. Therefore, if the local alarm is NOT promptly acknowledged to allow reflash capability for the RTGB annunciator, the ability to monitor RCS leakage from the Control Room via the CMS alarm is lost and may require placing the plant in a REQUIRED ACTION STATEMENT in accordance with ITS LCO 3.4.15 with the plant in Modes 1, 2, 3, or 4. (NCR 219670)</p> |    |  |
|   |    |  |



|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 3 | Page | 14 | of | 50 |
| Event Description: |            | HVH-1 Service Water Leak in CV  |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |                    |  |  |       |                   |  |                    |
|--|--------------------|--|--|-------|-------------------|--|--------------------|
| <b>APP-002-E2</b>  | RO                 | <b>OPERATOR ACTIONS</b><br>Determine the source of water, from available indications or CV entry   |  |       |                   |  |                    |
|  |                    |  |  |       |                   |  |                    |
| <b>APP-002-A8</b>  | RO                 | Reviews APP-002-A8<br><br><b>CAUSES:</b> 1. Operating Service Water Booster Pump Tripped<br>2. V6-33A (SW Booster Pump 'A' Supply to HVH-1), closed or other service water valves misaligned.<br>3. Standby Service Water Booster Pump Check Valve Stuck Open.<br>4. Service Water System Leak.<br><br><b>OBSERVATIONS</b><br>1. Service Water Booster Pump Status Lights on RTGB.<br>2. V6-33A (SW Booster Pump 'A' Supply to HVH-1) position indication.<br>3. Service Water Header Pressure, PI-1616 (North) and PI-1684 (South). |  |       |                   |  |                    |
|  |                    |  |  |       |                   |  |                    |
| <b>CAUTION</b>   |                    |  |  |       |                   |  |                    |
| HVH Units may be operated up to 15 minutes without cooling water to the fan motor. Continuous operation of the HVH Unit fan motor without cooling water may result in motor damage. (ESR 95-00700) |                    |  |  |       |                   |  |                    |
|  |                    |  |  |       |                   |  |                    |
| <b>APP-002-A8</b>  | RO                 | <b>OPERATOR ACTIONS</b><br><br>11. IF a SW line to OR from an HVH has ruptured, THEN perform the following:<br><br>a. Stop the affected HVH Unit and remove the control power fuses.<br><br>b. Close the affected HVH Unit inlet and outlet valves: <table border="1" style="margin-left: 40px;"> <tr> <td>HVH-1</td> <td>V6-33A - SW INLET</td> </tr> <tr> <td></td> <td>V6-34A - SW OUTLET</td> </tr> </table>   |  | HVH-1 | V6-33A - SW INLET |  | V6-34A - SW OUTLET |
| HVH-1  | V6-33A - SW INLET  |  |  |       |                   |  |                    |
|  | V6-34A - SW OUTLET |  |  |       |                   |  |                    |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 3 | Page | 15 | of | 50 |
| Event Description: |            | HVH-1 Service Water Leak in CV  |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |     |  |
|--|-----|--|
|  |     | V6-35A - WTR SAMPLING  |
|  |     |  |
| <b>APP-002-A8</b>  | CRS | Declare the affected HVH Unit inoperable and apply ITS LCO 3.6.6 |
|  |     |  |
| <b>BOOTH OPERATOR: If requested to check flow, wait 2 minutes and report HVH-1 flow is 500 gpm</b> |     |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 4 | Page | 16 | of | 50 |
| Event Description: |            | Loss of IB 3                    |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|   |    |  |
|---|----|--|
|   |    |  |
| <b>BOOTH OPERATOR: Insert Event #4, Loss of IB 3, on cue from the Chief Examiner.</b>   |    |  |
|   |    |  |
| <b>EVENT INDICATIONS:</b><br><br>S/G 'C' FRV shifts to manual<br>Loss of indication on Bistable Status Panel 'A'<br>PR NI indication fails to zero<br>Numerous alarms |    |  |
|   |    |  |
| <b>AOP-024</b>  | RO | <b>AOP-024, Loss of Instrument Bus</b><br><br><b>Immediate Action Steps</b><br><br>Place The Main Turbine in Manual<br><br>Verify S/G(s) Maintained At Program Level<br><br>Place Rods in M (Manual)   |
|   |    |  |
| <b>AOP-024</b>  | RO | Maintain Reactor Power Less Than OR Equal To 100%  |
|   |    |  |
| <b>AOP-024</b>  | RO | <b>Continuous Action Step</b><br><br>Determine if RCS Makeup needs to be stopped: <ul style="list-style-type: none"> <li>Check Auto Makeup, Boration OR Dilution – in progress (NO)</li> </ul> OR <ul style="list-style-type: none"> <li>Check IB 2 AND IB 7 De-energized (NO)</li> </ul> Go to step 7 |
|   |    |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 4 | Page | 17 | of | 50 |
| Event Description: |            | Loss of IB 3                    |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|  |     |   |                       |
|--|-----|---|-----------------------|
| AOP-024  | RO  | Control PZR Heaters And Sprays To Restore RCS Pressure To The Desired Control Band                            |                       |
|  |     |   |                       |
| AOP-024  | BOP | Make PA Announcement For Procedure Entry  |                       |
|  |     |   |                       |
| AOP-024  | RO  | Control Charging And Letdown Flow To Maintain PZR Level   |                       |
|  |     |   |                       |
| CAUTION  |     |   |                       |
| Maintain Charging Pump Discharge Pressure less than 2500 psig while adjusting seal injection flow to prevent lifting Charging Pump Discharge Relief valves |     |   |                       |
|  |     |   |                       |
| NOTE   |     |   |                       |
| Flow recorder FR-124, Seal Injection, will NOT be available if Instrument Bus 2 is not available   |     |   |                       |
|  |     |   |                       |
| AOP-024  | RO  | Check RCP Seal Injection Flow Between 8 GPM and 13 GPM (YES)  |                       |
|  |     |   |                       |
| AOP-024  | BOP | Determine Failed Instrument Bus (IB) From Any Of The Following:<br>Available indications<br>OR<br>Table Below |                       |
|  |     | IB  | Indication to check   |
|  |     | 3   | FR-498, "C" S/G Level |
|  |     |   |                       |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 4 | Page | 18 | of | 50 |
| Event Description: |            | Loss of IB 3                    |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

**BOOTH OPERATOR: When dispatched to check the IB-3 breaker wait 4 minutes and then report that a person was cleaning in the area and bumped the normal supply breaker**

|   |     |   |
|---|-----|---|
|   |     |   |
| <b>AOP-024</b>  | BOP | <b>Continuous Action Step</b><br>Check Emergency Busses E-1 AND E-2 – energized from the 4160V busses (YES)   |
|   |     |   |
| <b>AOP-024</b>  | BOP | <b>Continuous Action Step</b><br>Check affected IB – energized (NO)<br>WHEN affected Instrument Bus is Energized, THEN observe the NOTE prior to Step 14 and perform Step 14<br>Go To Step 15.                  |
|   |     |   |
| <p align="center"><b>NOTE</b></p> <p>When a manual/auto control station is reenergized, 15 to 20 sec. is needed for the AUTO light to go out and the manual/auto station to revert to the manual mode</p> |     |   |
|   |     |   |
| <b>AOP-024</b>  | RO  | Step 14<br>Restore Affected Controllers On The RTGB To AUTO Mode As Follows:<br>a. Check the affected controller - REVERTED TO MANUAL<br>b. Depress and release the AUTO pushbutton on the affected controller. |
|   |     |   |
| <b>AOP-024</b>  | RO  | Check LCV-460A & B, LTDN LINE STOP – CLOSED (NO)  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 4 | Page | 19 | of | 50 |
| Event Description: |            | Loss of IB 3                    |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|   |     |   |
|---|-----|---|
|   |     | Go to step 19   |
|   |     |   |
| <p style="text-align: center;"><b>NOTE</b></p> <ul style="list-style-type: none"> <li>IF the cause for the loss of Instrument Bus is known or is not due to a fault or suspected damage, THEN one attempt to reset and close the open breaker in the Instrument Bus Normal Supply should be attempted</li> <li>MCC-8 may only carry one Instrument Bus unless needed for nuclear safety concerns</li> </ul> |     |   |
|   |     |   |
| <b>AOP-024</b>  | RO  | Check affected IB energized (NO)<br><br>IF the cause is known OR NOT a fault OR suspected damage, THEN attempt to reset and close the open Instrument Bus normal supply breaker |
|   |     |   |
| <b>AOP-024</b>  | BOP | Stop All Radioactive Batch Releases   |
|   |     |   |
| <b>AOP-024</b>  | RO  | Check Status Of Local Actions:<br>a. Check Local Actions Of Step 19 RNO — REQUIRED (YES)<br>b. Check Local Actions Of Step 19 RNO — ATTEMPTED (YES)                             |
|   |     |   |
| <b>AOP-024</b>  | RO  | Check affected IB energized (YES)   |
|   |     |   |
| <b>AOP-024</b>  | RO  | Restore RCS Makeup Control To AUTO<br>a. Place the RCS MAKEUP SYSTEM Switch in STOP   |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 4 | Page | 20 | of | 50 |
| Event Description: |            | Loss of IB 3                    |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |  |
|----------------|-----|--|
|                |     | b. Verify the RCS MAKEUP MODE Switch in AUTO<br>c. Momentarily place the RCS MAKEUP SYSTEM Switch to START   |
|                |     |  |
| <b>AOP-024</b> | RO  | Restore Rod Control To Automatic As Follows:<br>a. Check Power - GREATER THAN 15% (YES)<br>b. Check Automatic Rod Control – available (YES)<br>c. Check Tavg – WITHIN – 1.5 to + 1.5 °F of Tref (YES)<br>d. Place the Rod Control selector switch to A (Automatic) |
|                |     |  |
| <b>AOP-024</b> | BOP | Check Emergency Busses E-1 AND E-2 energized (YES)   |
|                |     |  |
| <b>AOP-024</b> | BOP | Check Emergency Busses E-1 AND E-2 energized from their 4160V busses (YES)   |
|                |     |  |
| <b>AOP-024</b> | CRS | Implement the EALs   |
|                |     |  |
| <b>AOP-024</b> | RO  | Check status of IB-4 energized (YES)   |
|                |     |  |
| <b>AOP-024</b> | BOP | Place Turbine Controls in Automatic  |
|                |     |  |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 4 | Page | 21 | of | 50 |
| Event Description: |            | Loss of IB 3                    |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |   |
|----------------|-----|---|
| <b>AOP-024</b> | RO  | Determine CCW Pump status as follows:<br>Check CCW Pumps - MORE THAN ONE RUNNING (NO)<br>Go to step 31  |
|                |     |   |
| <b>AOP-024</b> | RO  | Check RMS-1, RMS-2, RMS-3, AND RMS-4 - ALL OPEN (YES)   |
|                |     |   |
| <b>AOP-024</b> | RO  | Check affected IB energized (YES)   |
|                |     |   |
| <b>AOP-024</b> | RO  | <b>Check PZR heater status – de-energized (NO)</b>  |
|                |     |   |
| <b>AOP-024</b> | RO  | Check Normal Letdown - ISOLATED   |
|                |     |   |
| <b>AOP-024</b> | BOP | Check All Radiation Monitor Alarms – EXTINGUISHED (NO)<br>Reset Radiation Monitor alarms that are illuminated due to loss of Instrument Bus as follows: <ul style="list-style-type: none"> <li>For RMS 1-12, 15-18, 20-31, OR 33, momentarily depress ALARM/RESET Pushbutton</li> <li>For RMS 14 OR 19, contact E&amp;C personnel to reset the monitor(s)</li> <li>For RMS-32, momentarily depress SAFE/RESET Pushbutton</li> </ul> |
|                |     |   |
| <b>AOP-024</b> | BOP | Check R-11 OR R-12 – in service (YES) <ul style="list-style-type: none"> <li>RMS-1, RMS-2, RMS-3, and RMS-4 – OPEN</li> </ul> AND   |



|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 4 | Page | 22 | of | 50 |
| Event Description: |            | Loss of IB 3                    |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|                |     |   |
|----------------|-----|---|
|                |     | <ul style="list-style-type: none"> <li>R-11 and R-12 Vacuum Pump Operating</li> <li></li> </ul>   |
| <b>AOP-024</b> | BOP | Check R-20, Fuel Handling Bldg Lower Level Low Range – in service (YES)<br>Check R-21, Fuel Handling Bldg Upper Level Low Range – in service (YES)  |
| <b>AOP-024</b> | BOP | Check Control Room Ventilation – aligned for pressurization mode (NO)<br>Go to step 43  |
| <b>AOP-024</b> | RO  | Check PZR PRV Safety Acoustic Monitor Lights – illuminated (NO)<br>Go to step 45  |
| <b>AOP-024</b> | RO  | Check IB's 1-4 energized from their normal source (YES)   |
| <b>AOP-024</b> | BOP | Check status of EDGs – start signal received (NO)<br>Go to step 65  |
| <b>AOP-024</b> | BOP | Check all safety related electrical busses energized (YES)  |
| <b>AOP-024</b> | CRS | Check Technical Specifications For Applicable LCOs <ul style="list-style-type: none"> <li>ITS LCO 3.8.1, AC Sources – Operating</li> <li>ITS LCO 3.8.7, AC Instrument Bus Sources – Operating</li> <li>ITS LCO 3.8.9, Distribution Systems - Operating</li> </ul> |

|                    |            |                                 |   |         |   |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|---|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 4 | Page | 23 | of | 50 |
| Event Description: |            | Loss of IB 3                    |   |         |   |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |   |      |    |    |    |

|   |     |   |
|---|-----|---|
| <b>AOP-024</b>  | RO  | Check Annunciator APP-005-A3, PR DROP ROD – ILLUMINATED (YES)   |
|   |     |   |
| <b>AOP-024</b>  | RO  | Reset Dropped Rod Alarm By Performing The Following: <ol style="list-style-type: none"> <li>Place DROPPED ROD MODE switch for the affected Power Range Drawer to RESET Position</li> <li>Place DROPPED ROD MODE switch for the affected Power RangeDrawer to NORMAL Position</li> <li>Check Annunciator APP-005-A3, PR DROP ROD – EXTINGUISHED (YES)</li> </ol> |
|   |     |   |
| <b>AOP-024</b>  | BOP | Check APP-006-F5, STEAM DUMP ARMED – ILLUMINATED (NO)<br>Go to step 71  |
|   |     |   |
| <b>AOP-024</b>  | RO  | Check APP-006-F5, Steam Dump Armed – Illuminated (YES)  |
|   |     |   |
| <b>AOP-024</b>  | RO  | Reset AMSAC TROUB/BYPD Alarm By Depressing The SYSTEM RESET Pushbutton On AMSAC Front Panel   |
|   |     |   |
| <b>BOOTH OPERATOR: When contacted wait 3 minutes and then reset AMSAC</b> |     |   |

|   |            |   |   |         |     |      |    |    |    |
|---|------------|---|---|---------|-----|------|----|----|----|
| Op Test No.:  | ILC-14 NRC | Scenario #  | 5 | Event # | 5/6 | Page | 24 | of | 50 |
| Event Description:  |            | Steam Leak on 72" Header  |   |         |     |      |    |    |    |
| Time  | Position   | Applicant's Actions or Behavior   |   |         |     |      |    |    |    |
| <b>BOOTH OPERATOR: Insert Event #5, Steam Leak on 72" Header, on cue from the Chief Examiner.</b>   |            |   |   |         |     |      |    |    |    |
| <b>EVENT INDICATIONS:</b><br><br>Steam noise is heard in the Control Room<br><br>Steam flow indication has risen on all S/G's on flow recorder<br><br>Tavg lowers   |            |   |   |         |     |      |    |    |    |
| <b>BOOTH OPERATOR: When requested to investigate steam leak, wait 2 minutes and report steam coming from the 72" header</b>   |            |   |   |         |     |      |    |    |    |
|   |            |   |   |         |     |      |    |    |    |
|   | CRS        | Call Operations management to inform them of steam leak and that the unit will be shutdown  |   |         |     |      |    |    |    |
| <b>BOOTH OPERATOR: If the CRS does not call Operations management then call them and let them know that you heard steam noise and saw steam rising from the Turbine deck. If they discuss shutting the unit down using GP-006-1 prompt them to use AOP-038 in case the leak gets worse.</b> |            |   |   |         |     |      |    |    |    |
|   |            |   |   |         |     |      |    |    |    |
| <b>AOP-038</b>  | BOP        | NOTIFY Plant Personnel Of Procedure Entry Using The Plant Page System   |   |         |     |      |    |    |    |
|   |            |   |   |         |     |      |    |    |    |
| <b>AOP-038</b>  | BOP        | DETERMINE Corrected Boration And Target Rod Height For Target Power Level Using Most Recently Performed OST-947, OPERATIONS REACTIVITY PLAN |   |         |     |      |    |    |    |

|                    |            |                                 |   |         |     |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 5/6 | Page | 25 | of | 50 |
| Event Description: |            | Steam Leak on 72" Header        |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |     |      |    |    |    |

|                |     |  |
|----------------|-----|--|
|                |     | o Target Load Reduction Rate<br>_____ %/min<br>o Target Power Level _____<br>o Target Rod Height _____ Steps<br>o Corrected Boration _____ Gallons   |
|                |     |  |
| <b>AOP-038</b> | CRS | PERFORM Brief Of Control Room Personnel To Include The Following: <ul style="list-style-type: none"> <li>Reason for downpower</li> <li>Target Power Level</li> <li>Target Rod Height</li> <li>Rate of load reduction</li> <li>Amount of boric acid addition</li> </ul> |
|                |     |  |
| <b>AOP-038</b> | CRS | <b>Continuous Action Step</b><br>CHECK Required Power Reduction Rate - LESS THAN OR EQUAL to 5%/MINUTE (YES)   |
|                |     |  |
| <b>AOP-038</b> | RO  | ENERGIZE All Available PZR Heaters <ul style="list-style-type: none"> <li>PZR HTR CONTROL GROUP</li> <li>PZR HTR BACK-UP GROUP A</li> <li>PZR HTR BACK-UP GROUP B</li> </ul>   |
| <b>AOP-038</b> | RO  | Check Rod Control – in auto (YES)  |

|                    |            |                                 |   |         |     |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 5/6 | Page | 26 | of | 50 |
| Event Description: |            | Steam Leak on 72" Header        |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |     |      |    |    |    |

|   |    |  |
|---|----|--|
|   |    |  |
| <b>AOP-038</b>  | RO | INITIATE Boration Using Attachment 1, RCS Boration, While Continuing With This Procedure                                       |
|   |    |  |
| <b>AOP-038 Attachment 1 RCS Boration</b>  |    |  |
|   |    |  |
| <b>Att 1</b>  | RO | PLACE The RCS MAKEUP MODE Selector Switch In BORATE  |
|   |    |  |
| <b>Att 1</b>  | RO | IF Frequent Boric Acid Transfer Pump Starts Are Anticipated, THEN PLACE Boric Acid Transfer Pump Switch Aligned To BLEND To ON |
|   |    |  |
| <p style="text-align: center;"><b>NOTE</b></p> <ul style="list-style-type: none"> <li>When the potentiometer setting for FCV-113A exceeds 9.0, FR-113 should be monitored closely. Based on system design characteristics, an indicated flow of 10 gpm may be greater than 10 gpm (actual) boric acid flow. This is past the range of indication available on FR-113.</li> <li>Due to RCS leak rates, batch additions may NOT be possible. FCV-113A, BORIC ACID FLOW, may be adjusted to compensate for RCS leakage.</li> </ul> |    |  |
|   |    |  |
| <b>Att 1</b>  | RO | SET YIC-113, BORIC ACID TOTALIZER to amount determined in Main Body Step 2   |
|   |    |  |
| <b>Att 1</b>  | RO | Momentarily PLACE the RCS MAKEUP SYSTEM switch to START  |
|   |    |  |
| <b>Att 1</b>  | RO | <p><b>Continuous Action Step</b></p> <p>IF Boric Acid flow is NOT achieving the desired effect, THEN PLACE</p>                 |

|                    |            |                                 |   |         |     |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 5/6 | Page | 27 | of | 50 |
| Event Description: |            | Steam Leak on 72" Header        |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |     |      |    |    |    |

|       |    |  |
|-------|----|--|
|       |    | FCV-113A, BORIC ACID FLOW, in MAN AND manually Adjust controller FCV-113A, BORIC ACID FLOW, using the UP and DOWN pushbuttons  |
|       |    |  |
| Att 1 | RO | <p>WHEN the desired amount of Boric Acid has been added to the RCS OR the RCS MAKEUP SYSTEM Switch is placed in STOP, THEN VERIFY the following:</p> <ol style="list-style-type: none"> <li>FCV-113A, BA TO BLENDER, closes.</li> <li>FCV-113B, BLENDED MU TO CHG SUCT, closes.</li> <li>IF in AUTO, THEN operating Boric Acid Pump stops.</li> <li>RCS MAKEUP SYSTEM is OFF</li> </ol>  |
|       |    |  |
| Att 1 | RO | <p>WHEN all Boric Acid additions are complete, THEN FLUSH the Boric Acid flow as follows:</p> <ol style="list-style-type: none"> <li>PLACE the RCS MAKEUP MODE selector switch in ALT DILUTE</li> <li>SET YIC-114, PRIMARY WTR TOTALIZER, to 15 to 20 gallons.</li> <li>PLACE FCV-114B, BLENDED MU TO VCT, to CLOSE</li> <li>Momentarily PLACE the RCS MAKEUP SYSTEM switch to START</li> <li>WHEN the Primary Water addition is complete,</li> </ol> <p>THEN VERIFY the following:</p> <ul style="list-style-type: none"> <li>FCV-114A, PW TO BLENDER, closes</li> <li>FCV-113B, BLENDED MU TO CHG SUCT, closes</li> <li>IF in AUTO, THEN operating Primary Water Pump stops</li> <li>RCS MAKEUP SYSTEM is OFF</li> </ul> |
| Att 1 | RO | RETURN the RCS Makeup System to automatic as follows:  |

|                    |            |                                 |   |         |     |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 5/6 | Page | 28 | of | 50 |
| Event Description: |            | Steam Leak on 72" Header        |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |     |      |    |    |    |

|                            |     |   |
|----------------------------|-----|---|
|                            |     | a. VERIFY FCV-114A, PRIMARY WTR FLOW DILUTE MODE, is in AUTO.<br>b. PLACE FCV-114B, BLENDED MU TO VCT, in AUTO.<br>c. PLACE the RCS MAKEUP MODE switch in AUTO.<br>d. VERIFY FCV-113A, BORIC ACID FLOW, in AUTO.<br>e. VERIFY Primary Water Pump switch in AUTO.<br>f. VERIFY Boric Acid Transfer Pump switch aligned to BLEND in AUTO.<br>g. Momentarily PLACE the RCS MAKEUP SYSTEM switch to START |
|                            |     |   |
| <b>Att 1</b>               | RO  | RECORD in AUTO LOG the total amount of Primary Water and Boric Acid added during the boration   |
|                            |     |   |
| <b>End of Attachment 1</b> |     |   |
|                            |     |   |
| <b>AOP-038</b>             | BOP | INITIATE Turbine Load Reduction While Continuing With This Procedure<br>a. CHECK EH Turbine Control - IN OPER AUTO<br>b. PREPARE For Turbine Load Reduction As Follows:<br>1) CHECK IMP IN - ILLUMINATED<br>2) SET desired load in the SETTER<br>3) SELECT the desired Load Rate<br>c. DEPRESS the GO pushbutton to initiate Turbine Load reduction   |
|                            |     |   |

|                    |            |                                 |   |         |     |      |    |    |    |
|--------------------|------------|---------------------------------|---|---------|-----|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #                      | 5 | Event # | 5/6 | Page | 29 | of | 50 |
| Event Description: |            | Steam Leak on 72" Header        |   |         |     |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior |   |         |     |      |    |    |    |

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|----------------|-----|--|
| <b>AOP-038</b> | BOP | <p>ADJUST Turbine Load To Control Tavg Within 5°F Of Tref Using One Of The Following:</p> <ul style="list-style-type: none"> <li>ADJUST Load Rate</li> <li>OR</li> <li>DEPRESS GO and HOLD pushbuttons</li> </ul>  |
|                |     |  |
| <b>AOP-038</b> | CRS | <p>INITIATE Notifications</p> <ul style="list-style-type: none"> <li>Load Dispatcher of load reduction</li> <li>E&amp;C to control secondary chemistry</li> <li>RC for elevated radiation levels in CV Pump Bays and Pipe Alley</li> <li>On-call Duty Manager to activate the Event Response Team</li> <li>E&amp;C for impending 15% power change for I-131 sampling within 2 to 6 hours</li> <li>E&amp;C for impending power reduction greater than 20% terminate zinc injection</li> <li>NRC within 4 hours</li> </ul> |



|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 30 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

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|  |     |   |
| <b>BOOTH OPERATOR: Insert Event #7, Steam Break on 72" Header, on cue from the Chief Examiner.</b> |     |   |
|  |     |   |
| <b>EVENT INDICATIONS:</b>  |     |   |
| Steam noise gets louder  |     |   |
| PZR level and pressure lowering rapidly  |     |   |
| RCS temperature lowering   |     |   |
|  |     |   |
| <b>EOP-E-0, Reactor Trip or Safety Injection</b>   |     |   |
|  |     |   |
| <b>EOP-E-0</b>   | RO  | <b>Immediate Action Steps</b><br>Check Reactor tripped (YES)  |
|  |     |   |
| <b>EOP-E-0</b>   | BOP | <b>Immediate Action Steps</b><br>Check Turbine Trip: <ul style="list-style-type: none"> <li>a. Both turbine stop valves - Closed (YES)</li> <li>b. All MSR purge and shutoff valves – Closed (YES)</li> </ul> |
|  |     |   |
| <b>EOP-E-0</b>   | BOP | <b>Immediate Action Steps</b><br>Check Power to AC Emergency Busses: <ul style="list-style-type: none"> <li>a. E1 or E2 – At least one energized (YES)</li> </ul>   |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 31 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|  |     |   |
|--|-----|---|
|  |     | b. E1 and E2 – Both energized (YES)   |
|  |     |   |
| EOP-E-0  | RO  | <b>Immediate Action Steps</b><br>Check SI Status:<br>a) Check if SI is actuated: <ul style="list-style-type: none"> <li>SI annunciators – ANY ILLUMINATED (YES)</li> <li>SI equipment – AUTO STARTED (YES)</li> </ul> b) Check BOTH trains of SI – ACTUATED <ul style="list-style-type: none"> <li>SI pumps – BOTH RUNNING (yes)</li> <li>RHR pumps – BOTH RUNNING (YES)</li> </ul> |
|  |     |   |
| EOP-E-0  | CRS | Verifies all immediate actions for EOP-E-0.   |
|  |     |   |
| <b>EXAMINER'S NOTE:</b> Crew may take early actions at this time to address items that did not function or operate as designed. <ul style="list-style-type: none"> <li>Stop MFP 'A'</li> <li>Close FRV's</li> <li>Close FW HDR Section Valves</li> </ul> Crew may also take a prompt and prudent action and attempt to close the MSIV's (will not close) |     |   |
|  |     |   |

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|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 32 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

**BOOTH OPERATOR: If dispatched to attempt to close the MSIV's notify the Control Room that they are damaged from the steam explosion and will not close**

|  |     |  |
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|  |     |  |
| <p><u>NOTE</u></p> <p>FOLDOUT for EOP-E-0 is in effect</p> <p>(Faulted S/G AFW Isolation Criteria does not apply due to no intact S/G)</p> |     |  |
|  |     |  |
| <b>EOP-E-0</b>   | CRS | Perform Attachment 1, Auto Action Verification, While continuing with this procedure. (Should be assigned to BOP.) (Att. 1 steps are presented next followed by the remainder of EOP-E-0.) |
|  |     |  |
| <p><b>Beginning of EOP-E-0 Attachment 1</b></p> <p>(Remainder of EOP-E-0 Follows this Section)</p>   |     |  |
|  |     |  |
| <p><u>CAUTION</u></p> <p>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.</p>       |     |  |
|  |     |  |
| <b>Att. 1</b>  | BOP | <p>Check ECCS Pumps Running:</p> <ul style="list-style-type: none"> <li>• SI pumps - BOTH RUNNING (YES)</li> <li>• RHR pumps - BOTH RUNNING (YES)</li> </ul>                               |
|  |     |  |

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|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 33 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

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| <b>Att. 1</b>                   | BOP | Check ECCS Valves - PROPER EMERGENCY ALIGNMENT (YES)  |
|                                 |     |   |
| <b>Att. 1</b>                   | BOP | Check CCW Pumps - AT LEAST ONE RUNNING (YES)  |
|                                 |     |   |
| <b>Att. 1</b>                   | BOP | Check Containment Isolation Phase A <ul style="list-style-type: none"> <li>a. Phase A – Actuated (YES)</li> <li>b. Phase A valves – Closed (YES)</li> <li>c. Excess letdown – Isolated (YES)               <ul style="list-style-type: none"> <li>• CVC-387 – Closed</li> <li>• HIC-137 – at 0% DEMAND</li> </ul> </li> <li>c. Manually close valve(s) as necessary</li> </ul>  |
|                                 |     |   |
| <b>Att. 1<br/>Critical Task</b> | BOP | Check Feedwater Isolation: <ul style="list-style-type: none"> <li>a) Main feed pumps – BOTH TRIPPED (NO)               <ul style="list-style-type: none"> <li>RNO – Trip MFP's as necessary</li> </ul> </li> <li>b) Main feedwater – ISOLATED               <ul style="list-style-type: none"> <li>• FRVs – Closed (NO)</li> <li>• Feedwater reg bypass valves – Closed (YES)</li> <li>• Feedwater header section valves – Closed (NO)</li> <li>RNO – Manually close valve(s) as necessary</li> </ul> </li> </ul> |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 34 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

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| <b>CRITICAL TASK – MANUALLY ISOLATE FEEDWATER PRIOR TO ANNOUNCING COMPLETION OF EOP-E-0 ATTACHMENT 1</b> |     |  |
|  |     |  |
| <b>Att. 1</b>  | BOP | Check if Main Steamlines Should Be Isolated: <ul style="list-style-type: none"> <li>a) Main steamline isolation – REQUIRED (YES)</li> <li>b) Check MSIV's and bypass valves closed (NO)</li> </ul> RNO – Manually close valve (s) as necessary (MSIV's will not close) |
|  |     |  |
| <b>Att. 1</b>  | BOP | Check Proper Service Water System Operation: <ul style="list-style-type: none"> <li>a. SW pumps – All running (YES)</li> <li>b. SW booster pumps – Both running (YES)</li> <li>c. Both SW header low pressure alarms (APP-008-F7/F8) – Extinguished (YES)</li> </ul>   |
|  |     |  |
| <b>Att. 1</b>  | BOP | Check Both EDGs – Running (YES)  |
|  |     |  |
| <b>Att. 1</b>  | BOP | Check ECCS Flow: <ul style="list-style-type: none"> <li>a. RCS pressure – less than 1650 psig (YES)</li> <li>b. SI pumps- Flow Indicated (YES)</li> <li>c. RCS pressure – less than 275 psig. (NO)</li> </ul> Go to step 10  |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 35 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

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|               |     |   |
| <b>Att. 1</b> | BOP | Check CV Recirculation Fans – All Running (HVH-1 is unavailable)  |
|               |     |   |
| <b>Att. 1</b> | BOP | Check IVSW - Actuated (YES) <ul style="list-style-type: none"> <li>• PCV-1922A – Open (YES)</li> <li>• PCV-1922B – Open (YES)</li> </ul>  |
|               |     |   |
| <b>Att. 1</b> | BOP | Check CV ventilation isolation (YES) <ul style="list-style-type: none"> <li>a. CV ventilation isolation valves – CLOSED (YES)</li> </ul>  |
|               |     |   |
| <b>Att. 1</b> | BOP | Check control room ventilation - aligned for pressurization mode (YES) <ul style="list-style-type: none"> <li>• HVA-1A or HVA-1B – Running (YES)</li> <li>• HVE-16 – Stopped (YES)</li> <li>• HVE-19A or HVE-19B – Running (NO, starts HVE-19A or HVE-19B)</li> <li>• Control Room HVAC outside air damper A or B – Open (YES)</li> <li>• CR-D1A-SA – Closed (YES)</li> <li>• CR-D1B-SB – Closed (YES)</li> </ul> |
|               |     |   |
| <b>Att. 1</b> | BOP | Check DS Bus – Energized (YES)  |
|               |     |   |

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| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 36 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

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| Att. 1                      | BOP | Check Battery Chargers – Energized (YES)<br>APP-036-D1 – Extinguished (YES)<br>APP-036-D2 – Extinguished (YES)   |
|                             |     |  |
| Att. 1                      | BOP | Stop R-11/12 Sample Pump   |
|                             |     |  |
| Att. 1                      | BOP | Locally Reset and Load IACs as necessary (N/A)   |
|                             |     |  |
| Att. 1                      | BOP | Perform Crew Update to include the following: <ul style="list-style-type: none"> <li>Attachment Completion</li> <li>Manual Actions Taken (<b>Manually isolated FW from the RTGB</b>)</li> <li>Failed Equipment status</li> <li>SW status SW to Turbine Building isolated</li> <li>Performing Supplement M</li> </ul> |
|                             |     |  |
| End of EOP-E-0 Attachment 1 |     |  |
|                             |     |  |
| Continuation of EOP-E-0     |     |  |
|                             |     |  |

|                    |                   |   |          |         |             |      |           |    |           |
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| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #  | <u>5</u> | Event # | <u>7-11</u> | Page | <u>37</u> | of | <u>50</u> |
| Event Description: |                   | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |          |         |             |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior   |          |         |             |      |           |    |           |

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|----------------|----|--|
| <b>EOP-E-0</b> | RO | Check AFW Pumps – Running (MDAFW Pumps are running) <ul style="list-style-type: none"> <li>a. MDAFW Pumps – both running (YES)</li> <li>b. S/G levels – 2 less than 16 % (YES)</li> <li>c. Steam driven AFW pump steam shutoff valves - ALL OPEN (YES)</li> </ul>                                    |
|                |    |  |
| <b>EOP-E-0</b> | RO | Check AFW Valves – Proper Emergency Alignment (YES) <ul style="list-style-type: none"> <li>• AFW header discharge valves – Full Open (YES)</li> <li>• AFW header section valves – Full Open (YES)</li> <li>• Steam driven AFW pump discharge valves – Full open if pump is running. (YES)</li> </ul> |
|                |    |  |
| <b>EOP-E-0</b> | RO | Check Total AFW Flow: <ul style="list-style-type: none"> <li>• Reset SI</li> <li>• Control feed flow to maintain NON-faulted S/Gs narrow range level – Between 8% and 50%.</li> <li>• Check total AFW flow- Greater than 300 gpm (YES)</li> </ul>  |
|                |    |  |
| <b>EOP-E-0</b> | RO | Check CV Spray NOT Required: <ul style="list-style-type: none"> <li>a. CV pressure – Has remained less than 10 psig. (YES)</li> <li>b. CV Spray – NOT actuated (YES)</li> </ul>  |
|                |    |  |
| <b>EOP-E-0</b> | RO | Check RCP Seal Cooling:  |



|                    |            |   |   |         |      |      |    |    |    |
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| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 38 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

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|----------------|----|--|
|                |    | <ul style="list-style-type: none"> <li>CCW flow to RCP thermal barriers – Normal (YES) <ul style="list-style-type: none"> <li>APP-001-C1 / D1 – Extinguished (YES)</li> </ul> </li> <li>OR</li> <li>Seal injection flow – Normal (YES) <ul style="list-style-type: none"> <li>Seal injection flow – Greater than 6 gpm per RCP</li> </ul> </li> <li>OR</li> <li>Thermal barrier <math>\Delta</math>Ps – Greater than 5 inches water.</li> </ul>  |
|                |    |  |
| <b>EOP-E-0</b> | RO | <p>Check RCS Temperature</p> <p>With NO RCPs running, RCS cold leg temperatures – Stable at or trending to 547°F (NO)</p> <p>RNO: IF temperature is less then 547°F AND lowering then perform the following: (YES)</p> <ol style="list-style-type: none"> <li>Stop dumping steam</li> <li>IF cooldown continues, THEN reduce total feed flow to minimum for decay heat removal: <ul style="list-style-type: none"> <li>Maintain total feed flow greater than 300 gpm until narrow range level is greater than 8% in at least one S/G.</li> </ul> </li> <li>IF cooldown continues, THEN close MSIVs and MSIV bypass valves. (MSIVs automatically closed due to Large Break LOCA)</li> </ol> |
|                |    |  |
| <b>EOP-E-0</b> | RO | <p>Check PZR PORVs and Spray Valves:</p> <ol style="list-style-type: none"> <li>PORVs – Closed (YES)</li> </ol>  |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 39 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|                             |     |  |
|-----------------------------|-----|--|
|                             |     | <ul style="list-style-type: none"> <li>b. Normal PZR spray valves – Closed (YES)</li> <li>c. Aux spray valve – Closed (YES)</li> </ul>   |
|                             |     |  |
| <b>EOP-E-0</b>              | RO  | <p>Check If RCPs should be stopped:</p> <ul style="list-style-type: none"> <li>a. RCPs – Any Running (YES)</li> <li>b. SI pumps – at least one running and capable of delivering flow (YES)</li> <li>c. RCS subcooling based on core exit TCs – less than 30°F (50°F) (NO)</li> </ul> <p>RNO: Go to Step 14</p>  |
|                             |     |  |
| <b>EOP-E-0</b>              | BOP | <p>Step 14: Check if S/G Secondary Pressure Boundaries are Intact:</p> <ul style="list-style-type: none"> <li>a. Check pressures in all S/Gs <ul style="list-style-type: none"> <li>○ None lowering in an uncontrolled manner (NO)</li> <li>○ None Completely depressurized (NO)</li> </ul> </li> </ul> <p>RNO - a. Reset SPDS and initiate monitoring of Critical Safety Functions Status Trees.</p> <p>Go To EOP-E-2, Faulted Steam Generator Isolation, Step 1.</p> |
|                             |     |  |
| <b>Beginning of EOP-E-2</b> |     |  |
|                             |     |  |
| <b>EOP-E-2</b>              | CRS | CAUTION  |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 40 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|   |      |   |
|---|------|---|
|   |      | <ul style="list-style-type: none"> <li>At least one S/G must be maintained available for RCS cooldown.</li> <li>Any faulted S/G or secondary break should remain isolated during</li> </ul>   |
|   |      |   |
| <b>EOP-E-2</b>  | BOP  | Check MSIVs and MSIV Bypass Valves for Faulted S/G – Closed (ALL Faulted, MSIV's will not close)<br><br>Manually close valves (will not close)  |
|   |      |   |
| <b>EOP-E-2</b>  | BOP  | Check if any S/G Secondary Pressure Boundary is Intact:<br>a. Check pressures in all S/Gs – Any stable or rising. (NO)<br><br>RNO - IF all S/G pressures are lowering in an uncontrolled manner, THEN reset SPDS and Go To EPP-16, Uncontrolled Depressurization Of All Steam Generators, Step 1. |
|   |      |   |
| <b>EXAMINERS NOTE: SPDS has been reset and may be indicating either an Orange or Red condition on RCS Integrity. The crew may have entered FRP-P.1 prior to entering EPP-16</b> |      |   |
|   |      |   |
| <b>Beginning of EPP-16</b>  |      |   |
|   |      |   |
| <b>EPP-16</b>   | CREW | Open foldout D  |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 41 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|   |     |  |
|---|-----|--|
|   |     |  |
| <b>EPP-16</b>   | BOP | Perform The Following:<br>a. Reset SPDS<br>b. Initiate monitoring of Critical Safety Function Status Trees |
|   |     |  |
| <p style="text-align: center;"><b>CAUTION</b></p> <p>Maintain one steam supply to the SDAFW available if the SDAFW Pump is the only available source of feed flow</p> |     |  |
|   |     |  |

|                    |                   |   |          |         |             |      |           |    |           |
|--------------------|-------------------|---|----------|---------|-------------|------|-----------|----|-----------|
| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #  | <u>5</u> | Event # | <u>7-11</u> | Page | <u>42</u> | of | <u>50</u> |
| Event Description: |                   | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |          |         |             |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior   |          |         |             |      |           |    |           |

|               |     |   |
|---------------|-----|---|
| <b>EPP-16</b> | BOP | <p>Isolate All S/Gs As Follows:</p> <p>a. Verify FW REG AND FW REG BYPASS Valves - CLOSED</p> <p>b. Verify FW HDR SECTION Valves - CLOSED</p> <ul style="list-style-type: none"><li>• V2-6A</li><li>• V2-6B</li><li>• V2-6C</li></ul> <p>c. Verify STEAM SHUTOFFS Valves - CLOSED</p> <ul style="list-style-type: none"><li>• V1-8A</li><li>• V1-8B</li><li>• V1-8C</li></ul> <p>d. Verify MSIVs AND MSIV BYP Valves - CLOSED</p> <p>e. Verify STEAM LINE PORVs - CLOSED</p> <ul style="list-style-type: none"><li>• RV-1</li><li>• RV-2</li><li>• RV-3</li></ul> |
|               |     |   |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 43 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|  |     |   |
|--|-----|---|
| <b>EPP-16</b>  | BOP | <p>Locally Open The Breakers For The Following Valves:</p> <ul style="list-style-type: none"> <li>V1-8A, SDAFW PUMP STEAM ISOLATION (MCC-5, CMPT-16F)</li> <li>V1-8B, SDAFW PUMP STEAM ISOLATION (MCC-6, CMPT-16M)</li> <li>V1-8C, SDAFW PUMP STEAM ISOLATION (MCC-6 CMPT-18M)</li> </ul> |
|  |     |   |
| <b>BOOTH OPERATOR: If requested to open the breakers for V1-8A/B/C use the P&amp;ID function S/G button and rack out the breaker – V1-8A EPSMCC5_189, V1-8B EPSMCC6_226, V1-8C EPSMCC6_227</b> |     |   |
|  |     |   |
| <b>EPP-16</b>  | RO  | Check The S/G Blowdown Isolation AND Sample Valves – CLOSED (YES)   |
|  |     |   |
| <b>EPP-16</b>  | BOP | <p>Locally Verify The Following Valves – CLOSED</p> <ol style="list-style-type: none"> <li>BYPASS DRN &amp; WARM-UP LINE TO AFW PUMP</li> <li>STEAM LINE BEFORE SEAT DRAIN ROOT ISOL</li> <li>STEAM LINE AFTER SEAT DRAIN ROOT ISOL</li> </ol>  |
|  |     |   |
| <b>EPP-16</b>  | RO  | Check Cooldown Rate In RCS Cold Legs - GREATER THAN 100°F/HR IN LAST 60 MINUTE (YES)  |
|  |     |   |
| <b>EPP-16</b>  | BOP | Check MDAFW Pump Status – AT LEAST ONE AVAILABLE (YES)  |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 44 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|  |     |   |
|--|-----|---|
|  |     |   |
| <b>EPP-16<br/>Critical<br/>Task</b>  | BOP | <p>Control Feed Flow To Minimize RCS Cooldown As Follows:</p> <p>Throttle feed flow to between 80 gpm and 90 gpm to each S/G using MDAFW FLOW CONTROLLER:</p> <ul style="list-style-type: none"> <li>FIC-1424, AFW Pump A Dischh Flow</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>FIC-1425, AFW Pump B Disch Flow</li> </ul> <p>RNO – Open breakers for V2-16A/B/C and locally throttle valves to establish 80-90 gpm to each S/G</p> |
|  |     |   |
| <b>CRITICAL TASK – Throttle feed flow to each S/G to 80-90 gpm</b>   |     |   |
|  |     |   |
| <b>BOOTH OPERATOR: When requested wait 3 minutes and then throttle V2-16A/B/C</b>                                |     |   |
|  |     |   |
| <b>Beginning of FRP-H.1</b>  |     |   |
|  |     |   |
| <b>EXAMINERS NOTE: This FRP may be entered after FRP-P.1 is implemented if AFW flow is throttled IAW FRP-P.1</b> |     |   |
|  |     |   |
| <b>CAUTION</b>   |     |   |
| Feed flow is not re- established to any faulted S/G if an intact S/G is available                                |     |   |
|  |     |   |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 45 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|   |     |  |
|---|-----|--|
| <b>FRP-H.1</b>  | BOP | Check Total Feed Flow - LESS THAN 300 GPM DUE TO OPERATOR ACTION (YES)   |
|   |     |  |
| <b>FRP-H.1</b>  | CRS | Reset SPDS And Return To Procedure And Step In Effect  |
|   |     |  |
| <b>End of FRP-H.1</b>   |     |  |
|   |     |  |
| <b>Beginning of FRP-P.1</b>   |     |  |
|   |     |  |
| <b>EXAMINERS NOTE: Remove malfunctions for FW/OVRD RESET and alarm block using the SCN file</b> |     |  |
|   |     |  |
| <b>FRP-P.1</b>  | BOP | Check CST level less than 10% (NO)   |
|   |     |  |
| <b>FRP-P.1</b>  | RO  | <p>Determine If RCS Cooldown Is Due To A Large Break LOCA As Follows:</p> <p>a. Check both of the following conditions exist:</p> <ul style="list-style-type: none"> <li>RCS pressure - LESS THAN 275 PSIG [350 PSIG] (NO)</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>RHR flow on FI-605 - GREATER THAN 1200 GPM (NO)</li> </ul> <p>Go to step 4</p> |
|   |     |  |



|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 46 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|                |     |  |
|----------------|-----|--|
| <b>FRP-P.1</b> | RO  | Check RCS Cold Leg Temperature – lowering (YES)  |
|                |     |  |
| <b>FRP-P.1</b> | BOP | <p>Attempt To Stop RCS Cooldown As Follows:</p> <p>a. Verify STEAM LINE PORVs - CLOSED (YES)</p> <p>b. Verify COND DUMPS – CLOSED (YES)</p> <p>c. Check RHR System - ALIGNED FOR CORE COOLING (NO)</p> <p>Go to step 6</p>   |
|                |     |  |
| <b>FRP-P.1</b> | BOP | <p>Check S/G Status - ANY INTACT (NO)</p> <p>RNO - Perform the following:</p> <p>a. Verify CLOSED all MSIVs AND MSIV BYPs. (NO)</p> <p>b. IF the MDAFW Pumps are NOT available, THEN maintain steam supply to the SDAFW Pump from at least one S/G.</p> <p>c. Verify CLOSED the following STEAM SHUTOFFs to the SDAFW PUMP:</p> <ul style="list-style-type: none"> <li>• V1-8A</li> <li>• V1-8B</li> <li>• V1-8C</li> </ul> <p>d. Maintain feed flow to each S/G between 80 gpm and 90 gpm.</p> <p>e. Go To Step 11.</p> |
|                |     |  |

|                    |                   |   |          |         |             |      |           |    |           |
|--------------------|-------------------|---|----------|---------|-------------|------|-----------|----|-----------|
| Op Test No.:       | <u>ILC-14 NRC</u> | Scenario #  | <u>5</u> | Event # | <u>7-11</u> | Page | <u>47</u> | of | <u>50</u> |
| Event Description: |                   | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |          |         |             |      |           |    |           |
| Time               | Position          | Applicant's Actions or Behavior   |          |         |             |      |           |    |           |

|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |
|---------------|-------------------|---|---------------------------|---------------------------|--------------|----------------|-------------|-------------------|-------------|-------------------|---------------|-------------------|
| FRP-P.1       | RO                | Check PORV BLOCK Valves As Follows:<br><br>a. Power to PORV BLOCK Valves – available (YES)<br><br>b. PORV BLOCK Valves - AT LEAST ONE OPEN (YES)  |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |
| FRP-P.1       | RO                | Check LTOPP - IN SERVICE (NO)<br><br>Go to step 12.d  |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |
| FRP-P.1       | RO                | Check PZR pressure – Less than 2335 psig (YES)<br><br>Verify PZR PORVs closed (YES)   |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |
| FRP-P.1       | RO                | Check SI PUMPs - ANY RUNNING (YES)  |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |
| FRP-P.1       | RO                | Determine If SI Can Be Terminated As Follows:<br><br>a. Check RCS subcooling - GREATER THAN 85°F [105°F] (YES)<br><br>b. Determine required RVLIS indication from Table:  |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   | <table><tr><td>Rcp Status</td><td>Required RVLIS Indication</td></tr><tr><td>None Running</td><td>69% Full Range</td></tr><tr><td>One Running</td><td>40% Dynamic Range</td></tr><tr><td>Two Running</td><td>57% Dynamic Range</td></tr><tr><td>Three Running</td><td>85% Dynamic Range</td></tr></table> | Rcp Status                | Required RVLIS Indication | None Running | 69% Full Range | One Running | 40% Dynamic Range | Two Running | 57% Dynamic Range | Three Running | 85% Dynamic Range |
|               |                   | Rcp Status  | Required RVLIS Indication |                           |              |                |             |                   |             |                   |               |                   |
|               |                   | None Running  | 69% Full Range            |                           |              |                |             |                   |             |                   |               |                   |
|               |                   | One Running   | 40% Dynamic Range         |                           |              |                |             |                   |             |                   |               |                   |
|               |                   | Two Running   | 57% Dynamic Range         |                           |              |                |             |                   |             |                   |               |                   |
| Three Running | 85% Dynamic Range |   |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |
|               |                   |   |                           |                           |              |                |             |                   |             |                   |               |                   |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 48 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|   |    |  |
|---|----|--|
| <b>FRP-P.1</b>  | RO | <p>Check RVLIS Indication - GREATER THAN REQUIRED VALUE FROM TABLE</p> <p>Observe CAUTION prior to step 17 and go to step 17</p>   |
|   |    |  |
| <p style="text-align: center;"><b>CAUTION</b></p> <p>If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment</p> |    |  |
|   |    |  |
| <b>FRP-P.1</b>  | RO | <p>Perform The Following:</p> <p>a. Reset SAFETY INJECTION</p> <p>b. Momentarily place the CONTAINMENT SPRAY Key Switch to the OVRD/RESET position AND return to the NORMAL position</p>   |
|   |    |  |
| <b>FRP-P.1</b>  | RO | <p>Reset The Following Containment Isolations:</p> <ul style="list-style-type: none"> <li>• PHASE A</li> <li>• PHASE B</li> </ul>  |
|   |    |  |
| <b>FRP-P.1</b>  | RO | <p>Establish Instrument Air To CV As Follows:</p> <p>a. Verify APP-002-F7, INSTR AIR HDR LO PRESS - EXTINGUISHED</p> <p>b. Momentarily place IA PCV-1716, INSTRUMENT AIR ISO TO CV Control Switch to the RESET position</p> <p>c. Check IA PCV-1716, INSTRUMENT AIR ISO TO CV - OPEN</p> |
|   |    |  |

|                    |            |   |   |         |      |      |    |    |    |
|--------------------|------------|---|---|---------|------|------|----|----|----|
| Op Test No.:       | ILC-14 NRC | Scenario #  | 5 | Event # | 7-11 | Page | 49 | of | 50 |
| Event Description: |            | Steam Break on 72" Header, On the SI FRV's Fail to Auto Close, FW Header Section Valves Fail to Auto Close, MFW Pump 'A' Fails to Auto Trip, and MSIV's Fail to Close |   |         |      |      |    |    |    |
| Time               | Position   | Applicant's Actions or Behavior   |   |         |      |      |    |    |    |

|   |    |  |
|---|----|--|
| FRP-P.1   | RO | Verify The Following: <ul style="list-style-type: none"><li>• SI Pumps - ALL STOPPED</li><li>• RHR Pumps - ALL STOPPED</li></ul> |
|   |    |  |
| The Lead Examiner may terminate the scenario anytime after THE Safety Injection Pumps are stopped |    |  |

## **ILC-14 NRC SCENARIO 5 TURNOVER SHEET**

### **1. INITIAL CONDITIONS**

- a) Time in Core Life: BOL
- b) Reactor Power: 50%
- c) Turbine Load: 353 MWe
- d) Boron Concentration: 1537 ppm
- e) Rod Height: 171 CBD
- f) RCS Pressure: 2235 psig
- g) RCS Level: 36 %
- h) Xenon: Equilibrium

### **2. TECHNICAL SPECIFICATION LCO ACTIONS STATEMENTS IN EFFECT**

| <u>T.S. #</u> | <u>Description</u> |
|---------------|--------------------|
|---------------|--------------------|

### **3. CLEARANCES IN EFFECT**

- a) MFP 'B' OOS for shaft repair

### **4. CAUTION CAPS IN EFFECT**

- a) None

### **5. PROTECTED EQUIPMENT**

- a) None

### **6. DEGRADED EQUIPMENT**

- a) None

### **7. SWITCHYARD ACCESS**

- a) Unrestricted

### **8. PLANNED EVOLUTIONS**

- a) Maintain current power level

### **9. TURNOVER INFORMATION**

- a) None

### **10. REACTIVITY INFORMATION**

- a) Review the OST-947 BOL/MOL/EOL charts for BA and PW additions

### **11. RISK**

- a) GREEN