| | |
|---|---|
| Facility: **CPNPP Units 1 and 2** | Date of Examination: **August 2021** |
| Examination Level: RO ☒ SRO ☐ | Operating Test Number: **NRC** |

| Administrative Topic (See Note) | Type Code* | Describe activity to be performed |
|---|---|---|
| Conduct of Operations (RA1) | R, M | 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (3.9)<br>JPM: Determine RCS Dilution Requirements and Change in Reactivity (RO1009) |
| Conduct of Operations (RA2) | R, M | 2.1.26 Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen). (3.4)<br>JPM: Determine Electrical Safe Work Practice Requirements (BA1110) |
| Equipment Control (RA3) | R, M | 2.2.13 Knowledge of tagging and clearance procedures. (4.1)<br>JPM: Determine Clearance Isolation Requirements (RO5005) |
| Radiation Control (RA4) | R, M | 2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions. (3.5)<br>JPM: Determine RWP requirements (RWT056) |
| Emergency Procedures/Plan | – | – |

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank ($\leq$ 3 for ROs; $\leq$ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank ($\geq$ 1)
(P)revious 2 exams ($\leq$ 1; randomly selected)

RA1 The applicant is presented with a set of RCS conditions including time after shutdown, core burn-up, current boron concentration, and estimated critical boron concentration. The applicant will calculate the amount of dilution required to achieve the estimated critical boron concentration provided. The applicant will the determine the change in reactivity that will be achieved based on diluting the RCS to the given estimated critical boron concentration. The critical steps include determination of RCS dilution (in gallons) required to achieve the estimated critical boron concentration and calculation of the change in reactivity that will be achieved based on diluting to the estimated critical boron concentration. This is a modified bank JPM. (K/A 2.1.25 - IR 3.9)

RA2 The applicant is presented with a task to determine the Hazard Category, Personnel Protective Equipment requirements, Tool requirements, and Safety Boundary requirements for installing grounding straps on the Main Generator Isophase busbar in accordance with STA-124, Electrical Safe Work Practices. The critical steps will be to identify the Hazard/Risk Category, Clothing requirements, Hearing Protection requirements, Glove requirements, Boundaries and Maximum Time the Flash Suit/Hood can be worn continuously before an Air Blower is required. This is a modified bank JPM. (K/A 2.1.26 - IR 3.4)

RA3 The applicant is presented a scenario in which CCP 1-01 is required to be isolated, vented, and drained for a maintenance clearance. The applicant will identify the correct mechanical and electrical isolation components as well as the correct positions and document on a manual clearance form. The critical steps are to identify the correct components and position of each isolation on the clearance. This is a modified bank JPM. (K/A 2.2.13 - IR 4.1).

RA4 The applicant will be required to refer to the latest Radiation Work Permit associated with Used Fuel Outage 7 (UFO 7). The applicant will be assigned a specific task on the RWP and will be required to determine the following information: if entry into a High Radiation Area is allowed, additional requirements for entry into a posted neutron dosimetry required area, the minimum protective clothing requirements for a firewatch to enter a posted contamination area of < 10K DPM/cm$^2$, and expected total dose received if work on the task takes 1.5 hours to complete. The critical steps will be to correctly determine the information above. This is a modified bank JPM. (K/A 2.3.7 - IR 3.5)

Facility: CPNPP JPM # NRC RA1 Task # RO1009 K/A # 2.1.25 3.9

Title: Determine RCS Dilution Requirements and Change in Reactivity

Examinee (Print): ____________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | ____ | Classroom: | X | | |
| Actual Performance: | X | Simulator: | ____ | | |
| Alternate Path: | ____ | Plant: | ____ | | |
| Time Critical: | ____ | Low Pwr: | ____ | RCA: | ____ |
| Bank / Mod / New: | M | Emerg: | ____ | EN: | ____ |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 has been shutdown for 100 hrs for Mid-Cycle outage
- Core burn-up is 10,000 MWD/MTU
- The start-up has progressed to IPO-002A, section 5.2, step 5.2.1 “Dilute or borate to the Critical Boron concentration per SOP-104A or SOP-106A”
- The RCS is at NOP/NOT with boron concentration currently 1600 ppm
- The ECC critical boron concentration is 1292 ppm

Initiating Cue: The US directs you to PERFORM the following:

- Calculate the required gallons of dilution to reach the ECC critical boron concentration of 1292 ppm
  - Number of gallons of Dilution: ____________________
- Determine the change in reactivity due to the dilution
  - Change in Reactivity (pcm): ____________________

Task Standard: Utilized TDM-201A and CALCULATED the number of gallons of dilution required to achieve the ECC boron concentration of 1292 ppm. Utilized the Nuclear Design Report and DETERMINED the total change in reactivity due to the dilution. Values of items above must be CALCULATED within the accuracy of the attached key.

| | |
|---|---|
| Ref. Materials: | TDM-201A, CVCS Calculations/Blended Flow (Rev. 6 - 2)<br>The Nuclear Design and Core Physics Characteristics of the CPNPP Unit 1 Cycle 22, Table 5.11 – MOL ARO Integral Boron Worth (pcm) as a Function of Boron Concentration and Core Average Temperature *****PROPRIETARY***** (October 2020)<br>SOP-104A, Reactor Make-up and Chemical Control System (Rev. 15 - 5)<br>SOP-106A, Boron Thermal Regeneration System (Rev. 12 - 9) |

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

## CLASSROOM SETUP

**EXAMINER:**
**PROVIDE examinee with copy of:**

- **TDM-201A, CVCS Calculations/Blended Flow (orange paper)**
- **The Nuclear Design and Core Physics Characteristics of the CPNPP U1 Cycle 22**
    - **Table 5.11, MOL ARO Integral Boron Worth (pcm) as a Function of Boron Concentration and Core Average Temperature (orange paper)**
- **SOP-104A, Reactor Make-up and Chemical Control System (orange paper)**
- **SOP-106A, Boron Thermal Regeneration System (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following step is a calculation from TDM-201A, DILUTION.** |
| **Perform Step: 1√**<br>DILUTION | $V_M = 70978 \bullet \ln [C_i / C_f]$<br>$V_M$ = PRIMARY WATER (GALLONS)<br>$C_i$ = INITIAL RCS BORON CONCENTRATION (PPM)<br>$C_f$ = FINAL RCS BORON CONCENTRATION (PPM)<br><br>Calculate the required gallons of dilution to reach the ECC critical boron concentration of 1292 ppm |
| **Standard:** | CALCULATED $V_M$ to be **15175 (-270 / +94) gallons**<br>$V_M = 70978 \bullet \ln [C_i / C_f]$<br>$V_M = 70978 \bullet \ln [1600 / 1292]$<br>$V_M$ = 15175 (-270 / +94) gal |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following utilizes the NDR Unit 1 Cycle 22, Table 5-11, MOL ARO Integral Boron Worth (pcm) as a Function of Boron Concentration and Core Average Temperature.** |
| **Perform Step: 2√**<br>CHANGE IN REACTIVITY | Determine the change in reactivity due to the dilution<br><br>Reactivity @ 1600 ppm and 557°F = -13771 pcm<br><br>Reactivity @ 1292 ppm and 557°F requires interpolation:<br>@ 1250 ppm = -10976 -407 pcm / 50 = -8.14<br>@ 1300 ppm = -11383 -8.14 x 42 = -341.88 pcm<br>-407 pcm -341.88 + (-10976) = -11317.88 pcm<br><br>Reactivity @ 1292 ppm and 557°F = -11317.88 pcm<br>@ 1600 ppm = -13771<br>@ 1292 ppm = -11317.88<br>-2453 (-3 / +6) pcm change in reactivity<br><br>Positive Reactivity was added to the core and total reactivity in the core became less negative.<br><br>Therefore, (+) 2453 (-3 / +6) pcm reactivity was added to the core by the dilution. |
| **Standard:** | DETERMINED **(+) 2453 (-3 / +6) pcm** reactivity was added to the core |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions: Given the following conditions:**

- **Unit 1 has been shutdown for 100 hrs for Mid-Cycle outage**
- **Core burn-up is 10,000 MWD/MTU**
- **The start-up has progressed to IPO-002A, section 5.2, step 5.2.1 "Dilute or borate to the Critical Boron concentration per SOP-104A or SOP-106A"**
- **The RCS is at NOP/NOT with boron concentration currently 1600 ppm**
- **The ECC critical boron concentration is 1292 ppm**

**Initiating Cue: The US directs you to PERFORM the following:**

- **Calculate the required gallons of dilution to reach the ECC critical boron concentration of 1292 ppm**
  - **Number of gallons of Dilution: ________________**
- **Determine the change in reactivity due to the dilution**
  - **Change in Reactivity (pcm): ________________**

Facility: CPNPP JPM # NRC RA2 Task # BA1110 K/A # 2.1.26 3.4

Title: Determine Electrical Safe Work Practices Requirements

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | ____ | Classroom: | X | | |
| Actual Performance: | X | Simulator: | ____ | | |
| Alternate Path: | ____ | Plant: | ____ | | |
| Time Critical: | ____ | Low Pwr: | ____ | RCA: | ____ |
| Bank / Mod / New: | M | Emerg: | ____ | EN: | ____ |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- The common ground strap must be installed on the Main Generator Iso Phase Rear Potential Transformer

Initiating Cue: The Shift Manager directs you to DETERMINE the following in accordance with STA-124, Electrical Safe Work Practices:

- Hazard Risk Category: ____________________
- Flash Suit/Hood Minimum ATPV in cal/cm$^2$: ____________________
- Flash Boundary: ____________________
- Limited Approach Boundary: ____________________
- Restricted Approach Boundary: ____________________
- Max time the Arc flash suit/hood can be worn without an air blower required: ____________________
- Ear canal hearing protection required:

  YES NO
- Insulated tools required:

  YES NO

Task Standard: DETERMINED the Hazard Risk Category, Minimum ATPV (Flash Suit), Flash Boundary, Limited Approach Boundary, Restricted Approach Boundary, and if ear canal protection and insulated tools are required per STA-124. Values of items above must be CALCULATED within the accuracy of the attached key.

Ref. Materials: STA-124, Electrical Safe Work Practices (Rev. 6 - 0)

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

## CLASSROOM SETUP

**Examiner:**

**PROVIDE the examinee with a copy of:**

- **STA-124, Electrical Safe Work Practices. (orange paper)**

**√ - Check Mark Denotes Critical Step**

| START TIME: | |
|---|---|

| | |
|---|---|
| **Perform Step: 1√** | DETERMINE Hazard Risk Category. |
| **Performance Standard:** | DETERMINED STA-124 Attachment 8.A, Hazard Risk Category – [4]. Attachment 8A Page 13 of 16, Installation of grounds on Iso-phase busbar row, Task column, number in brackets is Hazard Risk Category. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 2√** | DETERMINE Flash Suit/Hood Minimum ATPV in cal/cm$^2$. |
| **Performance Standard:** | DETERMINED STA-124 Attachment 8A, Minimum Flash Suit/Hood ATPV in cal/cm2 - ≥ 50 cal/cm$^2$. Attachment 8A Page 13 of 16, Installation of grounds on Iso-phase busbar row, minimum clothing column. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 3√** | DETERMINE Flash Boundary. |
| **Performance Standard:** | DETERMINED STA-124 Attachment 8.A, Flash Boundary – 40 ft. Attachment 8A Page 13 of 16, Boundaries at the top of table. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 4√** | DETERMINE Limited Approach Boundary. |
| **Performance Standard:** | DETERMINED STA-124 Attachment 8.A, Limited Approach Boundary - 6 ft., Attachment 8A Page 13 of 16, Boundaries at the top of table. |
| **Comment:** | **SAT ☐ UNSAT ☐** |
| **Perform Step: 5√** | DETERMINE Restricted Approach Boundary. |
| **Performance Standard:** | DETERMINED STA-124 Attachment 8.A, Restricted Approach Boundary – 2 ft. 7 in., Attachment 8A Page 13 of 16, Boundaries at the top of table. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| **Perform Step: 6√** | DETERMINE Max time the Arc flash suit/hood can be worn without an air blower required. | |
| **Performance Standard:** | DETERMINED that an air blower is required if the flash suit must be worn for ≥ 2 minutes. Attachment 8A Page 4 of 16, Hazard/Risk Matrix Note 12. | |
| **Comment:** | | **SAT** ☐ **UNSAT** ☐ |
| **Perform Step: 7√** | DETERMINE Ear canal hearing protection required. | |
| **Performance Standard:** | DETERMINED that Ear canal hearing protection is required Attachment 8A, Page 4 of 16, Hazard/Risk Matrix Note 11. Circled YES | |
| **Comment:** | | **SAT** ☐ **UNSAT** ☐ |

| | | |
|---|---|---|
| **Perform Step: 8√** | DETERMINE Insulated tools required. | |
| **Performance Standard:** | DETERMINED that Insulated tools are required. Attachment 8A, Page 13 of 16, Installation of grounds on Iso-phase busbar row, insulated tools column. Circled YES. | |
| **<u>Terminating Cue:</u>** | **This JPM is complete.** | |
| **Comment:** | | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **The common ground strap must be installed on the Main Generator Iso Phase Rear Potential Transformer**

**Initiating Cue:** **The Shift Manager directs you to DETERMINE the following in accordance with STA-124, Electrical Safe Work Practices:**

- **Hazard Risk Category:** ____________________
- **Flash Suit/Hood Minimum ATPV in cal/cm$^2$:** ____________________
- **Flash Boundary:** ____________________
- **Limited Approach Boundary:** ____________________
- **Restricted Approach Boundary:** ____________________
- **Max time the Arc flash suit/hood can be worn without an air blower required:** ____________________
- **Ear canal hearing protection required:**

  **YES** **NO**
- **Insulated tools required:**

  **YES** **NO**

Facility: CPNPP JPM # NRC RA3 Task # RO5005 K/A # 2.2.13 4.1

Title: Determine Clearance Isolation Requirements

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | X | | |
| Actual Performance: | X | Simulator: | | | |
| Alternate Path: | | Plant: | | | |
| Time Critical: | | Low Pwr: | | RCA: | |
| Bank / Mod / New: | M | Emerg: | | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is defueled and entering the CVCS work window
- Maintenance requires CCP 1-01 to be isolated, vented, and drained for corrective maintenance to replace pump seals

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Prepare a Manual Clearance for CCP 1-01 (placement only)
- An exceptional clearance is approved for single valve isolation from all high energy sources
- Document Clearance Isolation components and positions on provided STA-605 Form 19

Task Standard: DETERMINED the proper electrical and mechanical components to isolate, vent, and drain CCP 1-01 for a clearance as well the correct position of each component. Items must be DETERMINED in accordance with the attached key.

Ref. Materials:

STA-605, Clearance and Safety Tagging (Rev. 21 - 11)

STI-605.01, Work Control and Clearance and Safety Tagging (Rev. 7 - 0)

SOP-103A, Chemical and Volume Control System (Rev.18 - 31)

M1-0255 Sheet 01, Flow Diagram Chemical and Volume Control System Charging and Positive Displacement Pump Trains (Rev. CP-37)

E1-0007 Sheet -, Safeguard and Auxiliary Buildings 480V MCC’s (Rev. CP-36)

E1-0004 Sheet -, 6.9 KV Auxiliaries One Line Diagram Safeguard Buses (Rev. CP-44)

Validation Time: 45 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

## CLASSROOM SETUP

**EXAMINER:**

**PROVIDE the examinee with a copy of:**

- **CPNPP 2021 NRC JPM RA3 Handout (orange paper)**
- **STA-605, Clearance and Safety Tagging (orange paper)**
- **STI-605.01, Work Control and Clearance and Safety Tagging (orange paper)**
- **SOP-103A, Chemical and Volume Control System (orange paper)**
- **M1-0255 Sheet 01, Flow Diagram Chemical and Volume Control System Charging and Positive Displacement Pump Trains (yellow paper)**
- **E1-0007 Sheet -, Safeguard and Auxiliary Buildings 480V MCC's (yellow paper)**
- **E1-0004 Sheet -, 6.9 KV Auxiliaries One Line Diagram Safeguard Buses (yellow paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **Examinee may list components on STA-605 Form 19 in any order.** |
| **Perform Step: 1 √** | Determine clearance isolation components:<br>• 1APCH1 CCP 1-01 MTR BKR |
| **Standard:** | REFERENCED E1-0004 Sheet -, and DETERMINED 1APCH1, CCP 1-01 Motor Breaker is on 1EA1 Cubicle 11 and the correct position is DISCONNECT. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 2 √** | Determine clearance isolation components:<br>• 1CS-8479A CCP 1-01 RECIRC ISOL VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1CS-8479A is required to be CLOSED. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 3 √** | Determine clearance isolation components:<br>• 1EB1-1/6C/BKR, CCP 1-01 MINIFLO BYP VLV 1-8511A MTR BKR |
| **Standard:** | REFERENCED E1-0007 Sheet -, DETERMINED 1-8511A Motor Breaker is on 1EB1-1 compartment 6C and the correct position is OFF. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 4 √** | Determine clearance isolation components:<br>• 1-8511A, CCP 1 ALT MINIFLO ISOL VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1-8511A is required to be CLOSED. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 5 √** | Determine clearance isolation components:<br>• 1CS-8387A, CCP 1 ALT SL INJ VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1CS-8387A is required to be CLOSED. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 6 √** | Determine clearance isolation components:<br>• 1-8485A, CCP 1-01 DISCH VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1CS-8485A is required to be CLOSED. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 7 √** | Determine clearance isolation components:<br>• 1-8471A, CCP 1-01 SUCT VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1CS-8471A is required to be CLOSED. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 8 √** | Determine clearance isolation components:<br>• 1CS-0113, CCP 1-01 SUCT TO VCT VNT VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1CS-0113 is required to be CLOSED. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 9 √** | Determine clearance isolation components:<br>• 1CS-0018, CCP 1-01 DRN VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1CS-0018 is required to be CLOSED. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The examinee may choose to OPEN either or both 1CS-0030 and 1CS-8499A. Only one of the two valves is required to be OPEN for an adequate vent path.** |
| **Perform Step: 10 √** | Determine clearance isolation components:<br>• 1CS-0030, CCP 1-01 SUCT TC VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1CS-0030 is required to be OPEN for vent path. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The examinee may choose to OPEN either or both 1CS-0030 and 1CS-8499A. Only one of the two valves is required to be OPEN for an adequate vent path.** |
| **Perform Step: 11 √** | Determine clearance isolation components:<br>• 1CS-8499A, CCP 1-01 DISCH VENT VLV |
| **Standard:** | REFERENCED M1-0255 Sheet 1, and DETERMINED 1CS-8499A is required to be OPEN for vent path. DOCUMENTED on STA-605-19. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 is defueled and entering the CVCS work window**
- **Maintenance requires CCP 1-01 to be isolated, vented, and drained for corrective maintenance to replace pump seals**

**Initiating Cue:** **The Unit Supervisor directs you to PERFORM the following:**

- **Prepare a Manual Clearance for CCP 1-01 (placement only)**
- **An exceptional clearance is approved for single valve isolation from all high energy sources**
- **Document Clearance Isolation components and positions on provided STA-605 Form 19**

Facility: CPNPP JPM # NRC RA4 Task # RWT056 K/A # 2.3.7 3.5

Title: Determine RWP Requirements

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | X | | |
| Actual Performance: | X | Simulator: | | | |
| Alternate Path: | | Plant: | | | |
| Time Critical: | | Low Pwr: | | RCA: | |
| Bank / Mod / New: | M | Emerg: | | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- You have been assigned to assist in UFO 7
- You have signed on to Task 1 of RWP 20210601 Rev. 00

Initiating Cue: In accordance with the requirements of the RWP:

- Entry into High Radiation Areas is allowed:

  YES NO

- Allowable Neutron Dose and Dose Rate:

  Neutron Dose: __________ Neutron Dose Rate: ______________

- Requirement(s) for entry into a posted Neutron Dosimetry Required Area:

  ________________________________________________

  ________________________________________________

- DETERMINE the minimum Protective Clothing requirement(s) for a Firewatch to enter a posted Contamination area of < 10K DPM/100cm$^2$

  ________________________________________________

  ________________________________________________

- DETERMINE the expected total DOSE received if your work on TASK 1 will take 1.5 hours
  - Expected total DOSE received is between ______ and______ mrem

Task Standard: DETERMINED if entry into a High Radiation Area is allowed, the allowable Neutron Dose and Dose Rate, additional requirements for entry into a posted Neutron Dosimetry Required Area, the minimum protective clothing required for a Firewatch to enter a posted Contamination Area with contamination levels less than 10K DPM/100cm$^2$, and the expected dose rate range for 1.5 hours of work on TASK 1 of RWP 20210601 Rev. 00. Values of items above must be CALCULATED within the accuracy of the attached key.

Required Materials: RWP 20210601 Rev. 00.

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

## CLASSROOM SETUP

**EXAMINER:**

**PROVIDE the examinee with a copy of:**

- **RWP 20210601 Rev. 00 (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Perform Step: 1√** | DETERMINE if entry into High Radiation Areas is allowed. |
| **Standard:** | • DETERMINED entry into High Radiation Areas **is NOT** allowed. Circled NO |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 2√** | DETERMINE the allowable Neutron Dose and Dose Rate. |
| **Standard:** | DETERMINED the allowable Neutron Dose is **10 mrem**. DETERMINED the allowable Neutron Dose Rate is **30 mrem/hr**. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 3√** | DETERMINE requirement(s) for entry into a posted Neutron Dosimetry Required Area. |
| **Standard:** | DETERMINED requirement(s) for entry into a posted Neutron Dosimetry Required Area.<br>• **Neutron Alarming Dosimeter**. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 4√** | DETERMINE the minimum Protective Clothing requirement(s) for a Firewatch to enter a posted Contamination area of < 10K DPM/100cm$^2$ |
| **Standard:** | DETERMINED the minimum Protective Clothing requirement(s) for a Firewatch to enter a posted Contamination area of < 10K DPM/100cm$^2$<br>• **Shoe covers and gloves** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 5√** | DETERMINE the expected total DOSE received if your work on TASK 1 will take 1.5 hours |
| **Standard:** | DETERMINED based on expected dose rates of 0.5-6 mr/hr, that for 1.5 hours of work the expected total DOSE received is between **0.75** and **9** mrem. |
| **Terminating Cue:** | **This JPM is complete.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| **STOP TIME:** | |
|---|---|

**Initial Conditions:** **Given the following conditions:**

- **You have been assigned to assist in UFO 7**
- **You have signed on to Task 1 of RWP 20210601 Rev. 00**

**Initiating Cue:** **In accordance with the requirements of the RWP:**

- **Entry into High Radiation Areas is allowed:**

  **YES NO**

- **Allowable Neutron Dose and Dose Rate:**

  **Neutron Dose: _________ Neutron Dose Rate: ___________**

- **Requirement(s) for entry into a posted Neutron Dosimetry Required Area:**

  ______________________________________________________

  ______________________________________________________

- **DETERMINE the minimum Protective Clothing requirement(s) for a Firewatch to enter a posted Contamination area of < 10K DPM/100cm$^2$**

  ______________________________________________________

  ______________________________________________________

- **DETERMINE the expected total DOSE received if your work on TASK 1 will take 1.5 hours**
  - **Expected total DOSE received is between _____ and _____ mrem**

| | |
|---|---|
| Facility: **CPNPP Units 1 and 2** | Date of Examination: **August 2021** |
| Examination Level: RO ☐ SRO ☒ | Operating Test Number: **NRC** |

| Administrative Topic (See Note) | Type Code* | Describe activity to be performed |
|---|---|---|
| Conduct of Operations (SA1) | R, D, P | 2.1.42 Knowledge of new and spent fuel movement procedures. (3.4)<br>JPM: Determine Close Contact Fuel Assembly Movement (FH1305) |
| Conduct of Operations (SA2) | R, M | 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (4.2)<br>JPM: Determine Loss of RHR Time Limitations and Adequate Hot Leg Vent Path (SO1002) |
| Equipment Control (SA3) | R, N | 2.2.42 Ability to recognize system parameters that are entry-level conditions for Technical Specifications. (4.6)<br>JPM: Determine Technical Specification (SO1005) |
| Radiation Control (SA4) | R, M | 2.3.4 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (3.8)<br>JPM: Determine Personnel Contamination Requirements and Reporting Requirements (SO1112) |
| Emergency Procedures/Plan (SA5) | R, N | 2.4.41 Knowledge of the emergency action level thresholds and classifications. (4.6)<br>JPM: Classify an Emergency Plan Event (SO1136) |

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

| | |
|---|---|
| * Type Codes & Criteria: | (C)ontrol room, (S)imulator, or Class(R)oom |
| | (D)irect from bank ($\leq$ 3 for ROs; $\leq$ 4 for SROs & RO retakes) |
| | (N)ew or (M)odified from bank ($\geq$ 1) |
| | (P)revious 2 exams ($\leq$ 1; randomly selected) |

SA1 The applicant will determine the correct close contact movement for identified fuel assemblies in accordance with RFO-302, Handling of Fuel Assemblies. Three separate fuel moves are required to be analyzed for close contact. The critical steps are to describe the correct close contact fuel movement for each assembly. This is a direct from bank JPM previously used on the 2018 NRC exam. (K/A 2.1.42 - IR 3.4)

SA2 The applicant will calculate the time after shutdown and utilize ABN-104, Residual Heat Removal System Malfunction and IPO-010B, Reactor Coolant System Reduced Inventory Operations to determine the Core Time to Saturation, approximate Heat Up Rate, Time to Uncovery, Containment Closure Times, and if an Adequate Hot Leg Vent Path exists. This is a modified from bank JPM. (K/A 2.1.25 - IR 4.2)

SA3 The applicant will be provided a set of conditions and will be required to determine any Technical Specification Limiting Conditions for Operation that may be impacted by the given conditions, including the associated CONDITION, REQUIRED ACTION, and COMPLETION TIME for each applicable specification. The critical steps will include identifying the correct Technical Specification LCO along with the correct condition, required action, and completion time. This is a new JPM (K/A 2.2.42 - IR 4.6)

SA4 The applicant will determine the minimum Personnel Contamination Event (PCE) classification for a contamination event as well as the correct methods for removal of a Discrete Radioactive Particle (DRP) from clothing and skin. The applicant will then determine written and oral Reporting Requirements for an overexposure event per STA-501, Nonroutine reporting. The critical steps will be to determine the correct PCE level classification as well as the correct methods for removal of a DRP from skin and clothing and determine the correct oral and written Reporting Requirements for an overexposure event. This is a modified bank JPM. (K/A 2.3.14 - IR 3.8)

SA5 The applicant will determine the appropriate Emergency Plan Classification in accordance with EPP-201, Assessment of Emergency Action Levels, Emergency Classification, and Plan Activation. The critical steps will be to determine the correct classification within the notification time. This is a new JPM. (K/A 2.4.41 - IR 4.6)

Facility: CPNPP JPM # NRC SA1 Task # FH1305 K/A # 2.1.42 3.4

Title: Determine Close Contact Fuel Assembly Movement

Examinee (Print): ____________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | X | | |
| Actual Performance: | X | Simulator: | | | |
| Alternate Path: | | Plant: | | | |
| Time Critical: | | Low Pwr: | | RCA: | |
| Bank / Mod / New: | D | Emerg: | | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in Mode 6 and Core Reload is in progress
- The last Fuel Assembly placed in the Core was at location A8

Initiating Cue: You have just relieved the Fuel Handling Supervisor on the Refueling Machine and you have the following documents:

- RFO-302, Handling of Fuel Assemblies
- A copy of the current Fuel Reload Sequence Plan
- A map of all core locations showing the current status of Fuel Assemblies that have been placed in the core

You are to DETERMINE the types of Close Contact movement to be performed for the next 3 Fuel Assemblies.

Use the area below to describe the Close Contact movement for each Fuel Assembly:

First Fuel Assembly:

Second Fuel Assembly:

Third Fuel Assembly:

Task Standard: DETERMINED the correct Close Contact movement for the identified Fuel Assemblies per the key. The first assembly to be moved is to core location B7 by lowering until just above lower core plate (6” from bottom), then use manual or electronic inching to move on-index in one direction, then on-index in the other direction, and lower at slow speed. The second assembly to be moved is to core location B8 by lowering on-index at slow speed. The third assembly to be moved is to core location C12 by lowering until just above lower core plate (6” from bottom), then use manual or electronic inching to move on-index in one direction, then on-index in the other direction, and lower at slow speed.

Ref. Materials: RFO-302, Handling of Fuel Assemblies (Rev. 22 - 0)

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

## CLASSROOM SETUP

**EXAMINER:**

**MAKE the following available in the classroom:**

- **RFO-302, Handling of Fuel Assemblies (orange paper)**
- **The current Fuel Reload Sequence Plan (Handout 1) (orange paper)**
- **A map of all core locations showing the current status of Fuel Assemblies that have been placed in the core (Handout 2) (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| **Perform Step: 1√** | DETERMINE correct Close Contact movement for Fuel Assembly to be placed in core location B7. |
|---|---|
| **Standard:** | DETERMINED Fuel Assembly to be placed in core location B7 should be lowered until just above lower core plate (6” from bottom), then use manual or electronic inching to move on-index in one direction, then on-index in the other direction, and lower at slow speed. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| **Perform Step: 2√** | DETERMINE correct Close Contact movement for Fuel Assembly to be placed in core location B8. |
|---|---|
| **Standard:** | DETERMINED Fuel Assembly to be placed in core location B8 should be lowered on-index at slow speed. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| **Perform Step: 3√** | DETERMINE correct Close Contact movement for Fuel Assembly to be placed in core location C12. |
|---|---|
| **Standard:** | DETERMINED Fuel Assembly to be placed in core location C12 should be lowered until just above lower core plate (6” from bottom), then use manual or electronic inching to move on-index in one direction, then on-index in the other direction, and lower at slow speed. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| **STOP TIME:** | |
|---|---|

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 is in Mode 6 and Core Reload is in progress**
- **The last Fuel Assembly placed in the Core was at location A8**

**Initiating Cue:** **You have just relieved the Fuel Handling Supervisor on the Refueling Machine and you have the following documents:**

- **RFO-302, Handling of Fuel Assemblies**
- **A copy of the current Fuel Reload Sequence Plan**
- **A map of all core locations showing the current status of Fuel Assemblies that have been placed in the core**

**You are to DETERMINE the types of Close Contact movement to be performed for the next 3 Fuel Assemblies.**

**Use the area below to describe the Close Contact movement for each Fuel Assembly:**

**First Fuel Assembly:**

**Second Fuel Assembly:**

**Third Fuel Assembly:**

Facility: CPNPP JPM # NRC SA2 Task # SO1002 K/A # 2.1.25 4.2

Title: Determine Loss of RHR Time Limitations and Adequate Hot Leg Vent Path

Examinee (Print): ________________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | X | | |
| Actual Performance: | X | Simulator: | | | |
| Alternate Path: | | Plant: | | | |
| Time Critical: | | Low Pwr: | | RCA: | |
| Bank / Mod / New: | M | Emerg: | | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is in MODE 5 with Actual water level in the Reactor Vessel at 49" above the Core Plate
- All Pressurizer Safety Valves have been removed
- Reactor Coolant System temperature is 140ºF
- The Reactor was shutdown on August 4th at 0300 after operating at 100% power for the last 550 days
- Today is August 13th at 1400 hours

Initiating Cue #1: The Shift Manager directs you to EVALUATE the given conditions above and DETERMINE the following in accordance with IPO-010B, Reactor Coolant System Reduced Inventory Operations:

- Does an Adequate RCS Hot Leg Vent Path exist to allow placing RCPs on Backseat for an RCP Seal Inspection? (Circle correct choice)

YES NO

Initiating Cue #2: Today at 1500 hours, the Unit experienced a Loss of Residual Heat Removal.

The Shift Manager directs you to EVALUATE the conditions provided above and PERFORM the following:

- CALCULATE the following times per ABN-104, Residual Heat Removal System Malfunction, Attachment 5, Time to Saturation for Loss of All RHR with the RCS at Reduced Inventory and Attachment 19, Available Time for Containment Closure:
  - DETERMINE Time After Shutdown ________
  - DETERMINE Time to Saturation ________
  - DETERMINE Approximate Heat Up Rate ________
  - DETERMINE Time to Core Uncovery ________
  - DETERMINE Containment Closure Times:
    - Thermal Environment Limiting ________
    - Radiological Environment Limiting ________

Task Standard: DETERMINED an Adequate Hot Leg Vent Path DOES NOT exist to place RCPs on Backseat and perform a Seal Inspection. DETERMINED Time after Shutdown, Time to Saturation, Approximate Heat up rate, Time to Core Uncovery, and Containment Closure Time following a Loss of Residual Heat Removal System per ABN-104. All determinations are made/calculated within the accuracy of the attached key.

Ref. Materials: ABN-104, Residual Heat Removal System Malfunction (Rev. 9 - 11)
IPO-010B, Reactor Coolant System Reduced Inventory Operations (Rev. 16 - 0)

Validation Time: 30 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ________________________________ Date: ____________

## CLASSROOM SETUP

**EXAMINER:**

**PROVIDE the examinee with a copy of:**

- **ABN-104, Residual Heat Removal Malfunction (all pages) (orange paper)**
- **IPO-010B, Reactor Coolant System Reduced Inventory Operations (all pages) (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| **Examiner Note** | **The following is from IPO-010B, Attachment 15** |
|---|---|
| **Perform Step: 1√** | • Does an Adequate RCS Hot Leg Vent Path exist to allow placing RCPs on Backseat for an RCP Seal Inspection? |
| **Standard:** | REFERRED to IPO-010B, Attachment 15 and CIRCLED **NO**: Attachment 15, page 4 of 5 table for Adequate Hot Leg Vent Path with Temporary Seals Installed states 3 PRZR Safety Valves Removed is adequate 251 hours after Shutdown. In the case of Initiating Cue #1 the Reactor has only been shutdown 227 hours. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 2√** | Determine Time After Shutdown:<br>• Calculate Time After Shutdown. |
| **Standard:** | DETERMINED number of hours between August 4th at 0300 hours and August 13th at 1500. CALCULATED Time After Shutdown = **228 hours**. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| **Examiner Note** | **The following is from ABN-104, Attachment 5, Page 1** |
|---|---|
| **Perform Step: 3√** | Determine Time to Saturation:<br>• Find Time to Saturation from Attachment 5, Page 1. |
| **Standard:** | REFERRED to Page 1 of ABN-104, Attachment 5 and PLOTTED the intersection of Time After Shutdown (228 hours) and Initial Temp (140ºF) and DETERMINED: TIME TO SATURATION = **11 ± 0.5 minutes**. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| **Examiner Note** | **The following is from ABN-104, Attachment 5, Page 1** |
|---|---|
| **Perform Step: 4√** | Determine Approximate Heat Up Rate:<br>• Find approximate heat up rate for 200 and 300 hours after shutdown and calculate/interpolate the approximate heat up rate for 228 hours, from Attachment 5, Page 1. |
| **Standard:** | REFERRED to Page 1 of ABN-104, Attachment 5, approximate heat up rate, and uses 200 hours after shutdown value of 6.9°F/Min and 300 hours after shutdown value of 5.8, and interpolates a value of **6.59 ± 0.25°F/min**. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | | |
|---|---|---|
| **Examiner Note** | **The following is from ABN-104, Attachment 5, Page 2** | |
| **Perform Step: 5√** | Determine Time To Core Uncovery:<br>• Find Time To Core Uncovery from Attachment 5, Page 2 | |
| **Standard:** | REFERRED to Page 2 of ABN-104, Attachment 5 and PLOTTED the intersection of Time After Shutdown (9 days 12 hours or 228 hours) and Initial RCS Level (49 inches above the core plate) and DETERMINED: Time To Core Uncovery = **1.70 ± 0.5 hours**. | |
| **Comment:** | | **SAT** ☐ **UNSAT** ☐ |

| | | |
|---|---|---|
| **Examiner Note** | **The following is from ABN-104, Attachment 19** | |
| **Perform Step: 6√** | Determine Containment Closure time:<br>• Find Containment Closure Time from Attachment 19:<br>  • Thermal Environment Limiting Curve. | |
| **Standard:** | REFERRED to ABN-104, Attachment 19 and PLOTTED the intersection of Time After Shutdown and Thermal Environment Limiting Curve and DETERMINED: Containment Closure Time = **57 ± 3 minutes**. | |
| **Comment:** | | **SAT** ☐ **UNSAT** ☐ |

| | | |
|---|---|---|
| **Examiner Note** | **The following is from ABN-104, Attachment 19** | |
| **Perform Step: 7√** | Determine Containment Closure time:<br>• Find Containment Closure Time from Attachment 19:<br>  • Radiological Environment Limiting Curve. | |
| **Standard:** | REFERRED to ABN-104, Attachment 19 and PLOTTED the intersection of Time After Shutdown and Radiological Environment Limiting Curve and DETERMINED: Containment Closure Time = **57 ± 3 minutes**. | |
| **Terminating Cue:** | **This JPM is complete.** | |
| **Comment:** | | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 2 is in MODE 5 with Actual water level in the Reactor Vessel at 49" above the Core Plate**
- **All Pressurizer Safety Valves have been removed**
- **Reactor Coolant System temperature is 140ºF**
- **The Reactor was shutdown on August 4th at 0300 after operating at 100% power for the last 550 days**
- **Today is August 13th at 1400 hours**

**Initiating Cue #1:** **The Shift Manager directs you to EVALUATE the given conditions above and DETERMINE the following in accordance with IPO-010B, Reactor Coolant System Reduced Inventory Operations:**

- **Does an Adequate RCS Hot Leg Vent Path exist to allow placing RCPs on Backseat for an RCP Seal Inspection? (Circle correct choice)**

**YES NO**

**Initiating Cue #2:** **Today at 1500 hours, the Unit experienced a Loss of Residual Heat Removal.**

**The Shift Manager directs you to EVALUATE the conditions provided above and PERFORM the following:**

- **CALCULATE the following times per ABN-104, Residual Heat Removal System Malfunction, Attachment 5, Time to Saturation for Loss of All RHR with the RCS at Reduced Inventory and Attachment 19, Available Time for Containment Closure:**
  - **DETERMINE Time After Shutdown** _________
  - **DETERMINE Time to Saturation** _________
  - **DETERMINE Approximate Heat Up Rate** _________
  - **DETERMINE Time to Core Uncovery** _________
  - **DETERMINE Containment Closure Times:**
    - **Thermal Environment Limiting** _________
    - **Radiological Environment Limiting** _________

Facility: CPNPP JPM # NRC SA3 Task # SO1005 K/A # 2.2.42 4.6

Title: Determine Technical Specification

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | X | | |
| Actual Performance: | X | Simulator: | | | |
| Alternate Path: | | Plant: | | | |
| Time Critical: | | Low Pwr: | | RCA: | |
| Bank / Mod / New: | N | Emerg: | | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 in MODE 1 at 100% power
- On August 10th CPNPP received a vendor notification that the Wide Range Containment Sump Level Transmitters were assembled with Teflon tape and are not environmentally qualified for post accident conditions
  - 1-LT-4779, Containment Recirculating Sump 1-01 Level Transmitter
  - 1-LT-4781, Containment Recirculating Sump 1-02 Level Transmitter
- Replacement detectors are not expected to arrive until September 12th

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- DETERMINE all Technical Specifications currently impacted including CONDITION(s), REQUIRED ACTION(s), COMPLETION TIME(s) and REPORT(s), if any
- DETERMINE all Technical Specifications that will be impacted if the new detectors are received on September 12th, including CONDITION(s), REQUIRED ACTION(s), COMPLETION TIME(s) and REPORT(s), if any

Task Standard: Utilizing CPNPP Technical Specifications and Bases, DETERMINED Technical Specification LCO 3.3.3 Condition A – Restore required channel to OPERABLE status within 30 days, LCO 3.3.3 Condition C – Restore one channel to OPERABLE status within 7days. 7 days from initial inoperability enter Condition D - Required Action and associated Completion Time of Condition C not met. Which states: Enter the Condition referenced in Table 3.3.3-1 for the channel immediately. The applicable Condition from Table 3.3.3-1 is Condition E which states to be in Mode 3 in 6 hours and Mode 4 in 12 hours. 30 days from initial inoperability enter Condition B – Required Action and associated Completion Time of Condition A not met. Which states: Initiate action in accordance with Specification 5.6.8 immediately. Specification 5.6.8 requires a PAM Report to be submitted within 14 days. All determinations will be per the attached key.

Required Materials: CPNPP Technical Specifications - Unit 1 and 2 through Amendment 178
CPNPP Technical Specification Bases - Unit 1 and 2 (Rev. 82)
ODA-308, LCO Tracking Program (Rev. 19 - 0)

Validation Time: 25 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ________________________________ Date: ____________

## CLASSROOM SETUP

**EXAMINER:**

**PROVIDE the examinee with a copy of:**

- **CPNPP Technical Specifications - Unit 1 and 2 (orange paper)**
- **CPNPP Technical Specification Bases - Unit 1 and 2 (orange paper)**
- **ODA-308, LCO Tracking Program (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| **Examiner Note:** | **The following steps are from Technical Specification LCO 3.8.9.** |
|---|---|
| **Perform Step: 1√** | DETERMINE all Technical Specifications impacted including CONDITION(s), REQUIRED ACTION(s) and COMPLETION TIME(s), if any |
| **Standard:** | RECOGNIZED LCO 3.3.3, Post Accident Monitoring (PAM) instrumentation impacted and DETERMINED the following:<br>• DETERMINED the following CONDITIONs of LCO 3.3.3 will be applicable <u>at time of discovery</u>:<br>  • CONDITION A – One or more Functions with one required channel inoperable.<br>    • REQUIRED ACTION A.1 – Restore required channel to OPERABLE status within 30 days<br>  • CONDITION C – One or more Functions with two required channels inoperable<br>    • REQUIRED ACTION C.1 – Restore one channel to OPERABLE status within 7 days |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| **Perform Step: 2√** | DETERMINE all Technical Specifications impacted including CONDITION(s), REQUIRED ACTION(s) and COMPLETION TIME(s), if any |
|---|---|
| **Standard:** | RECOGNIZED LCO 3.3.3, Post Accident Monitoring (PAM) instrumentation impacted and DETERMINED the following:<br>• DETERMINED the following CONDITION of LCO 3.3.3 will be applicable <u>7 days from initial inoperability of two required channels</u>:<br>  • CONDITION D – Required Action and associated Completion Time of Condition C not met<br>    • REQUIRED ACTION D.1 – Enter the Condition referenced in Table 3.3.3-1 for the channel immediately |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 3√** | DETERMINE all Technical Specifications impacted including CONDITION(s), REQUIRED ACTION(s) and COMPLETION TIME(s), if any |
| **Standard:** | RECOGNIZED LCO 3.3.3, Post Accident Monitoring (PAM) instrumentation impacted and DETERMINED the following:<br>• DETERMINED the Condition referenced in Table 3.3.3-1 for Function 7, Containment Sump Water Level (Wide Range) is CONDITION E:<br>  • CONDITION E – As required by Required Action D.1 and referenced in Table 3.3.3-1<br>    • REQUIRED ACTION E.1 – Be in MODE 3 within 6 hours<br>    <u>AND</u><br>    • REQUIRED ACTION E.2 – Be in MODE 4 within 12 hours |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 4√** | DETERMINE all Technical Specifications impacted including CONDITION(s), REQUIRED ACTION(s) and COMPLETION TIME(s), if any |
| **Standard:** | RECOGNIZED LCO 3.3.3, Post Accident Monitoring (PAM) instrumentation impacted and DETERMINED the following:<br>• DETERMINED the following CONDITION of LCO 3.3.3 will be applicable <u>30 days from initial inoperability of one required channel</u>:<br>  • CONDITION B – Required Action and associated Completion Time of Condition A not met<br>    • REQUIRED ACTION B.1 – Initiate action in accordance with Specification 5.6.8 immediately |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 5√** | DETERMINE all Technical Specifications impacted including CONDITION(s), REQUIRED ACTION(s) and COMPLETION TIME(s), if any |
| **Standard:** | RECOGNIZED Specification 5.6.8, PAM Report is applicable and DETERMINED the following:<br>• DETERMINED a PAM Report shall be submitted within 14 days of the applicability of REQUIRED ACTION B. 1 and the report shall outline the following:<br>    • Preplanned alternate method of monitoring<br>    • The cause of the inoperability<br>    • The plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status |
| **Terminating Cue:** | **This JPM is complete.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 in MODE 1 at 100% power**
- **On August 10th CPNPP received a vendor notification that the Wide Range Containment Sump Level Transmitters were assembled with Teflon tape and are not environmentally qualified for post accident conditions**
  - **1-LT-4779, Containment Recirculating Sump 1-01 Level Transmitter**
  - **1-LT-4781, Containment Recirculating Sump 1-02 Level Transmitter**
- **Replacement detectors are not expected to arrive until September 12th**

**Initiating Cue:** **The Shift Manager directs you to PERFORM the following:**

- **DETERMINE all Technical Specifications currently impacted including CONDITION(s), REQUIRED ACTION(s), COMPLETION TIME(s) and REPORT(s), if any**
- **DETERMINE all Technical Specifications that will be impacted if the new detectors are received on September 12th, including CONDITION(s), REQUIRED ACTION(s), COMPLETION TIME(s) and REPORT(s), if any**

Facility: CPNPP JPM # NRC SA4 Task # SO1112 K/A # 2.3.14 3.8

Title: Determine Personnel Contamination Requirements and Reporting Requirements

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | X | | |
| Actual Performance: | X | Simulator: | | | |
| Alternate Path: | | Plant: | | | |
| Time Critical: | | Low Pwr: | | RCA: | |
| Bank / Mod / New: | M | Emerg: | | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: JPM Cue Sheet 1

Given the following conditions:

- Unit 1 is in Mode 6
- No Fuel movement is in progress
- OPT-831A, Appendix J Leak Rate Test of Penetration MIV-0002(b) (1-HV-4166, 1-HV-4167, and 1PS-0501) is being conducted
- An NEO is required to remove the cap and connect a drain hose to 1PS-0032, PRZR 1-01 LIQ SPACE SMPL LN ORC DRN VLV (located in SFGD 810' NORTH PENETRATION VLV RM / South Side (Room 77A))
- When the valve is opened to drain the penetration the drain hose blows off and sprays contaminated water on the NEO
- The NEO is found to be contaminated by a discrete radioactive particle

Initiating Cue: JPM Cue Sheet 1

The Work Control Supervisor directs you to PERFORM the following:

- DETERMINE the minimum Personnel Contamination Event (PCE) classification if contamination levels on the NEO are 60,000 ccpm
  - Contamination Level: ______________________________
- DETERMINE the decontamination method for removal of the discrete particle on the following:
  - Clothing: ______________________________
  - Skin: ______________________________

Initial Conditions: JPM Cue Sheet #2

Given the following conditions:

- The Shift Manager was notified by Radiation Protection the NEO received a Shallow Dose Equivalent (SDE) exposure of 275 rads to the skin.

| | |
|---|---|
| Initiating Cue: JPM Cue Sheet #2 | The Shift Manager directs you to PERFORM the following:<br>• DETERMINE Oral and Written Reportability Requirements, if any.<br>  • Oral Reporting Requirement: ____________________<br>  • Written Reporting Requirement: ____________________ |
| Task Standard: | Utilizing RPI-304, RPI-306, and RPI-313, DETERMINED the Personnel Contamination Event is a Level 3 contamination event. DETERMINED the decontamination method for removing a discrete radioactive particle from the skin is to use a wet wipe or similar material. DETERMINED the decontamination method for removing a discrete radioactive particle from clothing is to use masking or duct tape. Utilizing STA-501, DETERMINED Oral report to the NRC required immediately and Written report required within 30 days for an overexposure event. All determinations will be per the attached key. |
| Required Materials: | STA-501, Nonroutine Reporting (Rev. 21 - 2)<br>RPI-304, Radiological Posting and Labeling (Rev. 4 - 0)<br>RPI-306, Personnel Contamination Monitoring (Rev. 1 - 0)<br>RPI-313, Radiation Protection Standard Glossary of Terms (Rev. 1 - 0) |

Validation Time: 25 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

## CLASSROOM SETUP

**EXAMINER:**

**PROVIDE the examinee with a copy of:**

- **STA-501, Nonroutine Reporting**
- **RPI-304, Radiological Posting and Labeling**
- **RPI-306, Personnel Contamination Monitoring**
- **RPI-313, Radiation Protection Standard Glossary of Terms**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **Provide the examinee with copy of JPM Cue Sheet 1.** |
| **Examiner Note:** | **The following step is from RPI-306, Personnel Contamination Monitoring.** |
| **Examiner Note:** | **The definition of "ccpm" is found in RPI-304, Radiological Posting and Labeling, Section 6.2.4.3 Note** |
| **NOTE:** The value of net counts per minute is the count rate with background subtracted. Also referred to as corrected counts per minute (ccpm). | |
| **Examiner Note:** | **The definition of Discrete Radioactive Particle (DRP) is located in RPI-313, Radiation Protection Standard Glossary of Terms, Step 3.48** |
| **Perform Step: 1√**<br>Step 6.1.2 | DETERMINE the minimum Personnel Contamination Event (PCE) classification if contamination levels on the NEO are 60,000 ccpm |
| **Standard:** | • DETERMINED the minimum PCE classification is **Level 3** (exceeds 50,000 ccpm) |
| **Examiner Note:** | **Answer in bold print.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following step is from RPI-306, Personnel Contamination Monitoring.** |
| **Perform Step: 2√**<br>Step 6.4.7 | DETERMINE the decontamination method for removal of the discrete particle on the following:<br>• Clothing |
| **Standard:** | DETERMINED the decontamination method for removing a discrete radioactive particle from clothing is to use **masking or duct tape**. |
| **Examiner Note:** | **Answer in bold print.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| **Examiner Note:** | **The following step is from RPI-306, Personnel Contamination Monitoring.** | |
| **Perform Step: 3√**<br>Step 6.4.8 | DETERMINE the decontamination method for removal of the discrete particle on the following:<br>• Skin | |
| **Standard:** | DETERMINED the decontamination method for removing a discrete radioactive particle from the skin is to use a **wet wipe or similar material**. | |
| **Examiner Note:** | **Answer in bold print.** | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| **Examiner Note:** | **Provide the examinee with copy of JPM Cue Sheet 2.** | |
| **Examiner Note:** | **The following step is from STA-501, Attachment 8.D/4.** | |
| **Perform Step: 4√**<br>Attachment 8.D/4<br>Page 1 of 12 <u>or</u> 7 of 12 | Determine Oral Reporting Requirements per STA-501. | |
| **Standard:** | DETERMINED Oral Reporting Requirements per STA-501:<br>"Each licensee shall immediately report any events involving byproduct, source, or special nuclear material possessed by the Licensee that may have caused or threatens to cause: SE ≥ 250 rads (skin or extremity)."<br>• Oral Report **immediate notification** of occurrence via Emergency Notification System**.** | |
| **Examiner Note:** | **Answer in bold print.** | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| **Examiner Note:** | **The following step is from STA-501, Attachment 8.D/4.** | |
| **Perform Step: 5√**<br>Attachment 8.D/4<br>Page 1 of 12 <u>or</u> 7 of 12 | Determine written Reporting Requirements per STA-501. | |
| **Standard:** | DETERMINED written Reporting Requirement per STA-501:<br>"Event involving byproduct, source, or special nuclear material that may have caused or threatens to cause exposure to individual: SE ≥ 250 rads (skin or extremity)."<br>• Written Report within **30 days** (LER). | |
| **Examiner Note:** | **Answer in bold print.** | |
| **Terminating Cue:** | **This JPM is complete.** | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| STOP TIME: | |
|---|---|

**Initial Conditions: JPM Cue Sheet 1**

**Given the following conditions:**

- **Unit 1 is in Mode 6**
- **No Fuel movement is in progress**
- **OPT-831A, Appendix J Leak Rate Test of Penetration MIV-0002(b) (1-HV-4166, 1-HV-4167, and 1PS-0501) is being conducted**
- **An NEO is required to remove the cap and connect a drain hose to 1PS-0032, PRZR 1-01 LIQ SPACE SMPL LN ORC DRN VLV (located in SFGD 810' NORTH PENETRATION VLV RM / South Side (Room 77A))**
- **When the valve is opened to drain the penetration the drain hose blows off and sprays contaminated water on the NEO**
- **The NEO is found to be contaminated by a discrete radioactive particle**

**Initiating Cue: JPM Cue Sheet 1**

**The Work Control Supervisor directs you to PERFORM the following:**

- **DETERMINE the minimum Personnel Contamination Event (PCE) classification if contamination levels on the NEO are 60,000 ccpm**
  - **Contamination Level:** ______________________
- **DETERMINE the decontamination method for removal of the discrete particle on the following:**
  - **Clothing:** ______________________
  - **Skin:** ______________________

| | |
|---|---|
| **Initial Conditions: JPM Cue Sheet #2** | **Given the following conditions:**<br>• **The Shift Manager was notified by Radiation Protection the NEO received a Shallow Dose Equivalent (SDE) exposure of 275 rads to the skin.** |
| **Initiating Cue: JPM Cue Sheet #2** | **The Shift Manager directs you to PERFORM the following:**<br>• **DETERMINE Oral and Written Reportability Requirements, if any.**<br>  • **Oral Reporting Requirement:** __________<br>  • **Written Reporting Requirement:** __________ |

Facility: CPNPP JPM # NRC SA5 Task # SO1136 K/A # 2.4.41 4.6

Title: Classify an Emergency Plan Event

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | ____ | Classroom: | X | | |
| Actual Performance: | X | Simulator: | ____ | | |
| Alternate Path: | ____ | Plant: | ____ | | |
| Time Critical: | X | Low Pwr: | ____ | RCA: | ____ |
| Bank / Mod / New: | N | Emerg: | ____ | EN: | ____ |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Both Units are at 100% Rated Thermal power
- During the previous Unit 2 Refueling Outage it is believed foreign material was introduced into the RCS resulting in a leaking fuel pin
- 2-RE-0406 (FFL260), Gross Failed Fuel Monitor currently reading 0.9E-1 µCi/ml stable
- Fuse 41 in BOP ARR-03 CR-05 P.S. 2C3 blows resulting in a loss of C-9, CNDSR AVAIL STM DMP ARMED
- During this time, Electrical Maintenance is taking partial discharge data on Condensate Pump 2-02. An internal fault in the testing equipment results in a trip of Condensate Pump 2-02
- Subsequently, a Reactor Trip is manually initiated
- The resultant pressure spike with no Steam Dumps available lifts a Safety Valve on SG 2-04 which sticks partially open and dislodges a SG Tube Plug
- The Tube subsequently ruptures resulting in a 400 gpm SGTR
- 2-RE-0406 (FFL260), Gross Failed Fuel Monitor spikes to > 4.0E+4 µCi/ml
- Safety Injection is manually initiated

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- DETERMINE the HIGHEST Emergency Action Level Event Classification per EPP-201, Assessment of Emergency Action Levels, Emergency Classification, and Plan Activation

Task Standard: Utilizing EPP-201, determined the Emergency Action Level Event Classification as FG1.1 using the Emergency Action Level Hot, Common, and Cold Classification Charts within 15 minutes. Values of items above must be calculated within the accuracy of the attached key.

| | |
|---|---|
| Ref. Materials: | EPP-201, Assessment of Emergency Action Levels, Emergency Classification, and Plan Activation (Rev. 13 - 0)<br>EPP-201, Emergency Action Level Technical Bases Document (Rev. 1 - 0)<br>CPNPP Emergency Action Level Hot, Common, and Cold Classification Charts (Rev. 13) |
| Validation Time: | 10 minutes Time Critical: 15 minutes Completion Time: ________ minutes |

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ____________________________________________ Date: ________________

## CLASSROOM SETUP

**Handout:**

**MAKE the following available in the classroom:**

- **EPP-201, Assessment of Emergency Action Levels, Emergency Classification, and Plan Activation (orange paper)**
- **EPP-201, Emergency Action Level Technical Bases Document (orange paper)**
- **CPNPP Emergency Action Level Hot, Common, & Cold Classification Charts**

**√ - Check Mark Denotes Critical Step**

| START TIME: | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following steps are from CPNPP Emergency Action Levels Hot.** |
| **Perform Step: 1** | DETERMINE the Event Category. |
| **Performance Standard:** | REFERRED to CPNPP Emergency Action Levels Hot, Common, and Cold and DETERMINED the following chart is applicable:<br>• **CPNPP EAL HOT Conditions (RCS > 200°F)** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

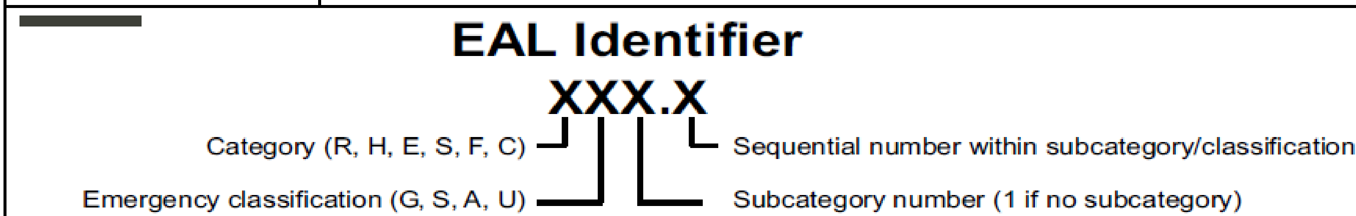
| | |
|---|---|
| **Perform Step: 2** | MATCH plant conditions in the EAL Group / Category. |
| **Performance Standard:** | IDENTIFIED EAL Group / Category as **Fission Product Barrier Degradation (F)**. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 3** | MATCH plant conditions in the selected EAL Subcategory. |
| **Performance Standard:** | REFERRED to Table F-1, Fission Product Barrier Matrix to determine Loss or Potential Loss of any Fission Product Barriers. IDENTIFIED a **Loss of the Containment Barrier as noted in Category A.1** due to a leaking or RUPTURED SG FAULTED outside containment. |
| **Examiner Note:** | **Examinee may refer to \ EPP-201, Emergency Action Level Technical Bases document for clarification regarding the event classification on pages 236-237 of 258.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 4** | MATCH plant conditions in the selected EAL Subcategory. |
| **Performance Standard:** | REFERRED to Table F-1, Fission Product Barrier Matrix to determine Loss or Potential Loss of any Fission Product Barriers. IDENTIFIED a **Loss of the RCS Barrier as noted in Category A.1** due to an automatic or manual ECCS (SI) actuation required by EITHER<br>• UNISOLABLE RCS leakage<br>• SG tube RUPTURE |
| **Examiner Note:** | **Examinee may refer to \ EPP-201, Emergency Action Level Technical Bases document for clarification regarding the event classification on pages 223 of 258.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 5** | MATCH plant conditions in the selected EAL Subcategory. |
| **Performance Standard:** | REFERRED to Table F-1, Fission Product Barrier Matrix to determine Loss or Potential Loss of any Fission Product Barriers. IDENTIFIED a **Loss of the Fuel Clad Barrier as noted in Category C.3** due to the Gross Failed Fuel Monitor, FFL260 (2-RE-0406), radiation reading greater than 1.0E+04 µCi/ml |
| **Examiner Note:** | **Examinee may refer to \ EPP-201, Emergency Action Level Technical Bases document for clarification regarding the event classification on pages 217 of 258.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| | |
| **Perform Step: 6√** | Classify the event. |




| | |
|---|---|
| **Performance Standard:** | CLASSIFIED the event as a **General Emergency (FG1.1) within 15 minutes.** Based on a Loss of any two Fission Product Barriers AND a Loss or Potential Loss of a third barrier. In this case all three Fission Product Barriers are lost. |
| **Terminating Cue:** | **This JPM is complete.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Both Units are at 100% Rated Thermal power**
- **During the previous Unit 2 Refueling Outage it is believed foreign material was introduced into the RCS resulting in a leaking fuel pin**
- **2-RE-0406 (FFL260), Gross Failed Fuel Monitor currently reading 0.9E-1 µCi/ml stable**
- **Fuse 41 in BOP ARR-03 CR-05 P.S. 2C3 blows resulting in a loss of C-9, CNDSR AVAIL STM DMP ARMED**
- **During this time, Electrical Maintenance is taking partial discharge data on Condensate Pump 2-02. An internal fault in the testing equipment results in a trip of Condensate Pump 2-02**
- **Subsequently, a Reactor Trip is manually initiated**
- **The resultant pressure spike with no Steam Dumps available lifts a Safety Valve on SG 2-04 which sticks partially open and dislodges a SG Tube Plug**
- **The Tube subsequently ruptures resulting in a 400 gpm SGTR**
- **2-RE-0406 (FFL260), Gross Failed Fuel Monitor spikes to > 4.0E+4 µCi/ml**
- **Safety Injection is manually initiated**

**Initiating Cue:** **The Shift Manager directs you to PERFORM the following:**

- **DETERMINE the HIGHEST Emergency Action Level Event Classification per EPP-201, Assessment of Emergency Action Levels, Emergency Classification, and Plan Activation**

**EAL Identifier:** ______________________________

## THIS JPM IS TIME CRITICAL. INFORM THE PROCTOR WHEN YOU HAVE COMPLETED THE CLASSIFICATION.

| | | | |
|---|---|---|---|
| Facility: **CPNPP 1 & 2** | | Date of Examination: **August 2021** | |
| Exam Level: RO SRO(I) **SRO (U)** | | Operating Test Number: **NRC** | |

Control Room Systems (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

| | System / JPM Title | Type Code* | Safety Function |
|---|---|---|---|
| S-1 | 001 – Control Rod Drive System (RO1008)<br>Perform Control Rod Exercises (RO ONLY) | D, S | 1 |
| S-2 | 004 – Chemical and Volume Control System (RO1335)<br>Emergency Boration from the RWST | A, D, S | 2 |
| **S-3** | **061 – Auxiliary/Emergency Feedwater System (RO3505)**<br>**Align Station Service Water to Feed Steam Generator from AFW** | **A, EN, L, N, S** | **4P** |
| S-4 | 035 – Steam Generator System (RO3005)<br>Control RCS Temperature during Reactor Trip Response | A, L, N, S | 4S |
| **S-5** | **064 – Emergency Diesel Generator System (RO4302)**<br>**Loss of Both 6.9 KV Safeguard Busses** | **A, EN, L, M, S** | **6** |
| **S-6** | **015 – Nuclear Instrumentation System (RO1818)**<br>**Respond to a Source Range Channel Energizing at Power** | **N, S** | **7** |
| S-7 | 086 – Component Cooling Water System (RO3603)<br>Rotate Component Cooling Water Pumps | A, D, S | 8 |
| S-8 | 071 – Waste Gas Disposal System (RO4001)<br>Establish Sample Flow to South Vent Stack Wide Range Gas Monitor | N, S | 9 |

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

| | | | |
|---|---|---|---|
| **P-1** | **013 – Emergency Safety Feature Actuation System (AO5422)**<br>**Restore SCW Surge Tank Level to Maintain Cooling to ESF Pump Rooms** | **E, L, N, R** | **2** |
| P-2 | 056 – Condensate System (AO3529)<br>Secondary System Isolation following Steam Generator Tube Rupture | E, L, N | 4S |
| **P-3** | **086 – Fire Protection System (AO4405)**<br>**Perform Actions for a Fire in Containment** | **A, E, M, R** | **8** |

| * | All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room. |
|---|---|

| *Type Codes | Criteria for RO / SRO-I / SRO-U |
|---|---|
| (A)lternate path | 4-6 **(6)** / 4-6 **(6)** / 2-3 **(3)** |
| (C)ontrol room | |
| (D)irect from bank | $\leq$ 9 **(3)** / $\leq$ 8 **(2)** / $\leq$ 4 **(0)** |
| (E)mergency or abnormal in-plant | $\geq$ 1 **(3)** / $\geq$ 1 **(3)** / $\geq$ 1 **(2)** |
| (EN)gineered safety feature | $\geq$ 1 **(2)** / $\geq$ 1 **(2)** / $\geq$ 1 **(2)** (control room system) |
| (L)ow-Power / Shutdown | $\geq$ 1 **(5)** / $\geq$ 1 **(5)** / $\geq$ 1 **(3)** |
| (N)ew or (M)odified from bank including 1(A) | $\geq$ 2 **(8)** / $\geq$ 2 **(8)** / $\geq$ 1 **(5)** |
| (P)revious 2 exams | $\leq$ 3 **(0)** / $\leq$ 3 **(0)** / $\leq$ 2 **(0)** (randomly selected) |
| (R)CA | $\geq$ 1 **(2)** / $\geq$ 1 **(2)** / $\geq$ 1 **(2)** |
| (S)imulator | **(8)** / **(7)** / **(3)** |

NRC JPM Examination
Summary Description

S-1 The applicant will perform Control Rod Exercises for Control Bank D rods per OPT-106A, Control Rods Exercise. The critical steps include selecting the proper bank to be tested (Bank D), withdrawing the bank to the desired position, returning the bank to the pre-test position, placing the control rods in Manual to verify conditions to return to Auto are met, and then placing the control rods in Auto. This is a direct from bank JPM. This JPM is under the Reactivity Control Safety Function. This will be an RO only JPM. (K/A 001 A4.03 – IR 4.0 / 3.7)

S-2 The applicant will be required to initiate Emergency Boration per ABN-107, Emergency Boration, for 2 stuck control rods following a reactor trip. The applicant will initially attempt to emergency borate per Attachment 1, Emergency Boration through Emergency Borate Valve 1-8104, however, this flowpath will be unavailable (after the running BAT pump trips.) The applicant will then be required to use attachment 4, Transfer of Charging Pump Suction to the RWST, (the only attachment that does not require the use of BAT pumps). The critical steps include opening one of the RWST to Charging Pump Suction Valves, closing both of the VCT to Charging Pump Suction Valves, and opening one of the CCP Miniflow Valves. This is a direct from bank JPM. This JPM is under the Reactor Coolant System Inventory Control Safety Function. (K/A 004 A2.14 – IR 3.8 / 3.9)

S-3 Following a tornado causing a loss of offsite power and damage to the Unit 1 CST, the applicant will be required to align the Station Service Water System to Supply the Auxiliary Feedwater System and feed a Steam Generator due to excessively low Condensate Storage Tank Level. The actions are per ABN-305, Auxiliary Feedwater System Malfunction. The applicant will be directed to supply SG 1-01 from either MDAFWP 1-01 or the TDAFWP, however the SSW to AFW pump suction valve will fail to open on the selected pump requiring the applicant to select the alternate pump. The critical steps include closing all AFW isolation valves to the Steam Generators not being used as Heat Sink, opening the SSW to AFW pump suction valves, opening the selected AFW pump suction valve, and starting the selected AFW pump. This is a new JPM. This JPM is under the Heat Removal from Reactor Core – Primary Systems Safety Function.
(K/A W E05 EA1.1 – IR 4.1 / 4.0)

S-4 Following a Loss of all Thermal Barrier Cooling flow to the RCPs, RCP criteria was met, the unit was tripped and all RCPs were secured. The applicant is directed to perform EOS-0.1A, Reactor Trip Response, beginning at Step 1 – Check RCS Temperature. The alternate path portion of the JPM will require the applicant to increase dumping steam from all Steam Generators via the ARVs and maintain a symmetrical cooldown of the RCS. The Steam Dumps will fail to respond in Steam Pressure Mode in Manual or Automatic control and the applicant must dump steam using the ARVs. The critical steps include manually increasing demand on all four Steam Generator ARV controllers to control RCS Temperature. This is a new JPM. This JPM is under the Heat Removal from Reactor Core – Secondary Systems Safety Function. (K/A EPE E09 EA1.1 – IR 3.5 / 3.5)

S-5 The applicant will respond to a loss of both 6.9 KV Safeguard Buses per ABN-601, Response to a 138/345 KV System Malfunction, Section 7.0, Loss of Both Safeguards Buses – MODE 1, 2, 3, or 4. The alternate path includes attempting to close the Train A or Train B Emergency Diesel Generator Output Breaker. The applicant will determine the first attempted DG Output Breaker will fail to close and energize the alternate AC Safeguards Bus via the alternate DG Output Breaker. This is a modified from bank JPM. This JPM is under the Electrical Safety Function. This is a PRA significant action. (K/A 064 A4.06 – IR 3.9 / 3.9)

S-6 Following Source Range Instrument N31 Energizing at Power, the applicant is required to perform the actions of ABN-701, Source Range Instrument Malfunction. Critical Steps will include bypassing the N31 Level Trip, placing the N31 High Flux at Shutdown switch in block, and removing the N31 Instrument Power Fuse to de-energize the high voltage. This is a new JPM. This JPM is under the Instrumentation Safety Function. (K/A 015 A2.02 – IR 3.1 / 3.5*)

S-7 The applicant will shift from Train A to Train B Component Cooling Water Pumps per SOP-502A, Component Cooling Water System, Step 5.2.1.1, Starting a Standby CCW Pump During Normal Operation, then Step 5.2.1.2, Placing a CCW Pump in Standby from Dual Pump Operation. The alternate path occurs when the Train B CCW Pump trips shortly after it is started. This is a direct from bank JPM under the Plant Service Systems Safety Function. (K/A 008 A2.01 – IR 3.3 / 3.6)

S-8 The applicant will utilize the PC-11 to establish Sample Flow to the South Vent Stack Wide Range Gas Monitor per SOP-706, Digital Radiation Monitoring System. The critical steps will include selecting the correct radiation monitor on the PC-11 and turning the associated sample pump on. This is a new JPM. This JPM is under the Radioactivity Release Safety Function.
(K/A 071 A4.09 – IR 3.3 / 3.5)

P-1 Actions of ABN-503, Safety Chilled Water System Malfunction are required to maintain Safety Chilled Water Surge Tank level during accident conditions (maintain cooling to ESF pump rooms). The applicant will locally fail open the Safety Chilled Water Surge Tank RMUW Supply Valve in accordance ABN-503 and OWI-206, Guidelines for Operation of Manual and Power Operated Valves, Section 6.3.2.G, Failing/Restoring a Simple Air Operated Valve (without handwheel). Critical Steps include closing the air supply to the filter regulator and opening the blowdown on the filter regulator. This is a new JPM. This JPM is under the Reactor Coolant System Inventory Control Safety Function.
(K/A 013 A3.02 – IR 4.1 / 4.2)

P-2 During Steam Generator Tube Rupture recovery actions, the applicant is required to perform field actions to isolate the condensate polishing demineralizers to minimize the spread of contamination to the secondary systems in accordance with EOP-3.0, Steam Generator Tube Rupture, Attachment 5, Secondary System Isolation. Critical Steps include closing the Condensate Supply Header to Condensate Polishing System Supply Header Isolation valves and isolating the 50 psi Auxiliary Steam Header. This is a new JPM. This JPM is under the Heat Removal from Reactor Core Secondary Systems Safety Function.
(K/A G2.3.14 – IR 3.4 / 3.8)

P-3 The applicant will perform actions for a fire in Containment per ABN-807A/B, Response to a Fire in the Containment Building, Attachment 1, Actions to be Taken by the Nuclear Equipment Operator. Critical Steps include de-energizing various breakers in the plant to preclude spurious valve actuations due to the fire as well as manually, locally closing the RHR Pump 1-01 to CCP Suction Valve which has spuriously opened (Alternate Path). This is a modified bank JPM. This JPM is under the Plant Service Systems Safety Function.
(K/A 067 AA2.17 – IR 3.5 / 4.3)

Facility: CPNPP JPM # NRC S-1 Task #RO1008 K/A #001 A4.03 4.0 / 3.7 SF-1

Title: Perform Control Rod Exercises

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | ______ | Classroom: | ______ | | |
| Actual Performance: | X | Simulator: | X | | |
| Alternate Path: | ______ | Plant: | ______ | | |
| Time Critical: | ______ | Low Pwr: | ______ | RCA: | ______ |
| Bank / Mod / New: | B | Emerg: | ______ | EN: | ______ |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is operating at 97% with all controls in AUTOMATIC
- OPT-106A, Control Rod Exercise, is in progress
- The fuel is fully conditioned
- ETP-106, Monthly RCCA Repositioning, is not being performed concurrently with this activity

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- EXERCISE Control Rods in Control Bank D per OPT-106A, Control Rod Exercise
- Initial direction of rod movement for Control Bank D Rods should be OUT per Shift Manager
- RESTORE Automatic Rod Control when complete

Task Standard: Utilizing OPT-106 PLACED the Control Bank Select switch in the CBD position, EXERCISED Control Bank D Control Rods 10 steps in Both directions by using the Control Rod Motion Control Switch, PLACED the Control Rod Bank Select switch in manual, PLACED Control Rod Bank Select switch in auto when conditions met.

Required Materials: OPT-106A, Control Rod Exercise (Rev. 12 - 0)
OPT-106A-2, MODE 1 or 2 Control Rod Exercise Data Sheet (Rev. 2)

Validation Time: 10 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

## SIMULATOR SETUP

**SIMULATOR OPERATOR:**

**INITIALIZE to IC-36 or any 97% power Initial Condition and ENSURE the following:**

- **VERIFY Control Bank D rod positions at 215 steps**
- **VERIFY all other Control Rod Groups at 228 steps**
- **VERIFY 1/1-RBSS, Control Rod Bank Select Switch is in the CBC position**

**NOTE: After each JPM, VERIFY 1/1-RBSS, Control Rod Bank Select Switch is in the CBC position prior to performance by the next candidate**

**Place Out of Position marker on 1/1-RBSS**

**EXAMINER:**

**PROVIDE the examinee with a marked up copy of:**

- **OPT-106A, Control Rod Exercise (orange paper)**
- **OPT-106A-2, MODE 1 or 2 Control Rod Exercise Data Sheet completed up to Control Bank D (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following steps are from OPT-106A, Control Rod Exercise, Section 8.2.** |
| **Perform Step: 1√**<br>Step 8.2.2 & 9th bullet | 8.2.2 PLACE 1/1-RBSS, CONTROL ROD BANK SELECT in the position corresponding to the bank to be tested.<br>• CBD Control Bank D |
| **Standard:** | PLACED Switch 1/1-RBSS, CONTROL ROD BANK SELECT Switch in the CBD, Control Bank D position. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

CAUTION:
- The following steps will cause a change in reactor power level and Tavg.
- If control rods are inadvertently pulled above 231 steps, rod motion should be stopped and step counters reset per SOP-702A.

| | |
|---|---|
| **Examiner Cue:** | **If asked, as the US provide examinee a Tave band of ± 1.0°F during control rod manipulations.** |
| **Perform Step: 2**<br>Step 8.2.3 & A. | 8.2.3 MOVE the bank being tested as follows:<br>A. IF the Bank being tested is greater than or equal to 220 AND <230 steps, THEN WITHDRAW the bank being tested to 230 steps as indicated on the step counter |
| **Standard:** | DETERMINED Control Bank D Rods are < 220 steps and step is N/A. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 3**<br>Step 8.2.3, B., & 1) | 8.2.3 MOVE the bank being tested as follows:<br>B. IF the Bank being tested is less than 220 steps, THEN PERFORM the following:<br>1) The Shift Manager is to determine the initial direction of rod movement based on:<br>• current rod position<br>• ΔI<br>• current location in the AFD band<br>• proximity to run-back limits<br>• fuel conditioning / rod motion limits |
| **Standard:** | DETERMINED SM directed rod withdrawal from Initiating Cue. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Note:** | **Examinee should recognize the effects on Reactor power and temperature as Control Rods are moved.** |
| **Perform Step: 4√**<br>Step 8.2.3, B., & 2) | 8.2.3 MOVE the bank being tested as follows:<br>B. IF the Bank being tested is less than 220 steps, THEN PERFORM the following:<br>2) MOVE the Bank being tested ≥10 AND <13 steps as indicated on the step counter. |
| **Standard:** | WITHDREW Control Bank D Rods from 215 steps to a Bank position of 225 to 227 steps on both counters |
| **Examiner Note:** | **Per ODA-102, Conduct of Operations, Attachment 8.G, Operations Department Alarm Response Expectations:**<br>• **When Control Bank D Rods are WITHDRAWN to 223 steps, 1-ALB-6D, Window 4.14 – CONTROL ROD BANK D FULL WITHDRWL will alarm.**<br>• **If examinee identifies alarm as expected (prior to receiving alarm) then referencing the alarm response is not required.** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 5**<br>Step 8.2.4 | 8.2.4 RECORD Initial step counter demand position for each rod group in the bank being tested. |
| **Standard:** | OBSERVED 1-SC-CBD1, CTRL BANK D GROUP 1 and 1-SC-CBD2, CTRL BANK D GROUP 2 Step Counter Demand Position and RECORDED Initial Position of Control Bank D Rod Groups on Form OPT-106A-2. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **Based on the CAUTION prior to Step 8.1 the Examinee should attempt to move the rods only the minimum of 10 steps if all position indications are OPERABLE.** |
| NOTE: If the controlling bank of rods is not returned to the original recorded position an adjustment of the Rod Bank Overlap Unit will be required (See Step 8.2.13). | |
| **Perform Step: 6√**<br>Step 8.2.5 | 8.2.5 MOVE the bank being tested ≥ 10 AND < 13 steps in the opposite direction of movement in step 8.2.3 (or INWARD if not moved in 8.2.3). |
| **Standard:** | PLACED 1/1-FLRM, CONTROL ROD MOTION CONTROL Switch in the IN position and INSERTED Control Bank D Rods to a Bank position of 215 to 217 steps on both counters. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| NOTE: DRPI indication is "SAT" if it indicates rod motion in the same direction as was demanded. | |
| **Perform Step: 7**<br>Step 8.2.6 & 1st bullet | 8.2.6 VERIFY:<br>• all rods in the bank being tested have moved by recording Test Position step counter demand |
| **Standard:** | OBSERVED 1-SC-CBD1, CTRL BANK D GROUP 1 and 1-SC-CBD2, CTRL BANK D GROUP 2 Step Counter Demand Position and RECORD Test Position of Control Bank D Rod Groups on Form OPT-106A-2 |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| NOTE: | DRPI indication is "SAT" if it indicates rod motion in the same direction as was demanded. |
| **Perform Step: 8**<br>Step 8.2.6 & 2nd bullet | 8.2.6 VERIFY:<br>• DRPI position indication has changed for each rod in the bank. |
| **Standard:** | VERIFIED movement of each Control Bank D Rod on DRPI |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Cue:** | **IF necessary, as the Shift Manager, direct that Control Bank D rods be returned to the Pre-Test position.** |
| **Perform Step: 9√**<br>Step 8.2.7 | 8.2.7 RETURN the bank being tested to Pre-test position (step 8.2.1) OR as directed by the Shift Manager. |
| **Standard:** | PLACED 1/1-FLRM, CONTROL ROD MOTION CONTROL Switch in the IN direction and ADJUSTED until Control Bank D Rods to the Pre-Test Position of 215 steps as documented on OPT-106A-2.<br>-OR-<br>PLACED 1/1-FLRM, CONTROL ROD MOTION CONTROL Switch in the OUT direction and ADJUSTED until Control Bank D Rods to the Pre-Test Position of 215 steps as documented on OPT-106A-2. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ **N/A** ☐ |

| | |
|---|---|
| **Perform Step: 10**<br>Step 8.2.8 | 8.2.8 RECORD the Final step counter demand position for each rod group in the bank being tested. |
| **Standard:** | OBSERVED 1-SC-CBD1, CTRL BANK D GROUP 1 and 1-SC-CBD2, CTRL BANK D GROUP 2 Step Counter Demand Position and RECORDED Final Position of Control Bank D Rod Groups of 215 steps on Form OPT-106A-2. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 11√**<br>Step 8.2.10 | 8.2.10 PLACE 1/1-RBSS, CONTROL ROD BANK SELECT in MAN. |
| **Standard:** | PLACED 1/1-RBSS, CONTROL ROD BANK SELECT Switch in MANUAL. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 12**<br>Step 8.2.11 | 8.2.11 VERIFY the following alarms are clear <u>OR</u> evaluate for current plant conditions:<br>• "CONTROL ROD CTRL URGENT FAIL" (6D-1.6)<br>• "ANY CONTROL ROD BANK AT LO LMT" (6D-1.7)<br>• "CONTROL ROD CTRL NON-URGENT FAIL" (6D-2.6)<br>• "ANY CONTROL ROD BANK AT LO-LO LMT" (6D-2.7)<br>• "DRPI ROD DEV" (6D-3.5)<br>• "DRPI URGENT FAIL" (6D-3.6)<br>• "DRPI NON-URGENT FAIL" (6D-4.6)<br>• "QUADRANT PWR TILT" (6D-4.10) |
| **Standard:** | VERIFIED the following alarms on ALB-6D clear:<br>• 6D-1.6, CONTROL ROD CTRL URGENT FAIL<br>• 6D-1.7, ANY CONTROL ROD BANK AT LO LMT<br>• 6D-2.6, CONTROL ROD CTRL NON-URGENT FAIL<br>• 6D-2.7, ANY CONTROL ROD BANK AT LO-LO LMT<br>• 6D-3.5, DRPI ROD DEV<br>• 6D-3.6, DRPI URGENT FAIL<br>• 6D-4.6, DRPI NON-URGENT FAIL<br>• 6D-4.10, QUADRANT PWR TILT |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The examinee may perform an Annunciator Alarm Test to verify PCIP Window 2-4 is clear.** |
| **Perform Step: 13**<br>Step 8.2.12 & A. | 8.2.12 IF AUTO rod control is desired, <u>THEN</u> perform the following:<br>A. VERIFY alarm "LO TURB PWR ROD WTHDRWL BLK C-5" is clear (PCIP-2.4). |
| **Standard:** | VERIFIED alarm PCIP-2.4, LO TURB PWR ROD WTHDRWL BLK C-5 clear. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following step may be critical if Tave is not within 1ºF of Tref and Control Rods need to be moved to establish the proper band.** |
| **Perform Step: 14**<br>Step 8.2.12 & B. | 8.2.12 IF AUTO rod control is desired, <u>THEN</u> perform the following:<br>B. ENSURE Tavg and Tref are within 1ºF of each other. |
| **Standard:** | OBSERVED 1-TI-412A, AVE $T_{AVE}$ $T_{REF}$ DEV meter and VERIFIED $T_{AVE}$ and $T_{REF}$ are within 1ºF of each other. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 15√**<br>Step 8.2.12 & C. | 8.2.12 IF AUTO rod control is desired, THEN perform the following:<br>C. PLACE 1/1-RBSS, CONTROL ROD BANK SELECT in AUTO. |
| **Standard:** | PLACED 1/1-RBSS, Control Rod Bank Select in AUTO. |
| **Terminating Cue:** | **This JPM is complete.** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 is operating at 97% with all controls in AUTOMATIC**
- **OPT-106A, Control Rod Exercise, is in progress**
- **The fuel is fully conditioned**
- **ETP-106, Monthly RCCA Repositioning, is not being performed concurrently with this activity**

**Initiating Cue:** **The Unit Supervisor directs you to PERFORM the following:**

- **EXERCISE Control Rods in Control Bank D per OPT-106A, Control Rod Exercise**
- **Initial direction of rod movement for Control Bank D Rods should be OUT per Shift Manager**
- **RESTORE Automatic Rod Control when complete**

Facility: CPNPP JPM # NRC S-2 Task # RO1335 K/A # 004.A2.14 3.8 / 3.9 SF-2

Title: Emergency Boration from the Refueling Water Storage Tank

Examinee (Print): ______________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | ____ | Classroom: | ____ | | |
| Actual Performance: | X | Simulator: | X | | |
| Alternate Path: | X | Plant: | ____ | | |
| Time Critical: | ____ | Low Pwr: | ____ | RCA: | ____ |
| Bank / Mod / New: | B | Emerg: | ____ | EN: | ____ |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Current RCS boron concentration is 771 ppm
- 1/1-APBA2, BA XFER PMP 2, is out of service for maintenance
- A Reactor trip has just occurred and two (2) Control Rods K10 and K14 have failed to fully insert
- Immediate actions of EOP-0.0A, Reactor Trip or Safety Injection, have been verified

Initiating Cue: The US directs you to PERFORM the following:

- Emergency Borate in accordance with ABN-107, Emergency Boration, for two Control Rods not fully inserted

Task Standard: Utilizing ABN-107, DETERMINED Attachment 1, 2, and 3 Emergency Boration flowpaths NOT available. REFERRED to ABN-107, Attachment 4 and INITIATED an Emergency Boration via the Refueling Water Storage Tank flowpath.

Required Materials: ABN-107, Emergency Boration (Rev. 9 - 6)

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________ Date: ____________

## SIMULATOR SETUP

**SIMULATOR OPERATOR:**

**INITIALIZE to IC-37:**

- **Silence nuisance annunciators and PLACE Simulator in FREEZE**
- **SET out EOP-0.0A, Reactor Trip or Safety Injection, Attachment 1.A, Foldout Page**
- **PLACE CB-06 PCS Screen on FOP**
- **PLACE Yellow Tag on 1/1-APBA2, BA XFER PMP 2**
- **When EXAMINEE is ready to begin PLACE Simulator in RUN**
- **When/If directed EXCUTE Key 1 to locally OPEN 1CS-8439, Emergency Manual Borate Valve (Remote Function is hidden as it is snapped into IC)**

**OR**

**PERFORM the following:**

- **ENSURE Centrifugal Charging Pump 1-01 is running**
- **INSERT malfunctions for Control Rods CBB K-14 and CBC K-10 stuck at 30 steps**
  - **IMF RD04K14 f:30 AND IMF RD04K10 f:30**
- **OVERRIDE and HANG clearance tag on 1/2-APBA2, Boric Acid Transfer Pump 1-02**
  - **IOR DICVAPBA2 f:0**
- **Add Event Trigger “8104 Emer Boration Failure” (Inset Malfunction CV19A to trip BA Transfer Pump 1 four seconds after 1/1-8104 is opened)**
- **PLACE Remote Function CVR02 on Key 1 to OPEN CS-8439 when directed**
  - **IRF CVR02 f:1 k:1**
- **Manually TRIP the Reactor**
- **ACKNOWLEDGE all annunciators**
- **Properly Throttle AFW flow per the FOP**
- **SET out EOP-0.0A, Reactor Trip or Safety Injection, Attachment 1.A, Foldout Page**
- **PLACE CB-06 PCS Screen on FOP**
- **FREEZE the simulator**
- **When examinee is ready, PLACE simulator in RUN**

**SIMULATOR OPERATOR NOTE:**

**After each JPM PERFORM the following:**

- **ENSURE ABN-107 inside the Control Board Job Aid orange folder and the Emergency Boration Hard Card are clean**
- **DELETE PCS History by EXECUTING Remote Function PCR04 to CLEAR while Simulator is in RUN**

**EXAMINER:**

**PROVIDE the examinee with a copy of:**

- **ABN-107, Emergency Boration (all pages) (orange paper)**

**√ - Check Mark Denotes Critical Step**

| START TIME: | |
|---|---|

# ***ABN-107, SECTION 2.0 STEPS BEGIN HERE***

| | |
|---|---|
| **Examiner Note:** | **The first attempt to emergency borate should be via ABN-107, Emergency Boration, Attachment 1, Emergency Boration through Emergency Borate Valve 1-8104. This flowpath will be unsuccessful because BAT Pump 1-01 will trip when 1/1-8104, EMER BORATE VLV is opened (BAT Pump 1-02 is tagged out).** |
| **Examiner Note:** | **Attachment 1 starts at Perform Step 4.**<br>**Attachment 2 starts at Perform Step 11.**<br>**Attachment 3 starts at Perform Step 15.** |
| **Examiner Note:** | **The following steps are from ABN-107, Section 2.0.** |

CAUTION: CCP runout may occur with simultaneous flow through both charging and SI flowpaths.

NOTE: Attachment 1 and Attachment 4 have been developed into Operator Aids for use during emergency boration and may be entered independently of this procedure.

| | |
|---|---|
| **Perform Step: 1**<br>2.3.1 | Check RWST TO CHRG PMP SUCT VLVs, 1/u-LCV-112D AND 1/u-LCV-112E - CLOSED. |
| **Standard:** | VERIFIED RWST TO CHRG PMP SUCT VLVs, 1/1-LCV-112D AND 1/1-LCV-112E both CLOSED. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 2**<br>2.3.2 | Verify BA pump - AT LEAST ONE AVAILABLE. |
| **Standard:** | DETERMINED 1/1-APBA1, BA XFER PMP 1, is available and 1/1-APBA2, BA XFER PMP 2 is TAGGED OUT. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| |
|---|
| NOTE: Attachment 1 is the preferred method of Emergency Boration. Train B Safeguards electrical power is required for operation of 1/u-8104. |
| NOTE: Attachment 2 utilizes the normal boration flow path, which requires 1/u-LCV-112B and 1/u-LCV-112C to be open. |

| | | |
|---|---|---|
| **Perform Step: 3**<br>2.3.3 & 1st 3 bullets | Initiate and Continue EMERGENCY BORATION using one of the following methods:<br>• Attachment 1 – 1/u-8104<br>• Attachment 2 – Normal Boration<br>• Attachment 3 – Manual Emergency Boration Valve (uCS-8439) | |
| **Standard:** | REFERRED to Attachment 1, Emergency Boration through Emergency Borate Valve 1/u-8104. | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

# ***ATTACHMENT 1 STEPS BEGIN HERE***

| | | |
|---|---|---|
| **Examiner Note:** | **The following steps are from ABN-107, Attachment 1.** | |
| **Perform Step: 4**<br>1 | Ensure a charging pump is running:<br>• 1/u-APCH1, CCP 1<br>• 1/u-APCH2, CCP 2<br>• 1/u-APPD, PDP | |
| **Standard:** | DETERMINED Centrifugal Charging Pump 1-01 is running. | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| **Perform Step: 5√**<br>2 | Start a boric acid transfer pump:<br>• 1/u-APBA1, BA XFER PMP 1 - AUTO (AFTER START) | |
| **Standard:** | PLACED 1/1- APBA1, BA XFER PMP 1 in START and OBSERVED red START light LIT. | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **When 1/1-8104, EMER BORATE VLV is opening the 1-01 BAT Pump will trip.** |
| **Perform Step: 6√**<br>3 | Open 1/u-8104, EMER BORATE VLV. |
| **Standard:** | PLACED 1/1-8104, EMER BORATE VLV in OPEN and OBSERVED red OPEN light LIT. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 7**<br>4 | Verify flow on u-FI-183A, EMER BORATE FLO. |
| **Standard:** | DETERMINED 1-FI-183A, EMER BORATE FLO indicates zero flow due to 1-01 BAT Pump trip. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 8**<br>5 | Verify flow on u-FI-121A, CHRG FLO. |
| **Standard:** | DETERMINED 1-FI-121A, CHRG FLO indicates flow. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 9**<br>6 | IF EMER BORATE FLOW OR CHRG FLOW can NOT be verified, THEN initiate Emergency Boration Flow per another method of ABN-107. |
| **Standard:** | DETERMINED Emergency Boration Flow could NOT be VERIFIED and attempted to Emergency Borate per another method listed in ABN-107 Step 2.3.3 (Perform Step 3) |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **When Attachment 1 fails to initiate Boric Acid flow, the applicant may reference Attachment 2, Attachment 3, or go back to ABN-107, Section 2.0, Step 2.3.4.**<br>**Attachment 2, Normal Boration steps are listed next starting at Perform Step 11.**<br>**Attachment 3 steps are listed starting at Perform Step 15.**<br>**Attachments 2 and 3 will be unsuccessful as they require a BAT Pump to be successful.** |
| **Perform Step: 10**<br>2.3.3 & 1st 3 bullets | Initiate and Continue EMERGENCY BORATION using one of the following methods:<br>• Attachment 1 – 1/u-8104 **(already attempted)**<br>• Attachment 2 – Normal Boration **(requires a BAT pump)**<br>• Attachment 3 – Manual Emergency Boration Valve (uCS-8439) **(requires a BAT pump)** |
| **Standard:** | DETERMINED 1-01 Boric acid transfer pump has tripped and REFERRED back to ABN-107, Section 2.0, Step 2.3.4. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

# ***ATTACHMENT 2 STEPS BEGIN HERE***

| | |
|---|---|
| **Examiner Note:** | **The following steps are from ABN-107, Attachment 2. The steps in this section will NOT be performed if the JPM is executed correctly, therefore NO steps in this section are Critical.** |
| **Examiner Note:** | **The following steps represent an Alternate Path that may be attempted, but because the BAT pump is tripped, it is not successful. The steps pertaining to Attachment 2 should be marked N/A if not completed by examinee.** |
| NOTE: Attachment 2 utilizes the normal boration flow path, which requires 1/u-LCV-112B and 1/u-LCV-112C to be open. | |
| **Perform Step: 11**<br>1 | Place 1/u-MU, RCS MU MAN ACT switch in – STOP. |
| **Standard:** | PLACED 1/1-MU, RCS MU MAN ACT switch in STOP and OBSERVED green STOP light LIT. |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

| | |
|---|---|
| **Perform Step: 12**<br>2 | Open 1/u-FCV-110B, RCS MU TO CHRG PMP SUCT ISOL VLV. |
| **Standard:** | PLACED 1/1-FCV-110B, RCS MU TO CHRG PMP SUCT ISOL VLV in OPEN and OBSERVED red OPEN light LIT. |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

| | |
|---|---|
| **Examiner Note:** | **Boric Acid Pump 1 is tripped and Boric acid pump 2 is tagged out.** |
| **Perform Step: 13**<br>3 | Start a boric acid transfer pump:<br>• 1/u-APBA1, BA XFER PMP 1 - AUTO (AFTER START) |
| **Standard:** | DETERMINED 1/1- APBA1, BA XFER PMP 1 has already tripped and DETERMINED another method of Emergency Boration must be used. |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

| | |
|---|---|
| **Examiner Note:** | **When Attachments 1 and 2 have failed to initiate Boric Acid flow, the applicant may reference Attachment 3, or go back to ABN-107 Section 2.0, Step 2.3.4.**<br>**Attachment 3, Manual Emergency Boration Valve steps are listed next starting at Perform Step 15.**<br>**Attachment 3 will be unsuccessful as it requires a BAT Pump to be successful.** |
| **Perform Step: 14**<br>2.3.3 & 1st 3 bullets | Initiate and Continue EMERGENCY BORATION using one of the following methods:<br>• Attachment 1 – 1/u-8104 **(already attempted)**<br>• Attachment 2 – Normal Boration **(already attempted)**<br>• Attachment 3 – Manual Emergency Boration Valve (uCS-8439) **(requires a BAT pump)** |
| **Standard:** | DETERMINED 1-01 Boric acid transfer pump has tripped and REFERRED back to ABN-107, Section 2.0, Step 2.3.4. |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

# ***ATTACHMENT 3 STEPS BEGIN HERE***

| | |
|---|---|
| **Examiner Note:** | **The following steps are from ABN-107, Attachment 3. The steps in this section will NOT be performed if the JPM is executed correctly, therefore no steps in this section are Critical.** |
| **Examiner Note:** | **The following steps represent an Alternate Path that may be attempted, but because the BAT pump is tripped, it is not successful. The steps pertaining to Attachment 3 should be marked N/A if not completed by examinee.** |
| **Perform Step: 15**<br>1 | Locally open affected unit emergency borate manual valve.<br>• uCS-8439-RO, Uu CVCS CHRG PMP EMER BORATE MAN VLV RMT OPER [AB 822 Blndr Rm X-209(X-208)] |
| **Standard:** | CONTACTED Nuclear Equipment Operator to OPEN 1CS-8439-RO, U1 CVCS CHRG PMP EMER BORATE MAN VLV RMT OPER. |
| **Simulator Operator:** | **When contacted, EXECUTE remote function CVR02, CS-8439, Emergency Manual Borate Valve to OPEN (Key 1) and REPORT completion.** |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

| | |
|---|---|
| **Perform Step: 16**<br>2 | Verify a charging pump is running:<br>• 1/u-APCH1, CCP 1<br>• 1/u-APCH2, CCP 2<br>• 1/u-APPD, PDP |
| **Standard:** | DETERMINED Centrifugal Charging Pump 1-01 is running. |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

| | |
|---|---|
| **Perform Step: 17**<br>3 | Place 1/u-MU, RCS MU MAN ACT switch in – STOP. |
| **Standard:** | PLACED 1/1-MU, RCS MU MAN ACT switch in STOP and OBSERVED green STOP light LIT. |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

| | |
|---|---|
| **Examiner Note:** | **Boric Acid Pump 1 is tripped and Boric acid pump 2 is tagged out.** |
| **Perform Step: 18**<br>4 | Start a boric acid transfer pump:<br>• 1/u-APBA1, BA XFER PMP 1 - AUTO (AFTER START) |
| **Standard:** | DETERMINED 1/1- APBA1, BA XFER PMP 1 has already tripped and DETERMINED another method of Emergency Boration must be used. |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

| | |
|---|---|
| **Examiner Note:** | **When Attachments 1, 2, and 3 have failed to initiate Boric Acid flow, the applicant should go back to ABN-107, Section 2.0, Step 2.3.4.** |
| **Perform Step: 19**<br>2.3.3 & 1st 3 bullets | Initiate and Continue EMERGENCY BORATION using one of the following methods:<br>• Attachment 1 – 1/u-8104 **(already attempted)**<br>• Attachment 2 – Normal Boration **(already attempted)**<br>• Attachment 3 – Manual Emergency Boration Valve (uCS-8439) **(already attempted)** |
| **Standard:** | DETERMINED 1-01 Boric acid transfer pump has tripped and REFERRED back to ABN-107, Section 2.0, Step 2.3.4. |
| **Comment:** | **SAT ☐ UNSAT ☐ N/A ☐** |

# ***ABN-107, SECTION 2.0 STEPS RESTART HERE***

| | |
|---|---|
| **Examiner Note:** | **The following steps are continued from ABN-107, Section 2.0.** |
| **Perform Step: 20**<br>2.3.4 & 2.3.4 RNO | Verify EMERGENCY BORATION flow<br>• GO TO Step 6. |
| **Standard:** | DETERMINED no Boric Acid flow available and TRANSITIONED to Step 6 per the RNO column. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 21**<br>2.3.6 | Verify RWST - AVAILABLE |
| **Standard:** | VERIFIED RWST available by level indications on CB-04:<br>• 1-LI-930, RWST LVL CHAN I<br>• 1-LI-931, RWST LVL CHAN II<br>• 1-LI-932, RWST LVL CHAN III<br>• 1-LI-933, RWST LVL CHAN IV |
| **Comment:** | **SAT ☐ UNSAT ☐** |

NOTE: Attachment 4 is the preferred method to EMERGENCY BORATE from the RWST.

| | |
|---|---|
| **Perform Step: 22**<br>2.3.7 & 1st bullet | Initiate and Continue EMERGENCY BORATION using one of the following methods:<br>• From the RWST via 1/u-LCV-112D OR 1/u-LCV-112E per Attachment 4. |
| **Standard:** | INITIATED Attachment 4, Transfer of Charging Pump Suction to the RWST. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

# ***ATTACHMENT 4 STEPS BEGIN HERE***

| | |
|---|---|
| **Examiner Note:** | **The following steps are from ABN-107, Attachment 4.** |
| **Examiner Note:** | **The following steps represent the correct Alternate Path for this JPM.** |

CAUTION: Injecting through a CCP SI ISOL VLV (8801A/B) requires CCP SI injection check valve leak test within 24 hours per SR 3.4.14.1 (requires MODE 3, 4, or 5).

| | |
|---|---|
| **Perform Step: 23**<br>1 | IF Safety Injection actuated (1/u-LCV-112D OR 1/u-LCV-112E OPEN), THEN perform the following steps: |
| **Standard:** | DETERMINED Safety Injection NOT actuated and N/A'd Step 1. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 24**<br>2 | IF Safety Injection NOT actuated (1/u-LCV-112D AND 1/u-LCV-112E CLOSED), THEN perform the following steps: |
| **Standard:** | DETERMINED Safety Injection NOT actuated and CONTINUED. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| NOTE: To ensure that the capability to achieve Mode 3 in 6 hours is met, AND pressurizer level is controlled, letdown flow of 120 GPM is required. Reference EV-TR-2019-002034-3. | | |
| **Perform Step: 25**<br>2.a | ENSURE letdown is in service at 120 GPM per SOP-103A/B | |
| **Standard:** | VERIFIED letdown in service with a 75 GPM and 45 GPM ORIFICE valve OPEN. | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| **Examiner Note:** | **Either 1/1-LCV-112D OR 1/1-LCV-112E may be opened to satisfy the Critical Step.** | |
| NOTE: To ensure that the capability to achieve Mode 3 in 6 hours is met, AND pressurizer level is controlled, letdown flow of 120 GPM is required. Reference EV-TR-2019-002034-3. | | |
| **Perform Step: 26√**<br>2.b & bullets | OPEN ONE of the following:<br>• 1/u-LCV-112D, RWST TO CHRG PMP SUCT VLV.<br>OR<br>• 1/u-LCV-112E, RWST TO CHRG PMP SUCT VLV. | |
| **Standard:** | PERFORMED ONE of the following:<br>• PLACED 1/1-LCV-112D, RWST TO CHRG PMP SUCT VLV in OPEN (**Critical**).<br>• OBSERVED red OPEN light LIT (**NOT critical**).<br>**OR**<br>• PLACED 1/1-LCV-112E, RWST TO CHRG PMP SUCT VLV in OPEN (**Critical**).<br>• OBSERVED red OPEN light LIT (**NOT critical**). | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **<u>Both</u> 1/1-LCV-112B <u>AND</u> 1/1-LCV-112C <u>must</u> be closed to satisfy the Critical Step.** |
| **Perform Step: 27√**<br>2.c & bullets | CLOSE <u>BOTH</u> of the following:<br>• 1/<u>u</u>-LCV-112B, VCT TO CHRG PMP SUCT VLV.<br><u>AND</u><br>• 1/<u>u</u>-LCV-112C, VCT TO CHRG PMP SUCT VLV |
| **Standard:** | PERFORMED <u>BOTH</u> of the following:<br>• PLACED 1/1-LCV-112B, VCT TO CHRG PMP SUCT VLV in CLOSE (**Critical**).<br>• OBSERVED green CLOSE light LIT (**NOT critical**).<br>**<u>AND</u>**<br>• PLACED 1/1-LCV-112C, VCT TO CHRG PMP SUCT VLV in CLOSE (**Critical**).<br>• OBSERVED green CLOSE light LIT (**NOT critical**). |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **<u>Either</u> 1/1/1-8110 <u>OR</u> 1/1-8111 may be closed to satisfy the Critical Step.** |
| **Perform Step: 28√**<br>2.d & bullets | CLOSE <u>ONE</u> of the following:<br>• 1/<u>u</u>-8110, CCP 1 & 2 MINIFLOW VLV.<br><u>OR</u><br>• 1/<u>u</u>-8111, CCP 1 & 2 MINIFLOW VLV. |
| **Standard:** | PERFORMED <u>ONE</u> of the following:<br>• PLACED 1/1-8110, CCP 1 & 2 MINIFLOW VLV in CLOSE (**Critical**).<br>• OBSERVED green CLOSE light LIT (**NOT critical**).<br>**<u>OR</u>**<br>• PLACED 1/1-8111, CCP 1 & 2 MINIFLOW VLV in CLOSE (**Critical**).<br>• OBSERVED green CLOSE light LIT (**NOT critical**). |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **If 1-LCV-112B (112C) is NOT closed then Vent Valve 8220 (8221) will also not close and 1-ZL-8220 (8221) will indicate OPEN.** |
| **Perform Step: 29**<br>2.e & bullets | Verify CLOSED BOTH of the following:<br>• u-ZL-8220, CHRG PMP SUCT HI POINT VENT VLV.<br>AND<br>• u-ZL-8221, CHRG PMP SUCT HI POINT VENT VLV. |
| **Standard:** | VERIFIED BOTH of the following:<br>• OBSERVED 1-ZL-8220, CHRG PMP SUCT HI POINT VENT VLV green CLOSE light LIT.<br>AND<br>• OBSERVED 1-ZL-8221, CHRG PMP SUCT HI POINT VENT VLV green CLOSE light LIT. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 30**<br>2.f & bullets | CLOSE BOTH of the following:<br>• 1/u-8202A, VENT VLV.<br>AND<br>• 1/u-8202B, VENT VLV. |
| **Standard:** | VERIFIED BOTH of the following:<br>• OBSERVED 1/1-8202A, VENT VLV green CLOSE light LIT.<br>AND<br>• OBSERVED 1/1-8202B, VENT VLV green CLOSE light LIT |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 31**<br>2.g | Start a centrifugal charging pump per SOP-103A/B, if one is not in service. |
| **Standard:** | DETERMINED Centrifugal Charging Pump 1-01 is running. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 32**<br>2.h | Stop the Positive Displacement Charging Pump per SOP-103A/B.<br>• 1/u-APPD, PDP |
| **Standard:** | DETERMINED the Positive Displacement Charging Pump not in service. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 33**<br>2.i | Manually control u-FK-121, CCP CHRG FLO CTRL to maintain desired flow rate. |
| **Standard:** | PLACED 1-FK-121, CCP CHRG FLO CTRL in manual and set to desired flow rate. |
| **Terminating Cue:** | **This JPM is complete.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Current RCS boron concentration is 771 ppm**
- **1/1-APBA2, BA XFER PMP 2, is out of service for maintenance**
- **A Reactor trip has just occurred and two (2) Control Rods K10 and K14 have failed to fully insert**
- **Immediate actions of EOP-0.0A, Reactor Trip or Safety Injection, have been verified**

**Initiating Cue:** **The US directs you to PERFORM the following:**

- **Emergency Borate in accordance with ABN-107, Emergency Boration, for two Control Rods not fully inserted**

Facility: CPNPP JPM # NRC S-3 Task #RO3505 K/A #W E05 EA1.1 4.1 / 4.0 SF-4P

Title: Align Station Service Water to Feed Steam Generator from AFW

Examinee (Print): ______________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | | | |
| Actual Performance: | X | Simulator: | X | | |
| Alternate Path: | X | Plant: | | | |
| Time Critical: | | Low Pwr: | X | RCA: | |
| Bank / Mod / New: | N | Emerg: | | EN: | X |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- A tornado has struck CPNPP and caused visible damage to multiple safety related components
- A Loss of Offsite Power has occurred
- Train B DG failed to re-energize Safeguards Bus 1EA2
- Security reported debris has damaged the Unit 1 CST and is actively leaking
- CST has lowered to approximately 4% level
- All AFW Pump handswitches have been placed in Pull-Out due to the loss of suction source from the CST
- The crew is performing actions of EOS-0.1A, Reactor Trip Response
- ABN-305, Auxiliary Feedwater System Malfunction has been entered per EOS-0.1A Foldout Page
- The Unit Supervisor has determined AFW must be switched to SSW supplying in accordance with ABN-305
- The Shift Manager has concurred and given permission to add SSW to SG 1-01 per ABN-305

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Initiate SSW flow to SG 1-01 per ABN-305 Step 5.3.9 using an available Auxiliary Feedwater Pump

Task Standard: Utilizing ABN-305, CLOSED AFW Isolation Valves to SGs 1-02, 1-03, and 1-04. OPENED the Train A SSW to AFW Isolation Valve. ATTEMPTED to OPEN either the MDAFWP 1-01 or TDAFWP to SSW Suction Valve and DETERMINED the valve would NOT OPEN. OPENED the alternate AFW pump to SSW Suction Valve and STARTED the associated AFW Pump and FED SG 1-01 with SSW.

Required Materials: ABN-305, Auxiliary Feedwater System Malfunction (Rev. 8 - 2)

Validation Time: 15 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ________________________________ Date: ____________

## SIMULATOR SETUP

**SIMULATOR OPERATOR:**

**INITIALIZE to IC-58 and LOAD CPNPP 2021 NRC JPM S-3 scenario file**

**or**

**INITIALIZE to IC-18 and PERFORM the following:**

- **Disable Train B DG from starting or tying on to Bus on LOOP**
- **Initiate a loss of all Offsite power**
- **Initiate a CST leak at 20,000 gpm (or remove mass from CST to 4% LEVEL)**
- **Perform FOP actions of EOP-0.0A**
- **When CST level is at approximately 4% FREEZE and SNAP**

**SIMULATOR OPERATOR:**

**PERFORM the following for each JPM:**

- **Ensure keys available to operate key-operated valves**
- **Place the FOP screen on CB06 PCS**
- **INITIATE Key 1 if directed to energize the TDAFWP SSW Suction Valve Breaker**
- **INITIATE Key 2 if directed to energize MDAFWP 1-01 SSW Suction Valve Breaker**
- **INITIATE Key 3 if directed to locally close AFWIVs 2492B, 2493B, and 2494B (SGs 1-02, 1-03, and 1-04 TDAFWP Isolation Valves)**

**EXAMINER:**

**PROVIDE the examinee with a marked up copy of:**

- **ABN-305, Auxiliary Feedwater System Malfunction, Section 5.0, Inadequate CST Level (pages 1, 2, and 62-74) (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following steps are from ABN-305, Auxiliary Feedwater System Malfunction, Section 5.0, Inadequate CST Level, starting at Step 5.3.9.** |

> CAUTION: SSW should only be supplied to the AFW system under emergency conditions. If possible, only one steam generator should be used as a heat sink when using SSW to feed AFW system.

| | |
|---|---|
| **Perform Step: 1**<br>Step 9 & a. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• OBTAIN Shift Manager's permission to add Service Water to SG |
| **Standard:** | DETERMINED from Initiating Cue that Shift Manager has directed SSW to be aligned to feed SG 1-01 |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 2√**<br>Step 9 & b. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• CLOSE Auxiliary Feedwater Isolation Valves to Steam Generators NOT being used as Heat Sink |
| **Standard:** | PLACED the following handswitches in CLOSED:<br>• 1-HS-2492, AFWIV 2 **(Critical)**<br>    • OBSERVED 1-ZL-2492A Red light extinguished and Green light LIT **(Not Critical)**<br>    • OBSERVED 1-ZL-2492B Both Red and Green lights DARK (no power on Train B) **(Not Critical)**<br>• 1-HS-2493, AFWIV 3 **(Critical)**<br>    • OBSERVED 1-ZL-2493A Red light extinguished and Green light LIT **(Not Critical)**<br>    • OBSERVED 1-ZL-2493B Both Red and Green lights DARK (no power on Train B) **(Not Critical)**<br>• 1-HS-2494, AFWIV 4 **(Critical)**<br>    • OBSERVED 1-ZL-2494A Red light extinguished and Green light LIT **(Not Critical)**<br>    • OBSERVED 1-ZL-2494B Both Red and Green lights DARK (no power on Train B) **(Not Critical)** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Note:** | **The following step may become critical if examinee subsequently initiates SSW flow to the incorrect SG(s) due to the omission of this step.** |
| **Simulator Operator:** | **When/If contacted to locally close 1-HV-2492B, 1-HV-2493B, and 1-HV-2494B INSERT Key 3.** |
| **Examiner Cue:** | **When contacted to locally CLOSE 1-HV-2492B, 1-HV-2493B, and 1-HV-2494B, coordinate with Simulator Operator to INSERT correct Key and INFORM examinee when complete.** |
| **Perform Step: 3**<br>Step 9 & RNO b. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• Locally CLOSE Auxiliary Feedwater Isolation Valves NOT being used |
| **Standard:** | CONTACTED the Unit 1 Safeguards Building NEO or the FSS and DISPATCHED to locally CLOSE 1-HV-2492B, 1-HV-2493B, and 1-HV-2494B |
| **Comment:** | **SAT  UNSAT ** |

| | |
|---|---|
| **Perform Step: 4**<br>Step 9 & c. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• PLACE ALL Auxiliary Feedwater Pump control switches in - PULLOUT |
| **Standard:** | VERIFIED the following handswitches in PULLOUT:<br>• 1-HS-2450A, MDAFWP 1<br>• 1-HS-2451A, MDAFWP 2<br>• 1-HS-2452-2, AFWPT STM SPLY VLV MSL 1<br>• 1-HS-2452-1, AFWPT STM SPLY VLV MSL 4 |
| **Comment:** | **SAT  UNSAT ** |

| | |
|---|---|
| **Examiner Cue:** | **When contacted as the Shift Manager to obtain key for following valve, provide examinee with key.** |
| NOTE: SSW to AFW isolation valves in Steps d and f are two position key locked switches. Keys must be obtained from the Shift Manager. | |
| **Perform Step: 5√**<br>Step 9 & d. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• OPEN Service Water to Auxiliary Feedwater isolation valve, from operating SSW train<br>  • 1-HS-4395, SSW TO AFWP SUCT VLV (TRN A) |
| **Standard:** | INSERTED KEY and PLACED Key Switch in the open position **(Critical)**<br>• OBSERVED Green light extinguished and Red light LIT **(Not Critical)** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Cue:** | **When contacted as Unit 1 Safeguards Building NEO, report a solid stream of water is present from 1AF-0120.** |
| **Perform Step: 6**<br>Step 9 & e. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• VERIFY piping full by observation of a solid stream of water from 1AF-0120 |
| **Standard:** | CONTACTED Unit 1 Safeguards Building NEO to OBSERVE if a solid water stream is issuing from 1AF-0120 |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Note:** | **Based on the Initial Cue the examinee will chose either MDAFWP 1-01 or the TDAFWP to supply SSW to SG 1-01. The pump chosen first will NOT work as the SSW Suction Valve will NOT open on that pump, requiring the examinee to move to the alternate pump.** |
| **Simulator Operator:** | **When contacted to CLOSE breaker for the selected AFW Pump SSW Suction valve PERFORM the following:**<br>• **If MDAFWP 1-01 is the selected pump INSERT Key 2 (FWR093) to CLOSE breaker for 1-HV-2480**<br>• **If TDAFWP is the selected pump INSERT Key 1 (FWR095) to CLOSE breaker for 1-HV-2482** |
| **Examiner Cue:** | **When contacted to close the Motor Breaker for the SSW Suction Valve on the selected pump, coordinate with Simulator Operator to INSERT correct Key and INFORM examinee when complete.** |
| **Perform Step: 7**<br>Step 9, f., & 1st or 3rd bullet | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• UNLOCK AND CLOSE 1EB1-1/10E/BKR, MD AFW PUMP 1-01 SSW SUCTION ISOLATION VALVE 1-HV-2480 (2480) MOTOR BREAKER<br>**OR**<br>• UNLOCK AND CLOSE 1EB1-1/10H/BKR, TD AFW PUMP 1-01 SSW SUCTION ISOLATION VALVE 1-HV-2482 (2482) MOTOR BREAKER |
| **Standard:** | CONTACTED Safeguards Building NEO to UNLOCK and CLOSE the Breaker for the selected pump noted below:<br>• 1EB1-1/10E/BKR, MD AFW PUMP 1-01 SSW SUCTION ISOLATION VALVE 1-HV-2480 (2480) MOTOR BREAKER<br>**OR**<br>• 1EB1-1/10H/BKR, TD AFW PUMP 1-01 SSW SUCTION ISOLATION VALVE 1-HV-2482 (2482) MOTOR BREAKER |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The Alternate Path portion of this JPM begins here.** |
| **Perform Step: 8√**<br>Step 9, f., & 1st or 3rd bullet | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• OPEN 1-HS-2480, MD AFWP 1 SSW SUCT VLV<br>**OR**<br>• OPEN 1-HS-2482, TD AFWP SSW SUCT VLV |
| **Standard:** | INSERTED Key into selected AFW Pump SSW Suction Valve and ATTEMPTED to OPEN Valve:<br>• PLACED 1-HS-2480, MD AFWP 1 SSW SUCT VLV in OPEN **(Critical)**<br>  • OBSERVED Green light remaining LIT and Red light extinguished **(Not Critical)**<br>**OR**<br>• PLACED 1-HS-2482, TD AFWP SSW SUCT VLV in OPEN **(Critical)**<br>  • OBSERVED Green light remaining LIT and Red light extinguished **(Not Critical)**<br>DETERMINED selected AFW Pump SSW Suction valve FAILED to OPEN and PROCEEDED to ALIGN alternate pump. |
| **Examiner Cue:** | **If contacted to locally, manually open the selected valve, inform the examinee that the valve appears mechanically bound and will not open.** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Note:** | **The examinee should proceed to the alternate available AFW pump, either MDAFWP 1-01 or the TDAFWP to supply SSW to SG 1-01.** |
| **Simulator Operator:** | **When contacted to CLOSE breaker for the alternate available AFW Pump SSW Suction valve PERFORM the following:**<br>• **If MDAFWP 1-01 is the selected pump INSERT Key 2 (FWR093) to CLOSE breaker for 1-HV-2480**<br>• **If TDAFWP is the selected pump INSERT Key 1 (FWR095) to CLOSE breaker for 1-HV-2482** |
| **Examiner Cue:** | **When contacted to close the Motor Breaker for the SSW Suction Valve on the alternate available AFW pump, coordinate with Simulator Operator to INSERT correct Key and INFORM examinee when complete.** |
| **Perform Step: 9√**<br>Step 9, f., & 1st or 3rd bullet | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• UNLOCK AND CLOSE 1EB1-1/10E/BKR, MD AFW PUMP 1-01 SSW SUCTION ISOLATION VALVE 1-HV-2480 (2480) MOTOR BREAKER<br>**OR**<br>• UNLOCK AND CLOSE 1EB1-1/10H/BKR, TD AFW PUMP 1-01 SSW SUCTION ISOLATION VALVE 1-HV-2482 (2482) MOTOR BREAKER |
| **Standard:** | CONTACTED Safeguards Building NEO to UNLOCK and CLOSE the Breaker for the alternate available AFW pump noted below:<br>• 1EB1-1/10E/BKR, MD AFW PUMP 1-01 SSW SUCTION ISOLATION VALVE 1-HV-2480 (2480) MOTOR BREAKER<br>**OR**<br>• 1EB1-1/10H/BKR, TD AFW PUMP 1-01 SSW SUCTION ISOLATION VALVE 1-HV-2482 (2482) MOTOR BREAKER |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 10√**<br>Step 9, f., & 1st or 3rd bullet | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• OPEN 1-HS-2480, MD AFWP 1 SSW SUCT VLV<br>**OR**<br>• OPEN 1-HS-2482, TD AFWP SSW SUCT VLV |
| **Standard:** | INSERTED Key into alternate available AFW Pump SSW Suction Valve and OPENED Valve:<br>• PLACED 1-HS-2480, MD AFWP 1 SSW SUCT VLV in OPEN **(Critical)**<br>  • OBSERVED Green light extinguished and Red light LIT **(Not Critical)**<br>**OR**<br>• PLACED 1-HS-2482, TD AFWP SSW SUCT VLV in OPEN **(Critical)**<br>  • OBSERVED Green light extinguished and Red light LIT **(Not Critical)** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Cue:** | **When contacted as Unit 1 Safeguards Building NEO to ENSURE system is filled and to CLOSE 1AF-0120 and 1AF-0020, REPORT solid streams of water were issuing from both valves and they are now CLOSED.** |
| **Perform Step: 11**<br>Step 9 & g. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• DISPATCH a Nuclear Equipment Operator to CLOSE the following valves WHEN system is filled PRIOR to starting pump:<br>  • 1AF-0020, SSW TO U1 AFW PMP SUCT HDR DRN VLV<br>  • 1AF-0120, SSW TO U1 AFW PMPS HI PNT VNT VLV |
| **Standard:** | DIRECTED NEO to ENSURE solid stream of water issuing from 1AF-0020 and 1AF-0120 and THEN CLOSE the valves |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Cue:** | **When contacted as Unit 1 Safeguards Building NEO to RE-VENT the system through 1AF-0120, REPORT 1AF-0120 was cycled back OPEN and a solid stream of water issued from the valve. The valve is now CLOSED.** |
| **Perform Step: 12**<br>Step 9 & h. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• RE-VENT the system through 1AF-0120, ensuring a solid stream of water to preclude potential void formation from residual air in the piping prior to starting the pump |
| **Standard:** | DIRECTED NEO to cycle 1AF-0120 OPEN then back CLOSED when a solid stream of water observed. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 13**<br>Step 9 & i. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• NOTE time SSW supply to AFW is started |
| **Standard:** | NOTED time SSW supply to AFW started. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 14√**<br>Step 9 & j. | ALIGN Service Water to Auxiliary Feedwater as follows:<br>• START selected Auxiliary Feedwater Pump(s) |
| **Standard:** | STARTED the alternate available AFW Pump by performing the following:<br>• STARTED the TDAFWP by placing 1-HS-2452-1, AFWPT STM SPLY VLV MSL 4 and/or 1-HS-2452-2, AFWPT STM SPLY VLV MSL 1 in the Normal-After-Stop position (or any position other than Pull-Out to allow the TDAFWP to Auto Start)<br>    • OBSERVED Green light extinguished and Red light LIT **(Not Critical)**<br>**OR**<br>• STARTED MDAFWP 1-01 by placing 1-HS-2450A, MD AFWP 1 in START<br>    • OBSERVED Green light extinguished and Red light LIT **(Not Critical)** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Cue:** | **Per the Initiating Cue the examinee should OPEN the alternate available AFW pump flow control valve and feed SG 1-01** |
| **Perform Step: 15√** | Feed SG 1-01 with SSW by performing the following for the alternate available AFW pump:<br>• IF the alternate available AFW Pump currently running is MDAFWP 1-01, THEN the OPEN 1-FCV-2453A, MD AFWP 1 SG 1 FLO CTRL VLV and ESTABLISH AFW flow from SSW to SG 1-01 by DEPRESSING the increase OUTPUT pushbutton on 1-FK-2453A<br>**OR**<br>• IF the alternate available AFW Pump currently running is the TDAFWP, THEN the OPEN 1-FCV-2459A, TD AFWP SG 1 FLO CTRL VLV and ESTABLISH AFW flow from SSW to SG 1-01 by DEPRESSING the increase OUTPUT pushbutton on 1-FK-2459A |

| | |
|---|---|
| **Standard:** | Fed SG 1-01 with SSW by performing the following for the alternate available AFW pump:<br>• IF the alternate available AFW Pump running is MDAFWP 1-01, THEN the OPENED 1-FCV-2453A, MD AFWP 1 SG 1 FLO CTRL VLV and ESTABLISHED AFW flow from SSW to SG 1-01 by DEPRESSING the increase OUTPUT pushbutton on 1-FK-2453A **(Critical)**<br>  • OBSERVED the following:<br>    • Demand increased on 1-FK-2453A, MD AFWP 1 SG 1 FLO CTRL **(Not Critical)**<br>    • 1-ZL-2453A, MD AFWP 1 SG 1 FLO CTRL VLV Green and Red lights LIT **(Not Critical)**<br>    • Flow INDICATED on 1-FI-2463A, SG 1 AFW FLO and 1-FI-2463C, SG 1 AFW FLO **(Not Critical)**<br>**OR**<br>• IF the alternate available AFW Pump currently running is the TDAFWP, THEN the OPENED 1-FCV-2459A, TD AFWP SG 1 FLO CTRL VLV and ESTABLISHED AFW flow from SSW to SG 1-01 by DEPRESSING the increase OUTPUT pushbutton on 1-FK-2459A **(Critical)**<br>  • OBSERVED the following:<br>    • Demand increased on 1-FK-2459A, TD AFWP SG 1 FLO CTRL **(Not Critical)**<br>    • 1-ZL-2459A, TD AFWP SG 1 FLO CTRL VLV Green and Red lights LIT **(Not Critical)**<br>    • Flow INDICATED on 1-FI-2463A, SG 1 AFW FLO and 1-FI-2463C, SG 1 AFW FLO **(Not Critical)** |
| **Terminating Cue:** | **JPM Complete.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| **STOP TIME:** | |
|---|---|

**Initial Conditions:** **Given the following conditions:**

- **A tornado has struck CPNPP and caused visible damage to multiple safety related components**
- **A Loss of Offsite Power has occurred**
- **Train B DG failed to re-energize Safeguards Bus 1EA2**
- **Security reported debris has damaged the Unit 1 CST and is actively leaking**
- **CST has lowered to approximately 4% level**
- **All AFW Pump handswitches have been placed in Pull-Out due to the loss of suction source from the CST**
- **The crew is performing actions of EOS-0.1A, Reactor Trip Response**
- **ABN-305, Auxiliary Feedwater System Malfunction has been entered per EOS-0.1A Foldout Page**
- **The Unit Supervisor has determined AFW must be switched to SSW supplying in accordance with ABN-305**
- **The Shift Manager has concurred and given permission to add SSW to SG 1-01 per ABN-305**

**Initiating Cue:** **The Unit Supervisor directs you to PERFORM the following:**

- **Initiate SSW flow to SG 1-01 per ABN-305 Step 5.3.9 using an available Auxiliary Feedwater Pump**

Facility: CPNPP JPM # NRC S-4 Task # RO3005 K/A # EPE.E09.EA1.1 3.5 / 3.5 SF-4S

Title: Control RCS Temperature during Reactor Trip Response

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | ____ | Classroom: | ____ | | |
| Actual Performance: | X | Simulator: | X | | |
| Alternate Path: | X | Plant: | ____ | | |
| Time Critical: | ____ | Low Pwr: | X | RCA: | ____ |
| Bank / Mod / New: | N | Emerg: | ____ | EN: | ____ |

**CUE THE EXAMINEE**

Provide the Initial Conditions and Initiating Cue to the Examinee. Any special conditions or instructions should be contained on this sheet.

Initial Conditions: Given the following conditions:

- Unit 1 has experienced a Loss of all Thermal Barrier Cooling flow to RCPs
- RCP Trip criteria was met and all RCPs secured
- Safety Injection is not actuated or required
- EOP-0.0A, Reactor Trip or Safety Injection was completed through step 4 and transition has just been made to EOS-0.1A, Reactor Trip Response.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Perform the steps of EOS-0.1A, beginning at Step 1 – Check RCS Temperature

Task Standard: DETERMINED no RCPs were running and PLACED Steam Dumps in Steam Pressure Mode of operation. DETERMINED RCS Temperature is NOT at or trending to 557°F. ATTEMPTED to control RCS temperature utilizing the Steam Dumps in Steam Pressure Mode and was unable to actuate the Steam Dumps in either the Manual or Automatic Mode of operation. DETERMINED Steam Generator ARVs were NOT opening in the Automatic Mode of operation and placed all Steam Generator ARVs in Manual and OPENED the ARVs to lower RCS temperature.

Required Materials: EOS-0.1A, Reactor Trip Response (Rev. 9 - 1)

Validation Time: 7 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

## SIMULATOR SETUP

**SIMULATOR OPERATOR:**

**INITIALIZE to IC-39, silence alarms and place Simulator in FREEZE. When examinee is ready to begin place Simulator in RUN.**

**OR**

**INITIALIZE to IC-18 and PERFORM the following:**

- **EXECUTE the following malfunctions:**
  - **Insert CC05A-D to 50 gpm until CCW Thermal Barrier Cooling Isolates to RCPs**
  - **Delete CC05A-D after RCP trip criteria met**
  - **Override each RCP Thermal Barrier CCW Return Valve handswitch to CLOSE**
  - **Override the Thermal Barrier Cooler CCW Return Isolation Valve handswitch to CLOSE (4709)**
  - **Isolate all Steam Dumps (MSR21 – MSR32)**
  - **Override all Steam Dump ZLs to Green Light ON and Red Light OFF**
  - **Insert Malfunctions to prevent all MSSVs from lifting (MS10XX to 0% - 20 Remote Functions)**
  - **Override each ARV potentiometer to 10.0**
- **Trip the Reactor, TRIP all RCPs, and place Spray valve controllers in manual**
- **Adjust Reactor Coolant Pump seal injection flow to 6-13 gpm.**
- **Adjust Auxiliary Feedwater Flow to 175 gpm per Steam Generator**
- **Pull out the TDAFWP Steam Supplies.**
- **Allow RCS temperature to rise to approximately 562°F**
- **Silence all alarms and SNAP IC when RCS temperature is sufficiently high**

**EXAMINER:**

- **PROVIDE the examinee with a copy of EOS-0.1A, Reactor Trip Response (pages 1-18) (orange paper)**

**SIMULATOR OPERATOR:**

- **Following each JPM ensure the Steam Dump Job Aid is cleaned and stowed**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following steps are from EOS-0.1A, Reactor Trip Response.** |
| CAUTION: If SI actuation occurs during this procedure, EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION shall be performed. | |
| **Perform Step: 1**<br>Step 1 and 1.a | Check RCS Temperature –<br>• Check RCPs – ANY RUNNING |
| **Standard:** | DETERMINED all RCPs were secured |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Cue:** | **If asked inform examinee to utilize the Transferring Steam Dumps Job Aid to place Steam Dumps in Steam Pressure Mode.** |
| **Perform Step: 2**<br>Step 1 and 1.a RNO | Check RCS Temperature –<br>• Transfer steam dump to steam pressure mode |
| **Standard:** | REFERRED to the Steam Dump Job Aid to place Steam Dumps in Steam Pressure Mode. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following steps are from the Transferring Steam Dumps Job Aid located at CB-08.** |
| **Perform Step: 3**<br>Step 1 | ENSURE 1-PK-507, STM DMP PRESS CTRL is in MANUAL |
| **Standard:** | DETERMINED 1-PK-507 is in MANUAL by observing the orange manual light LIT on the controller |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **Examinee may recognize Steam Dumps should currently be OPEN controlling temperature and choose NOT to place Steam Dumps in Auto to prevent Dumps from rapidly opening causing a potential depressurization event.** |
| **Perform Step: 4**<br>Step 2 and 1st bullet | PERFORM one of the following:<br>• MATCH 1-PK-507, STM DUMP PRESS CTRL to 1-UI-500, STM DMP DEMAND if NO control input channel is failed |
| **Standard:** | DETERMINED No control input channels were failed, DEPRESSED the red “Raise Output Demand” pushbutton on 1-PK-507 to match controller demand with the demand indicated on 1-UI-500. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 5**<br>Step 2 and 2nd bullet | PERFORM one of the following:<br>• MATCH 1-PK-507, STM DUMP PRESS CTRL demand to current steam dump valve position |
| **Standard:** | DETERMINED Step is N/A as there are no control input channels failed |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 6**<br>Step 3 | VERIFY 1-PCIP, 1.4, CNDSR AVAIL STM DMP ARMED C-9 is ON |
| **Standard:** | DETERMINED PCIP Widow 1.4 is ON |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| NOTE: STM DMP VLV lights provide indication of proper system response during subsequent steps. | |
| **Perform Step: 7 √**<br>Step 4 | PLACE 43/1-SD, STM DMP MODE SELECT in STM PRESS |
| **Standard:** | PLACED 43/1-SD in the STM PRESS position |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **When the current step is completed the steam dumps will be in the Manual Mode of operation and the Steam Dump valves will have demand to be OPEN. The examinee should recognize the valves are NOT open and may attempt to control the valves in AUTO via subsequent steps.** |
| **Examiner Cue:** | **If asked for Steam Dump Mode of Operation ask the examinee, what they recommend. Whatever the examinee recommends concur.** |
| **Perform Step: 8**<br>Step 5 | ENSURE BOTH STM DMP INTLK SELECT switches are ON |
| **Standard:** | VERIFIED BOTH 43/1-SDA and 43/1-SDB are in the ON position |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Note:** | **Neither Automatic nor Manual mode will be successful. The examinee should have already recognized Manual mode of operation was unsuccessful and may now attempt Automatic mode of operation or may determine the ARVs must be manually opened to control RCS temperature.** |
| **Examiner Cue:** | **If asked for Steam Dump Mode of Operation ask the examinee, what they recommend. Whatever the examinee recommends concur.** |
| **Perform Step: 9**<br>Step 6 and 6.A | IF DESIRED to control Steam Dumps in auto, THEN PERFORM the following:<br>• VERIFY 1-PI-507, MS HDR PRESS indicates current MSL pressure |
| **Standard:** | COMPARED 1-PI-507 to the Main Steam Line pressure channels and VERIFIED 1-PI-507 indicates current MSL pressure |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 10**<br>Step 6, 6.B and 1st bullet | IF DESIRED to control Steam Dumps in auto, THEN PERFORM the following:<br>• ENSURE 1-PK-507, STM DMP PRESS CTRL set to:<br>    • control at 1092 psig for “no load” conditions (Pot setting 6.86) |
| **Standard:** | DETERMINED no load conditions of 1092 psig are desired and verified 1-PK-507 set to 6.86 turns |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 11**<br>Step 6, 6.B and 2nd bullet | IF DESIRED to control Steam Dumps in auto, THEN PERFORM the following:<br>• ENSURE 1-PK-507, STM DMP PRESS CTRL set to:<br>  • control < 1092 psig for MSL pressure < "no load" (Set Pot as desired) |
| **Standard:** | DETERMINED no load conditions of 1092 psig are desired and step is N/A |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 12**<br>Step 6 and 6.C | IF DESIRED to control Steam Dumps in auto, THEN PERFORM the following:<br>• PLACE 1-PK-507, STM DMP PRESS CTRL in AUTO |
| **Standard:** | PLACED 1-PK-507 in AUTO by depressing the White AUTO pushbutton on 1-PK-507. DETERMINED Steam Dump valves did NOT OPEN and another method RCS temperature control is required. REFERRED back to EOS-0.1A for guidance. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Note:** | **The following steps are back in EOS-0.1A, Reactor Trip Response.** |
| **Perform Step: 13**<br>Step 1 and 1.b | Check RCS Temperature –<br>• RCS AVERAGE TEMPERATURE STABLE AT OR TRENDING TO 557°F |
| **Standard:** | DETERMINED RCS temperature is above 557°F and is NOT trending back to 557°F. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 14**<br>Step 1 and 1.b RNO | Check RCS Temperature –<br>• IF temperature greater than 557°F and increasing, THEN dump steam:<br>  • To condenser using steam dumps<br>  -OR-<br>  • To atmospheric using SG atmospherics |
| **Standard:** | DETERMINED RCS temperature is above 557°F and increasing. DETERMINED Steam Dumps ineffective at controlling RCS temperature. DETERMINED RCS temperature must be controlled utilizing the ARVs |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Note:** | **Steps 7 – 10 may be performed in any order but opening each ARV is Critical to ensure symmetrical cool down of the RCS.** |
| **Perform Step: 15 √**<br>Step 1 and 1.b RNO | Check RCS Temperature –<br>• IF temperature greater than 557°F and increasing, THEN dump steam:<br>  • To condenser using steam dumps<br>  -OR-<br>  • To atmospheric using SG atmospherics |
| **Standard:** | DETERMINED that RCS temperature is above 557°F and increasing. DEPRESSED amber manual pushbutton, then DEPRESSED red raise pushbutton on 1-PK-2325, SG 1 ATMOS RLF VLV CTRL until Red light LIT on 1-ZL-2325, SG 1 ATMOS RLF VLV |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 16 √**<br>Step 1 and 1.b RNO | Check RCS Temperature –<br>• IF temperature greater than 557°F and increasing, THEN dump steam:<br>  • To condenser using steam dumps<br>  -OR-<br>  • To atmospheric using SG atmospherics |
| **Standard:** | DETERMINED that RCS temperature is above 557°F and increasing. DEPRESSED amber manual pushbutton, then DEPRESSED red raise pushbutton on 1-PK-2326, SG 2 ATMOS RLF VLV CTRL until Red light LIT on 1-ZL-2326, SG 2 ATMOS RLF VLV |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 17 √**<br>Step 1 and 1.b RNO | Check RCS Temperature –<br>• IF temperature greater than 557°F and increasing, THEN dump steam:<br>  • To condenser using steam dumps<br>  -OR-<br>  • To atmospheric using SG atmospherics |
| **Standard:** | DETERMINED that RCS temperature is above 557°F and increasing. DEPRESSED amber manual pushbutton, then DEPRESSED red raise pushbutton on 1-PK-2327, SG 3 ATMOS RLF VLV CTRL until Red light LIT on 1-ZL-2327, SG 3 ATMOS RLF VLV |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 18 √**<br>Step 1 and 1.b RNO | Check RCS Temperature –<br>• IF temperature greater than 557°F and increasing, THEN dump steam:<br>  • To condenser using steam dumps<br>  -OR-<br>  • To atmospheric using SG atmospherics |
| **Standard:** | DETERMINED that RCS temperature is above 557°F and increasing. DEPRESSED amber manual pushbutton, then DEPRESSED red raise pushbutton on 1-PK-2328, SG 4 ATMOS RLF VLV CTRL until Red light LIT on 1-ZL-2328, SG 4 ATMOS RLF VLV |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |
| **Terminating Cue:** | **This JPM is complete.** |

| | |
|---|---|
| **STOP TIME:** | |

| | |
|---|---|
| **Initial Conditions:** | **Given the following conditions:** |

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 has experienced a Loss of all Thermal Barrier Cooling flow to RCPs**
- **RCP Trip criteria was met and all RCPs secured**
- **Safety Injection is not actuated or required**
- **EOP-0.0A, Reactor Trip or Safety Injection was completed through step 4 and transition has just been made to EOS-0.1A, Reactor Trip Response.**

**Initiating Cue:** **The Unit Supervisor directs you to PERFORM the following:**

- **Perform the steps of EOS-0.1A, beginning at Step 1 – Check RCS Temperature**

Facility: CPNPP JPM # NRC S-5 Task # RO4302 K/A # 064.A4.06 3.9 / 3.9 SF-6

Title: Loss of Both 6.9 KV Safeguard Buses

Examinee (Print): ______________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | | | |
| Actual Performance: | X | Simulator: | X | | |
| Alternate Path: | X | Plant: | | | |
| Time Critical: | | Low Pwr: | X | RCA: | |
| Bank / Mod / New: | M | Emerg: | | EN: | X |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1
- XST2 is Out of Service to place XST2A in service
- A subsequent loss of XST1 occurred
- ABN-601, Response to a 138/345 KV System Malfunction, is in progress

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- RESPOND to a loss of both 6900 Volt Safeguards Buses per ABN-601, Response to a 138/345 KV System Malfunction, Section 7.0, Loss of Both Safeguards Buses – MODE 1, 2, 3, or 4

Task Standard: Utilizing ABN-601, TRIPPED the Reactor, STOPPED all Reactor Coolant Pumps, and TURNED on a DG Breaker synchroscope (1EG1 or 1EG2) and attempted to PARALLEL the selected Emergency Diesel Generator (DG 1-01 or DG 1-02) to a Safeguard Bus (Safeguards Bus 1EA1 or 1EA2). DETERMINED the first selected DG Breaker failed to close and PROCEEDED to the alternate DG. TURNED on the DG Breaker synchroscope for the alternate DG (1EG1 or 1EG2) and PARALLELED the alternate Emergency Diesel Generator (DG 1-01 or DG 1-02) to the alternate Safeguard Bus (1EA1 or 1EA2).

Required Materials: ABN-601, Response to a 138/345 KV System Malfunction (Rev. 16 - 0)
ECA-0.0A, Loss of All AC Power (Rev. 9 - 4)

Validation Time: 10 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________ Date: __________

## SIMULATOR SETUP

**SIMULATOR OPERATOR:**

**INITIALIZE to IC-59 and PERFORM the following:**

- **PLACE Simulator in RUN then FREEZE until ready to begin**
- **PLACE GEM covers on the following equipment**
    - **CS-1EG1, DG 1 BKR 1EG1**
    - **CS-1DG1E, DG 1 EMER STOP/START**
    - **CS-1EG2, DG 2 BKR 1EG2**
    - **CS-1DG2E, DG 2 EMER STOP/START**
    - **1-HS-2452-1, AFWPT STM SPLY VLV MSL 4**
    - **1-HS-2452-2, AFWPT STM SPLY VLV MSL 1**
    - **1-HS-4250A, SSWP 1**
    - **1-HS-4251A, SSWP 2**
- **CS-1EA1-1, INCOMING BKR 1EA1-1 handswitch in PULLOUT and YELLOW tag**
- **CS-1EA2-1, INCOMING BKR 1EA2-1 handswitch in PULLOUT and YELLOW tag**
- **ENSURE MOAS 8012 is OPEN with a YELLOW tag**

**OR**

**PERFORM the following:**

- **Create SCN file(s) to prevent first selected DG Breaker from closing and allow alternate DG Breaker to close**
- **INITIALIZE to IC-18 at 100% power**
- **Take XST2 OOS and place XST1 in service for both Units**
- **PLACE GEM covers on the following equipment**
    - **CS-1EG1, DG 1 BKR 1EG1**
    - **CS-1DG1E, DG 1 EMER STOP/START**
    - **CS-1EG2, DG 2 BKR 1EG2**
    - **CS-1DG2E, DG 2 EMER STOP/START**
    - **1-HS-2452-1, AFWPT STM SPLY VLV MSL 4**
    - **1-HS-2452-2, AFWPT STM SPLY VLV MSL 1**
    - **1-HS-4250A, SSWP 1**
    - **1-HS-4251A, SSWP 2**
- **EXECUTE malfunction EG16A, Disable DG-1 Breaker 1EG1 Auto Closure**
- **EXECUTE malfunction EG16B, Disable DG-2 Breaker 1EG2 Auto Closure**
- **EXECUTE malfunction ED02, Loss of 345 KV Transformer XST1 and YELLOW tag**
- **CS-1EA1-1, INCOMING BKR 1EA1-1 handswitch in PULLOUT and YELLOW tag**
- **CS-1EA2-1, INCOMING BKR 1EA2-1 handswitch in PULLOUT and YELLOW tag**
- **ENSURE MOAS 8012 is OPEN with a YELLOW tag**
- **PLACE Simulator in RUN then FREEZE until ready**

**<u>SIMULATOR OPERATOR NOTE</u>:**

- **After each JPM, VERIFY Synchroscope Switch is in any position other than for the 1EG1 or 1EG2 Breaker.**

**<u>EXAMINER</u>:**

**PROVIDE the examinee with a copy of:**

- **ABN-601, Response to a 138/345 KV System Malfunction, Section 7.0, Loss of Both Safeguard Buses – MODE 1, 2, 3, or 4 (pages 1-2, 82-100) (orange paper)**
- **ECA-0.0A, Loss of All AC Power (pages 1 and 6-8) (blue paper)**

**<u>EXAMINER NOTE</u>:**

**During JPM verification it was determined that the plant would continue to operate with both 1E Safeguards Buses deenergized in excess of 10 minutes.**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following steps are from ABN-601, Section 7.0.** |
| **Simulator Operator:** | **When applicant is ready to begin, PLACE Simulator in RUN.** |

CAUTION: Loads SHALL NOT be placed on offsite power without the TGM Transmission Grid Controller's concurrence.

NOTE: Security card readers are equipped with a one hour battery pack. ENTRY into areas after this time may require use of hard keys. Security key rings may be obtained from the Key Control Facility (KCF) at the PAP. In addition, loss of normal lighting and ventilation may require USE of portable lighting or heat stress equipment while performing local actions.

| | |
|---|---|
| **Perform Step: 1**<br>7.3.1 | Verify Reactor – TRIPPED. |
| **Standard:** | DETERMINED Reactor is NOT tripped. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 2√**<br>7.3.1 RNO | Manually trip the Reactor. |
| **Standard:** | PLACED 1/1-RTC, RX TRIP BKR Switch **or** 1/1-RT, RX TRIP Switch in TRIP position and VERIFIED the following:<br>• Reactor Trip Breakers - at least one OPEN.<br>• Neutron flux - DECREASING.<br>• All Control Rod position rod bottom lights - ON. |
| **Examiner Cue:** | **Another operator will complete actions of EOP-0.0A.**<br>**Continue with actions in accordance with ABN-601, Section 7.0.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 3**<br>7.3.2 | Verify all RCPs – STOPPED. |
| **Standard:** | DETERMINED all Reactor Coolant Pumps are RUNNING. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| **Perform Step: 4√**<br>7.3.2 RNO | Manually stop all RCPs. |
|---|---|
| **Standard:** | PERFORMED the following:<br>• PLACED 1/1-PCPX1, RCP 1 in STOP (**critical**).<br>• OBSERVED green STOP light LIT (**NOT critical**).<br>• PLACED 1/1-PCPX2, RCP 2 in STOP (**critical**).<br>• OBSERVED green STOP light LIT (**NOT critical**).<br>• PLACED 1/1-PCPX3, RCP 3 in STOP (**critical**).<br>• OBSERVED green STOP light LIT (**NOT critical**).<br>• PLACED 1/1-PCPX4, RCP 4 in STOP (**critical**).<br>• OBSERVED green STOP light LIT (**NOT critical**). |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| **Perform Step: 5**<br>7.3.3 | Check all Unit 6.9 KV Non-Safeguard Buses - ALL REMAINED ENERGIZED WITH LOADS CONNECTED TO THE BUS |
|---|---|
| **Standard:** | PERFORMED the following and DETERMINED all Unit 6.9 KV Non-Safeguard Buses are ENERGIZED:<br>• TURNED VS-1A, 6.9 KV BUS VOLT/FREQ SELECT to 1A1, 1A2, 1A3, and 1A4 positions and OBSERVED V-1A, 6.9 KV NON-SFGD BUS VOLT and F-1A, 6.9 KV NON-SFGD BUS FREQ normal. |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

NOTE:

- Immediately following SHUTDOWN, there is a delay of approximately 2 minutes before the DG will accept a Normal start. This time delay is associated with the DG pneumatic logic board and may be over-ridden with an Emergency Start.
- PERFORMANCE of an Emergency Start will ALLOW the DG breaker to automatically CLOSE on a phase to ground bus fault (LOR 86-2/uEA1 or 86-2/uEA2). The DG breaker will NOT automatically CLOSE and can NOT be manually CLOSED on a phase to phase bus fault. (LOR 86-1/uEA1 or 86-1/uEA2)
- WHEN a fault exists on the 6.9 KV safeguard bus, THEN the SSW pump will NOT be running to supply cooling water to the DG. The time this condition exists SHOULD be minimized (approximately 15 minutes) to prevent damage to the DG.

| | |
|---|---|
| **Examiner Note:** | **When requested by the examinee provide applicable steps of ECA-0.0A.** |
| **Perform Step: 6**<br>7.3.4 | Restore power to any 6.9 KV Safeguard bus per ECA-0.0A/B |
| **Standard:** | REFERRED to ECA-0.0A to restore power to a Safeguards Bus. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following steps are from ECA-0.0A, Loss of ALL AC Power. The examinee may initially select to energize either Safeguards Bus in the steps below. The first selected DG Breaker will fail to close requiring the examinee to proceed to the alternate DG.**<br><br>**The following steps represent the Alternate Path of this JPM.** |
| **Perform Step: 7**<br>5, 5.a, and 5.a.1) | Restore power to any AC Safeguards bus:<br>• Energize the selected AC safeguards bus with diesel generator:<br>    • Verify selected diesel generator - RUNNING |
| **Standard:** | OBSERVED Train A (B) Emergency Diesel Generator parameters:<br>• V-1EG1(1EG2), DG 1(2) VOLT at 6900 Volts.<br>• F-1EG1(1EG2), DG 1(2) FREQ at 60 Hertz.<br>• CS-1DG1N(1DG2N), DG 1(2) NORM STOP/START red light LIT. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 8**<br>5, 5.a, and 5.a.2) | Restore power to any AC Safeguards bus:<br>• Energize the selected AC safeguards bus with diesel generator:<br>  • Check selected diesel generator AC safeguards bus supply breaker closed<br>    • CS-1EG1, DG 1 BKR 1EG1<br>    • CS-1EG2, DG 2 BKR 1EG2 |
| **Standard:** | DETERMINED CS-1EG1(1EG2), DG 1(2) BKR 1EG1(1EG2) is OPEN. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 9 √**<br>5.a.2) RNO 2) and RNO 2)A) | Close selected diesel generator AC safeguards bus supply breaker as follows:<br>• Manually close the diesel generator AC safeguards bus supply breaker |
| **Standard:** | PERFORMED the following:<br>• INSERTED Sync Switch into SS-1EG1(1EG2), BKR EG1(EG2) SYNCHROSCOPE and TURNED to ON position.<br>• PLACED CS-1EG1(1EG2), DG 1(2) BKR 1EG1(1EG2) in CLOSE.<br>• OBSERVED red CLOSE light EXTINGUISHED and green OPEN light LIT.<br>• DETERMINED selected diesel generator AC safeguards bus supply breaker failed to close. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 10 √**<br>5.a.2) RNO 2) and RNO 2)B) | Close selected diesel generator AC safeguards bus supply breaker as follows:<br>• IF the diesel generator supply breaker NOT closed, THEN Emergency Start the diesel generator |
| **Standard:** | PERFORMED the following:<br>• PLACED CS-1DG1E(1DG2E), DG 1(2) EMER STOP/START switch in START.<br>• OBSERVED red CLOSE light EXTINGUISHED and green OPEN light LIT on CS-1EG1(1EG2), DG 1(2) BKR 1EG1(1EG2).<br>• DETERMINED selected diesel generator AC safeguards bus supply breaker failed to close. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 11**<br>5.a.2) RNO 2) and RNO 2)C) | Close selected diesel generator AC safeguards bus supply breaker as follows:<br>• IF selected AC safeguards bus CAN NOT be energized, THEN place the DG EMER STOP/START handswitch in PULL-OUT |
| **Standard:** | PERFORMED the following:<br>• PLACED CS-1DG1E(1DG2E), DG 1(2) EMER STOP/START switch in PULL-OUT. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The steps below are to energize the alternate Safeguards Bus via the alternate DG Breaker.** |
| **Perform Step: 12**<br>5, 5.b, and 5.b.1) | Restore power to any AC Safeguards bus:<br>• Energize the remaining AC safeguards bus with diesel generator:<br>  • Verify remaining diesel generator - RUNNING |
| **Standard:** | OBSERVED Train A (B) Emergency Diesel Generator parameters:<br>• V-1EG1(1EG2), DG 1(2) VOLT at 6900 Volts.<br>• F-1EG1(1EG2), DG 1(2) FREQ at 60 Hertz.<br>• CS-1DG1N(1DG2N), DG 1(2) NORM STOP/START red light LIT. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 13**<br>5, 5.b, and 5.b.2) | Restore power to any AC Safeguards bus:<br>• Energize the remaining AC safeguards bus with diesel generator:<br>  • Check remaining diesel generator AC safeguards bus supply breaker closed<br>    • CS-1EG1, DG 1 BKR 1EG1<br>    • CS-1EG2, DG 2 BKR 1EG2 |
| **Standard:** | DETERMINED CS-1EG1(1EG2), DG 1(2) BKR 1EG1(1EG2) is OPEN. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 14√** 5.b.2) RNO 2) and RNO 2)A) | Close remaining diesel generator AC safeguards bus supply breaker as follows:<br>• Manually close the diesel generator AC safeguards bus supply breaker |
| **Standard:** | PERFORMED the following:<br>• INSERTED Sync Switch into SS-1EG1(1EG2), BKR EG1(EG2) SYNCHROSCOPE and TURNED to ON position (**critical**).<br>• PLACED CS-1EG1(1EG2), DG 1(2) BKR 1EG1(1EG2) in CLOSE (**critical**).<br>• OBSERVED red CLOSE light LIT (**NOT critical**). |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following step is back in ABN-601, Section 7.0** |
| **Perform Step: 15** 5 and 5.a | CHECK AC Safeguards Bus Status:<br>• VERIFY at least one 6.9 kV safeguard bus - ENERGIZED |
| **Standard:** | DETERMINED Train A(B) Safeguard Bus 1EA1(1EA2) is ENERGIZED. |
| **Terminating Cue:** | **This JPM is complete.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 is in MODE 1**
- **XST2 is Out of Service to place XST2A in service**
- **A subsequent loss of XST1 occurred**
- **ABN-601, Response to a 138/345 KV System Malfunction, is in progress**

**Initiating Cue:** **The Unit Supervisor directs you to PERFORM the following:**

- **RESPOND to a loss of both 6900 Volt Safeguards Buses per ABN-601, Response to a 138/345 KV System Malfunction, Section 7.0, Loss of Both Safeguards Buses – MODE 1, 2, 3, or 4**

Facility: CPNPP JPM # NRC S-6 Task # RO1818 K/A # 015.A2.02 3.1 / 3.5* SF-7

Title: Respond to a Source Range Channel Energizing at Power

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | | Classroom: | | | |
| Actual Performance: | X | Simulator: | X | | |
| Alternate Path: | | Plant: | | | |
| Time Critical: | | Low Pwr: | | RCA: | |
| Bank / Mod / New: | N | Emerg: | | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is operating at 100% power
- Source Channel N-31 has energized

Initiating Cue: Unit Supervisor directs you to PERFORM ABN-701, Source Range Instrument Malfunction, Section 4.0, Source Range High Voltage Energized at Power

Task Standard: Performed the following actions and de-energized SR Channel N31: Placed SR Channel N31 Level Trip Bypass Switch in the BYPASS position, placed SR Channel N31 High Flux at Shutdown Switch in the BLOCK position, and removed SR Channel N31 Instrument Power Fuses. Actions performed in accordance with ABN-701, Source Range Instrument Malfunction, Section 4.0, Source Range High Voltage Energized at Power.

Ref. Materials: ABN-701, Source Range Instrument Malfunction (Rev. 12 - 1)

Validation Time: 5 minutes Completion Time:

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

## SIMULATOR SETUP

**SIMULATOR OPERATOR:**
**INITIALIZE to IC-55 and PERFORM the following:**

- **Ensure SR Channel N-31 is failed high**
- **After each JPM ENSURE Cabinet N-31 Instrument fuses are properly re-installed**

**OR**

**PERFORM the following:**

- **INITIALIZE to IC-18**
- **INSERT Malfunction NI15A, Energize Source Range Cabinet N-31 at Power**
- **Allow plant to stabilize for 1 minute and SNAP**
- **Ensure SR Channel N-31 is failed high**
- **After each JPM ENSURE Cabinet N-31 Instrument fuses are properly re-installed**

**EXAMINER:**
**PROVIDE examinee:**

- **ABN-701, Source Range Instrument Malfunction (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following steps are from ABN-701, Section 4.0, Source Range High Voltage Energized at Power** |
| CAUTION: • Removing Source Range (SR) control power fuses will result in a Reactor Trip even with the LEVEL TRIP switch in BYPASS, unless above P-6 AND manually blocked OR unless above P-10. <br>• Removing SR instrument power fuses will result in a Reactor Trip unless LEVEL TRIP switch in BYPASS, OR above P-6 AND manually blocked, OR above P-10. <br>• Operation of the SR detectors during power operation can damage the detectors. | |
| **Perform Step: 1** <br>Step 4.3.1 | 1. VERIFY reactor NOT tripped. |
| **Standard:** | Applicant VERIFIED reactor NOT tripped by checking the following indications: <br>• Reactor Trip Breakers – BOTH indicate CLOSED <br>• Neutron Flux – Stable <br>• Control Rod positions – All Rod Bottom lights OFF and rod positions remain unchanged by DRPI indication <br>• Reactor Power – remains at or near 100% power |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 2√** <br>Step 4.3.2 | 2. PLACE affected SR LEVEL TRIP switch in – BYPASS |
| **Standard:** | At Source Range Cabinet N31, PLACED the Level Trip switch in the BYPASS position |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 3√** <br>Step 4.3.3 | 3. PLACE affected HIGH FLUX AT SHUTDOWN switch in – BLOCK |
| **Standard:** | At Source Range Cabinet N31, PLACED the High Flux at Shutdown switch in the BLOCK position |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 4√**<br>Step 4.3.4 | 4. REMOVE INSTRUMENT POWER fuses from failed detector drawer to de-energize high voltage |
| **Standard:** | At Source Range Cabinet N31, REMOVED 2 Instrument Power Fuses by applying slight inward pressure to fuse, turning counter-clockwise 45°, and pulling fuse out of cabinet |
| **Examiner Cue:** | **JPM Complete** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **STOP TIME:** | |

.

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 is operating at 100% power**
- **Source Channel N-31 has energized**

**Initiating Cue:** **Unit Supervisor directs you to PERFORM ABN-701, Source Range Instrument Malfunction, Section 4.0, Source Range High Voltage Energized at Power**

Facility: CPNPP JPM # NRC S-7 Task # RO3603 K/A # 008.A2.01 3.3 / 3.6 SF-8

Title: Rotate Component Cooling Water Pumps

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | ______ | Classroom: | ______ | | |
| Actual Performance: | X | Simulator: | X | | |
| Alternate Path: | X | Plant: | ______ | | |
| Time Critical: | ______ | Low Pwr: | ______ | RCA: | ______ |
| Bank / Mod / New: | B | Emerg: | ______ | EN: | ______ |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1
- Biweekly rotation of the CCW Pumps is required per OWI-409, Equipment Rotation Program
- An NEO is standing by for pump start

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- SHIFT from Train A to Train B CCW Pump per SOP-502A, Component Cooling Water System
- START at Step 5.2.1.1, Starting a Standby CCW Pump During Normal Operation, to place the Train B CCW Pump in service
- CONTINUE with Step 5.2.1.2, Placing a CCW Pump in Standby from Dual Pump Operation, to secure the Train A CCW Pump

Task Standard: Utilizing SOP-502A, ESTABLISHED additional flow through the Train B CCW system, STARTED the Train B CCW Pump, STOPPED the Train A CCW Pump by holding the handswitch in stop until system pressure stabilized. RESTARTED the Train A CCW Pump after the Train B CCW Pump tripped without tripping the Reactor.

Required Materials: SOP-502A, Component Cooling Water System (Rev. 20 - 0)
ABN-502, Component Cooling Water System Malfunctions (Rev. 11 - 0)

Validation Time: 12 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

## SIMULATOR SETUP

**SIMULATOR OPERATOR:**

**INITITIATE to IC-57**

- **SET UP Plant Computer screen to monitor CCW Pump temperatures**

**OR**

**PERFORM the following:**

- **RESET to any at power Initial Condition (IC-18)**
- **EXECUTE malfunction CC03B, CCW Train B Loop pressure switch failure**
- **INSERT malfunction CC02B on a conditional so that 10 seconds after CCW Pump 1-01 is stopped, malfunction is executed to trip CCW Pump 1-02**
- **SET UP Plant Computer screen to monitor CCW Pump temperatures**
- **INSERT malfunction RP13C, Manual Reactor Trip Failure at CB-07 and CB-10 to prevent examinee from tripping Reactor**

**EXAMINER:**

**PROVIDE the examinee with a copy of:**

- **SOP-502A, Component Cooling Water System, Step 5.2.1.1, Starting a Standby CCW Pump During Normal Operation and Step 5.2.1.2, Placing a CCW Pump in Standby from Dual Pump Operation (pages 1-5, 8-10 and 16-22) (orange paper)**

**When located or requested, PROVIDE the examinee with a copy of:**

- **ABN-502, Component Cooling Water System Malfunctions (all pages) (blue paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following steps are from SOP-502A, Step 5.2.1.1.** |
| NOTE: Starting a CCW Pump will automatically start the following equipment, if their control switches are in AUTO:<br>• Associated CCW Pump room fan cooler<br>• Associated SSW Pump<br>• Associated Safety Chilled Water Recirc Pump | |
| **Perform Step: 1**<br>5.2.1.1.A | Ensure the Station Service Water Pump, associated with the CCW Pump to be started is operating.<br>• SSWP 2 |
| **Standard:** | DETERMINED SSWP 2, Station Service Water Pump is running and OBSERVED red PUMP light LIT. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 2**<br>5.2.1.1.B | Ensure the oil level in the bearing housings are normal.<br>• CCWP 2 |
| **Standard:** | DISPATCHED NEO to verify oil levels for CCWP 2. |
| **Examiner Cue:** | **The NEO reports that bearing housing oil levels are normal.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

NOTE:
- Experience has shown that starting a second CCW Pump can result in lifting of CCW system relief valves if running CCW Pump discharge pressure is high (~ 140 psig). The following step may be required to limit CCW System pressure AND prevent relief valve operation when two CCW Pumps are running.
- Low flow alarms are provided for both CT & RHR Heat Exchanger flow. These alarms may OR may not occur as flow is started AND stopped, dependent on time spent at OR near the flow setpoint. This is a normal occurrence.
- CCWP RECIRC VLVs (1-HS-4536/1-HS-4537), open on low flow of approximately 8,200 gpm on CCW HX outlet flow with the CCW Pump breaker closed.

| | |
|---|---|
| **Examiner Note:** | **The examinee may choose to establish flow through all or none of the HXs listed below.** |
| **Perform Step: 3**<br>5.2.1.1.C | IF CCW heat load is low, THEN additional CCW flow should be established through the CS HX or RHR HX prior to starting the second pump.<br>TRAIN A<br>• 1-HS-4574, CS HX 1 CCW RET VLV<br>• 1-HS-4572, RHR HX 1 CCW RET VLV<br>TRAIN B<br>• 1-HS-4575, CS HX 2 CCW RET VLV<br>• 1-HS-4573, RHR HX 2 CCW RET VLV |
| **Standard:** | PERFORMED the following:<br>• PLACED 1-HS-4574, CS HX 1 CCW RET VLV in OPEN<br>• OBSERVED red OPEN light LIT<br>**and/or**<br>• PLACED 1-HS-4572, RHR HX 1 CCW RET VLV in OPEN<br>• OBSERVED red OPEN light LIT<br>**and/or**<br>• PLACED 1-HS-4575, CS HX 2 CCW RET VLV in OPEN<br>• OBSERVED red OPEN light LIT<br>**and/or**<br>• PLACED 1-HS-4573, RHR HX 2 CCW RET VLV in OPEN<br>• OBSERVED red OPEN light LIT |
| **Comment:** | **SAT ☐ UNSAT ☐** |

NOTE: The following indications are available on the Plant computer.

| | | ALARM |
|---|---|---|
| T2740A | CCWP 1 INBD RDL BRG TEMP | 185°F |
| T2741A | CCWP 1 OUTBD RDL BRG TEMP | 185°F |
| T2742A | CCWP 1 ACTIVE FACE THR BRG TEMP | 185°F |
| T2744A | CCWP 1 MOT INBD BRG TEMP | 185°F |
| T2745A | CCWP 1 MOT OUTBD BRG TEMP | 185°F |
| T2746A | CCWP 1 MOT STAT PHASE A TEMP | 236°F |
| T2747A | CCWP 1 MOT STAT PHASE B TEMP | 236°F |
| T2748A | CCWP 1 MOT STAT PHASE C TEMP | 236°F |
| T2760A | CCWP 2 INBD RDL BRG TEMP | 185°F |
| T2761A | CCWP 2 OUTBD RDL BRG TEMP | 185°F |
| T2762A | CCWP 2 ACTIVE FACE THR BRG TEMP | 185°F |
| T2764A | CCWP 2 MOT INBD BRG TEMP | 185°F |
| T2765A | CCWP 2 MOT OUTBD BRG TEMP | 185°F |
| T2766A | CCWP 2 MOT STAT PHASE A TEMP | 236°F |
| T2767A | CCWP 2 MOT STAT PHASE B TEMP | 236°F |
| T2768A | CCWP 2 MOT STAT PHASE C TEMP | 236°F |

| | |
|---|---|
| **Perform Step:4√** 5.2.1.1.D | Start the idle CCW Pump.<br>• 1-HS-4519A, CCWP 2 |
| **Standard:** | PERFORMED the following:<br>• PLACED 1-HS-4519A, CCWP 2 to START (**critical**).<br>• OBSERVED red FAN and PUMP lights LIT (**NOT critical**).<br>• OBSERVED 1-PI-4521, CCWP2 DISCH PRESS rising (**NOT critical**).<br>• OBSERVE 1-FI-4537A, CCW HX 2 OUT FLO rising (**NOT critical**). |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

> NOTE: Low flow alarms are provided for both CT & RHR Heat Exchanger flow. These alarms may OR may not occur as flow is started AND stopped, dependent on time spent at OR near the flow setpoint. This is a normal occurrence.

| | |
|---|---|
| **Examiner Note:** | **The following valves may be CLOSED later in the procedure.** |
| **Perform Step: 5a**<br>5.2.1.1.E for Train A | IF the CCW PUMPS are being alternated for their bi-weekly rotation per OWI-409 "EQUIPMENT ROTATION PROGRAM", THEN momentarily initiate flow through each RHR and CS heat exchanger while BOTH pumps are in service.<br>TRAIN A<br>• 1-HS-4574, CS HX 1 CCW RET VLV<br>• 1-HS-4572, RHR HX 1 CCW RET VLV |
| **Standard:** | PERFORMED the following:<br>• OPENED or VERIFED OPEN 1-HS-4574, CS HX 1 CCW RET VLV and OBSERVED 1-FI-4560, CS HX 1 CCW RET FLO rising.<br>• OPENED or VERIFIED OPEN 1-HS-4572, RHR HX 1 CCW RET VLV and OBSERVED 1-FI-4556, RHR HX 1 CCW RET FLO rising. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

> NOTE: Low flow alarms are provided for both CT & RHR Heat Exchanger flow. These alarms may OR may not occur as flow is started AND stopped, dependent on time spent at OR near the flow setpoint. This is a normal occurrence.

| | |
|---|---|
| **Examiner Note:** | **The following valves may be CLOSED later in the procedure.** |
| **Perform Step: 5b**<br>5.2.1.1.E for Train B | IF the CCW PUMPS are being alternated for their bi-weekly rotation per OWI-409 "EQUIPMENT ROTATION PROGRAM", THEN momentarily initiate flow through each RHR and CS heat exchanger while BOTH pumps are in service.<br>TRAIN B<br>• 1-HS-4575, CS HX 2 CCW RET VLV<br>• 1-HS-4573, RHR HX 2 CCW RET VLV |
| **Standard:** | PERFORMED the following:<br>• OPENED or VERIFIED OPEN 1-HS-4575, CS HX 2 CCW RET VLV and OBSERVED 1-FI-4562, CS HX 2 CCW RET FLO rising.<br>• OPENED or VERIFIED OPEN 1-HS-4573, RHR HX 2 CCW RET VLV and OBSERVED 1-FI-4558, RHR HX 2 CCW RET FLO rising. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following steps are from SOP-502A, Step 5.2.1.2.** |
| **Perform Step: 6** 5.2.1.2.A | IF the safeguards loops are not cross-connected, THEN ensure the following equipment for the pump to be stopped has been removed from service: |
| **Standard:** | DETERMINED the Safeguards Loops ARE cross-connected and N/A. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 7** 5.2.1.2.B | IF the safeguards loops are not cross-connected, AND the following equipment is NOT supplied by Unit 2 where applicable, THEN ENSURE the following equipment for the pump to be stopped has been removed from service: |
| **Standard:** | DETERMINED the Safeguards Loops ARE cross-connected and N/A. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

NOTE: Low flow alarms are provided for both CT & RHR Heat Exchanger flow. These alarms may OR may not occur as flow is started AND stopped, dependent on time spent at OR near the flow setpoint. This is a normal occurrence.

| | |
|---|---|
| **Perform Step: 8** 5.2.1.2.C.1) | IF additional flow was established for two pump operation AND is not required, THEN throttle the following valve(s) as necessary such that CCWP DISCHARGE PRESSURE is approximately 140 to 150 psig as indicated on 1-PI-4520 and 1-PI-4521. (MCB)<br>TRAIN A<br>• 1-HS-4574, CS HX 1 CCW RET VLV<br>• 1-HS-4572, RHR HX 1 CCW RET VLV<br>TRAIN B<br>• 1-HS-4575, CS HX 2 CCW RET VLV<br>• 1-HS-4573, RHR HX 2 CCW RET VLV |
| **Standard:** | PERFORMED the following:<br>• OBSERVED 1-PI-4520, CCWP1 DISCH PRESS approximately 140 to 150 PSIG.<br>• OBSERVED 1-PI-4521, CCWP2 DISCH PRESS approximately 140 to 150 PSIG. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| CAUTION: | Holding the CCW Pump handswitch in STOP, while CCW flow AND pressure stabilize, will minimize the likelihood of receiving an automatic restart. (ref. CR-2000-001848) |

| | | |
|---|---|---|
| **Perform Step: 9√** 5.2.1.2.C.2) | Stop the desired CCW Pump AND hold the handswitch in STOP.<br>• 1-HS-4518A, CCWP 1 | |
| **Standard:** | PERFORMED the following:<br>• PLACED and HELD 1-HS-4518A, CCWP 1 in STOP (**critical**).<br>• OBSERVED green PUMP and red FAN lights LIT (**NOT critical**). | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| **Perform Step: 10√** 5.2.1.2.C.3) | WHEN CCW flow and pressure stabilize, THEN release the CCW Pump handswitch. | |
| **Standard:** | RELEASED 1-HS-4518A, CCWP 1 handswitch when CCW flow and pressure stabilized. | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | | |
|---|---|---|
| **Perform Step: 11** 5.2.1.2.D | Ensure BOTH CCW Pump handswitches are in AUTO:<br>• 1-HS-4518A, CCWP 1<br>• 1-HS-4519A, CCWP 2 | |
| **Standard:** | VERIFIED 1-HS-4518A, CCWP 1 **and** 1-HS-4519A, CCWP 2 handswitches are in AUTO. | |
| **Comment:** | | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **ABN-502, CCW System Malfunctions, may be referred to for guidance upon CCW Pump trip. ODA-102, Conduct of Operations, allows for immediate pump start.** |
| **Examiner Note:** | **Examinee may attempt to trip Reactor per ABN-502, Section 6.0, Loss of all CCW Flow, however, they should refer to ABN-502, Section 2.0, CCW Pump Trip, and attempt to start CCWP 1-01.** |
| **Examiner Note:** | **The following steps are from ABN-502, Section 2.0.** |
| **Examiner Note:** | **The following steps represent the Alternate Path of this JPM.** |
| **Perform Step: 12** 2.3.1 | Verify unaffected train CCW pump – RUNNING |
| **Standard:** | DETERMINED Train A CCW Pump NOT Running. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 13√** 2.3.1 RNO | Manually start the CCW Pump in the unaffected train. IF the pump fails to start, THEN GO TO Section 6.0 of this procedure. |
| **Standard:** | PERFORMED the following:<br>• PLACED 1-HS-4518A, CCWP 1 to START (**critical**).<br>• OBSERVED red FAN and PUMP lights LIT (**NOT critical**). |
| **Terminating Cue:** | **This JPM is complete.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 is in MODE 1**
- **Biweekly rotation of the Component Cooling Water Pumps is required per OWI-409, Equipment Rotation Program**
- **A Nuclear Equipment Operator (NEO) is standing by for pump start**

**Initiating Cue:** **The Unit Supervisor directs you to PERFORM the following:**

- **SHIFT from Train A to Train B Component Cooling Water Pumps per SOP-502A, Component Cooling Water System**
- **START at Step 5.2.1.1, Starting a Standby CCW Pump During Normal Operation, to place the Train B CCW Pump in service**
- **CONTINUE with Step 5.2.1.2, Placing a CCW Pump in Standby from Dual Pump Operation, to secure the Train A CCW Pump**

Facility: CPNPP JPM # NRC S-8 Task #RO4001 K/A #071 A4.09 3.3 / 3.5 SF-9

Title: Establish Sample Flow to South Vent Stack WR Gas Monitor

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | ______ | Classroom: | ______ | | |
| Actual Performance: | X | Simulator: | X | | |
| Alternate Path: | ______ | Plant: | ______ | | |
| Time Critical: | ______ | Low Pwr: | ______ | RCA: | ______ |
| Bank / Mod / New: | N | Emerg: | ______ | EN: | ______ |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1
- Radiation Monitor 084, South Vent Stack Wide Range Gas XRE5570A has been out of service for maintenance
- Radiation Monitor 084 is ready to be returned to service

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- RESTART Radiation Monitor 084 pump to restore the Monitor to normal operation (Green Status) per SOP-706, Digital Radiation Monitoring System

Task Standard: SELECTED Radiation Monitor 084 on PC-11, utilizing Hot Keys PLACED Radiation Monitor 084, South Vent Stack Wide Range Gas XRE5570A pump in ON to restore to normal operation per SOP-706.

Required Materials: SOP-706, Digital Radiation Monitoring System (Rev. 9 - 0)

Validation Time: 5 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

## SIMULATOR SETUP

**SIMULATOR OPERATOR:**
**INITIALIZE to IC-18**

- **Turn off pump to Radiation Monitor 084, South Vent Stack Wide Range Gas XRE5570A**
- **ENSURE PC-11 Grid 1 is displayed on the PC-11 Monitor**

**OR**

**INITIALIZE to any at power Initial Condition and PERFORM the following:**

- **VERIFY Radiation Monitor 084, South Vent Stack Wide Range Gas XRE5570A pump is in OFF per SOP-706**
- **Ensure PC-11 GRID 1 is displayed on the PC-11 Monitor**

**EXAMINER:**
**PROVIDE the examinee with a copy of:**

- **SOP-706, Digital Radiation Monitoring System (pages 1-13) (orange paper)**

**√ - Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **Several critical steps involve accurate keyboard manipulations. Keyboard errors in of themselves should not be failure criteria if the examinee recognizes the error and appropriately corrects the input to the PC-11. Obtaining the desired result is considered critical in each step.** |
| **Examiner Note:** | **The following steps are from SOP-706, Section 5.1.**<br>**Specific steps are annotated in each Comment box.** |
| **Perform Step: 1√**<br>**5.1.A 1)** | Manual Selection of a Specific Monitor.<br>• Press <F7>. |
| **Standard:** | DEPRESSED F7 on the PC-11 Keyboard. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 2√**<br>**5.1.A 2)** | Manual Selection of a Specific Monitor.<br>• Enter and observe the 3 digit number on the keypad which is part of the selected monitor's 6 character DRMS NAME at the bottom of the screen in the command line (See Attachments 3, 4, and 5). |
| **Standard:** | DEPRESSED 084 on the PC-11 Keyboard. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

NOTE: The individual monitor item display screen appearing after the next step will display at the top center the three (3) numeric digits associated with the monitor's 6 character DRMS name, the noun name of the default detector and the default detector tag number. Listed immediately below this will be the individual detectors (channels) associated with the monitor, which varies depending upon the type of monitor and the number of detectors it has.

**EXAMPLE:** With reference to Attachment 3, 1-RE-5503 is the Unit 1 Containment Air PIG GAS detector. Its DRMS NAME is CAG-197. After pressing <F7>, entering '197' for the detector and pressing ENTER will display a monitor display screen with the following three (3) digit number and detector description at the top center of the new screen: **'197 CNTMT PIG 1RE5503'**.

The tag numbers and associated channel information for detector 1-RE-5503 and associated detectors 1-RE-5502 (CNTMT PIG PART) and 1-RE-5566 (CNTMT PIG IODINE) will appear immediately below the numeric number and description. If '198' (CNTMT PIG PART) or '199' (CNTMT PIG IODINE) were entered in lieu of '197', **'197 CNTMT PIG 1RE5503'**, the default detector, would still be displayed at the top center of the screen along with all three channels listed immediately below.

| | |
|---|---|
| **Perform Step: 3√ 5.1.A 3)** | Manual Selection of a Specific Monitor.<br>• Press ENTER to access the selected monitor item display screen |
| **Standard:** | DEPRESSED ENTER on the PC-11 Keyboard. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following steps are from SOP-706, Section 5.2. Specific steps are annotated in each Comment box.** |
| **Examiner Note:** | **Based on PC-11 response, examinee should be allowed to make more than one attempt to get Monitor Pop Up Window displayed.** |
| **Perform Step: 4 5.2.C 1)** | Starting/Stopping Monitor Pump/Purge Operation.<br>• With the selected monitor's screen displayed, press ENTER again. |
| **Standard:** | DEPRESSED ENTER on the PC-11 Keyboard. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 5√ 5.2.C 2)** | Starting/Stopping Monitor Pump/Purge Operation.<br>• When the monitor pop up window is displayed, select "ON" or "OFF" window as needed with Hot Keys (arrow keys). Press ENTER. |
| **Standard:** | Using the Hot Keys (arrow keys), HIGHLIGHTED Radiation Monitor 084 Pump "ON" selector box and DEPRESSED ENTER. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 6 5.2.C 3)** | Starting/Stopping Monitor Pump/Purge Operation.<br>• Verify status block displays correct color for operation selected. |
| **Standard:** | OBSERVED Radiation Monitor 084 status color changes from dark blue to green and DETERMINED Radiation Monitor 084 is returned to NORMAL OPERATIONS Status. |
| **Terminating Cue:** | **This JPM is complete.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 1 is in MODE 1**
- **Radiation Monitor 084, South Vent Stack Wide Range Gas XRE5570A has been out of service for maintenance**
- **Radiation Monitor 084 is ready to be returned to service**

**Initiating Cue:** **The Unit Supervisor directs you to PERFORM the following:**

- **RESTART Radiation Monitor 084 pump to restore the Monitor to normal operation (Green Status) per SOP-706, Digital Radiation Monitoring System**

Facility: CPNPP JPM # NRC P-1 (U2) Task #AO5422 K/A #013 A3.02 4.1 / 4.2 SF-2

Title: Restore SCW Surge Tank Level to Maintain Cooling to ESF Pump Rooms

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | X | Classroom: | | | |
| Actual Performance: | | Simulator: | | | |
| Alternate Path: | | Plant: | X | | |
| Time Critical: | | Low Pwr: | X | RCA: | X |
| Bank / Mod / New: | N | Emerg: | X | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 has lost makeup capability to the Safety Chilled Water Surge Tank
- The crew has entered ABN-503, Safety Chilled Water System Malfunction, Section 4.0, Loss of Surge Tank Makeup
- A RMUW Pump is in operation

Initiating Cue: The US directs you to PERFORM the following:

- Locally FAIL OPEN 2-HV-6720, SFTY CH WTR SRG TK 2-01 RMUW SPLY VLV per the following procedures:
  - ABN-503 Step 4.3.1.b RNO b
  - OWI-206, Guidelines for Operation of Manual and Power Operated Valves, Section 6.3.2 G

Task Standard: CLOSED 2-HV-6720-AS1, SFTY CH WTR SRG TK 2-01 RMUW SPLY VLV AS, OPENED the blowdown on the filter regulator to vent air pressure from the valve diaphragm and fail open 2-HV-6720, SFTY CH WTR SRG TK 2-01 RMUW SPLY VLV.

Ref. Materials: ABN-503, Safety Chilled Water System Malfunction (Rev. 2 - 0)
OWI-206, Guidelines for Operation of Manual and Power Operated Valves (Rev. 23 - 0)
ABN-301, Instrument Air System Malfunction (Rev. 14 - 0)

Validation Time: 5 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

## PLANT SETUP

**EXAMINER:**
**Provide examinee with the following:**

- **ABN-503, Safety Chilled Water System Malfunction, Section 4.0, Loss of Surge Tank Makeup (pages 1, 2, and 16-18) (orange paper)**
- **OWI-206, Guidelines for Operation of Manual and Power Operated Valves, Section 6.3.2 G (pages 1 and 41) (orange paper)**

**When/If requested by the examinee provide the following:**

- **ABN-301, Instrument Air System Malfunction, Attachment 2, Air Operated Equipment Failure Positions (pages 1 and 60-106) (blue paper)**

**All operations for this JPM will be in Unit 2 side Aux Building, 874’ elevation in the Ventilation Equipment Room (X-245).**

**√ - Check Mark Denotes Critical Step**

| START TIME: | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following step is from ABN-503, Safety Chilled Water System Malfunction, Section 4.0, Loss of Surge Tank Makeup.**<br><br>**Components are located on the East side of the Safety Chilled Water Surge Tank in the Aux Building, Elevation 874' in the Ventilation Equipment Room (X-245) (NE Corner of the room).** |
| **Perform Step: 1**<br>Step 4.3.1.b RNO & RNO b. | Manually ALIGN makeup to the SCW Surge Tank.<br>b. Locally FAIL OPEN 2-HV-6720, SFTY CH WTR SRG TK 2-01 RMUW SPLY VLV per OWI-206, Section 6.3.2 G. |
| **Standard:** | REFERRED to OWI-206, Section 6.3.2 G for instruction to fail open 2-HV-6720. |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following steps are from OWI-206, Guidelines for Operation of Manual and Power Operated Valves, Section 6.3.2 G, Failing/Restoring a Simple Air Operated Valve (without handwheel).**<br><br>**WHEN/IF requested provide ABN-301, Instrument Air System Malfunction, Attachment 2, Air Operated Equipment Failure Positions (blue paper).** |
| NOTE: An attachment in ABN-301 lists the failure positions of numerous air operated components. | |
| **Perform Step: 2**<br>Step 6.3.2 G and 1) | G. Failing/Restoring a Simple Air Operated Valve (without handwheel)<br>1) IF applicable, THEN POSITION valve to its failed position using its hand switch/controller. |
| **Standard:** | DETERMINED 2-HV-6720 is a FAIL OPEN valve by REFERRING to Initiating Cue of JPM.<br>-OR-<br>REFERRED to ABN-301, Instrument Air System Malfunction, Attachment 2, Air Operated Equipment Failure Positions, Page 15 of 47 and DETERMINED 2-HV-6720 is a FAIL OPEN valve.<br><br>CONTACTED U2 Control Room to ENSURE 2-HS-6720, SG TK RMUW SPLY VLV handswitch is in the OPEN position. |
| **Examiner Cue:** | **2-HS-6720 handswitch is in the OPEN position on CB-04.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 3 √**<br>Step 6.3.2 G and 2) | G. <u>Failing/Restoring a Simple Air Operated Valve (without handwheel)</u><br>2) Close the air supply valve going to the filter regulator. |
| **Standard:** | TURNED 2-HV-6720-AS1, SFTY CH WTR SRG TK 2-01 RMUW SPLY VLV AS black T-handle clockwise until the valve stops. |
| **Examiner Cue:** | **The air valve black T-handle turned freely, then stopped.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The Petcock valve to bleed air pressure off the filter regulator is on the bottom of the regulator.** |
| **Perform Step: 4 √**<br>Step 6.3.2 G and 3) | G. <u>Failing/Restoring a Simple Air Operated Valve (without handwheel)</u><br>3) OPEN the blowdown on the filter regulator to bleed air pressure off the valve diaphragm. |
| **Standard:** | TURNED filter regulator vent petcock counter-clockwise until air bleeds off. |
| **Examiner Cue:** | **The regulator pet cock turns freely and then stops.**<br>**AIR IS ESCAPING from the regulator petcock, then stops.**<br>**Indicate pressure on the regulator gauge reading 0 PSIG.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 5**<br>Step 6.3.2 G and 4) | G. <u>Failing/Restoring a Simple Air Operated Valve (without handwheel)</u><br>4) VERIFY valve is positioned to its failed position. |
| **Standard:** | DETERMINED 2-HV-6720 is failed to the OPEN position |
| **Examiner Cue:** | **2-HV-6720 position indicator plate is all the way up (top).** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Perform Step: 6** | Notify Unit 2 Control Room that 2-HV-6720 is FAILED OPEN. |
| **Standard:** | NOTIFIED Unit 2 Control Room that 2-HV-6720 is FAILED OPEN. |
| **Examiner Cue:** | **Control Room acknowledges 2-HV-6720 is failed open.** |
| **Terminating Cue:** | **JPM complete** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 2 has lost makeup capability to the Safety Chilled Water Surge Tank**
- **The crew has entered ABN-503, Safety Chilled Water System Malfunction, Section 4.0, Loss of Surge Tank Makeup**
- **A RMUW Pump is in operation**

**Initiating Cue:** **The US directs you to PERFORM the following:**

- **Locally FAIL OPEN 2-HV-6720, SFTY CH WTR SRG TK 2-01 RMUW SPLY VLV per the following procedures:**
  - **ABN-503 Step 4.3.1.b RNO b**
  - **OWI-206, Guidelines for Operation of Manual and Power Operated Valves, Section 6.3.2 G**

Facility: CPNPP JPM # NRC P-2 (U2) Task #AO3529 K/A # G2.3.14 3.4 / 3.8 SF-4S

Title: Secondary System Isolation following Steam Generator Tube Rupture

Examinee (Print): ____________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | X | Classroom: | | | |
| Actual Performance: | | Simulator: | | | |
| Alternate Path: | | Plant: | X | | |
| Time Critical: | | Low Pwr: | X | RCA: | |
| Bank / Mod / New: | N | Emerg: | X | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is performing recovery actions from a Ruptured Steam Generator in accordance with EOP-3.0B, Steam Generator Tube Rupture

Initiating Cue: The US directs you to PERFORM the following:

- Minimize secondary system contamination by performing Attachment 5, Secondary System Isolation
- A qualified Rad Waste Operator is NOT available

Task Standard: CLOSED 2CO-0004, U2 CNDS SPLY HDR TO CP SYS ISOL VLV and 2CO-0005, U2 CP SYS TO CNDS SPLY HDR ISOL VLV to isolate the condensate polishing system and minimize spread of contamination. CLOSED XSA-0007, AUX STM 50 PSI SPLY HDR IN ISOL VLV to isolate the auxiliary steam system and minimize spread of contamination.

Ref. Materials: EOP-3.0B, Steam Generator Tube Rupture (Rev. 9 - 3)

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ____________________ Date: ____________

## PLANT SETUP

**EXAMINER:**

**Provide examinee with the following:**

- **EOP-3.0B, Steam Generator Tube Rupture, Attachment 5, Secondary System Isolation (pages 1 and 55) (orange paper)**

√ **- Check Mark Denotes Critical Step**

| **START TIME:** | |
|---|---|

| | |
|---|---|
| **Examiner Note:** | **The following steps are from EOP-3.0B, Steam Generator Tube Rupture, Attachment 5, Secondary System Isolation. Valves in this attachment may be operated in any order.**<br><br>**Condensate polishing valves are located in the Turbine Building, Elevation 803' above and east of the condensate polishers.** |
| **Examiner Cue:** | **When examinee locates 2CO-0004 it should be open. If actual valve position is NOT open indicate to the examinee it is in the OPEN position.** |
| (1) IF qualified Rad Waste Operator is available, THEN individual Condensate Polisher Inlets and Outlets may be isolated instead of valve 2CO-0005, 2CO-0004, 2CO-0314, and 2CO-0317. 2CO-0004 and 2CO-0005 requires approximately 45 minutes to close each valve. | |
| **Perform Step: 1 √**<br>Step 1 and 1st bullet | 1. CLOSE or VERIFY CLOSED the following valves:<br>☐ 2CO-0004 (1) U2 CNDS SPLY HDR TO CP SYS ISOL VLV |
| **Standard:** | CLOSED 2CO-0004 by rotating handwheel Clockwise until valve handwheel becomes hard to turn |
| **Examiner Cue:** | **IF asked a Rad Waste Operator is NOT available.**<br><br>**When 2CO-0004 manipulated in the CLOSED (CW) direction:**<br>• **Simulate valve handwheel turns**<br>• **Use time compression (45 actual minutes to close valve)**<br>• **Simulate valve handwheel becomes hard to turn (valve closed)** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Cue:** | **When examinee locates 2C0-0314 it should be closed. If actual valve position is NOT closed indicate to the examinee it is in the CLOSED position.** |
| **Perform Step: 2**<br>Step 1 and 2nd bullet | 1. CLOSE or VERIFY CLOSED the following valves:<br>☐ 2CO-0314 (1) U2 CNDS POL SYS TO CNDS SPLY HDR ISOL VLV 004 BYP VLV |
| **Standard:** | VERIFIED CLOSED 2CO-0314 by checking handwheel in the fully Clockwise position |
| **Examiner Cue:** | **When 2CO-0314 manipulated in the CLOSED (CW) direction:**<br>• **Simulate valve handwheel does not turn (valve closed)** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Cue:** | **When examinee locates 2CO-0005 it should be open. If actual valve position is NOT open indicate to the examinee it is in the OPEN position.** |
| **Perform Step: 3 √**<br>Step 1 and 3rd bullet | 1. CLOSE or VERIFY CLOSED the following valves:<br>☐ 2CO-0005 (1) U2 CP SYS TO CNDS SPLY HDR ISOL VLV |
| **Standard:** | CLOSED 2CO-0005 by rotating handwheel Clockwise until valve handwheel becomes hard to turn |
| **Examiner Cue:** | **When 2CO-0005 manipulated in the CLOSED (CW) direction:**<br>• **Simulate valve handwheel turns**<br>• **Use time compression (45 actual minutes to close valve)**<br>• **Simulate valve handwheel becomes hard to turn (valve closed)** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **A ladder will be required to operate 2CO-0317 (approximately 12 feet in overhead just north of 2C0-0005).** |
| **Examiner Cue:** | **When examinee locates 2C0-0317 it should be closed. If actual valve position is NOT closed indicate to the examinee it is in the CLOSED position.** |
| **Perform Step: 4**<br>Step 1 and 4th bullet | 1. CLOSE or VERIFY CLOSED the following valves:<br>☐ 2CO-0317 (1) U2 CNDS POL SYS TO CNDS SPLY HDR ISOL VLV 005 BYP VLV |
| **Standard:** | VERIFIED CLOSED 2CO-0317 by checking handwheel in the fully Clockwise position |
| **Examiner Cue:** | **When 2CO-0317 manipulated in the CLOSED (CW) direction:**<br>• **Simulate valve handwheel does not turn (valve closed)** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Examiner Note:** | **XSA-0007 is a common valve for both units. ENSURE no other examinees are at the valve performing JPM activities before approaching.** |
| **Examiner Note:** | **The Aux Steam Supply Header Valve is located in the Turbine Building, Elevation 778' Aux Boiler Area just East of the Aux Boiler Control Panel.** |
| **Examiner Cue:** | **When examinee locates XSA-0007 it should be open. If actual valve position is NOT open indicate to the examinee it is in the OPEN position.** |
| **Perform Step: 5 √**<br>Step 1 and 5th bullet | 1. CLOSE or VERIFY CLOSED the following valves:<br>☐ XSA-0007 AUX STM 50 PSI SPLY HDR IN ISOL VLV |
| **Standard:** | CLOSED XSA-0007 by rotating handwheel Clockwise until valve handwheel becomes hard to turn |
| **Examiner Cue:** | **When XSA-0007 manipulated in the CLOSED (CW) direction:**<br>• **Simulate valve handwheel turns**<br>• **Simulate valve handwheel becomes hard to turn (valve closed)** |
| **Comment:** | **SAT** ☐ **UNSAT** ☐ |

| | |
|---|---|
| **Perform Step: 6**<br>Step 1 and 6th bullet | 1. CLOSE or VERIFY CLOSED the following valves:<br>☐ Notify Unit Supervisor attachment instructions complete AND secondary system isolation status. |
| **Standard:** | NOTIFIED Unit 2 Control Room Attachment 5 is complete and the secondary system is isolated. |
| **Examiner Cue:** | **Control Room acknowledges Attachment 5 complete and secondary system isolated.** |
| **Terminating Cue:** | **JPM complete** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **Unit 2 is performing recovery actions from a Ruptured Steam Generator in accordance with EOP-3.0B, Steam Generator Tube Rupture**

**Initiating Cue:** **The US directs you to PERFORM the following:**

- **Minimize secondary system contamination by performing Attachment 5, Secondary System Isolation**
- **A qualified Rad Waste Operator is NOT available**

Facility: CPNPP JPM # NRC P-3 (U2) Task #AO4405 K/A #067 AA2.17 3.5 / 4.3 SF-8

Title: Perform Actions for a Fire In Containment

Examinee (Print): ______________________________

Testing Method:

| | | | | | |
|---|---|---|---|---|---|
| Simulated Performance: | X | Classroom: | | | |
| Actual Performance: | | Simulator: | | | |
| Alternate Path: | X | Plant: | X | | |
| Time Critical: | | Low Pwr: | | RCA: | X |
| Bank / Mod / New: | M | Emerg: | X | EN: | |

**READ TO THE EXAMINEE**

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- There is a fire in Unit 2 Containment
- The crew is performing actions for ABN-807B, Response to Fire in the Containment Building

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- ALIGN Unit 2 Plant Equipment as required by ABN-807B, Response to Fire in the Containment Building, Attachment 1, Actions to Be Taken by the Nuclear Equipment Operator starting at Step 4.

Task Standard: DEENERGIZED RCP Seal Water Return Isolation Valve 2-8112, and RHR Pump Suction Valves, 8804A/B. DETERMINED RHR Pump Suction Valves had spuriously opened and CLOSED RHR Pump Suction Valves per ABN-807B, Attachment 1.

Required Materials: ABN-807B, Response to Fire in the Containment Building (Rev. 6 - 1)

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

## PLANT SETUP

**EXAMINER:**

**PROVIDE the examinee with a copy of:**

- **ABN-807B, Response to Fire in the Containment Building, Attachment 1 for Unit 2 (pages 1 and 11-12) (orange paper) with Steps 1, 2, and 3 completed.**

**EXAMINER CAUTION:**

**Entry into the ECCS Valve Rooms (last two steps in the JPM) will result in ~0.5 to 1.0 mrem of radiation exposure. If desired, have the examinee locate the room and valve on the Valve Map in the Low Dose Waiting Area just inside the door, then discuss operation of the valve.**

**√ - Check Mark Denotes Critical Step**

| **CRITICAL START TIME:** | |
| --- | --- |

| | |
| --- | --- |
| **Examiner Note:** | **The following steps are from ABN-807B, Attachment 1.** |

| | |
| --- | --- |
| **Examiner Note:** | **The following breakers are located in Safeguards Building 810' Train A Switchgear Room 2-083 on the East side of 6.9 KV Switchgear, South of the Shutdown Transfer Panel on MCC 2EB3-2.** |
| **Perform Step: 1√**<br>Step 4 & 1st bullet | 1. PLACE the following breakers in OFF:<br>• 2EB3-2/1G/BKR-1, U2 RC PUMP SEAL WATER RETURN ISOLATION VLV 8112 MOTOR BREAKER 1 (SFGD 810 Trn A swgr 2-083) |
| **Standard:** | PERFORMED the following at MCC 2EB3-2:<br>• PLACED 2EB3-2/1G/BKR-1, U2 RC PMP SEAL WATER RETURN ISOLATION VLV 8112 MOTOR BREAKER 1 in OFF position. |
| **Examiner Cue:** | **The breaker is to the LEFT (OFF).** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
| --- | --- |
| **Perform Step: 2√**<br>Step 4 & 2nd bullet | 4. PLACE the following breakers in OFF:<br>• 2EB3-2/1G/BKR-2, U2 RC PUMP SEAL WATER RETURN ISOLATION VLV 8112 MOTOR BREAKER 2 (SFGD 810 Trn A swgr 2-083) |
| **Standard:** | PERFORMED the following at MCC 2EB3-2:<br>• PLACED 2EB3-2/1G/BKR-2, U2 RC PMP SEAL WATER RETURN ISOLATION VLV 8112 MOTOR BREAKER 2 in OFF position. |
| **Examiner Cue:** | **The breaker is to the LEFT (OFF).** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following breaker is located in Safeguards Building 810' Train A Switchgear Room 2-083 on the South wall behind 6.9 KV Switchgear on MCC 2EB1-1.** |
| NOTE: The following action is taken due to the possibility of fire in containment in vicinity of RHR pump hot leg suction valves causing 2-HV-8804A or 2-HV-8804B to spuriously open. (Reference FX-90-1745) | |
| **Perform Step: 3√**<br>Step 5, 5.a, & 1st bullet | 5. PERFORM the following to ensure RHR valves 2-HV-8804A and 2-HV-8804B remain closed.<br>a. PLACE the following breakers - OFF<br>• 2EB1-1/6F/BKR, RHR PUMP 2-01 TO CCP SUCTION VALVE 8804A MOTOR BREAKER (SFGD 810 Trn A swgr 2-083) |
| **Standard:** | PERFORMED the following at MCC 2EB1-1:<br>• PLACED 2EB1-1/6F/BKR, RHR PUMP 2-01 TO CCP SUCTION VALVE 8804A MOTOR BREAKER in OFF position. |
| **Examiner Cue:** | **The breaker is to the LEFT (OFF).** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following breaker is located in Aux Building 810' Rm X-207 N end E wall by RHUT 1 Rm on MCC 2EB4-1.** |
| NOTE: The following action is taken due to the possibility of fire in containment in vicinity of RHR pump hot leg suction valves causing 2-HV-8804A or 2-HV-8804B to spuriously open. (Reference FX-90-1745) | |
| **Perform Step: 4√**<br>Step 5, 5.a, & 2nd bullet | 5. PERFORM the following to ensure RHR valves 2-HV-8804A and 2-HV-8804B remain closed.<br>a. PLACE the following breakers - OFF<br>• 2EB4-1/2J/BKR, RHR PUMP 2-02 TO SI PUMP SUCTION VALVE 8804B MOTOR BREAKER (AB 810 Rm X-207 N end E wall by RHUT 1 Rm) |
| **Standard:** | PERFORMED the following at MCC 2EB4-1:<br>• PLACED 2EB4-1/2J/BKR, RHR PUMP 2-02 TO SI PUMP SUCTION VALVE 8804B MOTOR BREAKER in OFF position. |
| **Examiner Cue:** | **The breaker is to the LEFT (OFF).** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following two steps represent the Alternate Path portion of this JPM.** |
| **Examiner Note:** | **The following valve is located in Safeguards Building 790' Train A ECCS Valve Room in the Southwest Corner.** |
| **Examiner Cue:** | **When approached indicate to the examinee the valve stem plunger is in the upward (top) position (valve is OPEN).** |
| **Perform Step: 5√**<br>Step 5, 5.b, & 1st bullet | 2. PERFORM the following to ensure RHR valves 2-HV-8804A and 2-HV-8804B remain closed.<br>b. Ensure the following valves – CLOSED:<br>• 2-8804A, RHR PMP 2-01 TO CCP SUCT VLV (SFGD 790 Trn a ECCS Vlv Rm) |
| **Standard:** | PERFORMED the following in the Train A ECCS Valve Room:<br>• DEPRESSED clutch lever for 2-8804A, RHR PMP 2-01 TO CCP SUCT VLV and ROTATED handwheel in clockwise direction until CLOSED. |
| **Examiner Cue:** | **When 2-8804A is manipulated in the CLOSED direction:**<br>• **Simulate valve handwheel turns and valve stem plunger begins to move down.**<br>• **Simulate valve handwheel becomes hard to turn.**<br>• **Valve stem plunger is in the fully downward (bottom) position and handwheel will no longer turn.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **Examiner Note:** | **The following valve is located in Safeguards Building 790' Train B ECCS Valve Room in the Southwest Corner.** |
| **Examiner Cue:** | **When approached indicate to the examinee the valve stem plunger is in the upward (top) position (valve is OPEN).** |
| **Perform Step: 6√**<br>Step 5, 5.b, & 2nd bullet | 5. PERFORM the following to ensure RHR valves 2-HV-8804A and 2-HV-8804B remain closed.<br>b. Ensure the following valves – CLOSED:<br>• 2-8804B, RHR PMP 2-02 TO SI PMPS SUCT VLV (SFGD 790 Trn B ECCS Vlv Rm) |
| **Standard:** | PERFORMED the following in the Train B ECCS Valve Room:<br>• DEPRESSED clutch lever for 2-8804B, RHR PMP 2-02 TO SI PMPS SUCT VLV and ROTATED handwheel in clockwise direction until CLOSED. |
| **Examiner Cue:** | **When 2-8804B is manipulated in the CLOSED direction:**<br>• **Simulate valve handwheel turns and valve stem plunger begins to move down.**<br>• **Simulate valve handwheel becomes hard to turn.**<br>• **Valve stem plunger is in the fully downward (bottom) position and handwheel will no longer turn.** |
| **Comment:** | **SAT ☐ UNSAT ☐** |

| | |
|---|---|
| **STOP TIME:** | |

**Initial Conditions:** **Given the following conditions:**

- **There is a fire in Unit 2 Containment**
- **The crew is performing actions for ABN-807B, Response to Fire in the Containment Building**

**Initiating Cue:** **The Unit Supervisor directs you to PERFORM the following:**

- **ALIGN Unit 2 Plant Equipment as required by ABN-807B, Response to Fire in the Containment Building, Attachment 1, Actions to Be Taken by the Nuclear Equipment Operator starting at Step 4.**

Facility: CPNPP 1 & 2 Scenario No.: 1 Op Test No.: August 2021 NRC

Examiners: ______________ Operators: ______________

Initial Conditions: 2-3% Power, BOL

Turnover: Raise Reactor Power to 6% - 8%, RWST is recirculating with Containment Spray Pump 1-02 (See Turnover Sheet)

**Critical Tasks:**

**CT-1 – Manually start Safety Injection Pump 1-01 due to an automatic start failure on Safety Injection, prior to RVLIS 79" above Core Plate Light going DARK.**

**CT-2 – Trip RCPs within 5 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection or EOP-1.0A, Loss of Reactor or Secondary Coolant**

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | - | R (RO, SRO) | Raise Reactor Power to 6% - 8%. |
| 2 | SW01B | C (BOP, SRO)<br>TS (SRO) | SSW Pump 1-02 Trip |
| 3 | RX12 | I (RO, SRO) | Main Steam Header Transmitter PT-507 Fails Low |
| 4 | RX08A<br>RX05A<br>RC12 | I (RO, SRO)<br>TS (SRO) | Pressurizer Common Instrument Line Failure |
| 5 | RC13 | C (RO, SRO)<br>TS (SRO) | 40 gpm Pressurizer Leak |
| 6 | RC12<br>RC13<br>RP07A | M (RO, BOP, SRO) | Spurious Safety Injection Train B, Automatic Safety Injection Train A Failure with a SBLOCA |
| 7 | SI04D | C (BOP) | Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal |

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

| Actual | Target Quantitative Attributes |
|---|---|
| 6 | Total malfunctions (5-8) |
| 1 | Malfunctions after EOP entry (1-2) |
| 4 | Abnormal events (2-4) |
| 1 | Major transients (1-2) |
| 1 | EOPs entered/requiring substantive actions (1-2) |
| 0 | EOP contingencies requiring substantive actions (0-2) |
| 2 | Critical tasks (2-3) |

## SCENARIO 1 SUMMARY

**Event 1**
Crew raises Reactor Power to 6%-8% per IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator.

*** Event 2**
Crew responds per ABN-501, Station Service Water System Malfunction Section 2.0, Station Service Water Pump Trip and ABN-502, Component Cooling Water Systems Malfunctions Section 2.0, CCW Pump Trip. Emergency Diesel 1-02 and Train B equipment are placed in Pull-Out. Technical Specifications 3.7.8 Condition B, 3.8.1 Condition B.

*** Event 3**
Crew responds per ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1$^{st}$ Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 3.0 Steam Header Pressure Malfunction. Crew takes manual control of Steam Dump Pressure Controller 1-PK-507 controlling RCS Temperature.

***Event 4**
Crew takes manual control of Pressurizer Level and Pressure and responds per ABN-706, Pressurizer Level Instrument Malfunction, Section 2.0 Pressurizer Level Instrument Malfunction and ABN-705, Pressurizer Pressure Malfunction, Section 2.0 Pressurizer Pressure Instrument Malfunction. Both failed channels are bypassed then restored to automatic control. Technical Specifications 3.3.1 Condition E Function 6 and 8b, 3.3.2 Condition D Function 1d, and Condition L Function 8b.

**** Event 5**
When Crew defeats failed pressurizer pressure and level channels, the Pressurizer steam space leak will be initiated. Crew responds per ABN-103, Excessive Reactor Coolant Leakage Section 2.0, Excessive Reactor Coolant Leakage. Crew may reduce letdown to 45 gpm to restore Pressurizer Level. Technical Specification 3.4.13 Condition A

*** Event 6**
Crew responds per EOP-0.0A, Reactor Trip or Safety Injection, manually initiates Safety Injection then transitions to EOP-1.0A, Loss of Reactor or Secondary Coolant.

**Event 7**
Crew starts SIP 1-01 during performance of EOP-0.0A, Attachment 2, Safety Injection Actuation Alignment.

***** - *On Lead Examiner's Cue*
****** - *Starts automatically or on Lead Examiners Cue*

**Termination Criteria**
Scenario will be terminated when the operators transition to EOS-1.2, Post LOCA Cooldown and Depressurization or at the Lead Examiner's discretion.

**Risk Significance:**

| | |
|---|---|
| • Failure of risk important system prior to trip: | Loss of SSWP 1-02<br>PRZR Common Instrument Line Failure |
| • Risk significant core damage sequence: | Loss of a Safety Train<br>SBLOCA |
| • Risk significant operator actions: | Manually Initiate Safety Injection<br>Manually start the 1-01 SIP<br>Trip all RCP’s on loss of subcooling |

**Critical Task Determination**

| **Critical Task** | **Safety Significance** | **Cueing** | **Measurable Performance Indicators** | **Performance Feedback** |
|---|---|---|---|---|
| | | | | |
| **CT-1 –** Manually start Safety Injection Pump 1-01 due to an automatic start failure on Safety Injection, prior to RVLIS 79" above Core Plate Light going DARK. | Recognize a failure or an incorrect automatic actuation of SIP 1-01 to start, to provide adequate injection capability/core cooling for a SBLOCA with Train B SI OOS. | Procedurally driven from EOP-0.0A, Attachment 2 to provide makeup inventory to the RCS during accident conditions. | The operator will start SI Pump 1-01 using the handswitch on CB-02. | Indication pump start including light indication, flow and discharge pressure on CB-02. |
| **CT-2 -** Trip RCPs within 5 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection or EOP-1.0A, Loss of Reactor or Secondary Coolant. | Take one or more actions that would prevent a challenge ability to cool the core during a SBLOCA. | Procedurally driven from EOP-0.0A and EOP-1.0A Foldout pages. Availability of Subcooling indication both on meters and computer. | The operator will secure ALL RCPs using the handswitches on CB-05. | Indication of pump stop including light indication, flow and motor current. |
| **<u>NOTE:</u>** (Per NUREG-1021, Appendix D) If an operator or the Crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review. | | | | |

Scenario Event Description
NRC Scenario 1

UNIT: 1

PART I TO BE PREPARED BY THE OFF-GOING UNIT SUPERVISOR.
1.0 SHIFT ACTIVITIES:

1.1 **Activities Completed This Shift:**
Increased Reactor Power to 2% to 3% per IPO-002A

1.2 **Activities In-Progress:**
The RWST is in recirculation with Containment Spray Pump 1-02 per SOP-204A section 5.1.3 awaiting Chemistry sample. Core Performance is developing a reactivity projection for power increase.

1.3 **Planned Activities:**
Raise Reactor Power to 6% to 8% per IPO-003A step 5.1.16

2.0 PLANT AND EQUIPMENT STATUS:

2.1 Technical Specification Related Equipment Summary:
None

2.2 Non-Technical Specification Equipment Summary:
None

3.0 General Information: MFWP 1A running in Manual on the GE controller. Steam Dumps are in Steam Pressure Mode in AUTO. FRV Bypass Valve controllers are in AUTO.

4.0 END OF SHIFT REVIEW:

| | | | | | |
|---|---|---|---|---|---|
| LOGS – RO/BOP | X | LOGS-NEO | X | CLOSED eLCOARs ARCHIVED | X |
| OPTS COMPLETED | X | DAILY ACTIVITIES LIST | X | LCOARs REVIEWED | X |

PART II TO BE COMPLETED BY THE ON-COMING UNIT SUPERVISOR.

1.0 CRITICAL PARAMETERS:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MODE: | 2 | | REACTOR POWER: | 2% | | MWE: | 0 |
| RCS TAVE: | 557 | °F | CONTROL ROD POSITION | 112 | ON BANK | D | |
| Cb: | 1591 | ppm | RCS PRESS: | 2235 | psig | | |

| | | | |
|---|---|---|---|
| X | Protected Train – Train A | X | Unit 2 is in Mode 1 at 100% power |
| X | Risk Assessment - GREEN | X | BAT $C_B$ = 7447 ppm |

| | SIMULATOR OPERATOR INSTRUCTIONS for SIMULATOR SETUP | | | | |
|---|---|---|---|---|---|
| **Initialize to IC50 and LOAD CPNPP 2021 NRC Simulator Scenario 1.** | | | | | |
| **EVENT** | **TYPE** | **MALF #** | **DESCRIPTION** | **DEMAND VALUE** | **INITIATING PARAMETER** |
| | | | | | |
| 2 | IMF | SW01B | Service Water Pump 2 Trip | F:1 | K2 |
| | | | | | |
| 3 | IMF | RX12 | MS Pressure Transmitter PT-507 fails Low | F:200 | K3 |
| | | | | | |
| 4 | IMF | RX05A | Pressurizer Level Transmitter Failure LT-459 | F:100 | K4 |
| | IMF | RX08A | Pressurizer Pressure Transmitter Failure PT-455 | F:2110 | K4, 120 sec ramp |
| | IMF | RC12 | Pressurizer Steam Space Leak | F:3 | K4, 600 sec ramp |
| | | | | | |
| 5 | IMF | RC13 | {DIRXLS459D.Value=2 && DIRXPS455F.Value=2} (Pressurizer Water Space Leak) | F:40 60 sec ramp | Automatically when the alternate channels are selected for PZR level and pressure. |
| | IMF | RC13 | {Key[5]!=0} (Pressurizer Water Space Leak) | F:40 60 sec ramp | K5, Used at Lead Examiners Discretion |
| | | | | | |
| 6 | IMF | RP14B | Safety Injection Spurious Actuation Train B | F:1 | K6 |
| | MMF | RC12 | {Key[6]!=0} MMF RC12 f:100 (Pressurizer Steam Space Leak) | F:100 | K6 |
| | MMF | RC13 | {Key[6]!=0} MMF RC13 f:1000 (Pressurizer Water Space Leak) | F:1000 | K6 |
| | IMF | RP07A | Automatic Safety Injection Train A Failure | F:1 | K0 |
| | | | | | |
| 7 | IMF | SI04C | SI Pump 1-01 Fails to Start on SI Sequencer | F:1 | K0 |
| | | | | | |

**Simulator Operator:** **INITIALIZE to IC50 and LOAD CPNPP 2021 NRC Simulator Scenario 1**
**ENSURE all Simulator Annunciator Alarms are ACTIVE**
**ENSURE all Control Board Tags are removed**
**ENSURE Operator Aid Tags reflect current boron conditions (1591 ppm)**
**ENSURE Operator Aid Tag for PDP last run indicates correct boron**
**ENSURE Rod Bank Update (RBU) is performed**
**ENSURE BOL Delta I graph is posted**
**RESET Delta I constant on plant computer**
**ENSURE ASD speakers are ON at half volume**
**ENSURE 1-FY-110B, BA BATCH FLO dial set to 43.0 gallons**
**ENSURE 1-FY-111B, RCS MU BATCH FLO dial set to 200 gallons**
**ENSURE Component Out of Positions Aids are on:**

- **1/1 RBSS – Control Rod Back Select**
- **1/1 – PCPR1 Back up Heater Group A**
- **1/1 – PCPR2 Back up Heater Group B**
- **1/1 – PCPR4 Back up Heater Group D**
- **1-HS-4766 CSP 1-02**

**ENSURE TT06 is on the MODE2 Screen**
**PLACE PCS Group Display CSP24 on the RO Desk**
**ENSURE electronic LBDs are available on the Unit Supervisor computer**
**ENSURE procedures in progress are on SRO desk:**

- **Copy of IPO-003A, Power Operations, Marked up thru Section 5.1.16, Warmup and synchronization of the Turbine Generator**
- **Copy of SOP-204A 5.1.3 marked up thru step 5.1.3 F**

**Control Room Annunciators in Alarm:**
**6D-1.1 – SR HI VOLT FAIL**
**6D-3.1 – SR SHTDN FLUX ALM BLK**
**PCIP-1.1 – SR TRN A RX TRIP BLK**
**PCIP-1.3 – AMSAC BLK TURB <40% PWR C-20**
**PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9**
**PCIP-1.7 – RX < 50% PWR TRUB TRIP PERM P-9**
**PCIP-2.1 – SR TRN B RX TRIP BLK**
**PCIP-2.4 – LO TURB PWR ROD WTHDRWL BLK C-5**
**PCIP-2.5 – SR RX TRIP BLK PERM P-6**
**PCIP-3.5 – RX & TRUB <= 10% PWR P-7**
**PCIP-4.5 – RX <= 48% PWR 3-LOOP FLO PERM P-8**
**PCIP-4.6 – TRUB <= 10% PWR P-13**
**7B-4.8 – FWP A/B RECIRC VLV NOT CLOSED**
**8A-1.3 – FWPT B TRIP**
**8A-1.10 – 1 OF 4 TURB STOP VLV CLOSE**
**Various secondary system alarms on CB10**

| Operating Test: | NRC | Scenario # | 1 | Event # | 1 | Page | 8 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Raise Reactor Power to 6%-8% | | | | | | | | |

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

**Examiner Note: The following steps are from IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator, Step 5.1.16.**

NOTE:

- During operation at BOL with a zero or small negative moderator temperature coefficient, very little reactivity feedback will result from changes in temperature. During a startup significant temperature transients can occur with relatively little change to power. This could result in large transients in Pressurizer level and RCS pressure. Care should be taken to ensure changes in steam flow are done gradually to prevent transients in the RCS.
- Steam dumps in automatic should be used to raise power. Steam drains and blowdown are not the preferred method as Operator action is required to change the steam flow. Using Steam Dumps in automatic can reduce the transients in the primary systems since the automatic control will reduce steam dump flow as the turbine speed/load is increased.
- Nuclear Instrumentation may be conservatively calibrated following an extended outage period. Other indication of thermal power, such as calorimetric data, steam dump demand, etc., should also be monitored during the power increase. N-16 should be monitored as an indication of power along with NIS and Calorimetric power. N-16 may be the most accurate indicator of power during a transient since it is temperature compensated. During transient conditions, the highest indication of Reactor power (N-16, NIS, or Calorimetric) should always be maintained within limits.
- If 1-ALB-6D, 1.14 IR HI FLUX ROD STOP C-1 is received prior to 1-PCIP, 1.6 RX $\geq$10% PWR P-10, Core Performance Engineering and I&C should be notified to evaluate.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | As Reactor power rises, VERIFY Steam Dump System continues to maintain Main Steam pressure at approximately 1092 psig. [Step 5.1.16.C] |

**Examiner Note: Crew will likely use N-16 power indication from Plant Computer.**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | When reactor power is greater than 5%, LOG entry into MODE 1. [Step 5.1.16.D] |
| | US | PERFORM OPT-102A for MODE 1 Surveillances. [Step 5.1.16.E] |

| Operating Test: | NRC | Scenario # | 1 | Event # | 1 | Page | 9 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Raise Reactor Power to 6%-8% | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **<u>Simulator Operator</u>: If requested, REPORT:**<br>• **IPO-003A Attachment 1 mode change checklist is complete**<br>• **OPT-102A, Operations Shiftly Routine Tests will be completed by an extra operator.** | | |
| | | |
| | RO | Slowly RAISE Reactor power to between 6% and 8%. [Step 5.1.16.F] |
| | | • Withdraw rods to raise reactor power |
| | | |
| ***When power level is stabilized at 6% to 8%, or at Lead Examiner discretion, PROCEED to Event 2.*** | | |

| Operating Test: | NRC | Scenario # | 1 | Event # | 2 | Page | 10 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Station Service Water Pump 1-02 Trip | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator:** When directed, EXECUTE Event 2 (Key 2).<br>- SW01B, Station Service Water Pump 1-02 Trip. | | |
| **Indications Available:**<br>01-1.8 – SSWP 1 / 2 OVRLOAD / TRIP<br>01-2.11 – CCP 2 L/O CLR SSW RET FLO LO<br>01-2.12 – SIP 2 L/O CLR SSW RET FLO LO<br>01-4.8 – CSP 2 & 4 BRG CLR SSW RET FLO LO | | |
| | | |
| | BOP | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | BOP | RECOGNIZE 1-HS-4251A, Service Water Pump 1-02 amber MISMATCH and white TRIP lights illuminated. |
| | | |
| **Examiner Note: The following steps are from ABN-501, Station Service Water System Malfunction, Section 2.0 Station Service Water Pump Trip.** | | |
| | | |
| NOTE: • The diesel generator can be operated, with load, for approximately one minute without SSW flow and not affect diesel performance.<br>• When a fault exists on the 6.9KV safeguard bus, the SSW pump will not be running to supply cooling water to the DG. The time this condition exists should be minimized (approximately 15 minutes) to prevent damage to the DG.<br>• Diamond step 1 denotes Initial Operator Actions. | | |
| | | |
| **Examiner Note: Diamond steps (◊) are Initial Operator Actions.** | | |
| | | |
| | ◊ BOP ◊ | PLACE CS-1DG2E, Train B Diesel Generator Emergency Start/Stop handswitch in PULLOUT. [Step 2.3.1] |
| | | |
| | BOP | VERIFY Train A SSW Pump – RUNNING. [Step 2.3.2] |
| | | |
| NOTE: Opposite train's SSW Pump and CCW Pump DO NOT provide cooling to CCW loads from the Ultimate Heat Sink. | | |
| | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 1 | Event # | 2 | Page | 11 of 40 |
| Event Description: | Station Service Water Pump 1-02 Trip | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | VERIFY Train A CCW Pump – RUNNING. [Step 2.3.3] |

**Simulator Operator: When asked about status of SSW Pump breaker/motor, wait 2 minutes and REPORT that the SSW Pump 1-02 50/51 overcurrent relays on Phases B & C are tripped and the motor is hot, no fire.**

CAUTION: With loss of SSW flow to the CCP oil cooler, CCP bearing damage will occur after approximately 13 minutes.

**Examiner Note: Crew may secure CSP 1-02 per SOP-204A prior to placing in PULL-OUT.**

| | | |
|---|---|---|
| | RO/BOP | VERIFY equipment on Train B not required for operation: [Step 2.3.4] |
| | | • Centrifugal Charging Pump 1-02<br>• Diesel Generator 1-02<br>• Safety Injection Pump 1-02<br>• Containment Spray Pumps 1-02 & 1-04 |

CAUTION: Do not place pump handswitch in STOP if pump tripped (white TRIP light). This will reset 86M relay (white TRIP light) and may result in an automatic restart.

| | | |
|---|---|---|
| | RO/BOP | PLACE equipment on Train B in PULL OUT. [Step 2.3.5] |
| | | • Centrifugal Charging Pump 1-02<br>• Station Service Water Pump 1-02 (may leave as is due to CAUTION)<br>• Safety Injection Pump 1-02<br>• Containment Spray Pumps 1-02 & 1-04 |
| | US | GO TO ABN-502, Section 2.0 to stop the CCW pump in the affected train while other qualified operators continue this procedure. [Step 2.3.6] |
| | US | Refer to Technical Specifications. Listed in Section 6.1[Step 2.3.7] |
| | US | • LCO 3.7.8.B, Station Service Water System. |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • CONDITION B – One SSWS Train inoperable.<br>• ACTION B.1 – Restore SSWS Train to OPERABLE status within 72 hours. |
| | US | • LCO 3.8.1.B, AC Sources – Operating. |
| | | • CONDITION B – One DG inoperable.<br>• ACTION B.1 – Perform SR 3.8.1.1 for the required offsite circuits within 1 hour <u>AND</u> once per 8 hours thereafter.<br>• ACTION B.2 – Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable within four hours from discovery of Condition B concurrent within inoperability of redundant required feature(s).<br>• ACTION B.3 – Determine OPERABLE DG(s) is not inoperable due to common cause failure within 24 hours. |
| | | |
| **<u>Simulator Operator</u>: If contacted, INFORM the Unit Supervisor that another operator will perform required Tech Spec Surveillance OPT-215A.** | | |
| | | |
| | US | Complete OPT-215 verification within one hour. [Step 2.3.8] |
| | | |
| | US | Refer to EPP-201. [Step 2.3.9] |
| | | |
| | US | Submit a Condition Report per STA-421. [Step 2.3.10] |
| | | |
| **<u>Examiner Note:</u> The following steps are from ABN-502, Component Cooling Water System Malfunctions, Section 2.0 CCW Pump Trip.** | | |
| | | |
| | US/BOP | VERIFY Train A CCW Pump – RUNNING [Step 1] |
| | | |
| <u>NOTE</u>: Opposite train's SSW Pump and CCW Pump DO NOT provide cooling to CCW loads from the Ultimate Heat Sink. | | |
| | | |
| | US/BOP | VERIFY Train A SSW Pump – RUNNING [Step 2] |
| | | |
| | BOP | VERIFY Train A Safety Chiller Recirc Pump – RUNNING [Step 3] |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | VERIFY TOTAL CCW heat exchanger outlet flow – LESS THAN 17,500 gpm per HEAT EXCHANGER. [Step 4] |
| | | • 1-FI-4536A, CCW HX 1 OUT FLO<br>• 1-FI-4537A, CCW HX 2 OUT FLO |
| | | |
| **Simulator Operator**: | | **If contacted, INFORM the Unit Supervisor that Unit 2 operators will take care of Control Room A/C and UPS HVAC systems** |
| | | |
| | US | VERIFY required equipment, for existing conditions, supplied by unaffected train – IN OPERATION: [Step 5] |
| | | • Control Room A/C Units<br>• Containment Spray System<br>• UPS HVAC Unit<br>• Excess Letdown<br>• RHR System |
| | | |
| | US/BOP | Shutdown equipment on the affected Train as necessary: [Step 6] |
| | | • To prevent auto operation without necessary support, shutdown the following on the affected train: [Step 6a] |
| | | • Containment Spray Pumps – 1-02 & 1-04 (Already in PULL OUT)<br>• RHR Pump – 1-02 PULL OUT |
| | | |
| NOTE: | | Any condition isolating CCW safeguards trains (e.g., Containment Spray actuation, CCW surge Tank Low-Low level), will stop cooling to the affected train Safety Chilled Water. |
| | | |
| | US | • VERIFY Shift Manager approves continued operation of affected train components using Attachment 3. [Step 6b] |
| | | |
| **Simulator Operator**: | | • **If contacted, INFORM the Unit Supervisor that Unit 2 operators will take care of the common systems**.<br>• **The Shift Manager does not approve of continued operation of the affected equipment.** |
| | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US/BOP | • SHUTDOWN THE FOLLOWING [Step 6b RNO]<br>• MDAFW Pump – 1-02 PULL OUT<br>• SI Pump – 1-02 PULL OUT<br>• CCP – 1-02 PULL OUT<br>• Control Room A/C – OFF<br>• UPS HVAC Unit – OFF<br>• SFP Cooling – OFF<br>• Electrical Area Fan Coolers – OFF |

NOTE: Step 6c is a continuous action step.

**Simulator Operator: If contacted to verify Safety Chiller 1-06 is running, wait 2 minutes then report that 1-06 Safety Chiller is running satisfactorily.**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • VERIFY affected train Safety Chiller – RUNNING. [Step 6c] |
| | | • ENSURE the following on the affected train: [Step 6d]<br>• CCW Pump – PULL OUT |
| | US/BOP | VERIFY CCW HX outlet temperature did NOT exceed 122F with pump running by one or more of the following: [Step 7] |
| | | • Temperature observed on 1-TI-4530 OR 1-TI-4534, CCW HX 1 OR CCW HX 2 OUT TEMP<br>• Plant computer trend<br>• ALB 3B-1.5 OR 2.5, CCW HX 1 OR HX 2 OUT TEMP HI – NOT LIT |
| | US | ENTER into Issue Reporting Program IAW STA-421. [Step 8] |
| | US | REFER to the following Technical Specifications for LCOs:<br>• 3.4.6<br>• 3.4.7<br>• 3.5.2<br>• 3.5.3<br>• 3.6.6<br>• 3.7.7<br>• 3.7.11<br>• 3.7.19<br>• 3.7.20 |

**Examiner Note: The Technical Specifications are addressed in ABN-501**

| Operating Test: | NRC | Scenario # | 1 | Event # | 2 | Page | 15 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Station Service Water Pump 1-02 Trip | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | US | LCO 3.7.8.B, Station Service Water System. |
| | | • CONDITION B – One SSWS Train inoperable.<br>• ACTION B.1 – Restore SSWS Train to OPERABLE status within 72 hours. |
| | US | LCO 3.8.1.B, AC Sources – Operating. |
| | | • CONDITION B – One DG inoperable.<br>• ACTION B.1 – Perform SR 3.8.1.1 for the required offsite circuits within 1 hour AND once per 8 hours thereafter.<br>• ACTION B.2 – Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable within four hours from discovery of Condition B concurrent within inoperability of redundant required feature(s).<br>• ACTION B.3 – Determine OPERABLE DG(s) is not inoperable due to common cause failure within 24 hours. |
| | | |

***When Technical Specifications have been addressed, or at Lead Examiner discretion, PROCEED to Event 3.***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 1 | Event # | 3 | Page | 16 | of 40 |
| Event Description: | Steam Header Pressure Transmitter (PT-507) fails Low | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **<u>Simulator Operator</u>: When directed, execute Event 3 (Key 3).<br>- RX12, Steam Header Pressure Transmitter (PT-507) fails Low.** | | |
| **<u>Indications Available:</u><br>6D-1.10 – AVE TAVE TREF DEV<br>PI-507 – MS HDR PRESS indication fails Low** | | |
| | | |
| | BOP | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | BOP | REPORT PT-507, Steam Header Pressure Channel has failed Low. |
| | | |
| **<u>Examiner Note:</u> Crew should take manual control of 1-PK-507, STM DMP PRESS CTRL and re-open the Steam Dumps, due to failed input into SD controls, to re-establish RCS temperature control.** | | |
| | | |
| | US | DIRECT implementation of ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 3.0 Steam Header Pressure Malfunction. |
| | | |
| **<u>Examiner Note:</u> The following steps are from ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 3.0 Steam Header Pressure Malfunction.** | | |
| | | |
| | BOP | CHECK 1-PI-507, MS HDR PRESS indicating Higher or Lower than Main Steam Line Pressure. [Step 3.3.1] |
| | | |
| <u>NOTE</u>: Computer point P5446A, FW STM FLOW SETPOINT may aid the operator. | | |
| | | |
| | BOP | MANUALLY CONTROL Feedwater Pumps. [Step 3.3.2] |
| | | • PLACE 1-SK-509A, FWPT MASTER SPD CTRL in MANUAL. [Step 3.3.2.a] |
| | | • ADJUST 1-SK-509A to maintain Feedwater Header pressure GREATER THAN Main Steam Line pressure. [Step 3.3.2.b] |
| | | |
| | BOP | MONITOR Steam Generator Levels: [Step 3.3.3] |
| | | • VERIFY SG levels – STABLE AT OR TRENDING TO NORMAL |

| Operating Test: NRC | Scenario # 1 | Event # 3 | Page 17 of 40 |
|---|---|---|---|
| Event Description: Steam Header Pressure Transmitter (PT-507) fails Low | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | PROGRAM. [Step 3.3.3.a] |
| | | • VERIFY Feedwater Control Valves – RESPONDING TO DEMAND SIGNAL. [Step 3.3.3.b] |
| | | |
| | | IF feedwater bypass control valves are controlling level, THEN ENSURE bypass control valves are responding to demand signal. [Step 3.3.3 b RNO]<br>• 1-LK-550, SG 1 FW BYP CTRL<br>• 1-LK-560, SG 2 FW BYP CTRL<br>• 1-LK-570, SG 3 FW BYP CTRL<br>• 1-LK-580, SG 4 FW BYP CTRL |
| | | |
| | BOP | DETERMINE Required Operational Mode of Steam Dumps: [Step 3.3.4] |
| | | • CHECK 43/1-SD, STM DMP MODE SELECT Switch in – Steam Pressure.<br>[Step 3.3.4.a] |
| | | • VERIFY $T_{AVE}$ AND steam pressure – STABLE. [Step 3.3.4.b] |
| | | |
| | BOP | PERFORM the following as applicable: [Step 3.3.4 RNO] |
| | | 2) Manually CONTROL 1-PK-507, STM DMP PRESS CTRL as necessary for conditions. |
| | | |
| | US | MANUALLY CONTROL 1-SK-509A, FWPT MASTER SPD CTRL to MAINTAIN differential pressure (ramp from 80 psid @ 20% power to 181 psid @ 100% power. [Step 3.3.5] |
| | | |
| | US | INITIATE a Condition Report per STA-421, AS APPLICABLE. [Step 3.3.6] |
| | | |
| ***When plant conditions are stable, or at Lead Evaluator's discretion, PROCEED to Event 4.*** | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operating Test: NRC | Scenario # 1 | Event # 4 | Page 18 of 40 | | | | |
| Event Description: Pressurizer Common Instrument Line Failure | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator: When directed, EXECUTE Event 4 (Key 4).** <br>**- Pressurizer Common Instrument Line Failure** | | |
| **Indications Available:** <br>**Pressurizer Level LT-0459 indicates high** <br>**Pressurizer Pressure PT-0455 indicates low** <br>**5A-1.6 – ANY RCP SEAL INJ FLO LO** <br>**5C-1.3 – PRZR LVL DEV HI** <br>**5C-3.3 – PRZR PRESS LO BACKUP HTRS ON** <br>**5C-4.2 PRZR 1 OF 3 LVL HI** | | |
| | | |
| **Examiner Note: The following steps are from ABN-706, Pressurizer Level Instrument Malfunction, Section 2.0 Pressurizer Level Instrument Malfunction.** | | |
| | | |
| **Examiner Note: The crew may enter ABN-705, Pressurizer Pressure Malfunction, Section 2.0 Pressurizer Pressure Instrument Malfunction first then enter ABN-706, Pressurizer Level Instrument Malfunction, Section 2.0 Pressurizer Level Instrument Malfunction.** | | |
| | | |
| CAUTION: To avoid thermal shock of the reactor coolant piping, the letdown flow should not be stopped without also stopping the charging flow when the reactor coolant temperature is greater than 350°F. | | |
| | | |
| NOTE: Channels 459 and 460 are normally the controlling channels. | | |
| | | |
| | RO | Manually CONTROL 1-LK-459, PRZR LVL CTRL OR 1-FK-121, CCP CHRG FLO CTRL to maintain level at program. [Step 2.3.1] |
| | | |
| | RO | TRANSFER 1/1-LS-459D, PRZR LVL CTRL CHAN SELECT to an operable alternate controlling channel. Selects 461/460 [Step 2.3.2] |
| | | |
| | RO | ENSURE 1/1-LS-459E, 1-LR-459 PRZR LVL SELECT selected to a valid channel. [Step 2.3.3] |
| | | |
| | RO | VERIFY normal letdown aligned. [Step 2.3.4] |
| | | |
| | RO/BOP | If necessary, RECLOSE 1/1-PCPR, PRZR CTRL HTR GROUP C by placing the control switch in the "ON" position. [Step 2.3.5] |

| Operating Test: | NRC | Scenario # | 1 | Event # | 4 | Page | 19 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Pressurizer Common Instrument Line Failure | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | RO/BOP | If desired, PLACE controller used in Step 1 in AUTO. [Step 2.3.6] |
| | | |
| | RO/BOP | VERIFY instruments on common instrument line – NORMAL (see Attachment 1) [Step 2.3.7] Check PT-0455 |
| | | |

ATTACHMENT 1
PAGE 1 OF 1

PRESSURIZER INSTRUMENT LOOPS

| | LEVEL | PRESSURE |
|---|---|---|
| INSTRUMENT LOOP - 1 | LT-459<br>LT-459F | PT-455<br>PT-455F |
| INSTRUMENT LOOP - 2 | LT-460 | PT-456<br>PT-458 |
| INSTRUMENT LOOP - 3 | LT-461<br>LT-462 | PT-457 |

Channels in the same instrument loop use common instrument taps into the pressurizer.

Instruments with "F" designator are located at the Remote Shutdown Panel.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | US | • PERFORM ABN-705 for affected pressure channel AND CONTINUE this procedure. [Step 2.3.7 RNO] |
| | | |

**<u>Examiner Note:</u> The following steps are from ABN-705, Pressurizer Pressure Malfunction, Section 2.0 Pressurizer Pressure Instrument Malfunction.**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | RO | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | RO | RECOGNIZE PRZR pressure channel PI-455A has failed low. |
| | | |

| Operating Test: | NRC | Scenario # | 1 | Event # | 4 | Page | 20 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Pressurizer Common Instrument Line Failure | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | DIRECT performance of ABN-705, Pressurizer Pressure Malfunction, Section 2.0. |
| | | |
| **<u>Examiner Note</u>: Diamond steps (◊) are Initial Operator Actions.** | | |
| | | |
| <u>NOTE</u>: • Diamond steps denote initial action. • A PORV is not considered INOPERABLE when its actuation instrumentation is not functioning. • Power should <u>NOT</u> be removed from a block valve closed in accordance with this procedure section. | | |
| | | |
| | ◊ RO ◊ | VERIFY PORV – CLOSED. [Step 2.3.1] |
| | | |
| | ◊ RO ◊ | PLACE 1-PK-455A, PRZR MASTER PRESS CTRL in MANUAL. [Step 2.3.2] |
| | | |
| | ◊ RO ◊ | ADJUST 1-PK-455A for current RCS pressure. [Step 2.3.3] |
| | | |
| | RO | TRANSFER 1/1-PS-455F, PRZR PRESS CTRL CHAN SELECT to an Alternate Controlling Channel (457/456). [Step 2.3.4] |
| | | |
| | RO | PLACE 1-PK-455A, PRZR MASTER PRESS CTRL in AUTO. [Step 2.3.5] |
| | | |
| | RO | VERIFY automatic control restoring Pressurizer pressure to 2235 psig. [Step 2.3.6] |
| | | |
| | RO | ENSURE valid channel to recorder 1/1-PS-455G, 1-PR-455 PRZR PRESS SELECT. [Step 2.3.7] |
| | | |
| | RO | ENSURE 1/1-PCV-455A, PRZR PORV in AUTO. [Step 2.3.8] |
| | | |
| | RO | ENSURE 1/1-8000A, PRZR PORV BLK VLV in OPEN position. [Step 2.3.9] |
| | | |

| Operating Test: NRC | Scenario # 1 | Event # 4 | Page 21 of 40 |
|---|---|---|---|
| Event Description: Pressurizer Common Instrument Line Failure | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | Within one hour, VERIFY PCIP Window 2.6 – PRZR PRESS SI BLK PERM P-11 – DARK. [Step 2.3.10] |
| | | |
| **<u>Examiner Note</u>: ABN – 706 Will be addressed at step 2.3.11 RNO if not already entered** | | |
| | | |
| | US/RO | VERIFY other instruments on common instrument line – NORMAL. [Step 2.3.11] |
| | | • VERIFY Loop 1 Instruments LT-459 responding normally per Attachment 1. [Step 2.3.11 RNO] Recognize LT-0459 failure has been addressed |
| | | |
| | US | REFER to Technical Specifications per ABN 705 and 706 |
| | | |
| **<u>Examiner Note</u>: Technical Specification 3.3.1 (9) M, does not apply due to Reactor Power < P7** | | |
| | | |
| | US | REFER TO TS 3.3.1, Engineered Safety Feature Actuation System Table 3.3.1-1 (6, 8.b) |
| | | CONDITION E – One channel inoperable.<br>E.1 Place channel in trip in 72 hours<br>OR<br>E.2 Be in MODE 3 in 78 hours |
| | | |
| | US | REFER TO TS 3.3.2, Engineered Safety Feature Actuation System Table 3.3.2-1 (1.d, 8.b) |
| | | CONDITION D – One Channel Inoperable<br>D.1 Place channel in trip in 72 hours<br>OR<br>D.2.1 Be in MODE 3 in 78 hours<br>AND<br>D.2.2 Be in MODE 4 in 84 hours<br><br>CONDITION L – One or more required channels inoperable<br>L.1 Verify interlock is in required state for existing unit condition in 1 hour<br>OR<br>L.2.1 Be in MODE 3 in 7 hours<br>AND<br>L.2.2 Be in MODE 4 13 hours |
| | | |
| | US | INITIATE a Condition Report per STA-421, as applicable. [Step 11] |

| Operating Test: | NRC | Scenario # | 1 | Event # | 4 | Page | 22 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Pressurizer Common Instrument Line Failure | | | | | | | | |

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

| |
|---|
| ***When Pressurizer Pressure and Level control have been transferred to alternate controlling channels Event 5 will automatically start, or on a key at the discretion of the Lead Evaluator.*** |

| Operating Test: | NRC | Scenario # | 1 | Event # | 5 | Page | 23 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | 40 gpm Pressurizer Leak | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator**: | | **Event 5 Starts automatically, when Pressurizer Pressure and Level control have been transferred to alternate controlling channels or on (Key 5) at the discretion of the Lead Evaluator**<br>**- RC13, 40 gpm Pressurizer Leak** |
| **Indications Available**: | | **2A-1.6 – CNTMT SMP 1 FILL RATE INCREASE**<br>**2A-2.8 – ANY CNTMT SMP PMP RUN**<br>**2B-3.12 – CNTMT FN CLR 3 & 4 CNDS FILL RATE HI**<br>**2B-4.12 – CNTMT FN CLR 1 & 2 CNDS FILL RATE HI**<br>**Pressurizer Level and Setpoint Deviation**<br>**PC-11 Containment Air PIG Radiation Monitor alarms**<br>**Containment Sump Pump 1-01 AUTO starts** |
| | | |
| | RO/BOP | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | RO/BOP | RECOGNIZE increasing RCS leak rate. |
| | | |
| **Examiner Note**: | | **The Following Steps are from ABN-103, Excessive Reactor Coolant Leakage, Section 2.0 Excessive Reactor Coolant Leakage.** |
| | | |
| | US | Direct Performance of ABN-103, Excessive Reactor Coolant Leakage, Section 2.0 Excessive Reactor Coolant Leakage |
| | | |
| NOTE: | | The symbol [R] has been located throughout this procedure where real or potential radiation hazards are positively identified. This identification technique should not preclude workers from following good radiation work practices throughout this procedure to ensure their occupational exposure is maintained As Low As Reasonably Achievable (ALARA). |
| | | |
| | RO | VERIFY Centrifugal Charging Pump 1-01 is running. [Step 2.3.1] |
| | | |
| NOTE: | | Step 2 is a Continuous Action Step. |
| | | |
| | RO | DETERMINE Pressurizer level NOT at or trending to Program Level |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 1 | Event # | 5 | Page | 24 | of 40 |
| Event Description: | 40 gpm Pressurizer Leak | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | Setpoint. [Step 2.3.2] |
| | | |
| **Examiner Note**: **Crew may determine PRZR level is being maintained and chose not to reduce Letdown Flow.** | | |
| | | |
| | RO | PLACE Charging Pump Controller in MANUAL and ADJUST Charging flow to maintain Pressurizer level at setpoint. [Step 2.3.2 RNO] |
| | | DETERMINE Pressurizer level > 17%. |
| | | DETERMINE Pressurizer level NOT being maintained and PERFORM the following: [Step 2.3.2 RNO] |
| | | • ENSURE OPEN 1/1-8149A, 45 gpm Letdown Orifice Isolation Valve in service. |
| | | • CLOSE 1/1-8149B, 75 gpm Letdown Orifice Isolation Valve. |
| | | • ENSURE 1-PK-131, LTDN HX OUT PRESS CTRL is maintaining 310 psig on 1-PI-131, LTDN HX OUT PRESS. |
| | | • If necessary, START Charging Pump 1-02. (CCP 1-02 is not available) |
| | | |
| **Examiner Note**: **Tech Specs may be addressed as follow up question due to the timing of Event 7, at the lead examiners discretion.** | | |
| | | |
| **Examiner Note**: **LCO 3.4.13 Condition A applies until discovery of leak location, at which point RCS pressure boundary LEAKAGE would be declared and Condition B would apply.** | | |
| | | |
| | US | REFER TO TS 3.4.13, RCS Operational LEAKAGE |
| | | CONDITION A – RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE<br>A.1 – Reduce LEAKAGE to within limits within 4 hours |
| | | |
| ***When letdown has been reduced to 45 gpm, or at the discretion of the lead evaluator, PROCEED to Event 6.*** | | |

| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 25 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|

Event Description: Spurious Safety Injection Train B with a SBLOCA
Automatic Safety Injection Train A Failure
Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal

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

**Simulator Operator: When directed, EXECUTE Events 6 and 7 (Key 6).**
**- RP14B Spurious SI Train B**
**- RC12 Pressurizer Steam Leak 100 gpm**
**- RC13 Pressurizer Water Leak 1,000 gpm**

**<u>Indications Available</u>:**

**2A-1.6 – CNTMT SMP 1 FILL RATE INCREASE**
**2A-2.6 – CNTMT SMP 2 FILL RATE INCREASE**
**2A-2.8 – ANY CNTMT SMP PMP RUN**
**5B-1.6 – PRZR LO PRESS PORV 456 BLK**
**5B-2.6 – PRZR LO PRESS PORV 455A BLK**
**5B-3.4 – PRZR 1 OF 4 PRESS LO**
**5B-4.4 – PRZR 1 OF 4 SI PRESS LO**
**5B-3.6 – PRZR LVL LO**
**5C-1.2 – PRZR LVL DEV LO**
**5C-3.3 – PRZR PRESS LO BACKUP HTRS ON**
**6A-3.4 – CHRG FLO HI / LO**
**PCIP-1.8 – SI ACT flashing**
**PC11 – 1-RE-5503 Containment Air Gas Alarm (CAG 197)**

| | | |
|---|---|---|
| | RO/BOP | RECOGNIZE a single train of SI actuation. |

**<u>Examiner Note:</u> The Crew may trip the Reactor Prior to Initiating Safety Injection.**

| | | |
|---|---|---|
| | RO | Manually INITIATE a Safety Injection. |
| | US | DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection. |

**<u>Examiner Note:</u> The following steps are from EOP-0.0A, Reactor Trip or Safety Injection.**

| | | |
|---|---|---|
| | RO | VERIFY Reactor Trip: [Step 1] |
| | | • VERIFY Reactor Trip Breakers – OPEN. [Step 1.a] |
| | | • VERIFY Neutron flux – DECREASING. [Step 1.a] |
| | | • VERIFY all Control Rod Position Rod Bottom Lights – ON. [Step 1.b] |
| | RO | VERIFY Turbine Trip: [Step 2] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 26 | of 40 |
| Event Description: | Spurious Safety Injection Train B with a SBLOCA<br>Automatic Safety Injection Train A Failure<br>Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • VERIFY all HP Turbine Stop Valves – CLOSED. [Step 2] |
| | | |
| | RO | VERIFY Power to AC Safeguards Buses: [Step 3] |
| | | • VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a] |
| | | • VERIFY both AC Safeguards Buses – ENERGIZED. [Step 3.b] |
| | | |
| **Examiner Note: Safety Injection may have already been manually actuated prior to step 4** | | |
| | | |
| | RO | CHECK SI status: [Step 4] |
| | | • CHECK if SI is actuated. [Step 4.a] |
| | | • VERIFY Both Trains SI Actuated: [Step 4.b] |
| | | • SI Actuated blue status light – (Window 1.8 is FLASHING) |
| | | • Manually Actuate SI. [Step 4.b RNO] |
| | | |
| CAUTION: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation. | | |
| NOTE: Attachment 2 is required to be completed before FRGs are implemented. | | |
| | | |
| **Examiner Note: EOP-0.0A, Attachment 2 steps, performed by the BOP, begin on Page 35.** | | |
| | | |
| | US/BOP | INITIATE Proper Safeguards Equipment Operation Per Attachment 2. [Step 5] |
| | | |

| Operating Test: NRC | Scenario # 1 | Event # 6 and 7 | Page 27 of 40 |
|---|---|---|---|
| Event Description: | Spurious Safety Injection Train B with a SBLOCA<br>Automatic Safety Injection Train A Failure<br>Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO | VERIFY AFW Alignment: [Step 6] |
| | | • VERIFY both MDAFW Pumps – 1-01 RUNNING. [Step 6.a] |
| | | • TDAFW – RUNNING. [Step 6.b] |
| | | • VERIFY AFW total flow – GREATER THAN 460 gpm. [Step 6.c] |
| | | • VERIFY AFW valve alignment - PROPER ALIGNMENT. [Step 6.d] |
| | | |
| | RO | VERIFY Containment Spray NOT Required: [Step 7] |
| | | Containment pressure – HAS REMAINED LESS THAN 18.0 PSIG [Step 7a] |
| | | • 1-ALB-2B window 1-8, CS ACT - NOT ILLUMINATED<br>-AND-<br>• 1-ALB-2B window 4-11, CNTMT ISOL PHASE B ACT - NOT ILLUMINATED<br>-AND<br>• Containment Pressure – LESS THAN 18.0 PSIG |
| | | Verify containment spray heat exchanger out valves – CLOSED [Step 7b] |
| | | Verify containment spray pumps – 1-01 and 1-03 RUNNING, 1-02 and 1-04 in PULLOUT [Step 7c] |
| | | |
| | RO | CHECK If Main Steamlines Should Be ISOLATED: [Step 8] |
| | | Verify the following: [Step 8a]<br>• Containment pressure – GREATER THAN 6.0 PSIG |
| | | • Steam Line pressure – LESS THAN 610 PSIG. |
| | | Verify Main Steam Isolation Complete:<br>• Main Steam isolation valves<br>• Before MSIV drippot isolation valves |
| | | |
| | RO | CHECK RCS Temperature: |
| | | • RCS AVERAGE TEMPERATURE STABLE AT OR TRENDING TO 557°F. [Step 9] |
| | | IF temperature less than 557°F and decreasing, THEN perform the following: [Step 9 RNO] |
| | | • Stop dumping steam. [Step 9 a. RNO] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 28 | of 40 |
| Event Description: | Spurious Safety Injection Train B with a SBLOCA<br>Automatic Safety Injection Train A Failure<br>Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • IF cooldown continues, THEN reduce total AFW flow as necessary to minimize the cooldown: [Step 9 b. RNO]<br>o Maintaining a minimum of 460 gpm UNTIL narrow range level greater than 43% (50% FOR ADVERSE CONTAINMENT) in at least one SG.<br>o As necessary to maintain SG levels WHEN narrow range level greater than 43% (50% FOR ADVERSE CONTAINMENT) in at least one SG.<br>o IF TDAFW pump is not required to maintain greater than 460 gpm flow, THEN stop TDAFW pump. |
| | | • IF cooldown continues, THEN close main steamline isolation valves. [Step 9 c. RNO] |
| | | |
| | RO | CHECK PRZR Valve Status: [Step 10] |
| | | • PRZR Safeties – CLOSED. [Step 10.a] |
| | | • Normal PRZR Spray Valves – CLOSED. [Step 10.b] |
| | | • PORVs – CLOSED. [Step 10.c] |
| | | • Power to at least 1 Block Valve – AVAILABLE. [Step 10.d] |
| | | • Block Valves – AT LEAST ONE OPEN. [Step 10.e] |
| | | |
| **CRITICAL TASK** | | **Trip RCPs within 5 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection or EOP-1.0A, Loss of Reactor or Secondary Coolant.** |
| | | |
| | RO | Check If RCPs Should Be Stopped: [Step 11] |
| | | • RCS subcooling - LESS THAN 25°F (55°F FOR ADVERSE CONTAINMENT) [Step 11a] |
| | | • ECCS pumps - AT LEAST ONE RUNNING [Step 11b]<br>• CCP<br>OR<br>• SI pump (CCP 1-01 is running; SIP 1-01 should be manually started per att 2) |
| **CT-2** | | • Stop all RCPs. [Step 11c] |
| | | |
| | RO | Check If Any SG Is Faulted: [Step 12] |
| | | • Check pressures in all SGs: [Step 12a] |

| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 29 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|

Event Description: Spurious Safety Injection Train B with a SBLOCA
Automatic Safety Injection Train A Failure
Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>-OR<br>• ANY SG COMPLETELY DEPRESSURIZED |
| | | • Go to step 13. [Step 12a RNO] |
| | | |
| | RO | Check If SG Tubes Are Not Ruptured: [Step 13] |
| | | • Condenser off gas radiation - NORMAL (COG-182, 1RE-2959)<br>• Main steamline radiation - NORMAL (MSL-178 through 181, 1RE-2325 through 2328)<br>• SG blowdown sample radiation monitor - NORMAL (SGS-164, 1RE-4200)<br>• No Steam Generator level increasing in an uncontrolled manner |
| | | |
| | RO | Check If RCS Is Intact: [Step 14] |
| | | • Containment pressure – LESS THAN 1.3 PSIG |
| | | • Go to EOP-1.0A, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. [Step 14 RNO] |
| | | |

**<u>Examiner Note:</u> The following steps are from EOP-1.0A, Loss of Reactor or Secondary Coolant**

CAUTION: Following a high energy line rupture inside containment, the operator should not rely upon steam generator water level indications in any depressurized steam generators.

NOTE: As PRZR Temperature decreases the error on indicated PRZR level will increase. Attachment 2 may be used to determine actual PRZR level.

**<u>Examiner Note:</u> RCPs may have already been secured as directed by EOP-0.0A**

| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 30 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Spurious Safety Injection Train B with a SBLOCA<br>Automatic Safety Injection Train A Failure<br>Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **CRITICAL TASK** | | **Trip RCPs within 5 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection or EOP-1.0A, Loss of Reactor or Secondary Coolant.** |
| | | |
| | RO | Check If RCPs Should Be Stopped: [Step 1] |
| | | • RCS subcooling - LESS THAN 25°F (55°F FOR ADVERSE CONTAINMENT) [Step 1a] |
| | | • ECCS pumps - AT LEAST ONE RUNNING [Step 1b]<br>  • CCP<br>  OR<br>  • SI pump (CCP 1-01 is running; SIP 1-01 should be manually started per att 2) |
| **CT-2** | | • Stop all RCPs. [Step 1c] |
| | | |
| | | Check pressures in all SGs [Step 2a] |
| | | • ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>-OR<br>• ANY SG COMPLETELY DEPRESSURIZED |
| | | • Go to Step 3. [Step 2 RNO] |
| | | |
| | RO | Check Intact SG Levels: [Step 3] |
| | | • Narrow range level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT) [Step 3a] |
| | | • Control AFW flow to maintain narrow range level between 43% (50% FOR ADVERSE CONTAINMENT) and 60% [Step 3b] |
| | | |
| | RO | Check Secondary Radiation – NORMAL [Step 4]<br>• Condenser Off Gas radiation (COG-182, 1RE-2959)<br>• Main steamline radiation (MSL-178 through 181, 1RE-2325 through 2328)<br>• SG blowdown sample radiation monitor (SGS-164, 1RE-4200) |
| | | |

| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 31 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|

Event Description: Spurious Safety Injection Train B with a SBLOCA
Automatic Safety Injection Train A Failure
Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | **CAUTION:** If any PRZR PORV opens because of high PRZR pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint. |
| | | |
| | RO | Check PRZR PORVs and Block Valves: [Step 5] |
| | | • Power to block valves – AVAILABLE [Step 5a] |
| | | • PORVs – CLOSED [Step 5b] |
| | | • Block valves - AT LEAST ONE OPEN [Step 5c] |
| | | |
| | | **Examiner Note: The crew should go to step 7 based on subcooling < 25°F or RCS Pressure Lowering** |
| | | |
| | RO | Check If ECCS Flow Should Be Reduced: [Step 6] |
| | | • Secondary heat sink: [Step 6a] |
| | | • Total AFW flow to intact SGs - GREATER THAN 460 GPM<br>-OR<br>• Narrow range level in at least one intact SG - GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT) |
| | | • RCS subcooling - GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT) [Step 6b] |
| | | • RCS pressure - STABLE OR INCREASING [Step 6c] |
| | | • Go to Step 7. OBSERVE CAUTIONS PRIOR TO STEP 7. [Step 6 RNO] |
| | | |
| | | **CAUTION:** If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 32 | of | 40 | |
| Event Description: | Spurious Safety Injection Train B with a SBLOCA<br>Automatic Safety Injection Train A Failure<br>Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal | | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | CAUTION: When time permits, Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION should be performed to realign equipment after an SI signal has been reset. |
| | | |
| | RO | Reset ESF Actuation Signals: [Step 7] |
| | | Check diesel generator(s) – 1-01 RUNNING, 1-02 PULLOUT [Step 7a] |
| | | Place 1-01 D/G EMER STOP/START handswitch in START [Step 7b] |
| | | Reset SI. [Step 7c] |
| | | Reset SI sequencers. [Step 7d] |
| | | Reset Containment Isolation Phase A and Phase B. [Step 7e] |
| | | Reset containment spray signal. [Step 7f] |
| | | |
| | | CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) the RHR pumps must be manually restarted to supply water to the RCS. |
| | | |
| | RO | Check If RHR Pumps Should Be Stopped: [Step 8] |
| | | • Check RCS pressure: [Step 8a] |
| | | • RCS pressure - GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) |
| | | • RCS pressure – STABLE OR INCREASING |
| | | • RHR pumps - ANY RUNNING WITH SUCTION ALIGNED TO RWST [Step 8b] |
| | | • Stop RHR pump 1-01 and place in standby. [Step 8c] |
| | | • Reset RHR auto switchover. [Step 8d] |
| | | |
| | RO | Check RCS and SG Pressures: [Step 9] |

| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 33 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Spurious Safety Injection Train B with a SBLOCA<br>Automatic Safety Injection Train A Failure<br>Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Check RCS Pressure - STABLE OR DECREASING<br>-AND<br>• Check Pressure in All SGs - STABLE OR INCREASING |
| | | |
| | RO | Check If Diesel Generators Should Be Stopped: [Step 10] |
| | | • Verify AC safeguard busses - ENERGIZED BY OFFSITE POWER [Step 10a] |
| | | • Stop any unloaded diesel generator by placing DG EMER STOP/START handswitch in STOP. STOP EDG 1-01 [Step 10b] |
| | | |
| | | NOTE: Verification of at least one flowpath from a RHR pump to the RCS via a SI pump or CCP is sufficient to verify cold leg recirculation capability. |
| | | |
| | RO/BOP | Initiate Evaluation of Plant Status: [Step 11] |
| | | • Verify cold leg recirculation capability: [Step 11a] |
| | | • Verify the following conditions for the train related RHR pump(s): [Step 11a1] |
| | | • TRAIN A<br>• RHR pump A - AVAILABLE<br>• CCW to RHR pump A - AVAILABLE<br>• 1/1-8811A, CNTMT SMP TO RHRP 1 SUCT ISOL VLV - AVAILABLE<br>• TRAIN B<br>• RHR pump B – NOT AVAILABLE<br>• CCW to RHR pump B - AVAILABLE<br>• 1/1-8811B, CNTMT SMP TO RHRP 2 SUCT ISOL VLV - AVAILABLE |
| | | • Verify RHR valve(s) that supply SI pumps and CCPs – AVAILABLE [Step 11a2] |
| | | • 1/1-8804A, RHRP 1 TO CCP SUCT VLV<br>-AND-<br>• 1/1-8804B, RHRP 2 TO SIP SUCT VLV |
| | | • Check auxiliary building and safeguards building radiation – NORMAL [Step 11b] |
| | | • Check PC-11 monitors (GRID 4) - NORMAL<br>-OR<br>• Notify Radiation Protection to take local radiation surveys. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 1 | Event # | 6 and 7 | Page | 34 | of 40 |
| Event Description: | Spurious Safety Injection Train B with a SBLOCA<br>Automatic Safety Injection Train A Failure<br>Safety Injection Pump 1-01 Auto Start Failure on Safety Injection Signal | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Notify Chemistry to obtain RCS samples to assist in determining extent of the accident. [Step 11c] |
| | | • Evaluate plant equipment: [Step 11d] |
| | | • Consult Plant Staff to determine equipment that should be available or started to assist in recovery. |
| | | |
| | RO/BOP | Check If RCS Cooldown and Depressurization Is Required: [Step 12] |
| | | • RCS pressure - GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) |
| | | • Go to EOS-1.2A, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1. |

***Scenario will be terminated when the transition to EOS-1.2A is complete, or at Lead Examiner's discretion.***

**Simulator Operator: Ensure Delta I target value is reset for MOL on plant computer.**

| Operating Test: | NRC | Scenario # | 1 | Event # | N/A | Page | 35 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | EOP-0.0A Attachment 2 | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Examiner Note: These steps are performed by the BOP per EOP-0.0A, Attachment 2.** | | |
| | | |
| CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment. | | |
| | | |
| | BOP | VERIFY SSW Alignment: [1] |
| | | • VERIFY SSW Pumps – 1-01 RUNNING. [1.a] |
| | | • VERIFY EDG Cooler SSW Return Flow. [1.b] |
| | | |
| **CRITICAL TASK** | | **Manually start Safety Injection Pump 1-01 due to an automatic start failure on Safety Injection, prior to RVLIS 79" above Core Plate Light going DARK.** |
| | | |
| | BOP | VERIFY Safety Injection Pumps – NONE RUNNING. [2] |
| **CT-1** | | • Manually Start SIP 1-01 |
| | | |
| | BOP | VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [3] |
| | | |
| | BOP | VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [4] |
| | | |
| | BOP | VERIFY CCW Pumps – 1-01 RUNNING. [5] |
| | | |
| | BOP | VERIFY RHR Pumps – 1-01RUNNING. [6] |
| | | |
| | BOP | VERIFY Proper CVCS Alignment: [7] |
| | | • VERIFY CCPs – 1-01 RUNNING. [7.a] |
| | | • VERIFY Letdown Relief Valve Isolation: [7.b] |

| Operating Test: | NRC | Scenario # | 1 | Event # | N/A | Page | 36 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | EOP-0.0A Attachment 2 | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Letdown Orifice Isolation Valves – CLOSED. [7.b.1)] |
| | | • Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [7.b.2)] |
| | | |
| | BOP | VERIFY ECCS flow: [8] |
| | | • CCP SI flow indicator – CHECK FOR FLOW. [8.a] |
| | | • RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [8.b] |
| | | • SIP discharge flow indicator – CHECK FOR FLOW. [8.c] |
| | | • RCS pressure – LESS THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [8.d] |
| | | • GO to Step 9. [8.d.RNO] |
| | | |
| | BOP | VERIFY Feedwater Isolation Complete: [9] |
| | | • Feedwater Isolation Valves – CLOSED. |
| | | • Feedwater Isolation Bypass Valves – CLOSED. |
| | | • Feedwater Bypass Control Valves – CLOSED. |
| | | • Feedwater Control Valves – CLOSED. |
| | | |
| | BOP | VERIFY Diesel Generators – 1-01 RUNNING. [10] |
| | | |
| | BOP | VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB10 – LIT. [11] |
| | | |
| | | <u>NOTE</u>: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication. |
| | | |
| | BOP | VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [12] |
| | | |

| Operating Test: | NRC | Scenario # | 1 | Event # | N/A | Page | 37 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | EOP-0.0A Attachment 2 | | | | | | | | |

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

**NOTE:** Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

**NOTE:** When the SI sequencer has timed out,the Reactor Makeup Water Pump with its handswitch in Auto will restart.

| Time | Position | Applicant's Actions or Behavior | | | |
|---|---|---|---|---|---|
| | BOP | VERIFY Components on Table 1 are Properly Aligned. [13] | | | |
| | | Location | Equipment | Description | Condition |
| | | CB-03 | X-HS-5534 | H2 PRG SPLY FN 4 | STOPPED |
| | | CB-03 | X-HS-5532 | H2 PRG SPLY FN 3 | STOPPED |
| | | CB-04 | 1/1-8716A | RHRP 1 XTIE VLV | OPEN |
| | | CB-04 | 1/1-8716B | RHRP 2 XTIE VLV | OPEN |
| | | CB-06 | 1/1-8153 | XS LTDN ISOL VLV | CLOSED/ H.S. in CLOSED |
| | | CB-06 | 1/1-8154 | XS LTDN ISOL VLV | CLOSED/ H.S. in CLOSED |
| | | CB-07 | 1/1-RTBAL | RX TRIP BKR | OPEN |
| | | CB-07 | 1/1-RTBBL | RX TRIP BKR | OPEN |
| | | CB-07 | 1/1-BBAL | RX TRIP BYP BKR | OPEN/DEENERGIZED |
| | | CB-07 | 1/1-BBBL | RX TRIP BYP BKR | OPEN/DEENERGIZED |
| | | CB-08 | 1-HS-2397A | SG 1 BLDN HELB ISOL VLV | CLOSED |
| | | CB-08 | 1-HS-2398A | SG 2 BLDN HELB ISOL VLV | CLOSED |
| | | CB-08 | 1-HS-2399A | SG 3 BLDN HELB ISOL VLV | CLOSED |
| | | CB-08 | 1-HS-2400A | SG 4 BLDN HELB ISOL VLV | CLOSED |
| | | CB-08 | 1-HS-2111C | FWPT A TRIP | TRIPPED |
| | | CB-08 | 1-HS-2112C | FWPT B TRIP | TRIPPED |
| | | CB-09 | 1-HS-2490 | CNDS XFER PUMP | STOPPED (MCC deenergized on SI) |
| | | CV-01 | X-HS-6181 | PRI PLT SPLY FN 17 & INTK DMPR | STOPPED/DEENERGIZED |

| Operating Test: | NRC | Scenario # | 1 | Event # | N/A | Page | 38 | of | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | EOP-0.0A Attachment 2 | | | | | | | | |

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

| | | | | |
|---|---|---|---|---|
| | CV-01 | X-HS-6188 | PRI PLT SPLY FN 18 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6195 | PRI PLT SPLY FN 19 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6202 | PRI PLT SPLY FN 20 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6209 | PRI PLT SPLY FN 21 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6216 | PRI PLT SPLY FN 22 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6223 | PRI PLT SPLY FN 23 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6230 | PRI PLT SPLY FN 24 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-3631 | UPS & DISTR RM A/C FN 1 & BSTR FN 42 | STARTED |
| | CV-01 | X-HS-3632 | UPS & DISTR RM A/C FN 2 & BSTR FN 43 | STARTED |
| | CV-01 | 1-HS-5600 | ELEC AREA EXH FN 1 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5601 | ELEC AREA EXH FN 2 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5602 | MS & FW PIPE AREA EXH FN 3 & EXH DMPR | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5603 | MS & FW PIPE AREA EXH FN 4 & EXH DMPR | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5618 | MS & FW PIPE AREA SPLY FN 17 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5620 | MS & FW PIPE AREA SPLY FN 18 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5855 | CR EXH FN 1 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5856 | CR EXH FN 2 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5731 | SFP EXH FN 33 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5733 | SFP EXH FN 34 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5727 | SFP EXH FN 35 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5729 | SFP EXH FN 36 | STOPPED/DEENERGIZED |

**Examiner Note**: **The next four (4) steps would be performed on Unit 2.**

| | | | | | | |
|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 1 | Event # | N/A | Page 39 of 40 |
| Event Description: | EOP-0.0A Attachment 2 | | | | | |

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

| | | | | |
|---|---|---|---|---|
| | CB-03 | 2-HS-5538 | AIR PRG EXH ISOL DMPR | CLOSED |
| | CB-03 | 2-HS-5539 | AIR PRG EXH ISOL DMPR | CLOSED |
| | CB-03 | 2-HS-5537 | AIR PRG SPLY ISOL DMPR | CLOSED |
| | CB-03 | 2-HS-5536 | AIR PRG SPLY ISOL DMPR | CLOSED |

| | | |
|---|---|---|
| | BOP | NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required. |

***EOP-0.0A, Attachment 2 steps are now complete.***

```
;2021 NRC Scenario 1

;Initialize to IC-50
;2-3% Power, Plant S/U in progress per IPO-003A
;Section 5.1, Pre-Requisites marked off,
;Complete thru Step 5.1.16.

;Event 1 - Raise Power to 6%-8% per IPO-003A

;Event 2 - SSWP 1-02 Trips
IMF SW01B f:1 k:2

;Event 3 PT-507 fails low
IMF RX12 f:200 k:3

;Event 4 - PRZR Common Instrument Line Failure
IMF RX08A f:2110 r:120 k:4
IMF RX05A f:100 k:4
IMF RC12 f:3 r:600 k:4

;Event 5 - PRZR Leak ABN-103
{Key[5]!=0}IMF RC13 f:40 r:60
{DIRXLS459D.Value=2 && DIRXPS455F.Value=2}IMF RC13 f:40 r:60

;Event 6 – Spurious actuation Train B SI concurrent with a SBLOCA on the PRZR, Train A automatic SI
failure
IMF RP14B f:1 k:6
{Key[6]!=0} MMF RC12 f:100
{Key[6]!=0} MMF RC13 f:1000
{(Key[6]!=0) && (AORXPI456.Value < 2100)} DMF RX08A
IMF RP07A f:1

;Event 7 – SI Pump 1-01 Fails to Auto Start on SI
IMF SI04C f:1
```

Facility: CPNPP 1 & 2 Scenario No.: 3 Op Test No.: August 2021 NRC

Examiners: ____________ Operators: ____________

Initial Conditions: 100% power MOL – RCS Boron is 771 ppm (by sample). XST1 is out of service to place XST1A in service.

Turnover: Maintain steady-state power conditions. Pressurizer Steam Space Sample is in progress.

**Critical Tasks:**

**CT-1 – Restore Power to Bus 1EA2 in accordance with ECA-0.0A, Loss of All AC Power, prior to placing equipment in PULL-OUT per ECA-0.0A, Step 8.**

**CT-2 – Manually start RHR Pump 1-02, in accordance with EOP-0.0A, Reactor Trip or Safety Injection, Attachment 2, Safety Injection Actuation Alignment, OR EOP-1.0A, Loss of Reactor or Secondary Coolant, Attachment 1.A, Foldout for EOP-1.0A, due to an automatic start failure on Safety Injection, prior to completion of EOP-0.0A Attachment 2.**

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | ED07B | C (RO, BOP, SRO)<br>TS (SRO) | Loss of Inverter (IV1PC2) |
| 2 | ED05H | C (RO, BOP, SRO)<br>TS (SRO) | 86-1 LOR 6.9KV Safeguards Bus 1EA1 |
| 3 | LQY-553 | C (BOP, SRO)<br>TS (SRO) | SG 1-03 Level Transmitter LT-553 Oscillations |
| 4 | OVRDE | C (RO, SRO)<br>TS (SRO) | Letdown Isolation Valve (HV-8160) fails closed. |
| 5 | ED21A<br>ED21B | M (RO, BOP, SRO) | Loss of 345 KV East and West busses |
| 6 | EG15B | C (BOP, SRO) | EDG 1-01 out of service due to 86-1 LOR actions<br>EDG 1-02 Auto/Emergency Start failure, Norm Start Required |
| 7 | OVRD | C (RO, SRO) | Pressurizer Steam Space Sample Valves (1/1-4165A & 1/1-4176A) fail to auto close. Manual closure required |
| 8 | RC08A2 | M (RO, BOP, SRO) | LBLOCA occurs when DG 1-02 Normal Start is Performed |
| 9 | RH01D | C (BOP) | RHR Pump 1-02 fails to auto-start from sequencer |

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

| Actual | Target Quantitative Attributes |
|---|---|
| **9** | Total malfunctions (5-8) |
| **4** | Malfunctions after EOP entry (1-2) |
| **4** | Abnormal events (2-4) |
| **2** | Major transients (1-2) |
| **2** | EOPs entered/requiring substantive actions (1-2) |
| **1** | EOP contingencies requiring substantive actions (0-2) |
| **2** | Critical tasks (2-3) |

## SCENARIO 3 SUMMARY

The crew will assume the watch at 100% power per IPO-003A, Power Operations. XST1 is out of service to swap to XST1A. A Pressurizer Steam Space sample is in progress.

*** Event 1**
The first event is a loss of Inverter IV1PC2, crew actions are in accordance with ABN-603, Loss of a Protection or Instrument Bus, and include stabilizing the plant, restoring an alternate power source, and verification of instrument restoration. The SRO will refer to Technical Specification LCOs 3.8.7 and 3.8.9 (applicable during the loss and exited upon power restoration).

*** Event 2**
The next event is an 86-1 LOR resulting in a loss of 6.9 KV Safeguards Bus 1EA1. The crew will respond per ABN-602, Response to a 6900/480V System Malfunction. Actions include starting Centrifugal Charging Pump 1-02 and placing Emergency Diesel Generator 1-01 (without Station Service Water flow) in Pull-Out. Additionally, the crew will perform actions per ABN-602 to ensure necessary plant equipment is operating and affected equipment is placed in PULL OUT. The SRO will refer to Technical Specification LCOs 3.8.9 and 3.7.5.

*** Event 3**
The third event is an oscillation of SG 1-03 feedwater level transmitter LT-530 (controlling channel). The BOP will diagnose improper control response, place SG 1-03 Flow Control Valve controller 1-FK-530 in manual and control feedwater flow to restore SG 1-03 level to program. The crew will take the actions of ABN-710, Steam Generator Level Instrumentation Malfunction. The SRO will refer to Technical Specification LCOs 3.3.1 and 3.3.2.

*** Event 4**
The fourth event is a loss of Letdown due to Letdown Isolation Valve (HV-8160) failing closed. Actions are per ABN-105, Chemical and Volume Control System Malfunction, and require controlling Charging and Seal Injection flows until Letdown can be restored. The RO will be directed to place Excess Letdown in service. The SRO will refer to Technical Specification LCO 3.6.3.

*** Events 5, 6, 7**
The first major event is a loss of the 345 KV East & West busses resulting in a Loss of Offsite Power with Diesel Generator 1-01 previously out of service due to an 86-1 LOR on Safeguards Bus 1EA1. Diesel Generator 1-02 will fail to start automatically or Manually in Emergency; a Manual Normal start of DG 1-02 will be required in accordance with ECA-0.0A, Loss of All AC Power. The event is complicated by the Pressurizer Steam Space Sample in progress and the valves must be manually closed.

**** Events 8 & 9**
A LBLOCA will occur (delayed by 180 seconds) when DG 1-02 is manually (normal) started. RHR Pump1-02 fails to auto-start from the SI sequencer; it is a critical task to manually start the only available RHR Pump. Entries into both FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition and FRZ-0.1, Response to High Containment Pressure, will be required; however, the actions of these procedures will not be substantive.

***** - *On Lead Examiner's Cue*
****** - *Starts automatically*

**Termination Criteria**
This scenario is terminated when the crew has performed the actions of EOP-1.0, Loss of Reactor or Secondary Coolant, and determined a transition to EOS-1.3 A, Transfer to Cold Leg Recirculation is required OR if conditions are met to transfer to EOS-1.3A due to RWST level.

**Risk Significance:**

| | |
|---|---|
| • Failure of risk important system prior to trip: | Loss of Inverter IV1PC2<br>86-1 LOR on 1EA1<br>Loss of All AC Power |
| • Risk significant core damage sequence: | LOCA |
| • Risk significant operator actions: | Isolate RCS Leakage Paths<br>Restore Safeguards Bus 1EA2 |

**Critical Task Determination**

| Critical Task | Safety Significance | Cueing | Measurable Performance Indicators | Performance Feedback |
|---|---|---|---|---|
| | | | | |
| **CT-1** – Restore Power to Bus 1EA2 in accordance with ECA-0.0A, Loss of All AC Power, prior to placing equipment in PULL-OUT per ECA-0.0A, Step 8. | Recognize a failure or an incorrect automatic actuation of an ESF system or component resulting in degraded ECCS capacity. | Procedural direction at ECA-0.0A Step 5 to restore power via EDG 1-02 to Safeguard Bus 1EA2. Bus voltage indication and EDG parameters. | The operator will manually perform a normal start on EDG 1-02 using the handswitch on CB-11. | Indication of DG running and loading via bus voltage and frequency. |
| **CT-2** – Manually start RHR Pump 1-02, in accordance with EOP-0.0A, Reactor Trip or Safety Injection, Attachment 2, Safety Injection Actuation Alignment, OR EOP-1.0A, Loss of Reactor or Secondary Coolant, Attachment 1.A, Foldout for EOP-1.0A, due to an automatic start failure on Safety Injection, prior to completion of EOP-0.0A Attachment 2. | Recognize a failure of RHR Pump 1-02 to start and provide adequate injection capability/core cooling during LBLOCA conditions with Train A RHR Pump unavailable. | Procedurally driven from EOP-0.0A, Attachment 2 to provide makeup inventory to the RCS during accident conditions. | The operator will start RHR Pump 1-02 using the handswitch on CB-04. | Indication of pump start including light indication, flow and discharge pressure on CB-04. |
| **<u>NOTE:</u>** (Per NUREG-1021, Appendix D) If an operator or the Crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review. | | | | |

UNIT: 1

PART I TO BE PREPARED BY THE OFF-GOING UNIT SUPERVISOR.

1.0 SHIFT ACTIVITIES:

1.1 **Activities Completed This Shift:** None

1.2 **Activities In-Progress:** PRZR Steam Space sample is in progress
Aligning XST1A for service

1.3 **Planned Activities:** Continue work aligning XST1A for service (field activities)
Maintain 100% power

2.0 PLANT AND EQUIPMENT STATUS:

2.1 Technical Specification Related Equipment Summary:
TS 3.8.1.A – One required offsite circuit inoperable. SR 3.8.1.1 completed satisfactorily, next OPT-215 required in 7 hours. Currently 9 hours in to the 72 hour LCO

2.2 Non-Technical Specification Equipment Summary:
None

3.0 General Information: Maintain Steady State Conditions in accordance with IPO-003A, Power Operations. Diluted 60 gallons three times last shift.

4.0 END OF SHIFT REVIEW:

| | | | | | |
|---|---|---|---|---|---|
| LOGS – RO/BOP | X | LOGS-NEO | X | CLOSED eLCOARs ARCHIVED | X |
| OPTS COMPLETED | X | DAILY ACTIVITIES LIST | X | LCOARs REVIEWED | X |

PART II TO BE COMPLETED BY THE ON-COMING UNIT SUPERVISOR.

1.0 CRITICAL PARAMETERS:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MODE: | 1 | | REACTOR POWER: | 100% | | MWE: | 1265 |
| RCS TAVE: | 585 | °F | CONTROL ROD POSITION | 215 | ON BANK | D | |
| Cb: | 771 | ppm | RCS PRESS: | 2235 | psig | | |

- [X] Protected Train – Train A
- [X] Risk Assessment - GREEN
- [X] Unit 2 is in Mode 1 at 100% power
- [X] BAT $C_B$ = 7447 ppm

| | SIMULATOR OPERATOR INSTRUCTIONS for SIMULATOR SETUP | | | | |
|---|---|---|---|---|---|
| **INITIALIZE to IC-18 and LOAD 2021 NRC Simulator Scenario 3.<br>Ensure the PC11 is restarted after each scenario due to the loss of power.** | | | | | |
| **EVENT** | **TYPE** | **MALF #** | **DESCRIPTION** | **DEMAND VALUE** | **INITIATING PARAMETER** |
| 6 | IMF | EG15B | DG 1-02 Fails to Auto or Emergency Manual Start | f:1 | K0 |
| | | | | | |
| 7 | IOR | LOANMLB 1A2_1 | PSS Valve MLB Light 1-4165A | f:1 | K0 (1) |
| | IOR | LOANMLB 1B2_1 | PSS Valve MLB Light 1-4167A | f:1 | K0 (2) |
| | | | | | |
| 9 | IMF | RH01D | RHR Pump 1-02 Fails to Sequence on SI | f:1 | K0 |
| | | | | | |
| 1 | IMF | ED07B | Loss of Inverter (IV1PC2) | f:1 | K1 |
| 1 | IRF | EDR02 | Transfer 1PC2 to alternate power | f:0 | K10 |
| | | | | | |
| 2 | IMF | ED05H | 86-1 LOR 6.9KV Safeguards Bus 1EA1 | f:1 | K2 |
| 2 | IRF | EAR081 | De-energize Train A BO Sequencer | f:0 | K15 |
| 2 | IRF | EAR522 | De-energize Train A BO Sequencer | f:0 | K15 |
| 2 | IRF | CVR04 | RMUW Pump 1 | f:0 | K16 |
| 2 | IRF | CVR07 | Common RMUW Pump 1 | f:1 | K16 + 10 |
| 2 | IRF | CVR05 | CCP 1-01 Aux LO Pump to OFF | f:0 | K20 |
| 2 | IRF | CVR06 | CCP 1-02 Aux LO Pump to AUTO | f:1 | K21 |
| | | | | | |
| 3 | COND | - | SG 1-03 FCV (FCV-530) Oscillations | - | K3 (3) |
| | | | | | |
| 4 | IOR | DICVHS8160 | Letdown Isolation Valve (HV-8160) Fails Closed | f:0 | K4 |
| | | | | | |
| 5 | IMF | ED21A<br>ED21B | Loss of 345 KV East and West Busses | f:1 | K5 |
| | | | | | |
| 6 | IMF | EG15B | DG 1-02 Fails to Auto or Emergency Manual Start | f:1 | K0 |
| | | | | | |
| 7 | IOR | LOANMLB 1A2_1 | PSS Valve MLB Light 1-4165A | f:1 | K0 (1) |

| | | | | | |
|---|---|---|---|---|---|
| | IOR | LOANMLB 1B2_1 | PSS Valve MLB Light 1-4167A | f:1 | K0 (2) |
| | | | | | |
| 8 | IMF | RC08A2 | LBLOCA linked to 1-02 DG Normal Start Attempt {DIEG1DG2N.Value=3} | f:1 | (4) |
| | | | | | |
| 9 | IMF | RH01D | RHR Pump 1-02 Fails to Sequence on SI | f:1 | K0 |

1) Allow PSS Valve 4165A to close with HS – {DIWDHS4165A.Value=1} DOR LOANMLB1A2_1
2) Allow PSS Valve 4167A to close with HS – {DIWDHS4167A.Value=1} DOR LOANMLB1B2_1
3) Key 3 will run scn CPNPP 2021 NRC Simulator Scenario 3a
4) LBLOCA 180 seconds after DG 1-02 normal start - {DIEG1DG2N.Value=3} IMF RC08A2 f:1 d:180

| | |
|---|---|
| **Simulator Operator:** | **INITIALIZE to IC-18 and LOAD 2021 NRC Simulator Scenario 3**<br>**ENSURE all Simulator Annunciator Alarms are ACTIVE**<br>**ENSURE Yellow Caution Tag on 1EA1-2 and place in PULL-OUT**<br>**ENSURE Yellow Caution Tag on 1EA2-2 and place in PULL-OUT**<br>**ENSURE Yellow Caution Tag on MOAS 8085 and place in CENTER-AFTER-TRIP**<br>**ENSURE GEM covers installed on Handswitches per STI-600.01**<br>• **CS-1EG1, DG 1 BKR 1EG1**<br>• **CS-1DG1E, DG 1 EMERG STOP/START**<br>• **CS-1EG2, DG 2 BKR 1EG1**<br>• **CS-1DG2E, DG 2 EMERG STOP/START**<br>• **1-HS-2452-1, AFWPT STM SPLY VLV MSL 4**<br>• **1-HS-2452-2, AFWPT STM SPLY VLV MSL 1**<br>• **1-HS-4250A, SSWP 1**<br>• **1-HS-4251A, SSWP 2**<br>• **CS-1EA1-1 INCOMING BKR 1EA1-1**<br>• **CS-1EA2-1 INCOMING BKR 1EA2-1**<br>**ENSURE all Control Board Tags are removed**<br>**ENSURE Operator Aid Tags reflect current boron conditions (771 ppm)**<br>**ENSURE Rod Bank Update (RBU) is performed**<br>**ENSURE Turbine Load Rate set at 10 MWe/minute**<br>**ENSURE ASD speakers are ON to half volume**<br>**ENSURE Reactivity Briefing Sheet printout provided with Turnover**<br>**ENSURE procedures in progress are on SRO desk:**<br>- **COPY of IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load**<br>**ENSURE Control Rods are in AUTO with Bank D at 215 steps**<br>**ENSURE PC-11 is restarted between each scenario**<br>**ENSURE electronic LBDs are available on the Unit Supervisor computer** |

**Control Room Annunciators in Alarm:**

**PCIP-1.1 – SR TRN A RX TRIP BLK**
**PCIP-1.2 – IR TRN A RX TRIP BLK**
**PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9**
**PCIP-1.6 – RX ≥ 10% PWR P-10**
**PCIP-2.1 – SR TRN B RX TRIP BLK**
**PCIP-2.2 – IR TRN B RX TRIP BLK**
**PCIP-2.5 – SR RX TRIP BLK PERM P-6**
**PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK**
**PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK**
**1-SSII-1 – ALT OFFSITE POWER**
**1-SSII-2 – ALT OFFSITE POWER**
**X-ALB-14, 1.1 – 138KV XFMR XST1 TRBL**
**X-ALB-14, 3.2 – INCOMING 138 KV XFMR FDR VOLT LO**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operating Test: NRC | Scenario # 3 | Event # 1 | Page 9 of 51 | | | | |
| Event Description: Loss of Protection Inverter IV1PC2 | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator**: **When directed, execute Event 1 (Key 1) - ED07B, Loss of Protection Bus IV1PC2.** | | |
| **Indications Available:**<br>**10B-2.16 – 118V CHAN 2 INV TRBL**<br>**5A-1.3 – RC LOOP 1 1 OF 3 FLO LO**<br>**5A-2.3 – RC LOOP 2 1 OF 3 FLO LO**<br>**5A-3.3 – RC LOOP 3 1 OF 3 FLO LO**<br>**5A-4.3 – RC LOOP 4 1 OF 3 FLO LO**<br>**Protection Channel 2 Windows on TSLB 1 through 7 and 9 lit**<br>**Numerous Other Loss of Protection Bus 1PC2 (Channel 2) Alarms** | | |
| | | |
| | RO/BOP | RECOGNIZE loss of Protection Bus 1PC2. |
| | | |
| **Examiner Note**: **Primary side actions include controlling Pressurizer pressure and level due to a loss of Letdown.**<br>**Secondary side actions include controlling Steam Generator (SG) levels in SGs 1-02 and 1-03 when Main Feedwater Pump speed lowers.** | | |
| | | |
| | RO/BOP | Take actions to place affected controllers in manual and control parameters within normal control bands. |
| | | |
| | US | DIRECT performance of ABN-603, Loss of Protection or Instrument Bus, Section 2.0, Loss of Protection Bus |
| | | |
| **Examiner Note:** **The following steps are from ABN-603, Loss of Protection or Instrument Bus, Section 2.0, Loss of Protection Bus** | | |
| | | |
| **Simulator Operator**: **If contacted wait 1 minute and REPORT, IV1PC2 is de-energized and has an acrid odor. No indications of a fault on Bus 1PC2.** | | |
| | | |
| | US/RO | Verify loss of protection bus did NOT cause - REACTOR TRIP [Step 2.3.1] |
| | | |
| | US | Verify Unit in MODE 1, 2, 3, OR 4 [Step 2.3.2] |
| | | |
| NOTE: Step 3 is a continuous action step. | | |

| Operating Test: | NRC | Scenario # | 3 | Event # | 1 | Page | 10 | of | 51 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Loss of Protection Inverter IV1PC2 | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO/BOP | Manually CONTROL parameters to maintain OR restore to normal as follows: [Step 2.3.3] |
| | | |
| | | • Place 1/1-RBSS, CONTROL ROD BANK SELECT Switch in MANUAL [Step 2.3.3a] |
| | | |

| | | |
|---|---|---|
| **NOTE**: Step b. RNO should be performed for loss of uPC1 since HCV-182 is failed open. Alignment of charging to RCP seals only may be performed prior to this step and should be verified as part of step b. performance | | |
| | | |
| | RO | • VERIFY RCP seal injection – WITHIN NORMAL OPERATING RANGE. [Step 2.3.3b] |
| | | |
| | RO | • VERIFY Pressurizer level controlled – BETWEEN 25% AND 70%. [Step 2.3.3c] |
| | | • Place 1-FK-121, CCP CHG FLO CTRL, in Manual and adjust as necessary.<br>• 1-HC-182, RCP SEAL WTR PRESS CTRL 0% demand |
| | | |

| | | |
|---|---|---|
| **NOTE**: Step 3.d. RNO should be performed (pressurizer master controller in manual) if uPC1 is the lost bus. This will preclude potential PORV lift when the bus is re-energized. | | |
| | | |
| | RO | • VERIFY Pressurizer pressure within NORMAL OPERATING RANGE FOR CONDITIONS [Step 2.3.3d] |
| | | |
| | | • VERIFY Steam Generator levels being controlled – BETWEEN 60% AND 70%. [Step 2.3.3.e] |
| | | • MANUALLY control Steam Generator levels and Feed Pumps as necessary to maintain level. [Step 2.3.3.e RNO] |
| | | • PLACE 1-SK-509A, FWPT MASTER SPD CTRL in MANUAL. [Step 2.3.3.e RNO] |
| | | • PLACE 1-FK-520, SG 2 FW FLO CTRL in MANUAL and CONTROL SG 1-02 level. [Step 2.3.3.e RNO] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 1 | Page | 11 | of 51 |
| Event Description: | Loss of Protection Inverter IV1PC2 | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • PLACE 1-FK-530, SG 3 FW FLO CTRL in MANUAL and CONTROL SG 1-03 level. [Step 2.3.3.e RNO] |
| | | |
| | US | • GO TO Step 6 [Step 2.3.3f] |
| | | |
| CAUTION: Reenergizing the affected protection bus may cause instrumentation spikes on controlling channels which may in turn initiate unwanted actions. | | |
| | | |
| | US | VERIFY Unit – IN MODE 1 [Step 2.3.6] |
| | | |
| NOTE: Rod Control should remain in MANUAL until all Tave channels are operable. | | |
| | | |
| | RO | • Place control rods in MANUAL [Step 2.3.6a] |
| | RO | • Select LOOP 2 on 1-TS-412T, TAVE CHAN DEFEAT switch [Step 2.3.6b] |
| | | • DISPATCH an operator to REENERGIZE Protection Bus 1PC2. [Step 2.3.6.c] |
| | | |
| **Simulator Operator: When contacted to re-energize 1PC2, WAIT 1 minute then EXECUTE remote function EDR02 (Key 10) Transfer 1PC2 to the Alternate Power Supply. Report completion.** | | |
| | | |
| **Examiner Note: The following actions will be performed upon Bus 1PC2 restoration.** | | |
| | | |
| | | • VERIFY PCIP, Window 3.4 – TURB LOAD REJ STM DMP ARMED C-7 - ARMED. [Step 2.3.6.d] |
| | | • Select RESET on 43/1-SD, STM DMP MODE SELECT to reset C-7 |
| | | • RESTORE 1-TS-412T, $T_{AVE}$ CHAN DEFEAT Switch to the NONE Position. [Step 2.3.6.e] |
| | | |

| Operating Test: NRC | Scenario # 3 | Event # 1 | Page 12 of 51 |
|---|---|---|---|
| Event Description: | Loss of Protection Inverter IV1PC2 | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | CAUTION: To prevent rods from potentially stepping, allow a minimum of 2 minutes for Tavg circuitry to stabilize following manipulation of u-TS-412T before returning rod control to Auto. |
| | | |
| | US/RO | • PLACE 1/1-RBSS, CONTROL ROD BANK SELECT Switch in AUTO [Step 2.3.6f] |
| | US | • INVESTIGATE and INITIATE corrective action on loss of power to protection bus [Step 2.3.6g] |
| | | |
| | US | GO TO Step 9 [Step 2.3.7] |
| | | |
| | US | VERIFY Unit – IN MODE 1, 2, 3 OR 4 [Step 2.3.9] |
| | | |
| | US | CHECK status of affected control systems and instrumentation [Step 2.3.10] |
| | | |
| | BOP | • Using Attachments 1 AND 2, verify control functions AND instruments – REACTING NORMALLY TO SIGNALS: [Step 2.3.10a] |
| | | |
| | | • RESTORE Pressurizer Pressure Control to normal operation. [Step 2.3.10.a] |
| | | |
| | | • RESTORE Feedwater System to normal operation. [Step 2.3.10.a] |
| | | • PLACE 1-FK-520, SG 2 FW FLO CTRL in AUTO. |
| | | • PLACE 1-FK-530, SG 3 FW FLO CTRL in AUTO. |
| | | • PLACE 1-SK-509A, FWPT MASTER SPD CTRL in AUTO. |
| | | |
| | BOP | • Ensure the Power Range Flux Rate MODE Selectors –RESET [Step 2.3.10b] |
| | | • Power Range Flux Rate Mode Selector on Drawer N-42A and VERIFY Positive Rate Mode alarm light DARK. |
| | | |

| Operating Test: NRC | Scenario # 3 | Event # 1 | Page 13 of 51 |
|---|---|---|---|
| Event Description: Loss of Protection Inverter IV1PC2 | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO | • RESTORE Charging and Letdown: [Step 2.3.10c] |
| | | • RESTORE Letdown flow using ABN-105 or Control Board Job Aid. [Step 2.3.10.c.4)] |
| | | |
| **Examiner Note: The following steps are from the Job Aid to restore letdown.** | | |
| | | |
| | RO | a. ENSURE Letdown Isolation Valves – OPEN |
| | | • 1/1-LCV-459, LTDN ISOL VLV |
| | | • 1/1-LCV-460, LTDN ISOL VLV |
| | | b. ENSURE 1-PK-131, LTDN HX OUT PRESS CTRL in MANUAL and 30% (75 gpm) or 50% (120 gpm) DEMAND |
| | | c. ENSURE 1-TK-130, LTDN HX OUT TEMP CTRL in MANUAL and 50% DEMAND |
| | | d. ADJUST Charging to desired flow and MAINTAIN Seal Injection flow between 6 and 13 gpm |
| | | e. OPEN the desired Orifice Isolation Valves |
| | | • 1/1-8149A, LTDN ORIFICE ISOL VLV |
| | | • 1/1-8149B, LTDN ORIFICE ISOL VLV |
| | | • 1/1-8149C, LTDN ORIFICE ISOL VLV |
| | | f. ADJUST 1-PK-131, LTDN HX OUT PRESS CTRL to ~310 psig on 1-PI-131, LTDN HX OUT PRESS then PLACE in AUTO. |
| | | g. ADJUST 1-TK-130, LTDN HX OUT TEMP CTRL to obtain ~95ºF on 1-TI-130, LTDN HX OUT TEMP, then place in AUTO. |
| | | |
| **Examiner Note: The operator may take 1-LK-459, PRZR LVL CTRL in manual and adjust demand to current conditions to remove the integral from the controller prior to placing the controller in automatic.** | | |
| | | |
| | | • RESTORE Pressurizer Level Control to normal operation. [Step 2.3.10.a] |
| | | • PLACE 1-FK-121, CCP CHG FLO CTRL Valve in Auto when Pressurizer Level has been restored and plant conditions are stable |
| | | • PLACE 1-LK-459, PRZR LVL CTRL in Auto when Pressurizer Level has been restored and plant conditions are stable |
| | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 1 | Page | 14 | of 51 |
| Event Description: | Loss of Protection Inverter IV1PC2 | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | EVALUATE Technical Specifications. [Step 2.3.11] |
| | | • LCO 3.8.7.A, Inverters – Operating |
| | | • CONDITION A - One required inverter inoperable<br>• ACTION A.1 - Restore inverter to OPERABLE status within 24 hours |
| | | |
| **Examiner Note:** | | **LCO 3.8.9.B is entered when power is lost and exited when power is restored. After Control Rods have been returned to the pre-event position and placed in automatic control, Pressurizer Level Control may remain in MANUAL and the next event may be initiated. The crew should continue to monitor Pressurizer level and place in automatic control if necessary to maintain plant conditions.** |
| | | |
| | | • LCO 3.8.9.B, Distribution Systems - Operating |
| | | • CONDITION B - One AC vital bus subsystem inoperable<br>• ACTION B.1 - Restore AC vital bus subsystem to OPERABLE status within 2 hours |
| | | |
| **Examiner Note:** | | **When Pressurizer pressure decreases below 2220 psig with 4 Pressurizer pressure channels in service -OR- 2222 psig with 3 Pressurizer pressure channels in service LCO 3.4.1 will apply during the time pressure is low due to Pressurizer pressure being below the specified limit in the COLR.** |
| | | |
| | US | • LCO 3.4.1, RCS Pressure, Temperature, and Departure from Nucleate Boiling (DNB) Limits |
| | | • CONDITION A – One or more RCS DNB parameters not within limits.<br>• ACTION A.1 – Restore RCS DNB parameter(s) to within limit in 2 hours. |
| | | |
| | US | REFER to EPP-201 [Step 2.3.12] |
| | | |
| | US | Notify System Engineering to expedite trouble shooting and any needed repairs [Step 2.3.13] |
| | | |
| | US | Initiate a Condition Report per STA-421, if required [Step 2.3.14] |
| | | |
| ***When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 2.*** | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 2 | Page | 15 | of 51 |
| Event Description: | 86-1 LOR 6.9KV Safeguards Bus 1EA1 | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator:** | | **When directed, EXECUTE Event 2 (Key 2).<br>- ED05H, 86-1 LOR 6.9KV Safeguards Bus 1EA1** |
| **Indications Available:**<br>**10B-1.5 – 6.9 KV BUS 1EA1 LOR TRIP**<br>**10B-2.6 – 6.9 KV BUS 1EA1 / 1EA2 VOLT LOSS**<br>**10B-3.6 – 6.9 KV BUS 1EA1 / 1EA2 NOT PWRD FROM PREF OFFSITE PWR**<br>**10B-4.5 – 6.9 KV / 480 V ANY 1E SECOND LVL UNDERVOLT**<br>**Multiple Safeguards Bus Loss of Voltage alarms** | | |
| | | |
| | RO/BOP | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | RO/BOP | RECOGNIZE loss of Safeguards Bus 1EA1. |
| | | |
| | US | DIRECT performance of ABN-602, Response to a 6900/480V System Malfunction, Section 2.0, Safeguard 6.9 KV Bus Fault (Modes 1, 2, 3, and 4). |
| | | |
| **Examiner Note:** | | **The following steps are from ABN-602, Response to a 6900/480V System Malfunction, Section 2.0, Safeguard 6.9 KV Bus Fault (Modes 1, 2, 3, and 4).** |
| | | |
| **Examiner Note:** | | **Due to the loss of 1EA1, CCP 1-01 will lose power. CCP 1-02 does NOT have an Auto Start signal present. The US should direct the RO to manually start CCP 1-02 as it is an Initial Operator Action of ABN-105, Chemical and Volume Control System, Section 3.0, Charging Pump Trip. This ABN may NOT be executed at this specific time; however, the Initial Actions should be completed to ensure Charging Flow is re-initiated.** |
| | | |
| | RO | START Centrifugal Charging Pump 1-02.<br>• PLACE 1/1-APCH2, CCP 2 is START and VERIFY Charging flow on 1-FI-121A, CHRG FLO on CB-06 |
| | | |
| **Simulator Operator:** | | **When contacted to swap CCP Aux Lube Oil pumps wait 2 minutes, INSERT Key 20 to place CCP 1-01 Aux LO Pump to OFF. INSERT Key 21 to place CCP 1-02 Aux LO Pump to AUTO. Report completion.** |
| | | |

| Operating Test: NRC | Scenario # 3 | Event # 2 | Page 16 of 51 |
|---|---|---|---|
| Event Description: 86-1 LOR 6.9KV Safeguards Bus 1EA1 | | | |

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

CAUTION:

- Only ONE attempt to close a tripped breaker should be allowed; provided NO obvious equipment damage or fault is indicated. Further attempts should NOT be made until checked by Electrical Maintenance.
- When a 6.9 KV safeguard bus fault prevents running a SSWP, DG run time should be limited to approximately 15 minutes unloaded, 1 minute loaded to prevent damage due to loss of cooling.
- Following overcurrent or instantaneous overcurrent relay operations, the CTs should be checked by Meter & Relay for proper operation. (ONE 97-806)
- After approximately 120 seconds BOS Operator Lockout (OL) signal automatically resets, as indicated by associated BOS OL light OFF and RMUW pump restart when BOS has timed out. Should an OL not automatically reset, resetting the sequencer may correct the condition.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | Check Unit MODE – 1, 2, 3 OR 4 [Step 2.3.1]. |
| | BOP | Check 6.9 KV safeguard bus – AT LEAST ONE ENERGIZED [Step 2.3.2] |

CAUTION:

- If power is greater than 10%. MDAFW should be allowed to run until the sequencer times out. The pumps will be stopped in Section 8.0, if not required. DO NOT throttle AFW above 10% power.
- The AFWP flow control and isolation valves are required to be fully open when above 10% power per TS 3.7.5.

NOTE:

- An emergency start will allow DG breaker to automatically close on a phase to ground bus fault (LOR 86-2/uEA1 or 86-2/uEA2).
- DG breaker will not automatically or manually close when a phase to phase bus fault (LOR 86-1) is present.
- An Operator Lockout signal from Blackout Sequencer (BOS) opens TDAFWP steam supply valves. The BOS also starts associated train MDAFWP. It may be necessary to limit AFW flow to prevent excessive RCS cooldown, or other adverse condition. Placing the TDAFW Pump in PULL-OUT with one safeguards bus de-energized will result in two inoperable AFW Pumps per TS 3.7.5. Throttling any train of AFW above 10% power renders the train INOPERABLE.
- Attachment 4 contains steps to deenergize the sequencer if the bus will not be needed. This would restore common equipment available to the other unit (e.g CRACs, UPS).

| Operating Test: NRC | Scenario # 3 | Event # 2 | Page 17 of 51 |
|---|---|---|---|
| Event Description: 86-1 LOR 6.9KV Safeguards Bus 1EA1 | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| **Examiner Note: The TDAFWP will start when the Blackout Sequencer Operator Lockout is initiated. The crew may initiate a 50 MW load reduction to maintain power less than 100%.** | | |
| | | |
| **Simulator Operator: When contacted as FSS, to check out TDAFW Pump and Train B equipment, acknowledge request.** | | |
| | | |
| | BOP | Check 6.9 KV safeguards buses – BOTH ENERGIZED [Step 2.3.3] |
| | | • Perform the following:<br>• Maintain Reactor Power ≤ 100% [Step 2.3.3 RNO 1)] |
| | | |
| | | • IF adequate feed flow available, THEN place affected TDAFWP steam supply valve handswitch in AUTO after CLOSE if BOS OL cleared or PULL-OUT if BOS OL not clear [Step 2.3.3 RNO 2)] |
| | | |
| | US | DIRECT TDAFWP be secured by placing Steam Supply valve in PULL-OUT since BOS OLs will not clear (BOS will not actuate without power on the bus preventing Operator Lockouts from clearing). |
| | BOP | • PLACE 1-HS-2452-1, AFWPT STM SPLY VLV MSL 4 in PULL-OUT based on condition of BOS OL |
| | | |
| | | • IF power < 10%, THEN control AFW flow as necessary [Step 2.3.3 RNO 3)] |
| | | • Check for fault condition locally (86-1/86-2) [Step 2.3.3 RNO 4)] |
| | US | DISPATCH an operator to locally check for fault condition. |
| | | |
| NOTE: Step 3 RNO 6 should be performed for loss of a safeguards bus when the associated DG is not needed immediately. Placing the affected DG in PULL-OUT may be performed prior to this step and should be verified as part of Step 3 performance. | | |
| | | |
| **Simulator Operator: When contacted to investigate the cause of the bus loss, wait 2 minutes and REPORT an 86-1/1EA1 Lockout Relay is energized on 1EA1. There are no visible signs of damage.** | | |
| | | |

| | | | |
|---|---|---|---|
| Operating Test: NRC | Scenario # 3 | Event # 2 | Page 18 of 51 |
| Event Description: 86-1 LOR 6.9KV Safeguards Bus 1EA1 | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • IF bus needed immediately, THEN GO TO Step 4 [Step 2.3.3 RNO 5)] |
| | | • IF DG running AND SSW not available, THEN place the affected DG in PULL-OUT to shutdown the DG [Step 2.3.3 RNO 6)] |
| | US | DIRECT BOP operator to PLACE CS-1DG1E, DG 1 EMER STOP/START handswitch in PULL-OUT |
| | BOP | PLACE CS-1DG1E Emergency Diesel Generator 1-01 Control Switch in PULL OUT to shutdown the Diesel Generator. |

**<u>Examiner Note</u>: Event 3 may proceed after:**

- **1-02 CCP is started,**
- **TDAFWP is stopped, AND**
- **1-01 Diesel Generator is placed in PULL OUT**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | • IF bus lockout actuated AND bus NOT needed immediately, THEN restore affected bus per Attachment 4 AND GO TO Step 5 [Step 2.3.3 RNO 7)] |
| | US | INITIATE Attachment 4 to restore Safeguards Bus 1EA1. |

**<u>Simulator Operator</u>: Simulator is not modeled with breakers for BOS Sequencer. If operator goes to SI/BOS Sequencer Cabinet, inform crew unit 2 will complete actions to de-energize the Train A BOS.**
**When contacted to de-energize Train A BOS, wait 2 minutes and EXECUTE Key 15 to insert EAR081 and EAR522 to OFF**

**<u>Examiner Note</u>: The following two steps describe Control Room activities performed by the BOP per ABN-602 Attachment 4. The majority of Attachment 4 actions are performed locally.**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | De-energize BOS by opening the breaker in the bottom of the Sequencer Cabinet for the affected bus. [Attachment 4 Step 1] |
| | | Ensure affected bus supply breaker handswitches in PULL OUT:<br>• CS-1EA1-1 INCOMING BKR 1EA1-1<br>• CS-1EA1-2 INCOMING BKR 1EA1-2<br>• CS-uEG1 DG 1 BKR 1EG1 [Attachment 4 Step 2] |

| | | |
|---|---|---|
| | RO/BOP | MONITOR Blackout Sequencer status: [Step 2.3.5] |
| | | • Affected bus – ENERGIZED [Step 2.3.5.a] |
| | | • Ensure all affected equipment – PULL OUT (Use Attachment 4, Step 6 for guidance, if necessary) [Step 2.3.5.a RNO a] |
| | | • Component Cooling Water Pump 1-01. |
| | | • HVAC Chiller 1 – LOCAL. |
| | | • Motor Driven AFW Pump 1-01. |
| | | • Containment Spray Pumps 1-01 and 1-03. |
| | | • Residual Heat Removal Pump 1-01. |
| | | • Safety Injection Pump 1-01. |
| | | • Centrifugal Charging Pump 1-01. |
| | | • Station Service Water Pump 1-01. |
| | | • Transformer T1EB3 – NO PULLOUT position. |
| | | • Transformer T1EB1 – NO PULLOUT position. |

**<u>Examiner Note</u>: The crew may contact Unit 2 to align common equipment.**

| | | |
|---|---|---|
| | RO/BOP | • Monitor Blackout Sequencer – OPERATED [Step 2.3.5.b]<br>• OUTPUT-STEP TIME lights – ALL DARK<br>OR<br>• Automatic lockouts AL light - DARK |
| | RO/BOP | • Align necessary equipment to unaffected train, using Attachment 2 for guidance [Step 2.3.5.b RNO b] |
| | | • Component Cooling Water Pump 1-02. (Auto Start) |
| | | • CRDM Vent Fan 1-02. |
| | | • Station Service Water Pump 1-02. (Already running) |
| | | • Containment Fan Coolers 1-02 and 1-04. (Already running) |
| | | • Neutron Detector Well Fan Cooler 10. |
| | | • Chill Water Recirc Pumps 1-02 and 1-04. (1-01 and 1-04 Already running) |
| | | • CR A/C FN 3. |
| | | • Instrument Air Compressor 1-02. (Auto Start) |

| Operating Test: NRC | Scenario # 3 | Event # 2 | Page 20 of 51 |
|---|---|---|---|
| Event Description: 86-1 LOR 6.9KV Safeguards Bus 1EA1 | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • UPS & DISTR RM Fan A/C 2 (CV-01) (X-HS-3632) |
| | | • RMUWP X-01 |
| | | • Vent Chiller X-02 |
| | | |
| | RO/BOP | • Verify all required equipment actuated per Attachment 2 [Step 2.3.5.c] |
| | | |
| **Examiner Note**: **Step 2.3.5.d is Not Applicable since the Blackout Sequencer did not operate.** | | |
| | | |
| **Simulator Operator**: **As FSS, when dispatched to align RMUW Pump X-01 to Unit 1 and status of Vent Chiller X-01, wait 2 minutes, then Execute Key 16. REPORT Vent Chiller X-01 checked de-energized and RMUW pump X-01 aligned to Unit 1.** | | |
| | | |
| | | • Recover from blackout sequencer operation per Section 8 while continuing [Step 2.3.5.d] |
| | | |
| | US/BOP | Check 138 KV/345 KV voltages [Step 2.3.6]<br>• 138 KV, 135 – 144 KV<br>• 345 KV, 340 – 361 KV |
| | | |
| | US/BOP | Check 6.9 KV and 480V safeguard bus voltages [Step 2.3.7]<br>• 6.9 KV, 6480 – 7150V<br>• 480V, 455 – 508V |
| | | |
| | RO/BOP | Check all MCCs and loads restored to normal configuration [Step 2.3.8] |
| | | • Ensure SFP cooling in operation [Step 2.3.8.a] |
| | | |
| | US | DETERMINE LIMITING CONDITION FOR OPERATION (MODE 1, 2, 3, OR 4) [STEP 2.3.9] |

| Operating Test: NRC | Scenario # 3 | Event # 2 | Page 21 of 51 |
|---|---|---|---|
| Event Description: 86-1 LOR 6.9KV Safeguards Bus 1EA1 | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Check TS: [Step 2.3.9.a]<br>• 3.8.1 • 3.8.4<br>• 3.8.7 • 3.8.9<br>• 3.4.4 • 3.4.5<br>• 3.4.6 |
| | | |
| | | • LCO 3.8.9.A, Distribution Systems - Operating. |
| | | • CONDITION A - One AC electrical power distribution subsystem inoperable.<br>• ACTION A.1 - Restore AC electrical power distribution subsystem to OPERABLE status within 8 hours. |
| | | |
| | | • LCO 3.7.5.C, Auxiliary Feedwater (AFW) System. |
| | | • CONDITION C – Two AFW trains inoperable.<br>• ACTION C.1 – Be in MODE 3 within 6 hours.<br>AND<br>• ACTION C.2 – Be in MODE 4 within 18 hours. |
| | | |
| | US | Perform OPT-215 to complete within one hour, as applicable. [Step 2.3.9.b] |
| | | |
| | BOP | Reset CVI, if necessary [Step 2.3.10] |
| | | |
| | US | Check RV-5100 [Step 2.3.11] |
| | | |
| | US | Notify Chemistry to determine if release permit required for TDAFW operation [Step 2.3.12] |
| | | |
| | US | Refer to EPP-201 [Step 2.3.13] |
| | | |
| | US | Enter into issue reporting program IAW STA-421 [Step 2.3.14] |
| | | |

***When Technical Specifications have been addressed, or at Lead Examiner discretion, PROCEED to Event 3.***

| Operating Test: NRC | Scenario # 3 | Event # 3 | Page 22 of 51 |
|---|---|---|---|
| Event Description: SG 1-03 Level Transmitter LT-553 Oscillations | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator**: When directed, EXECUTE Event 3 (Key 3). SG 1-03 Level Transmitter LT-553 Oscillations | | |
| **Indications Available**:<br>**8A-3.6 – SG 3 LVL LO**<br>**8A-3.12 – SG 3 LVL DEV**<br>**8A-3.14 – SG 3 1 OF 4 LVL LO-LO**<br>**1-LI-553, SG 3 LVL (NR) CHAN II oscillating** | | |
| | | |
| | BOP | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | BOP | RECOGNIZE SG 3 level is fluctuating and take manual control of 1-FK-530 to restore SG 3 level to program. |
| | | |
| **Examiner Note**: The operator may also take actions to control 1-FK-530 per the guidance of ODA-102 or Operations Guideline 3 with concurrence from the Unit Supervisor and prior to entry into ABN-710. | | |
| | | |
| | US | DIRECT performance of ABN-710, Steam Generator Level Instrumentation Malfunction |
| | | |
| **Examiner Note**: The following steps are from ABN-710, Steam Generator Level Instrumentation Malfunction, Section 2.0, Steam Generator Level Instrumentation Malfunction. | | |
| | | |
| | US | VERIFY controlling level channel - FAILED. [Step 2.3.1] |
| | BOP | • Determined 1-LI-553, SG 3 LVL (NR) CHAN II is the controlling channel. |
| | | |
| | US | Manually CONTROL the following, as necessary to maintain SG – AT PROGRAMMED LEVEL [Step 2.3.2] |
| | BOP | • Takes manual control of 1-FK-530, SG 3 FW FLO CTRL |
| | | |
| | US/BOP | VERIFY instruments on common instrument line - NORMAL [Step 2.3.3] |
| | BOP | • VERIFIES Steam Flow transmitter FT-533 indicating normally. [ABN-710, Att. 1] |
| | | |

| Operating Test: NRC | Scenario # 3 | Event # 3 | Page 23 of 51 |
|---|---|---|---|
| Event Description: SG 1-03 Level Transmitter LT-553 Oscillations | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| CAUTION: [C] | | • Turbine Trip AND Feedwater Isolation will occur if 2 or more of the 3 HI-HI level bistables for the SAME steam generator are TRIPPED.<br>• IF preferred level control channel has failed (551, 552, 553, or 554) AND automatic steam generator water level control is restored using alternate level control channel, THEN Step 9 must be completed within 72 hours for required channel protection coincidence. |
| | | |
| | US | VERIFY ALL other HI-HI level bistable windows on TSLB-3 for affected SG – DARK [Step 2.3.4] |
| | | • OBSERVE TSLB-3, Window 1.4 – SG 3 LVL HI-HI LB-539A is DARK. |
| | | • OBSERVE TSLB-3, Window 3.4 – SG 3 LVL HI-HI LB-538A is DARK. |
| | | • OBSERVE TSLB-3, Window 4.4 – SG 3 LVL HI-HI LB-537A is DARK. |
| | | |
| NOTE: | | Preferred level control channel switch positions are LQY-551, 552, 553, and 554.<br>Alternate level control channel switch positions are LY-519, 529, 539, and 549.<br>IF an alternate level control channel that is selected for control has failed, THEN the preferred level control channel may be substituted for "alternate" in the following steps. |
| | | |
| | BOP | VERIFY automatic SG level control – DESIRED: [Step 2.3.5] |
| | | • OBSERVE alternate level control channel 1-LI-539A indication NORMAL. [Step 2.3.5.a] |
| | | • DETERMINE automatic level control desired by Unit Supervisor. [Step 2.3.5.b] |
| | | |
| **Examiner Note:** | | **The crew will place 1-FK-530 back in automatic, which will respond normally on the Alternate channel. The failure will cause level instrument 1-LI-553 to continue to oscillate erratically.** |
| | | |
| | BOP | SELECT Alternate Channel: [Step 2.3.6] |
| | | • PLACE 1-LS-539C, SG 3 LVL CHAN SELECT to the LY-539 position. |
| | | |

| Operating Test: NRC | Scenario # 3 | Event # 3 | Page 24 of 51 |
|---|---|---|---|
| Event Description: SG 1-03 Level Transmitter LT-553 Oscillations | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | VERIFY affected SG level is stable at program level: [Step 2.3.7] |
| | | • OBSERVE Feedwater and Steam flows – MATCHED. |
| | | • OBSERVE Steam Generator Level – STABLE AT PROGRAM. |
| | | |
| NOTE: There is a 15-20 sec lag for input from the alternate channel to be seen by the level control circuit. The level deviation alarm should clear or the operator should wait 15-20 seconds before placing the control valves in automatic after selecting the alternate channel. | | |
| | | |
| | BOP | PLACE 1-FK-530, SG 3 FW FLO CTRL in AUTO and MONITOR operation. [Step 2.3.8] |
| | BOP | • DETERMINED FCV-530 responding normally in automatic control. |
| | | |
| | US | REFER to Technical Specifications as necessary: [Step 2.3.11] |
| | | • LCO 3.3.1.E, Reactor Trip System Instrumentation.<br>(Function 14, Steam Generator Water Level Low-Low) |
| | | • CONDITION E - One channel inoperable.<br>• ACTION E.1 - Place channel in trip within 72 hours,<br>OR<br>• ACTION E.2 – Be in MODE 3 within 78 hours. |
| | | |
| | | • LCO 3.3.2.D, ESFAS Instrumentation. |
| | | • CONDITION D - One channel inoperable.<br>• ACTION D.1 - Place channel in trip within 72 hours,<br>OR<br>• ACTION D.2.1 – Be in MODE 3 within 78 hours<br>AND<br>• ACTION D.2.2 – Be in MODE 4 within 84 hours |
| | | |
| | | • LCO 3.3.2.I, ESFAS Instrumentation.<br>(Function 5.b, SG Water Level High-High P-14) |
| | | • CONDITION I - One channel inoperable.<br>• ACTION I.1 - Place channel in trip within 72 hours,<br>OR<br>• ACTION I.2 – Be in MODE 3 within 78 hours. |

| Operating Test: NRC | Scenario # 3 | Event # 3 | Page 25 of 51 |
|---|---|---|---|
| Event Description: SG 1-03 Level Transmitter LT-553 Oscillations | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | US | INITIATE a work request per STA-606. [Step 2.3.12] |
| | | |
| | US | Refer to TS 3.7.5 and 3.6.3 [Step 3] |
| | | |
| | US | INITIATE an issue report per STA-421. [Step 2.3.13] |
| | | |

***When Technical Specifications have been addressed, or at Lead Examiner discretion, PROCEED to Event 4.***

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 4 | Page | 26 | of | 51 |
| Event Description: | Letdown Isolation Valve (HV-8160) fails closed. Place Excess Letdown in Service | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator**: When directed, EXECUTE Event 4 (Key 4).<br>- OVERRIDE, Letdown Isolation Valve (HV-8160) fails closed. | | |
| **Indications Available**:<br>**6A-3.8 – CVCS HELB PS-5385A**<br>**6A-4.8 – CVCS HELB PS-5385**<br>**6A-4.3 – LTDN RLF VLV OUT TEMP HI** | | |
| | RO | RESPOND to Annunciator Alarm Procedures. |
| | RO | RECOGNIZE 1-HV-8160, Letdown Isolation Valve has failed closed. |
| | US | DIRECT performance of ABN-105, Chemical and Volume Control System Malfunction, Section 5.0, Loss of Letdown. |
| CAUTION: To avoid thermal shock of the reactor coolant piping, the letdown flow should not be stopped without also stopping the charging flow when the reactor coolant temperature is greater than 350°F. | | |
| | RO | VERIFY Pressurizer level instrumentation – ALL CHANNELS INDICATING APPROXIMATELY SAME LEVEL. [Step 5.3.1] |
| | RO | VERIFY PRZR Level > 17% [Step 5.3.2]. |
| **Examiner Note**: **The crew may immediately reduce Charging flow to RCP seals only as soon as it is determined Letdown Flow has been lost.**<br>**Event 5 may proceed after actions to reduce charging flow to RCP seals only are completed.** | | |
| | RO | VERIFY 1-FI-132, LTDN FLO > 0 gpm [Step 5.3.3] |
| | | • Simultaneously PERFORM the following to REDUCE charging flow to minimum for RCP seals: [Step 5.3.3 RNO] |

| Operating Test: NRC | Scenario # 3 | Event # 4 | Page 27 of 51 |
|---|---|---|---|
| Event Description: Letdown Isolation Valve (HV-8160) fails closed. Place Excess Letdown in Service | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Slowly manually LOWER 1-FK-121 CCP CHRG FLO CTRL to 32 gpm <u>WHILE</u><br>• Adjusting 1-HC-182, RCP SEAL WTR PRESS CTRL to MAINTAIN 6-13 gpm seal injection flow [Step 5.3.3 RNO] |
| | | |
| | RO | VERIFY 1-PK-131, LTDN HX OUT PRESS CTRL – MAINTAINING APPROXIMATELY 310 PSIG. [Step 5.3.4] |
| | | • Manually CONTROL 1-PK-131, LTDN HX OUT PRESS CTRL. [Step 5.3.4 RNO] |
| | | |
| **<u>Examiner Note</u>:** | | **Step 5.3.5.a RNO 1) requires the manual opening of 1/1-8160, LTDN CNTMT ISOL VLV. This valve is failed closed and will not open. Normal Letdown cannot be aligned. The US may skip to Step 5.3.5.a RNO 8) once it is determined Normal Letdown cannot be aligned** |
| | | |
| | RO | VERIFY Normal Letdown – IN SERVICE [Step 5.3.5.a] |
| | | • PERFORM the following: [Step 5.3.5.a RNO] |
| | | • Manually OPEN Letdown Isolation Valves: [Step 5.3.5.a RNO 1)]<br>• 1/1-LCV-460, LTDN ISOL VLV<br>• 1/1-LCV-459, LTDN ISOL VLV<br>• 1/1-8152, LTDN CNTMT ISOL VLV ORC<br>• 1/1-8160, LTDN CNTMT ISOL VLV IRC (Will NOT open) |
| | | • IF normal letdown can NOT be established, THEN GO TO Step 6. [Step 5.3.5.a RNO 8)] |
| | | |
| <u>NOTE</u>: | | Excess Letdown can <u>NOT</u> be used indefinitely. It should only be used while repairs are being made to normal Letdown flow path. |
| | | |
| | RO | ESTABLISH Excess Letdown: [Step 5.3.6] |
| | | • ENSURE at least ONE Charging Pump - RUNNING. [Step 5.3.6.a] |
| | | • Simultaneously PERFORM the following to REDUCE charging flow to minimum for RCP seals: [Step 5.3.6.b] |

| Operating Test: NRC | Scenario # 3 | Event # 4 | Page 28 of 51 |
|---|---|---|---|
| Event Description: Letdown Isolation Valve (HV-8160) fails closed. Place Excess Letdown in Service | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Slowly manually LOWER 1-FK-121 CCP CHRG FLO CTRL to 32 gpm WHILE<br>• Adjusting 1-HC-182, RCP SEAL WTR PRESS CTRL to MAINTAIN 6-13 gpm seal injection flow [Step 5.3.6.b] |
| | | • WHEN Charging Flow is stable at 32 gpm, THEN ENSURE 1-HC-182, RCP SEAL WTR PRESS CTRL – CLOSED [Step 5.3.6.c] |
| | | • ALIGN Excess Letdown for Operation per SOP-103A. [Step 5.3.6.d] |

**Examiner Note**: **The following steps are from SOP-103A, Chemical and Volume Control System, Section 5.5.3, Placing Excess Letdown in Service.**

CAUTION:
- When Excess Letdown flow is aligned to the top of the VCT, the potential exists to bypass the VCT, supplying non-degassed coolant through the Charging Pump Suction Vent Line to the Charging Pump suctions. Therefore, the Charging Pump Suction Vent Line is isolated prior to aligning Excess Letdown flow to the top of the VCT. Additionally, since no constant vent path is available in this line-up, a LCOAR is entered and monitoring of the Charging Pump Suction Vent Line initiated. Excess Letdown flow is normally aligned to the suction of the charging pumps.
- Excess Letdown should be aligned to the RCDT for ~10 minutes at full flow (HC-123 open) to equalize boron concentration in the Excess Letdown piping, to avoid an unplanned boration or dilution.

NOTE:
- IF Normal Letdown is NOT in service, THEN Excess Letdown can NOT be used indefinitely. It should only be used while repairs are made to normal Letdown Flowpath and during Plant heatup.
- While excess letdown is aligned to the suction of the charging pumps and pressurizer level is constant (charging and letdown flows are matched), the VCT may not outflow to the charging pump suction.
- If the RCS is being borated or diluted through the VCT, then excess letdown should be established to the RCDT per Step 5.5.3.D or to the VCT Auxiliary Spray nozzle per Step 5.5.3.I.

| Operating Test: NRC | Scenario # 3 | Event # 4 | Page 29 of 51 |
|---|---|---|---|
| Event Description: Letdown Isolation Valve (HV-8160) fails closed. Place Excess Letdown in Service | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator:** | | **As, Shift Manager, when contacted about the failure of 1-HV-8160, inform the crew to make preparations to align Excess Letdown to the top of the VCT.**<br>**As Radiation Protection, when contacted, inform the crew there are no personnel inside the Excess Letdown Heat Exchanger room.**<br>**As Engineering, when contacted, acknowledge that monitoring of the charging pump suction vent line will be required and you will start to get personnel on station and ready.**<br>**As Maintenance/QC, when contacted, acknowledge that monitoring of the charging pump suction vent line will be required and you will start to get personnel on station and ready.** |
| | | |
| | RO | PERFORM the following: [Step 5.5.3.A] |
| | | • CONTACT Radiation Protection to verify that personnel are NOT inside the Excess Letdown Heat Exchanger room prior to placing it in service. [Step 5.5.3.A.1)] |
| | | • IF Excess Letdown will be subsequently aligned to the VCT, THEN NOTIFY Engineering and Maintenance/QC that monitoring of the charging pump suction vent line as directed by the engineer will be required per step 5.5.3.I. [Step 5.5.3.A.2)] |
| | | |
| | RO | ENSURE that the following CCW valves are OPEN AND SUPPLYING flow to the Excess Letdown Heat Exchanger (CB-03). [Step 5.5.3.B] |
| | | • 1-HS-4710, XS LTDN/RCDT HX CCW SPLY ISOL VLV<br>• 1-HS-4711, XS LTDN/RCDT HX CCW RET ISOL VLV<br>• 1-FI-4703, XS LTDN HX CCW RET FLO |
| | | |
| NOTE: | | • The following step is performed to ensure that boron concentration in the Excess Letdown lines does not cause an inadvertent boration or dilution of the RCS when it is placed in service to the VCT.<br>• Full flow (1-HC-123 fully open) should be diverted to the RCDT for at least 10 minutes prior to directing it to the VCT. IF full flow is not possible due to temperature limits, THEN the flush should be extended to at least 30 minutes. |
| | | |
| | RO | PLACE 1/1-8143, XS LTDN DIVERT VLV in RCDT. [Step 5.5.3.C] |
| | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 4 | Page | 30 of 51 |
| Event Description: | Letdown Isolation Valve (HV-8160) fails closed. Place Excess Letdown in Service | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO | OPEN the loop isolation valves to the excess letdown heat exchanger. [Step 5.5.3.D] |
| | | • 1/1-8153, XS LTDN ISOL VLV<br>• 1/1-8154, XS LTDN ISOL VLV |
| | | |
| **Examiner Note:** | | **Full flow flush to the RCDT will not be possible due to temperature limitations. The RO should be able to open 1-HC-123 approximately 12% without exceeding temperature limits. A 30-minute flush will then be required.** |
| | | |

CAUTION: Operator experience has shown that fully opening 1-HC-123 at NOP/NOT will cause flashing and/or lifting of the relief valve. To avoid flashing at NOP/NOT, 1-HC-123 should be opened only enough to establish Excess Letdown Flow while maintaining Excess Letdown Temperature less than or equal to 175 degrees as read on 1-TI-122. At NOP/NOT, 1-HC-123 may only be able to be throttled to 10-12% to avoid flashing.

NOTE: Establishing flow to the RCDT slowly will give 1/u-LCV-1003, RCDT LVL CTRL ISOL VLV a chance to respond. This will prevent RCDT level from going too high and possibly prevent receiving the RCDT HI Pressure and HI Vent Pressure alarms.

| | | |
|---|---|---|
| | RO | SLOWLY THROTTLE OPEN 1-HC-123, XS LTDN HX FLO CTRL to prevent thermal shock to the excess letdown heat exchanger, WHILE MONITORING the following: [Step 5.5.3.E] |
| | | • MONITOR 1-TI-0122, XS LTDN HX OUT TEMP (CB-06) to ENSURE remains < 175°F.<br>• MONITOR computer point L1003A, RCDT LVL to ENSURE remains approximately 40%. |
| | | |
| | RO | ENSURE seal injection flow is between 6-10 gpm per RCP. [Step 5.5.3.F] |
| | | • 1-FI-145, RCP 1 SEAL WTR INJ FLO<br>• 1-FI-144, RCP 2 SEAL WTR INJ FLO<br>• 1-FI-143, RCP 3 SEAL WTR INJ FLO<br>• 1-FI-142, RCP 4 SEAL WTR INJ FLO |
| | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operating Test: NRC | Scenario # 3 | Event # 4 | | Page 31 | of 51 | | |
| Event Description: | Letdown Isolation Valve (HV-8160) fails closed. Place Excess Letdown in Service | | | | | | |
| Time | Position | Applicant's Actions or Behavior | | | | | |

<u>NOTE</u>: Full flow (1-HC-123 fully open) should be diverted to the RCDT for at least 10 minutes prior to directing it to the VCT. <u>IF</u> full flow is not possible due to temperature limits, <u>THEN</u> the flush should be extended to at least 30 minutes.

**<u>Examiner Note</u>:** **When the crew has stabilized Excess Letdown Heat Exchanger Outlet Temperature and RCDT Level while performing the flush, the intent of the scenario is to move on to the first major event as a 30-minute flush of the excess letdown lines will be required to equalize boron concentration with the RCS.**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | ENSURE flush time COMPLETE. [Step 5.5.3.G] |

**<u>Examiner Note</u>:** **The US should refer to ODA-308-3.6.3-S01 page 2 to determine the Letdown line is containment penetration with 2 CIVs (page 2 of attachment).**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | Evaluate Technical Specifications |
| | | • LCO 3.6.3, Containment Isolation Valves. |
| | | • CONDITION A - One or more penetration flow paths with one containment isolation valve inoperable except for containment purge, hydrogen purge or containment pressure relief valve leakage not within limit.<br>• ACTION A.1 - Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured within 4 hours.<br>AND<br>• ACTION A.2 – Verify the affected penetration flow path is isolated prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment. |

***When Charging Flow has been reduced to RCP Seals ONLY, or at Lead Examiner discretion, PROCEED to Events 5, 6, 7 & 8.***

| Operating Test: NRC | Scenario # 3 | Event # 5, 6, 7, 8 | Page 32 of 51 |
|---|---|---|---|
| Event Description: | Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed. | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator:** | | **When directed, EXECUTE Events 5, 6, 7 and 8 (Key 5).**<br>**- ED21A, Loss of 345 KV East bus.**<br>**- ED21B, Loss of 345 KV West bus**<br>**- EG15B, DG 1-02 fails to auto-start**<br>**- OVRD, Pressurizer Steam Space Sample Valves fail to Auto Close.**<br>**- RC08A2, LBLOCA** |
| **Indications available:**<br>**Numerous Reactor Trip and Loss of Offsite Power Alarms.** | | |
| | | |
| | RO/BOP | RECOGNIZE Reactor Trip due to Loss of Offsite Power. |
| | | |
| | US | DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection or ECA- 0.0A, Loss of All AC Power. |
| | | |
| **Simulator Operator:** | | **When Unit 1 trips, Announce Unit 2 Reactor Trip.** |
| | | |
| **Examiner Note:** | | **Crew may recognize a Loss of All AC Power event in progress and immediately enter ECA-0.0A, Loss of All AC Power as opposed to EOP-0.0A, Reactor Trip or Safety Injection.** |
| | | |
| **Examiner Note:** | | **EOP-0.0A, Reactor Trip or Safety Injection steps begin here.** |
| | | |
| | RO | VERIFY Reactor Trip: [Step 1] |
| | | • VERIFY the following: [Step 1.a] |
| | | • VERIFY Reactor Trip Breakers – OPEN. |
| | | • VERIFY Neutron flux – DECREASING. |
| | | • VERIFY all Control Rod Position Rod Bottom Lights – DARK. [Step 1.b] |
| | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 33 | of | 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | **Examiner Note:** **All DRPI indication will be lost due to the Loss of Offsite Power. The crew will be required to Emergency Borate 3600 gallons of 7000 ppm boric acid for a Loss of DRPI if verification of "All Rod Bottom Lights – ON" is not made prior to the loss of DRPI. However, until power is restored to Bus 1EA2 via DG 1-02 the crew will be unable to start a CCP to initiate Emergency Boration. After DG 1-02 is powering 1EA2 a LBLOCA will occur and the crew should verify Emergency Boration via SI flow in accordance with ABN-107, Attachment 4.** |
| | | |
| | BOP | VERIFY Turbine Trip: [Step 2] |
| | | • VERIFY all HP Turbine Stop Valves – CLOSED. [Step 2] |
| | | |
| | BOP | VERIFY Power to AC Safeguards Buses: [Step 3] |
| | | • VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a] |
| | | • GO to ECA-0.0A, Loss of All AC Power, Step 1. [Step 3.a RNO a] |
| | | |
| | | **Examiner Note:** **ECA-0.0A, Loss of All AC Power steps begin here. Power will not be available to Train B components throughout the remainder of the scenario.** |
| | | |
| | | NOTE: CSF Status Trees should be monitored for information only. FRGs should not be implemented. |
| | | |
| | RO | VERIFY Reactor Trip: [Step 1] |
| | | • VERIFY Reactor Trip Breakers – AT LEAST ONE OPEN. |
| | | • VERIFY Neutron flux – DECREASING. |
| | | |
| | BOP | VERIFY Turbine Trip: [Step 2] |
| | | • VERIFY all HP Turbine Stop Valves – CLOSED. |
| | | |
| | RO | CHECK If RCS Is Isolated: [Step 3] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 34 | of | 51 |
| Event Description: | Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed. | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO | • CHECK Letdown Isolation Valves – CLOSED. [Step 3.a] |
| | | • 1/1-LCV-459 and 1/1-LCV-460 |
| | | |
| **Examiner Note:** | | **The Letdown Isolation Valves are interlocked with the Letdown Orifice Isolation Valves. The Letdown Isolation Valves cannot be closed until the Letdown Orifice Isolation Valves are closed.** |
| | | |
| | RO | • CLOSE Letdown Isolation Valves. [Step 3.a RNO] |
| | | • PLACE 1/1-LCV-459 and 1/1-LCV-460, Letdown Isolation Valve in CLOSE. [Step 3.a RNO] |
| | RO | • CHECK Pressurizer Power Operated Relief Valves – CLOSED. [Step 3.b] |
| | | • CHECK Excess Letdown Isolation Valves – CLOSED. [Step 3.c] |
| | | • 1/1-8153 and 1/1-8154 |
| | RO | • CLOSE Excess Letdown Isolation Valves [Step 3.c RNO] |
| | | • PLACE 1/1-8153 and 1/1-8154, XS LTDN ISOL VLV in CLOSE |
| | | • CHECK Primary Sample System Isolation Valves – CLOSED. [Step 3.d] |
| | | • 1/1-4165A and 1/1-4167A |
| | RO | • CLOSE Primary Sample System Isolation Valves. [Step 3.d RNO] |
| | | • PLACE 1-HS-4165A and 1-HS-4167A, Primary Sample System Isolation Valves in CLOSE. [Step 3.d RNO] |
| | | |
| | RO/BOP | VERIFY AFW Flow – GREATER THAN 460 GPM: [Step 4] |
| | | |
| **CRITICAL TASK STATEMENT** | | **Restore Power to Bus 1EA2 in accordance with ECA-0.0A, Loss of All AC Power, prior to placing equipment in PULL-OUT per ECA-0.0A, Step 8.** |
| | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 35 | of | 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Examiner Note:** | | **ECA-0.0A does not specify the order that power restoration to the AC Safeguards busses is performed. The crew will start DG 1-02 first, and should not attempt to start DG 1-01 due to the 86-1 LOR on 1EA1.** |
| | | |
| | US | RESTORE Power to Any AC Safeguards Bus: [Step 5] |
| | BOP | • ENERGIZE selected AC Safeguards Bus with Diesel Generator. [Step 5.a] |
| | | • VERIFY Diesel Generator 1-02 – NOT RUNNING. [Step 5.a.1)] |
| | | • Start Diesel Generator 1-02 As Follows: [Step 5.a. RNO 1)] |
| | | • Perform an Emergency Start. [Step 5.a.1) RNO 1)A)] |
| **CT-1** | | • IF the diesel generator is NOT running, THEN perform a Normal Start. [Step 5.a.1) RNO 1)B)] |
| | | • Check Selected Diesel Generator 1-02 Output Breaker CLOSED [Step 5.a.2)] |
| | US | • ENERGIZE remaining AC Safeguards Bus with Diesel Generator 1-01. [Step 5.b] |
| | BOP | • DETERMINE Diesel Generator 1-01 – NOT RUNNING. (Crew should not attempt to start DG 1-01 due to the 86-1 LOR on 1EA1) [Step 5.b.1)] |
| | | • VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 5.c] |
| | US | • Return to procedure and step in effect AND implement FRGs as necessary. [Step 5.d] |
| | | |
| **Examiner Note:** | | **180 Seconds after the Normal Stop/Start handswitch of DG 1-02 has been placed in START, a LBLOCA will occur. An automatic Safety Injection will occur. Critical Safety Function Status Tree Orange Paths will exist sometime after the LBLOCA occurs on Integrity and Containment. The crew should implement these FRGs after the transition to EOP-1.0A has been made AND EOP-0.0A, Attachment 2 is complete.** |
| | | |
| **Examiner Note:** | | **The following steps are from EOP-0.0A, Reactor Trip or Safety Injection.** |
| | | |

| | | | |
|---|---|---|---|
| Operating Test: NRC | Scenario # 3 | Event # 5, 6, 7, 8 | Page 36 of 51 |
| Event Description: | Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed. | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | Crew will transition back to EOP-0.0A, Reactor Trip or Safety Injection, Step 1, if a direct entry to ECA-0.0A was made, or step 3 if the crew performed the first two steps of EOP-0.0A |
| | | |
| | RO | VERIFY Reactor Trip: [Step 1] |
| | | • VERIFY the following: [Step 1.a] |
| | | • Reactor Trip Breakers – AT LEAST ONE OPEN<br>AND<br>• Neutron flux – DECREASING |
| | | • All Control Rod Position Rod Bottom Lights – ON. (DRPI is de-energized) [Step 1.b] |
| | | |
| | BOP | VERIFY Turbine Trip: [Step 2] |
| | | • All HP Turbine Stop Valves – CLOSED. |
| | | |
| | BOP | VERIFY Power to AC Safeguards Buses: [Step 3] |
| | | • VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a] |
| | | • VERIFY both AC Safeguards Buses – BOTH ENERGIZED. [Step 3.b] |
| | | • RESTORE power to de-energized AC safeguards bus per ABN-601, Response to a 138/345 KV System Malfunction or ABN-602, Response to a 6900/480 Volt System Malfunction when time permits [Step 3.b RNO b] |
| | | |
| **Examiner Note:** | | **The US may contact the SM to request personnel to perform appropriate ABN for loss of power; however, with only 3 personnel the crew will NOT perform the ABN.** |
| | | |
| **Simulator Operator:** | | **When/If contacted for extra personnel to perform the ABN-601/602 acknowledge the request as the SM.** |
| | | |
| | | CHECK SI Status: [Step 4] |
| | | • CHECK if SI is actuated. [Step 4.a] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 37 | of | 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • SI ACTUATED as indicated on the First Out Annunciator 1-ALB-6C |
| | | • SI ACTUATED blue status light – DARK (PCIP is de-energized) |
| | | • VERIFY Both Trains SI Actuated: [Step 4.b] |
| | | • SI ACTUATED blue status light – DARK (PCIP is de-energized) |
| | | • RWST Auto Swapover lights LIT (Alternate indication, however Train A is de-energized) |

CAUTION: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation.

NOTE: Attachment 2 is required to be completed before FRGs are implemented unless directed by this procedure.

**Examiner Note: The following steps are from ABN-107, Attachment 4, Transfer of Charging Pump Suction to the RWST and the Job Aid for verifying Emergency Boration via SI flow.**

**Examiner Note: Verification that either 1/1-LCV-112D or 1/1-LCV-112E is open satisfies the requirement for providing a flow path from the RWST to the charging pump suction. Due to single train availability, RWST flow path will be from 1/1-LCV-112E only.**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO/BOP | IF Safety Injection actuated (1/1-LCV-112D OR 1/1-LCV-112E OPEN), THEN perform the following steps: [Step 1] |
| | | • VERIFY ONE of the following valves are OPEN: [Step 1.a]<br>• 1/1-LCV-112D, RWST TO CHRG PMP SUCT VLV (De-energized)<br>OR<br>• 1/1-LCV-112E, RWST TO CHRG PMP SUCT VLV |

| | | | | |
|---|---|---|---|---|
| Operating Test: NRC | Scenario # 3 | Event # 5, 6, 7, 8 | Page 38 | of 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | **Examiner Note:** **Verification that either 1/1-LCV-112B or 1/1-LCV-112C is closed satisfies the requirement for isolation of the flow path from the VCT to the charging pump suction. Both valves are not required.** |
| | | • VERIFY the following valves CLOSED: [Step 1.b]<br>• 1/1-LCV-112B, VCT TO CHRG PUMP SUCT VLV (De-energized)<br>AND<br>• 1/1-LCV-112C, VCT TO CHRG PUMP SUCT VLV |
| | | • VERIFY at least ONE CCP running: [Step 1.c]<br>• 1/1-APCH1, CCP 1 (De-energized)<br>• 1/1-APCH2, CCP 2 (Automatically started on the BO Sequencer) |
| | | • VERIFY 1-FI-917, CCP SI FLOW indication [Step 1.d] |
| | | • IF CCP SI FLOW can NOT be verified, THEN initiate Emergency Boration Flow per another method of ABN-107 [Step 1.e] |
| | | NOTE: TDM-201A/B provides equivalency values for boration from 2400 ppm source and a 7000 ppm source. A conservative approach is to borate the entire volume required for the condition from the 7000 ppm source once boration flow from the 2400 ppm source is terminated. |
| | RO/BOP | • WHEN the RWST is isolated (1/1-LCV-112D AND 1/1-LCV-112E CLOSED) per the applicable ERG, THEN initiate Emergency Boration Flow per another method of ABN-107 until the desired amount of boration volume is injected. (Reference Attachment 7 of ABN-107) |
| | | **Examiner Note:** **The following steps are a continuation of EOP-0.0A, Reactor Trip or Safety Injection.**<br>**EOP-0.0A, Attachment 2 steps, performed by BOP, begin on Page 50.** |
| | US/BOP | INITIATE Proper Safeguards Equipment Operation Per Attachment 2. [Step 5] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 39 | of | 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | RO | VERIFY AFW Alignment: [Step *6] |
| | | • MDAFW Pump 1-02 – RUNNING. [Step 6.a] |
| | | • TDAFW Pump –RUNNING. [Step 6.b] |
| | | • AFW total flow – GREATER THAN 460 GPM. [Step 6.c] |
| | | • AFW valve alignment - PROPER ALIGNMENT. [Step 6.d] |
| | | |
| | RO | VERIFY Containment Spray NOT Required: [Step *7] |
| | | • VERIFY Containment pressure – HAS REMAINED LESS THAN 18.0 PSIG. [Step 7.a] |
| | | • 1-ALB-2B, Window 1.8 – CS ACT – ILLUMINATED (Flashing due to Train A de-energized) |
| | | • 1-ALB-2B, Window 4.11 – CNTMT ISOL PHASE B ACT – ILLUMINATED (Flashing due to Train A de-energized) |
| | | • Containment pressure – GREATER THAN 18.0 PSIG. |
| | | • PERFORM the following: [Step 7.a RNO a] |
| | | • VERIFY Containment Spray for Train A AND Phase B Actuation initiated. IF NOT, THEN manually actuate [Step 7.a RNO a.1)] |
| | | • VERIFY appropriate MLB indication for CNTMT SPRAY (BLUE WINDOWS) AND PHASE B (ORANGE WINDOWS) [Step 7.a RNO a.2)] (All Train B lights will be energized; Train A will be incomplete due to power loss) |
| | | • VERIFY Train B Containment Spray flow [Step 7.a RNO a.3)] |
| | | • ENSURE Train B CHEM ADD TK DISCH VLVs – OPEN [Step 7.a RNO a.4)] |
| | | • STOP all RCPs [Step 7.a RNO a.5)] |
| | | • Go to Step 8 [Step 7.a RNO a.6)] |
| | | |
| | RO | CHECK if Main Steam lines should be ISOLATED: [Step *8] |
| | | • VERIFY the following: [Step 8.a] |
| | | • Containment pressure – GREATER THAN 6.0 PSIG. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 40 | of 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Main Steam Line pressure – LESS THAN 610 PSIG. |
| | | • VERIFY main steamline isolation complete: [Step 8.b] |
| | | • Main Steam isolation valves |
| | | • Before MSIV drippot isolation valves |
| | | |
| | RO | CHECK RCS Temperature: [Step *9] |
| | | • VERIFY RCS Average Temperature – STABLE AT OR TRENDING TO 557°F. [Step 9] |
| | | • <u>IF</u> temperature less than 557ºF and decreasing, <u>THEN</u> perform the following: [Step 9 RNO] |
| | | • Stop dumping steam [Step 9 RNO a.] |
| | | • <u>IF</u> cooldown continues, <u>THEN</u> reduce total AFW flow as necessary to minimize the cooldown: [Step 9 RNO b.]<br>• Maintaining a minimum of 460 gpm UNTIL narrow range level greater than 43% (50% FOR ADVERSE CONTAINMENT) in at least one SG.<br>• As necessary to maintain SG levels WHEN narrow range level greater than 43% (50% FOR ADVERSE CONTAINMENT) in at least one SG.<br>• IF TDAFW pump is not required to maintain greater than 460 gpm flow, THEN stop TDAFW pump (TDAFWP is required). |
| | | |
| | RO | CHECK PRZR Valve Status: [Step 10] |
| | | • VERIFY PRZR Safeties – CLOSED. [Step 10.a] |
| | | • VERIFY Normal PRZR Spray Valves – CLOSED. [Step 10.b] |
| | | • VERIFY PORVs – CLOSED. [Step 10.c] |
| | | • VERIFY Power to at least 1 Block Valve – AVAILABLE. [Step 10.d] |
| | | • VERIFY Block Valves – AT LEAST ONE OPEN. [Step 10.e] |
| | | • 1/1-8000B open with power available and 1/1-8000A OPEN with NO power |
| | | |
| | RO | CHECK if RCPs Should Be Stopped: [Step 11] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 41 | of | 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • All RCPs are de-energized |
| | | • GO to Step 12. [Step 11.a RNO a] |
| | | |
| | RO/BOP | CHECK if Any Steam Generator Is Faulted: [Step 12] |
| | | • CHECK pressures in all SGs: [Step 12.a] |
| | | • Any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. |
| | | • Any Steam Generator pressure – COMPLETELY DEPRESSURIZED. |
| | | • GO to Step 13. [Step 12.a RNO a] |
| | | |
| | RO/BOP | CHECK if Steam Generator Tubes Are NOT Ruptured: [Step 13] |
| | | • Condenser Off Gas radiation – NORMAL. |
| | | • Main Steam Line radiation – NORMAL. |
| | | • SG Blowdown Sample Radiation Monitor – NORMAL. |
| | | |
| | RO/BOP | CHECK if RCS is Intact: [Step 14] |
| | | • Containment pressure – LESS THAN 1.3 PSIG. |
| | | • Containment recirculation sump levels – NORMAL. |
| | | • Containment radiation levels – NORMAL GRID 4. |
| | | • GO to EOP-1.0A, Loss of Reactor or Secondary, Step 1. [Step 14 RNO] |
| | | |
| | US | TRANSITION to EOP-1.0A, Loss of Reactor or Secondary Coolant, Step 1. |
| | | |

**Examiner Note:** **The following steps are from FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition. This step should be implemented if an Orange Path exists on Integrity any time after the transition to EOP-1.0A has been made AND EOP-0.0A, Attachment 2 is complete.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 42 | of | 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO/BOP | CHECK RCS Pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) [Step 1] |
| | | • IF total RHR pump injection flow is greater than 750 gpm, THEN return to procedure and step in effect. [Step 1 RNO] |
| | | |
| **Examiner Note:** | | **The following steps are from FRZ-0.1A, Response to High Containment Pressure. These steps should be implemented if an Orange Path exists on Containment any time after the transition to EOP-1.0A has been made AND EOP-0.0A, Attachment 2 is complete. If the Orange Path exists and the crew implements FRZ-0.1A prior to verification of Containment Spray in Step 7 of EOP-0.0A then all steps of FRZ-0.1A should be performed. If the Orange Path exists and FRZ-0.1A is implemented after verification of Containment Spray in Step 7 of EOP-0.0A then the FRZ-0.1A will be exited at Step 1 RNO. All steps are included in the Scenario Guide.** |
| | | |
| **Examiner Note:** | | **Only Train B of Containment Spray will be verified as Train A is de-energized.** |
| | | |
| | RO/BOP | CHECK Containment Pressure – GREATER THAN 50 PSIG [Step 1] |
| | | • IF proper Containment Spray alignment has been verified in EOP-0.0A, Reactor Trip or Safety Injection, THEN return to procedure and step in effect. [Step 1 RNO] |
| | | VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS) [Step 2] |
| | | VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS) [Step 3] |
| | | |
| NOTE: | | Component Cooling Water supply to the unit instrument air compressors isolates on a Phase B isolation signal. |
| | | |
| | RO/BOP | CHECK if Containment Spray is required: [Step 4] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 43 | of | 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Containment pressure – HAS INCREASED TO GREATER THAN 18.0 PSIG [Step 4.a]<br>• 1-ALB-2B, Window 1.8 – CS ACT Illuminated<br>OR<br>• 1-ALB-2B, Window 4.11 – CNTMT ISOL PHASE B ACT Illuminated<br>OR<br>• Containment pressure – GREATER THAN 18.0 PSIG |
| | | • VERIFY all RCPs – STOPPED (all RCPs de-energized) [Step 4.b] |
| | | • VERIFY Containment Isolation Phase B Valves – CLOSED [Step 4.c]<br>• VERIFY 1-MLB-4A3 and 4B3 – ORANGE LIGHTS LIT |
| | | • VERIFY ECA-1.1A, Loss of Emergency Coolant Recirculation is NOT in effect [Step 4.d] |
| | | • VERIFY containment spray pumps – RUNNING [Step 4.e] |
| | | • VERIFY spray system valve alignment – PROPER EMERGENCY ALIGNMENT PER ATTACHMENT 4 [Step 4.f] |
| | | VERIFY Main Steamline Isolation Valves – CLOSED [Step 5] |

CAUTION: At least one SG must be maintained available for RCS cooldown.

CAUTION: If all SGs are faulted, at least 100 gpm AFW flow should be maintained to each SG.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO/BOP | CHECK if feed flow should be isolated to any SG: [Step 6] |
| | | • CHECK pressures in all SGs [Step 6.a]<br>• ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>OR<br>• ANY SG COMPLETELY DEPRESSURIZED |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 44 | of 51 |
| Event Description: | Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed. | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • ISOLATE Feed flow to affected SG(s) [Step 6.b]<br>• ISOLATE Main Feedline<br>• ISOLATE AFW flow |
| | | RETURN to procedure and step in effect [Step 7] |
| | | |
| **Examiner Note**: | | **EOP-1.0A, Loss of Reactor or Secondary Coolant, steps begin here.** |
| | | |
| | | **CAUTION:** Following a high energy line rupture inside containment, the operator should not rely upon steam generator water level indications in any depressurized steam generators. |
| | | **NOTE:** As PRZR Temperature decreases the error on indicated PRZR level will increase. Attachment 2 may be used to determine actual PRZR level. |
| | | |
| | US/RO | CHECK If RCPs Should Be Stopped: [Step 1] |
| | | • All RCPs are de-energized |
| | RO | • Go to Step 2. [Step 1.a RNO a] |
| | | |
| | RO/BOP | CHECK if Any Steam Generator Is Faulted: [Step 2] |
| | | • CHECK pressure in all SGs [Step 2.a] |
| | | • Any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. |
| | | • Any Steam Generator pressure – COMPLETELY DEPRESSURIZED. |
| | | • GO to Step 3. [Step 2.a RNO] |
| | | |
| | US | CHECK Intact Steam Generator Levels: [Step *3] |

| Operating Test: NRC | Scenario # 3 | Event # 5, 6, 7, 8 | Page 45 of 51 |
|---|---|---|---|
| Event Description: | Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed. | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Narrow range level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT). [Step 3.a] |
| | | • MAINTAIN total AFW flow greater than 460 GPM until narrow range level GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT) in at least one intact SG. [Step 3.a RNO a] |
| | | • Control AFW flow to maintain narrow range level between 43% (50% FOR ADVERSE CONTAINMENT) and 60%. [Step 3.b] |
| | | |
| | US | CHECK Secondary Radiation NORMAL: [Step 4] |
| | | • Condenser off gas radiation – NORMAL. |
| | | • Main Steam Line radiation – NORMAL. |
| | | • SG Blowdown Sample Radiation Monitor – NORMAL. |
| | | |
| | | **CAUTION:** If any PRZR PORV opens because of high PRZR pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint. |
| | | |
| | US | CHECK PRZR PORVs and Block Valves: [Step *5] |
| | | • VERIFY power to block valves – AVAILABLE. [Step 5.a] Train A is de-energized and power cannot be restored. |
| | | • VERIFY PORVs – CLOSED. [Step 5.b] |
| | | • VERIFY Block valves – AT LEAST ONE OPEN. [Step 5.c] |
| | | • 1/1-8000B open with power available and 1/1-8000A OPEN with NO power |
| | | |
| | US/RO | CHECK if ECCS Flow Should Be Reduced: [Step *6] |
| | | • Secondary heat sink: [Step 6.a] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page 46 | of 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Total AFW flow to intact SGs – GREATER THAN 460 GPM<br>OR<br>• Narrow range level in at least one intact SG – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT) |
| | | • VERIFY RCS subcooling – GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 6.b] |
| | | • GO to Step 7. OBSERVE CAUTIONS Prior to Step 7. [Step 6.b RNO b] |
| | | |

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

**CAUTION:** When time permits, Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION should be performed to realign equipment after an SI signal has been reset.

| | | |
|---|---|---|
| | RO/BOP | RESET ESF Actuation Signals. [Step 7] |
| | | • CHECK diesel generators – DG 1-02 RUNNING [Step 7.a] |
| | | • CHECK DG 1-02 EMERG STOP/START handswitch in START. [Step 7.b] |
| | | |
| | RO/BOP | RESET SI. [Step 7.c] |
| | | • DEPRESS 1/1-SIRA, TRAIN A SI RESET pushbutton. |
| | | • DEPRESS 1/1-SIRB, TRAIN B SI RESET pushbutton. |

**Examiner Note:** **Train A Sequencer will not be required to be RESET due to Train A being de-energized.**

| | | |
|---|---|---|
| | RO/BOP | RESET SI Sequencers. [Step 7.d] |

| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 47 | of | 51 |
|---|---|---|---|---|---|---|---|---|---|

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • At SI Sequencer Train B Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET. |
| | | • After ~ 2 seconds, PLACE ON/RESET toggle switch in ON. |
| | | |
| | RO/BOP | RESET Containment Isolation Phase A and Phase B. [Step 7.e] |
| | | • DEPRESS 1/1-C1PARA, CNTMT ISOL – PHASE A RESET pushbutton. |
| | | • DEPRESS 1/1-C1PARB, CNTMT ISOL – PHASE A RESET pushbutton. |
| | | • DEPRESS 1/1-C1PBRA, CNTMT ISOL – PHASE B RESET pushbutton. |
| | | • DEPRESS 1/1-C1PBRB, CNTMT ISOL – PHASE B RESET pushbutton. |
| | | |
| | RO/BOP | RESET Containment Spray Signal. [Step 7.f] |
| | | • DEPRESS 1/1-CSRA, TRAIN A CS RESET pushbutton. |
| | | • DEPRESS 1/1-CSRB, TRAIN B CS RESET pushbutton. |
| | | |
| CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) the RHR pumps must be manually restarted to supply water to the RCS. | | |
| | | |
| | US | CHECK If RHR Pumps Should Be Stopped: [Step *8] |
| | | • CHECK RCS pressure: [Step 8.a] |
| | RO/BOP | • RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.a.1)] |
| | | • GO to Step 10. [Step 8.a.1) RNO 1)] |
| | | |
| | US | CHECK If Diesel Generators Should Be Stopped: [Step *10] |
| | RO/BOP | • VERIFY AC Safeguards Buses ENERGIZED by Offsite Power. [Step 10.a] |

| | | | |
|---|---|---|---|
| Operating Test: NRC | Scenario # 3 | Event # 5, 6, 7, 8 | Page 48 of 51 |
| Event Description: | Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed. | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | RO/BOP | • Restore offsite power to AC safeguards busses per ABN-601, RESPONSE TO A 138/345 KV SYSTEM MALFUNCTION or ABN-602, RESPONSE TO A 6900/480 VOLT SYSTEM MALFUNCTION. [Step 10.a RNO a] |
| | | • STOP any unloaded diesel generator by placing DG EMER STOP/START handswitch in STOP. [Step 10.b] (DG 1-02 is running loaded and DG 1-01 is in PULL-OUT) |

**NOTE:** Verification of at least one flowpath from a RHR pump to the RCS via a SI pump or CCP is sufficient to verify cold leg recirculation capability.

**Examiner Note: Emergency Recirculation capability will be verified for Train B as Train A is de-energized.**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | INITIATE Evaluation of Plant Status. [Step 11] |
| | BOP | • VERIFY Cold Leg Recirculation capability: [Step 11.a] |
| | | • VERIFY the following conditions for the train related RHR pump(s): [Step 11.a.1)] |
| | | • Train B RHR Pump – AVAILABLE. |
| | | • CCW to Train B RHR Pump – AVAILABLE. |
| | | • 1/1-8811B, CNTMT SMP TO RHRP 2 SUCT ISOL VLV AVAILABLE. |
| | | • VERIFY RHR valve(s) that supply SI pumps and CCPs – AVAILABLE [Step 11.a.2)] |
| | | • 1/1-8804A, RHRP 1 TO CCP SUCT VLV – NOT AVAILABLE. |
| | | • 1/1-8804B, RHRP 2 TO SIP SUCT VLV – AVAILABLE. |
| | | • Perform the following: [Step 11.a.2) RNO 2)] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | 5, 6, 7, 8 | Page | 49 | of | 51 |

Event Description: Loss of 345 KV East and West busses, EDG 1-01 out of service due to LOR actions, EDG 1-02 Auto/Emergency Start failure, Norm Start Required, Pressurizer Steam Space Sample Valves fail to auto close, Manual closure required, LBLOCA occurs when DG 1-02 Normal Start is Performed.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • IF 1/1-8804A OR 1/1-8804B, NOT available, THEN verify at least one SI ← → CHRG SUCT HDR XTIE VLV – AVAILABLE: [Step 11.a.2) RNO 2)A)]<br>• 1/1-8807A – NOT AVAILABLE<br>OR<br>• 1/1-8807B A – AVAILABLE |
| | RO/BOP | • CHECK Auxiliary Building and Safeguards Building radiation – NORMAL: [Step 11.b] |
| | | • CHECK PC-11 monitors – NORMAL <u>OR</u><br>• Notify Radiation Protection to take local Radiation Surveys. |
| | US | • NOTIFY Chemistry to obtain RCS samples to assist in determining extent of the accident. [Step 11.c] |
| | | • EVALUATE plant equipment: [Step 11.d] |
| | US | • CONSULT Plant Staff to determine equipment that should be available or started to assist in recovery |
| | | |
| | US | CHECK if RCS Cooldown and Depressurization Is Required: [Step 12] |
| | RO/BOP | • RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 12.a] |
| | US | • IF RHR pump flow greater than 750 gpm, THEN go to Step 13 [Step 12.a RNO a] |
| | | |
| | US | CHECK if transfer to Cold Leg Recirculation is required: [Step 13] |
| | | • RWST level – LESS THAN LO-LO LEVEL [Step 13.a] |
| | | • RETURN to Step 11. OBSERVE NOTE PRIOR TO STEP 11 [Step 13.a RNO a] |
| | | • Go To EOS-1.3A, Transfer to Cold Leg Recirculation, Step 1 [Step 13.a] |
| | | |

***When the Unit Supervisor has evaluated whether a transition to EOS-1.3A, Transfer to Cold Leg Recirculation, is required at Step 13 of EOP-1.0A, Loss of Reactor or Secondary Coolant, <u>OR</u> if conditions are met to transfer to EOS-1.3A due to RWST level, TERMINATE the scenario.***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | N/A | Page | 50 | of 51 |
| Event Description: | EOP-0.0A Attachment 2 | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Examiner Note:** | | **These steps are performed by the BOP per EOP-0.0A, Attachment 2.** |
| | | |
| | | CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment. |
| | | |
| | BOP | VERIFY SSW Alignment: [Step 1] |
| | | • VERIFY SSW Pump 1-02 – RUNNING. [Step 1.a] |
| | | • VERIFY EDG Cooler SSW return flow. [Step 1.b] |
| | | |
| | BOP | VERIFY Safety Injection Pump 1-02 – RUNNING. [Step 2] |
| | | |
| | BOP | VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [Step 3] |
| | | |
| | BOP | VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [Step 4] |
| | | |
| | BOP | VERIFY CCW Pump 1-02 – RUNNING. [Step 5] |
| | | |
| **CRITICAL TASK STATEMENT** | | **Manually start RHR Pump 1-02, in accordance with EOP-0.0A, Reactor Trip or Safety Injection, Attachment 2, Safety Injection Actuation Alignment, OR EOP-1.0A, Loss of Reactor or Secondary Coolant, Attachment 1.A, Foldout for EOP-1.0A, due to an automatic start failure on Safety Injection, prior to completion of EOP-0.0A Attachment 2.** |
| | | |
| | BOP | VERIFY RHR Pump 1-02 – RUNNING. [Step 6] |
| | | • Manually start pump(s) [Step 6 RNO] |
| **CT-2** | | • PLACE RHRP 2, 1/1-APRH2 in START |
| | | |

| Operating Test: NRC | Scenario # 3 | Event # N/A | Page 51 of 51 |
|---|---|---|---|
| Event Description: EOP-0.0A Attachment 2 | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | VERIFY Proper CVCS Alignment: [Step 7] |
| | | • VERIFY CCP 1-02 – RUNNING. [Step 7.a] |
| | | • VERIFY Letdown Relief Valve Isolation: [Step 7.b] |
| | | • Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1)] |
| | | • Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2)] |
| | | |
| | BOP | VERIFY ECCS flow: [Step 8] |
| | | • CCP SI flow indicator – CHECK FOR FLOW. [Step 8.a] |
| | | • RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [Step 8.b] |
| | | • SIP discharge flow indicator – CHECK FOR FLOW. [Step 8.c] |
| | | • RCS pressure – LESS THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.d] |
| | | • RHR TO CL INJ flow indicators – CHECK FOR FLOW. [Step 8.e] |
| | | |
| | BOP | VERIFY Feedwater Isolation Complete: [Step 9] |
| | | • Feedwater Isolation Valves – CLOSED. |
| | | • Feedwater Isolation Bypass Valves – CLOSED. |
| | | • Feedwater Bypass Control Valves – CLOSED. |
| | | • Feedwater Control Valves – CLOSED. |
| | | |
| | BOP | VERIFY Diesel Generator 1-02 – RUNNING. [Step 10] |
| | | |
| | BOP | VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB-10 – LIT. [Step 11] |
| | | |

| Operating Test: NRC | Scenario # 3 | Event # N/A | Page 52 of 51 |
|---|---|---|---|
| Event Description: EOP-0.0A Attachment 2 | | | |

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

NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [Step 12] |

NOTE: Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

NOTE: When the SI sequencer has timed out, the Reactor Makeup Water Pump with its handswitch in Auto will restart.

BOP VERIFY Components on Table 1 are properly aligned. [Step 13]

| | Location | Equipment | Description | Condition |
|---|---|---|---|---|
| | CB-03 | X-HS-5534 | H2 PRG SPLY FN 4 | STOPPED |
| | CB-03 | X-HS-5532 | H2 PRG SPLY FN 3 | STOPPED |
| | CB-04 | 1/1-8716A | RHRP 1 XTIE VLV | OPEN |
| | CB-04 | 1/1-8716B | RHRP 2 XTIE VLV | OPEN |
| | CB-06 | 1/1-8153 | XS LTDN ISOL VLV | CLOSED |
| | CB-06 | 1/1-8154 | XS LTDN ISOL VLV | CLOSED |
| | CB-07 | 1/1-RTBAL | RX TRIP BKR | OPEN |
| | CB-07 | 1/1-RTBBL | RX TRIP BKR | OPEN |
| | CB-07 | 1/1-BBAL | RX TRIP BYP BKR | OPEN/DEENERGIZED |
| | CB-07 | 1/1-BBBL | RX TRIP BYP BKR | OPEN/DEENERGIZED |
| | CB-08 | 1-HS-2397A | SG 1 BLDN HELB ISOL VLV | CLOSED |
| | CB-08 | 1-HS-2398A | SG 2 BLDN HELB ISOL VLV | CLOSED |
| | CB-08 | 1-HS-2399A | SG 3 BLDN HELB ISOL VLV | CLOSED |
| | CB-08 | 1-HS-2400A | SG 4 BLDN HELB ISOL VLV | CLOSED |

| Operating Test: NRC | Scenario # 3 | Event # N/A | Page 53 of 51 |
|---|---|---|---|
| Event Description: EOP-0.0A Attachment 2 | | | |

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

| | | | | |
|---|---|---|---|---|
| | CB-08 | 1-HS-2111C | FWPT A TRIP | TRIPPED |
| | CB-08 | 1-HS-2112C | FWPT B TRIP | TRIPPED |
| | CB-09 | 1-HS-2490 | CNDS XFER PUMP | STOPPED (MCC deenergized on SI) |
| | CV-01 | X-HS-6181 | PRI PLT SPLY FN 17 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6188 | PRI PLT SPLY FN 18 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6195 | PRI PLT SPLY FN 19 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6202 | PRI PLT SPLY FN 20 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6209 | PRI PLT SPLY FN 21 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6216 | PRI PLT SPLY FN 22 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6223 | PRI PLT SPLY FN 23 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6230 | PRI PLT SPLY FN 24 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-3631 | UPS & DISTR RM A/C FN 1 & BSTR FN 42 | STARTED |
| | CV-01 | X-HS-3632 | UPS & DISTR RM A/C FN 2 & BSTR FN 43 | STARTED |
| | CV-01 | 1-HS-5600 | ELEC AREA EXH FN 1 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5601 | ELEC AREA EXH FN 2 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5602 | MS & FW PIPE AREA EXH FN 3 & EXH DMPR | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5603 | MS & FW PIPE AREA EXH FN 4 & EXH DMPR | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5618 | MS & FW PIPE AREA SPLY FN 17 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5620 | MS & FW PIPE AREA SPLY FN 18 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5855 | CR EXH FN 1 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5856 | CR EXH FN 2 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5731 | SFP EXH FN 33 | STOPPED/DEENERGIZED |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 3 | Event # | N/A | Page | 54 | of 51 |
| Event Description: | EOP-0.0A Attachment 2 | | | | | | | |

| Time | Position | Applicant's Actions or Behavior | | |
|---|---|---|---|---|
| | CV-03 | X-HS-5733 | SFP EXH FN 34 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5727 | SFP EXH FN 35 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5729 | SFP EXH FN 36 | STOPPED/DEENERGIZED |
| | | | | |
| **Examiner Note: The next four (4) steps would be performed on Unit 2.** | | | | |
| | | | | |
| | CB-03 | 2-HS-5538 | AIR PRG EXH ISOL DMPR | CLOSED |
| | CB-03 | 2-HS-5539 | AIR PRG EXH ISOL DMPR | CLOSED |
| | CB-03 | 2-HS-5537 | AIR PRG SPLY ISOL DMPR | CLOSED |
| | CB-03 | 2-HS-5536 | AIR PRG SPLY ISOL DMPR | CLOSED |
| | | | | |
| | BOP | NOTIFY Unit Supervisor attachment instructions complete AND to implement FRGs as required. | | |
| | | | | |
| ***EOP-0.0A, Attachment 2 steps are now complete.*** | | | | |

```
;2021 CPNPP NRC Scenario 3
;Initial Conditions
;IC18 100% power

;XST1 is OOS for placing XST1A in service.  Guarded
;Equipment per STI-600.1.  Pull-Out 1EA1-2 and
;1EA2-2.

;Line up U2 to XST2 and take XST1 OOS
2 set bkED_2EA1-2.local_remote=0
2 set bkED_2EA2-2.local_remote=0
3 set bkED_2EA1-2.p52C=1
3 set bkED_2EA2-2.p52C=1
4 IRF U2R16 f:0
4 IRF U2R45 f:0
5 set bkED_2EA1-2.local_remote=1
5 set bkED_2EA2-2.local_remote=1
6 set bkED_2EA1-2.p52C=0
6 set bkED_2EA2-2.p52C=0
7 IRF EDR80 f:0
7 IRF EDR81 f:0
7 IRF A14_01 f:4
8 IOR DIEDHSDXST1 f:0
10 DOR DIEDHSDXST1
11 IOR DIED1EA12 f:0
12 IOR DIED1EA22 f:0

;DG 1-02 Fails to Auto Start or Manual Emerg Start
;Normal Start Required
IMF EG15B f:1

;PSS Valve MLB Lights
IOR LOANMLB1A2_1 f:1
IOR LOANMLB1B2_1 f:1

;Allow PSS Valves to close
{DIWDHS4165A.Value=1} DOR LOANMLB1A2_1
{DIWDHS4167A.Value=1} DOR LOANMLB1B2_1

;Event 1 - Loss of 1PC2
IMF ED07B f:1 k:1

;Transfer 1PC2 to alternate
IRF EDR02 f:0 k:10

;Event 2 - 86-1 LOR 6.9KV Safeguards Bus 1EA1
IMF ED05H f:1 k:2
```

;De-energize Train A BOS
IRF EAR081 f:0 k:15
IRF EAR522 f:0 k:15

;Swap Aux Lube Oil Pumps for starting CCP 1-02
IRF CVR05 f:0 k:20
IRF CVR06 f:1 k:21

;Align RMUW Pump X-01 to Unit 1
IRF CVR07 f:1 d:10 k:16
IRF CVR04 f:0 k:16

;Event 3 - SG 1-03 LT-553 Oscillates
{Key[3] != 0} scn 2021 NRC Exam\CPNPP 2021 NRC Simulator Scenario 3a

;Event 4 - Letdown Isolation Valve (HV-8160) fails closed
;Place Excess Letdown in Service
IOR DICVHS8160 f:0 k:4

;1st Major - 86-1 Lockouts on the East and West Busses
IMF ED21A f:1 k:5
IMF ED21B f:1 k:5

;2nd Major - RCS Loop 1 LBLOCA on DG 1-02 Normal Start
{DIEG1DG2N.Value=3} IMF RC08A2 f:1 d:180

;Event 9 - RHR Pump 1-02 Fails to Sequence on SI
IMF RH01D f:1

Facility: CPNPP 1 & 2 Scenario No.: 4 Op Test No.: August 2021 NRC

Examiners: ____________ Operators: ____________

Initial Conditions: 100% power MOL – RCS Boron is 771 ppm. MDAFW Pump 1-02 is out of service for an oil change.

Turnover: Maintain steady-state power conditions.

**Critical Tasks:**

**CT-1 – Trip the Reactor and secure all RCPs, due to loss of all Non-Safeguards Loop CCW flow, prior to any RCP tripping on overcurrent per ABN-502, Component Cooling Water System Malfunctions.**

**CT-2 – Manually initiate Train A and/or Train B Safety Injection, due to failure to automatically initiate, prior to exiting EOP-0.0A, Reactor Trip or Safety Injection.**

**CT-3 – Initiate RCS Feed and Bleed in accordance with FRH-0.1A, Response to Loss of Secondary Heat Sink, such that RCS depressurizes sufficiently for Intermediate Head Injection to occur, prior to all SG Wide Range levels lowering to 0%.**

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | RX05A | I (RO, SRO)<br>TS (SRO) | Pressurizer Level Transmitter (LT-459) fails low. |
| 2 | CH10 | C (BOP, SRO) | CRDM Vent Fan 1-01 Trips. Requires start of alternate fan. |
| 3 | CH21A | C (RO, BOP, SRO)<br>TS (SRO) | Safety Chiller 1-05 trip |
| 4 | MS13B | C (RO, SRO) | SG 1-02 Steam Pressure Channel (PT-2326) fails high |
| 5 | ICM | M (RO, BOP, SRO) | Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs |
| 6 | TC07C | C (BOP) | Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps |
| 7 | RP07A<br>RP07B | C (RO) | Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07 |
| 8 | FW09A | M (RO, BOP, SRO) | TDAFWP trips, Loss of Heat Sink |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications | | | |

| Actual | Target Quantitative Attributes |
|---|---|
| 8 | Total malfunctions (5-8) |
| 3 | Malfunctions after EOP entry (1-2) |
| 4 | Abnormal events (2-4) |
| 2 | Major transients (1-2) |
| 1 | EOPs entered/requiring substantive actions (1-2) |
| 1 | EOP contingencies requiring substantive actions (0-2) |
| 3 | Critical tasks (2-3) |

## SCENARIO 4 SUMMARY

*** Event 1 -**
The first event is a failure low of Pressurizer Level channel. Letdown will isolate due to PRZR LVL CHAN 1, LT-459A failing low. Crew actions are per ABN-706, Pressurizer Level Instrumentation Malfunction Section 2.0 and include manually reducing Charging flow to RCP Seals only, bypassing the failed channel, restoring normal letdown to service, and restoring pressurizer level control to automatic. The SRO will refer to Technical Specification LCO 3.3.1.

*** Event 2 -**
The operating CRDM vent fan trips. The crew will refer to 1-ALB-3A, Window 2.1, CNTMT FN MASTER TRIP, and ensure that at least one CRDM vent fan is in service, and manually start an alternate vent fan, per SOP-801A, Containment Ventilation System. They will use either Section 5.3.1, Control Rod Drive Mechanism Ventilation System Startup, or Section 5.3.3, Alternating Control Rod Drive Mechanism Ventilation Fans, for this evolution. The SRO may refer to the Technical Requirements Manual LCO 13.7.36 (depending on expediency of crew actions).

*** Event 3 -**
The next event is a trip of the Train A Safety Chiller (1-05). Crew actions are per ABN-503, Safety Chilled Water System Malfunction and include starting the unaffected train (Train B) Component Cooling Water Pump and Centrifugal Charging Pump. The crew will then shutdown all equipment supplied by the affected train (Train A) and place the equipment in Pull-Out. This equipment includes RHR Pump 1-01, Containment Spray Pumps 1-01 & 1-03, MDAFWP 1-01, SI Pump 1-01, CCW Pump 1-01, and CCP 1-01. The SRO will refer to Technical Specification LCOs 3.7.19 and 3.7.5 (for loss of two trains of AFW).

*** Event 4 -**
The next event is a failure high of Steam Line Pressure Transmitter PT-2326 causing SG 1-02 Atmospheric Relief Valve to open. The Reactor Operator will verify steam line pressure is below the lift pressure of 1125 psig and take manual control of 1-PK-2326 and close the ARV. The crew will take the actions of ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st-Stage Pressure and Feed Header Pressure Instrument Malfunction.

*** Event 5 -**
The first major event is a failure of the Train B CCW Surge Tank Level Transmitter, LT-4501 low. CCW Safeguards Loop Supply and Return valves automatically close resulting in a loss of CCW cooling flow to the Non-Safeguards loop components. Crew response will be per ABN-502, Section 5.0 and include a verification that the alternate (non-affected) CCW pump cannot be started (due to loss of Safety Chiller 1-05). The crew will then initiate a Reactor Trip and will be required to trip all RCPs. The crew will enter and take the actions of EOP-0.0A, Reactor Trip or Safety Injection and the Reactor Operator will secure all RCPs after performance of Immediate Operator Actions.

**** Events 6 & 7 -**
The Reactor Trip will be complicated by the Main Turbine failing to automatically trip or trip from the manual pushbutton at CB-10. The Main Turbine will be tripped when the BOP secures EHC pumps. The automatic and manual failure of the Main Turbine to trip will cause an RCS cooldown and lowering of SG pressures enough to meet automatic Safety Injection setpoints. Safety Injection will fail to automatically initiate and must be manually initiated from CB-07 by the Reactor Operator.

**** Event 8 -**
The second major will be a trip of the TDAFWP on a time delay after Reactor trip, resulting in an immediate or eventual loss of Secondary Heat Sink. The crew will enter and take the actions of FRH-0.1A, Response to Loss of Secondary Heat Sink. Actions include verifying SI has been actuated and both an SI pump and CCP are running, resetting safeguards signals, and establishing an RCS bleed path with both PRZR PORVs open.

***** - *On Lead Examiner's Cue*
****** - *Starts automatically or on Lead Examiners Cue*

**Termination Criteria**
Scenario will be terminated when the crew has established RCS Bleed and Feed cooling in accordance with FRH-0.1A, Response to Loss of Secondary Heat Sink, or at the Lead Examiner's discretion.

**Risk Significance:**

| | |
|---|---|
| • Failure of risk important system prior to trip: | Pressurizer Level Channel fails low<br>Trip of a Safety Chiller |
| • Risk significant core damage sequence: | Loss of Heat Sink |
| • Risk significant operator actions: | Manually trip the Main Turbine after failure to automatically trip or manually trip with the pushbutton, manually actuate SI after failure to automatically actuate, secure RCPs upon a loss of Non-Safeguards Loop CCW flow, establish RCS Bleed and Feed cooling |

**Critical Task Determination**

| **Critical Task** | **Safety Significance** | **Cueing** | **Measurable Performance Indicators** | **Performance Feedback** |
|---|---|---|---|---|
| | | | | |
| CT-1 – Trip the Reactor and secure all RCPs, due to loss of all Non-Safeguards Loop CCW flow, prior to any RCP tripping on overcurrent per ABN-502, Component Cooling Water System Malfunctions. | Failure to take action will result in significant degradation in the mitigative capability of the plant. Take action to prevent a challenge to plant safety | Procedural direction in ABN-502, CCW System Malfunction, Section 5.0, Loss of CCW Flow to the Non-Safeguards Loop to trip the Reactor and secure all RCPs when a loss of all Non-Safeguards CCW flow has occurred and the standby CCW pump cannot be started. | The operator will place one of the Reactor Trip Switches in the Trip position and place all RCP handswitches in the Stop position. | Reactor Trip Breakers will open, all Rod Bottom lights will light, and Neutron flux will lower. All RCP Loop flows will decrease and Motor Currents will lower to 0 amps. |
| CT-2 – Manually initiate Train A and/or Train B Safety Injection, due to failure to automatically initiate, prior to exiting EOP-0.0A, Reactor Trip or Safety Injection. | Recognize a failure or an incorrect automatic actuation of an ESF system or component. | Procedural direction at EOP-0.0A Step 4 to determine if a Safety Injection is required and annunciators indicating that an SI should have occurred yet did not occur. | The operator will manually actuate Safety Injection using the handswitch on CB-07. | PCIP Window 1.8 annunciates indicating both trains of SI have actuated. Numerous equipment changes of state. |

| | | | | |
|---|---|---|---|---|
| CT-3 - Initiate RCS Feed and Bleed in accordance with FRH-0.1A, Response to Loss of Secondary Heat Sink, such that RCS depressurizes sufficiently for Intermediate Head Injection to occur, prior to all SG Wide Range levels lowering to 0%. | Actuating SI ensures feed path of cool water to RCS and isolates containment to confine any RCS releases from bleed flow. Bleed flow through both PORVs will ensure enough cool water will feed from ECCS flow path to remove sufficient decay heat. | AFW flow will not be indicated on any AFW flow meter. Also no AFW pumps will be running. A RED path showing on CSFST for heat sink. The need for a heat sink as indicated by RCS temperature and pressure. | Actuated SI, ensured at least one CCP and SI pump is running with flow indicated providing a feed path for the RCS. Both PRZR PORVs open providing a bleed path for the RCS. | Flow indicated on both a CCP and an SI pump. PRZR PORVs open with block valves open. RCS pressure lowering and CETs will indicate core cooling. |
| **NOTE:** (Per NUREG-1021, Appendix D) If an operator or the Crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review. | | | | |

UNIT: 1

PART I TO BE PREPARED BY THE OFF-GOING UNIT SUPERVISOR.

1.0 SHIFT ACTIVITIES:

1.1 **Activities Completed This Shift:** MDAFWP 1-02 tagged out for bearing replacement

1.2 **Activities In-Progress:** Maintenance preparing to replace bearing in MDAFWP 1-02

1.3 **Planned Activities:** Maintain power and availability

2.0 PLANT AND EQUIPMENT STATUS:

2.1 Technical Specification Related Equipment Summary:
TS LCO 3.7.5.B – One AFW train inoperable for reasons other than condition A. Restore to OPERABLE status within 72 hours.

2.2 Non-Technical Specification Equipment Summary:
None

3.0 General Information: Maintain Steady State Conditions in accordance with IPO-003A, Power Operations. Diluted 60 gallons three times last shift.

4.0 END OF SHIFT REVIEW:

| | | | | | |
|---|---|---|---|---|---|
| LOGS – RO/BOP | X | LOGS-NEO | X | CLOSED eLCOARs ARCHIVED | X |
| OPTS COMPLETED | X | DAILY ACTIVITIES LIST | X | LCOARs REVIEWED | X |

PART II TO BE COMPLETED BY THE ON-COMING UNIT SUPERVISOR.

1.0 CRITICAL PARAMETERS:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MODE: | 1 | | REACTOR POWER: | 100% | | MWE: | 1265 |
| RCS TAVE: | 585 | °F | CONTROL ROD POSITION | 215 | ON BANK | D | |
| Cb: | 771 | ppm | RCS PRESS: | 2235 | psig | | |

| | | | |
|---|---|---|---|
| X | Protected Train – Train A | X | Unit 2 is in Mode 1 at 100% power |
| X | Risk Assessment - GREEN | X | BAT $C_B$ = 7447 ppm |

| | SIMULATOR OPERATOR INSTRUCTIONS for SIMULATOR SETUP | | | | |
|---|---|---|---|---|---|
| **Initialize to IC18 and LOAD CPNPP 2021 NRC Simulator Scenario 4.** | | | | | |
| **EVENT** | **TYPE** | **MALF #** | **DESCRIPTION** | **DEMAND VALUE** | **INITIATING PARAMETER** |
| SETUP | IRF | FWR021 | MDAFWP 1-02 Breaker Racked Out | f:0 | K0 |
| | IMF | TC07C | Main Turbine fails to trip, PB will not work | f:1 | K0 |
| | IMF | RP07A | Train A SI fails to Auto actuate | f:1 | K0 |
| | IMF | RP07B | Train B SI fails to Auto actuate | f:1 | K0 |
| | IMF | RP08A | SI Handswitch will not work on CB-02 | f:1 | K0 |
| | | | | | |
| 1 | IMF | RX05A | PRZR Level Channel 459 fails low | f:0 | K1 |
| | | | | | |
| 2 | IMF | CH10 | CRDM Vent Fan trip | f:1 | K2 |
| | | | | | |
| 3 | IMF | CH21A | Safety Chiller 1-05 trip | f:1 | K3 |
| | IRF | CVR06 | CCP 1-02 Aux LO Pump to AUTO | f:1 | K10 |
| | IRF | CVR05 | CCP 1-01 Aux LO Pump to OFF | f:0 | K11 |
| | | | | | |
| 4 | IMF | MS13B | SG 1-02 Pressure Transmitter fails high | f:1300 | K4 |
| | | | | | |
| 5-7 | ICM | LI-4501 | Train B CCW Surge Tank Level Transmitter fail low | f:0.3 | K5 |
| | IOR | AOCCLI4501 | Override CCW Surge Tank Level Transmitter | f:0 | K5 |
| | IMF | TC07C | Main Turbine fails to trip, PB will not work | f:1 | K0 |
| | IMF | RP07A | Train A SI fails to Auto actuate | f:1 | K0 |
| | IMF | RP07B | Train B SI fails to Auto actuate | f:1 | K0 |
| | IMF | RP08A | SI Handswitch will not work on CB-02 | f:1 | K0 |
| | | | | | |
| 8 | IMF | FW09A | TDAFWP trip (if running) on 480 second delay | f:1 | Rx trip + 480 |
| | | | | | |

| | |
|---|---|
| **Simulator Operator:** | **INITIALIZE to IC18 and LOAD CPNPP 2021 NRC Simulator Scenario 4**<br>**ENSURE all Simulator Annunciator Alarms are ACTIVE**<br>**ENSURE all Control Board Tags are removed**<br>**ENSURE Operator Aid Tags reflect current boron conditions (771 ppm)**<br>**ENSURE Rod Bank Update (RBU) is performed**<br>**ENSURE ASD speakers are ON at half volume**<br>**ENSURE Reactivity Briefing Sheet printout provided with Turnover**<br>**ENSURE procedures in progress are on SRO desk:**<br>**- COPY of IPO-003A, Power Operations**<br>**ENSURE Control Rods are in AUTO with Bank D at 215 steps**<br>**ENSURE YELLOW Caution Tag on 1-HS-2451A, MDAFW Pump 1-02 and place in PULL OUT**<br>**ENSURE GEM Box PLACED on 1-HS-2450A for MDAFW Pump 1-01**<br>**ENSURE electronic LBDs are available on the Unit Supervisor computer** |

**Control Room Annunciators in Alarm:**

**PCIP-1.1 – SR TRN A RX TRIP BLK**
**PCIP-1.2 – IR TRN A RX TRIP BLK**
**PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9**
**PCIP-1.6 – RX ≥ 10% PWR P-10**
**PCIP-2.1 – SR TRN B RX TRIP BLK**
**PCIP-2.2 – IR TRN B RX TRIP BLK**
**PCIP-2.5 – SR RX TRIP BLK PERM P-6**
**PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK**
**1-SSII2 – Train B MDAFW is Solid Red**

| Operating Test: | NRC | Scenario # | 4 | Event # | 1 | Page | 9 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Pressurizer Level Channel (LT-459) fails low | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator: When directed, EXECUTE Event 1 (Key 1).**<br>**- RX05A, PRZR level channel LT-459 fails low** | | |
| **Indications Available:**<br>**PRZR LVL LO (5B-3.6)**<br>**PRZR LVL DEV LO (5C-1.2)** | | |
| | | |
| | RO | RESPOND to Annunciator Alarm Procedures |
| | | |
| | RO | RECOGNIZE PRZR level channel LT-459 has failed low and Letdown has isolated. |
| | | |
| | US | Direct the performance of ABN-706, Pressurizer Level Instrumentation Malfunction, Section 2.0 Pressurizer Level Instrument Malfunction |
| | | |
| CAUTION: To avoid thermal shock of the reactor coolant piping, the letdown flow should not be stopped without also stopping the charging flow when the reactor coolant temperature is greater than 350°F.<br>NOTE: Channels 459 and 460 are normally the controlling channels. | | |
| | | |
| **Examiner Note: The following steps are from ABN-706, Pressurizer Level Instrumentation Malfunction, Section 2.0 Pressurizer Level Instrument Malfunction** | | |
| | | |
| | RO | Manually CONTROL 1-LK-459, PRZR LVL CTRL OR 1-FK-121, CCP CHRG FLO CTRL to maintain level at program. [Step 2.3.1] |
| | | |
| | RO | TRANSFER 1/1-LS-459D, PRZR LVL CTRL CHAN SELECT to an operable alternate controlling channel. [Step 2.3.2] |
| | | |
| | RO | ENSURE 1/1-LS-459E, 1-LR-459 PRZR LVL SELECT selected to a valid channel. [Step 2.3.3] |
| | | |
| | RO | VERIFY normal letdown aligned – Not Aligned [Step 2.3.4] |

| Operating Test: | NRC | Scenario # | 4 | Event # | 1 | Page | 10 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Pressurizer Level Channel (LT-459) fails low | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | WHEN pressurizer level is greater than 17%, [Step 2.3.4 RNO]<br>THEN RESTORE letdown per Attachment 6. |
| | | |
| **Examiner Note:** | | **Letdown flow is re-established using ABN-706, Attachment 6, or the Letdown Restoration Job Aid. The following steps are from Attachment 6.** |
| | | |
| | RO | OPEN OR VERIFY open both letdown isolation valves. [Att. 6 Step 1]<br>• 1/1-LCV-459, LTDN ISOL VLV<br>• 1/1-LCV-460, LTDN ISOL VLV |
| | | |
| | RO | ENSURE 1-PK-131, LTDN HX OUT PRESS CTRL in MANUAL AND 30% demand (50% if two orifice valves will be opened). [Att. 6 Step 2] |
| | | |
| | RO | ENSURE 1-TK-130, LTDN HX OUT TEMP CTRL in MANUAL AND 50% demand. [Att. 6 Step 3] |
| | | |
| | RO | ADJUST charging to desired flow WHILE maintaining seal injection flow between 6 and 13 gpm. [Att. 6 Step 4] |
| | | |
| | RO | OPEN the desired orifice isolation valves. [Att. 6 Step 5]<br>• 1/1-8149A, LTDN ORIFICE ISOL VLV (45 GPM)<br>• 1/1-8149B, LTDN ORIFICE ISOL VLV (75 GPM)<br>• 1/1-8149C, LTDN ORIFICE ISOL VLV (75 GPM) |
| | | |
| | RO | ADJUST 1-PK-131, LTDN HX OUT PRESS CTRL to obtain approximately 310 psig on 1-PI-131, LTDN HX OUT PRESS, THEN PLACE in automatic. [Att. 6 Step 6] |
| | | |
| | RO | ADJUST 1-TK-130, LTDN HX OUT TEMP CTRL to obtain ~ 95ºF on 1-TI-130, LTDN HX OUT TEMP, THEN PLACE in automatic. [Att. 6 Step 7] |
| | | |
| **Simulator Operator:** | | **If contacted as the prompt team, acknowledge the request to repair LT-459.** |
| | | |
| **Examiner Note:** | | **The following steps are back in Section 2.0 of ABN-706.** |
| | | |
| | RO | If necessary, RECLOSE 1/1-PCPR, PRZR CTRL HTR GROUP C by placing the control switch in the "ON" position. [Step 2.3.5] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operating Test: NRC | Scenario # 4 | Event # 1 | Page 11 of 42 | | | | |
| Event Description: Pressurizer Level Channel (LT-459) fails low | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | RO | If desired, PLACE controller used in Step 1 (1-LK-459, PRZR LVL CTRL OR 1-FK-121, CCP CHRG) in AUTO. [Step 2.3.6] |
| | | |
| | RO | VERIFY instruments on common instrument line – NORMAL (see Attachment 1) [Step 2.3.7] |
| | | |
| | US | Within 72 hours, HAVE an I&C Technician place bistable test switches for failed channel in CLOSED position per Attachment 3. [Step 2.3.8] |
| | | |
| | US | VERIFY appropriate alarm AND trip status lights ON per Attachment 4<br>AND<br>NOTE verification in Unit Log. [Step 2.3.9] |
| | | |
| | US | REFER to Technical Specifications per Attachment 5. [Step 2.3.10] |
| | | 3.3.1 – Reactor Trip System Instrumentation, function 9<br>• LCO 3.3.1.M, Reactor Trip System Instrumentation. (3.3.1-1, Function 9)<br>    • Condition M – One Channel Operable:<br>    • ACTION M.1 - Place channel in trip within 72 hours <u>OR</u><br>    • ACTION M.2 - Reduce THERMAL POWER to < P-7 within 78 hours |
| | | |
| | US | INITIATE a Condition Report per STA-421, as applicable. [Step 2.3.11] |
| | | |
| ***When Pressurizer Level Control is restored to automatic, or at Lead Examiner discretion, PROCEED to Event 2.*** | | |

| Operating Test: | NRC | Scenario # | 4 | Event # | 2 | Page | 12 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | CRDM Vent Fan 1-01 Trips. Requires start of alternate fan. | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator**: | | **When directed, EXECUTE Event 2 (Key 2).**<br>**- CH10, CRDM Vent Fan trips** |
| **Indications Available**:<br>**3A-2.1 – CNTMT FN MASTER TRIP**<br>**3A-1.3 – CRDM VENT FN 1 ∆P LO**<br>**3A-1.6 – CRDM SHROUD EXH TEMP HI**<br>**3B-4.2 – CRDM ANY VENT FAN DISCH TEMP HI (30 seconds later)**<br>**1-HS-5421 CRDM VENT FN amber MISMATCH, white TRIP, and green STOP lights LIT** | | |
| | | |
| | BOP | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | BOP | RECOGNIZE CRDM Vent Fan 1-01 tripped. |
| | | |
| | US | DIRECT performance of 1-ALB-3A, Window 2.1 – CTMT FN MASTER TRIP |
| | | |
| **Examiner Note**: | | **The Unit Supervisor may direct the operator to start a fan prior to procedure direction.**<br>**The US may direct actions from a different Alarm Response window. The actions of ALB-3A, Window 2.1 – CTMT FN MASTER TRIP are included in the Scenario Guide.**<br>**The following steps are from 1-ALB-3A, Window 2.1 – CTMT FN MASTER TRIP** |
| | | |
| **Simulator Operator**: | | **When dispatched to locally inspect CRDM Vent Fan breaker, report the breaker tripped on overcurrent.** |
| | | |
| NOTE: IF the trip is due to the overcurrent trip switch (OTS) , THEN the handswitch white light will be illuminated. A phase overcurrent trip can be identified at breaker compartment by red buttons on affected relays. | | |
| | | |
| | BOP | DETERMINE affected fan from the associated handswitch light indication. [Step 1]<br>• 1-HS-5421, CRDM VENT FN 1 |
| | BOP | START an alternate fan, as required per SOP-801A. [Step 2] |
| | | |

| Operating Test: | NRC | Scenario # | 4 | Event # | 2 | Page | 13 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | CRDM Vent Fan 1-01 Trips. Requires start of alternate fan. | | | | | | | | |

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

**Examiner Note: The crew may perform Section 5.3.1, Control Rod Drive Mechanism Ventilation System Startup OR Section 5.3.3, Alternating Control Rod Drive Mechanism Ventilation Fans to start the Alternate Fan.**

**The following steps are from SOP-801A, Containment Ventilation System, Section 5.3.1, Control Rod Mechanism Ventilation System Start-Up**

CAUTION: Startup of this system may change indicated radiation levels inside containment due to mixing of noble gases from stagnant areas of air. Radiation levels reaching High Alarm on Containment Air Gaseous (1-RE-5503) OR Particulate Monitors (1-RE-5502) will cause a Containment Ventilation Isolation (CVI).

NOTE:

- At least one CACR fan should be in operation to ensure chilled water flow to the CRDM fan.
- The CRDM Ventilation Fans are placed in PULL-OUT to support CRDM Air Handling Unit (AHU) discharge damper realignment in the following step.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | IF required to align the CRDM AHU volume discharge dampers, THEN perform the following: Step is N/A [Step A] |
| | BOP | Prerequisites in Section 2.3 are met. [Step B] |
| | BOP | VERIFY the Hydrogen Purge Supply and Exhaust System is NOT in service. [Step C] |
| | BOP | IF a Containment Purge OR Vent is in progress, THEN perform the following: Step is N/A [Step D] |

CAUTION:

- Starting a CRDM Ventilation Fan is potentially hazardous to personnel working at OR around the CRDM Air Handling Unit due to high D/P discharge pressures.
- A Plant Announcement should be made prior to starting either cooling fan to ensure personnel safety. Some of the key items to mention are ventilation changes AND hazards due to high D/P at the discharge dampers associated with starting a CRDM Vent Fan.

| Operating Test: NRC | Scenario # 4 | Event # 2 | Page 14 of 42 |
|---|---|---|---|
| Event Description: CRDM Vent Fan 1-01 Trips. Requires start of alternate fan. | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | US | IF placed, THEN remove standard clearances: Step is N/A [Step E] |
| | | |
| | BOP | Make a Plant Announcement. [Step F] |
| | | |
| | BOP | START the selected CRDM Ventilation Fan. [Step G]<br>• PLACE 1-HS-5423, CRDM VENT FN 2 handswitch in START. |
| | | |
| **Examiner Note**: | | **[Step H] should not be performed as the report was given that the fan breaker tripped on overcurrent. The affected fan should be placed in Pull-Out.** |
| | | |
| | BOP | PLACE the remaining CRDM Ventilation Fan in AUTO. Step is N/A [Step H] |
| | | |
| | BOP | MONITOR Containment Radiation levels until they stabilize. [Step I] |
| | | |
| | BOP | IF a Containment Purge OR Vent is in progress AND radiation levels rise to the Alert Alarm Limit on either the Containment Air Gaseous Monitor (1-RE-5503) OR the Containment Air Particulate Monitor (1-RE-5502), THEN perform ONE of the following: Step is N/A [Step J] |
| | | |
| | BOP | IF Containment Purge OR Vent was secured in Step D OR J, THEN: Step is N/A [Step K] |
| | | |
| | BOP | IF CVI was disabled in Step D OR J, THEN: Step is N/A [Step L] |
| | | |
| **Examiner Note**: | | **The crew may perform Section 5.3.1, Control Rod Drive Mechanism Ventilation System Startup OR Section 5.3.3, Alternating Control Rod Drive Mechanism Ventilation Fans to start the Alternate Fan.**<br><br>**The following steps are from SOP-801A, Containment Ventilation System, Section 5.3.3, Alternating Control Rod Drive Mechanism Ventilation Fans.** |
| | | |

| Operating Test: | NRC | Scenario # | 4 | Event # | 2 | Page | 15 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | CRDM Vent Fan 1-01 Trips. Requires start of alternate fan. | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | CAUTION: Alternating the CRDM Ventilation Fans may change indicated radiation levels inside containment due to mixing of noble gases from stagnant areas of air. Radiation levels reaching High Alarm on Containment Air Gaseous (1-RE-5503) OR Particulate Monitors (1-RE-5502) will cause a Containment Ventilation Isolation (CVI). |
| | BOP | VERIFY the Hydrogen Purge Supply AND Exhaust System is NOT in service. [Step A] |
| | BOP | IF a Containment Purge OR Vent is in progress, THEN perform the following: Step is N/A [Step B] |
| | BOP | START the idle CRDM Ventilation Fan. [Step C]<br>• 1-HS-5423, CRDM VENT FAN 2 to START |
| | | **Examiner Note: [Steps D & E] should not be performed as the report was given that the fan breaker tripped on overcurrent. The affected fan should be placed in Pull-Out.** |
| | BOP | STOP the other CRDM Ventilation Fan. [Step D] |
| | BOP | PLACE the shutdown CRDM Ventilation Fan handswitch in AUTO. [Step E] |
| | BOP | MONITOR Containment Radiation levels until they stabilize. [Step F] |
| | BOP | IF a Containment Purge OR Vent is in progress AND radiation levels rise to the Alert Alarm Limit on either the Containment Air Gaseous Monitor (1-RE-5503) OR the Containment Air Particulate Monitor (1-RE-5502), THEN perform ONE of the following: Step is N/A [Step G] |
| | BOP | IF Containment Purge OR Vent was secured in Step B OR G, THEN: Step is N/A [Step H] |
| | BOP | IF CVI was disabled in Step B OR G, THEN: Step is N/A [Step I] |

| Operating Test: NRC | Scenario # 4 | Event # 2 | Page 16 of 42 |
|---|---|---|---|
| Event Description: CRDM Vent Fan 1-01 Trips. Requires start of alternate fan. | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Examiner Note:** | | **The next steps continue with 1-ALB-3A, Window 2.1 – CNTMT FN MASTER TRIP**<br>**The US should direct the affected fan handswitch placed in Pull Out based on the report the fan tripped on overcurrent.** |
| | | |
| | BOP | PLACE affected fan handswitch in Pull Out OR Stop, as available. [Step 3] |
| | | |
| | | NOTE: The Control Rod Drive Mechanism Fan AND Containment Air Cooling AND Recirc Fan Overcurrent Trip Switch can be reset locally at the breaker compartment OR by placing the handswitch in Trip OR Pull Out. The Reactor Coolant Pipe Penetration Fan, Preaccess Filtration Fan OR Neutron Detector Well Fan motor overload must be reset at the breaker. |
| | | |
| **Simulator Operator:** | | **When dispatched to locally inspect CRDM Vent Fan breaker, report the breaker tripped on overcurrent.** |
| | | |
| | BOP | DISPATCH an operator to affected fan breaker to determine cause of trip. [Step 4] |
| | | |
| | BOP | WHEN conditions permit, THEN PERFORM a Containment entry per STA-620 to check the fan for signs of damage (smoke, acrid odor, overheating). [Step 5] |
| | | |
| | BOP | CORRECT the condition OR INITIATE a CR per STA-421, as applicable. [Step 6] |
| | | |
| **Examiner Note:** | | **The subsequent TRM call will not apply if crew response prevents Containment Area 6 Temperature from exceeding 172°F. This temperature can be read at the chart recorder on CB-03. The Temperature Element in question is 1-TE-5456, CRDM VENT FN 1. If the crew takes prompt action and starts an alternate fan immediately, the TRM limit of 172°F will most likely not be exceeded. If the US directs starting the fan per the SOP, the temperature may be exceeded. This TRM call can be asked as a follow-up question upon scenario conclusion if not addressed by the US at the time of occurrence.** |
| | | |
| | US | Evaluate Technical Requirements |

| Operating Test: NRC | Scenario # 4 | Event # 2 | Page 17 of 42 |
|---|---|---|---|
| Event Description: CRDM Vent Fan 1-01 Trips. Requires start of alternate fan. | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • TRM LCO 13.7.36, Area Temperature Monitoring (Area 6, Containment Buildings) |
| | | • CONDITION B – One or more areas exceeds the maximum temperature limit(s) for abnormal conditions shown in Table 13.7.36-1<br>• ACTION B.1.1 – Restore the area(s) to within the maximum temperature limit(s) for abnormal conditions within 4 hours, OR<br>• ACTION B.1.2.1 – Enter the appropriate Condition(s) of the appropriate TS(s) for the equipment in the affected area(s) inoperable within 4 hours, OR<br>• ACTION B.1.2.2.1 – Perform a review of the qualification envelope for the affected equipment within 4 hours, AND<br>• ACTION B.1.2.2.2 – Declare INOPERABLE any affected equipment in a qualification envelop that has been exceeded within 4 hours, OR<br>• ACTION B.1.3 – Perform an analysis that justifies continued operation within 4 hours |
| | | |

***When CRDM cooling is restored, or at Lead Examiner discretion, PROCEED to Event 3.***

| Operating Test: | NRC | Scenario # | 4 | Event # | 3 | Page | 18 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Safety Chiller 1-05 trip | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator:** | | **When directed, EXECUTE Event 3 (Key 3).<br>- CH21A, Safety Chiller 1-05 Trip** |
| **Indications Available:**<br>**4A-1.7 – SFTY CH WTR TRN A/B TRBL/TRIP** | | |
| | | |
| | BOP | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | BOP | RECOGNIZE Safety Chiller 1-05 tripped. |
| | | |
| | US | DIRECT performance of 1-ALB-4A, Window 1.7 – SFTY CH WTR TRN A/B TRBL/TRIP |
| | | |
| **Examiner Note:** | | **The following steps are from 1-ALB-4A, Window 1.7 – SFTY CH WTR TRN A/B TRBL/TRIP** |
| | | |
| **Simulator Operator:** | | **When dispatched to locally inspect Safety Chiller 1-05, wait 2 minutes and inform the crew the cause is unknown at this time. Prompt Team has been contacted to investigate.** |
| | | |
| NOTE: | | Safety Chiller Recirculation Pump will automatically start on Blackout, Safety Injection or start of associated CCW pump. With Safety Chiller in standby, recirculation pump run permissive and Chilled Water flow interlock allow chiller to start automatically. |
| | | |
| | BOP | DISPATCH an operator to Safety Chiller room to determine AND correct cause of alarm condition. [Step 1] |
| | | |
| **Simulator Operator:** | | **When/If contacted to check the Refrigerant Leak Detection Panel inform the crew there are no indications of a refrigerant leak in the Safety Chiller room.** |
| | | |
| | | IF either Refrigerant Leak Detection Panel indicates a refrigerant leak, THEN ENSURE Safety Chiller Rooms are sampled per STI-211.01. [Step 1.A] |
| | | |

| Operating Test: | NRC | Scenario # | 4 | Event # | 3 | Page | 19 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Safety Chiller 1-05 trip | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator**: | | **When/If contacted to check 1-PV-4552, SFTY CHLR 05 CCW RET PRESS CTRL VLV closed, inform the crew the valve is closed.** |
| | | |
| | | IF either chiller is shutdown, THEN ENSURE its associated CCW outlet pressure control valve is closed. [Step 1.B]<br>• 1-PV-4552, SFTY CHLR 05 CCW RET PRESS CTRL VLV<br>• 1-PV-4553, SFTY CHLR 06 CCW RET PRESS CTRL VLV |
| | | |
| | US | IF a Safety Chiller tripped, THEN REFER to ABN-503. [Step 2] |
| | | |
| CAUTION: | | With Safety Chiller out-of-service, Chilled Water temperature will gradually increase. Standby chiller must be started and affected Chilled Water Recirculation Pump must be shutdown to prevent lifting refrigerant reliefs on affected chiller. |
| | | |
| | BOP | SHUT DOWN affected Chilled Water Recirculation Pump per SOP-815A. [Step 3] |
| | | |
| | US | REFER to TS 3.7.19. [Step 4] |
| | | |
| | US | ENTER into issue reporting program IAW STA-421. [Step 5] |
| | | |
| **Examiner Note**: | | **The following steps are from ABN-503, Safety Chilled Water System Malfunction, Section 2.0, Loss of One Train Safety Chilled Water.** |
| | | |
| CAUTION: | | WHEN room cooling is lost AND the ESF Pump (motor) running, THEN equipment room temperatures will rise.<br><br>The time to reach Pump Room EQ temperature limits (TS 13.7.36, Area Temperature Monitoring) varies by room. Most limiting times are for RHR, Containment Spray and MD AFW Pump rooms (i.e., less than ten (10) minutes). (Reference Attachment 1)<br><br>Step 4 may be performed in parallel with steps 1 through 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 4 | Event # | 3 | Page | 20 | of 42 |
| Event Description: | Safety Chiller 1-05 trip | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | NOTE: Annunciator (u-ALB-4A-1.7) is common to Train A and Train B chiller status. Individual chiller status may be identified using either:<br>• local verification by dispatching a NEO OR<br>• plant computer points Y2281D and Y2282D. |
| | | |
| | BOP | VERIFY unaffected train Safety Chilled Water – IN SERVICE. [Step 1] |
| | | |
| | BOP | VERIFY cooling to unaffected train of Safety Chilled Water – IN SERVICE. [Step 2]<br>• Unaffected train CCW pump – RUNNING [Step 2.a]<br>• Unaffected train SSW pump – RUNNING [Step 2.b] |
| | | |
| | BOP | START unaffected train of CCW [Step 2 RNO] |
| | | |
| | | **Examiner Note: When contacted to place CCP 1-02 Aux Lube Oil Pump in AUTO execute Key 10 (CVR06 f:1). When contacted to place CCP 1-01 Aux Lube Oil Pump to OFF execute Key 11 (CVR05 f:0). Wait 2 minutes and report completion** |
| | | |
| | US | VERIFY required equipment for existing conditions on unaffected train – IN OPERATION. [Step 3]<br>• RHR Pump<br>• Containment Spray Pumps<br>• Motor Driven AFW Pump<br>• SI Pump<br>• **CCP (Start CCP 1-02)**<br>• SFP Pump<br>• UPS Room Fan Coil Units<br>• UPS Room HVAC |
| | | |
| | | **Simulator Operator: When/If contacted to start the Train B UPS HVAC unit acknowledge request as UNIT 2.** |
| | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 4 | Event # | 3 | Page | 21 | of 42 |
| Event Description: | Safety Chiller 1-05 trip | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | SHUT DOWN equipment supplied by affected train: [Step 4]<br>• RHR Pump – PULL OUT<br>• Containment Spray Pumps – PULL OUT<br>• MD AFW Pump – PULL OUT<br>• SI PUMP – PULL OUT<br>• CCW Pump – PULL OUT<br>• CCP – PULL OUT<br>• SFP Pump – OFF<br>• Elec Area Fan Coolers – OFF<br>• UPS HVAC – OFF<br>• UPS Room FCUs – OFF |

**Simulator Operator**: **When/If contacted to shutdown the X-01 SFP Pump, verify the Train A UPS Room HVAC unit is OFF, secure the Train A Electrical Area Fan Coolers, and secure the Train A UPS Room Fan Coil Units acknowledge request as Unit 2.**

NOTE: With Safety Chiller out-of-service, Chilled Water temperature will gradually increase. Affected Chilled Water Recirculation Pump must be shut down to prevent lifting refrigerant reliefs on affected chiller.

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | ENSURE affected Safety Chilled Water Recirc Pump is in – PULL OUT [Step 5]<br>• 1-HS-6700, RECIRC PMP 5 |

**Simulator Operator**: **When/If contacted to start another train of Control Room A/C acknowledge request as Unit 2.**

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | VERIFY Control Room A/C is ALIGNED to unaffected train OR opposite Unit. [Step 6] |
| | BOP | ENTER into Issue Reporting Program IAW STA-421. [Step 7] |

| Operating Test: | NRC | Scenario # | 4 | Event # | 3 | Page | 22 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | Safety Chiller 1-05 trip | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | REFER to Technical Specifications for LCOs: [Step 8]<br>• 3.3.5<br>• 3.4.6<br>• 3.5.2<br>• 3.5.3<br>• 3.6.6<br>• 3.7.5<br>• 3.7.7<br>• 3.7.19<br>• 3.7.20<br>• 3.8.9 |
| | | |
| | US | REFER to Technical Specifications. |
| | | LCO 3.7.5 Auxiliary Feedwater System<br>• CONDITION C – Two AFW trains inoperable<br>• ACTION C.1 – Be in MODE 3 within 6 hours<br>AND<br>• ACTION C.2 – Be in MODE 4 within 18 hours |
| | | LCO 3.7.19 Safety Chilled Water<br>• CONDITION A – One safety chilled water train inoperable<br>• ACTION A.1 – Restore safety chilled water train to OPERABLE status within 72 hours |
| | | |
| | US | REFER to EPP-201. [Step 9] |
| | | |

***When appropriate equipment has been started on the unaffected train and appropriate equipment on the affected train has been placed in PULL OUT, or at Lead Examiner discretion, PROCEED to Event 4.***

| Operating Test: | NRC | Scenario # | 4 | Event # | 4 | Page | 23 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | SG 1-02 Steam Pressure Channel (PT-2326) fails high | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator: When directed, EXECUTE Event 4 (Key 4).<br>- MS13B, SG 1-02 Pressure Transmitter Failure [PT-2326]** | | |
| **Indications Available:<br>1-PI-2326, MSL 2 PRESS failed high<br>1-ZL-2326, SG 2 ATMOS RLF VLV red OPEN light LIT<br>Y6845D, SG 2 ATMOS RLF VLV Plant Computer alarm** | | |
| | | |
| | BOP | RESPOND to Dynamic Alarm Display (DAD) Alarm. |
| | | |
| | BOP | RECOGNIZE PT-2326 failed high and SG 2 Atmospheric Relief Valve is open. |
| | | |
| | US | DIRECT performance of ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st-Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 2.0. |
| | | |
| **Examiner Note: The following steps are from ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st-Stage Pressure, and Feed Header Pressure Instrument Malfunction.<br><br>The operator may take manual control of 1-PK-2326 and close the ARV as soon as the failure is identified as allowed by Operations Guideline 3 and ODA-102 after verbalizing the actions to the Unit Supervisor.<br><br>If Reactor power exceeds 100%, the crew may initiate a 50 MW load reduction.** | | |
| | | |
| | US | CHECK ONE Main Steamline Pressure Channel indicating - GREATER THAN 60 psig difference between remaining channels. [Step 2.3.1] |
| | BOP | • IDENTIFIED 1-PI-2326, MSL 2 PRESS indicating 1300 psig with greater than a 60 psig difference between remaining channels. |
| | | |
| | US | VERIFY Steam Generator Atmospheric Relief Valve – CLOSED. [Step 2.3.2] |
| | BOP | • IF pressure is less than 1125 psig, THEN manually CLOSE affected atmospheric relief valve [Step 2.3.2.a RNO] |
| | BOP | • IDENTIFIED pressure less than 1125 PSIG, PLACED 1-PK-2326, SG 2 ATMOS RLF VLV CTRL in MANUAL and 0% DEMAND to CLOSE Valve. |

| Operating Test: | NRC | Scenario # | 4 | Event # | 4 | Page | 24 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | SG 1-02 Steam Pressure Channel (PT-2326) fails high | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | US | • NOTIFY Chemistry that a release has occurred and for Chemistry to determine if a release permit is required per STA-603. [Step 2.3.2.b RNO] |
| | US | GO TO Step 11 [Step 2.3.2.c RNO] |
| | | |
| **<u>Simulator Operator</u>: When contacted as the Shift Manager or Chemistry directly, after 5 minutes report last Unit 1 SG samples were all less than minimum detectable activity (MDA).** | | |
| | | |
| | US | REFER to Technical Specifications per Attachment 6. [Step 2.3.11] |
| | US | • Determined no Technical Specifications apply. |
| | | |
| | US | INITIATE a Condition Report per STA-421, as applicable. [Step 2.3.12] |
| | | |
| **<u>Simulator Operator</u>: When contacted as Prompt Team or Duty Manager inform the crew that you will generate an Issue Report and have a Work Order generated to troubleshoot and repair the failed pressure transmitter.** | | |
| | | |
| ***At Lead Examiners discretion, PROCEED to Event 5.*** | | |

| Operating Test: | NRC | Scenario # | 4 | Event # | 5, 6, & 7 | Page | 25 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|

Event Description:
- Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs
- Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps
- Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator:** | | **When directed, EXECUTE Events 5, 6, & 7 (Key 5)**<br>**- ICM LI-4501, CCW Surge Tank Level Transmitter (LT-4501) fails low**<br>**- TC07C, Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps**<br>**- RP07A/RP07B/RP08A, Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07** |
| **Indications Available:**<br>**1-LI-4501, CCW SRG TK LVL fails to 0%**<br>**1-HS-4513, SFGD LOOP CCW RET VLV closes**<br>**1-HS-4515, SFGD LOOP CCW RET VLV closes**<br>**1-ALB-3B, Window 1.3 – CCW SRG TK TRN A/B LVL LO-LO**<br>**1-ALB-3B, Window 1.4 – CCW SRG TK RMUW SPLY VLV OPEN HV-4600/1 (Auto M/U to the tank)**<br>**1-ALB-3B, Window 2.2 – CCW SRG TK TRN A/B EMPTY (Orange Alarm)**<br>**1-ALB-3B, Window 3.4 – CCW SRG TK TRN B LVL HI-HI/LO**<br>**(+270 seconds) 1-ALB-3B, Window 2.4 – CCW SRG TK TRN A LVL HI-HI/LO (Hi level due to M/U)** | | |
| | | |
| | RO/BOP | RESPOND to Annunciator Alarm Procedures. |
| | | |
| | BOP | RECOGNIZE Train B CCW Surge Tank Level Transmitter (LI-4501) has failed low. |
| | | |
| | US | DIRECT performance of 1-ALB-35, Window 2.2 – CCW SRG TK TRN A/B EMPTY |
| | | |
| **Examiner Note:** | | **The following steps are from 1-ALB-3B, Window 2.2 – CCW SRG TK TRN A/B EMPTY** |
| | | |
| | BOP | DETERMINE affected surge tank: [Step 1]<br>• 1-LR-4500, TRN A SRG TK LVL<br>• 1-LR-4501, TRN B SRG TK LVL |
| | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 4 | Event # | 5, 6, & 7 | Page | 26 | of | 42 |

Event Description:
- Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs
- Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps
- Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | IF surge tank level is <57%, ENSURE affected safeguard loop is isolated. [Step 1.A]<br>Train A<br>• 1-HS-4512, SFGD LOOP CCW RET VLV, closed<br>• 1-HS-4514, SFGD LOOP CCW RET VLV, closed<br>Train B<br>• 1-HS-4513, SFGD LOOP CCW RET VLV, closed<br>• 1-HS-4515, SFGD LOOP CCW RET VLV, closed |
| | | |
| | BOP | IF both CCW Pumps available, ENSURE both CCW pumps are IN SERVICE. [Step 2]<br>• 1-HS-4518A, CCWP 1<br>• 1-HS-4519A, CCWP 2 |
| | | |
| | US | IF standby CCW pump is NOT supplying non-safeguard loop, THEN REFER to ABN-502 for Loss of CCW to the NON-safeguards Loop. [Step 2.A] |
| | | |
| | US | DIRECT actions of ABN-502, Component Cooling Water System Malfunctions, Section 5.0, Loss of Flow to the Non-Safeguards Loop |
| | | |
| **Examiner Note:** | | **The following steps are from ABN-502, CCW System Malfunction, Section 5.0, Loss of CCW Flow to the Non-Safeguards Loop.** |
| | | |
| | BOP | ESTABLISH Non-Safeguards Loop flow: [Step 1] |
| | | |
| | BOP | START Standby CCW Pump. [Step 1.a] |
| | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 4 | Event # | 5, 6, & 7 | Page | 27 | of | 42 |

Event Description:
- Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs
- Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps
- Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | BOP | VERIFY the train associated safeguards loop isolation valves – OPEN [Step 1.b]<br>Train A<br>• 1-HS-4512, SFGD LOOP CCW RET VLV<br>• 1-HS-4514, SFGD LOOP CCW RET VLV<br>Train B<br>• 1-HS-4513, SFGD LOOP CCW RET VLV<br>• 1-HS-4515, SFGD LOOP CCW RET VLV |
| | | |
| | US | PERFORM the following: [Step 1 RNO]<br>1. TRIP the Reactor AND GO TO EOP-0.0A while other operators continue this procedure.<br>2. STOP ALL RCPs. |
| | | |
| | US | DIRECTS performance of EOP-0.0A, Reactor Trip or Safety Injection. |
| | | |
| **Examiner Note: The following steps are from EOP-0.0A, Reactor Trip or Safety Injection.** | | |
| | | |
| **CRITICAL TASK STATEMENT** | | **Trip the Reactor and secure all RCPs, due to loss of all Non-Safeguards Loop CCW flow, prior to any RCP tripping on overcurrent per ABN-502, Component Cooling Water System Malfunctions.** |
| | | |
| | RO | VERIFY Reactor Trip: [Step 1] |
| **CT-1** | | • PLACE 1/1-RTC, RX TRIP BKR in TRIP position and VERIFY Reactor Trip. [Step 1] |
| | | • VERIFY the following: [Step 1.a] |
| | | • DETERMINE Reactor Trip Breakers – OPEN AND |
| | | • DETERMINE Neutron flux – DECREASING. [Step 1.a] |
| | | • DETERMINE all Control Rod Position Rod Bottom Lights – ON. [Step 1.b] |
| | | |
| **Examiner Note: Turbine will not trip which will require the operator to stop EHC pumps or close the Main steam isolation valves, either action is acceptable.** | | |

| Operating Test: | NRC | Scenario # | 4 | Event # | 5, 6, & 7 | Page | 28 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | – Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs<br>– Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps<br>– Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07 | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | VERIFY Turbine Trip: [Step 2] |
| | | • All HP Turbine Stop Valves – CLOSED. |
| | BOP | Manually trip turbine [Step 2 RNO] |
| | | • IF the turbine will NOT trip, THEN pull-out all EHC fluid pumps [Step 2 RNO]<br>• IF the turbine still NOT tripped, THEN close or verify closed main steamline isolation valves. [Step 2 RNO] |
| | | PULL-OUT and/or STOP the following Pumps:<br>• 1-HS-6550, EHC FLUID PMP A<br>• 1-HS-6551, EHC FLUID PMP B<br>• 1-HS-6552, EHC FLUID PMP C |
| | | |
| | BOP | VERIFY Power to AC Safeguards Buses: [Step 3] |
| | | • AC safeguards busses – AT LEAST ONE ENERGIZED [Step 3.a] |
| | | • AC safeguards busses – BOTH ENERGIZED [Step 3.b] |
| | | |
| **CRITICAL TASK STATEMENT** | | **Manually initiate Train A and/or Train B Safety Injection, due to failure to automatically initiate, prior to exiting EOP-0.0A, Reactor Trip or Safety Injection.** |
| | | |
| | US/RO | CHECK SI status: [Step 4] |
| | | • CHECK if SI is actuated: [Step 4.a] |
| | | • SI actuation as indicated on the First Out Annunciator 1-ALB-6C<br>• SI actuated blue status light – ON |
| | | • CHECK if SI is required: [Step 4.a RNO a] |
| | | • Steam Line Pressure less than 610 psig<br>• Pressurizer Pressure less than 1820 psig<br>• Containment Pressure greater than 3.0 psig |

| Operating Test: | NRC | Scenario # | 4 | Event # | 5, 6, & 7 | Page | 29 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | – Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs<br>– Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps<br>– Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07 | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • IF SI is required, THEN manually actuate SI from either handswitch. [Step 4.a RNO a] |
| **CT-2** | RO | • ACTUATE SI from CB-07 using handswitch 1/1-SIA2, SI MAN ACT |
| | | |
| **CRITICAL TASK STATEMENT** | | **Trip the Reactor and secure all RCPs, due to loss of all Non-Safeguards Loop CCW flow, prior to any RCP tripping on overcurrent per ABN-502, Component Cooling Water System Malfunctions.** |
| | | |
| **CT-1** | RO | Secure all RCPs in accordance with ABN-502 due to a loss of CCW flow to the Non-Safeguards Loop<br>• PLACE 1/1-PCPX1, RCP 1 in STOP<br>• PLACE 1/1-PCPX2, RCP 2 in STOP<br>• PLACE 1/1-PCPX3, RCP 3 in STOP<br>• PLACE 1/1-PCPX4, RCP 4 in STOP |
| | | |
| **Examiner Note**: **The TDAFWP will trip on overspeed 8 minutes after Reactor trip. With no AFW flow, a Red Path will exist on Heat Sink when level in all Steam Generators drop below 43% NR and a transition to FRH-0.1A should occur.** | | |
| | | |
| **Examiner Note**: **EOP-0.0A, Attachment 2 Steps, performed by the BOP, begin on Page 37.** | | |
| | | |
| | RO | VERIFY AFW Alignment: [Step 6] |
| | | • MDAFW Pumps –RUNNING. [Step 6.a] |
| | | • Manually start pump(s) [Step 6.a RNO a] |
| | | • No MDAFWPs are available to be started |
| | | • Turbine Driven AFW Pump – RUNNING IF NECESSARY. [Step 6.b] |
| | | • AFW total flow – GREATER THAN 460 GPM. [Step 6.c] |
| | | • AFW valve alignment - PROPER ALIGNMENT. [Step 6.d] |
| | | |
| | RO | DETERMINE Containment Spray NOT Required: [Step 7] |
| | | • VERIFY 1-ALB-2B, Window 1-8, CS ACT – NOT ILLUMINATED. [Step 7.a] |

| Operating Test: | NRC | Scenario # | 4 | Event # | 5, 6, & 7 | Page | 30 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|

Event Description:
- Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs
- Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps
- Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | -AND- |
| | | • VERIFY 1-ALB-2B, Window 4-11, CNTMT ISOL PHASE B ACT – NOT ILLUMINATED. [Step 7.a] |
| | | -AND- |
| | | • VERIFY Containment pressure – LESS THAN 18.0 PSIG. [Step 7.a] |
| | RO | VERIFY Containment Spray Heat Exchanger Outlet Valves – CLOSED. [Step 7.b] |
| | RO | VERIFY Containment Spray Pumps – RUNNING. [Step 7.c] |
| | | |
| | RO/BOP | CHECK if Main Steam lines should be ISOLATED: [Step 8]<br>a. Verify the following: |
| | | • VERIFY Containment pressure – GREATER THAN 6.0 PSIG. [Step 8.a]<br>-OR-<br>• VERIFY Steam Line pressure – LESS THAN 610 PSIG. [Step 8.a] |
| | RO/BOP | Determine Main Steam lines should not be isolated and go to Step 9. [Step 8 a. RNO] |
| | | |
| | RO/BOP | Check RCS Temperature - RCS AVERAGE TEMPERATURE STABLE AT <u>OR</u> TRENDING TO 557$^{O}$F [Step 9] |
| | | • IF temperature less than 557°F and decreasing, THEN perform the following: [Step 9 RNO] |
| | | • Stop Dumping Steam [Step 9 RNO a] |
| | | • IF cooldown continues, THEN reduce total AFW flow as necessary to minimize the cooldown: [Step 9 RNO b] |
| | | • Maintain a minimum of 460 gpm UNTIL narrow range level greater than 43% (50% FOR ADVERSE CONTAINMENT) in at least one SG [Step 9 RNO b 1$^{st}$ bullet] |
| | | • As necessary to maintain SG levels WHEN narrow range level greater than 43% (50% FOR ADVERSE CONTAINMENT) in at least one SG [Step 9 RNO b 2$^{nd}$ bullet] |
| | | • IF TDAFW pump is not required to maintain greater than 460 gpm flow, THEN stop TDAFW pump [Step 9 RNO b 3$^{rd}$ bullet] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 4 | Event # | 5, 6, & 7 | Page | 31 | of | 42 |

Event Description:
- Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs
- Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps
- Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • IF cooldown continues, THEN close main steam isolation valves [Step 9 RNO c] |
| | | |
| | RO/BOP | Check PRZR Valve Status: [Step 10] |
| | | a. PRZR Safeties - CLOSED |
| | | b. Normal PRZR spray valves -CLOSED |
| | | c. PORVs - CLOSED |
| | | d. Power to at least one block valve - AVAILABLE |
| | | e. Block valves - AT LEAST ONE OPEN |
| | | |
| | RO/BOP | Check If RCPs Should Be Stopped: [Step 11] |
| | | • RCPs are secured |
| | | |
| | RO/BOP | Check If Any SG Is Faulted: [Step 12] |
| | | a. Check pressures in all SGs:<br>• ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>-OR-<br>• ANY SG COMPLETELY DEPRESSURIZED |
| | | • Go to Step 13 [Step 12.a RNO a] |
| | | |
| | RO/BOP | Check If SG Tubes Are Not Ruptured: [Step 13] |
| | | • Condenser off gas radiation - NORMAL (COG-182, 1RE-2959)<br>• Main steamline radiation - NORMAL (MSL-178 through 181, 1RE-2325 through 2328)<br>• SG blowdown sample radiation monitor - NORMAL (SGS-164, 1RE-4200)<br>• No Steam Generator level increasing in an uncontrolled manner |
| | | |
| | RO/BOP | CHECK If RCS Is Intact: [Step 14] |
| | | • Containment pressure – LESS THAN 1.3 PSIG<br>• Containment recirculation sump levels – NORMAL |

| Operating Test: | NRC | Scenario # | 4 | Event # | 5, 6, & 7 | Page | 32 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|

Event Description:
- Train B CCW Surge Tank Level Transmitter, LT-4501, fails low, Loss of flow to CCW Non-Safeguards Loop, requires Rx trip and stopping RCPs
- Main Turbine fails to trip on Rx trip, Manual pushbutton fails, requires tripping by securing EHC pumps
- Automatic Safety Injection actuation failure (both trains), Manual actuation required from CB-07

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Containment radiation – NORMAL GRID 4 |
| | | |
| | RO/BOP | CHECK If ECCS Flow Should Be Reduced: [Step 15] |
| | | a. Secondary heat sink: [Step 15.a]<br>• Narrow range level in at least one SG – GREATER THAN 43%<br>-OR-<br>• Total AFW flow to SGs – GREATER THAN 460 GPM |
| | | b. RCS subcooling – GREATER THAN 25°F [Step 15.b] |
| | | c. RCS pressure – STABLE OR INCREASING [Step 15.c] |
| | | d. PRZR level – GREATER THAN 13% [Step 15.d] |
| | | e. Go to EOS-1.1A, SAFETY INJECTION TERMINATION, Step 1 [Step 15.e] |
| | | |

**Examiner Note:** **When the TDAFWP trips, all AFW flow is lost. The crew will enter FRH-0.1A when all SG levels are less than 43% as a RED Path will exist on Heat Sink. SG Levels may not have exceeded 43% prior to trip of the TDAFWP which will necessitate an immediate entry to FRH-0.1A.**

| Operating Test: | NRC | Scenario # | 4 | Event # | 8 | Page | 33 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | TDAFWP trips, Loss of Heat Sink | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| **Simulator Operator:** | | **VERIFY Reactor trip causes TDAFWP Trip after 480 sec<br>- FW09A, TDAFWP Trip (if running) on a 480 second delay** |
| **Indications Available:**<br>**1-SI-2452A, DIGITAL TD AFWP SPEED lowering**<br>**1-PI-2455A, TD AFWP DISCH PRESS lowering to 0 psig**<br>**1-FI-2458A, TD AFWP DISCH FLO lowering to 0 gpm**<br>**1-ALB-8B, Window 4.4 – TD AFWP SUCT PRESS LO**<br>**1-ALB-8B, Window 4.5 – TD AFWP STM SPLY VLV LEAKING HV-2452-1/2** | | |
| | | |
| | US | Determines a Red Path will exist on Heat Sink, enters FRH-0.1A, Response to Loss of Secondary Heat Sink. |
| | | |
| **Examiner Note:** | | **The following steps are from FRH-0.1A, Response to Loss of Secondary Heat Sink.** |
| | | |
| | US | DIRECTS performance of FRH-0.1A, Response to Loss of Secondary Heat Sink. |
| | | |
| CAUTION: | | If total feed flow is less than 460 gpm due to operator action as directed by the ERGs, this procedure need not be performed. |
| CAUTION: | | Feed flow should not be re-established to any faulted SG if a non-faulted SG is available. |
| | | |
| | US/BOP | CHECK If Secondary Heat Sink Is Required: [Step 1] |
| | | • DETERMINE RCS pressure – > ANY NON-FAULTED SG PRESSURE. [Step 1.a] |
| | | • DETERMINE RCS temperature > 350ºF. [Step 1.b] |
| | | |
| | US/RO | DETERMINE Only CCP 1-02 – AVAILABLE. [Step *2] |

| Operating Test: | NRC | Scenario # | 4 | Event # | 8 | Page | 34 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | TDAFWP trips, Loss of Heat Sink | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Immediately PERFORM the following: [Step 2 RNO] |
| | | • STOP All RCPs [Step 2 RNO a] |
| | | • VERIFY power to PRZR PORV block valves – AVAILABLE [Step 2 RNO b] |
| | | • Go to Step 13. OBSERVE CAUTION PRIOR TO STEP 13 [Step 2 RNO c] |
| | | |
| CAUTION: Steps 13 through 22 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed. | | |
| | | |
| | RO/BOP | Manually ACTUATE Safety Injection. [Step 13] |
| | | |
| | RO/BOP | VERIFY RCS Feed Path: [Step 14] |
| | | • CHECK CCP SI flow indicator – CHECK FOR FLOW [Step 14.a]<br>• CCP 1-02 is running with flow |
| | | • CHECK SI pumps – BOTH RUNNING [Step 14.b] |
| | | • PERFORM the following: [Step 14.b RNO b] |
| | | • Manually start pumps and align valves as necessary - Unable to start SIP 1-01 as no room cooling is available. [Step 14.b RNO b.1)] |
| | | • IF either of the following RCS feed paths exist, THEN go to Step 15: [Step 14.b RNO b.2)]<br>• CCPs – BOTH INJECTING<br>-OR-<br>• AT LEAST ONE CCP AND ONE SI PUMP RUNNING |
| | | |
| **Examiner Note**: **The following six steps are performed per FRH-0.1A, Attachment 1.D. This attachment may be handed off to an operator.** | | |
| | | |
| | BOP | Check if Diesels Should Be Emergency Started: [Step 15] |
| | | [1D] Check diesel generator(s) RUNNING [Step 15.a] |
| | | [1.D] PLACE DG EMER STOP/START handswitches in START. [Step 15.b] |
| | | |
| | BOP | [1.D] RESET Safety Injection. [Step 16] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 4 | Event # | 8 | Page | 35 | of | 42 |
| Event Description: | TDAFWP trips, Loss of Heat Sink | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | |
| | BOP | [1.D] RESET Safety Injection Sequencers. [Step 17] |
| | | |
| | BOP | [1.D] RESET Containment Isolation Phase A and B. [Step 18] |
| | | |
| | BOP | [1.D] RESET Containment Spray Signal. [Step 19] |
| | | |
| | BOP/RO | [1.D] ESTABLISH instrument Air and Nitrogen To Containment. [Step 20] |
| | | • ESTABLISH Instrument Air: [Step 20.a] |
| | | • Verify Air Compressor – RUNNING. [Step 20.a.1)]<br>-AND-<br>• ESTABLISH Instrument Air to Containment by opening 1-HS-3487, CNTMT INSTR AIR ISOL VLV |
| | | • ESTABLISH Nitrogen: [Step 20.b] |
| | | • Verify 1-HC-943, ACCUM 1 4 Vent Valve CLOSED. [Step 20.b.1)] |
| | | • OPEN SI/PORV ACCUM N2 ISOL VLV 1/1-8880. [Step 20.b.2)] |
| | | |
| **CRITICAL TASK STATEMENT** | | **Initiate RCS Feed and Bleed in accordance with FRH-0.1A, Response to Loss of Secondary Heat Sink, such that RCS depressurizes sufficiently for Intermediate Head Injection to occur, prior to all SG Wide Range levels lowering to 0%.** |
| | | |
| | RO | ESTABLISH RCS Bleed Path: [Step 21] |
| | | • VERIFY power to PRZR PORV block valves - AVAILABLE. [Step 21.a] |
| | | • VERIFY PRZR PORV Block Valves – BOTH OPEN. [Step 21.b] |
| | | • OPEN PRZR PORVs [Step 21.c] |
| **CT-3** | | • OPEN 1-PCV-455A, PRZR PORV. [Step 21.c] |
| **CT-3** | | • OPEN 1-PCV-456, PRZR PORV. [Step 21.c] |
| | | |
| | | VERIFY Adequate RCS Bleed Path: [Step 22] |
| | | • PRZR PORVs – BOTH OPEN<br>• PRZR PORV block valves – BOTH OPEN |
| | | |

| Operating Test: | NRC | Scenario # | 4 | Event # | 8 | Page | 36 | of | 42 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Event Description: | TDAFWP trips, Loss of Heat Sink | | | | | | | | |

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

***When an adequate Reactor Coolant System bleed and feed path is aligned, TERMINATE the scenario.***

| Operating Test: | NRC | Scenario # | 4 | Event # | Att 2 | Page | 37 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | EOP-0.0A, Attachment 2 | | | | | | | | |

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

| | | |
|---|---|---|
| **Examiner Note: These steps are performed by the BOP per EOP-0.0A, Attachment 2.** | | |
| | | |
| CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment. | | |
| | | |
| | BOP | VERIFY SSW Alignment: [Step 1] |
| | | • VERIFY SSW Pumps – RUNNING. [Step 1.a] |
| | | • VERIFY EDG Cooler SSW return flow. [Step 1.b] |
| | | |
| | BOP | VERIFY Safety Injection Pump 1-02 – RUNNING. [Step 2]<br>• SI Pump 1-01 is unavailable due to loss of Safety Chiller 1-05 |
| | | |
| | BOP | VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [Step 3] |
| | | |
| | BOP | VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [Step 4] |
| | | |
| | BOP | VERIFY CCW Pump 1-02 – RUNNING. [Step 5]<br>• CCW Pump 1-01 is unavailable due to loss of Safety Chiller 1-05 |
| | | |
| | BOP | VERIFY RHR Pump 1-02 – RUNNING. [Step 6]<br>• RHR Pump 1-01 is unavailable due to loss of Safety Chiller 1-05 |
| | | |
| | BOP | VERIFY Proper CVCS Alignment: [Step 7] |
| | | • VERIFY CCP 1-02 – RUNNING. [Step 7.a]<br>  • CCP 1-01 is unavailable due to loss of Safety Chiller 1-05 |
| | | • VERIFY Letdown Relief Valve Isolation: [Step 7.b] |

| Operating Test: | NRC | Scenario # | 4 | Event # | Att 2 | Page | 38 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | EOP-0.0A, Attachment 2 | | | | | | | | |

| Time | Position | Applicant's Actions or Behavior |
|---|---|---|
| | | • Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1)] |
| | | • Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2)] |
| | | |
| | BOP | VERIFY ECCS flow: [Step 8] |
| | | • CCP SI flow indicator – CHECK FOR FLOW. [Step 8.a] |
| | | • RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [Step 8.b] |
| | | • GO to Step 9 of this attachment. [Step 8.b. RNO b.] |
| | | |
| | BOP | VERIFY Feedwater Isolation Complete: [Step 9] |
| | | • Feedwater Isolation Valves – CLOSED. |
| | | • Feedwater Isolation Bypass Valves – CLOSED. |
| | | • Feedwater Bypass Control Valves – CLOSED. |
| | | • Feedwater Control Valves – CLOSED. |
| | | |
| | BOP | VERIFY Diesel Generators – RUNNING. [Step 10] |
| | | |
| | BOP | VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB10 – LIT. [Step 11] |
| | | |
| NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication. | | |
| | | |
| | BOP | VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [Step 12] |
| | | |

| Operating Test: | NRC | Scenario # | 4 | Event # | Att 2 | Page | 39 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | EOP-0.0A, Attachment 2 | | | | | | | | |

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

**NOTE:** Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

**NOTE:** When the SI sequencer has timed out,the Reactor Makeup Water Pump with its handswitch in Auto will restart.

| Time | Position | Location | Equipment | Description | Condition |
|---|---|---|---|---|---|
| | BOP | VERIFY Components on Table 1 are Properly Aligned. [Step 13] | | | |
| | | Location | Equipment | Description | Condition |
| | | CB-03 | X-HS-5534 | H2 PRG SPLY FN 4 | STOPPED |
| | | CB-03 | X-HS-5532 | H2 PRG SPLY FN 3 | STOPPED |
| | | CB-04 | 1/1-8716A | RHRP 1 XTIE VLV | OPEN |
| | | CB-04 | 1/1-8716B | RHRP 2 XTIE VLV | OPEN |
| | | CB-06 | 1/1-8153 | XS LTDN ISOL VLV | CLOSED |
| | | CB-06 | 1/1-8154 | XS LTDN ISOL VLV | CLOSED |
| | | CB-07 | 1/1-RTBAL | RX TRIP BKR | OPEN |
| | | CB-07 | 1/1-RTBBL | RX TRIP BKR | OPEN |
| | | CB-07 | 1/1-BBAL | RX TRIP BYP BKR | OPEN/DEENERGIZED |
| | | CB-07 | 1/1-BBBL | RX TRIP BYP BKR | OPEN/DEENERGIZED |
| | | CB-08 | 1-HS-2397A | SG 1 BLDN HELB ISOL VLV | CLOSED |
| | | CB-08 | 1-HS-2398A | SG 2 BLDN HELB ISOL VLV | CLOSED |
| | | CB-08 | 1-HS-2399A | SG 3 BLDN HELB ISOL VLV | CLOSED |
| | | CB-08 | 1-HS-2400A | SG 4 BLDN HELB ISOL VLV | CLOSED |
| | | CB-08 | 1-HS-2111C | FWPT A TRIP | TRIPPED |
| | | CB-08 | 1-HS-2112C | FWPT B TRIP | TRIPPED |

| Operating Test: | NRC | Scenario # | 4 | Event # | Att 2 | Page | 40 | of | 42 |
|---|---|---|---|---|---|---|---|---|---|
| Event Description: | EOP-0.0A, Attachment 2 | | | | | | | | |

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

| | | | | |
|---|---|---|---|---|
| | CB-09 | 1-HS-2490 | CNDS XFER PUMP | STOPPED (MCC deenergized on SI) |
| | CV-01 | X-HS-6181 | PRI PLT SPLY FN 17 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6188 | PRI PLT SPLY FN 18 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6195 | PRI PLT SPLY FN 19 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6202 | PRI PLT SPLY FN 20 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6209 | PRI PLT SPLY FN 21 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6216 | PRI PLT SPLY FN 22 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6223 | PRI PLT SPLY FN 23 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-6230 | PRI PLT SPLY FN 24 & INTK DMPR | STOPPED/DEENERGIZED |
| | CV-01 | X-HS-3631 | UPS & DISTR RM A/C FN 1 & BSTR FN 42 | STARTED |
| | CV-01 | X-HS-3632 | UPS & DISTR RM A/C FN 2 & BSTR FN 43 | STARTED |
| | CV-01 | 1-HS-5600 | ELEC AREA EXH FN 1 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5601 | ELEC AREA EXH FN 2 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5602 | MS & FW PIPE AREA EXH FN 3 & EXH DMPR | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5603 | MS & FW PIPE AREA EXH FN 4 & EXH DMPR | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5618 | MS & FW PIPE AREA SPLY FN 17 | STOPPED/DEENERGIZED |
| | CV-01 | 1-HS-5620 | MS & FW PIPE AREA SPLY FN 18 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5855 | CR EXH FN 1 | STOPPED/DEENERGIZED |
| | CV-03 | X-HS-5856 | CR EXH FN 2 | STOPPED/DEENERGIZED |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operating Test: | NRC | Scenario # | 4 | Event # | Att 2 | Page | 41 of 42 |
| Event Description: | EOP-0.0A, Attachment 2 | | | | | | |

| Time | Position | Applicant's Actions or Behavior | | | |
|---|---|---|---|---|---|
| | | CV-03 | X-HS-5731 | SFP EXH FN 33 | STOPPED/DEENERGIZED |
| | | CV-03 | X-HS-5733 | SFP EXH FN 34 | STOPPED/DEENERGIZED |
| | | CV-03 | X-HS-5727 | SFP EXH FN 35 | STOPPED/DEENERGIZED |
| | | CV-03 | X-HS-5729 | SFP EXH FN 36 | STOPPED/DEENERGIZED |
| | | | | | |
| **Examiner Note: The next four steps would be performed on Unit 2.** | | | | | |
| | | | | | |
| | | CB-03 | 2-HS-5538 | AIR PRG EXH ISOL DMPR | CLOSED |
| | | CB-03 | 2-HS-5539 | AIR PRG EXH ISOL DMPR | CLOSED |
| | | CB-03 | 2-HS-5537 | AIR PRG SPLY ISOL DMPR | CLOSED |
| | | CB-03 | 2-HS-5536 | AIR PRG SPLY ISOL DMPR | CLOSED |
| | | | | | |
| | BOP | NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required. | | | |
| | | | | | |
| ***EOP-0.0A, Attachment 2 steps are now complete.*** | | | | | |

;2021 CPNPP NRC Scenario 4
;Initial Conditions
;IC18 100% power

;MDAFWP 1-02 OOS for bearing replacement
IRF FWR021 f:0

;Event 1 - PRZR LVL Channel 459 fails low
IMF RX05A f:0 k:1

;Event 2 - CRDM Vent Fan trip
IMF CH10 f:1 k:2

;Event 3 - Safety Chiller 1-05 trip
IMF CH21A f:1 k:3

;CCP 1-02 Aux LO Pump to Auto
IRF CVR06 f:1 k:10

;CCP 1-01 Aux LO Pump to Off
IRF CVR05 f:0 k:11

;Event 4 - SG 1-02 Pressure Transmitter failure
IMF MS13B f:1300 k:4

;Event 5,6 & 7 - Train B CCW Surge Tank Level
;Xmitter fails low, Main Turbine fails to Auto trip
;Manual PB fails, trip EHC pumps, Auto SI failure,
;Manual actuation from CB-07 required

{Key[5]!=0}ICM LI-4501 t:3 f:0.3 d:0 r:0
{Key[5]!=0}IOR AOCCLI4501 f:0
IMF TC07C f:1
IMF RP07A f:1
IMF RP07B f:1
IMF RP08A f:1

;Event 8 - TDAFWP trips (if running) 480 seconds
;after Rx Trip
{LORPRTBAL_1.Value=1} IMF FW09A f:1 d:480

Facility: **CPNPP 1 and 2** Date of Exam: **08/09/21** Operating Test No.: **NRC**

| APPLICANT | EVENT TYPE | SCENARIOS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CPNPP #1 | | | CPNPP #2 (SPARE) | | | CPNPP #3 | | | CPNPP #4 | | | TOTAL | MINIMUM (*) | | |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | SRO | ATC | BOP | SRO | ATC | BOP | SRO | ATC | BOP | SRO | ATC | BOP | | R | I | U |
| **SRO-U1** | RX | 1 | | | | | | | | | - | | | **1** | 1 | 1 | 0 |
| | NOR | - | | | | | | | | | - | | | **-** | 1 | 1 | 1 |
| | I/C | 4 | | | | | | | | | 4 | | | **8** | 4 | 4 | 2 |
| | MAJ | 1 | | | | | | | | | 2 | | | **3** | 2 | 2 | 1 |
| | TS | 3 | | | | | | | | | 2 | | | **5** | 0 | 2 | 2 |
| **SRO-U2** | RX | 1 | | | | | | | | | - | | | **1** | 1 | 1 | 0 |
| | NOR | - | | | | | | | | | - | | | **-** | 1 | 1 | 1 |
| | I/C | 4 | | | | | | | | | 4 | | | **8** | 4 | 4 | 2 |
| | MAJ | 1 | | | | | | | | | 2 | | | **3** | 2 | 2 | 1 |
| | TS | 3 | | | | | | | | | 2 | | | **5** | 0 | 2 | 2 |
| **SRO-U3** | RX | 1 | | | | | | - | | | | | | **1** | 1 | 1 | 0 |
| | NOR | - | | | | | | - | | | | | | **-** | 1 | 1 | 1 |
| | I/C | 4 | | | | | | 6 | | | | | | **10** | 4 | 4 | 2 |
| | MAJ | 1 | | | | | | 2 | | | | | | **3** | 2 | 2 | 1 |
| | TS | 3 | | | | | | 4 | | | | | | **7** | 0 | 2 | 2 |
| **SRO-I1** | RX | | 1 | | | | | - | | | | | | **1** | 1 | 1 | 0 |
| | NOR | | - | | | | | - | | | | | | **-** | 1 | 1 | 1 |
| | I/C | | 3 | | | | | 6 | | | | | | **9** | 4 | 4 | 2 |
| | MAJ | | 1 | | | | | 2 | | | | | | **3** | 2 | 2 | 1 |
| | TS | | - | | | | | 4 | | | | | | **4** | 0 | 2 | 2 |
| **SRO-I2** | RX | | 1 | | | | | - | | | | | | **1** | 1 | 1 | 0 |
| | NOR | | - | | | | | - | | | | | | **-** | 1 | 1 | 1 |
| | I/C | | 3 | | | | | 6 | | | | | | **9** | 4 | 4 | 2 |
| | MAJ | | 1 | | | | | 2 | | | | | | **3** | 2 | 2 | 1 |
| | TS | | - | | | | | 4 | | | | | | **4** | 0 | 2 | 2 |
| **RO1** | RX | | | | | | | | - | | | | - | **-** | 1 | 1 | 0 |
| | NOR | | | | | | | | - | | | | - | **-** | 1 | 1 | 1 |
| | I/C | | | | | | | | 4 | | | | 3 | **7** | 4 | 4 | 2 |
| | MAJ | | | | | | | | 2 | | | | 2 | **4** | 2 | 2 | 1 |
| | TS | | | | | | | | - | | | | - | **-** | 0 | 2 | 2 |

Facility: **CPNPP 1 and 2** Date of Exam: **08/09/21** Operating Test No.: **NRC**

| APPLICANT | EVENT TYPE | SCENARIOS | | | | | | | | | | | | TOTAL | MINIMUM (*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CPNPP #1 | | | CPNPP #2 (SPARE) | | | CPNPP #3 | | | CPNPP #4 | | | | | | |
| | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | CREW POSITION | | | | | | |
| | | SRO | ATC | BOP | SRO | ATC | BOP | SRO | ATC | BOP | SRO | ATC | BOP | | R | I | U |
| **RO2** | RX | | | - | | | | | | - | | - | | **-** | 1 | 1 | 0 |
| | NOR | | | - | | | | | | - | | - | | **-** | 1 | 1 | 1 |
| | I/C | | | 2 | | | | | | 5 | | 4 | | **11** | 4 | 4 | 2 |
| | MAJ | | | 1 | | | | | | 2 | | 2 | | **5** | 2 | 2 | 1 |
| | TS | | | - | | | | | | - | | - | | **-** | 0 | 2 | 2 |
| **RO3** | RX | | | - | | | | | - | | | | - | **-** | 1 | 1 | 0 |
| | NOR | | | - | | | | | - | | | | - | **-** | 1 | 1 | 1 |
| | I/C | | | 2 | | | | | 4 | | | | 3 | **9** | 4 | 4 | 2 |
| | MAJ | | | 1 | | | | | 2 | | | | 2 | **5** | 2 | 2 | 1 |
| | TS | | | - | | | | | - | | | | - | **-** | 0 | 2 | 2 |
| **RO4** | RX | | | | | | | | | - | | - | | **-** | 1 | 1 | 0 |
| | NOR | | | | | | | | | - | | - | | **-** | 1 | 1 | 1 |
| | I/C | | | | | | | | | 5 | | 4 | | **9** | 4 | 4 | 2 |
| | MAJ | | | | | | | | | 2 | | 2 | | **4** | 2 | 2 | 1 |
| | TS | | | | | | | | | - | | - | | **-** | 0 | 2 | 2 |
| **RO5** | RX | | 1 | | | | | | | - | | | | **1** | 1 | 1 | 0 |
| | NOR | | - | | | | | | | - | | | | **-** | 1 | 1 | 1 |
| | I/C | | 3 | | | | | | | 5 | | | | **8** | 4 | 4 | 2 |
| | MAJ | | 1 | | | | | | | 2 | | | | **3** | 2 | 2 | 1 |
| | TS | | - | | | | | | | - | | | | **-** | 0 | 2 | 2 |
| **RO6** | RX | | | - | | | | | - | | | | | **-** | 1 | 1 | 0 |
| | NOR | | | - | | | | | - | | | | | **-** | 1 | 1 | 1 |
| | I/C | | | 2 | | | | | 4 | | | | | **6** | 4 | 4 | 2 |
| | MAJ | | | 1 | | | | | 2 | | | | | **3** | 2 | 2 | 1 |
| | TS | | | - | | | | | - | | | | | **-** | 0 | 2 | 2 |

| Instructions: | |
|---|---|
| 1. | Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position. |
| 2. | Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis. |
| 3. | Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns. |

| Facility: **CPNPP** | Date of Examination: **08/09/21** | | | | | | | Operating Test No: **CP-2021-08** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Applicants | | | | | | | | | | | |
| Competencies | SRO-U1 | | | | SRO-U2 | | | | SRO-U3 | | | |
| | SCENARIO | | | | SCENARIO | | | | SCENARIO | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Interpret/Diag-nose Events and Conditions | 2,3,4,5,6 | | | 1,2,3,4,5,8 | 2,3,4,5,6 | | | 1,2,3,4,5,8 | 2,3,4,5,6 | | 1,2,3,4,5,6,7,8 | |
| Comply With and Use Procedures (1) | 1,2,3,4,5,6 | | | 1,2,3,4,5,8 | 1,2,3,4,5,6 | | | 1,2,3,4,5,8 | 1,2,3,4,5,6 | | 1,2,3,4,5,6,7,8 | |
| Operate Control Boards (2) | - | | | - | - | | | - | - | | - | |
| Communicate and Interact | 1,2,3,4,5,6,7 | | | 1,2,3,4,5,6,7,8 | 1,2,3,4,5,6,7 | | | 1,2,3,4,5,6,7,8 | 1,2,3,4,5,6,7 | | 1,2,3,4,5,6,7,8,9 | |
| Demonstrate Supervisory Ability (3) | 1,2,3,4,5,6,7 | | | 1,2,3,4,5,6,7,8 | 1,2,3,4,5,6,7 | | | 1,2,3,4,5,6,7,8 | 1,2,3,4,5,6,7 | | 1,2,3,4,5,6,7,8,9 | |
| Comply With and Use Tech. Specs. (3) | 2,4,5 | | | 1,3 | 2,4,5 | | | 1,3 | 2,4,5 | | 1,2,3,4 | |

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

| Facility: **CPNPP** | Date of Examination: **08/09/21** | | | | Operating Test No: **CP-2021-08** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Applicants | | | | | | | | | | | |
| Competencies | SRO-I1 | | | | SRO-I2 | | | | RO1 | | | |
| | SCENARIO | | | | SCENARIO | | | | SCENARIO | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Interpret/Diag-nose Events and Conditions | 3,4,5,6 | | 1,2,3,4,5,6,7,8 | | 3,4,5,6 | | 1,2,3,4,5,6,7,8 | | | | 1,2,4,5,7,8 | 2,3,5,6,8 |
| Comply With and Use Procedures (1) | 1,3,4,5,6 | | 1,2,3,4,5,6,7,8 | | 1,3,4,5,6 | | 1,2,3,4,5,6,7,8 | | | | 1,2,4,5,7,8 | 2,3,5,6,8 |
| Operate Control Boards (2) | 1,3,4,5,6 | | - | | 1,3,4,5,6 | | - | | | | 1,2,4,5,7,8 | 2,3,5,6,8 |
| Communicate and Interact | 1,2,3,4,5,6,7 | | 1,2,3,4,5,6,7,8,9 | | 1,2,3,4,5,6,7 | | 1,2,3,4,5,6,7,8,9 | | | | 1,2,3,4,5,6,7,8,9 | 1,2,3,4,5,6,7,8 |
| Demonstrate Supervisory Ability (3) | - | | 1,2,3,4,5,6,7,8,9 | | - | | 1,2,3,4,5,6,7,8,9 | | | | - | - |
| Comply With and Use Tech. Specs. (3) | - | | 1,2,3,4 | | - | | 1,2,3,4 | | | | - | - |

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

| Facility: **CPNPP** | Date of Examination: **08/09/21** | | | | | | | | | Operating Test No: **CP-2021-08** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Applicants | | | | | | | | | | | |
| Competencies | RO2 | | | | RO3 | | | | RO4 | | | |
| | SCENARIO | | | | SCENARIO | | | | SCENARIO | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Interpret/Diagnose Events and Conditions | 2,6,7 | | 1,2,3,5,6,8,9 | 1,3,4,5,7,8 | 2,6,7 | | 1,2,4,5,7,8 | 2,3,5,6,8 | | | 1,2,3,5,6,8,9 | 1,3,4,5,7,8 |
| Comply With and Use Procedures (1) | 2,6,7 | | 1,2,3,5,6,8,9 | 1,3,4,5,7,8 | 2,6,7 | | 1,2,4,5,7,8 | 2,3,5,6,8 | | | 1,2,3,5,6,8,9 | 1,3,4,5,7,8 |
| Operate Control Boards (2) | 2,6,7 | | 1,2,3,5,6,8,9 | 1,3,4,5,7,8 | 2,6,7 | | 1,2,4,5,7,8 | 2,3,5,6,8 | | | 1,2,3,5,6,8,9 | 1,3,4,5,7,8 |
| Communicate and Interact | 1,2,3,4,5,6,7 | | 1,2,3,4,5,6,7,8,9 | 1,2,3,4,5,6,7,8 | 1,2,3,4,5,6,7 | | 1,2,3,4,5,6,7,8,9 | 1,2,3,4,5,6,7,8 | | | 1,2,3,4,5,6,7,8,9 | 1,2,3,4,5,6,7,8 |
| Demonstrate Supervisory Ability (3) | - | | - | - | - | | - | - | | | - | - |
| Comply With and Use Tech. Specs. (3) | - | | - | - | - | | - | - | | | - | - |

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

| Facility: **CPNPP** | Date of Examination: **08/09/21** | | | Operating Test No: **CP-2021-08** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Applicants | | | | | | | | | | |
| Competencies | RO5 | | | | RO6 | | | | | | |
| | SCENARIO | | | | SCENARIO | | | | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | | |
| Interpret/Diagnose Events and Conditions | 3,4,5,6 | | 1,2,3,5,6,8,9 | | 2,6,7 | | 1,2,4,5,7,8 | | | | |
| Comply With and Use Procedures (1) | 1,3,4,5,6 | | 1,2,3,5,6,8,9 | | 2,6,7 | | 1,2,4,5,7,8 | | | | |
| Operate Control Boards (2) | 1,3,4,5,6 | | 1,2,3,5,6,8,9 | | 2,6,7 | | 1,2,4,5,7,8 | | | | |
| Communicate and Interact | 1,2,3,4,5,6,7 | | 1,2,3,4,5,6,7,8,9 | | 1,2,3,4,5,6,7 | | 1,2,3,4,5,6,7,8,9 | | | | |
| Demonstrate Supervisory Ability (3) | - | | - | | - | | - | | | | |
| Comply With and Use Tech. Specs. (3) | - | | - | | - | | - | | | | |

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.