

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301

Simulator Job Performance Measure APE001.AA2.05 (4.4/4.6)
[Alternate Path]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Respond to Continuous Rod Withdrawal

**K/A: Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal:
Uncontrolled rod withdrawal, from available indications.**

Applicability

Estimated Time

Actual Time

RO/SRO(I)/SRO(U)

3 Minutes

_____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- Plant is at 50% power with all systems in AUTO.

Standards

- Trip the Reactor in accordance with AP-1.00.

Initiating Cues

- Continuous rod withdrawal motion indicated.
- Shift Manager direction.

Terminating Cues

- Unit 1 manual reactor trip implemented.

Procedures

- 0-AP-1.00, Rod Control System Malfunction, Rev. 26.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 50% power IC and initialize. Place simulator in RUN.
- Enter the following triggers on a 1 second time delay: Continuous Rod Withdrawal All Modes (RD0102) and Control Banks W/D Speed fails to 72 SPM (RD07)

Initial Conditions

- Plant is at 50% power with all systems in AUTO.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 Reactor Operator.
- A unit transient is about to occur. You are to perform any immediate actions to respond to the transient.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST**Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:** _____

| | |
|--|---|
| <p>STEP 1:</p> <p>CHECKS FOR CONTINUOUS ROD INSERTION OR WITHDRAWAL <i>(Step 1)</i></p> <p>STANDARD:</p> <p>a) Checks continuous outward rod motion by examining the following:</p> <ul style="list-style-type: none"> • ROD DIRECTION OUT lamp lit. • CERPIs and/or step counters indicate motion. <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>ATTEMPTS TO STOP ROD MOTION BY SWITCHING RODS TO MANUAL. <i>(Step 2)</i></p> <p>STANDARD:</p> <p>*a) Rotates ROD CONT MODE SEL Switch from AUTO to MANUAL. This is a critical step.</p> <p>b) Determines that rod motion has not stopped by:</p> <ul style="list-style-type: none"> • serving ROD DIRECTION OUT lamp lit, and/or • observing rod step counters showing outward motion, and/or • step counters making an audible "clicking" noise <p>EVALUATOR'S NOTE:</p> <p>If rods are switched to BANK SELECT, this is allowable, as this is a form of manual control. However, motion should NOT stop even in bank select</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3:</p> <p>INITIATES UNIT REACTOR TRIP. <i>(Step 2-RNO)</i></p> <p>STANDARD:</p> <p style="padding-left: 40px;">*a) Manually initiates reactor trip by depressing the Benchboard 1-1 and/or Benchboard 1-2 Reactor Trip pushbutton. This is a critical step.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>REPORTS TO SHIFT MANAGER (EVALUATOR. <i>(Step 2-RNO)</i>)</p> <p>STANDARD:</p> <p style="padding-left: 40px;">a) Verbal status report made that immediate actions completed (with tripping of reactor).</p> <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • If operator continues with actions of verifying reactor trip by performing E-0 immediate operator actions, let the operator continue E-0 immediate action steps until completion. • <u>When the candidate completes this step then inform the candidate that the task is complete</u> <p>COMMENTS:</p> <p style="text-align: center;">** JPM COMPLETE **</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STOP TIME:

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be performed in the simulator.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Plant is at 50% power with all systems in AUTO.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 Reactor Operator.
- A unit transient is about to occur. You are to perform any immediate actions to respond to the transient.
- When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initial Conditions

- Plant is at 50% power with all systems in AUTO.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 Reactor Operator.
- A unit transient is about to occur. You are to perform any immediate actions to respond to the transient.
- When you finish the actions necessary to accomplish this, please inform me.

| NUMBER | PROCEDURE TITLE | REVISION |
|-----------|--------------------------------|----------------|
| 0-AP-1.00 | ROD CONTROL SYSTEM MALFUNCTION | 26 |
| | | PAGE 2 of 8 |

| STEP | ACTION/ EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|--|--|
| <p>*****</p> <p>CAUTION: If Tave decreases below 530°F, ()-E-0, Reactor Trip or Safety Injection, must be implemented.</p> <p>*****</p> | | |
| [1] | CHECK FOR EITHER OF THE FOLLOWING: <input type="checkbox"/> • Continuous rod withdrawal <input type="checkbox"/> • Continuous rod insertion | <input type="checkbox"/> GO TO Step 6. |
| [2] | STOP ROD MOTION: <input type="checkbox"/> a) Put ROD CONT MODE SEL switch in MANUAL <input type="checkbox"/> b) Check rod motion - STOPPED | <input type="checkbox"/> b) Trip Reactor and GO TO ()-E-0, REACTOR TRIP OR SAFETY INJECTION. |
| 3. | CHECK ROD MOTION - DUE TO INSTRUMENTATION FAILURE <input type="checkbox"/> • First Stage Impulse Pressure <input type="checkbox"/> • Tave/Tref <input type="checkbox"/> • Nuclear Instrumentation | <input type="checkbox"/> IF rod motion due to a dropped rod, <u>THEN</u> GO TO Step 6. <input type="checkbox"/> IF rod motion <u>NOT</u> due to a dropped rod, <u>THEN</u> GO TO Step 24. |
| 4. | CHECK ROD MOTION - DUE TO NUCLEAR INSTRUMENTATION FAILURE | <input type="checkbox"/> GO TO 0-AP-53.00, LOSS OF VITAL INSTRUMENTATION. |
| 5. | GO TO ()-AP-4.00, NUCLEAR INSTRUMENTATION FAILURE | |

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301

Simulator Job Performance Measure [KA 004A4.07 3.9/3.7]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title**Perform an Alternate Dilution of the RCS.****K/A: Ability to manually operate and/or monitor in the control room: Boration/dilution 3.9 / 3.7****Applicability****Estimated Time****Actual Time**

RO/SRO(I)/SRO(U)

10 Minutes

_____ Minutes

Conditions

- Task is to be Performed in the simulator.
- A ramp increase in power is occurring which requires a dilution.

Standards

- 1-OP-CH-021, Alternate Dilution Using Blender.

Initiating Cues

- Reactivity SRO Direction.
- A ramp increase in power requires a Dilution.

Terminating Cues

- Report to Shift Supervision, blender returned to automatic.

Procedures

- 1-OP-CH-021, Alternate Dilution Using Blender, Rev 16

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 25% power IC and initialize. Place simulator in RUN.
- Ramp the Unit to 30% power and match Tave and Tref.
- Shift Station Service bus power from RSSTs to SSTs.
- Set PG Flow Control 1-CH-FC-1114A to 4.0 on the pot.

Initial Conditions

- Unit 1 is at 30% power.
- The 30% hold for a flux map on Unit 1 is complete.
- Power escalation to 100% in accordance with 1-GOP-1.5, Unit Startup, 2% to Reactor Power to Max Allowable Power, is about to recommence.

Initiating Cues

- I am the Reactivity SRO. You are the Unit 1 RO.
- You are to perform a 200 gallon Alternate Dilute in accordance with 1-OP-CH-021 so that the ramp may be recommenced.
- You are to perform the dilution to the charging pump suction only.
- When you finish the actions necessary to accomplish this task, please inform me.

Notes

- During the instructions, the operator is to be given a copy of 1-OP-CH-021.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: None.
- START TIME: _____

PERFORMANCE CHECKLIST**Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME_____:**

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| STEP 1: 1-OP-CH-021, Initial Conditions. Check Primary Grade water is available to the Blender. STANDARD: a) Candidate checks PG pressure normal on Boron Recovery Panel. EVALUATOR'S NOTE: COMMENTS: | _____ SAT _____ UNSAT |
| STEP 2: 1-OP-CH-021, Precautions and Limitations. Candidate reviews and initials Precautions and Limitations. STANDARD: a) Candidate Reviews and initials P&L 4.1 through 4.8. EVALUATOR'S NOTE: None COMMENTS: | _____ SAT _____ UNSAT |

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|---|---|
| <p>STEP 3:</p> <p>1-OP-CH-021. (<i>Step 5.1.1</i>)</p> <p>Candidate acknowledges two (2) NOTES prior to Step 5.1. Candidate Notifies Shift Supervision of Impending Dilution.</p> <p>STANDARD:</p> <ul style="list-style-type: none">a) Candidate acknowledges this subsection is used for the first dilution of the shift. Attachment 1 is used for subsequent dilutions.b) Candidate identifies excess letdown NOT in service, 1-OP-CH-007 not required.c) Candidate Notifies Shift Supervision/Evaluator of impending Alternate Dilution. <p>EVALUATOR'S NOTE:</p> <p>When notified: Acknowledge Candidate will be performing an Alternate Dilution.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>1-OP-CH-021. (<i>Step 5.1.2</i>)</p> <p>Notify STA of impending Alternate Dilution.</p> <p>STANDARD:</p> <ul style="list-style-type: none">a) Candidate notifies STA/Evaluator of impending Alternate Dilute. <p>EVALUATOR'S NOTE:</p> <p>When notified: Acknowledge Candidate will be performing an Alternate Dilution.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 5:</p> <p>1-OP-CH-021. <i>(Step 5.1.3)</i></p> <p>Place the MAKE-UP MODE CNTRL switch in STOP</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Candidate place Blender Mode Control switch in STOP position. b) Candidate Checks RED Light out and GREEN light illuminates. <p>EVALUATOR'S NOTE:</p> <p>If asked: Acknowledge Candidates request for a peer check.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>1-OP-CH-021. <i>(Step 5.1.4)</i></p> <p>Adjust PG Flow Rate and Total gallons for the Dilution.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Checks 1-CH-FC-1114A, PG Flow CNTRL set at 100 gpm (refers to Attachment 2, as necessary. b) Determines required integrator setpoint by filling in blank for desired dilution, subtracting anticipated additional flow using P&L 4.7 as required, and writing 196 in GPM blank. c) Enter value in 1-YS-1114 PRI WATER SUP BATCH INTEGRATOR. <p>EVALUATOR'S NOTE:</p> <p>If asked concerning a) above: PG Flow Control not previously set.</p> <p>If asked concerning IV for Steps a) and b) above: State that the Candidate may assume an IV has been performed, please continue with the Task.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 7:</p> <p>1-OP-CH-021. (<i>Step 5.1.5</i>)</p> <p>Place the MAKE-UP MODE SEL switch in the ALT DIL position.</p> <p>STANDARD:</p> <p>a) Places the MAKE-UP MODE SEL switch in the ALT DIL position.</p> <p>EVALUATOR'S NOTE:</p> <p>None</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 8:</p> <p>1-OP-CH-021. (<i>Step 5.1.6</i>)</p> <p>Place 1-CH-FCV-1114B, BLENDER TO VCT, in the CLOSE position.</p> <p>STANDARD:</p> <p>a) Candidate remembers from Directions that PG flow is to be aligned to the charging pump suction.</p> <p>b) Places 1-CH-FCV-1114B, BLENDER TO VCT, in the CLOSE position.</p> <p>EVALUATOR'S NOTE:</p> <p>If asked: PG flow is to be aligned to the charging pump suction.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 9:</p> <p>1-OP-CH-021. <i>(Step 5.1.7 and 5.1.8)</i></p> <p>Place the MAKE-UP MODE CNTRL switch in the START position.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Places the MAKE-UP MODE CNTRL switch in the START position. b) Checks the following conditions: <ul style="list-style-type: none"> a. 1-CH-FCV-1113A, BORIC ACID TO BLENDER, is closed. b. 1-CH-FCV-1113B, BLENDER TO CHG PUMP, is open. c. 1-CH-FCV-1114A, PGW TO BLENDER, is controlling in AUTO *c) Checks flow indicated on 1-CH-FR-1113, PG Flow, equals desired flow rate. This is a critical step. *d) Checks Integrator counting to desired total gallons. This is a critical step. <p>EVALUATOR'S NOTE:</p> <p>None.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 10:</p> <p>1-OP-CH-021. <i>(Step 5.1.9 and 5.1.10)</i></p> <p>Stopping dilution.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Candidate monitors Dilution and Stops the dilution by: <ul style="list-style-type: none"> • Placing MAKE-UP MODE CNTRL switch in the STOP position, OR • Observing 1-CH-FCV-1113B closes and Integrator total gallons settles on 200 gallons. <p>EVALUATOR'S NOTE:</p> <p>Candidate may perform either bulleted item listed above.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

[illegible]

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be performed in the simulator.
- Perform a 200 gallon Alternate Dilute IAW 1-OP-CH-021.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Unit 1 is at 30% power.
- The 30% hold for a flux map on Unit 1 is complete.
- Power escalation to 100% in accordance with 1-GOP-1.5, Unit Startup, 2% to Reactor Power to Max Allowable Power, is about to recommence.

Initiating Cues

- I am the Reactivity SRO. You are the Unit 1 RO.
- You are to perform a 200 gallon Alternate Dilute in accordance with 1-OP-CH-021 so that the ramp may be recommenced.
- You are to perform the dilution to the charging pump suction only.
- When you finish the actions necessary to accomplish this task, please inform me.

Notes

- During the instructions, the operator is to be given a copy of 1-OP-CH-021.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: None.
- START TIME: _____

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initial Conditions

- Unit 1 is at 30% power.
- The 30% hold for a flux map on Unit 1 is complete.
- Power escalation to 100% in accordance with 1-GOP-1.5, Unit Startup, 2% to Reactor Power to Max Allowable Power, is about to recommence.

Initiating Cues

- I am the Reactivity SRO. You are the Unit 1 RO.
- You are to perform a 200 gallon Alternate Dilute in accordance with 1-OP-CH-021 so that the ramp may be recommenced.
- You are to perform the dilution to the charging pump suction only.
- When you finish the actions necessary to accomplish this task, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR09301

Simulator Job Performance Measure 026A2.03 (4.1/4.4)
Alternate Path

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

CONFIGURE SPRAY SYSTEMS IN ACCORDANCE WITH ECA-1.1 (LOSS OF EMERGENCY RECIRCULATION).

K/A: 026A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predications, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; Failure of ESF

Applicability

Estimated Time

Actual Time

RO/SRO(I)/SRO(U)

10 Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA has occurred and both LHSI pumps are inoperable. 1-ECA-1.1, Loss of Emergency Coolant Recirculation, has been performed up to step 8.

Standards

- 1-ECA-1.1, Loss of Emergency Coolant Recirculation, steps 8 and 9 are complete which result in 1-RS-P-2B in service to 1-RS-E-1D (with service water aligned) and 1-CS-P-1A and 1B in service.

Initiating Cues

- 1-ECA-1.1 step 8.
- Shift Manager direction

Terminating Cues

1-ECA-1.1 steps 8 and 9 complete.

Procedures

- 1-ECA-1.1, Loss of Emergency Coolant Recirculation, Rev. 37.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize (or IC-270).
- Enter the following malfunctions:
 - RS1001- TRN A HI HI CLS FAILS TO ACTIVATE- INSERT
 - RS1002- TRN B HI HI CLS FAILS TO ACTIVATE- INSERT
 - RC0102- RCS COLD LEG B PIPE RUPTURE- INSERT
 - RS0702- LOSS OF INSIDE RECIRC SPR PP 1B – Trigger 4
 - SI0901- LHSI PUMP SI-P-1A OVERCURRENT TRIP- Trigger 1
 - SI0902- LHSI PUMP SI-P-1B OVERCURRENT TRIP- Trigger 1
- Setup the following event trigger- Event action- rsp1b_amp>0.1 – Event 4
- Set up the following switch override- MOVSW104A_OPEN- OFF – INSERT
- Set up the following MOV override – SWMOV105C_BKR – set to OPEN and INSERT.
- Place the simulator in RUN and perform 1-E-0 steps, then transition to 1-E-1 and perform steps 1-18- on step 18 insert trigger 1 and transition to 1-ECA-1.1. Do not worry about stopping unloaded EDGs in E-1.
- Start 1-CS-P-1A and open 1-CS-MOV-101A/B and 1-CS-MOV-102A.
- Open 1-CS-MOV-101C, and 1-CS-MOV-101D.
- Ensure containment sump level is >4'.
- **On recall of JPM, activate/check activated Trigger 4.**

Initial Conditions

- A LBLOCA has occurred with the failure of Hi-Hi CLS to function and failure of both LHSI pumps. 1-ECA-1.1, Loss of Emergency Coolant Recirculation, has been performed up to step 8.

Initiating Cues

- I am the Shift Manager. A LOCA has occurred on Unit 1. Hi-Hi CLS failed to activate and both LHSI pumps have tripped. The team is performing 1-ECA-1.1, Loss of Emergency Coolant Recirculation, and is currently at step 8.
- Here's a copy of 1-ECA-1.1, steps 8 and 9. I need you to align Recirc Spray and Containment Spray in accordance with 1-ECA-1.1, steps 8 and 9.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST**Notes to the Evaluator**

- Task critical elements are bolded and noted at the end of the step as CRITICAL STEP.
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:**

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|---|---|
| <p>STEP 1:</p> <p>CAUTION AND NOTE PRIOR TO STEP 8</p> <p>CAUTION: Operation of an OSRS pump without the associated CS pump could cause cavitation as indicated by fluctuating amperage.</p> <p>NOTE: If CLS can NOT be reset, local breaker operation will be required to stop CS and ISRS pumps.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> • Acknowledges caution and note. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>Check for EITHER of the following (<i>Step 8a</i>):</p> <ul style="list-style-type: none"> • Any CS pump - RUNNING OR REQUIRED OR • RWST level - LESS THAN 20% <p>STANDARD:</p> <ul style="list-style-type: none"> • Observes 1-CS-P-1A running and continues to substep b. <p>EVALUATOR'S NOTE: N/A</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3:</p> <p>Verify CTMT sump level – GREATER THAN 4.0 ft (<i>Step 8b</i>).</p> <p>STANDARD:</p> <ul style="list-style-type: none">• Verifies containment sump level >4'. <p>EVALUATOR'S NOTE: N/A</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>Verify SW aligned to at least two RS HXs (<i>Step 8c</i>).</p> <p>STANDARD:</p> <ul style="list-style-type: none">• Observes that service water is not aligned to ANY RS HXs and goes to step 8c RNO. <p>EVALUATOR'S NOTE: N/A</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 5:</p> <p>Align SW to at least two RS HXs (<i>Step 8c RNO</i>).</p> <p>STANDARD:</p> <ul style="list-style-type: none"> • * Opens 1-SW-MOV-103A– either this valve or 103B must be opened- one valve must be open as a critical step. • * Opens 1-SW-MOV-103B- either this valve or 103A must be opened- one valve must be open as a critical step. • Opens 1-SW-MOV-103C. • Opens 1-SW-MOV-103D. • Opens 1-SW-MOV-104A – Determines that valve will not open • Opens 1-SW-MOV-104B. • Opens 1-SW-MOV-104C. • * Opens 1-SW-MOV-104D – This is a critical step. • Opens 1-SW-MOV-105A. • Opens 1-SW-MOV-105B. • Opens 1-SW-MOV-105C – Determines that valve will not open • * Opens 1-SW-MOV-105D – This is a critical step. <p>EVALUATOR’S NOTE: N/A</p> <p>BOOTH NOTE:</p> <ul style="list-style-type: none"> • If asked: Trainee may dispatch operator to investigate supply breaker to 1-SW-MOV-104A Report time compression has occurred and there are no abnormal indication on 1-SW-MOV-104A (1H1-2N-7B) supply breaker. • If asked: Trainee may dispatch operator to investigate supply breaker for 1-SW-MOV-105C Report time compression has occurred and that the supply breaker (1H1-2N-8C) has tripped. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
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|---|-------------------------------------|
| <p>STEP 6:</p> <p>Start RS pumps associated with aligned RS HXs (<i>Step 8d</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> • Trainee starts 1-RS-P-1B (“B” RS HX) • Trainee observes that 1-RS-P-1B tripped and continues. • * Trainee starts 1-RS-P-2B (“D” RS HX) - This is a critical step. <p>EVALUATOR’S NOTE: N/A</p> <p>BOOTH NOTE: If directed to investigate breaker for 1-RS-P-1B (14J4), report that breaker is tripped as indicated by a ‘Bell Lockout’.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7:</p> <p>CAUTIONS PRIOR TO STEP 9</p> <p>CAUTION:</p> <ul style="list-style-type: none"> • CHG and LHSI pumps taking suction from the RWST must be stopped when level decreases to 6%. • CS pumps taking suction from the RWST must be stopped when level decreases to 3%. <p>STANDARD:</p> <ul style="list-style-type: none"> • Acknowledges cautions <p>EVALUATOR’S NOTE: N/A</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STEP 8:

Determine number of CS pumps required (*Step 9a*):

| CONTAINMENT PRESSURE | RS PUMPS RUNNING | CS PUMPS REQUIRED |
|-----------------------------|------------------|-------------------|
| GREATER THAN 60 PSIA | ----- | 2 |
| BETWEEN 14 PSIA AND 60 PSIA | FEWER THAN 2 | 2 |
| | 2 OR MORE | 1 |
| LESS THAN 14 PSIA | ----- | 0 |

STANDARD:

- Determines that containment pressure is between 14 psia and 60 psia, fewer than two RS pumps are running, and determines that 2 CS pumps are required.

EVALUATOR'S CUE: If asked, there are no abnormalities noted on either containment spray pump.

COMMENTS:

_____ SAT

_____ UNSAT

STEP 9:

CS pumps running - EQUAL TO NUMBER REQUIRED (*Step 9b*)

STANDARD:

- Determines that 2 CS pumps are required, but only 1 currently in service.
- Goes to step 9 RNO.

EVALUATOR'S NOTE: N/A

COMMENTS:

_____ SAT

_____ UNSAT

| | |
|--|---|
| <p>STEP 10:</p> <p>Do the following (<i>Step 9b RNO</i>):</p> <ol style="list-style-type: none"> 1) Manually operate CS pump(s). 2) Close associated CS pump discharge MOVs for stopped pump(s): <ul style="list-style-type: none"> • 1-CS-P-1A, 1-CS-MOV-101A and 1-CS-MOV-101B • 1-CS-P-1B, 1-CS-MOV-101C and 1-CS-MOV-101D <p>STANDARD:</p> <ul style="list-style-type: none"> • * Trainee starts 1-CS-P-1B. This is a critical step. <p>EVALUATOR'S NOTE: N/A</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 11:</p> <p>REPORT TO SHIFT SUPERVISOR (EVALUATOR).</p> <p>STANDARD:</p> <p>Verbal status report that CS and RS have been aligned in accordance with ECA-1.1 steps 8 & 9.</p> <p>EVALUATOR'S NOTE: N/A</p> <p>STOP TIME:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STOP TIME:

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be performed in the simulator.
- Perform Steps 8 and 9 of 1-ECA-1.1, Loss of Emergency Coolant Recirculation, to align Recirc Spray and Containment Spray systems.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task

Initial Conditions

- A LBLOCA has occurred with the failure of Hi-Hi CLS to function and failure of both LHSI pumps. 1-ECA-1.1, Loss of Emergency Coolant Recirculation, has been performed up to step 8.

Initiating Cues

- I am the Shift Manager. A LOCA has occurred on Unit 1. Hi-Hi CLS failed to activate and both LHSI pumps have tripped. The team is performing 1-ECA-1.1, Loss of Emergency Coolant Recirculation, and is currently at step 8.
- Here's a copy of 1-ECA-1.1, steps 8 and 9. I need you to align Recirc Spray and Containment Spray in accordance with 1-ECA-1.1, steps 8 and 9.
- When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initial Conditions

- A LBLOCA has occurred with the failure of Hi-Hi CLS to function and failure of both LHSI pumps. 1-ECA-1.1, Loss of Emergency Coolant Recirculation, has been performed up to step 8.

Initiating Cues

- I am the Shift Manager. A LOCA has occurred on Unit 1. Hi-Hi CLS failed to activate and both LHSI pumps have tripped. The team is performing 1-ECA-1.1, Loss of Emergency Coolant Recirculation, and is currently at step 8.
- Here's a copy of 1-ECA-1.1, steps 8 and 9. I need you to align Recirc Spray and Containment Spray in accordance with 1-ECA-1.1, steps 8 and 9.
- When you finish the actions necessary to accomplish this, please inform me.

| | | |
|-------------------------|--|---------------------------------------|
| NUMBER 1-ECA-1.1 | PROCEDURE TITLE LOSS OF EMERGENCY COOLANT RECIRCULATION | REVISION 37 PAGE 7 of 32 |
|-------------------------|--|---------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|--|-----------------------|
| <p>*****</p> <p>CAUTION: Operation of an OSRS pump without the associated CS pump could cause cavitation as indicated by fluctuating amperage.</p> <p>*****</p> | | |
| <p>NOTE: If CLS can NOT be reset, local breaker operation will be required to stop CS and ISRS pumps.</p> | | |
| <p>8. ____ CHECK RECIRCULATION SPRAY SYSTEM:</p> | | |
| <p>a) Check for EITHER of the following:</p> <p><input type="checkbox"/> • Any CS pump - RUNNING OR REQUIRED</p> | <p><input type="checkbox"/> a) GO TO Step 10.</p> | |
| <p style="text-align: center;"><u>OR</u></p> | | |
| <p><input type="checkbox"/> • RWST level - LESS THAN 20%</p> | | |
| <p><input type="checkbox"/> b) Check CTMT sump level - GREATER THAN 4.0 ft</p> | <p>b) Do the following:</p> <p><input type="checkbox"/> 1) Check CLS reset. <u>IF NOT</u>, <u>THEN</u> reset both trains of CLS.</p> <p><input type="checkbox"/> 2) Stop RS pumps.</p> <p><input type="checkbox"/> 3) <u>WHEN</u> sump level greater than 4.0 ft, <u>THEN</u> do Steps 8c and 8d.</p> <p><input type="checkbox"/> 4) GO TO Step 9.</p> | |
| <p><input type="checkbox"/> c) Check SW aligned to at least two RS HXs</p> | <p><input type="checkbox"/> c) Align SW to at least two RS HXs.</p> | |
| <p><input type="checkbox"/> d) Start RS pumps associated with aligned RS HXs</p> | | |

| | | |
|-----------|---|-----------------|
| NUMBER | PROCEDURE TITLE | REVISION |
| 1-ECA-1.1 | LOSS OF EMERGENCY COOLANT RECIRCULATION | 37 |
| | | PAGE 8 of 32 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED | | | | | | | | | | | | | | |
|--|--------------------------|-----------------------|----------------------|------------------|-------------------|----------------------|-------|---|-----------------------------|--------------|---|-----------|---|-------------------|-------|---|
| <p>*****</p> <p>CAUTION: • CHG and LHSI pumps taking suction from the RWST must be stopped when level decreases to 6%.</p> <p>• CS pumps taking suction from the RWST must be stopped when level decreases to 3%.</p> <p>*****</p> <p>9. ____ DETERMINE CS REQUIREMENTS:</p> <p><input type="checkbox"/> a) Determine number of CS pumps required:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">CONTAINMENT PRESSURE</th> <th style="padding: 5px;">RS PUMPS RUNNING</th> <th style="padding: 5px;">CS PUMPS REQUIRED</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">GREATER THAN 60 PSIA</td> <td style="padding: 5px;">-----</td> <td style="padding: 5px;">2</td> </tr> <tr> <td rowspan="2" style="padding: 5px;">BETWEEN 14 PSIA AND 60 PSIA</td> <td style="padding: 5px;">FEWER THAN 2</td> <td style="padding: 5px;">2</td> </tr> <tr> <td style="padding: 5px;">2 OR MORE</td> <td style="padding: 5px;">1</td> </tr> <tr> <td style="padding: 5px;">LESS THAN 14 PSIA</td> <td style="padding: 5px;">-----</td> <td style="padding: 5px;">0</td> </tr> </tbody> </table> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><input type="checkbox"/> b) CS pumps running - EQUAL TO NUMBER REQUIRED</p> </div> <div style="width: 45%;"> <p>b) Do the following:</p> <p><input type="checkbox"/> 1) Manually operate CS pump(s).</p> <p>2) Close associated CS pump discharge MOVs for stopped pump(s):</p> <p><input type="checkbox"/> • 1-CS-P-1A, 1-CS-MOV-101A and 1-CS-MOV-101B</p> <p><input type="checkbox"/> • 1-CS-P-1B, 1-CS-MOV-101C and 1-CS-MOV-101D</p> </div> </div> | | | CONTAINMENT PRESSURE | RS PUMPS RUNNING | CS PUMPS REQUIRED | GREATER THAN 60 PSIA | ----- | 2 | BETWEEN 14 PSIA AND 60 PSIA | FEWER THAN 2 | 2 | 2 OR MORE | 1 | LESS THAN 14 PSIA | ----- | 0 |
| CONTAINMENT PRESSURE | RS PUMPS RUNNING | CS PUMPS REQUIRED | | | | | | | | | | | | | | |
| GREATER THAN 60 PSIA | ----- | 2 | | | | | | | | | | | | | | |
| BETWEEN 14 PSIA AND 60 PSIA | FEWER THAN 2 | 2 | | | | | | | | | | | | | | |
| | 2 OR MORE | 1 | | | | | | | | | | | | | | |
| LESS THAN 14 PSIA | ----- | 0 | | | | | | | | | | | | | | |

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301

Simulator Job Performance Measure EPEE02.EK3.3 (3.9/3.9)
Alternate Path

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Re-establish Normal Letdown Following SI

K/A: EPEEE02.EK3.3 Knowledge of the reasons for the following responses as they apply to the (SI Termination): Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations. 3.9 / 3/9

Applicability

Estimated Time

Actual Time

RO/SRO(I)/

40 Minutes

_____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- A spurious SI has occurred. E-0 has been performed, SI reduction criteria are satisfied, transition made to ES-1.1, and it has been performed through Step 14.

Standards

- Excess letdown placed in service.

Initiating Cues

- 1-ES-1.1, SI Termination, Step 15.
- Shift Manager direction.

Terminating Cues

- Report received that excess letdown is in service per 1-OP-CH-006.

Procedures

- 1-ES-1.1, SI Termination, Rev. 48.
- 1-OP-CH-006, Shifting or Increasing/Decreasing Letdown Flow, Rev.20.

Surry

2014-301

Establish L/D Following SI

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize (IC 268). Place simulator in RUN.
- Initiate SI. Perform E-0, reset SI, verify SI reduction criteria satisfied, transition to ES-1.1 and perform it through Step 14. Allow simulator until SR energize, place in freeze and snap until ready to run JPM.
- Close 1-CH-LCV-1460A & B. Initiate failure 1-CH-LCV-1460A shut; Switch O/R, CHLCV460A_CLOSE, ON, INSERT; CHLCV-460A_OPEN, OFF, INSERT.
- Open 1-CC0TV-109B.
- Press Green Pushbutton on 1-DG-TV-108A/B and pump down the PDTT.
- Set seal injection at 8 gpm.
- **Verify PRZR Level Control Channel Select Switch is in the III/II position.**
- Freeze simulator at these conditions for JPM performance.

Initial Conditions

- Plant was at 100% power with all systems operating normal and in automatic.

Initiating Cues

- I am the Shift Manager. We are currently recovering from a spurious SI initiation. The 1-ES-1.1, SI termination procedure has been completed up to Step 15. SI has been reset.
- Here's a copy of ES-1.1, Step 15. I need you to re-establish letdown by performing step 15 of 1-ES-1.1.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST**Notes to the Evaluator**

- Operator is given a copy of 1-ES-1.1, SI Termination, Step 15.
 - When Operator determines the need to place excess letdown in service, give them a copy of 1-OP-CH-006, Shifting or Increasing/Decreasing Letdown Flow.
- Task critical elements are bolded and noted at the end of the step as CRITICAL STEP.
- START TIME:** _____:

| | |
|---|-------------------------------------|
| <p>STEP 1:</p> <p><i>A (Step 15a of ES-1.1)</i></p> <p>STANDARD:</p> <p>Checks that indicated CHG line flow is greater than 40 gpm by observing flow on 1-CH-FI-1122A.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>Open Letdown Line pressure control valve. <i>(Step 15 b of ES-1.1)</i></p> <ul style="list-style-type: none"> 1-CH-PCV-1145 <p>STANDARD:</p> <p>(a) Places 1-CH-PCV-1145 controller into MANUAL. (b) Adjusts demand increase button until 1-CH-PCV-1145 indicates open (zero demand indicated).</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3:</p> <p>Check closed or close letdown orifice isolation valves. (<i>Step 15 c of ES-1.1</i>)</p> <ul style="list-style-type: none"> • 1-CH-HCV-1200A • 1-CH-HCV-1200B • 1-CH-HCV-1200C <p>STANDARD:</p> <p>a) Checks 1-CH-HCV-1200A closed. b) Checks 1-CH-HCV-1200B closed. c) Checks 1-CH-HCV-1200C closed.</p> <p>EVALUATOR'S NOTE:</p> <p>None.</p> <p>COMMENTS:</p> | <p>b</p> |
| <p>STEP 4:</p> <p>Open letdown isolation valves. (<i>Step 5 d of ES-1.1</i>)</p> <p>STANDARD:</p> <p>a) Opens 1-CH-TV-1204A. b) Opens 1-CH-TV-1204B. *c) Attempts to open 1-CHLCV-1460A, Valve will not open. *d) Goes to Step 15 RNO, Establish excess letdown IAW 1-OP-CH-006, Shifting or Increasing/Decreasing letdown Flow. This is a critical step.</p> <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • [This step is the Fault] The Operator should determine the letdown isolation valve 1-CH-LCV-1460A has failed and apply the RNO for placing excess letdown in service. Operator may reduce charging at this point to minimize it to attempt to maintain PRZR level. • When Operator determines the need to perform 1-OP-CH-006, hand him/her a copy of the procedure. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
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| <p>STEP 5:</p> <p>1-OP-CH-006.</p> <p>OBTAINS COPY OF 1-OP-CH-006 FROM EVALUATOR</p> <p>STANDARD:</p> <p>(a) Reviews initial conditions, precautions and limitations. (b) Determines Section 5.1 is to be used.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>1-OP-CH-006. (Steps 5.1.1 thru 5.1.4)</p> <p>CHECK ALL LOOP DRAINS AND EXCESS LETDOWN ISOLATIONS ARE SHUT</p> <p>STANDARD:</p> <p>(a) Verifies all loop drains are shut (1-RC-1557A, B, and C) using control board indicator lights. (b) Verifies excess letdown HX isolation is shut (1-CH-HCV-1201) using control board indicator lights. (c) Verifies excess letdown flow setpoint is at zero (1-CH-HCV-1137). (d) Verifies excess letdown divert valve (1-CH-HCV-1389) is set to VCT.</p> <p>EVALUATOR'S NOTE:</p> <p>None.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 7:</p> <p>1-OP-CH-006. (Step 5.1.5 and 5.1.6)</p> <p>OPENS RCP SEAL RETURN AND CCW</p> <p>STANDARD:</p> <ul style="list-style-type: none"> *(a) Checks open or opens RCP seal return isolation (1-CH-MOV-1381) using control board controls. (b) Checks at least one CC pump running using control board indications. <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 8:</p> <p>1-OP-CH-006. (Step 5.1.8 thru 5.1.12)</p> <p>VERIFIES LETDOWN HX TEMPERATURE CONTROL AND EXCESS LETDOWN READY FOR SERVICE.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Checks 1-CC-FI-109, LETDOWN HX OUTLET FLOW is ~ 160 gpm. (b) Applies note concerning 1-CC-HCV-108. (c) Checks 1-CC-TI-108, LETDOWN HX OUTLET TEMP, is indicating ambient. (d) Checks 1-CH-PI-1138, EXCESS LETDOWN HX OUTLET PRESS, is approximately 50 psig. (e) Checks 1-CH-TI-1139, EXCESS LETDOWN HX OUTLET TEMP, is indicating ambient. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 9:</p> <p>1-OP-CH-006. (Step 5.1.13 thru 5.1.23)</p> <p>ESTABLISH EXCESS LETDOWN FLOW PATH.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Acknowledges note on first directing excess letdown to the PDTT. (b) Places 1-CH-HCV-1389, EXCESS LETDOWN DIVERT, to the PDTT. Verifies position by board indications. (c) Verifies 1-CH-PI-1138, EXCES LETDOWN HX OUTLET PRESS, indicates ~ 10 psig. *(d) Opens 1-CH-HCV-1201, EXCESS HX LETDOWN ISOLATION, and verifies position by board indications. This is a critical step. (e) Records charging flow. (f) Acknowledges note on excess letdown effect on calorimetric. (g) N/A's step for calorimetric being performed. (h) Acknowledges cautions on opening loop drains. *(i) Opens one loop drain (1-RC-HCV-1557A, B, or C). Verifies position by board indications. This is a critical step. (j) Acknowledges notes on excess letdown flow rate and use of Attachment 1. *(k) Slowly opens 1-CH-HCV-1137, EXCESS LETDOWN FLOW, until 15 gpm to PDTT. This is a critical step. (l) Verifies excess letdown temperature 1-CC-TI-108 is < 150°F and 1-CH-TI-109 is < 195°F. (m) Records pot setting for 1-CH-HCV-1137. <p>EVALUATOR'S NOTE:</p> <p>If asked: A calorimetric is not being performed</p> <p>If asked: As the Shift Manager, direct the Operator to use the "A" loop drain path.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
|--|---|

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| <p>STEP 10:</p> <p>1-OP-CH-006. (Step 5.1.24 thru 5.1.26)</p> <p>ESTABLISH EXCESS LETDOWN FLOW PATH THROTTLES EXCESS LETDOWN AND TRANSFERS TO VCT.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Throttles 1-CH-HCV-1137 to 5 gpm. (b) Acknowledges Notes. * (c) When PDTT increases 10% (1-DG-LI-107) selects "VCT" on 1-CH-HCV-1389, (d) Increase 1-CH-HCV-1137 to previous recorded setpoint. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • To expedite JPM, Evaluator may time compress and direct Operator PDTT level has increased by 10%. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 11:</p> <p>1-OP-CH-006. (Step 5.1.27 thru 5.1.31)</p> <p>Checks Parameters.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Checks RCP and leakoff is in normal band. (b) Checks 1-CH-PI-1138 ~ 65 psig. (c) Acknowledges CAUTION concerning CH flow greater than expected, a leak on excess letdown flowpath is a possibility. (d) Verifies charging flow stable at ~ 15 gpm greater than previously recorded value. (e) Verifies 1-CC-TI-108 < 150°F, and 1-CH-TI-1139 < 195°F. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • • When Excess Letdown is in service, you can inform the Operator someone else will finish the procedure and terminate the JPM. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>Step 12</p> <p>REPORTS TO SHIFT MANAGER (EVALUATOR).</p> <p><u>Standards</u></p> <p>Verbal status report made that Step 15 completed and letdown has been re-established.</p> <p><u>Evaluator's Comments</u></p> <p>STOP TIME:_____</p> | |
|--|--|

STOP TIME:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be performed in the simulator.
- Perform Step 15 of ES-1.1, and 1-OP-CH-006 through Step 5.1.31.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Plant was at 100% power with all systems operating normal and in automatic.

Initiating Cues

- I am the Shift Manager and you are the BOP Operator. We are currently recovering from a spurious SI initiation. The 1-ES-1.1, SI termination procedure has been completed up to Step 15. SI has been reset.
- Here's a copy of ES-1.1, Step 15. I need you to re-establish letdown by performing step 15 of 1-ES-1.1.
- When you finish the actions necessary to accomplish this, please inform me.
-

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initial Conditions

- Plant was at 100% power with all systems operating normal and in automatic.

Initiating Cues

- I am the Shift Manager and you are the BOP Operator. We are currently recovering from a spurious SI initiation. The 1-ES-1.1, SI termination procedure has been completed up to Step 15. SI has been reset.
- Here's a copy of ES-1.1, Step 15. I need you to re-establish letdown by performing step 15 of 1-ES-1.1.
- When you finish the actions necessary to accomplish this, please inform me.

| | | |
|------------------------|---------------------------------------|-----------------|
| NUMBER 1-ES-1.1 | PROCEDURE TITLE SI TERMINATION | REVISION 48 |
| | | PAGE 9 of 28 |

| STEP | ACTION/ EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------|---|---|
| 15. ____ | <p>ESTABLISH LETDOWN:</p> <p><input type="checkbox"/> a) Adjust CHG line flow to establish greater than 40 gpm</p> <p>b) Open letdown line pressure control valve:</p> <p><input type="checkbox"/> • 1-CH-PCV-1145</p> <p>c) Check closed or close letdown orifice isolation valves:</p> <p><input type="checkbox"/> • 1-CH-HCV-1200A</p> <p><input type="checkbox"/> • 1-CH-HCV-1200B</p> <p><input type="checkbox"/> • 1-CH-HCV-1200C</p> <p>d) Open letdown isolation valves:</p> <p><input type="checkbox"/> • 1-CH-TV-1204A</p> <p><input type="checkbox"/> • 1-CH-TV-1204B</p> <p><input type="checkbox"/> • 1-CH-LCV-1460A</p> <p><input type="checkbox"/> • 1-CH-LCV-1460B</p> <p>e) Open letdown orifice isolation valve(s)</p> <p>f) Adjust letdown line pressure control valve to maintain letdown pressure:</p> <p><input type="checkbox"/> • 1-CH-PCV-1145</p> <p>g) Adjust NRHX outlet temperature control valve to control letdown temperature, if necessary:</p> <p><input type="checkbox"/> • 1-CC-TCV-103</p> | <p><input type="checkbox"/> Establish excess letdown IAW 1-OP-CH-006, SHIFTING OR INCREASING/DECREASING LETDOWN FLOW.</p> |

Init Verif

3.0 INITIAL CONDITIONS

None

4.0 PRECAUTIONS AND LIMITATIONS

4.1 The design flow rate for Excess Letdown is 15 gpm. This may be exceeded if all of the following conditions are met:

- 1-CH-TI-1139, EXCESS LETDOWN HX OUTLET TEMP, is indicating less than 195° F.
- 1-CC-TI-108, EXCESS LETDOWN HX OUTLT TEMP, is indicating less than 150° F.
- RCP Seal Leakoff is not affected.

4.2 Immediately isolate Excess Letdown on a loss of Component Cooling flow as indicated on 1-CC-FI-109, EXCESS LETDOWN HX OUTLT FLOW.

4.3 The Excess Letdown Flow path should be placed in service first and Charging Flow stabilized before Letdown Flow is isolated.

4.4 The following parameters should be monitored closely during the performance of this procedure. Reference values are for information only, and should only be used to identify a system imbalance.

| Parameter | Instrument | Reference Value (one orifice) | Reference Value (two orifices) |
|------------------------------|---------------|----------------------------------|-----------------------------------|
| Letdown Line Temp | 1-CH-TI-1143 | 100° F | 100° F |
| Regen HX Letdown Outlet Temp | 1-CH-TI-1140 | 280° F | 250° F |
| Non-Regen HX Outlet Temp | 1-CH-TI-1144 | 100° F | 100° F |
| Regen HX Chg Outlet Temp | 1-CH-TI-1123 | 500° F | 460° F |
| Letdown Relief Line Temp | 1-CH-TI-1141 | 100° F - 130° F | 100° F - 130° F |
| Letdown Line Pressure | 1-CH-PI-1145 | 300 - 350 psig (Ref. 2.4.1) | 300 - 350 psig (Ref. 2.4.1) |
| Letdown Line Flow | 1-CH-FI-1150 | 60 gpm | 105 gpm |
| Charging Line Flow | 1-CH-FI-1122A | 40 gpm | 85 gpm |

- _____ 4.5 Letdown Ion Exchangers will initially be bypassed when Letdown is returned to service to avoid a temperature transient.
- _____ 4.6 Effluent C_B and Influent C_B must be within 25 ppm of each other, or RCS Boron concentration must still be within 25 ppm of the last time the Mixed Bed Demineralizer was used, before demineralizer flow is directed to the VCT.
- _____ 4.7 An RCS temperature change should be anticipated when placing Excess Letdown in service. Excess Letdown is a standby system and the Boron concentration may be greater than or less than that of the RCS based on the last time the system was in service. The piping configuration does not allow for a complete flush of the system. The magnitude of the temperature change is a function of the difference in Boron concentrations. The volume of the section of pipe downstream of the PDTT divert valve to the Seal Return line tap is approximately two gallons. (Ref. 2.4.3)
- _____ 4.8 Due to no flow occurring through the VCT while on excess letdown, all dilutions, borations or manual makeups should be made to the Charging Pump suction through 1-CH-FCV-1113B.
- _____ 4.9 The Zinc Injection skid should be secured when normal Letdown is out of service.

Init Verif

5.0 INSTRUCTIONS

5.1 Shifting from Normal Letdown to Excess Letdown

5.1.1 Check all of the following Loop Drain header isolation valves are closed.

_____ • 1-RC-HCV-1557A, LOOP A DRAIN

_____ • 1-RC-HCV-1557B, LOOP B DRAIN

_____ • 1-RC-HCV-1557C, LOOP C DRAIN

_____ 5.1.2 Check 1-CH-HCV-1201, EXCESS LETDOWN HX ISOL, valve is closed.

_____ 5.1.3 Check 1-CH-HCV-1137, EXCESS LETDOWN FLOW, setpoint is zero.

_____ 5.1.4 Check 1-CH-HCV-1389, EXCESS LETDOWN DIVERT, valve is in the
VCT position.

_____ 5.1.5 Check open or open 1-CH-MOV-1381, RCP SEAL RETURN.

_____ 5.1.6 Check running at least one CC pump.

_____ 5.1.7 IF CC pump NOT running, THEN perform the following. Otherwise, enter
N/A.

_____ a. Throttle CC pump discharge to approximately 25% open for the CC
pump to be started. (✓)

_____ 1-CC-558 for 1-CC-P-1A

_____ 1-CC-564 for 1-CC-P-1B

- _____ b. Check closed or close Stub Bus Tie Breaker for CC pump to be started.
(✓)
_____ 1-EP-BKR-15H9
_____ 1-EP-BKR-15J9
- _____ c. Start one CC pump. (✓)
_____ 1-CC-P-1A
_____ 1-CC-P-1B
- _____ d. Fully open discharge valve throttled in Step 5.1.7.a.
- _____ 5.1.8 Check 1-CC-FI-109, LETDOWN HX OUTLT FLOW, is indicating
approximately 140 gpm.
- NOTE:** The reset switch located on the RHR flats must be held in the open position
until 1-CC-HCV-108, Excess Ldn HX CC Outlet Hand Cont Valve, opens
fully.
- _____ 5.1.9 IF flow NOT indicated on 1-CC-FI-109, THEN locally reset and
open 1-CC-HCV-108. Otherwise, enter N/A.
- _____ 5.1.10 Check 1-CC-TI-108, LETDOWN HX OUTLT TEMP, is indicating ambient.
- _____ 5.1.11 Check 1-CH-PI-1138, EXCESS LETDOWN HX OUTLET PRESS, is
indicating approximately 50 psig.
- _____ 5.1.12 Check 1-CH-TI-1139, EXCESS LETDOWN HX OUTLET TEMP, is
indicating ambient.

- NOTE:**
- The first 50 gallons of Excess Letdown flow should be directed to the Primary Drain Transfer Tank (PDTT) so that the Excess Letdown flow is not returned to the RCS.
 - PCS points Y4020A and U0911 for PDTT level can be found on the Pressurizer & Primary Relief Tank screen.

_____ 5.1.13 Place 1-CH-HCV-1389, EXCESS LETDOWN DIVERT, in the PDTT position to flush the Excess Letdown Heat Exchanger.

_____ 5.1.14 Check 1-CH-PI-1138, EXCESS LETDOWN HX OUTLET PRESS, indicates approximately 10 psig.

_____ 5.1.15 Open 1-CH-HCV-1201, EXCESS LETDOWN HX ISOL.

_____ 5.1.16 Check 1-CH-FI-1122A, CHG LINE FLOW, is stable and record the flow.
_____ gpm

NOTE: Letdown flow from the loops is not accounted for in the calorimetric while on Excess Letdown.

_____ 5.1.17 IF a calorimetric is being performed, THEN check initiated or initiate 1-OPT-RX-007, Shift Average Power Calculation.

CAUTION

- There are several potential leak points downstream of the loop drain valves.
- Only one loop drain valve may be open above 200 °F, to prevent the possibility of bypassing SI flow to the two intact loops in a Design Basis Accident, due to loop cross-connect through the drain header. (Reference 2.3.6)

_____ 5.1.18 Open one of the following Loop Drain header isolation valves. (✓)

_____ 1-RC-HCV-1557A, LOOP A DRAIN

_____ 1-RC-HCV-1557B, LOOP B DRAIN

_____ 1-RC-HCV-1557C, LOOP C DRAIN

NOTE: • An Excess Letdown flow rate can be calculated by using 1-DG-LI-107, PDTT LEVEL (2.5% level change is approximately 15 gallons), and/or change in Charging Flow.

- Attachment 1 may be used to lower Pressurizer Level if required.

_____ 5.1.19 Slowly open 1-CH-HCV-1137, EXCESS LETDOWN FLOW, until approximately 15 gpm flow is established to the PDTT.

_____ 5.1.20 Place 1-CH-FC-1122C, CHARGING FLOW CONTROL, in Manual and raise charging flow 15 gpm from initial value.

_____ 5.1.21 Check 1-CC-TI-108, EXCESS LETDOWN HX OUTLT TEMP, indicates less than 150°F.

_____ 5.1.22 Check 1-CH-TI-1139, EXCESS LETDOWN HX OUTLET TEMP, indicates less than 195°F.

_____ 5.1.23 Record pot setting for 1-CH-HCV-1137.

_____ %

_____ 5.1.24 Reduce Excess Letdown flow to approximately five gpm by throttling 1-CH-HCV-1137.

NOTE: • An RCS temperature change should be anticipated when placing Excess Letdown in service. (Ref. 2.4.3)

- Reactor Coolant Pump seal leakoff flow may become erratic when rapid changes to seal injection and seal leakoff occur. Providing a slow, steady transition when affecting charging or seal leakoff flows should keep seal leakoff flow steady. If seal leakoff flow becomes erratic, seal injection flow should be stabilized and management consulted to determine course of action. (Ref. 2.4.4)

_____ 5.1.25 WHEN the PDTT level has increased at least 10% as indicated on 1-DG-LI-107, THEN transfer flow from the PDTT to the VCT by placing 1-CH-HCV-1389, EXCESS LETDOWN DIVERT, to the VCT position.

- _____ 5.1.26 Slowly increase Excess Letdown flow by adjusting 1-CH-HCV-1137 to pot setting recorded in Step 5.1.23.
- _____ 5.1.27 Check that RCP Seal Leakoff flow is maintained within normal band. IF NOT, THEN initiate 1-AP-9.00, RCP Abnormal Conditions.
- _____ 5.1.28 Check 1-CH-PI-1138, EXCESS LETDOWN HX OUTLET PRESS, indicates approximately 65 psig.

CAUTION

If charging flow is higher than predicted, a leak in the Excess Letdown flow path is a possibility.

- _____ 5.1.29 Check Charging flow is stable at approximately 15 gpm greater than that recorded in Step 5.1.16.
- _____ 5.1.30 Check 1-CC-TI-108, EXCESS LETDOWN HX OUTLT TEMP, indicates less than 150°F.
- _____ 5.1.31 Check 1-CH-TI-1139, EXCESS LETDOWN HX OUTLET TEMP, indicates less than 195°F.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301

Simulator Job Performance Measure APE054.AA1.01 (4.5 / 4.4)

Applicant_____

Start Time_____

Examiner_____

Date_____

Stop Time_____

Title**Cross-Connect AFW from Unit 1 to Unit 2.****K/A: APE054.AA.01: Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW) - AFW controls, including the use of alternate AFW sources (RO 4.5/SRO 4.4.)****Applicability****Estimated Time****Actual Time**

RO/SRO(I)

12 Minutes

_____ Minutes

Conditions

- Task is to be PERFORMED in the Simulator.
- Unit 1 is at 100% power with all systems normal and in AUTO.
- Unit 2 is experiencing a loss of all Feed Water.

Standards

- 2-FR-H.1, Loss of Secondary Heat Sink, step 2d RNO, steps d3 through d5, Revision 34.

Initiating Cues

- Shift Manager Direction.
- 2-FR-H.1, Loss of Secondary Heat Sink, step 2d RNO, steps d3 through d5.

Terminating Cues

- 2-FR-H.1, Loss of Secondary Heat Sink, step 2d RNO, step d5 complete.
- Confirmation of AFW to Unit 2 from Unit 2 Operator.

Procedures

- 2-FR-H.1, Loss of Secondary Heat Sink, Revision 36

Tools and Equipment**Safety Considerations**

- None
- Standard Personal Safety Equipment

Simulator Setup

- Call up 100% power IC and initialize.
- Trip Unit 2, Remotes, Station Protection Unit 2, RXTRIP_UNIT2, and wait for swapover.
- Secure Unit 2 RCPs: Remotes, EL2, EL25A3_bkr / EL25B3_bkr / EL25C3_bkr, Open.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Unit 1 BOP.
- Unit 1 is at 100% power with all systems in AUTO. Unit 2 is currently experiencing a loss of all feedwater. They are in 2-FR-H.1 at step 3d RNO and need Aux Feed flow from both Unit 1 motor-driven AFW pumps. All Unit 2 RCPs have been secured. 1J bus will remain on its current (normal) power supply.
- Here's a copy of 2-FR-H.1, step 3. You are to cross-connect Aux Feedwater from Unit 1 to Unit 2 IAW 2-FR-H.1 3d RNO. RNO steps d. 1) and d. 2) are complete.
- When you finish the actions necessary to accomplish this, please inform me.

Evaluator Notes

- Operator is provided with a copy of 2-FR-H.1, step 3 during directions.
- Task critical elements are bolded and denoted by an asterisk (*).

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are **bolded** and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee, and respond as the Unit 2 Reactor Operator.*
- **START TIME:**

| | |
|--|-------------------------------------|
| <p>STEP 1: (Step 3d RNO, d 3), 2-FR-H.1)</p> <p>CLOSES THE UNIT 1 AFW MOVs</p> <p>STANDARD:</p> <p>Closes and verifies closed indication (green light on - red light off) the following AFW MOVs:</p> <ul style="list-style-type: none"> (a) 1-MOV-FW-151A. (b) 1-MOV-FW-151B, (c) 1-MOV-FW-151C, (d) 1-MOV-FW-151D, (e) 1-MOV-FW-151E, (f) 1-MOV-FW-151F. <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2: (Step 3d RNO, d4, 2-FR-H.1)</p> <p>OPENS THE AFW CROSS-CONNECT VALVES TO SUPPLY UNIT 2.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> *(a) Places control switch for 2-MOV-FW-260A to the OPEN position. *(b) Places control switch for 2-MOV-FW-260B to the OPEN position. (c) Checks 2-MOV-FW-260A open indication received (red on & green off). (d) Checks 2-MOV-FW-260B open indication received (red on & green off). (e) Acknowledges annunciator D-D-4, AFW X-TIE MOVs NOT FULLY CLOSED. <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 3: (<i>Step 3d RNO, d5, 2-FR-H.1</i>)</p> <p>STARTS THE UNIT 1 MOTOR DRIVEN AFW PUMPS.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Announces AFW pump start over Gai-tronics system. *(b) Starts 1-FW-P-3A by placing control switch to START. (c) Verifies start indications (red light on & amps indicated), *(d) Starts 1-FW-P-3B by placing control switch to START. (e) Verifies start indications (red light on & amps indicated). (f) Checks no Unit 1 AFW flow indicated on 1-FW-FI-100A, B & C. <p>EVALUATOR'S NOTE:</p> <p>Unit 2: Following Start of 1-FW-P-3A and 1-FW-P-3B, report that AFW flow is indicated on Unit 2.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 5:</p> <p>REPORTS TO SHIFT MANAGER (EVALUATOR).</p> <p>STANDARD:</p> <p>Reports to the Shift Manager (Evaluator) TASK COMPLETE.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> <p style="text-align: center;">JPM COMPLETE</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STOP TIME:

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**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be performed in the Simulator.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Unit 1 is at 100% power with all systems normal and in AUTO.
- Unit 2 is experiencing a loss of all Feed Water.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Unit 1 BOP.
- Unit 1 is at 100% power with all systems in AUTO. Unit 2 is currently experiencing a loss of all feedwater. They are in 2-FR-H.1 at step 3d RNO and need Aux Feed flow from both Unit 1 motor-driven AFW pumps. All Unit 2 RCPs have been secured.
- Here is a copy of 2-FR-H.1, step 2. You are to cross-connect Aux Feedwater from Unit 1 to Unit 2 IAW 2-FR-H.1 3d RNO. RNO steps d. 1) and d. 2) are complete.
- When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initial Conditions

- Unit 1 is at 100% power with all systems normal and in AUTO.
- Unit 2 is experiencing a loss of all Feed Water.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Unit 1 BOP.
- Unit 1 is at 100% power with all systems in AUTO. Unit 2 is currently experiencing a loss of all feedwater. They are in 2-FR-H.1 at step 3d RNO and need Aux Feed flow from both Unit 1 motor-driven AFW pumps. All Unit 2 RCPs have been secured.
- Here is a copy of 2-FR-H.1, step 3. You are to cross-connect Aux Feedwater from Unit 1 to Unit 2 IAW 2-FR-H.1 3d RNO. RNO steps d. 1) and d. 2) are complete.
- When you finish the actions necessary to accomplish this, please inform me.

| | | |
|----------|---|----------|
| NUMBER | PROCEDURE TITLE | REVISION |
| 2-FR-H.1 | RESPONSE TO LOSS OF SECONDARY HEAT SINK | 36 |
| | | PAGE |
| | | 4 of 22 |

| STEP | ACTION/ EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--------------------------|---|---|
| 3. | TRY TO ESTABLISH AFW FLOW TO AT LEAST ONE SG: (Continued) | |
| | d) Check AFW - AVAILABLE | <input type="checkbox"/> d) IF minimum feed flow <u>NOT</u> established, <u>THEN</u> do the following: |
| <input type="checkbox"/> | 1) Start AFW Pumps | <input type="checkbox"/> 1) Stop ALL RCPs. |
| <input type="checkbox"/> | 2) Check total flow to SGs - GREATER THAN 350 GPM [450 GPM] | <input type="checkbox"/> 2) IF desired to transfer EDG 3 to Bus 1J to restore power to 1-FW-P-3B, <u>THEN</u> GO TO Attachment 2. |
| | | <input type="checkbox"/> 3) Have Unit 1 operator close Unit 1 AFW MOVs. |
| | | 4) Have Unit 1 operator open the following valves: |
| | | <input type="checkbox"/> • 2-FW-MOV-260A |
| | | <input type="checkbox"/> • 2-FW-MOV-260B |
| | | <input type="checkbox"/> 5) Have Unit 1 operator start AFW pump(s). |
| | | <input type="checkbox"/> 6) Control flow to restore narrow range level in at least one SG greater than 12% [18%]. |
| | | <input type="checkbox"/> 7) <u>WHEN</u> narrow range level in at least one SG greater than 12% [18%], <u>THEN</u> RETURN TO procedure and step in effect. |
| | | <input type="checkbox"/> 8) IF minimum AFW flow <u>NOT</u> established, <u>THEN</u> try to locally restore AFW flow <u>AND</u> GO TO Step 4. |
| <input type="checkbox"/> | e) RETURN TO procedure and step in effect | |

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301

Simulator Job Performance Measure [KA 015A4.03 3.8 / 3.9]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title**Remove Source Range NIs From Service During a Reactor Startup.****K/A: 015A4.03 Ability to manually operate and/or monitor in the control room: Trip bypasses 3.8 / 3.9****Applicability****Estimated Time****Actual Time**

RO/SRO(I)

10 Minutes

_____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- N-31 has failed low with Reactor power at approximately 1.2×10^{-10} amps during a startup, and the SR high voltage cannot be removed from either N-31 or N-32.

Standards

- 1-AP-4.00, Nuclear Instrumentation Malfunction

Initiating Cues

- Shift manager Direction.

Terminating Cues

- 1-AP-4.00, Nuclear Instrumentation Malfunction, Step 38 complete.

Procedures

- 1-AP-4.00, Nuclear Instrumentation Malfunction, Rev 30.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up IC-14, S1C26 10-8 Amps D-131 Steps MSTV Shut, and initialize. Place simulator in RUN.
- Perform the startup to obtain power at $\approx 1.2 \times 10^{-10}$ amps (or slightly greater), then implement switch overrides (SRTRP_BLK_TRA_PB, and SRTRP_BLK_TRB_PB, override OFF, Insert), Flux Level Trip Cutout Pushbuttons. Freeze the simulator until ready for operator to perform JPM.
- Do not allow the SUR to be greater than +0.1 dpm.

Initial Conditions

- During a Reactor startup, when P-6 was reached the Operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. Both N-31 and N-32 failed to de-energize.

Initiating Cues

- I am the Nuclear Shift Manager. During a Reactor startup, when P-6 was reached the Operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. The high voltage was not removed from either detector (N-31 or N-32).
- Here is a copy of 1-AP-4.00. I need you to respond to a failure of both Source Range Nis to de-energize, so the Reactor startup can continue.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

- This task is to be **performed** in the Simulator.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: Step 2 before Step 4. Step 4(d) before 4(e), 4(f) before 4(g).
An additional instructor/operator may be needed to operate the control boards for the examinee.

PERFORMANCE CHECKLIST**Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME:** _____.

| | |
|--|-------------------------------------|
| <p>STEP 1:</p> <p>AP-4.00, (Step 1)</p> <p>DETERMINES PROCEDURAL STEPS TO RESPOND TO SRNI FAILURE.</p> <p>STANDARD:</p> <p>(a) Enters 1-AP-4.00 at Step 1. (b) Determines failure not in Power Range NI and goes to Step 10. (c) Determines failure not in Intermediate Range NI and goes to Step 19. (d) Identifies failure in the SRNIs.</p> <p>EVALUATOR'S NOTE:</p> <p>None.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>AP-4.00, Step 20</p> <p>STABILIZE UNIT CONDITIONS.</p> <p>STANDARD:</p> <p>(a) Verifies Unit conditions stable with a zero startup rate. (b) Maintains power with zero startup rate.</p> <p>EVALUATOR'S NOTE:</p> <p>A manual Reactor trip is NOT an acceptable action.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 3:</p> <p>AP-4.00. (Step 21)</p> <p>CHECK REACTOR POWER GREATER THAN P-6 (1×10^{-10}).</p> <p>STANDARD:</p> <p>a) Checks Reactor power level greater than P-6 (1×10^{-10} amps) by:</p> <ul style="list-style-type: none">• observing INT RNG FLUX meters NI-1-35B and NI-1-36B, Benchboard 1-2, $\sim 1.2 \times 10^{-10}$ amps• Meters on the IR CH 1 and CH2 Drawers $\sim 1.2 \times 10^{-10}$ amps.• Permissive Status Light on Vertical Board 1-2, B-3, LIT.• Trip Status Lights on Vertical Board 1-2, C-2 and D-2 LIT• Bistable Light, Power Above Permissive P6, on IR CH-1 and CH2 Drawer, LIT. <p>EVALUATOR'S NOTE:</p> <p>If asked: Indications and lights status is "as found".</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
|--|-------------------------------------|

| | |
|--|-------------------------------------|
| <p>STEP 4:</p> <p>AP-4.00. (Step 22)</p> <p>CHECK BOTH SOURCE RANGE CHANNELS- HIGH VOLTAGE OFF</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Determine that both SRNI Channels are still energized. (b) Pushes "1/N 33A TR A" pushbutton and "1/N 33B TR B" pushbutton. (c) Notes that N-31 and N-32 still have high voltage applied to the detectors. (d) Informs Evaluator (Shift Manager) that Annunciator 1G-D1, "Source or INT RNG NIS TRIP BYP" will be received. *(e) Places LEVEL TRIP switch for N-31 in BYPASS. This is a critical step. *(f) Removes INSTRUMENT POWER fuses for N-31. This is a critical step. *(g) Places LEVEL TRIP switch for N-32 in BYPASS. This is a critical step. *(h) Removes INSTRUMENT POWER fuses for N-32. This is a critical step. (i) Notes requirement to refer to Tech Spec Table 3.7-1 Item 4. (j) Notes requirement to make entry in PSL and Shift Turnover to reinstall fuses. (k) Goes to Step 37 of 1-AP-4.00. (l) Informs the Shift Manager that I&C and the OMOC must be notified <p>EVALUATOR'S NOTE:</p> <p>When Notified: Acknowledge that Tech Spec Table 3.7-1, item 4 requires review.</p> <p>When Notified: Acknowledge that I&C and OM on Call must be notified.</p> <ul style="list-style-type: none"> • When the Instrument Power fuses are pulled on the first channel, annunciator 1G-A3, "NIS SOURCE RNG LOSS OF DET VOLT" is received. • It is acceptable to place both SRNI in LEVEL TRIP BYPASS before removing the INSTRUMENT POWER fuses. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 5</p> <p>REPORT TO NUCLEAR SHIFT MANAGER (EVALUATOR).</p> <p><u>Standards</u></p> <p>Verbal status report that N-31 and N-32 have been removed from service IAW AP-4.00.</p> <p><u>Evaluator's Comments</u> STOP TIME: _____</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STOP TIME:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be performed in the simulator.
- N-31 has failed low with Reactor power at approximately 1.3×10^{-10} amps during a startup, and the SR high voltage cannot be removed from either N-31 or N-32.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initiating Cues

- 1-AP-4.00, Nuclear Instrumentation Malfunction, Step 1.
- Nuclear Shift Manager direction.

Directions to the Operator

- I am the Nuclear Shift Manager. During a Reactor startup, when P-6 was reached the Operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. The high voltage was not removed from either detector (N-31 or N-32).
- Here is a copy of 1-AP-4.00. I need you to respond to a failure of both Source Range Nis to de-energize, so the Reactor startup can continue.
- When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initiating Cues

- 1-AP-4.00, Nuclear Instrumentation Malfunction, Step 1.
- Nuclear Shift Manager direction.

Directions to the Operator

- I am the Nuclear Shift Manager. During a Reactor startup, when P-6 was reached the Operator pushed 1/N-33A TR A and 1/N-33B TR B to de-energize the Source Range NIs. The high voltage was not removed from either detector (N-31 or N-32).
- Here is a copy of 1-AP-4.00. I need you to respond to a failure of both Source Range Nis to de-energize, so the Reactor startup can continue.
- When you finish the actions necessary to accomplish this, please inform me.



SURRY POWER STATION

ABNORMAL PROCEDURE

| NUMBER | PROCEDURE TITLE | REVISION |
|-----------|---|-----------------|
| 1-AP-4.00 | NUCLEAR INSTRUMENTATION MALFUNCTION (WITH 9 ATTACHMENTS) | 30 |
| | | PAGE 1 of 10 |

PURPOSE

To provide guidance for malfunctions of the Nuclear Instrumentation System.

ENTRY CONDITIONS

- 1) Malfunction of any NI channel indicated by erratic, erroneous, or lost indication.
- 2) Malfunction of any NI channel indicated by any of the following annunciators:
 - 1G-A3, NIS SOURCE RNG LOSS OF DET VOLT
 - 1G-B3, NIS INT RNG LOSS OF DET VOLT
 - 1G-C3, NIS PWR RNG LOSS OF DET VOLT
 - 1G-D3, NIS INT RNG CH 1 LOSS OF COMPENSATION VOLT
 - 1G-E3, NIS INT RNG CH 2 LOSS OF COMPENSATION VOLT
- 3) Invalid Reactor Trip signal exists from any NI channel.
- 4) Invalid Rod Stop signal exists from any PR or IR NI channel.
- 5) Transition from 0-AP-53.00, Loss of Vital Instrumentation.

CONTINUOUS USE

| | | |
|---------------------|--|-----------------|
| NUMBER 1-AP-4.00 | PROCEDURE TITLE NUCLEAR INSTRUMENTATION MALFUNCTION | REVISION 30 |
| | | PAGE 2 of 10 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|--|
| <p>NOTE: Attachments 6, 7, and 8 show one-line diagrams of Nuclear Instrumentation.</p> | | |
| 1. ____ | CHECK NI MALFUNCTION - POWER RANGE FAILURE | <input type="checkbox"/> GO TO Step 10. |
| 2. ____ | STABILIZE UNIT CONDITIONS | |
| 3. ____ | CHECK N-44 - FAILED | <input type="checkbox"/> GO TO Step 6. |
| 4. ____ | CHECK ROD CONTROL - IN MANUAL | <input type="checkbox"/> Place Rod Control in MANUAL. |
| ***** | | |
| <p>CAUTION: To prevent operation with delta flux outside of target band, delta flux must be monitored and maintained within band if rods have moved.</p> | | |
| ***** | | |
| 5. ____ | PLACE 1-MS-43-N16, REACTOR POWER SOURCE, IN THE N43 POSITION (SWITCH LOCATED ON NI PROTECTION CHNL III CABINET) | |
| 6. ____ | CHECK N-43 - FAILED | <input type="checkbox"/> GO TO Step 8. |
| 7. ____ | PLACE 1-MS-43-N16, REACTOR POWER SOURCE, IN THE N44 POSITION (SWITCH LOCATED ON NI PROTECTION CHNL III CABINET) | |
| 8. ____ | CHECK POWER RANGE CHANNELS - ONLY ONE FAILED | <p>Do the following:</p> <p><input type="checkbox"/> a) Place the unit in HSD within six hours.</p> <p><input type="checkbox"/> b) Initiate 1-OPT-RP-001, CHECK OF PERMISSIVE STATUS LIGHTS P-6, P-7, P-8, AND P-10, to check Power Range permissives within one hour.</p> <p><input type="checkbox"/> c) GO TO Step 10.</p> |

| NUMBER | PROCEDURE TITLE | REVISION |
|-----------|-------------------------------------|-----------------|
| 1-AP-4.00 | NUCLEAR INSTRUMENTATION MALFUNCTION | 30 |
| | | PAGE 3 of 10 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------------------------------|--|--|
| | <p>NOTE: Performance of Attachment 1 to place the failed Power Range Channel in trip requires I&C assistance for N-41, N-42, or N-43.</p> | |
| 9. ____ | INITIATE ATTACHMENT 1 TO PLACE FAILED CHANNEL IN TRIP WITHIN 72 HOURS | |
| 10. ____ | CHECK NI MALFUNCTION - INTERMEDIATE RANGE FAILURE | <input type="checkbox"/> GO TO Step 19. |
| | <p>NOTE: A failed Intermediate Range instrument has the potential to prevent P-6 from operating properly.</p> | |
| 11. ____ | CHECK INTERMEDIATE RANGE FLUX | |
| | <input type="checkbox"/> a) Flux - LESS THAN 5×10^{-11} ON OPERABLE CHANNEL (5×10^{-6} ON GAMMA-METRICS) | <input type="checkbox"/> a) GO TO Step 12. |
| | <input type="checkbox"/> b) Check Source Range - ENERGIZED | b) Manually energize Source Range detectors by depressing SOURCE RANGE TRIP-RESET pushbuttons: <input type="checkbox"/> • TRA, 1/N 39A <input type="checkbox"/> • TRB, 1/N 39B |
| (STEP 11 CONTINUED ON NEXT PAGE) | | |

| NUMBER | PROCEDURE TITLE | REVISION |
|-----------|-------------------------------------|-----------------|
| 1-AP-4.00 | NUCLEAR INSTRUMENTATION MALFUNCTION | 30 |
| | | PAGE 6 of 10 |

| STEP | ACTION/ EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------|---|---|
| 18. ____ | CHECK ENERGIZED OR ENERGIZE THE SOURCE RANGE NI SCALER/TIMER DRAWER IAW THE FOLLOWING: <input type="checkbox"/> a) Turn on Scaler Timer power <input type="checkbox"/> b) Momentarily press RESET pushbutton <input type="checkbox"/> c) Momentarily press START pushbutton and check GATE lamp is LIT <input type="checkbox"/> d) Check ARMED lamp flashes ON and GATE lamp flashes OFF approximately every 10 seconds <input type="checkbox"/> e) Monitor source range counts | |
| 19. ____ | CHECK NI MALFUNCTION - SOURCE RANGE FAILURE | <input type="checkbox"/> GO TO Step 38. |
| 20. ____ | STABILIZE UNIT CONDITIONS | |
| 21. ____ | CHECK REACTOR POWER - GREATER THAN P-6 (1×10^{-10} AMPS) | <input type="checkbox"/> GO TO Step 27. |

| | | |
|-------------------------|--|---------------------------------------|
| NUMBER 1-AP-4.00 | PROCEDURE TITLE NUCLEAR INSTRUMENTATION MALFUNCTION | REVISION 30 PAGE 7 of 10 |
|-------------------------|--|---------------------------------------|

| STEP | ACTION/ EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------|--|--|
| 22. ____ | CHECK BOTH SOURCE RANGE CHANNELS- HIGH VOLTAGE OFF | <p>Do the following:</p> <p>a) Attempt to block high voltage by depressing SOURCE RNG BLOCK pushbuttons:</p> <p><input type="checkbox"/> • 1/N 33A, TR A</p> <p><input type="checkbox"/> • 1/N 33B, TR B</p> <p><input type="checkbox"/> b) <u>IF</u> Source Range high voltage OFF, <u>THEN</u> GO TO Step 38.</p> <p>c) <u>IF</u> high voltage still <u>NOT</u> OFF, <u>THEN</u> do the following:</p> <p><input type="checkbox"/> 1) Place LEVEL TRIP switch for failed channel(s) in BYPASS.</p> <p><input type="checkbox"/> 2) Pull the instrument power fuses on the failed channel(s).</p> <p><input type="checkbox"/> 3) Refer to Tech Spec Table 3.7-1, Item 4.</p> <p><input type="checkbox"/> 4) Make entry in Plant Status Log and Shift turnover sheets to reinstall fuses when RX power decreases to less than 5×10^{-11} amps.</p> <p>5) <u>WHEN</u> RX power decreases to less than 5×10^{-11} amps, <u>THEN</u> do the following:</p> <p><input type="checkbox"/> a. Reinstall the instrument power fuses on the failed channel(s).</p> <p><input type="checkbox"/> b. Place the LEVEL TRIP switch(es) in NORMAL.</p> <p><input type="checkbox"/> c. <u>IF</u> both Source Range Channels failed, <u>THEN</u> perform Attachment 3.</p> <p><input type="checkbox"/> d) GO TO Step 38.</p> |
| 23. ____ | PLACE LEVEL TRIP BYPASS SWITCH FOR FAILED CHANNEL(s) IN BYPASS | |

| | | |
|---------------------|--|------------------|
| NUMBER 1-AP-4.00 | PROCEDURE TITLE NUCLEAR INSTRUMENTATION MALFUNCTION | REVISION 30 |
| | | PAGE 10 of 10 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------|--|---|
| 34. ____ | CHECK REACTOR TRIP BREAKERS - CLOSED WITH CONTROL RODS CAPABLE OF WITHDRAWAL | <p>Do the following:</p> <p><input type="checkbox"/> a) Maintain Reactor power below P-6.</p> <p><input type="checkbox"/> b) <u>IF</u> both Source Range channels inoperable, <u>THEN</u> check adequate Shutdown Margin within one hour and once each 12 hours thereafter.</p> <p><input type="checkbox"/> c) GO TO Step 38.</p> |
| 35. ____ | MAINTAIN REACTOR POWER BELOW P-6 | |
| 36. ____ | IMMEDIATELY SUSPEND REACTIVITY CHANGES THAT ARE MORE POSITIVE THAN NECESSARY TO MEET THE REQUIRED SHUTDOWN MARGIN OR REFUELING BORON CONCENTRATION | |
| 37. ____ | CHECK THE FAILED CHANNEL - RESTORED WITHIN 48 HOURS | <p>Do the following:</p> <p><input type="checkbox"/> a) Open the Reactor Trip breakers within the next hour.</p> <p><input type="checkbox"/> b) Check adequate Shutdown Margin within one hour and once each 12 hours thereafter.</p> |
| 38. ____ | NOTIFY THE FOLLOWING <input type="checkbox"/> • Instrument Shop <input type="checkbox"/> • OM on call | |
| | - END - | |

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301

Simulator Job Performance Measure [KA 075A2.02 2.5 / 2.7]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title**Respond to a Low Level Transient**

K/A: 075A2.02 2.5/2.7, Ability to (a) predict the impacts of the following malfunctions or operations on the circulating water system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of circulating water pumps

Applicability**Estimated Time****Actual Time**

RO/SRO(I)/SRO(U)

14 Minutes

_____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- Both units are at 100% power when a lightning strike trips 2G screenwell transformer.

Standards

- Circ Water Pumps restored in accordance with AP-12.01, Loss of Intake Canal Level.

Initiating Cues

- LLIS TROUBLE annunciator.
- 500 KV HSE TROUBLE annunciator.
- Unit Two Circ Water Pumps secured.

Terminating Cues

- 0-AP-12.01, Loss of Intake Canal Level, completed.

Procedures

- 0-AP-12.01, Loss of Intake Canal Level, completed. Rev 30.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize. Place simulator in RUN.
- Implement EL0802, Loss of Screenwell Transformer 2, and place simulator in RUN.
- Acknowledge all annunciators and place simulator in FREEZE.

Initial Conditions

- Both units are at 100% power when a lightning strike trips 2G screenwell transformer.

Directions to the Operator.

- You are the BOP and I am the Unit One SRO. Alarm VSP L-7 "LLIS TROUBLE" and VSP-K6 "500KV HSE TRBL" have alarmed, and security reports a lightning strike in the vicinity of the low level intake.
- All Unit 2 Circulating Water Pumps were initially running.
- Unit One and Unit Two Reactor Operators are currently throttling CW MOVs to conserve intake canal level.
- Here's a copy of AP-12.01. You are to perform AP-12.01 in its entirety in response to the loss of 2G screenwell transformer.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: None.
- **START TIME:** _____

PERFORMANCE CHECKLIST**Notes to the Evaluator**

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee.*
- **START TIME_____:**

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| STEP 1: 0-AP-12.01 (<i>Step 1</i>) NOTE: EIPs may be applicable. CHECKS ENTRY INTO THIS PROCEDURE -FROM AN EOP OR AN AP TO RESTORE SW FLOW TO THE CCHXs. STANDARD: a) Acknowledges Note prior to Step 1. b) Identifies entry into this procedure is not from EOP or AP to restore SW. c) Goes to Step 3. EVALUATOR'S NOTE: If Asked: Entry into this procedure not an attempt to restore SW. COMMENTS: | _____ SAT _____ UNSAT |
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| <p>STEP 2:</p> <p>0-AP-12.01. (<i>Step 3</i>)</p> <p>TRY TO MAINTAIN INTAKE CANAL LEVEL</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Acknowledges CAUTIONs prior to step 3 regarding turbine stall flutter and reference to AP-14, if vacuum cannot be maintained. (b) Acknowledges NOTE prior to step 3 regarding potential need to trip one unit to reduce rate of intake canal drawdown. (c) Recalls that initial conditions revealed that Unit ROs were throttling waterboxes as required. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • If asked: Both units are currently throttling waterbox outlet MOVs as required due to loss of circ water pumps. • If asked: Unit SRO will direct unit ramping as required. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 3:</p> <p>0-AP-12.01. (<i>Step 4</i>)</p> <p>CHECK INTAKE CANAL LEVEL- DECREASING.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Candidate identifies that 3 CW pumps are insufficient to supply two units CW requirement. (b) Candidate reads intake canal level indicator and determines downward trend. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • If asked: Trend recorder shows a downward trend on canal level. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 4:</p> <p>0-AP-12.01. (Step 5)</p> <p>START CIRC WATER PUMPS AS REQUIRED FROM THE MCR IAW ATTACHMENT 3</p> <p>STANDARD:</p> <p>Candidate goes to Attachment 3.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 5:</p> <p>0-AP-12.01, Attachment 3. (Step 1)</p> <p>ATTACHMENT 3- REMOTE START OF CIRCULATING WATER PUMPS.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Candidate acknowledges NOTE prior to step (a) that requires 5-minute coastdown of CW pumps prior to starting. (b) Candidate checks 1G-2G Bus Tie Bkr Closed using "LLIS Electrical" PCS screen. (c) Trainee verifies that CW pumps are not in local by noting no white box around Unit 2 CW pumps on CW Pump PCS screen. *(d) Candidate calls up soft control box pumps to start CW pump by clicking on CW pump ICON on PCS CW screen. This is a critical step. *(e) Candidate enables soft control box for pump to be started by clicking on mark number box and verifies red border. This is a critical step. *(f) Candidate clicks "Start" button for pump to control that is active. This is a critical step. (g) Candidate verifies proper amp indication for pump started. *(h) Candidate completes steps (c) through (e) of attachment 3 for remaining Unit 2 CW pumps to be started. This is a critical step. (i) Candidate directs outside operator to perform post-start checks IAW respective OP 48.1.1. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • If asked: Greater than 5 minutes have elapsed since loss of transformer. • If asked: 2A, 2B, 2C and 2D circ water pumps were previously in service. • When Directed: Acknowledge as Outside Operator to perform post start checks of CW pumps IAW op-48.1.1. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 6:</p> <p>0-AP-12.01. (<i>Step 6</i>)</p> <p>SEND OPERATOR TO LOW LEVEL INTAKE TO PERFORM THE FOLLOWING PROCEDURES.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Candidate acknowledges Note prior to step 6 regarding PIN number for ESW pump house and statement regarding CW pump restrictions when 1G-2G busses are cross-tied. (b) Sends an Operator to Low Levels to perform Attachment 2 and OP-48.1.1. <p>EVALUATOR'S NOTE:</p> <p>None.</p> <p>Booth Operator:</p> <p>When directed: Acknowledge Direction to perform 0-AP-12.01, Attachment 2, Low Level Intake Responses; 0-OP-SW-002, Emergency Service Water Pump Operation; and OP-48.1.1. Starting any CW Pump.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7:</p> <p>0-AP-12.01. (<i>Step 7</i>)</p> <p>CHECK INTAKE CANAL LEVEL - GREATER THAN TRIP SETPOINT.</p> <p>STANDARD:</p> <p>Candidate determines that Intake canal level is greater than 23.5 feet and annunciator 1F-G-1, INTK CANAL LO LVL TRIP not lit.</p> <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • <u>If asked:</u> 2F-G1 not lit on Unit Two. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 8:</p> <p>0-AP-12.01. <i>(Step 8)</i></p> <p>CHECK CW LOSS - SUSTAINED WITH NO EXPECTATION OF RECOVERY</p> <p>STANDARD:</p> <p>a) Candidate identifies Canal Level Stable or increasing b) Candidate goes to Step 10</p> <p>EVALUATOR'S NOTE:</p> <p>None.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 9:</p> <p>0-AP-12.01. <i>(Step 10)</i></p> <p>CONTINUES TO REDUCE UNIT LOAD AS NECESSARY TO MAINTAIN VACUUM.</p> <p>STANDARD:</p> <p>Candidate determines that no actions are required based on number of CW pumps running</p> <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none">Both unit's Reactor Operators have stopped throttling CW MOVs. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 10:</p> <p>0-AP-12.01. (<i>Step 11</i>)</p> <p>CHECK INTAKE CANAL LEVEL – STABLE OR INCREASING.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Trainee evaluates canal level indication and/or trend recorder to verify canal level increasing. (b) Trainee then goes to Step 27 <p>EVALUATOR’S NOTE:</p> <ul style="list-style-type: none"> • None. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 11:</p> <p>0-AP-12.01. (<i>Step 27</i>)</p> <p>NOTIFY THE FOLLOWING.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Candidate notifies Evaluator that the OM on Call, Manager Nuclear Operations and STA need to be notified. <p>EVALUATOR’S NOTE:</p> <ul style="list-style-type: none"> • Respond: Notifications will be made. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 12:</p> <p>0-AP-12.01. (<i>Step 28</i>)</p> <p>CHECK INTAKE CANAL LEVEL- INCREASING.</p> <p>STANDARD:</p> <ul style="list-style-type: none">(a) Candidate acknowledges NOTE concerning Intake Canal Level must be maintained >17.2 feet.(b) Candidate evaluates canal level indication and/or trend recorder to and identifies canal level >17.2 feet, and increasing. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none">• None. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 13:</p> <p>0-AP-12.01. (<i>Step 29</i>)</p> <p>CHECK INTAKE CANAL LEVEL - GREATER THAN 17.2 FT.</p> <p>STANDARD:</p> <ul style="list-style-type: none">(a) Candidate identifies canal level greater than 17.2 feet. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none">• None. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 14:</p> <p>0-AP-12.01. (<i>Step 30</i>)</p> <p>THROTTLE OPEN CC HX SW OUTLET VALVES AS NECESSARY TO LOWER CC TEMPERATURE.</p> <p>STANDARD:</p> <p>(a) Acknowledges NOTE regarding restoration of CCHX SW flow. (b) Candidate recognizes that no throttling of CCHW SW flow was performed, so no actions required on this step.</p> <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none">• If asked: No actions were taken to reduce CCHX SW flow. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 15:</p> <p>0-AP-12.01. (<i>Step 31</i>)</p> <p>CHECK CAUSE OF LEVEL DECREASE -CORRECTED.</p> <p>STANDARD:</p> <p>(a) Candidate identifies that restoration of CW pumps corrects cause of level decrease.</p> <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none">• If asked: Control Ops group will be notified to initiate troubleshooting on 2G transformer. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 16:</p> <p>0-AP-12.01. (Step 32)</p> <p>RESTORE CW AND SW COMPONENTS (INCLUDING CW CHEMICAL INJECTION BY OPENING 1-SA-285 AND 2-SA-274) TO SUPPORT PLANT CONDITIONS.</p> <p>STANDARD:</p> <p>(a) Candidate reports that CW MOVs may be returned to previous position. (b) Candidate recognizes that chemical injections systems require no action.</p> <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> None. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 17</p> <p>Candidate Reports completion of Task to Shift Manager</p> <p>END OF JPM</p> | |

STOP TIME: _____

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be PERFORMED in the simulator.
- Both units are at 100% power when a lightning strike trips 2G screenwell transformer.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initiating Cues

- LLIS TROUBLE annunciator.
- 500 KV HSE TROUBLE annunciator.
- Unit Two Circ Water Pumps secured.

Directions

- You are the BOP and I am the Unit One SRO. Alarm VSP L-7 "LLIS TROUBLE" and VSP-K6 "500KV HSE TRBL" have alarmed, and alarmed and security reports a lightning strike in the vicinity of the low level intake.
- All Unit 2 Circulating Water Pumps were running.
- Unit One and Unit Two Reactor Operators are currently throttling CW MOVs to conserve intake canal level.
- Here is a copy of 0-AP-12.01. You are to perform 0-AP-12.01 in its entirety in response to the loss of 2G Screenwell Transformer.
- When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initiating Cues

- LLIS TROUBLE annunciator.
- 500 KV HSE TROUBLE annunciator.
- Unit Two Circ Water Pumps secured.

Directions

- You are the BOP and I am the Unit One SRO. Alarm VSP L-7 “LLIS TROUBLE” and VSP-K6 “500KV HSE TRBL” have alarmed, and security reports a lightning strike in the vicinity of the low level intake.
- All Unit 2 Circulating Water Pumps were running.
- Unit One and Unit Two Reactor Operators are currently throttling CW MOVs to conserve intake canal level.
- Here is a copy of 0-AP-12.01. You are to perform 0-AP-12.01 in its entirety in response to the loss of 2G Screenwell Transformer.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301

Simulator Job Performance Measure [KA 064.A4.06]
[Alternate Path]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title**Respond to a Failure of #3 EDG to Start and Load on 1J 4160V Bus.****K/A: 064.A4.06; Manual start, loading, and stopping of the ED/G, RO 3.9 / SRO 3.9****Applicability****Estimated Time****Actual Time**

RO

20 Minutes

_____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- A Loss of the "A" RSS Transformer has occurred.
- #3 EDG has failed to start and load.

Standards

- #3 EDG started and loaded on the 1J Emergency Bus IAW 0-AP-17.05, EDG 3 - Emergency Operations.

Initiating Cue

- Shift Manager Direction.

Terminating Cues

- Report of #3 EDG loaded on the 1J Emergency Bus.

Procedures

- 0-AP-17.05, EDG 3 – Emergency Operations, Revision 22.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize (IC 266). Place simulator in RUN.
- Load the following Malfunctions/Overrides:
 - EL4602, Bkr 15J8 Mechanically Stuck Closed, trigger 30.
 - ED0403, EDG 3 Auto Start Failure, Trigger 30
 - EL0501, Loss of reserve Station Service XMFMR A, Trigger 7
 - Remotes, EDG3, U2_EG3_BYPASS, Unit 2 EDG #3 Giveaway, U2_BYPASS, Trigger 1
 - Remotes, EDG3, SW_25J3_RF, 4KV BKR 25J3 Control Switch, PTL, Trigger 3.
 - Lamp Override, EL, BKR-15J8_RED, ACB 15J8-J Normal Supply (RED), ON, ACTIVE.
- Load the following in Event Trigger:
 - Select Trigger 5. Event: sw_15j8_trip Command: DMF el4602 (15J8 stuck closed)
 - Select Trigger 9. Event: edg3_auto_exer Command: DMF ed0403 (EDG 3 Start Failure)
 - Select Trigger 11. Event: sw_15j8_trip Command: DOR bkr_15J8_red (deletes red Light)
- Activate Trigger 30.
- Activate Trigger 7.
- Acknowledge Alarms.
- Freeze and Snap IC until ready for evaluation.

Initial Conditions

- Unit 1 operating at 100% power.
- The Loss of the “A” RSST has occurred and #3 EDG has failed to start and load on 1J 4160V Bus.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Unit 2 BOP. A Loss of the “A” RSST has occurred.
- #3 EDG has failed to start and on the 1J 4160V Bus.
- You are to start and load #3 EDG on the 1J 4160V bus IAW 0-AP-17.05, EDG 3 – Emergency Operations.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- *An additional instructor may be needed to silence and acknowledge alarms for the examinee, and perform actions for Unit 2.*
- **START TIME:**

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| <p>STEP 1: [CAUTIONS prior to Step 1, AP-17.05]</p> <p>STANDARD: Candidate Acknowledges the following CAUTIONS:</p> <ul style="list-style-type: none"> • An EDG should NOT run unloaded for more than ten minutes if the associated Emergency Bus is de-energized. • If a running EDG has been stopped because the associated Emergency Bus is de-energized, the EDG cooldown cycle should be completed before restarting the EDG. • The SS should direct the aligning of EDG 3 to either 1J or 2J Emergency Bus to best support plant recovery. • With Degraded Voltage or Undervoltage on 2J Bus, or a loss of Unit 2B DC Bus, Breaker 15J3 will not close automatically, except with a valid Unit 1 SI signal. <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2: [Step 1, AP-17.05]</p> <p>ASK ELECTRICAL AND MECHANICAL DEPARTMENTS TO PROVIDE ASSISTANCE.</p> <p>STANDARD:</p> <p>a) Candidate requests the Shift manager (Evaluator) to obtain Electrical and Mechanical department assistance.</p> <p>EVALUATOR'S NOTE:</p> <p>When Asked: Electrical and Mechanical Department personnel are standing by to render assistance.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3: [Step 2, AP-17.05]</p> <p>Check EDG 3 – Will be aligned to Unit 1.</p> <p>STANDARD:</p> <p>a) Candidate remembers from Directions or asks Shift Manager (Evaluator) whether #3 EDG is to be aligned to Unit 1.</p> <p>EVALUATOR’S NOTE:</p> <p>If asked: #3 EDG will be aligned to Unit 1.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4: [Step 3, AP-17.05]</p> <p>Commit EDG 3 to Unit 1.</p> <p>STANDARD:</p> <p>a) Directs Unit 2 operator to place the UNIT 2 PNL 3-2 SWITCH 43-15J3 IN BYP COMMITS NO. 3 EDG TO UNIT 1 in BYP.</p> <p>b) Directs Unit 2 operator to place the Emergency Supply Breaker 25J3 in PTL.</p> <p>EVALUATOR’S NOTE:</p> <p>When Directed: Unit 2 Operator will actuate Trigger 1, and report that the Unit 2 Switch 43-15J3 has been placed in bypass.</p> <p>When Directed: Unit 2 Operator will actuate Trigger 3 and report that Breaker 25J3 has been placed in PTL.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 5: [NOTE Prior to Step 4, AP-17.05]</p> <p>.</p> <p>STANDARD: Candidate Acknowledges the following NOTE.</p> <p style="padding-left: 40px;">If an auto-start signal has been received and the EDG has failed to start after crank attempts, the auto-start circuit will be locked out and a START FAILURE alarm will be LIT at the Engine Control Cabinet. The EDG STOP pushbuttons and the ALARM RESET must be pushed to reset the auto-start circuit. This condition will not interfere with a LOCAL start attempt in the EDG room, but the cause of the failure should first be determined.</p> <p>EVALUATOR'S NOTE:</p> <p style="padding-left: 40px;">If asked: Start Failure Alarm is NOT LIT at the Engine Control Cabinet.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6: [Step 4 , AP-17.05]</p> <p>CHECK ANNUNCIATOR VSP-B5, EMERG GEN 3 TRBL - NOT LIT</p> <p>STANDARD:</p> <p style="padding-left: 40px;">a) Candidate locates to the Ventilation Status Panel. b) Candidate identifies Annunciator VSP-B5 NOT LIT.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7: [Step 5, AP-17.05]</p> <p>CHECK AUXILIARY TRIP RELAY - RESET: Amber light on Unit 1 EDG 3 Control Panel - NOT LIT</p> <p>STANDARD:</p> <p style="padding-left: 40px;">a) Candidate identifies Annunciator VSP-B5 – NOT LIT.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 8: [Step 6, AP-17.05]</p> <p>CHECK EDG - RUNNING</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Candidate locates to #3 EDG Control Panel. b) Candidate identifies #3 EDG Speed at 0 RPM (#3 EDG not running). c) Candidate goes to Attachment 2. <p>EVALUATOR'S NOTE:</p> <p>When #3 EDG AUTO-EXERCISE Switch placed in EXERCISE, the #3 EDG Start Failure will be deleted.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 9: [Step 1, Attachment 2, AP-17.05]</p> <p>Place AUTO-EXERCISE EMERG GEN 3 switch to EXERCISE.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Candidate locates to #3 EDG Control Panel. b) Candidate Places #3 EDG AUTO-EXERCISE Switch in Exercise. c) Candidate notes Annunciator VSP-B-5 alarms (expected). <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 10: [Step 2, Attachment 2, AP-17.05]</p> <p>IF (1J) Bus de-energized, THEN strip loads IAW Attachment 3 (1J Bus) or Attachment 4 (2J Bus).</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Candidate identifies that 1J Bus is de-energized and goes to Attachment 3 to strip loads from the 1J Bus. <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 11: [Steps 1, 2, and 3, Attachment 3, AP-17.05]</p> <p>Place “J” bus components in PTL. Check component breakers open.</p> <p>STANDARD:</p> <p>a) Candidates places / checks the following components in PTL.</p> <ul style="list-style-type: none"> • 14J3 (1-SI-P-1B, B LHSI pump), • 14J5 (1-CS-P-1B, B CS pump), • 14J4 (1-RS-P-1B, B IRS pump), • 14J8 (1-RS-P-2B, B ORS pump), • 14J7 (1-VS-F-1B, B CARF), • 14J9 (PZR HEATER GRP A), • 14J13 (1-VS-F-58B, if powered from ALTERNATE source), • 15J5 (1-CH-P-1B, B Chg pump), • 15J2 (1-CH-P-1C alt, C Chg pump alt), • 15J4 (1-FW-P-3B, B AFW pump). <p>b) Candidate checks the following breakers open – Red Lights NOT LIT:</p> <ul style="list-style-type: none"> • 14J5, 1-CS-P-1B • 14J4, 1-RS-P-1B <p>EVALUATOR’S NOTE:</p> <p>Since the majority of the loads listed above are Safety Related, an Annunciator will sound when the component is placed in PTL.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 12: [Step 4 and 5, Attachment 3, AP-17.05]</p> <p>Check open or open 15J8, 1J Bus Normal Supply Breaker.</p> <p>STANDARD:</p> <p>* a) Candidates places breaker 15J8 in TRIP. This is a critical step.</p> <p>b) Candidate checks breaker 15J9, 1J Stub Bus breaker, open using PCS or dispatching an operator to check breaker position.</p> <p>c) Candidate returns to Attachment 2, Step 3.</p> <p>EVALUATOR’S NOTE:</p> <p>Critical Step: If Candidate Fails to open breaker 15J8, breaker 15J3, #3 EDG output breaker cannot close to energize the 1J Bus (Interlock).</p> <p><i>Placing breaker 15J8 in trip, removes malfunction for breaker 15J8 stuck closed, and breaker 15J8 Lamp override.</i></p> <p>IF: Candidate dispatches an operator for 15J9 breaker position, time compression will be used to report that the breaker indicates open locally.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 13: [Step 3, 4, 5, and 6 of Attachment 2, AP-17.05]</p> <p>Check Load Limit at maximum, Start EDG 3, Check #3 EDG Speed at 900 RPM, Place #3 EDG AUTO EXERCISE Switch in Auto.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Candidate dispatches an operator to check EDG #3 Load Limit at maximum clockwise position. b) Candidate presses the EDG NO. 3 Engine Start pushbutton. c) Candidate will check EDG started using RPM indication. *d) Candidate will place the AUTO-EXERCISE Switch for EDG #3 in AUTO position. e) Candidate will note that #3 EDG has energized the 1J Bus. f) Candidate returns to AP-17.05, Step 8. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> a) When Candidate dispatches an operator to check the Load Limit control, time compression will be used for operator report that the load limit control is fully clockwise. <p>Critical Step d): Placing the AUTO-EXERCISE switch in AUTO allows the output breaker to automatically close and energize the 1J Bus.</p> <p>COMMENTS:</p> | |
| <p>STEP 14: [Step 8, AP-17.05]</p> <p>CHECK BOTH J BUSES - ENERGIZED BY OFFSITE POWER</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Candidate Identifies 1J Bus Energized by #3 EDG. b) Candidate Goes To Step 10. <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 15: [Notes prior to Step 10 of AP-17.05]</p> <p>Acknowledges NOTES:</p> <ul style="list-style-type: none"> • If the B DC Bus is deenergized, the EDG output breaker and the J Bus load breakers must be closed manually. • The following conditions must exist for the EDG output breaker to close automatically: <ul style="list-style-type: none"> • EDG speed greater than 870 rpm • EDG INCOMING voltage greater than 113 volts • J8 breaker open • Control switch for the J3 breaker in AUTO AFTER TRIP • DC control power available to the J3 breaker <p>STANDARD:</p> <p>a) Candidate Identifies 1J Bus Energized by #3 EDG.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 16: [Step 10, AP-17.05]</p> <p>CHECK EDG 3 - SUPPLYING J BUS</p> <p>STANDARD:</p> <p>a) Candidate Identifies 15J3 – Closed.</p> <p>b) Candidate notifies the Shift Manager (Evaluator) that #3 EDG has been started and loaded on 1J Bus.</p> <p>c) Candidate reports Task Complete.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> <p style="text-align: right;">JPM ENDS</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STOP TIME:

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be performed in the simulator.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Unit 1 operating at 100% power.
- The Loss of the "A" RSST has occurred and #3 EDG has failed to start and load on 1J 4160V Bus.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Unit 2 BOP. A Loss of the "A" RSST has occurred.
- #3 EDG has failed to start on loss of the 1J 4160V Bus.
- You are to start and load #3 EDG on the 1J 4160V bus IAW 0-AP-17.05, EDG 3 – Emergency Operations.
- When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initial Conditions

- Unit 1 operating at 100% power.
- The Loss of the “A” RSST has occurred and #3 EDG has failed to start and load on 1J 4160V Bus.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Unit 2 BOP. A Loss of the “A” RSST has occurred.
- #3 EDG has failed to start on the loss of the 1J 4160V Bus.
- You are to start and load #3 EDG on the 1J 4160V bus IAW 0-AP-17.05, EDG 3 – Emergency Operations.
- When you finish the actions necessary to accomplish this, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301
Job Performance Measure [KA APE068.AA1.21 3.9/4.1]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title**LOCALLY TRANSFER INDIVIDUAL COMPONENTS TO THE AUX SHUTDOWN PANEL**

K/A: APE068.AA1.21 Ability to operate and / or monitor the following as they apply to the Control Room
Evacuation: Transfer of controls from control room to shutdown panel or local control 3.9 / 4.1

Applicability**Estimated Time****Actual Time**

RO/SRO(I)/SRO(U)

20 Minutes

_____ Minutes

Conditions

- Task is to be SIMULATED in the plant beginning at the **Unit 1 Aux Shutdown Panel**.
- A limiting MCR fire has occurred. The MCR has been evacuated and attempts are being made to transfer plant control to the ASD Panel. Neither the H-Group nor the J-Group Transfer Switch will actuate its components.

Standards

- FCA-1.00, Attachment 2.

Initiating Cues

- FCA-1.00, Limiting MCR Fire, Step 16 RNO
- Shift Manager direction.

Terminating Cues

- Report received that FCA-1.00, Attachment 2 completed for Unit 1 components.

Procedures

- FCA-1.00, Limiting MCR Fire, Attachment 2, Rev 48.

Tools and Equipment**Safety Considerations**

- None
- Standard Personal Safety Equipment

Directions to the Operator:

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. The MCR was evacuated due to a fire. We are attempting to establish control from the Unit 1 Aux Shutdown Panel but the H and J Group Transfer Switches have failed to function.
- Here is FCA-1.00, Attachment 2. I need you to locally transfer the individual Unit 1 components to the Unit 1 Aux Shutdown Panel.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator:

- **Operator briefing should occur at the Unit 1 Aux Shutdown Panel.**
- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: None
- **START TIME:** _____

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME_____:**

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| <p>STEP 1:</p> <p>0-FCA-1.00, Attachment 2 (<i>Caution Prior to Step 1</i>)</p> <p>REVIEWS CAUTION PRIOR TO STEP 1.</p> <p><u>Standards</u></p> <p>Notes that this Attachment should not be performed if transfer failure is due to the emergency bus being de-energized</p> <p><u>Cues</u></p> <p>If asked: Both emergency buses are energized on Unit 1.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>0-FCA-1.00, Attachment 2 (<i>Step 1</i>)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p><u>Standards</u></p> <p>(a) Proceeds to H Bus 4160v breaker 15H4.</p> <p>*(b) Places 1-FW-P-3A's local control box Mode switch (1-EP-43-15H4) to OVERRIDE position.</p> <p>*(c) Rotates Transfer switch (1-EP-43X-15H4) to AUX P position.</p> <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FW-P-3A breaker indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-CH-P-1A.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to H Bus 4160v breaker 15H5. *(b) Places 1-CH-P-1A's local control box Mode switch (1-EP-43A-15H5) to OVERRIDE position. *(c) Rotates Transfer switch (1-EP-43X-15H5) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-CH-P-1A breaker indicating lights, RED and GREEN OFF (control switch in PTL).</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-CH-P-1C (NORM).</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to H Bus 4160v breaker 15H6. *(b) Places 1-CH-P-1C's local control box Mode switch (1-EP-43-15H6) to OVERRIDE position. *(c) Rotates Transfer switch (1-EP-43X-15H6) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FCH-P-1C breaker indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 5:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-CH-P-1C (ALT).</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to J Bus 4160v breaker 15J2. (b) Places 1-CH-P-1C's (ALT) local control box Mode switch (1-EP-43-15J2) to OVERRIDE position (c) Rotates Transfer switch (1-EP-43X-15J2) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-CH-P-1C (ALT) breaker indicating lights, RED light and GREEN light OFF (switch in PTL).</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>6. LOCALLY TRANSFERS 1-FW-P-3B.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to J Bus 4160v breaker 15J4. *(b) Places 1-FW-P-3B's local control box Mode switch (1-EP-43-15J4) to OVERRIDE position *(c) Rotates Transfer switch (1-EP-43X-15J4) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FW-P-3B breaker indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 7:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-CH-P-1B.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to J Bus 4160v breaker 15J5. *(b) Places 1-CH-P-1B's local control box Mode switch (1-EP-43A-15J5) to OVERRIDE position *(c) Rotates Transfer switch (1-EP-43X-15J5) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-CH-P-1B breaker indicating lights, RED light and GREEN light OFF (switch in PTL).</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 8:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-MS-SOV-102A.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to Aux SD Panel, locates Transfer Relay Cabinet 5. *(b) Places 1-MS-SOV-102A's local control box Mode switch (1-MS-43B-SMS102A) to OVERRIDE position *(c) Rotates Transfer switch (1-MS-43X-SMS102A) to AUX PANEL position. <p><u>Cues</u></p> <ul style="list-style-type: none"> • If asked at ASP: RED Light LIT, GREEN light OFF, switch in CLOSE position. <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 9:</p> <p>0-FCA-1.00, Attachment 2, (<i>Step 1</i>)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-MS-SOV-102B.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Locates Transfer Relay Cabinet #3 (left of Aux SD Panel). *(b) Places 1-MS-SOV-102B's local control box Mode switch (1-MS-43B-SMS102B) to OVERRIDE position *(c) Rotates Transfer switch (1-MS-43X-SMS102B) to AUX P position. <p><u>Cues</u></p> <ul style="list-style-type: none"> • If asked at ASP: RED light ON, GREEN light OFF, switch in CLOSE position. <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 10:</p> <p>0-FCA-1.00, Attachment 2, (<i>Step 1, Page 2</i>)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-FW-MOV-151A.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to Unit 1 Cable Vault Transfer Relay Cabinet 1. *(b) Places 1-FW-MOV-151A's local control box Mode switch (1-FW-43B-FW151A) to OVERRIDE position *(c) Rotates Transfer switch (1-FW-43X-FW151A) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FW-MOV-151A indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 11:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-FW-MOV-151C.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Locates appropriate switch on Transfer Relay Cabinet 1. *(b) Places 1-FW-MOV-151C's local control box Mode switch (1-FW-43B-FW151C) to OVERRIDE position *(c) Rotates Transfer switch (1-FW-43X-FW151C) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FW-MOV-151C indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 12:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-FW-MOV-151E.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Locates appropriate switch on Transfer Relay Cabinet 1. *(b) Places 1-FW-MOV-151E's local control box Mode switch (1-FW-43B-FW151E) to OVERRIDE position *(c) Rotates Transfer switch (1-FW-43X-FW151E) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FW-MOV-151EA indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 13:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-CH-P-2A.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Locates appropriate switch on Transfer Relay Cabinet 1. *(b) Places 1-CH-P-2A's local control box Mode switch (1-CH-43B-CH2A) to OVERRIDE position *(c) Rotates Transfer switch (1-CH-43X-CH2A) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-CH-P-2A indicating lights, RED SLOW light LIT, switch in "A".</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 14:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-FW-MOV-151B.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to Unit 1 Cable Vault Transfer Relay Cabinet #2. *(b) Places 1-FW-MOV-151B's local control box Mode switch (1-FW-43B-FW151B) to OVERRIDE position *(c) Rotates Transfer switch (1-FW-43X-FW151B) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FW-MOV-151B indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 15:</p> <p>0-FCA-1.00, Attachment 2, (<i>Step 1</i>)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-FW-MOV-151D.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Locates appropriate switch on Transfer Relay Cabinet #2 *(b) Places 1-FW-MOV-151D's local control box Mode switch (1-FW-43B-FW151D) to OVERRIDE position. *(c) Rotates Transfer switch (1-FW-43X-FW151D) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FW-MOV-151D indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 16:</p> <p>0-FCA-1.00, Attachment 2, (<i>Step 1</i>)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-FW-MOV-151F.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Locates appropriate switch on Transfer Relay Cabinet #2 *(b) Places 1-FW-MOV-151F's local control box Mode switch (1-FW-43B-FW151F) to OVERRIDE position *(c) Rotates Transfer switch (1-FW-43X-FW151F) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-FW-MOV-151F indicating lights, RED light LIT, GREEN light OFF.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|---|---|
| <p>STEP 17:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-CH-P-2B.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Locates appropriate switch on Transfer Relay Cabinet #2 *(b) Places 1-CH-P-2B's local control box Mode switch (1-CH-43B-CH2B) to OVERRIDE position *(c) Rotates Transfer switch (1-CH-43X-CH2B) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-CH-P-2B indicating lights, RED SLOW light LIT, GREEN light OFF, switch in "S".</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 18:</p> <p>0-FCA-1.00, Attachment 2, (Step 1)</p> <p>Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:</p> <p>LOCALLY TRANSFERS 1-CH-MOV-1350.</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to Unit 1 Cable Vault Transfer Relay Cabinet 4. *(b) Places 1-CH-MOV-1350's local control box Mode switch (1-CH-43B-1350) to OVERRIDE position. *(c) Rotates Transfer switch (1-CH-43X-1350) to AUX P position. <p><u>Evaluator's Note:</u></p> <p>If Asked at the ASP: Following Step b) and c) above, 1-CH-MOV-1350 indicating lights, GREEN light LIT, RED light OFF.</p> <p>IF Asked at the ASP: All components indicate shifted to ASP Control.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|---|--|
| <p>REPORTS TO SHIFT MANAGER (EVALUATOR).</p> <p><u>Standards</u></p> <p>Verbal status report made that all affected Unit 1 components locally transferred to Aux Shutdown Panel.</p> <p>STOP TIME: _____</p> <p><u>Evaluator's Comments</u></p> <p>Evaluator's Note</p> <p>If Asked: Components shown below indicate status.</p> | |
|---|--|

1-FW-P-3A
Red Lite LIT

1-MS-SOV-102A
Red Lite LIT

1-MS-SOV-102B
Both Red Lites LIT

1-FW-P-3B
Red Lite LIT

1-CH-P-1A
No Lites (PTL)

1-CH-P-1C
Red Lite Lit

1-CH-P-1B
No Lites (PTL)

1-CH-P-1C (Alt)
No Lites (PTL)

1-FW-MOV-151A
Red Lite LIT

1-FW-MOV-151E
Red Lite LIT

1-FW-MOV-151D
Red Lite LIT

1-FW-MOV-151B
Red Lite LIT

1-FW-MOV-151C
Red Lite LIT

1-FW-MOV-151F
Red Lite LIT

1-CH-P-2A
Red SLOW LIT
Switch in "A"

1-CH-P-2B
Red SLOW LIT
Switch in "S"

STOP TIME:

[illegible]

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Conditions

- Task is to be SIMULATED in the plant beginning at the **Unit 1 Aux Shutdown Panel**.
- A limiting MCR fire has occurred. The MCR has been evacuated and attempts are being made to transfer plant control to the ASD Panel. Neither the H-Group nor the J-Group Transfer Switch will actuate its components.

Initiating Cues

- FCA-1.00, Limiting MCR Fire, Step 16 RNO
- Shift Manager direction.

Directions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. The MCR was evacuated due to a fire. We are attempting to establish control from the Unit 1 Aux Shutdown Panel but the H and J Group Transfer Switches have failed to function.
- Here is FCA-1.00, Attachment 2. I need you to locally transfer the individual **Unit 1** components to the **Unit 1** Aux Shutdown Panel.
- When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initiating Cues

- FCA-1.00, Limiting MCR Fire, Step 16 RNO
- Shift Manager direction.

Directions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. The MCR was evacuated due to a fire. We are attempting to establish control from the Unit 1 Aux Shutdown Panel but the H and J Group Transfer Switches have failed to function.
- Here is FCA-1.00, Attachment 2. I need you to locally transfer the individual **Unit 1** components to the **Unit 1** Aux Shutdown Panel.
- When you finish the actions necessary to accomplish this, please inform me.

| | | |
|----------------------|--|-----------------|
| NUMBER 0-FCA-1.00 | ATTACHMENT TITLE | ATTACHMENT 2 |
| REVISION 48 | OVERRIDE CONTROL TO AUXILIARY SHUTDOWN PANEL | PAGE 1 of 2 |

CAUTION: This attachment should NOT be performed if transfer failure is due to the Emergency Bus being de-energized.

1. ____ Locally select OVERRIDE position on Mode switch and rotate Transfer switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:

| COMPONENT | LOCATION | MODE Switch | TRANSFER Switch |
|-------------------------|----------|---------------|-----------------|
| ____ • 1-FW-P-3A | 15H4 | 1-EP-43-15H4 | 1-EP-43X-15H4 |
| ____ • 1-CH-P-1A | 15H5 | 1-EP-43A-15H5 | 1-EP-43X-15H5 |
| ____ • 1-CH-P-1C (NORM) | 15H6 | 1-EP-43-15H6 | 1-EP-43X-15H6 |

| | | | |
|------------------------|------|---------------|---------------|
| ____ • 1-CH-P-1C (ALT) | 15J2 | 1-EP-43-15J2 | 1-EP-43X-15J2 |
| ____ • 1-FW-P-3B | 15J4 | 1-EP-43-15J4 | 1-EP-43X-15J4 |
| ____ • 1-CH-P-1B | 15J5 | 1-EP-43A-15J5 | 1-EP-43X-15J5 |

| COMPONENT | LOCATION | MODE Switch | TRANSFER Switch |
|-------------------------|----------|---------------|-----------------|
| ____ • 2-FW-P-3A | 25H4 | 2-EP-43B-25H4 | 2-EP-43X-25H4 |
| ____ • 2-CH-P-1A | 25H5 | 2-EP-43A-25H5 | 2-EP-43X-25H5 |
| ____ • 2-CH-P-1C (NORM) | 25H6 | 2-EP-43-25H6 | 2-EP-43X-25H6 |

| | | | |
|------------------------|------|---------------|---------------|
| ____ • 2-CH-P-1C (ALT) | 25J2 | 2-EP-43-25J2 | 2-EP-43X-25J2 |
| ____ • 2-FW-P-3B | 25J4 | 2-EP-43B-25J4 | 2-EP-43X-25J4 |
| ____ • 2-CH-P-1B | 25J5 | 2-EP-43A-25J5 | 2-EP-43X-25J5 |

XFER Relay Cabinets located by the AUX S/D PNL:

| COMPONENT | LOCATION | MODE Switch | TRANSFER Switch |
|----------------------|----------|------------------|------------------|
| ____ • 1-MS-SOV-102A | No. 5 | 1-MS-43B-SMS102A | 1-MS-43X-SMS102A |
| ____ • 1-MS-SOV-102B | No. 3 | 1-MS-43B-SMS102B | 1-MS-43X-SMS102B |
| ____ • 2-MS-SOV-202A | No. 5 | 2-MS-43B-SMS202A | 2-MS-43X-SMS202A |
| ____ • 2-MS-SOV-202B | No. 3 | 2-MS-43B-SMS202B | 2-MS-43X-SMS202B |

| | | |
|----------------------|--|-----------------|
| NUMBER 0-FCA-1.00 | ATTACHMENT TITLE OVERRIDE CONTROL TO AUXILIARY SHUTDOWN PANEL | ATTACHMENT 2 |
| REVISION 48 | | PAGE 2 of 2 |

(Step 1 continued)

1. ____ Locally select OVERRIDE position on MODE switch and rotate TRANSFER switch to AUX P position for equipment failing to transfer control to the Auxiliary Shutdown Panel:

XFER Relay Cabinets located in Unit 1 Cable vault:

| | COMPONENT | LOCATION | MODE Switch | TRANSFER Switch |
|------|----------------------|----------|-----------------|-----------------|
| ____ | • 1-FW-MOV-151A | No. 1 | 1-FW-43B-FW151A | 1-FW-43X-FW151A |
| ____ | • 1-FW-MOV-151C | No. 1 | 1-FW-43B-FW151C | 1-FW-43X-FW151C |
| ____ | • 1-FW-MOV-151E | No. 1 | 1-FW-43B-FW151E | 1-FW-43X-FW151E |
| ____ | • 1-CH-P-2A (Unit 1) | No. 1 | 1-CH-43B-CH2A | 1-CH-43X-CH2A |
| ____ | • 1-FW-MOV-151B | No. 2 | 1-FW-43B-FW151B | 1-FW-43X-FW151B |
| ____ | • 1-FW-MOV-151D | No. 2 | 1-FW-43B-FW151D | 1-FW-43X-FW151D |
| ____ | • 1-FW-MOV-151F | No. 2 | 1-FW-43B-FW151F | 1-FW-43X-FW151F |
| ____ | • 1-CH-P-2B (Unit 1) | No. 2 | 1-CH-43B-CH2B | 1-CH-43X-CH2B |
| ____ | • 1-CH-MOV-1350 | No. 4 | 1-CH-43B-1350 | 1-CH-43X-1350 |

XFER Relay Cabinets located in Unit 2 Cable vault:

| | COMPONENT | LOCATION | MODE Switch | TRANSFER Switch |
|------|----------------------|----------|-----------------|-----------------|
| ____ | • 2-FW-MOV-251A | No. 1 | 2-FW-43B-FW251A | 2-FW-43X-FW251A |
| ____ | • 2-FW-MOV-251C | No. 1 | 2-FW-43B-FW251C | 2-FW-43X-FW251C |
| ____ | • 2-FW-MOV-251E | No. 1 | 2-FW-43B-FW251E | 2-FW-43X-FW251E |
| ____ | • 1-CH-P-2C (Unit 2) | No. 1 | 1-CH-43B-2CH2C | 1-CH-43X-2CH2C |
| ____ | • 2-FW-MOV-251B | No. 2 | 2-FW-43B-FW251B | 2-FW-43X-FW251B |
| ____ | • 2-FW-MOV-251D | No. 2 | 2-FW-43B-FW251D | 2-FW-43X-FW251D |
| ____ | • 2-FW-MOV-251F | No. 2 | 2-FW-43B-FW251F | 2-FW-43X-FW251F |
| ____ | • 1-CH-P-2D (Unit 2) | No. 2 | 1-CH-43B-2CH2D | 1-CH-43X-2CH2D |
| ____ | • 2-CH-MOV-2350 | No. 4 | 2-CH-43B-2350 | 2-CH-43X-2350 |

2. ____ IF breakers fail to operate, THEN initiate 0-FCA-15.00, LOCAL CIRCUIT BREAKER OPERATION.

SR14301
Job Performance Measure 076A2.01 (3.5/3.7)
[ALTERNATE PATH]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title**ISOLATE SERVICE WATER TO #3 MER DURING FLOODING**

K/A: 076A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the SWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; Loss of SWS. (3.5/3.7)

Applicability**Estimated Time****Actual Time**

RO/SRO(D)

15 Minutes

Conditions

- Task is to be SIMULATED in the plant.
- Any plant mode/condition where a large SW leak in #3 MER has occurred.

Standards

- Flooding isolated to #3 MER as indicated by decreasing water level in accordance with 0-AP-13.00 steps 38 and 39.

Initiating Cues

- 0-AP-13.00, Turbine Building or #3 MER Flooding, Step 38.
- Shift Manager direction.

Terminating Cues

- 0-AP-13.00, Turbine Building or #3 MER Flooding, Step 39 completed.

Procedures

- 0-AP-13.00, Turbine Building or #3 MER Flooding, Revision 28.

Safety Considerations

- None
- Standard Personal Safety Equipment

Notes to the Evaluator.

- **Task briefing should occur in the pre-determined location.**
- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are bolded and noted by the words "Critical Step" at the end of the step.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. There is a major Service Water leak in #3 MER.
- Here is a copy of 0-AP-13.00, Turbine Building or #3 MER Flooding, Steps 38 and 39. I need you to isolate Service Water to #3 MER in accordance with Steps 38 and 39.
- 1-SW-P-10B and 2-SW-P-10B have been secured.
- 1-VS-E-4A, 4B, and 4C have been secured.
- MER 3 Watertight Door has been checked closed.
- When you finish the actions necessary to accomplish this, please inform me.

Notes

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME:**

| | |
|--|-------------------------------------|
| <p>STEP 1: [Step 38a, AP-13.00]</p> <p>ISOLATE SW TO MER 3:</p> <p>a) Fail 1-SW-263 closed by opening Circuit 8 on Lighting Panel 2T3 (located north of 2-FW-E-2A)</p> <p>STANDARD:</p> <p>Locates lighting panel 2T3 (located north of 2-FW-E-2A).</p> <p>*b) Opens circuit 8 on lighting panel 2-EP-LP-2T3- this is a critical step.</p> <p>EVALUATOR'S NOTE:</p> <p>None</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>STEP 38b- Verify open or open 1-SW-500, SW Header Crosstie (MER 4)</p> <p>STANDARD:</p> <p>(a) Proceeds to #4 MER.</p> <p>(b) Locates manual valve 1-SW-500 (halfway across room under smoke detector).</p> <p>(c) Pulls pin from handwheel actuator.</p> <p>(d) *Opens or verifies open 1-SW-500 by rotating valve handwheel in the clockwise direction- This is a critical step.</p> <p><u>Evaluator's Cues</u></p> <p>Tell operator: Actual valve position in plant may be open or closed. Provide appropriate cue based on initial valve position.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STEP 3:

Step 38c- Close 2-SW-476, Water Box 2C Isol (MER 4)

STANDARD:

- (a) Locates 2-SW-476 (in #4 MER 2/3 of the way across the room on the right hand side.
- (b) Attempts to close 2-SW-476 by removing the locking pin and rotating the handwheel clockwise.
- (c) Recognizes that 2-SW-476 will not close and transitions to step 35b RNO column.

Evaluator's Cues

Tell operator: *As operator attempts to close valve, the handwheel will not move.*

COMMENTS:

_____ **SAT**

_____ **UNSAT**

STEP 4:

Step 38c RNO-

Do the following:

- 1) Verify open or open 2-SW-533.
- 2) Close 2-SW-474, located in Unit 2 BC HX SW MOV pit.

STANDARD:

- (a) ***Verifies or opens 2-SW-533 (MER-5) - by rotating valve handwheel in the clockwise direction- this is a critical step.**
- (b) Proceeds to Unit 2 BC HX SW MOV pit.
- (c) Locates manual valve 2-SW-474.
- (d) ***Closes 2-SW-474 by removing the locking pin and rotating valve handwheel in the clockwise direction- this is a critical step.**

Evaluator's Cues

- For 2-SW-533, provide appropriate cue based on actual initial valve position in plant.
- **If asked:** After trainee identifies 2-SW-474, if expected mark number not verbalized, ask the trainee what they expect the label to read, then tell trainee the label reads 2-SW-474. If wrong valve identified, tell trainee that what they expected is not what it reads.
- **If asked:** Security has been notified for entry.

Evaluator's Note

Safety concern: Trainee does not have to travel down into the valve pits. He can identify which label he is looking at, tell the evaluator what he expects the label to read, and if correct (**at the BC HX SW MOV PIT**), the evaluator can then state the label reads 2-SW-474. The trainee can describe actions to complete valve manipulation from above.

Security concern: Certain valve pits are now covered by grates. If the enclosure is to be opened, security should be contacted. It is acceptable for the trainee to describe the actions required to raise the grate(s) – utilize hand crank to raise the grating access door.

COMMENTS:

_____ SAT

_____ UNSAT

| | |
|--|---|
| <p>STEP 5:</p> <p>Step 38d- Close 2-SW-478, SW Header Crosstie. (MER 4)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Locates 2-SW-478 (in #4 MER 2/3 of the way across the room on the right hand side). (b) Pulls pin from handwheel actuator. (c) *Closes or verifies closed 1-SW-478 by rotating valve handwheel in the clockwise direction- This is a critical step. <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> • Tell operator: Provide appropriate cue for valve operation based on actual in plant valve position. <p>Safety concern: Trainee does not have to crawl across pipes to check the valve labels at the east end of the #4 MER. He can identify which valve label he is looking at, and the evaluator can state the label reads "2-SW-478" if the correct label is identified. The trainee can then describe the required actions to complete valve manipulation from the west end of #4 MER.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>Step 38e- SECURE CHEMICAL INJECTION TO MER 3 SW SUPPLY HEADER IAW 0-OP-SW-006, MER 3 AND MER 4 SERVICE WATER CHEMICAL INJECTION OPERATION</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Notifies Shift Manager (Evaluator) that Chemical Injection to MER 3 SW Supply Header needs to be secured IAW 0-OP-SW-006. <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> • Tell operator: Unit 1 Turbine Building Operator will secure chemical injection. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|---|---|
| <p>STEP 7:</p> <p>Step 39- CHECK WATER LEVEL IN MER 3 ON MER 4 GAUGE 2-PL-LI-201 - DECREASING</p> <p>STANDARD:</p> <p>(a) Locates MER 3 level gauge 2-PL-LI-201 in MER 4. (b) Checks that level in MER 3 is decreasing.</p> <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> • Tell operator: After the operator locates MER 3 level gauge, tell him the level is 50" H₂O and slowly decreasing. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 8:</p> <p>REPORT TO SHIFT SUPERVISOR (EVALUATOR).</p> <p>STANDARD:</p> <p>Verbal status report that steps 38 and 39 of 1-AP-13.00 are complete.</p> <p>EVALUATOR'S NOTE: N/A</p> <p>STOP TIME:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STOP TIME: _____

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Task

- Task is to be SIMULATED in the plant.
- Any plant mode/condition where a large SW leak in #3 MER has occurred.

Directions

The evaluator will explain the initial conditions of the task to be performed and will provide the initiating cue. Ensure you indicate to the evaluator when you understand your assigned task.

Initial Conditions

- Flooding is ongoing in #3 MER and the team has reached step 36 of 0-AP-13.00, Turbine Building or #3 MER Flooding.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. There is a major Service Water leak in #3 MER.
- Here is a copy of 0-AP-13.00, Turbine Building or #3 MER Flooding, steps 38 and 39. I need you to isolate Service Water to #3 MER in accordance with Steps 38 and 39.
- 1-SW-P-10B and 2-SW-P-10B have been secured.
- 1-VS-E-4A, 4B, and 4C have been secured.
- When you finish the actions necessary to accomplish this, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Initial Conditions

- Flooding is ongoing in #3 MER and the team has reached step 36 of 0-AP-13.00, Turbine Building or #3 MER Flooding.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Manager. There is a major Service Water leak in #3 MER.
- Here is a copy of 0-AP-13.00, Turbine Building or #3 MER Flooding, steps 38 and 39. I need you to isolate Service Water to #3 MER in accordance with Steps 38 and 39.
- 1-SW-P-10B and 2-SW-P-10B have been secured.
- 1-VS-E-4A, 4B, and 4C have been secured.
- When you finish the actions necessary to accomplish this, please inform me.

| | | |
|--------------------------|---|--|
| NUMBER 0-AP-13.00 | PROCEDURE TITLE TURBINE BUILDING OR MER 3 FLOODING | REVISION 28 PAGE 16 of 19 |
|--------------------------|---|--|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|--|--|
| 38. ____ ISOLATE SW TO MER 3: | <input type="checkbox"/> a) Fail 1-SW-263 closed by opening Circuit 8 on Lighting Panel 2T3 (located north of 2-FW-E-2A) <input type="checkbox"/> b) Check open or open 1-SW-500, SW Header Crosstie (MER 4) <input type="checkbox"/> c) Close 2-SW-476, Water Box 2C Isol (MER 4) <input type="checkbox"/> d) Close 2-SW-478, SW Header Crosstie. (MER 4) <input type="checkbox"/> e) Secure Chemical Injection to MER 3 SW Supply Header IAW 0-OP-SW-006, MER 3 and MER 4 Service Water Chemical Injection Operation | c) Do the following: <input type="checkbox"/> 1) Check open or open 2-SW-533, located in MER 5. <input type="checkbox"/> 2) Close 2-SW-474, located in Unit 2 BC HX SW MOV pit. |
| 39. ____ CHECK WATER LEVEL IN MER 3 ON MER 4 GAUGE 2-PL-LI-201 - DECREASING | | Do the following: a) Secure CHG Pump SW Pumps: <input type="checkbox"/> • 1-SW-P-10A <input type="checkbox"/> • 2-SW-P-10A <input type="checkbox"/> b) Close 1-SW-499, Water Box 1D Isol. <input type="checkbox"/> c) Close 1-SW-500, SW Header Crosstie. |

U.S. Nuclear Regulatory Commission
Surry Power Station

SR14301
Simulator Job Performance Measure [KA 061K4.01 4.1/4.2]
[Alternate Path]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title**LOCALLY SWAP THE AFW PUMP SUPPLY TO THE FIRE WATER ALTERNATE SOURCE (Faulted)**

K/A: Knowledge of AFW design feature(s) and/or interlock(s) which provide for the following: Water sources and priority of use. 4.1/4.2.

Applicability**Estimated Time****Actual Time**

RO/SRO(I)/SRO(U)

25 Minutes

_____ Minutes

Conditions

- Task is to be SIMULATED in the plant.
- A simulated loss of secondary heat sink is in progress. Both the ECST and underground tank levels are below 20% and it is desired to swap AFW pump suction to the Fire Main.

Standards

- 2-FR-H.1, Attachment 1, part 4
- Self-Checking (STAR) practices will be used throughout task performance.
- Operations Department Standards shall be adhered to.

Initiating Cues

- 2-FR-H.1, Attachment 1, part 4
- Self-Checking (STAR) practices will be used throughout task performance.
- Operations Department Standards shall be adhered to.

Terminating Cues

- Report received that alternate source aligned to AFW pumps.
- Any failure criteria listed under the Evaluation Criteria section above has been met.
- Candidate states "Task is complete."
-

Procedures

- 2-FR-H.1, Attachment 1, part 4, Rev 36

Surry

2014-301

Align AFW Supply

Tools and Equipment

- None

Safety Considerations

- Standard PPE Required.

Initial Conditions

- I am the Shift Manager and you are an extra operator.
- **Unit 2** is currently experiencing a loss of secondary heat sink and the team is currently at step 3 of 2-FR-H.1, Response to Loss of Secondary Heat Sink.
- AFW cross-tie from Unit 1 is unavailable and the basement of Unit 2 safeguards is not accessible due to high radiation levels. Health Physics is investigating.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- **Unit 2** is currently experiencing a loss of secondary heat sink and the team is currently at step 3 of 2-FR-H.1, Response to Loss of Secondary Heat Sink. I need you to complete Step 3 of 2-FR-H.1 in its entirety to establish AFW to at least one Steam Generator.
- When you finish the actions in step 3, please inform me.

Notes to the Evaluator:

- **This is a Faulted JPM.**
- Brief of this JPM may be accomplished in the RP Briefing Room, outside of the RCA. Step 1 of the JPM (Steps 3 a, b, and c of 2-FR-H.1 may be accomplished in the Briefing Room.
- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 1-9 before 10.
- **START TIME:** _____

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded and denoted by an asterisk (*).
- **START TIME**_____:

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| <p>STEP 1:</p> <p>Step 3, 2-FR-H.1</p> <p>TRY TO ESTABLISH AFW FLOW TO AT LEAST ONE SG (STEP 3)</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Checks blowdown TVs –CLOSED. Asks the Unit 2 MCR (evaluator) the status of the BDTVs. (b) Verifies AFW MOVs-OPEN. Asks the Unit 2 MCR (evaluator) the status of the AFW MOVs. (c) Checks ECST-AVAILABLE. Asks the Unit 2 MCR (evaluator) the status of the ECST. * (d) Goes to RNO and goes to attachment 1. <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> • When asked the status of Unit 2 BDTVs, all 6 BDTVs are closed. • When asked the status of Unit 2 AFW MOVs, all 6 MOVs are open. • When asked the status of ECST level, the level in 2-CN-TK-1 is < 20%, the AFW pumps on Unit 2 have been secured due to signs of cavitation. <p><u>Evaluator's Notes</u></p> <p>Operator should transition to the RNO. This is the Fault. Operator should go to attachment 1.</p> <p>When asked: Provide the Candidate with 2-FR-H.1, Attachment 1 (3 Pages).</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
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| <p>STEP 2: 2-FR-H.1, Attachment 1, Part 1</p> <p>Select one of the following methods as an alternate source of Auxiliary Feedwater. Makeup to 2-CN-TK-1 from 2-CN-TK-2</p> <p><u>Standards</u></p> <ul style="list-style-type: none"> (a) Proceeds to Unit 2 Turbine Building basement. (b) Attempts to open 2-CN-150. <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> • When attempts are made to open the valve, the handwheel will not turn with the chain. The valve is jammed closed. • If asked: 2-CN-TK-2 has a level of 88%. <p><u>Evaluator's Notes</u></p> <ul style="list-style-type: none"> • If the operator indicates he/she will get a ladder and attempt to open it without the aid of the chain, indicate that the valve will not move. <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 3: 2-FR-H.1, Attachment 1, Part 2</p> <p>Alignment of AFW Booster Pump(s)</p> <p>DETERMINES AFW BOOSTER PUMPS ARE NOT AVAILABLE</p> <p><u>Standards</u></p> <p>Based on directions given to operator, it will be determined that the AFW Booster pumps are not available due to Unit 2 safeguards basement being inaccessible.</p> <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> • As the Shift Manager, I need you to determine an alternate method based on the information given. • If operator attempts to go into Unit 2 safeguards basement, indicate that there is a High Radiation HP barrier across the entry bars leading down to the basement. <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 4:</p> <p>2-FR-H.1, Attachment 1, Part 3.</p> <p>Cross-tie from Unit 1.</p> <p><u>Standards</u></p> <p>Based on directions given to operator, determines AFW crosstie from Unit 1 unavailable.</p> <p><u>Evaluator's Cues</u></p> <p>As the Shift Manager, I need you to determine an alternate method based on the information given.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 5:</p> <p>2-FR-H.1, Attachment 1, Part, (Step 4a)</p> <p>Fire Water Alignment to AFW Pumps.</p> <p>LOCALLY CLOSE THE FIRE MAIN ISOLATION VALVES TELL-TALE DRAIN, 2-FW-119</p> <p><u>Standards</u></p> <p>(a) Proceeds to Unit 2 safeguards steam side. (b) Closes 2-FW-119 by turning handwheel in the clockwise direction.</p> <p><u>Evaluator's Cues</u></p> <p>When the valve is operated properly, the valve stem inserts until the handwheel will not turn.</p> <p><u>Evaluator's Notes</u></p> <ul style="list-style-type: none"> 2-FW-119 is located between the fire main isolation valves near the stairway to the upper levels and is normally open. <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 6:</p> <p>2-FR-H.1, Attachment 1, Part 4, (Step b.)</p> <p>Locally open fire main isolation valves:</p> <p><u>Standards</u></p> <p>*(a) Opens 2-FW-120 by turning handwheel in the counter-clockwise direction. *(b) Opens 2-FW-185 by turning handwheel in the counter-clockwise direction.</p> <p><u>Cues</u></p> <ul style="list-style-type: none"> • Provide cues valve stems rise as FW-120 & FW-185 are properly operated. • Tell Operator: After both FW-120 & FW-185 opened, provide cues flow noise is momentarily heard through the valves. • Tell Operator: If FW-119 NOT closed before opening FW-120 & FW-185, provide cues water is spraying out from 2-FW-119. • If asked: Diesel-driven Fire Pump has been started. <p><u>Evaluator's Notes</u></p> <ul style="list-style-type: none"> • 2-FW-120 & -185 are located on ground level near stairway. <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7:</p> <p>2-FR-H.1, Attachment 1, Part 4, (Step 4 c.)</p> <p>Locally start diesel driven fire pump.</p> <p>STANDARD:</p> <p>a) Asks Shift Manager/Evaluator status of diesel driven fire pump.</p> <p>EVALUATOR'S NOTE:</p> <p>When asked: Diesel driven fire pump has been started.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 8:</p> <p>2-FR-H.1, Attachment 1, Part 4, (Step 4 d.)</p> <p>Locally open fire water suction valves to available AFW pump(s):</p> <p>STANDARD:</p> <p>a) Acknowledges NOTE prior to Step d: The following steps should be used as needed to align water to each AFW pump one at a time and the MCR informed after each pump alignment is complete.</p> <p>*b) Opens 2-FW-154, (for 2-FW-P-2)</p> <p>*c) Opens 2-FW-169, (for 2-FW-P-3A)</p> <p>*d) Opens 2-FW-184, (for 2-FW-P-3B)</p> <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> Provide cues valve stems rise as each valve is properly operated. <p>If Notified: acknowledge opening 2-FW-154 / 169 / 184 as MCR Operator.</p> <p>If Asked: Inform Candidate that Unit 2 AFW Pumps have been secured due to cavitation.</p> <p>EVALUATOR'S NOTE:</p> <p>Candidate informs MCR (Evaluator) following manipulation of each individual valve or wait until all valves for each pump have been manipulated. (Steps 8, 9, and 10 describe valve operations).</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 9:</p> <p>2-FR-H.1, Attachment 1, Part 4, (Step 4 d.)</p> <p>LOCALLY CHECK AFW PUMP SUCTION PRESSURE AVAILABLE</p> <p><u>Standards</u></p> <p>Checks each AFW pump suction pressure gauge to verify pressure available:</p> <p>(a) 2-FW-PI-256A (for 2-FW-P-2),</p> <p>(b) 2-FW-PI-256B (for 2-FW-P-3A),</p> <p>(c) 2-FW-PI-256C (for 2-FW-P-3B).</p> <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> Provide cues each gauge indicates full range (> 30 psig). <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 10:</p> <p>2-FR-H.1, Attachment 1, Part 4, (Step 4 f.)</p> <p>LOCALLY CLOSE THE NORMAL AFW PUMP SUCTION VALVES</p> <p><u>Standards</u></p> <p>Closes/verifies closed the other AFW pump suction paths:</p> <ul style="list-style-type: none"> *(a) Closes 2-FW-153 (ECST to 2-FW-P-2) by turning handwheel in the clockwise direction (b) Verifies 2-FW-283 closed (booster pps to 2-FW-P-2). *(c) Closes 2-FW-168 (ECST to 2-FW-P-3A) by turning handwheel in the clockwise direction (d) Verifies 2-FW-284 closed (booster pps to 2-FW-P-3A). *(e) Closes 2-FW-183 (ECST to 2-FW-P-3B) by turning handwheel in the clockwise direction (f) Verifies 2-FW-285 closed (booster pps to 2-FW-P-3B). <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> • Provide cues valve stems go in as 2-FW-153, -168 & -183 are properly operated. • Provide cues valve stems for 2-FW-283, -284 & -285 are as indicated (~½ inch showing). <p>When notified: As each AFW pump valve alignment is complete, acknowledge completion of alignment as MCR Operator.</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
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| <p>STEP 11:</p> <p>2-FR-H.1, Step 3 d, (Step 4 f.)</p> <p>RETURNS TO 2-FR-H.1, STEP 3 d)</p> <p><u>Standards</u></p> <p>Checks AFW - Available</p> <ul style="list-style-type: none"> (a) Informs the Unit 2 MCR (evaluator) to start AFW Pumps. (b) Informs the Unit 2 MCR to check AFW flow greater than 350 GPM. <p><u>Evaluator's Cues</u></p> <ul style="list-style-type: none"> • If asked: Both motor driven AFW pumps have been started. • If asked: Containment is not adverse. • If asked: AFW flow is greater than 350 GPM total flow. <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 12:</p> <p>REPORTS TO SHIFT MANAGER (EVALUATOR)</p> <p><u>Standards</u></p> <p>Verbal status report made that AFW pumps are on fire water suction and step 3 of 2-FR-H.1 is complete.</p> <p>STOP TIME: _____</p> <p><u>Evaluator's Comments</u></p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STOP TIME:

**Operator Directions Handout
(TO BE READ TO APPLICANT BY EXAMINER)**

Directions:

Evaluator's Note:

- Brief of this JPM may be accomplished in the RP Briefing Room, outside of the RCA. Step 1 of the JPM (Steps 3 a, b, and c of 2-FR-H.1 may be accomplished in the Briefing Room.

Initial Conditions

- I am the Shift Manager and you are an extra operator.
- **Unit 2** is currently experiencing a loss of secondary heat sink and the team is currently at step 3 of 2-FR-H.1, Response to Loss of Secondary Heat Sink.
- AFW cross-tie from Unit 1 is unavailable and the basement of Unit 2 safeguards is not accessible due to high radiation levels. Health Physics is investigating.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- Here's a copy of 2-FR-H.1, Step 3. I need you to complete Step 3 of 2-FR-H.1 in its entirety to establish AFW to at least one Steam Generator
- When you finish the actions in step 3, please inform me.

**Operator Directions Handout
(TO BE GIVEN TO APPLICANT)**

Directions:

Initial Conditions

- I am the Shift Manager and you are an extra operator.
- **Unit 2** is currently experiencing a loss of secondary heat sink and the team is currently at step 3 of 2-FR-H.1, Response to Loss of Secondary Heat Sink.
- AFW cross-tie from Unit 1 is unavailable and the basement of Unit 2 safeguards is not accessible due to high radiation levels. Health Physics is investigating.

Initiating Cues

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- Here's a copy of 2-FR-H.1, Step 3. I need you to complete Step 3 of 2-FR-H.1 in its entirety to establish AFW to at least one Steam Generator.
- When you finish the actions in step 3, please inform me.

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| NUMBER | PROCEDURE TITLE | REVISION |
| 2-FR-H.1 | RESPONSE TO LOSS OF SECONDARY HEAT SINK | 36 |
| | | PAGE 3 of 22 |

| STEP | ACTION/ EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------------------------------|---|---|
| *2. ____ | CHECK IF BLEED AND FEED IS REQUIRED | |
| | a) Check for either of the following conditions | <input type="checkbox"/> a) GO TO Step 3. |
| | <input type="checkbox"/> • Wide range level in any 2 SGs - LESS THAN 12% [27%] | |
| | <u>OR</u> | |
| | <input type="checkbox"/> • RCS pressure - GREATER THAN 2335 PSIG DUE TO LOSS OF SECONDARY HEAT SINK | |
| | <input type="checkbox"/> b) Stop all RCPs | |
| | <input type="checkbox"/> c) GO TO Step 12 | |
| 3. ____ | TRY TO ESTABLISH AFW FLOW TO AT LEAST ONE SG: | |
| | <input type="checkbox"/> a) Check SG blowdown TVs - CLOSED | <input type="checkbox"/> a) Manually close valves. |
| | <input type="checkbox"/> b) Check AFW MOVs - OPEN | <input type="checkbox"/> b) Manually align valves. |
| | <input type="checkbox"/> c) Check ECST - AVAILABLE | <input type="checkbox"/> c) Use alternate ECST supply IAW Attachment 1. |
| (STEP 3 CONTINUED ON NEXT PAGE) | | |

| | | |
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| NUMBER | PROCEDURE TITLE | REVISION 36 |
| 2-FR-H.1 | RESPONSE TO LOSS OF SECONDARY HEAT SINK | PAGE 4 of 22 |

| STEP | ACTION/ EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|------|--|---|
| 3. | TRY TO ESTABLISH AFW FLOW TO AT LEAST ONE SG: (Continued) | |
| | d) Check AFW - AVAILABLE | <input type="checkbox"/> d) <u>IF</u> minimum feed flow <u>NOT</u> established, <u>THEN</u> do the following: |
| | <input type="checkbox"/> 1) Start AFW Pumps | <input type="checkbox"/> 1) Stop ALL RCPs. |
| | <input type="checkbox"/> 2) Check total flow to SGs - GREATER THAN 350 GPM [450 GPM] | <input type="checkbox"/> 2) <u>IF</u> desired to transfer EDG 3 to Bus 1J to restore power to 1-FW-P-3B, <u>THEN</u> GO TO Attachment 2. |
| | | <input type="checkbox"/> 3) Have Unit 1 operator close Unit 1 AFW MOVs. |
| | | 4) Have Unit 1 operator open the following valves: |
| | | <input type="checkbox"/> • 2-FW-MOV-260A |
| | | <input type="checkbox"/> • 2-FW-MOV-260B |
| | | <input type="checkbox"/> 5) Have Unit 1 operator start AFW pump(s). |
| | | <input type="checkbox"/> 6) Control flow to restore narrow range level in at least one SG greater than 12% [18%]. |
| | | <input type="checkbox"/> 7) <u>WHEN</u> narrow range level in at least one SG greater than 12% [18%], <u>THEN</u> RETURN TO procedure and step in effect. |
| | | <input type="checkbox"/> 8) <u>IF</u> minimum AFW flow <u>NOT</u> established, <u>THEN</u> try to locally restore AFW flow <u>AND</u> GO TO Step 4. |
| | <input type="checkbox"/> e) RETURN TO procedure and step in effect | |

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| NUMBER 2-FR-H.1 | ATTACHMENT TITLE ALTERNATE SUCTION TO AFW PUMPS | ATTACHMENT 1 |
| REVISION 36 | | PAGE 1 of 3 |

Select one of the following methods as an alternate source of Auxiliary Feedwater.

1. Makeup to 2-CN-TK-1 from 2-CN-TK-2

- ☐ To fill the ECST from the 300,000 gallon tank, locally open 2-CN-150.

2. Alignment of AFW Booster Pump(s)

___ a. Check 2-CN-TK-3 level greater than 20%.

___ b. Locally open booster pump discharge to available AFW pump(s):

2-FW-P-2

2-FW-P-3A

2-FW-P-3B

☐ 2-FW-283

☐ 2-FW-284

☐ 2-FW-285

___ c. Locally check selected booster pump suction valve open:

2-FW-P-4A

2-FW-P-4B

☐ 2-FW-277

☐ 2-FW-280

___ d. Locally open selected booster pump discharge valve:

2-FW-P-4A

2-FW-P-4B

☐ 2-FW-279

☐ 2-FW-282

___ e. Locally start aligned booster pump(s).

___ f. Locally check AFW pump suction pressure.

___ g. Locally close AFW pump normal suction valve(s):

2-FW-P-2

2-FW-P-3A

2-FW-P-3B

☐ 2-FW-153

☐ 2-FW-168

☐ 2-FW-183

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| NUMBER 2-FR-H.1 | ATTACHMENT TITLE ALTERNATE SUCTION TO AFW PUMPS | ATTACHMENT 1 |
| REVISION 36 | | PAGE 2 of 3 |

3. Crosstie from Unit 1

___ a. Consult with Unit 1 SRO.

___ b. Have Unit 1 Operator close AFW MOVs.

- ☐ • 1-FW-MOV-151A
- ☐ • 1-FW-MOV-151B
- ☐ • 1-FW-MOV-151C
- ☐ • 1-FW-MOV-151D
- ☐ • 1-FW-MOV-151E
- ☐ • 1-FW-MOV-151F

___ c. Have Unit 1 Operator open AFW Crosstie MOVs.

- ☐ • 2-FW-MOV-260A
- ☐ • 2-FW-MOV-260B

___ d. Have Unit 1 Operator start Unit 1 AFW pump(s).

___ e. Throttle AFW flow to maintain SG level.

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| NUMBER 2-FR-H.1 | ATTACHMENT TITLE ALTERNATE SUCTION TO AFW PUMPS | ATTACHMENT 1 |
| REVISION 36 | | PAGE 3 of 3 |

4. Fire Water Alignment to AFW pumps

___ a. Locally close telltale drain valve, 2-FW-119.

___ b. Locally open fire main isolation valves:

- ☐ • 2-FW-120
- ☐ • 2-FW-185

___ c. Locally start diesel driven fire pump.

NOTE: The following steps should be used as needed to align fire water to each available AFW pump one at a time and the MCR informed after each pump alignment is complete.

___ d. Locally open fire water suction valves to available AFW pump(s):

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| <u>2-FW-P-2</u> | <u>2-FW-P-3A</u> | <u>2-FW-P-3B</u> |
| <input type="checkbox"/> 2-FW-154 | <input type="checkbox"/> 2-FW-169 | <input type="checkbox"/> 2-FW-184 |

___ e. Locally check AFW pump suction pressure.

___ f. Locally close normal AFW pump suction valves:

- | | | |
|-----------------------------------|-----------------------------------|-----------------------------------|
| <u>2-FW-P-2</u> | <u>2-FW-P-3A</u> | <u>2-FW-P-3B</u> |
| <input type="checkbox"/> 2-FW-153 | <input type="checkbox"/> 2-FW-168 | <input type="checkbox"/> 2-FW-183 |
| <input type="checkbox"/> 2-FW-283 | <input type="checkbox"/> 2-FW-284 | <input type="checkbox"/> 2-FW-285 |