

U.S. Nuclear Regulatory Commission
Surry Power Station
Alternate Path

FINAL

Simulator Job Performance Measure 006A2.11 (4.0 / 4.4)

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Manually Align Alternate High Head Safety Injection Flowpath

K/A: 006A2.11 Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Rupture of ECCS header

Applicability

Estimated Time

Actual Time

RO/SRO(I)/SRO(U)

5 Minutes

____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- A Safety Injection has occurred from 100% power due to a SBLOCA resulting from an earthquake. 1-E-0, attachment 1 has been performed up to Step 12.
- PCS is non-functional due to the earthquake.

Standards

- Completion of 1-E-0, Reactor Trip or Safety Injection, attachment 1, Step 12.

Initiating Cues

- The operating team has initiated SI due to a SBLOCA on Unit 1 and has completed 1-E-0, Attachment 1 up to Step 12.

Terminating Cues

- Completion of 1-E-0, Reactor Trip or Safety Injection, Step 12.

Procedures

- 1-E-0, Reactor Trip or Safety Injection, Attachment 1, Step 12, Revision 65.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize. Place simulator in RUN.
- Implement malfunction for SBLOCA at 240 gpm. (RC04 at 20% deg)
- Implement malfunction for cold leg SI injection header break at 100% degradation (SI11)
- Implement meter overrides for SI cold leg individual loop flow indicators (SIFI961, 962, 963)
- Place following variables on a Trigger: SIMOV869A – Rackin; SIMOV869B – Rackin.
- Manually initiate SI. Perform 1-E-0 immediate actions and attachment 1 up to Step 12.
- Throttle AFW to approximately 200 gpm per generator.
- Place simulator in freeze until JPM performance.
- Have keys ready for 1869A/B (keys 46/47)
- **TURN PCS SCREENS OFF**

Initiating Cues

- Shift Manager Direction.
- 1-E-0, Reactor Trip or Safety Injection, Step 12.

Directions to the Applicant

- I am the Nuclear Shift Manager. A Safety Injection has occurred from 100% power due to a SBLOCA resulting from an earthquake. 1-E-0 is being performed and the operating team is currently at step 12 of attachment 1.
- Here is a copy of 1-E-0, attachment 1, Step 12. I need you to perform Step 12 of attachment 1.
- The PCS is non-functional due to the earthquake.
- When you finish the actions necessary to accomplish this task, please inform me.

Notes

- Operator is given a copy of 1-E-0, attachment 1, Step 12 during directions.
- Have keys ready for operation of 1-SI-MOV-1869A and 1869B (Keys 46/47).

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are **bolded**.
- *An additional instructor may be needed to silence alarms for the examinee.*
- **START TIME:**

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| <p>STEP 1:</p> <p>ACKNOWLEDGES NOTES PRIOR TO STEP 12 OF ATTACHMENT 1 (<i>Step 12</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Notes that CHG pumps should be run in the following order of priority: C, B, A. b) Notes that subsequent SI signals may be reset by reperforming step 12 <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>CHECK SI FLOW: (<i>Step 12 a</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) HHSI to cold legs - FLOW INDICATED <ul style="list-style-type: none"> • 1-SI-FI-1961 (NQ) • 1-SI-FI-1962 (NQ) • 1-SI-FI-1963 (NQ) • 1-SI-FI-1943 or 1-SI-FI-1943A. b) Identifies 0 (zero) indicated flow on 1-SI-FI-1961/1962/1963. c) Identifies greater than normal flow on 1-SI-FI-1943/1943A than expected for current RCS pressure. d) Identifies RCS pressure and subcooling decreasing. e) Diagnoses SI flow not reaching the core, notifies SM (Evaluator), and goes to Step 12 RNO. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3:</p> <p>Reads Step 12, RNO a). (Step 12 a)</p> <p>STANDARD:</p> <p>a) Manually start pumps and align valves. IF flow NOT established, THEN consult with Shift Supervision to establish another high pressure injection flowpath while continuing with this procedure.</p> <ul style="list-style-type: none"> • Alternate SI to cold legs • Hot leg injection <p>EVALUATOR'S NOTE:</p> <p>If asked: Which flowpath of SI flow should be attempted, Ask the Candidate which flowpath is recommended and concur with recommendation.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>Aligning Alternate Cold Leg SI Injection 1-SI-MOV-1842 (If Chosen). (Step 12 RNO a)</p> <p>STANDARD:</p> <p>(a) Consults with SM on establishing another path.</p> <p>(b) Opens 1-SI-MOV-1842 by holding control switch in Open position until Red light Lit and Green light off</p> <p>(c) Identifies HHSI flow Increase on 1-SI-FI-1940 and 1-SI-FI-1940A, Alternate Header SI Flow meters.</p> <p>(d) Identifies a decrease in flow on 1-SI-FI-1943 and 1-SI-FI-1943A, Normal SI Header Flow meters.</p> <p>(e) Identifies no change in Cold leg SI flow on 1-SI-FI-1961, 1-SI-FI-1962 and 1-SI-FI-1963, SI flow to RCS Loop "A", "B", and "C".</p> <p>(f) Closes 1-SI-MOV-1842.</p> <p>EVALUATOR'S NOTE:</p> <p>Candidate may elect to go straight to Th injection and not attempt to establish SI flow with 1-SI-MOV-1842. Also, the candidate can perform step 5 first.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 5:</p> <p>Aligns Hot Leg SI Isolation Valves 1-SI-MOV-1869A and/or 1869B. <i>(Step 12 RNO a)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Consults with SM on establishing Hot Leg SI flowpath. (b) Directs shift clerk, an auxiliary operator, or requests SM obtain keys for 1-SI-MOV-1869A and/or B from the Annex, and bring keys to the MCR. (c) Directs Desk SRO or SM to have an auxiliary operator clear tags and close breakers MCC 1H1-1-3C and MCC 1J1-1-9A for 1-SI-MOV 1869 A and/or B. (d) After receiving report that breakers MCC 1H1-1-3C and MCC 1J1-1-9A are closed, verify red lights are off and green lights are on for 1-SI-MOV-1869A and 1869B. (e) Hold the control switch(s) for 1-SI-MOV-1869A and/or 1-SI-MOV-1869B in the open position until RED light LIT and Green light OFF. (f) Checks 1-SI-MOV-1869A is open by observing red light on and green light off. (g) Checks 1-SI-MOV-1869B is open by observing red light on and green light off. (h) Checks hot leg flow indicated on 1-SI-FI-1940 and 1940A and/or 1-SI-FI-1943 and 1943A. (i) Checks hot leg flow indicated on individual loop flow transmitters 1-SI-FI-1933, 1960, and 1932. <p>EVALUATOR'S NOTE:</p> <p>Candidate may elect to go straight to Th injection and not attempt to establish SI flow with 1-SI-MOV-1842. Also, the candidate can perform step 5 first.</p> <p>When request made for keys for 1-SI-MOV-1869A and/or B (item b above) , state that a time compression has occurred, and supply the keys for 1-SI-MOV-1869A and B to the Candidate.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
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| <p>STEP 6:</p> <p>Closes Cold Leg Isolation Valves 1-SI-MOV-1867C and 1-SI-MOV-1867D. <i>(Step 12, RNO a)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Verify or reset SI by pushing the SI reset pushbuttons. (b) Hold the control switch in CLOSE for 1-SI-MOV-1867C until valve is CLOSED. (c) Verify 1-SI-MOV-1867C is closed by observing red light off and green light on. (d) Hold the control switch in CLOSE for 1-SI-MOV-1867D until valve is CLOSED. (e) Verify 1-SI-MOV-1867D is closed by observing red light off and green light on. (f) Verify no flow indicated on 1-SI-FI-1943 and 1943A. <p>EVALUATOR'S NOTE:</p> <p>At the end of Step 6, the Candidate should have established Hot leg SI flow with 1-SI-MOV-1869A and/or B open. There shall be verifiable flow indicated on the Th injection meters (1-SI-FI-1933, 1960, and 1932) – THIS IS A CRITICAL STEP.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7:</p> <p>CHECKS CHARGING PUMPS - THREE RUNNING. <i>(Step 12 b)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Checks 1-CH-P-1A breaker indication red light on and amps indicated. b) Checks 1-CH-P-1B breaker indication red light on and amps indicated. c) Checks 1-CH-P-1C breaker indication red light on and amps indicated <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 8:</p> <p>Reset SI. <i>(Step 12 c)</i></p> <p>STANDARD:</p> <p>Checks reset or resets SI by observing Annunciators 1A-F3 and 1A-F4 Not Lit.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 9:</p> <p>Stops One CHG Pump and Place in Auto. <i>(Step 12 d)</i></p> <p>STANDARD:</p> <p>a) Place the control switch for 1-CH-P-1A in the auto after stop position. b) Verify 1-CH-P-1A not running by observing zero amps and green breaker status light on and red status light off, and 0 (zero) amps indicated.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 10:</p> <p>Check RCS Pressure Greater than 185 PSIG. <i>(Step 12 e)</i></p> <p>STANDARD:</p> <p>a) Checks RCS pressure greater than 185 psig by observing pressure indicated on:</p> <ul style="list-style-type: none"> • PI-1-403, or • 1-RC-PI-1458, or • ICCM Train A, or • ICCM Train B. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 11:</p> <p>Stops One LHSI Pump and Place in Auto. <i>(Step 12 f)</i></p> <p>STANDARD:</p> <p>(a) Verifies SI reset by observing annunciators 1A-F3 and 1A-F4 not lit. (b) Stops either 1-SI-P-1A or 1B by placing the control switch for 1-SI-P-1A or 1B in the auto after stop position. (c) Verifies 1-SI-P-1A or 1B not running by observing zero amps and green breaker status light on and red status light off.</p> <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 of task completion.</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
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STOP TIME:

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

Task

- Task is to be performed in the simulator.
- Perform 1-E-0, Attachment 1, Step 12.

Directions to the Applicant

- I am the Nuclear Shift Manager. A Safety Injection has occurred from 100% power due to a SBLOCA resulting from an earthquake. 1-E-0 is being performed and the operating team is currently at step 12 of attachment 1.
- The PCS is non-functional due to the earthquake.
- Here is a copy of 1-E-0, attachment 1, Step 12. I need you to perform Step 12 of attachment 1.
- When you finish the actions necessary to accomplish this task, please inform me.

Notes (DO NOT READ)

- Operator is given a copy of 1-E-0, attachment 1, Step 12 during directions.
- Have keys ready for operation of 1-SI-MOV-1869A and 1869B (Keys 46/47).

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

Initial Conditions

- A Small Break LOCA has occurred on Unit 1.

Initiating Cues

- I am the Nuclear Shift Manager. A Safety Injection has occurred from 100% power due to a SBLOCA resulting from an earthquake. 1-E-0 is being performed and the operating team is currently at step 12 of attachment 1.
- The PCS is non-functional due to the earthquake.
- Here is a copy of 1-E-0, attachment 1, Step 12. I need you to perform Step 12 of attachment 1.
- When you finish the actions necessary to accomplish this task, please inform me.

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|-----------------|---|-----------------|
| NUMBER 1-E-0 | ATTACHMENT TITLE SYSTEM ALIGNMENT VERIFICATION | ATTACHMENT 1 |
| REVISION 65 | | PAGE 6 of 7 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|
| <p>NOTE:</p> <ul style="list-style-type: none"> • CHG pumps should be run in the following order of priority: C, B, A. • Subsequent SI signals may be reset by reperforming Step 12. | | |
| <p>12. ___ CHECK SI FLOW:</p> | | |
| | <p>a) HHSI to cold legs - FLOW INDICATED</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 1-SI-FI-1961 (NQ) <input type="checkbox"/> • 1-SI-FI-1962 (NQ) <input type="checkbox"/> • 1-SI-FI-1963 (NQ) <input type="checkbox"/> • 1-SI-FI-1943 or 1-SI-FI-1943A | <ul style="list-style-type: none"> <input type="checkbox"/> a) Manually start pumps and align valves. <u>IF</u> flow <u>NOT</u> established, <u>THEN</u> consult with Shift Supervision to establish another high pressure injection flowpath while continuing with this procedure. <input type="checkbox"/> • Alternate SI to cold legs <input type="checkbox"/> • Hot leg injection |
| | <ul style="list-style-type: none"> <input type="checkbox"/> b) Check CHG pumps - THREE RUNNING <input type="checkbox"/> c) Reset SI <input type="checkbox"/> d) Stop one CHG pump and put in AUTO <input type="checkbox"/> e) RCS pressure - LESS THAN 185 PSIG | <ul style="list-style-type: none"> <input type="checkbox"/> b) GO TO Step 12e. <input type="checkbox"/> e) <u>IF</u> two LHSI pumps are running, <u>THEN</u> do the following: <ul style="list-style-type: none"> <input type="checkbox"/> 1) Check reset or reset SI. <input type="checkbox"/> 2) Stop one LHSI pump and put in AUTO. <input type="checkbox"/> 3) GO TO Step 13. <input type="checkbox"/> <u>IF</u> one LHSI pump running, <u>THEN</u> GO TO Step 13. |
| | <ul style="list-style-type: none"> <input type="checkbox"/> f) LHSI flow - INDICATED | <ul style="list-style-type: none"> <input type="checkbox"/> f) Manually start pumps and align valves. |

U.S. Nuclear Regulatory Commission
Surry Power Station

FINAL

SR12301

Simulator Job Performance Measure 059AK3.01 (3.5 / 3.9)

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Isolate Leaking RSHX (“D”)

K/A: 059AK3.01 Knowledge of the reasons for the following responses as they apply to the Accidental Liquid Radwaste Release: Termination of a release of radioactive liquid

Applicability

Estimated Time

Actual Time

RO/SRO(I)/SRO(U)

8 Minutes

____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA has occurred on Unit 1. Following completion of 1-E-0, Attachment 1, Step 9d (Check OSRS pumps – NOT CAVITATING), Annunciator RM-C8, RS/SW HX D ALERT/FAILURE was received followed by Annunciator RM-D8, 1-SW-RI-117 High.

Standards

- Completion of Annunciator Response Procedure 1-RM-D8, 1-SW-RI-117 HIGH, Step 12.

Initiating Cues

- A LBLOCA has occurred on Unit 1. Unit 2 is operating at stable power level of 100%.
- The Operating Team is currently performing 1-E-1, Loss of Reactor or Secondary Coolant.
- 1-E-0, Attachment 1, Step 9d, Check OSRS pump –NOT CAVITATING has just been completed.
- Annunciator 1-RM-C8, RS/SW HX D ALERT/FAILURE, and 1-RM-D8. 1-SW-RI-117 HIGH have just been received.
- I am the Nuclear Shift Manager. You are the Unit 1 BOP. You are to perform Annunciator Response Procedure 1-RM-D8, 1-SW-RI-117 HIGH.
- When you have completed the actions to accomplish this Task, please inform me.

Terminating Cues

- Report of completion of Annunciator Response Procedure 1-RM-D8, 1-SW-RI-117 HIGH, Step 12.

Procedures

- 1-RM-D8, 1-SW-RI-117 HIGH (Rev 3)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize. Place simulator in RUN.
- Enter Malfunctions:
 - RC0101, RCS Cold Leg A Pipe Rupture
 - RS0504, Malf Leak Flow from RS-E-1D to SW System
- Place Simulator in Run. Perform Actions of E-0 until ORS Pumps start.
- Ensure RM-D8, 1-SW-RI-117 HI goes into alarm.
- Reset CLS signal when Containment decreases to < 14.2 psia.
- Place Simulator in Freeze until JPM performance.

Initiating Cues

- A LBLOCA has occurred on Unit 1. Unit 2 is operating at stable power level of 100%.
- The Operating Team is currently performing 1-E-1, Loss of Reactor or Secondary Coolant.
- 1-E-0, Attachment 1, Step 9d, Check OSRS pump –NOT CAVITATING has just been completed.
- Annunciator 1-RM-C8, RS/SW HX D ALERT/FAILURE, and 1-RM-D8. 1-SW-RI-117 HIGH have just been received.
- I am the Nuclear Shift Manager. You are the Unit 1 BOP. You are to perform Annunciator Response Procedure 1-RM-D8, 1-SW-RI-117 HIGH.
- When you have completed the actions to accomplish this Task, please inform me.

Directions to the Applicant

- I am the Nuclear Shift Manager. You are the Unit 1 BOP. You are to perform Annunciator Response Procedure 1-RM-D8, 1-SW-RI-117 HIGH.
- When you have completed the actions to accomplish this Task, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded.
- *An additional instructor may be needed to silence alarms for the examinee.*
- **START TIME:**

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| <p>STEP 1:</p> <p>VERIFY ALARM - READINGS ON MONITOR OR CHART RECORDER GREATER THAN OR EQUAL TO HIGH SETPOINT (<i>Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews CAUTION prior to Step 1: Operation of the RSHX SW radiation monitors is not required to directly support RS functional requirements. b) Verifies 1-SW-RI-117 greater than the High alarm setpoint by pressing the drawer High pushbutton and observing indication less than current reading. c) Verifies 1-RM-RR-150A, Pen 4 is trending with drawer indication. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>CHECK UNIT 2 - OPERATIONS NORMAL. (<i>Step 2</i>)</p> <p>STANDARD:</p> <p>Asks Unit 2 if Unit 2 Operation Normal or remembers Unit 2 status from initial briefing.</p> <p>EVALUATOR’S NOTE:</p> <p>If asked: Unit 2 is stable at 100% power.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3:</p> <p>CHECK AFFECTED HX IN SERVICE. <i>(Step 3)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Checks SW Flow to 1-RS-E-1D by observing 1-SW-MOV-103A or 103B OPEN, GREEN lights Out, RED Lights Lit. b) Check SW flow to RS-E-1D by observing 1-SW-MOV-104D and 1-SW-MOV-105D OPEN, GREEN Lights Out, RED Lights Lit. c) Check SW flow by observing SW flow through 1-SW-FI-106D, RS HX D SW OUTLET FLOW. d) Checks 1-RS-P-2B running by observing breaker closed indications, RED Light Lit and GREEN Light Out. e) Check amps indicated for 1-RS-P-2B and discharge pressure indication on 1-RS-PI-156B, DISCH PRESS PUMP B. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>PLACE ADDITIONAL RS HX(s) IN SERVICE AS REQUIRED. <i>(Step 4)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Identifies RS-E-1A, RS-E-1B, and 1-RS-E-1C in service by observing SW valves Open, SW Flow through the HXs, and 1-RS-P-1A/1B/2A running. b) Determines sufficient HXs in service to maintain heat sink for Reactor Core following shift to RMT. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 5:</p> <p>CONSULT WITH SHIFT SUPERVISION AND OMOC TO DETERMINE IF THE AFFECTED RSHX SHOULD BE REMOVED FROM SERVICE. <i>(Step 5)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews CAUTION prior to Step 5: CAUTION: An operating RS train should NOT be secured unless sufficient redundant trains are available for containment heat removal. b) Consults with Shift Manager (Evaluator) to determine if affected RSHX should be removed from service. <p>EVALUATOR’S NOTE:</p> <p>When asked: State that the OMOC has been consulted and will concur with Candidates decision.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>CHECK AFFECTED RSHX TO BE REMOVED FROM SERVICE. <i>(Step 6)</i></p> <p>STANDARD:</p> <p>Identifies 1-RS-E-1D to be removed from service .</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7:</p> <p>STOP ASSOCIATED RS PUMP AND PLACE IN PTL: <i>(Step 7)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Places control switch for 1-RS-P-2B in PTL. b) Checks 1-RS-P-2B secured by observing zero (0) amps indicated, GREEN Light Lit and RED Light Out on breaker control switch, and pump discharge pressure on 1-RS-PI-156B, DISCH PRESS PUMP B. c) Acknowledges Annunciator 1A-H8, RS PP 2B LOCKOUT OR OL TRIP. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 8:</p> <p>STOP ASSOCIATED RSHX SW PUMP: <i>(Step 8)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Places 1-SW-P-5D control switch to Stop. b) Verifies 1-SW-P-5D stopped by observing GREEN Light On, RED Light Off. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 9:</p> <p>ISOLATE SW TO 1-RS-E-1D BY CLOSING THE ASSOCIATED MOVS: <i>(Step 9)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews NOTE prior to Step 9: NOTE : If an undervoltage condition occurs before CLS reset, the SW MOVs will reopen when voltage is returned to normal. b) Closes 1-SW-MOV-104D by placing control switch in close position. c) Verifies 1-SW-MOV-104D closed by observing GREEN Light Lit, and RED Light Off. d) Closes 1-SW-MOV-105D by placing control switch in close position. e) Verifies 1-SW-MOV-105D closed by observing GREEN Light Lit, and RED Light Off. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 10:</p> <p>INCREASE SURVEILLANCE ON INSERVICE MONITORS. <i>(Step 10)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Locates to RM Panel and observes videographic recorder 1-RM-RR-150A,. and 1-SW-RI-114, 1-SW-RI-115, and 1-SW-RI-116. b) Observes trend stable on 1-RM-RR-150A, pen 1 through 3. c) Observes trend stable on 1-RM-RI-114, 115, and 116. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 11:</p> <p>INITIATE A CONDITION REPORT. <i>(Step 11)</i></p> <p>STANDARD:</p> <p>Candidate states need to initiate a Condition Report (CR) to Shift Manager (Evaluator).</p> <p>EVALUATOR’S NOTE:</p> <p>Inform Candidate that the STA will initiate the CR.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 12:</p> <p>PROVIDE NOTIFICATIONS AS NECESSARY. <i>(Step 12)</i></p> <p>STANDARD:</p> <p>Candidate notifies Shift Manager (Evaluator) that the following Notifications are required:</p> <ul style="list-style-type: none"> • Shift Supervision • OMOG • STA • Health Physics • Instrumentation Department <p>EVALUATOR’S NOTE:</p> <p>Acknowledge Notifications are required.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 13:</p> <p>NOTIFY NUCLEAR SHIFT MANAGER (EVALUATOR) STATUS OF TASK.</p> <p>Candidate should report completion of task.</p> <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.
- Perform 1-RM-D8, 1-SW-RI-117 HIGH.

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 on Unit 1. Unit 2 is operating at stable power level of 100%.
- The Operating Team is currently performing 1-E-1, Loss of Reactor or Secondary Coolant.
- 1-E-0, Attachment 1, Step 9d, Check OSRS pump –NOT CAVITATING has just been completed.
- Annunciator 1-RM-C8, RS/SW HX D ALERT/FAILURE, and 1-RM-D8, 1-SW-RI-117 HIGH have just been received.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP. You are to perform Annunciator Response Procedure 1-RM-D8, 1-SW-RI-117 HIGH.
- When you have completed the actions to accomplish this Task, please inform me.

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

Initial Conditions

- A LBLOCA has occurred on Unit 1. Unit 2 is operating at stable power level of 100%.
- The Operating Team is currently performing 1-E-1, Loss of Reactor or Secondary Coolant.
- 1-E-0, Attachment 1, Step 9d, Check OSRS pump –NOT CAVITATING has just been completed.
- Annunciator 1-RM-C8, RS/SW HX D ALERT/FAILURE, and 1-RM-D8, 1-SW-RI-117 HIGH have just been received.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP. You are to perform Annunciator Response Procedure 1-RM-D8, 1-SW-RI-117 HIGH.
- When you have completed the actions to accomplish this Task, please inform me.



SURRY POWER STATION

ANNUNCIATOR RESPONSE PROCEDURE

| | | |
|---------|------------------|----------------|
| NUMBER | PROCEDURE TITLE | REVISION |
| 1-RM-D8 | 1-SW-RI-117 HIGH | 3 |
| | | PAGE 1 of 4 |

REFERENCES

- 1) UFSAR 11.0
- 2) 11448-ESK-10R
- 3) CTS 844, NRC Comments, Item 15
- 4) Tech Spec Amendment 193, RSHX Service Water Radiation Monitors
- 5) VPAP-2103S, Offsite Dose Calculation Manual
- 6) DCP 92-028, RM Ratemeter and Recorder Replacement
- 7) ET CEP 99-0029, Reg. Guide 1.97 Operability, Reportability and Alternate Indications

PROBABLE CAUSE

- 1) Alarm actuates when 1-SW-RM-117 detects high activity in the Service Water side of Recirculation Spray Heat Exchanger.

High activity may be caused by a tube leak.
- 2) Instrumentation failure has occurred.

CONTINUOUS USE

| | | |
|-----------------------|---|-------------------------------------|
| NUMBER 1-RM-D8 | PROCEDURE TITLE 1-SW-RI-117 HIGH | REVISION 3 PAGE 2 of 4 |
|-----------------------|---|-------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|
| <p>*****</p> <p>CAUTION: Operation of the RSHX SW radiation monitors is not required to directly support RS functional requirements.</p> <p>*****</p> | | |
| 1. ___ | VERIFY ALARM - READINGS ON MONITOR OR CHART RECORDER GREATER THAN OR EQUAL TO HIGH SETPOINT <input type="checkbox"/> • 1-SW-RI-117 or 1-RM-RR-150A, Pen 4 | Do the following: <input type="checkbox"/> a) Evaluate entry into 0-AP-10.13, LOSS OF MAIN CONTROL ROOM ANNUNCIATORS. <input type="checkbox"/> b) Initiate a Condition Report. <input type="checkbox"/> c) GO TO Step 3. |
| 2. ___ | CHECK UNIT 2 - OPERATIONS NORMAL | <input type="checkbox"/> IF <u>UNIT 2</u> CTMT shine is causing alarm on Unit 1 Radiation Monitors, <u>THEN</u> GO TO Step 12. |
| 3. ___ | CHECK AFFECTED HX IN SERVICE <input type="checkbox"/> • 1-RS-E-1D | <input type="checkbox"/> Initiate a Condition Report and GO TO Step 12. |
| 4. ___ | PLACE ADDITIONAL RS HX(s) IN SERVICE AS REQUIRED | |
| <p>*****</p> <p>CAUTION: An operating RS train should NOT be secured unless sufficient redundant trains are available for containment heat removal.</p> <p>*****</p> | | |
| 5. ___ | CONSULT WITH SHIFT SUPERVISION AND OMOC TO DETERMINE IF THE AFFECTED RSHX SHOULD BE REMOVED FROM SERVICE | |

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|-------------------|-------------------------------------|---------------------------------------|
| NUMBER 1-RM-D8 | PROCEDURE TITLE 1-SW-RI-117 HIGH | REVISION 3 <hr/> PAGE 3 of 4 |
|-------------------|-------------------------------------|---------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|------------------------------------|---|--|
| 6. ___ <input type="checkbox"/> | CHECK AFFECTED RSHX TO BE REMOVED FROM SERVICE <input type="checkbox"/> • 1-RS-E-1D | Do the following: a) Review ET CEP 99-0029 and initiate preplanned alternate for affected RSHX as necessary: <input type="checkbox"/> • 1-SW-RI-120, DISCHARGE TUNNEL MONITOR <u>OR</u> <input type="checkbox"/> • HP sampling IAW VPAP-2103S, OFFSITE DOSE CALCULATION MANUAL <input type="checkbox"/> b) GO TO Step 10. |
| 7. ___ <input type="checkbox"/> | STOP ASSOCIATED RS PUMP AND PLACE IN PTL: <input type="checkbox"/> • 1-RS-P-2B | |
| 8. ___ <input type="checkbox"/> | STOP ASSOCIATED RSHX SW PUMP: <input type="checkbox"/> • 1-SW-P-5D | |
| | NOTE: If an undervoltage condition occurs before CLS reset, the SW MOVs will reopen when voltage is returned to normal. | |
| 9. ___ <input type="checkbox"/> | ISOLATE SW TO 1-RS-E-1D BY CLOSING THE ASSOCIATED MOVs: <input type="checkbox"/> • 1-SW-MOV-104D <input type="checkbox"/> • 1-SW-MOV-105D | |

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| NUMBER 1-RM-D8 | PROCEDURE TITLE 1-SW-RI-117 HIGH | REVISION 3 |
| | | PAGE 4 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|--|-----------------------|
| 10. ___ | INCREASE SURVEILLANCE ON INSERVICE MONITORS <input type="checkbox"/> • 1-SW-RI-114 <input type="checkbox"/> • 1-SW-RI-115 <input type="checkbox"/> • 1-SW-RI-116 | |
| 11. ___ | INITIATE A CONDITION REPORT | |
| 12. ___ | PROVIDE NOTIFICATIONS AS NECESSARY: <input type="checkbox"/> • Shift Supervision <input type="checkbox"/> • OMOG <input type="checkbox"/> • STA <input type="checkbox"/> • Health Physics <input type="checkbox"/> • Instrumentation Department | |
| - END - | | |

U.S. Nuclear Regulatory Commission
Surry Power Station

FINAL

SR12301

Simulator Job Performance Measure E02EK1.3 (3.5 / 3.8)

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Respond to a Spurious SI <350°F

K/A: E02EK1.3 Knowledge of the operational implications of the following concepts as they apply to the (SI Termination): Annunciators and conditions indicating signals, and remedial actions associated with the (SI Termination).

Applicability

Estimated Time

Actual Time

RO/SRO(I)/SRO(U)

7 Minutes

____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- A spurious SI has occurred, with Unit operating < 350°F, and the "A" RHR pump and heat exchanger in service.

Standards

- Completion of 1-AP-10.20, Response to Spurious Safety Injection with RCS Temperature Less Than 350°F, Step 10.

Initiating Cues

- A spurious safety injection has occurred with Unit 1 operating less than 289°F.
- 1-RH-P-1A and 1-RH-E-1A are in service.
- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to respond to the spurious SI by performing 1-AP-10.20, Response to Spurious Safety Injection with RCS Temperature Less Than 350°F
- When you complete the actions necessary to accomplish this Task, please inform me.

Terminating Cues

- Completion of 1-AP-10.20, Response to Spurious Safety Injection with RCS Temperature Less Than 350°F, Step 10.

Procedures

- 1-AP-10.20, Response to Spurious Safety Injection with RCS Temperature Less Than 350°F, Rev 9

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up IC with RHR in service and RCS temperature <350 degrees.
- Insert malfunction SI1801 (Spurious Train A SI) and SI1802 (Spurious Train B SI).
- Place red magnets on RH-MOV-1700/1701/1720A.
- Place green magnets on SI-MOV-1865A/B/C.
- Check RCS pressure ~320 psig on 1-RC-PI-1403 and 1-RC-PI-1458.
- Allow all components to align, then freeze the simulator.

Initiating Cues

- A spurious safety injection has occurred with Unit 1 operating at 289°F.
- 1-RH-P-1A and 1-RH-E-1A are in service.

Directions to the Applicant

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to respond to the spurious SI by performing 1-AP-10.20, Response to Spurious Safety Injection with RCS Temperature Less Than 350°F
- When you complete the actions necessary to accomplish this Task, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded.
- *An additional instructor may be needed to silence alarms for the examinee.*
- **START TIME:**

| | |
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| <p>STEP 1:</p> <p>CHECK SAFETY INJECTION INITIATION (<i>Step 1</i>)</p> <p>STANDARD:</p> <p>a) Checks HHSI to cold legs flow indicated by observing flow on 1-SI-FI-1961/1962/1963/1943/1943A and/or PCS.</p> <p>b) Checks #1 and #3 EDG running by observing EDG RPM indicated on #1 and #3 EDG Panels.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>PRESS BOTH SI RESET TRAIN A AND TRAIN B PUSHBUTTONS (60 SECOND TD). (<i>Step 2</i>)</p> <p>STANDARD:</p> <p>Depresses both SI reset pushbuttons on benchboard 1-1.</p> <p>EVALUATOR'S NOTE:</p> <p>If asked: SI actuation occurred 2 minutes ago.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3:</p> <p>CHECKS BOTH ANNUNCIATORS - NOT LIT. <i>(Step 3)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) 1A-F3, SI INITIATED TRAIN A. b) 1A-F4, SI INITIATED TRAIN B. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>CHECK CLOSED OR CLOSE SI TO COLD LEG MOVS: <i>(Step 4)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Closes 1-SI-MOV-1867C by placing and holding control switch in close. b) Checks 1-SI-MOV-1867C closed by observing GREEN Light Lit and RED Light OFF. c) Closes 1-SI-MOV-1867D by placing and holding control switch in close. d) Checks 1-SI-MOV-1867D closed by observing GREEN Light Lit and RED Light OFF <p>EVALUATOR'S NOTE:</p> <p>Substeps a) and c) above may be performed Simultaneously.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 5:</p> <p>CHECK RHR - REQUIRED. <i>(Step 5)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Identifies RHR required based on initial brief or queries Shift Manager (Evaluator). b) Identifies 1-RH-P-1A in operation by observing 1-RH-P-1A breaker position, RED Light On and GREEN Light Off, Amps indicated for 1-RH-P-1A, and/or RHR flow indicated on 1-RH-FI-1605. <p>EVALUATOR'S NOTE:</p> <p>If asked: RHR is required.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>CHECK CC TO RHR FLOW PATH. <i>(Step 6)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Check open or open the following Trip Valves: <ul style="list-style-type: none"> 1) 1-CC-TV-109A, RHR HX A CC RTN HDR TV 2) Identifies 1-CC-TV-109A closed and OPENS valve using OPEN pushbutton 3) Checks 1-CC-TV-109A OPEN by observing RED Light Lit and GREEN Light Off. 4) 1-CC-TV-109B, RHR HX A CC RTN HDR TV 5) Identifies 1-CC-TV-109B closed and OPENS valve using OPEN pushbutton 6) Checks 1-CC-TV-109B OPEN by observing RED Light Lit and GREEN Light Off. b) Check CC to in-service RHR HX - NORMAL. <ul style="list-style-type: none"> 1) Observes flow on 1-CC-FI-110A, OUTLET HDR A FLOW. 2) Observes flow on 1-CC-FI-110B, OUTLET HDR B FLOW <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 7:</p> <p>CHECK RCPS - ANY RUNNING. <i>(Step 7)</i></p> <p>STANDARD:</p> <p>Observes 1-RC-P-1A and 1-RC-P-1C running using breaker position indicating lights, RED Light On and GREEN Light OFF; 1-RC-P-1A and 1-RC-P-1C amps indicated.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 8:</p> <p>CHECK IF RCPs MUST BE STOPPED: <i>(Step 8)</i></p> <p>STANDARD:</p> <p>a) Check the following:</p> <ul style="list-style-type: none"> • RCS pressure – LESS THAN 240 psig <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> • Seal leakoff flow – LESS THAN 0.2 gpm <p>b) IF RCS pressure > 240 psig as indicated 1-RC-PI-1403 and 1-RC-PI-1458, AND seal leakoff flow >0.2 gpm on 1-CH-FR-1190, Pens 1 & 3, then the Candidate will go to Step 9.</p> <p>c) IF RCS pressure < 240 psig as indicated 1-RC-PI-1403 and 1-RC-PI-1458, OR seal leakoff flow < 0.2 gpm on 1-CH-FR-1190, Pens 1 & 3, then the Candidate will STOP 1-RC-P-1A and 1-RC-P-1C and go to Step 9.</p> <p>EVALUATOR'S NOTE:</p> <p>Depending upon the speed of the Candidates response, the Candidate is expected to perform EITHER step b) or c) above.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 9:</p> <p>CHECK IF RCP SEAL RETURN FLOW SHOULD BE ESTABLISHED: <i>(Step 9)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Check RCP Seal Return – REQUIRED FOR PLANT CONDITIONS. b) Check the following parameters – SATISFIED <ul style="list-style-type: none"> 1) CC pump – RUNNING 2) Identify 1-CC-P-1A and 1-CC-P-1B running by observing breaker indicating lights, RED Light Lit and GREEN Light Out; And amps indicated for both motors. 3) RCP seal injection flow - BETWEEN 6 GPM AND 10 GPM. 4) Identify Seal injection flow by observing 1-CH-FI-1124A and 1-CH-FI-1130A. c) Open RCP Seal Return Valve 1-CH-MOV-1381 and observe RED Light On and GREEN Light Off. <p>EVALUATOR’S NOTE:</p> <p style="padding-left: 40px;">If asked: For substep a) above; Yes Seal Return flow required.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 10:</p> <p>STABILIZE RCS PRESSURE AS NECESSARY FOR PLANT CONDITIONS <i>(Step 10)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Operate heaters and normal spray to maintain pressure stable. b) If 1-RC-P-1A and 1-RC-P-1C running – Candidate should adjust 1-RC-PCV-1455A or 1-RC-PCV-1455B to control RCS pressure. c) If 1-RC-P-1A and 1-RC-P-1C have been secured – Candidate should cycle pressurizer heaters On or Off as necessary to control RCS pressure. <p>EVALUATOR’S NOTE:</p> <p style="padding-left: 40px;">Candidate should use method in item b) or c) to control RCS pressure based upon RCP configuration.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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

Task

- Task is to be performed in the simulator.
- Perform Steps 1 through 10 of 1-AP-10.20, Response to Spurious Safety Injection with RCS Temperature Less Than 350°F.

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 spurious safety injection has occurred with Unit 1 operating at 289°F.
- 1-RH-P-1A and 1-RH-E-1A are in service.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to respond to the spurious SI by performing 1-AP-10.20, Response to Spurious Safety Injection with RCS Temperature Less Than 350°F
- When you complete the actions necessary to accomplish this Task, please inform me.

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

Initial Conditions

- A spurious safety injection has occurred with Unit 1 operating at 289°F.
- 1-RH-P-1A and 1-RH-E-1A are in service.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to respond to the spurious SI by performing 1-AP-10.20, Response to Spurious Safety Injection with RCS Temperature Less Than 350°F
- When you complete the actions necessary to accomplish this Task, please inform me.



SURRY POWER STATION

ABNORMAL PROCEDURE

| | | |
|--------------------------|--|-----------------|
| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F (WITH 4 ATTACHMENTS) | REVISION 9 |
| | | PAGE 1 of 16 |

PURPOSE

To provide guidance to terminate a spurious Safety Injection with RCS temperature less than 350°F, and then to stabilize the unit and return components to normal.

ENTRY CONDITIONS

A spurious Safety Injection has occurred with the unit less than 350°F as indicated by any of the following:

- Annunciator 1A-F3, SI INITIATED TRAIN A, is LIT
- Annunciator 1A-F4, SI INITIATED TRAIN B, is LIT
- One or both EDGs running
- Phase I Containment isolation has occurred as indicated by multiple Containment isolation valves in the SI position

CONTINUOUS USE

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|--------------------------|--|--------------------------------------|
| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 2 of 16 |
|--------------------------|--|--------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|--------------------------|--|
| 1. ___ CHECK SAFETY INJECTION INITIATION: <input type="checkbox"/> • HHSI to Cold Legs - FLOW INDICATED <input type="checkbox"/> • EDG 1 and EDG 3 - EITHER OR BOTH RUNNING | | Do the following: <input type="checkbox"/> a) Consult with Shift Supervision. <input type="checkbox"/> b) Perform detailed board walkdown. <input type="checkbox"/> c) Submit Condition Report. d) Notify the following: <input type="checkbox"/> • Operations Management <input type="checkbox"/> • STA <input type="checkbox"/> e) RETURN TO procedure in effect. |
| 2. ___ PRESS BOTH SI RESET TRAIN A AND TRAIN B PUSHBUTTONS (60 SECOND TD) | | |
| 3. ___ CHECK BOTH ANNUNCIATORS - NOT LIT <input type="checkbox"/> • 1A-F3, SI INITIATED TRAIN A <input type="checkbox"/> • 1A-F4, SI INITIATED TRAIN B | | Do the following: <input type="checkbox"/> a) <u>IF</u> SI Train A NOT reset, <u>THEN</u> open Breaker 17 on DC Panel 1-1. (behind MCR Vertical Board) <input type="checkbox"/> b) <u>IF</u> SI Train B NOT reset, <u>THEN</u> open Breaker 17 on DC Panel 1-2. (behind MCR Vertical Board) <input type="checkbox"/> c) Initiate 1-AP-10.19, Resetting Safety Injection. |
| 4. ___ CHECK CLOSED OR CLOSE SI TO COLD LEG MOVES: <input type="checkbox"/> • 1-SI-MOV-1867C <input type="checkbox"/> • 1-SI-MOV-1867D | | <input type="checkbox"/> Deenergize breakers and locally close valve(s). <input type="checkbox"/> • 1-SI-MOV-1867C, 1-EP-BKR-1H1-1-2C <input type="checkbox"/> • 1-SI-MOV-1867D, 1-EP-BKR-1J1-1-8C |
| 5. ___ CHECK RHR - REQUIRED | | <input type="checkbox"/> GO TO Step 7. |

| | | |
|--------------------------|--|--------------------------------------|
| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 4 of 16 |
|--------------------------|--|--------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|--|--|
| *8. ___ CHECK IF RCPs MUST BE STOPPED: | a) Check the following: <ul style="list-style-type: none"> <input type="checkbox"/> • RCS pressure - LESS THAN 240 PSIG <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> • Seal leakoff flow - LESS THAN 0.2 gpm b) Stop affected RCP(s) | <input type="checkbox"/> a) GO TO Step 9. |
| 9. ___ CHECK IF RCP SEAL RETURN FLOW SHOULD BE ESTABLISHED: | a) Check RCP Seal Return - REQUIRED FOR PLANT CONDITIONS b) Check the following parameters - SATISFIED <ul style="list-style-type: none"> <input type="checkbox"/> • CC pump - RUNNING <input type="checkbox"/> • RCP seal injection flow - BETWEEN 6 GPM AND 10 GPM c) Open RCP Seal Return Valve <ul style="list-style-type: none"> <input type="checkbox"/> • 1-CH-MOV-1381 | <input type="checkbox"/> a) GO TO Step 10. b) Do the following: <ul style="list-style-type: none"> <input type="checkbox"/> 1) Try to restore conditions for establishing RCP Seal Return. <input type="checkbox"/> 2) <u>WHEN</u> conditions in Step 9.b satisfied, <u>THEN</u> perform Step 9.c. <input type="checkbox"/> 3) GO TO Step 10. c) Locally open valve. |
| *10. ___ STABILIZE RCS PRESSURE AS NECESSARY FOR PLANT CONDITIONS | <ul style="list-style-type: none"> <input type="checkbox"/> • Operate heaters and normal spray to maintain pressure stable | <input type="checkbox"/> Check proper operation of PRZR PORVs at OPMS setpoints <u>OR</u> operate one PRZR PORV to maintain pressure specified by Shift Supervision. |
| 11. ___ CHECK CHARGING AND/OR LETDOWN - REQUIRED | | <input type="checkbox"/> GO TO Step 15. |

| | | |
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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 <hr/> PAGE 5 of 16 |
|----------------------|--|--|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------------------------------------|--|---|
| 12. ___ ESTABLISH CHG FLOW ALIGNMENT: | a) Close CHG flow control: <input type="checkbox"/> • 1-CH-FCV-1122 b) Check CHG line isolation - OPEN <input type="checkbox"/> • 1-CH-HCV-1310A c) Check opened or open CHG line isolation MOVs: <input type="checkbox"/> • 1-CH-MOV-1289A <input type="checkbox"/> • 1-CH-MOV-1289B <input type="checkbox"/> d) Check PRZR level - GREATER THAN 35% | <input type="checkbox"/> b) Manually open valve. <input type="checkbox"/> c) Locally open valve(s). <input type="checkbox"/> d) Do the following: <input type="checkbox"/> 1) Control CHG flow to restore PRZR level. <input type="checkbox"/> 2) <u>WHEN</u> PRZR level greater than 35%, <u>THEN</u> perform Step 13. <input type="checkbox"/> 3) GO TO Step 15. |

| | | |
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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 6 of 16 |
|--------------------------|--|--------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------------------------------|---|--|
| 13. ___ ESTABLISH LETDOWN: | <ul style="list-style-type: none"> a) Check closed or close RHR letdown flow control valve: <ul style="list-style-type: none"> <input type="checkbox"/> • 1-RH-HCV-1142 b) Check closed or close letdown orifice isolation valves: <ul style="list-style-type: none"> <input type="checkbox"/> • 1-CH-HCV-1200A <input type="checkbox"/> • 1-CH-HCV-1200B <input type="checkbox"/> • 1-CH-HCV-1200C c) Check open or open letdown isolation valves: <ul style="list-style-type: none"> <input type="checkbox"/> • 1-CH-TV-1204A <input type="checkbox"/> • 1-CH-TV-1204B d) Check open or open letdown line pressure control valve: <ul style="list-style-type: none"> <input type="checkbox"/> • 1-CH-PCV-1145 <input type="checkbox"/> e) Open 1-RH-HCV-1142 to establish letdown flow from RHR <input type="checkbox"/> f) Adjust CHG line flow to establish greater than 40 gpm if establishing letdown flow from RCS g) Check open or open letdown isolation valves if establishing letdown flow from RCS: <ul style="list-style-type: none"> <input type="checkbox"/> • 1-CH-LCV-1460A <input type="checkbox"/> • 1-CH-LCV-1460B | <ul style="list-style-type: none"> <input type="checkbox"/> Establish excess letdown IAW 1-OP-CH-006, SHIFTING OR INCREASING/DECREASING LETDOWN FLOW. |
| (STEP 13 CONTINUED ON NEXT PAGE) | | |

| | | |
|--------------------------|--|--------------------------------------|
| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 7 of 16 |
|--------------------------|--|--------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|---|--|
| 13. | ESTABLISH LETDOWN: (Continued) | |
| | <input type="checkbox"/> h) Open letdown orifice isolation valves as required <input type="checkbox"/> i) Adjust letdown line pressure control valve and letdown from RHR to maintain letdown pressure: <input type="checkbox"/> • 1-CH-PCV-1145 <input type="checkbox"/> • 1-RH-HCV-1142 <input type="checkbox"/> j) Control charging and letdown flow as required to maintain RCS pressure <input type="checkbox"/> k) Place 1-CH-PCV-1145 in Auto if desired <input type="checkbox"/> l) Adjust NRHX outlet temperature control valve to control letdown temperature, if necessary: <input type="checkbox"/> • 1-CC-TCV-103 | |
| 14. ___ | RESET CLS AS REQUIRED: | |
| | <input type="checkbox"/> a) Check annunciators - ANY LIT <input type="checkbox"/> • 1B-B4 <input type="checkbox"/> • 1B-B5 <input type="checkbox"/> • 1B-C4 <input type="checkbox"/> • 1B-C5 <input type="checkbox"/> b) Reset HI or HI-HI CLS | <input type="checkbox"/> a) GO TO Step 15. |
| 15. ___ | ALIGN CONTROL ROOM AND AUXILIARY VENTILATION IAW ATTACHMENT 2 | |

| | | |
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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 8 of 16 |
|--------------------------|--|--------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------|--|--|
| 16. ___ | CHECK CLOSED OR CLOSE RWST CROSSTIE VALVES: | |
| | <input type="checkbox"/> • 1-SI-TV-102A <input type="checkbox"/> • 1-SI-TV-102B <input type="checkbox"/> • 2-SI-TV-202A <input type="checkbox"/> • 2-SI-TV-202B | |
| 17. ___ | CHECK RCS TEMPERATURE CONTROL: | |
| | <input type="checkbox"/> a) Check SGs - STEAMING PRIOR TO EVENT <input type="checkbox"/> b) Check MSTVs - AT LEAST ONE OPEN <input type="checkbox"/> c) Control RCS temperature at pre-event value using steam dump, feed flow, and RHR, as required | <input type="checkbox"/> a) Control RCS temperature using RHR <u>AND GO TO</u> Step 18. <input type="checkbox"/> b) Use SG PORVs. |
| *18. ___ | PERFORM OR CHECK SHUTDOWN MARGIN FOR CURRENT PLANT AND EQUIPMENT CONDITIONS IAW 1-OP-RX-002, SHUTDOWN MARGIN (CALCULATED AT ZERO POWER) AND BORATE AS NECESSARY | |
| *19. ___ | CHECK ALL AC BUSES - ENERGIZED BY OFFSITE POWER | <input type="checkbox"/> Initiate 1-AP-10.07, LOSS OF UNIT 1 POWER. |
| | NOTE: RCPs may be required for RCS temperature control if RHR is unavailable. | |
| 20. ___ | CHECK RCPS - OPERATION DESIRED | <input type="checkbox"/> GO TO Step 22. |

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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 9 of 16 |
|--------------------------|--|--------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------|--------------------------------|---|
| *21. ___ | CHECK DESIRED RCP(S) - RUNNING | <p>Try to start RCP(s) to provide normal PRZR spray:</p> <p>a) <u>IF</u> RVLIS upper range indication less than 95%, <u>THEN</u> do the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • Raise PRZR level greater than 68%. <input type="checkbox"/> • Raise RCS subcooling based on CETCs greater than 55°F [110°F]. <input type="checkbox"/> • Use PRZR heaters as necessary to saturate the PRZR. <p>b) Establish conditions for starting an RCP IAW 1-OP-RC-001, STARTING AND RUNNING ANY RCP.</p> <p>c) <u>IF</u> conditions can be established, <u>THEN</u> start RCP C.</p> <p>d) <u>IF</u> RCP C can <u>NOT</u> be started, <u>THEN</u> attempt to start RCPs A and B to provide normal spray. (must use 1-RC-PCV-1455A)</p> |
| 22. ___ | CHECK FEED WATER - REQUIRED | <p><input type="checkbox"/> <u>IF</u> RCPs or RHR in service, <u>THEN</u> GO TO Step 25. <u>IF NOT</u>, <u>THEN</u> GO TO Step 24.</p> |

| | | |
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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 10 of 16 |
|--------------------------|--|---------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------|--|--|
| 23. ____ | <p>TRY TO ESTABLISH MFW / CONDENSATE FLOW:</p> <p><input type="checkbox"/> a) Check MFW / Condensate flow - DESIRED</p> <p><input type="checkbox"/> b) Push both FW isolation reset pushbuttons</p> <p><input type="checkbox"/> c) Check start of MFP - DESIRED</p> <p><input type="checkbox"/> d) Start one MFW pump IAW 1-OP-FW-004, MAIN FEEDWATER SYSTEM OPERATION</p> <p><input type="checkbox"/> e) Maintain intact SG levels using FW bypass valves</p> | <p>a) Do the following:</p> <p><input type="checkbox"/> 1) Check running or start AFW pump(s) and maintain intact SG level IAW Shift Supervision direction.</p> <p><input type="checkbox"/> 2) GO TO Step 24.</p> <p>c) Do the following to establish Condensate flow:</p> <p><input type="checkbox"/> 1) Check or rack breakers for one MFP to TEST.</p> <p><input type="checkbox"/> 2) Reset and close MFP breakers that are racked to TEST.</p> <p>3) Open associated MFP discharge MOV:</p> <p><input type="checkbox"/> • 1-FW-MOV-150A</p> <p><input type="checkbox"/> • 1-FW-MOV-150B</p> <p><input type="checkbox"/> 4) GO TO Step 23e.</p> |

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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 11 of 16 |
|--------------------------|--|---------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|--------------------------|---|
| *24. ___ CHECK NATURAL CIRCULATION, AS NECESSARY <input type="checkbox"/> • RCS subcooling based on CETCs - GREATER THAN 30°F [85°F] <input type="checkbox"/> • CETC temperatures - STABLE OR DECREASING <input type="checkbox"/> • SG Pressures - STABLE OR DECREASING <input type="checkbox"/> • RCS hot leg wide range temperatures - STABLE OR DECREASING <input type="checkbox"/> • RCS cold leg wide range temperatures - AT SATURATION TEMPERATURE FOR SG PRESSURE | | <input type="checkbox"/> Dump more steam. |
| 25. ___ CHECK IF EDGS CAN BE STOPPED: <input type="checkbox"/> a) Check AC emergency buses - BOTH ENERGIZED BY OFFSITE POWER <input type="checkbox"/> b) Stop any unloaded EDGs IAW Attachment 1 | | <input type="checkbox"/> a) Check initiated or initiate 1-AP-10.07, LOSS OF UNIT 1 POWER. |
| 26. ___ CONSULT WITH SHIFT SUPERVISION AND ESTABLISH BLOWDOWN FROM INTACT SG(s) IAW 1-OP-BD-001, STEAM GENERATOR BLOWDOWN SYSTEM OPERATION, AS DIRECTED | | |
| 27. ___ CHECK ALIGNMENT OF CHG PUMP SUCTION TO VCT - DESIRED | | <input type="checkbox"/> GO TO Step 30. |

| | | |
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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 |
| | | PAGE 12 of 16 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|--|--|
| 28. ___ | CHECK VCT MAKEUP CONTROLS: | |
| | <input type="checkbox"/> a) Check one BATP operating and aligned to Unit 1 | <input type="checkbox"/> a) Align one BATP IAW 1-OP-CH-010, BAST ALIGNMENTS. |
| | <input type="checkbox"/> b) Check at least one PG pump operating | <input type="checkbox"/> b) Start PG pump. |
| | c) Check Boric Acid and PG flow controls set for one of the following: | <input type="checkbox"/> c) Adjust controls. |
| | <input type="checkbox"/> • Greater than required RCS boron concentration | |
| | <u>OR</u> | |
| | <input type="checkbox"/> • 2300 ppm | |
| | <input type="checkbox"/> d) Check makeup set for AUTO control if required for plant conditions | <input type="checkbox"/> d) Put in AUTO. |
| 29. ___ | ALIGN CHG PUMP SUCTION TO VCT: | |
| | <input type="checkbox"/> a) Check VCT level - GREATER THAN 27% | <input type="checkbox"/> a) GO TO Step 30. <u>WHEN</u> VCT level greater than 34%, <u>THEN</u> do Steps 29b and 29c. |
| | b) Check open or open CHG pump suction from VCT MOVs: | <input type="checkbox"/> b) Locally open valve(s). |
| | <input type="checkbox"/> • 1-CH-MOV-1115C | |
| | <input type="checkbox"/> • 1-CH-MOV-1115E | |
| | c) Check closed or close CHG pump suction from RWST MOVs: | <input type="checkbox"/> c) Locally close valve(s). |
| | <input type="checkbox"/> • 1-CH-MOV-1115B | |
| | <input type="checkbox"/> • 1-CH-MOV-1115D | |

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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 13 of 16 |
|--------------------------|--|---------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|---|--|
| 30. ___ | MAINTAIN STABLE PLANT CONDITIONS AS DIRECTED BY SHIFT SUPERVISION: | |
| | <input type="checkbox"/> • PRZR pressure <input type="checkbox"/> • PRZR level <input type="checkbox"/> • RCS temperatures <input type="checkbox"/> • Intact SG levels | |
| | NOTE: The auto-start inhibit signal may be reset using one of three methods: <ul style="list-style-type: none"> • Placing the pump control switch in STOP or PTL and then back in AUTO after the time delay. (resets individual breaker) • Starting the pump at any time. (resets individual breaker) • Placing the NORMAL/RESET switch on the GDC-17 panel in the normal switchgear room for both units in RESET after the time delay. (resets all affected pumps on a unit) | |
| 31. ___ | RESET AUTO-START CAPABILITY OF PUMPS POWERED FROM RSS | |
| | <input type="checkbox"/> • CC Pumps (both units) <input type="checkbox"/> • BC Pumps <input type="checkbox"/> • CN Pumps | |
| 32. ___ | CHECK THE FOLLOWING ANNUNCIATORS - NOT LIT | <input type="checkbox"/> Notify Maintenance. |
| | <input type="checkbox"/> • 1-VSP-J2,UNIT 1 AUTO START BLOCK <input type="checkbox"/> • 2-VSP-J7,UNIT 2 AUTO START BLOCK | |
| 33. ___ | CHECK RESET OR RESET RSS TRANSFORMER TIME DELAY USING PUSHBUTTON ON UNIT 1 | |
| | <input type="checkbox"/> • RSST LTC TIME DELAY RESET | |

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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 14 of 16 |
|--------------------------|--|---------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|--|-----------------------|
| 34. ___ | CHECK CLOSED OR CLOSE AFW ISOL MOVES NOT BEING USED FOR RCS TEMPERATURE CONTROL: | |
| | <input type="checkbox"/> • 1-FW-MOV-151A <input type="checkbox"/> • 1-FW-MOV-151B <input type="checkbox"/> • 1-FW-MOV-151C <input type="checkbox"/> • 1-FW-MOV-151D <input type="checkbox"/> • 1-FW-MOV-151E <input type="checkbox"/> • 1-FW-MOV-151F | |
| 35. ___ | RESET THE DG SYSTEM IAW THE FOLLOWING : | |
| | <input type="checkbox"/> a) Depress the green close pushbutton for 1-DG-TV-108A <input type="checkbox"/> b) Depress the green close pushbutton for 1-DG-TV-108B <input type="checkbox"/> c) Check that the PDTT Pumps will start in HAND | |

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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 <hr/> PAGE 15 of 16 |
|----------------------|--|---|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|--|--|
| 36. ___ | RESET THE CV SYSTEM IAW THE FOLLOWING: | |
| | <input type="checkbox"/> a) Check CTMT - VACUUM ESTABLISHED | <input type="checkbox"/> a) GO TO Step 37. |
| | b) Check open or open the following Trip Valves: | |
| | <input type="checkbox"/> • 1-CV-TV-150A | |
| | <input type="checkbox"/> • 1-CV-TV-150B | |
| | <input type="checkbox"/> c) Reset the CV pump in AUTO by placing the control switch in OFF and then back to AUTO | |
| 37. ___ | CONSULT WITH SHIFT SUPERVISION AND ALIGN CONTAINMENT TRIP VALVES AS REQUIRED FOR PLANT CONDITIONS | |
| 38. ___ | SECURE HYDROGEN ANALYZER HEAT TRACING IF NEEDED: | |
| | <ul style="list-style-type: none"> • Turn Hydrogen Analyzer heat tracing panel switches to OFF, then to AUTO: | |
| | <input type="checkbox"/> • 1-HT-HTP-6 | |
| | <input type="checkbox"/> • 1-HT-HTP-7 | |
| 39. ___ | REVIEW VPAP-2802, NOTIFICATIONS AND REPORTS, FOR REPORTABILITY | |
| 40. ___ | CHECK SEAL INJECTION - WAS LOST TO ANY RUNNING RCP | <input type="checkbox"/> GO TO Step 42. |
| 41. ___ | NOTIFY ENGINEERING FOR EVALUATION | |

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| NUMBER 1-AP-10.20 | PROCEDURE TITLE RESPONSE TO SPURIOUS SAFETY INJECTION WITH RCS TEMPERATURE LESS THAN 350°F | REVISION 9 PAGE 16 of 16 |
|----------------------|--|-----------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|----------|--|-----------------------|
| 42. ____ | RETURN TO PROCEDURE AND STEP IN EFFECT OR AS DIRECTED BY SHIFT SUPERVISION | |
| - END - | | |

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| NUMBER 1-AP-10.20 | ATTACHMENT TITLE STOPPING UNLOADED EDGs | ATTACHMENT 1 |
| REVISION 9 | | PAGE 1 of 2 |

- NOTE:**
- Only one EDG should be stopped at a time.
 - EDG 1 should be stopped before EDG 3.

1. ___ Check that the EMERG GEN NO () SPEED ADJ red light is LIT and the green light is NOT LIT.
2. ___ Depress the EMERG GEN NO () FAST START RESET pushbutton and check the Red Light is LIT.

NOTE: Adjustments to the UG-8 Governor should be made slowly with the EDG running to prevent hunting and surging by the governor.

3. ___ Locally adjust the UG-8 Governor to the fast start settings:
 - ___ a. Slowly adjust the Speed Droop Control setting to ZERO.
 - ___ b. At the Engine Control Cabinet, using the Speed Control Switch, adjust EDG speed to match the speed knob pointer to the scribe mark on the dial.

4. ___ Use a Strobe Light to check engine speed is between 895 and 905 rpm.
5. ___ Check that the base tank fuel oil level is greater than 290 gallons.

NOTE: The Emergency Diesel Generator will continue to run for $9\frac{1}{2}$ minutes to $13\frac{1}{2}$ minutes after the Engine Stop pushbuttons are depressed. This unloaded run time allows engine metal temperatures to equalize, thereby reducing the stress on the engine.

6. ___ In the MCR, push both EMERG GEN NO () ENGINE STOP pushbuttons simultaneously to initiate the engine cool down and stop sequence.
7. ___ Check engine speed remains between 895 and 905 rpm as indicated by the Strobe Light.
8. ___ Check that the EMERG GEN # () TRIP AUX RESET amber light is LIT.
9. ___ Depress the following pushbuttons and check that the associated amber light is NOT LIT.
 - EDG 1 - Depress 1-EE-PB-EG1, EMERGENCY GENERATOR #1 PUSH BUTTON RESET, at the EDG Isolation Panel in the ESGR
 - EDG 3 - Depress the EMERG GEN #3 TRIP AUX RESET BUTTON, on the Unit 1 EDG 3 Control Panel

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| NUMBER 1-AP-10.20 | ATTACHMENT TITLE STOPPING UNLOADED EDGS | ATTACHMENT 1 |
| REVISION 9 | | PAGE 2 of 2 |

10. ___ Check that the EDG stops after the $9 \frac{1}{2}$ minute to $13 \frac{1}{2}$ minute cool down period.

11. At the UG-8 Governor, check the following conditions:

___ a. Check the speed knob is at the scribe mark on the dial.

___ b. Check the Speed Droop Control is set at Zero.

___ c. Check the Load Limit Control is at the maximum clockwise position, which is past the 10 mark.

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| NUMBER 1-AP-10.20 | ATTACHMENT TITLE ALIGNING CONTROL ROOM AND AUXILIARY VENTILATION | ATTACHMENT 2 |
| REVISION 9 | | PAGE 1 of 3 |

1. Check stopped or stop Control Room Emergency Supply Fan:
 - ___ • (-)VS-F-41
 - OR
 - ___ • (-)VS-F-42

2. Check closed or close Control Room Emergency Supply MOD:
 - ___ • (-)VS-MOD-()04A
 - OR
 - ___ • (-)VS-MOD-()04B

3. ___ Open Control Room supply dampers:
 - ___ • 1-VS-MOD-103A
 - ___ • 1-VS-MOD-103C

4. ___ Place 1-VS-43-VS103X, MCR ISOLATION switch in AUTO.

5. ___ Check MCR boundary fans - BREAKERS OPEN. IF NOT, THEN perform Attachment 3, Steps 2 and 3, AND GO TO Step 7.

6. ___ Initiate Attachment 3.

7. ___ Restart Turbine Building Supply and Exhaust Fans as necessary IAW 0-OP-VS-010, TURBINE BUILDING VENTILATION SYSTEM.

8. ___ Open Control Room exhaust dampers:
 - ___ • 1-VS-MOD-103B
 - ___ • 1-VS-MOD-103D

9. ___ Start exhaust fan:
 - ___ • 1-VS-F-15

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| NUMBER 1-AP-10.20 | ATTACHMENT TITLE ALIGNING CONTROL ROOM AND AUXILIARY VENTILATION | ATTACHMENT 2 |
| REVISION 9 | | PAGE 2 of 3 |

10. ___ Place Aux Building Central Area Mode switch on the VNTX-R panel to FILTER.
11. ___ At VNTX-R panel, push DAMPER AIR SUPPLY RESET pushbuttons:
- ___ • SOV-VS-101A
 - ___ • SOV-VS-101B
12. ___ Stop both Filtered Exhaust Fans:
- ___ • 1-VS-F-58A
 - ___ • 1-VS-F-58B
13. ___ Check if filtered exhaust is required in the following areas. IF filtered exhaust required, THEN perform Steps 14 through 17. IF filtered exhaust NOT required, THEN GO TO Step 18.
- ___ • Auxiliary BLDG Central
 - ___ • Safeguards
14. ___ Align Safeguards to filtered exhaust.
15. ___ Check stopped or stop both Safeguard BLDG Exhaust Fans:
- ___ • 1-VS-F-40A
 - ___ • 1-VS-F-40B
16. ___ Start 1-VS-F-58A or B.
17. ___ GO TO Step 22.
18. ___ Place Aux Bldg Central Area Mode switch on the VNTX-R panel to the UNFILTER position.
19. ___ Place Unit 1 Safeguards in UNFILTER:
- ___ • MOD-VS-100A
 - ___ • MOD-VS-100B

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| NUMBER 1-AP-10.20 | ATTACHMENT TITLE ALIGNING CONTROL ROOM AND AUXILIARY VENTILATION | ATTACHMENT 2 |
| REVISION 9 | | PAGE 3 of 3 |

20. ___ Check running or start one AUX BLDG Central Area Exhaust Fan.
- ___ • 1-VS-F-9A
 - ___ • 1-VS-F-9B
21. ___ Check running or start one Safeguard BLDG Exhaust Fan:
- ___ • 1-VS-F-40A
 - ___ • 1-VS-F-40B
22. ___ Locally reset the following contactors at the CONTACTOR GROUP panel:
- ___ • 1-VS-FC-6
 - ___ • 1-VS-FC-4A
 - ___ • 1-VS-FC-4B
 - ___ • 1-VS-FC-8A
 - ___ • 1-VS-FC-8B
 - ___ • 1-VS-HVC-1A
 - ___ • 1-VS-HVC-1B
 - ___ • 1-VS-HVC-2A
 - ___ • 1-VS-HVC-2B
23. ___ Align TSC ventilation IAW 0-OP-VS-007, TECHNICAL SUPPORT CENTER VENTILATION.
24. ___ Consult with Shift Supervision and align the following fans to pre-event lineup, if required:
- ___ • 1-VS-F-8A / 8B, Aux Bldg General Area Exhaust Fans
 - ___ • 1-VS-F-7A / 7B, Fuel Bldg Normal Exhaust Fans
 - ___ • 1-VS-F-56A / 56B, Decon Bldg Exhaust Fans
 - ___ • 1-VS-F-59, Aux Bldg (CAT-2) Filter Fan
25. ___ Notify I&C to reset 1-VG-RI-131A/B, MGPI Vent-Vent Particulate and Gas Rad Monitors, if required.

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| NUMBER 1-AP-10.20 | ATTACHMENT TITLE STARTING MCR BOUNDARY FANS | ATTACHMENT 3 |
| REVISION 9 | | PAGE 1 of 1 |

1. Close the following breakers for the MCR boundary fans.
 - CABLE TRAY ROOM AIR HANDLING UNIT AHU-1, 1-EP-DB-HVAC, Ckt 1
(Unit 1 Switchgear Room, West wall)
 - CABLE TRAY ROOM AIR HANDLING UNIT, 2-EP-DB-HVAC, Ckt 2
(Unit 2 Switchgear Room, South wall)
 - 1-VS-F-16, CABLE TUNNEL EXHAUST FAN, 1-EP-BKR-1B2-1-2D
(Unit 1 Switchgear Room)
 - 2-VS-F-16, CABLE TUNNEL EXHAUST FAN, 2-EP-BKR-2B2-1-4D
(Unit 2 Switchgear Room)
 - 1-VS-F-RAF-1, CABLE TRAY ROOM RETURN FAN, 1-EP-BKR-1B2-1-3D
(Unit 1 Switchgear Room)
 - 2-VS-F-RAF-2, CABLE TRAY ROOM RET FAN, 2-EP-BKR-2B2-1-3D
(Unit 2 Switchgear Room)
 - 1-VS-HV-2, CABLE VAULT HTG AND VENT UNITS, 1-EP-BKR-1A1-1EA1
(Unit 1 Upper Cable Vault)
 - 2-VS-HV-2, CABLE VAULT HTG AND VENT UNIT, 2-EP-BKR-2A1-1EA1
(Unit 2 Upper Cable Vault)

2. Check the following fans - RUNNING.
 - 1-VS-AHU-1
 - 1-VS-AHU-2
 - 1-VS-HV-2
 - 2-VS-HV-2
 - 1-VS-F-16
 - 2-VS-F-16
 - 1-VS-F-RAF-1
 - 2-VS-F-RAF-2

3. Notify the Unit 1 CRO of fan status.

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| NUMBER 1-AP-10.20 | ATTACHMENT TITLE PROBABLE CAUSES AND REFERENCES | ATTACHMENT 4 |
| REVISION 9 | | PAGE 1 of 1 |

I. PROBABLE CAUSES:

1. Spurious Safety Injection Occurs With RCS Temperature Less Than 350°F

II. REFERENCES:

1. CA088639, Ops to Develop a Procedure for Recovery From Inadvertent SI Less Than HSD
2. UFSAR 4.2, Reactor Coolant System
3. UFSAR 6.2, Safety Injection System
4. Tech Spec 3.3, Safety Injection
5. 1-AP-10.19, Resetting Safety Injection
6. 1-E-0, Reactor Trip or Safety Injection
7. 1-ES-0.1, Reactor Trip Response
8. 1-ES-1.1, SI Termination
9. DC SU-09-00075, Removal of Main Control Room Air Bottle System / TSCR 363, Removal of Main Control Room Bottled Air System Requirements from Technical Specifications
10. DC SU-10-01008, Reactor Coolant Pump (RCP) Seal Replacement (1-RC-P-1B)
11. CR400912, Procedural Issues Encountered in the Performance of 1-AP-10.20
12. DC SU-11-00007, Reactor Coolant Pump (RCP) Seal Replacement (1-RC-P-1A)
13. DC SU-11-00012, Reactor Coolant Pump (RCP) Seal Replacement (1-RC-P-1C)

U.S. Nuclear Regulatory Commission
Surry Power Station

FINAL

SR12301
Simulator Job Performance Measure 024AK3.02 (4.2 / 4.4)
[Alternate Path]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Perform AP-3.00 Emergency Boration of the RCS.

K/A: 024AK3.02 Knowledge of the reasons for the following responses as they apply to Emergency Boration: Actions contained in EOP for emergency boration.

Applicability

Estimated Time

Actual Time

RO/SRO(I)

10 Minutes

____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- A BOL startup was in progress IAW 1-OP-RX-006, Withdrawal of the Control Banks to Critical Conditions, Step 5.2.6.h.3, withdrawing control bank rods in overlap from "B" bank at 15 steps to "C" bank at 15 steps to verify proper overlap, when doubling occurred at 35 steps on "B" control bank. Attachment 1 Plot of 1-OP-RX-006 has shows that the 1/M = 0.5 point is below the MIL Line.
- Rod withdrawal has been stopped, Reactor Trip breakers have been opened, 1-OP-RX-004 reevaluated, and current RCS boron resampled with the result that RCS boron is 150 ppm less than required critical boron concentration.
- The STA has performed a calculation of the amount of Boric Acid to be added to ensure an adequate Shutdown Margin while a new ECC is prepared and verified.

Standards

- Emergency Borate for 2 minutes IAW AP-3.00.

Initiating Cues

- Emergency Borate for 2 minutes IAW AP-3.00.

Terminating Cues

- AP-3.00, Emergency Boration, Step 3 complete.

Procedures

- 1-AP-3.00, Emergency Boration, Rev 5.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up BOL, 10^{-8} amps IC and initialize. Place simulator in RUN. Open reactor trip breakers. Using Remote function, RC, BORON_INIT_ALL set boron concentration 100 ppm less than current over 180 sec ramp.
- Set Auto trigger 1; Event Action: CHMOV350_OPEN.
- Trigger 1: MOV Control, CH, CHMOV350_Rackin, Rackout.
- Trigger 3: MOV Control, CH, CHMOV350, Remote Value 100, 30 Sec Ramp

Initial Conditions

- A BOL startup was in progress IAW 1-OP-RX-006, Withdrawal of the Control Banks to Critical Conditions. While withdrawing control bank rods from "B" bank at 15 steps to "C" bank at 15 steps, doubling occurred at 35 steps on "B" control bank.
- Attachment 1 Plot of 1-OP-RX-006 shows that the 1/M = 0.5 point is below the MIL Line.
- Rod withdrawal has been stopped, Reactor Trip breakers have been opened, 1-OP-RX-004 reevaluated, and current RCS boron re-sampled with the result that RCS boron is 150 ppm less than required critical boron concentration.
- The STA has performed a calculation of the amount of Boric Acid to be added to ensure an adequate Shutdown Margin while a new ECC is prepared and verified

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to Emergency Borate 2 minutes IAW 1-AP-3.00.
- When you finish the actions necessary to accomplish this task, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded.
- *An additional instructor may be needed to silence alarms for the Candidate.*
- **START TIME:**

| | |
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| <p>STEP 1: Reviews NOTES prior to Step 1 of 1-AP-3.00. (<i>Step 1</i>)</p> <p>STANDARD:</p> <p style="padding-left: 40px;">Review NOTE 1: If a Reactor Trip occurs or is required, 1-E-0, REACTOR TRIP OR SAFETY INJECTION, should be implemented. Review NOTE 2: When the Reactor is shutdown with the Shutdown Banks withdrawn, tripping the Shutdown Banks may eliminate the need for emergency boration.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2: VERIFY CHARGING FLOW – GREATER THAN 75 GPM. (<i>Step 1</i>)</p> <p>STANDARD:</p> <p style="padding-left: 40px;">a) Verifies Charging flow > 75 gpm using 1-CH-FI-1122.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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|--|-------------------------------------|
| <p>STEP 3:</p> <p>START EMERGENCY BORATION. (<i>Step 2</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none">a) Transfer the in-service B ATP to FAST (<i>Step 2a</i>).b) Verifies indicating lights above control switch change from Slow (RED) to Fast (RED).c) Open 1-CH-MOV-1350 by removing brass cap and placing control switch to OPEN position.d) Identifies GREEN indication light immediately goes out and RED light remains out.e) Contacts Service Building Operator and directs local checking of 1-CH-MOV-1350 power supply breaker 1H1-2S-7C.f) Contacts Auxiliary Building Operator and directs local check of 1-CH-MOV-1350 for abnormal indication.g) Contacts Auxiliary Building Operator to locally open 1-CH-MOV-1350.h) When report of 1-CH-MOV-1350 full open, verifies flow on 1-CH-FI-1110.i) Determines with indicated flow rate, 1-CH-MOV-1350 should remain open approximately 2 minutes. <p>EVALUATOR'S NOTE:</p> <p>If asked: When 1-CH-MOV-1350 indication lost Candidate should notify Shift Manager. Evaluator should acknowledge report and direct Candidate to continue.</p> <p>Booth Operator: Will report as SBO that breaker 1H1-2S-7C is tripped. Will report as ABO that 1-CH-MOV-1350 – Normal. Initiates Trigger 3 when directed to open 1-CH-MOV-1350.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
|--|-------------------------------------|

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| <p>STEP 4:</p> <p>STOP BORATION WHEN DESIRED. (<i>Step 3</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Close 1-CH-MOV-1350 after 2 minutes of full flow indicated on 1-CH-FI-1110 by directing Auxiliary Building Operator to close 1-CH-MOV-1350. b) Verifies flow on 1-CH-FI-1110 goes to zero (0) gpm. c) Transfer the in-service BATP to AUTO. d) Verifies 1-CH-P-2A shifts to slow, RED slow light lit, RED fast light out. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • <u>When the candidate completes this step then inform the candidate that the task is complete.</u> <p>Booth Operator: When directed to close 1-CH-MOV-1350, double click on CHMOV350, set final value at 0, ramp 30 Secs, Insert.</p> <p>COMMENTS:</p> <p style="text-align: center; margin-top: 20px;">** 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.
- Perform Steps 1 through 3 of 1-AP-3.00.

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 BOL startup was in progress IAW 1-OP-RX-006, Withdrawal of the Control Banks to Critical Conditions. While withdrawing control bank rods from "B" bank at 15 steps to "C" bank at 15 steps, doubling occurred at 35 steps on "B" control bank.
- Attachment 1 Plot of 1-OP-RX-006 shows that the $1/M = 0.5$ point is below the MIL Line.
- Rod withdrawal has been stopped, Reactor Trip breakers have been opened, 1-OP-RX-004 reevaluated, and current RCS boron re-sampled with the result that RCS boron is 150 ppm less than required critical boron concentration.
- The STA has performed a calculation of the amount of Boric Acid to be added to ensure an adequate Shutdown Margin while a new ECC is prepared and verified

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to Emergency Borate 2 minutes IAW 1-AP-3.00.
- When you finish the actions necessary to accomplish this task, please inform me.

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

Initial Conditions

- A BOL startup was in progress IAW 1-OP-RX-006, Withdrawal of the Control Banks to Critical Conditions. While withdrawing control bank rods from "B" bank at 15 steps to "C" bank at 15 steps, doubling occurred at 35 steps on "B" control bank.
- Attachment 1 Plot of 1-OP-RX-006 shows that the 1/M = 0.5 point is below the MIL Line.
- Rod withdrawal has been stopped, Reactor Trip breakers have been opened, 1-OP-RX-004 reevaluated, and current RCS boron re-sampled with the result that RCS boron is 150 ppm less than required critical boron concentration.
- The STA has performed a calculation of the amount of Boric Acid to be added to ensure an adequate Shutdown Margin while a new ECC is prepared and verified

Initiating Cues

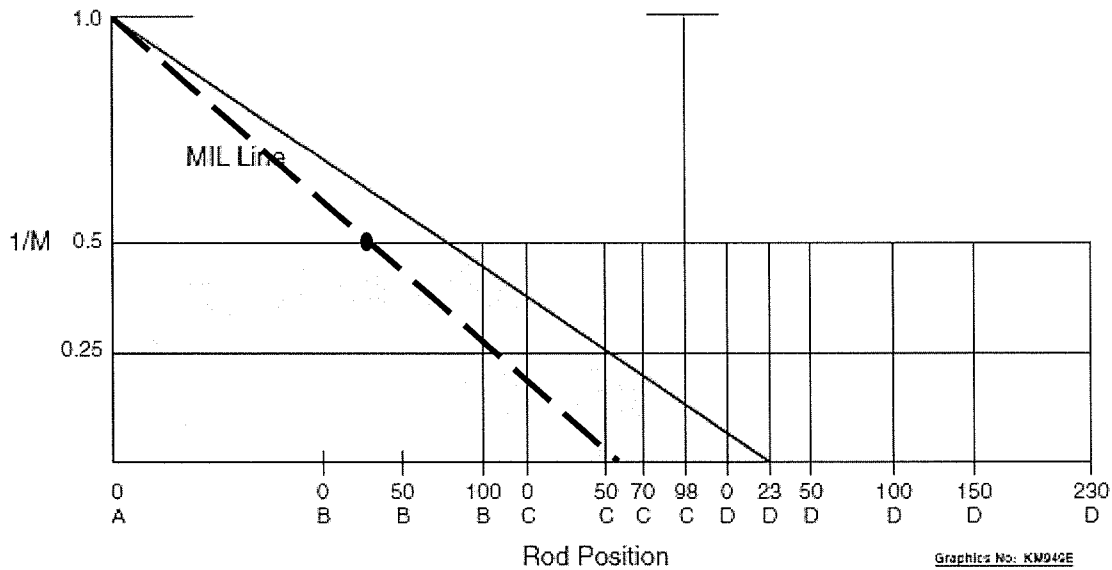
- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to Emergency Borate 2 minutes IAW 1-AP-3.00.
- When you finish the actions necessary to accomplish this task, please inform me.

INVERSE COUNT RATE RATIO PLOT (CONTROL BANKS A, B, AND C)

CAUTION

During rod withdrawal, if the second data point falls below the MIL Line, the rod withdrawal must be stopped, the Reactor Trip Breakers must be opened, and 1-OP-RX-004 must be reevaluated, to prevent a violation of Tech. Specs.

- JF 1. $(C_0) = \underline{288}$ cps (first data point) CONT BANK A at 000 steps
- JF $\frac{FNG}{IV}$ 2. $C_1 = 2 \times (C_0) = \underline{576}$ cps (second data point) (Ref. 2.4.11)
- JF $\frac{FNG}{IV}$ 3. $C_2 = 4 \times (C_0) = \underline{1152}$ cps (third data point) (Ref. 2.4.11)



INVERSE COUNT RATE RATIO PLOT

Performed by: _____

| | | | |
|-----------|---------|-------|------|
| Signature | Initial | Print | Date |
| Signature | Initial | Print | Date |



SURRY POWER STATION

ABNORMAL PROCEDURE

| | | |
|---------------------|--|----------------|
| NUMBER 1-AP-3.00 | PROCEDURE TITLE EMERGENCY BORATION (WITH 1 ATTACHMENT) | REVISION 5 |
| | | PAGE 1 of 4 |

PURPOSE

To provide guidance for conditions requiring and methods of emergency boration.

ENTRY CONDITIONS

- 1) Unexplained increase in Source Range count rate when shutdown.
- 2) Any transient that challenges the Tech Spec shutdown margin of 1.77% $\Delta K/K$.
- 3) Failure of normal boration methods or effectiveness.
- 4) Shift Supervision direction.

CONTINUOUS USE

| | | |
|---------------------|---------------------------------------|----------------|
| NUMBER 1-AP-3.00 | PROCEDURE TITLE EMERGENCY BORATION | REVISION 5 |
| | | PAGE 2 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--------|--|--|
| | <p>NOTE:</p> <ul style="list-style-type: none"> • If a Reactor Trip occurs or is required, 1-E-0, REACTOR TRIP OR SAFETY INJECTION, should be implemented. • When the Reactor is shutdown with the Shutdown Banks withdrawn, tripping the Shutdown Banks may eliminate the need for emergency boration. | |
| 1. ___ | VERIFY CHARGING FLOW - GREATER THAN 75 GPM | <input type="checkbox"/> Manually adjust charging flow to greater than 75 gpm. |
| 2. ___ | START EMERGENCY BORATION | |
| | <input type="checkbox"/> a) Transfer the in-service B ATP to FAST | a) Manually align CHG pump suction to the RWST: |
| | | <input type="checkbox"/> 1) Open 1-CH-MOV-1115B and D. |
| | | <input type="checkbox"/> 2) Close 1-CH-MOV-1115C and E. |
| | | <input type="checkbox"/> 3) GO TO Step 5. |
| | <input type="checkbox"/> b) Open 1-CH-MOV-1350 | <input type="checkbox"/> b) Locally open 1-CH-MOV-1350. |
| | | <u>IF</u> 1-CH-MOV-1350 can <u>NOT</u> be opened, <u>THEN</u> do the following: |
| | | <input type="checkbox"/> 1) Manually open 1-CH-FCV-1113A. |
| | | <input type="checkbox"/> 2) Locally open 1-CH-228. |
| | | <input type="checkbox"/> 3) Monitor Boric Acid flow on FR-1-113 (red trace). |
| | | <input type="checkbox"/> 4) GO TO Step 3. |
| | | <input type="checkbox"/> <u>IF</u> neither valve can be opened, <u>THEN</u> manually align CHG pump suction to the RWST <u>AND</u> GO TO Step 5. |
| | c) Monitor EMRG BORATE FLOW | |
| | <input type="checkbox"/> • 1-CH-FI-1110 | |

| | | |
|---------------------|---------------------------------------|----------------|
| NUMBER 1-AP-3.00 | PROCEDURE TITLE EMERGENCY BORATION | REVISION 5 |
| | | PAGE 3 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|---|--|
| 3. ___ | STOP BORATION WHEN DESIRED | |
| <input type="checkbox"/> | a) Close 1-CH-MOV-1350 | a) Locally close: <input type="checkbox"/> • 1-CH-MOV-1350 <u>OR</u> <input type="checkbox"/> • 1-CH-228 <input type="checkbox"/> b) Verify or place 1-CH-FCV-1113A in Auto. |
| <input type="checkbox"/> | b) Transfer the in-service BATP to AUTO | |
| 4. ___ | TURN ALL PRZR HEATERS ON | |
| 5. ___ | CHECK UNIT - AT POWER | <input type="checkbox"/> GO TO Step 8. |
| 6. ___ | VERIFY REACTOR AND TURBINE POWER - MATCHED AND STABLE | <input type="checkbox"/> Manually adjust control rods or turbine power as necessary. <input type="checkbox"/> <u>IF</u> plant parameters can <u>NOT</u> be stabilized and a Reactor Trip is imminent, <u>THEN</u> trip the Reactor and GO TO 1-E-0, REACTOR TRIP OR SAFETY INJECTION. |
| 7. ___ | VERIFY Δ FLUX - IN BAND | <input type="checkbox"/> Borate, dilute, or adjust control rod height as necessary to return Δ flux to operating band. |
| NOTE: Emergency boration has increased the boric acid concentration to the RCP seals. | | |
| 8. ___ | CHECK CHARGING FLOW | |
| <input type="checkbox"/> | a) Charging flow control - IN AUTO | <input type="checkbox"/> a) Put charging flow control in AUTO. |
| <input type="checkbox"/> | b) Charging flow - STABLE | <input type="checkbox"/> b) <u>IF</u> charging flow can <u>NOT</u> be controlled in AUTO, <u>THEN</u> put charging flow in MANUAL. |

| | | |
|---------------------|---------------------------------------|----------------|
| NUMBER 1-AP-3.00 | PROCEDURE TITLE EMERGENCY BORATION | REVISION 5 |
| | | PAGE 4 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|---|---|
| 9. ___ | VERIFY CHG PUMP SUCTION - ALIGNED TO THE VCT | Align CHG pump suction to the VCT: <input type="checkbox"/> a) Open 1-CH-MOV-1115C and E. <input type="checkbox"/> b) Close 1-CH-MOV-1115B and D. |
| 10. ___ | CONSULT WITH CHEMISTRY AND SHIFT SUPERVISION AND DEENERGIZE PRZR HEATERS IAW 1-OP-RC-019, PRESSURIZER BACKUP HEATER OPERATION | |
| 11. ___ | NOTIFY THE FOLLOWING: <input type="checkbox"/> • STA <input type="checkbox"/> • Chemistry <input type="checkbox"/> • OM on call <input type="checkbox"/> • Reactor Engineer | |
| - END - | | |

| | | |
|---------------------|--|-----------------|
| NUMBER 1-AP-3.00 | ATTACHMENT TITLE PROBABLE CAUSES AND REFERENCES | ATTACHMENT 1 |
| REVISION 5 | | PAGE 1 of 1 |

I. PROBABLE CAUSES:

1. Reactivity anomaly
2. Excessive cooldown
3. Excessive dilution
4. Rapid turbine load reduction

II. REFERENCES:

1. Tech Spec Sections 3.2 and 6.4
2. UFSAR Sect 9.1.3.5.1

U.S. Nuclear Regulatory Commission
Surry Power Station

FINAL

SR12301

Simulator Job Performance Measure 015K4.08 (3.4 / 3.7)
[Alternate Path]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Adjust the PRNIs in accordance with 1-OPT-RX-001

K/A: 015K4.08 Knowledge of NIS design feature(s) and/or interlock(s) provide for the following: Automatic rod motion on demand signals.

Applicability

Estimated Time

Actual Time

RO/SRO(I)

10 Minutes

____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- Unit 1 operating at 100% power. 1-OPT-RX-001 has been completed up to Section 6.2.

Standards

- Adjust N42 and N44 IAW 1-OPT-RX-001, Section 6.2 and Attachment 1.

Initiating Cues

- Unit 1 operating at 100% power.
- The Unit 1 RO has completed 1-OPT-RX-001, Section 6.1.
- I am the Nuclear Shift Manager. You are the Unit 1 BOP. You are to perform 1-OPT-RX-001, Section 6.2.
- When you have completed the actions associated with this task, please inform me.

Terminating Cues

- Rods placed in Manual IAW AP-1.00.

Procedures

- 1-OPT-RX-001, Rev 46

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize. Place simulator in RUN.
- Adjust N41 and N43 to 100% indication using drawer gain control.
- Adjust N42 to an indication of 97% power using the drawer gain control.
- Adjust N44 to an indication of 98% power using the drawer gain control.
- Trigger 1, enter malfunction RD0201, Continuous Rod Insertion Auto.

Initiating Cues

- Unit 1 is operating at 100%.
- The Unit 1 RO has completed 1-OPT-RX-001, Section 6.1, Calculating Reactor Power, Using Primary Performance Program, and recorded CALCALC Total Thermal Power on Step 6.1.12.

Directions to the Applicant

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to perform Section 6.2, Adjusting NI Channels, of 1-OPT-RX-001.
- When you finish the actions necessary to accomplish this task, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded.
- *An additional instructor may be needed to silence alarms for the examinee.*
- **START TIME:**

| | |
|---|---|
| <p>STEP 1:</p> <p>Reviews Purpose, Initial Conditions, and Precautions and Limitations of 1-OPT-RX-001.</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews Purpose 1.1, 1.2, and 1.3. b) Reviews Initial Conditions 3.1 and 3.2. c) Reviews Precautions and Limitations 4.1 through 4.22; noting 4.3, and 4.6. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>Adjusting NI Channels. (<i>Section 6.2, Step 6.2.1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reads and Initials Step 6.2.1: Compare each NI channel percent power indication with the Calcalc Total Thermal Pwr (UFM, Venturi or Normalized Feedwater) or Calcalc 10-Min Avg Pwr (Steam Flow), whichever is the standard. (Each NI should be within + 2% and - 0% of the Calorimetric value if Reactor power is greater than or equal to 90%, OR within + 4% and - 0% of the Calorimetric value if Reactor power is less than 90%). b) Refers to Step 6.1.12 to determine Calcalc Total Thermal Power: 99.94%. c) Locates to PRNI drawers and observes N41 indicating 100%, N42 indicating 97%, N43 indicating 100%, and N44 indicating 98%. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 3:</p> <p>Adjusting NI Channels. <i>(Section 6.2, Step 6.2.2)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews Note prior to Step 6.2.2: Gain potentiometer adjustment can cause average flux deviation alarms as well as high flux rod stop alarms. This should be anticipated when adjusting gain potentiometers. (Reference 2.4.6) b) Enters N/A and Initials Step 6.2.2: IF the NI Channel is within tolerance but adjustment will better align it with the calorimetric, THEN obtain Shift Supervision concurrence AND adjust NI Channel IAW Attachment 1 to the value recorded in Step 6.1.12 or Step 6.1.13. Record initials on Attachment 1. IF no NI adjustment is made, OR NI is NOT within tolerance, THEN enter N/A. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>Adjusting NI Channels. <i>(Section 6.2, Step 6.2.3)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Initials Step 6.2.3: IF NI channel is NOT within tolerance, THEN obtain Shift Supervision concurrence AND adjust the gain potentiometer on the front panel of each NI Channel IAW Attachment 1 to the value recorded in Step 6.1.12 or Step 6.1.13. Record initials on Attachment 1. IF all NI channels are within tolerance, THEN enter N/A. b) Reports to Shift Manager (Evaluator) that N42 and N44 require adjustment, and requests authorization to make these adjustments. c) Initiates Attachment 1. <p>EVALUATOR'S NOTE:</p> <p>When asked: Initial Step 6.2.3 to authorize adjustment of PRNIs.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 5:</p> <p>Attachment 1, 1-OPT-RX-001, NI Calibration. (<i>Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews CAUTION Prior to Step 1 of Attachment 1: CAUTION: To prevent introducing non-conservative High Flux Trip and High Flux Rod Stop setpoints, setpoint changes required by the following step must be completed before any associated Gain Potentiometer adjustments are performed. b) Enters N/A and Initials Step 1 of Attachment 1: IF Reactor power is less than 90% AND the Gain Potentiometer on any NI will be decreased, THEN before adjusting NIs, have I & C lower the High Flux Trip and High Flux Rod Stop setpoints on all NIs based on current Reactor power level. Otherwise, enter N/A. (Reference 2.4.5). <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>Attachment 1 Table, N41. (<i>Attachment 1, Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Enters N/A in Item 3) block, N41 column of the Table. b) Enters N/A in item 4) block, N41 Column of the Table. c) Enters N/A in Item 5) block, N41 column of the Table. <p>EVALUATOR'S NOTE: A KEY is provided on Page 7 of 7, depicting the completed Table on Page 26 of 1-OPT-RX-001.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7:</p> <p>Attachment 1 Table, N42. (<i>Attachment 1, Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Enters 97% in Item 3) block, N42 column of the Table. b) Checks alternate indications of reactor Power (i.e., N41, N43, Turbine Impulse Pressure, Calorimetric power) prior to adjustment of N42 IAW P&L 4.6. c) Adjusts gain control on N42 Drawer to 100% indication. (Band: 99.94 – 101.94%) d) Enters Initials in item 4) block, N42 Column of the Table. e) Records 100% in Item 5) block, N42 column of the Table. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|---|-------------------------------------|
| <p>STEP 8:</p> <p>Attachment 1 Table, N43. (<i>Attachment 1, Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Enters N/A in Item 3) block, N43 column of the Table. b) Enters N/A in item 4) block, N43 Column of the Table. c) Enters N/A in Item 5) block, N43 column of the Table. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 9:</p> <p>Attachment 1 Table, N44. (<i>Attachment 1, Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Places Rod control in manual, and initials item 2) block, N44 column of the Table. a) Enters 98% in Item 3) block, N44 column of the Table. b) Checks alternate indications of reactor Power (i.e., N41, N43, Turbine Impulse Pressure, Calorimetric power) prior to adjustment of N44 IAW P&L 4.6. c) Adjusts gain control on N44 Drawer to 100% indication. (Band: 99.94 – 101.94%) d) Enters Initials in item 4) block, N44 Column of the Table. e) Records 100% in Item 5) block, N44 column of the Table. f) Allows at least one (1) minute to pass before placing rod control in automatic following gain control manipulation. g) Places Rod control in Automatic. h) Identifies Rod Inward rod motion with no Tave/Tref deviation. i) Returns rod control to manual. j) Check Rod Motion stopped. k) Reports completion of Immediate Action Steps of AP-1.00. <p>EVALUATOR'S NOTE:</p> <p>Booth Operator: When rod control placed in manual for item a) above, actuate Trigger 1.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|---|---|
| <p>STEP 10:</p> <p>NOTIFY NUCLEAR SHIFT MANAGER (EVALUATOR) STATUS OF TASK.</p> <p style="padding-left: 40px;">When report of completion of AP-1.00 Immediate Actions made, Candidate should report completion of task.</p> <p>COMMENTS:</p> <p style="text-align: center; padding-top: 20px;">** JPM COMPLETE **</p> | <p style="text-align: center;">_____ SAT</p> <p style="text-align: center;">_____ UNSAT</p> |
|---|---|

STOP TIME:

KEY

| | NI-41 | NI-42 | NI-43 | NI-44 |
|--|-------|--------------------|-------|--------------------|
| 2) Place rod control to MANUAL. Enter N/A if NI-44 will <u>NOT</u> be adjusted. | | | | Candidate Initials |
| 3) Record As Found NI power level for each channel to be adjusted. Enter N/A for channel(s) not being adjusted. | N/A | 97% | N/A | 98% |
| 4) Adjust the Gain Potentiometer on the front panel of each NI channel to the new Reactor Power value and initial appropriate block(s). Enter N/A for channel(s) not being adjusted. | N/A | Candidate Initials | N/A | Candidate Initials |
| 5) Record As Left NI power level for each channel adjusted. Enter N/A for channel(s) not adjusted. | N/A | 100% | N/A | 100% |
| 6) Allow at least one minute to pass before placing the rod control back to AUTO. Enter N/A if NI-44 was <u>NOT</u> adjusted. | | | | ----- |

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

Task

- Task is to be performed in the simulator.
- Perform Section 6.2 of 1-OPT-RX-001.

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 operating at 100%.
- The Unit 1 RO has completed 1-OPT-RX-001, Section 6.1, Calculating Reactor Power, Using Primary Performance Program, and recorded CALCALC Total Thermal Power on Step 6.1.12.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to perform Section 6.2, Adjusting NI Channels, of 1-OPT-RX-001.
- When you finish the actions necessary to accomplish this task, please inform me.

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

Initial Conditions

- Unit 1 is operating at 100%.
- The Unit 1 RO has completed 1-OPT-RX-001, Section 6.1, Calculating Reactor Power, Using Primary Performance Program, and recorded CALCALC Total Thermal Power on Step 6.1.12.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to perform Section 6.2, Adjusting NI Channels, of 1-OPT-RX-001.
- When you finish the actions necessary to accomplish this task, please inform me.



Dominion

SURRY POWER STATION

PROCEDURE NO:
1-OPT-RX-001

REVISION NO:
46

PROCEDURE TYPE:
OPERATIONS PERIODIC TEST

UNIT NO:
1

PROCEDURE TITLE:
**REACTOR POWER CALORIMETRIC
USING PCS COMPUTER PROGRAM**

**REACT
MGT**

REVISION SUMMARY:

Revised to incorporate Operations Feedback OP FB 11-0473

- Added P&L 4.22
- Moved Notes from before Step 6.1.4 to before Step 6.1.5
- Added Steps 6.1.6, 6.1.7, and 6.3.1
- Moved Note from before old Step 6.3.4.c to before Step 6.3.1
- Changed Attachment 4 Steps 1.d and 2.c.3 to refer to Step 6.3.1
- Added Attachment 5

UNIT ONE

CONTINUOUS USE

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1.0 PURPOSE

- 1.1 To provide instructions for performing the daily calibration of Nuclear Power Range Instruments against a heat balance standard IAW Technical Specification Table 4.1-1, Item 1.
- 1.2 This OPT is not required to be performed while the unit is shutdown. 1-OPT-RX-001, 1-OPT-RX-002, 1-OPT-RX-003, or 1-OPT-RX-004 must be performed daily after Reactor power exceeds 15 percent power. (Reference 2.4.2)
- 1.3 To provide instructions to ensure that Unit 1 will be operated as described below:
 - Not above $2587 \text{ MW}_{\text{th}}$ (100%) if using UFM OR Normalized Feed Flow IAW TRM
 - Not above $2546 \text{ MW}_{\text{th}}$ (98.4%) if using Feed Flow OR Steam Flow

2.0 REFERENCES

2.1 Source Documents

- 2.1.1 UFSAR, Section 7.2.1, Reactor Protection System
- 2.1.2 UFSAR, Section 7.4, Nuclear Instrumentation System

2.2 Technical Specifications Surry Power Station Unit 1 & 2

- 2.2.1 Technical Specifications, Section 1.A, Rated Power
- 2.2.2 Technical Specifications, Table 3.7-1, Item 2, Nuclear Flux Power Range
- 2.2.3 Technical Specifications, Table 4.1-1, Item 1, Nuclear Power Range

2.3 Technical References

- 2.3.1 Phase 1 Results of Surry Unit 1 Efficiency Study
- 2.3.2 Phase 2 Results of Surry Unit 1 Efficiency Study
- 2.3.3 DCP 94-007-03, Removal of Turbine Runback on Dropped Rod
- 2.3.4 Technical Report NE-1076, A Review of the Secondary Calorimetric Calculation in the P-250 CALCALC Computer Program for Surry Power Station, Units 1 and 2
- 2.3.5 Technical Report EE-0108, Basis for the Steam Flow and Feedwater Flow Equations Used in the P-250 FLOWCALC Program
- 2.3.6 Technical Report NE-1084, A Standardized Model for Calculating Power Calorimetric Uncertainty, Surry and North Anna Power Stations, Units 1 and 2
- 2.3.7 Technical Report NE-1081, Power Calorimetric Task Team, Project Overview and Results, Summary Report for Surry Power Station, Units 1 and 2
- 2.3.8 Technical Report NE-1090, Power Calorimetric Input Notebook, Surry Units 1 and 2
- 2.3.9 Safety Evaluation 96-0102
- 2.3.10 ET-NAF-97-0239, Steam Flow vs. Feed Flow, impact of Calibration Tolerances
- 2.3.11 ET NAF 2000-003, Feedwater Flow Based Calorimetric
- 2.3.12 ET S-01-0122, Power Range Detector Operability Surry Power Station, Units 1 & 2
- 2.3.13 DCP 01-008, Instrument and Controls Upgrade Project, Unit 1
- 2.3.14 ET S-03-0052, Rev. 0, Use of 10 Minute Average Reactor Power for Calibration of Power Range NI

- 2.3.15 Primary Plant (PP) Functional Specification, NABU-FS-00072-VPA
- 2.3.16 Flow Corrections (FL) Functional Specification, NABU-FS-00098-VPA
- 2.3.17 ET NAF-03-0068, Evaluation of Plant Calorimetric Programs of the Ovation Computer System, Surry Power Station, Units 1 and 2, July 2003
- 2.3.18 DCP 08-007, Feedwater Ultrasonic Flow Meter Installation - PCS / Unit 1
- 2.3.19 DC SU-08-0027, SPS Unit 1 Measurement Uncertainty Recapture Reactor Power Uprate
- 2.3.20 CR439213, Address U-2 Maximum Reactor Power Limits for Margin
- 2.3.21 CR432601, Steam flow / Feed flow mismatch of 0.65%

2.4 Commitment Documents

- 2.4.1 CTS 1080, Unreliable Computer Points
- 2.4.2 CTS 1438, Revise procedures to require performance prior to applicable mode change (Technical Specifications Change 228B)
- 2.4.3 CTS 2753, Core Uprate
- 2.4.4 CTS 3423, Calorimetric Task Team
- 2.4.5 Plant Issue S-97-2350
- 2.4.6 Plant Issue S-99-2410, NIS Power Range Gain Adjustment
- 2.4.7 PI S-98-1461, Feedwater Temperature Bias on Power Calorimetric (ET No. NAF 98-0115, Rev. 1)
- 2.4.8 PI S-2004-4753, Calorimetric Invalid While on Excess Letdown
- 2.4.9 PI S-2005-0590, Coarse Adjustment
- 2.4.10 PI S-2005-1536, PCS Point Quality

- 2.4.11 PI S-2005-1251, Power Change When Condensate Polishing Vessel Placed in Service While on Feed Flow Calorimetric.
- 2.4.12 PI S-2005-1511, Calorimetric Quality Downgrade
- 2.4.13 CR 018970, RIS 2007-021, Adherence to Licensed Power Limits

Init Verif

3.0 INITIAL CONDITIONS

cb
3.1 Check Unit 1 is operating at a steady state power level of greater than or equal to 15% power.

cb
3.2 Check Excess Letdown is not in service.

4.0 PRECAUTIONS AND LIMITATIONS

cb
4.1 Shift Supervision shall be notified immediately if any acceptance criteria is not met or if any malfunction or abnormal condition occurs.

cb
4.2 Unit power shall be reduced immediately if the shift average power exceeds 100.00%, using UFM or Normalized Feed Flow, or 98.4% using Steam Flow or Feed Flow, as determined by the Primary Plant Performance Program.

cb
4.3 Changes to the NI channel indications will be made by a Licensed Reactor Operator under the supervision of a Senior Reactor Operator.

cb
4.4 The shift average power shall be recorded no earlier than 30 minutes (for example, between 1830-1900 \ 0630-0700) before the end of each calorimetric period. The defined twelve-hour calorimetric periods are 0700-1900 and 1900-0700.

cb
4.5 If computer indicates the calculation has POOR or BAD Quality or has any reason code, (for example, L, H, or S) reactor power must be calculated by using another method. (This does NOT include a code of F, Fair)

cb
4.6 If an adjustment of the power range channels is required, alternate indications of power must be compared before the adjustment. If the difference is greater than 2%, Shift Supervision must be notified.

cb
4.7 A wait of 5 minutes is required at a stable power level prior to recording Calcalc Total Thermal Pwr (U9104). A wait of 10 minutes is required at a stable power level prior to recording Calcalc 10 Min Avg Pwr (U9105).

cf

4.8 If both compservers are rebooted, a 30 minute wait period is required prior to using any calorimetric values.

cf

4.9 Operations shall not intentionally allow core thermal power as indicated by PCS point U9105 (Calcalc 10 Minute Avg Power) to indicate greater than 100.00%, using UFM or Normalized Feed Flow, or 98.4% using Steam Flow or Feed Flow. This includes items like dilutions and xenon transients. If U9105 is observed to be above the maximum allowed power, PROMPT operator action must be taken to reduce power less than the maximum allowed power. Statistical fluctuations in instantaneous power indications as indicated by PCS point U9104 may be allowed to exceed the maximum allowed power for brief periods as long as U9105 is not allowed to remain above the maximum allowed power. (Reference 2.4.13)

cf

4.10 When using Steam Flow as the basis for the calorimetric, Calcalc Total Thermal Pwr (U9104) does not have a filtered flow determination in the calculation. Its numerical value will be equal to Instantaneous Reactor Power. Calcalc 10 Min Avg Pwr (U9105) will be used when using Steam Flow as the basis for the calorimetric.

cf

4.11 When using Steam Flow or Feed Flow as the basis for the Calorimetric, during the last 30 minutes of any shift the Steam Flow and Feedwater Flow Calorimetrics should agree within 0.57%. A deviation larger than this requires limiting Operation to the more conservative Reactor Power indication. Prior to the last 30 minutes of any shift, deviations of $\geq 0.57\%$ are allowed. (Reference 2.3.10)

cf

4.12 The initials identification block in Subsection 7.3 must be completed before the procedure is closed out.

cf

4.13 The Steam Flow or Feed Flow calorimetric shall NOT be used when Reactor Power is greater than 98.4%.

ef

4.14 If using Feedwater Venturi Flow as the basis for the calorimetric, and evolutions occur during the shift that would invalidate only the Feedwater Venturi Flow calorimetric (e.g. opening the Feed Reg Bypass), the calorimetric basis may be changed before the evolution occurs and the calorimetric will remain valid. This is accomplished using the PP display and selecting another calorimetric basis. Once the evolution is complete, the Feedwater Venturi Flow calorimetric may be reselected. Reactor Engineering should be contacted prior to swapping to Steam Flow, UFM Flow, or Normalized Feedwater Flow.

d

4.15 Calorimetric indications are invalid while operating on Excess Letdown. Procedure 1-OPT-RX-007 should be initiated if Excess Letdown has been in service during this calorimetric shift.

ef

4.16 The performance of the PTs or calibrations listed on Attachment 2 make the calorimetric unreliable. However, due to the way in which the PCS propagates point quality, the calorimetric will not necessarily go to POOR or BAD quality. **(Reference 2.4.10)**

cb

4.17 Reactor power as indicated by calorimetric will fluctuate when a condensate polishing vessel is placed in service and feed flow is selected as the basis for the calorimetric. This does not cause the calorimetric to be invalid. **(Reference 2.4.11)**

cd

4.18 Due to the way that the Time Average (TA) program propagates quality, short duration changes in quality may not propagate to longer period time average calorimetric PCS points. For example, when on Feed Flow, a momentary blip in Feedwater Flow quality would propagate to the instantaneous and 10-minute average, but most likely not to the hourly average. **(Reference 2.4.12)**

cf

4.19 PP Data Screen PP0202, Comparison of Power Calculation - Pct, can be used to determine limiting Reactor Power determination.

ef

4.20 TRM 3.3.5 shall be reviewed for required actions for non-functionality of the UFM Calorimetric, Normalized Feedwater Venturi, or PCS Calorimetric. Power reduction to less than 98.4% may be required.

ef

4.21 The Normalized Feedwater Flow CALCALC program can NOT be used during the following conditions:

- Less than 98.4% Reactor Power
- Greater than 48 hours after UFM becomes non-functional

ef

4.22 When changing the basis for the calorimetric, documentation should be written in Subsection 7.3, and Precautions and Limitations reviewed for the basis in use.

5.0 SPECIAL TOOLS AND EQUIPMENT

None

Init Verif

6.0 INSTRUCTIONS

6.1 Calculating Reactor Power, Using Primary Plant Performance Program

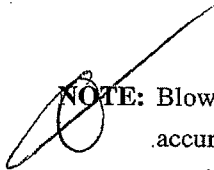
~~NOTE:~~ The Primary Plant Performance program uses the corrected Steam Generator Feedwater Flows or Steam Flows as calculated by the Flow Corrections (FL) program to calculate reactor power according to the following equation.

$$\begin{aligned} \text{Reactor Power} = & (h_{\text{steam}} - h_{\text{feed}}) \times \text{Flow}_{\text{feed or steam}} - \text{Added Pump Heat} \\ & - \text{Added Pressurizer Heat} \\ & + (\text{Steam}) \text{ or } - (\text{Feed}) \text{ Blowdown Heat Loss} \\ & + \text{Letdown Heat Loss} - \text{Added Charging Heat} \\ & + \text{Insulation Losses} - \text{Seal Water Injection Heat} \end{aligned}$$

Where:

- ~~1~~ Pump Heat equals 40.96×10^6 BTU/hr.
- ~~2~~ Blowdown Flow automatically updates from the PCS (preferred) or is recorded from Control Room indications.
- ~~3~~ Insulation losses equal $1.5 \text{ MW}_{\text{th}}$.

- 6
- MAA
- 6.1.1 Review Attachment 2 to check that none of the PTs or Cal procedures that affect the selected Calcalc basis are in progress.
 - 6.1.2 IF any of the listed PTs or Cal procedures that affect the selected Calcalc basis are in progress AND Reactor Power is greater than or equal to 95%, THEN initiate 1-OPT-RX-007, Shift Average Power Calculation. Otherwise, enter N/A.



NOTE: Blowdown flow must be maintained as constant as possible. The most accurate data will be obtained by isolating blowdown, but isolation is not required.

6.1.3 IF Blowdown is in Manual on the calorimetric program for any Blowdown line (PP0200 screen), THEN perform the following for the Blowdown lines affected. Otherwise, enter N/A.



a. Check current blowdown flows correspond to entered constant values.

b. IF NOT, THEN from the PCS operator's console, update the affected Blowdown flow constants on the PP Data Entry Screen (PP0200) with the current blowdown flows. Enter N/A if NOT required.

- FPP0001K SG A Blowdown Flow, from FI-BD-103A or FI-BD-104A
- FPP0002K SG B Blowdown Flow, from FI-BD-103B or FI-BD-104B
- FPP0003K SG C Blowdown Flow, from FI-BD-103C or FI-BD-104C

6.1.4 Perform Attachment 4 to confirm that the following programs are operational: (✓)

Primary Plant Performance Program (PP)

Flow Corrections Program (FL)

- NOTE:** If a different calorimetric basis is selected, Reactor Engineering should be contacted, and change documented in Subsection 7.3. (P&L 4.22)
- Normalized Feedwater flow shall not be used as a basis when power is less than 98.4%, OR greater than 48 hours after UFM becomes non-functional.

cl
6.1.5 Check or select the basis for CALCALC using the PP0200 screen. (✓)

UFM Flow (K7030 = 3)

Normalized Feedwater Flow (K7030 = 2) (Greater than 98.4%)

Steam Flow (K7030 = 1)

Feedwater Flow (K7030 = 0)

6.1.6 IF basis for CALCALC was changed in Step 6.1.5, THEN do the following:

- N/A
↓
- Notify Reactor Engineering.
 - Document change in Subsection 7.3, include the following:
 - Basis now in use
 - Time selected
 - Reason for changing

cl
6.1.7 IF UFM Flow is the basis for CALCALC, THEN check that the Normalization Factors are in Auto (highlighted RED) using the PP0203, PP0204, and PP0205 screens. IF not in Auto, AND Reactor Power is greater than 70%, THEN place in Auto by performing Attachment 5.

~~NOTE~~: Feedwater temperature can be obtained from PCS Point Review Group 118.

d
6.1.8 From the PCS Operator's console, check Feedwater temperatures. (✓)
(Reference 2.4.7)

/ T0418A SG A Feedwater Temperature

/ T0438A SG B Feedwater Temperature

— T0458A SG C Feedwater Temperature

N/A
6.1.9 IF Feedwater temperature for any loop is greater than or equal to 443°F,
THEN notify Reactor Engineering. Otherwise, enter N/A. (Reference 2.4.7)

~~NOTE~~: The Feedwater Flow calorimetric (K7030 = 0) will be invalid if feed flow transmitters are bypassed.

N/A
6.1.10 IF the calorimetric is based on feedwater venturi flow AND the Feed Reg Bypass HCVs are NOT closed AND feedwater flow is NOT aligned through the feed flow transmitters, THEN close the Feed Reg Bypass HCVs OR align bypass flow to the feed flow transmitters to obtain Calcalc Total Thermal Power, initiate 1-OPT-RX-007, and enter N/A for Steps 6.3.2 through 6.3.6. Otherwise, enter N/A for this step.

N/A
6.1.11 IF Step 6.1.10 was performed, THEN wait 5 minutes before performing Step 6.1.12. Otherwise, enter N/A.

6
6.1.12 IF using Feed Flow (UFM, Venturi or Normalized) as basis for calorimetric, THEN record the Calcalc Total Thermal Pwr (U9104). Otherwise, enter N/A.

Calcalc Total Thermal Pwr (U9104) 99.94 %

~~NOTE~~: Turbine load must remain stable for 10 minutes prior to recording the
Calcalc 10 Minute Avg Pwr.

N/A

6.1.13 IF using Steam Flow as basis for calorimetric, THEN record the Calcalc 10
Minute Avg Pwr (U9105). Otherwise, enter N/A.

Calcalc 10 Minute Avg Pwr (U9105) _____ %

N/A

6.1.14 IF the Feed Reg Bypass HCVs were closed in Step 6.1.10, THEN return the
Feed Reg Bypass HCVs to desired position. Otherwise, enter N/A.

~~NOTE~~: In order to minimize power excursions exceeding Maximum Allowed
Power, Reactor Power should be maintained at approximately 99.9%, when
using UFM or Normalized Feed Flow. (Reference 2.3.20)

✓

6.1.15 IF operating near Maximum Allowed Power using UFM or Normalized Feed
Flow as the calorimetric basis, THEN maintain Reactor Power at
approximately 99.9%.

6.2 Adjusting NI Channels

_____ 6.2.1 Compare each NI channel percent power indication with the Calcalc Total Thermal Pwr (UFM, Venturi or Normalized Feedwater) or Calcalc 10-Min Avg Pwr (Steam Flow), whichever is the standard. (Each NI should be within + 2% and - 0% of the Calorimetric value if Reactor power is greater than or equal to 90%, OR within + 4% and - 0% of the Calorimetric value if Reactor power is less than 90%.)

NOTE: Gain potentiometer adjustment can cause average flux deviation alarms as well as high flux rod stop alarms. This should be anticipated when adjusting gain potentiometers. (**Reference 2.4.6**)

_____ SS 6.2.2 IF the NI Channel is within tolerance but adjustment will better align it with the calorimetric, THEN obtain Shift Supervision concurrence AND adjust NI Channel IAW Attachment 1 to the value recorded in Step 6.1.12 or Step 6.1.13. Record initials on Attachment 1. IF no NI adjustment is made, OR NI is NOT within tolerance, THEN enter N/A.

_____ SS 6.2.3 IF NI channel is NOT within tolerance, THEN obtain Shift Supervision concurrence AND adjust the gain potentiometer on the front panel of each NI Channel IAW Attachment 1 to the value recorded in Step 6.1.12 or Step 6.1.13. Record initials on Attachment 1. IF all NI channels are within tolerance, THEN enter N/A.

6.2.4 IF the front panel gain adjustment can NOT bring power of any channel within the required tolerance in Step 6.2.1 OR coarse level adjustment is desired, THEN perform all of the following. Otherwise, enter N/A.

- _____ a. IF NI channel(s) is out of tolerance, THEN declare channel(s) inoperable. Otherwise, enter N/A.
- _____ b. Obtain concurrence from the Reactor Engineer to adjust the Power Range NI channel using the coarse level adjustment potentiometer.
- _____ c. IF channel N-43 coarse adjust is to be made, AND N-43 is the selected channel for the N-16 Radiation Monitor, THEN deselect N-43 using 1-MS-43-N16. Otherwise, enter N/A.
- _____ d. IF channel N-44 coarse adjust is to be made, AND N-44 is the selected channel for the N-16 Radiation Monitor, THEN deselect N-44 using 1-MS-43-N16. Otherwise, enter N/A.
- _____ e. IF channel N-44 coarse adjust is to be made, THEN place ROD CONT MOD SEL in Manual. Otherwise, enter N/A.
- _____ f. Have a qualified Instrument Technician adjust the coarse level adjust potentiometer, R312, and the potentiometer on the front panel, until the front panel potentiometer is near 7.0 on the dial and the Power Range NI channels are within + 2% and - 0% of the Calorimetric value if Reactor power is greater than or equal to 90%, OR within + 4% and - 0% of the Calorimetric value if Reactor power is less than 90%.
- _____ g. Note in the comment section any Power Range NI channel adjusted using the coarse level adjustment potentiometer.
- _____ h. IF the out-of-tolerance NI channel can NOT be properly adjusted, THEN comply with Tech Spec Table 3.7-1, Item 2.

- _____ i. IF N-44 coarse adjust was performed, THEN wait a minimum of one minute AND reposition ROD CONT MOD SEL as directed by Shift Supervision.

- _____ j. Reposition 1-MS-43-N16 as directed by Shift Supervision.

- _____ k. For each Power Range with a DROPPED ROD window LIT due to coarse adjust, perform the following. Otherwise, enter N/A.
 - _____ 1. Place the Power Range Test Switch in RESET.

 - _____ 2. Check DROPPED ROD window is NOT LIT.

 - _____ 3. Return the Power Range Test Switch to NORMAL.

 - _____ 4. Check annunciator 1G-H1, NIS DROPPED ROD FLUX DECREASE >5% PER 2 SEC, is NOT LIT.

- _____ 6.2.5 IF any NI channel had been declared inoperable AND is now within tolerance, THEN declare the channel operable. Otherwise, enter N/A.

6.3 Verification of Shift Average Power

NOTE: Changing the basis for the calorimetric could render the NIs non-conservative, and the indication should be adjusted as required.

6.3.1 IF the basis for the calorimetric changes or needs to be changed at any time during the calorimetric period, THEN perform the following. Otherwise, enter N/A for this step.

- _____
- a. Review Precautions and Limitations for applicability for the new calorimetric basis.
- b. Perform Attachment 4 to confirm that the programs are operational for the new basis.

- _____
- _____
- Primary Plant Performance Program (PP)
 - Flow Corrections program (FL)

c. Select the basis for CALCALC using the PP0200 screen. (✓)

- _____ UFM Flow (K7030 = 3)
- _____ Normalized Feedwater Flow (K7030 = 2) (Greater than 98.4%)
- _____ Steam Flow (K7030 = 1)
- _____ Feedwater Flow (K7030 = 0)

d. IF UFM Flow is selected, AND Reactor Power is greater than 70%, THEN place the Normalization Factors in Auto by performing Attachment 5.

e. Document change in Subsection 7.3, include the following.

- Basis now in use
- Time selected
- Reason for changing

_____ 6.3.2 IF any of the following conditions occur or are initiated during the calorimetric period, AND Reactor Power is greater than or equal to 95%, THEN initiate 1-OPT-RX-007 for Shift Average Power Determination, AND enter N/A for Steps 6.3.3 through 6.3.6. Otherwise, enter N/A for this step.

_____ Any of the PTs or Calibration procedures listed in Attachment 2 that affect the selected CALCALC basis

_____ The calorimetric is POOR or BAD

_____ The PP program is out of service

_____ Excess Letdown is or has been in service

_____ 6.3.3 IF Calcalt 10 Min Avg Pwr (U9105) exceeds the maximum allowed power (P&L 4.9) during the Calorimetric period, THEN initiate Attachment 3. Otherwise, enter N/A.

_____ 6.3.4 Record the Calcalt Running Shift Avg Pwr.

Calcalt Running Shift Avg Pwr (U9103) _____ %

NOTE: The difference between the Steam Flow and Feedwater Flow Calorimetrics should normally be less than 0.57% power. This limit only applies during the last 30 minutes of any shift if Steam Flow or Feed Flow is being used as the basis for the Calorimetric.

_____ 6.3.5 IF Calcalt Running Shift Avg Power (U9103) is greater than 95%, THEN do the following. Otherwise, enter N/A.

_____ a. Check that UFM is the basis for CALCALC (K7030 = 3), if available.

_____ b. Compare the Steam Flow and Feedwater Flow Calorimetric results.

c. IF Steam Flow or Feed Flow is the basis for the Calorimetric AND Steam/Feed Shift Power Diff (U1220) is $\geq 0.57\%$, THEN do the following. Otherwise, enter N/A.

1. Notify Reactor Engineering.

2. Submit a Condition Report.

6.3.6 IF the Shift Average Reactor Power as recorded in Step 6.3.4 is greater than the maximum allowed power (P&L 4.9), THEN reduce the Unit power so that the Shift Average Reactor Power is at or less than the maximum allowed power. IF the Shift Average Reactor Power is at or less than the maximum allowed power, THEN enter N/A for this step.

7.0 FOLLOW-ON

7.1 Acceptance Criteria

_____ 7.1.1 Evaluate the test results by reviewing the Acceptance Criteria for the components tested. (✓)

- ___ All power range channels are found to be or are adjusted to be within +2, -0% ($\geq 90\%$ power) OR +4, -0% ($< 90\%$ power) of the Calcalc Total Thermal Pwr or Calcalc 10 Min Avg Pwr power level determined by the Primary Plant Performance program. Any adjustment shall be noted below.

N-41 required adjustment _____ Yes _____ No

N-42 required adjustment _____ Yes _____ No

N-43 required adjustment _____ Yes _____ No

N-44 required adjustment _____ Yes _____ No

- ___ Shift Average Reactor Power is at or less than the maximum allowed power (P&L 4.9), as recorded in Step 6.3.4. Enter N/A if Steps 6.3.3 through 6.3.6 were not performed.

_____ 7.1.2 Document the test results. (✓)

___ Satisfactory _____ Unsatisfactory

7.2 **Follow-On Tasks**

7.2.1 IF the test was unsatisfactory, THEN perform all of the following.
Otherwise, enter N/A.

a. Document the reason for the unsatisfactory test in Subsection 7.3,
Operator Comments.

b. Notify Shift Supervision and record the name.

Shift Supervision: _____

c. Declare equipment inoperable.

d. Notify Reactor Engineering and record the name of the person notified.

Reactor Engineer: _____

e. Initiate a Condition Report and record the number.

CR No. _____

7.2.2 IF a partial operability test was performed, THEN document the reason for
the partial test in Subsection 7.3, Operator Comments. Otherwise, enter N/A.

7.3 Notification, Documentation, and Procedure Closeout

7.3.1 Notify Shift Supervision that the test is complete.

The Initials in this procedure will be identified by the Printed Name.

| Initials | Printed Name |
|----------|--------------|
| CF | C. IRWIN |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Operator Comments: _____

Completed by: _____ Date: _____

7.4 Reviewed

Shift Supervision Comments: _____

Reviewed by: _____ Date: _____
Shift Supervision

Forward original procedure to Station Records

(Page 1 of 1)
Attachment 1
NI CALIBRATION

CAUTION

To prevent introducing non-conservative High Flux Trip and High Flux Rod Stop setpoints, setpoint changes required by the following step must be completed before any associated Gain Potentiometer adjustments are performed.

1. IF Reactor power is less than 90% AND the Gain Potentiometer on any NI will be decreased, THEN before adjusting NIs, have I & C lower the High Flux Trip and High Flux Rod Stop setpoints on all NIs based on current Reactor power level. Otherwise, enter N/A. (**Reference 2.4.5**)

| <u>Reactor Power Level</u> | <u>High Power Trip/Rod Stop Setpoint</u> |
|----------------------------|--|
| ≥ 55% < 90% | ≤ 100% / ≤ 96% |
| ≥ 35% < 55% | ≤ 85% / ≤ 81% |
| ≥ 25% < 35% | ≤ 65% / ≤ 61% |
| < 25% | ≤ 40% / ≤ 36% |

| | NI-41 | NI-42 | NI-43 | NI-44 |
|--|-------|-------|-------|-------|
| 2) Place rod control to MANUAL. Enter N/A if NI-44 will <u>NOT</u> be adjusted. | | | | |
| 3) Record As Found NI power level for each channel to be adjusted. Enter N/A for channel(s) not being adjusted. | | | | |
| 4) Adjust the Gain Potentiometer on the front panel of each NI channel to the new Reactor Power value and initial appropriate block(s). Enter N/A for channel(s) not being adjusted. | | | | |
| 5) Record As Left NI power level for each channel adjusted. Enter N/A for channel(s) not adjusted. | | | | |
| 6) Allow at least one minute to pass before placing the rod control back to AUTO. Enter N/A if NI-44 was <u>NOT</u> adjusted. | | | | |

(Page 1 of 3)

Attachment 2

COMPUTER POINTS USED BY PRIMARY PLANT PERFORMANCE AND FLOW CORRECTIONS

Primary Plant Performance Constant Value Inputs

| <u>Computer Point IDs</u> | <u>Description</u> | <u>Value/Units</u> | <u>PT/CAL</u> |
|---------------------------|---|----------------------|----------------------------|
| K0314 | Insulation Heat Losses | 1.5 MW _{th} | None |
| FPP0001K | SG A Blowdown Flow (Manual Input) | gpm | 1-CAL-224 and 1-CAL-227 |
| FPP0002K | SG B Blowdown Flow (Manual Input) | gpm | 1-CAL-225 and 1-CAL-228 |
| FPP0003K | SG C Blowdown Flow (Manual Input) | gpm | 1-CAL-226 and 1-CAL-229 |
| K2051 | psig to psia conversion constant | 14.7 psi | None |
| K7029 | Alarm Inhibit | =1 | None |
| | Print Alarm | ≠1 | None |
| K7030 | Primary Plant Performance Based on UFM | =3 (preferred) | None |
| | Primary Plant Performance Based on Normalized Feed Flow | =2 | None |
| | Primary Plant Performance Based on Steam Flow | =1 | None |
| | Primary Plant Performance Based on Feed Flow | =0 | None |

Primary Plant Performance and Flow Corrections Analog Inputs

| <u>Computer Point IDs</u> | <u>Description</u> | <u>Value/Units</u> | <u>PT/CAL</u> |
|---------------------------|---|--------------------|-----------------------|
| P0403A | SG A Feedwater Inlet Pressure (P-100A) | psig | 1-IPM-FW-P-100A |
| P0423A | SG B Feedwater Inlet Pressure (P-100B) | psig | 1-IPM-FW-P-100B |
| P0443A | SG C Feedwater Inlet Pressure (P-100C) | psig | 1-IPM-FW-P-100C |
| Q0400A | Pressurizer Heater Power | KW | None |
| P0480A | Pressurizer Pressure Ch 1(P-455) | psig | 1-IPT-FT(CC)-RC-P-455 |
| T0418A | SG A Feed Water Temperature (RTD-111A) | °F | 0-IPM-FW-RTD-001 |
| T0438A | SG B Feed Water Temperature (RTD-111B) | °F | 0-IPM-FW-RTD-001 |
| T0458A | SG C Feed Water Temperature (RTD-111C) | °F | 0-IPM-FW-RTD-001 |
| F0128A | Charging Header Flow (F-122) | gpm | 1-PT-2.13 (F-1-122) |
| P0142A | Charging Pump Disch Header Pressure (P-121) | psig | 1-CAL-286 |
| T0126A | Regen Hx Charging Outlet Temp (T-123) | °F | 1-CAL-238 |
| F0134A | NRHX Letdown Flow (F-150) | gpm | 1-CAL-519 |
| P0135A | Low Pressure Letdown Line Press (P-1-145) | psig | 1-CAL-324 |
| T0406A | RC Loop A Cold Leg Temp (T-410) | °F | 1-IPT-RC-T-410 |
| T0140A | Volume Control Tank Outlet Temp (T-116) | °F | 1-CAL-237 |
| T0145A | NRHX Letdown Line Outlet Temp (T-144) | °F | 1-CAL-574 |

(Page 2 of 3)

Attachment 2

**COMPUTER POINTS USED BY PRIMARY PLANT PERFORMANCE AND FLOW
CORRECTIONS**

| <u>Computer Point IDs</u> | <u>Description</u> | <u>Value/Units</u> | <u>PT/CAL</u> |
|---------------------------|-----------------------------------|--------------------|----------------------------|
| F2551A | SG A Blowdown Flow (Analog Input) | gpm | 1-CAL-224 and 1-CAL-227 |
| F2552A | SG B Blowdown Flow (Analog Input) | gpm | 1-CAL-225 and 1-CAL-228 |
| F2553A | SG C Blowdown Flow (Analog Input) | gpm | 1-CAL-226 and 1-CAL-229 |

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Attachment 2

**COMPUTER POINTS USED BY PRIMARY PLANT PERFORMANCE AND FLOW
CORRECTIONS**

| <u>Computer Point ID</u> | <u>Description</u> | <u>Value/Units</u> | <u>PT/CAL</u> |
|--------------------------|---------------------------------|--------------------|-----------------------|
| F0405Y | SG A Steam Flow Ch 3 (F474) | volts | 1-IPT-FT(CC)-MS-F-474 |
| F0406Y | SG A Steam Flow Ch 4 (F475) | volts | 1-IPT-FT(CC)-MS-F-475 |
| F0425Y | SG B Steam Flow Ch 3 (F484) | volts | 1-IPT-FT(CC)-MS-F-484 |
| F0426Y | SG B Steam Flow Ch 4 (F485) | volts | 1-IPT-FT(CC)-MS-F-485 |
| F0445Y | SG C Steam Flow Ch 3 (F494) | volts | 1-IPT-FT(CC)-MS-F-494 |
| F0446Y | SG C Steam Flow Ch 4 (F495) | volts | 1-IPT-FT(CC)-MS-F-495 |
| | | | |
| F0403Y | Feedwater Flow Ch 4 (F476) | volts | 1-IPT-FT(CC)-FW-F-476 |
| F0404Y | Feedwater Flow Ch 3 (F477) | volts | 1-IPT-FT(CC)-FW-F-477 |
| F0423Y | Feedwater Flow Ch 4 (F486) | volts | 1-IPT-FT(CC)-FW-F-486 |
| F0424Y | Feedwater Flow Ch 3 (F487) | volts | 1-IPT-FT(CC)-FW-F-487 |
| F0443Y | Feedwater Flow Ch 4 (F496) | volts | 1-IPT-FT(CC)-FW-F-496 |
| F0444Y | Feedwater Flow Ch 3 (F497) | volts | 1-IPT-FT(CC)-FW-F-497 |
| | | | |
| P0400A | SG A Steam Pressure Ch 2 (P474) | psig | 1-IPT-FT(CC)-MS-P-474 |
| P0401A | SG A Steam Pressure Ch 3 (P475) | psig | 1-IPT-FT(CC)-MS-P-475 |
| P0402A | SG A Steam Pressure Ch 4 (P476) | psig | 1-IPT-FT(CC)-MS-P-476 |
| P0420A | SG B Steam Pressure Ch 2 (P484) | psig | 1-IPT-FT(CC)-MS-P-484 |
| P0421A | SG B Steam Pressure Ch 3 (P485) | psig | 1-IPT-FT(CC)-MS-P-485 |
| P0422A | SG B Steam Pressure Ch 4 (P486) | psig | 1-IPT-FT(CC)-MS-P-486 |
| P0440A | SG C Steam Pressure Ch 2 (P494) | psig | 1-IPT-FT(CC)-MS-P-494 |
| P0441A | SG C Steam Pressure Ch 3 (P495) | psig | 1-IPT-FT(CC)-MS-P-495 |
| P0442A | SG C Steam Pressure Ch 4 (P496) | psig | 1-IPT-FT(CC)-MS-P-496 |

(Page 1 of 3)

Attachment 3

PROMPT ACTIONS TO REDUCE REACTOR POWER

MITIGATING INCREASES IN REACTOR POWER CAUSED BY SECONDARY TRANSIENTS

NOTE: An increase in Reactor power due to a Main Steam malfunction is addressed by 1-AP-38.00, Main Steam System Control Malfunction. An increase in Reactor power due to instrumentation or controller malfunction is addressed by 0-AP-53.00, Loss of Vital Instrumentation / Controls.

1. IF Turbine control is in Operator Auto, THEN mitigate increases in Reactor Power caused by secondary transients by decreasing steam demand or Turbine load as follows:

- _____ a. Reduce the Turbine Setter by an appropriate amount.
- _____ b. Place the Load Rate Selector thumbwheel to 1% / min.
- _____ c. Depress the GO pushbutton.

(Page 2 of 3)

Attachment 3

PROMPT ACTIONS TO REDUCE REACTOR POWER

CAUTION

The GV ∇ and GV Δ pushbuttons move the governor valves at a rate of 33% full travel per minute (3 minutes for full travel).

Using the GV FAST in conjunction with the GV ∇ and GV Δ pushbuttons move the governor valves at a rate of 133% full travel per minute (45 seconds for full travel).

Shift Supervision shall check that unexplained or abnormal reactivity changes or neutron flux distributions are investigated immediately and if necessary direct a unit shutdown or trip to terminate the problem. Shift Supervision shall notify the STA and the Reactor Engineer to investigate the problem.

Control of reactivity and those parameters that affect reactivity is essential to the safe operation of the plant. In order to maintain control of reactivity, conservative decision making shall be practiced at all times.

GV buttons may stick when operated. Contingencies should be in place to address this possibility.

Turbine Manual provides a step change in power. The push button should not be depressed any longer than one second.

NOTE: The Reference and Setter indications correlate to a direct voltage output and can be used for trending.

- _____
2. IF Turbine control is in Turbine Manual, THEN mitigate increases in Reactor Power caused by secondary transients by decreasing steam demand or Turbine load using the GV ∇ pushbutton to adjust turbine load as necessary.

NOTE: The CALCALC 10 Minute Average Power will lag actual Reactor Power following a transient, and may continue to increase even after core thermal power has been reduced to less than the maximum allowed power (P&L 4.9).

- _____
3. Check Reactor Power decreases to less than the maximum allowed power (P&L 4.9).
 - Power Range NI power
 - _____
 - Core ΔT power
 - _____
 - CALCALC Instantaneous power (if reliable)

(Page 3 of 3)

Attachment 3

PROMPT ACTIONS TO REDUCE REACTOR POWER

MITIGATING INCREASES IN REACTOR POWER CAUSED BY PRIMARY TRANSIENTS

1. Mitigate increases in Reactor Power caused by primary transients as follows:

- a. Place the Rod Control Selector switch in Manual.
- b. Insert control rods.

NOTE: The CALCALC 10 Minute Average Power will lag actual Reactor Power following a transient, and may continue to increase even after core thermal power has been reduced to less than the maximum allowed power (P&L 4.9).

2. Check Reactor Power decreases to less than the maximum allowed power (P&L 4.9).

- Power Range NI power
- Core ΔT power
- CALCALC Instantaneous power (if reliable)

3. IF necessary, THEN initiate a normal boration to control $\Delta Flux$.

4. WHEN Tave and Tref are within 1°F, THEN place control rods in Auto.

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Attachment 4

CALORIMETRIC PROGRAM OPERABILITY

~~NOTE~~: TRM 3.3.5 shall be reviewed for required actions for non-functionality of the UFM Calorimetric, Normalized Feedwater Venturi, or PCS Calorimetric. Power reduction to less than 98.4% may be required.

1. To check the Primary Plant Performance Program (PP) operability perform the following:

cb

a. Open Programs - Operator Display / Engineering Display

cb

b. Open PP Output Summary - (Operator Display - Primary Plant Poke)

cb

c. Check short timed values for selected basis, Steam Flow (1-OPT-RX-002 box) or Feedflow (1-OPT-RX-003 box), are updating and either good or fair quality.

cb N/A

d. IF selected basis NOT updating and either good or fair quality, THEN contact Reactor Engineering (if available), and then select another calorimetric basis IAW Step 6.3.1. Otherwise, enter N/A.

2. To check the Flow Corrections Program (FL) operability perform the following:

cb

a. Open Programs - Operator Display / Engineering Display

cb

b. Open FL Output Summary (Operator Display - Flow Corr Poke)

cb

c. Check FL Program Status is OK. IF NOT OK, THEN perform the following to check status of different bases.

cb

1. Open FL0101 - Output Summary (FL Summary Poke)

cb

2. Compare displayed values to the FL0101 Table below and check selected calorimetric values are updating and either good or fair quality.

cb

3. IF selected basis NOT operable, THEN contact Reactor Engineering (if available), and then select another calorimetric basis IAW Step 6.3.1.

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Attachment 4

CALORIMETRIC PROGRAM OPERABILITY

| FL0101 Table | | | | |
|-------------------------|----------------------|---------------|-------------------|------------|
| Flow Correction List | Normalized Feedwater | UFM Feedwater | Venturi Feedwater | Steam Flow |
| Charging Line Flow Corr | X | X | X | X |
| Letdown Line Flow Corr | X | X | X | X |
| SG A-1 FF CORR | | X | X | |
| SG A-2 FF CORR | | X | X | |
| SG B-1 FF CORR | | X | X | |
| SG B-2 FF CORR | | X | X | |
| SG C-1 FF CORR | | X | X | |
| SG C-2 FF CORR | | X | X | |
| SG A-1 SF CORR | | | | X |
| SG A-2 SF CORR | | | | X |
| SG B-1 SF CORR | | | | X |
| SG B-2 SF CORR | | | | X |
| SG C-1 SF CORR | | | | X |
| SG C-2 SF CORR | | | | X |
| SG A-1 FF CORR NORM | X | | | |
| SG A-2 FF CORR NORM | X | | | |
| SG B-1 FF CORR NORM | X | | | |
| SG B-2 FF CORR NORM | X | | | |
| SG C-1 FF CORR NORM | X | | | |
| SG C-2 FF CORR NORM | X | | | |

(Page 1 of 1)

Attachment 5

PLACING NORMALIZATION FACTORS IN AUTO

- NOTE:**
- When the UFM is declared non-functional, the Normalized Feedwater Flow Calorimetric is valid for only 48 hours. Following restoration of the UFM, the Normalized Feedwater Flow Calorimetric is valid for use when greater than or equal to 98.4% power when the Normalization factors are placed in AUTO, AND the UFM has been functional for one hour or greater.
 - When AUTO is selected, there is a 5 second time delay before the AUTO button turns red. Clicking APPLY is not required.

1. IF Reactor power is greater than 70%, THEN place Normalization Factors in AUTO IAW the following:

- a. Select the PP0200 Screen.

- b. Reset the Normalization factors from MANUAL to AUTO by selecting AUTO for the PCS points on the following screens:

- _____
- PP0203 - FW BIAS (6 PCS points)
 - PP0204 - FW NORM (6 PCS points)
 - PP0205 - STM NORM (6 PCS points)
- _____

U.S. Nuclear Regulatory Commission
 Surry Power Station

FINAL

Simulator Job Performance Measure 028A4.03 (3.1 / 3.3)

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Place the Containment Hydrogen Analyzer in Service

K/A: 028A4.03 Ability to predict and/or monitor changes in parameter (to prevent exceeding design limits) associated with operating the HRPS controls including: Location and operation of hydrogen sampling and analysis of containment atmosphere, including alarms and indications.

Applicability

Estimated Time

Actual Time

RO/SRO(I)

5 Minutes

_____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA has occurred from 100% power.
- A determination of Containment Hydrogen concentration is required.

Standards

- 1-E-1, Loss of Reactor or Secondary Coolant (Rev 37).

Initiating Cues

- 1-E-1, Loss of Reactor or Secondary Coolant, Step 26a
- Shift Manager direction.

Terminating Cues

- 1-E-1, Attachment 3, Step I.2.h.

Procedures

- 1-E-1, Loss of Reactor or Secondary Coolant, Attachment 3, Rev 37

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize. Place simulator in RUN.
- Initiate LBLOCA malfunction. Perform E-0 and E-1 Actions up to Step 26.
- Allow CTMT pressure to increase and return to < 18 psia.
- Place selector switch for H2A-GW104 in the Unit 2 position.
- Verify selector switch for the H₂ ANALYZER (H2A-GW-104) HEAT TRACE PANEL 6, 1-HT-HTP-6, is in the AUTO position & reset SI. Check heat tracing de-energized.
- Freeze simulator until JPM performance.

Initiating Cues

- A LBLOCA has occurred on Unit 1.
- The Operating Team has reached Step 26 of 1-E-1, Loss of Reactor or Secondary Coolant.

Directions to the Applicant

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to place Hydrogen Analyzer H2A-GW104 in service on Unit 1 Containment IAW 1-E-1, Attachment 3, Part I.
- When you complete the actions necessary to accomplish this Task, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are **bolded**.
- *An additional instructor may be needed to silence alarms for the examinee.*
- **START TIME:**

| | |
|---|---|
| <p>STEP 1:</p> <p>Review NOTES prior to Step 1 of Attachment 3: (<i>Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews NOTE 1: Containment pressure should be between 9 and 60 PSIA. <ul style="list-style-type: none"> • Observes CTMT Pressure indication on 1-LM-PI-100A/100B/100C and 100D and notes indication of ~10.5 psia. b) Reviews NOTE 2: Containment temperature should be between 40°F and 290°F. <ul style="list-style-type: none"> • Observes CTMT Temperature on 1-LM-TI-100-1 and 100-2, and notes indication of ~ 92 °F. <p>EVALUATOR'S NOTE:</p> <p>If asked: CTMT Pressure and Temperature Indications are as found.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>Select Hydrogen Analyzer to be placed in service: (<i>Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> • Determines from previous instructions that H2A-GW104 is the analyzer to be used. <p>EVALUATOR'S NOTE:</p> <p>If asked: H2A-GW-104 is to be used.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 3:</p> <p>IF H2A-GW104 is to be placed in service, THEN do the following: <i>(Step 2a)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Put selector switch XFER CKT UNIT #1 TO UNIT #2 in the UNIT 1 position (Switch is located on Unit 1 Post Accident Monitoring Panel). b) Checks that white analyzer indicating light for Unit 1 lit. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>Put selector switch H2 ANALYZER (H2A-GW-104) HEAT TRACE PANEL 6, 1-HT-HTP-6, in ON. <i>(Step 2b)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Places selector switch for H₂ ANALYZER (H2A-GW-104) HEAT TRACE PANEL 6, 1-HT-HTP-6, in the ON position. b) Checks RED light illuminates after switch is in ON position. c) Records the time Heat Tracing is energized _____. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 5:</p> <p>Align H2 Analyzer valves to Detector. <i>(Step 2 c - f)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Open 1-GW-TV-100, H2 ANALYZER VLV. b) Checks valve open by observing RED light lit and GREEN off. c) Opens 1-GW-TV-101, H2 ANALYZER VLV. d) Checks valve open by observing RED light lit and GREEN off. e) Opens 1-GW-TV-103, H2 ANALYZER VLV. f) Checks valve open by observing RED light lit and GREEN off. g) Opens 1-GW-TV-102, H2 ANALYZER VLV. h) Checks valve open by observing RED light lit and GREEN off. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>NOTE: Before the Hydrogen Analyzer is placed in service, the heat tracing circuit must be energized for 20 minutes. <i>(Step 2, Note prior to 2g)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> • Reviews Note Prior to Step 2g: Before the Hydrogen Analyzer is placed in service, the heat tracing circuit must be energized for 20 minutes <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|---|---|
| <p>STEP 7:</p> <p>Energizes H2 Analyzer. (Step 2 g, h)</p> <p>STANDARD:</p> <p>a) Verify that 20 minutes have elapsed since the time recorded in Step 2b.</p> <p>EVALUATOR'S CUE: 20 minutes have elapsed since Step 2b performed.</p> <p>b) Put selector switch H2 ANALYZER H2A-GW104 in the ANALYZE position.</p> <p>c) Checks RED light illuminates after switch is in ANALYZE position.</p> <p>d) Observes 10GW-H2A-104 TR A, CTMT H2 Analyzer, moves upscale to an indication of approximately 0.7%.</p> <p>EVALUATOR'S NOTE:</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 8:</p> <p>NOTIFY NUCLEAR SHIFT MANAGER (EVALUATOR) STATUS OF TASK.</p> <p>When Step 2 h) Completed, Candidate should report completion of task.</p> <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.
- Place Hydrogen Analyzer H2A-GW104 in service on Unit 1 Containment IAW 1-E-1, Attachment 3, Part 1.

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 on Unit 1.
- The Operating Team has reached Step 26 of 1-E-1, Loss of Reactor or Secondary Coolant.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to place Hydrogen Analyzer H2A-GW104 in service on Unit 1 Containment IAW 1-E-1, Attachment 3, Part 1.
- When you complete the actions necessary to accomplish this Task, please inform me.

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

Initial Conditions

- A LBLOCA has occurred on Unit 1.
- The Operating Team has reached Step 26 of 1-E-1, Loss of Reactor or Secondary Coolant.

Initiating Cues

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- You are to place Hydrogen Analyzer H2A-GW104 in service on Unit 1 Containment IAW 1-E-1, Attachment 3, Part 1.
- When you complete the actions necessary to accomplish this Task, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

FINAL

Simulator Job Performance Measure 039A4.04 (3.8 / 3.9)
[Alternate Path]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Respond to "B" SG High Level IAW 1-FR-H.3

K/A: 039A4.04 Ability to manually operate and/or monitor in the control room: Emergency feedwater pump turbines.

Applicability

Estimated Time

Actual Time

RO/SRO(I)

10 Minutes

____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- Unit 1 "B" SG level at 95% following reactor trip.

Standards

- Isolation of feed sources to "B" SG IAW 1-FR-H.3, Response to Steam Generator High Level.

Initiating Cues

- An automatic reactor trip has occurred on Unit 1.
- "B" SG level has reached 95% NR level.
- I am the Nuclear Shift Manager. You are to take action IAW 1-FR-H.3, Response to Steam Generator High Level, for the "B" steam generator.
- When you have completed the Task, please inform me.

Terminating Cues

- Completion of Step 10 of 1-FR-H.3, Response to Steam Generator High Level.

Procedures

- 1-FR-H.3, Response to Steam Generator High Level (Rev 13).

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 50% power IC and initialize. Place simulator in RUN.
- Enter the following Malfunctions:
 - RD18, Failure of Auto Reactor Trip, ACTIVE
 - FW0201, Main Feed Reg Valve FCV-1478 Fails Shut, Trigger 1, 30 Sec TD
 - FW0203, Main Feed Reg Valve FCV-1498 Fails Shut, Trigger 1, 30 Sec TD
 - SI14, Spurious Initiation of AMSAC Train A&B, Trigger 1
 - EL0403 RSS XFMR C Pilot Wire Relay Actuation, Trigger 1, 210 Sec TD
- Enter the following Switch Overrides
 - FWSOV155A_RESET, Stm Gen Level Reset Train A PB, Active
 - FWSOV155B_RESET, Stm Gen Level Reset Train B PB, Active
- Enter FWMOV151(1) through (6) on monitor screen.
- Actuate Trigger 1
- After "C" RSST lockout occurs, Place 1-RC-PCV-1455B in manual and close.
- When "A" or "C" SG NR level > 12%, throttle AFW = 0.2 using Monitor. ("H" Train AFW will re-open fully when "H" bus is lost and regained by #1 EDG – AFW will require re-throttling.
- Ensure SG PORVs are returned to "L" and "A" after SVB re-energized.
- When "B" SG NR level reaches 90%, place the "B" FRV in manual and set demand at 10%.
- Adjust B SG PORV setpoint to 1005 psig.
- When "B" SG NR level reaches 93%, Freeze Simulator until JPM performance.

Initiating Cues

- Shift Manager Direction

Directions to the Applicant

- I am the Nuclear Shift Manager and you are the Unit 1 BOP. Unit 1 was initially operating at 50% with a ramp to 100% power in progress. A lightning strike near the Station caused a spurious AMSAC initiation. Upon transition to 1-ES-0.1, a second lightning strike caused a Pilot wire lockout on the "C" RSST.
- The Unit 1 RO and SRO are performing 1-AP-10.07, Loss of Unit 1 Power.
- Reactor Trip breaker "A" and "B" are stuck closed, an Operator has been dispatched to locally open them.
- The STA has just noted that the "B" SG NR Level is above 85% level and increasing.
- Here is a copy of 1-FR-H.3, Response to Steam Generator High Level. You are to perform 1-FR-H.3.
- When you complete the actions necessary to accomplish this task, please inform me.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded.
- *An additional instructor may be needed to silence alarms for the examinee.*
- **START TIME:**

| | |
|---|-------------------------------------|
| <p>STEP 1:</p> <p>CAUTIONS and NOTES Prior to <i>Step 1</i></p> <p>STANDARD:</p> <p>a) Reviews CAUTION: If SG narrow range level has increased to greater than 93% [82%], an evaluation should be made for SG overfill considerations. Steam should NOT be released from any SG with level greater than 93% [82%] before overfill evaluation.</p> <p>b) Reviews NOTE: Throughout this procedure, AFFECTED refers to any SG in which narrow range level is greater than 75%.</p> <p>EVALUATOR'S NOTE:</p> <p>If asked: Shift Manager is conducting a SG overfill evaluation. <i>Candidate may check for Adverse CTMT conditions by observing CTMT pressure indication < 20 psia on 1-LM-PI-100A/B/C/D, and CTMT Radiation < 1E5 R/hr on 1-RM-RR-127/128.</i></p> <p>If asked: CTMT Pressure and CTMT Radiation are as found.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>IDENTIFY AFFECTED SG(s). (<i>Step 1</i>)</p> <p>STANDARD:</p> <p>Identifies "B" SG is approximately 93% NR Level and increasing.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 3:</p> <p>VERIFY MFW ISOLATION TO AFFECTED SG(s): <i>(Step 2)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) MFW Pumps - STOPPED. <i>(STEP 2 a)</i> <ul style="list-style-type: none"> 1) Identifies 1-FW-P-1A running by observing breaker RED light Lit, GREEN Light NOT Lit and Amps indicated for both MFW Pump motors. 2) Secures 1-FW-P-1A by placing control switch for 1-FW-P-1A1 and 1-FW-P-1A2 in STOP/PTL. 3) Checks 1-FW-P-1A secured by verifying No amps indicated. 4) Checks 1-FW-P-1B by observing breaker GREEN light LIT and RED light NOT Lit for Both MFP motors, and No amps indicated for Both MFP Motors. b) Feed Pump discharge MOVs – CLOSED. <i>(Step 2 b)</i> <ul style="list-style-type: none"> 1) Monitors 1-FW-MOV-150A until fully closed, GREEN light Lit and Red Light Out. 2) Checks 1-FW-MOV-150B closed, GREEN light Lit and RED light Out. c) SG feed Reg valves – CLOSED. <i>(Step 2 c)</i> <ul style="list-style-type: none"> 1) Identifies 1-FW-FCV-1488 (B FRV) in Manual with Demand indicated. 2) Reduces Demand on B FRV until Zero (0) Demand Indicated and GREEN Closed light Lit and RED open light Not Lit. 3) Identifies A and C FRV full closed using GREEN Closed Light Lit and RED Open Light Not Lit. d) SG FW bypass flow valves – CLOSED <i>(Step 2 d)</i> <ul style="list-style-type: none"> 1) Checks A, B, and C feed bypass valves closed by turning pot counterclockwise with no rotation, and No demand indicated. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>ISOLATE AFW FLOW TO AFFECTED SG(s). <i>(Step 3)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Identifies AFW flow to B SG by observing 1-FW-MOV-151C and 1-FW-MOV-151D in intermediate position, RED and GREEN lights Lit; and AFW flow indicated on 1-FW-FI-100B. b) Throttles closed on 1-FW-MOV-151C and 1-FW-MOV-151D until No flow indicated on 1-FW-FI-100B, and GREEN lights Lit and RED Lights Out on 1-FW-MOV-151C and 1-FW-MOV-151D. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 5:</p> <p>CHECK AFFECTED SG(s) NARROW RANGE LEVEL: <i>(Step 4)</i></p> <p>STANDARD:</p> <p>a) Level - LESS THAN 93% [82%]. 1) Identifies containment Not Adverse by observing CTMT pressure indication < 20 psia on 1-LM-PI-100A/B/C/D, and CTMT Radiation < 1E5 R/hr on 1-RM-RR-127/128. 2) Identifies B SG NR Level > 93% and Goes to Step 5.</p> <p>EVALUATOR'S NOTE:</p> <p>If asked: CTMT pressure is as found. If asked: CTMT Radiation is as found. <i>Adverse CTMT Conditions may have been verified during review of CAUTION prior to Step 1.</i></p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 6:</p> <p>ADJUST AFFECTED SG(s) PORV CONTROLLER SETPOINT TO 1035 PSIG. <i>(Step 5)</i></p> <p>STANDARD:</p> <p>a) Checks setpoint on 1-MS-PC-101B and observes setpoint indicates 1005 psig. b) Adjusts setpoint using ▲ or ▼ pushbuttons to an indication of 1035 psig.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7:</p> <p>Reviews CAUTION Prior to Step 6. <i>(Step 6)</i></p> <p>STANDARD:</p> <p>Reviews CAUTION: If the TD AFW pump is the only available source of feed flow, steam supply to the TD AFW pump must be maintained from at least one SG.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|---|-------------------------------------|
| <p>STEP 8:</p> <p>LOCALLY CLOSE AFFECTED SG(s) STEAM SUPPLY VALVES TO TD AFW PUMP: <i>(Step 6)</i></p> <p>STANDARD:</p> <p>Directs Operator to locally close 1-MS-120 for SG B.</p> <p>EVALUATOR'S NOTE:</p> <p>When Booth Operator Directed to close 1-MS-120, the Booth Operator will inform the Candidate that a time compression has occurred and 1-MS-120 is closed.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 9:</p> <p>CLOSE AFFECTED SG(s) MSTVs. <i>(Step 7)</i></p> <p>STANDARD</p> <ul style="list-style-type: none"> a) Identifies 1-MS-TV-101B Open, by observing RED light On and GREEN Light Off. b) Removes Brass Cap over control switch and places 1-MS-TV-101B control switch to close. c) Verifies 1-MS-TV-101B closed by observing GREEN Light Lit and RED Light Out. d) Silences and Acknowledges alarm 1H-A8, STM LINE ISOL TRIP V Vs CLOSED. <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> • d) Action above may be performed by Booth Operator if Candidate requested Alarms to be Silenced during JPM performance. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|---|-------------------------------------|
| <p>STEP 10:</p> <p>CHECK AFFECTED SG(s) RADIATION - NORMAL. <i>(Step 8)</i></p> <p>STANDARD</p> <ul style="list-style-type: none"> a) Checks B MS line RM (RM-125) normal using PCS (MS Screen). b) Checks SG Blowdown Normal using PCS or 1-RM-RMS-113 (B/D RM for B/C SG). c) Samples. <p>EVALUATOR'S NOTE:</p> <p>If asked: PCS Indication as found. If asked: 1-RM-RMS-113 indication as found. If asked: Sampling will be considered following Blowdown Restoration.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 11:</p> <p>ESTABLISH BLOWDOWN FROM AFFECTED SG(s) IAW 1-OP-BD-001, STEAM GENERATOR BLOWDOWN SYSTEM OPERATION. <i>(Step 9)</i></p> <p>STANDARD</p> <ul style="list-style-type: none"> a) Identifies that Blowdown is isolated by observing 1-BD-TV-100C and 1-BD-TV-100D closed on VB1-1, and zero (0) blowdown flow indicated in FI-BD-103B/FI-BD-104B. <p>EVALUATOR'S NOTE:</p> <p>After Candidate identifies indications for Blowdown flow, inform Candidate that another Operator is currently being briefed and will place blowdown in service IAW 1-OP-BD-001.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 12:</p> <p>RETURN TO PROCEDURE AND STEP IN EFFECT (Step 10)</p> <p>NOTIFY NUCLEAR SHIFT MANAGER (EVALUATOR) STATUS OF TASK. When Step 10 reached, Candidate should report task complete.</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.
- Perform 1-FR-H.3, Response to Steam Generator High Level

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 was initially operating at 50% with a ramp to 100% power in progress. A lightning strike near the Station caused a spurious AMSAC initiation. Upon transition to 1-ES-0.1, a second lightning strike caused a Pilot wire lockout on the "C" RSST.
- The Unit 1 RO and SRO are performing 1-AP-10.07, Loss of Unit 1 Power.
- Reactor Trip breaker "A" and "B" are stuck closed, an Operator has been dispatched to locally open them.
- The STA has just noted that the "B" SG NR Level is above 85% level and increasing.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Unit 1 BOP.
- Here is a copy of 1-FR-H.3, Response to Steam Generator High Level. You are to perform 1-FR-H.3.
- When you complete the actions necessary to accomplish this task, please inform me.

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

Initial Conditions

- Unit 1 was initially operating at 50% with a ramp to 100% power in progress. A lightning strike near the Station caused a spurious AMSAC initiation. Upon transition to 1-ES-0.1, a second lightning strike caused a Pilot wire lockout on the "C" RSST.
- The Unit 1 RO and SRO are performing 1-AP-10.07, Loss of Unit 1 Power.
- Reactor Trip breaker "A" and "B" are stuck closed, an Operator has been dispatched to locally open them.
- The STA has just noted that the "B" SG NR Level is above 85% level and increasing.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Unit 1 BOP.
- Here is a copy of 1-FR-H.3, Response to Steam Generator High Level. You are to perform 1-FR-H.3.
- When you complete the actions necessary to accomplish this task, please inform me.



SURRY POWER STATION

FUNCTION RESTORATION PROCEDURE

| | | |
|--------------------|---|----------------|
| NUMBER 1-FR-H.3 | PROCEDURE TITLE RESPONSE TO STEAM GENERATOR HIGH LEVEL | REVISION 13 |
| | | PAGE 1 of 4 |

PURPOSE

To provide guidance to respond to a high SG level condition and to address the potential overflow concern.

ENTRY CONDITIONS

This procedure is applicable when RCS temperature is greater than 200°F. Using this procedure in any other plant condition requires a step by step evaluation to determine if a specified action is still applicable.

Transition from any of the following procedures:

- F-3, HEAT SINK, when a YELLOW path exists,
- 1-FR-H.2, RESPONSE TO STEAM GENERATOR OVERPRESSURE.

CONTINUOUS USE

| | | |
|--------------------|---|----------------|
| NUMBER 1-FR-H.3 | PROCEDURE TITLE RESPONSE TO STEAM GENERATOR HIGH LEVEL | REVISION 13 |
| | | PAGE 2 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|--|--|
| ***** | | |
| <p>CAUTION: If SG narrow range level has increased to greater than 93% [82%], an evaluation should be made for SG overfill considerations. Steam should NOT be released from any SG with level greater than 93% [82%] before overfill evaluation.</p> | | |
| ***** | | |
| <p>NOTE: Throughout this procedure, AFFECTED refers to any SG in which narrow range level is greater than 75%.</p> | | |
| 1. ___ IDENTIFY AFFECTED SG(s): | <input type="checkbox"/> • Narrow range level - GREATER THAN 75% | <input type="checkbox"/> • <u>IF</u> less than 75% in all SGs, <u>THEN</u> RETURN TO procedure and step in effect. |
| 2. ___ VERIFY MFW ISOLATION TO AFFECTED SG(s): | <input type="checkbox"/> a) MFW pumps - STOPPED <input type="checkbox"/> b) Feed pump discharge MOVs - CLOSED <input type="checkbox"/> c) SG feed REG valve(s) - CLOSED <input type="checkbox"/> d) SG FW bypass flow valves - CLOSED | <input type="checkbox"/> a) Manually stop pumps. <input type="checkbox"/> b) Manually close valves. <input type="checkbox"/> c) Manually close valve(s). <input type="checkbox"/> d) Manually close valve(s). |
| 3. ___ ISOLATE AFW FLOW TO AFFECTED SG(s) | | |

| | | |
|--------------------|---|----------------|
| NUMBER 1-FR-H.3 | PROCEDURE TITLE RESPONSE TO STEAM GENERATOR HIGH LEVEL | REVISION 13 |
| | | PAGE 3 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|---|---|
| 4. ___ | CHECK AFFECTED SG(s) NARROW RANGE LEVEL: | |
| | <input type="checkbox"/> a) Level - LESS THAN 93% [82%] | <input type="checkbox"/> a) GO TO Step 5. |
| | <input type="checkbox"/> b) Level - DECREASING | <input type="checkbox"/> b) GO TO Step 5. |
| | <input type="checkbox"/> c) Control AFW flow to maintain narrow range level between 22% and 50% | |
| | <input type="checkbox"/> d) RETURN TO procedure and Step in effect | |
| 5. ___ | ADJUST AFFECTED SG(s) PORV CONTROLLER SETPOINT TO 1035 PSIG | |
| ***** | | |
| CAUTION: If the TD AFW pump is the only available source of feed flow, steam supply to the TD AFW pump must be maintained from at least one SG. | | |
| ***** | | |
| 6. ___ | LOCALLY CLOSE AFFECTED SG(s) STEAM SUPPLY VALVES TO TD AFW PUMP: | |
| | <input type="checkbox"/> • 1-MS-87 for SG A | |
| | <input type="checkbox"/> • 1-MS-120 for SG B | |
| | <input type="checkbox"/> • 1-MS-158 for SG C | |
| 7. ___ | CLOSE AFFECTED SG(s) MSTVs | |

| | | |
|--------------------|---|--|
| NUMBER 1-FR-H.3 | PROCEDURE TITLE RESPONSE TO STEAM GENERATOR HIGH LEVEL | REVISION 13 <hr/> PAGE 4 of 4 |
|--------------------|---|--|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|---|--|
| 8. ___ | CHECK AFFECTED SG(s) RADIATION - NORMAL | <input type="checkbox"/> IF an E-3 or ECA-3 series procedure is in effect, <u>THEN</u> RETURN TO procedure and step in effect. IF NOT, THEN GO TO 1-E-3, STEAM GENERATOR TUBE RUPTURE. |
| | a) Main steam line: | |
| | <input type="checkbox"/> • Use PCS | |
| | <u>OR</u> | |
| | <input type="checkbox"/> • Locally check monitors | |
| | <input type="checkbox"/> b) SG Blowdown | |
| | <input type="checkbox"/> c) Samples | |
| 9. ___ | ESTABLISH BLOWDOWN FROM AFFECTED SG(s) IAW 1-OP-BD-001, STEAM GENERATOR BLOWDOWN SYSTEM OPERATION | |
| 10. ___ | RETURN TO PROCEDURE AND STEP IN EFFECT | |
| | - END - | |

U.S. Nuclear Regulatory Commission
Surry Power Station

FINAL

SR12301

Simulator Job Performance Measure 056AK3.02 (4.4 / 4.7)

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Load the AAC Diesel on the Unit One J Bus

K/A:056 AK3.02 Knowledge of the reasons for the following responses as they apply to the Loss of Offsite Power: Actions contained in EOP for loss of offsite power.

Applicability

Estimated Time

Actual Time

RO

10 Minutes

____ Minutes

Conditions

- Task is to be PERFORMED in the simulator.
- Unit 1 has sustained a loss of all AC power and Unit 2 has only the "H" Bus energized from #2 EDG.
- The Operating Team is performing ECA-0.0.

Standards

- 0-AP-17.06, AAC Diesel Generator – Emergency Operations.

Initiating Cues

- **This JPM is **TIME CRITICAL**.**
- You are the Unit 1 BOP and I am the Nuclear Shift Manager.
- Unit 1 has sustained a loss of all AC power and Unit 2 has only the "H" Bus energized from #2 EDG.
- The Operating Team is performing ECA-0.0.
- Here is a copy of 0-AP-17.06, AAC Diesel Generator - Emergency Operations.
- I need you to restore power to Unit 1 "J" Bus with the AAC Diesel Generator by performing steps 1-6 of 0-AP-17.06, AAC Diesel Generator – Emergency Operations.
- When you finish the actions necessary to accomplish this, please inform me so I can have the Operating Team restore loads on the Unit 1 "J" Bus.

Terminating Cues

- Unit 1 "J" Bus re-energized.
- 0-AP-17.06, Step 6 complete.

Procedures

- 0-AP-17.06, AAC Diesel Generator – Emergency Operations (Rev 24)

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% IC and initialize.
- Implement Failure of #1 and #3 EDGs to start (ED0201 and ED0203).
- Enter Loss of Offsite Power (EL01) with a 1 second time delay.
- Open SA_223 to valve in Temporary Air Compressor.
- Trigger 3, FW3102, FW-P-3B Spurious Trip.
- Place the simulator in run, implement all malfunctions, and perform the ECA-0.0 to Step 5c.
- Freeze the simulator and save this condition.

Initiating Cues

- Shift Manager direction
- ECA-0.0, Loss of all AC Power, Step 5c.

Directions to the Applicant

- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- **This JPM is **TIME CRITICAL**.**
- Unit 1 has sustained a loss of all AC power and Unit 2 has only the "H" Bus energized from #2 EDG.
- The Operating Team is performing ECA-0.0.
- Here is a copy of 0-AP-17.06, AAC Diesel Generator - Emergency Operations.
- I need you to restore power to Unit 1 "J" Bus with the AAC Diesel Generator by performing steps 1-6 of 0-AP-17.06, AAC Diesel Generator – Emergency Operations.
- When you finish the actions necessary to accomplish this, please inform me so I can have the Operating Team restore loads on the Unit 1 "J" Bus.

Notes

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are Bolded.
- *An additional instructor may be needed to silence alarms for the examinee.*
- **START TIME:**

| | |
|---|---|
| <p>STEP 1:</p> <p>REVIEWS NOTEs prior to Step 1 (<i>Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews NOTE 1: A one-line diagram showing the AAC Electrical distribution is provided in Attachment 1. b) Reviews NOTE 2: The AAC Diesel Generator should automatically start when Transfer Buses D and F OR E and F are deenergized. <p>EVALUATOR'S NOTE:</p> <p>JPM is TIME CRITICAL. 0-DRP-049, Time Critical Operator Actions, E11, allows 10 minutes to Align the AAC Diesel to respective emergency bus. Time starts when Simulator placed in RUN; Time Stops when breaker 15J8 closed and 1J bus energized.</p> <p>If asked: Unit 2 Transfer buses are de-energized, #2 EDG is supplying 2H emergency bus.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>CHECKS EMERGENCY BUSES 1J and 2H - EITHER OR BOTH DE-ENERGIZED. (<i>Step 1</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Identifies 1J Bus is de-energized by observing zero (0) volts indicated on 1J bus. b) Identifies from instructions or Unit 2 inquiry that 2H energized. <p>EVALUATOR'S NOTE:</p> <p>If asked: "2H" Bus is energized from the #2 EDG.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 3:</p> <p>GO TO APPROPRIATE STEP BASED ON DESIRED USE OF THE AAC DIESEL GENERATOR. <i>(Step 2)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews CAUTION prior to Step 2: Loading of the AAC Diesel should consider availability of Instrument Air from 1-IA-C-1 or the Temporary Diesel Air Compressor. b) Identifies 1J to be re-energized from the AAC Diesel from initial task briefing or Evaluator query. <p>EVALUATOR'S NOTE:</p> <p>If asked: Temporary Air Compressor is in service. If asked: Load the AAC on 1J Bus.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4:</p> <p>CHECKS AAC DIESEL GENERATOR - AVAILABLE AND RUNNING. <i>(Step 3)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Observes 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D, is lit. b) Observes 0-WD-D1, AAC GENERATOR TRIP, is not lit. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 5:</p> <p>REVIEWS CAUTION AND NOTE PRIOR TO STEP 4. <i>(Step 4)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) An overcurrent fault on 15D1 will prevent 0-AAC-BKR-05L3 from closing. b) Annunciator 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D, should go out when 0-AAC-BKR-05L3 closes. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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| <p>STEP 6:</p> <p>ENERGIZE TRANSFER BUS D BY CLOSING 0-AAC-BKR-05L3. <i>(Step 4)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in AAC position. b) Check Annunciator 1K-D3, BUS 1D UNDERVOLT - NOT LIT. c) Checks annunciator 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D extinguished (from NOTE prior to step). <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 7:</p> <p>CHECK OR PLACE THE FOLLOWING LOADS IN PTL. <i>(Step 5)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Places 1-VS-F-1B in PTL b) Places 1-SI-P-1B in PTL c) Places 1-RS-P-2B in PTL d) Places 1-RS-P-1B in PTL e) Places 1-CS-P-1B in PTL f) Places "A" PZR heater group in LOCKOUT g) Places 1-CH-P-1B in PTL h) Identifies 1-CH-P-1C ALT in PTL. i) Places 1-FW-P-3B in PTL j) Places 1-CC-P-1B in PTL k) Identifies 1-VS-F-58B is powered from its normal source and not required to be manipulated. l) Identifies 1-CS-P-1B breaker open (RED light off, GREEN light off). m) Identifies 1-RS-P-1B breaker open (RED light off, GREEN light off). n) Identifies 1-FW-P-3B breaker closed (RED light on, GREEN light off). o) Opens 1-FW-P-3B breaker by resetting AMSAC or dispatching an operator to locally open breaker 15J4. (p) Identifies 1-FW-P-3B breaker opened (RED light off, GREEN light off). <p>EVALUATOR'S NOTE:</p> <p>If 1-VS-F-58B placed in PTL in k) above – this action warrants a follow-up question if not corrected prior to completion of task.</p> <p>Booth Operator: If contacted to locally open 1-FW-P-3B breaker, actuate Trigger 3, inform Candidate that a time compression has occurred and 15J4 open.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 8:</p> <p>ENERGIZE EMERGENCY BUS 1J. <i>(Step 6)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews NOTE Prior to Step 6: The control switch for Breaker 15J8 must be held in Closed position for at least five seconds. b) Locates the generator synch switch and places it in 15J8. c) Rotates the synch switch for 15J8 in the clockwise direction to the "ON" position. d) Verifies breaker 15J3 is open (green light on red light off). e) Rotates 15J8 breaker control switch in the clockwise direction to the close position and holds for 5 seconds, releases switch and verifies rotation back to 12:00 position. <p>NOTE: TIME CRITICAL ACTION COMPLETE; TIME _____.</p> <ul style="list-style-type: none"> f) Verifies 15J8 breaker closed (Red light on, green light off). g) Verifies 1J Bus energized (frequency at approximately 60 HZ and voltage approximately 4200V). h) Rotates the synch switch for 15J8 in the counterclockwise direction to the "OFF" position. <p>EVALUATOR'S NOTE:</p> <p>The operator should not attempt to use the synch switch on the Liquid Waste Panel. Usage of this switch warrants a follow-up question.</p> <p>Step e) above: 15J8 amber light reset by rotating 15J8 breaker counter-clockwise before closing breaker is a good practice, but not a critical step.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 9:</p> <p>REPORTS TO SHIFT MANAGER (EVALUATOR)</p> <p><u>Standards</u></p> <p>Verbal status report that 1J Bus is energized and AP-17.06 is completed up to Step 7</p> <p>STOP TIME: _____</p> <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.
- Load the AAC Diesel Generator on the 1J Bus IAW 0-AP-17.06, Steps 1-6.

-

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 has sustained a loss of all AC power and Unit 2 has only the "H" Bus energized from #2 EDG.
- The Operating Team is performing ECA-0.0.

Initiating Cues

- **This JPM is **TIME CRITICAL**.**
- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- Here is a copy of 0-AP-17.06, AAC Diesel Generator - Emergency Operations.
- I need you to restore power to Unit 1 "J" Bus with the AAC Diesel Generator by performing steps 1-6 of 0-AP-17.06, AAC Diesel Generator – Emergency Operations.
- When you finish the actions necessary to accomplish this, please inform me so I can have the Operating Team restore loads on the Unit 1 "J" Bus.

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

Initial Conditions

- Unit 1 has sustained a loss of all AC power and Unit 2 has only the "H" Bus energized from #2 EDG.
- The Operating Team is performing ECA-0.0.

Initiating Cues

- **This JPM is **TIME CRITICAL**.**
- I am the Nuclear Shift Manager. You are the Unit 1 BOP.
- Here is a copy of 0-AP-17.06, AAC Diesel Generator - Emergency Operations.
- I need you to restore power to Unit 1 "J" Bus with the AAC Diesel Generator by performing steps 1-6 of 0-AP-17.06, AAC Diesel Generator – Emergency Operations.
- When you finish the actions necessary to accomplish this, please inform me so I can have the Operating Team restore loads on the Unit 1 "J" Bus.



SURRY POWER STATION

ABNORMAL PROCEDURE

| | | |
|--------------------------|---|-----------------|
| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS (WITH 12 ATTACHMENTS) | REVISION 24 |
| | | PAGE 1 of 26 |

PURPOSE

To provide guidance for starting, loading, and securing the AAC Diesel Generator.

ENTRY CONDITIONS

Transition from any of the following procedures.

- 1-ECA-0.0, LOSS OF ALL AC POWER
- 2-ECA-0.0, LOSS OF ALL AC POWER
- 1-AP-10.07, LOSS OF UNIT 1 POWER
- 2-AP-10.07, LOSS OF UNIT 2 POWER
- 0-AP-17.04, EDG 1 OR 2 - EMERGENCY OPERATIONS
- 0-AP-17.05, EDG 3 - EMERGENCY OPERATIONS
- 0-FCA-1.00, LIMITING MCR FIRE
- 1-FCA-2.00, UNIT 1 CONTAINMENT FIRE
- 2-FCA-2.00, UNIT 2 CONTAINMENT FIRE
- 1-FCA-3.00, LIMITING CABLE VAULT AND CABLE TUNNEL FIRE
- 2-FCA-3.00, LIMITING CABLE VAULT AND CABLE TUNNEL FIRE
- 1-FCA-4.00, LIMITING ESGR NUMBER 1 FIRE
- 2-FCA-4.00, LIMITING ESGR NUMBER 2 FIRE
- 0-FCA-7.00, LIMITING MER 3 FIRE
- 0-FCA-8.00, LIMITING AUXILIARY BUILDING FIRE

CONTINUOUS USE

| | | |
|--------------------------|--|---------------------------------------|
| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 2 of 26 |
|--------------------------|--|---------------------------------------|

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--------|--|---|
| | <p>NOTE:</p> <ul style="list-style-type: none"> • A one-line diagram showing the AAC Electrical distribution is provided in Attachment 1. • The AAC Diesel Generator should automatically start when Transfer Buses D and F <u>OR</u> E and F are deenergized. | |
| 1. ___ | CHECK EMERGENCY BUSES 1J AND 2H - EITHER OR BOTH DEENERGIZED | Check the following conditions: <ul style="list-style-type: none"> <input type="checkbox"/> • Emergency Bus 1J - ENERGIZED BY EDG 3 <input type="checkbox"/> • Emergency Bus 2J - DEENERGIZED <input type="checkbox"/> • Swapping of EDG 3 to Emergency Bus 2J - DESIRED <input type="checkbox"/> <u>IF</u> all of the above conditions met, <u>THEN</u> GO TO Attachment 2. <input type="checkbox"/> <u>IF NOT</u>, <u>THEN</u> RETURN TO procedure and step in effect. |
| | ***** | |
| | <p>CAUTION: Loading of the AAC Diesel should consider availability of Instrument Air from 1-IA-C-1 or the Temporary Diesel Air Compressor.</p> | |
| | ***** | |
| 2. ___ | GO TO THE APPROPRIATE STEP BASED ON DESIRED USE OF THE AAC DIESEL GENERATOR <ul style="list-style-type: none"> <input type="checkbox"/> • Step 3, <u>Only</u> Bus 1J to be energized <input type="checkbox"/> • Step 15, <u>Only</u> Bus 2H to be energized <input type="checkbox"/> • Step 27, <u>Both</u> 1J and 2H buses to be energized | |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 3 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| 3. ___ CHECK AAC DIESEL GENERATOR - AVAILABLE AND RUNNING | <input type="checkbox"/> • Annunciator 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D - LIT <u>AND</u> <input type="checkbox"/> • Annunciator 0-WD-D1, AAC GENERATOR TRIP - NOT LIT | Do the following: a) Perform Annunciator Response procedure(s) as necessary: <input type="checkbox"/> • 0-WD-D1, AAC GENERATOR TRIP <input type="checkbox"/> • 0-WD-D2, AAC SYSTEM ALARM <input type="checkbox"/> • 0-WD-D3, AAC BUS 0L TROUBLE <input type="checkbox"/> b) <u>WHEN</u> problem corrected, or if no AUTO Start signal exists, <u>THEN</u> perform Attachment 3. <input type="checkbox"/> c) <u>WHEN</u> the AAC Diesel Generator supplying Bus 0L, <u>THEN</u> GO TO Step 4. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 4 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| ***** CAUTION: An overcurrent fault on 15D1 will prevent 0-AAC-BKR-05L3 from closing. ***** | | |
| NOTE: Annunciator 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D, should go out when 0-AAC-BKR-05L3 closes. | | |
| 4. ___ ENERGIZE TRANSFER BUS D BY CLOSING 0-AAC-BKR-05L3: | <input type="checkbox"/> a) At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in AAC position <input type="checkbox"/> b) Check Annunciator 1K-D3, BUS 1D UNDERVOLT - NOT LIT | <input type="checkbox"/> b) Do the following: <ol style="list-style-type: none"> 1) Locally investigate breakers: <ul style="list-style-type: none"> <input type="checkbox"/> • 15D1 <input type="checkbox"/> • 0-AAC-BKR-05L3 <input type="checkbox"/> 2) <u>IF</u> breakers normal, <u>THEN</u> locally turn on synch switch <u>AND</u> close (AAC BLDG) 0-AAC-BKR-05L3. <input type="checkbox"/> 3) Contact the Electrical Department for assistance as necessary. <input type="checkbox"/> 4) <u>WHEN</u> Transfer Bus D energized, <u>THEN</u> GO TO 5. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 5 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| 5. ___ | CHECK OR PLACE THE FOLLOWING LOADS IN PTL | |
| | a) Put the following switches in PTL: | |
| | <input type="checkbox"/> • 1-VS-F-1B (14J7) <input type="checkbox"/> • 1-SI-P-1B (14J3) <input type="checkbox"/> • 1-RS-P-2B (14J8) <input type="checkbox"/> • 1-RS-P-1B (14J4) <input type="checkbox"/> • 1-CS-P-1B (14J5) <input type="checkbox"/> • PRZR Heater Group A (14J9) <input type="checkbox"/> • 1-CH-P-1B (15J5) <input type="checkbox"/> • 1-CH-P-1C (15J2, ALT) <input type="checkbox"/> • 1-FW-P-3B (15J4) <input type="checkbox"/> • 1-CC-P-1B (15J10) <input type="checkbox"/> • 1-VS-F-58B, if powered from Alternate source, 14J13 | |
| | b) Check breakers open by checking breaker position indicating lights - RED LIGHTS NOT LIT | b) Locally open CS and ISRS pump breakers: |
| | <input type="checkbox"/> • 1-CS-P-1B (14J-5) <input type="checkbox"/> • 1-RS-P-1B (14J-4) | <input type="checkbox"/> • 1-CS-P-1B (14J-5) <input type="checkbox"/> • 1-RS-P-1B (14J-4) |
| | c) Check breaker open by checking breaker position indicating lights - RED LIGHTS NOT LIT | c) Do the following: |
| | <input type="checkbox"/> • 1-FW-P-3B (15J4) | <input type="checkbox"/> • Reset AMSAC. <u>OR</u> <input type="checkbox"/> • Locally open MD AFW pump breaker: <input type="checkbox"/> • 1-FW-P-3B (15J4) |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 6 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED | | | | | | | | | | | | |
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| | <p>NOTE: The control switch for Breaker 15J8 must be held in Closed position for at least five seconds.</p> | | | | | | | | | | | | | |
| 6. ___ | <p>ENERGIZE EMERGENCY BUS 1J</p> <p><input type="checkbox"/> a) Place the Sync switch for 15J8 in ON</p> <p><input type="checkbox"/> b) Check breaker 15J3 is OPEN <input type="checkbox"/> b) <u>IF</u> breaker 15J3 is closed, <u>THEN</u> notify Shift Supervision.</p> <p><input type="checkbox"/> c) Close breaker 15J8</p> <p><input type="checkbox"/> d) Place the Sync switch for 15J8 in OFF</p> | | | | | | | | | | | | | |
| | <p>*****</p> <p>CAUTION: If all RCP seal cooling has been previously lost, a charging pump should <u>NOT</u> be started until the RCP seals are isolated.</p> <p>*****</p> | | | | | | | | | | | | | |
| | <p>NOTE:</p> <ul style="list-style-type: none"> • The AAC Diesel Generator has a 4.0 hour fuel supply when operating at rated load of 3640 KW. • The approximate power required for J bus loads are as follows: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">•CC pump, 450 KW•</td> <td style="width: 50%;">CHG pump, 430 KW</td> </tr> <tr> <td>•AFW pump, 310 KW•</td> <td>PRZR Heaters, 200 KW</td> </tr> <tr> <td>•RHR pump, 215 KW•</td> <td>OSRS pump, 245 KW</td> </tr> <tr> <td>•ISRS pump, 225 KW•</td> <td>LHSI pump, 190 KW</td> </tr> <tr> <td>•CS pump, 170 KW•</td> <td>Filtered Exhaust Fan, 125 KW</td> </tr> <tr> <td>•CTMT Air Recirc Fan, 100 KW</td> <td></td> </tr> </table> | | •CC pump, 450 KW• | CHG pump, 430 KW | •AFW pump, 310 KW• | PRZR Heaters, 200 KW | •RHR pump, 215 KW• | OSRS pump, 245 KW | •ISRS pump, 225 KW• | LHSI pump, 190 KW | •CS pump, 170 KW• | Filtered Exhaust Fan, 125 KW | •CTMT Air Recirc Fan, 100 KW | |
| •CC pump, 450 KW• | CHG pump, 430 KW | | | | | | | | | | | | | |
| •AFW pump, 310 KW• | PRZR Heaters, 200 KW | | | | | | | | | | | | | |
| •RHR pump, 215 KW• | OSRS pump, 245 KW | | | | | | | | | | | | | |
| •ISRS pump, 225 KW• | LHSI pump, 190 KW | | | | | | | | | | | | | |
| •CS pump, 170 KW• | Filtered Exhaust Fan, 125 KW | | | | | | | | | | | | | |
| •CTMT Air Recirc Fan, 100 KW | | | | | | | | | | | | | | |
| 7. ___ | <p>START LOADS ON EMERGENCY BUS 1J IAW SHIFT SUPERVISION DIRECTION</p> | | | | | | | | | | | | | |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 7 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| | <p>NOTE:</p> <ul style="list-style-type: none"> • The AAC Diesel Generator has a 4.0 hour fuel supply when operating at rated load of 3640 KW. Fuel oil should be ordered as soon as possible depending on the anticipated run time. • The Fuel Oil Tank should not be filled above 95%. • The Environmental Compliance Coordinator must be notified of the total run time of the AAC Diesel Generator. <p>8. ___ LOCALLY MONITOR THE AAC DIESEL GENERATOR FOR PROPER OPERATION</p> | |
| | <p>NOTE: The purpose of Steps 9 through 12 is to secure the AAC Diesel Generator if all loads necessary for safe operation can be started on Bus 1H. The AAC Diesel Generator should remain running if a component necessary for safe operation can <u>NOT</u> be started on Bus 1H.</p> | |
| | <p>*9. ___ CHECK THE FOLLOWING - OFFSITE POWER OR EDG 1 AVAILABLE TO SUPPLY BUS 1H</p> | <p><input type="checkbox"/> GO TO Step 13.</p> |
| | <p>10. ___ START LOADS ON EMERGENCY BUS 1H IAW SHIFT SUPERVISION DIRECTION</p> | |
| | <p>11. ___ SECURE EMERGENCY BUS 1J LOADS</p> | |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 8 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| | <p>NOTE: If all necessary loads have been transferred to Bus 1H, the AAC Diesel should be secured IAW Step 12. Otherwise, the AAC Diesel should remain running.</p> <p>12. ___ SECURE THE AAC DIESEL GENERATOR:</p> <ul style="list-style-type: none"> <input type="checkbox"/> a) Open Breaker 15J8 <input type="checkbox"/> b) Check MER 5 Chillers - NOT SUPPLIED FROM AAC DIESEL GENERATOR <input type="checkbox"/> c) Open Breaker 0-AAC-BKR-05L3 <input type="checkbox"/> d) At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in NORMAL position <input type="checkbox"/> e) GO TO Attachment 4 | <p>b) Do the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1) Continue to monitor AAC Diesel Generator operation. <input type="checkbox"/> 2) <u>WHEN</u> an MCR Chiller supplied from a normal power source, <u>THEN</u> perform Steps 12c through 12e. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 9 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|
| ***** CAUTION: EDG 3, RSST A, and the AAC Diesel Generator <u>MUST NOT</u> be paralleled to Transfer Bus D at the same time. ***** | | |
| *13. ___ | CHECK OFFSITE POWER OR EDG 3 - AVAILABLE TO SUPPLY EMERGENCY BUS 1J | Do the following: <input type="checkbox"/> a) Continue to locally monitor the AAC Diesel Generator for proper operation. <input type="checkbox"/> b) Initiate AP-17 series procedures to restore EDGs. <input type="checkbox"/> c) Order fuel oil for AAC Diesel as necessary. <input type="checkbox"/> d) GO TO Step 50. |
| 14. ___ | PARALLEL AND SECURE THE AAC DIESEL GENERATOR <input type="checkbox"/> • With Reserve Station Service Transformer A available - GO TO 0-AP-10.08, STATION POWER RESTORATION <input type="checkbox"/> • With EDG 3 available - GO TO Attachment 5 | |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 10 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|---|---|
| 15. ___ | CHECK AAC DIESEL GENERATOR - AVAILABLE AND RUNNING <input type="checkbox"/> • Annunciator 0-WD-C1, AAC SYSTEM AVAILABLE BUS 1E - LIT <u>AND</u> <input type="checkbox"/> • Annunciator 0-WD-D1, AAC GENERATOR TRIP - NOT LIT | Do the following: a) Perform Annunciator Response procedure(s) as necessary: <input type="checkbox"/> • 0-WD-D1, AAC GENERATOR TRIP <input type="checkbox"/> • 0-WD-D2, AAC SYSTEM ALARM <input type="checkbox"/> • 0-WD-D3, AAC BUS 0L TROUBLE <input type="checkbox"/> b) <u>WHEN</u> problem corrected, or if no AUTO Start signal exists, <u>THEN</u> perform Attachment 3. <input type="checkbox"/> c) <u>WHEN</u> the AAC Diesel Generator supplying Bus 0L, <u>THEN</u> GO TO Step 16. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 11 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| <p>***** CAUTION: An overcurrent fault on 15E1 will prevent 0-AAC-BKR-05L1 from closing. *****</p> | | |
| <p>NOTE: Annunciator 0-WD-C1, AAC SYSTEM AVAILABLE BUS 1E, should go out when 0-AAC-BKR-05L1 closes.</p> | | |
| 16. ___ | ENERGIZE TRANSFER BUS E BY CLOSING 0-AAC-BKR-05L1: | |
| | <input type="checkbox"/> a) At EDG 2 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-25H8, in AAC position | |
| | <input type="checkbox"/> b) Check Annunciator 1K-E3, BUS 1E UNDERVOLT - NOT LIT | b) Do the following: <ol style="list-style-type: none"> 1) Locally investigate breakers: <ul style="list-style-type: none"> <input type="checkbox"/> • 15E1 <input type="checkbox"/> • 0-AAC-BKR-05L1 2) <u>IF</u> breakers normal, <u>THEN</u> locally turn on synch switch <u>AND</u> close (AAC BLDG) 0-AAC-BKR-05L1. 3) Contact the Electrical Department for assistance as necessary. 4) <u>WHEN</u> Transfer Bus E energized, <u>THEN</u> GO TO 17. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 12 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| 17. ____ | <p>CHECK OR PLACE THE FOLLOWING LOADS IN PTL</p> <p>a) Put the following switches in PTL:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 1-VS-F-58B, if powered from Normal source, 24H1-7 <input type="checkbox"/> • 2-SI-P-1A (24H3) <input type="checkbox"/> • 2-CS-P-1A (24H5) <input type="checkbox"/> • 2-RS-P-1A (24H4) <input type="checkbox"/> • 2-RS-P-2A (24H7) <input type="checkbox"/> • PRZR Heater Group E (24H2) <input type="checkbox"/> • 2-CH-P-1A (25H5) <input type="checkbox"/> • 2-CH-P-1C (25H6, NORM) <input type="checkbox"/> • 2-FW-P-3A (25H4) <input type="checkbox"/> • 1-CC-P-1C (25H10) <input type="checkbox"/> • 2-VS-F-1A (24H8) <p>b) Check breakers open by checking breaker position indicating lights - RED LIGHTS NOT LIT</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 2-CS-P-1A (24H-5) <input type="checkbox"/> • 2-RS-P-1A (24H-4) <p>c) Check breaker open by checking breaker position indicating lights - RED LIGHTS NOT LIT</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 2-FW-P-3A (25H4) | <p>b) Locally open CS and ISRS pump breakers:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 2-CS-P-1A (24H-5) <input type="checkbox"/> • 2-RS-P-1A (24H-4) <p>c) Do the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • Reset AMSAC. <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> • Locally open MD AFW pump breaker: <input type="checkbox"/> • 2-FW-P-3A (25H4) |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 <hr/> PAGE 13 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED | | | | | | | | | | | | |
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| | <p>NOTE: The control switch for Breaker 25H8 must be held in Closed position for at least five seconds.</p> | | | | | | | | | | | | | |
| 18. | <p>ENERGIZE EMERGENCY BUS 2H</p> <ul style="list-style-type: none"> <input type="checkbox"/> a) Place the Sync switch for 25H8 in ON <input type="checkbox"/> b) Close breaker 25H8 <input type="checkbox"/> c) Place the Sync switch for 25H8 in OFF | | | | | | | | | | | | | |
| | <p>*****</p> <p>CAUTION: If all RCP seal cooling has been previously lost, a charging pump should <u>NOT</u> be started until the RCP seals are isolated.</p> <p>*****</p> | | | | | | | | | | | | | |
| | <p>NOTE:</p> <ul style="list-style-type: none"> • The AAC Diesel Generator has a 4.0 hour fuel supply when operating at rated load of 3640 KW. • The approximate power required for H bus loads are as follows: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">•CC pump, 450 KW•</td> <td style="width: 50%;">CHG pump, 430 KW</td> </tr> <tr> <td>•AFW pump, 310 KW•</td> <td>PRZR Heaters, 250 KW</td> </tr> <tr> <td>•RHR pump, 215 KW•</td> <td>OSRS pump, 245 KW</td> </tr> <tr> <td>•ISRS pump, 225 KW•</td> <td>LHSI pump, 190 KW</td> </tr> <tr> <td>•CS pump, 170 KW•</td> <td>Filtered Exhaust Fan, 125 KW</td> </tr> <tr> <td>•CTMT Air Recirc Fan, 100 KW</td> <td></td> </tr> </table> | | •CC pump, 450 KW• | CHG pump, 430 KW | •AFW pump, 310 KW• | PRZR Heaters, 250 KW | •RHR pump, 215 KW• | OSRS pump, 245 KW | •ISRS pump, 225 KW• | LHSI pump, 190 KW | •CS pump, 170 KW• | Filtered Exhaust Fan, 125 KW | •CTMT Air Recirc Fan, 100 KW | |
| •CC pump, 450 KW• | CHG pump, 430 KW | | | | | | | | | | | | | |
| •AFW pump, 310 KW• | PRZR Heaters, 250 KW | | | | | | | | | | | | | |
| •RHR pump, 215 KW• | OSRS pump, 245 KW | | | | | | | | | | | | | |
| •ISRS pump, 225 KW• | LHSI pump, 190 KW | | | | | | | | | | | | | |
| •CS pump, 170 KW• | Filtered Exhaust Fan, 125 KW | | | | | | | | | | | | | |
| •CTMT Air Recirc Fan, 100 KW | | | | | | | | | | | | | | |
| 19. | <p>START LOADS ON EMERGENCY BUS 2H IAW SHIFT SUPERVISION DIRECTION</p> | | | | | | | | | | | | | |
| 20. | <p>LOCALLY MONITOR THE AAC DIESEL GENERATOR FOR PROPER OPERATION</p> | | | | | | | | | | | | | |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 14 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| <p>NOTE: The purpose of Steps 21 through 24 is to secure the AAC Diesel Generator if all loads necessary for safe operation can be started on Bus 2J. The AAC Diesel Generator should remain running if a component necessary for safe operation can <u>NOT</u> be started on Bus 2J.</p> | | |
| *21. ___ | CHECK THE FOLLOWING - OFFSITE POWER OR EDG 3 AVAILABLE TO SUPPLY BUS 2J | <input type="checkbox"/> GO TO Step 25. |
| 22. ___ | START LOADS ON EMERGENCY BUS 2J IAW SHIFT SUPERVISION DIRECTION | |
| 23. ___ | SECURE EMERGENCY BUS 2H LOADS | |
| <p>NOTE: If all necessary loads have been transferred to Bus 2J, the AAC Diesel should be secured IAW Step 24. Otherwise, the AAC Diesel should remain running.</p> | | |
| 24. ___ | SECURE THE AAC DIESEL GENERATOR: | |
| | <input type="checkbox"/> a) Open Breaker 25H8 | |
| | <input type="checkbox"/> b) Open Breaker 0-AAC-BKR-05L1 | |
| | <input type="checkbox"/> c) At EDG 2 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-25H8, in NORMAL position | |
| | <input type="checkbox"/> d) GO TO Attachment 4 | |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 15 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|--|---|
| <p>*****</p> <p>CAUTION: EDG 2, RSST B, and the AAC Diesel Generator <u>MUST NOT</u> be paralleled to Transfer Bus E at the same time.</p> <p>*****</p> | | |
| *25. ___ | CHECK OFFSITE POWER <u>OR</u> EDG 2 - AVAILABLE TO SUPPLY EMERGENCY BUS 2H | Do the following: <ul style="list-style-type: none"> <input type="checkbox"/> a) Continue to locally monitor the AAC Diesel Generator for proper operation. <input type="checkbox"/> b) <u>WHEN</u> offsite power or EDG 2 available to supply Emergency Bus 2H, <u>THEN</u> perform Step 26. <input type="checkbox"/> c) Initiate AP-17 series procedures to restore EDGs. <input type="checkbox"/> d) Order fuel oil for AAC Diesel as necessary. <input type="checkbox"/> e) GO TO Step 51. |
| 26. ___ | PARALLEL AND SECURE THE AAC DIESEL GENERATOR <ul style="list-style-type: none"> <input type="checkbox"/> • With Reserve Station Service Transformer B available - GO TO 0-AP-10.08, STATION POWER RESTORATION <input type="checkbox"/> • With EDG 2 available - GO TO Attachment 6 | |
| 27. ___ | CHECK ANNUNCIATOR 0-WD-D1, AAC GENERATOR TRIP - NOT LIT | Do the following: <ul style="list-style-type: none"> <input type="checkbox"/> a) Perform Annunciator Response Procedure. <input type="checkbox"/> b) <u>WHEN</u> problem corrected, <u>THEN</u> perform Attachment 3. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 16 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| 28. ___ | <p>CHECK AAC DIESEL GENERATOR - AVAILABLE AND RUNNING</p> <ul style="list-style-type: none"> <input type="checkbox"/> • Annunciator 0-WD-C1, AAC SYSTEM AVAILABLE BUS 1E - LIT <p style="text-align: center;"><u>AND</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> • Annunciator 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D - LIT | <p>Do the following:</p> <p>a) <u>IF</u> only one annunciator <u>NOT</u> LIT, <u>THEN</u> perform applicable steps for the AVAILABLE bus:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • Bus 1D, Steps 29 through 31 <input type="checkbox"/> • Bus 1E, Steps 32 through 34 <p>b) Perform Annunciator Response procedure(s) as necessary:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 0-WD-D2, AAC SYSTEM ALARM <input type="checkbox"/> • 0-WD-D3, AAC BUS 0L TROUBLE <p>c) <u>WHEN</u> the AAC Diesel Generator available to energize the affected Bus(es), <u>THEN</u> GO TO the applicable step.</p> <ul style="list-style-type: none"> <input type="checkbox"/> • Bus 1D, Steps 29 through 31 <input type="checkbox"/> • Bus 1E, Steps 32 through 34 |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 17 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| ***** CAUTION: An overcurrent fault on 15D1 will prevent 0-AAC-BKR-05L3 from closing. ***** | | |
| NOTE: <ul style="list-style-type: none"> Annunciator 0-WD-C2, AAC SYSTEM AVAILABLE BUS 1D, should go out when 0-AAC-BKR-05L3 closes. Steps 29 through 31 energize Bus 1J and Steps 32 through 34 energize Bus 2H. These steps should be performed concurrently. | | |
| 29. ___ | ENERGIZE TRANSFER BUS D BY CLOSING 0-AAC-BKR-05L3: | |
| | <input type="checkbox"/> a) At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in AAC position | |
| | <input type="checkbox"/> b) Check Annunciator 1K-D3, BUS 1D UNDERVOLT - NOT LIT | b) Do the following: <ol style="list-style-type: none"> Locally investigate breakers: <ul style="list-style-type: none"> <input type="checkbox"/> • 15D1 <input type="checkbox"/> • 0-AAC-BKR-05L3 <u>IF</u> breakers normal, <u>THEN</u> locally turn on synch switch <u>AND</u> close (AAC BLDG) 0-AAC-BKR-05L3. Contact the Electrical Department for assistance as necessary. <u>WHEN</u> Transfer Bus D energized, <u>THEN GO TO</u> 30. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 18 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| 30. ___ CHECK OR PLACE THE FOLLOWING BUS 1J LOADS IN PTL a) Put the following switches in PTL: <input type="checkbox"/> • 1-VS-F-1B (14J7) <input type="checkbox"/> • 1-SI-P-1B (14J3) <input type="checkbox"/> • 1-RS-P-2B (14J8) <input type="checkbox"/> • 1-RS-P-1B (14J4) <input type="checkbox"/> • 1-CS-P-1B (14J5) <input type="checkbox"/> • PRZR Heater Group A (14J9) <input type="checkbox"/> • 1-CH-P-1B (15J5) <input type="checkbox"/> • 1-CH-P-1C (15J2, ALT) <input type="checkbox"/> • 1-FW-P-3B (15J4) <input type="checkbox"/> • 1-CC-P-1B (15J10) <input type="checkbox"/> • 1-VS-F-58B, if powered from Alternate source, 14J1-3 b) Check breakers open by checking breaker position indicating lights - RED LIGHTS NOT LIT <input type="checkbox"/> • 1-CS-P-1B (14J-5) <input type="checkbox"/> • 1-RS-P-1B (14J-4) c) Check breaker open by checking breaker position indicating lights - RED LIGHTS NOT LIT <input type="checkbox"/> • 1-FW-P-3B (15J4) | | b) Locally open CS and ISRS pump breakers: <input type="checkbox"/> • 1-CS-P-1B (14J-5) <input type="checkbox"/> • 1-RS-P-1B (14J-4) c) Do the following: <input type="checkbox"/> • Reset AMSAC. <u>OR</u> • Locally open MD AFW pump breaker: <input type="checkbox"/> • 1-FW-P-3B (15J4) |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|---|---|
| <p>NOTE: The control switch for Breaker 15J8 must be held in Closed position for at least five seconds.</p> | | |
| 31. | <p>ENERGIZE EMERGENCY BUS 1J</p> | |
| | <ul style="list-style-type: none"> <input type="checkbox"/> a) Place the Sync switch for 15J8 in ON <input type="checkbox"/> b) Check breaker 15J3 is OPEN <input type="checkbox"/> c) Close breaker 15J8 <input type="checkbox"/> d) Place the Sync switch for 15J8 in OFF <input type="checkbox"/> e) Check or perform Steps 32 through 34 <u>AND GO TO</u> Step 35 | <ul style="list-style-type: none"> <input type="checkbox"/> b) <u>IF</u> breaker 15J3 is closed, <u>THEN</u> notify Shift Supervision. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|--|--|
| <p>*****</p> <p>CAUTION: An overcurrent fault on 15E1 will prevent 0-AAC-BKR-05L1 from closing.</p> <p>*****</p> | | |
| <p>NOTE: Annunciator 0-WD-C1, AAC SYSTEM AVAILABLE BUS 1E, should go out when 0-AAC-BKR-05L1 closes.</p> | | |
| 32. ___ | ENERGIZE TRANSFER BUS E BY CLOSING 0-AAC-BKR-05L1: | |
| | <input type="checkbox"/> a) At EDG 2 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-25H8, in AAC position | |
| | <input type="checkbox"/> b) Check Annunciator 1K-E3, BUS 1E UNDERVOLT - NOT LIT | b) Do the following: <ol style="list-style-type: none"> 1) Locally investigate breakers: <ul style="list-style-type: none"> <input type="checkbox"/> • 15E1 <input type="checkbox"/> • 0-AAC-BKR-05L1 2) <u>IF</u> breakers normal, <u>THEN</u> locally turn on synch switch <u>AND</u> close (AAC BLDG) 0-AAC-BKR-05L1. 3) Contact the Electrical Department for assistance as necessary. 4) <u>WHEN</u> Transfer Bus E energized, <u>THEN</u> GO TO 33. |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 21 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|--|--|
| 33. ___ | <p>CHECK OR PLACE THE FOLLOWING BUS 2H LOADS IN PTL</p> <p>a) Put the following switches in PTL:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 1-VS-F-58B, if powered from Normal source, 24H1-7 <input type="checkbox"/> • 2-SI-P-1A (24H3) <input type="checkbox"/> • 2-CS-P-1A (24H5) <input type="checkbox"/> • 2-RS-P-1A (24H4) <input type="checkbox"/> • 2-RS-P-2A (24H7) <input type="checkbox"/> • PRZR Heater Group E (24H2) <input type="checkbox"/> • 2-CH-P-1A (25H5) <input type="checkbox"/> • 2-CH-P-1C (25H6, NORM) <input type="checkbox"/> • 2-FW-P-3A (25H4) <input type="checkbox"/> • 1-CC-P-1C (25H10) <input type="checkbox"/> • 2-VS-F-1A (24H8) <p>b) Check breakers open by checking breaker position indicating lights - RED LIGHTS NOT LIT</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 2-CS-P-1A (24H-5) <input type="checkbox"/> • 2-RS-P-1A (24H-4) <p>c) Check breaker open by checking breaker position indicating lights - RED LIGHTS NOT LIT</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 2-FW-P-3A (25H4) | <p>b) Locally open CS and ISRS pump breakers:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 2-CS-P-1A (24H-5) <input type="checkbox"/> • 2-RS-P-1A (24H-4) <p>c) Do the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • Reset AMSAC. <p style="text-align: center;"><u>OR</u></p> <p>• Locally open MD AFW pump breaker:</p> <ul style="list-style-type: none"> <input type="checkbox"/> • 2-FW-P-3A (25H4) |

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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 22 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|---|-----------------------|
| ***** CAUTION: Closing of supply breaker 25H8 must be coordinated with Unit 1 to prevent closing of 25H8 and 15J8 simultaneously. ***** | | |
| NOTE: The control switch for Breaker 25H8 must be held in Closed position for at least five seconds. | | |
| 34. ___ ENERGIZE EMERGENCY BUS 2H <input type="checkbox"/> a) Place the Sync switch for 25H8 in ON <input type="checkbox"/> b) Close breaker 25H8 <input type="checkbox"/> c) Place the Sync switch for 25H8 in OFF | | |
| 35. ___ CHECK ECA-0.0 - IN PROGRESS ON BOTH UNITS | <input type="checkbox"/> GO TO Step 37. | |
| 36. ___ GO TO ATTACHMENT 9 | | |
| ***** CAUTION: <ul style="list-style-type: none"> • The AAC Diesel Generator has a 4.0 hour fuel supply when operating at rated load of 3640 KW. • Loads must not be started simultaneously. Coordination must be maintained between units to prevent simultaneously starting loads. • Loads should be energized IAW Shift Supervision direction. (not to exceed 3640 KW) ***** | | |
| NOTE: If all RCP seal cooling has been previously lost, a charging pump should <u>NOT</u> be started until the RCP seals are isolated. | | |
| 37. ___ START LOADS ON BUSES 1J AND 2H IAW SHIFT SUPERVISION DIRECTION | | |

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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|
| 38. ___ | LOCALLY MONITOR THE AAC DIESEL GENERATOR FOR PROPER OPERATION | |
| 39. ___ | ORDER FUEL OIL FOR THE AAC DIESEL GENERATOR AS NECESSARY | |
| NOTE: Steps 40 through 43 allow the AAC Diesel Generator to be removed from service on Bus 1J when Bus 1H is energized from offsite power or EDG 1 and loads on Bus 1J are not required. | | |
| *40. ___ | CHECK EMERGENCY BUS 1H - ENERGIZED BY OFFSITE POWER OR EDG 1 | <input type="checkbox"/> GO TO Step 44. |
| 41. ___ | START BUS 1H LOADS IAW SHIFT SUPERVISION DIRECTION | |
| 42. ___ | CHECK BUS 1J LOADS - NONE REQUIRED FOR SAFE OPERATION | <input type="checkbox"/> GO TO Step 44. |

| | | |
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| NUMBER 0-AP-17.06 | PROCEDURE TITLE AAC DIESEL GENERATOR - EMERGENCY OPERATIONS | REVISION 24 PAGE 24 of 26 |
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|---|---|
| 43. ___ REMOVE AAC DIESEL GENERATOR FROM SERVICE ON BUS 1J: <input type="checkbox"/> a) Secure Bus 1J loads <input type="checkbox"/> b) Open Breaker 15J8 <input type="checkbox"/> c) Check MER 5 Chillers - NOT SUPPLIED FROM AAC DIESEL GENERATOR <input type="checkbox"/> d) Open Breaker 0-AAC-BKR-05L3 <input type="checkbox"/> e) At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in NORMAL position <input type="checkbox"/> f) RETURN TO procedure Step 20 | | c) Do the following: <input type="checkbox"/> 1) <u>WHEN</u> an MCR Chiller supplied from a normal power source, <u>THEN</u> perform Steps 43d and 43e. <input type="checkbox"/> 2) GO TO Step 43f. |
| | NOTE: Steps 44 through 47 allow the AAC Diesel Generator to be removed from service on Bus 2H when Bus 2J is energized from offsite power or EDG 3 and loads on Bus 2H are not required. | |
| *44. ___ CHECK EMERGENCY BUS 2J - ENERGIZED BY OFFSITE POWER OR EDG 3 | | <input type="checkbox"/> GO TO Step 48. |
| 45. ___ START BUS 2J LOADS IAW SHIFT SUPERVISION DIRECTION | | |
| 46. ___ CHECK BUS 2H LOADS - NONE REQUIRED FOR SAFE OPERATION | | <input type="checkbox"/> GO TO Step 48. |

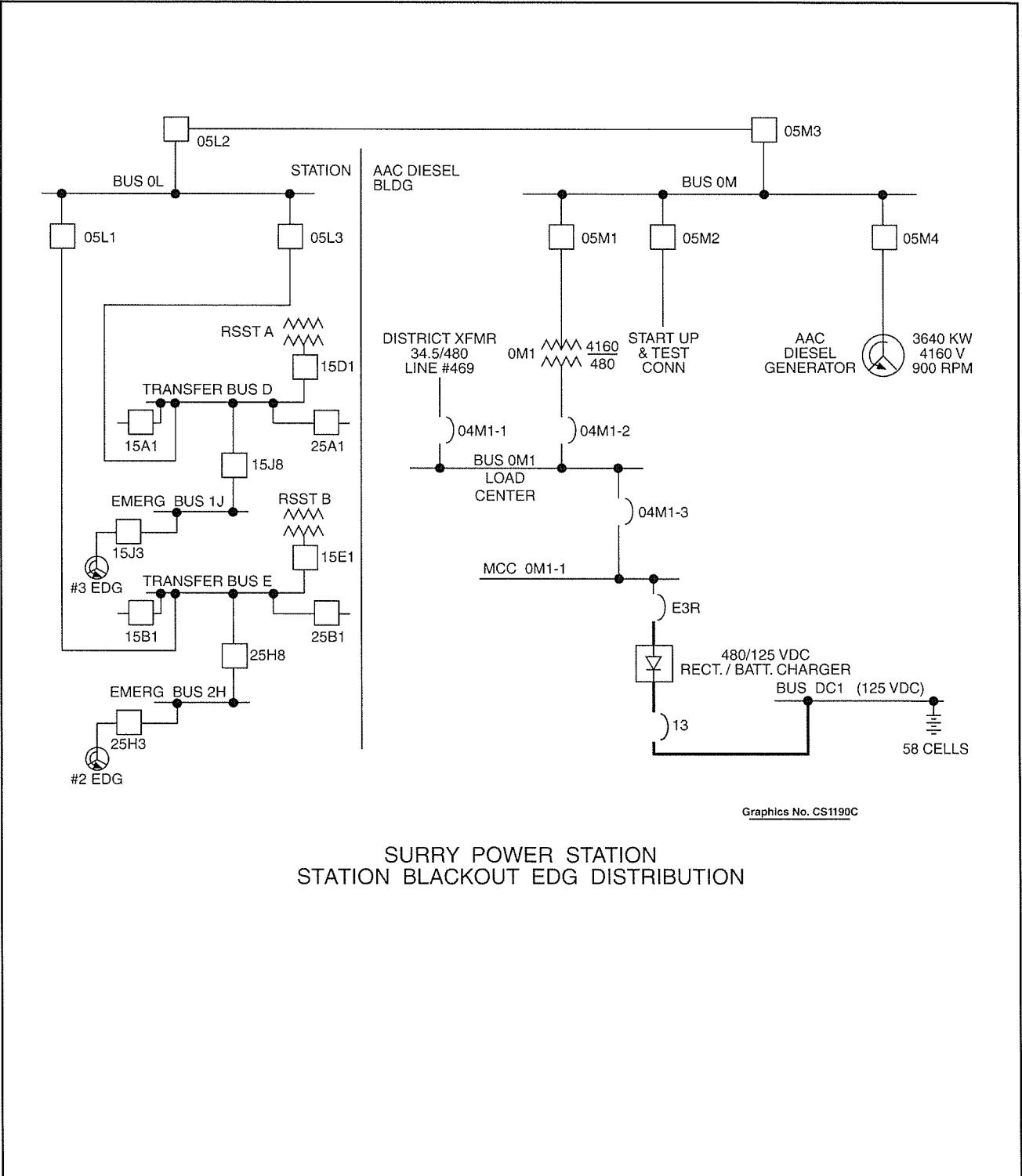
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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|--------------------------|--|
| 47. ___ REMOVE AAC DIESEL GENERATOR FROM SERVICE ON BUS 2H: <input type="checkbox"/> a) Secure Bus 2H loads <input type="checkbox"/> b) Open Breaker 25H8 <input type="checkbox"/> c) Open Breaker 0-AAC-BKR-05L1 <input type="checkbox"/> d) At EDG 2 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-25H8, in NORMAL position <input type="checkbox"/> e) RETURN TO procedure Step 8 | | |
| *48. ___ CHECK OFFSITE POWER (BUS #5) - AVAILABLE | | Do the following: <input type="checkbox"/> a) Continue efforts to restore offsite power. <input type="checkbox"/> b) <u>IF</u> EDG 3 available to supply Bus 1J, <u>THEN</u> GO TO Attachment 7. <input type="checkbox"/> c) <u>IF</u> EDG 2 available, to supply Bus 2H, <u>THEN</u> GO TO Attachment 8. |
| 49. ___ GO TO 0-AP-10.08, STATION POWER RESTORATION | | |
| 50. ___ CHECK THE FOLLOWING DAMPERS - BOTH OPEN <input type="checkbox"/> • 1-VS-MOD-103B <input type="checkbox"/> • 1-VS-MOD-103D | | <input type="checkbox"/> <u>IF</u> Emergency Bus 1J has been deenergized during the course of this event, <u>THEN</u> initiate Attachment 10 to realign Battery Room Ventilation. <input type="checkbox"/> <u>IF</u> Emergency Bus 2H has been deenergized during the course of this event, <u>THEN</u> initiate Attachment 11 to realign Battery Room Ventilation. |

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| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
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| 51. ___ | NOTIFY THE FOLLOWING: <input type="checkbox"/> • OMOG <input type="checkbox"/> • STA <input type="checkbox"/> • Maintenance Department | - END - |

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE AAC ELECTRICAL DISTRIBUTION (ONE LINE DIAGRAM) | ATTACHMENT 1 |
| REVISION 24 | | PAGE 1 of 1 |



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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE ENERGIZING 1J BUS FROM THE AAC DIESEL GENERATOR AND SUPPLYING 2J BUS FROM EDG 3 | ATTACHMENT 2 |
| REVISION 24 | | PAGE 1 of 2 |

***** :

CAUTION: Loads on Emergency Bus 1J must be stopped and the bus will be temporarily deenergized by this Attachment while shifting from EDG 3 to the AAC Diesel Generator.

***** :

1. ___ Check running or start the AAC Diesel Generator IAW Attachment 3.

2. ___ Check Reset or Reset AMSAC.

3. ___ Check or place the following loads on Emergency Bus 2J in PTL.

- 1-VS-F-58A, if powered from ALTERNATE source, 24J1-3
- 2-SI-P-1B (24J3)
- 2-CS-P-1B (24J5)
- 2-RS-P-1B (24J4)
- 2-RS-P-2B (24J8)
- PRZR Heater Group A (24J9)
- 2-CH-P-1B (25J5)
- 2-CH-P-1C (25J2, ALT)
- 2-FW-P-3B (25J4)
- 2-VS-F-1B (24J7)

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 2 |
| REVISION 24 | ENERGIZING 1J BUS FROM THE AAC DIESEL GENERATOR AND SUPPLYING 2J BUS FROM EDG 3 | PAGE 2 of 2 |

4. ___ Check or place the following loads on Emergency Bus 1J in PTL.

- 1-VS-F-1B (14J7)
- 1-SI-P-1B (14J3)
- 1-CS-P-1B (14J5)
- 1-RS-P-1B (14J4)
- 1-RS-P-2B (14J8)
- PRZR Heater Group A (14J9)
- 1-CH-P-1B (15J5)
- 1-CH-P-1C (15J2, ALT)
- 1-FW-P-3B (15J4)
- 1-VS-F-58B, if powered from ALTERNATE source, 14J1-3

5. ___ Place ACB-15J3, EMERG SUP, in PTL.

6. ___ Check that ACB-25J3, EMERG SUP, closes.

7. ___ Start loads on Emergency Bus 2J IAW Shift Supervision direction.

8. ___ RETURN TO procedure Step 3.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE STARTING THE AAC DIESEL GENERATOR | ATTACHMENT 3 |
| REVISION 24 | | PAGE 1 of 7 |

1. ___ IF neither unit has experienced a blackout AND operation of the AAC Diesel is desired, THEN GO TO Step 13.

2. ___ IF either unit has experienced a blackout AND the AAC Diesel is running, THEN GO TO Step 17. IF the AAC Diesel is NOT running, THEN at 0-AAC-MCC-0M1-1, AAC System 480V MCC 0M1-1, check the following breakers are closed AND the HAND-OFF-AUTO switches for the breakers are in AUTO:
 - ___ • 0-AAC-BKR-0M1-1-B4, AAC System Fuel Oil Cooler Circuit Breaker 0-BFO-F-1
 - ___ • 0-AAC-BKR-0M1-1-C1, AAC System Radiator Fan Circuit Breaker 0-BCW-F-1A
 - ___ • 0-AAC-BKR-0M1-1-C2, AAC System Exhaust Fan Circuit Breaker 0-VS-F-700
 - ___ • 0-AAC-BKR-0M1-1-C3, AAC System Exhaust Fan Circuit Breaker 0-VS-F-702
 - ___ • 0-AAC-BKR-0M1-1-D1, AAC System Radiator Fan Circuit Breaker 0-BCW-F-1B
 - ___ • 0-AAC-BKR-0M1-1-D2, AAC System Exhaust Fan Circuit Breaker 0-VS-F-701

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE STARTING THE AAC DIESEL GENERATOR | ATTACHMENT 3 |
| REVISION 24 | | PAGE 2 of 7 |

***** :

CAUTION: If the diesel engine is rolled over while 0-AAC-TV-1, SBO DG Inlet Air Guillotine Valve, is closed, damage to engine components may result.

***** :

NOTE: Valve 0-AAC-TV-1, SBO DG Inlet Air Guillotine Valve, is reset (opened) using a long handled $\frac{3}{4}$ inch box end wrench. Pulling the wrench toward the north about 90 degrees will engage the latch for the valve actuator into the OPEN position.

NOTE: Checking the hole in the Overspeed Trip Bar aligned with the sensor for the Mechanical Overspeed Trip Device can be used in place of climbing up on the engine and resetting the trip device. The reset is located on top of the Overspeed Device on the south side generator end of the diesel. A red band on the Mechanical Overspeed Trip Device is exposed when device is tripped.

3. ___ Check 0-AAC-TV-1, SBO DG Inlet Air Guillotine Valve, is open as indicated by position arrow on end of valve actuator in OPEN (pointer at 2 o'clock position). IF 0-AAC-TV-1, SBO DG Inlet Air Guillotine Valve, needs reset, THEN perform the following steps.

- ___ a. Reset the Electronic Overspeed reset on the black box inside the Engine Control Panel (lower left corner)
- ___ b. Reset the Mechanical Overspeed Trip Device by quickly pushing in the reset device.
- ___ c. Acknowledge, then reset local alarms.
- ___ d. Reset 0-AAC-TV-1, SBO DG Inlet Air Guillotine Valve

4. ___ Check at least one Air Compressor, 0-BSA-C-1B or 0-BSA-C-1A, operable.

- White CONTROL POWER ON light LIT
- AUTO OFF/RESET switch in AUTO
- Blue AUTO OPERATION light LIT
- Lube Oil visible in bulls eye of sight glass (right side of compressor)
- Air Dryer amber rocker switch LIT
- Green LED for cycle light LIT
- Green LED for flow light LIT

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE STARTING THE AAC DIESEL GENERATOR | ATTACHMENT 3 |
| REVISION 24 | | PAGE 3 of 7 |

5. ___ Check Starting Air Pressure at 0-BSA-PI-4, AAC Starting Air Tk Press Indicator, (local at tank) is greater than 350 psig.

NOTE: If the Engine Barring Device is engaged, pulling the spring loaded reset knob will cause the drive shaft for the barring device to move slightly to the right about $\frac{1}{4}$ inch after a clicking feel and an unlatching sound is sensed.

6. ___ Check reset or reset Engine Barring Device Reset knob by pulling the spring loaded black knob located on the barring device on the north side generator end of diesel.

7. ___ Check the following at the Woodward Governor:

- Lube oil level at or above 50%
- Extension arm in the Bimba Cylinder (grey air cylinder on the north face of the governor with rod connecting the fuel racks to the governor) is retracted. IF Bimba Cylinder extended, THEN contact Maintenance to provide assistance.

8. Check the following at the Engine Control Panel.

___ a. Check parameters in the indicated band.

- Lube Oil FM Cooler Temperature - GREATER THAN OR EQUAL TO 80°F
- Jacket Water Outlet Temperature - GREATER THAN OR EQUAL TO 100°F
- Expansion Tank Level - 50% TO 80%
- Fuel Oil Day Tank Level - 90% TO 95%
- Starting Air Pressure - 180 PSIG TO 240 PSIG

___ b. Check PANEL POWER ON light LIT at the Annunciator Panel.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE STARTING THE AAC DIESEL GENERATOR | ATTACHMENT 3 |
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___ c. Check or align switches as follows:

- Exhaust Gas - IN 13, 14, 15, or 16
- System Mode: (Selector Key Switch) - STANDBY
- Alarm Control - OFF after RESET
- Generator Heater - AUTO
- Lube Oil Heater - AUTO
- Coolant Heater - AUTO

9. ___ Check switches aligned. IF switches NOT aligned, THEN notify the SRO for evaluation.

- AAC System Test Switch (0-AAC-43-ESPO) - NORM (AAC Control Panel)
- Sequence Mode Selector Switch AAC System (0-AAC-SMSS-ESPO) - AUTO (AAC Control Panel)
- AAC System Test Switch (0-AAC-43-ESPA) - NORM (next to Network 90 Panel)

10. ___ Check or align switches at the Generator Control Panel.

- GEN. FRONT - Both Switches in - ENGINE
- VOLTMETER - Position 1-2

11. ___ Check or align switches inside the Generator Control Panel.

- PCB (Power Circuit Breaker gang switch up) - ON
- FCB (Field Circuit Breaker upside down) - ON
- VOLTAGE CONTROL MODE - AUTO (left position)
- IDLE/RATED toggle switch - RATED

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE STARTING THE AAC DIESEL GENERATOR | ATTACHMENT 3 |
| REVISION 24 | | PAGE 5 of 7 |

12. ___ Check open or open the following breaker control switches on the AAC Control Panel.

- 0-AAC-1-05M4, ACB 05M4 Generator Breaker
- 0-AAC-1-05M3, ACB 05M3 Bus 0M Tie to Bus 0L
- 0-AAC-1-05L2, ACB 05L2 Bus 0M Tie to Bus 0L
- 0-AAC-1-05L1, Transfer Bus E Tie
- 0-AAC-1-05L3, ACB 05L3 Transfer Bus D Tie
- 0-AAC-1-05M1, ACB 05M1 Feed to Xfmr 0M1
- 0-AAC-1-04M1-2, ACB 04M1-2 480V Alternate Feed

NOTE: If power to the AAC Building is being supplied from the Line 469, opening the 04M1-1 breaker will deenergize MCC 0M1-1 resulting in a loss of building lighting.

13. ___ Check open or open 0-AAC-1-04M1-1, ACB 04M1-1 480V Normal Feed.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE STARTING THE AAC DIESEL GENERATOR | ATTACHMENT 3 |
| REVISION 24 | | PAGE 6 of 7 |

***** :

- CAUTION:**
- The diesel MUST be stopped using the EMERGENCY STOP on the Engine Control Panel button within 10 seconds after engine start, if oil pressure on the LUBE OIL PRESSURE gauge is not on scale.
 - If the AAC Diesel is stopped using the EMERGENCY STOP button, the red EMERGENCY STOP button should NOT be reset until the engine has come to a complete stop. The EMERGENCY STOP button should be reset by turning the button clockwise to release the button latch mechanism after emergency condition is mitigated.
 - If a PLC FAILURE alarm (lower left hand corner) is indicated, the engine should not be operated. If the AAC Diesel is started with this condition, the following additional precautions should be considered:
 1. Automatic trip of the Diesel may not occur.
 2. Engine prelube will not take place.
 3. Automatic disengagement of the start motors will not occur at 170 rpm. As the engine approaches this speed, the Engine Start/Stop switch should be returned to Neutral.

***** :

14. ___ Start the AAC Diesel from the Engine Control Panel by placing and holding the ENGINE CONTROL switch in START for at least 5 seconds.
15. ___ Check the AAC diesel starts and oil pressure at the LUBE OIL PRESSURE gauge is indicated within 10 seconds.
16. ___ IF pressure is NOT indicated on the LUBE OIL PRESSURE gauge within 10 seconds, THEN immediately press the EMERGENCY STOP button.
17. ___ Check engine speed is approximately 900 rpm as indicated on the ENGINE SPEED meter.
18. ___ Check generator voltage is between 4000 and 4400 volts as indicated on the GENERATOR VOLTAGE meter on the Generator Control Panel. Adjust the VOLTAGE CONTROL switch on the AAC Control Panel as required.
19. ___ Check generator frequency is between 59.67 and 60.33 hertz as indicated on the GENERATOR FREQUENCY meter on the Generator Control Panel. Adjust the SPEED CONTROL switch on the AAC Control Panel as required.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 3 |
| REVISION 24 | STARTING THE AAC DIESEL GENERATOR | PAGE 7 of 7 |

20. ___ Check 0-AAC-BKR-05M4, AAC Generator Output Breaker, closed. IF breaker NOT closed, THEN do the following:
- ___ a. Obtain the Sync Switch Key from inside the AAC Generator Control Panel.
 - ___ b. Insert Synch Switch Key in receptacle 0-AAC-1SS-05M4, Manual Synch SW Gen Output, and place in ON.
 - ___ c. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in CLOSE.
 - ___ d. Place Synch Switch Key in OFF.

21. ___ Check closed 0-AAC-BKR-05M1, Feed To Xfmr 0M1. IF NOT, THEN close breaker by placing 0-AAC-1-05M1, Control Switch ACB 05M1 Feed to Xfmr 0M1, in CLOSE.

***** :

CAUTION: To prevent out of phase circulating currents and damage to equipment powered from 0-AAC-MCC-0M1, 0-AAC-BKR-04M1-1, 480V Bus 0M1 Normal Feed Circuit Breaker, and 0-AAC-BKR-04M1-2, 480V Bus 0M1 Alternate Feed Circuit Breaker, MUST NEVER be closed at the same time.

***** :

22. ___ Check closed 0-AAC-BKR-04M1-2, 480V Bus 0M1 Alternate Feed. IF NOT, THEN close breaker by placing 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480V Alternate Feed, in CLOSE.

23. ___ Check closed 0-AAC-BKR-05M3, Bus 0M Tie To Bus 0L. IF NOT, THEN close breaker by placing 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in CLOSE.

24. ___ Check closed or close 0-AAC-BKR-05L2, Bus 0M Tie To Bus 0L. IF NOT, THEN close breaker by placing 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in CLOSE.

25. ___ Check the following loads are reenergized.
- ___ • 0-BLO-P-1, Continuous Pre-lube Oil Pump, running
 - ___ • 0-BCW-P-3, Jacket Water Heater Pump, running
 - ___ • 0-BCW-HTR-1, Jacket Water Heater, Switch on/ Light Lit
 - ___ • 0-BSA-C-1A, Starting Air Compressor, Control Power On Light Lit
 - ___ • 0-BSA-C-1B, Starting Air Compressor, Control Power On Light Lit

26. ___ RETURN TO Step in effect.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE AAC DIESEL GENERATOR SHUTDOWN | ATTACHMENT 4 |
| REVISION 24 | | PAGE 1 of 5 |

NOTE: • If Line Circuit 469, Transfer Bus D or Transfer Bus E is NOT energized, OR an MER 5 MCR Chiller is being supplied from the AAC Diesel Generator, the AAC Diesel Generator should remain running as long as possible to keep the AAC BLDG loads or the MER 5 Chiller energized.

- A one-line diagram showing the AAC Electrical distribution is provided in Attachment 1.

1. ___ Check Line Circuit 469 - ENERGIZED, and at AAC Control Panel, perform the following to secure the AAC Diesel Generator. IF Line Circuit 469 NOT energized, THEN GO TO Step 2.
 - ___ a. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in TRIP.
 - ___ b. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.
 - ___ c. Place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480 V Normal Feed, in CLOSE.
 - ___ d. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.
Record time _____
 - ___ e. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.
 - ___ f. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.
 - ___ g. Check or place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.
 - ___ h. Check or place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in TRIP.
 - ___ i. Check or place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus E Tie, in TRIP.
 - ___ j. WHEN 5 to 10 minutes have elapsed from Step 1d, THEN perform Step k.
 - ___ k. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.
 - ___ l. GO TO Step 5.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE AAC DIESEL GENERATOR SHUTDOWN | ATTACHMENT 4 |
| REVISION 24 | | PAGE 2 of 5 |

2. ___ Check Transfer Bus D - ENERGIZED, and at the AAC Control Panel, perform the following.
IF Transfer Bus D NOT energized, THEN GO TO Step 3.
- ___ a. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.
 - ___ b. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.
 - ___ c. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.
 - ___ d. Place 0-AAC-1SS-05L3, Synchronizing Switch Bus 0L To Bus D in ON.
 - ___ e. Place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in CLOSE.
 - ___ f. Place 0-AAC-1SS-05L3, Synchronizing Switch Bus 0L To Bus D in OFF.
 - ___ g. Check or place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in CLOSE.
 - ___ h. Check or place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in CLOSE.
 - ___ i. Check or place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in CLOSE.
 - ___ j. Check or place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in CLOSE.
 - k. GO TO Step 5. WHEN Line Circuit 469 available, THEN do the following:
 - ___ 1. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in TRIP.
 - ___ 2. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.
 - ___ 3. Place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480 V Normal Feed, in CLOSE.
 - ___ 4. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.
 - ___ 5. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.
 - ___ 6. Place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.
 - ___ 7. Place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in TRIP.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE AAC DIESEL GENERATOR SHUTDOWN | ATTACHMENT 4 |
| REVISION 24 | | PAGE 3 of 5 |

___ 8. Check the following loads are reenergized.

- ___ 0-BLO-P-1, Continuous Pre-lube Oil Pump, running
- ___ 0-BCW-P-3, Jacket Water Heater Pump, running
- ___ 0-BCW-HTR-1, Jacket Water Heater, Switch on/ Light Lit
- ___ 0-BSA-C-1A, Starting Air Compressor, Control Power On Light Lit
- ___ 0-BSA-C-1B, Starting Air Compressor, Control Power On Light Lit

3. ___ Check Transfer Bus E - ENERGIZED, and at the AAC Control Panel, perform the following. IF Transfer Bus E NOT energized, THEN GO TO Step 4.

- ___ a. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.
- ___ b. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.
- ___ c. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.
- ___ d. Place 0-AAC-1SS-05L1, Synchronizing Switch Bus 0L To Bus E in ON.
- ___ e. Place 0-AAC-1-05L1, Control Switch ACB 05L3 Transfer Bus E Tie, in CLOSE.
- ___ f. Place 0-AAC-1SS-05L1, Synchronizing Switch Bus 0L To Bus E in OFF.
- ___ g. Check or place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in CLOSE.
- ___ h. Check or place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in CLOSE.
- ___ i. Check or place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in CLOSE.
- ___ j. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in CLOSE.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE AAC DIESEL GENERATOR SHUTDOWN | ATTACHMENT 4 |
| REVISION 24 | | PAGE 4 of 5 |

k. GO TO Step 5. WHEN Line Circuit 469 available, THEN do the following:

- ___ 1. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480 V Alternate Feed, in TRIP.
 - ___ 2. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.
 - ___ 3. Place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480 V Normal Feed, in CLOSE.
 - ___ 4. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.
 - ___ 5. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.
 - ___ 6. Place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.
 - ___ 7. Place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus E Tie, in TRIP.
 - ___ 8. Check the following loads are reenergized.
 - ___ 0-BLO-P-1, Continuous Pre-lube Oil Pump, running
 - ___ 0-BCW-P-3, Jacket Water Heater Pump, running
 - ___ 0-BCW-HTR-1, Jacket Water Heater, Switch on/ Light Lit
 - ___ 0-BSA-C-1A, Starting Air Compressor, Control Power On Light Lit
 - ___ 0-BSA-C-1B, Starting Air Compressor, Control Power On Light Lit
4. ___ Check Line Circuit 469, Transfer Bus D, or Transfer Bus E NOT available. WHEN any source becomes available, THEN complete Step 1, 2, or 3, depending on which source energized. GO TO Step 5.
5. ___ Check that auto-start signals are clear by checking the following. IF an auto-start signal is present, THEN GO TO Step 8. Perform Steps 6 and 7 when auto-start signals are clear.
- Unit 1: 1K-D3, BUS 1D UNDERVOLT, OR 1K-F3, BUS 1F UNDERVOLT, is NOT LIT
- AND
- Unit 2: 2K-E3, BUS 1E UNDERVOLT, OR 2K-F3, BUS 1F UNDERVOLT, is NOT LIT

| | | |
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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE AAC DIESEL GENERATOR SHUTDOWN | ATTACHMENT 4 |
| REVISION 24 | | PAGE 5 of 5 |

NOTE: The white light associated with the SEQUENCE MODE SELECTOR switch will light when the auto-start sequence is reset.

6. ___ WHEN all auto-start signals are clear, THEN reset the auto-start sequence by placing the SEQUENCE MODE SELECTOR switch on the AAC Control Panel in AUTO after OFF/RESET.
7. ___ Check SEQUENCE MODE SELECTOR white light is LIT.
8. ___ Place the Synch Switch Key inside SBO Generator Control Panel cubicle.
9. ___ Check the following loads are reenergized.
 - ___ • 0-BLO-P-1, Continuous Pre-lube Oil Pump, running
 - ___ • 0-BCW-P-3, Jacket Water Heater Pump, running
 - ___ • 0-BCW-HTR-1, Jacket Water Heater, Switch on/ Light Lit
 - ___ • 0-BSA-C-1A, Starting Air Compressor, Control Power On Light Lit
 - ___ • 0-BSA-C-1B, Starting Air Compressor, Control Power On Light Lit
10. ___ Check Diesel Engine crankcase oil level. Have the Maintenance Department fill if necessary. Oil level should be between the ADD and FULL marks on the ENGINE STOPPED WITH COLD OIL side of the dipstick.
11. ___ Order fuel oil to fill the Fuel Oil Day Tank.
12. ___ RETURN TO procedure in effect.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 5 |
| REVISION 24 | PARALLELING THE AAC DIESEL GENERATOR WITH EDG 3 AND SECURING THE AAC DIESEL GENERATOR | PAGE 1 of 5 |

- NOTE:**
- Continuous communications will be necessary to operate the AAC Diesel Generator in coincidence with the MCR indications and controls for EDG 3.
 - The speed and voltage of the AAC Diesel Generator may be adjusted as required to support the performance of Steps 7 and 8 below.

1. ___ Check or place ACB-25J3, Emergency Diesel Generator Output Breaker, in PTL.
2. ___ Check or place the UNIT 2 PNL 3-2 SWITCH 43-15J3 IN BYP COMMITS NO. 3 EDG TO UNIT 1 in BYP.
3. ___ Record the AAC Diesel Generator Kilowatts and Kilovars. (The var meter reads in Megavars)
 - _____ KW
 - _____ KVAR
4. ___ Slowly adjust the EDG 3 Speed Droop Control on the UG-8 Governor from zero to the scribe mark on the face of the dial.
5. ___ Check or place the ACB-15J3 Synchroscope Switch in ON at the Unit 1 EDG 3 Control Panel.
6. ___ Check EDG 3 voltage established on the Incoming Volt Meter. IF EDG 3 voltage NOT established, THEN establish voltage by depressing the EMERG GEN NO. 3 FIELD FLASH pushbutton.
7. ___ Adjust EDG 3 speed using the EMERG GEN NO 3 SPEED ADJ switch until the Synchroscope is rotating slowly in the Fast direction. (Preferably less than 1 revolution every 8 seconds)
8. ___ Adjust Incoming Volts to between 0 to plus 5 volts of the Running Volts using the EMERG GEN NO. 3 VOLT ADJ control switch.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE PARALLELING THE AAC DIESEL GENERATOR WITH EDG 3 AND SECURING THE AAC DIESEL GENERATOR | ATTACHMENT 5 |
| REVISION 24 | | PAGE 2 of 5 |

***** :

- CAUTION:**
- The load on Emergency Bus 1J should be picked up by EDG 3 as quickly as possible to prevent generator damage from circulating currents. IF unstable operation between the diesel generators occurs, THEN immediately open the 15J3 breaker.
 - EDG load shall not exceed 2750 KW.
 - The speed and voltage of the AAC Diesel Generator should NOT be adjusted while in parallel with EDG 3.
 - The load on the AAC Diesel Generator shall be maintained above 200 KW while in parallel with EDG 3. The MCR EDG 3 operator should be notified if load on the AAC Diesel Generator drops below 200 KW.

***** :

9. ___ WHEN the Synchroscope approaches the 12 o'clock position AND the Synchronization Lights are NOT LIT, THEN close ACB-15J3, Emergency Diesel Generator Output Breaker.
10. ___ Using the EMERG GEN NO. 3 SPEED ADJ switch, adjust load on EDG 3 to a value 200 KW - 500 KW less than the load recorded in Step 3.
11. ___ Using the EMERG GEN NO. 3 VOLT ADJ switch, adjust EDG 3 KVARs to a value 200 - 500 KVARs less than the KVARs recorded in Step 3.
12. ___ WHEN EDG 3 parameters are within Step 10 and 11 limits, THEN open breaker 15J8. Record the time breaker open. _____
13. ___ Place the Emergency Diesel Generator Output Breaker Synchroscope Switch in OFF.
14. ___ Adjust 1J Bus voltage between 4000 V and 4400 V using the EMERG GEN NO. 3 VOLT ADJ switch.
15. ___ Adjust 1J Bus frequency between 59.7 Hz and 60.3 Hz using EMERG GEN NO. 3 SPEED ADJ switch.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE PARALLELING THE AAC DIESEL GENERATOR WITH EDG 3 AND SECURING THE AAC DIESEL GENERATOR | ATTACHMENT 5 |
| REVISION 24 | | PAGE 3 of 5 |

***** :

- CAUTION:**
- Adjustments to the EDG governor speed droop setting while the EDG is running should be made slowly or hunting and surging by the engine may result.
 - If hunting or surging should develop, adjustment to the droop setting should be stopped until the EDG is steady.
 - The Control Room EDG Panel operator should avoid adjustments intended to compensate for hunting or surging, as directed by Shift Supervision, as these adjustments may increase the magnitude or duration of the upset.

***** :

16. ___ Notify the Operator stationed at the EDG governor to slowly adjust the governor speed droop to zero.
17. ___ Maintain 1J Bus voltage and frequency within the following limits:
 - 4000-4400 Volts
 - 59.7-60.3 Hertz
18. ___ Monitor EDG 3 for proper operation.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE PARALLELING THE AAC DIESEL GENERATOR WITH EDG 3 AND SECURING THE AAC DIESEL GENERATOR | ATTACHMENT 5 |
| REVISION 24 | | PAGE 4 of 5 |

- NOTE:**
- If Line Circuit 469 is NOT energized, OR an MER 5 MCR Chiller is being supplied from the AAC Diesel Generator, the AAC Diesel Generator should remain running as long as possible to keep AAC BLDG loads or an MCR Chiller energized.
 - If RSS Transformer A becomes available before Line Circuit 469 is available, 0-AP-10.08, STATION POWER RESTORATION, should be used to secure the AAC Diesel Generator.

19. ___ Check Line Circuit 469 energized. IF energized, THEN perform the following at the AAC Control Panel to secure the AAC Diesel Generator. IF Line Circuit 469 NOT energized, THEN perform Steps a through p when Line Circuit 469 is energized. IF RSST A becomes available before Line Circuit 469, THEN GO TO 0-AP-10.08, STATION POWER RESTORATION.

___ a. Allow the AAC Diesel to run for at least 10 minutes while only carrying the AAC BLDG loads. (10 minutes from Step 12)

___ b. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480V Alternate Feed, in TRIP.

___ c. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ d. Reset and place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480V Normal Feed, in CLOSE.

___ e. Wait 5 to 10 minutes for the AAC Diesel to cool down.

___ f. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ g. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ h. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ i. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.

___ j. Check or place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ k. Check or place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in TRIP.

___ l. Check that auto-start signals are clear by checking the following. IF an auto-start signal is present, THEN GO TO Step o. Perform Steps m and n when auto-start signals are clear.

- Unit 1: 1K-D3, BUS 1D UNDERVOLT, OR 1K-F3, BUS 1F UNDERVOLT, is NOT LIT

AND

- Unit 2: 2K-E3, BUS 1E UNDERVOLT, OR 2K-F3, BUS 1F UNDERVOLT, is NOT LIT

| | | |
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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE PARALLELING THE AAC DIESEL GENERATOR WITH EDG 3 AND SECURING THE AAC DIESEL GENERATOR | ATTACHMENT 5 |
| REVISION 24 | | PAGE 5 of 5 |

NOTE: The white light associated with the SEQUENCE MODE SELECTOR switch will light when the auto-start sequence is reset.

- ___ m. WHEN all auto-start signals are clear, THEN reset the auto-start sequence by placing the SEQUENCE MODE SELECTOR switch on the AAC Control Panel in AUTO after OFF/RESET.
- ___ n. Check SEQUENCE MODE SELECTOR white light is LIT.
- ___ o. Check Diesel Engine crankcase oil level. IF Oil level is NOT between the ADD and FULL marks on the ENGINE STOPPED WITH COLD OIL side of the dipstick, THEN have the Maintenance Department fill if necessary.
- ___ p. Order fuel oil to refill the Fuel Oil Day Tank.

20. ___ RETURN TO procedure Step 50.

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|----------------------|--|-----------------|
| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 6 |
| REVISION 24 | PARALLELING THE AAC DIESEL GENERATOR WITH EDG 2 AND SECURING THE AAC DIESEL GENERATOR | PAGE 1 of 5 |

- NOTE:**
- Continuous communications will be necessary to operate the AAC Diesel Generator in coincidence with the MCR indications and controls for EDG 2.
 - The speed and voltage of the AAC Diesel Generator may be adjusted as required to support the performance of Steps 5 and 6 below.

1. ___ Record the AAC Diesel Generator Kilowatts and Kilovars. (The var meter reads in Megavars)
 - _____ KW • _____ KVAR
2. ___ Slowly adjust the EDG 2 Speed Droop Control on the UG-8 Governor from zero to the scribe mark on the face of the dial.
3. ___ Check or place the ACB-25H3 Synchroscope Switch in ON at the EDG 2 Control Panel.
4. ___ Check EDG 2 voltage established on the Incoming Volt Meter. IF EDG 2 voltage NOT established, THEN establish voltage by depressing the EMERG GEN NO 2 FIELD FLASH pushbutton.
5. ___ Adjust EDG 2 speed using the EMERG GEN 2 SPEED CONT switch until the Synchroscope is rotating slowly in the Fast direction. (Preferably less than 1 revolution every 8 seconds)
6. ___ Adjust Incoming Volts to between 0 to plus 5 volts of the Running Volts using the EMERG GEN NO 2 VOLT ADJ control switch.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE PARALLELING THE AAC DIESEL GENERATOR WITH EDG 2 AND SECURING THE AAC DIESEL GENERATOR | ATTACHMENT 6 |
| REVISION 24 | | PAGE 2 of 5 |

***** :

- CAUTION:**
- The load on Emergency Bus 2H should be picked up by EDG 2 as quickly as possible to prevent generator damage from circulating currents. IF unstable operation between the diesel generators occurs, THEN immediately open the 25H3 breaker.
 - EDG load shall not exceed 2750 KW.
 - The speed and voltage of the AAC Diesel Generator should NOT be adjusted while in parallel with EDG 2.
 - The load on the AAC Diesel Generator shall be maintained above 200 KW while in parallel with EDG 2. The MCR EDG 2 operator should be notified if load on the AAC Diesel Generator drops below 200 KW.

***** :

7. ___ WHEN the Synchroscope approaches the 12 o'clock position AND the Synchronization Lights are NOT LIT, THEN close ACB-25H3, Emergency Diesel Generator Output Breaker.
8. ___ Using the EMERG GEN NO 2 SPEED CONT switch, adjust load on EDG 2 to a value 200 KW - 500 KW less than the load recorded in Step 1.
9. ___ Using the EMERG GEN NO 2 VOLT CONT switch, adjust EDG 2 KVARs to a value 200 - 500 KVARs less than the KVARs recorded in Step 1.
10. ___ WHEN EDG 2 parameters are within Step 8 and 9 limits, THEN open breaker 25H8. Record the time breaker open. _____
11. ___ Place the Emergency Diesel Generator Output Breaker Synchroscope Switch in OFF.
12. ___ Adjust 2H Bus voltage between 4000 V and 4400 V using the EMERG GEN NO 2 VOLT CONT switch.
13. ___ Adjust 2H Bus frequency between 59.7 Hz and 60.3 Hz using EMERG GEN NO 2 SPEED CONT switch.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE PARALLELING THE AAC DIESEL GENERATOR WITH EDG 2 AND SECURING THE AAC DIESEL GENERATOR | ATTACHMENT 6 |
| REVISION 24 | | PAGE 3 of 5 |

***** :

- CAUTION:**
- Adjustments to the EDG governor speed droop setting while the EDG is running should be made slowly or hunting and surging by the engine may result.
 - If hunting or surging should develop, adjustment to the droop setting should be stopped until the EDG is steady.
 - The Control Room EDG Panel operator should avoid adjustments intended to compensate for hunting or surging, as directed by the Shift Supervision, as these adjustments may increase the magnitude or duration of the upset.

***** :

14. ___ Notify the Operator stationed at the EDG governor to slowly adjust the governor speed droop to zero.

15. ___ Maintain 2H Bus voltage and frequency within the following limits:

- 4000-4400 Volts
- 59.7-60.3 Hertz

16. ___ Monitor EDG 2 for proper operation.

- NOTE:**
- If Line Circuit 469 is NOT energized, OR an MER 5 MCR Chiller is being supplied from the AAC Diesel Generator, the AAC Diesel Generator should remain running as long as possible to keep AAC BLDG loads or an MCR Chiller energized.
 - If RSS Transformer B becomes available before Line Circuit 469 is available, 0-AP-10.08, STATION POWER RESTORATION, should be used to secure the AAC Diesel Generator.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 6 |
| REVISION 24 | PARALLELING THE AAC DIESEL GENERATOR WITH EDG 2 AND SECURING THE AAC DIESEL GENERATOR | PAGE 4 of 5 |

17. ___ Check Line Circuit 469 energized. IF energized, THEN perform the following at the AAC Control Panel to secure the AAC Diesel Generator. IF Line Circuit 469 NOT energized, THEN perform Steps a through p when Line Circuit 469 is energized. IF RSST B becomes available before Line Circuit 469, THEN initiate 0-AP-10.08, STATION POWER RESTORATION.

___ a. Allow the AAC Diesel to run for at least 10 minutes while only carrying the AAC BLDG loads. (10 minutes from Step 10)

___ b. Place 0-AAC-1-04M1-2, Control Switch ACB 04M1-2 480V Alternate Feed, in TRIP.

___ c. Wait 10 to 20 seconds for the voltage to decay on the 480V Bus.

___ d. Reset and place 0-AAC-1-04M1-1, Control Switch ACB 04M1-1 480V Normal Feed, in CLOSE.

___ e. Wait 5 to 10 minutes for the AAC Diesel to cool down.

___ f. Place the ENGINE CONTROL switch in STOP at the Engine Control Panel.

___ g. Place 0-AAC-1-05M1, Control Switch ACB 05M1 Feed To Xfmr 0M1, in TRIP.

___ h. Place 0-AAC-1-05M3, Control Switch ACB 05M3 Bus 0M Tie To Bus 0L, in TRIP.

___ i. Place 0-AAC-1-05M4, Control Switch ACB 05M4 Generator Breaker, in TRIP.

___ j. Check or place 0-AAC-1-05L2, Control Switch ACB 05L2 Bus 0M Tie To Bus 0L, in TRIP.

___ k. Check or place 0-AAC-1-05L1, Control Switch ACB 05L3 Transfer Bus E Tie, in TRIP.

___ l. Check that auto-start signals are clear by checking the following. IF an auto-start signal is present, THEN GO TO Step o. Perform Steps m and n when auto-start signals are clear.

- Unit 1: 1K-D3, BUS 1D UNDERVOLT, OR 1K-F3, BUS 1F UNDERVOLT, is NOT LIT

AND

- Unit 2: 2K-E3, BUS 1E UNDERVOLT, OR 2K-F3, BUS 1F UNDERVOLT, is NOT LIT

| | | |
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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE PARALLELING THE AAC DIESEL GENERATOR WITH EDG 2 AND SECURING THE AAC DIESEL GENERATOR | ATTACHMENT 6 |
| REVISION 24 | | PAGE 5 of 5 |

NOTE: The white light associated with the SEQUENCE MODE SELECTOR switch will light when the auto-start sequence is reset.

- ___ m. WHEN all auto-start signals are clear, THEN reset the auto-start sequence by placing the SEQUENCE MODE SELECTOR switch on the AAC Control Panel in AUTO after OFF/RESET.
- ___ n. Check SEQUENCE MODE SELECTOR white light is LIT.
- ___ o. Check Diesel Engine crankcase oil level. IF Oil level is NOT between the ADD and FULL marks on the ENGINE STOPPED WITH COLD OIL side of the dipstick, THEN have the Maintenance Department fill if necessary.
- ___ p. Order fuel oil to refill the Fuel Oil Day Tank.

18. ___ RETURN TO procedure Step 50.

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|----------------------|--|-----------------|
| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 7 |
| REVISION 24 | PARALLELING EDG 3 WITH BUS 1J WITH BUS 2H REMAINING ON THE AAC DIESEL GENERATOR | PAGE 1 of 3 |

1. ___ Check or place ACB-25J3, Emergency Diesel Generator Output Breaker, in PTL.
2. ___ Check or place the UNIT 2 PNL 3-2 SWITCH 43-15J3 IN BYP COMMITS NO. 3 EDG TO UNIT 1 in BYP.
3. ___ At Unit 1 EDG 3 Control Panel record XFER BUS D AMPS below.
_____ amps
4. ___ Slowly adjust the EDG 3 Speed Droop Control on the UG-8 Governor from zero to the scribe mark on the face of the dial.
5. ___ Place the ACB-15J3 Synchroscope Switch in ON at the Unit 1 EDG 3 Control Panel.
6. ___ Check EDG 3 voltage established on the Incoming Volt Meter. IF EDG 3 voltage NOT established, THEN establish voltage by depressing the EMERG GEN NO. 3 FIELD FLASH pushbutton.
7. ___ Adjust EDG 3 speed using the EMERG GEN NO 3 SPEED ADJ switch until the Synchroscope is rotating slowly in the Fast direction. (Preferably less than 1 revolution every 8 seconds)
8. ___ Adjust Incoming Volts to between 0 to plus 5 volts of the Running Volts using the EMERG GEN NO. 3 VOLT ADJ control switch.

***** :

- CAUTION:**
- The load on Emergency Bus 1J should be picked up by EDG 3 as quickly as possible to prevent generator damage from circulating currents. IF unstable operation between the diesel generators occurs, THEN immediately open the 15J3 breaker.
 - EDG load shall not exceed 2750 KW.
 - The speed and voltage of the AAC Diesel Generator should NOT be adjusted while in parallel with EDG 3.
 - The load on the AAC Diesel Generator shall be maintained above 200 KW while in parallel with EDG 3. The MCR EDG 3 operator should be notified if load on the AAC Diesel Generator drops below 200 KW.

***** :

| | | |
|----------------------|--|-----------------|
| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 7 |
| REVISION 24 | PARALLELING EDG 3 WITH BUS 1J WITH BUS 2H REMAINING ON THE AAC DIESEL GENERATOR | PAGE 2 of 3 |

9. ___ WHEN the Synchroscope approaches the 12 o'clock position AND the Synchronization Lights are NOT LIT, THEN close ACB-15J3, Emergency Diesel Generator Output Breaker.
10. ___ Using the EMERG GEN NO. 3 VOLT ADJ switch, adjust EDG 3 KVARs to a value of 200 - 600 KVARs OUT.
11. ___ Using the EMERG GEN NO. 3 SPEED ADJ switch, adjust EDG 3 load until the reading on EMERG BUS 1J AMPS meter is equal to the value recorded in Step 3. (plus or minus 50 amps)
12. ___ WHEN the reading on the EMERG BUS 1J AMPS meter is within Step 11 limits, THEN open ACB-15J8.
13. ___ Place the Emergency Diesel Generator Output Breaker Synchroscope Switch in OFF.
14. ___ Adjust 1J Bus voltage to between 4000 V and 4400 V using the EMERG GEN NO. 3 VOLT ADJ switch.
15. ___ Adjust 1J Bus frequency to between 59.7 Hz and 60.3 Hz using EMERG GEN NO. 3 SPEED ADJ switch.

***** :

- CAUTION:**
- Adjustments to the EDG governor speed droop setting while the EDG is running should be made slowly or hunting and surging by the engine may result.
 - If hunting or surging should develop, adjustment to the droop setting should be stopped until the EDG is steady.
 - The Control Room EDG Panel operator should avoid adjustments intended to compensate for hunting or surging, as directed by Shift Supervision, as these adjustments may increase the magnitude or duration of the upset.

***** :

16. ___ Notify the Operator stationed at the EDG governor to slowly adjust the governor speed droop to zero.
17. ___ Maintain Bus 1J voltage and frequency within the following limits:
 - 4000-4400 Volts
 - 59.7-60.3 Hertz

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE PARALLELING EDG 3 WITH BUS 1J WITH BUS 2H REMAINING ON THE AAC DIESEL GENERATOR | ATTACHMENT 7 |
| REVISION 24 | | PAGE 3 of 3 |

18. ___ IF an MCR Chiller is supplied from the AAC Diesel Generator, THEN GO TO Step 20.
IF NOT, THEN place 0-AAC-1-05L3, Control Switch ACB 05L3 Transfer Bus D Tie, in TRIP.
19. ___ At Unit 1 EDG 3 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-15J8, in NORMAL position.
20. ___ Monitor EDG 3 for proper operation.
21. ___ RETURN TO procedure Step 20.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 8 |
| REVISION 24 | PARALLELING EDG 2 WITH BUS 2H WITH BUS 1J REMAINING ON THE AAC DIESEL GENERATOR | PAGE 1 of 2 |

1. ___ At EDG 2 Control Panel record XFER BUS E AMPS below.
_____ amps
2. ___ Slowly adjust the EDG 2 Speed Droop Control on the UG-8 Governor from zero to the scribe mark on the face of the dial.
3. ___ Place the ACB-25H3 Synchroscope Switch in ON at the EDG 2 Control Panel.
4. ___ Check EDG 2 voltage established on the Incoming Volt Meter. IF EDG 2 voltage NOT established, THEN establish voltage by depressing the EMERG GEN NO 2 FIELD FLASH pushbutton.
5. ___ Adjust EDG 2 speed using the EMERG GEN 2 SPEED CONT switch until the Synchroscope is rotating slowly in the Fast direction. (Preferably less than 1 revolution every 8 seconds)
6. ___ Adjust Incoming Volts to between 0 to plus 5 volts of the Running Volts using the EMERG GEN NO 2 VOLT ADJ control switch.

***** :

CAUTION: • The load on Emergency Bus 2H should be picked up by EDG 2 as quickly as possible to prevent generator damage from circulating currents. IF unstable operation between the diesel generators occurs, THEN immediately open the 25H3 breaker.

- EDG load shall not exceed 2750 KW.
- The speed and voltage of the AAC Diesel Generator should NOT be adjusted while in parallel with EDG 2.
- The load on the AAC Diesel Generator shall be maintained above 200 KW while in parallel with EDG 2. The MCR EDG 2 operator should be notified if load on the AAC Diesel Generator drops below 200 KW.

***** :

7. ___ WHEN the Synchroscope approaches the 12 o'clock position AND the Synchronization Lights are NOT LIT, THEN close ACB-25H3, Emergency Diesel Generator Output Breaker.
8. ___ Using the EMERG GEN NO 2 VOLT ADJ switch, adjust EDG 2 KVARs to a value of 200 - 600 KVARs OUT.

| | | |
|----------------------|--|-----------------|
| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 8 |
| REVISION 24 | PARALLELING EDG 2 WITH BUS 2H WITH BUS 1J REMAINING ON THE AAC DIESEL GENERATOR | PAGE 2 of 2 |

9. ___ Using the EMERG GEN 2 SPEED CONT switch, adjust EDG 2 load until the reading on EMERG BUS 2H AMPS meter is equal to the value recorded in Step 1. (plus or minus 50 amps)
10. ___ WHEN the reading on the EMERG BUS 2H AMPS meter is within Step 9 limits, THEN open ACB-25H8.
11. ___ Place the Emergency Diesel Generator Output Breaker Synchroscope Switch in OFF.
12. ___ Adjust 2H Bus voltage to between 4000 V and 4400 V using the EMERG GEN NO 2 VOLT ADJ switch.
13. ___ Adjust 2H Bus frequency to between 59.7 Hz and 60.3 Hz using EMERG GEN NO 2 SPEED CONT switch.

***** :

CAUTION: • Adjustments to the EDG governor speed droop setting while the EDG is running should be made slowly or hunting and surging by the engine may result.

- If hunting or surging should develop, adjustment to the droop setting should be stopped until the EDG is steady.
- The Control Room EDG Panel operator should avoid adjustments intended to compensate for hunting or surging, as directed by Shift Supervision, as these adjustments may increase the magnitude or duration of the upset.

***** :

14. ___ Notify the Operator stationed at the EDG governor to slowly adjust the governor speed droop to zero.
15. ___ Maintain Bus 2H voltage and frequency within the following limits:
 - 4000-4400 Volts
 - 59.7-60.3 Hertz
16. ___ Place 0-AAC-1-05L1, Control Switch ACB 05L1 Transfer Bus E Tie, in TRIP.
17. ___ At EDG 2 Control Panel, place Transfer Switch NORMAL/AAC, 0-AAC-43-25H8, in AAC position.
18. ___ Monitor EDG 2 for proper operation.
19. ___ RETURN TO procedure Step 8.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 9 |
| REVISION 24 | LOADING BUSES 1J AND 2H DURING SIMULTANEOUS ECA-0.0 EVENT | PAGE 1 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--|--------------------------|-----------------------|
| ***** : | | |
| <p>CAUTION:</p> <ul style="list-style-type: none"> • The AAC Diesel Generator has 4.0 hour fuel supply when operating at rated load of 3640 KW. • When the AAC Diesel Generator is supplying both units, <u>only</u> the following loads may be started <u>initially</u> to maintain both units at HSD. After this equipment is started, additional loads may be energized IAW Shift Supervision direction (not to exceed 3640 KW). <ul style="list-style-type: none"> • One CHG pump per unit • PRZR heaters on each unit (Unit 1, Bank A) (Unit 2, Bank E) • One Filtered Exhaust Fan • 480 V loads (including 2 Control Room Chillers, 2 ESGR AHUs, and 2 MCR AHUs) • CHG pumps and PRZR heaters must not be started simultaneously. Coordination must be maintained between units to prevent starting these loads simultaneously. | | |
| ***** : | | |
| <p>NOTE: If all RCP seal cooling has been previously lost, a charging pump should <u>NOT</u> be started until the RCP seals are isolated.</p> | | |

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 9 |
| REVISION 24 | LOADING BUSES 1J AND 2H DURING SIMULTANEOUS ECA-0.0 EVENT | PAGE 2 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|--------|--|-----------------------|
| 1. ___ | LOAD THE FOLLOWING EQUIPMENT ON BUSES 1J AND 2H | |
| | a) Align CHG pumps: | |
| | <input type="checkbox"/> 1) Select one CHG to be started on each unit <ul style="list-style-type: none"> • 1-CH-P-1B • 2-CH-P-1A • 1-CH-P-1C (ALT) • 2-CH-P-1C (NORM) | |
| | <input type="checkbox"/> 2) Check open or open NORMAL suction MOV for CHG pump to be started | |
| | 3) Check open CHG pump suction from RWST on each unit | |
| | <input type="checkbox"/> • 1-CH-MOV-1115D | |
| | <input type="checkbox"/> • 2-CH-MOV-2115B | |
| | 4) Check open or open CHG pump recirc MOV | |
| | 5) Check open or open CHG pump miniflow recirc valves | |
| | <input type="checkbox"/> • 1-CH-MOV-1373 | |
| | <input type="checkbox"/> • 2-CH-MOV-2373 | |
| | 6) Check closed or close CHG line isolation valve | |
| | <input type="checkbox"/> • 1-CH-MOV-1289B | |
| | <input type="checkbox"/> • 2-CH-MOV-2289A | |
| 2. ___ | DIVERT AUX BLDG CENTRAL AND DECON BLDG TO FILTERED EXHAUST | |
| 3. ___ | START 1-VS-F-58B | |

| | | |
|----------------------|--|-----------------|
| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 9 |
| REVISION 24 | LOADING BUSES 1J AND 2H DURING SIMULTANEOUS ECA-0.0 EVENT | PAGE 3 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|--|--|
| 4. ___ | START SELECTED UNIT 1 CHG PUMP | |
| 5. ___ | START SELECTED UNIT 2 CHG PUMP | |
| 6. ___ | CHECK IA - AVAILABLE | <p>Do the following:</p> <p><input type="checkbox"/> a) Locally control CHG flow using CHG FCV manual isolation.</p> <p>b) Open CHG line isolation valves.</p> <p><input type="checkbox"/> • ()-CH-MOV-()289A</p> <p><input type="checkbox"/> • ()-CH-MOV-()289B</p> <p>c) GO TO Step 9.</p> |
| 7. ___ | <p>OPEN CHG LINE ISOLATION VALVES</p> <ul style="list-style-type: none"> • ()-CH-MOV-()289B • ()-CH-MOV-()289A | |
| 8. ___ | <p>CONTROL PRZR LEVEL USING</p> <ul style="list-style-type: none"> • ()-CH-FCV-()122 | |
| 9. ___ | <p>ENERGIZE PRZR HEATERS BANKS ONE AT A TIME AS NECESSARY TO CONTROL RCS PRESSURE</p> <ul style="list-style-type: none"> • Unit 1, Bank A • Unit 2, Bank E | |
| 10. ___ | <p>START TWO CRDM FANS ON EACH UNIT</p> <ul style="list-style-type: none"> • 1-VS-F-60C • 1-VS-F-60D • 2-VS-F-60A • 2-VS-F-60F | |
| 11. ___ | ALIGN AND START TWO MCR CHILLERS ON LOOP C | |

| | | |
|----------------------|--|-----------------|
| NUMBER 0-AP-17.06 | ATTACHMENT TITLE LOADING BUSES 1J AND 2H DURING SIMULTANEOUS ECA-0.0 EVENT | ATTACHMENT 9 |
| REVISION 24 | | PAGE 4 of 4 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------|---|-----------------------|
| 12. ___ | ALIGN TWO ESGR AHUs AND TWO MCR AHUs ON LOOP C | |
| 13. ___ | LOCALLY CHECK AAC DIESEL GENERATOR LOAD | |
| 14. ___ | START LOADS ON EITHER UNIT TO SUPPORT PLANT STABILIZATION (NOT TO EXCEED 3640 KW) | |
| 15. ___ | INITIATE ()-OP-RX-002, SHUTDOWN MARGIN (CALCULATED AT ZERO POWER) | |
| 16. ___ | RETURN TO PROCEDURE STEP 38 | |

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE ALIGNING BATTERY ROOM VENTILATION (BUS 1J) | ATTACHMENT 10 |
| REVISION 24 | | PAGE 1 of 1 |

Bus 1J

NOTE: The actions in Step 1 provide a positive air supply into Battery Room thereby preventing a Hydrogen build-up while batteries are being recharged.

1. ___ Align Battery Room 1B Ventilation.
 - ___ a. Open slide damper 1-VS-DMP-134. (West Wall of Battery Room 1B)
 - ___ b. Close slide damper 1-VS-DMP-135. (West Wall of Battery Room 1B)
 - ___ c. Open Battery Room 1B door.
 - ___ d. Establish fire watch and security watch.

2. ___ Record the time when Battery Room Ventilation was realigned: _____

3. ___ Check 1J Emergency Bus - SEVEN HOURS HAVE ELAPSED SINCE VENTILATION REALIGNMENT. (Time recorded in Step 2.)

NOTE: The actions in Step 4 are taken to prevent over-cooling the Station Batteries and thus compromising the batteries' operability.

4. ___ Align Battery Room 1B Ventilation to prevent over-cooling Battery Rooms.
 - ___ a. Open slide damper 1-VS-DMP-135. (West Wall of Battery Room 1B)
 - ___ b. Close slide damper 1-VS-DMP-134. (West Wall of Battery Room 1B)
 - ___ c. Close Battery Room 1B door.
 - ___ d. Relax fire watch and security watch.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE ALIGNING BATTERY ROOM VENTILATION (BUS 2H) | ATTACHMENT 11 |
| REVISION 24 | | PAGE 1 of 1 |

Bus 2H

NOTE: The actions in Step 1 provide a positive air supply into the Battery Room thereby preventing a Hydrogen build-up while batteries are being recharged.

1. ___ Align Battery Room 2A Ventilation.
 - ___ a. Open slide damper 2-VS-DMP-63. (East Wall of Battery Room 2A)
 - ___ b. Close slide damper 2-VS-DMP-64. (East Wall of Battery Room 2A)
 - ___ c. Open Battery Room 2A door.
 - ___ d. Establish fire watch and security watch.

2. ___ Record the time when Battery Room Ventilation was realigned: _____

3. ___ Check 2H Emergency Bus - SEVEN HOURS HAVE ELAPSED SINCE VENTILATION REALIGNMENT. (Time recorded in Step 2.)

NOTE: The actions in Step 4 are taken to prevent over-cooling the Station Batteries and thus compromising the batteries' operability.

4. ___ Align Battery Room 2A Ventilation to prevent over-cooling Battery Rooms.
 - ___ a. Open slide damper 2-VS-DMP-64. (East Wall of Battery Room 2A)
 - ___ b. Close slide damper 2-VS-DMP-63. (East Wall of Battery Room 2A)
 - ___ c. Close Battery Room 2A door.
 - ___ d. Relax fire watch and security watch.

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| NUMBER 0-AP-17.06 | ATTACHMENT TITLE | ATTACHMENT 12 |
| REVISION 24 | PROBABLE CAUSES AND REFERENCES | PAGE 1 of 1 |

I. PROBABLE CAUSES:

1. Loss of off-site power with failure of the station EDGs

II. REFERENCES:

1. DCP 92-052-3, Alternate Diesel Generator Installation
2. 0-OP-EG-001, NUMBER 3 EMERGENCY DIESEL GENERATOR
3. 1K-D3, 1K-E3, 1K-F3, BUS 1(D, E, F) UNDERVOLT
4. Plant Issue S-1999-2394, Caution before Step 2
5. DCP 99-002, Air Supply Modification to Vital Bus Battery Rooms
6. Plant Issue S-2000-0863, Parallel Operation of 58 Fans at 18,000 cfm, JCO SC-00-01 and associated Safety Evaluation S-00-057
7. PI S-2001-2626, Minimum 1-VS-E-4A/4B Bus Voltage
8. CME 01-0041, Rev. 0, Final Control and Operating Arrangement of 1-VS-58A, -58B
9. DCP 01-070, MCR Chiller Breaker Replacement
10. PI S-2004-1503, SOER 99-01, Loss of Grid Events
11. DCP 06-052, Modify Circuit Breaker Logic for Loading AAC Diesel Generator onto the Emergency Buses
12. CR110847, EDG 3 may load onto 1J Emergency Bus in parallel with AAC Diesel
13. CR341449, Check 480 VAC Loads Repowered Following Swap

U.S. Nuclear Regulatory Commission
Surry Power Station

FINAL

SR12301
In Plant Job Performance Measure 076A2.01 (3.5 / 3.7)
[Alternate Path]

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Isolate Service Water to #5 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.

Applicability

Estimated Time

Actual Time

RO/SRO(I)/SRO(U)

12 Minutes

____ Minutes

Conditions

- Task is to be SIMULATED in the Plant.
- Major Service Water Leak in #5 MER.

Standards

- 0-AP-13.00, Turbine Building or MER 3 Flooding, Step 22.

Initiating Cues

- Shift Manager Direction.
- 0-AP-13.00, Turbine Building or MER 3 Flooding, Step 22.

Terminating Cues

- 0-AP-13.00, Turbine Building or MER 3 Flooding, Step 22, complete.

Procedures

- 0-AP-13.00, Turbine Building or MER 3 Flooding, Rev 25
- Probabilistic Risk Assessment, SPS Units 1&2 IPE, FDS-1ME2
- SA-AA-104, Confined Space Entry

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Initial Conditions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- A major Service Water leak has been reported in #5 MER.
- The SW header from Unit 1D Waterbox is in service.
- The #5 MER chillers have been secured.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Service Building Inside Operator.
- Here is a copy of 0-AP-13.00, Turbine Building or #3 MER Flooding, Step 22. I need you to isolate Service Water to #5 MER in accordance with Step 22.
- When you finish the actions necessary to accomplish this Task, please inform me.

Notes

- This task is to be SIMULATED. Do NOT allow the Candidate to manipulate controls, operate switches or reposition valves

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded.
- **START TIME:**

| | |
|---|---|
| <p>STEP 1:</p> <p>CLOSE OR CHECK CLOSED 2-SW-530 TO ISOLATE SW TO MER 5 (<i>Step 22a</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Proceeds to #5 MER. b) Locates 2-SW-530 in northwest corner of MER 5. c) Closes 2-SW-530 by rotating the handwheel clockwise until valve stem is fully inserted. <p>EVALUATOR'S NOTE:</p> <p>If asked: Approximately 3" of water on floor. If asked: Flooding is from dike area next to electrical room, overflowing into chiller area.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>CLOSE OR CHECK CLOSED 2-SW-532 TO ISOLATE SW TO MER 5 (<i>Step 22a</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> (a) Locates 2-SW-532 in northwest corner of MER 5. (b) Closes 2-SW-532 by rotating the handwheel clockwise until valve stem is fully inserted. <p>EVALUATOR'S NOTE:</p> <p>If asked: Flooding continues from dike area next to electrical room, overflowing into chiller area.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
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| <p>STEP 3: CLOSE OR CHECK CLOSED 2-SW-535 TO ISOLATE SW TO MER 5. <i>(Step 22a)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Locates 2-SW-535 in MER 5 on back wall 10 feet from the west wall, waist high. b) Closes 2-SW-535 by rotating the valve handle clockwise until the valve stem is fully inserted. c) Observes no flow indicated on 1-SW-FI-132D. <p>EVALUATOR'S NOTE:</p> <p>If asked: Flooding continues from dike area next to electrical room, overflowing into chiller area.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 4: CLOSE OR CHECK CLOSED 2-SW-536 TO ISOLATE SW TO MER. <i>(Step 22a)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Locates 2-SW-536 in MER 5 on back wall 10 feet from the east wall, waist high. b) Closes 2-SW-536 by rotating the valve handle clockwise until the valve stem is fully inserted. c) Observes no flow indicated on 1-SW-FI-132E <p>EVALUATOR'S NOTE:</p> <p>If asked: Flooding continues from dike area next to electrical room, overflowing into chiller area.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 5: Check flooding - STOPPED. <i>(Step 22b)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Identifies flooding continues. b) Goes to 22b RNO. <p>EVALUATOR'S NOTE:</p> <p>If asked: Water still pouring over top of dike.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STEP 6: [ALTERNATE PATH STARTS HERE]

Check or place in service SW Header 1D IAW 0-OP-SW-49.3, SWAPPING CONTROL ROOM CHILLER AND CHARGING PUMP SW SUPPLY HEADERS. (Step 22 b, RNO 1))

STANDARD:

- a) Recalls from initial briefing that the 1D SW header is in service. (or)
- b) Simulates Gai-Tronics use to contact SRO for the status of the 1D SW header. (or)
- c) Checks 1-SW-495, in the Unit 1 CC HX SW MOV Pit, open and supplying the 1D SW header.

EVALUATOR'S NOTE:

- **If asked:** 1D SW header is in service.
- **If asked:** Evaluated Space requirements are met. No potential for additional atmospheric hazards
- **If asked:** Should Candidate go to Unit 1 CC HX SW MOV Pit to determine 1-SW-495 position, after Candidate points out valve location, use flashlight to indicate 1-SW-495 position arrow is pointing towards the OPEN position.

Safety Concern: Candidate does not have to travel down into the valve pits. They can identify which valve label they are looking at, and the evaluator can state the label reads "1-SW-495" if the correct label is identified. The Trainee can describe actions to complete valve manipulation from above.

Safety Concern: The valve pits have been classified as Evaluated Spaces. Do not allow the Candidate to enter the valve pits. The Candidate should mention that the valve pits are Evaluated Spaces.

Security Concern: Certain valve pits are now covered by gated enclosures. If the enclosure is to be opened security must be contacted first. It is permissible for the Candidate to simply describe the actions required to open the gated enclosures.

COMMENTS:

_____ SAT
 _____ UNSAT

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| <p>STEP 7:</p> <p>Close 2-SW-474, located in Unit 2 BC HX SW MOV pit. (<i>Step 22b, RNO 2</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none">a) Locates 2-SW-474 in Unit 2 BC HX SW MOV Pit and pulls pin from 2-SW-474 valve operator.b) Closes 2-SW-474 by rotating the handwheel in the clockwise direction.c) Candidate returns to #5 MER to determine status of #5 MER flooding. <p>EVALUATOR'S CUE: If asked, after 2-SW-474 closed; Water is still flowing over the dike in #5 MER.</p> <p>EVALUATOR'S NOTE:</p> <p>When Candidate locates 2-SW-474 in Unit 2 BC HX MOV pit and describes action in b) above, use flashlight to indicate 2-SW-474 position indicator moving from OPEN to CLOSE position; valve motion stops when CLOSED position reached.</p> <p>If asked: All confined space requirements have been met by another operator and that operator is standing by the valve pits acting as a "hole watch".</p> <p>Safety Concern: Candidate does not have to travel down into the valve pits. They can identify which valve label they are looking at, and the evaluator can state the label reads "1-SW-495" if the correct label is identified. The Trainee can describe actions to complete valve manipulation from above.</p> <p>Safety Concern: The valve pits have been classified as Evaluated Spaces. Do not allow the Candidate to enter the valve pits. The Candidate should mention that the valve pits are Evaluated Spaces.</p> <p>Security Concern: Certain valve pits are now covered by gated enclosures. If the enclosure is to be opened security must be contacted first. It is permissible for the Candidate to simply describe the actions required to open the gated enclosures.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
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| <p>STEP 8:</p> <p>CHECK THAT FLOODING HAS STOPPED. (<i>Step 22b, RNO 3</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Locates 2-SW-11 in Unit 2 RS HX SW MOV (SW-MOV-203C/D) Pit. b) Pull pin from 2-SW-11 valve positioner. c) Closes 2-SW-11 by rotating the handwheel in the clockwise direction. <p>EVALUATOR'S CUE: When Candidate locates 2-SW-11 in Unit 2 RS HX SW MOV pit and describes action in c) above, use flashlight to indicate 2-SW-11 position indicator moving from OPEN to CLOSE position; valve motion stops when CLOSED position reached.</p> <ul style="list-style-type: none"> d) Returns to MER #5 and verifies flooding stopped. <p>EVALUATOR'S CUE: When Candidate returns to #5 MER to determine status of flooding, inform Candidate that water has stopped flowing over the dike, and water level on the floor is 2" and decreasing.</p> <p>EVALUATOR'S NOTE:</p> <p>Safety Concern: Candidate does not have to travel down into the valve pits. They can identify which valve label they are looking at, and the evaluator can state the label reads "2-SW-11" if the correct label is identified. The Trainee can describe actions to complete valve manipulation from above.</p> <p>Safety Concern: The valve pits have been classified as Evaluated Spaces. Do not allow the Candidate to enter the valve pits. The Candidate should mention that the valve pits are Evaluated Spaces.</p> <p>Security Concern: Certain valve pits are now covered by gated enclosures. If the enclosure is to be opened security must be contacted first. It is permissible for the Candidate to simply describe the actions required to open the gated enclosures.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
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| | |
|---|---|
| <p>STEP 9: REPORTS TO SHIFT MANAGER (EVALUATOR). STANDARD: Verbal report that 0-AP-13.00, Step 22 is complete. COMMENTS: <p style="text-align: center;">** JPM COMPLETE **</p> </p> | <p style="text-align: center;">_____ SAT</p> <p style="text-align: center;">_____ UNSAT</p> |
|---|---|

STOP TIME:

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

Task

- Task is to be performed in the Plant.
- Perform 0-AP-13.00, Turbine Building or MER 3 Flooding, Step 22.

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

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- A major Service Water leak has been reported in #5 MER.
- The SW header from Unit 1D Waterbox is in service.
- The #5 MER chillers have been secured.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Service Building Inside Operator.
- Here is a copy of 0-AP-13.00, Turbine Building or #3 MER Flooding, Step 22. I need you to isolate Service Water to #5 MER in accordance with Step 22.
- When you finish the actions necessary to accomplish this Task, please inform me.

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

Initial Conditions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- A major Service Water leak has been reported in #5 MER.
- The SW header from Unit 1D Waterbox is in service.
- The #5 MER chillers have been secured.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Service Building Inside Operator.
- Here is a copy of 0-AP-13.00, Turbine Building or #3 MER Flooding, Step 22. I need you to isolate Service Water to #5 MER in accordance with Step 22.
- When you finish the actions necessary to accomplish this Task, please inform me.

| | | |
|------------|------------------------------------|----------|
| NUMBER | PROCEDURE TITLE | REVISION |
| 0-AP-13.00 | TURBINE BUILDING OR MER 3 FLOODING | 25 |
| | | PAGE |
| | | 6 of 18 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---------------|--|---|
| 21. <u>RO</u> | SECURE MER 5 CHILLERS: | |
| | <input checked="" type="checkbox"/> • 1-VS-E-4D <input checked="" type="checkbox"/> • 1-VS-E-4E | |
| 22. ___ | ISOLATE SW TO MER 5: | |
| | a) Close or check closed the following isolation valves: | |
| | <input type="checkbox"/> • 2-SW-530 (NW corner of MER 5) <input type="checkbox"/> • 2-SW-532 (NW corner of MER 5) <input type="checkbox"/> • 2-SW-535 (South wall, West side of MER 5) <input type="checkbox"/> • 2-SW-536 (South wall, East side of MER 5) | |
| | <input type="checkbox"/> b) Check flooding - STOPPED | b) Do the following: |
| | | <input type="checkbox"/> 1) Check or place in service SW Header 1D IAW 0-OP-SW-49.3, SWAPPING CONTROL ROOM CHILLER AND CHARGING PUMP SW SUPPLY HEADERS. <input type="checkbox"/> 2) Close 2-SW-474, located in Unit 2 BC HX SW MOV pit. <input type="checkbox"/> 3) <u>IF</u> flooding <u>NOT</u> stopped, <u>THEN</u> close 2-SW-11, located in Unit 2 RX HX SW MOV pit. |
| 23. ___ | CHECK CONTROL ROOM CHILLERS - ONE RUNNING | <input type="checkbox"/> Start Control Room Chiller IAW Shift Supervision direction using 0-OP-VS-006, CONTROL ROOM RELAY ROOM VENTILATION SYSTEM. |
| 24. ___ | GO TO STEP 49 | |

U.S. Nuclear Regulatory Commission
Surry Power Station

SR12301
In Plant Job Performance Measure 065AK3.08 (3.7 / 3.9)

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Align Turbine Building IA to Containment

K/A: 065AK3.08 Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Actions contained in EOP for loss of instrument air.

Applicability

Estimated Time

Actual Time

RO/SRO(I)/SRO(U)

7 Minutes

____ Minutes

Conditions

- Task is to be SIMULATED in the Plant.
- Any plant mode/condition.

Standards

- ARP 1B-F6, CTMT INST AIR LO HDR PRESS, Step 2b RNO steps 1 & 2 complete.

Initiating Cues

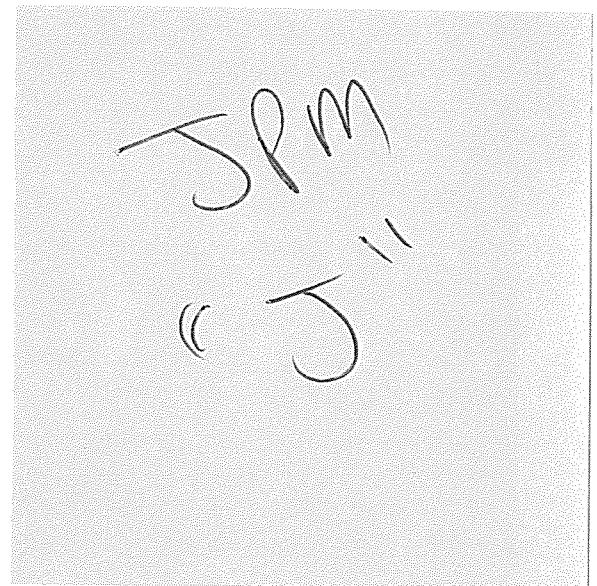
- Shift Manager Direction.
- ARP 1B-F6, CTMT INST AIR LO HDR PRESS, Step 2 RNO.

Terminating Cues

- 1-IA-446 and 1-IA-447 open.

Procedures

- ARP 1B-F6, CTMT INST AIR LO HDR PRESS, Rev 1



Tools and Equipment

- Zone 5 (Aux Bldg) Admin Key

Safety Considerations

- Standard Personal Safety Equipment
- ALARA
- Potential overhead contamination

Initiating Cues

- Unit 1 is experiencing a loss of Ctmt IA pressure.

Directions to the Candidate

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager and you are the Auxiliary Building Operator. Unit 1 is experiencing a loss of Containment IA pressure.
- I need you to locally open 1-IA-446 and 447 to cross-connect Unit 1 Turbine Bldg IA to containment, and standby until an operator has been briefed and sent to relieve you.
- You have all the necessary keys to perform this task.
- When you finish the actions necessary to accomplish this Task, please inform me.

Notes

- This task is to be SIMULATED. Do NOT allow the operator to manipulate valves or violate the containment integrity boundary.
- There is **potential overhead contamination** in the Aux Bldg basement clean floor areas, DO NOT touch overhead piping.

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded.
- **START TIME:**

| | |
|--|---|
| <p>STEP 1</p> <p>LOCATE 1-IA-446 AND 1-IA-447. <i>(Step 2b, RNO 2)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Proceeds to the Unit 1 side of Aux Bldg basement penetration area and locates these valves (in overhead). b) Unlocks and removes lock and chain from 1-IA-446 and 1-IA-447. c) Open 1-IA-446 by turning handwheel counter-clockwise. d) Open 1-IA-447 by turning handwheel counter-clockwise. <p>EVALUATOR CUE:</p> <p>If asked: When the second valve is opened, flow noise is heard.</p> <ul style="list-style-type: none"> e) Candidate locates to low dose waiting area near Unit 1 Auxiliary Building penetration area. <p>EVALUATOR'S NOTE:</p> <p>1-IA-446 and 1-IA-447 are in series. When last valve opened, flow noise will be heard.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 2:</p> <p>REPORT TO NUCLEAR SHIFT MANAGER (EVALUATOR).</p> <p>STANDARD</p> <p>Verbal status report made of task completion</p> <p>COMMENTS:</p> <p style="text-align: center;">** JPM COMPLETE **</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

STOP TIME:

Notes:

| | | |
|-------------------------|---|------------------------|
| <p>NUMBER 1B-F6</p> | <p>PROCEDURE TITLE CTMT INST AIR HDR LO PRESS</p> | <p>REVISION 1</p> |
| | | <p>PAGE 2 of 6</p> |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|------|---|--|
| 1. | <p><input checked="" type="checkbox"/> VERIFY CTMT IA PRESSURE - LESS THAN OR EQUAL TO 80 PSIG</p> | <p><input type="checkbox"/> GO TO Step 7.</p> |
| 2. | <p><input type="checkbox"/> VERIFY PROPER LINEUP FOR PLANT CONDITIONS:</p> | <p>Do the following:</p> |
| | <p><input checked="" type="checkbox"/> • 1-IA-TV-100 →</p> <p><input type="checkbox"/> • 1-IA-TV-101A</p> <p><input type="checkbox"/> • 1-IA-TV-101B</p> <p><input type="checkbox"/> • 1-IA-AOV-103</p> | <p><input checked="" type="checkbox"/> a) Manually align valves.</p> <p>b) <u>IF</u> proper valve alignment can <u>NOT</u> be obtained, <u>THEN</u> do the following:</p> <p><input type="checkbox"/> 1) Dispatch Operator with Zone 5 admin key.</p> <p><input type="checkbox"/> 2) Have Operator open 1-IA-446 and 1-IA-447.</p> <p><input type="checkbox"/> 3) Start 4 hour clock for CTMT integrity.</p> <p><input type="checkbox"/> 4) Brief an Operator and assign Admin Control of 1-IA-446 and 1-IA-447 IAW 1-OP-IA-005, ADMINISTRATIVE CONTROL OF UNIT 1 INSTRUMENT AIR TO UNIT 1 CONTAINMENT VALVES 1-IA-446 AND 1-IA-447.</p> <p><input type="checkbox"/> 5) Stop 4 hour clock for CTMT integrity.</p> <p><input type="checkbox"/> 6) GO TO Step 4.</p> |

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

Task

- Task is to be SIMULATED in the Plant.
- Perform ARP 1B-F6, CTMT INST AIR LOW HDR PRESS, Step 2b RNO steps 1 & 2 complete.

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 experiencing a loss of Ctmt IA pressure.

Directions to the Candidate

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager and you are the Auxiliary Building Operator. Unit 1 is experiencing a loss of Containment IA pressure.
- I need you to locally open 1-IA-446 and 447 to cross-connect Unit 1 Turbine Bldg IA to containment, and standby until an operator has been briefed and sent to relieve you.
- You have all the necessary keys to perform this task.
- When you finish the actions necessary to accomplish this Task, please inform me.

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

Initial Conditions

- Unit 1 is experiencing a loss of Ctmt IA pressure.

Directions to the Candidate

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Nuclear Shift Manager and you are the Auxiliary Building Operator. Unit 1 is experiencing a loss of Containment IA pressure.
- I need you to locally open 1-IA-446 and 447 to cross-connect Unit 1 Turbine Bldg IA to containment, and standby until an operator has been briefed and sent to relieve you.
- You have all the necessary keys to perform this task.
- When you finish the actions necessary to accomplish this Task, please inform me.

U.S. Nuclear Regulatory Commission
Surry Power Station

FINAL

SR12301
Simulator Job Performance Measure 038EA1.32 (4.6 / 4.7)

Applicant _____

Start Time _____

Examiner _____

Date _____

Stop Time _____

Title

Locally Isolate the Secondary System (1-E-3, Attachment 1)

K/A: 038EA1.32 Ability to operate and monitor the following as they apply to a SGTR: Isolation of a ruptured SG

Applicability

Estimated Time

Actual Time

RO/SRO(I)

15 Minutes

____ Minutes

Conditions

- Task is to be SIMULATED in the Plant.
- A SGTR has occurred on the Unit 1 "B" SG and the "B" MSTV and NRV will not close. The "A" and "C" SG MSTVs have been closed.

Standards

- Unit 1 secondary system isolated IAW 1-E-3, Attachment 1, Step 6 completed.

Initiating Cues

- Shift Manager Direction.
- 1-E-3, SGTR, (RNO column) Step 3.e RNO e.1.

Terminating Cues

- 1-E-3, SGTR, Attachment 1, Step 6 completed.

Procedures

- 1-E-3, Steam Generator Tube Rupture, Rev 43.

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Initiating Cues

- "B" Steam Generator Tube Rupture with the failure of "B" SG isolation from the Control Room.

Directions to the Applicant

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- A SGTR has occurred on the Unit 1 "B" SG and the "B" MSTV and NRV will not close. The "A" and "C" SG MSTVs have been closed.
- Steam Dumps have NOT been locally isolated.
- I am the Nuclear Shift Manager and you are the Turbine Building Operator.
- Here's 1-E-3, Attachment 1. I need you to locally isolate Unit 1 secondary system IAW 1-E-3, Attachment 1, Steps 4 through 6.
- When you finish the actions necessary to accomplish this Task, please inform me.

Notes

- This task is to be SIMULATED. Do NOT allow the Candidate to manipulate controls, operate switches or reposition valves.

PERFORMANCE CHECKLIST

Notes to the Evaluator

- Task critical elements are bolded.

- **START TIME:**

| | |
|--|-------------------------------------|
| <p>STEP 1:</p> <p>Auxiliary and Gland Steam Isolation (<i>Step 4</i>)</p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Locally open auxiliary steam crosstie: 1-AS-8. (<i>Step 4a</i>) b) Locally close auxiliary steam isolation: 1-AS-1. (<i>Step 4b</i>) c) Locally verify gland steam supply from main steam closed: 1-MS-15 (<i>Step 4c</i>) <p>EVALUATOR'S NOTE:</p> <ul style="list-style-type: none"> a) 1-AS-8 located on right side of stairs, near Unit 1 side of Fire Door #28. When SIMULATING Opening: Valve freely moves when handwheel turned Counter-clockwise, and stem threads appear above handwheel. After several turns, handwheel motion stops. Candidate should move handwheel one half turn clockwise to ensure valve does not jam on backseat. b) 1-AS-1 located on Turbine Building Mezzanine level, west of 1-AS-PCV-100, six feet above floor. When valve handwheel turned Clockwise, valve freely moves and stem threads disappear into valve handwheel. After several turns of the handwheel, valve motion stops, and two threads showing above handwheel. c) 1-MS-15 located on Turbine Building Mezzanine, west of 1-MS-PCV-104, six feet above floor. When valve handwheel turned Clockwise, valve freely moves and stem threads disappear into valve handwheel. After several turns of the handwheel, valve motion stops, and two threads showing above handwheel. <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
|--|-------------------------------------|

| | |
|---|-------------------------------------|
| <p>STEP 2:</p> <p>Turbine Building Steam Trap Isolation, Locally Close Main steam line and Turbine trap isolation valves: <i>(Step 5a)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) Reviews Note prior to Step 5: NOTE: Steps 5 and 6 may be performed in any order. b) 1-MS-46 (mezz level north face of south stanchion under HP turb). c) 1-MS-50 (mezz level north face of south stanchion under HP turb). d) 1-MS-30 (mezz level south face of north stanchion under HP turb). e) 1-MS-35 (mezz level south face of north stanchion under HP turb) f) 1-MS-55 (mezz level west of grating over HP drain pp). <p>EVALUATOR'S NOTE:</p> <p>When valve handwheel turned Clockwise, valve moves freely. After several turns of the handwheel, valve motion stops.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 3:</p> <p>Turbine Building Steam Trap Isolation, Locally close Reheat steam line trap isolation valves: <i>(Step 5b)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) 1-SD-367 (mezz level; NW corner of condenser; between 2nd & 3rd point ES piping). b) 1-SD-382 (mezz level; SW corner of condenser). c) 1-SD-415 (mezz level; SE corner of condenser; left of stairs to H₂ area; ~2 feet below grating level) d) 1-SD-420 (mezz level; NE corner of condenser; behind VP tank). <p>EVALUATOR'S NOTE:</p> <p>When valve handwheel turned Clockwise, valve moves freely. After several turns of the handwheel, valve motion stops.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

| | |
|--|-------------------------------------|
| <p>STEP 4:</p> <p>Turbine Building Steam Trap Isolation, locally close Steam Dump steam traps. <i>(Step 5c)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) 1-SD-425 (Locally at the steam dumps on mezz level). b) 1-SD-430 (Locally at the steam dumps on mezz level). c) 1-SD-372 (north side of mezz level handrails at access platforms). d) 1-SD-377 (north side of mezz level handrails at access platforms). e) 1-SD-432 (TB bsmt; East end of condenser; left under TCV-MS-105B). f) 1-SD-436 (TB bsmt; East end of condenser; left under TCV-MS-106B). g) 1-SD-401 (TB bsmt; West end of condenser; right under TCV-MS-106A). h) 1-SD-405 (TB bsmt; West end of condenser; right under TCV-MS-105A). <p>EVALUATOR'S CUE: If asked: Concerning Steam Dump Local isolation, have the Candidate refer to the Initial Conditions.</p> <p>EVALUATOR'S NOTE:</p> <p>When valve handwheel turned Clockwise, valve moves freely. After several turns of the handwheel, valve motion stops.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |
| <p>STEP 5:</p> <p>Sample Line Isolation, locally close valves on Sample Panel 1-SS-PNL-101. <i>(Step 6)</i></p> <p>STANDARD:</p> <ul style="list-style-type: none"> a) 1-SS-711, "A" steam line sample isolation. b) 1-SS-626, "A" steam line sample isolation. c) 1-SS-710, "B" steam line sample isolation. d) 1-SS-627, "B" steam line sample isolation. e) 1-SS-709, "C" steam line sample isolation. f) 1-SS-628, "C" steam line sample isolation. <p>EVALUATOR'S NOTE:</p> <p>When valve handwheel turned Clockwise, valve moves freely. After several turns of the handwheel, valve motion stops.</p> <p>COMMENTS:</p> | <p>_____ SAT</p> <p>_____ UNSAT</p> |

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

Task

- Task is to be SIMULATED in the Plant.
- Locally isolate Unit 1 secondary system IAW 1-E-3, Attachment 1, Steps 4 though 6.

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

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- A SGTR has occurred on the Unit 1 "B" SG and the "B" MSTV and NRV will not close. The "A" and "C" SG MSTVs have been closed.
- Steam Dumps have NOT been locally isolated.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Turbine Building Operator.
- Here's 1-E-3, Attachment 1. I need you to locally isolate Unit 1 secondary system IAW 1-E-3, Attachment 1, Steps 4 though 6.
- When you finish the actions necessary to accomplish this Task, please inform me.

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

Initial Conditions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- A SGTR has occurred on the Unit 1 "B" SG and the "B" MSTV and NRV will not close. The "A" and "C" SG MSTVs have been closed.
- Steam Dumps have NOT been locally isolated.

Initiating Cues

- I am the Nuclear Shift Manager and you are the Turbine Building Operator.
- Here's 1-E-3, Attachment 1. I need you to locally isolate Unit 1 secondary system IAW 1-E-3, Attachment 1, Steps 4 through 6.
- When you finish the actions necessary to accomplish this Task, please inform me.

| | | |
|-----------------|--|-----------------|
| NUMBER 1-E-3 | ATTACHMENT TITLE SECONDARY SYSTEM ISOLATION | ATTACHMENT 1 |
| REVISION 43 | | PAGE 1 of 2 |

1. Steam Dump Isolation

- a. Put the STM DUMP CONTR switch in OFF and verify the steam dumps close.
- b. IF steam dump valves do NOT close, THEN locally close the following valves:
- N/A 1-MS-21 N/A 1-MS-61

2. Reheat Steam Isolation

- Verify reheat FCVs closed.
- Close MSR STM SUP valves:
- 1-MS-MOV-100A 1-MS-MOV-100B
- 1-MS-MOV-100C 1-MS-MOV-100D

3. Safeguards Steam Trap Isolation

- Verify steam trap trip valves closed:
- 1-MS-TV-109 1-MS-TV-110
- IF trip valves will NOT close, THEN locally close the following steam trap header isolation valve:
- N/A 1-MS-3

4. Auxiliary and Gland Steam Isolation

- a. Locally open auxiliary steam crosstie:
- ___ 1-AS-8
- b. Locally close auxiliary steam isolation:
- ___ 1-AS-1
- c. Locally verify gland steam supply from main steam closed:
- ___ 1-MS-15

| | | |
|-----------------|--|-----------------|
| NUMBER 1-E-3 | ATTACHMENT TITLE SECONDARY SYSTEM ISOLATION | ATTACHMENT 1 |
| REVISION 43 | | PAGE 2 of 2 |

NOTE: Steps 5 and 6 may be performed in any order.

5. Turbine Building Steam Trap Isolation

a. Locally close Main steam line and Turbine trap isolation valves:

___ 1-MS-55 ___ 1-MS-30 ___ 1-MS-46
 ___ 1-MS-35 ___ 1-MS-50

b. Locally close Reheat steam line trap isolation valves:

___ 1-SD-382 ___ 1-SD-420
 ___ 1-SD-415 ___ 1-SD-367

c. IF steam dumps were NOT locally isolated, THEN locally close the following isolation valves:

___ 1-SD-425 ___ 1-SD-372 ___ 1-SD-401 ___ 1-SD-432
 ___ 1-SD-430 ___ 1-SD-377 ___ 1-SD-405 ___ 1-SD-436

6. Sample Line Isolation

Locally close the following sample line isolation valves at west end of Sample Panel 1-SS-PNL-101.

___ 1-SS-711 MS line A
 ___ 1-SS-626 MS line A
 ___ 1-SS-710 MS line B
 ___ 1-SS-627 MS line B
 ___ 1-SS-709 MS line C
 ___ 1-SS-628 MS line C