# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Establishing Charging Pump Cooling

JPM Number: 2017 NRC P.1 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. Brower 8/18/17

Technical Reviewer Date

Approved:

M.S. Cote 8/18/17

Supervisor, Nuclear Training Date

# SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Original issue from Bank (JPM P093) | 0 |

## JPM WORKSHEET

Facility: MP3 Examinee: __________

JPM Number: 2017 NRC P.1 Revision: 0

Task Title: Establishing Charging Pump Cooling

System: 076 Service Water System

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 21

Task Number(s): 344-05-002, 344-05-153

Applicable To: SRO **X** RO **X**

K/A Number: 076.A2.01 K/A Rating: 3.5 / 3.7

Method of Testing: Simulated Performance: X Actual Performance: ____

Location: Classroom: ____ Simulator: ____ In-Plant: X

Task Standards: Satisfactorily complete establishing alternate charging pump cooling following a loss of service water, using AOP 3560, Attachment B.

Required Materials: (procedures, equipment, etc.) Depending on plant conditions, a high radiation area key may be required. Check status and obtain key if required.

General References: AOP 3560, *Loss of Service Water*, Rev. 010

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC P.1 Revision : 0

Initial Conditions: A complete loss of service water occurred and a service water pump cannot be started.

- The reactor has tripped and the crew has entered E-0, *Reactor Trip or Safety Injection*.
- The crew is performing steps in AOP 3560, *Loss of Service Water*, in parallel with E-0.
- The "A" Charging Pump is running.

Initiating Cues: The US directs you to perform AOP 3560, Attachment B, steps B.1 through B.4 to establish alternate charging pump cooling.

Simulator Requirements: NONE

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC P.1 Revision: 0

Task Title: Establishing Charging Pump Cooling

START TIME: ________

| | | | | |
|---|---|---|---|---|
| **STEP #1** AOP3560 Att B step B.1 | Performance:<br>**DETERMINE Affected Charging Pump**<br><br>**CHECK** a Train A Charging pump - RUNNING | Standard:<br>Realizes from Initial Conditions that Charging Pump A is running. Examinee may also simulate checking which pump is running locally, or call Control Room to determine which pump is running. After determining the "A" Charging pump is running, proceeds to to the Note prior to step 2 of procedure (versus step 3 for "B" charging pump). | Critical:<br>Y[ ] N[X] | Grade<br>S[ ] U[ ] |
| Cue: | If the Examinee checks which Charging Pump is running locally, or asks the Control Room which pump is running, state "The "A" Charging Pump is running." | | | |
| Comments: | | | | |
| **STEP #2** AOP3560 Att B step B.2 NOTE | Performance:<br>**NOTE:** Fire Water System pressure is higher than the CCE Heat Exchanger Service Water Outlet Relief Valve (3SWP*RV96A) setpoint pressure. | Standard:<br>Examinee reviews the Note | Critical:<br>Y[ ] N[X] | Grade<br>S[ ] U[ ] |
| Cue: | | | | |
| Comments: | | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #3** AOP3560 Att B step B.2.a | Performance: **Locally ALIGN Fire Water Supply to CCE Heat Exchanger A** **CONNECT** a hose from Fire Header Hose Station 52 Supply Valve (3FPW-V812) to CCE HX A Service Water Inlet Drain Valve (3SWP*V196) | Standard: Locates valve 3FPW-V812 in AB 24' west side near the "B" RPCCW HX; Locates valve 3SWP*V196 in CCE HX area, about waist high, west corner; Simulates obtaining hose, fittings and tools as necessary from EOP/AOP locker 43' AB outside boron evaporator cubicle and simulates connecting. | Critical: Y **[X]** N [ ] | Grade S [ ] U [ ] |
| Cue: | | | | |
| Comments: | Obtaining equipment will be simulated, but the Examinee must go to the locker to locate the hose as well as appropriate tools and fittings | | | |
| **STEP #4** AOP3560 Att B Step B.2.b | Performance: **CLOSE** CCE HX A Service Water Supply Valve (3SWP*V31) | Standard: Locates valve 3SWP*V31 in CCE HX area about neck level, near west corner; and rotates handle in the clockwise direction to close the valve. | Critical: Y **[X]** N [ ] | Grade S [ ] U [ ] |
| Cue: | "The valve handwheel starts rotating in the clockwise direction - eventually, resistance is met, and the valve handwheel comes to a hard stop." | | | |
| Comments: | | | | |
| **STEP #5** AOP3560 Att B step B.2.c | Performance: **THROTTLE** Open Fire Header Hose Station 52 Supply Valve (3FPW-V812) **One** turn | Standard: Locates valve 3FPW-V812 in AB 24' west side outboard of "B" RPCCW HX; rotates hand wheel in the COUNTER-clockwise direction to throttle open the valve one turn. | Critical: Y **[X]** N [ ] | Grade S [ ] U [ ] |
| Cue: | "The valve hand wheel rotates one turn in the counter-clockwise direction." "The hose begins to pressurize" | | | |

| | | | | |
|---|---|---|---|---|
| Comments: | | | | |
| **STEP #6**<br>AOP3560 Att B step B.2.d | Performance:<br>**THROTTLE** Open CCE HX A Service Water Inlet Drain Valve (3SWP*V196) to establish between 30 and 40 gpm flow (3SWP*FI 160A) | Standard:<br>Locates valve 3SWP*V196 in CCE HX area, about waist high, west corner; rotates handle in the COUNTER-clockwise direction to throttle open the valve to obtain flow.<br><br>Locates flow indicator 3SWP*FI 160A in CCE HX area entrance, east side, floor level; and verifies and adjusts flow as necessary. | Critical:<br>Y **[X]** N[ ] | Grade<br>S[ ] U[ ] |
| Cue: | "The valve hand wheel rotates one turn in the counter-clockwise direction."<br>"Water begins to flow through the hose."<br>When the examinee looks at the indicator, state, "Flow indicates 18 gpm."<br>If the examinee checks flow intermittently as 3SWP*V196 is throttled open, provide flow indication between 18 and 24 gpm.<br>Eventually state that "the valve handwheel comes to a hard stop."<br>Then, when flow is checked on 3SWP*FI 160A, state, "Flow indicates 25 gpm." | | | |
| Comments: | This requires the Examinee to go to the RNO to adjust 3FPW-V812. | | | |
| **STEP #7**<br>AOP3560 Att B step B.2.d RNO | Performance:<br>**ADJUST** Fire Hose Station 52 Supply Valve (3FPW-V812) to establish between 30 and 40 gpm flow (3SWP*FI 160A) | Standard:<br>Locates valve 3FPW-V812 in AB 24' west side outboard of "B" RPCCW HX; rotates hand wheel in the COUNTER-clockwise direction to throttle open, to obtain 30 to 40 gpm.<br>Locates flow indicator 3SWP*FI 160A in CCE HX area entrance, east side, floor level; and verifies and adjusts flow to obtain between 30 and 40 gpm. | Critical:<br>Y **[X]** N[ ] | Grade<br>S[ ] U[ ] |
| Cue: | "The valve hand wheel rotates in the COUNTER-clockwise direction."<br>When the checks the flow indicator, state, "Flow indicates 35 gpm." | | | |
| Comments: | | | | |

| STEP | Performance: | Standard: | Critical: | Grade |
|---|---|---|---|---|
| **STEP #8** AOP3560 Att B step B.2.e | Performance: **CHECK** CCE HX SW Outlet Relief (3SWP*RV96A) - **<u>NOT</u>** LIFTING | Standard: Locates valve 3SWP*RV96A in CCE HX area, middle of west wall, and checks for flow through valve. | Y[ ] N[X] | S[ ] U[ ] |
| Cue: | "No flow through the valve is indicated." | | | |
| Comments: | | | | |
| **STEP #9** AOP3560 Att B step B.2.f | Performance: <u>PROCEED</u> <u>TO</u> step B.4 | Standard: Proceeds to step B.4 | Y[ ] N[X] | S[ ] U[ ] |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #10** AOP3560 Att B step B.4.a | Performance: **Locally MONITOR CCE System**<br>**CHECK** operating Charging pump oil temperature - BETWEEN 55 AND 131°F<br>• For pump A, 3CHS-TI 1022A | Standard: Locates temperature indicator 3CHS-TI 1022A in the "A" charging pump cubicle (indicator on east side, approximately waist-high on "A" charging pump) | Y[ ] N[X] | S[ ] U[ ] |
| Cue: | When the temperature indicator is checked, state, "Temperature indicates 95°F and steady." | | | |
| Comments: | | | | |

| STEP #11 | Performance: Notify the Control Room that steps B.1 through B.4 of AOP 3560, Attachment B are complete | Standard: Reports to the US that alternate charging pump cooling is established for the "A" charging pump in accordance with AOP 3560, Attachment B. | Critical: Y [ ] N [X] | Grade S [ ] U [ ] |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

**TERMINATION CUE: The evaluation for this JPM is concluded.**

STOP TIME: ________________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC P.1 Revision: 0

Task Title: Establishing Charging Pump Cooling

Date Performed: ______________

Examinee: ______________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **21** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC P.1 Revision: 0

Initial Conditions: A complete loss of service water occurred and a service water pump cannot be started.

- The reactor has tripped and the crew has entered E-0, *Reactor Trip or Safety Injection*.
- The crew is performing steps in AOP 3560, *Loss of Service Water*, in parallel with E-0.
- The "A" Charging Pump is running.

Initiating Cues: The US directs you to perform AOP 3560, Attachment B, steps B.1 through B.4 to establish alternate charging pump cooling.

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Energizing MCC 32-3T following CDA

JPM Number: 2017 NRC P.2 Revision: 0

Initiated:

Robert Royce

Developer 8/17/17

Date

Reviewed:

Dave Minnich

Technical Reviewer 8/17/17

Date

Reviewed:

E. BRADEK

Technical Reviewer 8/18/17

Date

Approved:

M.J. Cote

Supervisor, Nuclear Training 8/18/17

Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Modified from Bank (JPM P007A) | 0 |
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# JPM WORKSHEET

Facility: **MP3** Examinee: ____________

JPM Number: 2017 NRC P.2 Revision: **0**

Task Title: Energizing MCC 32-3T following CDA

System: 062

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 20

Applicable To: SRO **X** RO **X**

K/A Number: 062.A2.01 K/A Rating: 3.4 / 3.9

Method of Testing: Simulated Performance: X Actual Performance: ____

Location: Classroom: ____ Simulator: ____ In-Plant: X

Task Standards: Energize MCC 32-3T and verify the MCC is supplying inverter 6

Required Materials: (procedures, equipment, etc.) EOP 35 GA-1, *Energizing MCC 32-3T*, Rev. 004

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC P.2 Revision : 0

Initial Conditions:

**A large-break LOCA occurred 15 minutes ago, resulting in the following sequence of events:**

1. **SIS, LOP, and CDA all actuate.**
2. **Both Emergency Buses energize from the Emergency Diesels.**
3. **The crew enters E-1, *Loss of Reactor or Secondary Coolant*.**
4. **The crew resets SIS and LOP.**

Initiating Cues:

**The US directs you to energize MCC 32-3T using GA-1, *Energizing MCC 32-3T,* starting with Step 2.**

Simulator Requirements: N/A

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC P.2 Revision: 0

Title: Energizing MCC 32-3T following CDA

START TIME: ________

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #1** GA-1 Note prior to Step 1 | Performance: **NOTE:** The Inverter 6 DC INPUT breaker will trip after 30 minutes of operation without AC power. | Standard: Reads note. | Critical: Y ☐ N ☒ | Grade S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Initial Condition specified it has been 15 minutes since offsite power was lost. | | | |
| **STEP #2** GA-1 Step 1 | Performance: **Reset ESF Actuation Signals**<br>a. **RESET** SI<br>b. **RESET** LOP | Standard: Determines from Initial Conditions or call to Control Room that SI and LOP are reset. | Critical: Y ☐ N ☒ | Grade S ☐ U ☐ |
| | Cue: If examinee contacts Control Room to determine status of SI and LOP signals, state "SI and LOP have been reset." | | | |
| | Comments: Initial Condition specified that SI and LOP signals are reset. | | | |
| **STEP #3** GA-1, Caution prior to Step 1 | Performance: **CAUTION:** MCC 32-3T feeder breaker trip should **NOT** be overridden without BOTH a CDA and LOP (Sequencer signal) present. | Standard: Reviews Caution. | Critical: Y ☐ N ☒ | Grade S ☐ U ☐ |
| | Cue: | | | |
| | Comment: | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| STEP #4<br>GA-1 Step 2.a | Performance:<br>**Check if MCC32-3T Feeder Breaker Trip Should Be Overridden**<br>a. Check annunciator CONTAINMENT DEPRES ACTUATION (MB2B 5-5)- LIT | Standard:<br>Determines from Initial Conditions or call to Control Room that CDA annunciator is lit.<br>Proceeds to GA-1, step 2.b | Critical:<br>Y ☐ N ☒ | Grade<br>S ☐ U ☐ |
| | Cue:<br>If examinee requests status of CDA annunciator, state: "The CDA annunciator at MB2B 5-5 is lit." | | | |
| | Comment: Initial Condition specified that CDA actuated. | | | |
| STEP #5<br>GA-1 Step 2.b | Performance:<br>b. CHECK emergency bus 34C - ENERGIZED BY EDG A | Standard:<br>Determines from Initial Conditions or call to Control Room that bus 34C is energized by EDG A.<br>Proceeds to GA-1, step 3 | Critical:<br>Y ☐ N ☒ | Grade<br>S ☐ U ☐ |
| | Cue:<br>If examinee requests status of bus 34C, state: "Bus 34C is energized from the 'A' Emergency Diesel." | | | |
| | Comment: Initial Condition specified that bus 34C is energized by its EDG. | | | |
| STEP #6<br>GA-1 Step 3.a | Performance:<br>**At Bus 32T, Override MCC 32-3T Feeder Breaker**<br>a. On cubicle 32T10-2, **PRESS** SIS/CDA/LOP OVERRIDE MCC 32-3T pushbutton | Standard:<br>At cubicle 32T10-2 (top right cubicle), locates the override pushbutton and depresses it. | Critical:<br>**Y** ☒ N ☐ | Grade<br>S ☐ U ☐ |
| | Cue:<br>If examinee looks at or requests the status of the red "Override" indicating light <u>prior to</u> pressing the override pushbutton, state, "The red indicating light is lit."<br>If examinee looks at or requests the status of the red "Override" indicating light <u>after</u> pressing the override pushbutton, state, "The red indicating light NOT lit." | | | |
| | Comments: | | | |

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|---|---|---|---|---|
| **STEP #7** GA-1 Step 3.b | Performance:<br>b. **CHECK** associated red indicating light - **NOT** LIT | Standard:<br>Locates red "Override" light on Bus 32T to determine status.<br>Proceeds to GA-1, step 4 | Critical:<br>Y ☐ N ☒ | Grade<br>S ☐ U ☐ |
| | Cue:<br>State, "The Red indicating light is not lit." | | | |
| | Comments: | | | |
| **STEP #8** GA-1 Step 4 | Performance:<br>**At inverter 6, check DC input Ammeter Indicating - ZERO AMPS** | Standard:<br>Checks DC ammeter reading on inverter 6 (turbine bldg. 38' elev.)<br>Proceeds to step 4.a RNO | Critical:<br>Y ☐ N ☒ | Grade<br>S ☐ U ☐ |
| | Cue:<br>The DC Input Ammeter indicates 5 amps. | | | |
| | Comments:<br>This check for amps determines the recovery method, since it is expected that the DC input Ammeter will indicate some amps less than 30 minutes after the SIS, and Zero Amps $\geq$30 minutes after the SIS.<br>Indicated Amps means it has been less than 30 minutes after the SIS, since the DC Bus is still supplying the Instrument Bus.<br>The strategy is to restore the AC Input path from MCC 32-3T while the Instrument Bus is still being supplied from the DC Bus. | | | |
| **STEP #9** GA-1 Step 4. RNO.a | Performance:<br>Locally, **PERFORM** the following:<br>a. At Inverter 6, OPEN The AC INPUT Breaker (CB-43). | Standard:<br>Locates AC Input Breaker (CB-43) and positions it to the OPEN position. | Critical:<br>**Y** ☒ N ☐ | Grade<br>S ☐ U ☐ |
| | Comments:<br>As found position of the breaker is in CLOSED position. | | | |
| | Cue:<br>When the examinee initially observes the AC Input Breaker, state, "The AC Input Breaker is in the CLOSED position."<br>As examinee simulates opening breaker, state: "A clunk sound is heard and breaker aligns to the OPEN position." | | | |

<table>
<tr><td rowspan="3">STEP #10<br>GA-1 Step 4. RNO.b</td><td>Performance:<br>b. At Bus 32T, CLOSE the feeder breaker for MCC 32-3T (32T13-2).</td><td>Standard:<br>Locates feeder breaker for MCC 32-3T on Load Center 32T in the East Switchgear room.<br>Rotates breaker control switch to CLOSE position and returns control switch to mid position.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:<br>When the examinee initially observes the MCC 32-3T Feeder Breaker, state, "The Breaker Green light is ON, and the red light is OFF."<br>As the examinee closes the breaker for MCC 32-3T, state, "A clunk sound is heard from the lower right of the switchgear. The Control switch is now in the CLOSE position, and the breaker's indicating lights are Green OFF, Red ON."</td></tr>
<tr><td colspan="4">Comments: The as-found position of the breaker for MCC 32-3T is Open.</td></tr>
<tr><td rowspan="3">STEP #11<br>GA-1 Step 4. RNO.c</td><td>Performance:<br>c. CHECK Inverter 6 DC INPUT breaker (CB-44) closed.</td><td>Standard:<br>Locates Inverter 6 DC INPUT breaker (CB-44) and observes it in the OPEN position.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:<br>The Breaker is aligned to the OPEN position.</td></tr>
<tr><td colspan="4">Comments: The expected position of the DC Input Breaker less than 30 minutes after the SIS is CLOSED. Finding the Breaker OPEN starts the "Alternate Path" portion of this JPM.</td></tr>
<tr><td rowspan="3">STEP #12<br>GA-1 Step 4. RNO.d</td><td>Performance:<br>d. <u>IF</u> Inverter 6 DC INPUT breaker is <u>NOT</u> closed, <u>THEN</u> <u>PROCEED</u> <u>TO</u> step 5.</td><td>Standard:<br>Proceeds to step 5.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Finding the DC input breaker NOT closed requires a new strategy.<br>The new strategy is to open all electrical paths into and out of the inverter, then re-energize the inverter.<br>This discovery starts the alternate path portion of this JPM.</td></tr>
</table>

| STEP | Performance: | Standard: | Critical: | Grade |
|---|---|---|---|---|
| STEP #13 GA-1 Step 5 | Performance: **At Inverter 6, OPEN The AC INPUT Breaker (CB-43)** | Standard: Locates the AC Input breaker (CB-43) and observes the breaker (CB-43) already OPEN at Inverter 6. | Critical: Y ☐ N ☒ | Grade S ☐ U ☐ |
| | Cue: When the examinee initially observes the AC Input breake, state, "The Breaker is aligned to the OPEN position." | | | |
| | Comments: | | | |
| STEP #14 GA-1 Step 6 | Performance: **At Inverter 6, OPEN The Inverter Output Breaker (CB-45)** | Standard: Locates the Inverter Output breaker (CB-45) and simulates moving the breaker handle to the OPEN position. | Critical: **Y** ☒ N ☐ | Grade S ☐ U ☐ |
| | Cue: When the examinee initially observes the Inverter Output Breaker, state, "The Breaker is Aligned to the CLOSED position." As the examinee opens the Inverter Output breaker, state, "The Breaker aligns to the OPEN position." | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade |
|---|---|---|---|---|
| STEP #15 GA-1 Step 7 | Performance: **At Inverter 6, OPEN The DC INPUT breaker (CB-44)** | Standard: Observes the DC INPUT breaker (CB-44) already OPEN at Inverter 6. | Critical: Y ☐ N ☒ | Grade S ☐ U ☐ |
| | Cue: When the examinee initially observes the DC Input Breaker, state, "The Breaker is aligned to the OPEN position." | | | |
| | Comments: | | | |
| STEP #16 GA-1 Step 8 | Performance: **At Bus 32T, CLOSE The Feeder Breaker For MCC 32-3T (32T13-2)** | Standard: Examinee recognizes that an earlier step already closed this breaker. Examinee may choose to re-check this breaker closed. | Critical: Y ☐ N ☒ | Grade S ☐ U ☐ |
| | Cue: If the examinee chooses to re-check the breaker, state "The Breaker Red light is lit, and green light is off." | | | |
| | Comments: | | | |

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|---|---|---|---|---|
| **STEP #17** GA-1 Step 9.a | Performance:<br>**At Inverter 6, Check If Computer Panels (3VBA-PNL-6A and 6B) Should Be Energized**<br>a. CHECK ALT SOURCE SUPPLYING LOAD light - NOT LIT | Standard:<br>Locates Alt Source Supplying Load light at Inverter 6, and observes the Alt Source Supplying Load light is not lit. | Critical:<br>Y ☐ N ☒ | Grade<br>S ☐ U ☐ |
| | Cue: When the examinee observes the Alt Source Supplying Load light, state, "The light is OFF." | | | |
| | Comments: | | | |
| **STEP #18** GA-1 Step 9.b | Performance:<br>b. **CHECK** manual bypass switch (3VBA-SW-6) in NORMAL OPERATION | Standard:<br>Checks the manual bypass switch (3VBA-SW-6, located in the Turbine Building, 38'level), and determines it is already aligned to the NORMAL OPERATION position. | Critical:<br>Y ☐ N ☒ | Grade<br>S ☐ U ☐ |
| | Cue: When the examinee observes the manual bypass switch, state, "the Manual Bypass Switch is in the NORMAL OPERATION position." | | | |
| | Comments: | | | |
| **STEP #19** GA-1 Step 9.c | Performance:<br>c. **PRESS** and **HOLD** PRECHARGE button **AND WHEN** the PRE-CHARGE light is lit, **THEN**<br>1. CLOSE the DC INPUT breaker (CB-44)<br>2. RELEASE the PRE-CHARGE button | Standard:<br>1. Locates the Pre-Charge Pushbutton on Inverter 6,<br>2. Presses and holds it.<br>3. When the amber light lights, takes the DC Input Breaker on Inverter 6 to "CLOSE",<br>4. And then releases the Pre-Charge Pushbutton. | Critical:<br>**Y** ☒ N ☐ | Grade<br>S ☐ U ☐ |
| | Cue: When the examinee depresses the Pre-Charge Pushbutton, state, "The Pre-Charge light illuminates.<br>When the examinee simulates taking the DC Input breaker to CLOSE, state, "The DC Input Breaker is aligned to the CLOSE position. | | | |
| | Comments: | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| STEP #20 GA-1 Step 9.d | Performance: d. **CLOSE** the AC INPUT breaker (CB-43) | Standard: Locates the AC Input breaker (CB-43) and simulates moving the breaker handle to the CLOSE position. | Critical: **Y** ☒ N ☐ | Grade S ☐ U ☐ |
| | Cue: When the examinee initially observes the AC Input breaker, state, "The Breaker is Aligned to the OPEN position." As the examinee closes the AC Input breaker, state, "The Breaker aligns to the CLOSE position." | | | |
| | Comments: | | | |
| STEP #21 GA-1 Step 9.e | Performance: e. **CLOSE** the INVERTER OUPUT breaker (CB-45) | Standard: Locates the Inverter Output breaker (CB-45) and simulates moving the breaker handle to the CLOSE position. | Critical: **Y** ☒ N ☐ | Grade S ☐ U ☐ |
| | Cue: When the examinee initially observes the Inverter Output breaker, state, "The Breaker is Aligned to the OPEN position." As the examinee closes the Inverter Output breaker, state, "The Breaker aligns to the CLOSE position." | | | |
| | Comments: | | | |
| STEP #22 GA-1 Step 9.f | Performance: f. **PRESS** the INVERTER TO LOAD STATIC SWITCH button (PB-1) | Standard: Locates the Inverter to Load Static Switch Pushbutton on Inverter 6, and observes the Inverter Supplying Load light is already lit. | Critical: Y ☐ N ☒ | Grade S ☐ U ☐ |
| | Cue: When the examinee initially observes the Inverter to Load Static Switch Pushbutton, state, "the Inverter Supplying Load light is already lit." | | | |
| | Comments: | | | |
| STEP #23 | Performance: **NOTIFY The Control Room MCC 32-3T Has Been Re-energized** | Standard: Informs Control Room that 32-3T has been re-energized. | Critical: Y ☐ N ☒ | Grade S ☐ U ☐ |
| | Cue: "Control Room acknowledges report. A Control Room Operator will complete GA-1 Step 11, "Rearm Turbine Lift Oil Pumps" and Step 12, "Restore Plant Process Computer". | | | |
| | Comments: | | | |

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ____________________

# VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC P.2 Revision: ________

Task Title: Energizing MCC 32-3T following CDA

Date Performed: ________

Examinee: ________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **20** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: **2017 NRC P.2** Revision: **0**

Initial Conditions: A large-break LOCA occurred 15 minutes ago, resulting in the following sequence of events:

1. SIS, LOP, and CDA all actuate.
2. Both Emergency Buses energize from the Emergency Diesels.
3. The crew enters E-1, *Loss of Reactor or Secondary Coolant*.
4. The crew resets SIS and LOP.

Initiating Cues: The US directs you to energize MCC 32-3T using GA-1, *Energizing MCC 32-3T,* starting with Step 2.

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Align "C" CCW Pump and Heat Exchanger to the "A" Train

JPM Number: 2017 NRC P.3 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. BRODEUR 8/18/17

Technical Reviewer Date

Approved:

M.S. COTE 8/18/17

Supervisor, Nuclear Training Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Original issue direct from Bank (JPM P113) | 0 |
| | | |
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## JPM WORKSHEET

Facility: Millstone Unit 3 Examinee: ______________________

JPM Number: 2017 NRC P.3 Revision: 0

Task Title: Align "C" CCW Pump and Heat Exchanger to the "A" Train

System: CCW

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 25

Task Number(s): 344-05-024

Applicable To: SRO **X** RO **X**

K/A Number: 008.A2.01 K/A Rating: 3.3 / 3.6

Method of Testing: Simulated Performance: X Actual Performance: ______

Location: Classroom: ______ Simulator: ______ In-Plant: X

Task Standards: Satisfactorily align the "C" RPCCW pump and heat exchanger to the "A" train of RPCCW using OP 3330A Section 4.9.

Required Materials: (procedures, equipment, etc.) OP 3330A (Rev. 23-0), Section 4.9 **(handout)**

General References: None

| *** READ TO THE EXAMINEE *** |
|---|
| I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed. |

## JPM WORKSHEET

JPM Number: 2017 NRC P.3 Revision : 0

Initial Conditions:

- Train "A" RPCCW Pump has tripped.
- The crew has entered AOP 3561, *Loss of Reactor Plant Component Cooling Water.*
- The RPCCW CTMT Headers have been cross-connected.

Initiating Cue:

The US directs you to align the "C" RPCCW Pump and Heat Exchanger to the "A" Train of RPCCW using OP 3330A, *Reactor Plant Component Cooling Water*, Section 4.9.

- Both RPCCW Pump "C" Control Switches are in the PULL-TO-LOCK position (Step 4.9.3).
- Another PEO will complete steps 4.9.10 through 4.9.14 in OP 3330A and will provide you with the appropriate Kirk key when these steps are completed.
- The vents on the "C" RPCCW Heat Exchanger have been closed to allow opening either 3SWP*V37, RPCCW HX C SW A Service Water Supply Valve or 3SWP*V69, RPCCW HX C SW B Service Water Supply Valve (due to valve leak by of 3SWP*V38).

Simulator Requirements: NA

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC P.3 Revision: 0

Task Title: Align "C" CCW Pump and Heat Exchanger to the "A" Train

START TIME: ____________

| STEP #1<br>3330A Note prior to Step 4.9.1 | Performance:<br>NOTE<br>Breaker realignment may be performed concurrently with mechanical realignment. | Standard:<br>Examinee reads the NOTE. | Critical:<br>Y[ ] N[X] | Grade<br>S[ ] U[ ] |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | The position indicators for several of the valves that are manipulated cannot be observed without a ladder. For the purposes of this JPM, it is not required that a ladder be obtained to check the position.<br>However, the examinee should point (light pointer or flashlight) to each specific valve that would be operated.<br>The location for Performance Steps 2 through 9 is Aux. Bldg. 24'6", near HX and pumps. | | | |

<table>
<tr><td>STEP #2<br>3330A Step 4.9.1</td><td>Performance:<br>CLOSE the following RPCCW heat exchanger C Train B service water return valves:<ul><li>3SWP*V70, RPCCW HX C SW B rtn isol</li><li>3SWP*V71, RPCCW HX C SW B rtn stop</li></ul></td><td>Standard:<br>Rotates the handwheel for 3SWP*V70 in the clockwise direction to close the valve.<br><br>Rotates the handwheel for 3SWP*V71 in the clockwise direction to close the valve.</td><td>Critical:<br>Y [X] N [ ]</td><td>Grade<br>S [ ] U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4">"It is not required to obtain a ladder to check the position of valves that cannot be reached from the floor. However, you should point (light pointer or flashlight) to each specific valve that would be operated."<br>For each valve, state<br>1. "The valve handwheel rotates in the clockwise direction and the position indicator starts moving toward the close position. Eventually some resistance is met and the valve handwheel comes to a hard stop."<br>2. "The position indicator points to the "closed" position."</td></tr>
<tr><td>Comments:</td><td colspan="4">Closing EITHER V70 or V71 meets the critical nature of this step.</td></tr>
</table>

| STEP #3<br>OP 3330A Step 4.9.2 | Performance:<br>OPEN the following RPCCW heat exchanger C Train A service water return valves:<br>• 3SWP*V40, RPCCW Hx C SW A rtn stop<br>• 3SWP*V41, RPCCW HX C SW A rtn isol | Standard:<br>Rotates the handwheel for 3SWP*V40 in the counter-clockwise direction to open the valve. Rotates the handwheel ¼ turn in the close direction.<br>Rotates the handwheel for 3SWP*V41 in the counter-clockwise direction to open the valve.<br>Rotates the handwheel ¼ turn in the close direction. | Critical:<br>**Y [X]** N [ ] | Grade<br>S [ ] U [ ] |
|---|---|---|---|---|
| Cue: | For each valve, state<br>1. "The valve handwheel rotates in the counter-clockwise direction and the position indicator starts moving toward the open position. Eventually some resistance is met and the valve handwheel comes to a hard stop."<br>2. "The valve has been taken one-quarter turn in the closed direction."<br>3. "The position indicator points to the "open" position." | | | |
| Comments: | The critical nature of this step does not require taking the valves off their backseat. | | | |

| STEP #4<br>OP 3330A Step 4.9.3 | Performance:<br>PLACE the following in "PULL-TO-LOCK" (MB1):<br>• 3SWP*P1C, "PP C" (Train A)<br>• 3SWP*P1C, "PP C" (Train B) | Standard:<br>Recalls from initial conditions that these switches are already in Pull-To-Lock.<br>May ask examiner to confirm the switches are in Pull-To-Lock. | Critical:<br>Y [ ] N [**X**] | Grade<br>S [ ] U [ ] |
|---|---|---|---|---|
| Cue: | If asked, state, "Both Main Board Switches for 3SWP*P1C are in Pull-To-Lock." | | | |
| Comments: | | | | |

| STEP #5 | Performance: | Standard: | Critical: | Grade |
|---|---|---|---|---|
| OP 3330A Note prior to Step 4.9.4 | **NOTE**<br>The following valve manipulation sequence will prevent cross-tying the RPCCW Trains. | Examinee reads the NOTE. | Y[ ] N[**X**] | S[ ] U[ ] |
| Cue: | Cue: | | | |
| Comments: | | | | |

| STEP #6 | Performance: | Standard: | Critical: | Grade |
|---|---|---|---|---|
| OP 3330A Step 4.9.4 | CLOSE the following Train B RPCCW discharge cross-connects:<br>• 3CCP*V8, train B RPCCW secondary discharge cross connect<br>• 3CCP*V10, train B RPCCW primary discharge cross connect | Rotates the handwheel for 3CCP*V8 in the clockwise direction to close the valve.<br><br>Rotates the handwheel for 3CCP*V10 in the clockwise direction to close the valve. | **Y[X]** N[ ] | S[ ] U[ ] |
| Cue: | For each valve:<br>"The valve handwheel rotates in the clockwise direction. Eventually some resistance Is met and the valve comes to a hard stop." | | | |
| Comments: | The initial positions of 3CCP*V8 and 3CCP*V10 are OPEN.<br>Closing either valve meets the critical nature of this step. | | | |

| STEP #7<br>OP 3330A Step 4.9.5 | Performance:<br>CLOSE the following Train B RPCCW suction cross-connects:<br>• 3CCP*V94, train B RPCCW secondary suction cross connect to P1C<br>• 3CCP*V95, train B RPCCW primary suction cross connect to P1C | Standard:<br>Rotates the handwheel for 3CCP*V94 in the clockwise direction to close the valve.<br><br>Rotates the handwheel for 3CCP*V95 in the clockwise direction to close the valve. | Critical:<br>**Y [X]** N [ ] | Grade<br>S [ ] U [ ] |
|---|---|---|---|---|
| Cue: | For each valve:<br>"The valve handwheel rotates in the clockwise direction. Eventually some resistance Is met and the valve comes to a hard stop." | | | |
| Comments: | The initial positions of 3CCP*V94 and 3CCP*V95 are OPEN.<br>Closing either valve meets the critical nature of this step. | | | |

| STEP #8<br>OP 3330A Step 4.9.6 | Performance:<br>OPEN the following Train A RPCCW suction cross-connects:<br>• 3CCP*V092, TR A RPCCW PRIMARY SUCTION X-CONN TO PC1<br>• 3CCP*V093, TR A RPCCW SECONDARY SUCTION X-CONN TO PC1 | Standard:<br>Rotates the handwheel for 3CCP*V092 in the counterclockwise direction to open the valve.<br>Rotates the handwheel 1/4 turn in the clockwise (close) direction.<br>Standard:<br>Rotates the handwheel for 3CCP*V093 in the counterclockwise direction to open the valve.<br>Rotates the handwheel 1/4 turn in the clockwise (close) direction. | Critical:<br>**Y [ X ]** N [ ] | Grade<br>S [ ] U [ ] |
|---|---|---|---|---|
| Cue: | For each valve:<br>1. "The valve handwheel rotates in the counterclockwise direction. Eventually some resistance Is met and the valve handwheel comes to a hard stop. The position indicator points to the "open" position."<br>2. "The handwheel has been rotated 1/4 turn in the clockwise direction." | | | |
| Comments: | The initial positions of 3CCP*V092 and 3CCP*V093 are CLOSED.<br>Removing the valves from their backseat is not required to meet the critical nature of this step. | | | |

| STEP #9<br>OP 3330A Step 4.9.7 | Performance:<br>Ensure 3CCP*V96, RPCCW pump C suction isolation, open. | Standard:<br>Rotates 3CCP*V96 in the clockwise direction.<br>When the valve handwheel moves, rotates the handwheel in the counterclockwise direction.<br>Rotates the handwheel ¼ turn in the clockwise direction. | Critical:<br>Y [ ] N **[ X ]** | Grade<br>S [ ] U [ ] |
|---|---|---|---|---|
| Cue: | 1. When the valve is rotated in the clockwise direction, state, "The valve handwheel rotates in the clockwise direction."<br>2. When the valve handwheel is rotated in the counter-clockwise direction, state, "The handwheel rotates in briefly in the counterclockwise direction, then comes to a hard stop."<br>3. When the valve is taken off its backseat, state, "The handwheel has been rotated 1/4 turn in the clockwise direction." | | | |
| Comments: | Initial position of 3CCP*V96 is OPEN. | | | |

<table>
<tr><td>STEP #10<br>OP 3330A Step 4.9.8</td><td>Performance:<br>OPEN the following Train A RPCCW discharge cross-connects:<br>• 3CCP*V007, TR A RPCCW PRIMARY DISCHARGE X-CONN<br>• 3CCP*V009, TR A RPCCW SECONDARY DISCHARGE X-CONN</td><td>Standard:<br>Rotates the handwheel for 3CCP*V007 in the counterclockwise direction to open the valve.<br>Rotates the handwheel 1/4 turn in the clockwise (close) direction.<br><br>Standard:<br>Rotates the handwheel for 3CCP*V009 in the counterclockwise direction to open the valve.<br>Rotates the handwheel 1/4 turn in the clockwise (close) direction.</td><td>Critical:<br>Y [ X ] N [ ]</td><td>Grade<br>S [ ] U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4">For each valve:<br>1. "The valve handwheel rotates in the counterclockwise direction. Eventually some resistance Is met and the valve handwheel comes to a hard stop.<br>2. "The handwheel has been rotated 1/4 turn in the clockwise direction."</td></tr>
<tr><td>Comments:</td><td colspan="4">The initial positions of 3CCP*V007 and 3CCP*V009 are CLOSED.<br>Removing the valves from their backseat is not required to meet the critical nature of this step.</td></tr>
<tr><td>STEP #11<br>OP 3330A Step 4.9.9</td><td>Performance:<br>Ensure 3CCP*V005, RPCCW PUMP P1C DISCHARGE ISOLATION, open.</td><td>Standard:<br>Rotates 3CCP*V005 in the clockwise direction. When the valve handwheel moves, rotates the handwheel in the counterclockwise direction.<br><br>Rotates the handwheel ¼ turn in the clockwise direction.</td><td>Critical:<br>Y [ ] N [ X ]</td><td>Grade<br>S [ ] U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4">1. When the valve is rotated in the clockwise direction, state, "The valve handwheel rotates in the clockwise direction."<br>2. When the valve handwheel is rotated in the counter-clockwise direction, state, "The handwheel rotates in briefly in the counterclockwise direction, then comes to a hard stop."<br>3. When the valve is taken off its backseat, state, "The handwheel has been rotated 1/4 turn in the clockwise direction."</td></tr>
<tr><td>Comments:</td><td colspan="4">Initial position of 3CCP*V005 is OPEN</td></tr>
</table>

| STEP #12 OP 3330A Step 4.9.10 | Performance: Refer to OP 3370A, “Electrical Breaker Procedure” and RACK DOWN circuit breaker 34D9-2, RPCCW pump C | Standard: Recalls from initial conditions that another PEO will complete steps 4.9.10 through 4.9.14 in OP 3330A and will provide you with the appropriate Kirk key when these steps are completed.<br><br>Examinee may also ask the examiner to confirm these actions have been completed. | Critical: Y [ ] N [X] | Grade S[ ] U[ ] |
|---|---|---|---|---|
| Cue: | State, “The PEO who completed steps 4.9.10 through 4.9.14 has provided you with Kirk Key number 3.”<br><br>If the examinee attempts to confirm steps 4.9.10 through 4-9-14 have been completed, state "Another PEO has completed steps 4.9.10 through 4.9.14 in OP 3330A. | | | |
| Comments: | | | | |

| STEP #13 OP 3330A Step 4.9.15 | Performance: At 3CCP*TRS-P1C (east MCC/RCA 46’), INSERT the Kirk Key No. 3 (RE11339) into the lower block at switch 2 and UNLOCK switch 2. | Standard: Inserts Kirk key No. 3 into the lower block and rotates the key to unlock switch 2. | Critical: **Y [X]** N [ ] | Grade S[ ] U[ ] |
|---|---|---|---|---|
| Cue: | WHEN the Examinee states / simulates inserting and rotating the key, state: “The Kirk key has been inserted and rotated.” | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #14**<br>OP 3330A Step 4.9.16 | Performance:<br>To open switch 2, PULL the lever arm down. | Standard:<br>Pulls the lever arm down | Critical:<br>**Y [X]** N [ ] | Grade<br>S [ ] U [ ] |
| Cue: | WHEN the Examinee states / simulates pulling the lever arm down, state:<br>"The lever arm is in the down position." | | | |
| Comments: | | | | |
| **STEP #15**<br>OP 3330A Step 4.9.17 | Performance:<br>LOCK switch 2 open and REMOVE the upper Kirk key No. 2 (RE11337). | Standard:<br>Rotates the Kirk key No. 2 to lock switch 2 and pulls the Kirk key out of the locking block. | Critical:<br>**Y [X]** N [ ] | Grade<br>S [ ] U [ ] |
| Cue: | WHEN the Examinee states / simulates rotating and removing the key, state:<br>"The upper Kirk key No. 2 has been rotated, and you have the key in your hand." | | | |
| Comments: | | | | |
| **STEP #16**<br>OP 3330A Step 4.9.18 | Performance:<br>INSERT Kirk Key No. 2 (RE11337) into the lower block at switch 1 and UNLOCK switch 1. | Standard:<br>Inserts Kirk key No. 2 into the lower block and rotates the key to unlock switch 1. | Critical:<br>**Y [X]** N [ ] | Grade<br>S [ ] U [ ] |
| Cue: | WHEN the Examinee states or indicates inserting and rotating the key, state:<br>"The Kirk key has been inserted and rotated, and switch 1 is unlocked." | | | |
| Comments: | | | | |

| STEP | Performance: | Standard: | Critical: | Grade |
|---|---|---|---|---|
| **STEP #17** OP 3330A Step 4.9.19 | Performance: To close switch 1, PUSH lever UP. | Standard: Pushes the lever up. | Critical: **Y [X]** N [ ] | Grade S [ ] U [ ] |
| Cue: | WHEN the Examinee states / simulating motion in the upward direction, state: "The lever is aligned to the up position." | | | |
| Comments: | | | | |
| **STEP #18** OP 3330A Step 4.9.20 | Performance: LOCK switch 1 closed and REMOVE the upper Kirk key No. 1 (RE11336). | Standard: Rotates the Kirk key No. 1 to lock switch 1 and pulls the Kirk key out of the locking block. | Critical: **Y [X]** N [ ] | Grade S [ ] U [ ] |
| Cue: | WHEN Examinee states or indicates rotating and removing the key, state: "The upper Kirk key No. 1 has been rotated and you have the key in your hand." | | | |
| Comments: | | | | |
| **STEP #19** 3330A Note prior to Step 4.9.21 | Performance: **NOTE** This interlock is electrical as well as mechanical, therefore the key must be turned as far as it will go clockwise, to ensure the electrical contact is made up. | Standard: Examinee reads the NOTE. | Critical: Y [ ] N **[X]** | Grade S [ ] U [ ] |
| Cue: | "Another PEO has taken Kirk Key number 1 from you, and has completed the operations at the Switchgear." | | | |
| Comments: | | | | |

| STEP #20 | Performance: Notify the US that the "C" RPCCW pump and heat exchanger are aligned to the Train A RPCCW System. | Standard: Informs the US that Section 4.9 of OP 3330A has been completed and the "C" RPCCW pump and heat exchanger are aligned to the Train A RPCCW System. | Critical: Y [ ] N [ X ] | Grade S [ ] U [ ] |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

**TERMINATION CUE: The evaluation for this JPM is completed.**

STOP TIME: ______________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC P.3 Revision: 0

Task Title: Align “C” CCW Pump and Heat Exchanger to the “A” Train

Date Performed: ____________

Examinee: ____________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **25** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC P.3 Revision: 0

Initial Conditions:

- Train "A" RPCCW Pump has tripped.
- The crew has entered AOP 3561, *Loss of Reactor Plant Component Cooling Water*.
- The RPCCW CTMT Headers have been cross-connected.

Initiating Cue:

The US directs you to align the "C" RPCCW Pump and Heat Exchanger to the "A" Train of RPCCW using OP 3330A, *Reactor Plant Component Cooling Water*, Section 4.9.

- Both RPCCW Pump "C" Control Switches are in the PULL-TO-LOCK position (Step 4.9.3).
- Another PEO will complete steps 4.9.10 through 4.9.14 in OP 3330A and will provide you with the appropriate Kirk key when these steps are completed.
- The vents on the "C" RPCCW Heat Exchanger have been closed to allow opening either 3SWP*V37, RPCCW HX C SW A Service Water Supply Valve or 3SWP*V69, RPCCW HX C SW B Service Water Supply Valve (due to valve leak by of 3SWP*V38).

KEY

**Form Approval**

| Approval Date 8/22/11 | Effective Date 8/25/11 |
|---|---|

# Surveillance Form

**Generic Information**

| Form Title | | | Rev. No. |
|---|---|---|---|
| **RCS Inventory Balance** | | | 003–02 |
| Reference Procedure | Applicable Tech. Spec. | Applicability (Tech. Spec.) | Frequency |
| SP 3601F.6 | T/S 4.4.6.2.1.d | MODE 1, 2, 3, 4 | Note 1 |

**Specific Information**

| Schedule Start Date | | AWO Number | Mntc Restoration ☐ Yes ☐ No |
|---|---|---|---|
| Performance MODES All | Prerequisites Completed (Initials) RO | Precautions Noted (Initials) RO | |
| Test Authorized By SM | | Date today | Partial Surveillance ☐ Yes ☐ No |
| Performed By RO | | Date today | |
| Accepted By | | Date | Acceptance Criteria Satisfied ☐ Yes ☐ No |
| Approved By (Department Head or Designee) | | Date | |

**Surveillance Information**

| Test Equipment Type | ID Number | Cal Due Date |
|---|---|---|
| NA | NA | NA |

**Comments**

CR# ____________

Note 1: Within 12 hours of achieving steady–state operation and at least once per 72 hours thereafter during steady–state operation.

# RCS Inventory Balance

| DATA TABLE (Note 2) | | | | |
|---|---|---|---|---|
| Parameter | Instrument | Computer Point | Initial (Step 4.3.1) | Final (Step 4.3.3) |
| "PZR LVL" | 3RCS*LI 459A (MB4) | RCS–L459 | 64.1 % | 63.5 % |
| "PZR LVL" | 3RCS*LI 460A (MB4) | RCS–L460 | 64.2 % | 63.6 % |
| "PZR LVL" | 3RCS*LI 461 (MB4) | RCS–L461 | 64.3 % | 63.7 % |
| CALCULATED AVERAGE PRESSURIZER LEVEL | | | 64.2 % | 63.6 % |
| "NARROW RANGE PRES" (Note 3) | 3RCS–PI 455A (MB4) | RCS–P455A* | N/A psia | N/A psia |
| | 3RCS–PI 456A (MB4) | RCS–P456 | psia | psia |
| | 3RCS–PI 457 (MB4) | RCS–P457 | psia | psia |
| | 3RCS–PI 458 (MB4) | RCS–P458 | psia | psia |
| CALCULATED AVERAGE NARROW RANGE PRESSURIZER PRESSURE (OR CVPZRP) | | | 2250 psia | 2250 psia |
| "LOOP 1 AVG TEMP" (Note 4) | 3RCS–TI 412 (MB4) | RCS–T412A* | 586.8 °F | 586.7 °F |
| "LOOP 2 AVG TEMP" (Note 4) | 3RCS–TI 422 (MB4) | RCS–T422A* | 587.0 °F | 587.1 °F |
| "LOOP 3 AVG TEMP" (Note 4) | 3RCS–TI 432 (MB4) | RCS–T432A* | 587.1 °F | 587.2 °F |
| "LOOP 4 AVG TEMP" (Note 4) | 3RCS–TI 442 (MB4) | RCS–T442A* | 587.1 °F | 587.0 °F |
| "COLD LEG WR TEMP" "LOOP 1" (Note 5) | 3RCS–TR413B (MB4) | RCS–T413B | N/A °F | N/A °F |
| "COLD LEG WR TEMP" "LOOP 2" (Note 5) | 3RCS–TR413B (MB4) | RCS–T423B | °F | °F |
| "COLD LEG WR TEMP" "LOOP 3" (Note 5) | 3RCS*TR433B (MB4) | RCS–T433B | °F | °F |
| "COLD LEG WR TEMP" "LOOP 4" (Note 5) | 3RCS*TR433B (MB4) | RCS–T443B | °F | °F |
| "HOT LEG WR TEMP" "LOOP 1" (Note 5) | 3RCS–TR413A (MB4) | RCS–T413A | °F | °F |
| "HOT LEG WR TEMP" "LOOP 2" (Note 5) | 3RCS–TR413A (MB4) | RCS–T423A | °F | °F |
| "HOT LEG WR TEMP" "LOOP 3" (Note 5) | 3RCS*TR433A (MB4) | RCS–T433A | °F | °F |
| "HOT LEG WR TEMP" "LOOP 4" (Note 5) | 3RCS*TR433A (MB4) | RCS–T443A | °F | °F |
| CALCULATED AVERAGE TEMPERATURE | | | 587.0 °F | 587.0 °F |
| "WIDE RANGE LOOP PRES" (LOOP 1) (Note 6) | 3RCS*PI 405 (MB4) | RCS–P405 | N/A psia | N/A psia |
| "WIDE RANGE LOOP PRES" (LOOP 4) (Note 6) | 3RCS*PI 403 (MB4) | RCS–P403 | psia | psia |
| CALCULATED AVERAGE WIDE RANGE LOOP PRESSURE | | | psia | psia |
| "PRT LVL" | 3RCS–LI 470 (MB4) | RCS–L470 | 68.1 % | 68.1 % |
| "VCT LVL" | 3CHS–LI 185 (MB3) | CHS–L112 | 55.1 % | 46.6 % |
| "PRI DRAIN TK LVL" | 3DGS–LI 36 (MB1) | DGS–L36 | 354.7 gal | 369.6 gal |
| "CTMT DRAIN TK LVL" | 3DGS–LI 33 (MB1) | DGS–L33 | 327.3 gal | 338.9 gal |
| "PRI WTR" "FLOW" (Make–up totalizer) | 3CHS–FY/111E (MB3) | CVCHS–F111 | 7982372 gal | 7982372 gal |
| TIME | | | 1300 | 1500 |

Note 2: Primary source for data entered shall be computer point data (to nearest tenth), if available. Control Room or local instrument shall be used as backup source if computer point data is not available.

Note 3: If computer point CVPZRP is available, enter N/A in "NARROW RANGE PRES" indication blocks and enter CVPZRP as average. If CVPZRP is not available, use the computer points or instruments specified and calculate the average. If RCS pressure is below 1,700 psia, "NARROW RANGE PRES" indication blocks are N/A.

Note 4: If RCS temperature is > 530 °F, use these instruments for calculated average temperature, otherwise N/A.

Note 5: If RCS temperature is < 530 °F, use these instruments for calculated average temperature, otherwise N/A.

Note 6: If RCS pressure is below 1,700 psia, use loop 4 and loop 1 RCS wide range pressure channels. If pressure is above 1,700 psia, these blocks are N/A.

## Calculation Table 1A: $\Delta V_{PZR}$

Assumptions: No change in steam mass (changes are small)
Pressurizer conditions of 652 °F and 2,250 psia
Pressurizer level within program band

Initial Pressurizer Level = 64.2 $\%_{initial}$

Final Pressurizer Level = 63.6 $\%_{final}$

Initial Pressurizer Pressure = 2250 psia

Final Pressurizer Pressure = 2250 psia

K = 74.15 (See Table 1B for value of K)

$\Delta V_{PZR}$ = (Initial Pressurizer Level − Final Pressurizer Level) × K

$\Delta V_{PZR}$ = (64.2 $\%_{initial}$ − 63.6 $\%_{final}$) × 74.15 gal/% = 44.49 $gal_{PZR}$

## Table 1B: K Values

| K Values for converting level to volume based on pressure | |
|---|---|
| **Pressure (psia)** | **K** |
| 2260 | 73.99 |
| 2250 | 74.15 |
| 2240 | 74.30 |
| 2220 | 74.62 |
| 2000 | 77.98 |
| 1800 | 80.91 |
| 1700 | 82.38 |
| 1500 | 85.26 |
| 1000 | 92.64 |
| 900 | 94.21 |
| 400 | 103.42 |
| 300 | 105.88 |

## Calculation Table 2: $\Delta V_{VCT}$

Assumptions: Conditions in VCT are 110°F and 34 psia

Initial VCT Level = 55.1 $\%_{initial}$

Final VCT Level = 46.6 $\%_{final}$

$\Delta V_{VCT}$ = (Initial VCT Level − Final VCT Level) × 18.92 gal/%

$\Delta V_{VCT} = ($ 55.1 $\%_{initial} -$ 46.6 $\%_{final}) \times 18.92$ gal/% = 160.82 gal $_{VCT}$

## Calculation Table 3: $\Delta V_{RCS}$

Assumptions: Pressurizer pressure remains constant (within 3 psi)
Design pressurizer level program is 28 % to 64 % | 1
Design Tavg program is 557 °F to 587 °F

Initial Pressurizer or Wide Range Pressure = 2250 psia $_{initial}$

Initial Calculated Average Temperature = 587 °F $_{initial}$

Initial specific volume ($\upsilon_{initial}$) = 0.02260 $\frac{ft^3}{lbm}$ (From R*Time>Unit 3 Top Menu> NSSS Menu>Reactivity Utilities Menu> Properties of Water)

$$\text{Initial Density } (\rho_{initial}) = \frac{1}{\upsilon_{initial}} = \frac{1}{0.02260 \ \frac{ft^3}{lbm}} = 44.25 \ \frac{lbm}{ft^3}\ _{initial}$$

Final Pressurizer or Wide Range Pressure = 2250 psia $_{final}$

Final Calculated Average Temperature = 587 °F $_{final}$

Final specific volume ($\upsilon_{final}$) = 0.02260 $\frac{ft^3}{lbm}$

$$\text{Final Density } (\rho_{final}) = \frac{1}{\upsilon_{final}} = \frac{1}{0.02260 \ \frac{ft^3}{lbm}} = 44.25 \ \frac{lbm}{ft^3}\ _{final}$$

$$\Delta V_{RCS} = V_{RCS\ initial} - V_{RCS\ final}$$

$$= (1251.9 \times \rho_{initial}) - (1251.9 \times \rho_{final})$$

$$= 1251.9 \times (\rho_{inital} - \rho_{final})$$

$$\Delta V_{RCS} = 1251.9 \frac{gal\ ft^3}{lbm} \times \left(44.25 \ \frac{lbm}{ft^3}\ _{initial} - 44.25 \ \frac{lbm}{ft^3}\ _{final}\right) = \varnothing \text{ gal}$$

## Calculation Table 4: $\Delta V_{PRT}$

Assumptions: Pressurizer Relief Tank level indication is linear from 0 to 100%
Conditions in PRT remain constant

Initial PRT Level = 68.1 $\%_{initial}$

Final PRT Level = 68.1 $\%_{final}$

$\Delta V_{PRT}$ = (Final PRT Level − Initial PRT Level) × 126.57 gal/%

$\Delta V_{PRT}$ = ( 68.1 $\%_{final}$ − 68.1 $\%_{initial}$) × 126.57 gal/% = Ø $gal_{PRT}$

## Calculation Table 5: $\Delta V_{PDTT}$

Initial PDTT Level = 354.7 $gal_{initial}$

Final PDTT Level = 369.6 $gal_{final}$

$\Delta V_{PDTT}$ = (Final PDTT Level − Initial PDTT Level)

$\Delta V_{PDTT}$ = 369.6 $gal_{final}$ − 354.7 $gal_{initial}$ = 14.90 $gal_{PDTT}$

## Calculation Table 6: $\Delta V_{CDTT}$

Initial CDTT Level = 327.3 $gal_{initial}$

Final CDTT Level = 338.9 $gal_{final}$

$\Delta V_{CDTT}$ = (Final CDTT Level − Initial CDTT Level)

$\Delta V_{CDTT}$ = 338.9 $gal_{final}$ − 327.3 $gal_{initial}$ = 11.60 $gal_{CDTT}$

# RCS Inventory Balance

| Calculation Table 7: $V_{Makeup}$ and $V_{Divert}$ |
|---|
| Initial Primary Water Flow (makeup totalizer) = 7982372 gal $_{initial}$ |
| Final Primary Water Flow (makeup totalizer) = 7982372 gal $_{final}$ |
| $V_{Makeup}$ = 7982372 gal $_{final}$ − 7982372 gal $_{initial}$ = Ø gal $_{M/U}$ |
| Total Divert Time = ____ min $_{Divert\ 1}$ + ____ min $_{Divert\ 2}$ + ____ min $_{Divert\ 3}$ = ____ min $_{Total\ Divert\ Time}$ |
| Letdown Flow Rate = ____ $\frac{gal}{min_{Letdown\ Flow}}$ No Divert – N/A |
| $V_{Divert}$ = Letdown Flow Rate × Total Divert Time |
| $V_{Divert}$ = ____ $\frac{gal}{min_{Letdown\ Flow}}$ × ____ $min_{Total\ Divert\ Time}$ = N/A gal $_{Divert}$ |

| Calculation Table 8: Other Source of Leakage |
|---|
| (List other sources) None |
| Inside Containment Quantified Leakage = N/A $gal_{Inside}$ |
| Outside Containment Quantified Leakage = N/A $gal_{Outside}$ |
| $V_{Other}$ = N/A $gal_{Inside}$ + N/A $gal_{Outside}$ = N/A $gal_{Other}$ |

| Calculation Table 9: ΔTime, Total RCS Leakage, and Total RCS Leak Rate |
|---|
| ΔTime = 1500 Time $_{final}$ − 1300 Time $_{initial}$ = 120 min |
| Total RCS Leakage = $\Delta V_{PZR} + \Delta V_{VCT} + \Delta V_{RCS} + V_{Makeup} - V_{Divert}$ |
| Total RCS Leakage = 44.49 gal $_{PZR}$ + 160.82 gal $_{VCT}$ + Ø gal $_{RCS}$ + Ø gal $_{M/U}$ − Ø gal $_{Divert}$ = 205.31 gal |
| Total RCS Leak Rate = $\frac{\text{Total RCS Leakage}}{\Delta\text{Time}}$ |
| Total RCS Leak Rate = $\frac{205.31\ \text{gal}}{120\ \text{min}}$ = 1.711 gal/$min_{RCS}$ |

## Calculation Table 10: IDENTIFIED LEAKAGE

$$\text{IDENTIFIED LEAKAGE} = \frac{\Delta V_{PRT} + \Delta V_{PDTT} + \Delta V_{CDTT} + V_{Other}}{\Delta \text{Time}}$$

**T/S ACCEPTANCE CRITERIA**
IDENTIFIED LEAKAGE shall not be greater than 10 gpm.

IDENTIFIED LEAKAGE =

$$\frac{\underline{\phi}\ \text{gal}_{PRT} + \underline{14.90}\ \text{gal}_{PDTT} + \underline{11.60}\ \text{gal}_{CDTT} + \underline{\phi}\ \text{gal}_{Other}}{\underline{120}\ \text{min}} = \underline{0.221}\ \text{gpm}$$

## Calculation Table 11: UNIDENTIFIED LEAKAGE

$$\text{UNIDENTIFIED LEAKAGE} = \text{Total RCS Leak Rate} - \text{IDENTIFIED LEAKAGE} + \frac{\Delta V_{PDTT}}{\Delta \text{Time}}$$

**T/S ACCEPTANCE CRITERIA**
UNIDENTIFIED LEAKAGE shall not be greater than 1 gpm.

UNIDENTIFIED LEAKAGE =

$$\underline{1.711}\ \text{gpm}_{RCS} - \underline{0.221}\ \text{gpm}_{IDENT} + \left(\frac{\underline{14.90}\ \text{gal}_{PDTT}}{\underline{120}\ \text{min}}\right) = \underline{1.614}\ \text{gpm}$$

**NOTE**

Calculation Table 12 is performed only if PDTT inventory changes are verified all RCS or CVCS related as specified in step 4.1.15.d. or 4.3.6.d.

## Calculation Table 12: Corrected UNIDENTIFIED LEAKAGE

Corrected UNIDENTIFIED LEAKAGE = Total RCS Leak Rate − IDENTIFIED LEAKAGE

**T/S ACCEPTANCE CRITERIA**
UNIDENTIFIED LEAKAGE shall not be greater than 1 gpm.

Corrected UNIDENTIFIED LEAKAGE = ______ $\text{gpm}_{RCS}$ − ______ $\text{gpm}_{IDENT}$ = ______ gpm

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Determine RCS Leakrate, and Determine if the Leakrate is within Limits.

JPM Number: 2017 NRC RO A.1.1 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. BRODEUR 8/18/17

Technical Reviewer Date

Approved:

M.J. COTE 8/18/17

Supervisor, Nuclear Training Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Direct from Bank (JPM A216) | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: ________

JPM Number: 2017 NRC RO A.1.1 Revision: 0

Task Title: Determine RCS Leakrate, and Determine if the Leakrate is within Limits.

Topic: Conduct of Operations

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 40

Applicable To: SRO ____ RO **X**

K/A Number: 2.1.7 K/A Rating: 4.4 / 4.7

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: X Simulator: ____ In-Plant: ____

Task Standards: Carry out and correctly disposition the surveillance for RCS Inventory Balance.

Required Materials: (procedures, equipment, etc.)
SP 3601F.6, Rev 007
Completed surveillance Form SP 3601F.6 – 001, Rev 003-02
Tech Spec LCO 3.4.6.2, Operational Leakage, Amendment No. 238
Calculator

General References: Unit 3 Technical Specifications

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC RO A.1.1 Revision : 0

**Initial Conditions:**

The plant is at 100% power, and current conditions are as follows:

- The PPC RCS Leakage Program is malfunctioning.
- VCT level appears to be dropping at a faster rate than expected.
- The SM has directed a RCS Leakage calculation to be performed in accordance with SP3601F.6, *Reactor Coolant System Water Inventory Measurement*.
- The SM has directed the data be gathered over a two-hour interval.
- Other operators have gathered the required initial and final data over the two-hour interval per SP3601F.6, steps 4.3.1 through 4.3.3.
- Other operators have recorded the data on Surveillance Form SP 3601F.6 – 001, *RCS Inventory Balance*, on the DATA TABLE (page 2 of 7).
- Initial and final RCS specific volume values have been determined using R*Time and are 0.02260 $ft^3$ /lbm.
- The data gathered by the other operators have been verified to be correct.
- The proper initial conditions were established for the data gathering period.
- All assumptions listed in SP-3601F.6 for a manual RCS leakage calculation are met.
- VCT Divert did not occur during the data gathering period.
- There is no known RCS leakage from other sources inside CTMT.
- There is no known RCS leakage from other sources outside CTMT.

**Initiating Cues:**

- The US directs you to perform a manual RCS water inventory balance using SP 3601F.6, *Reactor Coolant System Water Inventory Measurement*, section 4.3, "Manual RCS Leakage Calculation", step 4.3.4.
- You are directed to complete Surveillance Form SP 3601F.6 – 001, using the previously recorded data on the form.
- After completing SP 3601F.6, step 4.3.4, report to the US as to whether or not RCS leakage exceeds Tech Spec limits.

Record any required actions as a result of your leak rate calculations at the bottom / back of this page.

**Simulator Requirements:** None

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

# PERFORMANCE INFORMATION

JPM Number: 2017 NRC RO A.1.1 Revision: 0

Task Title: Determine RCS Leakrate, and Determine if the Leakrate is within Limits.

START TIME: ___________

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| STEP #1 | Performance: Obtains copy of SP3601.F, and Surveillance form SP3601F.6-001 | Standard: Obtains copy of SP 3601F.6 from US. Obtains copy of Surveillance Form SP 3601F.6-001 from US. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| STEP #2 SP 3601F.6 – 001, Cover sheet | Performance: Reviews prerequisites, and initials "Prerequisites Completed" block on FORM SP 3601F.6 – 001. | Standard: Reviews prerequisites, or verifies "Prerequisites Completed" block has been initialed on FORM SP 3601F.6 – 001. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Examinee was informed prerequisites were met as part of the initial conditions for this JPM. | | | |

| STEP | Performance / Standard | Critical | Grade |
|---|---|---|---|
| **STEP# 3**<br>SP 3601F.6 – 001, Cover sheet | Performance:<br>Reviews precautions, and initials "Precautions Noted" block is initialed on FORM SP 3601F.6 – 001<br><br>Standard:<br>Reviews Precautions.<br>Verifies "Precautions completed" block has been initialed on FORM SP 3601F.6 – 001.<br><br>Cue:<br><br>Comments: | Y ☐ N ☒ | S ☐ U ☐ |
| **STEP #4**<br>SP 3601F.6 – 001, Cover sheet | Performance:<br>Verify "Test Authorized By" block is signed on FORM SP 3601F.6 – 001.<br><br>Standard:<br>Verifies "Test Authorized By" block is signed on FORM SP 3601F.6 – 001.<br><br>Cue:<br><br>Comments: | Y ☐ N ☒ | S ☐ U ☐ |
| **STEP #5**<br>SP 3601F.6 Note prior to step 4.3.4 | Performance:<br>**NOTE**<br>If desired, calculations may be performed after restoration of plant equipment.<br><br>Standard:<br>Reads the note<br><br>Cue:<br><br>Comments: | Y ☐ N ☒ | S ☐ U ☐ |

| STEP #6 SP 3601F.6 step 4.3.4.a | Performance: Refer To SP 3601F.6-001 and PERFORM the following:<br>a. CALCULATE and RECORD change in volume using initial and final data for the following components in the Calculation Tables listed for each:<br>• Pressurizer, Calculation Table 1A | Standard: Examinee determines the correct Table 1B value for 'K' (74.15) for current plant conditions, and enters the following on Table 1A:<br>(64.2% - 63.6%) x 74.15 gal/% = **44.49 gal** | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: Rounding allowance accepts range from 44 to 45 gallons on Table 1A. | | | |

| STEP #7 3601F.6 step 4.3.4.a | Performance:<br>• VCT, Calculation Table 2 | Standard: Examinee enters the following on Table 2:<br>55.1% - 46.6% x 18.92 gal/% = **160.82 gal** | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: Rounding allowance accepts range from 160.0 to 161.0 on Table 2. | | | |
| STEP #8 3601F.6 step 4.3.4.a | Performance:<br>• RCS, Calculation Table 3 | Standard: Examinee refers to Table 3, and records Data Table values for initial PZR pressure (CVPZRP) and initial calculated average temperature.<br>Using the value given in the initial cue, the Examinee records initial specific volume obtained from R*Time. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: For initial and final specific volume the Examinee should use the value of 0.02260 $ft^3$ /lbm. | | | |

| | | | | |
|---|---|---|---|---|
| | | Standard:<br>Using the value recorded for initial specific volume, the Examinee calculates and records initial density. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| | | Standard:<br>Examinee refers to Table 3 and records Data Table values for final PZR pressure (CVPZRP) and final calculated average temperature.<br>Using the value given in the initial cue, the Examinee records final specific volume obtained from R*Time. | Critical:<br>**Y** ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| | | Standard:<br>Using the value recorded for final specific volume, the Examinee calculates and records final density. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| | | Standard:<br>Using the recorded values for initial and final density and the conversion factor 1251.9 gal $ft^3$ /lbm, the Examinee calculates and records a change in RCS volume of **0.0** gallons. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is determining RCS Calculation = 0 on Table 3. Initial and final specific volume are effectively the same value, thus there is no change in RCS volume. | | | |
| **STEP #9**<br>3601F.6 step 4.3.4.a | Performance:<br>• PRT, Calculation Table 4 | Standard:<br>Examinee enters the following on Table 4:<br>(68.1% - 68.1%) x 126.57 gal/% = 0.0 gal | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: To be graded as “Satisfactory” on this step, Examinee needs to determine PRT Calculation = 0 on Table 3 | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #10** 3601F.6 step 4.3.4.a | Performance:<br>• PDTT, Calculation Table 5 | Standard:<br>Examinee enters the following on Table 5:<br>(369.6 gal – 354.7gal) = 14.90 gal | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Acceptable to round to 14.9 gal on Table 5 | | | |
| **STEP #11** 3601F.6 step 4.3.4.a | Performance:<br>• CDTT, Calculation Table 6 | Standard:<br>Examinee enters the following on Table 6:<br>(338.9 gal – 327.3 gal) = 11.60 gal | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Acceptable to round to 11.6 gal on Table 6 | | | |
| **STEP #12** 3601F.6 step 4.3.4.b | Performance:<br>CALCULATE and RECORD volume of makeups using initial and final makeup totalizer flow in Calculation Table 7. | Standard:<br>Examinee enters the following on Table 7:<br>(7982372 gal – 7982372 gal) = 0.0 gal | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: To be graded as "Satisfactory" on this step, Examinee needs to determine Makeup Volume = 0 on Table 7 | | | |
| **STEP #13** 3601F.6 step 4.3.4.c.1) | Performance:<br>CALCULATE volume diverted by performing the following in Calculation Table 7:<br>1) CALCULATE total time flow was diverted by summing individual divert times and RECORD as "Total Divert Time." | Standard:<br>Recognizes this is zero, or N/A, since no divert occurred. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #14** 3601F.6 step 4.3.4.C2) | Performance:<br>2) CALCULATE and RECORD total volume diverted using letdown flow rate and total divert time. | Standard:<br>Recognizes this is N/A, since no divert occurred. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #15** 3601F.6 Note prior to step 4.3.4.d | Performance:<br>**NOTE**<br>Quantified leakage is RCS leakage, inside or outside Containment, collected and quantified by measurements using graduated cylinders or containers of known volumes over a test period which satisfy the following conditions:<br>• Leakage is not PRESSURE BOUNDARY LEAKAGE<br>• Leakage does not interfere with Leak Detection System (i.e., over range the detection system) | Standard:<br>Reads the Note | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #16** 3601F.6 step 4.3.4.d.1) | Performance:<br>CALCULATE total leakage from other known sources in Calculation Table 8 as follows:<br>1) IF any leakage is quantified from inside Containment, ENTER quantified value for RCS leakage as "Inside Containment Quantified Leakage." | Standard:<br>Recognizes this is N/A, as given in JPM initial conditions, or cue. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: If Examinee asks US if other sources of leakage exist, state "There is no known RCS leakage from other sources inside CTMT. | | | |
| | Comments: | | | |

| Step | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| STEP #17 3601F.6 step 4.3.4.d.2) | Performance: 2) IF any leakage is quantified from outside Containment, ENTER quantified value for RCS leakage as "Outside Containment Quantified Leakage." | Standard: Recognizes this is N/A, as given in JPM initial conditions, or cue. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: Cue: If Examinee asks US if other sources of leakage exist, state "There is no known RCS leakage from other sources outside CTMT. | | | |
| | Comments: | | | |
| STEP #18 3601F.6 step 4.3.4.d.3) | Performance: 3) CALCULATE and RECORD volume from other sources of leakage by adding inside and outside Containment quantified leakage. | Standard: Enters zero gallons, or N/A, since no other known sources of leakage exist. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| STEP #19 3601F.6 step 4.3.4.e | Performance: CALCULATE and RECORD time difference from initial data collection to final data collection in Calculation Table 9. | Standard: Enters 15:00 – 13:00 = 120 minutes on Table 9. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| STEP #20 3601F.6 step 4.3.4.f | Performance: CALCULATE and RECORD total RCS leakage using the previously calculated volumes in Calculation Table 9. | Standard: Calculates 44.49 gal + 160.82 gal + 0 + 0 – 0 = 205.31 gal, and enters this on Table 9. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #21** 3601F.6 step 4.3.4.g | Performance: CALCULATE and RECORD total RCS leak rate by dividing total RCS leakage by the time difference in Calculation Table 9. | Standard: Calculates 205.31 gal / 120 min = 1.711 gal/min, and enters this on Table 9. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #22** 3601F.6 step 4.3.4.h | Performance: CALCULATE and RECORD IDENTIFIED LEAKAGE by dividing the sum of the total collected leakage by the time difference in Calculation Table 10. | Standard: Enters the following on Table 10: (0 gal + 14.90 gal + 11.60 gal + 0 gal) / 120 min = 0.221 gpm | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #23** 3601F.6 step 4.3.4.i | Performance: CALCULATE and RECORD UNIDENTIFIED LEAKAGE by subtracting IDENTIFIED LEAKAGE from total RCS leak rate and adding the change in PDTT volume in Calculation Table 11. | Standard: Enters the following on Table 11: 1.711 gpm – 0.221 gpm + (14.90 gal / 120 min) = 1.614 gpm | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion is this step is met with leakage rate between 1.5 and1.7 gpm, to allow for rounding. Table 12 data (<u>corrected</u> UNIDENTIFIED LEAKAGE) is not required for this JPM, since this calculation occurs later in the procedure, and the Examinee will be cued that those steps will be completed by a SRO. | | | |

| STEP #24 Tech Spec LCO 3.4.6.2 | Performance: Reactor Coolant System operational LEAKAGE shall be limited to…<br>b. 1 gpm UNIDENTIFIED LEAKAGE…<br>d. 10 gpm IDENTIFIED LEAKAGE… | Standard: Compares calculated leakage to Tech Spec leakage limits.<br>Reports that Unidentified Leakage (1.6 gpm) exceeds Tech Spec limit (of 1 gpm). | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: "The US asks you to report whether or not RCS leakage exceeds Tech Spec limits."<br>"An SRO will complete the remaining steps in SP3601F.6. " | | | |
| | Comments: | | | |

Termination cue: The evaluation for this JPM is concluded.

STOP TIME: ________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC RO A.1.1 Revision: ______

Task Title: Determine RCS Leakrate, and Determine if the Leakrate is within Limits.

Date Performed: ______

Examinee: ______

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | 40 | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## **EXAMINEE HANDOUT**

JPM Number: 2017 NRC RO A.1.1 Revision: 0

Initial Conditions: The plant is at 100% power, and current conditions are as follows:

- The PPC RCS Leakage Program is malfunctioning.
- VCT level appears to be dropping at a faster rate then expected.
- The SM has directed a RCS Leakage calculation to be performed SP3601F.6, *Reactor Coolant System Water Inventory Measurement.*
- The SM has directed the data be gathered over a two-hour interval.
- Other operators have gathered the required initial and final data over the two-hour interval per SP3601F.6, steps 4.3.1 through 4.3.3.
- Other operators have recorded the data on Surveillance Form SP 3601F.6 – 001, *RCS Inventory Balance*.
- Initial and final RCS specific volume values have been determined using R*Time and are 0.02260 $ft^3$ /lbm.
- The data gathered by the other operators have been verified to be correct.
- The proper initial conditions were established for the data gathering period.
- All assumptions listed in SP-3601F.6 for a manual RCS leakage calculation are met.
- VCT Divert did not occur during the data gathering period.
- There is no known RCS leakage from other sources inside CTMT.
- There is no known RCS leakage from other sources outside CTMT.

Initiating Cues:

- The US directs you to perform a manual RCS water inventory balance using SP 3601F.6, *Reactor Coolant System Water Inventory Measurement*, section 4.3, "Manual RCS Leakage Calculation", step 4.3.4.
- You are directed to complete Surveillance Form SP 3601F.6 – 001, using the previously recorded data on the form.
- After completing SP 3601F.6, step 4.3.4, report to the US as to whether or not RCS leakage exceeds Tech Spec limits.

Record any required actions as a result of your leak rate calculations at the bottom / back of this page.

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Calculate a dilution without the PPC

JPM Number: 2017 NRC RO A.1.2 Revision: 0

Initiated:

Robert Royce — 8/17/17

Developer — Date

Reviewed:

Dave Minnich — 8/17/17

Technical Reviewer — Date

Reviewed:

E. BRODEUR — 8/18/17

Technical Reviewer — Date

Approved:

M.J. COTE — 8/18/17

Supervisor, Nuclear Training — Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Modified from Bank (JPM A141-02) | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: Millstone 3 Examinee: ____________

JPM Number: 2017 NRC RO A.1.2 Revision: 0

Task Title: Calculate a dilution without the PPC

System: NA

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 12

Applicable To: SRO X RO X

K/A Number: GEN.2.1.43 K/A Rating: 4.1 / 4.3

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: X Simulator: ____ In-Plant: ____

Task Standards: Calculate the required amount of Dilution to lower RCS Boron 200 ppm, and determine new boric acid pot setting.

Required Materials: (procedures, equipment, etc.)
OP3304C, *Primary Makeup and Chemical Addition*, Rev 029
Scientific Calculator
Monthly Reactivity Data Sheet in the Reactor Engineering Curve and Data Book

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC RO A.1.2 Revision : 0

Initial Conditions: The plant is in MODE 3, HOT STANDBY, and current conditions are as follows:

- Core Burnup: 13,000 MWD/MTU.
- RCS Boron concentration: 1500 ppm.
- RCS Pressure: 2250 psia.
- Tave: 557°F.
- PZR Level: 28%.
- The plant computer is unavailable
- There is no reactivity plan required for this evolution.
- BAST Tank Boron Concentration is 6850 ppm.

Initiating Cues: The Unit Supervisor directs you to calculate the required amount of PGS needed to lower RCS Boron concentration from 1500 ppm to 1300 ppm using OP3304C, *Primary Makeup and Chemical Addition*, step 4.9.1.

You are not required to determine the required dilution rate (GPM).

The US also directs you to determine the required pot setting **for the new 1300 ppm RCS boron concentration** after the dilution is complete using OP3304C, *Primary Makeup and Chemical Addition*, step 4.2.1.

Another operator will perform the dilution and make the actual pot setting adjustment.

Simulator Requirements: NA

**** **NOTES TO TASK PERFORMANCE EVALUATOR** ****

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC RO A.1.2 Revision: 0

Task Title: Calculate a dilution without the PPC

START TIME: ________________

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| STEP #1 | Obtains copy of OP 3304C | Obtains copy of OP 3304C | Y ☐ N ☒ | S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| STEP #2<br>OP 3304C, NOTE prior to Step 4.9.1 | 1. The maximum dilution flow rate while in the DILUTE mode is 115 gpm. If a dilution flow rate greater than 115 gpm is required, the makeup system must be aligned for alternate dilution.<br>2. Main Board components identified in this section are located on MB3. | Reviews the Notes. | Y ☐ N ☒ | S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP #3<br>OP 3304C, Step 4.9.1 | Performance:<br>DETERMINE the quantity and flow rate of dilution water to be added for the desired boron concentration reduction using one of the following:<br>• Attachment 2, "Determining Boration or Dilution Volume and Rate"<br>• Computer program for Dilution<br>• Approved Reactivity Plan | Standard:<br>Transitions to Attachment 2, "Determining Boration or Dilution Volume and Rate." | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: (If asked) "The plant computer is unavailable, and no reactivity plan is required for this evolution. The US directs you to use Attachment 2 to determine the required dilution volume." | | | |
| | Comments: | | | |

| STEP #4<br>OP 3304C, Att. 2, Step 1 | Performance:<br>Gallons of boric acid required for a boration =<br>(M/8.33) [ln (7000 – Ci/7000 – Cf)] K | Standard:<br>Does not perform step, since this step is for a boration. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: | | | |

| STEP #5<br>OP 3304C, Att. 2, Step 2 | Performance:<br>GPM of boric acid required for a specific boration rate =<br>[(δC/δt) M/500 (7000 – C)] K | Standard:<br>Does not perform step, since this step is for a boration. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: | | | |

<table>
<tr><td rowspan="3">STEP #6<br>OP 3304C, Att. 2, Step 3</td><td>Performance:<br>Gallons of PGS required for a dilution =<br><br>(M/8.33) [ln (Ci/Cf)] K</td><td>Standard:<br>Gallons of PGS required for a dilution = ([507,127 lbm/8.33] [ln 1500/1300]) x 0.98 =<br>8538 gallons</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: <u>Amplifying information for the evaluator for JPM Step 6:</u><br><br>M = RCS Mass = 507,127 lbm<br>C = boron concentration<br>Ci = initial boron concentration<br>Cf = final boron concentration<br>(δC/δt) = rate of boron concentration change (ppm/hr)<br>K = Correction Factor (from following procedure table)<br>K is determined to be 0.98 per OP 3304C, Att. 2 Table, which directs the use of 0.98 for "K" at 2250 psia, 557°F, 28% Pressurizer level.<br><br>Obtaining the exact value of 8538 gallons is not required. Range from 8535 gallons (obtained using 3 significant digits) to 8540 gallons is acceptable due to rounding of numbers. Use of the wrong "K" value of 1.0 will result in a number outside of this acceptable range.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #7<br>OP 3304C, NOTE prior to Step 4.2.1</td><td>Performance:<br>NOTE<br>Components identified in this section are located on MB3.</td><td>Standard:<br>Reviews the Note.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #8<br>OP 3304C, Step 4.2.1</td><td>Performance:<br>Refer To Attachment 1 and ENSURE 3CHS-FK110, “BORIC ACID BLEND FLOW CONT,” is set to provide required boric acid flow rate.</td><td>Standard:<br>Transitions to Attachment 1, “3CHS-FK110 Controller Pot Setting”</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: (If Examinee asks about actually adjusting the pot, state, “Another operator will make the actual pot setting adjustment.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #9<br>OP 3304C, Att. 1, NOTE prior to Step 1</td><td>Performance:<br>NOTE<br>Although makeup controller is operating within design parameters, operating experience from performing blended makeups at high RCS boron concentrations (>2,500 ppm) and large volumes (>200 gallons) has shown that the difference between setpoint and actual flow may result in a makeup concentration that is up 5 to 7% below the calculated value. Makeup concentration should be set 100 to 150 ppm above the desired value. Consideration should also be given to dividing large blended makeups into parts and sampling the RCS in between the parts of the makeups. This will allow correction of any undesirable results prior to completion of the makeup.</td><td>Standard:<br>Reads the Note.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Note does not apply, since RCS boron is less than 2500ppm, and is not being set for a large makeup.</td></tr>
</table>

| STEP #10<br>OP 3304C, Att. 1 Step 1 | Performance:<br>DETERMINE required boric acid flow rate, based on current RCS and in-service Boric Acid Storage Tank boron concentrations, by performing one of the following:<br>• OBTAIN flow rate from Attachment 3, “Boric Acid Flow Rate Based on 80 gpm Blended Makeup”<br>• CALCULATE flow rate by applying the following formula:<br>Required boric acid flow rate = (RCS CB / In–service BAST CB) x (80 gpm) | Standard:<br>Determines required boric acid flowrate, either by going to Attachment 3, or by using the formula.<br>Attachment 3 shows for 1300 ppm RCS boron concentration and 6850 ppm BAST boron concentration, the required boric acid flowrate is **15.18**<br><br>Calculation method shows (1300 ppm / 6850 ppm) x 80 gpm = **15.18** for the required boric acid flowrate. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: Either method may be used to determine the required boric acid flowrate of 15.18 gpm. (Acceptable range is from 15.18 to 15.2 gpm, to allow for rounding.) | | | |

| STEP #11<br>OP 3304C, Att. 1<br>Step 2 | Performance:<br>**NOTE**<br>During long on-line periods, B-10 depletes more than indicated by regular RCS sampling. Without correction, an auto makeup will over-borate the RCS. The correction factor is to account for B-10 depletion. | Standard:<br>Reads the Note. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: When requested, provide the Monthly Reactivity Data Sheet. | | | |
| | Comments: Monthly Reactivity Data Sheet shows an auto makeup reactivity correction factor of 1.0. | | | |

| STEP #12<br>OP 3304C, Att. 1<br>Step 2 | Performance:<br>Refer To the current Monthly Reactivity Data Sheet in the Reactor Engineering Curve and Data Book and CALCULATE the corrected boric acid flow rate by multiplying the flow rate determined in step 1. by the auto makeup reactivity correction factor. | Standard:<br>Calculates the corrected boric acid flow rate by multiplying the flow rate determined in step 1. by the auto makeup reactivity correction factor.<br><br>15.18 gpm x 1.0 = 15.18 gpm | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: When requested, provide the Monthly Reactivity Data Sheet. | | | |
| | Comments: Monthly Reactivity Data Sheet shows an auto makeup reactivity correction factor of 1.0. | | | |

| STEP #13<br>OP 3304C, Att. 1<br>Step 3 | Performance:<br>CALCULATE 3CHS-FK110 pot setting by applying the following formula:<br><br>3CHS–FK110 pot setting = Corrected boric acid flow rate x (10 turns / 40 gpm) | Standard:<br>Calculates the 3CHS-FK110 pot setting:<br><br>15.18 gpm x (10/40) = **3.795 turns** | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: Acceptable pot setting range is from 3.79 to 3.80 turns. | | | |

| STEP #14 | Performance: Notify the US. | Standard: Reports to the US that (approximately) 8538 gallons of dilution water is required, and the required pot setting is approximately 3.80 turns. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: Acceptable dilution volume range is from 8535 to 8540 gallons.<br>Acceptable pot setting range is from 3.79 to 3.80 turns. | | | |

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ________________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC RO A.1.2 Revision: 0

Task Title: Calculate a dilution without the PPC

Date Performed: ______________

Examinee: ______________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **12** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

# EXAMINEE HANDOUT

JPM Number: 2017 NRC RO A.1.2 Revision: 0

Initial Conditions: The plant is in MODE 3, HOT STANDBY, and current conditions are as follows:

- Core Burnup: 13,000 MWD/MTU.
- RCS Boron concentration: 1500 ppm.
- RCS Pressure: 2250 psia.
- Tave: 557°F.
- PZR Level: 28%.
- The plant computer is unavailable
- There is no reactivity plan required for this evolution.
- BAT Tank Boron Concentration is 6850 ppm.

---

Initiating Cues: The US directs you to calculate the required amount of PGS needed to lower RCS Boron concentration from 1500 ppm to 1300 ppm using OP3304C, *Primary Makeup and Chemical Addition*, step 4.9.1.

You are not required to determine the required dilution rate (GPM).

The US also directs you to determine the required pot setting **for the new 1300 ppm RCS boron concentration** after the dilution is complete using OP3304C, *Primary Makeup and Chemical Addition*, step 4.2.1.

Another operator will make the actual pot setting adjustment.

KEY RO A.2

## Form Approval

| Approval Date | Effective Date |
|---|---|
| 11/4/16 | 11/4/16 |

# Surveillance Form

## Generic Information

| Form Title | | | Rev. No. |
|---|---|---|---|
| T/S 3.8.1.1 ACTION b. – One EDG Inoperable | | | 007 |
| **Reference Procedure** | **Applicable Tech. Spec./TRM** | **Applicability (Tech. Spec./TRM)** | **Frequency** |
| SP 3646A.7 | T/S 3.8.1.1 | MODEs 1, 2, 3, 4 | AR* |

## Specific Information

| | | | |
|---|---|---|---|
| Schedule Start Date | | WO Number | Mntc Restoration ☐ Yes ☐ No |
| Performance Modes 1, 2, 3, 4 | Prerequisites Completed (Initials) RO | Precautions Noted (Initials) RO | |
| Test Authorized By | Shift Manager | Date today | Partial Surveillance ☐ Yes ☐ No |
| Performed By | Reactor Operator | Date/Time today / now | |
| Accepted By | | Date/Time | Acceptance Criteria Satisfied ☐ Yes ☐ No |
| Approved By (Department Head or Designee) | | Date | |

## Surveillance Information

CR# ____________

| Test Equipment Type | ID Number | Cal Due Date |
|---|---|---|
| N/A | | |

## Comments

* Tech Spec LCO Actions must be completed within the specified time interval.
Tech Spec surveillance requirement 4.0.2 does not apply.

## T/S 3.8.1.1 ACTION b. – One EDG Inoperable

**Step 4.2.1 Bus 34C Offsite Sources**

| From NSST A | | |
|---|---|---|
| **Component** | **Required Condition** | **Initial** |
| NSST A | Energized / No Valid Alarms | RO |
| NSSA–34A–2 | Breaker Racked Up, Indicating on MB8, and OPERABLE | RO |
| 34C*1T–2 | Breaker Racked Up, Indicating on MB8, and OPERABLE | RO |

AND

| From RSST A | | |
|---|---|---|
| **Component** | **Required Condition** | **Initial** |
| RSST A | Energized / No Valid Alarms | RO |
| RSSA*34C–2 | Breaker Racked Up, Indicating on MB8, and OPERABLE | RO |

| Acceptance Criteria | Sat | Unsat |
|---|---|---|
| Bus 34C capable of being powered from both off–site sources (NSST A AND RSST A) and breakers aligned and OPERABLE. | ✓ | |

**<u>Step 4.2.1 Bus 34D Offsite Sources</u>**

| From NSST A | | |
|---|---|---|
| **Component** | **Required Condition** | **Initial** |
| NSST A | Energized / No Valid Alarms | RO |
| NSSA–34B–2 | Breaker Racked Up, Indicating on MB8, and OPERABLE | RO |
| 34D*1T–2 | Breaker Racked Up, Indicating on MB8, and OPERABLE | |

AND

| From RSST A | | |
|---|---|---|
| **Component** | **Required Condition** | **Initial** |
| RSST A | Energized / No Valid Alarms | RO |
| RSSA*34D–2 | Breaker Racked Up, Indicating on MB8, and OPERABLE | RO |

| Acceptance Criteria | Sat | Unsat |
|---|---|---|
| Bus 34D capable of being powered from both off–site sources (NSST A AND RSST A) and breakers aligned and OPERABLE. | ✓ | |

## T/S 3.8.1.1 ACTION b. – One EDG Inoperable

**Step 4.2.2.a. Associated Systems, Subsystems, Trains, Components and Devices Check**

| Applicable LCO | System | EDG A OPERABLE Initial | EDG B OPERABLE Initial |
|---|---|---|---|
| T/S 3.4.3.1<br>T/S 3.4.3.2 | PZR Heaters | RO | |
| T/S 3.5.2<br>T/S 3.5.3 | ECCS Subsystems | RO | |
| T/S 3.6.2.1 | QSS | RO | |
| T/S 3.6.2.2 | RSS | RO | |
| T/S 3.6.6.1 | SLCRS | RO | |
| T/S 3.7.1.2 | AFW | RO | |
| T/S 3.7.3 | RPCCW | RO | |
| T/S 3.7.4 | Service Water | RO | |
| T/S 3.7.7 | Control Bldg Filter | RO | |
| T/S 3.7.9 | Aux Bldg Filter | RO | |
| T/S 3.8.1.1 | AC Sources | RO | |
| T/S 3.8.2.1 | DC Sources | RO | |
| T/S 3.8.3.1 | Onsite Power Distribution | RO | |
| TRM 3.1.2.2 | Boration Flow Paths | RO | |
| TRM 3.1.2.4 | Charging Pump | RO | |

**T/S 3.8.1.1 ACTION b. – One EDG Inoperable**

**Step 4.2.2.b. Bypass Annunciator Check (EDG A OPERABLE, otherwise N/A)**

| Window No. | Name | OPERABLE Initial |
|---|---|---|
| MB1D 4–1 | MOTOR DRIVEN AUX FW SYSTEM | RO |
| MB1D 3–2 | CTMT RECIRC INJECT SYSTEM | RO |
| MB1D 6–2 | SERVICE WATER SYSTEM | RO |
| MB1D 2–3 | CHARG PP HI PRES SI SYSTEM | RO |
| MB1D 3–3 | QUENCH SPRAY SYSTEM | RO |
| MB1D 6–3 | RPCCW SYSTEM | RO |
| MB1D 2–4 | SI PP HI PRES SI SYSTEM | RO |
| MB1D 3–4 | CTMT RECIRC SPRAY SYSTEM | RO |
| MB1D 4–4 | SEQUENCE | RO |
| MB1D 6–4 | DIESEL GEN | RO |
| MB1D 2–5 | RHR PP LO PRES SI SYSTEM | RO |
| MB1D 3–5 | SLCRS | RO |
| MB1D 6–5 | BATTERY | RO |

**Step 4.2.2.c. Associated Equipment Check (EDG A OPERABLE, otherwise N/A)**

**NOTE**

3SWP*MOV115A cannot be operated. 3SWP*MOV115A is replaced by a blank flange as directed by TCC–MP–2016–023, "Installation of a Blank Flange Assembly at 3SWP*MOV115A."

| Equipment ID | Equipment Name | OPERABLE Initial |
|---|---|---|
| 3CCP*MV222/224 | SPLY/RTN TRN A | RO |
| 3CCP*MV223/225 | SPLY/RTN TRN A | RO |
| 3CHS*MV8511A | MINFLOW ISOL | RO |
| 3CHS*MV8112 | RCP SEAL ISOL | RO |
| 3SWP*MOV71A | A HDR TPCCW SPLY | RO |
| 3SWP*MOV115A | CIRC PP LUBE | RO |

## T/S 3.8.1.1 ACTION b. – One EDG Inoperable

**Step 4.2.2.b. Bypass Annunciator Check (EDG B OPERABLE, otherwise N/A)**

| Window No. | Name | OPERABLE Initial |
|---|---|---|
| MB1E 4–1 | TURBINE DRIVEN AUX FW SYSTEM | N/A |
| MB1E 3–2 | CTMT RECIRC INJECT SYSTEM | |
| MB1E 6–2 | SERVICE WATER SYSTEM | |
| MB1E 2–3 | CHARG PP HI PRES SI SYSTEM | |
| MB1E 3–3 | QUENCH SPRAY SYSTEM | |
| MB1E 6–3 | RPCCW SYSTEM | |
| MB1E 2–4 | SI PP HI PRES SI SYSTEM | |
| MB1E 3–4 | CTMT RECIRC SPRAY SYSTEM | |
| MB1E 4–4 | SEQUENCE | |
| MB1E 6–4 | DIESEL GEN | |
| MB1E 2–5 | RHR PP LO PRES SI SYSTEM | |
| MB1E 3–5 | SLCRS | |
| MB1E 6–5 | BATTERY | |
| MB1D 4–1 | MOTOR DRIVEN AUX FW SYSTEM | |

**Step 4.2.2.c. Associated Equipment Check (EDG B OPERABLE, otherwise N/A)**

| Equipment ID | Equipment Name | OPERABLE Initial |
|---|---|---|
| 3CCP*MV226/228 | SPLY/RTN TRN B | N/A |
| 3CCP*MV227/229 | SPLY/RTN TRN B | |
| 3CHS*MV8511B | MINFLOW ISOL | |
| 3CHS*MV8100 | RCP SEAL ISOL | |
| 3SWP*MOV71B | B HDR TPCCW SPLY | |
| 3SWP*MOV115B | CIRC PP LUBE | |

**Step 4.2.3 TDAFW Pump Operability Check**

| Acceptance Criteria | Sat | Unsat |
|---|---|---|
| TDAFW Pump OPERABLE | | ✓ |

## T/S 3.8.1.1 ACTION b. – One EDG Inoperable

**Step 4.2.5/4.2.6 Common Mode Failure Check**

| Acceptance Criteria | Sat | Unsat |
|---|---|---|
| Determination that *no* common mode failure mechanism is present or Unloaded EDG operability surveillance performed<br>Indicate method used for determination:<br>☐ Pre–planned maintenance or testing<br>☑ Common Mode Failure Determination<br>☐ EDG Unloaded Operability Test (SP 3646A.1 or SP 3646A.2) | ✓ | |

**Step 4.2.7 14 day AOT for Pre–planned Maintenance Requirements**

| Acceptance Criteria | Sat | Unsat |
|---|---|---|
| Unit 2 EDG A OPERABLE | | |
| Unit 2 EDG B OPERABLE N/A | | |
| SBO Diesel Generator Available | | |

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Perform AC Electrical Source Inoperability Surveillance Requirements.

JPM Number: 2017 NRC RO A.2 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. Brodeur 8/18/17

Technical Reviewer Date

Approved:

M.J. Cote 8/18/17

Facility Reviewer Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Direct from Bank (JPM A011; 2K15 RO A.1.1) | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: ____________

JPM Number: 2017 NRC RO A.2 Revision: 0

Task Title: Perform AC Electrical Source Inoperability Surveillance Requirements.

Admin Section: Conduct of Operations

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 8

Applicable To: SRO ____ RO X

K/A Number: 2.2.12 K/A Rating: 3.7 / 4.1

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: ____ Simulator: X In-Plant: ____

Task Standards: Correctly complete AC Electrical Source Inoperability Surveillance for one EDG inoperable.

Required Materials: (procedures, equipment, etc.)
SP 3646A.7, "AC Electrical Sources Inoperability" Rev 011
SP 3646A.7-002, Rev 007
"T/S 3.8.1.1 ACTION b – One EDG Inoperable"

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

# JPM WORKSHEET

JPM Number: 2017 NRC RO A.2 Revision : 0

**Initial Conditions:**

The plant is at 100% power, and the following conditions exist:

- 10 minutes ago, the "B" EDG was declared INOPERABLE due to discovery of a significant jacket water leak into the rocker arm lube oil system.
- Tech Spec LCO 3.8.1.1, "AC Sources Operating", ACTION b was entered at the time of discovery.

**Initiating Cues:**

The US directs you to complete SP 3646A.7, *AC Electrical Sources Inoperability* for the "B" EDG.

The US provides you with a copy of the procedure and Surveillance Form.

**Simulator Requirements:**

1. Reset to **IC-356**, 100% steady-state power.
2. Close **3MSS*MOV17A, B, D** for TDAFW pump.
3. Place the simulator in "RUN", check for a stable IC condition, and acknowledge/clear annunciators.

Approximate setup time is 4 minutes.

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the applicant states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question applicant for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the applicant be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC RO A.2 Revision: 0

Task Title: Perform AC Electrical Source Inoperability Surveillance Requirements.

START TIME: ______________

| | | | | |
|---|---|---|---|---|
| **STEP # 1** | Performance:<br>Obtains copy of SP 3646A.7, *AC Electrical Sources Inoperability* and associated surveillance form SP 3646A.7-002 from the US | Standard:<br>Obtains copy of SP 3646A.7, *AC Electrical Sources Inoperability*.<br>Obtains copy of surveillance form SP 3646A.7-002 | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Provide a copy of SP 3646A.7, and associated surveillance form SP 3646A.7-002 to the examinee. | | | |
| **STEP # 2**<br>SP 3646A.7 Prerequizite 2.1.1 | Performance:<br>SM/US has signed the "Test Authorized By" block on the appropriate form. | Standard:<br>Reviews Prerequisites from SP 3646A.7, then reviews cover sheet of SP 3646A.7-002. Confirms "Test Authorized By" has been signed. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP # 3**<br>SP 3646A.7-002, Cover Sheet | Performance:<br>Initial for "Prerequisites Completed" on cover sheet. | Standard:<br>Verifies all prerequisites met, then initials for "Prerequisites Completed" on cover sheet. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

<table>
<tr><td rowspan="3">STEP #4<br>SP 3646A.7-002, Cover Sheet</td><td>Performance:<br>Initial for “Precautions Noted” on cover sheet.</td><td>Standard:<br>Reviews Precautions from SP 3646A.7, which are listed as “N/A”. Initials for “Precautions Noted” on cover sheet.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #5<br>SP 3646A.7 Note prior to Step 4.2.1</td><td>Performance:<br>T/S 3.8.1.1 ACTION b. – One EDG Inoperable<br>NOTE<br>Verification of the offsite sources must be performed as follows:<br>• Within one hour prior to or one hour after entering the ACTION statement<br>• At least once every eight hours while in the ACTION statement</td><td>Standard:<br>Reviews the NOTE.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #6<br>SP 3646A.7 Step 4.2.1</td><td>Performance:<br>Refer To SP 3646A.7-002 and PERFORM the following:<br>• CHECK that both RSST A <u>AND</u> NSST A are energized with no valid alarms.<br>• ENSURE the breaker alignment for supplying the vital 4,160V bus 34C from the credited source (NSST A or RSST A) is OPERABLE.<br>• ENSURE the breaker alignment for supplying vital 4,160V bus 34D from the credited source (NSST A or RSST A) is OPERABLE.</td><td>Standard:<br>1. Initials each row on SP 3646A.7-002 for Step 4.2.1 in space provided for Bus 34C (pg 2).<br>2. Marks or initials SAT for Bus 34C capable of being powered from both off-site sources (pg 2).<br>3. Initials each row on SP 3646A.7-002 for Step 4.2.1 in space provided for Bus 34D (pg 3).<br>4. Marks or initials SAT for Bus 34D capable of being powered from both off-site sources (pg 3).</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If the US is asked which offsite source is being credited, state “Acceptance Criteria for both Bus 34C and 34D is that they are capable of being powered from both off-site sources (NSST A AND RSST A) and breakers aligned and OPERABLE.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

| STEP #7<br>SP 3646A.7 Step 4.2.2.a | Performance:<br>Within two hours, Refer To SP 3646A.7-002 and PERFORM the following for the OPERABLE EDG:<br><br>a. REVIEW LCO ACTION statements in effect for each OPERABLE system, subsystem, train, component, or device. | Standard:<br>1 Request US review applicable LCO ACTION statements.<br>2 Initials every row of the "EDG A OPERABLE" column for step 4.2.2.a (pg 4).<br>3 Leaves the "EDG B OPERABLE" column blank or documents all rows N/A for step 4.2.2.a (pg 4). | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: "The US has performed a review of all applicable Tech Specs. Continue on with the procedure." | | | |
| | Comments: | | | |

| STEP #8<br>SP 3646A.7 Step 4.2.2.b | Performance:<br>b. ENSURE equipment associated with the listed bypass annunciators is OPERABLE. | Standard:<br>1 Observes status of Train A bypass annunciator windows at MB1, none are LIT for Train A.<br>2 Initials each row of the "OPERABLE" column for step 4.2.2.b for "EDG A OPERABLE" (pg 5).<br>3 Documents N/A or leaves blank the Initial box for window MB1E 4-1, TDAFW (pg 7).<br>4 Documents N/A for the remaining boxes in the "OPERABLE" column for step 4.2.2.b for "EDG B OPERABLE" (pg 7). | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: If examinee reports window MB1E 4-1 lit, provide the cue: "The US directs you to continue on with the procedure." | | | |
| | Comments: Examinee may perform a Lamp Test to confirm annunciator status. | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #9**<br>SP 3646A.7 Step 4.2.2.c | Performance:<br>c. ENSURE associated equipment is OPERABLE. | Standard:<br>1 Reviews the Turnover Sheet, recognizing that none of the MOVs listed on pg 6 for step 4.2.2.c for "EDG A OPERABLE" are out of service.<br>2 Initials each row of the "OPERABLE" column for step 4.2.2.c for "EDG A OPERABLE" (pg 6).<br>3 Documents N/A for the "OPERABLE" column for step 4.2.2.c for "EDG B OPERABLE" (pg 7) | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #10**<br>SP 3646A.7 Step 4.2.3 | Performance:<br><u>IF</u> in MODE 1, 2, or 3, within two hours, ENSURE the turbine driven auxiliary feedwater pump is OPERABLE and DOCUMENT on SP 3646A.7-002. | Standard:<br>1. Recognizes from observation that the TDAFW pump is out of service from one or more of the following:<br>• Either the Bypass Annunciator window is lit for MB1E 4-1<br>• MOVs 3MSS*MOV17A, B, D are closed at MB5.<br>2. Marks or initials the **"Unsat"** column for step 4.2.3 (pg 7). | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: If examinee requests US to perform step 4.2.3, state: "You are the only operator available. You are to evaluate step 4.2.3." If examinee reports TDAFW pump is out of service, provide the cue: "The US acknowledges, and directs you to continue on with the procedure." | | | |
| | Comments: | | | |
| **STEP #11**<br>SP 3646A.7 Step 4.2.4 | Performance:<br>Refer To LCO 3.8.1.1, "A.C. Sources – Operating," ACTION b.3 and DETERMINE if any additional ACTION requirements are applicable based on performance of steps 4.2.2 and 4.2.3. | Standard:<br>Requests US to determine if action requirements are applicable. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: "The US will review if there any additional ACTION requirements, continue on with procedure." | | | |
| | Comments: | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #12**<br>SP 3646A.7 Step 4.2.5 | Performance:<br>IF the EDG became inoperable due to pre-planned maintenance or testing, PERFORM the following:<br>a. Refer To SP 3646A.7-002 and DOCUMENT "Pre-planned maintenance or testing."<br>b. Go To step 4.2.7. | Standard:<br>Recognizes step is not applicable. Proceeds to the NOTE prior to step 4.2.6. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #13**<br>SP 3646A.7 Note prior to step 4.2.6 | Performance:<br>**NOTE**<br>An independently testable component is one which can be tested without running the EDG. Examples would be I&C loops out of calibration, valves found out of alignment, leaks on piping, breaker failures, and other similar items. | Standard:<br>Reviews the NOTE. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

<table>
<tr><td rowspan="3">STEP #14<br>SP 3646A.7 Step 4.2.6</td><td>Performance:<br><u>IF</u> the EDG became inoperable due to an inoperable support system OR an independently testable component, PERFORM one the following within 24 hours and DOCUMENT on SP 3646A.7-002:<ul><li>ENSURE no potential Common Mode Failure exists and Go To step 4.2.7</li><li>Refer To the applicable procedure below and PERFORM actions for starting the OPERABLE EDG from MB8 without loading:<ul><li>SP 3646A.1, “Emergency Diesel Generator A Operability Test”</li><li>SP 3646A.2, “Emergency Diesel Generator B Operability Test”</li></ul></li></ul></td><td>Standard:<ol><li>Based on NOTE, examinee determines that the ‘A’ EDG has no symptoms of jacket water leak.</li><li>Checks the box for “Common Mode Failure Determination” for step 4.2.5/4.2.6 (pg 8).</li><li>Marks or initials the “Sat” column for step 4.2.5/4.2.6 (pg 8).</li></ol></td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If requested assistance to assess the status of the ‘A’ EDG for Common Mode Failure, state:<br>“The System Engineer and PEO have inspected the ‘A’ EDG, no symptoms of a jacket water leak exist.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #15<br>SP 3646A.7 Step 4.2.7</td><td>Performance:<br><u>IF</u> the EDG may be subject to an extended on–line maintenance window of more than 72 hours, PERFORM the following to ensure Tech Spec 14 day on–line maintenance requirements are met:</td><td>Standard:<br>Recognizes step is not applicable.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: “The US has determined that Tech Spec 14 day requirements do not apply.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| STEP #16<br>SP 3646A.7 Step 4.2.8 | Performance:<br>Refer To LCO 3.8.1.1, "A.C. Sources – Operating," ACTION b. and DETERMINE if any additional ACTION requirements are applicable. | Standard:<br>Informs US of requirement. Candidate may also attempt to refer to the LCO. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: "The US will perform the LCO review, continue on with SP 3646A.7." | | | |
| | Comments: | | | |
| STEP #17<br>SP 3646A.7 Step 4.2.9 | Performance:<br>REPEAT step 4.2.1 through 4.2.4 at least once every eight hours until both EDGs are restored to OPERABLE status. | Standard:<br>Informs the US that surveillance must be repeated at least once every eight hours until both EDGs are restored to OPERABLE status. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: "The US acknowledges that the surveillance must be repeated."<br>"The US directs you to complete the Surveillance Form Cover Sheet." | | | |
| | Comments: | | | |
| STEP #18<br>SP 3646A.7-002, Cover Sheet | Performance:<br>Review Surveillance Form for Acceptance Criteria and document status on cover sheet. | Standard:<br>1 Marks the "NO" box on the cover sheet for Acceptance Criteria Satisfied, or leaves both boxes empty.<br>2 Signs and dates the cover sheet as "Performed By"<br>3 Informs the US that Acceptance Criteria is NOT satisfied. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: The critical portion of this step is informing the US that Acceptance Criteria is NOT satisfied. | | | |

**TERMINATION CUE: The evaluation for this JPM is concluded.**

**STOP TIME:** ____________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC RO A.2 Revision: 0

Task Title: Perform AC Electrical Source Inoperability Surveillance Requirements.

Date Performed: ______________

Examinee: ______________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | 8 | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

# EXAMINEE HANDOUT

JPM Number: **2017 NRC RO A.2** Revision: 0

Initial Conditions: The plant is at 100% power, and the following conditions exist:

- 10 minutes ago, the "B" EDG was declared INOPERABLE due to discovery of a significant jacket water leak into the rocker arm lube oil system.
- Tech Spec LCO 3.8.1.1, "AC Sources Operating", ACTION b was entered at the time of discovery.

Initiating Cues: The US directs you to complete SP 3646A.7, *AC Electrical Sources Inoperability* for the "B" EDG.

The US provides you with a copy of the procedure and Surveillance Form.

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Determine Dose Limits Under Changing Plant Conditions

JPM Number: 2017 NRC RO A.3 Revision: 0

Initiated:

| | |
|---|---|
| Robert Royce | 8/17/17 |
| Developer | Date |

Reviewed:

| | |
|---|---|
| Dave Minnich | 8/17/17 |
| Technical Reviewer | Date |

Reviewed:

| | |
|---|---|
| E. Brower | 8/18/17 |
| Technical Reviewer | Date |

Approved:

| | |
|---|---|
| M.J. Cote | 8/18/17 |
| Facility Representative | Date |

JPM Number: 2017 NRC RO A.3 Revision: 0

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Original issue (new) | 0 |
| | | |
| | | |
| | | |

# JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC RO A.3 Revision: 0

Task Title: Determine Dose Limits Under Changing Plant Conditions

System: NA

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 12

Applicable To: SRO ______ RO X

K/A Number: GEN.2.3.4 K/A Rating: 3.2 / 3.7

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards:
1) Determine dose limit under normal plant operations
2) Determine dose limit upon declaration of an emergency
3) Determine dose limit needed for protection of large populations

Required Materials: (procedures, equipment, etc.)
RP-AA-105 (Rev 2), *External Radiation Exposure Control Program*
MP-26-EPI-FAP09 (Rev 004-01), *Radiation Exposure Controls*
Calculator

General References: 10CFR20, *Standards for Protection Against Radiation*

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC RO A.3 Revision : 0

Initial Conditions: You are the extra licensed operator on shift.

Your annual TEDE dose this year is 400 mr, all received at Millstone 3.

The plant is initially at 100% power when the following sequence of events occurs:

09:00: The US directs you to assist a PEO with a solid waste resin transfer.

11:00: A large break LOCA occurs, resulting in entry into the EOP network and the declaration of an ALERT, Charlie 1.

12:00: The US directs you to assist a PEO in checking a valve lineup in the ESF Building.

17:00: The US obtains Assistant Director of Technical Support (ADTS) approval, and directs you to perform an action in the plant that is deemed necessary to protect large populations.

Initiating Cues: Determine your available TEDE dose (taking your existing annual dose into consideration, if required) prior to reaching the following limits at the following times. Provide the allowable dose on the following table:

| Time | Allowable dose to prevent exceeding the Admin guideline limit at Millstone 3 | Allowable dose to prevent exceeding the Federal Dose Limit | Allowable dose to prevent exceeding the Emergency Dose Limit |
|---|---|---|---|
| 09:01 | | | N/A |
| 12:01 | N/A | N/A | |
| 17:01 | N/A | N/A | |

Simulator Requirements: N/A

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC RO A.3 Revision: 0

Task Title: Determine Dose Limits Under Changing Plant Conditions

**START TIME:** ____________

<table>
<tr><td rowspan="3">STEP #1</td><td colspan="2">Performance:<br>Obtain a copy of RP-AA-105, External Radiation Exposure Control Program, Attachment 1, "Federal Limits and Administrative Guidelines for Exposure."</td><td>Standard:<br>Obtains copy of RP-AA-105 (Electronic or Hard Copy)</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="5">Cue:</td></tr>
<tr><td colspan="5">Comments: It is acceptable if Examinee finds the correct limit in another reference.</td></tr>
<tr><td rowspan="5">STEP #2<br>RP-AA-105 Att. 1</td><td colspan="2">Performance:<br>Determine allowable dose at 09:01 to prevent exceeding the Millstone 3 Administrative Guideline.</td><td rowspan="3">Standard:<br>Calculates allowable dose at 09:01 by determining the proper column is the Dominion Site Specific administrative limit, which is 2000 mr for the year.<br><br>Subtracts the 400 mr already received at Millstone, and fills in 1600 mr (1.6 Rem) on the table.</td><td rowspan="3">Critical:<br>Y ☒ N ☐</td><td rowspan="3">Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Classification:</td><td>Administrative Guideline at Dominion Site</td></tr>
<tr><td>Radiation Worker and Escorted Radiation Worker (TEDE)</td><td>2000 mrem/year at home Dominion Site</td></tr>
<tr><td colspan="5">Cue:</td></tr>
<tr><td colspan="5">Comments:</td></tr>
</table>

<table>
<tr><td>STEP #3</td><td>Performance:<br>Determine allowable dose at 09:01 to prevent exceeding the Federal Dose Limit:<br>Obtain copy of RP-AA-105, External Radiation Exposure Control Program, Attachment 1, "Federal Limits and Administrative Guidelines for Exposure." OR a copy of 10CFR20.1201</td><td>Standard:<br>Obtains copy of RP-AA-105 (Electronic or Hard Copy)</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue:</td></tr>
<tr><td></td><td colspan="4">Comments: It is acceptable if Examinee finds the correct limit in another reference.</td></tr>
<tr><td>STEP #4<br>RP-AA-105 Att 1</td><td>Performance:<br>Determine allowable dose at 09:01 to prevent exceeding the Federal Dose Limit<br><table><tr><th>Classification</th><th>Federal Dose Limit</th></tr><tr><td>Radiation Worker and Escorted Radiation Worker (TEDE)</td><td>5000 mrem/year at all licensees (with extension)</td></tr></table></td><td>Standard:<br>Calculates allowable dose at 09:01 by determining the Federal Limit is 5000 mr for the year, subtracts the 400 mr already received at Millstone, and fills in 4600 mr (4.6 Rem) on the table.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue:</td></tr>
<tr><td></td><td colspan="4">Comments:</td></tr>
<tr><td>STEP #5</td><td>Performance:<br>Determine the allowable dose at 12:01 to prevent exceeding the Emergency Dose Limit:<br>Obtain copy of EPI-FAP09, Radiation Exposure Controls, Attachment 3, "Emergency Exposure Control Guidance."</td><td>Standard:<br>Obtains copy of EPI-FAP09 (Electronic or Hard Copy)</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue:</td></tr>
<tr><td></td><td colspan="4">Comments: It is acceptable if Examinee finds the correct limit in another reference.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #6<br>EPI-FAP09 Att. 3</td><td>Performance:<br>Determine allowable dose at 12:01 to prevent exceeding the Emergency Dose Limit:<br>At Alert and higher classification levels, dose limits are automatically extended to 4.5 Rem and continue to follow 10 CFR 20 criteria (any emergency dose is added to any accumulated annual dose to establish control limits)… The table below assumes an Alert or higher classification has been declared:<br><table><tr><td>If the following condition is expected</td><td>The following may be applicable</td></tr><tr><td>Dose (including annual exposure to date) is not expected to reach 4.5 Rem TEDE</td><td>Emergency workers may be dispatched without exposure extension.</td></tr></table></td><td>Standard:<br>Calculates the allowable dose at 12:01 by determining the proper Emergency Dose Limit is NOT the limit required to protect valuable property or protect large populations, selecting 4500 mr for the year, and determines this dose IS to include the annual exposure to date, so the Examinee subtracts the 400 mr already received at Millstone, and fills in 4100 mr (4.1 Rem) on the table.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If asked, inform the Examinee that the valve lineup is NOT required to protect valuable property, for lifesaving or protect large populations.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #7</td><td>Performance:<br>Obtain copy of EPI-FAP09, Radiation Exposure Controls, Attachment 3, "Emergency Exposure Control Guidance."</td><td>Standard:<br>Obtains copy of EPI-FAP09 (Electronic or Hard Copy)</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Reference is being obtained to determine allowable dose at 17:01 to prevent exceeding the Emergency Dose Limit.<br>It is acceptable if Examinee finds the correct limit in another reference.</td></tr>
</table>

| | | | | |
|---|---|---|---|---|
| **STEP #8**<br>EPI-FAP09 Att. 3 | Performance:<br>Determine allowable dose at 17:01 to prevent exceeding the Emergency Dose Limit:<br>For situations where exposure may exceed 4.5 Rem, dose accumulated during the emergency follows EPA-400 criteria and is independent of any prior occupational exposure. The table below assumes an Alert or higher classification has been declared:<br><br>**If the following condition is expected** — Dose (accumulated during the emergency) **may** reach 25 Rem TEDE for actions needed for lifesaving or protection of large populations.<br>**The following may be applicable** — Assistant Director approval required for exposure > 4.5 Rem and ≤ 25 Rem. | Standard:<br>Calculates 17:01 allowable dose by determining the proper Emergency Dose Limit IS the limit required to protect large populations—which is 25 Rem during the emergency—and determines that since this is the dose accumulated during the emergency, the 400 mr already received at Millstone should NOT be subtracted, and fills in **25 Rem (25,000 mr)** on the table. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue:<br>If asked, inform the Examinee that Dose accumulated during the emergency should not exceed 25 Rem. | | | |
| | Comments: | | | |
| **STEP #9** | Performance:<br>Informs Examiner all required limits have been determined | | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

TERMINATION CUE: The evaluation for this JPM is concluded.

**STOP TIME:** ____________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC RO A.3 Revision: 0

Task Title: Determine Dose Limits Under Changing Plant Conditions

Date Performed: ____________

Examinee: ____________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | 12 | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

# EXAMINEE HANDOUT

JPM Number: 2017 NRC RO A.3 Revision: 0

Initial Conditions:

You are the extra licensed operator on shift.

Your annual TEDE dose this year is 400 mr, all received at Millstone 3.

The plant is initially at 100% power when the following sequence of events occurs:

09:00: The US directs you to assist a PEO with a solid waste resin transfer.

11:00: A large break LOCA occurs, resulting in entry into the EOP network and the declaration of an ALERT, Charlie 1.

12:00: The US directs you to assist a PEO in checking a valve lineup in the ESF Building.

17:00: The US obtains Assistant Director of Technical Support (ADTS) approval, and directs you to perform an action in the plant that is deemed necessary to protect large populations.

Initiating Cues:

Determine your available TEDE dose (taking your existing annual dose of 400 mr into consideration, if required) prior to reaching the following limits at the following times. Provide the allowable dose on the following table:

| Time | Allowable dose to prevent exceeding the Admin guideline limit at Millstone 3 | Allowable dose to prevent exceeding the Federal Dose Limit | Allowable dose to prevent exceeding the Emergency Dose Limit |
|---|---|---|---|
| 09:01 | | | N/A |
| 12:01 | N/A | N/A | |
| 17:01 | N/A | N/A | |

KEY

# EXAMINEE HANDOUT

JPM Number: 2017 NRC RO A.3 Revision: 0

Initial Conditions:

You are the extra licensed operator on shift.

Your annual TEDE dose this year is 400 mr, all received at Millstone 3.

The plant is initially at 100% power when the following sequence of events occurs:

09:00: The US directs you to assist a PEO with a solid waste resin transfer.

11:00: A large break LOCA occurs, resulting in entry into the EOP network and the declaration of an ALERT, Charlie 1.

12:00: The US directs you to assist a PEO in checking a valve lineup in the ESF Building.

17:00: The US obtains Assistant Director of Technical Support (ADTS) approval, and directs you to perform an action in the plant that is deemed necessary to protect large populations.

Initiating Cues:

Determine your available TEDE dose (taking your existing annual dose of 400 mr into consideration, if required) prior to reaching the following limits at the following times. Provide the allowable dose on the following table:

| Time | Allowable dose to prevent exceeding the Admin guideline limit at Millstone 3 | Allowable dose to prevent exceeding the Federal Dose Limit | Allowable dose to prevent exceeding the Emergency Dose Limit |
|---|---|---|---|
| 09:01 | 1600 mr | 4600 mr | N/A |
| 12:01 | N/A | N/A | 4100 mr |
| 17:01 | N/A | N/A | 25 R (25,000 mr) |

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Initiate Immediate Boration

JPM Number: 2017 NRC S.1 Revision: 0

Initiated:

Robert Royce — Developer — Date: 8/17/17

Reviewed:

Dave Minnich — Technical Reviewer — Date: 8/17/17

Reviewed:

E. BRODEUR — Technical Reviewer — Date: 8/18/17

Approved:

M.J. COTE — Supervisor, Nuclear Training — Date: 8/18/17

**SUMMARY OF CHANGES**

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Original issue from Bank (JPM S23A-2) | 0 |
| | | |
| | | |
| | | |

# Job Performance Measure Guide

Facility: Millstone Unit 3 Examinee ____________________

JPM ID Number: 2017 NRC S.1 Revision: 0

Task Title: Initiate Immediate Boration

System: 004 CVCS

Time Critical Task: (   ) YES ( X ) NO

Validated Time (minutes): 20

Applicable To: SRO X RO X

K/A Number: 004.A2.14 K/A Rating: 3.8 / 3.9

Applicable Methods of Testing:

Simulated Performance: ______ **Actual Performance: X**

Classroom: ______ **Simulator: X** In-Plant:: ______

Task Standards: Complete step 6 of ES-0.1, including initiating an immediate boration using AOP 3566

Required Materials: AOP 3566, Rev. 13-0,
EOP 35 ES-0.1, Rev. 028

General References: None

*****READ TO THE EXAMINEE*****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective(s) for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution were actually being performed.

Simulator Requirements:

Reset to IC 44, ES-0.1, step 6 with two stuck rods, or,
Reset to any 100% steady state IC and perform the following:

1. Insert IO override "CVDI0033", "3CHS*MV8104". "CLOSE" to ON (immediate boration valve 3CHS*MV8104 failure).
2. Insert malfunctions RD0406 and RD0416 - Control Rods B4 and C7 stuck.
3. Check remote function CVR79 (B Bat Pump Disch Valve) set at 100% and CVR 83 (BA Pump B Recirc Flow Throttle) set at 0%.
4. Insert malfunctions RP02A and RP02B - Reactor Trip, MS02A at 200,000 severity, steam break outside CTMT and place the simulator in RUN
   a. Carry out the immediate actions of E-0 and first 5 steps of ES 0.1
   b. With the plant stable, acknowledge/clear the annunciators
   c. Check RCS cold leg WR temperature is less than 550 °F, but greater than 540 °F
   d. Remove malfunction MS02A (Steam Break)
   e. Place the simulator in "Freeze"
5. Place the simulator in "run" just prior to giving the examinee the initial conditions and initiating cues. This will allow the temperature trend recorders to show a downward trend.

Approximate setup time is 10 minutes.

Initial Conditions:

A reactor trip has occurred, and current conditions are as follows:

- The crew has transitioned to ES-0.1, *Reactor Trip Response*.
- The crew has completed steps 1 through 5 of ES-0.1.
- RCS boron concentration is 500 ppm.

Initiating Cues:

The US directs you to carry out ES-0.1, step 6.

**** **NOTES TO EVALUATOR** ****

1. Critical steps for this JPM are indicated by a check box. For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. The Examinees performance is graded by an "S" for satisfactory or a "U" for unsatisfactory on each step.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question the Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

**PERFORMANCE INFORMATION**

JPM Number: 2017 NRC S.1 Revision: 0

Task Title: Initiate Immediate Boration

START TIME: ________________

| STEP #1<br>ES-0.1, step 6 | Performance:<br>**CHECK All Control Rods – FULLY INSERTED** | Standard:<br>Recognizes two rods did not insert on the trip. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | Two rods are not inserted | | | |

| STEP #2<br>ES-0.1, step 6 RNO | Performance:<br><u>IF</u> two or more control rods are NOT fully inserted, <u>THEN</u> using AOP 3566, Immediate Boration, **IMMEDIATE BORATE** until one of the following conditions is met:<br>• **INCREASE** of 200 ppm for each control rod <u>NOT</u> verified fully inserted<br><u>**OR**</u><br>• Increase of 1300 ppm in RCS boron concentration<br><u>**OR**</u><br>• Increase of RCS boron concentration to 2600 ppm | Standard:<br>Obtains copy of AOP 3566, *Immediate Boration* in preparation to borate 200 ppm for each stuck rod<br><br>JPM Initial Conditions state RCS boron concentration is 500 ppm. Examinee determines required increase in RCS boron concentration is 200 ppm x two stuck rods = 400 ppm increase in RCS boron concentration is required (to a total of 900 ppm). | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | If Examinee does not state how much boron is required to be added, cue "The US directs you to report how much boron is required to be added to the RCS." | | | |
| Comments: | | | | |

| STEP #3 AOP 3566, Caution prior to Step1 | Performance: **CAUTION:** If SI actuation occurs, restoration from Rapid Boration lineup must be completed. | Standard: Reads Caution | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | Caution currently does not apply. | | | |

| STEP #4 AOP 3566, Step1.a | Performance: **1. Initiate Immediate Boration of RCS**<br>a. CHECK ONE Charging Pump - RUNNING | Standard: Observes one Charging Pump running by observing the Red light is lit on MB3 | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #5 AOP 3566, Step 1.b.1 | Performance: b. **ALIGN** boration path:<br>1. **START** ONE Boric Acid Transfer Pump<br>• BA PP A<br>• BA PP B | Standard: Starts one Boric Acid Transfer Pump by depressing the Start pushbutton on MB3. Observes the pump starts (Red light comes on, green light goes off). | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #6<br>AOP 3566, Step 1.b.2 | Performance:<br>2. **OPEN** Emergency Boration Valve (3CHS*MV8104) | Standard:<br>Depresses the OPEN pushbutton for 3CHS*MV8104 on MB3.<br>Observes that 3CHS*MV8104 does NOT open (Green light remains lit, Red light remains off).<br>Moves to the Step 1.b RNO column. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | The failure of 3CHS*MV8104 to open requires the examinee to align a completely different path to route boron from the BAT Tanks to the suction of the Charging Pumps. This is where the alternate path for this JPM commences. | | | |

| STEP #7<br>AOP 3566, Step1, RNOb.1 | Performance:<br>1. **STOP** running Boric Acid Transfer Pump(s) and Place in AUTO.<br>• BA PP A<br>• BA PP B | Standard:<br>Depresses the STOP pushbutton on the BA Transfer Pump controller for the running Pump.<br>Depresses the AUTO pushbutton.<br>Observes the AUTO pushbutton lights on the BA Transfer Pump controller. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #8<br>AOP 3566, Step1, RNOb.2 | Performance:<br>2. **OPEN** a minimum of ONE Gravity Feed Boration Valve.<br>• 3CHS*MV8507A<br>• 3CHS*MV8507B | Standard:<br>Opens at least one Gravity Feed Boration Valve by depressing the OPEN pushbutton on MB3.<br>Observes the valve(s) open (Green light goes off, Red light lights). | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | Critical nature of this step is to open a minimum of one Gravity Feed Boration Valve. | | | |

| STEP #9<br>AOP 3566, Step1, RNOb.3 | Performance:<br>3. **IF** AT LEAST ONE Gravity Feed Boration Valve CANNOT be opened, **THEN OPEN** AT LEAST ONE RWST to Charging Pump Suction Isolation Valve<br>• 3CHS*LCV112D<br>• 3CHS*LCV112E<br>**AND**<br>**WHEN** ONE RWST to Charging Pump Suction Isolation Valve is open, **THEN CLOSE** AT LEAST ONE VCT Outlet Isolation Valve<br>• 3CHS*LCV112B<br>• 3CHS*LCV112C<br>**AND**<br>**PROCEED TO** step 1.c. | Standard:<br>Realizes this step does not apply, and proceeds to step 1, RNO.b.4, not step 1.c. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #10<br>AOP 3566, Step1, RNOb.4 | Performance:<br>4. **LIMIT** net charging flow to the RCS to LESS THAN 85 gpm (Charging + Seal Injection – RCP Seal Return). | Standard:<br>Reads Charging flow, Seal Injection flow, and RCP Seal Return flows on MB3.<br>Determines net flow by adding Charging + Seal Injection – RCP Seal Return flow.<br>Adjusts Charging flow through 3CHS*FCV121 by depressing the down arrow on the MB3 pushbutton as necessary to reduce net charging flow to less than 85 gpm. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | Critical nature of this step is to reduce net charging flow to less than 85 gpm, if required. | | | |

| STEP #11<br>AOP 3566, Step1, RNOb.5 | Performance:<br>5. **CLOSE** a minimum of ONE VCT Outlet Isolation Valve.<br>• 3CHS*LCV112B<br>• 3CHS*LCV112C | Standard:<br>Closes either one or both VCT Outlet Isolation Valves 3CHS*LCV112B and / or 3CHS*LCV112C.<br>Observes that 3CHS*LCV112B and / or 3CHS*LCV112C close (Green light lights, Red light goes off) on MB3. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | Critical nature of this step is to close at least one VCT Outlet Valve | | | |

| STEP #12<br>AOP 3566, Step1, RNOb.6 | Performance:<br>6. **VERIFY** BOTH RWST to Charging Pump Suction Isolation Valves – CLOSED<br>• 3CHS*LCV112D<br>• 3CHS*LCV112E | Standard:<br>Observes both 3CHS*LCV112D and 3CHS*LCV112D are closed (Green lights lit, Red lights off) on MB3. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | Valves are already closed. | | | |

| STEP #13<br>AOP 3566, Step1.c | Performance:<br>c. **CHECK** normal Charging Flow Path aligned<br>• **CHECK** Charging Flow Control Valve (3CHS*FCV121) - CAPABLE OF BEING THROTTLED | Standard:<br>May adjust 3CHS*FCV121 by pushing the up and / or down arrows on the controller on MB3, or may just realize this valve has already been throttled while performing steps in this procedure. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | AOP 3566, step 1.c actions can be performed in any order, since the step is bulleted. | | | |

| STEP #14<br>AOP 3566, Step1.c | Performance:<br>• **CHECK** ONE Charging Header Loop Isolation Valve – OPEN<br>• 3CHS*AV8146<br>**OR**<br>• 3CHS*AV8147 | Standard:<br>Observes 3CHS*AV8146 or 3CHS*AV8147 open by observing the Green light off and the Red light lit for only one of the two valves on MB3. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | AOP 3566, step 1.c actions can be performed in any order, since the step is bulleted.<br>These valves should already be in this alignment. | | | |

| STEP #15<br>AOP 3566, Step1.c | Performance:<br>• **CHECK** Charging Header Isolation Valves - OPEN<br>• 3CHS*MV8106 <u>AND</u><br>• 3CHS*MV8105 | Standard:<br>Observes MV8106 and MV8105 open by observing the Green light off and the Red light lit for both valves on MB3. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | AOP 3566, step 1.c actions can be performed in any order, since the step is bulleted.<br>These valves should already be in this alignment. | | | |

| STEP #16<br>AOP 3566, Step 1.d | Performance:<br>d. **<u>PROCEED</u> <u>TO</u>** step 3. | Standard:<br>Proceeds to step 3 of AOP 3566. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #17<br>AOP 3566, Note prior to Step3 | Performance:<br>**NOTE:** Net Charging Flow to the RCS is Charging + Seal Injection - RCP Seal Return.<br><br>**NOTE:** Thumb rule: With RWST as boration source: 100 gpm ≈ 33 gpm of 4% boric acid | Standard:<br>Reads Notes | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | The second Note does not apply | | | |

| STEP #18<br>AOP 3566, Step3.a | Performance:<br>**Check Boration Flow**<br>a. **CHECK** PZR Pressure - LESS THAN 2350 psia | Standard:<br>Checks RCS pressure less than 2350 psia on meter on MB4, or on PPC. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #19<br>AOP 3566, Step 3.b | Performance:<br>b. **CHECK** normal Charging Flow Path - ALIGNED | Standard:<br>Verifies flowpath from Charging Pump to the RCS exists by checking 3CHS*FCV121 throttled open at its controller at MB3, and Charging Header Isolation Valves 3CHS*MV8105 and 8106 open (Red light lit, Green light off) on MB3.<br>Also acceptable to state the flowpath is available, since these valves have already been checked while performing earlier procedure steps. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #20<br>AOP 3566, Step 3.c | Performance:<br>c. **PLACE** Charging Flow Control Valve (3CHS*FCV121) in MANUAL | Standard:<br>Verifies 3CHS*FCV121 is already in Manual by observing lit up or down arrow on controller on MB3. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #21<br>AOP 3566, Step 3.d | Performance:<br>d. **CHECK** Boration flow to the RCS – EQUAL TO OR GREATER THAN 33 gpm<br>• **IF** Immediate Boration is in service, **THEN** **CHECK** Direct BA Flow (3CHS-FI183A)<br>• **IF** Gravity Boration is in service, **THEN** **CHECK** Net Charging Flow | Standard:<br>Checks Net Charging Flow, since Gravity Boration is in service.<br>Reads Charging flow, Seal Injection flow, and RCP Seal Return flows on MB3.<br>Determines net flow by calculating Charging + Seal Injection – RCP Seal Return flow.<br>Also acceptable to state flow is adequate, since these flows have already been checked while performing earlier procedure steps. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | This step is critical only if less than 33 gpm net charging flow exists, after which increasing flow to 33 gpm or more would be required.<br>Approximate values are 40 gpm Charging flow + 37 gpm Seal Injection flow – 10 gpm seal return flow = 67 gpm | | | |

| STEP #22<br>AOP 3566, Step 4.a | Performance:<br>**Energize PZR Heaters To Equalize Boron Concentration**<br>a. **ENERGIZE** ALL PZR Heaters | Standard:<br>Takes all Pzr Heater Control Switches to ON at MB4.<br>Verifies the Heater Indication Lights are Red on MB4. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | Critical nature of the step is to energize the heaters. | | | |

| STEP #23 AOP 3566, Step 4.b | Performance: b. **ADJUST** PZR Spray Valves to 50% setpoint<br>• 3RCS-PK 455B<br>• 3RCS-PK 455C | Standard: Adjusts Pzr Spray Valve Controller knobs for both 3RCS-PK 455B and 3RCS-PK 455C to approximately 50% at MB4. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #24 AOP 3566, Step 5 | Performance: **Check Dilution Paths Isolated**<br>• **CHECK** Primary Makeup Water to Blender (3CHS*FCV111A) - CLOSED<br>• Locally **CHECK** Chemical Mix Tank Outlet Isolation Valve (3CHS*V317) - CLOSED<br>• Locally **CHECK** Manual Dilution Valve (3CHS*V305) – CLOSED | Standard: Checks 3CHS*FCV111A at MB3 (Green light lit, Red light off)<br>Calls PEO to check these valves, or requests the US contacts a PEO to check these valves. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | "The US will be tracking the completion of this step." | | | |
| Comments: | These valves should already be closed. | | | |

| STEP #25<br>AOP 3566, Step 6.a | Performance:<br>**Check If Immediate Boration is Required Due To Control Rod Bank Height**<br><br>a. **CHECK** EITHER of the following annunciators - LIT<br>• ROD CONTROL BANKS LIMIT LO (MB4C 3-9)<br>**OR**<br>• ROD CONTROL BANKS LIMIT LO-LO (MB4C4-9) | Standard:<br>Checks annunciators windows MB4C 3-9 and MB4C 4-9 not lit | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | These annunciators are not lit. | | | |

| STEP #26<br>AOP 3566, Step 6.a RNO | Performance:<br>a. **PROCEED TO** step 7. | Standard:<br>Proceeds to AOP 3566, step 7 | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

<table>
<tr><td>STEP #27<br>AOP 3566, Step 7.a</td><td>Performance:<br>Check If Immediate Boration Should Be Stopped<br>a. CHECK EITHER condition satisfied<br>• The conditions requiring entry into this procedure - NO LONGER EXIST<br><u>OR</u><br>• The required amount of Boric Acid solution - HAS BEEN ADDED TO THE RCS</td><td>Standard:<br>400 ppm of boric acid is required.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4">"The STA is checking how long boration is required."</td></tr>
<tr><td>Comments:</td><td colspan="4">The time may or may not have been met, based on boration rate and the speed at which the Examinee moves through the procedure. Terminate the JPM when the Examinee decides whether or not the boration is required to continue.</td></tr>
</table>

**Terminating Cue:** The evaluation for this JPM is concluded

Stop Time: ___________

## VERIFICATION OF JPM COMPLETION

JPM Number: **2017 NRC S.1** Revision: 0

Task Title: Initiate Immediate Boration

Date Performed: ____________________

Examinee: ____________________

| |
|---|
| For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.<br>If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade. |

**EVALUATION SECTION**:

| Time Critical Task? | | ☐ Yes ☒ No | |
|---|---|---|---|
| Validated Time (minutes): | **20** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

JPM ID Number: 2017 NRC S.1 Revision: 0

**Initial Conditions:** A reactor trip has occurred, and current conditions are as follows:

- The crew has transitioned to ES-0.1, *Reactor Trip Response.*
- The crew has completed steps 1 through 5 of ES-0.1.
- RCS boron concentration is 500 ppm.

**Initiating Cues:** The US directs you to carry out ES-0.1, step 6.

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Establish Feed and Bleed Cooling of the RCS

JPM Number: 2017 NRC S.2 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. BROWER 8/18/17

Technical Reviewer Date

Approved:

M.J. COTE 8/18/17

Facility Reviewer Date

JPM Number: 2017 NRC S.2 Revision: 0

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Original issue - New | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: __________

JPM Number: 2017 NRC S.2 Revision: 0

Task Title: Establish Feed and Bleed Cooling of the RCS

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 12

Applicable To: SRO X RO X

K/A Number: W/E05.EK2.2 K/A Rating: 3.9 / 4.2

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: ____ Simulator: X In-Plant: ____

Task Standards: Attempt to establish AFW flow, and correctly implement bleed and feed cooling of the RCS.

Required Materials: (procedures, equipment, etc.) EOP35 FR-H.1, Rev 026

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC S.2 Revision : 0

Initial Conditions: A Reactor Trip occurred, resulting in the following sequence of events:

1. The crew entered E-0, *Reactor Trip or Safety Injection.*
2. The crew determined Safety Injection is not required.
3. The crew transitioned from E-0, step 4, to FR-H.1, *Response to Loss of Secondary Heat Sink.*

Initiating Cues: The US directs you to attempt to restore Auxiliary Feedwater flow, starting at FR-H.1, step 1.

Simulator Requirements: Reset to **IC 43, E-0, steps 1 through 4 complete, no AFW Pumps running.**

- **FW18A, "A" MDAFW Pump trip**
- **FW18B, "B" MDAFW Pump trip**
- **FW19, TDAFW Pump trip**
- **CV11A "A" Charging Pump trip, Trigger 1**
- **CV11B "B" Charging Pump trip, Trigger 1**

Acknowledge/clear annunciators. Place the simulator in "freeze". Place the simulator in "run" after the examinee has read the initial conditions and initiating cues.

Approximate simulator setup time is 5 minutes.

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.2 Revision: 0

Task Title: Establish Feed and Bleed Cooling of the RCS

**START TIME:** ______

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP # 1** | Performance:<br>Obtain copy of FR-H.1, and locates step 1, "Check If Secondary Heat Sink Is Required." | Standard:<br>Obtains copy of FR-H.1, and turns to step 1. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP # 2**<br>FR-H.1, Caution prior to step 1 | Performance:<br>Caution:<br>• Feed flow must **NOT** be reestablished to any faulted SG if a non- faulted SG is available.<br>• With all steam generators faulted and total feed flow LESS THAN 530 gpm due to operator action, this procedure should **NOT** be performed. | Standard:<br>Reads cautions | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #3** FR-H.1, step 1.a | Performance: **Check If Secondary Heat Sink Is Required**<br>a. **CHECK** RCS pressure - GREATER THAN ANY NON - FAULTED SG PRESSURE | Standard: Checks RCS pressure at MB4, or the PPC (about 2250 psia), and compares it to non-faulted SG pressures at MB5, MB2, or the PPC (about 1100 psig).<br>Recognizes RCS pressure is greater than SG pressures, and proceeds to FR-H.1, step 1.b. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #4** FR-H.1, step 1.b | Performance:<br>b. **CHECK** RCS hot leg WR temperature - GREATER THAN 350°F | Standard: Checks RCS temperature at MB4, or PPC (about 557°F), and determines it is greater than 350°F. Proceeds to FR-H.1, step 1.c | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #5** FR-H.1, step 1.c | Performance:<br>c. **CHECK** a secondary heat sink established<br>• Check WR level in at least one SG – RISING<br>• Check Core exit TCs - STABLE OR LOWERING | Standard: Checks WR SG levels at MB5 or the PPC (stable or lowering), and determines they are not rising.<br>Checks Core Exit TCs on the PPC or ICC cabinet (stable).<br>Determines Secondary Heat Sink is NOT established.<br>Proceeds to step 1.c RNO. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: When the Charging Pump trips, state "The RO is addressing the ARP for the tripped Charging Pump." | | | |
| | Comments: Sim Booth Operator is to insert malfunctions CV11A and CV11B (Trigger 1) to trip the running Charging Pump when the Examinee is checking Core Exit Thermocouples per step 1.c. The Charging Pump Auto Trip / Overcurrent annunciator will illuminate at MB3. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #6** FR-H.1, step 1.c.RNO | Performance: **<u>PROCEED</u> <u>TO</u>** step 2 . | Standard: Proceeds to FR-H.1, step 2 | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #7** FR-H.1, step 2 | Performance: **CHECK Charging Pump Status - AT LEAST ONE RUNNING** | Standard: Observes no Charging Pumps running by observing green lights lit and red lights off at MB3.<br>Proceeds to FR-H.1, step 2.RNO | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

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|---|---|---|---|---|
| **STEP #8**<br>FR-H.1, step 2 RNO | Performance:<br>**START** one charging pump.<br>• <u>IF</u> one charging pump **<u>CANNOT</u>** be started, **<u>THEN</u> <u>PROCEED</u> <u>TO</u>** CAUTION prior to step 12. | Standard:<br>Attempts to start the standby Charging Pump by taking the switch to Start on MB3. Observes the pump does not start (Green light stays lit, amber light lights, and red light stays off).<br>Proceeds in FR-H.1 to Caution prior to step 12 | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: If asked, state, "the US directs you to attempt to start the standby Charging Pump. | | | |
| | Comments: Examinee may request US permission before starting the standby pump.<br>The loss of all Charging Pumps requires the examinee to leave the portion of the procedure and initiate bleed and feed. This step commences the alternate path portion of this JPM. | | | |
| **STEP #9**<br>FR-H.1, Caution prior to step 12 | Performance:<br>CAUTION: Steps 12 through 16 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.<br>CAUTION: During the remainder of the procedure, feed flow to the SGs must be established as specified by step 21. | Standard:<br>Reads the Cautions | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #10**<br>FR-H.1, step 12 | Performance:<br>**CHECK All RCPs - STOPPED** | Standard:<br>Observes RCPs red lights lit on MB4.<br>Proceeds to FR-H.1, Step 12 RNO. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

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|---|---|---|---|---|
| **STEP #11** FR-H.1, step 12.RNO | Performance: **STOP** pump(s). | Standard: Stops all four RCPs by taking their switches to "Stop" on MB4, observing the green lights illuminate and the red lights go off. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is to stop all four RCPs. | | | |
| **STEP #12** FR-H.1, step 13 | Performance: **INITIATE SI** | Standard: Depresses the SIS Actuation pushbuttons on MB2, or turns the SIS Actuation switch to "Actuate" on MB4. Observes SIS Actuation Annunciator lights on MB4. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: After SIS actuates, state, "The US is going to Master Silence." | | | |
| | Comments: Critical portion of this step is to actuate SIS.<br>Booth operator is to select "Master Silence" at US desk. | | | |
| **STEP #13** FR-H.1, step 14.a | Performance: **Check RCS Feed Path**<br>a. **CHECK** charging pumps - AT LEAST ONE RUNNING | Standard: Observes no Charging Pumps running (Green and Amber lights lit) on MB3<br>Proceeds to FR-H.1, step 14.a.RNO | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #11** FR-H.1, step 12.RNO | Performance: **STOP** pump(s). | Standard: Stops all four RCPs by taking their switches to "Stop" on MB4, observing the green lights illuminate and the red lights go off. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is to stop all four RCPs. | | | |
| **STEP #12** FR-H.1, step 13 | Performance: **INITIATE SI** | Standard: Depresses the SIS Actuation pushbuttons on MB2, or turns the SIS Actuation switch to "Actuate" on MB4. Observes SIS Actuation Annunciator lights on MB4. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: After SIS actuates, state, "The US is going to Master Silence." | | | |
| | Comments: Critical portion of this step is to actuate SIS.<br>Booth operator is to select "Master Silence" at US desk. | | | |
| **STEP #13** FR-H.1, step 14.a | Performance: **Check RCS Feed Path**<br>a. **CHECK** charging pumps - AT LEAST ONE RUNNING | Standard: Observes no Charging Pumps running (Green and Amber lights lit) on MB3<br>Proceeds to FR-H.1, step 14.a.RNO | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #14** FR-H.1, step 14.a.RNO | Performance: **START** a pump. **IF** a charging pump **CANNOT** be started, **THEN** perform the applicable: • **IF** Core Exit TCs are LESS THAN 596 °F **THEN PROCEED TO** step 14.c. | Standard: May attempt to restart the tripped Charging Pumps at MB3. Also acceptable to realize attempts to start the pumps have already been taken. Checks Core Exit TCs on the PPC or ICC cabinet are less than 596 °F. Proceeds to step 14.c. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: If asked, state, "The US directs you NOT to attempt a restart of the tripped Charging Pumps, and to proceed in FR-H.1." | | | |
| | Comments: | | | |
| **STEP #15** FR-H.1, step 14.c | Performance: c. **CHECK** SI pumps - BOTH RUNNING | Standard: Observes both SIH Pumps are running (red lights on) at MB2. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #16** FR-H.1, step 14.d | Performance: d. **CHECK** ECCS valve alignment - PROPER EMERGENCY ALIGNMENT | Standard: Traces flowpath from RWST through the SIH Pump Suction Valves (Red lights lit), through the SIH Pumps, through the SIH Cold Leg Injection Valves (Red lights lit) on MB2. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #17** FR-H.1, step 15.a | Performance: **Establish RCS Bleed Path** a. **CHECK** PZR PORV block valves - BOTH OPEN | Standard: Observes both PORV Block Valves open by observing their red lights lit on MB4. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #18** FR-H.1, step 15.b | Performance: b. **OPEN** both PZR PORVs | Standard: Opens both PORVs by taking their switches to OPEN on MB4. Observes the red lights light, and the green lights go off. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical nature of this step is to open both PORVs. | | | |
| **STEP #19** FR-H.1, step 16 | Performance: **Check Adequate RCS Bleed Path** • **CHECK** PZR PORVs - BOTH OPEN • **CHECK** PZR PORV block valves - BOTH OPEN | Standard: Observes both PORVs open and both PORV block Valves Open (Red lights lit, green lights off) on MB4 | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: The JPM is concluded after the Examinee verifies the bleed path is adequate. | | | |

**TERMINATION CUE: The evaluation for this JPM is concluded.**

**STOP TIME:** ____________

<table>
<tr><td rowspan="3">STEP #14<br>FR-H.1, step 14.a.RNO</td><td>Performance:<br>START a pump.<br><br><u>IF</u> a charging pump <u>CANNOT</u> be started, <u>THEN</u> perform the applicable:<br>• IF Core Exit TCs are LESS THAN 596 °F THEN PROCEED TO step 14.c.</td><td>Standard:<br>May attempt to restart the tripped Charging Pumps at MB3.<br>Also acceptable to realize attempts to start the pumps have already been taken.<br><br>Checks Core Exit TCs on the PPC or ICC cabinet are less than 596 °F.<br><br>Proceeds to step 14.c.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If asked, state, “The US directs you NOT to attempt a restart of the tripped Charging Pumps, and to proceed in FR-H.1.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #15<br>FR-H.1, step 14.c</td><td>Performance:<br>c. CHECK SI pumps - BOTH RUNNING</td><td>Standard:<br>Observes both SIH Pumps are running (red lights on) at MB2.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #16<br>FR-H.1, step 14.d</td><td>Performance:<br>d. CHECK ECCS valve alignment - PROPER EMERGENCY ALIGNMENT</td><td>Standard:<br>Traces flowpath from RWST through the SIH Pump Suction Valves (Red lights lit), through the SIH Pumps, through the SIH Cold Leg Injection Valves (Red lights lit) on MB2.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #17<br>FR-H.1, step 15.a</td><td>Performance:<br>Establish RCS Bleed Path<br><br>a. CHECK PZR PORV block valves - BOTH OPEN</td><td>Standard:<br>Observes both PORV Block Valves open by observing their red lights lit on MB4.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #18<br>FR-H.1,<br>step 15.b</td><td>Performance:<br>b. OPEN both PZR PORVs</td><td>Standard:<br>Opens both PORVs by taking their switches to OPEN on MB4.<br>Observes the red lights light, and the green lights go off.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical nature of this step is to open both PORVs.</td></tr>
<tr><td rowspan="3">STEP #19<br>FR-H.1,<br>step 16</td><td>Performance:<br>Check Adequate RCS Bleed Path<br>• CHECK PZR PORVs - BOTH OPEN<br>• CHECK PZR PORV block valves - BOTH OPEN</td><td>Standard:<br>Observes both PORVs open and both PORV block Valves Open (Red lights lit, green lights off) on MB4</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: The JPM is concluded after the Examinee verifies the bleed path is adequate.</td></tr>
</table>

**TERMINATION CUE: The evaluation for this JPM is concluded.**

**STOP TIME:** ____________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.2 Revision: 0

Task Title: Establish Feed and Bleed Cooling of the RCS

Date Performed: ____________

Examinee: ____________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **12** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

# EXAMINEE HANDOUT

JPM Number: 2017 NRC S.2 Revision: **0**

Initial Conditions: A Reactor Trip occurred, resulting in the following sequence of events:

1. The crew entered E-0, *Reactor Trip or Safety Injection*.
2. The crew determined Safety Injection is not required.
3. The crew transitioned from E-0, step 4, to FR-H.1, *Response to Loss of Secondary Heat Sink.*

Initiating Cues: The US directs you to attempt to restore Auxiliary Feedwater flow, starting at FR-H.1, step 1.

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Depressurize the RCS During a SG Tube Rupture

JPM Number: 2017 NRC S.3 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. BRODEUR 8/18/17

Technical Reviewer Date

Approved:

M.J. Cote 8/18/17

Facility Reviewer Date

JPM Number: 2017 NRC S.3 Revision: 0

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Direct from Bank (JPM S052A-2) | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

| | | | |
|---|---|---|---|
| Facility: | MP3 | Examinee: | |
| JPM Number: | 2017 NRC S.3 | Revision: | 0 |
| Task Title: | Depressurize the RCS During a SG Tube Rupture | | |
| Time Critical Task: | ☐ YES ☒ NO | | |
| Validated Time (minutes) | 16 | | |
| Applicable To: | SRO X | RO X | |
| K/A Number: | EPE.038.EA1.04 | K/A Rating: | 4.3 / 4.1 |
| Method of Testing: | Simulated Performance: ____ | Actual Performance: | X |
| Location: | Classroom: ____ | Simulator: X | In-Plant: ____ |

Task Standards: Depressurize the RCS to minimize break flow and refill the Pressurizer, using the Auxiliary Spray Valve

Required Materials: (procedures, equipment, etc.)
EOP35 E-3, Rev 024-01
EOP35 GA-28, Rev 000

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC S.3 Revision : 0

Initial Conditions: A Steam Generator Tube Rupture has occurred on the "D" Steam Generator, and current conditions are as follows:

- The crew has entered E-3, *Steam Generator Tube Rupture*.
- The crew has completed the RCS cooldown per E-3, step 13, "Check If Cooldown Should Be Stopped."
- The crew has just verified adequate subcooling exists per E-3, step 15, "Check RCS Subcooling Based on Core Exit TCs - GREATER THAN 52°F (135°F ADVERSE CTMT)."
- The "A" PORV Block Valve is tagged closed with its power removed.

Initiating Cues: The US directs you to Depressurize the RCS using E-3, step 16, "Depressurize RCS To Minimize Break Flow And Refill PZR".

Inform the US when the depressurization has commenced.

Simulator Requirements:

1. Reset to IC 121, E-3, ready for RCS depressurization, or, Reset to any 100% power IC, then
   - Enter SG01D, (300 gpm) SGTR on "D" SG
   - Enter RC08A, "A" PORV (455) failed closed.
   - Enter RC08B, "B" PORV (456) failed closed.
   - Enter IO RCLO0050 to OFF "A" PORV Block Valve green light off.
   - Enter IO RCLO0051 to OFF "A" PORV Block Valve red light off.
   - Place "A" PORV in CLOSE, and close the "A" PORV Block Valve.
   - Trip RCPs,
   - Perform E-0, step 1, through E-3, cooldown complete.
2. Place Yellow Tags on the "A" PORV and PORV Block Valve.
3. Freeze the Simulator, and check
   - RCPs tripped.
   - "A" PORV Block Valve closed with power removed, and
   - Yellow Tags hung on "A" PORV and "A" PORV Block Valve.

Approximate simulator setup time is 10 minutes.

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

# PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.3

Revision: 0

Task Title: Depressurize the RCS During a SG Tube Rupture

START TIME: ______

| | | | | |
|---|---|---|---|---|
| **STEP # 1** | Performance:<br>Obtain copy of E-3, and locates step 16, Depressurize RCS To Minimize Break Flow And Refill PZR | Standard:<br>Obtains copy of E-3, and turns to step 16. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP # 2**<br>E-3, step 16.a | Performance:<br>**Depressurize RCS To Minimize Break Flow And Refill PZR**<br>a. Check normal PZR spray - AVAILABLE | Standard:<br>Realizes RCPs have been tripped, making spray not available, or attempts to depressurize the RCS using spray valves, and determines spray is ineffective.<br>May attempt to use normal spray, and observe it is ineffective. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP # 3**<br>E-3, step 16.a.RNO | Performance:<br>a. RNO Proceed to CAUTION prior to step 17. | Standard:<br>Proceeds to E-3, step 17 | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

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|---|---|---|---|---|
| **STEP # 4**<br>E-3, Caution prior to step 17 | Performance:<br>CAUTION<br>• The PRT may rupture if a PZR PORV is used to depressurize the RCS resulting in abnormal containment conditions.<br>• Cycling of the PZR PORVs should be minimized. | Standard:<br>Reads Caution | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP # 5**<br>E-3, Note prior to step 17 | Performance:<br>**NOTE**<br>If an RCP is NOT running, the upper head region may void during RCS depressurization resulting in a rapidly increasing PZR level. | Standard:<br>Reads Note | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP # 6**<br>E-3, step 17.a | Performance:<br>**Depressurize RCS Using PZR PORV To Minimize Break Flow And Refill PZR**<br>a. Check PZR PORV – AT LEAST ONE AVAILABLE | Standard:<br>Realizes "B" PORV is available (Block Valve red light lit, green light off, and PORV green light lit) at MB4, and "A" PORV is not available (Tagged) on MB4. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: This commences the Alternate Path portion of this JPM. Failure of the PORV to OPEN will require the Examinee to enter GA-28 to depressurize the RCS. | | | |

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|---|---|---|---|---|
| **STEP #7** E-3, step 17.b | Performance: b. Proceed to step 17.f. | Standard: Proceeds to E-3, step 17.f | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #8** E-3, step 17.f | Performance: f. Depressurize RCS using one PZR PORV | Standard: Selects "Open" on the "B" PORV switch on MB4.<br>Observes the PORV does NOT open (Green light still lit, Red light still off).<br>Proceeds to step 17.f RNO. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #9** E-3, step 17.f.RNO | Performance: f. RNO Return to step 17.c. | Standard: Returns to E-3, step 17.c | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #10** E-3, step 17.c | Performance: c. Verify at least one SI pump - RUNNING | Standard: Checks at least one SIH Pump running by observing red light(s) lit and green light(s) off at MB2. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Both SIH Pumps are running. | | | |
| **STEP #11** E-3, step 17.d | Performance: d. Using GA-28, Initiate auxiliary spray to reduce RCS pressure | Standard: Obtains copy of GA-28, *Controlling RCS Pressure Using Auxiliary Spray.* | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #12** GA-28, Note prior to step 1 | Performance: <u>NOTE</u> With no RCPs running, the upper head region may void during RCS depressurization resulting in a rapidly increasing PZR level. | Standard: Reads note | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #13** GA-28, step 1.a | Performance: **Determine Auxiliary Spray Availability**<br>a. Verify the following:<br>• Instrument air - AVAILABLE<br>• At least one charging pump - RUNNING<br>• RCPs – NONE RUNNING | Standard: Verifies Instrument Air pressure exists on Meter on MB1. May also check Air Compressor running (Red light lit) on MB1.<br>Verifies Charging Pumps are running (Red lights lit, Green lights off) at MB3<br>Checks no RCPs are running (Green lights lit, red lights off) at MB4 | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #14** GA-28, step 2.a | Performance: **Align Auxiliary Spray For RCS Pressure Control**<br>a. Unlock (key tag #37) and OPEN auxiliary spray valve (3RCS*AV8145) | Standard: Obtains key from either key box on the side of the US desk, or from a Main Board component.<br>Inserts key into Aux Spray Valve controller on MB3, and rotates to the OPEN position.<br>Observes Red light lights, and green light goes off. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical nature of this step is to open the Aux Spray Valve. | | | |
| **STEP #15** GA-28, step 2.b | Performance: b. Check both charging isolation valves - OPEN<br>• 3CHS*MV8106<br>• 3CHS*MV8105 | Standard: Checks both charging isolation valves, observes they are closed (Red lights off, green lights on) at MB3.<br>Proceeds to Response Not Obtained column. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #16** GA-28, step 2.b. RNO | Performance: b. RNO OPEN valves. | Standard: Depresses the OPEN pushbuttons for both charging isolation valves. Observes they stroke Open (Red lights light, green lights go off) at MB3. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical nature of this step is to open the both Charging Isolation valves. | | | |
| **STEP #17** GA-28, step2.c | Performance: c. CLOSE charging loop isolation valves<br>• 3CHS*AV8146<br>• 3CHS*AV8147 | Standard: Closes Charging Loop Isolation Valves at MB3 by depressing the Close Pushbuttons. Observes the Charging Loop Isolation Valves are closed (Green lights lit, Red lights off) at MB3. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is to close the Charging Loop Isolation Valves. | | | |
| **STEP #18** GA-28, step 2.d | Performance: d. Check both charging pump cold leg injection valves - CLOSED<br>• 3SIH*MV8801A<br>• 3SIH*MV8801B | Standard: Checks both charging pump cold leg injection valve position indications. Observes they are open (Red lights on, green lights off) at MB3<br>Proceeds to RNO column. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

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|---|---|---|---|---|
| **STEP #19** GA-28, step 2.d. RNO | Performance: d. RNO CLOSE valves. | Standard: Depresses the CLOSE pushbuttons for both charging pump cold leg injection valves.<br>Observes Red lights go off, green lights light at MB3 | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical nature of this step is to close both Charging Isolation valves. | | | |
| **STEP #20** GA-28, step 3.a | Performance: **Initiate Auxiliary Spray**<br>a. Throttle charging flow controller as necessary to maintain or reduce RCS pressure as specified by the procedure in effect | Standard: Observes the Aux Spray Valve is already open (Red light lit, Green light off) at MB3 | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #21** GA-28, step 3.b | Performance: b. Check REGEN HX LETDOWN TEMP HI (395°F) (MB3A 5-4) annunciator - LIT | Standard: Checks annunciator window at MB3A, 5-4. Observes it NOT lit. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: It is likely this annunciator is not lit. If the annunciator is lit, Examinee implements step 3.c to OPEN one charging header loop isolation valve, which increases cooling to the Regenerative Heat Exchanger. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #22** GA-28, step 3.b RNO | Performance:<br>b. RNO Proceed to step 3.d. and IF at any time, REGEN HX LETDOWN TEMP HI (395°F) (MB3A 5-4) annunciator actuates, THEN OPEN one charging header loop isolation valve. | Standard:<br>Proceeds to step 3.d.<br>If the annunciator illuminates, Examinee OPENs one charging header loop isolation valve | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments:<br>This action increases cooling to the Regenerative Heat Exchanger. | | | |
| **STEP #23** GA-28, step 3.d | Performance:<br>d. Check RCS depressurization as specified by the procedure in effect - IN PROGRESS | Standard:<br>Observes RCS pressure decreasing, either on a meter on MB3, or on the PPC | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #24** | Performance:<br>Inform the US when the depressurization has commenced. | Standard:<br>Informs the US that the depressurization has commenced. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

**TERMINATION CUE: The evaluation for this JPM is complete.**

**STOP TIME:** ____________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.3 Revision: 0

Task Title: Depressurize the RCS During a SG Tube Rupture

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION:**

| | | | |
|---|---|---|---|
| Time Critical Task? | ☐ Yes ☒ No | | |
| Validated Time (minutes): | **16** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC S.3 Revision: 0

Initial Conditions:

A Steam Generator Tube Rupture has occurred on the "D" Steam Generator, and current conditions are as follows:

- The crew has entered E-3, *Steam Generator Tube Rupture*.
- The crew has completed the RCS cooldown per E-3, step 13, "Check If Cooldown Should Be Stopped."
- The crew has just verified adequate subcooling exists per E-3, step 15, "Check RCS Subcooling Based on Core Exit TCs - GREATER THAN 52°F (135°F ADVERSE CTMT)."
- The "A" PORV Block Valve is tagged closed with its power removed.

Initiating Cues:

The US directs you to Depressurize the RCS using E-3, step 16, "Depressurize RCS To Minimize Break Flow And Refill PZR".

Inform the US when the depressurization has commenced.

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Shifting the RHR System During Single Loop Operation

JPM Number: 2017 NRC S.4 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. BRODEUR 8/18/17

Technical Reviewer Date

Approved:

MJCOTE 8/18/17

Facility Reviewer Date

JPM Number: 2017 NRC S.4 Revision: 0

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Direct from Bank (JPM S136) | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC S.4 Revision: **0**

Task Title: Shifting the RHR System During Single Loop Operation

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes) 22

Applicable To: SRO ____ RO X

K/A Number: 005.A4.01 K/A Rating: 3.6 / 3.4

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: ____ Simulator: X In-Plant: ____

Task Standards: Correctly shift the RHR system during single loop operation from Loop A to Loop B using OP 3310A

Required Materials: (procedures, equipment, etc.) OP 3310A, Rev 018

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC S.4 Revision : 0

Initial Conditions: The plant is in MODE 5, and the following conditions exist:

- The crew is in the process of shifting protected trains from "A" Train protected to "B" train protected.
- OP 3310A, *Residual Heat Removal System*, Section 4.4, "Establishing RHR Train B Boron Concentration" is complete,
- OP 3310A, Section 4.6, "Aligning RHR Train B for Plant Cooldown" is complete.
- The "B" RHR Train has been previously operated during this outage.
- Current RCS boron concentration is the same as it was when RHR Train "B" was last in operation.

Initiating Cues: The US directs you to shift the RHR system from Train "A" to Train "B" using OP 3310A, Section 4.8, "Shifting the RHR System During Single Loop Operation From Train A to Train B".

Simulator Requirements: Reset to **IC 294**

Ensure the following are set properly:

- 3CHS*PK131 set to maintain RCS pressure at 350# (controller pot setting of 5.2)
- 3RCS*HCV607 is closed
- 3RCS*HCV606 potentiometer set for a valve position of 20% open

Acknowledge/clear annunciators. Place the simulator in "freeze".
Place the simulator in "run" after the examinee has read the initial conditions and initiating cues.

Approximate simulator setup time is 10 minutes.

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the applicant states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question applicant for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the applicant be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

**JPM Number:** 2017 NRC S.4 **Revision:** 0

**Task Title:** Shifting the RHR System During Single Loop Operation

**START TIME:** ____________

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #1** OP 3310A Step.4.8.1 | Performance:<br>ENSURE Section 4.6, "Aligning RHR Train B for Plant Cooldown," completed. | Standard:<br>Recollects from (or reviews) JPM initial conditions that section 4.6 has been completed for the "B" Train of RHR. May ask US to confirm that section 4.6 has been completed. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: If asked, state, "Section 4.6, "Aligning RHR Train B for Plant Cooldown,' has been completed." | | | |
| | Comments: | | | |
| **STEP #2** OP 3310A Step.4.8.2 | Performance:<br>IF RHR Train B has previously been in operation during this shutdown, PERFORM the following:<br>a. IF *either* of the following conditions exist, Go To step 4.8.3:<br>• Current RCS boron concentration is less than or equal to the RCS boron concentration when RHR Train B was last in operation.<br>• RHR Train B boron concentration is known to be greater than required to meet the SDM of T/S 3.1.1.1.2 or 3.9.1.1, as applicable, AND T/S ACTION is *not* in effect prohibiting positive reactivity additions | Standard:<br>Recollects from (or reviews) JPM initial conditions that current RCS boron concentration is the same as it was when RHR Train "B" was last in operation. May ask US to confirm that one of these bullets is met.<br><br>Goes to step 4.8.3 | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: If asked, state, "current RCS boron concentration is the same as it was when RHR Train "B" was last in operation." | | | |
| | Comments: | | | |

| | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #3** OP 3310A Note prior to Step.4.8.3 | Note<br>RPCCW return line temperature from the RHR heat exchanger must not exceed 145F. Initial CCP flow of greater than 1,500 gpm will prevent exceeding this limit.<br>The RPCCW Train B flow rates may be monitored using the computer points for Train B (CCP-F11B*, CCP-F12B*, and CCP-F15B*) or the corresponding MB1 indications. | Reviews the notes. | Y ☐ N ☒ | S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #4** OP 3310A, Step 4.8.3 | Slowly THROTTLE open 3CCP-HK66B1, "RPCCW HX FLOW" (MB2), to provide at least 1,500 gpm cooling flow without exceeding the following limits:<br>• RPCCW Train B total flow - 8,100 gpm<br>• RPCCW flow through RHR HX - 7,000 gpm | Throttles open on controller 3CCP-HK66B1 thumbwheel.<br>Observes RPCCW flow increases, and does not exceed flow limits (total Train B flow limit of 8,100 gpm and "B" RHR Heat Exchanger flow limit of 7,000 gpm) monitoring MB1 and MB3 meters, or PPC computer points. | **Y** ☒ N ☐ | S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical nature of this step is to avoid exceeding the flow limits. Momentary exceedance does not violate the critical nature of this step, since these flows are concerned with long term effects such as heat exchanger tube vibration. | | | |
| **STEP #5** OP 3310A Step.4.8.4 | START 3RHS*P1B, "RHR PP B" (MB2). | Rotates the "B" RHR Pump Control Switch to the "Start" position on MB2.<br>Observes Red running light comes on, and the Green stopped light goes off on MB2. | **Y** ☒ N ☐ | S ☐ U ☐ |
| | Cue: | | | |
| | Comments: The critical portion of this step is to start the "B" RHR Pump. Candidate may also check motor amps on MB2. | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #6**<br>OP 3310A<br>Step.4.8.5 | Performance:<br>Slowly OPEN 3RHS-FK619, "RHR HDR FLOW," to establish 4,000 gpm flow (MB2). | Standard:<br>Depresses the up arrow (↑) pushbutton on 3RHS-FK619 and monitors the flow rate on MB2.<br>Releases the pushbutton when indicated flow is approximately 4,000 gpm. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #7**<br>OP 3310A<br>Step.4.8.6 | Performance:<br>ENSURE 3RHS-FK619, "RHR HDR FLOW," set to 4,000 gpm and PLACE in "AUTO" (MB2). | Standard:<br>Verifies flow indicates approximately 4,000 gpm, and Depresses the 3RHS-FK619 "Auto/Manual" pushbutton and observes that the manual light goes out and the auto light comes on at MB2. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is placing the controller in AUTO, since the candidate has just verified 4.000 gpm flow in the previous step. | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #8**<br>OP 3310A<br>Step.4.8.7 | Performance:<br>To shift RHR cooling from Train A to Train B, PERFORM the following concurrently (MB2):<br>• OPEN 3RHS-HC607, "HX B FLOW," as necessary to maintain required RCS temperature<br>• CLOSE 3RHS-HC606, "HX A FLOW" | Standard:<br>Rotates the potentiometer for HCV606 in the close direction and HCV607 in the open direction on MB2.<br>Observes that the position indicating pointer for HCV607 throttles open toward the 100% (open) position, and the position indicating pointer for HCV606 moves to the 0% (close) position.<br>Stops rotating the potentiometers when HCV606 is fully closed. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: The critical portion of this step is to throttle open HC607, and close HC606.<br>Candidate may observe the position of 3RHS*HCV606 when starting to throttle the valves to determine an approximate position to open 3RHS*HCV607. | | | |
| **STEP #9**<br>OP 3310A<br>Step.4.8.8 | Performance:<br>ENSURE 3HVQ*ACUS1B, "RHR ACU," running (VP1). | Standard:<br>Candidate goes to VP1 and observes the red light lit and green light out for ACUS1B on VP1C.<br>Or, acknowledges cue from examiner that HVU1B is running (if two JPMs are being conducted in parallel). | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: If this JPM is being conducted in parallel with another JPM in the vicinity of VP1, cue the candidate: "The BOP Operator has verified ACU1B is running at VP1. | | | |
| | Comments: | | | |
| **STEP #10**<br>OP 3310A<br>Step.4.8.9 | Performance:<br>OPEN 3RHS*V37, RHR loop B to CVCS letdown isolation. | Standard:<br>Either directly contacts a PEO or requests that the US contact a PEO to locally open 3RHS*V37. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: Simulator Booth Operator calls the control room as a PEO to report "3RHS*V37 is open." | | | |
| | Comments: Simulator Booth Operator uses remote function RHR02 to open V37.<br>It is acceptable to direct the PEO to open 3RHS*V37 and close 3RHS*V20 with a single phone call. | | | |

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|---|---|---|---|---|
| **STEP #11** OP 3310A Step.4.8.10 | Performance:<br>CLOSE 3RHS*V20, RHR loop A to CVCS letdown isolation. | Standard:<br>Either directly contacts a PEO or requests that the US contact a PEO to locally close 3RHS*V20. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: After closing V20, the Simulator Booth Operator calls the control room as a PEO to report "3RHS*V20 is closed." Time compression is allowed with NRC Examiner concurrence. | | | |
| | Comments: Simulator Booth Operator uses remote function RHR01 to close V20.<br>It is acceptable to direct the PEO to open 3RHS*V37 and close 3RHS*V20 with a single phone call. | | | |
| **STEP #12** OP 3310A Step.4.8.11 | Performance:<br>STOP 3RHS*P1A, "RHR PP A" (MB2). | Standard:<br>Rotates the control switch for 3RHS*P1A to "stop" at MB2.<br>Observes the green "off" light comes on, and the red "on" light goes off. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical nature of this step is stopping the RHR Pump.<br>Examinee may also check current indication for the motor goes to zero. | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #13** OP 3310A Note prior to Step.4.8.12 | Performance: **NOTE** The RPCCW train flow rates may be monitored using the computer points for Train A (CCP-F11A*, CCP-F12A*, and CCP-F15A*), or Train B (CCP-F11B*, CCP-F12B*, and CCP-F15B*), or the corresponding MB1 indications. | Standard: Reviews the note. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #14** OP 3310A Step.4.8.12 | Performance: THROTTLE 3CCP-HK66A1 and 3CCP-HK66B1, "RPCCW HX FLOW" (MB2), as necessary without exceeding the following limits:<br>• RPCCW Train A total flow - 8,100 gpm<br>• RPCCW Train B total flow - 8,100 gpm<br>• RPCCW flow through RHR HX - 7,000 gpm | Standard: Throttles controllers 3CCP-HK661 and 3CCP-HK66B1 thumbwheel if needed.<br><br>Observes RPCCW flow changes, and does not exceed flow limits (total Train A flow and Train B flow limit of 8,100 gpm, and "B" RHR Heat Exchanger flow limit of 7,000 gpm) monitoring MB1 and MB3 meters, or PPC computer points. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical nature of this step is to avoid exceeding the flow limits. Momentary exceedance does not violate the critical nature of this step, since these flows are concerned with long term effects such as heat exchanger tube vibration. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #15** OP 3310A Step.4.8.13 | Performance:<br>PLACE 3RHS-FK618, "RHR HDR FLOW," in "MAN" and ADJUST to 100% output (full closed) (MB2). | Standard:<br>Depresses the down arrow (↓) pushbutton on 3RHS-FK618 on MB2.<br>Releases the pushbutton after 100% output is indicated on MB2. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP #16** OP 3310A Step 4.8.14.a | Performance:<br><u>IF</u> Train A SI and QSS pumps *not* running, PERFORM the following (VP1):<br>a. STOP 3HVQ*ACUS1A, "RHR ACU," and PLACE in "AUTO." | Standard:<br>Candidate goes to VP1 and places the control switch for 3HVQ*ACUS1A in "Stop", and then to "Auto".<br>Observes the red light is off and green light is lit at VP1.<br>Or, acknowledges cue from examiner that the BOP operator has stopped 3HVQ*ACUS1A (if two JPMs are being conducted in parallel). | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: If this JPM is being conducted in parallel with another JPM in the vicinity of VP1, cue the candidate: "The BOP Operator has verified ACU1B is running at VP1." | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #17**<br>OP 3310A Step 4.8.14.b | b. IF AFW pumps are *not* running, PERFORM the following:<br>1) STOP 3HVQ*FN5A and 3HVQ*FN6A, "AFW AREA EMER SPLY/FANS/DMPRS."<br>2) WHEN at least 90 seconds has elapsed, ENSURE 3HVQ*FN5B and 3HVQ*FN6B, "AFW AREA EMER SPLY/FANS/DMPRS," running. | Candidate goes to VP1 and places the control switch for 3HVQ*FN5A 3HVQ*FN6A in "Stop".<br>Observes the red light is off and green light is lit at VP1.<br>After 90 seconds, observes 3HVQ*FN5B and 3HVQ*FN6B red light is lit, and green light is off at VP1.<br>Or, acknowledges cue from examiner that the BOP operator has stopped 3HVQ*FN5A and 3HVQ*FN6A, and has verified 3HVQ*FN5B and 3HVQ*FN6B have started (if two JPMs are being conducted in parallel). | Y ☐ N ☒ | S ☐ U ☐ |
| | Cue: If this JPM is being conducted in parallel with another JPM in the vicinity of VP1, cue the candidate: "The BOP Operator has stopped 3HVQ*FN5A and 3HVQ*FN6A, and has verified 3HVQ*FN5B and 3HVQ*FN6B have started | | | |
| | Comments: | | | |
| **STEP #18**<br>OP 3310A Step.4.8.15 | Performance:<br>TRACK the time that Train A RHR is out of service while aligned to the RCS and IF Train A RHR is out of service for seven days or more AND IF any RCS loop is isolated AND there is fuel in the vessel, NOTIFY Chemistry Department in writing to obtain weekly boron sample of the A RHR loop through the A RHR heat exchanger drain valve. | Standard:<br>Informs the US that the time that Train A of RHR is out of service must be tracked. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: "The US is performing step 4.8.15." | | | |
| | Comments: | | | |

| STEP #19 OP 3310A Step.4.8.16 | Performance: IF Train B RHR heat exchanger drain was being sampled on a weekly basis because Train B RHR was out of service while aligned to the RCS and an RCS loop was isolated with fuel in the vessel, NOTIFY Chemistry Department to stop sampling Train B RHR. | Standard: Informs the US about possible Chemistry Department notification requirement, Or determines this step is not applicable. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: "The US is performing step 4.8.16." | | | |
| | Comments: | | | |

| STEP #20 OP 3310A Step.4.8.16 | Performance: Notifies US that RHR Trains have been shifted from Train A to Train B. | Standard: Reports to the US that RHR Trains have been shifted from Train A to Train B. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: "The US acknowledges the trains have been shifted." | | | |
| | Comments: | | | |

**TERMINATION CUE: The evaluation for this JPM is concluded.**

**STOP TIME:** ____________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.4 Revision: 0

Task Title: Shifting the RHR System During Single Loop Operation

Date Performed: ____________

Examinee: ____________

| |
|---|
| For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade. |

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **22** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## APPLICANT HANDOUT

JPM Number: 2017 NRC S.4 Revision: **0**

Initial Conditions: The plant is in MODE 5, and the following conditions exist:

- The crew is in the process of shifting protected trains from "A" Train protected to "B" train protected.
- OP 3310A, *Residual Heat Removal System*, Section 4.4, "Establishing RHR Train B Boron Concentration" is complete,
- OP 3310A, Section 4.6, "Aligning RHR Train B for Plant Cooldown" is complete.
- The "B" RHR Train has been previously operated during this outage.
- Current RCS boron concentration is the same as it was when RHR Train "B" was last in operation.

Initiating Cues: The US directs you to shift the RHR system from Train "A" to Train "B" using OP 3310A, Section 4.8, "Shifting the RHR System During Single Loop Operation From Train A to Train B".

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Shift to SG Feedwater Flow Control Valves

JPM Number: 2017 NRC S.5 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. Broker 8/18/17

Technical Reviewer Date

Approved:

M.J. Cote 8/18/17

Facility Reviewer Date

JPM Number: 2017 NRC S.5 Revision: 0

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Original issue - New | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: ____________________

JPM Number: 2017 NRC S.5 Revision: 0

Task Title: Shift to SG Feedwater Flow Control Valves

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes) 12

Applicable To: SRO X RO X

K/A Number: 059.A4.03 K/A Rating: 2.9 / 2.9

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Correctly shift the FWS System from feeding the SGs with the Feed Control Bypass Valves to the Main Feed Control Valves

Required Materials: (procedures, equipment, etc.) OP 3203, Rev 022

General References:

| *** READ TO THE EXAMINEE *** |
|---|
| I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed. |

## JPM WORKSHEET

JPM Number: 2017 NRC S.5 Revision : **0**

Initial Conditions: The plant is at 25% power, and the following conditions exist:

- The crew is performing a plant startup using OP 3203, *Plant Startup*.
- OP 3203, Step 4.3.57, "INCREASE reactor power to approximately 25%" has just been completed.

Initiating Cues: The US directs you to SHIFT to SG feedwater flow control valves using OP 3203, Section 4.3.58, "Shift to SG Feedwater Flow Control Valves".

Simulator Requirements: Reset to 25% power **IC on Feed Control Bypass Valves**

Set up MB4 computer display for "Wide Range Level" on a narrow band (approximately 60 to 70%).

Acknowledge/clear annunciators. Place the simulator in "freeze". Place the simulator in "run" after the examinee has read the initial conditions and initiating cues.

Approximate simulator setup time is 5 minutes.

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.5 Revision: **0**

Task Title: Shift to SG Feedwater Flow Control Valves

**START TIME:** ____________

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP # 1**<br>OP 3203, Note prior to step 4.3.58 | Performance:<br>**NOTE**<br>1. Computer display for "Wide Range Level" on a narrow band (approximately 60 to 70%) may be used as an aid in maintaining steam generator inventory constant.<br>2. Shifting to SG feedwater flow control valves may be shifted in any order, one SG at a time. | Standard:<br>Reads Note | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |
| **STEP # 2**<br>OP 3203 Step 4.3.58.a | Performance:<br>SHIFT to SG feedwater flow control valves as follows:<br>a. STATION an additional Operator at the feedwater control station. | Standard:<br>Requests an additional operator at the feed station. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: An additional operator has been stationed. | | | |
| | Comments: | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #3** OP 3203 Step 4.3.58.b | Performance:<br>OPEN the following valves:<br>• OPEN 3FWS-MOV35A, "SG FEEDWATER" "SG 1" "CNTL ISOL."<br>• OPEN 3FWS-MOV35B, "SG FEEDWATER" "SG 2" "CNTL ISOL."<br>• OPEN 3FWS-MOV35C, "SG FEEDWATER" "SG 3" "CNTL ISOL."<br>• OPEN 3FWS-MOV35D, "SG FEEDWATER" "SG 4" "CNTL ISOL." | Standard:<br>Depresses the OPEN pushbutton for 3FWS-MOV35A, B, C, and D.<br>Observes each of the valves' Green lights go off, and Red lights illuminate. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: The critical portion of this step is to open the valves. | | | |
| **STEP #4** OP 3203, Step 4.3.58.c.1) | Performance:<br>SHIFT SG1 flow control as follows (MB5):<br>1) While maintaining feedwater flow as constant as possible, simultaneously PERFORM the following:<br>• OPEN 3FWS-FK510, "SG FEEDWATER" "SG 1" "CONTROL" "FLOW"<br>• CLOSE 3FWS-LK550, "SG FEEDWATER" "SG1" "CONTROL" "BYP" | Standard:<br>Throttles open on controller 3FWS-FK510 while throttling down on 3FWS-LK550 at MB5 until the Feed Control Bypass valve is fully closed.<br>Observes Feed Reg Valve throttles open (red light illuminates), and the Bypass Valve is closed (Green light lit, Red light off) on MB5. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Per the note prior to this step, the operator can swap the four feed valves in any order.<br>The critical portion of this step is to maintain feed from the Feed Reg Valve, and close the Bypass Valve. | | | |
| **STEP #5** OP 3203, Step 4.3.58.c.2) | Performance:<br>2) WHEN SG 1 NR level is stable at approximately 50%, PLACE 3FWS- K510, "SG FEEDWATER" "SG1" "CONTROL" FLOW," in "AUTO." | Standard:<br>Depresses the "AUTO" pushbutton for 3FWS-FK510 on MB5.<br>Observes the AUTO light illuminates. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is to place the controller in Auto. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #6** OP 3203, Step 4.3.58.d.1) | Performance:<br>SHIFT SG2 flow control as follows (MB5):<br>1) While maintaining feedwater flow as constant as possible, simultaneously PERFORM the following:<br>• OPEN 3FWS-FK520, "SG FEEDWATER" "SG 2" "CONTROL" "FLOW"<br>• CLOSE 3FWS-LK560, "SG FEEDWATER" "SG2" "CONTROL" "BYP" | Standard:<br>Throttles open on controller 3FWS-FK520 while throttling down on 3FWS-LK560 at MB5 until the Feed Control Bypass valve is fully closed. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Per the note prior to this step, the operator can swap the four feed valves in any order.<br>The critical portion of this step is to maintain feed from the Feed Reg Valve, and close the Bypass Valve. | | | |
| **STEP #7** OP 3203, Step 4.3.58.d.2) | Performance:<br>2) WHEN SG 2 NR level is stable at approximately 50%, PLACE 3FWS-FK520, "SG FEEDWATER" "SG2" "CONTROL" "FLOW," in "AUTO." | Standard:<br>Depresses the "AUTO" pushbutton for 3FWS-FK520 on MB5.<br>Observes the AUTO light illuminates. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is to place the controller in Auto. | | | |

<table>
<tr><td rowspan="3">STEP #8<br>OP 3203, Step 4.3.58.e.1)</td><td>Performance:<br>SHIFT SG3 flow control as follows (MB5):<br>1) While maintaining feedwater flow as constant as possible, simultaneously PERFORM the following:<br>• OPEN 3FWS-FK530, “SG FEEDWATER” “SG 3” “CONTROL” “FLOW”<br>• CLOSE 3FWS-LK570, “SG FEEDWATER” “SG 3” “CONTROL” “BYP”</td><td>Standard:<br>Throttles open on controller 3FWS-FK530 while throttling down on 3FWS-LK570 at MB5 until the Feed Control Bypass valve is fully closed.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Per the note prior to this step, the operator can swap the four feed valves in any order.<br>The critical portion of this step is to maintain feed from the Feed Reg Valve, and close the Bypass Valve.</td></tr>
<tr><td rowspan="3">STEP #9<br>OP 3203, Step 4.3.58.e.2)</td><td>Performance:<br>2) WHEN SG 3 NR level is stable at approximately 50%, PLACE 3FWS-FK530, “SG FEEDWATER” “SG 3” “CONTROL” “FLOW,” in “AUTO.”</td><td>Standard:<br>Depresses the “AUTO” pushbutton for 3FWS-FK530 on MB5.<br>Observes the AUTO light illuminates.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical portion of this step is to place the controller in Auto.</td></tr>
</table>

| | | | | |
|---|---|---|---|---|
| **STEP #10** OP 3203, Step 4.3.58.f.1) | Performance:<br>SHIFT SG4 flow control as follows (MB5):<br>1) While maintaining feedwater flow as constant as possible, simultaneously PERFORM the following:<br>• OPEN 3FWS-FK540, "SG FEEDWATER" "SG 4" "CONTROL" "FLOW"<br>• CLOSE 3FWS-LK580, "SG FEEDWATER" "SG 4" "CONTROL" "BYP" | Standard:<br>Throttles open on controller 3FWS-FK540 while throttling down on 3FWS-LK580 at MB5 until the Feed Control Bypass valve is fully closed. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Per the note prior to this step, the operator can swap the four feed valves in any order.<br>The critical portion of this step is to maintain feed from the Feed Reg Valve, and close the Bypass Valve. | | | |
| **STEP #11** OP 3203, Step 4.3.58.f.2) | Performance:<br>2) WHEN SG 4 NR level is stable at approximately 50%, PLACE 3FWS-FK540, "SG FEEDWATER" "SG 4" "CONTROL" "FLOW," in "AUTO." | Standard:<br>Depresses the "AUTO" pushbutton for 3FWS-FK540 on MB5.<br>Observes the AUTO light illuminates. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is to place the controller in Auto. | | | |
| **STEP #12** | Performance:<br>Notify US that feedwater has been shifted from the Feed Control Bypass Valves to the Feed Control Valves. | Standard:<br>Report to the US that that feedwater has been shifted from the Feed Control Bypass Valves to the Feed Control Valves. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: The US acknowledges that feedwater has been shifted from the Feed Control Bypass Valves to the Feed Control Valves. | | | |
| | Comments: | | | |

**TERMINATION CUE: The evaluation for this JPM is concluded.**

**STOP TIME:** ______________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.5 Revision: 0

Task Title: Shift to SG Feedwater Flow Control Valves

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **12** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC S.5 Revision: 0

Initial Conditions: The plant is at 25% power, and the following conditions exist:

- The crew is performing a plant startup using OP 3203, *Plant Startup*.
- OP 3203, Step 4.3.57, "INCREASE reactor power to approximately 25%" has just been completed.

Initiating Cues: The US directs you to SHIFT to SG feedwater flow control valves using OP 3203, Section 4.3.58, "Shift to SG Feedwater Flow Control Valves".

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Manual CIA

JPM Number: 2017 NRC S.6 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. BRODEUR 8/18/17

Technical Reviewer Date

Approved:

M.J. COTE 8/18/17

Supervisor, Nuclear Training Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
| --- | --- | --- |
| 8/15/17 | Direct from Bank (JPM S076-1) | 0 |
| | | |
| | | |
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| | | |
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| | | |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: ____________

JPM Number: 2017 NRC S.6 Revision: 0

Task Title: Manual CIA

System: 103 Containment System

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 16

Applicable To: SRO **X** RO **X**

K/A Number: 103.A2.03 K/A Rating: 3.5 / 3.8

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Complete a manual CIA using EOP 35 E-0 and identify minimum safety function criteria.

Required Materials: (procedures, equipment, etc.) E-0, Rev. 32, Attachments "B" and "C"

General References: NA

| *** READ TO THE EXAMINEE *** |
|---|
| I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed. |

# JPM WORKSHEET

JPM Number: 2017 NRC S.6 Revision : 0

Initial Conditions: With the plant initially at 100% power, the following sequence of events occurs:

1. The reactor trips, and Safety Injection actuates.
2. The Main Board annunciators are in “Master Silence”.
3. The crew enters E-0, *Reactor Trip or Safety Injection*.
4. E-0, Attachment B, *Actuation Signal Verification*, is complete through step B.9.

Initiating Cues: The US directs you to perform E-0, Attachment B, steps B.10 and B.11.

Simulator Requirements: **Preferred:**
Reset to IC-120

**OR**

**Optional:**

1. Reset to any 100% power IC
2. Insert Malfunctions:
   a. MS01A – 1 E 6
   b. RP11K - Failure of "CIA" to actuate
3. Insert I/O overrides for manual CIA:
   a. PB1-3ISC-CIA, RPDI0066 NISOLATE
   b. PB2-3ISC-CIA, RPDI0067 NISOLATE
   c. CHDI0082 "3FPW*CTV48" (open/auto)
   d. CHLO0033 to "off"
   e. CHLO0034 to "on"
   f. ANLO1163 to "off"
   g. ANLO1043 to "off"
   h. CHLO0029 to "off"
   i. CHLO0030 to "on"
4. Take the master silence switch to the SILENCE position
5. Place simulator in "RUN"
6. A reactor trip and safety injection will occur. Allow ESF Status Panel to finish changing state (CIA) components will remain "as is")
7. Place the simulator in "FREEZE"
8. Place simulator in "RUN", after the examinee has received the initial conditions and initiating cues

(Approximate simulator setup time is 15 minutes)

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.6 Revision: 0

Task Title: Manual CIA

START TIME: ____________

<table>
<tr><td rowspan="3">STEP #1<br>E-0<br>Att. B<br>Step<br>B.10<br><br>Cue:<br><br>Comments</td><td>Performance:<br>Check CIA<br><br>Check ESF Group 2, columns 2 through 10 - LIT</td><td>Standard:<br>Observes Status Panel indication on MB2 and observes not all lights are lit (Group 2, columns 2 through 10).<br><br>Proceeds to step B.10 a. RNO.</td><td>Critical:<br>Y [ ]<br>N [X]</td><td>Grade<br>S [ ]<br>U [ ]</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td rowspan="3">STEP #2<br>E-0<br>Att. B<br>Step<br>B.10.a<br>RNO<br><br>Cue:<br><br>Comments</td><td>Performance:<br>Initiate CIA<br><br><u>IF</u> ESF Group 2, columns 2 through 10 are <u>NOT</u> lit, <u>THEN</u> Refer to ATTACHMENT C <u>AND</u> REPOSITION valves to establish at least minimum safety function</td><td>Standard:<br>Initiates CIA by depressing both of the following CIA pushbuttons on MB2:<br>• TRAIN A CIA<br>• TRAIN B CIA<br><br>Determines CIA did NOT actuate and obtains Attachment C.</td><td>Critical:<br>Y [ ]<br>N [X]</td><td>Grade<br>S [ ]<br>U [ ]</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4">The failure of CIA to automatically or manually actuate begins the alternate path portion of the JPM.</td></tr>
</table>

| STEP #3 E-0 Att. B Step B.10.a RNO | Performance: Using Attachment C, Reposition valves as necessary for minimum safety function. | Standard: Obtains copy of E-0, Attachment C.<br><br>1. For each containment penetration isolation valve depresses the close push button or rotates control switch to the "close" position and observes indicating lights shift to green illuminated, red extinguished.<br><br>2. Recognizes three valves (in comment 2 below) will not go closed. | Critical: Y **[X]** N [ ] | Grade S [ ] U [ ] |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | In order to improve the examiner's ability to track examinee progress, E-0, Attachment C has been attached to this JPM, rather than separating each set of valves that requires checking into approximately 40 separate JPM steps.<br><br>The examinee Is expected to attempt to close all valves on Attachment C.<br>• The critical nature of these checks requires only one valve per block to be closed to meet minimum safety function<br>• The failed CDS penetration cannot be isolated from the Main Boards. This is to be reported to the US.<br>• Some penetrations only have single valve isolation. For these penetrations, there is only one valve in a block and it must be closed to meet minimum safety function.<br><br>All valves will operate as expected with the exceptions of the following valves, which are failed in the OPEN position:<br>• 3FPW*CTV48, Fire Water<br>• 3CDS*CTV39B, Train B Return<br>• 3CDS*CTV40B, Train B Return (both valves). | | | |

| | Performance: | Standard: | Critical: | Grade |
|---|---|---|---|---|
| **STEP #4**<br>E-0<br>Att. B<br>Step<br>B.11 | Verify Proper ESF Status Panel Indication<br><br>• **CHECK** ESF Group 1 lights – OFF<br>• **CHECK** ESF Group 2 lights – LIT<br><br>**RNO**- **ALIGN** component(s) for at least minimum safety function. | Observes status panel indication on MB2 and makes the following determination / report:<br>1) All valves are closed with the exception of 3FPW*CTV48, 3CDS*CTV39B, and 3CDS*CTV40B.<br>2) MINIMUM SAFETY FUNCTION is **NOT MET** as a CDS penetration is not isolated.<br>3) Reports expected exceptions of GROUP 2; 'A' and 'B' RPCCW Pump lights lit (expected with CDA present, which trips the pumps). | Y **[ X ]**<br>N [ ] | S [ ]<br>U [ ] |
| Cue: | If the Examinee completes the step without making a report to the US, state "The US directs you to report the status of meeting Minimum Safety Function for CIA." | | | |
| Comments: | The **ONLY critical aspect** of this step is that the **examinee recognizes** that the **CDS penetration** is not isolated & **does NOT meet minimum safety function**. In order to make this decision, the examinee may reference a P&ID.<br><br>After successful completion, the MB2 Status Panel should show only the following exceptions:<br>- **GROUP 1: 9-17 & 10-17 LIGHTS LIT** for 'A' & 'B' RPCCW pumps<br>- **GROUP 2: 2-3** (3CDS*V39B), **5-3** (3CDS*V40B), & **6-12** (3FPW*V48) lights **NOT LIT** | | | |

**TERMINATION CUE: The evaluation for this JPM is concluded.**

STOP TIME: _______________

## Attachment C "Containment Isolation Phase A Valves"

**NOTE:** Components are listed in a box with associated path isolation valve (where available).

| Main Board 1 (Vertical) | | | |
|---|---|---|---|
| **Component** | **Description** | **Position** | **Train** |
| 3SSP*CTV7 | PASS Isolation | Closed | A |
| 3SSP*CTV8 | PASS Isolation | Closed | A |
| 3SSR*CTV26<br>3SSR*CTV27 | Rx Hot Leg<br>Rx Hot Leg | Closed<br>Closed | A<br>B |
| 3SSR*CTV29<br>3SSR*CTV30 | Rx Cold Leg<br>Rx Cold Leg | Closed<br>Closed | A<br>B |
| 3SSR*CTV20<br>3SSR*CTV21 | PZR Vapor<br>PZR Vapor | Closed<br>Closed | A<br>B |
| 3SSR*CV8026<br>3SSR*CV8025 | PRT Gas<br>PRT Gas | Closed<br>Closed | A<br>B |
| 3SSR*CTV32<br>3SSR*CTV33 | SI Accumulator<br>SI Accumulator | Closed<br>Closed | A<br>B |
| 3IAS*PV15<br>3IAS*MOV72 | Instrument Air<br>Instrument Air | Closed<br>Closed | A<br>B |
| 3GSN*CTV105<br>3GSN*CV8033 | Nitrogen to PRT<br>Nitrogen to PRT | Closed<br>Closed | A<br>B |
| 3CMS*CTV20<br>3CMS*CTV21 | Ctmt Atmospheric Monitor<br>Ctmt Atmospheric Monitor | Closed<br>Closed | A<br>B |
| 3CMS*CTV23<br>3CMS*MOV24 | Ctmt Atmospheric Monitor<br>Ctmt Atmospheric Monitor | Closed<br>Closed | A<br>B |
| 3VRS*CTV20<br>3VRS*CTV21 | Gas Vent<br>Gas Vent | Closed<br>Closed | A<br>B |
| 3DGS*CTV24<br>3DGS*CTV25 | Reactor Plant Drains Gaseous<br>Reactor Plant Drains Gaseous | Closed<br>Closed | A<br>B |
| 3DAS*CTV24<br>3DAS*CTV25 | Reactor Plant Drains Aerated<br>Reactor Plant Drains Aerated | Closed<br>Closed | A<br>B |
| 3PGS*CV8046<br>3PGS*CV8028 | Primary Water<br>Primary Water | Closed<br>Closed | A<br>B |
| 3FPW*CTV48<br>3FPW*CTV49 | Fire Water<br>Fire Water | Closed<br>Closed | A<br>B |
| 3CVS*CTV20A<br>3CVS*CTV21A | Ctmt Vacuum Pump<br>Ctmt Vacuum Pump | Closed<br>Closed | A<br>B |
| 3CVS*CTV20B<br>3CVS*CTV21B | Ctmt Vacuum Pump<br>Ctmt Vacuum Pump | Closed<br>Closed | A<br>B |

| Main Board 1 (Horizontal) | | | |
|---|---|---|---|
| **Component** | **Description** | **Position** | **Train** |
| 3CDS*CTV38A<br>3CDS*CTV91A | Train A Supply<br>Train A Supply | Closed<br>Closed | A<br>B |
| 3CDS*CTV38B<br>3CDS*CTV91B | Train B Supply<br>Train B Supply | Closed<br>Closed | A<br>B |
| 3CDS*CTV39A<br>3CDS*CTV40A | Train A Return<br>Train A Return | Closed<br>Closed | A<br>B |
| 3CDS*CTV39B<br>3CDS*CTV40B | Train B Return<br>Train B Return | Closed<br>Closed | A<br>B |
| 3CDS*AOV45C/46C | Coil 1A (Train A) | Closed | A |
| 3CDS*AOV45B/46B | Coil 1B (Train B) | Closed | B |
| 3CCP*AOV10A/19A<br>3CCP*AOV197A/194A | Train A Supply / Return Isol<br>Train A Supply / Return Isol | Closed<br>Closed | A<br>B |
| 3CCP*AOV10B/19B<br>3CCP*AOV197B/194B | Train B Supply / Return Isol<br>Train B Supply / Return Isol | Closed<br>Closed | B<br>A |
| 3CCP*MV223/225 | CDS/CCP Train A cross-connect | Open | A |
| 3CCP*MV222/224 | CDS/CCP Train A cross-connect | Open | A |
| 3CCP*MV226/228 | CDS/CCP Train B cross-connect | Open | B |
| 3CCP*MV227/229 | CDS/CCP Train B cross-connect | Open | B |

| Main Board 2 (Horizontal) | | | |
|---|---|---|---|
| **Component** | **Description** | **Position** | **Train** |
| 3SIH*CV8823 | Cold Legs | Closed | A |
| 3SIH*CV8824 | 1/3 Hot Legs | Closed | A |
| 3SIH*CV8881 | 2/4 Hot Legs | Closed | A |
| 3SIH*CV8843 | Chg Cold Legs | Closed | A |
| 3SIH*CV8888 | SI Accumulator Master Fill | Closed | B |
| 3SIH*CV8964<br>3SIH*CV8871 | SI Test Header<br>SI Test Header | Closed<br>Closed | B<br>A |
| 3SIL*CV8890A | 1/2 Cold Legs | Closed | A |
| 3SIL*CV8890B | 3/4 Cold Legs | Closed | A |
| 3SIL*CV8825 | 2/4 Hot Legs | Closed | A |
| 3SIL*CV8968<br>3SIL*CV8880 | Nitrogen Supply<br>Nitrogen Supply | Closed<br>Closed | A<br>B |

| Main Board 3 (Horizontal) | | | |
|---|---|---|---|
| **Component** | **Description** | **Position** | **Train** |
| 3CHS*MV8100<br>3CHS*MV8112 | RCP Seal Isolation<br>RCP Seal Isolation | Closed<br>Closed | B<br>A |
| 3CHS*CV8160<br>3CHS*CV8152 | Letdown Hdr Isolation<br>Letdown Hdr Isolation | Closed<br>Closed | A<br>B |

## VERIFICATION OF JPM COMPLETION

JPM Number: **2017 NRC S.6** Revision: 0

Task Title: Manual CIA

Date Performed: ____________

Examinee: ____________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION:**

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **16** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC S.6 Revision: 0

Initial Conditions: With the plant initially at 100% power, the following sequence of events occurs:

1. The reactor trips, and Safety Injection actuates.
2. The Main Board annunciators are in "Master Silence".
3. The crew enters E-0, *Reactor Trip or Safety Injection.*
4. E-0, Attachment B, *Actuation Signal Verification*, is complete through step B.9.

Initiating Cues: The US directs you to perform E-0, Attachment B, steps B.10 and B.11.

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Test Start The "B" EDG From MB8

JPM Number: 2017 NRC S.7 Revision: 0

Initiated:

Robert Royce

Developer Date 8/17/17

Reviewed:

Dave Minnich

Technical Reviewer Date 8/17/17

Reviewed:

E. BRODER

Technical Reviewer Date 8/18/17

Approved:

M.J. COTE

Supervisor, Nuclear Training Date 8/18/17

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Direct from Bank (JPM S026) | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: MP 3 Examinee: ______

JPM Number: 2017 NRC S.7 Revision: 0

Task Title: Test Start The "B" EDG From MB8

System: 064 Emergency Diesel

Time Critical Task: ( ) YES ( x ) NO

Validated Time (minutes): 18

Task Number(s): 064-01-016

Applicable To: SRO x RO x

K/A Number: 064.A4.06 K/A Rating: 3.9 / 3.9

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Satisfactorily start and load the "B" Emergency Diesel Generator from MB8 using OP 3346A.

Required Materials: (procedures, equipment, etc.) OP 3346A, Rev 035-00

General References:

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC S.7 Revision : 0

Initial Conditions:

The plant is at 100% power.

- The Outside Rounds PEO at the "B" EDG enclosure and has completed the preliminary checks for starting the "B" EDG.
- The prestart portions of the EDG Data Sheet (OP 3346A-013) and Diesel B Operating Log (OP 3346A-015) have been completed.
- The SBO diesel is not running.
- Bus 34B is *not* paralleled to Unit 2 bus 24E.
- The Extra Operator will be filling out all required Ops Forms.
- The RO has just opened 3SWP*AOV39B "DG B OUT" at MB1.

Initiating Cues:

- The US directs you to conduct a test fast-start of the "B" EDG from MB8.
- The EDG is to be paralleled to Bus 34D and loaded to 1000KW, with Reactive Load adjusted to 0.6 MVAR Out.
- You are to use OP 3346A, *Emergency Diesel Generator*, Sections 4.27 and 4.31, performing steps 4.27.5 through 4.31.6.

Simulator Requirements:

1. Reset to IC-18 or equivalent IC with a normal electrical lineup..
2. Place the simulator in "Run" and check that the IC is stable. It is not necessary to place the simulator in "freeze".
3. Open 3SWP*AOV39B "DG B OUT" at MB1.
4. Commence the JPM evaluation after the Examinee has received the initial conditions and initiating cues.

Approximate simulator setup time is 3-5 minutes.

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.7 Revision: 0

Task Title: Test Start The "B" EDG From MB8

START TIME: ______________

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| STEP #1 | Performance:<br>Obtains copy of OP 3346A, *Emergency Diesel Generator.* | Standard:<br>Obtains copy of OP 3346A, *Emergency Diesel Generator.* Turns to section 4.27, step 4.27.5. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| STEP #2<br>OP 3346A Step 4.27.5 | Performance:<br>ENSURE "EDG B" "VOLT REG SEL" (MB8) in "AUTO" (preferred) or "MANUAL." | Standard:<br>Observes the control switch for the "B" diesel generator voltage regulator aligned to the "AUTO" position. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP #3 OP 3346A Note prior to Step 4.27.6 | Performance: **NOTE** The rocker arm prelube pump should *not* be run more than 30minutes a day. | Standard: Reviews Note. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: Inform the Examinee that the rocker arm prelube pump has not been run in the last 24 hours. | | | |
| | Comments: | | | |

| STEP #4 OP 3346A Step 4.27.6 | Performance: START EGO*P1B, "PRELUBE" pump (MB8). | Standard: Rotates the control switch for the "B" diesel generator rocker arm prelube pump to the "start" position and observes that the indicating lights shift to green OFF, red ON. Also notes the time that the prelube pump was started. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: If desired to shorten the JPM run time, the examiner may provide the following cue after ~ 15 seconds, "The prelube pump has run for 2 minutes." | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #5** OP 3346A Step 4.27.7 | WHEN two minutes have elapsed, STOP EGO*P1B, "PRELUBE" pump (MB8). | When at least two minutes have elapsed, or after the examiner has cued the Examinee that the prelube pump has run for 2 minutes, rotates the control switch for the "B" diesel generator rocker arm prelube pump to the "stop" position and observes the indicating lights shift to green ON, red OFF. | Y ☐ N ☒ | S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #6** OP 3346A Caution prior to Step 4.27.8 | **CAUTION** Due to load sharing instability, parallel operation with station blackout diesel is prohibited. | Reviews Caution | Y ☐ N ☒ | S ☐ U ☐ |
| | Cue: If the Examinee asks the US for the status of the SBO Diesel, state, "The SBO diesel is not running." | | | |
| | Comments: As part of the initial conditions, the Examinee was told that the SBO diesel was not running. | | | |

<table>
<tr><td rowspan="3">STEP<br>#7<br>OP<br>3346A<br>Step<br>4.27.8</td><td>Performance:<br>ENSURE SBO diesel is not paralleled to bus 34D.</td><td>Standard:<br>As part of the initial conditions, the Examinee was told that the SBO diesel was not running. May check the SBO diesel breaker (3BGS-ACB-BG-A is OPEN) on MB8 as a second check.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If the Examinee asks the US for the status of the SBO Diesel, state, “The SBO diesel is not running.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP<br>#8<br>OP<br>3346A<br>Caution<br>prior to<br>Step<br>4.27.9</td><td>Performance:<br>CAUTION<br>The emergency diesel generator may be test started to ENSURE OPERABILITY, but should not be paralleled to emergency bus under any of the following conditions:<ul><li>Emergency diesel generator A is inoperable</li><li>Emergency diesel generator A is operating in parallel</li><li>During severe weather</li><li>During possible loss of offsite power</li><li>Cross-tie breaker 34D*1T---2 closed while 34B is paralleled to Unit 2 bus 24E.</li></ul></td><td>Standard:<br>Reviews the Caution</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If asked, state<br>“The opposite train diesel is operable.”<br>“Severe weather conditions do not exist.”<br>“The grid is stable and a loss of offsite power is not anticipated.”<br>“34B is not paralleled to Unit 2 bus 24E.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #9** OP 3346A Step 4.27.9 | Performance:<br>CHECK the following conditions do *not* exist:<br>• Emergency diesel generator A is inoperable<br>• Emergency diesel generator A is operating in parallel Severe weather<br>• Other possible loss of offsite power (LOP) condition<br>• 34D*1T-2 closed while 34B paralleled to Unit 2 bus 24E | Standard:<br>The Examinee may rely on JPM Initial Conditions to determine that none of these conditions exist. Examinee may also check MB8 indications for the status of the other diesel generator and offsite power, and may ask the US for the status of the other parameters. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: If asked, state<br>"The opposite train diesel is operable."<br>"Severe weather conditions do not exist."<br>"The grid is stable and a loss of offsite power is not anticipated."<br>"34B is not paralleled to Unit 2 bus 24E." | | | |
| | Comments: | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #10** OP 3346A Note prior to Step 4.27.10 | Performance:<br>**NOTE**<br>1. Sequence of events computer points EGB-START and EGB-LOAD should be used to determine diesel start time. If the plant computer is unavailable, a stopwatch may be used to determine diesel start time (period between diesel start and the "LOAD" light on).<br>2. For routine starts, the time between engine start and loading to 20% load (1000 kW) should *not* be more than 30 minutes. | Standard:<br>Reviews the Note | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: The Extra Operator will be checking and recording the Diesel Start Time. | | | |

| | |
|---|---|
| | Comments: |

| | | | | |
|---|---|---|---|---|
| **STEP #11** OP 3346A Step 4.27.10 .a | Performance: <br> IF a fast start of the B EDG is desired, PERFORM the following: <br> a. REVIEW steps 4.27.10b. through 4.27.10g. AND steps 4.31.1 through 4.31.7 prior to continuing with this procedure to minimize time between engine start and loading to 20% load (1000 kW). | Standard: <br> Reviews Note, and reviews steps 4.27.10b. through 4.27.10g. AND steps 4.31.1through 4.31.7 prior to continuing with the procedure. | Critical: <br> Y ☐ N ☒ | Grade: <br> S ☐ U ☐ |
| | Cue: If the Examinee asks the US to confirm a fast-start is to be performed, state, "A fast-start is to be performed." | | | |
| | Comments: As part of the initial conditions, the Examinee was told a fast start of the diesel is to be performed.. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #12** OP 3346A Step 4.27.10 .b | Performance: <br> ENSURE the "START MODE" switch is in "NORMAL" (3EGS*PNLB). | Standard: <br> Contacts a PEO at the EDG, or requests the US contact the PEO, to ensure the "START MODE" switch is in "NORMAL" (3EGS*PNLB). | Critical: <br> Y ☐ N ☒ | Grade: <br> S ☐ U ☐ |
| | Cue: When asked, report, "The START MODE switch at 3EGS*PNLB .is in "NORMAL" | | | |
| | Comments: | | | |

| STEP #13 OP 3346A Step 4.27.10.c. | Performance: PLACE diesel generator B "START" switch in "START" (MB8). | Standard: Rotates the start switch for the B diesel generator to the "start" position and observes that exciter volts, generator volts and generator frequency meters will move off their bottom pegs as EDG comes up to speed. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: The critical nature of this step is to take the start switch to "START". | | | |

| STEP #14 OP 3346A Step 4.27.10.d | Performance: CHECK diesel generator B "LOAD" light, lit (MB8). | Standard: Observes that the white "LOAD" light is lit after the "B" diesel generator frequency meter indicates 60 Hz. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: | | | |

| STEP #15 OP 3346A Step 4.27.10.e | Performance: Refer To OP 3346A-013 “Start” Section and DOCUMENT the following:<br>• Time diesel started<br>• Diesel start time | Standard: | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: If the Examinee asks the US to confirm the start times are being documented, state “”The extra operator is documenting the diesel start times on the “Start” Section of 3346A-013 | | | |
| | Comments: As part of the initial conditions, the Examinee was told that the Extra Operator will be filling out all required Ops Forms. | | | |

| STEP #16 OP 3346A Note prior to Step 4.27.10.f | Performance: **NOTE**<br>Step 4.27.10f. can be performed in parallel with the remainder of this Section. | Standard: Reviews the Note | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #17** OP 3346A Step 4.27.10.f | COMPLETE "Immediately after diesel started" Section of OP 3346A---015. | Recalls extra operator will be filling out forms, or confirms this by asking the US. | Y ☐ N ☒ | S ☐ U ☐ |
| | Cue: If the Examinee asks, or attempts to fill out this form, state, "The Extra Operator and the PEO at the Diesel will be filling out all required forms. | | | |
| | Comments: | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #18** OP 3346A Step 4.27.10.g | IF diesel generator B is to be paralleled to bus 34D, Go To Section 4.31. | Goes to Section 4.31, since the diesel is to be loaded. | Y ☐ N ☒ | S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP #19 OP 3346A Caution prior to Step 4.31.1 | Performance:<br>**CAUTION**<br>1. SBO diesel must *not* be supplying the bus to which the emergency diesel generator is to be paralleled.<br>2. When Unit 3 is supplying Unit 2 offsite power through the SBO cross-tie, paralleling a Unit 3 emergency diesel generator to the same bus that is supplying Unit 2 bus 24E will increase the available fault current above the fault duty rating of Unit 2 and Unit 3 equipment, and should *not* be attempted, except during the performance of the monthly operability test. | Standard:<br>Examinee may rely on previous reports that the SBO Diesel is not running, and Unit 3 is not supplying Unit 2 through the SBO cross-tie, or may request this information from the US. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: If the Examinee asks the US for the status of the SBO Diesel, state, "The SBO diesel is not running." If the Examinee asks the US for the status of Unit 3 supplying Unit 2, state," Unit 3 is not supplying Unit 2 offsite power through the SBO cross-tie." | | | |
| | Comments: As part of the initial conditions, the Examinee was told that the SBO diesel was not running. | | | |

| STEP #20 OP 3346A Note prior to Step 4.31.1 | Performance:<br>**NOTE**<br>1. Key # ILCO 999NY1E, "EGS*PNLB Local/Remote/MNTC," located on the SM key ring or in the Work Control key locker (#6), may be required during the performance of this Section to position the "CONTROL MODE" selector switch on 3EGS*PNLB.<br>2. For routine starts, the time between engine start and loading to 20% load (1000 kW) should *not* be more than 30 minutes. | Standard:<br>Reviews Notes | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: Note 1 is not applicable, since the Control Mode Switch does not need to be repositioned. | | | |

| STEP #21 OP 3346A Step 4.31.1.a | Performance: <u>IF</u> paralleling diesel from Control Room, PERFORM the following (MB8):<br>a. ENSURE "CONTROL MODE" switch in "REMOTE" (EGPB). | Standard: Requests PEO confirm the Control Mode Switch is in Remote at EGPB. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: The PEO reports "the "CONTROL MODE" switch is in "REMOTE" at EGPB." | | | |
| | Comments: | | | |

| STEP #22 OP 3346A Step 4.31.1 b | Performance: IF, at any time, a loss of offsite power occurs, Refer To Attachment 2 and PERFORM appropriate actions to ensure proper diesel operation or to restore diesel. | Standard: Reads step, but does not currently need to reference Attachment 2, since offsite power is available. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: | | | |

| STEP #23 OP 3346A Step 4.31.1 c | Performance: PLACE diesel generator B "MODE SEL" switch in "PARALLEL." | Standard: Rotates the "B" diesel generator mode selector switch to the "parallel" position at MB8. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: | | | |

| STEP #24 OP 3346A Step 4.31.1 d | Performance: PLACE diesel generator B to bus 34D "SYNC SEL" switch in "ON." | Standard: Places the "B" train handle into the "B" diesel generator to bus 34D synchronizing selector switch and rotates the handle to the "on" position at MB8. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: The synchroscope is placed in service by this action, so the synchroscope starts to rotate. | | | |

| STEP #25 OP 3346A Step 4.31.1 e | Performance: <u>IF</u> 34D*1T-2, "34B-34D TIE" is closed, CHECK the following:<br>• Bus 34B is *not* paralleled to Unit 2 bus 24E.<br>• SBO D/G *not* paralleled to bus 34B. | Standard: Recognizes that, based on the Initial Conditions given for this JPM, Bus 34B is not paralleled to Unit 2, and the SBO Diesel is not paralleled to bus 34B. It is also acceptable if the Examinee requests the US confirm these conditions. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: If the Examinee asks the US for the status of the SBO Diesel, state, "The SBO diesel is not running."<br>If the Examinee asks the US for the status of Unit 3 supplying Unit 2, state," Unit 3 is not supplying Unit 2 bus 24E." | | | |
| | Comments: As part of the initial conditions, the Examinee was told that the SBO diesel was not running, and Bus 3B is not paralleled to Unit 2. | | | |

| STEP #26 OP 3346A Step 4.31.1 f | Performance: Refer To the following and ENTER required actions for EDG B inoperable:<br>• T/S 3.8.1.1, "A.C. Sources, Operating"<br>• T/S 3.8.1.2, "A.C. Sources, Shutdown" | Standard: Requests the US reference these LCOs. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: The US has referred to these Tech Specs, and has entered the required actions. | | | |
| | Comments: | | | |

| STEP #27 OP 3346A Step 4.31.1 g.1) | Performance: SYNCHRONIZE diesel to bus 34D as follows:<br>1) ADJUST diesel generator B "SPEED/LOAD" switch to obtain slow rotation of synchroscope in fast direction (8 to 20 seconds per revolution). | Standard: Rotates the "B" diesel generator Speed/Load switch to the "raise/lower" positions as necessary on MB8 so the synchroscope is rotating slowly in the fast direction. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: | | | |

| STEP #28 OP 3346A Step 4.31.1 g.2) | Performance:<br>2) Using the selected voltage regulator control, ADJUST "EDG B" voltage regulator to obtain "INCOMING" voltage slightly greater than "RUNNING" voltage. | Standard: Rotates the "B" diesel generator voltage regulator adjust switch to the "raise/lower" positions as necessary until the "INCOMING" voltage is slightly higher than the "RUNNING" voltage. | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: This step is only critical if incoming voltage is initially lower than running voltage. | | | |

| STEP #29 OP 3346A Note prior to Step 4.31.1 h. | Performance: **NOTE** As soon as the diesel generator B supply breaker is closed, the diesel load should be increased to 200 kW to prevent a reverse power trip. | Standard: Reviews the Note | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: The "Seq B Trouble" Annunciator will come in at MB2. Simulator Instructor is to acknowledge this alarm. | | | |

| STEP #30 OP 3346A Step 4.31.1 h | Performance: WHEN the synchroscope is rotating slowly in fast direction AND is at five minutes before twelve o' clock position, CLOSE DGB*34D-2, "EDG B SPLY." | Standard: When the synchroscope is approximately five minutes to twelve o'clock position, rotates the control switch for diesel generator "B" supply breaker to the "close" position and observes the indicating lights shift to green OFF, red ON. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: Critical nature of this step is to actually close the breaker, which requires the closing interlock to be met. More than one attempt is allowed. | | | |

<table>
<tr><td rowspan="2">STEP<br>#31<br>OP<br>3346A<br>Step<br>4.31.1<br>i</td><td>Performance:<br>Using diesel generator B “SPEED/LOAD” switch, LOAD diesel to a minimum of 200 kW as read on “kW.”</td><td>Standard:<br>Using the diesel generator B “SPEED/LOAD” switch, LOADs diesel to a minimum of 200kW as read on “KW”. On MB8</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:<br><br>Comments: Per the Note prior to this step, there should not be a delay in loading the diesel after closing the output breaker, to avoid a reverse power trip.</td></tr>
</table>

<table>
<tr><td rowspan="2">STEP<br>#32<br>OP<br>3346A<br>Step<br>4.31.1<br>j</td><td>Performance:<br>PLACE diesel generator B to bus 34D “SYNC SEL” switch in “OFF.”</td><td>Standard:<br>Rotates the diesel generator “B” to bus 34D synchronizing selector switch to the “off” position.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:<br><br>Comments:</td></tr>
</table>

| | | | | |
|---|---|---|---|---|
| **STEP #33** OP 3346A Step 4.31.1 k | Performance: Go To step 4.31.3 | Standard: Goes To step 4.31.3 | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #34** OP 3346A Note prior to Step 4.31.3 | Performance: **NOTE** Step 4.31.3 can be performed while EDG is being loaded. | Standard: Reads the Note | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP #35 OP 3346A Step 4.31.3 | Performance: COMPLETE "After EDG Output Breaker is closed" Section of OP 3346A-015. | Standard: | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: If the Examinee asks the US to confirm the After EDG Output Breaker is closed" Section of OP 3346A-015 is being completed, state ""The extra operator is completing OP 3346A-015." | | | |
| | Comments: As part of the initial conditions, the Examinee was told that the Extra Operator will be filling out all required Ops Forms. | | | |

| STEP #36 OP 3346A Step 4.31.4 | Performance: IF EDG B is to be the sole source supplying Bus 34D, Go To Section 4.32. | Standard: Recognizes that EDG B is not the sole source supplying Bus 34D, and does not go to section 4.32. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: Bus 34D is also being supplied from offsite power via the 34B-34D bus cross-tie breaker. | | | |

<table>
<tr><td rowspan="3">STEP #37<br>OP 3346A Step 4.31.5</td><td>Performance:<br>OBSERVE the following load/duration limits and NOTIFY Engineering Department of any operation and duration with load greater than 5,000 kW.<br><br>Load — Maximum Duration<br>< 5,000 kW — 8,760 hours<br>5,000 to 5335 kW — 2000 hours<br>5,335 to 5,500 kW — 160 hours<br>5,500 to 6,000 kW — 30 min<br>> 6,000 kW — Prohibited</td><td>Standard:<br>As the diesel is loaded, the Examinee does not exceed 6,000 kW on EDG load.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #38<br>OP 3346A Caution prior to Step 4.31.6</td><td>Performance:<br>CAUTION<br>Unless during emergency situation or specified by surveillance test, diesel should not be loaded immediately to rated capacity.</td><td>Standard:<br>Reads the Caution</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

| STEP | Performance | Standard | Critical | Grade |
| --- | --- | --- | --- | --- |
| **STEP #39** OP 3346A Note prior to Step 4.31.6 | Performance:<br>**NOTE**<br>Normal loading rate is no more than 200 kW (0.2 MW) per minute and 0.2 MVAR per minute. | Standard:<br>Reads the Note | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP | Performance | Standard | Critical | Grade |
| --- | --- | --- | --- | --- |
| **STEP #40** OP 3346A Step 4.31.6 bullet #1 | Performance:<br><u>IF</u> operating diesel from Control Room, PERFORM the following simultaneously to raise EDG to desired loading: (MB8)<br>• Using "SPEED/LOAD" switch, ADJUST EDG load as indicated on either of the following:<br>• PPC Point 15G-15U-W<br>• "EDG B" "KW" (MB8) | Standard:<br>Rotates the "SPEED/LOAD" switch in the "raise/lower" directions as necessary to increase load.<br>Observes the normal loading limit of no more than 200 kW (0.2 MW) per minute, so the total time to reach 1000KW should be approximately 4 minutes based in initial 200 KW load. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: Critical portion of this step is to load the diesel to approximately 1000 kW. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #41** OP 3346A Step 4.31.6 bullet #2 | Performance:<br>• WHEN EDG B is 20% loaded (1000 kW), RECORD time on OP 3346A-013. | Standard:<br>May verify extra operator is logging this time, or may assume it is being done per the initial conditions provided for this JPM. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: If the Examinee asks the US to confirm the time the diesel is 20% loaded on OP3346A-013, state ""The extra operator is completing OP 3346A-013." | | | |
| | Comments: As part of the initial conditions, the Examinee was told that the Extra Operator will be filling out all required Ops Forms. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #42** OP 3346A Step 4.31.6 bullet #3 | Performance:<br>• Using selected voltage regulator control, ADJUST reactive load (3.0 to 3.2 MVAR OUT at full load, if *not* otherwise directed) as indicated on either of the following:<br>• PPC Point 15G---15U---VR<br>• "EDG B" "MVAR" (MB8) | Standard:<br>Rotates the "B" diesel generator voltage regulator switch to the "raise/lower" positions as necessary to obtain 0.6 MVAR Out as read on either the PPC or on the MB8 meter. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| | Cue: | | | |
| | Comments: | | | |

| STEP #43 | Performance: Informs US that the B EDG has been loaded to 1,000 kW (1 MWe). | Standard: Reports to the US that the B EDG has been loaded to 1,000 kW (1 MWe). | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| | Cue: | | | |
| | Comments: | | | |

Termination cue: The evaluation for this JPM is complete.

Stop Time:__________________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.7 Revision: 0

Task Title: Test Start The "B" EDG From MB8

Date Performed: ______________

Examinee: ______________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **18** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC S.7 Revision: 0

Initial Conditions:

The plant is at 100% power.

- The Outside Rounds PEO at the "B" EDG enclosure and has completed the preliminary checks for starting the "B" EDG.
- The prestart portions of the EDG Data Sheet (OP 3346A-013) and Diesel B Operating Log (OP 3346A-015) have been completed.
- The SBO diesel is not running.
- Bus 34B is *not* paralleled to Unit 2 bus 24E.
- The Extra Operator will be filling out all required Ops Forms.
- The RO has just opened 3SWP*AOV39B "DG B OUT" at MB1.

Initiating Cues:

- The US directs you to conduct a test fast-start of the "B" EDG from MB8.
- The EDG is to be paralleled to Bus 34D and loaded to 1000KW, with Reactive Load adjusted to 0.6 MVAR Out.
- You are to use OP 3346A, *Emergency Diesel Generator*, Sections 4.27 and 4.31, performing steps 4.27.5.through 4.31.6.

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Starting Control Building Ventilation on Filtered Outside Air

JPM Number: 2017 NRC S.8 Revision: 0

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. BRODEUR 8/18/17

Technical Reviewer Date

Approved:

M.J. COTE 8/18/17

Supervisor, Nuclear Training Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/15/17 | Direct from Bank (JPM S032) | 0 |
| | | |

## JPM WORKSHEET

Facility: MP 3 Examinee: ______

JPM Number: 2017 NRC S.8 Revision: 0

Task Title: Starting Control Building Ventilation on Filtered Outside Air

System: 013

Time Critical Task: ( ) YES (x ) NO

Validated Time (minutes): 9

Applicable To: SRO **X** RO **X**

K/A Number: 071.A2.09 K/A Rating: 3.0 / 3.5

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Satisfactorily complete starting Control Building Ventilation on filtered outside air using Train A in accordance with OP 3314F, *Control Building Heating, Ventilation, Air Conditioning and Chill Water*

Required Materials: (procedures, equipment, etc.) OP 3314F, Rev 033-00

General References: AOP 3573, *Radiation Monitor Alarm Response*

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

| | | | |
|---|---|---|---|
| JPM Number: | 2017 NRC S.8 | Revision: | 0 |

Initial Conditions: With the plant at 100% power, the following sequence of events has occurred:

1. A relief valve on the Gaseous Waste System lifts, and sticks open.
2. The RO reports Turbine Building Stack Rad Monitor 3HVR-RE10A shows an increasing trend.
3. The RO reports Control Room Return Air Rad Monitors 3HVC-RE91-1 and 3HVC-RE91-2 show an increasing trend.
4. The crew enters AOP 3573, *Radiation Monitor Alarm Response*.

There are no restrictions (solvents, painting, etc.) involving the use of the Control Building Filter Banks.

Initiating Cues: The US directs you to align the Train A Control Room Emergency Ventilation System to operate with recirculated outside filtered air using the Train "A" filter per OP 3314F, Section 4.10.2.

Simulator Requirements:

1. Reset to any 100% power IC.
2. Place the simulator in "RUN".

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.8 Revision: 0

Task Title: Starting Control Building Ventilation on Filtered Outside Air

START TIME: ____________

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #1** OP 3314F Note prior to Step 4.10.2 | Performance: **NOTE** The Control Room will be pressurized in this mode. | Standard: Reads the Note. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #2** OP 3314F, Step 4.10.2 | Performance: IF desired to operate Train A Control Room Emergency Ventilation System with recirculated outside filtered air, PERFORM the following: | Standard: Uses this section of OP 3314F | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

<table>
<tr><td>STEP #3<br>OP 3314F Step 4.10.2.a</td><td>Performance:<br>IF desired, PERFORM the following:<br>• CLOSE and DOG the following Control Building pressure boundary doors:<br>  • CB west 47'6" (C-47-1A)<br>  • CB east 64'6" (C-64-1B)<br>• ENSURE the following Control Building pressure boundary doors, closed:<br>  • CB west 47'6" (C-47-1)<br>  • CB north 64'6" chiller room door, (C-64-4)<br>  • CB north 64'6" chiller room door, (C-64-5)<br>  • CB east 49'6" (C-49-1)</td><td>Standard:<br>Requests the US dispatch a PEO to perform step 4.10.2.a</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4">"It is NOT desired to CLOSE and DOG Control Building pressure boundary doors."</td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>STEP #4<br>OP 3314F, Step 4.10.2.b</td><td>Performance:<br>CLOSE the following (VP1):<br>▪ 3HVC*AOD27A, "NORM SPLY DMPR"<br>▪ 3HVC*AOD27B, "NORM SPLY DMPR"</td><td>Standard:<br>Presses "CLOSE" Pushbuttons for 3HVC*AOD27A and HVC*AOD27B.<br>Observes the indicating lights green ON red light OFF.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">The critical portion of this step is closing the AOVs.</td></tr>
</table>

<table>
<tr><td>STEP #5<br>OP 3314F, Step 4.10.2.c.1)</td><td>Performance:<br>PERFORM the following to stop Kitchen Exhaust Fan Ventilation System (VP1):<br>1) PLACE 3HVC-FN6, “KITCHEN EXH FAN,” to “OFF.”</td><td>Standard:<br>Places 3HVC-FN6, “KITCHEN EXH FAN” control switch to OFF at VP1.<br>Verifies Red light goes off, and Green light lights at VP1.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>STEP #6<br>OP 3314F Step 4.10.2.c.2)</td><td>Performance:<br>2) CLOSE the following:<br>• 3HVC*AOV20, “KITCHEN EXH AIR ISOL”<br>• 3HVC*AOV21, “KITCHEN EXH AIR ISOL”</td><td>Standard:<br>Presses “CLOSE” pushbuttons for 3HVC*AOV20 and 3HVC*AOV21 at VP-1.<br>Observes that the indicating lights green ON red OFF.</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">The critical portion of this step is closing the AOVs.</td></tr>
<tr><td>STEP #7<br>OP 3314F Step 4.10.2.d</td><td>Performance:<br>ENSURE the following, open (VP1):<br>• 3HVC*AOV25, “OUTSIDE AIR ISOL”<br>• 3HVC*AOV26, “OUTSIDE AIR ISOL”</td><td>Standard:<br>Observes 3HVC*AOV25, “OUTSIDE AIR ISOL” and 3HVC*AOV26, “OUTSIDE AIR ISOL” indicating lights green OFF red ON.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

| | | | | |
|---|---|---|---|---|
| **STEP #8** OP 3314F, Step 4.10.2.e | Performance:<br>IF 3HVC*AOV25 cannot be opened OR maintained opened, PERFORM the following (Local): | Standard:<br>Observes 3HVC*AOV25 is already open (Red light ON, Green light OFF) at VP1.<br>Marks step N/A. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | Step is **N/A**. No local action required, as 3HVC*AOV25 is open. | | | |
| **STEP #9** OP 3314F, Step 4.10.2.f | Performance:<br>IF 3HVC*AOV26 cannot be opened OR maintained opened, PERFORM the following (Local)…. | Standard:<br>Observes 3HVC*AOV26 is already open (Red light ON, Green light OFF) at VP1.<br>Marks step N/A. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | Step is **N/A**. No local action is required, since 3HVC*AOV26 is open. | | | |
| **STEP #10** OP 3314F, Step 4.10.2.g | Performance:<br>ENSURE one of the following, running (VP1):<br>• 3HVC*ACU1A, "CNTL RM ACU"<br>• 3HVC*ACU1B, "CNTL RM ACU" | Standard:<br>Observes indicating lights at VP1:<br>3HVC***ACU1A** green OFF red ON.<br>3HVC***ACU1B** green ON red OFF. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

<table>
<tr><td>STEP #11<br>OP 3314F Step 4.10.2.h</td><td>Performance:<br><u>IF</u> Purge System is in service, Refer To step 4.12.2 and SHUTDOWN Control Building Purge System.</td><td>Standard:<br>Verifies Purge System is not in service, by observing Purge Off (Red light OFF, Green lights ON) on VP1. May also check Purge Dampers. Marks step N/A.</td><td>Critical:<br>Y ☐ N ☒</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">This step is N/A. Purge system is not in service.</td></tr>
<tr><td>STEP #12<br>OP 3314F Step 4.10.2.i</td><td>Performance:<br>PLACE 3HVC*FN1A, “FLTR UNIT FAN/DMPRS,” to “ON” and OBSERVE the following (VP1):<br>1) 3HVC*MOD33A, “FLTR UNIT FAN/DMPRS,” opens.<br>2) 3HVC*FN1A, “FLTR UNIT FAN/DMPRS,” starts.<br>3) 3HVC*FLT1A, “FLTR BANK HTR,” on.<br>4) 3HVC*AOD119A. “RECIRC DMPR,” in “EMERGENCY.”</td><td>Standard:<br>Places 3HVC*FN1A to “ON” and observes the following (VP1):<br>1) 3HVC*MOD33A, “FLTR UNIT FAN/DMPRS,” opens (Red light ON, Green light OFF).<br>2) 3HVC*FN1A, “FLTR UNIT FAN/DMPRS,” starts (Red light ON, Green light OFF).<br>3) 3HVC*FLT1A, “FLTR BANK HTR,” on (Red light ON, Green light OFF).<br>4) 3HVC*AOD119A. “RECIRC DMPR,” in “EMERGENCY.”</td><td>Critical:<br>Y ☒ N ☐</td><td>Grade:<br>S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">Critical nature of the step is to start 3HVC*FN1A</td></tr>
</table>

| STEP #14 | Performance: Notifies the US that Train A Control Building Ventilation has been started on Filtered Outside Air | Standard: Reports to the US that Train A Control Building Ventilation has been started on Filtered Outside Air. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

TERMINATION CUE: **"The evaluation for this JPM is completed".**

Stop Time:__________________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.8 Revision: 0

Task Title: Starting Control Building Ventilation on Filtered Outside Air

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **9** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC S.8 Revision: 0

Initial Conditions: With the plant at 100% power, the following sequence of events has occurred:

1. A relief valve on the Gaseous Waste System lifts, and sticks open.
2. The RO reports Turbine Building Stack Rad Monitor 3HVR-RE10A shows an increasing trend.
3. The RO reports Control Room Return Air Rad Monitors 3HVC-RE91-1 and 3HVC-RE91-2 show an increasing trend.
4. The crew enters AOP 3573, *Radiation Monitor Alarm Response*.

There are no restrictions (solvents, painting, etc.) involving the use of the Control Building Filter Banks.

Initiating Cues: The US directs you to align the Train A Control Room Emergency Ventilation System to operate with recirculated outside filtered air using the Train "A" filter per OP 3314F, Section 4.10.2.

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| | | |
|---|---|---|
| **SITE:** | **Millstone Power Station** | |
| **PROGRAM:** | **Unit 3 ILT** | |
| **COURSE:** | **N/A** | |
| **EXAM TITLE:** | **Large Break LOCA** | **EXAM #: 2K17 NRC-01** |
| **Total Time** | **90 Minutes** | |

| | | | |
|---|---|---|---|
| Prepared by: | Dave Minnich | | 8/16/17 |
| | Printed Name | Developer | Date |
| Reviewed by: | Robert Royce | | 8/17/17 |
| | Printed Name | Technical Reviewer | Date |
| Reviewed by: | E. BRODEUR | | 8/18/17 |
| | Printed Name | Technical Reviewer | Date |
| Approved by: | M.J. COTE | | 8/18/17 |
| | Printed Name | Facility Reviewer | Date |

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## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Original issue. | 0 |
| | | |
| | | |
| | | |
| | | |

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## TABLE OF CONTENTS

SECTIONS LISTED IN ORDER

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# SECTION 3

# EXAM OVERVIEW

Title: **Large Break LOCA**

1. The crew takes the shift with the plant at 100% power and at middle of life. The 'A' EDG is out of service for planned maintenance.

   Event 1: The controlling channel of pressurizer pressure (3RCS*PT455) fails high. Pressurizer spray valves will open and RCS pressure will lower. The RO will perform immediate actions of AOP 3581, *Immediate Actions*, to place the master pressure controller in manual and return the output to ≥ 50% to stabilize pressure. The US will enter AOP 3581, confirm immediate actions are complete and transition to AOP 3571, *Instrument Failure Response*. The crew will defeat the failed pressure channel, restore pressurizer pressure to setpoint, and request I&C to trip bistables. The SRO will refer to Technical Specifications 3.3.1 Action 6 (FU# 7, 9 & 10) and 3.3.2 Action 20 (FU# 1.d) and Action 21 (FU# 9.a). The SRO will refer to TRM 3.3.2.1 Action 27.

   Event 2: Turbine Impulse pressure instrument (3MSS-PT505) fails low. Control rods will automatically insert. The RO should note that no runback is in progress, respond to the rapid inward rod motion by taking immediate actions in accordance with AOP-3581, *Immediate Actions*, to place rod control in manual. The US will enter AOP 3581, confirm immediate actions are complete and transition to AOP 3571, *Instrument Failure Response*. The crew will select the unaffected channel of turbine impulse pressure, place the Steam Dump system in the steam pressure mode and place rod control back in automatic. AMSAC will be placed in 'Bypass'. The SRO will refer to TRM 7.2, AMSAC. The SRO will refer to Technical Specification 3.3.1, Action 8, Functional Unit 17.

   Event 3: 'A' Charging pump trip. The "A" charging (CHS) pump will trip due to a motor problem. The RO will perform immediate actions of AOP 3581, *Immediate Actions,* to simultaneously close the letdown orifice isolation valves and the charging flow control valve. The US will enter AOP 3581, confirm immediate actions are complete, and transition to AOP 3580, *Loss Of All Charging Pumps*. Actions in AOP 3580 will include a verification that pump parameters were stable prior to the trip, a check for proper CHS System valve lineup, proper RCP seal temperatures and flows, and then a start of the standby charging pump ('B'). Normal charging and letdown will be reestablished by the RO. The SRO will refer to TS 3.5.2, Action a and TRM 3.1.2.4. This event is the precursor for a subsequent RCP seal problem.

   Event 4: 'C' RCP seal degradation. The Lower Seal on the "C" RCP will degrade prompting entry into Annunciator Response Procedures. The leak will be slowly increasing and significant enough to procedurally require the crew to begin a plant shutdown. Station management will direct a downpower at 1% per minute. The crew will enter AOP 3575, *Rapid Downpower*, and perform the downpower.

   Event 5: Controlling channel of PZR level fails 'as is'. During the downpower, the controlling PZR Level transmitter, 3RCS-L459, will fail as is. Once identified, the crew will enter AOP 3571, *Response to an Instrument Failure*, to address the problem. The crew will defeat the failed level channel, restore pressurizer level to setpoint, and request I&C to trip bistables. The SRO should enter TS 3.3.1, Functional Unit 11, Action 6.

   Event 6: 'C' RCP seal continues to degrade.The crew will return to the Annunciator response for high seal leakoff flow (MB3B 2-10) and based on RCP seal package parameters determine that a reactor trip is required. The US will direct a reactor trip, a trip of the 'C' RCP and transition to E-0, *Reactor Trip and Safety Injection*.

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Event 7: Small break LOCA inside CTMT. At the time of the reactor trip a small break LOCA on loop 3 occurs (catastrophic loss of 'C' RCP seal package). The crew will carry out the immediate actions of E-0, *Reactor Trip and Safety Injection,* and continue in E-0 to step 16 (Check If RCS Is Intact.) Events 8 and 9 occur at steps 4 and 7 of E-0 respectively.

Event 8: Safety Injection fails to automatically actuate. A Safety Injection is expected to automatically occur from low PZR pressure. Both trains of Safety Injection failed to automatically actuate requiring the RO to manually initiate Safety Injection. **[Critical Task]**.

Event 9: AFW pumps fail to auto start. The BOP will have to manually start the 'A' MDAFW and 'B' MDAFW pumps at MB5. Steam supply valves must be opened to start the Turbine Driven AFW pump. **[Critical Task]** – Establish at least 530 gpm AFW flow to the SGs before transition out of E-0.

Event 10: Large break LOCA inside CTMT, CDA fails to automatically or manually actuate. At step 16 of E-0, the crew will transition to E-1, *Loss of Reactor or Secondary Coolant.* The crew will stop the RHR pumps when procedurally directed. After the crew stops the RHR pumps, the LOCA will rapidly increase in severity, requiring the crew to restart the RHR pumps. As the break size increases an "Orange" Path will be generated based on CTMT pressure. The crew should respond by transitioning to FR-Z.1, *Response to high CTMT Pressure.* CDA Train "A" & "B" will fail to automatically or manually actuate. This will require the crew to manually manipulate individual components to align CTMT spray **[Critical Task]**. Once FR-Z.1 is complete and the crew transitions back to E-1, the session can be terminated.

2. The SRO candidate (US) should classify this event as an **ALERT Charlie One** based on failure of the RCS barrier.

3. Duration of Exam: 90 minutes

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## SECTION 4

## EXAM GUIDE

All Control Room Conduct, Operations and Communications shall be in accordance with OP-AA-100, Conduct of Operations.

"Review the Simulator Operating Limits (design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded." (NSEM 6.06)

| INPUT SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| **RESET SIMULATOR TO IC–29** | | | | | | |
| Either **INPUT** or **Load** Schedule **NRC–01.sch** AND Event file **NRC-01.evt,** THEN **VERIFY** the following functions: | | | | | | |
| ID | Description | Event Trigger | Delay Time | Ramp Time | Delete Time | Severity Or Value |
| **MALFUNCTIONS** | | | | | | |
| RP07A | 'A' Train of Safety Injection fails to automatically actuate | initial | | | | |
| RP07B | 'B' Train of Safety Injection fails to automatically actuate | initial | | | | |
| FW20A | 'A' MDAFW pump fails to automatically start | initial | | | | |
| FW20B | 'B' MDAFW pump fails to automatically start | initial | | | | |
| FW20C | TDAFW pump fails to automatically start | initial | | | | |
| RP06A | Failure of CDA (train A) to automatically actuate | initial | | | | |
| RP06B | Failure of CDA (train B) to automatically actuate | initial | | | | |
| EG07A | EDG A Trip | initial | | | | |
| MB8B-B01 | DG A Local Panel Trouble | initial | | | | OFF |
| MB8B-A03 | DG A Emergency Shutdown | initial | | | | OFF |
| RX09A | Pzr PT455 Fail (high) | 1 | | | | 2500 psi |
| RX16A | MSS*PT505 failure | 3 | | 60 sec | | 0.0% |
| MB4C-F08 | AMSAC Trouble/Bypass | 4 | 60s | | | ON |
| CV11A | Charging Pump Trip P3A | 5 | | | | |
| CV13C | RCP C #1 Seal Failure | 6 | | 80s | | 6.0% |

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| INPUT SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| **RESET SIMULATOR TO IC–29** | | | | | | |
| Either **INPUT** or **Load** Schedule **NRC–01.sch** AND Event file **NRC-01.evt,** THEN **VERIFY** the following functions: | | | | | | |
| ID | Description | Event Trigger | Delay Time | Ramp Time | Delete Time | Severity Or Value |
| CV14C | RCP C #2 Seal Failure | 7 | | | | 2.0% |
| RX10A | PZR Level LT*459 Fails 'as is' | 8 | | | | 64.0% |
| RC03C | RCS Cold Leg leak (loop 3) | 30 | | 60 s | | 100 lbm/sec |
| **REMOTE FUNCTIONS** | | | | | | |
| RXR106 | Prot Set Door 1 (open) | 2 | | | | OPEN |
| RXR40 | RX:P455A PB455A Hi Pzr Press Trip | 2 | 20 s | | | TRIP |
| RXR120 | PZR Press Lo PB-455B (P-11) | 2 | 40 s | | | TRIP |
| RXR48 | RX:P455C PB455C Lo Pzr Press Trip | 2 | 60 s | | | TRIP |
| RXR44 | RX:P455D PB455D Lo Pzr Press SI | 2 | 80 s | | | TRIP |
| RXR05 | OTDT Loop 1 B/S TB411C (Trip) | 2 | 100 s | | | TRIP |
| RXR34 | OTDT Loop 1 B/S TB411D (C-3) | 2 | 120 s | | | TRIP |
| RPR40 | PB455H – Hi Press PORV Act (PS455E) | 2 | 140 s | | | TRIP |
| RXR106 | Prot Set Door 1 (close) | 2 | 160 s | | | CLOSE |
| RXR106 | Protection Set #1 Door | 9 | | | | OPEN |
| RXR25 | PZR HI LEV RX TRIP LS/459A, C1-751, BS-1 (PZR LVL B/S LB459A) | 9 | 20 sec | | | TRIP |
| RXR106 | Protection Set #1 Door | 9 | 30 sec | | | CLOSE |

| INPUT SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| **RESET SIMULATOR TO IC–29** | | | | | | |
| Either **INPUT** or **Load** Schedule **NRC–01.sch** AND Event file **NRC-01.evt,** THEN **VERIFY** the following functions: | | | | | | |
| ID | Description | Event Trigger | Delay Time | Ramp Time | Delete Time | Severity Or Value |
| **OVERRIDES** | | | | | | |
| EGLO0001 | ‘A’ EDG Pre-Lube Pump ‘red’ | | | | | OFF |
| EGLO0002 | ‘A’ EDG Pre-Lube Pump ‘green’ | | | | | OFF |
| EGLO0012 | ‘A’ EDG Output Breaker ‘green’ | | | | | OFF |
| EGLO0013 | ‘A’ EDG Output Breaker ‘red’ | | | | | OFF |
| EGLO0014 | ‘A’ EDG Output Breaker ‘amber’ | | | | | OFF |
| EGLO0083 | White D/G A Start Light | | | | | OFF |
| RPDI0004 | PB1 CDA Actuate Train ‘A’ | initial | | | | NACTUATE |
| RPDI0005 | PB2 CDA Actuate Train ‘A’ | initial | | | | NACTUATE |
| RPDI0006 | PB3 CDA Actuate Train ‘B’ | initial | | | | NACTUATE |
| RPDI0007 | PB4 CDA Actuate Train ‘B’ | initial | | | | NACTUATE |
| | | | | | | |

| EVENTS | | |
|---|---|---|
| Event Code | Description | Event Number |
| | | |
| | | |

<table>
<tr><th colspan="3">SCENARIO TIME LINE</th></tr>
<tr><th>BOOTH INSTRUCTOR</th><th>FLOOR INSTRUCTOR</th><th>STUDENTS</th></tr>
<tr><td colspan="2">❑ COMPLETE Simulator Setup and Readiness Checklist.<br>❑ SELECT appropriate IC: IC-29, 100% power, MOL.<br>❑ LOAD and RUN applicable Schedule, NRC-01.sch.<br>❑ LOAD event file NRC-01.evt.<br>❑ As necessary, VERIFY the following Initial Malfunctions / I/Os / Remote Functions, as specified on previous ‘Input Summary’ page.<br>❑ When the simulator is ready, PLACE to Run and VERIFY the simulator reflects the following Initial Conditions for the scenario and is stable:<br>▪ Ensure the ‘A’ CHS pump is running.<br>▪<br>❑ As necessary, REMOVE the following Equipment from service and tag accordingly:<br>▪ “A” EDG, Yellow Tag Pre Lube Pump, start switch and EDG output breaker<br>▪ Depress Bypass Annunciator for “A” EDG<br>▪ Remove “A” EDG from service in EOOS.<br>❑</td><td>N/A</td></tr>
<tr><td>❑ CONDUCT briefing with evaluators.</td><td colspan="2">PRE-SCENARIO:<br>❑ BRIEF the crew initial plant conditions and provide a shift turnover.<br>❑ <u>IF</u> this is the first simulator scenario of the week, REVIEW the Plant/Simulator Differences List and Simulator Training Objectives with the crew.<br>❑ As necessary, REVIEW any scenario specific differences and any planned simulator freeze points.</td></tr>
<tr><td></td><td></td><td>(All) Walk down control boards and conduct shift briefing.</td></tr>
</table>

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | *********** **EVENT 1** *********** | |
| | **Controlling channel of PZR pressure (3RCS*PT455) fails high.** | |
| | Notes on Event 1:<br>(1) The controlling channel of pressurizer pressure RCS*PT455 will fail high.<br>(2) Pressurizer spray valves will open, variable heaters will go to minimum current and RCS pressure will lower.<br>(1) Returning Master Pressure Controller output to ≥ 50% output will close the spray valves. | |
| **<u>Event 1</u>**<br><br>**T = ≈ 1 min after taking the shift**<br><br>**Trigger 1**<br><br>(RX09A) 3RCS*PT455 fails high | | |
| | The RO should recognize spray valves are open and performs Immediate Actions of AOP 3581, Attachment E, from memory | |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | **AOP 3581 (Rev 004), *Immediate Operator Actions*** | **RO:**<br>(E.1)* **TERMINATE Pressurizer Spray**<br><br>(a.) **CHECK** pressurizer spray valves - BOTH CLOSED<br><br>• 3RCS*PCV455B<br>• 3RCS*PCV455C |
| | The RO should Place Master Pressure Controller in "MAN" and Adjust to >50% output. | (a. RNO) **IF** Pressurizer Pressure is less than 2270 psia, **THEN PLACE** Master Pressure Controller in MAN **AND ADJUST** to **GREATER THAN OR EQUAL TO** 50% output to maintain Pressurizer Pressure between 2225 psia and 2280 psia.<br><br>**IF** Spray Valves do **NOT** close, **THEN** Manually **CLOSE** Spray Valves (MB4):<br><br>• 3RCS*PCV455B<br>• 3RCS*PCV455C |
| | The RO should focus brief immediate actions are complete. | **RO:**<br>(E.2) **CHECK Pressurizer Spray TERMINATED**<br><br>(a.) **CHECK** Pressurizer Pressure - STABLE OR INCREASING |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | The RO should report a failure of 3RCS*PT455. | **RO:**<br>(E.3) **CHECK Initiating Event - INSTRUMENT FAILURE**<br>• Pressurizer Pressure |
| | Depending on the speed of the RO, RCS pressure could lower to 2204 psia, in which case the US should enter TS 3.2.5, DNB Parameters. | **US:**<br>(E.4) **GO TO AOP 3571, Instrument Failure Response** |
| | | |
| | **AOP 3571 (Rev 013), *Instrument Failure Response*** | |
| | **US should enter AOP 3571** and reads Note and Caution to crew. | **NOTE:** It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, I&C personnel are **NOT** able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations personnel may trip the bistables, using the guidance provided within this procedure.<br><br>**CAUTION:** The rod selector switch shall **NOT** be left in AUTO while diagnosing a related instrument failure, unless the reason for rod movement is a turbine runback. |

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<table>
<tr><th colspan="3">SCENARIO TIME LINE</th></tr>
<tr><th>BOOTH INSTRUCTOR</th><th>FLOOR INSTRUCTOR</th><th>STUDENTS</th></tr>
<tr><td></td><td></td><td>US:<br>(1.) PROCEED TO the Appropriate Attachment, AND PERFORM Corrective Actions<br><br><u>Instrument Failure</u> <u>Attachment</u><br>Pressurizer Pressure Channel Failure B</td></tr>
<tr><td></td><td>AOP 3571 Attachment B</td><td></td></tr>
<tr><td></td><td>Master Pressure Controller will already be in manual from immediate actions.</td><td>RO:<br>(B.1) CHECK PZR PRES (3RCS-PK455A) - IN MAN</td></tr>
<tr><td></td><td>RO directed to select Channel 3–4<br>RO should select a channel other than Ch 1 (likely channel 3).<br>RO should select a channel other than Ch 1</td><td>RO: using Attachment B<br>(B.2) DEFEAT The Failed Channel Input<br><table><tr><th></th><th>Name</th><th>Switch ID</th><th>Position</th></tr><tr><td>☐</td><td>PZR PRES SEL - CNTL (MB4)</td><td>3RCS-PS455F</td><td>Select Unaffected Loops</td></tr><tr><td>☐</td><td>PZR PRES SEL - RECORD (MB4)</td><td>3RCS-PS455G</td><td>Select Unaffected Loop</td></tr><tr><td>☐</td><td>OT/OPΔT Record Select (MB4)</td><td>3RCS-TS411E</td><td>Select Unaffected Loop</td></tr></table></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>RO:<br>(B.3) CHECK PZR Pressure - 2250 psia</td></tr>
<tr><td></td><td></td><td>(B.3 RNO) RESTORE pressurizer pressure to 2250 psia.</td></tr>
</table>

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **US:**<br>(B.5) **Trip The Associated Reactor Protection System Bistable(s)**<br>(a.) Using Table B.1, **PLACE** a check mark in the box above the channel required to be tripped |
| | The US should Log into 3.3.1 Action 6 (FU #7, 9 &10) and 3.3.2 Actions 20 & 21 (FU #1.d, 9.a & 11). | (b.) **REFER** to the following Tech Specs for required actions<br>• TS 3.3.1, Reactor Trip System Instrumentation<br>• TS 3.3.2, Engineered Safety Features Actuation System Instrumentation<br>• TS 3.3.3.5, Remote Shutdown Instrumentation |
| | Log into TRM 3.3.2.1, Action 27. | (c.) **REFER** to the following Technical Requirement for required actions<br>• TRM 3.3.2.1, Engineered Safety Features Actuation System Instrumentation |
| | The RO should do a lamp check to ensure all bistable lights are functional, then verify no coincidence would be met when bistables are tripped. | **RO:**<br>(d.) **CHECK** the existing bistable status to ensure a Reactor trip will **NOT** occur when the failed channel is tripped |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Bistable status lights are lit and Channel indication is <u>not</u> normal. The US should proceed to next step. | **US:**<br>(e.) **CHECK** BOTH of the following conditions exist:<br>• Affected Channel Bistable status lights (MB2D **<u>AND</u>** MB4F) - LIT<br>**<u>AND</u>**<br>• Affected channel indication - **<u>NOT</u>** NORMAL |
| **T = When requested:**<br>**Report to the Control Room as I&C.**<br><br>**T = After I&C brief**<br>INSERT **TRIGGER 2** to trip bistables | | **US:**<br>(f.) **REQUEST** I&C use Table B.1 and ATTACHMENT S to perform the following:<br>1. **PLACE** the selected Master Test switch in TEST<br>2. **PLACE** the selected Bistable switches in TEST |
| **T = bistables tripped**<br>**Move on to Event 2** | | **RO:**<br>(g.) **CHECK** the appropriate bistable status light(s) are lit |
| | | **US:**<br>(B.6) **REQUEST I&C perform corrective maintenance on failed instrument** |
| | | |
| *********** EVENT 2 *********** | | |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| **Event 2**<br><br>**T = Examiner Cue**<br>**Trigger 3**<br><br>RX16A sev = 0.0% ramp = 060 seconds<br>3MSS-PT505 fails low | | |
| | **AOP-3581 (Rev 004)**<br>**Immediate Operator Actions** | |
| | The RO should identify uncontrolled rod motion with no turbine runback in progress and perform Immediate Actions of AOP 3581, Attachment A, from memory. | **RO:**<br>(A.1*) **CHECK Turbine Runback In Progress**<br><br>(a.) **CHECK** the following:<br><br>• Main Generator MWE - **NOT** AT EXPECTED VALUE<br><br>• Main Generator MWE - CHANGING |
| | | **RO:**<br>(a. RNO) **PERFORM** the following:<br><br>1. **PLACE** Rod Control SEL switch in MAN.<br><br>2. **PROCEED TO** step A.2. |
| | | **RO:**<br>(A.2*) **CHECK Rod Motion – STOPPED** |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Yes. Turbine Impulse Pressure (PT505) failed. | **BOP:**<br>(A.3) **CHECK Initiating Event - INSTRUMENT FAILURE**<br>• Tavg<br>• Nuclear Instrument<br>• Turbine Impulse Pressure |
| | | **US:**<br>(A.4) **GO TO AOP 3571, Instrument Failure Response** |
| | **AOP 3571 Rev 013**<br>**Instrument Failure Response** | |
| | | **US: Enters AOP 3571 (Rev-013)** and reads Note and Caution to crew:<br>**NOTE:** It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, I&C personnel are **NOT** able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations personnel may trip the bistables, using the guidance provided within this procedure.<br><br>**CAUTION:** The rod selector switch shall **NOT** be left in AUTO while diagnosing a related instrument failure, unless the reason for rod movement is a turbine runback. |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | The US should proceed to **Attachment G** for a Turbine Impulse Pressure Channel Failure | **US:**<br>**1. <u>PROCEED TO</u> the Appropriate Attachment, <u>AND</u> PERFORM Corrective Actions**<br><br>**<u>Instrument Failure Attachment</u>**<br>Turbine Impulse Pressure Channel Failure …**G** |
| | **AOP 3571 Attachment G** | |
| | Rod Control will already be in manual from the RO's immediate actions. | **RO:**<br>(G.1) **CHECK Control Rods in – MAN** |
| | | **BOP:**<br>(G.2) **PLACE ONE Steam Dump Interlock Selector Switch – OFF**<br>• INTLK-TR A (MSS-N05)<br>• INTLK-TR B (MSS-N06) |
| | | **BOP:**<br>(G.3) **SELECT** the unaffected channel on 1st STG STM PRESS CH SEL switch (3MSS-PS505Z)<br>• CHAN 1 (3MSS-PI505)<br>• CHAN 2 (3MSS-PI506) |
| | C-7 will Not be lit. | **BOP:**<br>(G.4) **CHECK** annunciator TURB LOAD REJECTION ARM C-7 – LIT |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **BOP:**<br>(G.4 RNO) **<u>PROCEED</u> <u>TO</u>** step G.6. |
| | | **BOP:**<br>(G.6) **ADJUST** Steam Pressure Controller setpoint to maintain 1092 psig (pot setting of approximately 8.4) |
| | | **BOP:**<br>(G.7) **PLACE** the Steam Dump MODE SEL switch (3MSS-N07) in the STM PRESS mode |
| | | **BOP:**<br>(G.8) **PLACE** Both Steam Dump Interlock Selector Switches – ON<br>• INTLK-TR A (3MSS*N05)<br>• INTLK-TR B (3MSS*N06) |
| | The Turbine HOLD light will not be lit. | **BOP:**<br>(G.9) **CHECK** Main Turbine HOLD light - NOT LIT |
| | | **RO:**<br>(G.10) **CHECK** Tavg - Tref error/deviation - LESS THAN +/-1°F |
| | | **RO:**<br>(G.11) **PLACE** Rod Control SEL switch in AUTO |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| **T = Requested to bypass AMSAC INSERT Trigger 4.** | | **US:**<br>(G.12) Using OP 3350, ATWS Mitigation System Actuation Circuitry, **PLACE** AMSAC in Bypass |
| | The US should enter TRM 7.2.1, action 1. | **US:**<br>(G.13) **REFER** to TRM 7.2, Additional Requirement, AMSAC |
| | | **US:**<br>**NOTE:** If the interlock (permissive annunciator window) is in the required state for the existing plant conditions, **NO** further actions are required (e.g., tripping of bistables). |
| **Once lead evaluator is satisfied that Tech Specs have been addressed, move on to Event 2.** | The US should enter Technical Specification 3.3.1 Functional Unit 17, action 8. | **US:**<br>(G.14) Within one hour, **PERFORM** the following:<br>(a.) **CHECK** Reactor power - LESS THAN 10% |
| | | **US:**<br>(a. RNO) **PROCEED TO** step G.15. |
| | | **NOTE:** The following step will distinguish whether the failure is within SSPS or the Protection channel. |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Bistable status lights are lit and Channel indication is <u>not</u> normal. The US should proceed to next step. | (G.15) **CHECK BOTH of the following conditions - EXIST:**<br>• Affected Channel Bistable status light (MB4G) - LIT<br>**<u>AND</u>**<br>• Affected channel indication - **<u>NOT</u>** NORMAL |
| | | **US:**<br>(G.16) **REQUEST** I&C perform corrective maintenance on failed instrument |
| | *********** **EVENT 3** *********** | |
| **<u>Event 3</u>**<br><br>**T = Examiner Cue**<br>**Insert Trigger 5**<br><br>CV11A | **Trip of the 'A' CHS Pump** | |
| | **AOP-3581 (Rev 004)**<br>**Immediate Operator Actions** | |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Annunciators "CHARG PP FLOW HI/LO", and "CHARG PP AUTO TRIP / OVERCURRENT" will alarm.<br><br>The RO should Identify the 'A' CHS pump has tripped and perform Immediate Actions of AOP 3581, Attachment F, from memory. | **RO:**<br>(F.1*) **ISOLATE Letdown And Charging**<br><br>(a.) Simultaneously **PERFORM** the following:<br>• **CLOSE** Letdown Orifice Isolation Valves<br>• **CLOSE** the Charging Flow Control Valve |
| | No instrument failure | **US:**<br>(F.2) **CHECK Initiating Event - INSTRUMENT FAILURE** |
| | | **US:**<br>(F.2 RNO) **GO TO** procedure and step in effect. |
| | The US should announce the transition to AOP 3580. | |
| | **AOP 3580 (Rev 003)**<br>**Loss Of All Charging Pumps** | |
| | The US should read the NOTE aloud to the crew. | **NOTE:** Foldout page shall be monitored throughout this procedure. |
| T = 4 min from being dispatched<br>**Report as PEO, Ground Overcurrent was cause of trip. If dispatched to pump, report an acrid electrical smell from the motor.** | NO Charging Pumps will be running. | **RO:**<br>(1) **CHECK Charging Pumps - NONE RUNNING** |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | The reactor will not be tripped. | **RO:**<br>(2) **CHECK Reactor - NOT TRIPPED** |
| | Both busses will be energized. | **BOP:**<br>(3) **CHECK Busses 34C And 34D - BOTH ENERGIZED** |
| | Letdown Orifice Isolation Valves should already be closed as a result of carrying out immediate actions. | **RO:**<br>(4) **Isolate Charging And Letdown**<br>( a.) **CLOSE** Letdown Orifice Isolation Valves<br>• 3CHS*AV8149A<br>• 3CHS*AV8149B<br>• 3CHS*AV8149C |
| | Excess Letdown and Reactor Head Vent Isolation Valves will be closed. | **RO:**<br>(b.) **CHECK** Excess Letdown and Reactor Head Vent Isolation Valves – CLOSED<br>• HEAD VENT TO EXCESS L/D (3RCS*MV8098)<br>• RX HEAD VENT A (3RCS*HCV442A)<br>• RX HEAD VENT B (3RCS*HCV442B)<br>• HD VENT ISOL (3RCS*SV8095A)<br>• HD VENT ISOL (3RCS*SV8096A)<br>• HD VENT ISOL (3RCS*SV8095B)<br>• HD VENT ISOL (3RCS*SV8096B |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Charging Flow Control Valve should already be closed as a result of carrying out immediate actions. | **RO:**<br>(c.) **CLOSE** Charging Flow Control Valve (3CHS*FCV121) |
| | A check of the 'A' CHS pump parameters will show no fluctuations.<br><br>The US should proceed to step 5.c. | **RO:**<br>(5) **Check For Loss Of Charging Pump Suction**<br><br>(a.) **CHECK** previously running charging pump - ANY OF THE FOLLOWING FLUCTUATING PRIOR TO PUMP TRIP (PPC, screen 3580_1)<br><br>• Charging Flow<br>**OR**<br>• RCP Seal Supply Flows<br>**OR**<br>• Charging Pump Discharge Pressure<br>**OR**<br>• Charging Pump Amps |
| | | **US:**<br>(a. RNO) **PROCEED TO** step 5.c. |
| **T = When called**<br>**Report as PEO no indication of pump cavitation or gas binding, but report an acrid electrical smell from the pump motor.** | The US should proceed to step 5.f. | **US:**<br>(c.) **CHECK** indications of pump cavitation or gas binding - REPORTED FROM FIELD |
| | | **US:**<br>(c. RNO) **PROCEED TO** step 5.f. |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | VCT to charging isolation valves will be open. | **RO:**<br>(f.) **CHECK** Charging Pump Suction<br>• **CHECK** VCT to Charging Isolation Valves – OPEN<br>• 3CHS*LCV112B<br>**AND**<br>• 3CHS*LCV112C |
| | All RCPs #1 seal inlet temperatures should be less than 190°F. | **RO:**<br>(6.) **Check RCPs For A Loss Of All Seal Cooling**<br>(a.) **CHECK** RCP Seal Inlet Temperatures - ANY GREATER THAN 190°F (PPC, 3580_1) |
| | The US should proceed to step 7. | **US:**<br>(a. RNO) **PROCEED TO** step 7**AND**<br>**IF** seal temperatures indicate a loss of all seal cooling, **THEN RETURN TO** step 6.b. |
| | The US should read the NOTE aloud to the crew. | **NOTE:** Water hammer may have occurred with the loss of charging flow to the Regenerative Heat Exchanger until letdown was isolated. |
| | Yes, no charging pumps are running. | **RO:**<br>(7.) **Check If A Charging Pump Should Be Started**<br>(a.) **CHECK** Charging Pump operation - NONE RUNNING |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Charging Pump Recirculation Isolation Valves are all open. | **RO:**<br>(b.) **CHECK** Charging Pump Recirculation Isolation Valves – OPEN<br>• 3CHS*MV8111A<br>• 3CHS*MV8111B<br>• 3CHS*MV8111C<br>• 3CHS*MV8110 |
| | Yes, all RCPs are running. | **RO:**<br>(c.) **CHECK** RCPs - ALL RUNNING |
| | The US should direct the RO to start the 'B' Charging Pump.<br><br>'RCP SEAL INJ FLOW LO' will clear. | **RO:**<br>(d.) **START One** Charging Pump |
| | | **US:**<br>(e.) **PROCEED TO** step 7.k |
| | There should be no indication of water hammer. | **RO:**<br>(k.) **CHECK** Charging System – **NO** INDICATIONS OF WATER HAMMER |
| | No. | **US:**<br>(l.) **CHECK** procedure entered from - ES-0.1, REACTOR TRIP RESPONSE |
| | | **US:**<br>(l. RNO) **PROCEED TO** step 8. |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **RO:**<br>(8) **Check Charging System Alignment**<br><br>(a.) **THROTTLE** Charging Line Flow Control Valve to establish/maintain pressurizer level control |
| | 3CHS*AV8147 will be open. | **RO:**<br>(b.) **CHECK** Charging Header Loop Isolation Valves - **One** OPEN<br><br>• 3CHS*AV8146<br>**OR**<br>• 3CHS*AV8147 |
| | Charging Header Isolation Valves will be open. | **RO:**<br>(c.) **CHECK** Charging Header Isolation Valves – OPEN<br><br>• 3CHS*MV8106<br>**AND**<br>• 3CHS*MV8105 |
| | Charging Pump Miniflow Isolation Valves to RWST will be closed. | **RO:**<br>(d.) **CHECK** Charging Pump Miniflow Isolation Valves to RWST – CLOSED<br><br>• 3CHS*MV8511A<br>**AND**<br>• 3CHS*MV8511B |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | RCP Seal Supply Valve will be open. | **RO:**<br>(e.) **CHECK** RCP Seal Supply Valve (3CHS*HCV182) – OPEN |
| | Yes Seal Injection flow will be about 8.5 gpm to each RCP. | **RO:**<br>(f.) **CHECK** Seal Injection flow to RCPs with unisolated seals – BETWEEN 8 and 13 gpm |
| | Yes | **RO:**<br>(9.) **Check Charging Flow**<br>(a.) **CHECK** Charging flow<br>• **CHECK** PZR level - STABLE OR INCREASING<br>• **CHECK** Charging Flow Control Valve - CAPABLE OF BEING THROTTLED |
| | | **US:**<br>(b.) **PROCEED TO** step 11 |
| | Yes, Normal Letdown is isolated. | **RO:**<br>(11.) **Align RCS Letdown**<br>(a.) **CHECK** Normal Letdown – ISOLATED |
| | Yes. | **RO:**<br>(b.) **CHECK** PZR level – GREATER THAN 22% |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Yes. | **RO:**<br>(c.) **CHECK** Normal Charging path - ESTABLISHED |
| | | **RO:**<br>(d.) Using GA-13, **ESTABLISH** Normal Letdown |
| | **GA-13** (Rev 002), *Establish Normal Charging and Letdown* | |
| | AOP 3580 continues on page 33<br><br>Yes, Letdown Orifice Isolation Valves will be closed. | **RO:**<br>(1) **Prepare For Restoration**<br><br>(a.) **CHECK** Letdown Orifice Isolation Valves – CLOSED<br><br>• 3CHS*AV8149A<br>• 3CHS*AV8149B<br>• 3CHS*AV8149C |
| | Yes. | (b.) **CHECK** Letdown Containment Isolation Valves – OPEN<br><br>• 3CHS*CV8160<br>**AND**<br>• 3CHS*CV8152 |
| | Yes. | (c.) **CHECK** the Letdown Isolation Valves – OPEN<br><br>• 3RCS*LCV459<br>**AND**<br>• 3RCS*LCV460 |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **NOTE:** System Engineering should be notified when charging flow is established with NO letdown flow. |
| | Yes. | **RO:**<br>(2) **Align For Letdown**<br>(a.) **CHECK** valve alignment for normal charging flow - ESTABLISHED |
| | | (b.) **ADJUST** Charging Flow Controller (3CHS-FK121) in MANUAL to approximately 55 gpm |
| | | (c.) **PLACE** the Letdown Pressure Controller (3CHS-PK131) in MANUAL **AND ADJUST** to 50% output |
| | | (d.) **PLACE** the Letdown Heat Exchanger Outlet Temperature Controller (3CHS-TK130) in MANUAL **AND ADJUST** to 60% output |
| | Yes. | **RO:**<br>**(3) Establish Letdown**<br>(a.) **CHECK** normal charging flow - ESTABLISHED |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (b.) **OPEN** one of the following letdown Orifice Isolation Valves<br>• 3CHS*AV8149A (45 gpm)<br>**<u>OR</u>**<br>• 3CHS*AV8149B<br>**<u>OR</u>**<br>• 3CHS*AV8149C |
| | | (c.) **ADJUST** Letdown Pressure Controller (3CHS-PK131) to maintain 350 psig **<u>AND</u> PLACE** in AUTO |
| | | (d.) **ADJUST** the Letdown Heat Exchanger Outlet Temperature Controller (3CHS-TK130) to maintain between 70°F and 115°F **AND PLACE** in AUTO |
| | | (e.) **ADJUST** charging flow to obtain desired PZR level |
| | | **RO:**<br>**(4 ) Check Pressurizer Level**<br>(a.) **CHECK** PZR Level – AT DESIRED LEVEL |
| | Yes. | (b.) **CHECK** Pzr Level automatic control-AVAILABLE |
| | | (c.) **PLACE** Charging Flow Controller (3CHS-FK121) in AUTO |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | No. | (d.) **CHECK** Head Vent Letdown - IN SERVICE |
| | | (d.) **GO TO** procedure and step in effect. |
| | **AOP 3580 (continued)** | |
| | | **US:**<br>(e.) **PROCEED TO** step 12 |
| | **The US should enter TS 3.5.2, Action a – 72 hours** | **US:**<br>(12.) **Check Technical Specifications And Technical Requirements**<br>(a.) **REFER** to the following Technical Specifications for additional actions:<br>• TS 3.5.2, ECCS Subsystems - Tavg Greater Than or Equal to 350°F<br>• TS 3.5.3, ECCS Subsystems - Tavg Less Than 350°F |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | TRM 3.1.2.2, **72 hours**<br><br>TRM 3.1.2.4, **72 hours**<br><br>Although not specified, TRM 3.5.2, ECCS Subsystems and TRM 7.4.1, Fire related Safe Shutdown Components; 14 days | **US:**<br>(b.) **REFER** to the following Technical Requirements for additional actions:<br>• TRM 3.1.2.1, Boration Systems - Flow Path - Shutdown<br>• TRM 3.1.2.2, Boration Systems - Flow Paths - Operating<br>• TRM 3.1.2.3, Boration Systems – Charging Pump - Shutdown<br>• TRM 3.1.2.4, Boration Systems - Charging Pump – Operating |
| **When letdown has been restored and Tech Specs addressed, Go To Event 4** | | **US:**<br>(13.) **Using Applicable Plant Procedures, CONTINUE With Normal Plant Evolutions** |
| | | |
| *********** **EVENT 4** *********** | | |
| **<u>Event 3</u>**<br><br>**T = Examiner Cue**<br>**Trigger 6**<br><br>**(CV13C @ 6.0%)** | **'C' RCP Seal Degradation**<br><br>This will cause mid stage inlet pressure to increase to approximately 2070 psi (normal is 1450 psi). Alarm setpoint is 1875 psi. Hi Range seal leakoff will be 2.9 gpm. | |
| | **MB4B (2-6B)**<br>**RCP C MID STG INLET PRES HI CORRECTIVE ACTIONS (rev 008)** | |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | The US should enter ARP MB4B (2-6B) and read the Caution to the crew: | CAUTION<br>Gross failure of all seal stages could be indicated by:<br>• Seal return (CBO) flow rate exceeding 4 gpm from a pump<br>• Third stage leakage flow indicating zero or near zero, which may be caused by steam formation in the seal water return (CBO) line |
| | MB3B (2-10) is not lit. | (1.) IF "RCP HI RANGE LKG FLOW HI" (MB3B 2-10) is lit, Go To 3353.MB3B Window 2-10, "RCP HI RANGE LKG FLOW HI." |
| | MB3B (2-9) is not lit. | (2.) IF "RCP HI RANGE LKG FLOW LO" (MB3B 2-9) is lit, Go To 3353.MB3B Window 2-9, "RCP HI RANGE LKG FLOW LO." |
| | | (3.) DISPLAY "RCP Status" RCS_2.dis (PPC) |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | US should request current value and assign an owner to monitor these parameters.<br><br>A complete loss of seal cooling has not occurred. | (4.) <u>IF</u> at any time, any of the following occur:<br>• RCP seal inlet temperature exceeds 190°F<br>• RCP seal outlet temperature exceeds 260°F<br>• DP across any one stage exceeds 1750 psid<br><br><u>THEN</u> PERFORM the following:<br><br>(4.1) TRIP reactor.<br>(4.1.1) STOP RCP C. |
| | | NOTE<br>A complete loss of seal cooling is defined as no seal injection flow, AND no thermal barrier cooling flow. |
| | | (4.1.2) <u>IF</u> a complete loss of seal cooling has occurred, CLOSE CHS-AV8141C, RCP seal return (CBO) isolation valve.<br>(4.1.3) Go To E---0, “Reactor Trip or Safety Injection.” |
| **When called as OMOC acknowledge report and if asked inform SM that you will have engineering review data and provide recommendations.** | | (5.) NOTIFY OMOC (Duty Officer) of the alarm condition. |
| **As Engineering Duty Officer, report that engineering will review data and make recommendations.** | | (6.) REQUEST Engineering Department evaluate continued pump operation. |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| **T= Step 6 of ARP MB4B (2-2B) complete**<br>**INSERT Trigger 7 (CV14C @ 2.0%)** | MB4B (2-6A), RCP C UP STG INLET PRES HI will light.<br>Crew to monitor seal inlet temp, outlet temp, and differential pressures.<br>If seal inlet temp > 190°F, OR seal outlet temp > 260°F, OR dp across any stage > 1750#, Trip the reactor and Stop "A" RCP. | (7.) IF RCP removal from service is recommended, PERFORM the following to remove RCP C from service within 8 hours:<br><br>7.1 IF reactor power is greater than 25%, Refer To OP 3204, "At Power Operation," and COMMENCE an orderly plant shutdown while continuing with this step. |
| | Leakage flow for "C" RCP seal will increase to about 3.3 gpm. Alarm setpoint is 3.0 gpm | |
| | | |
| | **3353.MB3B (2-10)**<br>**RCP HI RANGE LKG FLOW HI**<br>**CORRECTIVE ACTIONS** (rev 012) | |
| **T= Crew reaches Step 1 of ARP MB3B (2-10), MODIFY CV14C to 8.0% on 40 minute ramp.**<br><br>**8% severity will result in CBO flow less than 4 gpm.** | Modification of malfunction will allow the crew to determine the seal package is slowly degrading. | (1.) CHECK the following to confirm alarm and determine affected RCP:<br><br>• 3CHS-FR158 and 3CHS-FR160, high range seal leak flow recorders (MB3)<br><br>• CHS-F159*, RCP C seal return (CBO) flow computer point |
| | | (2.) DISPLAY "RCP Status," RCS_2.dis. |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (3.) ASSESS leakage flow high indication by observing the following indications:<br>• Seal injection flow<br>• Affected RCP seal inlet temperatures<br>• VCT level<br>• Charging header flow<br>• Pressurizer level<br>• 3CHS-PI 124, excess L/D Hx outlet pressure |
| | CBO flow is > 3 gpm, seal temps are sat and Mid stage inlet pressure high alarm is in. Crew should go to Step 8. | (4.) Using Table 1, EVALUATE plant conditions for the affected RCP, and Go To indicated Step. |
| | | |

Table 1

| RCP Seal Return (CBO) Flow | Seal Inlet Temp | Seal Outlet Temp | RCP MID STG INLET PRESS HI Alarm (MB4B) | RCP UP STG INLET PRESS HI Alarm (MB4B) | Go To Step: |
|---|---|---|---|---|---|
| ≥ 4 gpm | | | Lit | Lit | 6. |
| ≥ 4 gpm | | | Either Lit | | 7. |
| ≥ 3 gpm | | ≥ 260°F | | | 5. |
| ≥ 3 gpm | ≥ 190°F | | | | 6. |
| ≥ 3 gpm | ≤ 190°F | ≤ 260°F | Either Lit | | 8. |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| **T= Crew reaches Step 8 of ARP 3353.MB3B (2-10), call US as OMOC and report that based on Engineering and Vendor recommendations plant management has decided to take the unit off line. Recommend to SM to use 1% per minute rapid downpower to 30% Reactor Power. OMOC will make DEMI notification.** | | (8.) PERFORM the following:<br><br>(8.1) NOTIFY OMOC (Duty Officer) of alarm condition.<br><br>(8.2) IF "VCT TEMP HI" (MB3A 5---10) is lit, Refer To OP 3353.MB3A 5---10, "VCT TEMP HI."<br><br>(8.3) REQUEST Engineering Department evaluate continued pump operation.<br><br>(8.4) IF, at any time, affected RCP seal parameters degrade, IMPLEMENT steps as specified in Table 1, while proceeding to step 9. |
| | | (9.) IF total seal return flow from all four RCPs exceeds 16 gpm, Refer To TRM 7.4.1, "Fire Related Safe Shutdown Components," and PERFORM required ACTIONs. |
| | | |
| **T = AOP 3575 entered**<br>**INSERT Trigger 8**<br>**RX10A failed 'as is'** | **Sometime during the downpower, the crew should notice a failed PZR level transmitter staying at the 100% program value. Page forward in the exam guide to AOP 3571 Actions when the crew responds to the failed transmitter. The crew may elect to stop the downpower to deal with the level channel failure. This is satisfactory.** | |
| | **AOP 3575, *Rapid Downpower* (Rev 026)** | |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **US:**<br>Receives phone call, briefs crew, and **enters AOP 3575, *Rapid Downpower*** |
| | | **RO:**<br>(1) **CHECK Rod Control - IN AUTO** |
| | | **NOTE:** For a plant shutdown the preferred reactor power target is 30% Reactor Power |
| | | **NOTE:** Reactor Power to MWe correlation is an approximate value and will vary based on seasonal temperatures and equipment performance. |
| | | **BOP:**<br>(2) **Align EHC Panel**<br>(a.) **CHECK** Load reduction using Load Set – DESIRED |
| | Desired reactor power for a plant shutdown is 30%. This correlates to a Load Set Indicated MWe Setting of about **375 MWe**. | **BOP:**<br>(b.) Referring to ATTACHMENT H, **DETERMINE** the Load Set Indicated MWe setting for the applicable:<br>• Desired MWE Unit Output<br>**OR**<br>• Equivalent MWE for the Desired final Reactor Power |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **BOP:**<br>(c.) Using ATTACHMENT E, **ALIGN** EHC Panel for Load Set operation |
| | | **NOTE:** ISO-NE requested load reductions should be completed within 25 minutes of notification. |
| | No, OMOC recommended 1% min rate. | **US:**<br>**(3) Determine Power Reduction Rate (% / min)**<br>(a.) **CHECK** power reduction rate - 3%/min or 5%/min |
| | The US should proceed to step 5. | **US:**<br>(a. RNO) **PERFORM** the following:<br>(1.) **IF** power reduction rate is 1%/min, **THEN PROCEED TO** step 5. |
| | | **RO:**<br>(5) **Align RCS Makeup System For Boration**<br>(a.) **CHECK** Rod Control - AVAILABLE FOR ROD INSERTION |
| | | **US:**<br>(b.) **PROCEED TO** step 5.e |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Crew may elect to calculate required boron. | **US:**<br>(b.) **CHECK** use of Rapid Downpower Summary Sheet (RE-H-17) in the RE Curve and Data Book – DESIRED |
| | | **US:**<br>(c.) **REFER TO** the Rapid Downpower Summary Sheet (RE-H-17), **DETERMINE** the boric acid required |
| | | **US:**<br>(d.) **PROCEED TO** step 5.g |
| | | **US:**<br>(g.) Using the formula below, **DETERMINE** boration amount |
| | | Total Power Change(Δ%) X ( )gal BA/% Power = $\underline{\hspace{3cm}}$ gal Boration Amount |
| | | **RO**:<br>(h) **SET** Boric Acid Batch Counter to the boration amount determined |
| | | (i.) **ADJUST** Boric Acid Blend Flow Controller Pot setting to 6.25 (25 gpm) |
| | | |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **RO:**<br>(j.) **SELECT** BORATE on Reactor Coolant Makeup select switch |
| | | **RO:**<br>(k.) **SELECT** START on Reactor Coolant Makeup START switch |
| | | **RO:**<br>(l.) **CHECK** boric acid flow – INDICATED |
| | | **US:**<br>(m.) **PROCEED TO** step 6 **AND WHEN** boration has been performed for the selected amount, **THEN CHECK** Reactor Coolant Makeup boration stops |
| | | **NOTE:** Delta-T indications are selected as being more accurate than NIS for monitoring power during the rapid downpower. |
| | | **NOTE:** Perform step 8 if the downpower must be stopped **OR** a lower final power level is required **OR** boron injection alignment must be changed. |
| | Rapid or gravity boration is not in progress | (6) **Initiate Load Reduction**<br>(a.) **CHECK** rapid or gravity boration - IN PROGRESS |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | The US should direct the RO to inform him when either Tavg, power or changes as a result of the boration. | (a. RNO) **PERFORM** the following:<br><br>(1.) **<u>WHEN</u>** Tavg **<u>OR</u>** Reactor power change due to boration, **<u>THEN</u>** **<u>PROCEED</u>** **<u>TO</u>** step 6.b. |
| | | (b.) **CHECK** Turbine OPERATING MODE – MANUAL |
| | | (c.) **CHECK** load reduction- USING LOAD SET |
| | 1% minute is desired. | (d.) **SELECT** LOAD RATE LIMIT %/MIN (1%/MIN, 3%/MIN, or 5%/MIN) |
| | | (e.) Refer to ATTACHMENT H **<u>AND</u>** Using the LOAD SELECTOR pushbuttons, **ADJUST** LOAD SET to Load Set Indicated MWe setting recorded in step 2.b |
| | | (f.) **ENERGIZE** ALL PZR Heaters |
| | | (g.) **ADJUST** PZR Spray Valves to 50% setpoint<br><br>• 3RCS-PK 455B<br>• 3RCS-PK 455C |
| | | **NOTE:** Adjusting the loading rate (%/min), boration time, boration flow rate, or rod position are acceptable means to control plant parameters during the downpower. |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (h.) **MAINTAIN** plant parameters values as listed in ATTACHMENT C **OR** as directed by Operations Management |
| | | (i.) RNO **CHECK** power reduction - ISO-NE REQUESTED |
| | | (i. RNO) **NOTIFY** ISO-NE of load reduction rate (MWe/min) and final MWe level. |
| | | **RO:**<br>**(7 ) Check Rod Position Above RIL**<br>(a.) **CHECK** ROD CONTROL BANKS LIMIT LO-LO, (MB4C 4-9) annunciator – LIT |
| | | **US:**<br>(a. RNO) **PROCEED TO** step 7.k **AND IF** the annunciator is received, **THEN PERFORM** steps 7.b through 7.i. |
| | | (k.) **CHECK** ROD CONTROL BANKS LIMIT LO, (MB4C 3-9) annunciator – LIT |
| | | (k. RNO) **PROCEED TO** step 8 **AND IF** the annunciator is received, **THEN PERFORM** steps 7.l through 7.m. |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (8) **Monitor Downpower**<br><br>(a.) **CHECK** the following- REMAINS UNCHANGED<br><br>• Final desired MWe load<br>• Final desired target power level<br>• Boron injection path |
| | | **US:**<br>(b.) **PROCEED TO** step 9 |
| | | (9) **Degrade Condenser Backpressure**<br><br>(a.) **CHECK** final desired Turbine load (MWe) - LESS THAN 907 MWe (apprx 75% reactor power) |
| **As PEO when requested report to Control Room or acknowledge request to degrade vacuum. INSERT and MODIFY MALF FW01 as needed to maintain 2.0 – 4.0 in.** | Crew should diagnose the failed PZR level channel.<br>First indication may be MB4A 4-1, PZR Level Deviation or rods reaching the Rod control banks limit LO, which is NOT expected for a downpower rate of 1%/min. | (b.) Using OP 3329, Condenser Air Removal, **PERFORM** SJAE Operation to Increase Condenser Backpressure to between 2.0 in. HgA |
| | | **(10) Align One Feedwater Pump For Removal from Service**<br><br>(a.) **CHECK** final desired Reactor power - LESS THAN 50% |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (b.) **CHECK** removing a Feedwater Pump from service during the downpower – DESIRED |
| | | (c.) **CHECK** TD FW Pump Status –<br>• Both OPERATING<br>**AND**<br>• At Least One OPERATING in AUTO |
| | | (d.) Using the applicable Attachment, **REMOVE** ONE TD FW Pump from service:<br>• ATTACHMENT A, Removing A TD FW Pump From Service<br>• ATTACHMENT B, Removing B TD FW Pump From Service |
| | | **(11) Check Power Related Interlock Status**<br>(a.) **CHECK** Reactor power – LESS THAN THE P-9 SETPOINT (resets at approx. 49% NIS power) |
| | | (a. RNO) **PROCEED TO** step 12 **AND WHEN** Power Less Than P-9, **THEN RETURN** to step 11. |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (12) **Align Plant Systems For Less Than 30% Reactor Power Operation**<br><br>(a.) **CHECK** final desired Reactor power level - LESS THAN or EQUAL TO 30% |
| **As PEO, acknowledge request to start Aux Boilers. Wait 8 minutes and INSERT MSR01.** | | (b.) Using OP 3331A, Auxiliary Boiler Steam and Condensate, **START** the Auxiliary Boiler(s) |
| | | |
| *********** **EVENT 5** *********** | | |
| | **Event 2: Failure of 3RCS-L459** | |
| **T= When identified by crew**<br><br>**RX10A Sev= "as is"** | **3RCS-L459 is failed "as is" during the downpower** | |
| | Annunciater "CHARG PP FLOW HI/LO" eventually comes in on low flow (setpoint 25 gpm). The ARP will direct the crew to AOP 3571, if the cause is an instrument failure. | |
| | **OP 3353.MB3A 4-9 (rev 003) CORRECTIVE ACTIONS** | |
| | Other indications may be MB4A 4-1, PZR Level Deviation or rods reaching the Rod control banks limit LO, which is NOT expected for a downpower rate of 1%/min. | **US:**<br>(1.) IF no charging pumps are operating, Go To AOP 3580, "Loss of All Charging Pumps." |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | **PZR level will not be on program.** | **RO:**<br>(2.) CHECK the following, (MB3):<br>• 3CHS-FI 121A, charging flow (MB3), 55 to 100 gpm<br>• 3CHS-FI 132, letdown flow (MB3), 75 to 120 gpm<br>• Pressurizer level on program:<br>  • 3RCS*LI 459, pressurizer level<br>  • 3RCS*LI 460, pressurizer level<br>  • 3RCS*LI 461, pressurizer level |
| | After the crew recognizes that the controlling channel of PZR level has failed, the US should go to AOP 3571. | **US:**<br>(3.) <u>IF</u> alarm is due to instrument failure, Go To AOP 3571, "Instrument Failure Response." |
| | | |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | **AOP 3571, *Instrument Failure Response*** **(Rev 013)** | |
| | **The US should enter AOP 3571** and read the Note and Caution to the crew. | **NOTE:** It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, I&C personnel are **NOT** able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations personnel may trip the bistables, using the guidance provided within this procedure.<br><br>**CAUTION:** The rod selector switch shall **NOT** be left in AUTO while diagnosing a related instrument failure, unless the reason for rod movement is a turbine runback. |
| | | **US:**<br>(1.) **PROCEED TO the Appropriate Attachment, AND PERFORM Corrective Actions**<br><br>**Instrument Failure** — **Attachment**<br>PZR Level Channel Failure — C |

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<table>
<tr><th colspan="3">SCENARIO TIME LINE</th></tr>
<tr><th>BOOTH INSTRUCTOR</th><th>FLOOR INSTRUCTOR</th><th>STUDENTS</th></tr>
<tr><td></td><td>RO should identify a failure of 3RCS*LT459.<br>RO will likely adjust 3CHS*FCV121 in manual to restore pressurizer level to setpoint.</td><td>RO:<br>(C.1) CHECK one of the following PZR Level Controllers in MAN<br>• PZR MASTER LVL CONTROL (3RCS-LK459)<br><u>OR</u><br>• CHARGING FLOW CONTROL (3CHS-FK-121)</td></tr>
<tr><td></td><td>RO directed to place 3RCS-LS459D in Channel 3-2.<br>RO directed to place 3RCS-LS459E in any channel other than 1.</td><td>RO:<br>(C.2) DEFEAT the failed channel input</td></tr>
<tr><td></td><td colspan="2"><table>
<tr><th></th><th>Name</th><th>Switch ID</th><th>Position</th></tr>
<tr><td>☐</td><td>PZR LVL SEL - CNTL (MB4)</td><td>3RCS-LS459D</td><td>Select Unaffected Channels</td></tr>
<tr><td>☐</td><td>PZR LVL SEL - RECORD (MB4)</td><td>3RCS-LS459E</td><td>Select Unaffected Channel</td></tr>
</table></td></tr>
<tr><td></td><td>The US should give specific direction to the RO to restore PZR level to program for the present power level.</td><td>RO:<br>(C.3) MAINTAIN PZR Level - IN NORMAL OPERATING BAND</td></tr>
<tr><td></td><td>Letdown isolation should not have occurred.</td><td>RO:<br>(C.4) CHECK Letdown - IN SERVICE</td></tr>
</table>

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **RO:**<br>(C.5) **CHECK PZR Level - STABLE AT PROGRAM LEVEL** |
| | | **RO:**<br>(C.6) **Restore PZR Level Control to Automatic**<br><br>(a.) **PLACE** the PZR Level Controller selected in step C.1 to AUTO:<br><br>• PZR MASTER LVL CONTROL 3RCS-LK459<br>• CHARGING FLOW CONTROL 3CHS-FK-121 |
| | | **RO:**<br>(C.7) **CHECK Pressurizer Heaters - NOT TRIPPED** |
| | | (C.8) **Trip the associated Reactor Protection System bistable(s)**<br><br>(a.) Using Table C.1, **PLACE** a check mark in the box above the channel required to be tripped |

<table>
<tr><th colspan="3">SCENARIO TIME LINE</th></tr>
<tr><th>BOOTH INSTRUCTOR</th><th>FLOOR INSTRUCTOR</th><th>STUDENTS</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td colspan="4">☐ Trip this channel</td></tr>
<tr><th colspan="4">LT-459 Protection Set I (Red)</th></tr>
<tr><th>Parameter</th><th>Designator</th><th>Location</th><th>Switch</th></tr>
<tr><td>Master Test Card</td><td>UY/761S</td><td>C1-769</td><td>SW-7</td></tr>
<tr><th>Parameter</th><th>Designator</th><th>Location</th><th>Bistable</th></tr>
<tr><td>PZR LEVEL HI [Rx Trip]</td><td>LS/459A</td><td>C1-751</td><td>BS-1</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td></td><td>The US should enter:<br>[Tech Specs] 3.3.1, Functional Unit 11, Action 6</td><td>US:<br>(b.) REFER to the following Tech Specs for required actions<ul><li>TS 3.3.1, Reactor Trip System Instrumentation</li><li>TS 3.3.3.5, Remote Shutdown Instrumentation</li><li>TS 3.3.3.6, Accident Monitoring Instrumentation</li></ul></td></tr>
<tr><td></td><td>The RO should do a lamp check to ensure all bistable lights are functional, then verify no coincidence would be met when bistables are tripped.</td><td>(c.) CHECK the existing bistable status to ensure a Reactor trip will NOT occur when the failed channel is tripped</td></tr>
</table>

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Channel indication is <u>not</u> normal. The US should proceed to next step. | **US:**<br>(d.) **CHECK** BOTH of the following conditions - EXIST:<br>• Affected Channel Bistable status light (MB4F) - LIT<br>**<u>AND</u>**<br>• Affected channel indication - **<u>NOT</u>** NORMAL |
| **T = When requested:**<br>**Report to the Control Room as I&C.** | | **US:**<br>(e.) **REQUEST** I&C use Table C.1 and ATTACHMENT S to perform the following:<br>1. **PLACE** the Master Test Card switches in TEST<br>2. **PLACE** the bistable switches in TEST |
| **T = After I&C brief**<br>**Trigger 9**<br>Trip Bistables (RXR106, RXR25) | | **RO:**<br>(f.) **CHECK** appropriate bistable status light – LIT |
| | | **RO:**<br>(g.) **CHECK** indicator 3RCS*LI459C – FAILED |
| | Indicator 3RCS*LI459C is affected by the failure of 3TCS*LT459. However, Appendix R transmitter 3RCS-LT459C is not affected and therefore can be used to meet the TRM requirement. Entry into TRM 7.4.1 is not required. | **US:**<br>(h.) **REFER** to TRM Table 7.4.1, Fire Related Safe Shutdown Components, Reactor Coolant System |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| When lead evaluator is satisfied with downpower and Tech Specs for failed instrument have been addressed move on to Event 6. | | **US:**<br>**C.9 REQUEST I&C perform corrective maintenance on failed instrument** |
| | | |
| *********** **EVENT 6** *********** | | |
| **T= Lead evaluator satisfied with downpower and Tech Spec review**<br><br>**MODIFY CV13C to 10.5 on 2 minute ramp.** | **'C' RCP Seal Degradation Requiring a Reactor Trip** | |
| | **When crew diagnoses worsening conditions on C RCP seal the US should return to Table at Step 4 of ARP MB3B (2-10). CBO flow will exceed 4.0 gpm.** | |

Table 1

| RCP Seal Return (CBO) Flow | Seal Inlet Temp | Seal Outlet Temp | RCP MID STG INLET PRESS HI Alarm (MB4B) | RCP UP STG INLET PRESS HI Alarm (MB4B) | Go To Step: |
|---|---|---|---|---|---|
| ≥ 4 gpm | | | Lit | Lit | 6. |
| ≥ 4 gpm | | | Either Lit | | 7. |
| ≥ 3 gpm | | ≥ 260°F | | | 5. |
| ≥ 3 gpm | ≥ 190°F | | | | 6. |
| ≥ 3 gpm | ≤ 190°F | ≤ 260°F | Either Lit | | 8. |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | The US should direct the RO to trip the reactor, stop the 'C' RCP and then transition to E-0. | (6.) PERFORM the following:<br><br>(6.1) TRIP reactor.<br><br>(6.2) STOP affected reactor coolant pumps.<br><br>(6.3) Go To E---0, "Reactor Trip or Safety Injection." |
| | | |
| | *********** **EVENT 7** *********** | |
| | **"C" Cold Leg break Inside CTMT** | |
| **The small break LOCA will initiate upon the reactor trip.**<br>(RC03C, 200 lbm/sec) | | |
| | **E-0, *REACTOR TRIP OR SAFETY INJECTION*<br>Rev. 030** | |
| | | **NOTE:** ADVERSE CTMT is defined as GREATER THAN 180°F or GREATER THAN 105 R/hr in containment.<br><br>**NOTE:** The reactor can be interpreted as tripped when any two of the actions in step 1 are satisfied.<br><br>**NOTE:** Attachment D identifies Time Critical Actions. |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **RO:**<br>(1 *) **Check Reactor Trip**<br>• **CHECK** Reactor Trip and Bypass Breakers – OPEN<br>• **CHECK** Rod Bottom lights – LIT<br>• **CHECK** Neutron Flux – DECREASING |
| | | **BOP:**<br>(2 *) **Check Turbine Trip**<br>(a.) **CHECK** all Turbine Stop Valves - CLOSED |
| | | (3 *) **Check Power To AC Emergency Busses**<br>(a.) **CHECK** AC Emergency Busses 34C and 34D - BOTH ENERGIZED |
| *********** **EVENT 8** *********** | | |
| | | |
| | **EVENT 8: Safety Injection fails to automatically actuate.**<br>**Critical Task – Crew should identify that SI did not actuate and it is required. SI should be manually actuated.** | (4 *) **Check If SI Is Actuated**<br>(a.) **CHECK** SAFETY INJECTION ACTUATION annunciators, (MB4D 1-6 or MB2B 5-9) – LIT |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **RO/BOP:**<br>(a. RNO) **CHECK** if SI is required:<br>• CTMT pressure GREATER THAN 18 psia<br>**OR**<br>• PZR pressure LESS THAN 1890 psia<br>**OR**<br>• PZR level LESS THAN 9%<br>**OR**<br>• RCS subcooling LESS THAN 32°F<br>**OR**<br>• SG pressure LESS THAN 660 psig |
| | | **US:**<br>(a. RNO) **IF** SI is required, **THEN INITIATE** SI and **PROCEED TO** step 5. |
| | | **NOTE:** Foldout page must be open. |
| | CTMT will not be Adverse. | (5) **DETERMINE IF ADVERSE CTMT CONDITIONS EXIST**<br>• Ctmt temperature - GREATER THAN 180°F<br>**OR**<br>• Ctmt radiation - GREATER THAN 105 R/ hr |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | **US:**<br>(5 RNO) DO **NOT** USE ADVERSE CTMT Parameters |
| | The RO should monitor for RCP Trip criteria and trip all four RCP's when RCS pressure less than 1500 psia (1800 psia ADVERSE) AND either an SI pump running or a CHS pump running with its cold leg injection MOV open. | |
| | The US should hand off ATTACHMENT B to the RO | **RO:**<br>(6) **Using** ATTACHMENT B**, Actuation Signal Verification, CHECK Equipment Alignment** |
| *********** **EVENT 9** *********** | | |
| | | |
| | **EVENT 9: AFW pumps fail to auto – start.**<br><br>**Critical Task –**<br>**The BOP should identify that the AFW pumps failed to automatically start when required. The BOP should manually start ALL AFW pumps.** | **BOP:**<br>(7) **Check AFW Pumps Running**<br>(a.) **CHECK** MD Pumps – RUNNING |
| | | (a. RNO) **START** pump(s). |
| | | (b.) **CHECK** Turbine-Driven Pump - RUNNING IF NECESSARY |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (b. RNO) **OPEN** Steam Supply Valves. |
| | | **BOP:**<br>(8) **CHECK AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT** |
| | | **CAUTION:** With TD AFW Pump feeding SG(s): Full travel stroking of any AFW Flow Control Valve should occur one at a time, at a rate GREATER THAN 15 seconds. |
| | | **BOP:**<br>(9) **Check Adequate Heat Sink**<br>(a.) **CHECK** NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT) |
| | | (b.) **CONTROL** feed flow to maintain NR level - BETWEEN 8% and 50% (42% and 50% ADVERSE CTMT) |
| | | **US:**<br>(c.) **PROCEED TO** step 10 |
| | | **RO and BOP:**<br>(10) **Check RCS Temperature**<br>(a.) Using GA-26, **DUMP** steam to control No-Load RCS Temperature - AT 557°F |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (b.) **CHECK** RCS Temperature – AT NO-LOAD VALUE:<br>• **IF ANY** RCP RUNNING - RCS Tavg - STABLE AT OR TRENDING TO 557°F<br>**OR**<br>• **IF NO** RCP RUNNING – RCS COLD LEG WR TEMPERATURE - STABLE AT OR TRENDING TO 557°F |
| | | **US:**<br>(c.) **PROCEED TO** step 11 |
| | | **BOP:**<br>(11) **Check Power To SBO Diesel Auxiliaries**<br>(a). **CHECK** any SBO Bus Tie Breaker - CLOSED TO AN ENERGIZED BUS<br>• Bus 34A: 34A1-2<br>• Bus 34B: 34B1-2<br>• Bus 24E: A505 (Unit 2) |
| | | **US:**<br>(b.) **PROCEED TO** Step 12 **AND IF** SBO Diesel Auxiliaries DEENERGIZE, **THEN PERFORM** step 11.a RNO |
| | | **RO:**<br>(12) **Check PZR Valves**<br>(a.) **CHECK** PORVs - CLOSED |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (b.) **CHECK** normal PZR Spray Valves - CLOSED |
| | | (c.) **CHECK** PORV Block Valves - AT LEAST ONE ENERGIZED VALVE OPEN |
| | | (d.) **CHECK** PORV Block Valves - ALL ENERGIZED VALVES OPEN |
| | | (e.) **CHECK** PZR Safety Valves - CLOSED |
| | | **CAUTION:** To prevent seal damage, seal injection flow should be maintained to all RCPs. |
| | **RCS pressure will eventually lower to < 1500 psia. Crew should identify this and trip all RCPs.** | **RO:**<br>(13) **Check If RCPs Should Be Stopped**<br>(a.) **CHECK** RCPs - ANY RUNNING |
| | | (b.) **CHECK** RCS pressure – LESS THAN 1500 psia (1800 psia ADVERSE CTMT) |
| | | (c.) **CHECK** either of the following:<br>• Charging pumps - AT LEAST ONE RUNNING AND AT LEAST ONE COLD LEG INJECTION VALVE OPEN<br>**OR**<br>• SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF INJECTION |
| | | (d.) **STOP** all RCPs |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | All SG Secondary Boundaries Are Intact | **BOP:**<br>(14) **Check If SG Secondary Boundaries Are Intact**<br>(a.) **CHECK** pressure in all SGs:<br>• **NO** SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>• **NO** SG COMPLETELY DEPRESSURIZED |
| | All SG tubes are intact. | **BOP:**<br>(15) **Check If SG Tubes Are Intact**<br>(a.) **CHECK** Steam Generator levels - **NO** SG LEVEL INCREASING IN AN UNCONTROLLED MANNER |
| | | **RO:**<br>(b.) **CHECK** trend history and alarm status of radiation monitors<br>• Main Steam Line - NORMAL<br>• Condenser Air Ejector - NORMAL<br>• SG Blowdown - NORMAL |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | CTMT pressure will not be normal. | **RO:**<br>(16) **Check If RCS Is Intact**<br>• **CHECK** Ctmt radiation using 3CMS*RE22 (pre-trip) – NORMAL<br>• **CHECK** Ctmt radiation using radiation monitoring group histogram (CTMT) - NORMAL<br>• **CHECK** Ctmt pressure - NORMAL<br>• **CHECK** Ctmt recirculation sump level - NORMAL |
| | Depending on CTMT pressure, the **crew may go to FR-Z.1** if the CTMT CSF is ORANGE, since status trees are now in effect. | **US:**<br>(16 RNO)<br>**INITIATE** monitoring of CSF Status Trees **AND GO TO** E-1, Loss of Reactor or Secondary Coolant. |
| | **E-1, *LOSSOF REACTOR OR SECONDARY COOLANT* (Rev. 026)** | |
| | | CAUTION<br>To prevent seal damage, seal injection flow should be maintained to all RCPs. |
| | | NOTE<br>Foldout page must be open. |

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | RCP's should have been stopped in E-0 | **RO:**<br>(1.) **Check If RCPs Should Be Stopped**<br>(a.) Verify RCPs - ANY RUNNING |
| | | **US:**<br>(a. RNO) Proceed to step 2. |
| | Secondary Boundaries Are Intact | **BOP:**<br>(2.) **Check If SG Secondary Boundaries Are Intact**<br>(a.) Check pressures in all SGs –<br>• NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>• NO SG COMPLETELY DEPRESSURIZED |
| | | **BOP:**<br>(3.) **Check Intact SG Levels**<br>(a.) Verify NR level - GREATER THAN 8% (42% ADVERSE CTMT) |
| | | (b.) Control feed flow to maintain NR level - BETWEEN 8% and 50% (42% and 50% ADVERSE CTMT) |

SEG# 2K17 NRC-01 Rev ; 0

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Secondary radiation will be normal. | **RO/BOP:**<br>(4.) **Check Secondary Radiation**<br><br>(a.) Using GA---30, Align RPCCW for RCS and SG sampling |
| | | (b.) Verify trend history and alarm status of radiation monitors<br><br>• Main steam line - NORMAL<br>• Condenser air ejector - NORMAL<br>• SG blowdown - NORMAL |
| | | (c.) Verify SG chemistry activity sample results - AVAILABLE |
| | | (d.) Verify chemistry samples- NO SG INDICATES ABNORMAL RADIATION |
| | | <u>CAUTION:</u><br>If any PZR PORV opens because of high PZR pressure, step 5.a. should be repeated after pressure decreases to LESS THAN 2350 psia. |
| | | **RO:**<br>(5.) **Check PZR PORVs and Block Valves**<br><br>(a.) Verify PORVs - CLOSED |
| | | (b.) Verify block valves - AT LEAST ONE OPEN |

SEG# 2K17 NRC-01 Rev ; 0

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Subcooling should be <32°F and/or PZR level < 16%. | **RO/BOP:**<br>(6.) **Check If ECCS Flow Should Be Reduced**<br>(a.) Verify RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT) |
| | | (b.) Verify secondary heat sink<br>• Total feed flow to intact SGs - GREATER THAN 530 gpm<br><u>OR</u><br>• Narrow range level in at least one intact SG - GREATER THAN 8% (42% ADVERSE CTMT) |
| | | (c.) Verify RCS pressure - STABLE OR INCREASING |
| | | (d.) Verify PZR level - GREATER THAN 16% (50% ADVERSE CTMT) |
| | The US should proceed to step 7. | **US:**<br>(6. RNO) Proceed to Step 7. |
| | | **RO:**<br>(7.) **Check If Ctmt Spray Should Be Stopped**<br>(a.) Verify quench spray pumps - RUNNING |

SEG# 2K17 NRC-01 Rev ; 0

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (b.) Verify Ctmt pressure - LESS THAN 17.5 psia |
| | | **US:**<br>(b. **RNO)** Proceed to CAUTION prior to step 8. and, WHEN Ctmt pressure is LESS THAN 17.5 psia, THEN Perform step 7.c. |
| | | CAUTION:<br>After SI reset, manual operator action is required to:<br>• Open the charging pump cold leg injection valves when RCS pressure decreases to LESS THAN 1900 psia.<br>• Restart the RHR pumps if RCS pressure decreases in an uncontrolled manner to LESS THAN 300 psia (500 psia ADVERSE CTMT).<br>• Restart safeguards equipment if offsite power is lost. |
| | | **RO:**<br>(8.) **Check If RHR Pumps Should Be Stopped**<br>a. Check RCS pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT) |
| | **Depending on the speed of the crew, RCS pressure may still be going down very slowly. If the crew elects NOT to stop RHR pumps based on this trend, this is satisfactory.** | (b.) Check RCS pressure - STABLE OR INCREASING |

SEG# 2K17 NRC-01 Rev ; 0

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | | (c.) Check RHR pumps – ANY RUNNING IN SI MODE |
| | Crew should reset SI. | (d.) RESET the following, if required:<br>1) SI<br>2) CDA |
| | **NOTE**: This step will stop the RHR Pumps. If stopped, the pumps will need to be restarted when the LOCA becomes larger. | (e.) STOP RHR pumps and Place in AUTO |
| | | **RO and BOP:**<br>(9.) **Check RCS And SG Pressures**<br>• Check pressure in all SGs - INCREASING OR STABLE (consistent with plant cooldown)<br>• Check RCS pressure - DECREASING OR STABLE |
| **T = Step 10 or Chief Examiner's cue**<br>**Modify RC03C to 100% severity** | | **BOP:**<br>(10.) **Check If Diesel Generators Should Be Stopped**<br>(a.) Verify AC emergency busses - BOTH ENERGIZED BY OFFSITE POWER |
| *********** **EVENT 10** *********** | | |
| | | |

SEG# 2K17 NRC-01 Rev ; 0

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | **The crew will need to recognize 3 items:**<br>**1- The rise in CTMT pressure will generate an orange path on CTMT, and require transition to FR-Z.1**<br>**2- CDA has failed to actuate.**<br>**3- If stopped, RHR pumps will need to be restarted.** | |
| | NOTE: A red path on RCS Integrity may come in first. If so the crew will perform FR-P.1 first as it has a higher priority | |
| | **FR-P.1 (rev 016) Steps** | |
| | | **CAUTION**<br>• If DWST level decreases to LESS THAN 80,000 gal, Shift AFW pump suction to the CST using GA-4.<br>• If RWST level decreases to LESS THAN 520,000 gal, Go to ES-1.3, Transfer to Cold Leg Recirculation, to align the ECCS system. |
| | | **RO:**<br>(1.) **Check RCS Pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)** |

SEG# 2K17 NRC-01 Rev ; 0

| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | RHR Pump flow should be > 1,000 gpm. The appropriate transition will be to FR-Z.1 | **US:**<br>(1. RNO) Perform the applicable action:<br>• IF RHR pump flow is LESS THAN OR EQUAL TO 1000 gpm, THEN Proceed to step 2.<br>• IF RHR pump flow is GREATER THAN 1000 gpm, THEN Go to procedure and step in effect. |
| | **FR-Z.1 (rev 017) STEPS** | |
| | | **CAUTION**<br>If RWST level decreases to LESS THAN 520,000 gal, Go to ES-1.3, Transfer to Cold Leg Recirculation, to align the ECCS system. |
| | | **RO:**<br>(1.) **Check IF CDA Required**<br>(a.) Check Ctmt pressure - GREATER THAN 23 psia |
| | "CONTAINMENT DEPRESS ACTUATION" will NOT be lit. | (b.) Verify annunciator "CONTAINMENT DEPRES ACTUATION" (MB2B 5-5) - LIT |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | The **RO** is expected to attempt to **manually initiate CDA** using the main board pushbuttons<br><br>**Critical Task –**<br>**The RO must manually start the QSS pumps.** | (b. RNO) Initiate CDA.<br>IF CDA will NOT actuate, THEN<br>1) START quench spray pumps.<br>2) OPEN quench spray pump discharge valves. |
| | The RPCCW pumps will have to be manually stopped. | (c.) Check RPCCW pumps - STOPPED |
| | | (c. RNO) Perform the following:<br>1) RESET SI and LOP (if required)<br>2) STOP RPCCW pumps. |
| | | d. STOP all RCPs |
| | The BOP will have to manually stop the CAR and CRDM fans. | **BOP:**<br>(e.) Check CAR fans - STOPPED |
| | | (e. RNO) STOP CAR fans. |
| | | (f.) Check CRDM fans – STOPPED |
| | | (f. RNO) STOP CRDM fans. |
| | | **CAUTION**<br>If ECA-1.1, Loss of Emergency Coolant Recirculation, is in progress, Ctmt spray should be operated as directed in ECA-1.1. |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| | Yes, not lit. | **RO:**<br>(2.) **Verify Quench Spray System Operation**<br>(a.) Check annunciator RWST EMPTY QSS PP OFF (69,331 gal) (MB2A 5-2) - NOT LIT |
| | QSS pumps were started and their discharge valves opened in step 1. | (b.) Verify quench spray pumps - RUNNING |
| | | (c.) Verify running quench spray pump discharge valve(s) – OPEN<br>• 3QSS*MOV34A<br>• 3QSS*MOV34B |
| | Yes, Ctmt pressure will be less than 60 psia. | (3.) **Check Ctmt Status**<br>(a.) Check Ctmt pressure - LESS THAN 60 psia |
| | | **US:**<br>(b.) Go to procedure and step in effect and, after evaluating step applicability based on plant conditions, Perform the remainder of this procedure as time allows |
| | | |
| **The scenario may be terminated upon completion of FR-Z.1.** | | |
| | | |

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| SCENARIO TIME LINE | | |
|---|---|---|
| **BOOTH INSTRUCTOR** | **FLOOR INSTRUCTOR** | **STUDENTS** |
| RESTORE simulator to "training ready" conditions by cleaning/replacing marked up procedures, removing placekeeping tabs or marks from all references and control panel indicators, etc. | **POST-SCENARIO:**<br>a. ENSURE simulator problems encountered during the scenario are documented IAW site specific process. | |

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SECTION 5
EXAM GUIDE SUMMARY

Title: Four Faulted SG's

**Critical Tasks**

| TASK DESCRIPTION | TASK # | K/A >/= 3.0 | BASIS SELECTION |
|---|---|---|---|
| Manually actuate at least one train of SIS-actuated safeguards before transition out of E-0. | CT-2 | ESFAS 013-A3.02 (4.1 / 4.2) | Failure to manually actuate SI under the postulated conditions constitutes misoperation or incorrect crew performance in which the crew does not prevent "degraded emergency core cooling system (ECCS)…capacity." |
| Establish 530 gpm AFW flow to the SGs before transition out of E-0. | CT-4 | AFW 061-A2.05 (3.1 / 3.4) | Failure to establish the minimum required AFW flow rate, under the postulated plant conditions, results in "adverse consequence or a significant degradation in the mitigative capability of the plant." |
| Establish at least one train of quench spray flow before an extreme challenge to the CTMT critical safety function exists. | CT-3 | CSS 026-A4.01 (4.5 / 4.3)<br><br>Westinghouse EPE E14–EA1.1 (3.7 / 3.7) | Failure to manually actuate [the minimum required complement of containment cooling equipment][1] under the postulated conditions demonstrates the inability of the crew to "recognize a failure or an incorrect automatic actuation of an ESF system or component." |
| | | | |

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**Appendix D** **Scenario Outline** **Form ES-D-1**

Facility: Millstone 3 Scenario No.: 2K17 NRC-01(Rev 0) Op-Test No.: 2K17
Examiners:__________ Operators:__________

Initial Conditions: IC-29, 100% Power, Middle of life, Equilibrium Xe

Turnover: The plant is at 100% power and at middle of life. The 'A' EDG is out of service for planned maintenance.

Critical Tasks:

1. Manually actuate at least one train of SIS-actuated safeguards before transition out of E-0. (CT-2)
2. Establish 530 Gpm AFW flow to the SGs before transition out of E-0. (CT-4)
3. Establish at least one train of quench spray flow before an extreme challenge to the CTMT critical safety function exists. (CT-3)

| Event No. | Malf. No | Event Type* | Event Description |
|---|---|---|---|
| 1 | RX09A | I (RO) | Controlling channel of PZR pressure (3RCS*PT455) fails high. (AOP 3571) *(Tech Spec entry)* |
| 2 | RX16A | I (RO)<br>I (BOP) | Turbine Impulse pressure instrument (3MSS-PT505) fails low. (AOP 3571) *(Tech Spec entry)* |
| 3 | CV11A | C (RO) | 'A' Charging pump trip. (AOP 3580) *(Tech Spec entry)* |
| 4 | CV13C<br>CV14C | R (SRO)<br>R (RO)<br>N (BOP) | 'C' RCP seal degradation. Rapid Downpower (1%/min) to take the unit offline. |
| 5 | RX10A | I (RO) | Controlling channel of PZR level (3RCS*L459) fails 'as is' in conjunction with downpower. (AOP 3571) *(Tech Spec entry)* |
| 6 | CV13C<br>CV14C | | 'C' RCP seal continues to degrade, resulting in high seal leakoff and a procedurally required reactor trip. (Annunciator Response) |
| 7 | RC03C | M (All) | Small break LOCA inside CTMT (catastrophic loss of 'C' RCP seal package). |
| 8 | RP07A/B | C (RO) | Safety Injection fails to automatically actuate. |
| 9 | FW20 | C (BOP) | AFW pumps fail to auto start. |
| 10 | RP06A/B<br>RPDI0004<br>RPDI0006 | C (RO)<br>C (BOP) | Large break LOCA inside CTMT. CDA fails to automatically or manually actuate. |

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

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# SHIFT TURNOVER REPORT

| DATE-TIME | PREPARED BY | SHIFT |
|---|---|---|
| Today 0515 | Unit Supervisor /"NIGHT" Shift | 18:00 - 06:00 |

**PLANT STATUS:**

| | | | |
|---|---|---|---|
| Mode: | 1 | Rx Power: | 100 % |
| Megawatts: | Thermal: 3645 MWTH | PZR Pressure: | 2250 psia |
| | Electric: 1285 MWe | RCS T-AVE: | 587 deg F |
| RCS Leakage: | Identified: 0.015 gpm | Core Burnup: | 10000 MWD/MTU |
| | Unidentified: 0.036 gpm | Protected Train/Facility: | B (Purple) |
| Date/Time: | Today 0015 | Intake: | Green |

**Active Tracking Records and Action Statements**

**Equipment/Reason**

| LCO | Action | Date | Time in LCO | Action Requirement | Time Left |
|---|---|---|---|---|---|
| **"A" EDG OOS for Planned Maintenance** | | | | | |
| 3.8.1.1 | b.1, b.2, b.3, b.4, b.5 | yesterday | 18 hours | SR 4.8.1.1.1.a due in 3 hours | 13 days |
| 7.4.1 | a.1, a.3 | yesterday | 18 hours | | 13 days |
| | | | | | |

**OD Compensatory Actions / Temp Logs**

| Open Date | Class Reason | Reason | Watch Position |
|---|---|---|---|
| | | | |

**PLANT SYSTEMS APC**

| System | Notes |
|---|---|
| EDG | 'A' EDG is out of service for planned maintenance. |
| | |

**CROSS UNIT SYSTEM STATUS**

| | |
|---|---|
| U3 Power to 24E | 34A aligned to 24E |

**SURVEILLANCES / EVOLUTIONS IN PROGRESS**

| | |
|---|---|
| | Steady State Operation |

**REACTIVITY BRIEFING (SEE REACTIVITY THUMBRULES / SPREAD SHEET FOR ADDITIONAL INFO)**

| | | |
|---|---|---|
| Current Rod Height | 218 | |
| Xenon Trend | Stable | |
| Current Boron | 1035 | |
| Boron Pot Setting / Blend Ratio | 2.95 / 11.8 gpm | |
| Plant Risk | LERF 1.06 ACT: 1 year | CDF 4.15 ACT: 46.9 days |

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| | | |
|---|---|---|
| SITE: | Millstone Power Station | |
| PROGRAM: | Unit 3 ILT | |
| COURSE: | N/A | |
| EXAM TITLE: | Faulted, Ruptured Steam Generator | EXAM #: 2K17 NRC-02 |
| Total Time | 90 Minutes | |

| | | | |
|---|---|---|---|
| Prepared by: | Dave Minnich | | 8/16/17 |
| | Printed Name | Developer | Date |
| Reviewed by: | Robert Royce | | 8/17/17 |
| | Printed Name | Technical Reviewer | Date |
| Reviewed by: | ERIC BRODEUR | | 8/18/17 |
| | Printed Name | Technical Reviewer | Date |
| Approved by: | M.J. Coré | | 8/18/17 |
| | Printed Name | Facility Reviewer | Date |

SEG# 2K17 NRC-02 Rev ; 0

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Original issue. | 0 |
| | | |
| | | |
| | | |
| | | |

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## TABLE OF CONTENTS

### SECTIONS LISTED IN ORDER

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# SECTION 3

# EXAM OVERVIEW

Title: **Faulted, Ruptured Steam Generator**

1. The crew will take the shift with reactor power at 74%. The plant is being returned to service following a refueling outage. The crew is to stabilize reactor power at 74% while Reactor Engineering performs EN 31015 "Power Ascension Testing of Millstone Unit 3". The 'C' CCP heat exchanger is out of service for tube leak repair. The 'D' SWP is out of service for corrective maintenance.

   Event 1: 'A' steam generator level transmitter (3FWS-LT551) fails low. The BOP will perform immediate actions of AOP 3581, *Immediate Actions*, which include taking manual control the 'A' Feed Reg Valve and matching feed flow to steam flow to stop the level increase. The US will enter AOP 3581, confirm immediate actions are complete and transition to AOP 3571, *Instrument Failure Response,* to address the failed channel. The BOP will restore narrow range level to 50% and defeat the failed level channel. The SRO will direct I&C to trip bistables. The SRO refers to Technical Specification 3.3.1 and logs into Action 6 (FU #13). The SRO refers to Technical Specification 3.3.2 and logs into Actions 20 and 21 (FU #5.b, #6.c). The SRO refers to Technical Specifications 3.3.3.5 and 3.3.3.6, and should verify they do not apply.

   Event 2: 'B' Service Water Pump trip on overcurrent. The other Train 'B' Service Water Pump ('D') is out of service, requiring the crew to enter AOP 3560, *Loss of Service Water*, to address the lost pump, and then AOP 3561, *Loss of RPCCW*, to address the loss of service water to the 'B' train of RPCCW. Crew actions include starting a second SWP in the non-affected train, reestablishing SW cooling to TPCCW and cross-connecting the RPCCW CTMT headers to ensure cooling to the RCPs. The SRO refers to Technical Specification 3.7.3, 3.7.4 and 3.8.1.1, all of which have 72 hour allowed outage time.

   Event 3: 'C' SG Tube Leak, and subsequent procedurally required rapid downpower. A tube leak will develop on the 'C' SG. First indication will be the N2 Monitoring System going into alarm and increasing radiation levels on radiation monitor 3ARC-RE21. The crew will mitigate the tube leak using AOP 3576, *SG Tube Leak*. The severity of the leak will be such that a Tech Spec power reduction is required to be in MODE 3 within 6 hours. Plant management will direct the crew to conduct a downpower at 3%/minute. The crew will enter AOP 3575, *Rapid Downpower*, and perform the downpower. The SRO refers to Technical Specification 3.4.6.2 for Operational Leakage.

   Event 4: 'C' main steamline break in CTMT. A major steam line break will occur in CTMT ('C' SG). The break will be severe enough to require a Reactor Trip and Safety Injection. The crew should diagnose the presence of the steam break and the SRO should direct a reactor trip and main steamline isolation.

   Event 5: Automatic and MB7 manual reactor trip switch fail. The steamline break will be severe enough to require a Reactor Trip and Safety Injection, and a Reactor Trip 'First Out' will be received prior to the crew taking action. Automatic and the MB7 manual reactor trip switch are failed requiring the RO to manually trip the reactor from MB4 **[Critical Task]**. The crew will carry out the actions of E-0, *Reactor Trip Or Safety Injection* and transition to E-2, *Faulted Steam Generator Isolation*, to isolate the faulted SG **[Critical Task]**. After isolation the 'C' steam generator will continue to blow down into CTMT and completely depressurize. CTMT will go 'ADVERSE' and CTMT pressure will ultimately reach the CDA setpoint (22.7 psia).

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Event 6: Multiple HPSI components fail to automatically actuate. The RO should manually start the SI pumps. In addition, 3SIH*MV8801A and B (Charging Cold Leg Injection valves) will need to be opened.

Event 7: CTMT Isolation Phase 'A' fails to automatically actuate. Containment Isolation Phase 'A' fails to automatically actuate, requiring the RO to manually actuate CI'A' from the main board.

Event 8: Hot, dry 'C' SG results in a SGTR. When the "C" SG tubes become hot and dry, a SG Tube Rupture will occur. The 'C' SG will be faulted and ruptured. The crew will ultimately identify wide range levels and/or pressure going up in 'C' SG and transition to E-3, *Steam Generator Tube Rupture*, from E-2. Once in E-3, the crew will determine that ruptured SG pressure is not sufficient to support the cooldown and depressurization method specified in E-3, and transition to ECA-3.1, *SGTR With Loss of Reactor Coolant - Subcooled Recovery Desired.* The crew will initiate an RCS cooldown as specified in ECA-3.1. Once the crew has shown that the cooldown rate is controlled, the session will end.

2. The SRO candidate (US) should classify this event as an **ALERT- Charlie One**, Barrier Failure, BA1, or an **ALERT- Charlie One**, Equipment Failure, EA1.

3. Duration of Exam: 90 minutes

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# SECTION 4

# EXAM GUIDE

All Control Room Conduct, Operations and Communications shall be in accordance with OP-AA-100, Conduct of Operations.

"Review the Simulator Operating Limits (design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded." (NSEM 6.06)

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| INPUT SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| **RESET SIMULATOR TO IC–160** | | | | | | |
| Either **INPUT** or **Load** Schedule **NRC–02.sch** AND Event file **NRC-02.evt,** THEN **VERIFY** the following functions: | | | | | | |
| ID | Description | Event Trigger | Delay Time | Ramp Time | Delete Time | Severity Or Value |
| **MALFUNCTIONS** | | | | | | |
| RP09B | Manual Reactor Trip failure (MB7) | initial | | | | |
| RP10A | Auto Reactor Trip failure Train A | initial | | | | |
| RP10B | Auto Reactor Trip failure Train B | initial | | | | |
| RP11K | CTMT Isolation Phase 'A' fails to automatically actuate. | initial | | | | |
| RP11E | Multiple HPSI components fail to re-align | initial | | | | |
| | | | | | | |
| RX12M | SG Level LT551 Fail | 1 | | 30 sec | | 0 |
| SW01B | 'B' SWP trip on overcurrent | 3 | | | | |
| SG03C | 'C' SG Tube Leak | 6 | | 60 sec | | 410 gpd |
| MS01C | Steamline break in CTMT from the 'C' SG | 9 | | 60 sec | | 1.5E6 lbm/hr |
| SG01C | 'C' SG Tube Rupture | 10 | | | | 1000 gpm |
| | | | | | | |
| **REMOTE FUNCTIONS** | | | | | | |
| RXR106 | Protection set 1 door | 2 | | | | open |
| RXR131 | SG1 HI-HI Level Trip | 2 | 60s | | | Trip |

SEG# 2K17 NRC-02 Rev ; 0

| INPUT SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| **RESET SIMULATOR TO IC–160** | | | | | | |
| Either **INPUT** or **Load** Schedule **NRC–02.sch** AND Event file **NRC-02.evt,** THEN **VERIFY** the following functions: | | | | | | |
| ID | Description | Event Trigger | Delay Time | Ramp Time | Delete Time | Severity Or Value |
| RXR78 | SG1 LO-LO Level Trip | 2 | 120s | | | Trip |
| RXR106 | Protection set 1 door | 2 | 130s | | | Closed |
| TPR07 | H2 panel | 4 | | | | ACK |
| CVR95 | Seals to VCT top | 5 | | | | VCT |
| MSR01 | Start Aux Boiler | 7 | 5 min | 0 | | START |
| FWR33 | Close 3CNS-V11 | 8 | 5 min | 0 | | CLOSE |
| FWR62 | Close 3CNS-V9 | 8 | 5 min | 0 | | CLOSE |
| | | | | | | |
| **OVERRIDES** | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

<table>
<tr><th colspan="3">SCENARIO TIME LINE</th></tr>
<tr><th>BOOTH INSTRUCTOR</th><th>FLOOR INSTRUCTOR</th><th>STUDENTS</th></tr>
<tr><td colspan="2">❑ COMPLETE Simulator Setup and Readiness Checklist.<br>❑ SELECT appropriate IC: IC-160, 77% power, MOL.<br>❑ LOAD and RUN applicable Schedule, NRC-02.sch.<br>❑ LOAD event file NRC-02.evt.<br>❑ As necessary, VERIFY the following Initial Malfunctions / I/Os / Remote Functions, as specified on previous 'Input Summary' page.<br>❑ Place the SG pressure/cooldown computer points (CPCDSG(A)(B)(C)(D)HR) 'in scan'.<br>❑ When the simulator is ready, PLACE to Run and VERIFY the simulator reflects the following Initial Conditions for the scenario and is stable:<br>▪ 'A' CHS Pump running<br>▪ 'B' SWP in lead.<br>❑ As necessary, REMOVE the following Equipment from service and tag accordingly:<br>▪ The 'C' CCP heat exchanger is out of service for tube leak repair. PLACE YCT on 'C' CCP pump control switches (both trains)<br>▪ The 'D' SWP is out of service for planned maintenance. PLACE YCT on 'D' SWP pump control switch.<br>❑</td><td>N/A</td></tr>
<tr><td>❑ CONDUCT briefing with evaluators.</td><td colspan="2">PRE-SCENARIO:<br>❑ BRIEF the crew initial plant conditions and provide a shift turnover.<br>❑ <u>IF</u> this is the first simulator scenario of the week, REVIEW the Plant/Simulator Differences List and Simulator Training Objectives with the crew.<br>❑ As necessary, REVIEW any scenario specific differences and any planned simulator freeze points.</td></tr>
<tr><td></td><td></td><td>(All) Walk down control boards and conduct shift briefing.</td></tr>
<tr><td colspan="3"></td></tr>
</table>

| | | |
|---|---|---|
| ************ EVENT 1 ************ | | |
| **Event 1**<br><br>**T = Examiner Cue**<br>**Trigger 1**<br><br>RX12M sev = 0.0% | **'A' SG controlling level channel (3FWS-LT551) fails low.**<br><br>Notes on Event 1:<br>(1) This failure will cause the 'A' feed reg valve to modulate open; SG level will increase.<br>(2) The BOP needs to take manual control of the 'A' Feed Reg Valve controller (3FWS-FK510) and match feed flow to steam flow to stop the level increase. | |
| | The BOP should recognize the **Abnormal Steam Generator Level** and perform the immediate actions of AOP 3581, Attachment B, from memory: | |
| | **AOP 3581, *Immediate Actions* Rev 001)** | |
| | No | **BOP:**<br>(B.1)* **CHECK Steam Generator Narrow Range Level - STABLE AT 50%** |

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| | | **BOP:**<br>(B.1* RNO) <u>**IF**</u> SG Level is changing in an uncontrolled manner, <u>**THEN**</u> **PERFORM** the following:<br><br>(a.) As necessary, **SHIFT** affected SG Feedwater Flow Control to **MAN** and **THROTTLE** affected SG Feedwater Flow Control Valve to maintain SG narrow range level stable between 45% and 55%:<br><br>• 3FWS-FK510 for SG A |
| | It should not be necessary to take manual control of Master Feed Pump Speed Controller. | **BOP:**<br>(b.) As necessary, **PERFORM** any of the following to control Feed Pump differential pressure in normal operating band (program: 40-175 psid):<br><br>• **PLACE** FW PP MASTER SPEED CNTL (3FWS-SK509A) in manual **AND ADJUST** to maintain D/P. |
| | | **US:**<br>(B.2) **Check Main Feedwater Pump Status:**<br><br>(a.) **CHECK** Reactor Power - GREATER THAN 50% |
| | Yes | **BOP:**<br>(b.) **CHECK** two Main Feedwater Pumps:<br><br>• RUNNING<br><u>**AND**</u><br>• OPERATING PROPERLY |

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| | Yes | **BOP:**<br>(c.) **CHECK ALL** Running Feedwater Pumps- OPERATING PROPERLY |
| | | **NOTE:** If suction pressure is LESS THAN 250 psig, following a 30 second time delay, the operating feed pump trips. |
| | Yes | **BOP:**<br>(B.3) **Check Main Feedwater Pump Suction Pressure:**<br>• **CHECK** the Following Annunciators- NOT LIT<br>• MOTOR FW PP SUCTION PRESSURE LO (MB5A 3-2)<br>• TDFW PP A SUCTION PRESSURE LO (MB5A 3-6)<br>• TDFW PP B SUCTION PRESSURE LO (MB5C 3-4)<br>**AND**<br>• Suction Pressure- STABLE OR INCREASING |
| | No | **BOP:**<br>(B.4) **CHECK COND DEMIN DP HI (MB6A 2-7) - LIT** |
| | | **US:**<br>(B.4 RNO) **PROCEED TO** step B.6. |

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| | | **BOP:**<br>(B.6) **CHECK** Initiating Event - ANY LISTED INSTRUMENT FAILURE<br><br>• SG Narrow Range Level |
| | | **US:**<br>(B.7) **GO TO AOP 3571, Instrument Failure Response** |
| | | |
| | **AOP 3571 (Rev 013)**<br>**Instrument Failure Response** | |
| | **The US should enter AOP 3571** and read the Note and Caution to crew. | **NOTE:** It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, I&C personnel are **NOT** able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations personnel may trip the bistables, using the guidance provided within this procedure.<br><br>**CAUTION:** The rod selector switch shall **NOT** be left in AUTO while diagnosing a related instrument failure, unless the reason for rod movement is a turbine runback. |
| | The US should proceed to **Attachment N** for a Narrow Range SG Level Channel Failure.<br>The US should assign an appropriate level band to the BOP. | **US:**<br>**1. PROCEED TO the Appropriate Attachment, AND PERFORM Corrective Actions** |
| | **AOP 3571 Attachment N** | |
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| | Yes, 3FWS-LT551 is the controlling level channel for 'A' SG. | **BOP:**<br>(N.1) **CHECK** failed NR level channel is selected as input to SG level control |
| | "A" FRV controller should already be in manual. | **BOP:**<br>(N.2) **CHECK Affected, In-Service, Steam Generator Feed Controller in – MAN**<br>• SG Feed Reg Valve Controller |
| | BOP should restore level to 50% | **BOP:**<br>(N.3) **THROTTLE** affected, in-service, SG Feed Flow Valve **<u>OR</u>** Feed Bypass Level Control Valve to maintain SG Narrow Range level stable between 45% and 55% (target 50%) |
| | When directed, the BOP should select channel 2 on the level selector for 'A' SG. (Switch ID 3FWS-LS519C)<br>'SG A LEVEL LO' and 'SG A LEVEL DEVIATION' annunciators will clear. | **BOP:**<br>(N.4) **DEFEAT** the failed channel input by selecting the alternate channel on the Level Selector |
| | | **BOP:**<br>(N.5) **CHECK** affected SG NR level - STABLE AT 50% |
| | | **BOP:**<br>(N.6) **PLACE** affected in-service SG Feed Flow Controller **OR** Feed Bypass Level Controller in – AUTO<br>• STM GEN 1 FW FLOW CONTROL (3FWS-FK510) |

<table>
<tr>
<td></td>
<td></td>
<td>US:<br>(N.7) Trip the associated Reactor Protection System bistable(s)<br><br>(a.) Using Table N.1, PLACE a check mark in the box above the channel required to be tripped</td>
</tr>
<tr>
<td>T= Requested to Trip bistables<br><br>Trigger 2</td>
<td>This will open Protection Set I door channel 1 and trip the 2 associated B/Ss for SG Level HI-HI and Level LO-LO. Then the trigger will close the protection set door.</td>
<td>
<table>
<tr><td colspan="4">☐ Trip this channel</td></tr>
<tr><td colspan="4">LT-551 Protection Set I (Red)</td></tr>
<tr><td>Parameter</td><td>Designator</td><td>Location</td><td>Switch</td></tr>
<tr><td>Master Test Card</td><td>UY/761U</td><td>C1-771</td><td>SW-1</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>Parameter</td><td>Designator</td><td>Location</td><td>Bistable</td></tr>
<tr><td>SG A LEVEL HI-HI [P-14]</td><td>LS/551B</td><td>C1-736</td><td>BS-2</td></tr>
<tr><td>STM GEN A LEVEL LO LO</td><td>LS/551A</td><td>C1-736</td><td>BS-1</td></tr>
</table>
</td>
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<tr>
<td></td>
<td>US should log into TS 3.3.1, FU 13, action 6A, 72 hrs to trip bistables.<br><br>TS 3.3.2, FU 5.b, action 20A, 72 hrs to trip bistables. (3.3.2 FU 5.b / action 21 is for < minimum channels, which is not the case)<br><br>TS 3.3.2, FU 6.c, action 20A, 72 hrs to trip bistables.<br>Channel operable requirements for 3.3.3.5 and 3.3.3.6 are met. However the US should verify that they don't apply.</td>
<td>US:<br>(b.) REFER to the following Tech Specs for required actions<br>• TS 3.3.1, Reactor Trip System Instrumentation<br>• TS 3.3.2, Engineered Safety Features Actuation System Instrumentation<br>• TS 3.3.3.5, Remote Shutdown Instrumentation<br>• TS 3.3.3.6, Accident Monitoring Instrumentation</td>
</tr>
</table>

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| | The RO should do a lamp check to ensure all bistable lights are functional, then verify no coincidence would be met when bistables are tripped. | **RO:**<br>(c.) **CHECK** the existing bistable status to ensure a Reactor trip will **<u>NOT</u>** occur when the failed channel is tripped |
| | Bistable status lights are lit and Channel indication is <u>not</u> normal. The US should proceed to next step. | **US:**<br>(d.) **CHECK BOTH of the following conditions - EXIST:**<br>• Affected Channel Bistable status lights (MB2D **<u>AND</u>** MB4G) - LIT<br>**<u>AND</u>**<br>• Affected channel indication - **<u>NOT</u>** NORMAL |
| | Annunciator "SG LEVEL HI HI" comes in during the tripping of B/Ss. | **US:**<br>(e.) **REQUEST** I&C use Table N.1 and ATTACHMENT S to perform the following:<br>1. **PLACE** the selected Master Test switch in TEST<br>2. **PLACE** the selected Bistable switches in TEST |
| | | **BOP:**<br>(f.) **CHECK** the appropriate bistable status light(s) - LIT |

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| | No, only one. | **US:**<br>(N.8) **CHECK** any TWO of the following NR level channels, which serve as inputs to AMSAC, are failed:<br>• 3FWS*LT551<br>**OR**<br>• 3FWS*LT552<br>**OR**<br>• 3FWS*LT538<br>**OR**<br>• 3FWS*LT547 |
| | No. | **BOP:**<br>(N.11) **CHECK** EITHER of the following STEAM GEN LVL indicators failed:<br>• 2 - NR, 3FWS*LI529A<br>• 4 - NR, 3FWS*LI548A |
| | | **US:**<br>(N.11 RNO) **PROCEED TO** step N.13. |
| | | **US:**<br>**(N.13) REQUEST** I&C perform corrective maintenance on failed instrument |
| | | |
| | *********** **EVENT 2** *********** | |
| **Event 2**<br><br>**T = Examiner Cue**<br>**Insert Trigger 3**<br><br>SW01B | **'B' Service Water Pump Trip on Overcurrent** | |

| | **AOP 3560 (Rev 010),**<br>***Loss Of Service Water*** | |
|---|---|---|
| | The NOTE does not apply. | **US:**<br>**NOTE:** Alarm Response Procedures provide guidance to initially address a service water piping rupture and, when appropriate, provide a transition to this procedure. |
| **When dispatched as PEO, wait 3 minutes and report Overcurrent trip is in for 3SWP*P1B.** | Yes | **BOP:**<br>(1.) **CHECK Busses 34C and 34D - BOTH ENERGIZED** |
| | Yes, both 'A' train SWPs are running. | **RO:**<br>(2.) **CHECK Status Of Service Water System**<br><br>(a.) **CHECK** at least **One** SW pump - RUNNING |
| | No, there is no 'B' train SWP running and one cannot be started. | **RO:**<br>(b.) **CHECK** at least **One** SW pump in each Train - RUNNING |
| | | **US:**<br>(b. RNO) **PROCEED TO** step 2.d. |
| | No | **RO:**<br>(d.) **CHECK** affected Train SW pumps - IN PULL-TO-LOCK DUE TO A NON-ISOLABLE SW LEAK |

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| | | **RO/US:**<br>(d.) **PERFORM** the following:<br><br>(1.) **START** a SW pump in the affected Train.<br><br>(a.) **IF** ONE SW pump **CANNOT** be started in the affected Train, **THEN PROCEED TO** step 2.e. |
| | Yes, 3SWP*MOV71B should have closed on low SW pressure. | **RO:**<br>(e.) **CHECK** service water supply valve to TPCCW from affected train (3SWP*MOV71A or 3SWP*MOV71B) – CLOSED |
| | RO should start the 'A' SWP. | **RO:**<br>(f.) **START** the second SW pump in the non-affected Train |
| | No, 3SWP*MOV71A automatically closed on low SW discharge pressure. | **RO:**<br>(g.) **CHECK** service water supply valve to TPCCW from the operating SW train (3SWP*MOV71A or 3SWP*MOV71B) – OPEN |
| **T = 3 minutes after being dispatched and SW to TPCCW established:**<br>**Trigger 4**<br>**To acknowledge/reset panel and report "Outlet Temp High and "Generator Protection Circuit Energized" were lit but have cleared on reset. Temperatures returning to normal.** | Important to avoid runback on stator coolant temperature. Timely action will prevent the runback.<br>When directed, the RO opens 3SWP*MOV71A | **RO:**<br>(g. RNO) **OPEN** valve. |

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| | The US should transition to **AOP 3561, Attachment B;** *Response To Loss Of SW To RPCCW* | **US:**<br>(h.) **<u>GO</u> <u>TO</u>** AOP 3561, Loss of Reactor Plant Component Cooling Water, Attachment B **<u>AND</u> OPEN** the Foldout Page |
| | **AOP 3561 (Rev 018)**<br>**Loss Of Reactor Plant Component Cooling Water, Att. B** | |
| | Yes, NO Service Water Pump can be started on the affected train. | **US:**<br>(B.1) **Verify Service Water Status**<br>(a.) **CHECK** one of the following conditions – MET<br>• **NO** Service Water Pump can be started on the affected train<br>**<u>OR</u>**<br>• All Service Water Pumps on the affected train in PULL-TO-LOCK due to a non-isolable Service Water leak<br>**<u>OR</u>**<br>• Service Water Inlet Isolation Valve to the affected RPCCW Heat Exchanger closed due to a downstream Service Water Pipe rupture<br>• 3SWP*MOV50A<br>**<u>OR</u>**<br>• 3SWP*MOV50B |
| | Containment Supply and Return Header Isolation Valves will be open. | **RO:**<br>(B.2) **Cross-Connect RPCCW Containment Headers**<br>(a.) **VERIFY** the RPCCW Containment Supply and Return Header Isolation Valves in the non-affected train – OPEN |

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| | RO should obtain permission from the US to use two-handed operation. | **RO:**<br>(b.) Simultaneously **OPEN** the RPCCW Containment Header Cross-Connect Valves:<br>• 3CCP*AOV179A<br>• 3CCP*AOV179B<br>• 3CCP*AOV180A<br>• 3CCP*AOV180B |
| | | **RO:**<br>(c.) **CLOSE** the RPCCW Containment Supply and Return Header Isolation Valves in the affected train |
| | | **BOP:**<br>(B.3) **Isolate Auxiliary Steam To Auxiliary Building**<br>(a.) **CLOSE** Auxiliary Steam Isolation Valves to the Auxiliary Building<br>• 3ASS*AOV102A<br>• 3ASS*AOV102B |
| | | **NOTE:** A functioning relief valve on the CVC Controlled Bleed Off (CBO) line is adequate for maintaining CVC Controlled Bleed Off (CBO) flow. |
| | The crew should consider placing the 'B' CHS and 'A' SI pumps in PTL. | **RO:**<br>(B.4) **Remove Affected RPCCW Train From Service**<br>(a.) **CHECK** the affected RPCCW train - TRAIN B |

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| **T = 3 minutes after being dispatched:** **Trigger 5 (remote CVR95)** Report back to the CR, 'seal return has been shifted to the VCT.' | This shifts seal return to the VCT.<br><br>OP 3304A, section 4.19 will be used. | **RO:**<br>(b.) Using OP 3304A, Charging and Letdown, **PERFORM** Shifting Seal Return Flowpaths to shift Seal Return to the top of the VCT |
| | | **RO:**<br>(c.) **THROTTLE** open the Letdown Heat Exchanger RPCCW Flow Control Valve to stabilize VCT temperature |
| | | **RO:**<br>(d.) **CHECK** VCT temperature:<br>• STABLE<br>**OR**<br>• DECREASING |
| | | **RO:**<br>(e.) **CLOSE** Train B RPCCW Heat Exchanger SW Inlet Isolation Valve (3SWP*MOV50B) |
| | | **RO:**<br>(f.) **STOP** the affected train RPCCW pump<br>**AND**<br>**PLACE** in PULL-TO-LOCK |
| **CCP31 is aligned to A train if requested.** | | **PEO:**<br>(g.) Locally **CHECK** RPCCW Process Radiation Monitor (3CCP-RE31) – ALIGNED TO NON-AFFECTED TRAIN |

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| | The RO will use OP 3313E, section 4.2, to start both CTMT vacuum pumps. | **RO:**<br>(B.5) **Maintain Containment Pressure**<br><br>(a.) Using OP 3313E, Containment Vacuum, **MAINTAIN** normal operating Containment pressure - BETWEEN 13.7 psia and 13.9 psia |
| | OP 3313E, *Containment Vacuum*<br>Section 4.2 | |
| | AOP 3561 picks up on page | **RO:**<br>(4.2.1) IF using 3CVS-P1A, containment vacuum pump A, PERFORM the following:<br><br>(a.) OPEN 3CVS*CTV20A, "CTMT VAC PP" (MB1). |
| | | (b.) OPEN 3CVS*CTV21A, "CTMT VAC PP" (MB1). |
| | | (c.) START 3CVS-P1A, "CTMT VAC PP'S" "1A" (MB2). |
| | | **RO:**<br>(4.2.2) IF using 3CVS-P1B, containment vacuum pump A, PERFORM the following:<br><br>(a.) OPEN 3CVS*CTV20B, "CTMT VAC PP" (MB1). |
| | | (b.) OPEN 3CVS*CTV21B, "CTMT VAC PP" (MB1). |
| | | (c.) START 3CVS-P1B, "CTMT VAC PP'S" "1B" (MB2). |

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| | | **RO:**<br>(4.2.1) IF using 3CVS-P1A, containment vacuum pump A, PERFORM the following:<br><br>(a.) OPEN 3CVS*CTV20A, "CTMT VAC PP" (MB1). |
| | **AOP 3561** (continued) | |
| | | **RO:**<br>(B.6) **Check Charging Pump Cooling Alignment**<br><br>(a.) **VERIFY** Charging Pump Cooling Suction and Discharge Cross-tie Valves – OPEN<br><br>• 3CCE*AOV26A<br>• 3CCE*AOV26B<br>• 3CCE*AOV30A<br>• 3CCE*AOV30B |
| | | **RO:**<br>(B.7) **Verify Spent Fuel Pool Cooling Alignment**<br><br>(a.) Using the following RPCCW indications, **CHECK** RPCCW flow indicated to the in-service Spent Fuel Pool Cooling Heat Exchanger<br><br>• Safety Header flow<br>**<u>AND</u>**<br>• RHR HX RPCCW flow |

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| | | **BOP:**<br>(B.8) **Verify Service Water Flow To The Operating Control Building Chiller Heat Exchanger**<br><br>• For Chiller A (HVK*CHL1A), **CHECK** annunciator CONTROL BLDG CHLR CNDSR A SW FLOW LO (VP1A 3-3) - **NOT** LIT<br><br>• For Chiller B (HVK*CHL1B), **CHECK** annunciator CONTROL BLDG CHLR CNDSR B SW FLOW LO (VP1C 3-3) - **NOT** LIT |
| | NOTE does not apply. | **NOTE:** During a loss of Shutdown Cooling event, the loss of forced flow through the reactor vessel prevents an accurate determination of RCS temperature. Classifications for EA2 and EU1 will need to be based on times calculated by OU-M3-201. The Shutdown Safety Assessment Checklist includes the time for the RCS to increase 10°F and the time for the RCS to reach 200°F from the current plant conditions. |

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| | T.S 3.7.3; 72 hrs<br>T.S. 3.7.4; 72 hrs<br>T.S. 3.8.1.1; 72 hrs | **US:**<br>(B.9) **Check Plant Conditions Stabilized**<br>(a.) **REFER** to the following Technical Specifications for any additional required actions:<br>• TS 3.7.3, Reactor Plant Component Cooling Water System<br>• TS 3.7.4, Service Water System<br>• TS 3.8.1.1, AC Sources - Operating<br>• TS 3.8.1.2, AC Sources - Shutdown<br>• TRM 3.7.4, Service Water System<br>• TRM 3.7.4, Fire Related Safe Shutdown Components |
| | | **US:**<br>(b.) Using MP-26-EPI-FAP06, Classification and PARs, **EVALUATE** the incident classification |
| | | **US:**<br>(B.10) **CONSULT With OMOC And Determine Need To Commence A Plant Shutdown** |
| **T = Tech Specs addressed and Examiner's cue, move on to event 3** | | |
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| | *********** **EVENT 3** *********** | |
| | **"C' SG Tube Leak, and subsequent procedurally required rapid downpower.** | |

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| **Event 3**<br><br>**T = Examiner Cue**<br>**Insert Trigger 6**<br><br>SG03C | This will insert a 'C' SG tube leak at 460 gpd.<br>'N-16 ALERT' and 'N-16 HI' will alarm.<br>ARC-21 will show an increasing rad level. | |
| | **AOP 3576 (Rev 008), *Steam Generator Tube Leak*** | |
| | | **CAUTION:** With TD AFW Pump feeding SG(s): Full travel stroking of any AFW flow control valve should occur one at a time, at a rate GREATER THAN 15 seconds. |
| | | **NOTE:** Foldout page must be open. |
| | PZR level will not be decreasing | **RO:**<br>(1) **Check PZR Level**<br><br>(a.) **CHECK** PZR Level – DECREASING |
| | | **US:**<br>(a. RNO) **PROCEED TO** step 2. |
| | | **NOTE:** If the N-16 radiation monitors are **NOT** available, then Chemistry sampling and leak rate determination should be completed as quickly as possible, as there are EPRI requirements to reduce power and shut down if the leak rate is 75 gpd or more. |

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| | US should call Chemistry | **US:**<br>(2) **Notify Chemistry**<br><br>(a.) **REQUEST** Chemistry perform SP 3861, Primary to Secondary Leak Rate Determination, to:<br><br>• Determine the presence of primary to secondary leakage<br><br>• Determine the leak rate<br><br>• Identify the leaking SG |
| | N16 Monitoring System is in service | **RO:**<br>(3) **Check Primary To Secondary Leakage**<br><br>(a.) **CHECK** N16 monitors in service **AND** trend history **OR** alarm status - **NOT** NORMAL |
| | | **US:**<br>(b.) **PROCEED TO** step 4 |
| | | **RO/BOP:**<br>(4) **Perform Monitoring Of N16 Monitor Trends**<br><br>(a.) **IF** N16 monitors are in service, **THEN MONITOR** trend history **AND** leak rate at least once every 15 minutes |

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| | The crew will satisfy this step by meeting multiple bullets (likely all satisfied except Chemistry grab sample is not completed yet). | **RO/BOP:**<br>(5) **Check SG Blowdown Status**<br>(a.) **CHECK** if Blowdown should be isolated<br><br>• Steam Generator Blowdown radiation monitor - IN ALARM<br>**OR**<br>• Chemistry grab sample indicates Primary to Secondary leakage - GREATER THAN OR EQUAL TO 75 gpd<br>**OR**<br>• Annunciator N-16 HIGH (MB2B 3-6A) – LIT |
| | | **RO:**<br>(b.) **CHECK** SG Blowdown Isolation Valves - CLOSED:<br><br>• 3BDG-CTV22A<br>• 3BDG-CTV22B<br>• 3BDG-CTV22C<br>• 3BDG-CTV22D |
| | Blowdown will need to be isolated. | **RO:**<br>(b. RNO) **CLOSE** valves. |
| | | **US:**<br>(c.) **PROCEED TO** step 6. |
| | Yes | **BOP:**<br>(6) **Limit Effects Of Secondary Contamination**<br><br>(a.) **CHECK** Auxiliary Steam -SUPPLIED FROM MAIN STEAM |

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| **T = When Requested**<br><br>**INSERT TRIGGER 7** | This will start the Aux Boilers | (b.) Using OP 3331A, Auxiliary Boiler, Steam and Condensate, **PERFORM** the following:<br><br>1. Startup of Auxiliary Boiler A(B)<br>2. Shift Auxiliary Steam from Main Steam to Auxiliary Boiler System |
| **T = When Requested**<br><br>**INSERT TRIGGER 8** | This will locally close 3CNS-V9, V11 | (c.) Locally **CLOSE** Condensate Recirculation to Condensate Surge Tank Isolation Valves:<br><br>• Cond Drawoff VV Inlet Isol, (3CNS-V9)<br>• Cond Drawoff VV Bypass, (3CNS-V11) |
| | | **US:**<br>(d.) **REQUEST** HP determine if personnel should be evacuated from affected areas:<br><br>• North end of Turbine Bldg<br>• Secondary Sample Sink<br>• Condensate Polishing Enclosure (CPE)<br>• Main Steam Valve Building |
| | Based upon above HP request, the US would make necessary evacuations. However, the HP surveys will not be completed yet. | **US:**<br>(e.) **EVACUATE** personnel from affected areas as determined in step 6.d |
| | **Examiner:**<br>**Inform the US that the SM will Refer to C OP 200.11.** | **US:**<br>(f.) Using C OP 200.11, Operation of a Cross Contaminated System, **PERFORM** any required actions |

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| | Yes, N-16 HIGH will be LIT | US:<br>(7) **Check If Unit Shutdown Should Be Initiated**<br><br>(a.) **CHECK** either of the following conditions exist:<br><br>• Chemistry grab sample indicates primary to secondary leakage in any SG - GREATER THAN OR EQUAL TO 75 gpd<br>**OR**<br>• Annunciator N-16 HIGH (MB2B 3-6A) – LIT |
| | **Examiner:**<br>**Inform the US that the SM will evaluate the event for classification** | **US:**<br>(b.) Using MP-26-EPI-FAP06-003, Unit 3 Emergency Action Levels (Barrier Failure), **EVALUATE** the event for classification |
| | | **US:**<br>(c.) **CHECK** plant status - MODE 1 **OR** 2 |
| | A plant shutdown will be required based on N-16 HIGH in alarm.<br><br>The US should proceed to the 'Perform Unit Shutdown' step 9. | **US:**<br>(d.) **PROCEED TO** step 9. |
| | | **NOTE:** If a unit shutdown is initiated based on a N-16 MB annunciator HIGH condition and subsequent Chemistry calculations indicate actual leakage does **NOT** meet a shutdown criterion, then the shutdown may be suspended. |
| | | **NOTE:** The rate of leakage increase limit does **NOT** apply to initial leak rate increase followed by stable or decreasing leak rates. |

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| | | **NOTE:** Plant shutdown may be accomplished using AOP 3575, Rapid Downpower, or appropriate General Operating Procedures as determined necessary. |
| **T = brief for plant shutdown occurs Report as chemistry "C" S/G sample results indicate the presence of primary to secondary leakage.** | | **US:**<br>(9) **Perform Unit Shutdown**<br>(a.) **CHECK** leakage increased in any SG by - GREATER THAN OR EQUAL TO 15 gpd IN A 30 min PERIOD AFTER THE INITIAL SPIKE |
| | | **US:**<br>(a. RNO) **PROCEED TO** step 9.c. |
| | Rate of Increase limit NOT met, but leakage > 150 gpd | **RO or BOP:**<br>(c.) **CHECK** N16 SG Leak Detection Status (PPC) HIGH RATE (75 GPD & 15 GPD RISE IN 30 MIN) - IN ALARM |
| | | **US:**<br>(c. RNO) **PROCEED TO** step 9.e. |
| | N16 Monitors are AVAILABLE | **RO:**<br>(e.) **CHECK** N16 Monitors – **NOT** AVAILABLE |
| | | **US:**<br>(e.) **PROCEED TO** step 9.g. |
| | | **RO:**<br>(g.) **CHECK** Charging Pumps - TWO REQUIRED TO MAINTAIN PZR LEVEL |
| | Yes | **US:**<br>(g. RNO) **PROCEED TO** step 9.m. |

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| | Tech Spec:<br>Ensure The US enters the **LCO for 3.4.6.2, OPERATIONAL LEAKAGE** for primary to secondary leakage (150 gpd, 6 hour AOT to hot standby). | **RO or BOP:**<br>(m.) **CHECK** SG leakage:<br>• Chemistry grab sample indicates any SG leakage – GREATER THAN OR EQUAL TO 150 gpd<br>**OR**<br>• N16 SG Leak Detection Status (PPC) any SG HIGH HIGH (GREATER THAN 150 GPD) - IN ALARM |
| **T = Calls the OMOC**<br>**Direct as OMOC to commence a rapid load reduction in accordance with AOP 3575, *Rapid Downpower,* at 3%/min.** | | **US:**<br>(n.) **INITIATE** power reduction to be in MODE 3 within 6 hours. |
| | | **US:**<br>(o.) **CHECK** plant status - MODE 3 |
| | | **US:**<br>(o. RNO) **RETURN TO** Note prior to step 9. |
| | | |
| | **AOP 3575, *Rapid Downpower* (Rev 026)** | |
| | After receiving the phone call, the US should brief the crew, and enter AOP 3575, *Rapid Downpower* | **US:** |
| | Yes | **RO:**<br>(1) **CHECK Rod Control - IN AUTO** |
| | | **NOTE:** For a plant shutdown the preferred reactor power target is 30% Reactor Power |

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| | | **NOTE:** Reactor Power to MWe correlation is an approximate value and will vary based on seasonal temperatures and equipment performance. |
| | | **BOP:**<br>(2) **Align EHC Panel**<br><br>(a.) **CHECK** Load reduction using Load Set – DESIRED |
| | Desired reactor power is 30%. This correlates to a Load Set Indicated MWe Setting of about **375 MWe**. | **BOP:**<br>(b.) Referring to ATTACHMENT H, **DETERMINE** the Load Set Indicated MWe setting for the applicable:<br><br>• Desired MWE Unit Output<br>**OR**<br>• Equivalent MWE for the Desired final Reactor Power |
| | | **BOP:**<br>(c.) Using ATTACHMENT E, **ALIGN** EHC Panel for Load Set operation |
| | The NOTE does not apply. | **NOTE:** ISO-NE requested load reductions should be completed within 25 minutes of notification. |
| | OMOC recommended 3% min rate. | **US:**<br>(3) **Determine Power Reduction Rate (% / min)**<br><br>(a.) **CHECK** power reduction rate - 3%/min or 5%/min |

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| | | **CAUTION:** If SI actuation occurs, restoration from Rapid Boration lineup must be completed. |
| | | **RO:**<br>(4) **Initiate Rapid Boration**<br><br>(a.) **CHECK** RCS Makeup System in – AUTO |
| | | (b.) **START** ONE Boric Acid Transfer Pump<br><br>• BA PP A<br>• BA PP B |
| | | (c.) **OPEN** Emergency Boration Valve, (3CHS*MV8104) |
| | | (d.) **CHECK** direct Boric Acid flow (3CHS-FI183A) – INDICATED |
| | | (e.) **OPEN** Charging Line Flow Control Valve, to match indicated boric acid flow (3CHS-FI183A) |
| | | (f.) **RECORD** time boration started<br><br>Time: ____________ |
| | | (g.) **CHECK** Rod Control – AVAILABLE FOR ROD INSERTION |
| | No. | **US:**<br>(h.) **CHECK** use of Rapid Downpower Summary Sheet (RE-H-17) in the RE Curve and Data Book – DESIRED |
| | | **US:**<br>(h. RNO) **PROCEED TO** step 4.k. |

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| | Target power level is 30%.<br><br>31.56 gal / % power | **US:**<br>(k.) **REFER TO** the Monthly Reactivity Data Sheet in the RE Curve and Data Book to **DETERMINE** the Gallons of Boric Acid/%Power Reduction |
| | | **NOTE:** 1/2 the value of Gallons of Boric Acid/%Power reduction is used to obtain an approximate 50/50 ratio of boron and rod movement during the downpower. |
| | 31.56 / 2 = 15.78 | **US:**<br>(l.) **USE** 1/2 the value of Gallons of Boric Acid/%Power from the Data Sheet in step 4.m |
| | | **US:**<br>(m.) Using the formula below, **DETERMINE** boration time<br><br>• **IF** rapid borating, **THEN USE** 3CHS-FI183A for BA flow rate |
| | [Total power change (4%) × (___ gals BA/% pwr) – (___ BA amount recorded in step 4.a RNO)] / BA Flow Rate = Boration Time in minutes | |
| | 47% x 15.78 -0 / flow rate = | **US:**<br>(n.) **PROCEED TO** step 6 **AND WHEN** boration has been performed for the calculated time, **THEN** using ATTACHMENT G, **STOP** boration |
| | | **NOTE:** Delta-T indications are selected as being more accurate than NIS for monitoring power during the rapid downpower. |

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| | | **NOTE:** Perform step 8 if the downpower must be stopped **OR** a lower final power level is required **OR** boron injection alignment must be changed. |
| | Rapid boration is in progress. | (6) **Initiate Load Reduction**<br>(a.) **CHECK** rapid or gravity boration - IN PROGRESS |
| | | (b.) **CHECK** Turbine OPERATING MODE – MANUAL |
| | | (c.) **CHECK** load reduction- USING LOAD SET |
| | 3% minute is desired. | (d.) **SELECT** LOAD RATE LIMIT %/MIN (1%/MIN, 3%/MIN, or 5%/MIN) |
| | 375 MWe<br>(desired is 300 MWe) | (e.) Refer to ATTACHMENT H **AND** Using the LOAD SELECTOR pushbuttons, **ADJUST** LOAD SET to Load Set Indicated MWe setting recorded in step 2.b |
| | | (f.) **ENERGIZE** ALL PZR Heaters |
| | | (g.) **ADJUST** PZR Spray Valves to 50% setpoint<br>▪ 3RCS-PK 455B<br>▪ 3RCS-PK 455C |
| | | (h.) **MAINTAIN** plant parameters values as listed in ATTACHMENT C **OR** as directed by Operations Management |

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| | | (i.) **CHECK** power reduction - ISO-NE REQUESTED |
| | The US should call ISO-NE and inform the load reduction rate (MWe/min) and final MWe level. | (i. RNO) **NOTIFY** ISO-NE of load reduction rate (MWe/min) and final MWe level. |
| | | **RO:**<br>(7) **Check Rod Position Above RIL**<br><br>(a.) **CHECK** ROD CONTROL BANKS LIMIT LO-LO, (MB4C 4-9) annunciator – LIT |
| | | **US:**<br>(a. RNO) **<u>PROCEED</u> <u>TO</u>** step 7.k **<u>AND</u>** **<u>IF</u>** the annunciator is received, **<u>THEN</u>** **PERFORM** steps 7.b through 7.i. |
| | | **RO:**<br>(k.) **CHECK** ROD CONTROL BANKS LIMIT LO, (MB4C 3-9) annunciator – LIT |
| | | **US:**<br>(k. RNO) **<u>PROCEED</u> <u>TO</u>** step 8 **<u>AND</u> <u>IF</u>** the annunciator is received, **<u>THEN</u> PERFORM** steps 7.l through 7.m. |
| | | **US:**<br>(8) **Monitor Downpower**<br>(a.) **CHECK** the following- REMAINS UNCHANGED<br><br>• Final desired MWe load<br>• Final desired target power level<br>• Boron injection path |

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| | | **US:**<br>(b.) **<u>PROCEED</u> <u>TO</u>** step 9 |
| **As PEO when requested report to Control Room or acknowledge request to degrade vacuum. INSERT and MODIFY MALF FW01 as needed to maintain 2.0 – 4.0 in.** | | **US:**<br>(9) **Degrade Condenser Backpressure**<br>(a.) **CHECK** final desired Turbine load (MWe) - LESS THAN 907 MWe |
| | | **BOP:**<br>(b.) Using OP 3329, Condenser Air Removal, **PERFORM** SJAE Operation to Increase Condenser Backpressure to between 2.0 in. HgA and 4.0 in. HgA |
| | | **BOP:**<br>(10) **Align One Feedwater Pump For Removal from Service**<br><br>(a.) **CHECK** final desired Reactor power - LESS THAN 50% |
| | | (b.) **CHECK** removing a Feedwater Pump from service during the downpower - DESIRED |
| | | (c.) **CHECK** TD FW Pump Status –<br>• Both OPERATING<br>**<u>AND</u>**<br>• At Least One OPERATING in AUTO |

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| | | (d.) Using the applicable Attachment, **REMOVE** ONE TD FW Pump from service:<br>• ATTACHMENT A, Removing A TD FW Pump From Service<br>• ATTACHMENT B, Removing B TD FW Pump From Service |
| | | (11) **Check Power Related Interlock Status**<br>**RO:**<br>(a.) **CHECK** Reactor power – LESS THAN THE P-9 SETPOINT (resets at approx. 49% NIS power) |
| | | **US:**<br>(a. RNO) **PROCEED TO** step 12 **AND WHEN** Power Less Than P-9, **THEN RETURN** to step 11. |
| | | **BOP:**<br>(12) **Align Plant Systems For Less Than 30% Reactor Power Operation**<br>(a.) **CHECK** final desired Reactor power level - LESS THAN or EQUAL TO 30% |
| **When lead evaluator is satisfied with downpower move on to Event 4.** | | (b.) Using OP 3331A, Auxiliary Boiler Steam and Condensate, **START** the Auxiliary Boiler(s) |
| *********** **EVENT 4** *********** | | |
| | **'C' main steamline break in CTMT.** | |

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| **Event 4**<br><br>**T = Examiner Cue**<br>**Trigger 9**<br><br>MS01C (1.5E6 lbm/hr over 60 sec) | The break will be severe enough to require a Reactor Trip and Safety Injection, and a Reactor Trip 'First Out' will be received prior to the crew taking action. Automatic and the MB7 manual reactor trip switch are failed requiring the RO to manually trip the reactor from MB4 **[Critical Task]** | |
| | **The US should direct the RO to trip the reactor** | |
| | **E-0, *REACTOR TRIP OR SAFETY INJECTION* (Rev. 030)** | |
| | CTMT will ultimately go ADVERSE. | **NOTE:** ADVERSE CTMT is defined as GREATER THAN 180°F or GREATER THAN 105 R/hr in containment.<br>**NOTE:** The reactor can be interpreted as tripped when any two of the actions in step 1 are satisfied.<br>**NOTE:** Attachment D identifies Time Critical Actions. |
| *********** **EVENT 5** *********** | | |
| | Automatic and the MB7 manual reactor trip switch are failed requiring the **RO to manually trip the reactor from MB4 [Critical Task]**. | **RO:**<br>(1 *) **Check Reactor Trip**<br>• **CHECK** Reactor Trip and Bypass Breakers - OPEN<br>• **CHECK** Rod Bottom lights - LIT<br>• **CHECK** Neutron Flux – DECREASING |

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| | The RO should trip the reactor using the manual trip switch at MB4. | **RO and BOP:**<br>(1 RNO) **TRIP** the Reactor.<br><br>**IF** reactor will **NOT** trip, **THEN**:<br><br>a. **TRIP** Bus 32B and 32N. |
| | | **BOP:**<br>(2 *) **Check Turbine Trip**<br><br>a. **CHECK** all Turbine Stop Valves - CLOSED |
| | | **BOP:**<br>(3 *) **Check Power To AC Emergency Busses**<br><br>(a.) **CHECK** AC Emergency Busses 34C and 34D - BOTH ENERGIZED |
| | | **RO/BOP:**<br>(4 *) **Check If SI Is Actuated**<br><br>(a.) **CHECK** SAFETY INJECTION ACTUATION annunciators, (MB4D 1-6 or MB2B 5-9) – LIT |

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| | | (a. RNO) **CHECK** if SI is required:<br>• CTMT pressure GREATER THAN 18 psia<br>**OR**<br>• PZR pressure LESS THAN 1890 psia<br>**OR**<br>• PZR level LESS THAN 9%<br>**OR**<br>• RCS subcooling LESS THAN 32°F<br>**OR**<br>• SG pressure LESS THAN 660 psig<br>**US:**<br>**IF** SI is required, **THEN INITIATE** SI and **PROCEED TO** step 5.\ |
| | | **NOTE:** Foldout page must be open. |
| | The crew should opt to trip the 'B' and 'C' RCPs since they have no RPCCW cooling. (The CTMT cross-connect valves went closed on the SI signal)<br>The crew should opt to trip the 'B' EDG.<br>**The BOP should isolate feed to the faulted SG ('C') as soon as identified.** | **RO:**<br>(5) **DETERMINE IF ADVERSE CTMT CONDITIONS EXIST**<br>• Ctmt temperature - GREATER THAN 180°F<br>OR<br>• Ctmt radiation - GREATER THAN 105 R/ hr |
| | | (5 RNO) DO **NOT** USE ADVERSE CTMT parameters |

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| | | **RO:**<br>(6) **Using** ATTACHMENT B**, Actuation Signal Verification, CHECK Equipment Alignment** |
| | *********** **EVENT 6** *********** | |
| | The following step is in **Attachment B of E-0** which has been handed off to the RO. | |
| | **Multiple HPSI components fail to automatically actuate.** | |
| | **RO should manually start the 'A'SI pump. The 'A'CCI pump (SI pump cooling) should start when the SI pumps are started. In addition, 3SIH*MV8801A and B (Charging Cold Leg Injection valves) will need to be OPENED.** | **RO:**<br>(B.5) **Check ECCS Pumps Running**<br>• **CHECK** SI Pumps – RUNNING<br>• **CHECK** RHR Pumps – RUNNING<br>• **CHECK** two Charging Pumps – RUNNING |
| | | **RO:**<br>(B.5 RNO) **START** pumps. |
| | | |
| | *********** **EVENT 7** *********** | |
| | The following step is in **Attachment B of E-0** which has been handed off to the RO. | |
| | **CTMT Isolation Phase 'A' fails to automatically actuate.** | |

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| | | **RO:**<br>(B.10) **Check CIA**<br><br>(a.) **CHECK** ESF Group 2, columns 2 through 10 – LIT |
| | **RO should manually actuate CIA from MB2.** | **RO:**<br>(a. RNO) **INITIATE** CIA |
| | Back to the main body of **E-0, step 7** | |
| | | **BOP:**<br>(7) **Check AFW Pumps Running**<br>(a.) **CHECK** MD Pumps – RUNNING |
| | | (b.) **CHECK** Turbine-Driven Pump - RUNNING IF NECESSARY |
| | | **BOP:**<br>(8) **CHECK AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT** |
| | | **CAUTION:** With TD AFW Pump feeding SG(s): Full travel stroking of any AFW Flow Control Valve should occur one at a time, at a rate GREATER THAN 15 seconds. |

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| | **The BOP should isolate feed to the faulted SG ('C') as soon as identified.** | **BOP:**<br>(9) **Check Adequate Heat Sink**<br>(a.) **CHECK** NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT) |
| | | **BOP:**<br>(b.) **CONTROL** feed flow to maintain NR level - BETWEEN 8% and 50% (42% and 50% ADVERSE CTMT) |
| | | **US:**<br>(c.) **PROCEED TO** step 10 |
| | CDA will occur when CTMT pressure reaches 22.7 psia.<br>RCS pressure will eventually lower to < 1500 psia. Crew should identify this and trip all RCPs (or 'A' and 'D' RCPs if 'B' and 'C' RCPs were previously tripped due to no cooling. | **BOP:**<br>(10) **Check RCS Temperature**<br>(a.) Using GA-26, **DUMP** steam to control No-Load RCS Temperature - AT 557°F |

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| | RCS cold leg WR temperature will be less than 550°F | **RO:**<br>(b.) **CHECK** RCS Temperature – AT NO-LOAD VALUE:<br>• **IF ANY** RCP RUNNING - RCS Tavg - STABLE AT OR TRENDING TO 557°F<br>**OR**<br>• **IF NO** RCP RUNNING – RCS COLD LEG WR TEMPERATURE - STABLE AT OR TRENDING TO 557°F |
| | | **US:**<br>(b. RNO) **PERFORM** the applicable:<br>• IF RCS Temperature is LESS THAN 557°F THEN PROCEED TO step 10.d |
| | | **BOP:**<br>(d.) **MAINTAIN** total feed flow BETWEEN 530 to 600 gpm until NR level is GREATER THAN 8% (42% ADVERSE CTMT) in at least one SG |
| | | **BOP:**<br>(e.) **CLOSE** SG Atmospheric Relief and Relief Bypass Valves |
| | | **BOP:**<br>(f.) **CHECK** the following valves – CLOSED<br>• MSIVs<br>• MSIV Bypass Valves |

| ************ EVENT 8 ************ | | |
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| | **Hot, dry 'C' SG results in a SGTR. Faulted, ruptured SG.** | |
| **T = "C" SG WR level reaches 10%**<br>**Trigger 10**<br>SG01C, sev=1000 gpm | At 10% WR level, the 'C' SG will be hot and dry. Malfunction insertion will rupture the 'C' SG. | |
| | Yes, Bus 34A: 34A1-2 | **BOP:**<br>(11) **Check Power To SBO Diesel Auxiliaries**<br>(a.) **CHECK** any SBO Bus Tie Breaker - CLOSED TO AN ENERGIZED BUS<br>• Bus 34A: 34A1-2<br>• Bus 34B: 34B1-2<br>• Bus 24E: A505 (Unit 2) |
| | | **US:**<br>(b.) **<u>PROCEED</u> TO** Step 12 **<u>AND</u> <u>IF</u>** SBO Diesel Auxiliaries DEENERGIZE, **<u>THEN</u> PERFORM** step 11.a RNO |
| | | **RO:**<br>(12) **Check PZR Valves**<br>(a.) **CHECK** PORVs – CLOSED |
| | | (b.) **CHECK** normal PZR Spray Valves – CLOSED |
| | | (c.) **CHECK** PORV Block Valves - AT LEAST ONE ENERGIZED VALVE OPEN |

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| | | (d.) **CHECK** PORV Block Valves - ALL ENERGIZED VALVES OPEN |
| | | (e.) **CHECK** PZR Safety Valves - CLOSED |
| | | **CAUTION:** To prevent seal damage, seal injection flow should be maintained to all RCPs. |
| | Yes | **RO:**<br>(13) **Check If RCPs Should Be Stopped**<br>(a.) **CHECK** RCPs - ANY RUNNING |
| | RCS pressure will eventually lower to < 1500 psia. Crew should identify this and trip all RCPs (or 'A' and 'D' RCPs if 'B' and 'C' RCPs were previously tripped due to no cooling. | (b.) **CHECK** RCS pressure – LESS THAN 1500 psia (1800 psia ADVERSE CTMT) |
| | | **US:**<br>(b.) **PROCEED TO** step 14. |
| | | **RO:**<br>(c.) **CHECK** either of the following:<br>• Charging pumps - AT LEAST ONE RUNNING AND AT LEAST ONE COLD LEG INJECTION VALVE OPEN<br>**<u>OR</u>**<br>• SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF INJECTION |
| | | **RO:**<br>(d.) **STOP** all RCPs |

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| | The 'C' SG will be depressurized. | **BOP:**<br>(14) **Check If SG Secondary Boundaries Are Intact**<br>(a.) **CHECK** pressure in all SGs:<br>• **NO** SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>• **NO** SG COMPLETELY DEPRESSURIZED |
| | The US should announce and make the transition to E-2. | **US:**<br>(a. RNO) **INITIATE** monitoring of CSF Status Trees **AND GO TO** E-2, Faulted Steam Generator Isolation. |
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| | **E-2 (Rev 012), *Faulted Steam Generator Isolation*** | |

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| | | **CAUTION**<br>• At least one SG must be maintained available for RCS cooldown.<br>• Any faulted SG or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown or sampling is required.<br>• If RWST level decreases to LESS THAN 520,000 gal, Go to ES-1.3, Transfer to Cold Leg Recirculation, to align the ECCS system. |
| | | **BOP:**<br>(1.) **Check Main Steam Isolation And Bypass Valves – CLOSED** |
| | | **BOP:**<br>(2.) **Check At Least One SG Secondary Boundary Is Intact**<br>(a.) Check pressures in all SGs - AT LEAST ONE STABLE OR INCREASING |

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| | Yes, the 'C' SG will be depressurized. | **BOP:**<br>(3.) **Identify Faulted SG(s)**<br>(a.) Check pressure in all SGs –<br>• ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>OR<br>• ANY SG COMPLETELY DEPRESSURIZED |
| | | **CAUTION**<br>If the TD AFW pump is the only available source of feed flow, a steam supply to the TD AFW pump must be maintained from at least one SG. |

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| | **[Critical Task] Isolate the faulted S/G before transition out of E-2.**<br><br>**For proper isolation the BOP will need to close:**<br><br>**3FWA*HIC31C, HIC32C, HIC36C and FWA*MOV35C (AFW Valves)**<br><br>**3MSS*MOV17C (TD AFW pump steam supply )**<br><br>**3DTM*AOV29C, 61C (Upstream Traps)**<br><br>The 'C' SG blowdown sample isolation valve (3SSR*CTV19C) could be open for sampling and should be closed.<br><br>The 'C' main feed line valves, 'C' MSIV and its bypass valve, 'C' atmospheric relief and bypass valves should already be closed due to the Main Steamline and Feedwater Isolation signals. The 'C' SG Blowdown Isolation and Chemical Feed Isolation valves should already be closed due to the CI'A'. | **BOP/RO:**<br><br>(4.) **Isolate Each Faulted SG**<br><br>• Verify main feed line – ISOLATED<br>• TRIP TD FW pumps<br>• Place MD FW pump in PULL-TO-LOCK<br>• Isolate AFW flow path<br>• CLOSE steam supply isolation valve to TD AFW pump<br>• Verify SG atmospheric relief and bypass valves – CLOSED<br>• Verify SG blowdown isolation valve – CLOSED<br>• Verify SG blowdown sample isolation valve – CLOSED<br>• Verify SG chemical feed isolation valve – CLOSED<br>• Using table, Verify main steam line drains upstream of MSIVs and TD AFW pump – CLOSED |

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| | | **SG C**<br>3DTM*AOV29C<br>3DTM*AOV61C |
| | | **CAUTION**<br>Main steam safety valve flow indication (derived from differential temperature switches) may erroneously indicate flow if the common drain header is warmed by previous steam releases. Flow indication should be verified by local observation and other plant responses. |
| **T = 3 minutes after being dispatched**<br>**Report no observable steam from the MSVB Roof** | | **BOP/PEO:**<br>(5.) **Check SG Code Safety Valves Closed**<br>• Flow switches (MB5) - NOT LIT<br>• Local observation of safety valves (MSVB Roof) - NO STEAM OBSERVED |
| | No | **BOP:**<br>(6.) **Check AFW Suction Source**<br>(a.) Check DWST level - LESSTHAN 80,000 gal |

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| | | **US:**<br>(a. RNO) Proceed to step 7. and, IF DWST level decreases to LESS THAN 80,000 gal, THEN Perform step 6.b. |
| | NO: 'C' SG is ruptured<br>CDA has occurred, so presently RPCCW cannot be aligned. | (7.) **Check If SG Tubes Are Intact**<br>**RO:**<br>(a.) Using GA-30, Align RPCCW for RCS and SG sampling |
| **Verify 'C' SG WR level is rising.** | It takes approximately 4 - 5 minutes after the SGTR for wide range level to start rising. The crew can identify the ruptured SG by any of the following means:<br>'C' SG wide range level is slowly increasing<br>'C' SG pressure is slowly increasing.<br>Observable steam flow from 'C' SG.<br>RCS remaining depressurized when the expectation for a major steam break would be RCS pressure ultimately increasing. | **BOP:**<br>(b.) Check steam generator levels - NO SG LEVEL INCREASING IN AN UNCONTROLLED MANNER |
| | The rupture will not show on the rad monitor, since it occurred post trip. | **RO/BOP:**<br>(c.) Verify trend history and alarm status of radiation monitors:<br>• Main steam line – NORMAL<br>• Condenser air ejector – NORMAL<br>• SG blowdown – NORMAL |

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| | | **US:**<br>(d.) Verify SG chemistry activity sample results – AVAILABLE |
| | | **US:**<br>(d.) Proceed to step 8. and, WHEN SG sample results are available, THEN Perform step 7.e. |
| | The US should announce and make the **transition to E-3**. | **US:**<br>(7.b. RNO) Go to E-3, Steam Generator Tube Rupture. |
| | **E-3 (Rev 024-01), *Steam Generator Tube Rupture*** | |
| | | **<u>CAUTION</u>**<br>To prevent seal damage, seal injection flow should be maintained to all RCPs. |
| | | **<u>NOTE</u>**<br>• Foldout page must be open.<br>• The RCP trip criteria is only applicable until a controlled cooldown is initiated in step 6. |
| | RCPs should have already been stopped. | **RO:**<br>(1.) **Check If RCPs Should Be Stopped**<br>(a.) Check RCPs - ANY RUNNING |

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| | | **US:**<br>(a. RNO) Proceed to step 2. |
| | | **RO/BOP:**<br>(2.) **Identify Ruptured SGs**<br>• Unexpected increase in any SG level<br>OR<br>• High radiation from any SG steam line as indicated by the trend history or alarm status<br>OR<br>• High radiation from any SG sample |
| | | **CAUTION**<br>• If the TD AFW pump is the only available source of feed flow, a steam supply to the TD AFW pump must be maintained from at least one SG.<br>• At least one SG must be maintained available for RCS cooldown. |
| | The ruptured SG has already been isolated in E-2. | **BOP:**<br>(3.) **Isolate Flow From Each Ruptured SG**<br>(a.) Verify each ruptured SG atmospheric relief valve controller - IN AUTO AT 1125 psig |
| | | (b.) Check each ruptured SG atmospheric relief valve – CLOSED |

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| | | (c.) Check each ruptured SG atmospheric relief bypass valve – CLOSED<br>• 3MSS*MOV 74A<br>• 3MSS*MOV 74B<br>• 3MSS*MOV 74C<br>• 3MSS*MOV 74D |
| | | (d.) CLOSE each ruptured SG steam supply isolation valve to TD AFW pump<br>• 3MSS*MOV17A<br>• 3MSS*MOV17B<br>• 3MSS*MOV17D |
| | | **RO:**<br>(e.) Verify each ruptured SG blowdown isolation valve – CLOSED |
| | | **RO:**<br>(f.) CLOSE each ruptured SG blowdown sample isolation valve |
| | | **RO:**<br>(g.) Verify each ruptured SG chemical feed isolation valve – CLOSED |
| | | **BOP:**<br>(h.) Using table, CLOSE the main steam line drains upstream of MSIVs and TD AFW pump for the ruptured SG(s) |

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| | | **SG C**<br>3DTM*AOV29C<br>3DTM*AOV61C |
| | | **BOP:**<br>(i.) CLOSE each ruptured SG MSIV and MSIV bypass valve |
| | **This caution applies. Feed flow should remain isolated to the "C" SG. The other SGs are available for cooldown.** | **CAUTION**<br>If any ruptured SG is faulted, feed flow to that SG should remain isolated during subsequent recovery actions unless the SG is needed for RCS cooldown. |
| | Level will not be > 67% WR or > 8% NR. However, **feed flow** to the 'C' SG **should remain isolated**. | **BOP:**<br>(4.) **Check Ruptured SG Level**<br>(a.) Verify one of the following is satisfied:<br>• Ruptured SG WR level - GREATER THAN 67% (75% ADVERSE CTMT)<br>OR<br>• Ruptured SG NR level - GREATER THAN 8% (42% ADVERSE CTMT) |
| | | **BOP:**<br>(b.) Stop feed flow to ruptured SG(s) |

| | | |
|---|---|---|
| | | **CAUTION**<br>Major steam flow paths from the ruptured SG(s) must be isolated prior to RCS cooldown. Major flow paths include the main steam line, TD AFW pump steam supply, and SG atmospheric relief and bypass lines. |
| | 'C' SG pressure will NOT be greater than 530 psig. | **BOP:**<br>(5.) **Check Ruptured SGs Pressure - GREATER THAN 530 psig** |
| | The US should announce and make the **transition to ECA-3**.1. | **US:**<br>(5. RNO) Go to ECA-3.1, SGTR With Loss of Reactor Coolant – Subcooled Recovery Desired. |
| | **ECA-3.1** (Rev 021), ***SGTR With Loss of Reactor Coolant – Subcooled Recovery Desired.*** | |
| | | **CAUTION**<br>After SI reset, manual operator action is required to:<br>• Open the charging pump cold leg injection valves when RCS pressure decreases to LESS THAN 1900 psia.<br>• Restart safeguards equipment if offsite power is lost. |
| | | **NOTE**<br>Foldout page must be open. |

| | | |
|---|---|---|
| | | **RO:**<br>(1.) **RESET ESF Actuation Signals If Required**<br>(a.) RESET SI |
| | | (b.) RESET the following:<br>• CDA<br>• LOP<br>• CIA<br>• CIB |
| | | **RO:**<br>(2.) **Establish Instrument Air To Ctmt**<br>(a.) Check instrument air compressors - AT LEAST ONE RUNNING |
| | | (a. RNO) START one instrument air compressor. |
| | | (b.) OPEN instrument air Ctmt isolation valves |
| | Yes | **BOP:**<br>(3.) **Check Electrical Alignment**<br>(a.) Verify AC emergency busses - BOTH ENERGIZED BY OFFSITE POWER |
| | | **US:**<br>(b.) Proceed to step 3.g. |

| | | |
|---|---|---|
| | Yes | **BOP:**<br>(g.) Perform the following to energize MCC 32-3T:<br>(1) Check emergency bus 34C-ENERGIZED |
| | GA-1 will not allow a reset and an energization of 32-3T with a CDA present and bus 34C energized by offsite power. | (2) Using GA-1, Energize MCC 32-3T |
| | Yes | **BOP:**<br>(h.) Verify Busses 34A and 34B - BOTH ENERGIZED BY OFFSITE POWER |
| | | **US:**<br>(i.) Proceed to step 3.l. |
| | | **RO:**<br>(l.) Check RCPs - ANY RUNNING |
| | RCPs have been tripped. | **US:**<br>(l. RNO) Proceed to step 4. |
| | | (4.) **Deenergize PZR Heaters**<br>**RO:**<br>(a.) Turn OFF all Pzr heaters |

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| | | |
|---|---|---|
| T = When Called<br>**REPORT as ADTS to use 22% as the level that covers PZR Heaters.** | | **US:**<br>(b.) Consult ADTS for a recommended minimum indicated PZR water level to ensure heaters are covered |
| | Yes, quench spray pumps are running. | **RO:**<br>(5.) **Check If Containment Spray Should Be Stopped**<br>(a.) Verify quench spray pumps – RUNNING |
| | No, CTMT pressure will be about 24 psia. | (b.) Verify Ctmt pressure - LESS THAN 17.5 psia |
| | | (b.) Proceed to CAUTION prior to step 6. and, WHEN Ctmt pressure is LESS THAN 17.5 psia, THEN Perform step 5.c. |
| | | **<u>CAUTION</u>**<br>If any ruptured SG is faulted, feed flow to that SG should remain isolated during subsequent recovery actions unless the SG is needed for RCS cooldown. |

| | | |
|---|---|---|
| | **Since the 'C' SG is faulted, feed flow should remain isolated, per the CAUTION.** | **BOP:**<br>(6.) **Check Ruptured SG Level**<br>(a.) Verify one of the following is satisfied:<br>• Ruptured SG WR level - GREATER THAN 67% (75% ADVERSE CTMT)<br><u>OR</u><br>• Ruptured SG NR level - GREATER THAN 8% (42% ADVERSE CTMT) |
| | | (b.) Stop feed flow to ruptured SG(s) |
| | | **<u>CAUTION</u>**<br>After SI reset, manual operator action is required to restart the RHR pumps if RCS pressure decreases in an uncontrolled manner to LESS THAN 300 psia (500 psia ADVERSE CTMT). |
| | | **RO:**<br>(7.) **Check If RHR Pumps Should Be Stopped**<br>(a.) Check RHR Pumps - ANY RUNNING IN SI MODE |
| | RCS pressure may or may not be stable, depending on the timing of the crew. | (b.) Check RCS pressure:<br>• RCS pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)<br>• RCS pressure – STABLE OR INCREASING |

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| | | |
|---|---|---|
| | | **US:**<br>(b. RNO) Proceed to step 8. and, IF conditions for stopping RHR pumps are met, THEN Perform step 7.c. |
| | | **RO:**<br>(c.) STOP RHR pumps and Place in AUTO |
| | Radiation in the Auxiliary Building and ESF Building will be normal. | (8.) **Initiate Evaluation Of Plant Status**<br>**RO:**<br>(a.) Check Auxiliary Building and ESF Building radiation (radiation monitoring group histogram)<br>• Auxiliary Building (AUX) – NORMAL<br>• ESF Building (ESF) – NORMAL |
| | **Examiner:**<br>**Inform the US that the Tech Support Center will carry out ECA-3.1 steps 8.b, c and d.** | (b.) Using GA-30, Align RPCCW for RCS and SG sampling to obtain the following: |
| | | (c.) Evaluate plant equipment for continued usage capabilities |
| | | (d.) Start additional plant equipment as needed for plant recovery |

| | | |
|---|---|---|
| | | **BOP:**<br>(9.) **Check If SG Secondary Boundaries Are Intact**<br>(a.) Check pressures in all SGs –<br>• NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER<br>• NO SG COMPLETELY DEPRESSURIZED |
| | The 'C' SG will already be isolated. | (a. RNO) Verify each faulted SG NOT required for cooldown is isolated ...... |
| | | **BOP:**<br>(10.) **Check Intact SG Levels**<br>( a.) Verify NR level - GREATER THAN 8% (42% ADVERSE CTMT) |
| | | (b.) Control feed flow to maintain NR level --- BETWEEN 30% and 50% (42% and 50% ADVERSE CTMT) |
| | | **<u>NOTE</u>**<br>• Shutdown margin must be monitored during RCS cooldown using GA-15, Establishing RCS Boron Concentration For Shutdown Margin.<br>• Ensure Low Steam Line Pressure SI is blocked when PZR pressure is LESS THAN 2000 psia. |

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| | | |
|---|---|---|
| | NOTE: A cooldown may already be in progress as a result of ECCS flow, and the BOP may not need to immediately initiate an operator controlled cooldown at this point. | **BOP:**<br>(11.) **Initiate RCS Cooldown To COLD SHUTDOWN**<br>(a.) Maintain cooldown in RCS cold legs - AT A MAXIMUM RATE NOT TO EXCEED 80°F/hr |
| | | (b.) Use RHR System if in service |
| | The BOP should use GA-26 to commence the cooldown (if required), using the atmospheric relief bypass valves. | (c.) Using GA-26, Dump steam from intact SGs |
| | Depending on the timing of the crew, RWST level may or may not be less than 920,000 gal. | **US:**<br>**(12.) Check If Saturated Recovery Should Be Performed**<br>(a.) Check RWST level - LESS THAN 920,000 gal |
| | | (a. RNO) Proceed to step 12.d. |
| | | (b.) Using Attachment A, Check Ctmt WR sump level - IN UNACCEPTABLE LEAKAGE REGION |
| | | (b. RNO) Proceed to step 12.d. |
| | | (c.) Go to ECA-3.2, SGTR With Loss of Reactor Coolant - Saturated Recovery Desired |

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| | | |
|---|---|---|
| | | (d.) Check ruptured SG NR level - GREATER THAN OR EQUAL TO 87% (68% ADVERSE CTMT) |
| | | (d. RNO) Proceed to step 13. |
| | | (e.) Check ADTS determines - RECOVERY TO BE COMPLETED USING ECA---3.2, SGTR WITH LOSS OF REACTOR COOLANT – SATURATED RECOVERY DESIRED |
| | | (e. RNO) Proceed to step 13. |
| | | (f.) Go to ECA-3.2, SGTR With Loss of Reactor Coolant - Saturated Recovery Desired |
| | | |
| | | |
| **The scenario may be terminated once the RCS cooldown is shown to be controlled and the US makes the decision to transition ECA-3.2, or remain in ECA-3.1.** | | |
| | | |
| RESTORE simulator to "training ready" conditions by cleaning/replacing marked up procedures, removing placekeeping tabs or marks from all references and control panel indicators, etc. | **POST-SCENARIO:**<br>a. ENSURE simulator problems encountered during the scenario are documented IAW site specific process. | |

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SECTION 5
EXAM GUIDE SUMMARY

Title: Faulted, Ruptured Steam Generator

**Critical Tasks**

| TASK DESCRIPTION | TASK # | K/A >/= 3.0 | BASIS SELECTION |
|---|---|---|---|
| Manually trip the reactor from the control room with either the main board trip switch or opening the load center supply breakers before completing step 1 of E-0. | CT-1 | EPE 029-EA1.08 (4.5 / 4.5) | Failure to manually trip the reactor causes a challenge to the subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an incorrect performance that "necessitates the crew taking compensating action that would complicate the event mitigation strategy" and demonstrates the inability of the crew to "recognize a failure or an incorrect automatic actuation of an ESF system or component." |
| Isolate the faulted SG before transition out of E-2. | CT-17 | APE 040-AA1.04 (4.3 / 4.3) | Failure to isolate a faulted SG that can be isolated causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Also, depending upon the plant conditions, it could constitute a failure by the crew to "demonstrate the ability to recognize a failure or an incorrect automatic actuation of an ESF system or component." |
| | | | |

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Appendix D | Scenario Outline | Form ES-D-1

Facility: Millstone 3 Scenario No.: 2K17 NRC-02(Rev 0) Op-Test No.: 2K17

Examiners: ____________ Operators: ____________

Initial Conditions: IC-160, 74% Power, Middle of life, Equilibrium Xe

Turnover: The crew will take the shift with reactor power at 74%. The plant is being returned to service following a refueling outage. The crew is to stabilize reactor power at 74% while Reactor Engineering performs EN 31015 "Power Ascension Testing of Millstone Unit 3". The 'C' CCP heat exchanger is out of service for tube leak repair. The 'D' SWP is out of service for corrective maintenance.

Critical Tasks:

1. Manually trip the reactor from the control room with either Main board trip switch or by opening 32B and 32N supply breakers before completing Step 1 of E-0. (CT-1)
2. Isolate the faulted SG(s) before transition out of E-2. (CT-17)

| Event No. | Malf. No | Event Type* | Event Description |
|---|---|---|---|
| 1 | RX12M | I (BOP) | 'A' steam generator level transmitter (3FWS-LT551) fails low (AOP 3581 / AOP 3571). *(Tech Spec entry)* |
| 2 | SW01B | C(RO) | 'B' Service Water Pump trip on overcurrent. (AOP 3560 / AOP 3561) *(Tech Spec entry)* |
| 3 | SG03C | R (SRO)<br>R (RO)<br>N (BOP) | "C' SG Tube Leak (460 gpd), and subsequent procedurally required rapid downpower. (3%/min). (AOP 3576, AOP 3575) *(Tech Spec entry)* |
| 4 | MS01C | M(ALL) | 'C' main steamline break in CTMT. Requires reactor trip and safety injection. |
| 5 | RP10A/B<br>RP09B | C (RO) | Automatic and MB7 manual reactor trip switch fail. Successful manual reactor trip MB4. |
| 6 | RP11E | C(RO) | Multiple HPSI components fail to automatically actuate. |
| 7 | RP11K | C(RO) | CTMT Isolation Phase 'A' fails to automatically actuate. |
| 8 | SG01C | M (ALL) | Hot, dry 'C' SG results in a SGTR. Faulted, ruptured SG. (ECA-3.1) |
| | | | |

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

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## SHIFT TURNOVER REPORT

| DATE-TIME | PREPARED BY | SHIFT |
|---|---|---|
| Today 0515 | Unit Supervisor /"NIGHT" Shift | 18:00 - 06:00 |

**PLANT STATUS:**

| | | | | |
|---|---|---|---|---|
| Mode: | 1 | | Rx Power: | 74 % |
| Megawatts: | Thermal: | 2726 MWTH | PZR Pressure: | 2250 psia |
| | Electric: | 863 MWe | RCS T-AVE: | 577 deg F |
| RCS Leakage: | Identified: | 0.015 gpm | Core Burnup: | 10000 MWD/MTU |
| | Unidentified: | 0.036 gpm | Protected Train/Facility: | A (Orange) |
| Date/Time: | Today 0015 | | Intake: | Green |

**Active Tracking Records and Action Statements**

**Equipment/Reason**

| LCO | Action | Date | Time in LCO | Action Requirement | Time Left |
|---|---|---|---|---|---|
| 'D' SWP is out of service for planned maintenance. | | | | | |
| TR 3.7.4 | a | yesterday | 18 hours | SFP heat load eval SAT. | 29 days |
| | | | | | |

**OD Compensatory Actions / Temp Logs**

| Open Date | Class Reason | Reason | Watch Position |
|---|---|---|---|
| | | | |

**PLANT SYSTEMS APC**

| System | Notes |
|---|---|
| CCP | 'C' CCP HX is tagged out / drained to repair a tube leak. Both trains of 'C' CCP pump control switches are tagged out of service. |
| SWP | 'D' SWP is out of service for corrective maintenance due to excessive packing leakage severe enough to challenge the Service Water Cubicle sump. |

**CROSS UNIT SYSTEM STATUS**

| | |
|---|---|
| U3 Power to 24E | 34A aligned to 24E |

**SURVEILLANCES / EVOLUTIONS IN PROGRESS**

| | |
|---|---|
| OP 3204 | Plant is being returned to service following a refueling outage. HOLD POWER at 75% to support while Reactor Engineering performs EN 31015 "Power Ascension Testing of Millstone Unit 3" (test to be completed shortly. |

**REACTIVITY BRIEFING (SEE REACTIVITY THUMBRULES / SPREAD SHEET FOR ADDITIONAL INFO)**

| | | |
|---|---|---|
| Current Rod Height | 185 steps | |
| Xenon Trend | equilibrium | |
| Current Boron | 1514 | |
| Boron Pot Setting / Blend Ratio | 4.41 / 17.7 gpm | |
| Plant Risk | LERF 1.06 ACT: 1 year | CDF 4.15 ACT: 46.9 days |

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Determine Effects on Calorimetric of Removing Instruments from Service, and Determine Required Actions

JPM Number: 2017 NRC SRO A.1.1 Revision: 0

Initiated:

Robert Royce ____________ 8/17/17

Developer Date

Reviewed:

Dave Minnich ____________ 8/17/17

Technical Reviewer Date

Reviewed:

____________ E. BREWER 8/18/17

Technical Reviewer Date

Approved:

M.J. COTE ____________ 8/18/17

Supervisor, Nuclear Training Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Original issue (new) | 0 |
| | | |
| | | |
| | | |

# JPM WORKSHEET

Facility: MP3 Examinee: ____________

JPM Number: 2017 NRC SRO A.1.1 Revision: 0

Task Title: Determine Effects on Calorimetric of Removing Instruments from Service, and Determine Required Actions

Admin Area Conduct of Operations

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 15

Applicable To: SRO X RO ____

K/A Number: 2.1.7 K/A Rating: 4.4 / 4.7

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: X Simulator: ____ In-Plant: ____

Task Standards: Given a specific set Instruments being removed from service, correctly determine the impact on the Plant Calorimetric Program, and determine required actions to maintain power within the licensed maximum power level.

Required Materials: (procedures, equipment, etc.) SP 31002, Rev 018
OP 3204, Rev 030

General References: Millstone 3 Operating License

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC SRO A.1.1 Revision : 0

Initial Conditions: The plant is at 100% power, as indicated by the Calorimetric program, which is in the "Steam Calc" mode.

The following sequence of events occurs:

| Time: | Event: |
|---|---|
| 08:00: | An I&C Technician reports to the control room, requesting to remove Steam Generator A Steam Pressure instrument 3MSS-PI516 from service. |
| 09:00: | 3MSS-PI516 is returned to service. |
| 10:00: | S/G C Steam Flow Instrument 3MSS-F532 fails to zero. |
| 10:00: | The crew enters AOP 3571, *Instrument Failure Response*, to address the failed instrument. |

Initiating Cues: At 08:00, the Shift Manager directs you, the extra SRO on shift, to determine:

1. The effect, if any, that removing the Steam Generator A Steam Pressure instrument 3MSS-PI516 from service will have on the plant calorimetric.
2. Any actions, if any, required to be taken with reactor power prior to taking the instrument out of service.

At 10:00, the Shift Manager directs you to determine:

1. The effect, if any, that S/G C Steam Flow Instrument 3MSS-F532 failing to zero had on the plant calorimetric.
2. Any actions, if any, required to be taken with reactor power due to the failed instrument.

Consider each instrument separately.

Simulator Requirements: NONE

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.1.1 Revision: 0

Task Title: Determine Effects on Calorimetric of Removing Instruments from Service, and Determine Required Actions

START TIME: ______________

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| STEP #1 | Obtains a copy of SP 31002, *Plant Calorimetric*. | Obtains SP 31002.<br>May review Prerequisites and Precautions. | Y ☐ N ☒ | S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| STEP #2<br>SP 31002, Attachment 7, Sheet 2 of 3 | Determine the effect on the plant calorimetric, if any, of removing 3MSS-PI516 from service. | Locates 3MSS-P516 on Attachment 7 of SP 31002.<br>Determines that it takes 2 or more of the 3 'A' SG pressure channels to cause a Shift to NIs.<br>Notes that removing this instrument may affect CVSGP1, causing the averaged value to change (up or down). | Y ☒ N ☐ | S ☐ U ☐ |
| Cue: | If the examinee starts looking at addressing a potential change in CVSGP1, as the US state, "All three 'A' SG pressure channels are indicating the same value (948 psig), therefore, CVSGP1 will not change."<br>If the examinee starts looking at other actions, such as Tech Specs, state, "Your task is to determine the effect, if any, on the Calorimetric. The SM will be looking at other required actions." | | | |
| Comments: | Critical nature of this step includes determining that the Calorimetric will still function when this channel is removed from service.<br>Examinee may consider actions such as directing the crew to monitor power indications when the instrument is removed from service. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #3** SP 31002, Attachment 7, Sheet 2 of 3 | Performance: Determine the effect on the plant calorimetric, if any, of 3MSS-F532 failing low. | Standard: Determines that the Calorimetric will Shift to NIs Calc (since the Calorimetric was in the Steam Flow Calc mode). | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| Cue: | **When the SRO candidate states or otherwise indicates the Calorimetric will Shift to NIs, provide the candidate with Handout 2.** | | | |
| Comments: | Handout 2 will cue the examinee to determine actions required to maintain reactor power below the licensed maximum power level of 3650 MWth. (CVQRPA is a ten minute average of CVQRPI. This value updates once per second). | | | |
| **STEP #4** | Performance: Obtains a copy of OP 3204, *At Power Operations*. | Standard: References OP 3204, *At Power Operation*, **Section 4.3, "Steady State Operation".** | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | OP 3204 is referenced to determine the actions needed to address CVQRPA indicating 3725 MWth. | | | |

| STEP #5 OP 3204, Note prior to step 4.3.1 | Performance:<br>1. Major steps in this section may be performed in any order.<br>2. Calorimetric input shifts to the average of the four NI power range instruments when a faulty or invalid input to the calculated calorimetric is detected. The shift is indicated by a Computer Priority Alarm.<br>3. CVQRPI may experience a short duration (15 to 30 seconds) downward spike of four to six MWth while in steam flow calorimetric mode. This condition is caused by "Lower Plenum Flow Anomaly" and has been evaluated as acceptable by Reactor Engineering. A CR is *not* required for these occurrences.<br>4. If feedwater flow or steam generator levels are changing due to a transient, the calorimetric may *not* be accurate. Diverse reactor power indications should be used, as identified in SP 31002, "Plant Calorimetric," (Att.) "Characteristics of Various Power Level Indications." | Standard:<br>Reviews the Note. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP | Performance | Standard | Critical | Grade |
|---|---|---|---|---|
| **STEP #6** OP 3204, step 4.3.1.a.1) | Performance: MAINTAIN CVQRPA less than or equal to the licensed maximum power level (3,650 MWth) and PERFORM the following: <br> IF CVQRPA exceeds 102% (3,723 MWth), PERFORM the following: <br> 1) Immediately REDUCE reactor power to less than or equal to the licensed maximum power level (3,650 MWth). | Standard: Recognizes CVQRPA did exceed 102% (3,723 MWth). <br> Examinee directs the crew (or otherwise states) to immediately lower reactor power to less than or equal to the licensed maximum power level (3,650 MWth). | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #7** OP 3204, step 4.3.1.a.2) | Performance: 2) NOTIFY Reactor Engineering. | Standard: Notifies Reactor Engineering that CVQRPA exceeded 102% (3,723 MWth). | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | When the examinee requests or calls RE, state "Reactor Engineering has been notified." | | | |
| Comments: | | | | |
| **STEP #8** OP 3204, step 4.3.1.a.3) | Performance: IF the increase in indicated thermal power is due to a shift in calculation to feedwater flow OR NI input, Go To step 4.3.1.f. | Standard: Recognizes the reason CVQRPA exceeded 102% was due to a secondary transient and NOT due to a shift in calculation to feedwater flow or NI input. <br> Moves on to step 4.3.1.a.4) | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #9**<br>OP 3204, step 4.3.1.a.4) | Performance:<br>SUBMIT a CR. | Standard:<br>Examinee directs the STA or the extra licensed operator to submit a CR, detailing the event or otherwise states that a CR must be submitted. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | If the examinee questions whether it is desired for him to initiate a CR, state, "Another crewmember will initiate the CR." | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #10**<br>OP 3204, step 4.3.1.a.5) | Performance:<br>REQUEST Reactor Engineering determine Reportability. | Standard:<br>Examinee calls Reactor Engineering or otherwise states that RE needs to determine reportability. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #11**<br>OP 3204, step 4.3.1.a.6) | Performance:<br>Go To step 4.3.1.f. | Standard:<br>Examinee proceeds to step 4.3.1.f. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #12** OP 3204, step 4.3.1.f | Performance: MAINTAIN CVQRPSHFT less than or equal to the licensed maximum power level (3,650 MWth). | Standard: Examinee directs the crew (or otherwise states) to maintain CVQRPSHFT less than or equal to the licensed maximum power level (3,650 MWth). | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | CVQRPSHFT is the average power over the course of the 12 hour shift. The crew is required to monitor CVQRPSHFT to ensure the 12 hour average does not exceed the maximum licensed power level. | | | |
| **STEP #13** OP 3204, step 4.3.1.g | Performance: <u>IF</u> CVQRPSHFT exceeds licensed maximum power level (3,650 MWth) at the completion of a computer defined 12 hour shift, PERFORM the following…. | Standard: Recognizes that there is ample time to ensure CVQRPSHFT can be maintained less than or equal to 3,650 MWth, so there is no urgent action required for this step. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| STEP #15 | Performance: Notifies the US that all required actions for this JPM have been completed. | Standard: Reports to the US that all required actions for this JPM have been completed. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

**TERMINATION CUE: The evaluation for this JPM is complete.**

STOP TIME: ______________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.1.1 Revision: 0

Task Title: Determine Effects on Calorimetric of Removing Instruments from Service, and Determine Required Actions

Date Performed: ____________

Examinee: ____________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **15** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC SRO A.1.1 Revision: 0

Initial Conditions: The plant is at 100% power, as indicated by the Calorimetric program, which is in the "Steam Calc" mode.

The following sequence of events occurs:

| Time: | Event: |
|---|---|
| 08:00: | An I&C Technician reports to the control room, requesting to remove Steam Generator A Steam Pressure instrument 3MSS-PI516 from service. |
| 09:00: | 3MSS-PI516 is returned to service. |
| 10:00: | S/G C Steam Flow Instrument 3MSS-F532 fails to zero. |
| 10:00: | The crew enters AOP 3571, *Instrument Failure Response*, to address the failed instrument. |

Initiating Cue: At 08:00, the Shift Manager directs you, the extra SRO on shift, to determine:

1. The effect, if any, that removing the Steam Generator A Steam Pressure instrument 3MSS-PI516 from service will have on the plant calorimetric.
2. Any actions, if any, that are required to be taken with reactor power prior to taking the instrument out of service.

At 10:00, the Shift Manager directs you to determine:

1. The effect, if any, that S/G C Steam Flow Instrument 3MSS-F532 failing to zero had on the plant calorimetric.
2. Any actions if any, that are required to be taken with reactor power due to the failed instrument.

Consider each instrument separately.

# EXAMINEE HANDOUT 2

## **DO NOT** provide this handout until cued

Initial Conditions: A secondary transient has occurred which resulted in a reactor power excursion. The secondary plant has been stabilized utilizing the appropriate ARPs.

The RO reports that CVQRPA has increased to 3,725 MWth.

Initiating Cue: The SM directs you to determine the actions needed to address CVQRPA indicating 3725 MWth."

**Form Approval**

| Approval Date | Effective Date |
|---|---|
| 11/2/16 | 11/7/16 |

# Surveillance Form

**Generic Information**

| Form Title | | | Rev. No. |
|---|---|---|---|
| MODE 5/6/0 Daily and Shiftly Control Room Rounds | | | 006 |
| Reference Procedure | Applicable Tech. Spec. | Applicability (Tech. Spec.) | Frequency |
| SP 3670.1 | As Specified in Attachment 2 | MODEs 5, 6, 0 | Shiftly, Daily |

**Specific Information**

| | | | |
|---|---|---|---|
| Schedule Start Date | | WO Number | Mntc Restoration ☐ Yes ☐ No |
| Performance MODEs 5, 6, and 0 | Prerequisites Completed (Initials) | Precautions Noted (Initials) | |
| Test Authorized By | | Date | Partial Surveillance ☐ Yes ☐ No |
| Performed By | | Date | |
| Accepted By | | Date | Acceptance Criteria Satisfied ☐ Yes ☐ No |
| Approved By (Department Head or Designee) | | Date | |

CR# ______________

**Surveillance Information**

| Test Equipment Type | MTE Number | Cal Due Date |
|---|---|---|
| N/A | | |

**Comments**

## MODE 5/6/0 Daily and Shiftly Control Room Rounds

<u>T/S ACCEPTANCE CRITERIA</u>

The data collected on pages 3 through 11 fall within the Acceptance Criteria listed and as defined on page 2. If a parameter is discovered out of the range of the Acceptance Criteria and this is the initial identification, log the affected LCO and initiate a CR. For any parameter that has been previously identified is out of the range of the Acceptance Criteria, the LCO action taken will be listed. A new CR is *not* necessary.

<u>ACCEPTANCE CRITERIA</u>

1. All channel checks, availability requirements, and parameter limits are recorded and verified on the corresponding data sheets as specified.
2. The data sheets have been completed with any exceptions noted in the comment section.

## MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| 36. | Ultimate Heat Sink Temp (LIS / SW) | Temp ≤80°F (<u>IF</u> temp >80°F, Refer To Note 22) | | | X | (Note 21) | | * |
| 1. | MB1 Annunciator Alarms | All lamps light | | X | | Test | | |
| 2. | Spent Fuel Pool Temp | Temp < 125°F | | | X | SFC*TI 27A | * | * |
| | | | | | X | SFC*TI 27B | * | * |
| 1. | MB2 Annunciator Alarms | All lamps light | | X | | Test | | |
| 3. | STM GEN 1 NR Level | Level > 17% (Note 1) MADL: 8.0% | | | X | FWS*LI 518 | * | * |
| | | | | | X | FWS*LI 517 | * | * |
| | | | | | X | FWS–LI 551 | * | * |
| | | | | | X | FWS*LI 519 | * | * |
| | STM GEN 2 NR Level | Level > 17% (Note 1) MADL: 8.0% | | | X | FWS*LI 528 | * | * |
| | | | | | X | FWS*LI 527 | * | * |
| | | | | | X | FWS*LI 529 | * | * |
| | | | | | X | FWS–LI 552 | * | * |
| | STM GEN 3 NR Level | Level > 17% (Note 1) MADL: 8.0% | | | X | FWS*LI 538 | * | * |
| | | | | | X | FWS*LI 537 | * | * |
| | | | | | X | FWS*LI 539 | * | * |
| | | | | | X | FWS–LI 553 | * | * |
| | STM GEN 4 NR Level | Level > 17% (Note 1) | | | X | FWS*LI 548 | * | * |
| | | | | | X | FWS*LI 547 | * | * |
| | | | | | X | FWS–LI 554 | * | * |
| | | | | | X | FWS*LI 549 | * | * |
| 4. | RWST Temperature | ≥ 42°F; Applicable <u>IF</u> Outside Temp < 35°F | | | X | QSS–TI 23 | | * |

# MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| 26. | SI Accum TK 1 Press | IF Disc Pressurization is in service; at least two Accumulators, each with Pressure > 465 psia (Note 15) | | | X | SIL–PI 960 | * | * |
| | | | | | X | SIL–PI 961 | * | * |
| | SI Accum TK 2 Press | | | | X | SIL–PI 962 | * | * |
| | | | | | X | SIL–PI 963 | * | * |
| | SI Accum TK 3 Press | | | | X | SIL–PI 964 | * | * |
| | | | | | X | SIL–PI 965 | * | * |
| | SI Accum TK 4 Press | | | | X | SIL–PI 966 | * | * |
| | | | | | X | SIL–PI 967 | * | * |
| | SI Accum TK 1 Level | IF Disc Pressurization is in service; at least two Accumulators, each with Level > 6,600 gal (Note 15) | | | X | SIL–LI 950 | * | * |
| | | | | | X | SIL–LI 951 | * | * |
| | SI Accum TK 2 Level | | | | X | SIL–LI 952 | * | * |
| | | | | | X | SIL–LI 953 | * | * |
| | SI Accum TK 3 Level | | | | X | SIL–LI 954 | * | * |
| | | | | | X | SIL–LI 955 | * | * |
| | SI Accum TK 4 Level | | | | X | SIL–LI 956 | * | * |
| | | | | | X | SIL–LI 957 | * | * |
| 5. | RHR Pump A Flow | (Note 1) | | X | | RHS*P1A | | |
| | | | | | X | RHS–FI 618 | * | * |
| | RHR Pump B Flow | | | X | | RHS*P1B | | |
| | | | | | X | RHS–FI 619 | * | * |
| 1. | MB3 Annunciator Alarms | All lamps light | | X | | Test | | |
| | MB4 Annunciator Alarms | | | X | | Test | | |
| 8. | MB4C 2–2 SMM alarm | Annunciator *not* lit | | X | | MB4C (2–2) | | |
| | MB4C 2–3 SMM alarm | Annunciator *not* lit | | X | | MB4C (2–3) | | |

# MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| COLD OVERPRESSURE PROTECTION<br>Required when one or both PORV(s) providing protection (Note 2)<br><br>PORV(s) Train proving protection (circle one): A B Both N/A | | | | | | | | |
| 6. | PORV BLOCK | Open Indication (MB4 or Computer) | | X | | RCS*MV8000A | | |
| | | | | X | | RCS*MV8000B | | |
| | COPPS ARM/BLOCK | TR A in ARM | | X | | MB4 | | |
| | | TR B in ARM | | X | | MB4 | | |
| | General Warning | Tr A light off | | X | | RPS*RAKLOGA | | |
| | | Tr B light off | | X | | RPS*RAKLOGB | | |
| | RCS–T413B/423B on RCS–TR 413B or Process Plant Computer, (COLD LEG WR TEMP LOOP 1/2) | MADL<br>40.0°F by MB indicators<br>15.1°F by plant process computer | X | | | RCS–T413B | | |
| | | | X | | | RCS–T423B | | |
| | RCS*T433B/443B on RCS*TR 433B or Process Plant Computer, (COLD LEG WR TEMP LOOP 3/4) | | X | | | RCS*T433B<br>RCS–T443B | | |
| | | | X | | | RCS*T443B<br>RCS–T443B | | |
| | RCS–T413A/423A on RCS–TR 413A or Process Plant Computer, (HOT LEG WR TEMP LOOP 1/2) | | X | | | RCS–T413A | | |
| | | | X | | | RCS–T423A | | |
| | RCS*T433A/443A on RCS*TR 433A or Process Plant Computer, (HOT LEG WR TEMP LOOP 3/4) | | X | | | RCS*T433A<br>RCS–T433A | | |
| | | | X | | | RCS*T443A<br>RCS–T443A | | |
| | PRES LOW RANGE | Pressure < COPPS setpoint (Note 16) | X | | | RCS–PI 403A | | |
| | | | X | | | RCS–PI 405A | | |

## MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| COLD OVERPRESSURE PROTECTION<br>Required when one or both PORV(s) providing protection (Note 2) | | | | | | | | |
| 6. | HOT LEG ISOL | Open Indication (Note 3) | | X | | RCS–MV8001A | | |
| | COLD LEG ISOL | | | X | | RCS–MV8002A | | |
| | HOT LEG ISOL | | | X | | RCS–MV8001B | | |
| | COLD LEG ISOL | | | X | | RCS–MV8002B | | |
| | HOT LEG ISOL | | | X | | RCS–MV8001C | | |
| | COLD LEG ISOL | | | X | | RCS–MV8002C | | |
| | HOT LEG ISOL | | | X | | RCS–MV8001D | | |
| | COLD LEG ISOL | | | X | | RCS–MV8002D | | |
| COLD OVERPRESSURE PROTECTION<br>Required when one or both RHR Suction Relief(s) providing protection (Note 2)<br><br>RHR Suction Relief(s) Train providing protection (circle one): A B Both N/A | | | | | | | | |
| 7. | Train A RHR suction reliefs | Open Indication | | X | | RHS*MV8701A | | |
| | | | | X | | RHS*MV8701C | | |
| | Train B RHR suction reliefs | | | X | | RHS*MV8702B | | |
| | | | | X | | RHS*MV8702C | | |
| COLD OVERPRESSURE PROTECTION<br>Required when ≥2.0 sq inch open vent path providing protection<br>(Note 2) | | | | | | | | |
| 23. | Overpressure Protection | Vent Path Open | | X | | N/A | | |
| MASS INJECTION PROTECTION (Note 17) | | | | | | | | |
| 33. | Charging/SI pump inoperability verification | SP 3604A.6 complete | | X | | N/A | | |

## MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| 27. | Cavity Seal integrity | Level Stable or changes in Level are Expected > 0% Level (Note 4) | | | X | RCS–LI 462 | * | * |
| 9. | SG PRI/SEC Temp | > 70°F<br>IF Acceptance Criteria is *not* met, PERFORM SP 3601B.3, "Steam Generator Low Temperature Integrity Verification." | | | X | (Note 5) | * | * |
| 25. | Circ Water Pump | Channel Check Sat<br><br>For running pumps | X | X | | CWS–P1A | | |
| | | | X | X | | CWS–P1B | | |
| | | | X | X | | CWS–P1C | | |
| | | | X | X | | CWS–P1D | | |
| | | | X | X | | CWS–P1E | | |
| | | | X | X | | CWS–P1F | | |
| 1. | MB5 Annunciator alarms | All lamps light | | X | | Test | | |
| | MB6 Annunciator alarms | | | X | | Test | | |
| | MB7 Annunciator alarms | | | X | | Test | | |
| | MB8 Annunciator alarms | | | X | | Test | | |
| | VP1 Annunciator alarms | | | X | | Test | | |
| 10. | Control Room Temp | Temp ≤ 95°F (Note 22) | | | X | HVC*TIC 166A | * | * |
| | | | | | X | HVC–TIC 179 | * | * |
| | | | | | X | HVC–TIC 29A | * | * |
| | | | | | X | HVC–TIC 29B | * | * |
| | | | | | X | HVC*TIC 166B | * | * |

# MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| 12. | Direct communications with Refueling Station | Communications established within one Hour prior to and during core alterations | | X | | | | |
| 13. | Wind Speed 33′EL | Channel Check (Note 12) | X | | | 33′ Level | | |
| | Wind Direction 33′EL | | X | | | 33′ Level | | |
| | Wind Speed 142′EL | | X | | | 142′ Level | | |
| | Wind Direction 142′EL | | X | | | 142′ Level | | |
| | Air Temp ΔT 33−142′EL | | X | | | 142′ Level | | |
| | Wind Speed 374′EL | | X | | | 374′ Level | | |
| | Wind Direction 374′EL | | X | | | 374′ Level | | |
| | Air Temp ΔT 33−374′EL | | X | | | 374′ Level | | |
| 28. | Area temperature monitor | All areas satisfactory (Note 6) | | X | | EEQPIC 1 thru 29 | | |
| 14. | Fuel Storage Pool Area | Channel Check: −Normal Status on Status Grid Display −No Abnormal Alarms on Database Display | X | | | RMS36−1 | | |
| | | | X | | | RMS08−1 | | |
| 15. | Control Room Intake Air | | X | | | HVC16A−1 | | |
| | | | X | | | HVC16B−1 | | |
| 16. | WSTE Neut Sump Monitor | Channel Check: −Monitor on line −No unexpected Alarms on Database Display | X | | | CND07−1 | | |
| | Turb Bldg Floor Drain | | X | | | DAS50−1 | | |
| | Liquid Waste Monitor | | X | | | LWS70−1 | | |
| 17. | SG Blowdown | | X | | | SSR08−1 | | |

# MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| 16. | SG Blowdown Flowrates | Channel Check:<br>Indication of flow during periods of release<br>(Note 7) | X | | | FI46A/47A at BDG–HIC20A | | |
| | | | X | | | FI46B/47B at BDG–HIC20B | | |
| | | | X | | | FI46C/47C at BDG–HIC20C | | |
| | | | X | | | FI46D/47D at BDG–HIC20D | | |
| 18. | ESF Bldg Monitor | Channel Check – Sat | X | | | HVQ49–1 | | |
| | – Sampler Flow | No Flow Alarms<br>(Note 13) | | X | | HVQ49–1 | | |
| | U–3 Vent Stack Monitor | Channel Check – Sat | X | | | HVR10B–1 | | |
| | – Process Flow | Routine Operations:<br>1.6E+5 to 2.5E+5<br><br>One SLCRS Fan:<br>1.20E+5 to 2.0E+5<br><br>Process Flow removed from service:<br>2.50E+4 to 3.50E+4<br><br>(Note 8) | X | | X | HVR10B–1 | | * |
| | – Sampler Flow | Pump on/5.0E–2 to 2.6<br>(Note 9) | X | | X | HVR10B–1 | | * |
| 19. | – 1 HR Trend over 30 Hours | < 50% Increase;<br>IF > 50% Unexplained Increase<br>CONTACT Chemistry | | X | | HVR10B–1 | | |

## MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| 18. | Normal Range SLCRS Monitor | Channel Check – Sat | X | | | HVR19B–1 | | |
| | – Process Flow | One SLCRS Fan:<br>7.0E+3 to 1.0E+4<br><br>Two SLCRS Fans:<br>1.1E+4 to 1.4E+4<br><br>All SLCRS Fans Off:<br>4.0E+2 to 7.0E+2<br><br>Process Flow removed from service:<br>1.50E+2 to 4.50E+2<br><br>(Note 18) | X | | X | HVR19B–1 | | * |
| | – Sampler Flow | Pump on<br>7.6E–2 to 3.08<br>(Note 19) | X | | X | HVR19B–1 | | * |
| 19. | – 1 HR Trend over 30 Hours | ≤ 50% Increase;<br><u>IF</u> >50%<br>Unexplained Increase<br>CONTACT Chemistry | | X | | HVR19B–1 | | |
| 11. | Shutdown Margin | OP 3209B Complete and Sat, MODE 5 only | | X | | | | |

## MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| 8. | Shutdown Margin Monitor | MODE 5 only ≥ 1.0 cps (Note 14) | | | X | NME*SMM1 | * | |
| | | | | | X | NME*SMM2 | * | |
| | Source Range Countrate | MODE 5 with Reactor trip breakers closed AND the Control Rod Drive System capable of rod withdrawal >0 cps | X | | X | NMS*NI31B | * | * |
| | | | X | | X | NMS*NI32B | * | * |
| | Source Range Flux Monitors | MODE 6 only; Two channels OPERABLE. (Note 10) | X | X | | NMS*NI31B | | |
| | | | X | X | | NMS*NI32B | | |
| | | | X | X | | NME*SMM1 | | |
| | | | X | X | | NME*SMM2 | | |
| 35. | 3SRW*SUMP6 level | N/A (Note 20) | | | X | SRW–L18* | * | |
| | 3SRW–TK1 level | N/A (Note 20) | | | X | SRW–L16* | * | |
| 32. | Fire Door Inspection – Control Bldg 47′6″ | Door Closed | | X | | C–47–4 | | |
| | | | | X | | C–47–5 | | |
| | | | | X | | C–47–6 | | |
| | | | | X | | C–47–7 | | |
| | | | | X | | C–47–8 | | |
| | | | | X | | C–47–9 | | |
| | | | | X | | C–47–10 | | |
| | | | | X | | C–47–11 | | |
| | | | | X | | C–47–12 | | |
| 30. | S/D Safety Assessment | (Note 11) | | X | | | | |

## MODE 5/6/0 Daily and Shiftly Control Room Rounds

| Item No. | Title | Acceptance Criteria | CC | AR | PL | Channel | 0700 | 1900 |
|---|---|---|---|---|---|---|---|---|
| N/A | PPC Boron Concentration Constant | UPDATE PPC with current:<br>– RCS Boron PPM<br>– Boron Depletion Factor | | X | | OPENTRY_BORON | | |
| | | | | | | Operator's Initials / Time Completed | / | / |
| | | | | | | Unit Supervisor Signature | | |
| All Acceptance Criteria or LCO Actions Met | | | | | | Shift Manager Signature | | |

Comments:

## MODE 5/6/0 Daily and Shiftly Control Room Rounds

| | |
|---|---|
| **Note 1:** | MODE 5 (with two RCS Loops filled): One RHR Loop in operation AND OPERABLE with either one additional RHR Loop OPERABLE OR two SGs with greater than 17% level. "Reactor Coolant Loops filled" means capable of supporting natural circulation heat transfer AND able to meet one of the following:conditions:<br>*Associated steam generator tubes have *not* been drained and has *not* been exposed to gas swept from other loops.<br>*Vacuum filled or filled, swept, and vented.<br>MODE 5 (with less than two RCS Loops filled): One RHR Loop in operation AND one additional RHR Loop OPERABLE.<br>MODE 6 ($\geq$ 23 feet above vessel flange): One RHR loop operating with $\geq$ 2,800 gpm.<br>MODE 6 (< 23 feet above vessel flange): Two RHR loops OPERABLE with $\geq$ one RHR loop operating with at least 2,800 gpm. |
| **Note 2:** | The Cold Overpressure Protection requirements of T/S 3.4.9.3 must be satisfied. |
| **Note 3:** | There must be at least one loop stop valve OPEN in at least three RCS loops. |
| **Note 4:** | *Not* applicable when Temporary Reactor Vessel Cover installed. WHEN Temporary Reactor Vessel Cover *is not* installed AND cavity is filled within the indicating range of the pressurizer, RECORD pressurizer level to monitor cavity seal integrity. Pressurizer level transmitter must be in service as specified in OP 3305, "Fuel Pool Cooling and Purification," for remote monitoring of refueling cavity level. |
| **Note 5:** | For loops where both the RCS AND S/G are filled, USE RCS WR temperature OR local S/G temperature as a measure of reactor and secondary coolant temperature.<br>For loops where both the RCS AND S/G are drained, USE Containment AVG Temp as a measure of reactor and secondary coolant temperature.<br>For loops where the RCS is filled AND the S/G is drained, USE RCS WR temperature as a measure of reactor coolant temperature and USE Containment AVG Temp as a measure of secondary coolant temperature.<br>For loops where the RCS is drained AND the S/G is filled, USE Containment AVG Temp as a measure of reactor coolant temperature and USE local S/G temperature as a measure of secondary coolant temperature.<br>IF feeding a S/G, USE temperature of the feedwater. IF using OP 3322, (Att) Steam Generator Temperature Determination, THEN USE calculated final temperature.<br>RECORD lowest temperature. |

| | |
|---|---|
| **Note 6:** | IF the EEQ data is *not* available, PERFORM SP 3670.1–012, "Manual Area Temperature Monitoring."<br>IF a temperature point exceeds the High limit, PERFORM the following:<br>a. TREND the affected point twice per shift.<br>b. DETERMINE the cause for increased temperature and PERFORM actions necessary to reduce temperature below the High limit including:<br>1) NOTIFY Maintenance to install a temporary blower.<br>2) NOTIFY OMOC, I&C, etc.<br>IF a temperature point exceeds the TRM limit, NOTIFY the SM to review TRM 3.7.14, INITIATE a Condition Report, and REQUEST Engineering perform an assessment relative to operability/functionality of equipment in the affected areas.<br>c. ECS–T8010BU is a backup point to primary point ECS–T137 for pressurizer cubicle (CS–03).<br>d. The boric acid system *cannot* be credited for TRM 3.1.2.1, 3.1.2.5, and borated flowpaths (SP 3604C.2–002) if the boric acid transfer pump room temperature OR boric acid storage tank room temperature is less than 67°F.<br>e. All other low temperature conditions are *not* a concern of the EEQ program. |
| **Note 7:** | CHANNEL CHECK shall consist of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once per<br>24 hours on day on which continuous, periodic, or batch releases are made. Minimum possible circulating and service water dilution flow during periods of open cycle blowdown is two circulating water pumps and two service water pumps. |
| **Note 8:** | IF the process flow monitor is out of service, CALCULATE HVR10A and B stack flow using SP 3670.1–003, "3HVR*10A & 3HVR*10B Stack Flow Surveillance."<br>Flows outside of listed Acceptance Criteria can be expected to occur during outage conditions. IF flows are outside of listed Acceptance Criteria for more than three days, DETERMINE expected flow per SP 3670.1–003. Measured flow should be within 25% of the expected flow.<br>IF process flow fails to meet Channel Check acceptance criteria (high or low), Refer To OP 3250.62 Section "Removing/Restoring Process Flow Indication from Service for Kaman HRH/HRN Radiation Monitors (3HVR10 and 3HVR19)."<br>With Process Flow instrument removed from service and rad monitors still in service, minimum process flow is reported to the Rad Monitor to ensure conservative particulate sampling. |
| **Note 9:** | IF sampler flow monitoring is out of service, REQUEST Chemistry connect a temporary sample pump and flow device.<br>PERFORM SP 3670.1–013, "Temporary Sampling Surveillance." |

# MODE 5/6/0 Daily and Shiftly Control Room Rounds

| | |
|---|---|
| **Note 10:** | During core reload, the first two fuel assemblies must be placed next to each Westinghouse source range detector. The CHANNEL CHECK for source range includes:<br><br>Two Source Range Neutron Flux Monitors shall be OPERABLE with continuous visual indication in the control room,<br><br>AND<br><br>One with audible indication in the containment and the control room. (Containment audible indication is available *only* with the Westinghouse source range channels).<br><br>One Gamma–Metrics source range channel may be used to satisfy the Mode 6 source range neutron flux monitoring requirement provided that the channel is "coupled" to the core (see definition of "nuclear coupling" in SP 3670.1, "Control Room and PEO Surveillance"). Contact Reactor Engineering to determine if the Gamma–Metrics source range channel is coupled to the core. |
| **Note 11:** | Checklist required to be performed daily AND prior to removing any system required to support the Key Safety Systems credited on previous Shutdown Safety Assessment Checklist, as specified in OP 3260A, "Conduct of Outages." |
| **Note 12:** | North is the "fail" value of wind direction indicator. IF wind direction indicators have consecutive readings of 360°, this may indicate faulty readings. NOTIFY U2 SM and U2 I&C of problem. |
| **Note 13:** | IF sampler flow monitoring is out of service, REQUEST Chemistry connect a temporary sample pump and flow device per REMODCM Table V.C.–3. Refer To SP 3670.1–015, "3HVQ*RE49 Temporary Sampling Surveillance." |
| **Note 14:** | IF count rate <1.0 cps, Refer To TRM 8.1 (COLR) Section for "Shutdown Margin Monitor Alarm Setpoint" and DETERMINE the required minimum count rate for the current T/S LCO (3.3.5.a, 3.3.5.b.1, or 3.3.5.b.2). and Refer To the RE Curve and Data Book, "Miscellaneous Core Data," and DETERMINE the current Alarm Ratio setting. |
| **Note 15:** | N/A Accumulators *not* used. IF DISC Pressurization *not* in Service, N/A all four accumulators. |
| **Note 16:** | Refer To T/S figures 3.4–4a and 3.4–4b. |
| **Note 17:** | Required when Cold Overpressure Protection is in service AND the reactor head is on the vessel. |
| **Note 18:** | IF the process flow monitor is out of service, CALCULATE HVR19B stack flow using SP 3670.1–005, "3HVR*RE19A & 3HVR*RE19B SLCRS Stack Flow Surveillance."<br>IF process flow fails to meet Channel Check acceptance criteria (high or low), Refer To OP 3250.62 Section "Removing/Restoring Process Flow Indication from Service for Kaman HRH/HRN Radiation Monitors (3HVR10 and 3HVR19)."<br>With Process Flow instrument removed from service and rad monitors still in service, minimum process flow is reported to the Rad Monitor to ensure conservative particulate sampling. |
| **Note 19:** | IF sampler flow monitoring is out of service, REQUEST Chemistry connect a temporary sample purge and flow device IAW SP 3670.1–016, "3HVR*RE19B Temporary Sampling Surveillance." |
| **Note 20:** | This applies to TRM 3.6.1.6 , "Containment Structural Integrity," which is applicable in MODEs 1, 2, 3 and 4, but needs to be recorded in all MODEs. The level should be less than the associated high level alarm setpoint (SRW–16 or SRW–18). IF *not*, the guidance in the associated Priority Alarm response should be followed. |

| | |
|---|---|
| **Note 21:** | MONITOR Ultimate Heat Sink (i.e. Long Island Sound / Service Water) temperature as follows:<br>• IF both RPCCW trains are in service, OBTAIN UHS temperature from the following:<br>  • PPC point CVUHSTEMP (preferred)<br>  • The higher reading of local instruments 3SWP–TIT47A and 3SWP–TIT47B (alternate)<br>• IF only one (1) RPCCW train is in service, OBTAIN UHS temperature from the in–service RPCCW train:<br>  • PPC point CVSWP–T47A or CVSWP–T47B (preferred)<br>  • Local instruments 3SWP–TIT47A or 3SWP–TIT47B (alternate) |
| **Note 22:** | With Service Water (i.e. UHS) temperature >80°F, the Service Water cross–tie to Control Building Chill Water is *not* functional and *cannot* be credited for TRM 3.7.7.1, "Control Room Emergency Ventilation." |

MILLSTONE POWER STATION
SURVEILLANCE PROCEDURE

# Containment Boundary During Movement of Fuel within the Containment Building

SP 3613F.3

Rev. 005-02

STOP THINK ACT REVIEW

Approval Date: 5/22/08

Effective Date: 6/26/08

Level of Use
Information

Millstone Unit 3
Surveillance Procedure

# Containment Boundary During Movement of Fuel within the Containment Building

## TABLE OF CONTENTS

1. PURPOSE

1.1 **Objective**

This procedure provides instructions to verify control of containment penetrations prior to and during Movement of Fuel within the Containment Building to meet the requirements of T/S 4.9.4.a. 02

1.2 **Discussion**

OP 3250.12 is an administrative aid that *exceeds* the requirement of the Technical Specification Acceptance Criteria in SP 3613F.3, "Containment Boundary During Movement of Fuel within the Containment Building." If the conditions of OP 3250.12 are *not* met, an evaluation must be performed to determine if the Technical Specification Acceptance Criteria is satisfied per SP 3613F.3. For example, OP 3250.12 requires components used to provide a boundary be red tagged. If the tag is cleared or lifted, but the boundary is *not* breached, SP 3613F.3 T/S Acceptance Criteria is still met. 01 02 01

Once containment boundary is established per OP 3250.12, the penetrations are *not* required to be physically checked. Only a verification of the tag clearances is required.

1.3 **Applicability**

This procedure may be performed in MODEs 5, 6, and 0.

1.4 **Frequency**

At least once per 7 days during Movement of Fuel within the Containment Building. 02

2. PREREQUISITES

2.1 **General**

2.1.1 The "Test Authorized By" block has been signed on SP 3613F.3–001.

2.2 **Documents**

2.2.1 OP 3250.12, "Establishing Containment Boundary for Movement of Fuel within the Containment Building" 02

3. PRECAUTIONS

3.1 N/A

## 4. INSTRUCTIONS

4.1 VERIFY "General Prerequisites" have been completed and INITIAL SP 3613F.3–001.

4.2 IF establishing containment boundary, Refer To SP 3613F.3–001 and PERFORM the following for each penetration:

4.2.1 Refer To OP 3250.12, "Establishing Containment Boundary for Movement of Fuel within the Containment Building,"and PERFORM actions to establish Containment Boundary. (02)

4.2.2 ATTACH OP 3250.12, (Att.), "Containment Boundary Master Sign–off Sheet," to SP 3613F.3–001.

4.2.3 INITIAL for T/S Acceptance Criteria met.

4.3 IF verifying containment boundary, Refer To SP 3613F.3–001, and PERFORM the following for each penetration:

4.3.1 Refer To OP 3250.12, "Establishing Containment Boundary for Movement of Fuel within the Containment Building," and VERIFY tags are in place for containment boundaries. (02)

4.3.2 IF system operating boundary is selected, VERIFY proper system status as described in OP 3250.12 (Att), "Containment Penetration Validation."

4.3.3 IF isolation valve is required to be closed for containment boundary and is *not* tagged or open under Administrative Controls, VERIFY valve is closed.

4.3.4 ATTACH OP 3250.12 (Att), "Containment Boundary Master Sign–off Sheet," to SP 3613F.3–001.

4.3.5 INITIAL for T/S Acceptance Criteria met.

**– End of Section –**

5. REVIEW AND SIGNOFF

5.1 Review and signoff for this procedure is located on SP 3613F.3–001.

6. REFERENCES

6.1 Technical Specifications

6.1.1 T/S 3.9.4, "Refueling Operations, Containment Penetrations"

6.1.2 T/S 4.9.4.a,"Refueling Operations, Containment Penetrations"

6.2 Procedures

6.2.1 OP 3250.12, "Establishing Containment Boundary for Movement of Fuel within the Containment Building." (02)

7. SUMMARY OF CHANGES

Revision 005–02

7.1 New title to reflect that surveillance requirement removes reference to core alterations.

7.2 Changed references in title of OP3250.12

Revision 005–01

7.3 Modified Discussion paragraph regarding tagged boundaries and SP 3613F.3 acceptance criteria based upon Operations feedback in 3R11.

Revision 005

7.4 New title to reflect that surveillance requirement includes movement of any fuel in Containment, not just irradiated fuel.

7.5 Changed T/S Reference to T/S 4.9.4.a to match actual surveillance requirement.

7.6 Deleted requirement to perform SP 3613F.2 or manually isolate Containment Purge and Exhaust penetrations. T/S Amendment 219 modified T/S 3.9.4 to eliminate separate requirements for this penetration. These penetrations are treated like other penetrations.

7.7 Deleted SP 3613F.2 and OP 3250.12 (Att) from References Section. SP 3613F.2 is no longer referenced in this procedure and OP 3250.12 is already listed.

7.8 Added "for each penetration" in step 4.2 as this is the same process as 4.3.

**Form Approval**

| Approval Date | Effective Date |
|---|---|
| 7/1/08 | 7/24/08 |

# Surveillance Form

**Generic Information**

| Form Title | | | Rev. No. |
|---|---|---|---|
| **Containment Boundary during Movement of Fuel within the Containment Building** | | | 006-01 |
| Reference Procedure | Applicable Tech. Spec./TRM | Applicability (Tech. Spec./TRM) | Frequency |
| SP 3613F.3 | T/S 4.9.4.a | ALL MODEs | W* |

(01)

**Specific Information**

| | | | |
|---|---|---|---|
| Schedule Start Date | | AWO Number | Mntc Restoration ☐ Yes ☐ No |
| Performance Modes 5, 6, or 0 | Prerequisites Completed (Initials) | Precautions Noted (Initials) | |
| Test Authorized By | | Date | Partial Surveillance ☐ Yes ☐ No |
| Performed By | | Date | |
| Accepted By | | Date | Acceptance Criteria Satisfied ☐ Yes ☐ No |
| Approved By (Department Head or Designee) | | Date | |

**Surveillance Information**

CR# ____________

| Test Equipment Type | ID Number | Cal Due Date |
|---|---|---|
| N/A | | |

**Comments**

* During movement of fuel within the containment building.

## Containment Boundary during Movement of Fuel within the Containment Building

**NOTE**

OP 3250.12, "Containment Boundary During Movement of Fuel within the Containment Building," *exceeds* the requirement of this Technical Specification Acceptance Criteria. If the conditions of OP 3250.12 are *not* met, an evaluation must be performed to determine if this Technical Specification Acceptance Criteria is satisfied. 01

| ACCEPTANCE CRITERIA | Initials |
|---|---|
| The equipment access hatch is closed and held in place by a minimum of four bolts, or open under administrative control and capable of being closed and held in place by a minimum of four bolts.<br>AND<br>Any closed hatch penetrations do <u>not</u> provide direct access from the containment atmosphere to the outside atmosphere. | |
| A minimum of one door in the personnel access hatch is closed.<br>OR<br>The personnel access hatch shall be capable of being closed by an OPERABLE personnel access hatch door, under administrative control. | |
| Each penetration providing direct access from the containment atmosphere to the outside atmosphere (except the equipment access hatch and the personnel access hatch) shall be closed by an isolation valve, blind flange, or manual valve, or be capable of being closed under administrative control. | |

MILLSTONE POWER STATION
SURVEILLANCE PROCEDURE

# Initial Refueling Requirements

**SP 3672.2**

**Rev. 005–00**

STOP THINK ACT REVIEW

Approval Date: 4/25/13

Effective Date: 4/28/13

Level of Use
Information

Millstone Unit 3
Surveillance Procedure

# Initial Refueling Requirements

## TABLE OF CONTENTS

1. PURPOSE

1.1 **Objective**

This procedure provides a list of all initial refueling requirements to be fulfilled prior to movement of any fuel or core alterations.

1.2 **Discussion**

T/S and TRM requirements for refueling and core alterations are fulfilled by performance of various Operations surveillance procedures and maintenance procedures. This procedure tracks completion and provides verification of T/S and TRM requirements being fulfilled prior to movement of any fuel or core alterations.

Failure to meet surveillance requirements can cause a delay or suspension of core alterations.

1.3 **Applicability**

This procedure is performed in MODE 5 or 6 for applicability in MODE 6.

1.4 **Frequency**

Refueling

2. PREREQUISITES

2.1 **General**

N/A

2.2 **Definitions**

2.2.1 $C_b$ – boron concentration

3. PRECAUTIONS

N/A

## 4. INSTRUCTIONS

4.1 Refer To Attachment 1, "Initial Refueling Requirements," and PERFORM the following:

4.1.1 ENSURE all initial refueling requirements are fulfilled within the required time limitations.

4.1.2 INITIAL and DATE to indicate requirement has been satisfied.

4.2 Refer To Attachment 2, "Initial Refueling Surveillances," and PERFORM the following:

4.2.1 ENSURE all surveillance requirements specified are complete.

a. IF a surveillance is performed at the end of the surveillance window AND surveillance fails, ENSURE surveillance will not cause suspension of core alterations.

b. IF a failed surveillance will cause suspension of core alterations, ENSURE surveillance is performed prior to core alteration.

4.2.2 INITIAL and DATE to indicate surveillance requirement has been satisfied.

4.3 WHEN requirements are completed, REQUEST SM/US REVIEW Attachment 1, "Initial Refueling Requirements" and Attachment 2, "Initial Refueling Surveillances."

**– End of Section –**

5. <u>REVIEW AND SIGNOFF</u>

5.1 The review and signoff for this procedure is located on Attachment 1, "Initial Refueling Requirements," and Attachment 2, "Initial Refueling Surveillances."

6. <u>REFERENCES</u>

6.1 Technical Specifications and TRM

6.1.1 T/S 3.7.7, "Control Room Emergency Ventilation System"

6.1.2 T/S 4.9.1.1.1, "Refueling Operations, Boron Concentration"

6.1.3 T/S 4.9.1.2, "Refueling Operations, Boron Concentration"

6.1.4 T/S 4.9.2, "Refueling Operations, Instrumentation"

6.1.5 T/S 4.9.3, "Refueling Operations, Decay Time"

6.1.6 T/S 4.9.4, "Refueling Operations, Containment Building Penetrations"

6.1.7 T/S 4.9.10, "Refueling Operations, Water Level – Reactor Vessel"

6.1.8 TRM 4.9.5, "Refueling Operations, Communications"

6.1.9 TRM 4.9.6, "Refueling Operations, Refueling Machine"

6.2 FSAR

6.2.1 Section 9.1.4, "Fuel Handling System"

6.2.2 Section 7.6.2, "Refueling Interlocks"

6.2.3 Section 7.6.10, "Shutdown Margin Monitor"

6.2.4 Section 7.2, "Reactor Trip System"

6.3 Procedures

6.3.1 OP 3209A, "Reactivity Calculations – Estimated Critical Conditions"

6.3.2 OP 3314F, "Control Building Heating, Ventilation, Air Conditioning and Chill Water"

6.3.3 SP 3603A.1, "Testing of the Spent Fuel Bridge Fuel Overload"

6.3.4 SP 3603A.2, "Testing of the New Fuel Handling Crane Limit Switches"

6.3.5 SP 3603C.1, "Refueling Machine Operability Test"

6.3.6 SP 3603C.2, "Auxiliary Hoist Operability Test"

6.3.7 SP 3604A.1, "A Charging Pump Operability Readiness Test"

6.3.8 SP 3604A.2, "B Charging Pump Operability Readiness Test"

6.3.9 SP 3604A.3, "C Charging Pump Operability Readiness Test"

6.3.10 SP 3604C.2, "Borated Water Source Flow Path Verification – Monthly"

6.3.11 SP 3604C.6, "Valve Closure Verification for Chemical and Volume Control System Dilution Flow Paths"

6.3.12 SP 3613F.3, "Containment Boundary During Core Alterations or Movement of Irradiated Fuel"

6.3.13 SP 3614F.1, "Control Room Emergency Filtration System Operability Test"

6.3.14 SP 3614F.2, "Control Room Emergency Ventilation Pressurization"

6.3.15 SP 3646A.1, "Emergency Diesel Generator A Operability Test"

6.3.16 SP 3646A.2, "Emergency Diesel Generator B Operability Test"

6.3.17 SP 3646A.5, "Offsite Power Transfer Operability Test"

6.3.18 SP 3646B.5, "Diesel Generator Fuel Oil Storage Tank Dewatering and Sample"

6.3.19 C SP 600.5, "Fuel Oil Delivery Sampling Requirement"

6.3.20 SP 3646B.8, "Emergency Generator Fuel Oil Particulate Sample Analysis"

6.3.21 SP 3863, "Reactor Coolant System and Reactor Vessel Cavity Analysis for Boron Concentration"

6.3.22 SP 3441E01, "Gamma–Metric Neutron Flux/Shutdown Margin Monitor Channel Calibration"

6.3.23 C SP 750, "Battery Weekly and Quarterly Surveillance"

6.3.24 C SP 760 "Battery Discharge Test"

6.3.25 SP 3712NC, "Vital Battery Charger Surveillance Load Testing"

## 7. SUMMARY OF CHANGES

### 7.1 **Revision 005–00**

7.1.1 This revision incorporated all previous changes have been incorporated into this revision.

7.1.2 Removed TRM 4.9.7 for New Fuel handling crane limit switch testing for SP 3603A.2 from Attachment 1. OPS FS–303G prerequisite requires completion of SP 3603A.2 within seven days.

7.1.3 Removed IC 3441C12 procedure from Reference section procedure has been voided. Revised 6.3.23 and 6.3.25 changed number of procedure in accordance with EDMS.

## Attachment 1
## Initial Refueling Requirements
(Sheet 1 of 2)

| T/S or TRM Reference | Requirement | Applicable Procedure | Time Limit | Date/Time Performed | Initial/ Date |
|---|---|---|---|---|---|
| 3.7.7 | Two independent Control Room Emergency Air Filtration Systems shall be OPERABLE and aligned for automatic operation | OP 3314F | N/A | | |
| 4.9.3 | Initial reactor subcritcallity achieved:<br>TIME: __________<br>DATE: __________ | N/A | $\geq$100 hours | N/A | |
| TRM 4.9.7 | Spent fuel pool bridge crane interlocks and limit switch tests performed | SP 3603A.1 | within the last 7 days | | |
| 4.9.1.1.1 | The more restrictive of the following:<br>• $C_b$ equivalent for $K_{eff} \leq 0.95$<br>or<br>• $C_b \geq 2{,}600$ ppm (Note 1)<br>Actual $C_b$ __________<br>Date/Time | Curve Book Miscellaneous Core Data | N/A | N/A | |
| 4.9.4 | Containment integrity set | SP 3613F.3 | within the last 7 days | | |
| 4.9.2.b | Gamma−Metrics/Source range channel calibration performed for the credited channel | IC 3441C01<br>IC 3441E01 | within the last 18 months | | |
| 4.9.10 | Reactor cavity water level is $\geq$ 23 feet above reactor vessel flange | SP 3670.1−009 (Station 249) | within the last 24 hours | | |
| TRM 4.9.5 | Direct communications have been established between Control Room and refueling station | N/A | within the last 1 hour | | |

Note 1: The requirement of OP 3210A, Refueling Preparation," is that the RCS is borated to greater than or equal to 2700 ppm. This is consistent with the TRM requirement for boron concentration in the RWST and allows the RCS/refueling cavity to be pumped back to the RWST without diluting the RWST to less than 2700 ppm.

# Attachment 1
## Initial Refueling Requirements
(Sheet 2 of 2)

| T/S or TRM Reference | Requirement | Applicable Procedure | Time Limit | Date/Time Performed | Initial/ Date |
|---|---|---|---|---|---|
| 4.9.2.a | 2 source range nuclear instruments OPERABLE with continuous visual indication in the Control Room<br><br>(N/A if no fuel in the core) | N/A | within the last 12 hours | | |
| 4.9.2 | 1 source range nuclear instrument with audible indication in the Control Room and Containment<br><br>(N/A if no fuel in the core) | N/A | within the last 12 hours | | |
| 4.9.1.2 | Boron concentration is greater than or equal to 800 ppm in the spent fuel pool | SP 3863 | within the last 7 days | | |

Comments: ______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

Completed by: ____________________ / ____________________
Name (print) Signature

Completed by: ____________________ / ____________________
Name (print) Signature

Reviewed by: ________________________________ (SM/US)
Signature

## Attachment 2
## Initial Refueling Surveillances
(Sheet 1 of 2)

1. CHECK the following surveillances have been performed:

| Form | Description | Initial/Date |
|---|---|---|
| SP 3604A.1–001<br>or<br>SP 3604A.2–001<br>or<br>SP 3604A.3–001 | Charging pumps | |
| SP 3604C.2–001<br>or<br>SP 3604C.2–002 | Boration from RWST or BAT | |
| SP 3604C.6–002 | Valve closure verification for CVCS dilution flow path | |
| 3614F.1–001 | Control Room Emergency Filtration System Operabilty Test – Train A | |
| 3614F.1–002 | Control Room Emergency Filtration System Operabilty Test – Train B | |
| SP 3646A.1–001<br>or<br>SP 3646A.2–001 | Emergency diesel generator Train A OPERABLE | |
| | Emergency diesel generator Train B OPERABLE | |
| SP 3646A.5–001 | Offsite power transfer – Train A | |
| SP 3646A.5–003 | Offsite power transfer – Train B | |
| SP 3646B.5–001 | Fuel oil storage tank A dewatering | |
| SP 3646B.5–002 | Fuel oil storage tank B dewatering | |
| C SP 600.5–001 | QA Diesel Fuel Oil Delivery Tracking Form | |
| C SP 600.5–002 | QA Diesel Fuel Oil sample results follow–up | |
| SP 3646B.8–002<br>or<br>SP 3646B.8–004 | Diesel fuel oil particulate results – Train A | |
| | Diesel fuel oil particulate results – Train B | |

# Attachment 2
## Initial Refueling Surveillances
(Sheet 2 of 2)

| Form | Description | Initial/Date |
|---|---|---|
| C SP 750–004 | Battery Quarterly Surveillance | |
| C SP 760–005<br>C SP 760–006<br>C SP 760–007<br>C SP 760–008 | Battery 18 Month Surveillance | |
| SP 3712NC–001 | Vital Battery Charger Surveillance Load Testing | |
| C SP 760–005<br>C SP 760–006<br>C SP 760–007<br>C SP 760–008 | Battery Performance Discharge Test (5 year) | |
| SP 3441E01–001 | Gamma–Metric Neutron Flux Shutdown Margin Monitor Channel 1 Calibration (only if credited channel) | |
| SP 3441E01–002 | Gamma–Metric Neutron Flux Shutdown Margin Monitor Channel 2 Calibration (only if credited channel) | |

Comments: ______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

Completed by: ____________________ / ____________________
Name (print) Signature

Completed by: ____________________ / ____________________
Name (print) Signature

Reviewed by: ________________________________________ (SM/US)
Signature

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Check Refueling Admin Requirements

JPM Number: 2017 NRC SRO A.1.2 Revision: 0

Initiated:

Robert Royce

Developer 8/17/17

Date

Reviewed:

Dave Minnich

Technical Reviewer 8/17/17

Date

Reviewed:

Broder

Technical Reviewer 8/22/17

Date

Approved:

M.J. Cote

Supervisor, Nuclear Training 8/22/17

Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Original issue (new) | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC SRO A.1.2 Revision: 0

Task Title: Check Refueling Admin Requirements

Admin Area Conduct of Operations

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 30

Applicable To: SRO X RO ______

K/A Number: 2.1.40 K/A Rating: 2.8 / 3.9

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Given a specific set of plant conditions, correctly determine the status of Refueling Admin Requirements

Required Materials: (procedures, equipment, etc.)

OP 3210A, Rev 14-3
OP 3210B, Rev 10-4
SP 3613F.3, Rev 05-2
SP 3613F.3-001, Rev 06-1
SP 3672.2, Rev 005-00
MP3 Technical Specifications, Section 9, Refueling Operations
SP 3670.1-017, MODE 5/6/0 Daily and Shiftly Control Room Rounds

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC SRO A.1.2 Revision : 0

Initial Conditions: Current Conditions:

- The plant is in MODE 6.
- The Reactor has been subcritical for 200 hours.
- Refueling Cavity level is 49 feet, 10 inches.
- Refueling Cavity Boron concentration is 2800 ppm.
- Fuel Pool Boron concentration is 2800 ppm.
- Westinghouse Source Range Channel N31 is out of service for surveillance testing.
- Both Gammametrics Channels are OPERABLE.
- The status of the Containment Equipment Hatch is as follows:
  - The hatch is open, open under administrative control.
  - It is estimated that the hatch is capable of being closed and bolted in place in 25 minutes.
  - Maintenance has reported the bolts used to bolt the hatch have been spilled, and currently only three bolts are available to bolt the equipment hatch.
  - It is estimated the remaining bolts can be retrieved and bolted in place in 45 minutes, if needed.
- The status of the Containment personnel access hatch is as follows:
  - Both personnel access hatch doors are open for personnel access to Containment, under administrative control.
  - Only one of the two personnel access hatch doors is OPERABLE. and capable of being closed.
- All other Containment penetrations providing direct access from the containment atmosphere to the outside atmosphere are closed by an isolation valve, blind flange, or manual valve.
- The "A"RHR loop is OPERABLE and in operation.
- The "B" RHR Pump has been tagged out for maintenance.
- Five hours ago, RHR flow was suspended for one hour to improve fuel pool visibility.
- Fifteen minutes ago, RHR flow was lowered from 4000 gpm to 2500 gpm to improve fuel pool visibility.
- The refueling team has established communications with the control room
- All other conditions are as expected for fuel movement.

The refueling team requests permission from the Refueling SRO to re-commence moving fuel, moving the next fuel bundle from the fuel building to the core.

Initiating Cues: As the refueling SRO, determine the following:

- All conditions that are required to be corrected in order to re-commence moving fuel.
- Which LCO ACTION(S), if any, which is/are required to be entered.
- What specific action(s), if any, other than stopping fuel movement is/are required to be taken based on any LCO ACTIONs that have been entered.

Record any required actions or reporting requirements as a result of your review at the bottom/back of this page.

Simulator Requirements: NONE

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the student to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the student states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question student for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the student be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.1.2 Revision: 0

Task Title: Check Refueling Admin Requirements

START TIME: ____________

| | | | | |
|---|---|---|---|---|
| **STEP #1** | Performance:<br>Obtains references, and determines correct sections to be used. | Standard:<br>Obtains OP 3210B.<br>Obtains Tech Specs and COLR.<br>May also obtain OP 3210A, SP3613F.3 and/or SP 3672.2 | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | If asked at any time during this JPM about any condition not specified in the initial conditions of this JPM, state, "All other conditions not specified in the Initial Conditions for this JPM are as expected for fuel movement." | | | |
| Comments: | The examinee is to assume all admin requirements not specified in the initial conditions for this JPM are met, since the initial conditions also state, "All other conditions are as expected for fuel movement."<br>The steps in this JPM may be performed in any order, and references may be obtained as needed. | | | |
| **STEP #2**<br>LCO 3.9.1.1 COLR | Performance:<br>An RCS boron concentration of greater than or equal to the limit specified in the CORE OPERATING LIMITS REPORT (COLR). | Standard:<br>Confirms actual RCS Boron concentration (2800 ppm) exceeds the required minimum amount specified in the COLR. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | If asked about Keff or CVCS Dilution Valve status, state "RE has confirmed Keff is <0.95, and the CVCS valves of Specification 4.1.1.2.2 are closed and secured in position." | | | |
| Comments: | The examinee may assume dilution valves are in the proper position, and that Keff is <0.95, since the initial conditions for this JPM stated that all other conditions are as expected for fuel movement.<br>The COLR is located in the Technical Requirements Manual, Appendix 8.1. | | | |

| STEP #3<br>LCO 3.9.1.2 | Performance:<br>The soluble boron concentration of the Spent Fuel Pool shall be greater than or equal to 800 ppm. | Standard:<br>Confirms actual Fuel Pool Boron concentration (2800 ppm) exceeds the required minimum amount of 800 ppm specified in Tech Specs. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |
| STEP #4<br>LCO 3.9.2<br>OP 3210B, Step 2.1.18 | Performance:<br>Two Source Range Neutron Flux Monitors shall be OPERABLE with continuous visual indication in the control room, and one with audible indication in the containment and control room. | Standard:<br>Determines that even with one Westinghouse SR NIS Channel INOPERABLE, Gammametrics is an acceptable substitute, and either Westinghouse channel is capable of providing audible indication in Containment and in the Control Room. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | If asked, "Reactor Engineering has determined that Gamma-Metrics source range channel is coupled to the core." | | | |
| Comments: | SP 3670.1-017 (MODE 5/6/0 CR logs) and Tech Spec bases clarifies TS LCO 3.9.2.<br>One Gamma---Metrics source range channel may be used to satisfy the Mode 6 source range neutron flux monitoring requirement provided that the channel is "coupled" to the core. | | | |
| STEP #5<br>LCO 3.9.3. | Performance:<br>The reactor shall be subcritical for at least 100 hours. | Standard:<br>Confirms actual time subcritical (200 hours) exceeds the required minimum time of 100 hours specified in Tech Specs. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #6**<br>LCO 3.9.4.a<br>SP 3613F.3-001 | Performance:<br>The containment building penetrations shall be in the following status:<br>The equipment access hatch shall be either:<br>1. closed and held in place by a minimum of four bolts, or<br>2. open under administrative control * and capable of being closed and held in place by a minimum of four bolts,<br>* Administrative controls shall ensure that appropriate personnel are aware that the equipment access hatch penetration, personnel access hatch doors and/or other containment penetrations are open, and that a specific individual(s) is designated and available to close the equipment access hatch penetration, a personnel access hatch door and/or other containment penetrations within 30 minutes if a fuel handling accident occurs. | Standard:<br>Recognizes the Containment Equipment Hatch status will NOT allow movement of fuel in Containment, since, even though other admin controls are in place, having only three bolts that can be bolted in place within 30 minutes does NOT meet the minimum requirement of four bolts. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | Examinee must recognize that a minimum of four bolts are required within 30 minutes to meet this requirement. | | | |
| **STEP #7**<br>LCO 3.9.4.b<br>SP 3613F.3-001 | Performance:<br>A personnel access hatch shall be either:<br>1. closed by one personnel access hatch door, or<br>2. capable of being closed by an OPERABLE personnel access hatch door, under administrative control* | Standard:<br>Determines that even with one personnel Access Door INOPERABLE, and both doors open, the Access Hatch is acceptable, since admin controls are in place, and one door is OPERABLE. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| STEP #8<br>LCO 3.9.4.c.<br>SP 3613F.3-001 | Performance:<br>Each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be either:<br>1. Closed by an isolation valve, blind flange, or manual valve, or<br>2. Be capable of being closed under administrative control.* | Standard:<br>Recalls from JPM initial conditions that each of these penetrations are are closed by an isolation valve, blind flange, or manual valve, or asks the Control Room to confirm the state of these penetrations. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | If asked to verify status of these penetrations, state, "Each of these penetrations are closed by an isolation valve, blind flange, or manual valve." | | | |
| Comments: | The examinee may recall from the initial conditions that these paths are isolated. | | | |

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #9**<br>LCO 3.9.8.1 and 3.9.8.2<br>OP 3210B, Step 2.1.15<br>OP 3210A, Att. 2. | At least one residual heat removal (RHR) loop shall be OPERABLE and in operation.*<br>Applicability: MODE 6, when the water level above the top of the reactor vessel flange is greater than or equal to 23 feet.<br><br>Two independent residual heat removal (RHR) loops shall be OPERABLE, and at least one RHR loop shall be in operation.*<br>Applicability: MODE 6, when the water level above the top of the reactor vessel flange is less than 23 feet. | Determines that LCO 3.9.8.1 applies, rather than LCO 3.9.8.2, since water level is above the top of the reactor vessel flange by $\geq$ 23 feet.<br>Determines that it is acceptable to have one RHR Pump INOPERABLE, since adequate refueling cavity level exists, since only one RHR loop is required. | Y ☐ N ☒ | S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #10**<br>LCO 4.9.8.1.1, plus NOTE for LCO 3.9.8.1<br>OP 3210B, Step 3.9 and 3.10 | At least one RHR loop shall be verified in operation and circulating reactor coolant at a flow rate of greater than or equal to 2800 gpm at the frequency specified in the Surveillance Frequency Control Program.<br>*The RHR loop may be removed from operation for up to 1 hour per 8-hour period, provided no operations are permitted that could cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.1. | Determines that current RHR flowrate (2500 gpm) is **below the minimum flow** required by Surveillance Requirement 4.9.8.1.1 (2800 gpm).<br><br>This is acceptable per the Note associated with LCO 3.9.8.1, up to a maximum of 1 hour per 8-hour period.<br>Recognizes this 1 hour flow allowance was used up 5 hours ago, so RHR flow is required to be increased before commencing fuel movement. | Y ☒ N ☐ | S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #11**<br>LCO 3.9.10<br>OP 3210A, Att. 2. | Performance:<br>At least 23 feet of water shall be maintained over the top of the reactor vessel flange. | Standard:<br>Determines level given in the Initial Conditions (49', 10") is above the top of the reactor vessel flange by $\geq$ 23 feet, | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #12**<br>LCO 3.9.11 through 3.9.14 | Performance<br>Water Level - Storage Pool<br>Spent Fuel Pool – Reactivity<br>Spent Fuel Pool - Storage Pattern | Standard:<br>Recognizes from the JPM Initial Conditions that there are no abnormal conditions in the Spent Fuel Pool | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | If asked about the status of conditions in the Spent Fuel Pool, state, "All conditions in the Spent Fuel Pool are as expected for fuel movement." | | | |
| Comments: | The examinee may assume that all conditions in the Spent Fuel Pool are acceptable, since the initial conditions for this JPM stated that all other conditions are as expected for fuel movement. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #13**<br>Required LCO ACTIONS | Performance:<br>• Determine which LCO ACTION(S), if any, which is/are required to be entered.<br><br>• Determine what specific action(s), other than stopping fuel movement that is/are required to be taken based on any LCO ACTIONs that have been entered, if any. | Standard:<br>Logs into<br>1. LCO 3.9.4.a ACTION and<br>2. 3.9.8.1 ACTION,<br><br>Actions required beyond stopping fuel movement are from 3.9.8.1 ACTION, which requires the crew to:<br>1. Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1, and<br>2. Immediately initiate corrective action to return the required RHR loop to OPERABLE and operating status as soon as possible. Also,<br>3. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #14** | Performance:<br>Notify the Control Room. | Standard:<br>Reports that issues with the Containment Equipment Hatch and RHR flow prevent fuel movement, and reports required ACTIONS per LCO 3.9.4.a and 3.9.8.1, including specific actions required. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

**TERMINATION CUE: The evaluation for this JPM is complete.**

STOP TIME: _________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.1.2 Revision: 0

Task Title: Check Refueling Admin Requirements

Date Performed: ____________

Examinee: ____________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | 30 | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## STUDENT HANDOUT

JPM Number: 2017 NRC SRO A.1.2 Revision: 0

Initial Conditions: Current Conditions:

- The plant is in MODE 6.
- The Reactor has been subcritical for 200 hours.
- Refueling Cavity level is 49 feet, 10 inches.
- Refueling Cavity Boron concentration is 2800 ppm.
- Fuel Pool Boron concentration is 2800 ppm.
- Westinghouse Source Range Channel N31 is out of service for surveillance testing.
- Both Gammametrics Channels are OPERABLE.
- The status of the Containment Equipment Hatch is as follows:
  - The hatch is open, open under administrative control.
  - It is estimated that the hatch is capable of being closed and bolted in place in 25 minutes.
  - Maintenance has reported the bolts used to bolt the hatch have been spilled, and currently only three bolts are available to bolt the equipment hatch.
  - It is estimated the remaining bolts can be retrieved and bolted in place in 45 minutes, if needed.
- The status of the Containment personnel access hatch is as follows:
  - Both personnel access hatch doors are open for personnel access to Containment, under administrative control.
  - Only one of the two personnel access hatch doors is OPERABLE. and capable of being closed.
- All other Containment penetrations providing direct access from the containment atmosphere to the outside atmosphere are closed by an isolation valve, blind flange, or manual valve.
- The "A"RHR loop is OPERABLE and in operation.
- The "B" RHR Pump has been tagged out for maintenance.
- Five hours ago, RHR flow was suspended for one hour to improve fuel pool visibility.
- Fifteen minutes ago, RHR flow was lowered from 4000 gpm to 2500 gpm to improve fuel pool visibility.
- The refueling team has established communications with the control room
- All other conditions are as expected for fuel movement.

The refueling team requests permission from the Refueling SRO to re-commence moving fuel, moving the next fuel bundle from the fuel building to the core.

Initiating Cue: As the refueling SRO, determine the following:

- All conditions that are required to be corrected in order to re-commence moving fuel.
- Which LCO ACTION(S), if any, which is/are required to be entered.
- What specific action(s), if any, other than stopping fuel movement is/are required to be taken based on any LCO ACTIONs that have been entered.

Record any required actions or reporting requirements as a result of your review at the bottom/back of this page.

STA completes

Dominion

*Millstone Unit 3 Shutdown Safety Assessment (SSA) Checklist*

**OU-M3-201 – Attachment 1** **Page 1 of 8**

**Section 1**

**Protected Train A / B** *(Circle one or both)*

☐ Single train exception in effect

| | |
|---|---|
| Date/Time Performed: ________ / ________ | Date/Time of Shutdown: ________ / ________ |
| ☐ Actual Conditions | Days Shutdown: ________ |
| ☐ Predicted Conditions for ________ | Reason for SSA (e.g., 00:00 hour, mode change, configuration changes): |

| | | | |
|---|---|---|---|
| Required RCS/Refueling Cavity Boron Concentration | ________ PPM | Required SFP Boron Concentration | ________ PPM |
| Actual RCS/Refueling Cavity Boron Concentration | ________ PPM | Actual SFP Boron Concentration | ________ PPM |
| Actual Greater than Required | ☐ Yes ☐ No | Actual Greater than Required | ☐ Yes ☐ No |

**Section 2**

| **Time To Core Boil** | **Spent Fuel Pool Heatup Time** |
|---|---|
| ☐ RCS Pressure: _____ psia | ☐ SFP Temp: _____ °F |
| ☐ RCS Temp: _____ °F | ☐ > 80 fuel assemblies transferred to SFP |
| ☐ RCS Level: _____ feet above/below flange | ☐ >145 fuel assemblies transferred to SFP |
| ☐ RCS Time to Boil: ________ | ☐ SFP Time to 150°F _____ hours |
| ☐ NA (Mode 0) | ☐ SFP Time to 200°F _____ hours |
| **Time To 200°F (EAL EA2 Criterion)** | |
| RCS Time to 200°F: ________ | |
| ☐ NA if not in Mode 5 or 6 | |
| **Time To Heatup 10°F (EAL EU1 Criterion)** | |
| RCS Time to Heatup 10°F: ________ | |
| ☐ NA if not in Mode 5 or 6 | |

**Section 3 Decay Heat Removal (DHR)**

**RCS DECAY HEAT REMOVAL (DHR)**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| | | | | *(Circle)* |
| ☐ 'A' Train RHR | (1) | ∅ | | |
| ☑ 'B' Train RHR | (1) | 1 | 0 | RED |
| | | | 1 | ORANGE |
| ☐ > 23' refuel cavity (> 40.4% adjusted level RCS-LI462) | (1) | | 2 | YELLOW |
| | | | 3 | GREEN |
| ☑ All conditions met to meet natural circulation in the RCS | (1) | 1 | | |
| ☐ RCS in Reduced Inventory Operation (Orange) | (-1) | ∅ | | |

☐ Additional Credited Charging Pump: A / B / C(O) / C(P) / NA *(Circle One)*

**RCS Decay Heat Removal Total** ☐ **NA for Mode 0**

**BEYOND DESIGN BASIS**

**NA for Mode 0**

**Mode 5**:

Steam Generator available for Decay Heat Removal:

☑ A ☑ B ☑ C ☑ D

AC Independent Aux Feedwater Pump:

☑ Terry Turbine ☐ BDB AFW Pump

☐ Pressurizer Safety Removed

AND

☑ BDB AFW Pump Available for RCS Injection

**Mode 6**:

☐ BDB AFW Pump pre-staged for injection into the RCS

**Transition Period**

☐ Transitioning to Natural Circulation or Bleed and Feed Cooling. Actions are in progress to establish a BDB heat removal method.

**Section 3 Decay Heat Removal (Continued)**

**SFP DECAY HEAT REMOVAL (SDR)**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| | | | | *(Circle)* |
| ☐ SFP Level > 23' above fuel (Tech Spec) (48'3" elev (6% SFC-LI26)) | (1) | ____ | 0 | RED |
| ☐ 'A' SFPC pump* | (1) | ____ | 1 | ORANGE |
| | | | 2 | YELLOW |
| ☐ 'B' SFPC pump* | (1) | ____ | 3 | GREEN |

*The SFPC pump must be powered from the normal power source to be credited.

**N/A if in MODE 5 OR core reload is complete**

**SFP Decay Heat Removal Total** $\boxed{\text{N/A}}$

**FUEL OFFLOAD REQUIRED EQUIPMENT (LA 182)**

| | Available Equipment *(Circle)* | | | |
|---|---|---|---|---|
| Protected train spent fuel cooling pump | N/A A | B | | |
| Non-protected train spent fuel cooling pump | A | B | | |
| Electrician's name or beeper number (if applicable) ______________________ | | | | |
| Two RPCCW pumps | A | B | C | |
| Two Service Water pumps | A | B | C | D |

Form No. 729450(Jul 2017)

*Millstone Unit 3 Shutdown Safety Assessment (SSA) Checklist*

**OU-M3-201 – Attachment 1** **Page 4 of 8**

**Section 4 Inventory Control**

**RCS Inventory Control**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| ☐ 'A' Train CHS with flow path A / C *(Circle)** | (1) | Ø | | *(Circle)* |
| ☑ 'B' Train CHS with flow path B / C *(Circle)** | (1) | 1 | 0 | RED |
| ☐ 'A' Train SIH aligned to RWST with either hot leg or cold leg injection path capability* | (1) | Ø | 1 | ORANGE |
| | | | 2 | YELLOW |
| ☑ 'B' Train SIH aligned to RWST with either hot leg or cold leg injection path capability* | (1) | 1 | 3-6 | GREEN |
| ☐ Both RHR trains available for DHR and both capable of alignment to the RWST* | (1) | Ø | | |
| ☐ One RHR train aligned to the RWST or capable for alignment using Section 4.8 of either SP 3606.2 or SP 3606.4 as applicable* | (1) | Ø | | |
| ☑ RCS Inventory > Decreased Inventory Conditions | (1) | 1 | | |
| ☐ RCS in Decreased Inventory Operation (at best Yellow) | | Ø | | |
| ☐ RCS in Reduced Inventory Operation (Orange) | (-1) | Ø | | |

**Inventory Control Total** 3

**NA for Mode 0**

☑ RWST level > 250,000 gallons

☑ 3RHS*V43, RHR to RWST recirculation tagged and locked closed (It is permissible to open this valve under administrative control if the RHR hot leg injection valve (3RHS*MV8716A/B) for the operating RHR pump connected to the RCS is closed with power lockouts off and valve handwheel locked.)

Tagout Number M3-31298

*Minimum defense in depth for this KSF: One CHS pump and one backup pump.

Form No. 729450(Jul 2017)

**Section 4 Inventory Control (Continued)**

**SFP Inventory Control**

| Check boxes for available equipment. | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| | | | | *(Circle)* |
| ☑ Gravity Makeup from the RWST (Level >800,000 gallons) | (1) | 1 | 0 | RED |
| ☐ 'A' Primary Grade Water System Pump and Makeup Flow Path | (1) | Ø | 1 | ORANGE |
| ☑ 'B' Primary Grade Water System Pump and Makeup Flow Path | (1) | 1 | 2 | YELLOW |
| ☑ Makeup Available from Fire Protection System (e.g., hose) | (1) | 1 | ≥3 | GREEN |

**SFP Inventory Control Total** 3

**Section 5 Reactivity Control**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| ☑ RCS Boron > required SDM* | (1) | 1 | | |
| ☑ Inventory flow paths* | (0,1,2) | 2 | | *(Circle)* |
| | | | 0-2 | RED |
| ☑ In Mode 5, at least one Shutdown Margin Monitor train operable or one channel source range with automatic or manual monitoring of count rate* | (1) | 1 | 3 | ORANGE |
| | | | 4 | YELLOW |
| | | | 5 | GREEN |
| ☐ In Mode 6, at least one** source range flux detector with automatic or manual monitoring of count rate* | (1) | N/A | | |
| ☑ Dilution paths tagged using SP 3604C.6 (may be opened under admin control) | (1) | 1 | | |

Tagout Number M3 - 31289

*Minimum defense in depth for this KSF: RCS Boron, two inventory flow paths, and one monitoring method.
**During core alterations two source range detectors are required to meet Technical Specifications.

**Reactivity Total** 5

**NA for Mode 0**

**Section 6 Containment**

**NOTE:** See OP 3260A, Attachment 6, Containment Penetration Tracking Sheet, and OP 3260A-005, Containment Boundary or RCS Integrity Work Log, or equivalent sheet from OP 3260A, for status of containment penetrations.

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| ☑ Containment Closure Capability | (0,2,3) | 2 | | |
| ☐ Containment Closure Set (3 points) | | | | *(circle)* |
| OR | | | | |
| ☑ Containment Closure Set with exceptions tracked and capable of being closed prior to the lesser of: | | | 0 | RED |
| | | | 1 | ORANGE |
| • Time to Core Boil (2 points) | | | 2 | YELLOW |
| OR | | | ≥3 | GREEN |
| • 4 hours (2 points) | | | | |
| OR | | | | |
| ☐ Containment Closure Set with administrative controls of OP 3250.12 during fuel movement within the containment building. (2 points) | | | | |
| ☑ No significant fuel failures indicated | (1) | 1 | | |
| ☑ No Core Alterations in progress in Containment | (1) | 1 | | |
| ☑ RCS Pressure Boundary intact | (1) | 1 | | |
| ☑ Low Decay Heat (>8 days Shutdown) | (1) | 1 | | |

**Containment Total** $\boxed{6}$

**NA for Mode 0**

**Section 7 Power Availability**

**Power Sources**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| On-site Power Source** | | | | |
| ☐ 'A' EDG* | (1) | Ø | | *(circle)* |
| ☑ 'B' EDG * | (1) | 1 | 0-1 | RED |
| ☐ SBO Diesel (Time to Boil > 30 min) | (1) | Ø | 2 | ORANGE |
| Off-Site Power Source** | | | 3 | YELLOW |
| ☑ NSST/Main | (1) | 1 | 4-5 | GREEN |
| ☑ RSST | (1) | 1 | | |

**Power Availability Sub-Total** 3

* At least one EDG must be available at all times. If no EDG is available, Power Availability is automatically RED.
**Minimum defense in depth for this KSF: one EDG, one off-site power source, and one additional on-site or off-site power source.

**Off-site GRID Risk Penalty Factor**

| | Point Value | Score | |
|---|---|---|---|
| Environmental Conditions[1] | (-1) | Ø | |
| N/A ☐ Avg sustained wind speed ≥ 75 mph | | | |
| ☐ Salt contamination buildup or arcing in the 345 kV switchyard | | | |
| ☐ Tornado watch, hurricane watch or warning | | | |
| OR | | | |
| Switchyard and Blockhouse Work[1,2] | (-1) | Ø | (At best Orange) |
| N/A ☐ Trip Testing affecting more than one 345 kV line | | | |
| ☐ Two 345 kV lines out of service | | | |
| ☐ Planned switchyard bus outage or bus trip testing (North or South)[3] | | | |
| ☐ Planned maintenance or projects | | | |
| OR | | | |
| N/A ISO-NE/CONVEX Alerts[1] | (-1) | | |
| ☐ Abnormal transmission network conditions with potential for loss of grid. | | Ø | |
| ☐ ______________________ | | Ø | |

**Power Availability Total** 3

[1]If multiple events/evolutions are planned or in progress, use most restrictive penalty factor NOT to exceed number of off-site power sources credited.
[2]Only deduct penalty point if all the following conditions are met:
- Natural circulation NOT available.
- At least 1 RCS loop isolated.
- Reactor cavity NOT full.
- Switchyard maintenance contingency plan NOT in place.

[3]For North and South bus outages where there is no work being performed that could jeopardize the other bus, the penalty point does not need to be taken.

*Millstone Unit 3 Shutdown Safety Assessment (SSA) Checklist*



| Assessment Completion | | |
|---|---|---|
| The following SSA Checklist items have been performed:<br>❑ Containment<br>❑ RCS Decay Heat Removal<br>❑ SFP Decay Heat Removal<br>❑ RCS Inventory Control<br>❑ SFP Inventory Control<br>❑ Power Availability<br>❑ Reactivity Control | Signature (Licensed Operator or STA) | |
| Protected Equipment signs in place based on SSA | Signature (Licensed Operator or STA) | |
| Conflicts between the availability reflected in the outage schedule and this checklist have been brought to the attention of the SM. | Conflicts?<br>*(Circle One)*<br>YES / NO | Initial |
| Remarks: | | |
| CR written to address unplanned entries into RED or ORANGE conditions | CR Number: | |
| Shift Manager Review | Signature | |
| SSA Equipment Status Board(s) / Programs Updated | Initials | |
| SOM, OOM, and Maintenance Rule Coordinator Notifications made for *unplanned* RED or ORANGE. OMOC notifications made. | Initials | |
| Completed SSA Checklist maintained with the Shift Turnover Report | Initials | |

*Nuclear Fleet*

# Administrative Procedure

Dominion

## Title: Shutdown Safety Assessment Checklist

| Procedure Number | Revision Number | Effective Date and Approvals On File |
|---|---|---|
| OU-M3-201 | 23 | |

**Revision Summary**

Incorporated the following changes based on Training feedback:

- Corrected step 3.2.1.a.11 to notify SM if Required boron concentrations are greater than Actual boron concentrations, rather than less than Actual, since greater than is not the proper condition
- Changed Attachment 1, Section 1 (729450(Jul 2017)), from "Required Greater than Actual" to "Actual Greater than Required" to elicit a "Yes" response, which is the proper condition

**Functional Area Manager: Manager Nuclear Operations**

**INFORMATION USE**

## TABLE OF CONTENTS

**NOTE:** SSA Checklist may be completed by any licensed Operator (except on-duty SM) or STA using, at a minimum, main control board system status.

**NOTE:** Systems planned to be removed from service in the next 24 hours may be assumed to be out of service, and, therefore, **NOT** credited.

**NOTE:** Attachment 2 through Attachment 8 provide further guidance while performing SSA Checklist.

**NOTE:** SSA Checklists are completed as follows:

- Daily
- Prior to removing any equipment required to support KSFs unless daily review already assumed equipment is out of service
- Equipment available to support KSFs unexpectedly becomes unavailable
- Prior to performing plant MODE changes when shutdown
- A system/component is restored to available status and is desired to either immediately credit system/component for Shutdown Risk or it is more than six hours until the next SSA Checklist is to be performed

### 3.2 Shutdown Safety Assessment (SSA) Checklist Preparation

3.2.1 Using the following detailed information for each KSF, **COMPLETE** Attachment 1:

a. Section 1

1. **CIRCLE** appropriate Protected Train.
2. **CHECK** box if single train exception in effect.
3. **RECORD** date and time assessment is being performed.
4. **RECORD** date and time of reactor shutdown.
5. **INDICATE** if assessment is being performed for Actual or Predicted Conditions.
6. **CALCULATE** and **RECORD** number of Days Shutdown between the date/time (Actual or Predicted) and shutdown date/time.
7. **ENTER** a brief description of the reason assessment is being performed.

8. **ENTER** one of the following required RCS/Refueling Cavity Boron Concentrations:
   - For Mode 5, Total required Xe Free Boron Concentration from most recent OP 3209B-002
   - For Mode 6, $\geq$ 2,700 PPM
   - For Mode 0, $\geq$ 2,700 PPM
9. **ENTER** one of the following required SFP Boron Concentrations:
   - For Mode 5, N/A
   - For Mode 6, $\geq$ 2,700 PPM
   - For Mode 0, $\geq$ 2,700 PPM
10. **RECORD** from Operations Narrative Log the most recent RCS/Refueling Cavity Boron Concentration (Actual) and Spent Fuel Pool Boron Concentration (Actual).
11. <u>IF</u> Required boron concentrations are greater than Actual boron concentrations, **<u>THEN</u> NOTIFY** Shift Manager.

b. Section 2 - Time to Core Boil

1. <u>IF</u> in MODE 0, **<u>THEN</u> CHECK** "NA (MODE 0)" and **<u>GO TO</u>** step 3.2.1.e.
2. **REFER** to applicable attachments in OP 3216, Reactor Coolant System Drain (ICCE), and OP 3260I, RCS Inventory Tracking, and **DETERMINE** RCS Pressure, RCS Temp, and RCS Level.
3. **REFER** to ATTACHMENT 8 and determine RCS Time to Boil.
4. <u>IF</u> Time to Core Boil is less than 8 hours **<u>AND</u>** SBO diesel auto start feature is **<u>NOT</u>** available, **<u>THEN</u> STATION** an operator in the SBO with EOP 3501, Attachment G, Start the SBO Diesel.

c. Section 2 - Time to 200°F (EA2 Criterion)

1. <u>IF</u> <u>NOT</u> in MODE 5 or 6, **<u>THEN</u> CHECK** "NA not in MODE 5 or 6" and **<u>GO TO</u>** step 3.2.1.e.

2. **REFER** to ATTACHMENT 8 and **PERFORM** the following:

   - **RECORD** RCS Pressure, RCS Temp, and RCS Level.
   - **PERFORM** Time to 200°F calculation using Attachment 8 and **RECORD** results.

d. Section 2 - Time to Heatup 10°F (EU1 Criterion)

1. **<u>IF</u> <u>NOT</u>** in MODE 5 or 6, **<u>THEN</u> CHECK** "NA not in MODE 5 or 6" and **<u>GO</u> <u>TO</u>** step 3.2.1.e.

2. **REFER** to ATTACHMENT 8 and **PERFORM** the following:

   - **RECORD** RCS Pressure, RCS Temp, and RCS Level.
   - **PERFORM** Time to Heatup 10°F calculation using ATTACHMENT 8 and **RECORD** results.

**NOTE:** RE-G-7, "Millstone 3 Spent Fuel Pool Time to 200°F," which is located in Millstone 3 Reactor Engineering Curve and Data Book, is applicable until first fuel assembly is transferred to the Spent Fuel Pool (SFP).

**NOTE:** Reactor Engineering will issue a new RE-G-7 curve during the refueling outage. This will be the heatup curve for recently discharged fuel which will remain in the SFP.

e. Section 2 - Spent Fuel Pool Heatup Time

1. **DETERMINE** Spent Fuel Pool Temperature.

2. **DETERMINE** number of fuel assemblies transferred to the SFP.

3. **<u>IF</u>** < 80 fuel assemblies transferred to SFP, **<u>THEN</u> PERFORM** the following:

   - **ENTER** "NA" for SFP time to 150°F.
   - **DETERMINE** SFP Time to 200°F.

4. IF ≥ 80 but < 145 fuel assemblies transferred to SFP, **THEN** **PERFORM** the following
   - **CALCULATE** time to reach 150°F from current temperature based on heatup rate of 5°F/hr.
   - **ENTER** SFP Time to 150°F.
   - **ENTER** "N/A" for SFP Time to 200°F.
5. **IF** > 145 fuel assemblies transferred to SFP, **THEN** **PERFORM** the following:
   - **CALCULATE** time to reach 150°F from current temperature based on heatup rate of 10°F/hr.
   - **ENTER** SFP Time to 150°F.
   - **ENTER** "N/A" for SFP Time to 200°F.
6. **IF** fuel assemblies are reloaded to Reactor Vessel, **THEN** **PERFORM** the following:
   - **ENTER** "NA" for SFP Time to 150°F.
   - **DETERMINE** SFP Time to 200°F.
   - **IF** SFP Time to 200°F is less than 72 hours, **THEN** **COMPLY** with OP-MP-601, Protected Equipment.

f. Section 3 - Decay Heat Removal (DHR)

1. RCS Decay Heat Removal (DHR)
   - **IF** in MODE 0, **THEN** **CIRCLE** "NA for MODE 0" and **GO TO** step 3.2.1.f.2.
   - **REFER** to ATTACHMENT 2 for background information of each element associated with the Decay Heat Removal KSF.
   - **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of RCS decay heat removal.
   - **IF** natural circulation is the only backup for decay heat removal **AND** **NOT** in a Bus 34C or 34D outage, **THEN** **CIRCLE** additional credited charging pump.
   - **TOTAL** score and **ENTER** value in RCS DHR Total box.
   - **CIRCLE** Condition color corresponding to point total.

2. Beyond Design Basis

    - **CHECK** appropriate boxes corresponding to present BDB condition.

3. SFP Decay Heat Removal

    - **IF** in MODE 5 **OR** core reload is complete, **THEN CIRCLE** "N/A in MODE 5 **OR** core reload is complete," and **GO TO** step 3.2.1.f.4.
    - **REFER** to ATTACHMENT 2 for background information of each element associated with the Decay Heat Removal KSF.
    - **CHECK** appropriate boxes for conditions supporting Key Safety Function of SFC decay heat removal.
    - **TOTAL** score and **ENTER** value in the SFP Decay Heat Removal Total box.
    - **CIRCLE** Condition color corresponding to point total.

4. Fuel Offload Required Equipment

    - **IF** the following conditions are met, **THEN REFER** to ATTACHMENT 2 for Fuel Offload Required Equipment and **DOCUMENT** available equipment:
        - In MODE 6. Core offload has started and core reload has **NOT** been completed.
        - In MODE 0.

g. Section 4 - Inventory Control

1. RCS Inventory Control

   - <u>IF</u> in MODE 0, <u>THEN</u> **CIRCLE** "NA for Mode 0" and <u>**GO TO**</u> step 3.2.1.g.2.
   - **REFER** to ATTACHMENT 3 for background information of each element associated with the RCS Inventory Control KSF.
   - **CHECK** appropriate boxes for conditions supporting "Key Safety Function" inventory.
   - **TOTAL** score and **ENTER** value in Inventory Control Total box.
   - **CIRCLE** Condition color corresponding to the point total.
   - **ENSURE** RWST level is greater than 250,000 gallons and **CHECK** box.
   - **CHECK** 3RHS*V43, RHR to RWST recirculation isolation, is tagged and locked closed by verifying the clearance is active in the tagging computer (Preferred Method) and **CHECK** box.

2. Spent Fuel Pool Inventory Control

   - **REFER** to ATTACHMENT 3 for background information of each element associated with the Inventory KSF.
   - **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of SFP Inventory Control.
   - **TOTAL** score and **ENTER** value in SFP Inventory Control Total box.
   - **CIRCLE** Condition color corresponding to the point total.

h. Section 5 - Reactivity Control

1. <u>IF</u> in MODE 0, <u>THEN</u> **CIRCLE** "NA for Mode 0" and <u>**GO TO**</u> step 3.2.1.i.
2. **REFER** to ATTACHMENT 4 for background information of each element associated with the Reactivity KSF.
3. **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of Reactivity.

4. **TOTAL** score and **ENTER** value in the Reactivity Total box.

5. **CIRCLE** Condition color corresponding to point total.

i. Section 6 - Containment

1. **IF** in MODE 0, **THEN** **CIRCLE** "NA for Mode 0" and **GO TO** step 3.2.1.j.

2. **REFER** to ATTACHMENT 5 for background information of each element associated with Containment KSF.

3. **CHECK** one of the Containment Closure requirements are met.

4. **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of Containment.

5. **TOTAL** score and **ENTER** value in Containment Total box.

6. **CIRCLE** Condition color corresponding to the point total.

j. Section 7 - Power Availability

1. **REFER** to ATTACHMENT 6 for background information for each element associated with Power Sources KSF.

2. **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of Power Availability.

3. REFER to ATTACHMENT 6 for applicable Off-Site GRID Risk Penalty Factor and **SUBTRACT** from Power Availability subtotal to determine Power Availability Total.

4. **TOTAL** score and **ENTER** value in Power Availability Total box.

5. **CIRCLE** Condition color corresponding to point total.

# ATTACHMENT 2
## Decay Heat Removal Requirements
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1. For RCS Decay Heat Removal, **MAINTAIN** the following
   a. **MAINTAIN** one train of RHR in operation.

> **NOTE:** All RHR loops may be removed from operation during a planned plant heatup to MODE 4 when at least one RCS loop is OPERABLE and in operation and when two additional steam generators meet the requirements listed below.
>
> **NOTE:** RHR non-operating train is available to credit for heat removal when aligned to the RWST.

   b. IF in MODE 5, THEN **PERFORM** at least one of the following to ensure a backup for decay heat removal:
      1) **MAINTAIN** non-operating RHR train available
      2) **MAINTAIN** all of the following satisfied to ensure two steam generators available and proper RCS conditions are established to support natural circulation:
         - Both available SG NR levels greater than 17%
         - Capability to feed available SGs with a MD AFW pump
         - Capability to release steam from available SGs
         - RCS pressurized or capable of being pressurized to between 170 psia and 330 psia prior to core boiling
         - RCS openings being tracked
         - RCS loops associated with the available SGs; filled, and unisolated
         - Pressurizer cold calibrated level $\geq$ 50% unless a steam bubble is established in pressurizer

> **NOTE:** An RCS pressure of at least 170 psia ensures subcooled natural circulation.

   c. IF natural circulation is the only available backup for decay heat removal (only 1 RHR pump is available), THEN **PERFORM** the following:
      1) IF time to core boiling is less than one hour, THEN **MAINTAIN** one of the following:
         - RCS pressure greater than 170 psia
         - Contingency plan to re-pressurize the RCS to greater than 170 psia prior to core boiling
      2) IF a Bus 34C or 34D outage is planned AND ONE of the following conditions do NOT exist, THEN **PRESSURIZE** RCS to greater than 170 psia:
         - Outage Bus Recovery Time is less than time to core boiling.
         - Non-outage bus can be reenergized by SBO diesel generator prior to core boiling.

## ATTACHMENT 2

## Decay Heat Removal Requirements

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3) IF NOT in a Bus 34C or 34D outage **AND** RCS is depressurized, THEN **MAINTAIN** an additional credited charging pump using one of the following methods (pump on non-protected train is preferred):
   - Breaker racked down
   - Pump Control Switch in PTL with UC fuses pulled
   - Pump Control Switch in PTL with pump discharge valve closed
   - Pump discharge valve closed with valve power removed
4) IF RCS openings are desired, **THEN** **PERFORM** the following:
   - **ENSURE** time required to restore RCS integrity, including allowance for contingency plan to repressurize RCS to greater than 170 psia, is less than time to core boiling.
   - **ENSURE** individual(s) responsible for restoring RCS integrity is carrying a beeper to ensure timely response.
   - **TRACK** all RCS openings on plant "status board."

**NOTE:** RHR loop may be removed from operation for up to 1 hour each 8-hour period during performance of CORE ALTERATIONS in the vicinity of reactor vessel hot legs as allowed by T/S 3.9.8.1 and T/S 3.9.8.2.

**NOTE:** NUREG/CR-5820, "Consequences of the loss of the Residual Heat Removal Systems in Pressurized Water Reactors," indicated that with Reactor Cavity flooded and core upper internals in place, inadequate mixing of RPV water and cavity water could lead to localized boiling in the core. Westinghouse letter NEU-95-619 concluded that differences in Unit 3 upper internals design negate this concern.

d. IF in MODE 6, **THEN** **MAINTAIN** at least one of the following to ensure a backup for decay heat removal:
   - **MAINTAIN** greater than or equal to 23 feet of water above top of reactor vessel flange.
   - **MAINTAIN** non-operating RHR train OPERABLE.

e. IF in MODE 6 **AND** in Decreased or Reduced Inventory, **THEN** **PERFORM** the following:
   - **MAINTAIN** one train of RHR in operation and one train of RHR available.
   - **ENSURE** each train is powered from off-site power.
   - **ENSURE** protected train is capable of being powered from its associated emergency diesel.
   - **ENSURE** backup train is capable of being powered from its associated emergency diesel or SBO.
   - **PROTECT** electrical buses between diesels and decay heat removal equipment.

## ATTACHMENT 2
### Decay Heat Removal Requirements
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f. IF RCS is in Reduced Inventory Operations (RIO), **THEN APPLY** an ORANGE condition, irrespective of other point totals, and **MAINTAIN** maximum support system availability during RIO while minimizing duration of time spent in RIO (reference OU-AA-200).

g. IF an Entry Condition is met, **THEN GO TO** EOP 3505, Loss of Shutdown Cooling and/or RCS Inventory, and **PERFORM** required actions.

| |
|---|
| **NOTE:** Beyond Design Basis program acknowledges there will be a transition period between natural circulation and RCS Feed and Bleed capability during which neither requirement will be met. The transition shall be executed in an efficient manner and efforts to establish the subsequent method must be continuous. [Ref. 5.4.14] |

2. To comply with Millstone 3 Order EA-12-049 on Beyond Design Basis Events (extended loss of all AC power), **MAINTAIN** the following in addition to the requirements of step 1.:

a. IF in MODE 5, **THEN MAINTAIN** one of the following:

- Two steam generators and proper RCS conditions established to support natural circulation, along with an AC power independent means of restoring steam generator inventory as described below:
  - •• Both available SG NR levels greater than 17%
  - •• Capability to feed available SGs with a power independent source (TDAFW pump or BDB AFW pump)
  - •• Capability to release steam from available SGs
  - •• RCS pressurized greater than 170 psia.
  - •• RCS openings being tracked
  - •• RCS loops associated with the available SGs; filled, and unisolated
  - •• Pressurizer cold calibrated level ≥ 50% unless a steam bubble is established in the pressurizer

## ATTACHMENT 2
## Decay Heat Removal Requirements
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- Two steam generators and proper RCS conditions established to support natural circulation, along with an AC power independent means of restoring steam generator inventory as described below:
  - •• Both available SG NR levels greater than 17%
  - •• Capability to feed available SGs with a power independent source (TDAFW pump or BDB AFW pump)
  - •• Capability to release steam from available SGs
  - •• RCS loops associated with the available SGs; filled and unisolated
  - •• Pressurizer cold calibrated level >92%
  - •• RCS temperature maintained below 100°F
  - •• RCS openings being tracked
  - •• Letdown capable of being isolated within 10 minutes of the ELAP
  - •• Pressurizer vent valve 3RCS*V187 (and any other RCS vent paths) closed or capable of being closed in the lesser of the time to boil or 20 minutes
- A vent path in the pressurizer that is greater than 6 square inches (cumulative) (i.e., pressurizer safety). BDB AFW pump must be pre-staged in designated area adjacent to Turbine Driven Auxiliary Feedwater pump cubicle. Hoses do **NOT** need to be connected to A Train SIH BDB connections, but must be staged in the immediate area of BDB AFW pump.

b. **IF** in MODE 6, **THEN PRE-STAGE** a BDB AFW Pump for injection into the RCS. Hoses do **NOT** need to be connected to the A Train SIH BDB connections, but must be staged in the immediate area of the BDB AFW Pump.

> **NOTE:** The Spent Fuel Pool Key Safety Function is applicable when the plant is in MODE 6 and 0, since the heat load is increased by the addition of recently irradiated fuel. During normal operation, or if the plant is shutdown and no spent fuel has been moved to the spent fuel pool, the spent fuel pool KSF is maintained by OP-MP-601, Protected Equipment, and WM-AA-301, Operational Risk Assessment.
>
> **NOTE:** Spent Fuel Pool Decay Heat Removal has two separate sets of requirements. There are requirements for Shutdown Risk and requirements for License Amendment 182. Both sets of requirements are separate from each other and are satisfied separately.
>
> **NOTE:** SFPC pump must be powered from the normal power source to be credited.

3. For Spent Fuel Pool Decay Heat Removal SDR, **MAINTAIN** the following:
   a. **MAINTAIN** at least one train of spent fuel cooling available.
   b. **MAINTAIN** greater than or equal to 23 ft pool water level above the fuel.

## ATTACHMENT 2
## Decay Heat Removal Requirements
(Page 5 of 7)

4. To satisfy License Amendment 182 requirements, during core off load **AND** until reload has been completed, **MAINTAIN** the following in addition to the requirements of steps 3.a. and 3.b.:
   a. One protected train Spent Fuel Pool Cooling pump

> **NOTE:** The non-protected train Spent Fuel Pool Cooling pump **NOT** capable of being powered from normal power source can **NOT** be credited as an available SFP Decal Heat Removal Source; however, it can be relied upon to meet the LA182 additional available equipment requirements.
>
> **NOTE:** The non-protected train Spent Fuel Pool Cooling pump, capable of being powered from the normal power source, does **NOT** need to have its own associated train Reactor Plant Component Cooling Water or Service Water system components available. It must be able to be cooled from the protected train.

   b. One non-protected Spent Fuel Pool Cooling pump capable of being powered from normal power source or an Electrician, carrying a beeper, capable of establishing temporary power to the non protected spent fuel cooling pump in accordance with EOP 3505A. (License Amendment 182, dated 9/12/2000)
   c. Either of the following:
      - One Spent Fuel Pool Cooling Heat Exchanger with:
        - •• Two CCP pumps aligned to the associated CCP train
        - •• Two Service Water pumps on the train supplying the associated CCP train
      - Two Spent Fuel Pool Cooling Heat Exchangers each with at least one associated CCP pump and Service Water pump to supply its associated CCP train
5. **IF** an Entry Condition is met, **THEN GO TO** EOP 3505A, Loss of Spent Fuel Pool Cooling, and **PERFORM** required actions.

**ATTACHMENT 2**
**Decay Heat Removal Requirements**
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6. Systems Which Provide Defense In Depth

**NOTE:** This is a list of all components and acceptable alternate components utilized to support various Key Safety Functions. All components listed may **NOT** be required available or OPERABLE at all times. Availability for this purpose is to maintain the ability to place selected components in a functional state versus the ability of a component to meet licensing/design basis assumptions. In this case, operation of manual valves and racking in of breakers is acceptable. These components are considered available if all of the following criteria are met:

- Component is maintained under Operations' control as required by the Unit shutdown risk procedures.
- Component can be placed in service using existing procedures.
- Component can be placed in service within a time frame to meet its intended function.

6.1 RCS Decay Heat Removal

| A. RHR Loops |
|---|
| RHR pumps A & B |
| RHR heat exchangers A & B |
| RHR flow path from hot legs to the cold legs |
| 3HVQ*ACUS1A & B (if required to maintain room temperature below 110°F) |
| RHR pump seal cooling |
| CCP cooling flow path to support RHR heat exchanger cooling |
| SWP cooling flow path to support CCP |
| 3HVQ*ACUS1A & ACUS1B Service Water cooling (if required to maintain room temperature below 110°F) |
| 3HVQ*FN5A & B (as required by OP 3314D) |
| 3HVQ*FN6A & B (as required by OP 3314D) |
| 3HVR*FN13A & B (Note 1) |
| 3HVR*FN14A & B (Note 1) |
| 3HVY*FN2A & 2B |

## ATTACHMENT 2

## Decay Heat Removal Requirements

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| | |
|---|---|
| B. | SG Loops (to meet Natural Circulation in the RCS) |
| | RCS loops must be filled and unisolated |
| | FWA pump A & B and flow path to feed the OPERABLE SGs |
| | Steam path via atmospheric vent path (3MSS*PV20s or 3MSS*MOV74s) |
| | CST or DWST inventory and flow path available |
| | CHS pump A, B &or C and associated CCE cooling (to pressurize RCS) |
| | CHS discharge path via 3CHS*FCV121, 3SIH*MV8801A & B |
| | 3HVQ*FN5A & B (as required by OP 3314D) |
| | 3HVQ*FN6A & B (as required by OP 3314D) |

6.2 SFP Decay Heat Removal

| | |
|---|---|
| A. | SFC Loops (Note 2)(Note 3) |
| | SFC pumps A & B |
| | SFC heat exchangers A and/or B |
| | SFC cooling flow path(s) |
| | CCP system(s) to support SFC cooling |
| | SWP system(s) to support CCP cooling |
| | 3HVY*FN2A & 2B |
| | 3HVR-FN9, 3HVR*FN10A, or 3HVR*FN10B (only one required, and as needed for room temperature control) |
| | 3HVR*FN13A, or 3HVR*FN13B (only one required, and as required for room temperature control) (Note 1) |
| | 3HVR*FN14A, or 3HVR*FN14B (only one required, and as required for room temperature control) (Note 1) |

Note 1: If in MODE 5, 6 or 0, all Charging Pump/RPCCW area ventilation may be stopped if either of the following exist:

- Outside air temperature <65°F
- No charging pumps running

Note 2: Step 4. describes the acceptable combinations if crediting more than one Spent Fuel Pool Cooling Loop.

Note 3: Calibration of relays, timers, and meters for 32X and 32Y can cause SFC loops to become unavailable.

## ATTACHMENT 3
## Inventory Control Requirements
(Page 1 of 6)

1. **RCS Inventory Control Requirements**

> **NOTE:** Plant Configuration and planned work activity shall **NOT** allow more than one drain path during reduced inventory conditions.
>
> **NOTE:** If plant is in MODE 0, RCS Inventory Control is **NOT** applicable. Spent Fuel Pool Inventory Control is applicable.
>
> **NOTE:** With its breaker racked down, a Charging pump is **NOT** available to meet Inventory Control Requirements due to the time required to place it into operation for inventory control.
>
> **NOTE:** Minimum defense in depth for this KSF: One CHS pump and one backup pump as detailed below. The additional defense of RCS Greater Than Decreased Inventory point value cannot be credited toward meeting the minimum DID criteria (YELLOW).

a. **MAINTAIN** one charging pump in operation or available and capable of being aligned to the RWST

## ATTACHMENT 3
## Inventory Control Requirements
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**NOTE:** Safety Injection Pumps and an additional credited charging pump may be credited as an available backup source for inventory for MODEs 5 and 6 and used when directed in EOP 3505, Loss of Shutdown Cooling and/or Inventory.

**NOTE:** RHR may be credited for Inventory if both RHR trains are available for decay heat removal and both are capable of being aligned to the RWST.

**NOTE:** While performing an ESF LOP test, the train of CHS being tested has that CHS pump racked into the test position. The other train (protected train) may be running. The running CHS has the recirc valve opened and breaker racked down so it does **NOT** close on SI signal. The inside CTMT manual isolation valves for the 3SIH*V8801A/B are closed, so the normal charging path through the 3CHS*MV8105 and 8106 has to be available. When the test is initiated, 3CHS*MV8105 and 8106 will close, the running CHS will continue to run on the protected train. CHS remains supplying Seal Injection. If needed, Inventory can be established by stopping the test, resetting SI, and opening 3CHS*MV8105 and 8106. The Boration Path and CHS are in INOP, but available for SDR purposes.

**NOTE:** The inventory flow path from RHR train aligned to RWST may be credited when performing SP 3606.2 or SP 3606.4 because restoration steps in specific procedures contain a separate and independent restoration section should restoration become necessary.

b. **MAINTAIN** at least one of the following as a backup for Inventory:
   - One or both safety injection pumps aligned to RWST (if only one, pump on non-protected train is preferred)
   - Another credited charging pump capable of alignment to RWST
   - Both RHR trains available for decay heat removal and both capable of being aligned to RWST
   - One RHR train aligned to RWST or capable for alignment using Section 4.8 of either SP 3606.2 or SP 3606.4 as applicable.

**NOTE:** Additional defense can be credited for RCS Greater Than Decreased Inventory. This condition is by definition a measure of RCS Inventory.

c. **IF** RCS Inventory is at or below Reactor Vessel Flange, **THEN REFER** to OP-MP-601, Protected Equipment, and **ENSURE** a heightened station personnel awareness.

d. **IF** RCS is in Reduced Inventory Operations (RIO), **THEN APPLY** an ORANGE condition irrespective of other point totals and **MAINTAIN** maximum support system availability during RIO while minimizing duration of time spent in RIO (reference OU-AA-200).

## ATTACHMENT 3
## Inventory Control Requirements
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e. IF RCS is in Decreased Inventory, **THEN** **ENSURE** Inventory Key Safety Function is at best YELLOW, fuel in reactor vessel, and vessel level at or below 10% pressurizer level.

> **NOTE:** It is permissible to open 3RHS*V43 under administrative control if RHR hot leg injection valve (3RHS*MV8716A/B) for the operating RHR pump connected to RCS is closed with power lockouts off and valve handwheel locked.

f. IF COLD SHUTDOWN is expected to exceed 48 hours, **THEN** within 24 hours, **PERFORM** one of the following:
   1) **TAG** RHR to RWST recirculation isolation valve (3RHS*V43) Locked Closed, under administrative control of SM/US.
   2) IF A RHR pump is the RHR pump operating **AND** connected to RCS for DHR, **THEN** **ENSURE** clearance for RHR hot leg injection valve (3RHS*MV8716A) is active with the following:
      - 3RHS*MV8716A closed
      - Power lockouts off
      - Valve handwheel locked
   3) IF B RHR pump is the RHR pump operating **AND** connected to RCS for DHR, **THEN** **ENSURE** clearance for RHR hot leg injection valve (3RHS*MV8716B) is active with the following:
      - 3RHS*MV8716B closed
      - Power lockouts off
      - Valve handwheel locked

g. **MAINTAIN** the RWST volume greater than 250,000 gallons.

h. IF RWST volume is less than 250,000 gallons, **THEN** **REFER** to OP 3304C, Primary Makeup and Chemical Addition, and **ALIGN** for manual makeup to RWST.

## ATTACHMENT 3
## Inventory Control Requirements
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> **NOTE:** This step provides normal method for maintaining SI pump inoperable but available for inventory. Other methods of verifying SI pump inoperability per SP 3604A.6, Charging/SI Pump Inoperability Verification, can also be used as long as pump and flow path can be established within 15 minutes.

i. **IF** maintaining one or both safety injection pumps available as a backup for Inventory control, **THEN PERFORM** the following:

1) **IF** a pump is **NOT** in operation, **THEN MAINTAIN** associated pump control switch in "PULL-TO-LOCK" with breaker racked up and UC fuses removed.

2) Unless directed by another procedure, **MAINTAIN** the following power lockout switches in the "OFF" position:

- 3SIH*MV8835, "SI COLD LEG INJ"
- 3SIH*MV8802A, "PP A HOT LEG INJ"
- 3SIH*MV8802B, "PP B HOT LEG INJ"

3) Unless directed by another procedure, **MAINTAIN** the following valve closed with DC power fuses removed:

- 3SIH*CV8888, SI ACCUM TK MSTR FILL ISOL" (MB2)
- Fuse for 3SIH*CV8888, in 3BYS-PNL4F, CKT 5

> **NOTE:** With its breaker racked down, a Charging pump is **NOT** available to meet Inventory Control Requirements due to time required to place it into operation for inventory control. Therefore, this option is **NOT** listed.

j. **IF** maintaining an additional charging pump available as a backup for Inventory control, **THEN PERFORM** one of the following:

- **MAINTAIN** desired pump in "PULL TO LOCK" **AND** its associated discharge valve closed.
- **MAINTAIN** desired pump in "PULL TO LOCK" with its breaker racked up **AND** UC fuses removed.
- **MAINTAIN** desired pump's discharge valve closed with power removed.

k. **IF** Entry Conditions are met, **THEN GO TO** EOP 3505, Loss of Shutdown Cooling and/or RCS Inventory, and **PERFORM** required actions.

## ATTACHMENT 3
## Inventory Control Requirements
(Page 5 of 6)

**2. Spent Fuel Pool Inventory Control**

a. **MAINTAIN** at least 2 methods for SFP inventory control available:
   - Gravity Makeup from the RWST (RWST volume greater than 800,000 gallons)
   - A Primary Grade Water System pump and makeup flow path
   - B Primary Grade Water System pump and makeup flow path
   - Emergency makeup from the Fire Protection Water System

b. IF Entry Conditions are met, **THEN GO TO** EOP 3505A, Loss of Spent Fuel Pool Cooling, and **PERFORM** required actions.

**3. Systems Which Provide Defense In Depth**

**NOTE:** This is a list of all the components and acceptable alternate components utilized to support various Key Safety Functions. All components listed may **NOT** be required available or OPERABLE at all times. Availability for this purpose is to maintain the ability to place selected components in a functional state versus the ability of a component to meet licensing/design basis assumptions. In this case, operation of manual valves and racking in of breakers is acceptable. These components are considered available if all of the following criteria are met:

- Component is maintained under Operations control as required by Unit shutdown risk procedures.
- Component can be placed in service using existing procedures.
- Component can be placed in service within a time frame to meet its intended function.

**a. RCS Inventory Control Requirements**

| | |
|---|---|
| A. | CHS Loops |
| | CHS pumps A, B, & C |
| | Flow path from the RWST using combinations of discharge paths via 3CHS*FCV121, 3SIH*MV8801A & B |
| | CCE cooling flow path to support CHS pump |
| | SWP cooling flow path to support CCE cooling as needed (Ref. OP 3330D) |
| | 3HVY*FN2A & 2B |
| | 3HVR*FN13A & B cooling path (as required for room temperature control) (Note 1) |
| | 3HVR*FN14A & B cooling path (as required for room temperature control) (Note 1) |

# ATTACHMENT 3
## Inventory Control Requirements
(Page 6 of 6)

### a. RCS Inventory Control Requirements (Continued)

| | |
|---|---|
| B. | SIH Loop |
| | SIH pumps A & B (Breaker racked up and UC fuses removed) |
| | SIH flowpath from RWST to hot legs (capability) |
| | SIH flowpath from RWST to cold legs (capability) |
| | CCI cooling flow path to support SIH pump |
| | 3HVQ*ACUS1A & B (if required to maintain room temperature below 110°F) |
| | SWP cooling flow path to support CCI & ACUS1A and 1B cooling (if required to maintain room temperature below 110°F) |
| | 3HVY*FN2A & 2B |
| | 3HVQ*FN5A & B (as required by OP 3314D) |
| | 3HVQ*FN6A & B (as required by OP 3314D) |
| C. | RHR Loop |
| | Same items for RHR used in Decay Heat Removal (except CCP & SWP cooling is **NOT** required for the RHR heat exchanger or seal water cooling) |
| | 3RHS*MV8812A & B (ability to transfer to RWST) |

Note 1: If in MODE 5, 6 or 0, all Charging Pump/RPCCW area ventilation may be stopped if either of the following exist:

- Outside air temperature < 65°F
- No charging pumps running

### b. Spent Fuel Pool Inventory Requirements

| | |
|---|---|
| A. | Gravity Makeup from the RWST |
| | Flowpath from RWST using RWST cooling system piping and connection to Spent Fuel Pool Purification System |
| B. | Primary Grade Water |
| | Primary Grade Water pumps |
| | Primary Grade Water flowpath from a Primary Grade Water Storage Tank to Spent Fuel Pool |
| | Primary Grade Water Storage Tanks |
| C. | Emergency makeup from Fire Protection Water System |
| | Fire Water Pumps |
| | Fire Water Storage Tanks |

## ATTACHMENT 4
## Reactivity Control Requirements
(Page 1 of 4)

> **NOTE:** If plant is in MODE 0, this Section is NOT applicable.
>
> **NOTE:** With its breaker racked down, a Charging pump is NOT available to meet Reactivity Control Requirements due to the time required to place it into operation for reactivity control.
>
> **NOTE:** Minimum defense in depth for this KSF: RCS Boron, two inventory flow paths and one monitoring method. Additional defense of Dilution paths tagged cannot be credited toward meeting the minimum DID (YELLOW).
>
> **NOTE:** If performing either SP 3606.2 or SP 3606.4 and the RHR train is aligned to the RWST and being credited as an inventory flow path, it can also be credited as a reactivity control flow path to maintain minimum defense in depth.

1. For RCS Reactivity Control **MAINTAIN** the following:
   - RCS boron concentration greater than required boron concentration
   - Two inventory flow paths
   - In MODE 5, either one channel of Shutdown Margin Monitor (SMM) or one channel of source range with either automatic or manual monitoring of count rate

> **NOTE:** When performing core alterations, two channels of source range monitors are normally used to meet Technical Specifications.

   - In MODE 6, one channel of source range with either automatic or manual monitoring of count rate
2. **MAINTAIN** the following for additional defense in depth:
   - Administrative control of potential dilution flow paths
   - One of the following methods of monitoring core:
     - In MODE 5 or 6, additional source range neutron flux monitor with either automatic or manual monitoring of count rate.
     - In MODE 5, additional channel of Shutdown Margin Monitor (SMM)

> **NOTE:** Opening dilution valves under admin control as allowed by Tech Specs does NOT increase shutdown risk and does NOT require change in shutdown self assessment checklist.

3. IF COLD SHUTDOWN is expected to exceed 48 hours, **THEN REFER** to SP 3604C.6, Valve Closure Verification for Chemical and Volume Control System Dilution Flow Paths, and within 24 hours after reaching COLD SHUTDOWN, **TAG** closed dilution sources (see SP 3604C.6-002).

## ATTACHMENT 4
## Reactivity Control Requirements
(Page 2 of 4)

4. IF an unexpected dilution occurs, THEN **REFER** to OP 3353.MB4C, Main Board 4C Annunciator Response, and **PERFORM** the applicable actions for alarm response "SHUTDOWN MARGIN MONITOR CHANNEL 1" (MB4C 2-2) or "SHUTDOWN MARGIN MONITOR CHANNEL 2" (MB4C 2-3).

> **NOTE:** Shutdown margin monitors are unreliable during fuel movement and therefore, should NOT be credited during any fuel movement evolutions.
>
> **NOTE:** Source range detectors remain OPERABLE during fuel movement as no minimum count rate is required. Audible count rate is NOT required to credit source range detectors for shut down risk.

5. WHEN in MODE 5, THEN **REFER** to SP 3670.1-017, MODE 5/6/0 Daily and Shiftly Control Room Rounds, and **DETERMINE** if shutdown margin monitors are OPERABLE.
6. IF one or both shutdown margin monitor is inoperable, THEN **REFER** to T/S 3.3.5 and **ENSURE** applicable requirements have been completed.

> **NOTE:** Computer points CVMCORE31F and CVMCORE32F are placed into priority alarm, with a setpoint of 1.33 unless directed by Reactor Engineering.
>
> **NOTE:** Computer points compare current average reading of Westinghouse source range detectors with baseline data gathered at midnight. If baseline information is incorrect, the affected computer point should NOT be used until the baseline can be reset.

7. **PERFORM** the following to provide additional defense in depth for MODE 5 and required core reactivity monitoring for MODE 6:
   a. **REFER** to OP 3349A, Process Computer Points, and PLACE the following PPC points in priority alarm status:
      - CVMCORE31F
      - CVMCORE32F
   b. IF desired, THEN **TREND** one or both computer points using real time display.

> **NOTE:** Base counts are automatically reset at midnight. Manual reset should be used if midnight baseline is known to be erroneous or as counts increase or decrease during fuel movement.

   c. IF desired, THEN **RESET** base count rate (CVBASE31F and CVBASE32F).
   d. IF plant process computer/priority alarm AND both Shutdown Margin Monitors are inoperable, THEN **REFER** to OP 3260A and **PERFORM** actions specified to monitor the core.

## ATTACHMENT 4
## Reactivity Control Requirements
(Page 3 of 4)

e. **WHEN** use of source range is **NO** longer desired, **THEN REFER** to OP 3349A, Process Computer Points, and **REMOVE** the following computer points from priority alarm status:
   - CVMCORE31F
   - CVMCORE32F

8. RCS Reactivity Control Requirements

| | |
|---|---|
| A. | Instrumentation |
| | 3NME-NR1 & 2 (Gammametrics) |
| | 3NME-SMM1 & 2 (Shutdown Margin Monitor) |
| | 3NMS-SR31 & 32 (Source Range Detectors) |
| B. | BAST |
| | 3CHS*MV8104 |
| | 3CHS*P2A & P2B |
| | 3CHS*FCV121, 3CHS*HCV190A & 3CHS*MV8116 |
| | 3CHS*HCV190B & 3CHS*MV8438B |
| | 3CHS*MV8105 & 3CHS*MV8106 |
| | 3CHS*MV112B or 3CHS*MV112C |
| | 3CHS*AV8146 or 3CHS*AV8147 |
| | 3CHS*MV8507A or 3CHS*MV8507B |
| C. | Charging Pump (credited for inventory and boration flow paths) |
| | CHS pumps A, B, & or C |
| | CCE cooling flow path to support CHS pump |
| | SWP cooling flow path to support CCE cooling as needed (Ref. OP 3330D) |
| | 3HVY*FN2A & 2B |
| | 3HVR*FN13A & B cooling path (as required for room temperature control) (Note 1) |
| | 3HVR*FN14A & B cooling path (as required for room temperature control) (Note 1) |

Note 1: If in MODE 5, 6 or 0, all Charging Pump/RPCCW area ventilation may be stopped if either of the following exist:
- Outside air temperature < 65°F
- No charging pumps running

## ATTACHMENT 4
## Reactivity Control Requirements
(Page 4 of 4)

8. RCS Reactivity Control Requirements (Continued)

| | |
|---|---|
| D. | RWST |
| | 3CHS*MV8468A or 3CHS*MV8468B |
| | 3CHS*MV112B or 3CHS*MV112C |
| | 3SIH*MV8801A or 3SIH*MV8801B |
| | 3CHS*FCV121 |
| | 3CHS*HCV190A and 3CHS*MV8116 |
| | 3CHS*HCV190B and 3CHS*MV8438B |
| E. | SIH Loop (credited for inventory and boration flow paths) |
| | SIH pumps A & B (Breaker racked up and UC fuses removed) |
| | SIH flowpath from RWST to hot legs (capability) |
| | SIH flowpath from RWST to cold legs (capability) |
| | CCI cooling flow path to support SIH pump |
| | 3HVQ*ACUS1A B (if required to maintain room temperature below 110°F) |
| | SWP cooling flow path to support CCI & ACUS1A and 1B cooling (if required to maintain room temperature below 110°F) |
| | 3HVY*FN2A & 2B |
| | 3HVQ*FN5A & B (as required by OP 3314D) |
| | 3HVQ*FN6A & B (as required by OP 3314D) |
| F. | RHR Loop (credited for inventory and boration flow paths) |
| | Same items for RHR used in Decay Heat Removal (except CCP & SWP cooling is **NOT** required for the RHR heat exchanger or seal water cooling) |
| | 3RHS*MV8812A & B (ability to transfer to RWST) |

# ATTACHMENT 5
## Containment Requirements
(Page 1 of 4)

**NOTE:** If the plant is in MODE 0, this Section is **NOT** applicable.

**NOTE:** "Defense in Depth" for containment is the policies and procedure controls which maintain the ability to establish a barrier between the fuel and the environment (i.e., the containment boundary).

**NOTE:** Containment Closure Coordinator is responsible for establishing and maintaining Containment closure.

1. Containment Closure Capability is required
   a. For Containment Closure, **ESTABLISH** one of the following conditions:
      - Containment Closure set
      - Capability to perform Containment Closure prior to core boiling or four hours, whichever is less
      - Containment Closure Set with administrative controls per OP 3250.12 during fuel movement within the containment building with closure within 30 minutes
      - MODE 0

**NOTE:** All Containment penetrations must be tracked including equipment hatch, personnel hatch, and containment purge and exhaust lines.

   b. **IF** Containment penetration exceptions are desired, **THEN PERFORM** the following:
      1) **IF** movement of fuel within the containment building is desired, **THEN REFER** to OP 3250.12, Establishing Containment Boundary for Movement of Fuel within the Containment Building, and **MAINTAIN** additional administrative controls.
      2) **REQUEST** Shift Outage Manager to verify the requirements of OU-AA-200, Shutdown Risk Management, for Containment Closure are met.
      3) **IF** time to core boiling is less than or equal to 30 minutes, **THEN LIMIT** the number of exceptions to the following:
         - No more than four exceptions that require restoration from outside the Control Room
         - No more than four additional exceptions if they can be promptly restored from the Control Room

## ATTACHMENT 5
## Containment Requirements
(Page 2 of 4)

4) IF time to core boiling is greater than 30 minutes, **THEN LIMIT** number of exceptions to the following:
   - No more than seven exceptions that require restoration from outside Control Room, and
   - No more than 10 components controlled by one operator (with no concurrent onshift duties) if they can be promptly restored from the Control Room

5) IF plant is in MODE 5 OR MODE 6, **THEN ENSURE** time required to close containment penetration(s) is less than the more restrictive of the following:
   - Time to core boiling
   - Four hours

6) **ENSURE** individual(s) responsible for closing excepted penetration(s) is carrying a beeper and has been briefed on specific duties to ensure timely response.

7) IF Containment Equipment Hatch is being opened, **THEN PERFORM** the following:
   - **REQUEST** Health Physics to refer to RPM 2.2.13, Alternate Source Term Monitoring, and **ESTABLISH** Alternate Source Term surveys at Containment Equipment Hatch.
   - **REQUEST** Chemistry analyze continuous air monitor particulate and charcoal collectors at least weekly per REMODCM Section I, Table I.D-3.
   - **REFER** to OP 3313F, Containment Purge Air, and **ALIGN** Containment Purge System for operation with Containment access open.
   - **WHEN** notified Containment Equipment Hatch is closed, **THEN REQUEST** Health Physics terminate monitoring and transfer particulate and charcoal collectors to Chemistry for final analysis per REMODCM Section I, Table I.D-3.

8) IF either personnel or equipment Containment hatch are to be maintained open, **THEN PERFORM** the following:
   - For devices required to support outage activities which prevent immediate Containment hatch closure, **ENSURE** one of the following is satisfied:
     - Device(s) must be capable of immediate disconnect and removal as determined by maintenance lead person (carrying the beeper), or
     - A member of responsible department must carry a beeper for notification to remove interference to support hatch closure.
   - **ESTIMATE** total Containment hatch closure time including time to clear hatch and close hatch.

9) **TRACK** all Containment penetration openings (exceptions) and total time to restore each opening on plant "status board."

10) IF plant "status board" is being used to track penetration openings, **THEN ENSURE** time to core boiling reference is maintained current.

11) IF a new Containment penetration exception is desired, **THEN REPEAT** step 1.b.

## ATTACHMENT 5
## Containment Requirements
(Page 3 of 4)

> **NOTE:** Time to restore a containment exception can be tested at any time as desired by Operations Department management or SM/US. Time to restore must include time to return a beeper page to the Control Room, transit to restoration location, and restore penetration.

c. IF desired to evaluate plant response to Containment Closure requirements, THEN **PERFORM** evacuation drills or beeper tests.

> **NOTE:** Personnel may be pre-staged to prevent unnecessary crossing of radiation boundaries.

d. Prior to core offload, **PERFORM** a Containment closure drill per OP 3210B.

2. No Significant Fuel Failures Indicated

   No Significant Fuel Failures Indicated provides margin to release of radioactive material to the environment. If RCS boiling occurs but there is no fuel failure, then consequences are not nearly as great as if fuel failure existed. If fuel failure is indicated by chemistry samples, then additional precautions will need to be taken when performing outage activities. This item is scored a "1" if no significant fuel failures are indicated by radiochemistry sampling. A"0" is scored if significant fuel failure is indicated. For the purposes of SDR assessment, identification from radiochemistry samples and confirmation from NAF of significant fuel rod/pin failures is necessary to score this item as "0." The INPO industry goal is zero industry fuel failures by 2010.

3. No Core Alterations in Progress in Containment

   No Core Alterations in Progress in Containment is an indicator of susceptibility to a fuel handling event. Item is scored a "1" if no Core Alterations are in progress and a "0" if Core Alterations are in progress.

   Technical Specifications defines Core Alterations as "CORE ALTERATIONS shall be the movement of any fuel, sources, reactivity control components, or other components affecting reactivity within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall NOT preclude completion of movement of a component to a safe position." Specific activities that are considered Core Alterations are unlatching/latching of CEAs, removal/installation of the Reactor Vessel Upper Internals, core offload/onload, and Reactor Vessel Head Lift (until it has been verified no control rods are moving with head removal).

4. RCS Pressure Boundary Intact

   RCS Pressure Boundary Intact is indicative of no breaches in the "second" fission product barrier. Normal condition for an outage is for RCS to be "breached." This would be a pressure boundary opening such as removal of Pressurizer Safety Valves or reactor vessel head. This item is scored a "1" if RCS is intact and a "0" if any RCS opening exists.

## ATTACHMENT 5
## Containment Requirements
(Page 4 of 4)

5. Volatile Isotopes Would Not Contribute to Large Early Release Frequency (LERF)

   After eight days (from the start of the outage) it is assumed that short-lived, volatile isotopes that are principally responsible for early health effects have decayed sufficiently such that the event would **NOT** contribute to LERF. This item is scored a "0" if ≤ 8 days shut down and a "1" if > 8 days shut down.

## ATTACHMENT 6
## Power Availability Requirements
(Page 1 of 5)

**NOTE:** The Unit 3 NSSA or RSSA is typically credited by Unit 2 as a Unit 2 off site power source. The SBO diesel is also credited by Unit 2 for SBO and certain Appendix R fire scenarios. Any evolutions affecting the Unit 3 NSSA or RSSA or the SBO diesel must be discussed with Unit 2 prior to performing the evolution.

**NOTE:** Attachment 7 provides a listing of components and systems which support the Power Availability Key Safety Function.

1. **MAINTAIN** communications with Unit 2 Control Room personnel regarding OPERABILITY of the following:
   - Unit 3 NSSA
   - Unit 3 RSSA
   - SBO Diesel
2. **MAINTAIN** the following electric power sources:

**NOTE:** Associated Train EDG sequencer must be OPERABLE to support respective EDG operability. However, credited EDG only needs to be available for shutdown risk purposes.

**NOTE:** An EDG becomes unavailable when its associated battery supply breaker (Battery 1 for EDG A, Battery 2 for EDG B) is opened. EDG becomes available when its associated battery supply breaker is closed and supplying charger comes out of current limit (typically 2-3 hours after equalize charge has begun) and applicable portions of C SP 760, Battery Discharge Test, are complete. Bus can be considered available for operating one 4kV breaker at a time.

**NOTE:** At least one EDG must be available at all times. If no EDG is available, Power Availability is automatically RED.

   - One available EDG
   - One offsite power source
3. **MAINTAIN** at least one of the following backup power sources:
   - EDG
   - Redundant offsite source
   - Station blackout diesel (SBO) (available only when time to core boiling > 30 min.)

## ATTACHMENT 6
## Power Availability Requirements
(Page 2 of 5)

4. **DETERMINE** if a Offsite Grid Risk Penalty Factor should be applied.

> **NOTE:** The purpose of this evaluation is to determine if a penalty factor should be applied to overall Power Availability Score to more accurately assess risk to outage unit in the event of a loss of one or more offsite electrical source(s). Additional risk may be a result of planned maintenance activities either onsite, or beyond the switchyard, CONVEX generated limitations, or natural conditions, such as adverse weather. Although the penalty may be applied against an offsite power source, the power source is still considered available for SDR and PRA.
>
> **NOTE:** Offsite Grid Risk penalty points for Environmental Conditions apply at all times.
>
> **NOTE:** Offsite Grid Risk penalty points for ISO-NE/CONVEX Alerts apply at all times.

a. **Environmental Conditions**

1) IF Environmental Conditions threaten the grid, **THEN DEDUCT** points equivalent to number of off-site sources being credited from Power Availability Score.

- Average sustained wind speed 75 mph
- Salt contamination buildup or arcing in 345kV switchyard
- Entry into AOP 3569, Severe Weather Conditions for:
  - •• Tornado Watch
  - •• Hurricane Watch or Warning
- Tornado Warning is **NOT** included as it is issued when a tornado has already been observed on the ground. There is insufficient time to take action to mitigate the situation.Focus on AOP provides immediate actions necessary.

## ATTACHMENT 6
## Power Availability Requirements
(Page 3 of 5)

b. **Switchyard and Blockhouse Work**

> **NOTE:** For North and South bus outages where there is **NO** work being performed that could jeopardize the other bus, the penalty point does **NOT** need to be taken.
>
> **NOTE:** The following are examples of High Risk Switchyard Evolutions:
>
> - Trip testing affecting more than one 345KV line
> - Any two 345KV lines being out of service
> - North or south bus outage or bus trip testing

- IF in a High Risk Evolution for Switchyard and Blockhouse Work in progress **AND NONE** of the following conditions are met, **THEN DEDUCT** points equivalent to number of Off-site sources being credited from Power Availability Score. Power Availability KSF is no better than ORANGE.
  - •• Two steam generators are available for decay heat removal.
  - •• RCS is greater than 10% Prz level and all loop stop valves open.
  - •• Reactor Vessel Head is off and refueling cavity > 23' (> 40.4% adjusted level RCS-LI462).
  - •• Approved switchyard/blockhouse work Contingency Plan
- IF in an RSST outage with breaker 13T open to support Unit 2, **THEN DEDUCT** one penalty point. A fault on 348/3252 line will open breakers 14T and 15T. This will cause a loss of offsite power. A risk mitigation plan can **NOT** be used in this case to prevent entry into an Orange or Red Condition. **[Ref.** 5.4.13**]**

c. **ISO New England/CONVEX Alerts**

- IF ISO New England/CONVEX issue alerts, **THEN DEDUCT** points equivalent to number of Off-site sources being credited from the Power Availability Score.

d. **NOTIFY** Millstone Unit 2 that a Penalty Factor is being applied and an assessment of the impact on their PRA profile is required.

e. IF multiple events/evolutions are planned or in progress, **THEN USE** most restrictive penalty factor **NOT** to exceed number of off-site power sources credited.

5. IF an Entry Condition is met, **THEN GO TO** EOP 3501, Loss of All AC Power (MODE 5, 6, and Zero).
6. **REFER** to Attachment 7 for specific AC/DC circuits which support “Defense in Depth” and **PREVENT** those electrical circuits from being removed from service or being tested while providing support for Key Safety Systems.

## ATTACHMENT 6
## Power Availability Requirements
(Page 4 of 5)

**NOTE:** CONVEX/Eversource schedules are strictly date driven with the exception of some limiting environmental conditions (e.g., rain, ice, high winds) while the Millstone outage schedule is sequential event driven. Therefore, CONVEX/Eversource activities should be scheduled with a work date and a contingency date, making CONVEX/Eversource contractor availability more flexible.

**NOTE:** NUC WC 12, 345kV Transmission Facilities Testing and Maintenance, describes allowed configurations for switchyard maintenance.

**CAUTION:** Approved work activities in transformer yards or switchyard must **NOT** be a risk to availability when redundant offsite source is out of service.

7. IF notified that a scheduled or emergency transmission facility outage is ready to be implemented, **THEN PERFORM** the following:
   a. **DETERMINE** if an existing condition or event would conflict with facility outage.
   b. **EVALUATE** Unit 3's electrical system for abnormal conditions.
   c. IF conflicts or abnormal conditions exist that would pose an unacceptably high risk to power availability, **THEN NOTIFY** Unit 2 Shift Manager.
8. IF Unit 3 RSSA is out of service **AND** 15G-13T-2 breaker is to be opened to allow Unit 2 to credit Unit 3 NSSA as an offsite power source, **THEN ENSURE** one of the following conditions exists before opening 15G-13T-2 breaker:
   - Refueling cavity is full.
   - RCS is capable of being pressurized with at least 2 S/Gs able to provide decay heat removal.
   - Unit 3 reactor is defueled (MODE 0).

## ATTACHMENT 6
## Power Availability Requirements
(Page 5 of 5)

9. Power Availability requirements

| |
|---|
| A. EDG A & B |
| EGA support functions |
| EGD support functions |
| EGF support functions |
| EGO support functions |
| EGS support functions |
| EDG ventilation support functions |
| SWP flow path to the EDG available |
| 3HVY*FN2A & 2B |
| Battery 1 (301A-1) & Battery 2 (301B-1) |
| B. Main/NSST offsite source |
| Nitrogen support functions |
| Oil cooling support functions |
| Circuit alignment capability available from switchyard to 4160v busses |
| C. RSST offsite source |
| Nitrogen support functions |
| Oil cooling support functions |
| Circuit alignment capability available from the switchyard to 4160v busses |
| D. Station Blackout EDG (available only when time to core boiling > 30 min.) |
| Battery 5 |
| Busses 34A OR 34B |
| E. Emergency Power (MCC/RC area) |
| 3HVR*ACU1A and 1B (Note 1) |
| SWP cooling flow path to support ACU1A/B cooling (if required to maintain room temperature below 120°F) |
| 3HVY*FN2A & 2B |
| F. Emergency Power (control building switchgear) |
| 3HVY*FN2A & 2B |

Note 1: OP 3314A, Auxiliary Building Heating, Ventilation and Air Conditioning, contains guidance and limits on removing one or both MCC Rod Control ACUs from service.

Dominion

*Millstone Unit 3 Shutdown Safety Assessment (SSA) Checklist*

**OU-M3-201 – Attachment 1** **Page 1 of 8**

**Section 1**

**Protected Train A / B** *(Circle one or both)*

☐ Single train exception in effect

| | |
|---|---|
| Date/Time Performed: ________ / ________ | Date/Time of Shutdown: ________ / ________ |
| ☐ Actual Conditions | Days Shutdown: ____________ |
| ☐ Predicted Conditions for ____________ | Reason for SSA (e.g., 00:00 hour, mode change, configuration changes): |

| | | | |
|---|---|---|---|
| Required RCS/Refueling Cavity Boron Concentration | _______ PPM | Required SFP Boron Concentration | _______ PPM |
| Actual RCS/Refueling Cavity Boron Concentration | _______ PPM | Actual SFP Boron Concentration | _______ PPM |
| Actual Greater than Required | ☐ Yes ☐ No | Actual Greater than Required | ☐ Yes ☐ No |

**Section 2**

| Time To Core Boil | Spent Fuel Pool Heatup Time |
|---|---|
| ☐ RCS Pressure: _____ psia | ☐ SFP Temp: _____ °F |
| ☐ RCS Temp: _____ °F | ☐ > 80 fuel assemblies transferred to SFP |
| ☐ RCS Level: _____ feet above/below flange | ☐ >145 fuel assemblies transferred to SFP |
| ☐ RCS Time to Boil: __________ | ☐ SFP Time to 150°F _____ hours |
| ☐ NA (Mode 0) | ☐ SFP Time to 200°F _____ hours |
| **Time To 200°F (EAL EA2 Criterion)** | |
| RCS Time to 200°F: ______________ | |
| ☐ NA if not in Mode 5 or 6 | |
| **Time To Heatup 10°F (EAL EU1 Criterion)** | |
| RCS Time to Heatup 10°F: ______________ | |
| ☐ NA if not in Mode 5 or 6 | |

Form No. 729450(Jul 2017)

**Section 3 Decay Heat Removal (DHR)**

**RCS DECAY HEAT REMOVAL (DHR)**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| | | | | *(Circle)* |
| ☐ 'A' Train RHR | (1) | _____ | 0 | RED |
| ☐ 'B' Train RHR | (1) | _____ | 1 | ORANGE |
| ☐ > 23' refuel cavity (> 40.4% adjusted level RCS-LI462) | (1) | _____ | 2 | YELLOW |
| | | | 3 | GREEN |
| ☐ All conditions met to meet natural circulation in the RCS | (1) | _____ | | |
| ☐ RCS in Reduced Inventory Operation (Orange) | (-1) | _____ | | |

☐ Additional Credited Charging Pump: A / B / C(O) / C(P) / NA *(Circle One)*

**RCS Decay Heat Removal Total** ☐

**NA for Mode 0**

**BEYOND DESIGN BASIS**

**NA for Mode 0**

**Mode 5:**

Steam Generator available for Decay Heat Removal:

☐ A ☐ B ☐ C ☐ D

AC Independent Aux Feedwater Pump:

☐ Terry Turbine ☐ BDB AFW Pump

☐ Pressurizer Safety Removed

AND

☐ BDB AFW Pump Available for RCS Injection

**Mode 6:**

☐ BDB AFW Pump pre-staged for injection into the RCS

**Transition Period**

☐ Transitioning to Natural Circulation or Bleed and Feed Cooling. Actions are in progress to establish a BDB heat removal method.

**Section 3 Decay Heat Removal (Continued)**

**SFP DECAY HEAT REMOVAL (SDR)**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| | | | | *(Circle)* |
| ☐ SFP Level > 23' above fuel (Tech Spec) (48'3" elev (6% SFC-LI26)) | (1) | ____ | 0 | RED |
| ☐ 'A' SFPC pump* | (1) | ____ | 1 | ORANGE |
| | | | 2 | YELLOW |
| ☐ 'B' SFPC pump* | (1) | ____ | 3 | GREEN |

*The SFPC pump must be powered from the normal power source to be credited.

**N/A if in MODE 5 <u>OR</u> core reload is complete**

**SFP Decay Heat Removal Total** ☐

**FUEL OFFLOAD REQUIRED EQUIPMENT (LA 182)**

| | Available Equipment *(Circle)* | | | |
|---|---|---|---|---|
| Protected train spent fuel cooling pump | A | B | | |
| Non-protected train spent fuel cooling pump | A | B | | |
| Electrician's name or beeper number (if applicable) ____________ | | | | |
| Two RPCCW pumps | A | B | C | |
| Two Service Water pumps | A | B | C | D |

## Section 4 Inventory Control

**RCS Inventory Control**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| ☐ 'A' Train CHS with flow path A / C *(Circle)** | (1) | ____ | | *(Circle)* |
| ☐ 'B' Train CHS with flow path B / C *(Circle)** | (1) | ____ | 0 | RED |
| ☐ 'A' Train SIH aligned to RWST with either hot leg or cold leg injection path capability* | (1) | ____ | 1 | ORANGE |
| | | | 2 | YELLOW |
| ☐ 'B' Train SIH aligned to RWST with either hot leg or cold leg injection path capability* | (1) | ____ | 3-6 | GREEN |
| ☐ Both RHR trains available for DHR and both capable of alignment to the RWST* | (1) | ____ | | |
| ☐ One RHR train aligned to the RWST or capable for alignment using Section 4.8 of either SP 3606.2 or SP 3606.4 as applicable* | (1) | ____ | | |
| ☐ RCS Inventory > Decreased Inventory Conditions | (1) | ____ | | |
| ☐ RCS in Decreased Inventory Operation (at best Yellow) | | ____ | | |
| ☐ RCS in Reduced Inventory Operation (Orange) | (-1) | ____ | | |
| **Inventory Control Total** | ☐ | | | **NA for Mode 0** |

☐ RWST level > 250,000 gallons

☐ 3RHS*V43, RHR to RWST recirculation tagged and locked closed (It is permissible to open this valve under administrative control if the RHR hot leg injection valve (3RHS*MV8716A/B) for the operating RHR pump connected to the RCS is closed with power lockouts off and valve handwheel locked.)

Tagout Number ______________________

*Minimum defense in depth for this KSF: One CHS pump and one backup pump.

**Section 4 Inventory Control (Continued)**

**SFP Inventory Control**

| Check boxes for available equipment. | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| ☐ Gravity Makeup from the RWST (Level >800,000 gallons) | (1) | ____ | | *(Circle)* |
| | | | 0 | RED |
| ☐ 'A' Primary Grade Water System Pump and Makeup Flow Path | (1) | ____ | | |
| | | | 1 | ORANGE |
| ☐ 'B' Primary Grade Water System Pump and Makeup Flow Path | (1) | ____ | | |
| | | | 2 | YELLOW |
| ☐ Makeup Available from Fire Protection System (e.g., hose) | (1) | ____ | | |
| | | | ≥3 | GREEN |

**SFP Inventory Control Total** ☐

**Section 5 Reactivity Control**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| ☐ RCS Boron > required SDM* | (1) | ____ | | |
| | | | | *(Circle)* |
| ☐ Inventory flow paths* | (0,1,2) | ____ | 0-2 | RED |
| ☐ In Mode 5, at least one Shutdown Margin Monitor train operable or one channel source range with automatic or manual monitoring of count rate* | (1) | ____ | 3 | ORANGE |
| | | | 4 | YELLOW |
| | | | 5 | GREEN |
| ☐ In Mode 6, at least one** source range flux detector with automatic or manual monitoring of count rate* | (1) | ____ | | |
| ☐ Dilution paths tagged using SP 3604C.6 (may be opened under admin control) | (1) | ____ | | |

Tagout Number ____________________

*Minimum defense in depth for this KSF: RCS Boron, two inventory flow paths, and one monitoring method.

**During core alterations two source range detectors are required to meet Technical Specifications.

**Reactivity Total** ☐ **NA for Mode 0**

## Section 6 Containment

**NOTE:** See OP 3260A, Attachment 6, Containment Penetration Tracking Sheet, and OP 3260A-005, Containment Boundary or RCS Integrity Work Log, or equivalent sheet from OP 3260A, for status of containment penetrations.

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| ☐ Containment Closure Capability | (0,2,3) | _____ | | |
| ☐ Containment Closure Set (3 points) | | | *(circle)* | |
| OR | | | | |
| ☐ Containment Closure Set with exceptions tracked and capable of being closed prior to the lesser of: | | | 0 | RED |
| | | | 1 | ORANGE |
| • Time to Core Boil (2 points) | | | 2 | YELLOW |
| <u>OR</u> | | | ≥3 | GREEN |
| • 4 hours (2 points) | | | | |
| OR | | | | |
| ☐ Containment Closure Set with administrative controls of OP 3250.12 during fuel movement within the containment building. (2 points) | | | | |
| ☐ No significant fuel failures indicated | (1) | _____ | | |
| ☐ No Core Alterations in progress in Containment | (1) | _____ | | |
| ☐ RCS Pressure Boundary intact | (1) | _____ | | |
| ☐ Low Decay Heat (>8 days Shutdown) | (1) | _____ | | |

**Containment Total** ☐ **NA for Mode 0**

**Section 7 Power Availability**

**Power Sources**

| | Point Value | Score | Total | Condition |
|---|---|---|---|---|
| On-site Power Source** | | | | |
| ☐ 'A' EDG* | (1) | _____ | | *(circle)* |
| ☐ 'B' EDG * | (1) | _____ | 0-1 | RED |
| ☐ SBO Diesel (Time to Boil > 30 min) | (1) | _____ | 2 | ORANGE |
| Off-Site Power Source** | | | 3 | YELLOW |
| ☐ NSST/Main | (1) | _____ | 4-5 | GREEN |
| ☐ RSST | (1) | _____ | | |

**Power Availability Sub-Total** ☐

* At least one EDG must be available at all times. If no EDG is available, Power Availability is automatically RED.
**Minimum defense in depth for this KSF: one EDG, one off-site power source, and one additional on-site or off-site power source.

**Off-site GRID Risk Penalty Factor**

| | Point Value | Score | |
|---|---|---|---|
| Environmental Conditions[1] | (-1) | _____ | |
| ☐ Avg sustained wind speed ≥ 75 mph | | | |
| ☐ Salt contamination buildup or arcing in the 345 kV switchyard | | | |
| ☐ Tornado watch, hurricane watch or warning | | | |
| OR | | | |
| Switchyard and Blockhouse Work[1,2] | (-1) | _____ | (At best Orange) |
| ☐ Trip Testing affecting more than one 345 kV line | | | |
| ☐ Two 345 kV lines out of service | | | |
| ☐ Planned switchyard bus outage or bus trip testing (North or South)[3] | | | |
| ☐ Planned maintenance or projects | | | |
| OR | | | |
| ISO-NE/CONVEX Alerts[1] | (-1) | | |
| ☐ Abnormal transmission network conditions with potential for loss of grid. | | _____ | |
| ☐ ______________________________ | | _____ | |

**Power Availability Total** ☐

[1] If multiple events/evolutions are planned or in progress, use most restrictive penalty factor NOT to exceed number of off-site power sources credited.
[2] Only deduct penalty point if all the following conditions are met:
- Natural circulation NOT available.
- At least 1 RCS loop isolated.
- Reactor cavity NOT full.
- Switchyard maintenance contingency plan NOT in place.

[3] For North and South bus outages where there is no work being performed that could jeopardize the other bus, the penalty point does not need to be taken.

*Millstone Unit 3 Shutdown Safety Assessment (SSA) Checklist*



| Assessment Completion | | |
|---|---|---|
| The following SSA Checklist items have been performed:<br>❑ Containment<br>❑ RCS Decay Heat Removal<br>❑ SFP Decay Heat Removal<br>❑ RCS Inventory Control<br>❑ SFP Inventory Control<br>❑ Power Availability<br>❑ Reactivity Control | Signature (Licensed Operator or STA) | |
| Protected Equipment signs in place based on SSA | Signature (Licensed Operator or STA) | |
| Conflicts between the availability reflected in the outage schedule and this checklist have been brought to the attention of the SM. | Conflicts?<br>*(Circle One)*<br>YES / NO | Initial |
| Remarks: | | |
| CR written to address unplanned entries into RED or ORANGE conditions | CR Number: | |
| Shift Manager Review | Signature | |
| SSA Equipment Status Board(s) / Programs Updated | Initials | |
| SOM, OOM, and Maintenance Rule Coordinator Notifications made for *unplanned* RED or ORANGE. OMOC notifications made. | Initials | |
| Completed SSA Checklist maintained with the Shift Turnover Report | Initials | |

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Complete a Shutdown Safety Assessment Checklist.

JPM Number: 2017 NRC SRO A.2

Revision: 0

Initiated:

Robert Royce — 8/17/17

Developer — Date

Reviewed:

Dave Minnich — 8/17/17

Technical Reviewer — Date

Reviewed:

BRODEUR — 8/22/17

Technical Reviewer — Date

Approved:

M. J. COTE — 8/22/17

Supervisor, Nuclear Training — Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Direct from Bank (JPM A105) | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: ____________

JPM Number: 2017 NRC SRO A.2 Revision: 0

Task Title: Complete a Shutdown Safety Assessment Checklist.

Admin Area Equipment Control

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 30

Applicable To: SRO X RO ____

K/A Number: 2.2.18 K/A Rating: 2.6 / 3.9

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: X Simulator: ____ In-Plant: ____

Task Standards: Given a specific set of plant conditions, correctly perform a Shutdown Safety Assessment Checklist.

Required Materials: (procedures, equipment, etc.) OU-M3-201, Rev 23, *Shutdown Safety Assessment Checklist.*

General References: OU-AA-200, *Shutdown Risk Management*

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC SRO A.2 Revision : 0

Initial Conditions:

The plant is in MODE 5, and initial conditions are as follows:

- The plant is in day 28 of a scheduled 30 day refueling outage.
- RCS Boron concentration is 1987 ppm, which is in excess of required Shutdown margin.
- RCS temperature is 160°F
- RCS pressure is 360 psia.
- "A" Train is protected.
- Both RHR trains are aligned for cooldown with the 'A' RHR running.
- The 'A' Charging pump is running.
- The 'C' Charging pump is tagged out with its breaker racked down.
- All four RCS loops have been vacuum filled.
- All four SGs are at 50% narrow range level.
- The 'B' SI pump is available for inventory control, caution tagged in the Pull-to-Lock position, with its breaker racked up, and its UC fuses removed.
- Containment Closure is set with exceptions tracked and capable of being closed prior to core boiling and prior to 4 hours.
- 3RHS*V43, RHR to RWST recirculation, is tagged and locked closed.
- 1,200,000 gallons in the RWST.
- Both the North and South busses of the 345KV switchyard are energized and considered reliable.
- Dilution flowpaths are tagged closed.
- Spent Fuel Pool level is normal.
- The SBO Diesel is out of service for planned maintenance.
- No other equipment is out of service.
- The BDB AFW Pump is available for RCS injection.

The following sequence of events occurs:

1. A loss of "A" Train normal and emergency buses 34A and 34C occurs.
2. The crew enters EOP 3505, *Loss of Shutdown Cooling and/or Inventory.*
3. The 'B' RHR pump is started.
4. The 'B' Charging pump is racked up and started.
5. RCS temperature is stabilized.

Initiating Cues:

The Shift Manager directs you to complete a Shutdown Safety Assessment Checklist to address the new current plant conditions for the loss of buses 34A and 34C.

OU-M3-201, Section 3.2, "Shutdown Safety Assessment (SSA) Checklist Preparation", sections 1 and 2 are being completed by the STA.

Complete the Shutdown Safety Assessment Checklist, Section 3.2, starting with section 3 (Decay Heat Removal, step 3.2.1.f), and determine the color condition for each Key Safety Function.

Simulator Requirements: NONE

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.2 Revision: 0

Task Title: Complete a Shutdown Safety Assessment Checklist.

START TIME: ______________

| | | | | |
|---|---|---|---|---|
| **STEP #1** | Performance: Obtains materials, locates correct procedure section. | Standard: Examinee is provided with a copy of OU-M3-201, *Shutdown Safety Assessment Checklist*. Reviews front matter, and arrives at section 3.2.1.f, "Section 3 - Decay Heat Removal (DHR)." | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | If the Candidate questions the completion of sections 1 and 2 of the Checklist, state that " Sections 1 and 2 are being completed by the STA and will not be completed by you as part of this JPM." | | | |
| Comments: | The examinee is provided with a copy of OU-M3-201 and a copy of Attachment 1 (Millstone Unit 3 Shutdown Assessment (SSA) Checklist. | | | |
| **STEP #2**<br>OU-M3-201, step 3.2.1.f.1 | Performance: RCS Decay Heat Removal (DHR)<br>• **IF** in MODE 0, **THEN CIRCLE** "NA for MODE "0" and **GO TO** step 3.2.1.f.2. | Standard: Examinee recognizes that the plant is in MODE 5 and not in MODE 0, and moves on to the next step. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #3**<br>OU-M3-201, step 3.2.1.f.1 | Performance:<br>• **REFER** to ATTACHMENT 2 for background information of each element associated with the Decay Heat Removal KSF. | Standard: Examinee refers to Attachment 2 and reviews background information | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| STEP #4<br>OU-M3-201, step 3.2.1.f.1 | Performance:<br>RCS Decay Heat Removal (DHR)<br>• **CHECK** appropriate boxes for conditions supporting “Key Safety Function” of RCS decay heat removal.<br>• **IF** natural circulation is the only backup for decay heat removal **AND NOT** in a Bus 34C or 34D outage, **THEN CIRCLE** additional credited charging pump.<br>• **TOTAL** score and **ENTER** value in RCS DHR Total box.<br>• **CIRCLE** Condition color corresponding to point total. | Standard:<br>Examinee determines that ‘B’ RHR is in operation in the cooldown mode and checks the following boxes:<br>• “B” Train RHR<br>• All conditions met to meet natural circulation in the RCS<br>Assigns one point each, for a total of two points.<br>Determines RCS decay heat removal is “Yellow”. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |
| STEP #5<br>OU-M3-201, step 3.2.1.f.2 | Performance:<br>Beyond Design Basis<br>• **CHECK** appropriate boxes corresponding to present BDB condition. | Standard:<br>Determines all four SGs are available, along with the Terry Turbine and checks the appropriate boxes. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #6**<br>OU-M3-201, step 3.2.1.f.3. | Performance:<br>SFP Decay Heat Removal<br>• **IF** in MODE 5 **OR** core reload or shuffle is complete, **THEN CIRCLE** "N/A in MODE 5 **OR** core reload is complete," and **GO TO** step 3.2.1.f.4. | Standard:<br>Recognizes the plant is in MODE 5, Circles "N/A in MODE 5 OR core reload is complete" and goes to step 3.2.1.f.4 | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #7**<br>OU-M3-201, step 3.2.1.f.4. | Performance:<br>Fuel Offload Required Equipment<br>IF the following conditions are met, **THEN REFER** to ATTACHMENT 2 for Fuel Offload Required Equipment and **DOCUMENT** available equipment:<br>• In MODE 6. Core offload has started and core reload has **NOT** been completed.<br>• In MODE 0 | Standard:<br>Recognizes the plant is not in MODE 6, and not in MODE 0.<br>Proceeds to next step. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| STEP #8<br>OU-M3-201, step 3.2.1.g.1. | Performance:<br>Section 4 - Inventory Control<br><br>RCS Inventory Control<br><br><u>IF</u> in MODE 0, **THEN CIRCLE** "NA for Mode 0" and **GO TO** step 3.2.1.g.2.<br>• **REFER** to ATTACHMENT 3 for background information of each element associated with the RCS Inventory Control KSF.<br>• **CHECK** appropriate boxes for conditions supporting "Key Safety Function" inventory.<br>• **TOTAL** score and **ENTER** value in Inventory Control Total box.<br>• **CIRCLE** Condition color corresponding to the point total.<br>• **ENSURE** RWST level is greater than 250,000 gallons and **CHECK** box.<br>• **CHECK** 3RHS*V43, RHR to RWST recirculation isolation, is tagged and locked closed by verifying the clearance is active in the tagging computer (Preferred Method) and **CHECK** box. | Standard:<br><br>Recognizes the plant is not in MODE 0, so the step is required to be completed.<br><br>Reviews background information for RCS Inventory Control.<br><br>Checks boxes for<br>• 'B' Train CHS with flow path<br>• 'B' Train SIH aligned to RWST with either hot leg or cold leg injection path capability<br>• RCS Inventory > Decreased Inventory Conditions<br><br>Assigns one point each, for a total of three points.<br><br>Determines RCS Inventory Control is "Green".<br><br>Checks boxes for adequate RWST level and for 3RHS*V43, locked closed. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color<br><br>The "B" RHR Pump cannot be credited, even though it is available, since is it required for temperature control.<br><br>Minimum defense in depth for this KSF: One CHS pump and one backup pump.<br><br>The additional defense of RCS Greater Than Decreased Inventory point value cannot be credited toward meeting the minimum DID criteria (YELLOW). | | | |

| STEP #9 | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| OU-M3-201, step 3.2.1.g.2. | Spent Fuel Pool Inventory Control<br>• **REFER** to ATTACHMENT 3 for background information of each element associated with the Inventory KSF.<br>• **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of SFP Inventory Control.<br>• **TOTAL** score and **ENTER** value in SFP Inventory Control Total box.<br>• **CIRCLE** Condition color corresponding to the point total. | Reviews background information for Spent Fuel Pool Inventory Control Inventory Control.<br>Checks boxes for<br>• Gravity Makeup from the RWST (Level >800,000 gallons)<br>• 'B' Primary Grade Water System Pump and Makeup Flow Path<br>• Makeup Available from Fire Protection System (e.g., hose)<br>Assigns one point each, for a total of three points.<br>Determines Spent Fuel Pool Inventory Control is "Green". | **Y** ☒ N ☐ | S ☐ U ☐ |
| Cue: | | | | |
| Comments: | Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color | | | |

<table>
<tr>
<td>STEP #10<br><br>OU-M3-201, step 3.2.1.h.</td>
<td>Performance:<br>Section 5 - Reactivity Control<br><br>1. IF in MODE 0, THEN CIRCLE “NA for Mode 0” and GO TO step 3.2.1.i.<br>2. REFER to ATTACHMENT 4 for background information of each element associated with the Reactivity KSF.<br>3. CHECK appropriate boxes for conditions supporting “Key Safety Function” of Reactivity.<br>4. TOTAL score and ENTER value in the Reactivity Total box.<br>5. CIRCLE Condition color corresponding to point total.</td>
<td>Standard:<br>Recognizes the plant is not in MODE 0, so the step is required to be completed.<br><br>Reviews background information for Reactivity Control.<br><br>Checks boxes for<br>• RCS Boron > required SDM*<br>• Inventory flow paths* (2)<br>• In Mode 5, at least one Shutdown Margin Monitor train operable or one channel source range with automatic or manual monitoring of count rate*<br>• Dilution paths tagged using SP 3604C.6 (may be opened under admin control)<br><br>And assigns one point each, for a total of five points.<br><br>Determines RCS Inventory Control is “Green”.</td>
<td>Critical:<br>Y ☒ N ☐</td>
<td>Grade:<br>S ☐ U ☐</td>
</tr>
<tr>
<td>Cue:</td>
<td colspan="4"></td>
</tr>
<tr>
<td>Comments:</td>
<td colspan="4">Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color.<br>Inventory flowpaths are determined from RCS Inventory Control Section 4, which is CHS Pump and SIH Pump.</td>
</tr>
</table>

| STEP #11 | Performance | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| OU-M3-201, step 3.2.1.i. | Section 6 - Containment<br>1. **IF** in MODE 0, **THEN CIRCLE** "NA for Mode 0" and **GO TO** step 3.2.1.j.<br>2. **REFER** to ATTACHMENT 5 for background information of each element associated with Containment KSF.<br>3. **CHECK** one of the Containment Closure requirements are met.<br>4. **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of Containment.<br>5. **TOTAL** score and **ENTER** value in Containment Total box.<br>6. **CIRCLE** Condition color corresponding to the point total. | Recognizes the plant is not in MODE 0, so the step is required to be completed.<br>Reviews background information for Containment.<br>Checks boxes for<br>• Containment Closure Set with exceptions tracked and capable of being closed prior to the lesser of:<br>  • Time to Core Boil (2 points) OR<br>  • 4 hours (2 points)<br>• No significant fuel failures indicated<br>• No Core Alterations in progress in Containment<br>• RCS Pressure Boundary intact<br>• Low Decay Heat (>8 days Shutdown)<br>Assigns one point each, and two points for Containment Closure, for a total of six points<br>Determines Containment is Green | Y ☒ N ☐ | S ☐ U ☐ |
| Cue: | | | | |
| Comments: | Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color. | | | |

| STEP #12 OU-M3-201, step 3.2.1.j. | Performance: Section 7 - Power Availability | Standard: Reviews background information for Power Availability. | Critical: | Grade: |
|---|---|---|---|---|
| | 1. **REFER** to ATTACHMENT 6 for background information for each element associated with Power Sources KSF.<br>2. **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of Power Availability.<br>3. REFER to ATTACHMENT 6 for applicable Off-Site GRID Risk Penalty Factor and **SUBTRACT** from Power Availability subtotal to determine Power Availability Total.<br>4. **TOTAL** score and **ENTER** value in Power Availability Total box.<br>5. **CIRCLE** Condition color corresponding to point total. | Checks boxes for<br>• "B" EDG<br>• NSST/Main<br>• RSST<br>Assigns one point each, for a total of three points.<br>Determines the grid risk factor is zero.<br>Determines Power Availability is Yellow. | Y ☒ N ☐ | S ☐ U ☐ |
| Cue: | | | | |
| Comments: | Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color | | | |

| STEP #13 | Performance: To obtain each Key Safety Function Total, SUM the points allotted for each credited component or condition supporting the Key Safety Function and ENTER in box. | Standard: Candidate sums the points for each credited component or condition supporting the Key Safety Function<br>• RCS Decay Heat Removal: 2<br>• RCS Inventory: 3<br>• SFC Inventory: 3<br>• Reactivity: 5<br>• Containment: 6<br>• Power Availability: 3 | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #14 | Performance: **Using the Key Safety Function Total, CIRCLE the associated color CONDITION.** | Standard: Candidate circles the color condition below for each Key Safety Function<br>RCS Decay Heat Removal<br>**Yellow**<br>RCS Inventory<br>**Green**<br>SFC Inventory<br>**Green**<br>Reactivity<br>**Green**<br>Containment<br>**Green**<br>Power Availability<br>**Yellow** | Critical: Y ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | "The STA's independent assessment and the review process will be tracked by the US." | | | |
| Comments: | | | | |

| STEP #15 | Performance: Notify the Shift Manager that the Shutdown Safety Assessment Checklist is complete. | Standard: Reports to the Shift Manager that the Shutdown Safety Assessment Checklist is complete. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

**TERMINATION CUE: The evaluation for this JPM is complete.**

STOP TIME: ____________________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.2 Revision: 0

Task Title: Complete a Shutdown Safety Assessment Checklist.

Date Performed: ____________

Examinee: ____________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **30** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT

JPM Number: 2017 NRC SRO A.2 Revision: 0

Initial Conditions

The plant is in MODE 5, and initial conditions are as follows:

- The plant is in day 28 of a scheduled 30 day refueling outage.
- RCS Boron concentration is 1987 ppm, which is in excess of required Shutdown margin.
- RCS temperature is 160°F
- RCS pressure is 360 psia.
- "A" Train is protected.
- Both RHR trains are aligned for cooldown with the 'A' RHR running.
- The 'A' Charging pump is running.
- The 'C' Charging pump is tagged out with its breaker racked down.
- All four RCS loops have been vacuum filled.
- All four SGs are at 50% narrow range level.
- The 'B' SI pump is available for inventory control, caution tagged in the Pull-to-Lock position, with its breaker racked up, and its UC fuses removed.
- Containment Closure is set with exceptions tracked and capable of being closed prior to core boiling and prior to 4 hours.
- 3RHS*V43, RHR to RWST recirculation, is tagged and locked closed.
- 1,200,000 gallons in the RWST.
- Both the North and South busses of the 345KV switchyard are energized and considered reliable.
- Dilution flowpaths are tagged closed.
- Spent Fuel Pool level is normal.
- The SBO Diesel is out of service for planned maintenance.
- No other equipment is out of service.
- The BDB AFW Pump is available for RCS injection.

The following sequence of events occurs:

1. A loss of "A" Train normal and emergency buses 34A and 34C occurs.
2. The crew enters EOP 3505, *Loss of Shutdown Cooling and/or Inventory.*
3. The 'B' RHR pump is started.
4. The 'B' Charging pump is racked up and started.
5. RCS temperature is stabilized.

Initiating Cues:

The Shift Manager directs you to complete a Shutdown Safety Assessment Checklist to address the new current plant conditions for the loss of buses 34A and 34C.

OU-M3-201, Section 3.2, "Shutdown Safety Assessment (SSA) Checklist Preparation", sections a, b, c, d, and e have not changed, have been verified to be correct, and do not need to be repeated.

Complete the Shutdown Safety Assessment Checklist, Section 3.2, and determine the color condition for each Key Safety Function.

# JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Evaluation of an Unplanned Gaseous Release.

JPM Number: 2017 NRC SRO A.3 Revision: 0

Initiated:

Robert Royce

Developer 8/17/17 Date

Reviewed:

Dave Minnich

Technical Reviewer 8/17/17 Date

Reviewed:

E. Brodeur

Technical Reviewer 8/18/17 Date

Approved:

M.J. Cote

Supervisor, Nuclear Training 8/18/17 Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Direct from Bank (JPM A220; 2K11 SRO A.3). | 0 |
| | | |
| | | |
| | | |

## JPM WORKSHEET

Facility: Millstone Unit 3 Examinee: ______

JPM Number: 2017 NRC SRO A.3 Revision: 0

Task Title: Evaluation of an Unplanned Gaseous Release.

System: GENERIC

Time Critical Task: ( ) YES ( X ) NO

Validated Time (minutes): 30

Applicable To: SRO **X** RO ______

K/A Number: 2.3.11 K/A Rating: 3.8 / 4.3

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Evaluate an unplanned gaseous release and as a result, the proper notifications and event reporting requirements.

Required Materials: (procedures, equipment, etc.) RAC 14, *Non-Emergency Station Events,* Rev 011

General References: RAC 05, *Reportability Determinations and Licensee Event Reports*
AOP 3573, *Radiation Monitor Alarm Response*
MP-26-EPI-FAP06, *Classification and PARs*

*** READ TO THE EXAMINEE ***

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC SRO A.3 Revision : 0

Initial Conditions:

The plant is at 100% power, and the following sequence of events has occurred:

1. About 30 minutes ago MB2B 2-8 "RADIATION ALERT" alarmed.
2. The RO reported that 3HVR*RE10B is in alert.
3. The crew entered AOP 3573, *Radiation Monitor Alarm Response,* and has completed actions for 3HVR*RE10B.
4. The crew has determined that the cause of the release was a Degasifier overpressure event that lifted the degasifier condenser relief valve (3GWS-RV35).
5. The relief valve was found initially stuck open, but it has since closed.

Current conditions are as follows:

- There is no indication that there is an equipment problem associated with 3HVR*RE10B.
- 3HVR*10B has cleared the alert setpoint. It is currently reading $1.0 \times 10^{-5}$ µCi/cc and slowly lowering. The highest reading during the event was $6.0 \times 10^{-5}$ µCi/cc. The highest 10 minute average net increase was $3 \times 10^{-5}$ µCi/cc.
- The SM has already determined that the event is not Classifiable at the Alert level or above.
- The Chemistry Department has determined that Delta-Two Posture Code Limits (for OU1, Unplanned Release) have not been exceeded.
- The Chemistry Department has determined that the release did not exceed 40CFR302 limits (EPA Reportable Releases).
- HP, Chemistry, Environmental, Licensing and other personnel are in the Control Room ready to assist.
- Turbine Building vent stack flowrate is 186,000 cfm.

Initiating Cues:

The SM has directed you to carry out step 2.1.3 of MP-26-EPI-FAP06, *Classification and PARs*, which states,

"IF the event has been evaluated and is *not* addressed by the Emergency Action Level tables, Go To RAC 14, "Non-Emergency Station Events."

Record any required actions or reporting requirements as a result of your review at the bottom/back of this page.

Simulator Requirements: NONE

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.3 Revision: 0

Task Title: Evaluation of an Unplanned Gaseous Release.

START TIME: ____________

| STEP | Performance: | Standard: | Critical: | Grade: |
|---|---|---|---|---|
| **STEP #1**<br>RAC 14, Section 3 | Obtains a copy of RAC 14, *Non-Emergency Station Events*. | Obtains a copy of RAC 14.<br>Reviews precautions 3.1 through 3.8.<br>Goes to section 4.1 | Y ☐ N ☒ | S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #2**<br>RAC 14, Note prior to step 4.1.1 | **NOTE**<br>Attachments 1 through 6 are tools to provide conservative, prompt reportability assessments of events or conditions. Extensive guidance and examples exist in many documents beyond what is contained in Attachments 1 through 6. If time permits (generally for 4, 8, and 24-hour notifications), contacting Licensing should be considered for additional guidance and insights for determining event or condition reportability. | Reviews note | Y ☐ N ☒ | S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| STEP #3 RAC 14, step 4.1.1.a | Performance:<br>**Initial Event Reportability Determination**<br><u>IF</u> sufficient cause exists for reporting a non-emergency event, PERFORM the following:<br>a. ANALYZE available information and DEVELOP a general understanding of event in progress. | Standard:<br>Determines sufficient cause may exist for reporting this event. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #4 RAC 14, step 4.1.1.b | Performance:<br>ASSIGN staff to collect and track information. | Examinee requests additional staff. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | If the Examinee requests additional personnel to track the event, or requests additional assistance, state: "Additional assistance will be available shortly. Continue with your task." | | | |
| Comments: | | | | |

| STEP #5<br>RAC 14, step 4.1.1.c.1) | Performance:<br>IF necessary, PERFORM the following:<br>REQUEST assistance from any of the following, as applicable, to determine reportability and respond to event:<br>• Unit Chemistry Supervision<br>• Environmental Compliance Coordinator<br>• On-Shift Chemistry Technician<br>• On-Shift Health Physics Technician<br>• Security Shift Operations Supervisor (SSOS)<br>• Licensing | Standard:<br>Examinee reviews the step.<br><br>May request assistance from Chemistry, Health Physics, and Licensing. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | If help is requested, state, "The Shift Manager will request assistance from these people." | | | |
| Comments: | | | | |
| STEP #6<br>RAC 14, step 4.1.1.c.2) | Performance:<br>DOCUMENT resulting basis for reportability and Licensing contact who provided input in eSOMS, if applicable. | Standard:<br>Reads step.<br>May request if there is any available input in eSOMS. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | If asked, state "Licensing has not provided input in ESOMS for this event." | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #7**<br>RAC 14, step 4.1.1.d | Performance:<br>As required, REQUEST Station Duty Officer (typically the non-affected unit STA) and Emergency Communicator (typically the non-affected unit WC SRO) report to the Control Room and prepare to send a Non Emergency Event Report. | Standard:<br>Reads step.<br>May request SDO and Emergency Communicator to come to the Control Room. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | When the examinee requests the SDO and Emergency Communicator (maybe later during the performance of this JPM), state "The SM will contact the SDO and Emergency Communicator." | | | |
| Comments: | The Examinee may wait to determine if the event is reportable prior to requesting the SDO and EC. This is acceptable. | | | |
| **STEP #8**<br>RAC 14, step 4.1.1.e NOTE | Performance:<br>**NOTE**<br>Certain reportable environmental events, including those not reportable to the NRC, have reportable time limits listed in Attachments 1 through 7. | Standard:<br>Examinee reviews the NOTE. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #9**<br>RAC 14, step 4.1.1.e | Performance:<br><u>IF</u> event is *an unplanned or unmonitored radioactive release*, Refer To and PERFORM Section 4.2, "Evaluation of an Unplanned Radioactive Release." | Standard:<br>Examinee recognizes that the event potentially is an unplanned radioactive release, and proceeds to Section 4.2. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| STEP #10 RAC 14, step 4.2.1 CAUTION | Performance: Leaks from plant systems, e.g., aux steam, condensate. etc., that have the potential to be radioactive could constitute an unplanned, unmonitored radioactive release and must be evaluated. | Standard: Examinee reviews the CAUTION. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #11 RAC 14, step 4.2.1 | Performance: IF an unplanned or unmonitored radioactive release has occurred including any spills and/or leaks of radioactive liquid, NOTIFY the following, as applicable, for assistance in determining reportability requirements:<br><br>• Health Physics Supervisior<br>• Unit Chemistry<br>• Environmental Compliance Coordinator<br>• Licensing | Standard: Examinee request Health Physics, Environmental and Licensing. Examinee may have already requested help in a previous step.. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | If help is requested, state, "The Shift Manager will request assistance from these people." | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #12**<br>RAC 14, step 4.2.2 | Performance:<br>IF release source is not identified, Refer To Attachment 8, Section 6, "Maintenance Operations," and REVIEW current plant operations to identify source of release. | Standard:<br>Examinee recognizes that the release source is already identified. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | The release source (3GWS-RV35) was given in Initial Conditions. | | | |
| **STEP #13**<br>RAC 14, step 4.2.3 | Performance:<br>IF applicable, Refer To and IMPLEMENT C OP 200.4 "Response to Plant Leaks." | Standard:<br>Examinee recognizes that C OP 200.4 does not apply and proceeds to step 4.2.4. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #14**<br>RAC 14, step 4.2.4 | Performance:<br>IF applicable, Refer To and IMPLEMENT C OP 200.5, "Oil, Hazardous Material, Hazardous Waste, and Mixed Waste Contingency Plan." | Standard:<br>Examinee recognizes that C OP 200.5 does not apply and proceeds to step 4.2.5. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| STEP #14 RAC 14, step 4.2.5 | Performance: IF applicable, Refer To C OP 200.11, "Operation of a Cross Contaminated System," and simultaneously COMPLETE requirements. | Standard: Examinee recognizes that C OP 200.11 does not apply and proceeds to step 4.2.6. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | The Degasifier relief valve and associated piping are considered contaminated. | | | |
| STEP #15 RAC 14, step 4.2.6, and Att 8 Section 2 | Performance: Refer To Attachment 8, Section 2, "Reportable Releases," and REVIEW for type of release involved. | Standard: Refers to Attachment 8, Section 2, and reviews for type of release involved.<br>Recognizes the following types of release may be involved:<br>1. Releases Exceeding Gaseous Release Rate Limit<br>2. Unplanned Gaseous Releases | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | When the examinee requests the SDO and Emergency Communicator (maybe later during the performance of this JPM), state "The SM will contact the SDO and Emergency Communicator." | | | |
| Comments: | Examinee may request SDO and Emergency Communicator, if not requested earlier. | | | |
| STEP #16 RAC 14, step 4.2.7 | Performance: Refer To Attachment 8, Section 3, "Release Calculations," and COMPLETE calculations listed for released material, or other method as approved by the Chemistry Department. | Standard: Examinee refers to Attachment 8, Section 3, and reviews various the Release Calculations to determine which may apply. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | The various Release Calculations listed in Section 3 follow in JPM steps **17** through **20**. | | | |

| STEP #17 RAC 14, Att 8 Section 3 | Performance: GASEOUS RELEASE RATE LIMIT If an effluent radiation monitor (HVR-RE10B), exceeds the alarm setpoint request that Chemistry enter SP 823/2823/3823 to determine if the instantaneous release rate limit has been exceeded. | Standard: Examinee recognizes that 3HVR*RE10B did NOT exceed its alarm setpoint, therefore this release calculation does not apply. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #18 RAC 14, Att 8 Section 3 | Performance: UNMONITORED GASEOUS RELEASES: | Standard: Examinee recognizes that the release was monitored, therefore this calculation does not apply. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #19<br>RAC 14, Att 8<br>Section 3 | Performance:<br><u>UNPLANNED GASEOUS RELEASES</u><br><br><u>Unit 3 Vent</u><br><br>Average 10 Minute Net Increase on HVR-RE10B in µci/cc **x** Flow Rate (CFM) **x** 472 cc/sec **x** Pressure Correction<br>= __________ µCi/sec | Standard:<br>Examinee recognizes that the release path was via the Unit 3 Vent (Turbine Building stack); therefore this calculation does apply.<br><br>Examinee refers to the initial conditions and records values for the average 10 minute net increase on 3HVR*RE10B ($3 \times 10^{-5}$ µCi/cc) and Unit 3 Vent stack flowrate (186,000 cfm).<br><br>Using these recorded values, the conversion factor of 472 cc/sec/cfm, and pressure correction (1.5), the Examinee calculates and records a release rate **3951 µci/sec**. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | If the Examinee requests assistance performing the calculation, provide the following cue: "A second person will be independently performing the calculation. Perform the calculation."<br>If the Examinee requests Chemistry to perform the calculation, provide the following cue: "There is a delay getting the Chemistry Tech to the Control Room. Perform the calculation." | | | |
| Comments: | | | | |

| STEP #20<br>RAC 14, Att 8<br>Section 3 | Performance:<br>Unit 3 SLCRS<br>Unit 3 ESF Bldg.<br><br>Unit 3 Total = _______ <1500 µCi/sec | Standard:<br>Examinee recognizes that any contribution from the SLCRS or ESF Building effluent release paths will be negligible compared to Unit 3 Vent path release. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | When the examinee requests the SDO and Emergency Communicator (maybe later during the performance of this JPM), state "The SM will contact the SDO and Emergency Communicator." | | | |
| Comments: | Examinee may recognize at this point that 3951 µci/sec is NOT <1500 µCi/sec. Therefore, an unplanned gaseous release has occurred from Unit 3. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #21**<br>RAC 14, Att 8 Section 3 | Performance:<br><u>UNPLANNED OR UNMONITORED LIQUID RELEASE:</u> | Standard:<br>Examinee recognizes that the release was gaseous, therefore this calculation does not apply. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #22**<br>RAC 14, step 4.2.8 | Performance:<br>Refer To the following and DETERMINE if release exceeds limits:<br><br>a. Attachment 8, Section 2, "Reportable Releases."<br><br>b. Attachment 8, Section 4, "EPA Reportable Releases." | Standard:<br>Examinee refers to Attachment 8, Section 2, and reviews to determine if the release exceeds a limit. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #23**<br>RAC 14, Att 8 Section 2.C | Performance:<br><u>Unplanned Gaseous Releases</u> (State Regulation)<br><br>Any increase in noble gas release rates which, when averaged over 10 minutes, is greater than 1500 microcuries/sec above the normal (existing) release rate and this increase is not due to a planned or expected event as listed in Section 6, "Maintenance Operations." | Standard:<br>Examinee recognizes that **3951 µci/sec** is NOT <1500 µCi/sec. Therefore, an unplanned gaseous release has occurred from Unit 3. | Critical:<br>**Y** ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |

| | | | | |
|---|---|---|---|---|
| Comments: | Critical portion of this step is to determine that a gaseous release has occurred. | | | |
| **STEP #24** RAC 14, Att 8 Section 1 | Performance: Environmental Protection Agency Reportable Quantity (RQ) Reportable Release - Any release or loss of radioactive material (airborne, liquid, or solid) to the environment which exceeds the levels permitted in 40CFR302, see Section 4, "EPA Reportable Releases." | Standard: Examinee recognizes from initial conditions that the release did NOT exceed 40CFR302 limits (EPA Reportable Releases). | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #25** RAC 14, step 4.2.9 | Performance: IF release exceeds limits, Refer To appropriate Attachments 1 through 7 and DIRECT Emergency Communicator to perform Section 4.7, "Radiopager Notifications." | Standard: Examinee refers to Attachments 1 through 7 and determines that Attachment 2, **"Radiological Events"**, is the applicable attachment.<br><br>Examinee directs the Emergency Communicator to perform Section 4.7, 'Radiopager Notifications.'" | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | "The SM will contact the Emergency Communicator to perform Section 4.7, "Radiopager Notifications."" | | | |

| STEP #26 RAC 14, step 4.2.9 | | Standard:<br>Examinee matches the event in progress with the following event description in attachment 2:<br>"Any unplanned, unmonitored, or unauthorized release of radiological material to the environment."<br><br>Examinee correctly determines the NRC Reporting Requirement for the event is as follows:<br>**"Within 1 hour via ENS"** (10CFR50.72(b)(2)(xi) | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |
| **STEP #27** RAC 14, step 4.2.9 | | Standard:<br>Examinee correctly determines the State posture code for the event is an **"Foxtrot"**<br>Examinee correctly determines the State Reporting Requirement for the event is as follows:<br>"Within 1 hour of report to NRC"<br>(State Reg. 22a-135-1 / ENV 4.1.6.1) | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

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|---|---|---|---|---|
| **STEP #28** RAC 14, step 4.2.9 | Performance: Determine additional requirements. | Standard: Examinee correctly determines that NOTEs 1, 17 and 19 in Attachment 2 of RAC 14 apply. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | NOTES are located in Attachment 7 to RAC 14. | | | |
| Comments: | | | | |
| **STEP #29** RAC 14, Att 7 NOTE 1 | Performance: Refer To Attachment 15 for additional notifications. | Standard: Examinee reviews Attachment 15 and determines that no additional notifications are required. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #30** RAC 14, Att 7 NOTE 17 | Performance: When Federal and State reporting requirements overlap, the "Clock" for the State reporting does not start until the report is made to the Federal Authority. | Standard: Examinee reviews the NOTE. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| RAC 14, Att 7 NOTE 19 | Performance: The existing CR process is to be used to identify any spills and/or leaks of radioactive liquid. Chemistry, HP and/or Station Licensing personnel will perform any necessary evaluations based on CR information and subsequent investigations as appropriate, and determine if GPI reporting is necessary. | Standard: Examinee recognizes that the release was gaseous, therefore this NOTE does not apply. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

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|---|---|---|---|---|
| **STEP #31** RAC 14, step 4.2.10 | Performance: IF applicable, Refer To Section 4.8, "NRC Notifications." | Standard: Examinee refers to Section 4.8. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | Once the Examinee refers to Section 4.8, provide the following cue:"The Emergency Communicator will prepare and send the Non Emergency Event Report and the Station Duty Officer will complete the remaining required notifications. " | | | |

**Termination cue: The evaluation for this JPM is complete.**

STOP TIME: ____________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.3 Revision: 0

Task Title: Evaluation of an Unplanned Gaseous Release.

Date Performed: ______________

Examinee: ______________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☐ Yes ☒ No | |
| Validated Time (minutes): | **30** | Actual Time to Complete (minutes): | |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

**EXAMINEE HANDOUT**

JPM Number: 2017 NRC SRO A.3 Revision: 0

Initial Conditions: The plant is at 100% power, and the following sequence of events has occurred:

1. About 30 minutes ago MB2B 2-8 "RADIATION ALERT" alarmed.
2. The RO reported that 3HVR*RE10B is in alert.
3. The crew entered AOP 3573, *Radiation Monitor Alarm Response,* and has completed actions for 3HVR*RE10B.
4. The crew has determined that the cause of the release was a Degasifier overpressure event that lifted the degasifier condenser relief valve (3GWS-RV35)
5. The relief valve was found initially stuck open, but it has since closed.

Current conditions are as follows:

- There is no indication that there is an equipment problem associated with 3HVR*RE10B.
- 3HVR*10B has cleared the alert setpoint. It is currently reading $1.0 \times 10^{-5}$ µCi/cc and slowly lowering. The highest reading during the event was $6.0 \times 10^{-5}$ µCi/cc. The highest 10 minute average net increase was $3 \times 10^{-5}$ µCi/cc.
- The SM has already determined that the event is not Classifiable at the Alert level or above.
- The Chemistry Department has determined that Delta-Two Posture Code Limits (for OU1, Unplanned Release) have not been exceeded.
- The Chemistry Department has determined that the release did not exceed 40CFR302 limits (EPA Reportable Releases).
- HP, Chemistry, Environmental, Licensing and other personnel are in the Control Room ready to assist.
- Turbine Building vent stack flowrate is 186,000 cfm.

Initiating Cues: The SM has directed you to carry out step 2.1.3 of MP-26-EPI-FAP06, *Classification and PARs*, which states,

"IF the event has been evaluated and is *not* addressed by the Emergency Action Level tables, Go To RAC 14, "Non-Emergency Station Events."

Record any required actions or reporting requirements as a result of your review at the bottom/back of this page.

## JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Emergency Plan Classification and PAR

JPM Number: 2017 NRC SRO A.4 Revision: 0

Initiated:

Robert Royce

Developer 8/17/17

Date

Reviewed:

Dave Minnich

Technical Reviewer 8/17/17

Date

Reviewed:

E. Brodeur

Technical Reviewer 8/18/17

Date

Approved:

M.J. Cote

Supervisor, Nuclear Training 8/18/17

Date

## SUMMARY OF CHANGES

| DATE | DESCRIPTION | REV/CHANGE |
|---|---|---|
| 8/16/17 | Direct from Bank (2K13 SRO A.4) | 0 |
| | | |

## JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC SRO A.4 Revision: 0

Task Title: Emergency Plan Classification and PAR

System: N/A

Time Critical Task: ( X ) YES ( ) NO

Validated Time (minutes): 22

Applicable To: SRO **X** RO ____ PEO ____

K/A Number: 2.4.44 K/A Rating: 2.4 / 4.4

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: X Simulator: ____ In-Plant: ____

Task Standards: Determine the EAL and State Posture Code
Determine the minimum required PAR

Required Materials:

- MP-26-EPI-FAP06-003 Rev. 011, MILLSTONE UNIT 3 EMERGENCY ACTION LEVELS
- MP-26-EPI-FAP06 Rev 010, CLASSIFICATION AND PARs
- MP-26-EPI-FAP06-005 Rev. 006, CONTROL ROOM PROTECTIVE ACTION RECOMMENDATIONS
- Incident Report Form (MP-26-EPI-FAP07-001)- Rev. 001-03

**(All required references are in the binder labeled "CR DSEO" in the simulator)**

General References: MP-26-EPI-FAP-01-001, CONTROL ROOM DIRECTOR OF STATION EMERGENCY OPERATION, Rev. 014 (CR DSEO)

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

## JPM WORKSHEET

JPM Number: 2017 NRC SRO A.4 Revision : 0

Initial Conditions: With the plant initially at 100% power, an earthquake occurs, resulting in the following sequence of events:

| Time | Event |
|---|---|
| 08:00 | A Small Break LOCA occurs. |
| 08:04 | The RO reports no Charging Pumps and no High Head Safety Injection Pumps are running, and none can be started from the Main Boards. |
| 08:06 | The Core Cooling Status Tree turns yellow based on a loss of RCS subcooling. |
| 08:10 | Core Cooling Status Tree turns orange based on low RVLMS plenum level. |
| 08:15 | The crew transitions from E-0, *Reactor Trip or Safety Injection*, FR-C.1, *Response to Inadequate Core Cooling*. |
| 08:28 | Containment High Range Rad Monitors 3RMS*RE-04A/05A indicate 5.2 R/hr and increasing |
| 08:30 | The Core Cooling Status Tree turns red based on CET's reading 1200°F and rising. |
| 08:35 | 3RMS*RE04A /05A read 230 R/hr and increasing |
| 08:46 | CET's are 1450°F and rising. |
| 08:47 | 3RMS*RE04A/05A read 31,000 R/hr and increasing |

- The current wind speed is fifteen (15) miles per hour.
- The current wind direction is from 145°.

Initiating Cues: **Determine the appropriate emergency classification. This is time critical.**

**Record the Highest required Classification Level, State Posture Code and the required** EAL Major and Minor Heading on the space provided below. **Report to the Examiner when your Classification is made (FOR PROPER TIMING).**

**CLASSIFICATION LEVEL:** ______________________________

**EAL MAJOR HEADING:** ______________________________

**MINOR HEADING:** ______________________________

Simulator Requirements: NONE

**** **NOTES TO TASK PERFORMANCE EVALUATOR** ****

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

## PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.4 Revision: 0

Task Title: Emergency Plan Classification and PAR

START TIME: __________

**For timing purposes, both of the following tasks have time limits:**

1. 15 minutes to determine Emergency Action Level and State Posture Code.
2. 15 minutes after classifying the event to determine minimum required PAR (**Examiner Note:** The initial cue does **not** have the Examinee perform a PAR (as this may lead the Examinee into a GE classification). Once the successful GE classification is made, the examiner will ask for the PAR to be made. This direction is contained in the body of this JPM.

**The timing for the EAL determination (item 1 above) will begin ONCE the book labeled "CR DSEO" is handed to the Examinee** (this will be after the EXAMINEE HANDOUT is read and understood)

**Record the JPM start time above.**

| STEP #1 | Performance:<br>Obtain Proper procedure. | Standard:<br>Examinee obtains or requests copy of MP-26-EPI-FAP06-003, MP3 Emergency Action Levels. | Critical:<br>Y ☐ N ☒ | Grade:<br>S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | After allowing the examinee to read the initial conditions and initiating cue, pass out the CR DSEO book and inform the Examinee that "Timing to complete the Classification has begun." | | | |
| Comments: | Provide the Examinee a blank copy of an Incident Report Form and a Control Room PAR Process Flowchart (Handout #1).<br>Examinee may also request copies of:<br>• MP-26-EPI-FAP-01-001, CR-DSEO Checklist<br>• MP-26-EPI-FAP06, Classification and PARs<br>• MP-26-EPI-FAP06-005, CR PARs<br>• MP-26-EPI-FAP07, Notifications & Comms<br>• MP-26-EPI-FAP07-001, Incident Report Form<br>The **CR DSEO Notebook** contains all these procedures. | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #2.a** FAP06-003 | Performance: Classify the Event | Standard: Examinee recognizes a **LOSS** of the **Fuel Clad Barrier**, based on EITHER one of following:<br>• **FCB1** - Core Cooling RED<br>• **FCB2** - CET > 1200 F<br>• **FCB3** - > 200 R/hr on RE04/05, ≤2hrs after shutdown. (FCB3 AND Table 1 values) | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #2.b** FAP06-003 | Performance: Classify the Event | Standard: Examinee recognizes a **LOSS** of the **RCS Barrier** based on **RCB2** RCS Subcooling < 32°F Due to RCS Leak | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #2.c** FAP06-003 | Performance: Classify the Event | Standard: Examinee recognizes a **POTENTIAL LOSS** of the **CTMT Barrier** based on EITHER one of the following:<br>• **CNB2** – Entry in FR-C.1 with conditions met<br>• **CNB5** – > 800 R/hr on RE04/05, ≤2hrs after shutdown. (FCB3 AND Table 1 values) | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #2.d** FAP06-003 | Performance:<br>Classify the Event | Standard:<br>Examinee reviews MP-26-EPI-FAP06-003 and determines that a NRC EAL of **GENERAL EMERGENCY** based on EITHER one of the following:<br>• Barrier Table (BG1) described above (BG1 exists. Fuel Clad Barrier (L), RCS Barrier (L) and CTMT Barrier (Potential L)).<br>• IN PLANT RADIATION (RG1), based on sustained RE04A/05A reading > 800 R/hr | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #3** FAP06-003 | Performance:<br>Determine State Posture Code | Standard:<br>Examinee reviews MP-26-EPI-FAP06-003 and determines that the block for BG1 or RG1 is the same color as **State Posture ALPHA**. | Critical:<br>Y ☒ N ☐ | Grade:<br>S ☐ U ☐ |
| Cue: | | | | |
| Comments: | **1. Record the Time Classification is Completed: ________ (must be within 15 minutes of JPM start)**<br>**2. If the Examinee correctly answers YES, then CUE the Examinee "Determine Protective Action Recommendations and record recommendation on page 2 of the Examinee handout."**<br>**3. Record start time _________.**<br>**NOTE: If the Examinee unsuccessfully declares another action level (ie not GE Alpha), then end the JPM. The Examinee will have failed the JPM and a PAR is not necessary.** | | | |

| | | | | |
|---|---|---|---|---|
| **STEP #4** | Performance: Determine the State Protective Action Recommendation | Standard: Examinee uses MP-26-EPI-FAP06-005, Section B, Control Room PAR Process Flowchart, to determine the PAR. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #5** FAP06-005 Flowchart | Performance: Determine the State Protective Action Recommendation | Standard: Examinee reviews flowchart and progresses based on a General Emergency being declared | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #6** FAP06-005 Flowchart | Performance: Determine the State Protective Action Recommendation | Standard: Examinee reviews flowchart and progresses based on a General Emergency-Alpha being declared | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |
| **STEP #7** FAP06-005 Flowchart | Performance: Determine the State Protective Action Recommendation | Standard: Examinee reviews flowchart and progresses after determines from Table 3 that this is NOT a rapidly progressing severe incident, since the Containment Barrier is only potentially lost. | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
| Cue: | | | | |
| Comments: | | | | |

| STEP #8 FAP06-005 Flowchart | Performance: Determine the State Protective Action Recommendation | Standard: Examinee reviews Table 1 and determines that 31,000 R/hr exceeds Table 1 Values (Yes). Examinee progresses to the required PAR | Critical: Y ☐ N ☒ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | | | | |
| Comments: | | | | |

| STEP #9 FAP06-005 Flowchart | Performance: Determine the State Protective Action Recommendation | Standard: Examinee reviews flowchart and makes the determination to:<br>1. Evacuate 5 mile radius,<br>2. Evacuate 10 miles downwind, which includes **A** and **B** and **C** and **Lyme** in **D**.<br>3. All other zones shelter in place. | Critical: **Y** ☒ N ☐ | Grade: S ☐ U ☐ |
|---|---|---|---|---|
| Cue: | If asked about a dose assessment from Chemistry state, "Dose assessment results from the Chemistry Technician are not available." | | | |
| Comments: | **Record the Time PAR is Completed: ____________________**<br>**The PAR is required to be completed within 15 minutes of completing the Classification** | | | |

**The evaluation for this JPM is complete.**

STOP TIME: ________________

## VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.4 Revision: 0

Task Title: Emergency Plan Classification and PAR.

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

**EVALUATION SECTION**:

| | | | |
|---|---|---|---|
| Time Critical Task? | | ☒ **Yes** ☐ No | |
| Validated Time (minutes): | 10 min classify<br>12 min PAR | Actual Time to Complete (minutes): | Classify: ____________.<br>PAR: ____________. |
| Overall Result of JPM: | | ☐ SAT ☐ UNSAT | |

Comments:

## EXAMINEE HANDOUT (page 1 of 2)

Initial Conditions: With the plant initially at 100% power, an earthquake occurs, resulting in the following sequence of events:

| Time | Event |
|---|---|
| 08:00 | A Small Break LOCA occurs. |
| 08:04 | The RO reports no Charging Pumps and no High Head Safety Injection Pumps are running, and none can be started from the Main Boards |
| 08:06 | The Core Cooling Status Tree turns yellow based on a loss of RCS subcooling. |
| 08:10 | Core Cooling Status Tree turns orange based on low RVLMS plenum level. |
| 08:15 | The crew transitions from E-0, *Reactor Trip or Safety Injection*, FR-C.1, *Response to Inadequate Core Cooling*. |
| 08:28 | Containment High Range Rad Monitors 3RMS*RE-04A/05A indicate 5.2 R/hr and increasing |
| 08:30 | The Core Cooling Status Tree turns red based on CET's reading 1200°F and rising. |
| 08:35 | 3RMS*RE04A /05A read 230 R/hr and increasing |
| 08:46 | CET's are 1450°F and rising. |
| 08:47 | 3RMS*RE04A/05A read 31,000 R/hr and increasing |

- The current wind speed is fifteen (15) miles per hour.
- The current wind direction is from 145°.

EXAMINEE HANDOUT (page 2 of 2)

Initiating Cues:

**Determine the appropriate emergency classification. This is time critical.**

**Record the Highest required Classification Level, State Posture Code and the required EAL Major and Minor Heading on the space provided below. Report to the Examiner when your Classification is made (FOR PROPER TIMING).**

CLASSIFICATION LEVEL: ______________________________

EAL MAJOR HEADING:________________________________

MINOR HEADING: ____________________________________