

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.1-1 RO & SRO
2010-08 NRC Exam

A.1-1 RO & SRO
Calculation of values required to raise
RWST level.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
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Tools/Equipment/Procedures Needed:

The latest revision of SOI-62.02, "Boron Concentration Control."
Calculator

NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant.

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

1. RWST level has been reported to be at 371,000 gallons.
2. RWST boron concentration is currently 3100 ppm.
3. A problem in the makeup control circuit is currently limiting the maximum boric acid flow rate to 30 gpm.
4. You are an extra operator assigned to the shift.

INITIATING CUES:

1. The Unit Supervisor directs you to determine the amount of primary water and the amount of boric acid needed to raise RWST level to 374,000 gallons while maintaining the current boron concentration.
2. You are to notify Unit Supervisor when you have completed your determination of the amount of primary water and the amount of boric acid needed.

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STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p><u>STEP 1:</u> Obtain a copy of the procedure.</p> <p><u>STANDARD:</u> A copy of SOI-62.02, Boron Concentration Control," Section 8.1 is located by the applicant.</p> <p>EXAMINER'S CUE: <i>After the applicant has demonstrated the method of obtaining the correct instruction, the examiner will provide a copy of the instruction.</i></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>NOTE</p> <p>Performance of this Section should be coordinated with performance of 1-TRI-62-3, Boric Acid Flow Paths: Valve Position Verification.</p>	
<p><u>STEP 2:</u> [1] REFER TO one of the following methods to determine amount of Primary Water (PW) & Boric Acid (BA) needed: (N/A method NOT used)</p> <p style="padding-left: 40px;">[1.1] IF blending at less than 2500 ppm, THEN USE TI-59.</p> <p style="padding-left: 40px;">[1.2] IF blending at 2500 ppm or greater, THEN USE Appendix B.</p> <p><u>STANDARD:</u></p> <p style="padding-left: 40px;">Applicant determines from the INITIAL CONDITIONS that the blended solution is greater than 2500 ppm, and enters an N/A in Step 1.1.</p> <p style="padding-left: 40px;">Applicant locates Appendix B to continue the calculation.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p style="text-align: center;">NOTE</p> <p>This Appendix should only be used in conjunction with Sections 6.5 or 8.1. Primary water flow must be varied to blend at concentrations greater than 2500 ppm; therefore, blending is only possible when 1-HS-62-140B, VCT MAKEUP MODE is in MANUAL.</p>	
<p><u>STEP 3:</u> From the Table on Page 2 of 2, the applicant locates the row which contains the Desired Blend Concentration of 3100 ppm, and determines Primary Water flow rate to be 48 gpm.</p> <p><u>STANDARD:</u></p> <p>Applicant reads the primary flow rate to be 48 gpm from the row for 3100 ppm.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 4:</u> Calculates Required PW flow rate using the formula provided at the bottom of Page 2 of 2 of Appendix B.</p> <p><u>STANDARD:</u></p> <p>Applicant performs the calculation at the bottom of Page 2 of 2, and determines that the Required PW Flow Rate to be used with 30 gpm of Boric Acid Flow rate is 36 gpm.</p> <p>* For Boric Acid flow rates other than 40 gpm the following formula may be used:</p> $\frac{\text{Actual BA flow rate}}{40} = \frac{\text{Required PW flow rate}}{\text{PW flow rate from Table}}$ <p style="text-align: center;">OR</p> $\frac{\text{Actual BA flow rate}}{40} \times \text{PW flow rate from Table} = \text{Required PW flow rate}$ $\frac{30}{40} \times 48 = 36 \text{ gpm}$ <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p>STEP 5: Calculates the amount of primary water to be entered into the PW integrator, by using the ratio of the primary water flow rate to the total flow rate.</p> <p><u>STANDARD:</u></p> <p>Applicant determines the Total Flow rate to be 66 gpm by adding the primary water and boric acid flow rates together.</p> <p>Applicant determines the total amount of primary water to be added by first calculating the percentage of flow due to primary water by dividing the primary water flow by the total flow, then multiplying the 3000 gallon change by that percentage. This results in 1637 gallons of primary water to be placed in the PW integrator.</p> <p>Acceptable value: 1637 ± 5 gallons.</p> <p>Total Flow Rate = 36 gpm + 30 gpm = 66 gpm</p> $\frac{36 \text{ gpm}}{66 \text{ gpm}} = 0.54545$ <p>0.54545 X 3000 = 1637 gal. PW</p> <p>Could also perform calculation:</p> <p>3000 gal./66 gpm = 45.45 minutes</p> <p>36 gpm x 45.45 min. = 1636 gal. of PW</p> <p>Step is critical since the proper adjustment in primary flow rate is required to ensure proper blended solution is delivered to the RWST.</p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p>STEP 6: Calculates the amount of boric acid to be entered into the BA integrator, by using the ratio of the boric acid rate to the total flow rate.</p> <p>STANDARD:</p> <p>Applicant determines the total amount of boric acid to be added by first calculating the percentage of flow due to boric acid by dividing the boric acid flow by the total flow, then multiplying the 3000 gallon change by that percentage. This results in 1363 gallons of boric acid to be placed in the BA integrator.</p> <p>Acceptable values: 1363 ± 5 gallons.</p> $\text{Total Flow Rate} = 36 \text{ gpm} + 30 \text{ gpm} = 66 \text{ gpm}$ $\frac{30 \text{ gpm}}{66 \text{ gpm}} = 0.45455$ $0.45455 \times 3000 = 1363 \text{ gal. BA}$ <p>Could also perform calculation:</p> $3000 \text{ gal.} / 66 \text{ gpm} = 45.45 \text{ minutes}$ $30 \text{ gpm} \times 45.45 \text{ min.} = 1364 \text{ gal. of PW}$ <p>Step is critical since the proper adjustment in boric acid flow rate is required to ensure proper blended solution is delivered to the RWST.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 10:</u> Notify the Unit Supervisor that the primary water flow rate, amount of boric acid and primary water have been determined.</p> <p><u>STANDARD:</u></p> <p style="padding-left: 40px;">Applicant informs the Unit Supervisor of the results of the calculations.</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END OF TASK</p>	<p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. RWST level has been reported to be at 371,000 gallons.
2. RWST boron concentration is currently 3100 ppm.
3. A problem in the makeup control circuit is currently limiting the maximum boric acid flow rate to 30 gpm.
4. You are an extra operator assigned to the shift.

INITIATING CUES:

1. The Unit Supervisor directs you to determine the amount of primary water and the amount of boric acid needed to raise RWST level to 374,000 gallons while maintaining the current boron concentration.
2. You are to notify Unit Supervisor when you have completed your determination.

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**Appendix B
(Page 1 of 2)**

Blending Greater Than 2500 ppm

NOTE

This Appendix should only be used in conjunction with Sections 6.5 or 8.1. Primary water flow must be varied to blend at concentrations greater than 2500 ppm., therefore, blending is only possible when 1-HS-62-140B, VCT MAKEUP MODE is in MANUAL.

(Table is continued on next page)

Desired Blend Concentration ppm.	Boric Acid flow rate gpm*	1-FC-62-139 BA to Blender [1-M-6] %	Primary Water Flow rate gpm
2500	40	100	69
2550	40	100	67
2600	40	100	65
2650	40	100	63
2700	40	100	61
2750	40	100	59
2800	40	100	57

* For Boric Acid flow rates other than 40 gpm the following formula may be used:

$$\frac{\text{Actual BA flow rate}}{40} = \frac{\text{Required PW flow rate}}{\text{PW flow rate from Table}}$$

OR

$$\frac{\text{Actual BA flow rate}}{40} \times \text{PW flow rate from Table} = \text{Required PW flow rate}$$

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**Appendix B
(Page 2 of 2)**

(Table is continued from previous page)

Desired Blend Concentration ppm.	Boric Acid flow rate gpm*	1-FC-62-139 BA to Blender [1-M-6] %	Primary Water Flow rate gpm
2850	40	100	56
2900	40	100	54
2950	40	100	52
3000	40	100	51
3050	40	100	49
3100	40	100	48
3150	40	100	47
3200	40	100	45
3300	40	100	43

* For Boric Acid flow rates other than 40 gpm the following formula may be used:

$$\frac{\text{Actual BA flow rate}}{40} = \frac{\text{Required PW flow rate}}{\text{PW flow rate from Table}}$$

OR

$$\frac{\text{Actual BA flow rate}}{40} \times \text{PW flow rate from Table} = \text{Required PW flow rate}$$

$$\text{Required PW flow rate} = (30 / 40) \times 48 = 36 \text{ gpm}$$

$$\text{Total flow rate} = 30 \text{ gpm} + 36 \text{ gpm} = 66 \text{ gpm}$$

$$\text{Primary Water integrator setting} = (36 \text{ gpm} / 66 \text{ gpm}) = 0.54545$$

$$= 0.54545 \times 3000 \text{ gallons} = 1637 \text{ gallons of primary water}$$

Acceptable value: 1637 +/- 5 gallons.

$$\text{Boric Acid integrator setting} = (30 \text{ gpm} / 66 \text{ gpm}) = 0.45455$$

$$= 0.45455 \times 3000 \text{ gallons} = 1364 \text{ gallons of boric acid solution}$$

Acceptable value: 1364 +/- 5 gallons.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.1-2 RO/SRO
2010-08 NRC Exam**

**A.1-2 RO/SRO
Determine RCP Start Requirements**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.1-2 RO/SRO
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EVALUATION SHEET

Task: Determine RCP Start Requirements.

Alternate Path: n/a

Facility JPM #: New

Safety Function: n/a **Title:** Conduct of Operations.

K/A 2.1.32 Ability to explain and apply system limits and precautions.

Rating(s): 2.7/3.5 **CFR:** 41.10/43.2/45.12 “

Evaluation Method: Simulator _____ In-Plant _____ Classroom X

References: SOI-68.02, “Reactor Coolant Pumps,” Rev. 33.

Task Number: RO-068-SOI-68-007 **Title:** Start a Reactor Coolant Pump.

Task Standard: The applicant determines that RCP #2 should be started first, and the earliest time to start the pump is 1742.

Validation Time: 10 minutes **Time Critical:** Yes _____ No X

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Applicant: _____ _____ Time Start: _____
 NAME Docket No. Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____ / _____
 NAME SIGNATURE DATE

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COMMENTS

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.1-2 RO/SRO
2010-08 NRC Exam**

DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Reactor Coolant System "sweeps and vents" is in progress per GO-10," Reactor Coolant System Drain and Fill Operations," Section 5.4.2, "RCP Sweeps and Vents."

The following is the "run" history for RCP #1 and RCP #2:

<u>Pump</u>	<u>Start Time</u>	<u>Shutdown Time</u>	<u>Run Time</u>
1	1456	1456	30 seconds
	1535	1536	1 minute
	1650	1659	9 minutes
2	1502	1502	30 seconds
	1602	1603	1 minute
	1704	1712	8 minutes

Current time is 1725.

INITIATING CUE:

You have been assigned to determine which of these pumps can be started first, and the earliest time that the selected pump may be started.

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STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p><u>STEP 1:</u> Applicant determines the number of starts for each of the RCPs in the previous two hours.</p> <p><u>STANDARD:</u></p> <p> The applicant determines that RCP #1 has been started 3 times in the previous two hours, and RCP #2 has been started two times in the past two hours.</p> <p> Step is critical to evaluate the starting duty limits for the RCPs.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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A.1-2 RO-SRO

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 2:</u> Applicant determines how much idle time is required prior to each pumps restart.</p> <p><u>STANDARD:</u></p> <p>From SOI-68.02, "Reactor Coolant Pumps," PRECAUTIONS AND LIMITATIONS:</p> <p>E. RCP Maximum Starting Duty limits:</p> <ol style="list-style-type: none">1. For Restart after any period running or attempted start where motor failed to achieve full speed before it is stopped: Motor must be idle at least 30 min before restart.2. Consecutive Starts: In any 2 hr period: Maximum of 3 starts with minimum 30 min idle period before each restart. When 3 starts (or attempted starts) are made in 2 hrs, then a fourth start should NOT be made until motor is idle at least 1 hr. <p>The applicant determines that RCP #1 must be idle for 1 hour, and that RCP #2 must be idle for 30 minutes.</p> <p>Step is critical to determine the required idle period for each RCP.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 3:</u> Applicant calculates the earliest start time for each pump.</p> <p><u>STANDARD:</u></p> <p style="padding-left: 40px;">Applicant determines the earliest start time for RCP #1 is 1659 plus 1 hour, or 1759.</p> <p style="padding-left: 40px;">Applicant determines the earliest start time for RCP #2 is 1712 plus 30 minutes, or 1742.</p> <p style="padding-left: 40px;">Step is critical to ensure the correct RCP is started without violating starting duty limits.</p> <p><u>COMMENTS:</u></p> <p style="text-align: center;">END OF TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Reactor Coolant System “sweeps and vents” is in progress per GO-10,” Reactor Coolant System Drain and Fill Operations,” Section 5.4.2, “RCP Sweeps and Vents.”

The following is the “run” history for RCP #1 and RCP #2:

<u>Pump</u>	<u>Start Time</u>	<u>Shutdown Time</u>	<u>Run Time</u>
1	1456	1456	30 seconds
	1535	1536	1 minute
	1650	1659	9 minutes
2	1502	1502	30 seconds
	1602	1603	1 minute
	1704	1712	8 minutes

Current time is 1725.

INITIATING CUE:

You have been assigned to determine which of these pumps can be started first, and the earliest time that the selected pump may be started.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.2 RO
2010-08 NRC Exam

A.2 RO
Review 1-SI-0-4, “Monthly Surveillances.”

WATTS BAR NUCLEAR PLANT

JOB PERFORMANCE MEASURE

A.2 RO

2010-08 NRC Exam

EVALUATION SHEET

Task: Review 1-SI-0-4, "Monthly Surveillances."

Alternate Path: N/A

Facility JPM #: Modified

Safety Function: **Title:**

K/A 2.2.12 Knowledge of surveillance procedures.

Rating(s): 3.7/4.1 **CFR:** 45.10/45.13

Evaluation Method: Simulator _____ In-Plant _____ Classroom X

References: 1-SI-0-4, "Monthly Surveillances," Rev. 24.

Task Number: RO-113-GEN-004 **Title:** Perform surveillance tests.

Task Standard: The applicant reviews a completed 0-SI-4, "Monthly Surveillance," and determines that the following 5 items require the indicated actions:

1. AFW PMP B-B SG4 LEVEL instrument loop is reading outside the channel check MCD value, requiring the SM/Unit SRO to be notified and a Work Order (or Service Request to be initiated.
2. 1-PI-68-336C PZR PRESS is exceeding its MCD value, requiring the requiring the SM/Unit SRO to be notified and a Work Order (or Service Request to be initiated.
3. 1-PI-68-70 LOOP 4 HL PRESS is exceeding its MCD value, requiring the requiring the SM/Unit SRO to be notified and a Work Order (or Service Request to be initiated. Also requires MIG notification to perform 1-SI-68-88.
4. 1-FI-62-93C CHARGING FLOW is within its MCD value, but exceeding the 20 gpm limit of NOTE (32) requiring the requiring the SM/Unit SRO to be notified and a Work Order (or Service Request to be initiated. Also requires calibration of the flow instrumentation.
5. 1-PI-62-81C LP LETDOWN PRESS is exceeding its MCD value, requiring the requiring the SM/Unit SRO to be notified and a Work Order (or Service Request to be initiated.

Validation Time: 10 minutes **Time Critical:** Yes _____ No X

Applicant: _____ **Time Start:** _____
NAME Docket No. **Time Finish:** _____

Performance Rating: SAT _____ UNSAT _____ **Performance Time** _____

Examiner: _____ **SIGNATURE** _____ **DATE** _____
NAME

COMMENTS

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

**A.2 RO
2010-08 NRC Exam**

DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. The Unit is in Mode 1, with no LCO entries at this time.
2. You are the Unit Operator responsible for the review of a partial performance of 1-SI-0-4, "Monthly Surveillances," Appendix D, "Remote Shutdown and PAM Channel Check Data Sheet," pages 42 through 44, 47 and 54.

INITIATING CUES:

You are to review the data entered on pages provided to you from Appendix D, list the actions required to be taken to address any deviations found, and notify the Unit Supervisor that you have completed your task.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.2 RO
2010-08 NRC Exam

STEP/STANDARD	SAT/UNSAT
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START TIME: _____

EXAMINERS CUE: 1-SI-0-4, Appendix D, pages 42 through 44, 47 and 54 are attached as the key to this JPM. Values which fall outside the MCD are circled on the key, and actions to be taken for each item are listed

<p><u>STEP 1:</u> Item 3 (Page 44) values for AFW PMP B-B SG 4 LEVEL.</p> <p><u>STANDARD:</u></p> <p>Applicant evaluates data provided and determines that the readings in the Main Control Room (1-M-3) and the Auxiliary Control Room (1-L-10) for 1-LI-3-171 and 1-LI-3-171C are outside the channel check MCD of 6%.</p> <p>The applicant indicates that the following actions are required (in no particular order):</p> <ol style="list-style-type: none"> 1. SM/Unit SRO must be notified. 2. A Work Order (WO) must be prepared for SG 4 LEVEL loop. <p><u>COMMENTS:</u></p> 	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.2 RO
2010-08 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 2.</u> Item 7 (Page 47) value for 1-PI-68-336C PZR PRESS.</p> <p><u>STANDARD:</u></p> <p>Applicant evaluates data provided and determines that the reading for 1-PI-68-336C in the Auxiliary Control Room (1-L-10) is outside the channel check MCD of 50 psig.</p> <p>The applicant indicates that the following actions are required (in no particular order):</p> <ol style="list-style-type: none">1. SM/Unit SRO must be notified of 1-PI-68-336C exceeding its MCD limit.2. A Work Order (WO) or Service Request (SR) must be prepared for 1-PI-68-336C. <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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A.2 RO
2010-08 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 3.</u> Item 7 (Page 47) values for 1-PI-68-70 LOOP 4 HL PRESS.</p> <p><u>STANDARD:</u></p> <p>Applicant evaluates data provided and determines that the reading for 1-PI-68-70 in the Main Control Room (1-L-10) is outside the channel check MCD of 50 psig.</p> <p>The applicant indicates that the following actions are required (in no particular order):</p> <ul style="list-style-type: none">3. SM/Unit SRO must be notified of 1-PI-68-70 exceeding its MCD limits.4. A Work Order (WO) or Service Request (SR) must be prepared for 1-PI-68-70 LOOP 4 HL PRESS.5. Per Note (10), MIG must be notified to perform 1-SI-68-88 since 1-PI-68-70 is out-of-tolerance. <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 4:</u> Item 25 (Page 54) value for 1-FI-62-93A CHARGING FLOW.</p> <p><u>STANDARD:</u></p> <p>Applicant evaluates data provided and determines that the reading for 1-FI-62-93C in the Auxiliary Control Room (1-L-10) is within the channel check MCD of 40 psig, but exceeds the 20 gpm value given in NOTE (32).</p> <p>The applicant indicates that the following actions are required (in no particular order):</p> <ol style="list-style-type: none"> 1. SM/Unit SRO must be notified. 2. The Work Order (WO) or Service Request (SR) number must be included in REMARKS. <p>Per Note (32) If channel deviation is greater than 20 gpm, action shall be initiated to calibrate the flow instrumentation W.O. number shall be recorded in REMARKS.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.2 RO
2010-08 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 5:</u> Item 29 (Page 54) value for 1-PI-62-81C LP LETDOWN PRESS.</p> <p><u>STANDARD:</u></p> <p>Applicant evaluates data provided and determines that the reading for 1-PI-62-81C in the Auxiliary Control Room (1-L-10) exceeds the 30 gpm MCD value.</p> <p>The applicant indicates that the following actions are required (in no particular order):</p> <ol style="list-style-type: none"> 1. SM/Unit SRO must be notified. 2. A Work Order (WO) or Service Request (SR) must be prepared for 1-PI-62-81C. <p><u>COMMENTS:</u></p> 	<p style="text-align: center;">CRITICAL STEP</p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The Unit is in Mode 1, with no LCO entries at this time.
2. You are the Unit Operator responsible for the review of a partial performance of 1-SI-0-4, "Monthly Surveillances," Appendix D, "Remote Shutdown and PAM Channel Check Data Sheet," pages 42 through 44, 47 and 54.

INITIATING CUES:

You are to review the data entered on pages provided to you from Appendix D, list the actions required to be taken to address any deviations found, and notify the Unit Supervisor that you have completed your task.

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Appendix D
(Page 1 of 15)
Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page 1 of Date TODAY
Mode 1

1.0 REMOTE SHUTDOWN AND PAM CHANNEL CHECKLIST

ITEM NO.	REFERENCE NUMBER	REQUIRED MODE	NOTES	DESCRIPTION	LOC	INST NO	READING	LOC	INST NO	READING	DATA UNITS	MCD					
1	SR 3.3.3.1-22 SR p3.3.4.1-4.d	1, 2, 3	(1)	AFW TO SG 1 FLOW	1-M-3	1-FI-3-163A	0	1-L-10	1-FI-3-163C	0	gpm	60 gpm					
				AFW TO SG 2 FLOW	1-M-3	1-FI-3-155B	0		1-FI-3-155C	0							
				AFW TO SG 3 FLOW	1-M-3	1-FI-3-147A	0		1-FI-3-147C	0							
				AFW TO SG 4 FLOW	1-M-3	1-FI-3-170B	0		1-FI-3-170C	0							
				AFW TO SG 1 FLOW	1-M-3	1-FI-3-163B	0		N/A	N/A							
				AFW TO SG 2 FLOW	1-M-3	1-FI-3-155A	0		N/A	N/A							
				AFW TO SG 3 FLOW	1-M-3	1-FI-3-147B	10		N/A	N/A							
				AFW TO SG 4 FLOW	1-M-3	1-FI-3-170A	0		N/A	N/A							
				AFW PUMP A DIFF PRESSURE	1-M-4	1-PDIC-3-122A	1200		1-PDIC-3-122C	1200							
				AFW PUMP B DIFF PRESSURE	1-M-4	1-PDIC-3-132A	1200		1-PDIC-3-132C	1200							
								Operator's Initials		DAH			Operator's Initials		DAH		
								Operator's Initials		DAH			Operator's Initials		DAH		

(1) The following pairs of indicators are to be channel checked against each other to satisfy the surveillance requirement: 1-FI-3-163A and -163C; 1-FI-3-155B and -155C; 1-FI-3-147A and -147C; 1-FI-3-170B and -170C; 1-PDIC-3-122A and -122C; 1-PDIC-3-132A and -132C. All AFW flow indicators on 1-M-3 are to be channel checked against each other.

Remarks:

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Appendix D
(Page 2 of 15)
Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page 2 of _____ Date _____ TODAY

1.0 REMOTE SHUTDOWN AND PAM CHANNEL CHECKLIST (continued)

Mode 1

ITEM NO.	REFERENCE NUMBER	REQUIRED MODE	NOTES	DESCRIPTION	LOC	INST NO	READING	LOC	INST NO	READING	DATA UNITS	MCD				
2	SR 3.3.3.1-17	1, 2, 3	N/A	ERCW TO AFWP A-A SUCT FRM HDR A - FCV-3-116A & B	1-M-3	1-FCV-3-116A	CLOSED <input checked="" type="checkbox"/> OPEN <input type="checkbox"/>	N/A	N/A	N/A	N/A	N/A				
						1-FCV-3-116B	CLOSED <input checked="" type="checkbox"/> OPEN <input type="checkbox"/>			N/A						
				ERCW TO AFWP B-B SUCT FRM HDR B - FCV-3-126A & B	1-M-3	1-FCV-3-126A	CLOSED <input checked="" type="checkbox"/> OPEN <input type="checkbox"/>	N/A	N/A	N/A						
						1-FCV-3-126B	CLOSED <input checked="" type="checkbox"/> OPEN <input type="checkbox"/>		N/A							
				ERCW TO T-D AFWP SUCT FRM HDR A - FCV-3-136A & B	1-M-3	1-FCV-3-136A	CLOSED <input checked="" type="checkbox"/> OPEN <input type="checkbox"/>	N/A	N/A	N/A						
						1-FCV-3-136B	CLOSED <input checked="" type="checkbox"/> OPEN <input type="checkbox"/>		N/A							
				ERCW TO T-D AFWP SUCT FRM HDR B - FCV-3-179A & B	1-M-3	1-FCV-3-179A	CLOSED <input checked="" type="checkbox"/> OPEN <input type="checkbox"/>	N/A	N/A	N/A						
						1-FCV-3-179B	CLOSED <input checked="" type="checkbox"/> OPEN <input type="checkbox"/>		N/A							
						Operator's Initials							DAH		Operator's Initials	
															N/A	

Remarks: _____

A.2 PRO KEY

WBN Unit 1	Monthly Surveillances	1-SI-0-4 Rev. 0024 Page 44 of 74
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Appendix D
Remote Shutdown and PAM Channel Check Data Sheet
(Page 3 of 15)

Data Package: Page 3 of _____ Date TODAY _____

1.0 REMOTE SHUTDOWN AND PAM CHANNEL CHECKLIST (continued)

Mode 1

Per 6.1.1. G.
SM/Unit SRO is to be notified that the loop is reading outside the channel check MCD value.
A Work Order (WO) is to be initiated to have the suspect loops calibrated.

ITEM NO.	REFERENCE NUMBER	REQUIRED MODE	NOTES	DESCRIPTION	LOC	INST NO	READING	LOC	INST NO	READING	DATA UNITS	MCD				
3	SR 3.3.3.1-16 SR 3.3.4.1-4. d	1, 2, 3		T-D AFW PMP SG 1 LEVEL	1-M-3	1-LI-3-174	57	N/A	N/A	N/A	%	6.0%				
				T-D AFW PMP SG 2 LEVEL	1-M-3	1-LI-3-173	60		N/A	N/A						
				T-D AFW PMP SG 3 LEVEL	1-M-3	1-LI-3-172	58		N/A	N/A						
				T-D AFW PMP SG 4 LEVEL	1-M-3	1-LI-3-175	60		N/A	N/A						
				AFW PMP A-A SG 1 LEVEL	1-M-3	1-LI-3-164	60		1-L-10	1-LI-3-164C			60			
			(2)	AFW PMP A-A SG 2 LEVEL	1-M-3	1-LI-3-156	58	1-L-10	1-LI-3-156C	61						
				AFW PMP B-B SG 3 LEVEL	1-M-3	1-LI-3-148	59	1-L-10	1-LI-3-148C	59						
				AFW PMP B-B SG 4 LEVEL	1-M-3	1-LI-3-171	56	1-L-10	1-LI-3-171C	63						
								Operator's Initials		DAH			Operator's Initials		DAH	

(2) The indicators on 1-M-3 and 1-L-10 listed for AFW PMP A-A and B-B are in the same loop and are NOT to be channel checked against each other to satisfy the surveillance requirement, but should be reading within the channel check MCD value.

WBN
Unit 1

Monthly Surveillances

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Appendix D
(Page 6 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page 4 of _____

Date _____

TODAY

1.0 REMOTE SHUTDOWN AND PAM CHANNEL CHECKLIST (continued)

Mode _____

1

Exceeds MCD Limit.

SM/Unit SRO is to be notified that an MCD value has been exceeded.

A Work Order (WO) is to be initiated to have the suspect indicator(s) (loop(s)) calibrated.

ITEM NO.	REFERENCE NUMBER	REQUIRED MODE	NOTES	DESCRIPTION	LOC	INST NO	READING	LOC	INST NO	READING	DATA UNITS	MCD
6	SR 3.3.3.1-14 SR 3.3.4.1-3.a	1, 2, 3	N/A	PZR LEVEL	1-M-4	1-LI-68-339A	60	1-L-10	1-LI-68-325C	58	%	6.0%
						1-LI-68-335A	59		1-LI-68-326C	60		
						1-LI-68-320	62		N/A	N/A		
7	SR 3.3.3.1-5 SR 3.3.4.1-2.a	1, 2, 3	(8)	PZR PRESS	1-M-5	1-PI-68-340A	2235	1-L-10	1-PI-68-336C	2170	psig	50 psig
						1-PI-68-334	2240		1-PI-68-337C	2235		
						1-PI-68-323	2225					
			(9)	PZR-COLD CAL PRESS	1-M-5	1-PI-68-322	2240	1-L-10	1-PI-68-342C	2250	psig	200 psig
						1-PI-68-342A	2250		N/A	N/A		
			(10)	LOOP 4 HL PRESS	1-M-6	1-PI-68-70	2000	N/A	N/A	N/A		
				LOOP 3 HL PRESS		1-PI-68-64	2250		N/A	N/A		
				LOOP 1 HL PRESS		1-PI-68-63	2300		N/A	N/A		
						Operator's Initials		Operator's Initials		DAH		

- (8) Remote Shutdown requires PZR PRESS or RCS WR RANGE PRESS, but both are **NOT** required to satisfy SR 3.3.4.1-2.a.
(9) PZR COLD CAL PRESS is to be considered the same as RCS WR RANGE PRESS.
(10) If 1-PI-68-70 is out-of-tolerance, MIG is to be notified to perform 1-SI-68-88.

Exceeds MCD Limit.

Requires performance of 1-SI-68-88 by MIG, per Note (10)
SM/Unit SRO is to be notified.

A Work Order (WO) is to be initiated.

WBN Unit 1	Monthly Surveillances	1-SI-0-4 Rev. 0024 Page 54 of 74
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Appendix D
(Page 13 of 15)
Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page 5 of Date TODAY

1.0 REMOTE SHUTDOWN AND PAM CHANNEL CHECKLIST (continued)

Exceeds MCD Limit.
SM/Unit SRO is to be notified.
A Work Order (WO) is to be initiated.

Mode 1

ITEM NO.	REFERENCE NUMBER	REQUIRED MODE	NOTES	DESCRIPTION	LOC	INST NO	READING	LOC	INST NO	READING	MCD
24	SR 3.3.3.1-26	1, 2, 3	N/A	AB PASSIVE SUMP LEVEL	1-M-15	0-LI-77-134 0-LI-77-135	12.5 12.5	N/A	N/A	N/A	4.8 in. WC
25	SR p3.3.4.1-3.b	1, 2, 3	(32)	CHARGING FLOW	1-M-5	1-FI-62-93A	85	1-L-10	1-FI-62-93C	120	40 gpm
26	LCO 3.3.4	1, 2, 3	(32)	CHARGING HDR PRESS	1-M-5	1-PI-62-92A	2475	1-L-10	1-PI-62-92C	2450	150 psig
27	LCO 3.3.4	1, 2, 3	(32)	EMERG BORATE FLOW	1-M-5	1-FI-62-137A	0	1-L-10	1-FI-62-137C	0	7.5 gpm
28	SR p3.3.4.1-3.b	1, 2, 3	(32)	LETDOWN HX OUTLET TEMP	1-M-6	1-TI-62-78	91	1-L-10	1-TI-62-80C	93	6°F
29	LCO 3.3.4	1, 2, 3	(32)	LP LETDOWN PRESS	1-M-6	1-PI-62-81	330	1-L-10	1-PI-62-81C	370	30 psig
30	LCO 3.3.4	1, 2, 3	(32)	VCT LEVEL	1-M-6	1-LI-62-129A	62	1-L-10	1-LI-62-129C	61	6%
31	LCO 3.3.4	1, 2, 3	(32) (33)	1A ERCW SUP HDR FLOW 1B ERCW SUP HDR FLOW 2A ERCW SUP HDR FLOW 2B ERCW SUP HDR FLOW	0-M-27A 0-M-27A 0-M-27A 0-M-27A	1-FI-67-61 1-FI-67-62 2-FI-67-61 2-FI-67-62	2500 1000 8500 9500	1-L-10 1-L-10 2-L-10 2-L-10	1-FI-67-61C 1-FI-67-62C 2-FI-67-61C 2-FI-67-62C	2000 1250 8000 9250	1000 gpm

(32) MCR indications are recorded for comparison purposes only. The following requirement is applicable to Item 25 (Charging Flow) ONLY: If channel deviation is greater than 20 gpm, action shall be initiated to calibrate the flow instrumentation. WO no. shall be recorded in REMARKS.

(33) Descriptions for the Remote Shutdown board instruments:
A. 1-TI-67-61C, SUP HDR A FLOW. B. 1-TI-67-62C, SUP HDR B FLOW. C. 2-TI-67-61C, SUP HDR A FLOW. D. 2-TI-67-62C, SUP HDR B FLOW.

Remarks:

Per Note (32) If channel deviation is greater than 20 gpm, action shall be initiated to calibrate the flow instrumentation. WO number shall be recorded in REMARKS.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.2 SRO
2010-08 NRC Exam**

**A.2 SRO
Determine a Technical Specification
Completion Time Extension**

A.2 SRO
2010-08 NRC Exam

Task: Determine a Technical Specification Completion Time Extension.

Alternate Path: n/a

Facility JPM #: New

Safety Function: n/a **Title:** Equipment Control

K/A 2.2.42 Ability to track Technical Specification limiting conditions for operations.

Rating(s): 3.1/4.6 **CFR:** 41.10 / 43.2 / 45.13

Evaluation Method: Simulator _____ In-Plant _____ Classroom X

References: Watts Bar Nuclear Plant Technical Specifications, All Amendments through Amendment 81. 1.3, "Completion Times." LCO 3.5.2, "ECCS - Operating."

Task Number: SRO-119-SSP-12.56-005 **Title:** Evaluate status changes for Tech. Spec. equipment to determine if LCO action statement entry is required.

Task Standard: The applicant determines the LATEST date and time that Unit must be placed in Mode 4 if the 1B-B Safety Injection pump cannot be restored to OPERABLE STATUS to be 1900 on 7/6/2010.

Validation Time: 10 minutes **Time Critical:** Yes _____ No X

=====

Applicant: _____ _____ Time Start: _____
NAME Docket No. Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ / _____
NAME SIGNATURE DATE

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**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

**A.2 SRO
2010-08 NRC Exam**

DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

1. The unit is at 100% power.
2. Today's date is July 4, 2010. The time is 0700.
3. On July 2, 2010 at 0700, the 1A-A Safety Injection pump was declared INOPERABLE.
4. LCO Action Statement 3.5.2.A, "One or more trains inoperable AND at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available," was entered at that time.
5. The 1B-B Safety Injection pump was declared INOPERABLE today at 0700, and LCO 3.0.3 was entered.
6. At 0900 on July 4, 2010, the 1A-A Safety Injection pump was declared OPERABLE.

INITIATING CUE:

You are to determine the LATEST date and time that Unit must be placed in Mode 4 if the 1B-B Safety Injection pump cannot be restored to OPERABLE STATUS.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.2 SRO
2010-08 NRC Exam

STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p><u>STEP 1:</u> Application of Technical Specifications 1.3, Completion Times, to the return of the 1A-A Safety Injection pump to service at 0900 on July 4, 2010.</p> <p>Application of Technical Specifications 3.5.2.B, Required Action and Completion Time not met, and determination of time to place the Unit in Mode 4.</p> <p><u>STANDARD:</u></p> <p>Applicant determines that LCO 3.0.3 can be exited at 0900 on 7/4/2010.</p> <p>Applicant determines from the second INITIATING CUE that the conditions described in Tech Spec Section 1.3,"Completion Times" have been met.</p> <p>Applicant determines that the total Completion Time is 24 hours added to the initial entry into LCO 3.5.2 Condition A. Initial entry July 2, 2010 at 0700. The 1B-B SI pump must be restored to OPERABLE status before 0700 on 7/6/2010.</p> <p>Applicant determines LCO 3.5.2 Condition B cannot be met, and that the Unit must be placed in Mode 4 within the next 12 hours, with the time starting at 0700 on 7/6/2010. Therefore, the Unit must be in Mode 4 by 1900 on 7/6/2010.</p> <p>Step is critical to ensure equipment is returned to service within the times allowed in Technical Specifications.</p> <p><u>COMMENTS:</u></p> <p>END OF TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. The unit is at 100% power.
2. Today's date is July 4, 2010. The time is 0700.
3. On July 2, 2010 at 0700, the 1A-A Safety Injection pump was declared INOPERABLE.
4. LCO Action Statement 3.5.2.A, "One or more trains inoperable AND at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available," was entered at that time.
5. The 1B-B Safety Injection pump was declared INOPERABLE today at 0700, and LCO 3.0.3 was entered.
6. At 0900 on July 4, 2010, the 1A-A Safety Injection pump was declared OPERABLE.

INITIATING CUE:

You to determine the LATEST date and time that Unit must be placed in Mode 4 if the 1B-B Safety Injection pump cannot be restored to OPERABLE STATUS.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.3 RO & SRO
2010-08 NRC Exam**

**A.3 RO & SRO
Calculate Maximum Permissible Stay Time
within Emergency Dose Limits**

EVALUATION SHEET

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.3 RO & SRO
2010-08 NRC Exam**

Tools/Equipment/Procedures Needed:

EPIP-15, "EMERGENCY EXPOSURE GUIDELINES."
Calculator

NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.3 RO & SRO
2010-08 NRC Exam**

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

1. A loss of coolant accident is in progress.
2. ECA-1.1, "Loss of RHR Sump Recirculation," has been entered.
3. Automatic swap over to the containment sump has failed to occur.
4. The Auxiliary Building AUO has been dispatched to perform the following tasks:

#	TASK	TIME	DOSE RATE
1	Go to task performance area.	12 minutes	0.5 R/hr
2	Remove cover from enclosure for 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT.	54 minutes	9 R/hr
3	Manually open 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT.	45 minutes	20 R/hr
4	Return from task performance area.	12 minutes	0.5 R/hr

5. Authorization to exceed occupational dose limits to restore critical safety functions has been approved by the Shift Manager (SED) for the Auxiliary Building AUO.

INITIATING CUES:

The Auxiliary Building AUO has completed Tasks 1 and 2 in the time listed. You are to determine:

1. The total exposure that would be received by the AB AUO after completing Tasks 1 through 4.
2. What restrictions, if any, are imposed on the AB AUO based on the dose that was received?

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.3 RO & SRO
2010-08 NRC Exam

STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p>STEP 1: Applicant reviews EPIP-15, Emergency Exposure Guidelines," Appendix A, "Watts Bar Emergency Exposure Reference," and determines that the exposure limit to be 25 Rem.</p> <p>STANDARD: A</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: Determine dose received performing Tasks 1through 4.</p> <p>STANDARD:</p> <p>Applicant calculates dose to complete Task 1 as: $12 \text{ min. } / 60 \text{ min/hr} \times 0.5 \text{ Rem/hr} = 0.1 \text{ Rem}$</p> <p>Applicant calculates dose to complete Task 2 as: $54 \text{ min. } / 60 \text{ min/hr.} \times 9 \text{ Rem/hr} = 8.1 \text{ Rem}$</p> <p>Applicant calculates dose to complete Task 3 as: $45 \text{ min.} / 60 \text{ min/hr.} \times 20 \text{ Rem/hr} = 15 \text{ Rem}$</p> <p>Applicant calculates dose to complete Task 4 as: (SAME CALCULATION AND DOSE AS Task 1, or 0.1 Rem.</p> <p>Total for Tasks 1, 2, 3 and 4 is 23.3 Rem</p> <p>Step is critical to determine the total dose for the assigned tasks, and to determine that the Emergency Dose Limit is NOT exceeded.</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

A.3 RO & SRO
2010-08 NRC Exam

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. A loss of coolant accident is in progress.
2. ECA-1.1, "Loss of RHR Sump Recirculation," has been entered.
3. Automatic swap over to the containment sump has failed to occur.
4. The Auxiliary Building AUO has been dispatched to perform the following tasks:

#	TASK	TIME	DOSE RATE
1	Go to task performance area.	12 minutes	0.5 R/hr
2	Remove cover from enclosure for 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT.	54 minutes	9 R/hr
3	Manually open 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT.	45 minutes	20 R/hr
4	Return from task performance area.	12 minutes	0.5 R/hr

5. Authorization to exceed occupational dose limits to restore critical safety functions has been approved by the Shift Manager (SED) for the Auxiliary Building AUO.

INITIATING CUES:

The Auxiliary Building AUO has completed Tasks 1 and 2 in the time listed. You are to determine:

1. The total exposure that would be received by the AB AUO after completing Tasks 1 through 4.
2. What restrictions, if any, are imposed on the AB AUO based on the dose that was received?

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.4 SRO
2010-08 NRC Exam**

A.4-SRO

Determine if conditions warrant a Follow-up Report or Upgrade to General Emergency based on changing conditions.

A.4 SRO
2010-08 NRC Exam

Task: Determine if conditions warrant a Follow-up Report or Upgrade to General Emergency based on changing conditions.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
A.4 SRO
2010-08 NRC Exam

THIS JPM IS PERFORMED IN A CLASSROOM SETTING.

REQUIRED MATERIALS:

EPIP-1 through EPIP-5

Tools/Equipment/Procedures Needed:

Copies of the WBN EIPs for each applicant.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

**A.4 SRO
2010-08 NRC Exam**

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

1. Unit 1 was at 100% power when a loss of reactor coolant event occurred.
2. A Site Area Emergency has been declared 30 minutes ago for Unit 1, based on a Loss or Potential Loss of any two barriers:
 - a. 1.1 Fuel Clad Barrier - Loss (1.1.2, Primary Coolant Activity Level, RCS sample activity is Greater Than 300 $\mu\text{Ci/gm}$ dose equivalent iodine - 131).
 - b. 1.2 RCS Barrier - Loss (1.2.2, RCS Leakage/LOCA, RCS Leak results in Loss of subcooling ($<65^{\circ}\text{F}$ indicated) [85°F ADV]).
3. EPIP-4, "SITE AREA EMERGENCY," has been performed through Step 15.
4. The Shift Technical Advisor now reports the following conditions exist on Unit 1:
 - a. RVLIS level is 30%, with no RCPs running.
 - b. RCS subcooling is 15°F .
 - c. Containment Radiation monitors 1-RE-90-273 and 1-RE-90-274 both indicate 90R/hr and are slowly trending up.
 - d. Initial wind direction was from 165 and has now shifted to from 180 degrees.
 - e. Wind speed has increased from 5 mph to 12 mph.

INITIATING CUES:

1. As the SED, you are to evaluate current plant conditions and decide the appropriate actions.
2. Once your decision is made, fill out the appropriate forms to make notifications to appropriate personnel.
3. This JPM contains time critical elements.

A.4 SRO
2010-08 NRC Exam

<p>STEP 1: Refers to EPIP-1 to determine level of event.</p> <p>STANDARD:</p> <p>Applicant refers to EPIP-1, Section 1, and "Fission Product Barrier Matrix."</p> <p>Applicant determines that the following conditions exist:</p> <p>1.1.2 Loss, "RCS sample activity is greater than 300 µCi/gm dose equivalent I131"</p> <p>1.2.2 Loss, "RCS Leakage/LOCA, RCS Leak results in Loss of subcooling (<65°F indicated) [85°F ADV]."</p> <p>1.3.5 Potential Loss, "Significant Radioactivity in Containment, VALID Reading increase of Greater Than 108 R/hr on 1-RE-90-271 and 1-RE-90-272 OR 86 R/hr on 1-RE-90-273 and 1-RE-90-274."</p> <p>Based on "Emergency Class Criteria", the applicant determines the need to declare a General Emergency, based on Loss of two barriers and potential loss of the third barrier.</p> <p>Criteria to meet the critical step is for the EALs to be correctly identified and the declaration made within 15 minutes.</p> <p>NOTE TO EXAMINER:</p> <p>RECORD time that declaration was made: _____</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
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**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

**A.4 SRO
2010-08 NRC Exam**

<p><u>STEP 2:</u> Implements EPIP-5, "GENERAL EMERGENCY."</p> <p><u>STANDARD:</u> EPIP-5, GENERAL EMERGENCY, is implemented.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>The following steps are from EPIP-5</p>	
<p><u>STEP 3:</u> [1] IF the onsite emergency centers are not staffed, THEN DIRECT Shift Personnel to activate the Emergency Paging System (EPS) to staff the Technical Support Center (TSC) and Operations Support Center (OSC). Shift Personnel should confirm activation and provide the 20 minute printed report to the SM for review.</p> <p style="margin-left: 20px;">a. IF the EPS system fails, call the ODS, ringdown or (5-751-1700) and DIRECT him to activate the EPS.</p> <p style="margin-left: 20px;">b. IF the above methods of activating the EPS fail, THEN DIRECT Shift Personnel to use the Watts Bar Nuclear Plant Emergency Response Call-List to staff the TSC and OSC. (This list is located in the EPS Manual near the terminal.)</p> <p><u>STANDARD:</u> Shift Personnel are directed to activate the Emergency Paging System (EPS)</p> <p>CUE: When directed state "Emergency paging has been activated."</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

A.4 SRO
2010-08 NRC Exam

TIME STOP: _____

APPLICANT HANDOUT SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. Unit 1 was at 100% power when a loss of reactor coolant event occurred.
2. A Site Area Emergency has been declared 30 minutes ago for Unit 1, based on a Loss or Potential Loss of any two barriers:
 - a. 1.1 Fuel Clad Barrier - Loss (1.1.2, Primary Coolant Activity Level, RCS sample activity is Greater Than 300 $\mu\text{Ci/gm}$ dose equivalent iodine - 131).
 - b. 1.2 RCS Barrier - Loss (1.2.2, RCS Leakage/LOCA, RCS Leak results in Loss of subcooling ($<65^{\circ}\text{F}$ indicated) [85°F ADV]).
3. EPIP-4, "SITE AREA EMERGENCY," has been performed through Step 15.
4. The Shift Technical Advisor now reports the following conditions exist on Unit 1:
 - a. RVLIS level is 30%, with no RCPs running.
 - b. RCS subcooling is 15°F .
 - c. Containment Radiation monitors 1-RE-90-273 and 1-RE-90-274 both indicate 90R/hr and are slowly trending up.
 - d. Wind direction has shifted from 165 to 180 degrees.
 - e. Wind speed has increased from 5 mph to 12 mph.

INITIATING CUES:

1. As the SED, you are to evaluate current plant conditions and decide the appropriate actions.
2. Once your decision is made, fill out the appropriate forms to make notifications to appropriate personnel.
3. This JPM contains time critical elements.

EXAM MATERIAL - KEY

EPIP-1
Revision 31
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1.1. _ Fuel Clad Barrier

1. Critical Safety Function Status

LOSS	Potential LOSS
Core Cooling Red (FR-C.1)	Core Cooling Orange (FR-C.2) OR Heat Sink Red (FR-H.1) (RHR <u>Not</u> in Service)

-OR-

2. Primary Coolant Activity Level

LOSS	Potential LOSS
RCS sample activity is Greater Than 300 μ Ci/gm dose equivalent iodine-131	Not applicable

-OR-

3. Incore TCs Hi Quad Average

LOSS	Potential LOSS
Greater Than 1200°F	Greater Than 727°F

-OR-

4. Reactor Vessel Water Level

LOSS	Potential LOSS
Not Applicable	VALID RVLIS level <33% (No RCP running)

-OR-

5. Containment Radiation Monitors

LOSS	Potential LOSS
VALID reading increase of Greater Than: 74 R/hr On 1-RE-90-271 and 272 OR 59 R/hr On 1-RE-90-273 and 274 (see instruction note 5)	Not Applicable

-OR-

6. Site Emergency Director Judgment

Any condition that, in the Judgment of the SM/SED, Indicates Loss or Potential Loss of the Fuel Clad Barrier Comparable to the Conditions Listed Above.

1.2. _ RCS Barrier

1. Critical Safety Function Status

LOSS	Potential LOSS
Not Applicable	Pressurized Thermal Shock Red (FR-P.1) OR Heat Sink Red (FR-H.1) (RHR <u>Not</u> in Service)

-OR-

2. RCS Leakage/LOCA

LOSS	Potential LOSS
RCS Leak results in Loss of subcooling (<65°F Indicated), [85°F ADV]	Non Isolatable RCS Leak Exceeding The Capacity of One Charging Pump (CCP) In the Normal Charging Alignment. OR RCS Leakage Results In Entry Into E-1

-OR-

3. Steam Generator Tube Rupture

LOSS	Potential LOSS
SGTR that results in a safety injection actuation OR Entry into E-3	Not Applicable

-OR-

4. Reactor Vessel Water Level

LOSS	Potential LOSS
VALID RVLIS level <33% (No RCP Running)	Not Applicable

-OR-

5. Site Emergency Director Judgment

Any condition that, in the Judgment of the SM/SED, Indicates Loss or Potential Loss of the RCS Barrier Comparable to the Conditions Listed Above.

EXAM MATERIAL - KEY

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1.3._ CNTMT Barrier

1. Critical Safety Function Status

LOSS	Potential LOSS
Not Applicable	Containment (FR-Z.1) Red <u>OR</u> Actions of FR-C.1 (Red Path) are INEFFECTIVE (i.e.: core TCs trending up)

-OR-

2. Containment Pressure/Hydrogen

LOSS	Potential LOSS
Rapid unexplained decrease following initial increase <u>OR</u> Containment pressure or Sump level <u>Not</u> increasing (with LOCA in progress)	Containment Hydrogen Increases to >4% by volume <u>OR</u> Pressure >2.8 PSIG (Phase B) with < One full train of Containment spray

-OR-

3. Containment Isolation Status

LOSS	Potential LOSS
Containment Isolation is Incomplete (when required) <u>AND</u> a Release Path to the Environment Exists	Not Applicable

-OR-

4. Containment Bypass

LOSS	Potential LOSS
RUPTURED S/G is also FAULTED outside CNTMT <u>OR</u> Prolonged (>4 Hours) Secondary Side release outside CNTMT from a S/G with a SGTL > T/S Limits	Unexplained VALID increase in area or ventilation RAD monitors in areas adjacent to CNTMT (with LOCA in progress)

-OR-

5. Significant Radioactivity in Containment

LOSS	Potential LOSS
Not Applicable	VALID Reading increase of Greater Than: 108 R/hr on 1-RE-90-271 and 1-RE-90-272 <u>OR</u> 86 R/hr on 1-RE-90-273 and 1-RE-90-274 (see instruction note 5)

-OR-

6. Site Emergency Director Judgment

Any condition that, in the Judgment of the SM/SED, Indicates
Loss or Potential Loss of the CNTMT Barrier Comparable to
the Conditions Listed Above.

Modes: 1, 2, 3, 4

INSTRUCTIONS

*NOTE: A condition is considered to be MET if, in the
judgment of the Site Emergency Director, the
condition will be MET imminently (i.e., within 1 to 2
hours, in the absence of a viable success path).
The classification shall be made as soon as this
determination is made.*

- In the matrix to the left, review the **INITIATING CONDITIONS** in all columns and identify which, if any, **INITIATING CONDITIONS** are MET. Circle these **CONDITIONS**.
- For each of the three barriers, identify if any **LOSS** or Potential **LOSS INITIATING CONDITIONS** have been MET.
- If a CSF is listed as an **INITIATING CONDITION**; the respective status tree criteria will be monitored and used to determine the **EVENT** classification for the Modes listed on the classification flowchart.
- Compare the barrier losses and potential losses to the **EVENTS** below and make the appropriate declaration.
- Containment Radiation Monitors are temperature sensitive and can be affected by temperature induced currents. Following a rapid increase or decrease in containment temperature, testing has shown rad monitors to give unreliable indication for up to 2 minutes.

EVENTS

UNUSUAL EVENT

Loss or Potential LOSS of
Containment Barrier

ALERT

Any LOSS or Potential
LOSS of Fuel Clad barrier

OR

Any LOSS or Potential
LOSS of RCS barrier

SITE AREA EMERGENCY

LOSS or Potential LOSS of
any two barriers

GENERAL EMERGENCY

LOSS of any two barriers
and Potential LOSS of
third barrier

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EXAM MATERIAL - KEY

WBN	GENERAL EMERGENCY	EPIP-5
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APPENDIX A

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TVA INITIAL NOTIFICATION FORM FOR GENERAL EMERGENCY

1. ☒ This is a Drill ☐ This is an Actual Event - Repeat - This is an Actual Event

2. This is Applicant's Name,
Watts Bar has declared a **GENERAL EMERGENCY** affecting Unit 1

3. EAL Designator(s): 1.1.2 L OR 1.1.5 L, 1.2.2 L, 1.3.5 PL

4. Brief Description of the Event: Loss of Coolant accident with failed fuel, and significant radiation in containment. (or words to this effect)

5. Radiological Conditions: (Check one under **both** Airborne and Liquid column.)

Airborne Releases Offsite <input type="checkbox"/> Minor releases within federally approved limits ¹ <input type="checkbox"/> Releases above federally approved limits ¹ <input checked="" type="checkbox"/> Release information not known (¹ Tech Specs)	Liquid Releases Offsite <input type="checkbox"/> Minor releases within federally approved limits ¹ <input type="checkbox"/> Releases above federally approved limits ¹ <input checked="" type="checkbox"/> Release information not known (¹ Tech Specs)
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6. Event Declared: Time: Applicant ENTRY Date: Today

7. The Meteorological Conditions are: (Use 46 meter data from the Met Tower)

Wind Direction is FROM: 180 degrees Wind Speed: 12 m.p.h

8. Provide Protective Action Recommendation: (Check either 1, 2 or 3, and mark wind direction.)

<input type="checkbox"/> Recommendation 1 ⇒EVACUATE LISTED SECTORS (2 mile Radius and 10 miles downwind) ⇒SHELTER remainder of 10 mile EPZ. ⇒CONSIDER issuance of Potassium Iodide in accordance with the State Plan.	* R E C	WIND FROM ° (Mark)	* R E C	<input checked="" type="checkbox"/> Recommendation 2 ⇒EVACUATE LISTED SECTORS (2 mile radius and 5 mile downwind) ⇒SHELTER remainder of 10 mile EPZ. ⇒CONSIDER issuance of Potassium Iodide in accordance with the State Plan.
A-1, B-1, C-1, D-1, C-7, -9, D-2, -4, -5, -6, -7, -8, -9	1	26-68	2	A-1, B-1, C-1, D-1, C-7, D-2, -4, -5
A-1, B-1, C-1, D-1, A-3, -4, D-2, -3, -4, -5, -6, -7, -8, -9		69-110		A-1, B-1, C-1, D-1, A-3, D-2, -4, -5
A-1, B-1, C-1, D-1, A-2, -3, -4, -5, -6, -7, D-2, -3, -5, -6		111-170		A-1, B-1, C-1, D-1, A-2, -3, D-2, -5
A-1, B-1, C-1, D-1, A-2, -3, -5, -6, -7, B-2, -3, -4, -5, C-2		171-230	X	A-1, B-1, C-1, D-1, A-2, -3, B-2, -4, C-2
A-1, B-1, C-1, D-1, B-2, -3, -4, -5, C-2, -3,		231-270		A-1, B-1, C-1, D-1, B-2, -4, C-2
A-1, B-1, C-1, D-1, B-2, -3, C-2, -3, -4, -5, -6, -11		271-325		A-1, B-1, C-1, D-1, B-2, C-2, -4, -5,
A-1, B-1, C-1, D-1, C-2, -4, -5, -6, -7, -8, -9, -10, -11, D-4, -9		326-25		A-1, B-1, C-1, D-1, C-2, -4, -5, -7, -8, D-4

☐ **Recommendation 3**
 ⇒SHELTER all sectors. ⇒CONSIDER issuance of Potassium Iodide in accordance with the State Plan.

9. Please repeat the information you have received to ensure accuracy.

10. Time and Date this information was provided. Time: Applicant ENTRY Date: Today

*Action: When notification complete, FAX form as prescribed in this instruction.

EXAM MATERIAL - KEY

WBN

GENERAL EMERGENCY

EPIP-5

APPENDIX B

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PROTECTIVE ACTION RECOMMENDATIONS

Note 1: If conditions are unknown utilizing the flowchart, then answer is NO.

Note 2: A short term release is defined as "a release that does not exceed a 15 minute duration".

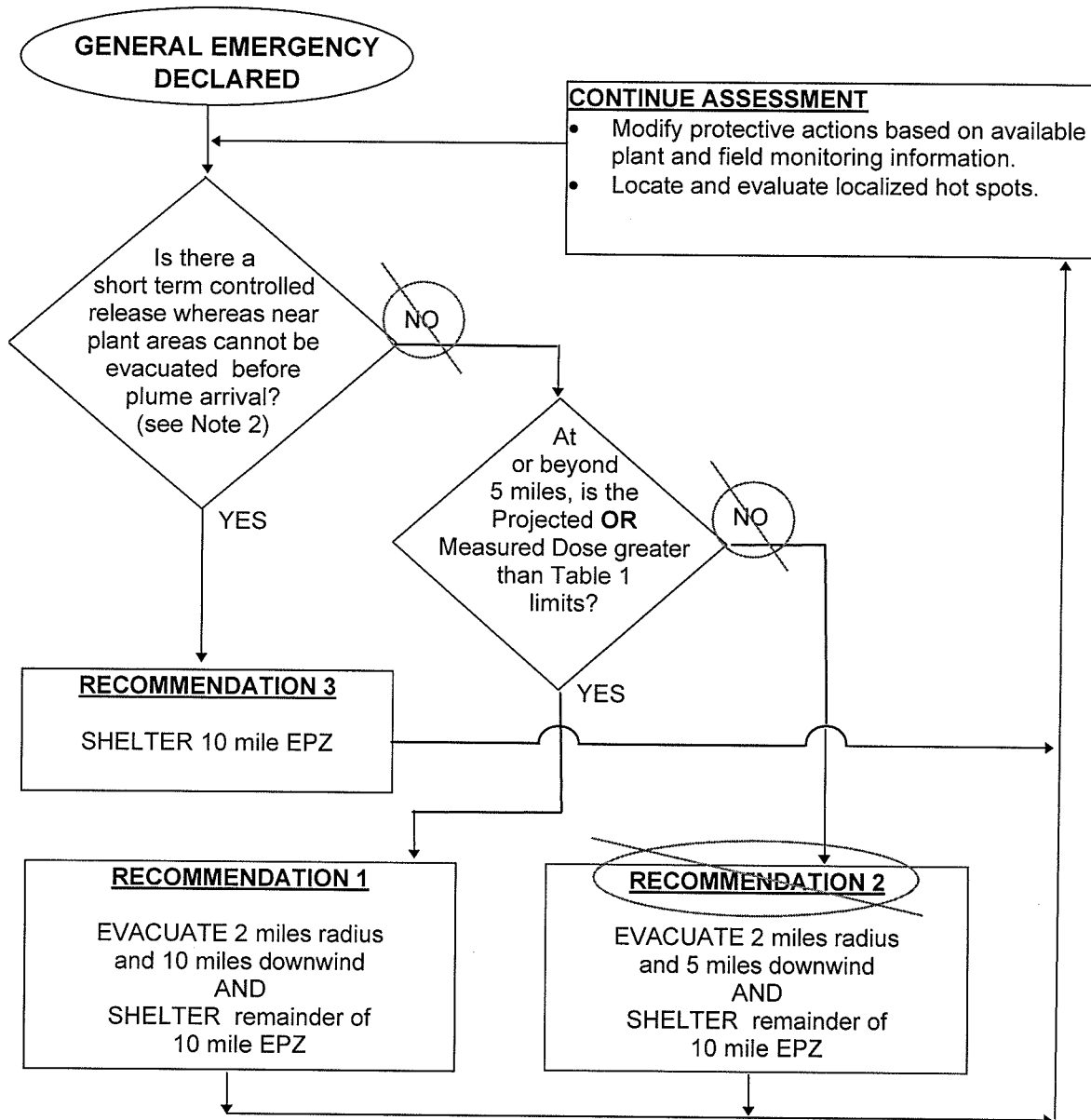


TABLE 1 Protective Action Guides (PAG)

TYPE	LIMIT
Measured	3.9 E-6 micro Ci/cc of Iodine 131 or 1 REM per hour External Dose
Projected	1 REM TEDE or 5 REM Thyroid CDE