Watts Bar Nuclear Plant

NRC EXAM 2013-302

Administrative JPM 1

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
1
NRC EXAM 2013-302
EVALUATION SHEET

Task: PERFORM SOI-62.01, "BORON CONCENTRATION CONTROL," APPENDIX C, "CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)."

Alternate Path: n/a

Facility JPM #:

Safety Function: 2.1 **Title:** Conduct of Operations

K/A 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.

Rating(s): 3.9/4.2 **CFR:** 41.10 / 43.5 / 45.12

Evaluation Method: Simulator _____ In-Plant _____ **Classroom** **X**

References: SOI-62.02, "Boron Concentration Control," Rev. 56.
TI-59, "Boron Tables," Rev. 7.

Task Number: RO-062-SOI-62-017 **Title:** Perform manual makeup to the Volume Control Tank.

Task Standard: The applicant performs SOI-62.02, "Boron Concentration Control," Appendix C, "CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)," and calculates:

1.) The total VCT addition to be 367 ± 1 gallon.

2.) The BA flow rate to be 10.60 gpm. (10.729 gpm is acceptable, if applicant elects to perform conservative calculation.)

3.) The amount of BA to be entered into the BA integrator to be 48 gallons ± 1 gallon.

4.) The amount of PW to be entered into the PW integrator to be 318 gallons ± 1 gallon.

Validation Time: 25 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

==========

COMMENTS

_____

_____

_____

_____

_____

Tools/Equipment/Procedures Needed:

- ***A copy of the NRC REFERENCE DISK***.
- ***A copy of SOI-62.02, "Boron Concentration Control," Appendix C, "CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)," for each applicant.***

***NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the NRC REFERENCE DISK.**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
1
NRC EXAM 2013-302
READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. 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 is at 100% power, MOL conditions.**
2. **AUTO MAKEUP is currently out-of-service.**
3. **VCT level has decreased, and is now stable at 22%.**
4. **RCS Boric Acid Concentration is 915 ppm.**
5. **BAT Boric Acid Concentration is 6900 ppm.**
6. **REACTINW computer program is NOT AVAILABLE.**

INITIATING CUES:

Using SOI-62.02, "Boron Concentration Control," Appendix C, "CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)," you are to determine the following:

1. **Total volume to raise VCT level from 22% to 41%.**
2. **Boric acid flow rate to be used during the manual makeup.**
3. **Amount of boric acid to be added.**
4. **Amount of primary water to be added.**

Notify the Examiner when you have completed the calculation.

UNLESS DIRECTED OTHERWISE BY THE PROCEDURE, ROUND ALL CALCULATIONS TO 3 DECIMAL PLACES

STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: [1] **OBTAIN** the following data for use in the HAND CALCULATION: [1.1] Current RCS Boric Acid Concentration. [1.2] Current BAT Boric Acid Concentration. [1.3] B-10 Depletion Value from Reactivity Management Briefing Sheet [1.4] Current VCT Level [1.5] Desired VCT Level STANDARD: Applicant correctly transposes the data from the INITIAL CONDITIONS and INITIATING CUES portion to the APPLICANT HANDOUT SHEET. Applicant refers to the Reactivity Management Briefing Sheet and determines the B-10 depletion to be **0** PPM [1.1] Current RCS Boric Acid Concentration: **915 ppm** [1.2] Current BAT Boric Acid Concentration: **6900 ppm** _____[1.3] B-10 Depletion Value from Reactivity Management Briefing Sheet: **0 from Cycle 12 MOL Reactivity Briefing Book.** [1.4] Current VCT Level: **22%** [1.5] Desired VCT Level: **41%** COMMENTS:	___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
EXAMINER: Step 2 allows for the entry of 1.0 for a conservative calculation. This value is also acceptable. Remaining steps which are affected by this difference are calculated each of the values.	
STEP 2: [2] **CALCULATE** BAT Boric Acid Concentration Ratio (BACR): 6820 ppm ÷ Step 2.0[1.2]ppm =_____ (ENTER 1.0 for BACR following a reactor shutdown or for a conservative calculation). STANDARD: _____Applicant determines that the BACR is **0.988**. (Rounded from 0.988405) 6820PPM / 6900 PPM = 0.988405 **OR** _____Applicant elects to perform the conservative calculation and enters a value of **1.0**. **Step is critical since the BACR affects a later calculation of the BA Blender Flow Rate setting.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 3: [3] **CALCULATE** B-10 corrected boron concentration: _____-_____=_____ PPM STEP 2.0[1.1] STEP 2.0[1.3] B-10 corrected boron STANDARD: Applicant adds **915** PPM and **0** PPM and calculates the B-10 corrected boron concentration to be **915 PPM**. **Step is critical since the B-10 value affects a later calculation of the BA Blender Flow Rate setting.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: [4] **CALCULATE** total VCT addition volume needed for desired level. [_____% (Step 1.0[1.5]) - _____% (Step 1.0[1.4])] X 19.3 Gals/% = _____ (Total Volume) GALS (Round to nearest whole number) STANDARD: _____Applicant calculates the total VCT additional volume to be **367 GAL**. 41%-22% x 19.3 GAL/% = 366.7 GAL, rounded to 367 GAL. **Step is critical since the change in level is the basis for the remainder of the calculation.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT

NOTE

Corrected Boric Acid Flow Rate in Step 2.0[5] should be obtained from TI-59, Appendix C for the B-10 corrected boron value calculated in Step 2.0[3].

STEP 5: [5] **CALCULATE** 1-FC-62-139, BA TO BLENDER FCV-62-140 CONTROL, flow setpoint.

CRITICAL STEP

___ SAT

___ UNSAT

GPM Corrected Boric Acid Flow Rate	x	BACR from Step 2.0[2]	=	GPM **[X]** BA to Blender Flow

STANDARD:

Applicant refers to TI-59, "Boron Tables," Appendix C, Reactor Coolant Boron Concentration Vs. Automatic Makeup Flow Rate Primary Water Flow of 70 GPM With 4% Boric Acid," Page 20.

BORON CONCENTRATION	BORIC ACID FLOW RATE (gpm)
910	10.661
920	10.796

10.796 **-** 10.661 **=** 0.135 **/** 2 **=** 0.068 **+** 10.661 **= 10.7285 rounded to 10.729**

_____Applicant performs an interpolation and determines that the corrected boric acid flow rate for 915 PPM is **10.729 GPM**.

_____Applicant multiplies **10.729** times **0.988** and determines that the BA to Blender Flow is **10.600 GPM** (Rounded from 10.600252).

OR

_____Applicant multiplies **10.729** times **1.0** and determines that the BA to Blender Flow is **10.729 GPM**

Step is critical since the flow rate determination affects the total amount of boric acid which will be added.

COMMENTS:

STEP/STANDARD	SAT/UNSAT
STEP 6: [6] **CALCULATE** TOTAL flow rate. GPM (Step 2.0[5] **[X]**) + 70 GPM (PW to Blender Flow) = GPM (Total Flow Rate) STANDARD: _____Applicant adds **10.600** GPM to **70** GPM to determine the TOTAL FLOW RATE to be **80.600** GPM. **OR** _____Applicant adds **10.729** GPM to **70** GPM to determine the TOTAL FLOW RATE to be **80.729** GPM. **Step is critical since the flow rate determination affects the total amount of boric acid which will be added.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: [7] **CALCULATE** [Y] BA Fraction. GPM (Step 2.0[5] **[X]**) ÷ GPM (Step 2.0[6] Total Flow Rate) = GPM (**[Y]** BA Fraction) STANDARD: _____Applicant divides **10.600** GPM by **80.600** GPM and determines the BA Fraction to be **0.132** (Rounded from 0.131513648.) **OR** _____Applicant divides **10.729** GPM by **80.729** GPM and determines the BA Fraction to be **0.133** (Rounded from 0.132901436.) **Step is critical since the flow rate determination affects the total amount of boric acid which will be added.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 8: [8] **CALCULATE** 1-FQ-62-139, BA BATCH COUNTER Setting. _____ (Step 2.0[7] **[Y]**) x GALS (Step 2.0[4] Total Volume) = GALS (Boric Acid Batch Counter Setting) STANDARD: _____Applicant multiplies **0.132** times **367** GALs and determines the Boric Acid Batch Counter Setting to be **48** GAL (Rounded from 48.44 GAL.). **OR** _____Applicant multiplies **0.133** times **367** GALs and determines the Boric Acid Batch Counter Setting to be **49** GAL (Rounded from 48.811 GAL.). **Step is critical since the flow rate determination affects the total amount of boric acid which will be added.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

NOTE

Corrected Boric Acid Flow Rate in Step 2.0[5] should be obtained from TI-59, Appendix C for the B-10 corrected boron value calculated in Step 2.0[3].

STEP/STANDARD	SAT/UNSAT
STEP 9: [9] **CALCULATE** [Z] PW Fraction. 70 GPM (Primary H_2O) ÷ ____ GPM (Step 2.0[6] Total Flow Rate) = ____ (**[Z]** PW Fraction) STANDARD: _____Applicant divides 70 GPM by 80.600 GPM and determines the PW Fraction to be **0.868.** **OR** _____Applicant divides 70 GPM by 80.729 GPM and determines the PW Fraction to be **0.867.** **Step is critical since the flow rate determination affects the total amount of primary water which will be added.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 10: [10] **CALCULATE** 1-FQ-62-142, PW BATCH COUNTER Setting. _____ (Step 2.0[9] **[Z]**) x GALS (Step 2.0[4] Total Volume) = _____ GALS (Primary Water Batch Counter Setting) STANDARD: _____Applicant multiplies **0.868** times **367 GAL** and determines the Primary Water Batch Counter Setting to be **319 GAL** (Rounded from 318.556 GAL.). **OR** _____Applicant multiplies **0.867** times **367 GAL** and determines the Primary Water Batch Counter Setting to be **318 GAL** (Rounded from 318.189 GAL.). ***Acceptable Range 318 ± 1 GAL*** **Step is critical since the flow rate determination affects the total amount of primary water which will be added.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 11: Notify the Unit Supervisor that SOI-62.02, "Boric Concentration Control," Appendix C, "CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)." STANDARD: Applicant notifies the Unit Supervisor that the calculation is complete and ready for review. COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

STOP TIME _____

1

KEY

DO NOT HAND TO APPLICANT

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Reactor Coolant Boron Concentration Vs. Automatic Makeup Flow Rate
Primary Water Flow of 70 GPM With 4% Boric Acid

BORON CONCENTRATION	BORIC ACID FLOW RATE (gpm)	BORON CONCENTRATION	BORIC ACID FLOW RATE (gpm)
810	9.332	1010	12.036
820	9.463	1020	12.176
830	9.594	1030	12.317
840	9.726	1040	12.458
850	9.858	1050	12.600
860	9.991	1060	12.742
870	10.124	1070	12.884
880	10.258	1080	13.027
890	10.392	1090	13.171
900	10.526	1100	13.315
910	10.661	1110	13.460
915 PPM BORIC ACID FLOW RATE IS 10.729			
920	10.796	1120	13.605
930	10.932	1130	13.750
940	11.069	1140	13.896
950	11.206	1150	14.043
960	11.343	1160	14.190
970	11.481	1170	14.338
980	11.619	1180	14.486
990	11.757	1190	14.635
1000	11.897	1200	14.784

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CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)

Date Today Initials

NOTES

1) Use page 1 of this appendix when using "VCT MAKEUP CALCULATION" program in REACTINW, otherwise use pages 2 and 3 when performing Hand Calculations.
2) The computer code named REACTINW (VCT MAKEUP CALCULATION) when used from the Y: server is a verified and validated program. The methodology used is based on the equations:

$V_1C_1 + V_2C_2 = V_3C_3$ & $V_1 + V_2 = V_3$

1.0 REACTINW "VCT MAKEUP CALCULATION"

[1] **OBTAIN** the following data for input to the REACTINW program:

N/A

[1.1] Current RCS Boric Acid Concentration. _____ PPM

[1.2] Current BAT Boric Acid Concentration. _____ PPM

[1.3] B-10 Depletion Value from Reactivity Management Briefing Sheet _____ PPM

[1.4] Current VCT Level _____ %

[1.5] Desired VCT Level _____ %

[2] **RUN** REACTINW calculation "VCT Makeup Calculation".

[3] **PRINT** the output file: "VCT MAKEUP INTEGRATOR SETTINGS CALCULATION"

[4] **SIGN** and DATE output sheets.

[5] **OBTAIN** independent verification and approval by an SRO on output sheets.

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CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)

Date Today — Initials

2.0 HAND CALCULATION

[1] **OBTAIN** the following data for use in the HAND CALCULATION: — DAH

- [1.1] Current RCS Boric Acid Concentration. — 915 PPM
- [1.2] Current BAT Boric Acid Concentration. — 6900 PPM
- [1.3] B-10 Depletion Value from Reactivity Management Briefing Sheet — 0 PPM
- [1.4] Current VCT Level — 22 %
- [1.5] Desired VCT Level — 41 %

[2] **CALCULATE** BAT Boric Acid Concentration Ratio (BACR):
6820 ppm ÷ Step 2.0[1.2]ppm = 0.988 (or 1.0)
(ENTER 1.0 for BACR following a reactor shutdown or for a conservative calculation). — DAH

[3] **CALCULATE** B-10 corrected boron concentration:
915 (STEP 2.0[1.1]) - 0 (STEP 2.0[1.3]) = 915 (B-10 corrected boron) PPM — DAH

[4] **CALCULATE** total VCT addition volume needed for desired level.

[41 % (Step 1.0[1.5]) - 22 % (Step 1.0[1.4])] X 19.3 Gals/% = 367 (Total Volume) GALS — DAH

(Round to nearest whole number)

(366.7 rounded to 367)

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CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)

Date Today Initials

2.0 HAND CALCULATION (continued)

NOTE

Corrected Boric Acid Flow Rate in Step 2.0[5] should be obtained from TI-59, Appendix C for the B-10 corrected boron value calculated in Step 2.0[3].

[5]

10.729 GPM	x	0.988 (or 1.0)	=	10.60 (10.729) GPM		DAH
Corrected Boric Acid Flow Rate		BACR from Step 2.0[2]		**[X]** BA to Blender Flow		

[6]

10.60 (10.729) GPM	+	70 GPM	=	80.60 (80.729) GPM		DAH
Step 2.0[5] **[X]**		PW to Blender Flow		Total Flow Rate		

[7]

10,60 GPM	÷	80.60 (80.729) GPM	=	0.132 (0.133) GPM		DAH
Step 2.0[5] **[X]**		Step 2.0[6] Total Flow Rate		**[Y]** BA Fraction		

[8]

0.132 (or 0.133)	x	367 GALS	=	48 (or 49) GALS		DAH
Step 2.0[7] **[Y]**		Step 2.0[4] Total Volume		Boric Acid Batch Counter Setting		

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CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)

Date Today Initials

2.0 HAND CALCULATION (continued)

NOTE
Round answer to nearest whole number.

[9] (or 80.729) (or 0.867)

70 GPM	÷ 80.60 GPM	= 0.868	DAH
Primary H_2O	Step 2.0[6] Total Flow Rate	**[Z]** PW Fraction	

[10] (or 0.867) (or 318)

0.868	x 367 GALS	= 319 GALS	DAH
Step 2.0[9] **[Z]**	Step 2.0[4] Total Volume	Primary Water Batch Counter Setting	

[11] **APPROVE** calculation results. IV/SRO

Calculation check: Step 2.0[8] results + Step 2.0[10] results should ~ = Step 2.0[4] results

1

Handout Package for Applicant

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. **Unit 1 is at 100% power, MOL conditions.**
2. **AUTO MAKEUP is currently out-of-service.**
3. **VCT level has decreased, and is now stable at 22%.**
4. **RCS Boric Acid Concentration is 915 ppm.**
5. **BAT Boric Acid Concentration is 6900 ppm.**
6. **The "REACTINW" computer program is NOT AVAILABLE.**

INITIATING CUES:

Using SOI-62.02, "Boron Concentration Control," Appendix C, "CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)," you are to determine the following:

1. **Total volume to raise VCT level from 22% to 41%.**
2. **Boric acid flow rate to be used during the manual makeup.**
3. **Amount of boric acid to be added.**
4. **Amount of primary water to be added.**

Notify the Examiner when you have completed the calculation.

UNLESS DIRECTED OTHERWISE BY THE PROCEDURE, ROUND ALL CALCULATIONS TO 3 DECIMAL PLACES

Watts Bar Nuclear Plant

Unit 1

System Operating Instruction

SOI-62.02

Boron Concentration Control

Revision 0056

VFV
Today
DAH

Quality Related

Level of Use: Continuous Use

Effective Date: 06-27-2013

Responsible Organization: OPS, Operations

Prepared By: P.R. Neu

Approved By: R.B. Nessell

Revision Log

Rev or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
51	10/01/10	2, 4, 7, 9-12, 14-17, 19, 21, 23-29, 31-33, 35, 38, 40-44, 57	Minor/editorial revision: Added signoffs to Steps 8.1[22] through 8.1[25] (PCR 4637). Added (ρ) notation for direct reactivity steps. Reformatted source notes, added section end identification and created external attachments for all checklists.
UC-1	12/31/10	2, 33, 35-39	Added steps to section 8.2 to prevent invalid data being sent to the BEACON core monitoring software [SR 303078] [DCN 52277]. Minor/ Editorial and administrative changes to correct step number in NOTE in section 8.1, change branching steps to IF/THEN logic and reformatted a step for ease of use.
52	01/11/11	2, 33, 35, 36, 38, 39	Incorporate UC-1
53	07/14/11	2, 7	Minor Editorial change. PER 367518: Revise Section 3.0.B to state pressurizer boron concentration should be within 50 ppm of RCS boron concentration.
54	07/16/12	2, 7, 35, 50, 51	Added P&L to show overflow volume of the RWST [PER 522766] Corrected formulas to use subscripts for better formula formatting [PCR 5826] Corrected Cross References in Appendix C section 2.0 [PCR 5964]
UC-1	08/29/12	2, 26, 27	Removed notes defining minor boration and dilution from section 6.6 and 6.7.
55	09/04/12	2, 26, 27	Incorporated UC-1.
56	06/27/13	2, 18, 40	Updated procedure steps for Boron Concentration Control [PER708518-001]

Table of Contents

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ATTACHMENTS

1.0 INTRODUCTION

1.1 Purpose

To provide instructions for operation of the CVCS Boron Concentration Control System.

1.2 Scope

This Instruction includes the following operations:

A. Startup (Standby Readiness)

B. Automatic Makeup

C. Dilution

D. Alternate Dilution

E. Boration

F. Manual Makeup

G. Minor Dilution

H. Minor Boration

I. RWST Makeup Using Blender

J. Batching to Holdup Tank A Prior to Pumping Transfer Canal

K. Major and Minor Boration with Boric Acid Integrator out of service

L. VCT Level Reduction

2.0 REFERENCES

2.1 Performance References

A. 1-TRI-62-3, Boric Acid Flow Paths: Valve Position Verification

B. NUPOP, Nuclear Parameters and Operations Package

C. SOI-62.01, CVCS-Charging and Letdown

D. SOI-62.05, Boric Acid Batching, Transfer and Storage

E. SOI-62.06, Boron Disposal System

F. SOI-78.01, Spent Fuel Pit Cooling and Cleaning System

G. SOI-81.01, Primary Makeup Water Systems

H. SOI-236.01, 125V DC Vital Battery Board I

I. TI-4 PART II, Pant Curve Book, Tank Curves, Turbine Curves

J. Tech Requirements Fig 3.1.6, Boric Acid Tank Limits

K. Computer Program REACTW and REACTW Computer Program User's Guide.

L. Computer Program REACTINW and REACTINW Computer Program User's Guide

M. TI-59, Boration Tables

2.2 Developmental References

A. Tech Spec Section 3.1, Reactivity Control Systems

B. System Description N3 62 4001, Chemical and Volume Control System

C. TVA Drawings:

1. 47W610-62-3
2. 47W611-62-2
3. 47W809-2
4. 47W812-1
5. 47W855-1

3.0 PRECAUTIONS AND LIMITATIONS

A. At least one Reactor Coolant Pump (RCP) or one Residual Heat Removal (RHR) Pump will be in operation during boron concentration (C_B) changes. [C.1][C.2][C.3]

B. Pressurizer (Pzr) C_B should be within 50 ppm of RCS C_B.

C. Axial Offset should be maintained in Target Band during C_B changes.

D. Normally the reactor will **NOT** be made critical by boron dilution.

E. Boric Acid Tank (BAT) level should be monitored during makeup or boration to avoid violating Tech Requirement (TR) 3.1.6 level limits, and consideration of the other requirements of TR 3.1.5 and 3.1.6 should be evaluated, particularly in sections which use the in-service BAT.

F. TI-59 Boration Tables were calculated using 70 gpm Primary Water flow up to 2500 ppm. For blending at concentrations greater than 2500 ppm, primary water flow will need to be adjusted downward per Appendix B while Boric Acid flow is maintained at 40 gpm (e.g. 100% on 1-FC-62-142)

G. Expect a delay between time boration/dilution is started until effect is seen in RCS.

H. When subcritical, Boration/Dilution effects are monitored by Source Range counts. Unexplained change in count rate requires the operation to be stopped.

I. At power, Boration/Dilution effects are monitored by Rod movement and T_{avg}. Operation must be stopped if Rods move in the wrong direction or T_{avg} change is unexplained.

J. The following should be evaluated as potential Reactivity Management issues: unanticipated

1. power change >0.5%,
2. rod motion > 5 steps,
3. T_{avg} change >1°F.

K. During refueling operations, boron concentration changes can affect Mansell readings. If Mansell is in service for RCS level indication, and RCS boron concentration is changed, the Boron Concentration Input value to Mansell should be adjusted.

L. The overflow volume for the RWST is 380,000 gallons. Overflow is through an 8" line which drains back into the pipe tunnel that connects with the auxiliary building.

Date Today **Initials**

4.0 PREREQUISITE ACTIONS

4.1 Preliminary Actions

NOTES

1) Throughout the Instruction where an **IF/THEN** statement occurs, the step should be **N/A** if stated condition does **NOT** exist.
2) Signoffs/information in unused Sections may be left blank.

[1] **INDICATE** Section to be performed, and reason for use:

5.0	Startup	N/A	7.0	Shutdown	N/A
6.0	Normal Operation	6.5	8.0	Infrequent Operations	N/A

Section/ Reason/ Remarks: Perform manual makeup calculations per APPENDIX C, CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS).

4.2 Field Preparations

[1] **ENSURE** Section 3.0, Precautions, and Limitations, REVIEWED. DAH

[2] **CHECK** Primary Water System IN SERVICE (ref SOI-81.01). DAH

[3] **ENSURE** Refuel Water Storage Tank (RWST) and Boric Acid Tank(s) AVAILABLE. DAH

[4] **CHECK** Boric Acid Pump(s) IN OPERATION (ref SOI-62.05). DAH

4.3 Approvals and Notifications

[1] **COORDINATE** performance with US and UO. DAH

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CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)

Date Today **Initials**

NOTES

1) Use page 1 of this appendix when using "VCT MAKEUP CALCULATION" program in REACTINW, otherwise use pages 2 and 3 when performing Hand Calculations.

2) The computer code named REACTINW (VCT MAKEUP CALCULATION) when used from the Y: server is a verified and validated program. The methodology used is based on the equations:

$V_1C_1 + V_2C_2 = V_3C_3$ & $V_1 + V_2 = V_3$

1.0 REACTINW "VCT MAKEUP CALCULATION"

[1] **OBTAIN** the following data for input to the REACTINW program:

N/A

[1.1] Current RCS Boric Acid Concentration. _____ PPM

[1.2] Current BAT Boric Acid Concentration. _____ PPM

[1.3] B-10 Depletion Value from Reactivity Management Briefing Sheet _____ PPM

[1.4] Current VCT Level _____ %

[1.5] Desired VCT Level _____ %

[2] **RUN** REACTINW calculation "VCT Makeup Calculation".

[3] **PRINT** the output file: "VCT MAKEUP INTEGRATOR SETTINGS CALCULATION"

[4] **SIGN** and DATE output sheets.

[5] **OBTAIN** independent verification and approval by an SRO on output sheets.

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CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)

Date Today **Initials**

2.0 HAND CALCULATION

[1] **OBTAIN** the following data for use in the HAND CALCULATION: _____

[1.1] Current RCS Boric Acid Concentration. _____PPM

[1.2] Current BAT Boric Acid Concentration. _____PPM

[1.3] B-10 Depletion Value from Reactivity Management Briefing Sheet _____PPM

[1.4] Current VCT Level _____%

[1.5] Desired VCT Level _____%

[2] **CALCULATE** BAT Boric Acid Concentration Ratio (BACR):
6820 ppm ÷ Step 2.0[1.2]ppm =_____
(ENTER 1.0 for BACR following a reactor shutdown or for a conservative calculation). _____

[3] **CALCULATE** B-10 corrected boron concentration:
_____-_____=_____ PPM _____
STEP 2.0[1.1] STEP 2.0[1.3] B-10 corrected boron

[4] **CALCULATE** total VCT addition volume needed for desired level.

[_____% (Step 1.0[1.5]) - _____% (Step 1.0[1.4])] X 19.3 Gals/% = _____ (Total Volume) GALS _____
(Round to nearest whole number)

Appendix C
(Page 3 of 4)

CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)

Date_____ **Initials**

2.0 HAND CALCULATION (continued)

NOTE
Corrected Boric Acid Flow Rate in Step 2.0[5] should be obtained from TI-59, Appendix C for the B-10 corrected boron value calculated in Step 2.0[3].

[5]

GPM	x		=	GPM		_____
Corrected Boric Acid Flow Rate		BACR from Step 2.0[2]		**[X]** BA to Blender Flow		

[6]

GPM	+	70 GPM	=	GPM		_____
Step 2.0[5] **[X]**		PW to Blender Flow		Total Flow Rate		

[7]

GPM	÷	GPM	=	GPM		_____
Step 2.0[5] **[X]**		Step 2.0[6] Total Flow Rate		**[Y]** BA Fraction		

[8]

	x	GALS	=	GALS		_____
Step 2.0[7] **[Y]**		Step 2.0[4] Total Volume		Boric Acid Batch Counter Setting		

Appendix C
(Page 4 of 4)

CALCULATION OF BORIC ACID AND PRIMARY WATER INTEGRATOR SETTING FOR MANUAL MAKEUP TO VCT (RCS)

Date_____ **Initials**

2.0 HAND CALCULATION (continued)

NOTE
Round answer to nearest whole number.

[9]

70 GPM	÷	GPM	=		
Primary H_2O		Step 2.0[6] Total Flow Rate		**[Z]** PW Fraction	_____

[10]

_____	x	GALS	=	GALS	
Step 2.0[9] **[Z]**		Step 2.0[4] Total Volume		Primary Water Batch Counter Setting	_____

[11] **APPROVE** calculation results. _____ IV/SRO

Calculation check: Step 2.0[8] results + Step 2.0[10] results should ~ = Step 2.0[4] results

Watts Bar Nuclear Plant

NRC EXAM 2013-302

Administrative JPM **2 R**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
2 R
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EVALUATION SHEET

Task: DETERMINE AFW PUMP 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: GOI-7, "Generic Equipment Operating Guidelines," Rev. 50.

Task Number: RO-003-SOI-3.02-006 **Title:** Manually startup the motor driven Auxiliary Feedwater pumps.

Task Standard: The applicant determines:

1.) No starting limitations have been violated based on GOI-7, "Generic Equipment Operating Guidelines."

2.) 1B-B MD AFW Pump may be started immediately, or at any time after 2125. The 1A-A MD AFW pump cannot be restarted on October 15, 2013.

3.) Electrical Maintenance (EM) must be notified to perform 2500-volt megger, bridge, and dc high-potential tests after the 1B-B AFW pump tripped by instantaneous overcurrent relay operation.

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

==========

COMMENTS

_____

_____

_____

_____

_____

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
2 R
NRC EXAM 2013-302
DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. 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:

The following is the "run" history for 1A-A MD AFW pump and 1B-B MD AFW pump on October 15, 2013:

Pump	Start Time	Shutdown Time	Run Time (minutes)
1A-A	0115	0137	
	0205	0220	
	0310	0335	
	0818	0845	
	1130	1215	
	1400	1445	
1B-B	0230	0255	
	0350	0410	
	0535	0615	
	1545	1620	
	1950	2025	

Each of the listed pump starts resulted in a normal start.

Current time is 2125.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
2 R
NRC EXAM 2013-302

INITIATING CUE:

Part 1

Evaluate the Auxiliary Feedwater pump start history provided and determine:

1. **If any starting limitations have been violated.**

2. **The pump(s) allowed to be started an additional time on October 15, 2013.**

Part 2

If an instantaneous overcurrent relay operation occurs on the next Auxiliary Feedwater Pump start, what motor testing is required to be performed?

STEP/STANDARD	SAT/UNSAT

START TIME: _____

Part 1

STEP 1: Applicant determines that no starting limitations have been violated based on GOI-7, "Generic Equipment Operating Guidelines."

___ SAT

___ UNSAT

STANDARD:

From GOI-7, "Generic Equipment Operating Guidelines," Section 5.2.5, "Motor Operating and Starting Limitations."

[3] **IF NO** Nameplate data exists, **THEN USE** the following generic guidelines for starting motors:

A. Two starts in succession, coasting to rest between starts with the motor initially at ambient temperature; or

B. One start with the motor initially at normal operating temperature.

[4] **APPLY** the following limitations to motors greater than/equal to 200 hp following any start under either condition in Step 5.2.5[3] above:

A. Allow the motor to cool for 20 minutes while running at normal or no load; **OR**

B. Allow the motor to cool for 45 minutes while standing idle before each additional restart is attempted.

Applicant locates GOI-7, "Generic Equipment Operating Guidelines," Page 28 NOTE, which states that "The Auxiliary Feedwater Pump motor is limited to six starts per day and the Condenser Circulating Water Pump motor is limited to eight starts per day."

The applicant determines that 1A-A MD AFW Pump has been started 6 times today, and 1B-B MD AFW Pump has been started 5 times today.

COMMENTS:

STEP/STANDARD	SAT/UNSAT
STEP 2: Applicant determines that the 1B-B MD AFW Pump may be started immediately, or at 2125. Applicant determines the 1A-A MD AFW pump cannot be restarted on October 15, 2013. STANDARD: _____Applicant determines that the 1B-B MD AFW Pump may be started at 2125 or any time thereafter. **Step is critical to ensure the correct AFW Pump started without violating starting duty limits.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
Part 2	
STEP 3: Applicant addresses the question **If an instantaneous overcurrent relay operation occurs on the <u>next</u> Auxiliary Feedwater Pump start, what motor testing is required to be performed?** STANDARD: Applicant determines that Electrical Maintenance (EM) must be notified to perform 2500-volt megger, bridge, and dc high-potential tests after a 6,900-volt motor has been tripped by relay operation. **Step is critical since the specified tests are required to prove that the 1A-A AFW pump motor has not been damaged.** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME _____

2 R

KEY

DO NOT HAND TO APPLICANT

2-R KEY

Part 1

Evaluate the Auxiliary Feedwater pump start history provided and determine:

1. **If any starting limitations have been violated.**

   The applicant evaluates the data provided and determines that there were NO starting limitations violated.

2. **The pump(s) allowed to be started an additional time on October 15, 2013.**

   The applicant determines that the 1B-B AFW pump may be started at 2125 or any time thereafter on October 15, 2013.

Part 2

If an instantaneous overcurrent relay operation occurs on the next Auxiliary Feedwater Pump start, what motor testing is required to be performed?

From GOI-7, "Generic Equipment Operating Guidelines," Section 5.2,5, "Motor Operating and Starting Limitations," Item [6]

NOTIFY Electrical Maintenance (EM) to perform 2500-volt megger, bridge, and dc high-potential tests after a 6,900-volt motor has been tripped by relay operation. This is done to determine whether the motor (or, in some cases, the motor cable) is suitable for service.

5.2.5 Motor Operating and Starting Limitations (continued)

CAUTION

The Auxiliary Feed Pump motor is limited to six starts per day and the Condenser Circulating Water Pump motor is limited to eight starts per day.

NOTE

The life of a motor is affected by the number of start attempts made on an individual motor. Most squirrel-cage motors are "rotor critical," and the stator temperature rise will **NOT** reflect excessive temperature rise in the rotor squirrel cage caused by excessive starting duty.

[2] **START** motors greater than/equal to 200 hp once when at ambient or once when at operating temperature, **THEN**

START motors per Nameplate data for any additional starts.

[3] **IF NO** Nameplate data exists, **THEN**

USE the following generic guidelines for starting motors:

A. Two starts in succession, coasting to rest between starts with the motor initially at ambient temperature; or

B. One start with the motor initially at normal operating temperature.

[4] **APPLY** the following limitations to motors greater than/equal to 200 hp following any start under either condition in Step 5.2.5[3] above:

A. Allow the motor to cool for 20 minutes while running at normal or no load; **OR**

B. Allow the motor to cool for 45 minutes while standing idle before each additional restart is attempted.

[5] **IF** a motor stalls during a starting attempt, **THEN**

CORRECT the conditions which caused the motor to stall, **AND**

EXAMINE the motor thoroughly for damage caused by overheating before an additional restart is attempted. The rotor squirrel cage should be examined visually and tested electrically.

5.2.5 Motor Operating and Starting Limitations (continued)

NOTES

1) Severe damage to the motor and the auxiliary electrical system can be sustained by attempting to start a motor that already has a faulted stator winding.
2) If it is determined by an SRO that plant safety requires the restart of the motor, an exception to the limitations below may be made.

[6] **NOTIFY** Electrical Maintenance (EM) to perform 2500-volt megger, bridge, and dc high-potential tests after a 6,900-volt motor has been tripped by relay operation. This is done to determine whether the motor (or, in some cases, the motor cable) is suitable for service.

[7] **NOTIFY** EM to perform megger and bridge tests after a 480V motor (greater than/equal to 100 horsepower) has been tripped by protective relays or devices. This is done to determine whether the motor is suitable for service unless it can be determined that the motor was tripped because of overloading. When the trip out is apparently the result of overloading, the motor and the driven equipment should be inspected visually before attempting to restart the motor.

5.2.6 Auxiliary Power System Transformer Loading

NOTE

Yellow lines are placed on transformer primary and secondary ammeters to indicate nameplate loading (primary feeds to multiple transformers are **NOT** marked). Red lines are placed on the ammeters to indicate maximum transformer loading.

[1] **MAINTAIN** loadings at or below the yellow line on all transformers having associated ammeters, **AND**

NOTIFY the Shift Manager (SM) of any transformer loaded above the yellow line.

2 R

Handout Package for Applicant

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The following is the "run" history for 1A-A MD AFW pump and 1B-B MD AFW pump on October 15, 2013:

Pump	Start Time	Shutdown Time	Run Time (minutes)
1A-A	0115	0137	
	0205	0220	
	0310	0335	
	0818	0845	
	1130	1215	
	1400	1445	
1B-B	0230	0255	
	0350	0410	
	0535	0615	
	1545	1620	
	1950	2025	

Each of the listed pump starts resulted in a normal start.

Current time is 2125.

INITIATING CUE:

Part 1

Evaluate the Auxiliary Feedwater pump start history provided and determine:

1. If any starting limitations have been violated.

2. The pump(s) allowed to be started an additional time on October 15, 2013.

Part 2

If an instantaneous overcurrent relay operation occurs on the next Auxiliary Feedwater Pump start, what motor testing is required to be performed?

Watts Bar Nuclear Plant

NRC EXAM 2013-302

Administrative JPM **2 S**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
2 S
NRC EXAM 2013-302
EVALUATION SHEET

Task: DETERMINE AFW PUMP 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: GOI-7, "Generic Equipment Operating Guidelines," Rev. 50.
LCO 3.7.5, Auxiliary Feedwater (AFW) System, Amendment 91.

Task Number: RO-003-SOI-3.02-006 **Title:** Manually startup the motor driven Auxiliary Feedwater pumps.

Task Standard: The applicant determines:

1. NO motor start limitations have been violated based on the history provided.
2. 1B-B AFW pump can be started at 2125 on October 15, 2013. The 1A-A AFW pump cannot be restarted on October 15, 2013.
3. Electrical Maintenance (EM) must be notified to perform 2500-volt megger, bridge, and dc high-potential tests after the 1B-B AFW pump tripped by instantaneous overcurrent relay operation.
4. LCO 3.7.5, Auxiliary Feedwater (AFW) System, Action B is applicable, and the 1B-B AFW pump must be declared INOPERABLE, and restored to OPERABLE status within 72 hours.

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

==========

COMMENTS

_____

_____

_____

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
2 S
NRC EXAM 2013-302
DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. 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:

The following is the "run" history for 1A-A MD AFW pump and 1B-B MD AFW pump on October 15, 2013:

Pump	Start Time	Shutdown Time	Run Time (minutes)
1A-A	0115	0137	
	0205	0220	
	0310	0335	
	0818	0845	
	1130	1215	
	1400	1445	
1B-B	0230	0255	
	0350	0410	
	0535	0615	
	1545	1620	
	1950	2025	

Each of the listed pump starts resulted in a normal start.

Current time is 2125.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
2 S
NRC EXAM 2013-302

INITIATING CUES:

Part 1

Evaluate the Auxiliary Feedwater pump start history provided and determine:

1. **If any starting limitations have been violated.**

2. **The pump(s) allowed to be started an additional time on October 15, 2013.**

Part 2

Unit 1 is in Mode 2 when the 1A-A MD AFW Pump trips on instantaneous overcurrent relay operation when started.

1.) What testing must be performed on the 1A-A MD AFW Pump motor as a result of the trip?
2.) What actions are required to be taken to comply with Tech Specs?

STEP/STANDARD	SAT/UNSAT

START TIME: _____

Part 1

STEP 1: Applicant determines that no starting limitations have been violated based on GOI-7, "Generic Equipment Operating Guidelines."

___ SAT

___ UNSAT

STANDARD:

From GOI-7, "Generic Equipment Operating Guidelines," Section 5.2.5, "Motor Operating and Starting Limitations."

[3] **IF NO** Nameplate data exists, **THEN USE** the following generic guidelines for starting motors:

A. Two starts in succession, coasting to rest between starts with the motor initially at ambient temperature; or

B. One start with the motor initially at normal operating temperature.

[4] **APPLY** the following limitations to motors greater than/equal to 200 hp following any start under either condition in Step 5.2.5[3] above:

A. Allow the motor to cool for 20 minutes while running at normal or no load; **OR**

B. Allow the motor to cool for 45 minutes while standing idle before each additional restart is attempted.

Applicant locates GOI-7, "Generic Equipment Operating Guidelines," Page 28 NOTE, which states that "The Auxiliary Feedwater Pump motor is limited to six starts per day and the Condenser Circulating Water Pump motor is limited to eight starts per day."

The applicant determines that 1A-A MD AFW Pump has been started 6 times today, and 1B-B MD AFW Pump has been started 5 times today.

COMMENTS:

STEP/STANDARD	SAT/UNSAT
STEP 2: Applicant determines that the 1B-B MD AFW Pump may be started immediately, or at 2125. Applicant determines the 1A-A MD AFW pump cannot be restarted on October 15, 2013. STANDARD: _____Applicant determines that the 1B-B MD AFW Pump may be started at 2125 or any time thereafter. **Step is critical to ensure the correct AFW Pump started without violating starting duty limits.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
Part 2	
STEP 3: Applicant addresses the question **Unit 1 is in Mode 2 when the 1A-A MD AFW Pump trips on instantaneous overcurrent relay operation when started.** **1.) What testing must be performed on the 1A-A MD AFW Pump motor as a result of the trip?** STANDARD: Applicant determines that Electrical Maintenance (EM) must be notified to perform 2500-volt megger, bridge, and dc high-potential tests after a 6,900-volt motor has been tripped by relay operation. **Step is critical since the specified tests are required to prove that the 1A-A AFW pump motor has not been damaged.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Applicant addresses the question. **2.) What actions are required to be taken to comply with Tech Specs?** STANDARD: _____Applicant refers to LCO 3.7.5, and determines that CONDITION B applies. **Step is critical since the compliance with Tech Specs is a requirement of the plant license.** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME _____

2 S

KEY

DO NOT HAND TO APPLICANT

2-S KEY

Part 1

Evaluate the Auxiliary Feedwater pump start history provided and determine:

1. **If any starting limitations have been violated.**

   The applicant evaluates the data provided and determines that there were NO starting limitations violated.

2. **The pump(s) allowed to be started an additional time on October 15, 2013.**

   The applicant determines that the 1B-B AFW pump may be started at 2125 or any time thereafter on October 15, 2013.

Part 2

Unit 1 is in Mode 2 when the 1A-A MD AFW Pump trips on instantaneous overcurrent relay operation when started.

1.) What testing must be performed on the 1A-A MD AFW Pump motor as a result of the trip?

From GOI-7, "Generic Equipment Operating Guidelines," Section 5.2,5, "Motor Operating and Starting Limitations," Item [6]

NOTIFY Electrical Maintenance (EM) to perform 2500-volt megger, bridge, and dc high-potential tests after a 6,900-volt motor has been tripped by relay operation. This is done to determine whether the motor (or, in some cases, the motor cable) is suitable for service.

2.) What actions are required to be taken to comply with Tech Specs?

Applicant refers to LCO 3.7.5, and determines that CONDITION B applies.

5.2.5 Motor Operating and Starting Limitations (continued)

CAUTION

The Auxiliary Feed Pump motor is limited to six starts per day and the Condenser Circulating Water Pump motor is limited to eight starts per day.

NOTE

The life of a motor is affected by the number of start attempts made on an individual motor. Most squirrel-cage motors are "rotor critical," and the stator temperature rise will **NOT** reflect excessive temperature rise in the rotor squirrel cage caused by excessive starting duty.

[2] **START** motors greater than/equal to 200 hp once when at ambient or once when at operating temperature, **THEN**

START motors per Nameplate data for any additional starts.

[3] **IF NO** Nameplate data exists, **THEN**

USE the following generic guidelines for starting motors:

A. Two starts in succession, coasting to rest between starts with the motor initially at ambient temperature; or

B. One start with the motor initially at normal operating temperature.

[4] **APPLY** the following limitations to motors greater than/equal to 200 hp following any start under either condition in Step 5.2.5[3] above:

A. Allow the motor to cool for 20 minutes while running at normal or no load; **OR**

B. Allow the motor to cool for 45 minutes while standing idle before each additional restart is attempted.

[5] **IF** a motor stalls during a starting attempt, **THEN**

CORRECT the conditions which caused the motor to stall, **AND**

EXAMINE the motor thoroughly for damage caused by overheating before an additional restart is attempted. The rotor squirrel cage should be examined visually and tested electrically.

5.2.5 Motor Operating and Starting Limitations (continued)

NOTES

1) Severe damage to the motor and the auxiliary electrical system can be sustained by attempting to start a motor that already has a faulted stator winding.
2) If it is determined by an SRO that plant safety requires the restart of the motor, an exception to the limitations below may be made.

[6] **NOTIFY** Electrical Maintenance (EM) to perform 2500-volt megger, bridge, and dc high-potential tests after a 6,900-volt motor has been tripped by relay operation. This is done to determine whether the motor (or, in some cases, the motor cable) is suitable for service.

[7] **NOTIFY** EM to perform megger and bridge tests after a 480V motor (greater than/equal to 100 horsepower) has been tripped by protective relays or devices. This is done to determine whether the motor is suitable for service unless it can be determined that the motor was tripped because of overloading. When the trip out is apparently the result of overloading, the motor and the driven equipment should be inspected visually before attempting to restart the motor.

5.2.6 Auxiliary Power System Transformer Loading

NOTE

Yellow lines are placed on transformer primary and secondary ammeters to indicate nameplate loading (primary feeds to multiple transformers are **NOT** marked). Red lines are placed on the ammeters to indicate maximum transformer loading.

[1] **MAINTAIN** loadings at or below the yellow line on all transformers having associated ammeters, **AND**

NOTIFY the Shift Manager (SM) of any transformer loaded above the yellow line.

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE.

----------NOTE----------
Only one AFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable when entering MODE 1.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One steam supply to turbine driven AFW pump inoperable.	A.1 Restore steam supply to OPERABLE status.	7 days AND 10 days from discovery of failure to meet the LCO
B. One AFW train inoperable in MODE 1, 2 or 3 for reasons other than Condition A.	B.1 Restore AFW train to OPERABLE status.	72 hours AND 10 days from discovery of failure to meet the LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time for Condition A or B not met. OR Two AFW trains inoperable in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 18 hours
D. Three AFW trains inoperable in MODE 1, 2, or 3.	D.1 ----------NOTE---------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. ---------- Initiate action to restore one AFW train to OPERABLE status.	 Immediately
E. Required AFW train inoperable in MODE 4.	E.1 Initiate action to restore AFW train to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.5.1	Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.5.2	----------NOTE---------- Not required to be performed for the turbine driven AFW pump until 24 hours after $\geq$ 1092 psig in the steam generator. ---------- Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	31 days on a STAGGERED TEST BASIS
SR 3.7.5.3	----------NOTE---------- Not applicable in MODE 4 when steam generator is relied upon for heat removal. ---------- Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.4	----------NOTES---------- 1. Not required to be performed for the turbine driven AFW pump until 24 hours after $\geq$ 1092 psig in the steam generator. 2. Not applicable in MODE 4 when steam generator is relied upon for heat removal. ---------- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.7.5.5	Verify proper alignment of the required AFW flow paths by verifying flow from the condensate storage tank to each steam generator.	Prior to entering MODE 2 after initial fuel loading and whenever unit has been in MODE 5 or 6 for $>$ 30 days

2 S

Handout Package for Applicant

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The following is the "run" history for 1A-A MD AFW pump and 1B-B MD AFW pump on October 15, 2013:

Pump	Start Time	Shutdown Time	Run Time (minutes)
1A-A	0115	0137	
	0205	0220	
	0310	0335	
	0818	0845	
	1130	1215	
	1400	1445	
1B-B	0230	0255	
	0350	0410	
	0535	0615	
	1545	1620	
	1950	2025	

Each of the listed pump starts resulted in a normal start.

Current time is 2125.

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIATING CUES:

Part 1

Evaluate the Auxiliary Feedwater pump start history provided and determine:

1. **If any starting limitations have been violated.**

2. **The pump(s) allowed to be started an additional time on October 15, 2013.**

Part 2

Unit 1 is in Mode 2 when the 1A-A MD AFW Pump trips on instantaneous overcurrent relay operation when started.

1.) What testing must be performed on the 1A-A MD AFW Pump motor as a result of the trip?
2.) What actions are required to be taken to comply with Tech Specs?

Watts Bar Nuclear Plant

NRC EXAM 2013-302

Administrative JPM 3**R**

WATTS BAR NUCLEAR PLANT
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3 R
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EVALUATION SHEET

Task: REVIEW 1-SI-0-4, "MONTHLY SURVEILLANCES."

Alternate Path: n/a

Facility JPM #: A.2 2010-08 NRC Exam (Modified)

Safety Function: 2.2 **Title:** Equipment Control

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. 29.

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** are exceeding MCD limits OR have exceeded specified values:

1. **ITEM 4:** 1-PI-1-1C, SG 1 Press, is exceeding its MCD value.
2. **ITEM 7:** 1-PI-68-336C PZR PRESS is exceeding its MCD value.
3. **ITEM 13:** 1-TI-68-43C LOOP 3 HL TEMP is exceeding its MCD value.
4. **ITEM 25:** 1-FI-68-93C CHARGING FLOW is within its MCD value, but exceeding the 20 gpm limit of NOTE (32).
5. **ITEM 29:** 1-PI-62-81C LP LETDOWN PRESS is exceeding its MCD value.

The applicant indicates that the following actions are required (in no particular order) for **each** of the 5 items identified:

1. SM/Unit SRO must be notified of each item that exceeds limits.
2. A Work Order (WO) or Service Request (SR) must be prepared for each item that exceeds limits.
3. **ITEM 25** requires a calibration of 1-FI-68-93C CHARGING FLOW.

Validation Time: 25 minutes **Time Critical:** Yes _____ No **X**

==========

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

Performance Rating: SAT ____ UNSAT ____ Performance Time ___

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

Tools/Equipment/Procedures Needed:

- **Marked up copy of 1-SI-0-4, "Monthly Surveillances," Pages 46, 47, 51, and 54 included in the 3 R Handout Package for Applicant portion of this JPM.**

- ***NRC REFERENCE DISK***.

***NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the NRC REFERENCE DISK.**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
3 R
NRC EXAM 2013-302
READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. 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 46, 47, 51 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.

RAISE YOUR HAND to inform the EXAMINER when you have completed your review and your list of actions has been developed.

STEP/STANDARD	SAT/UNSAT

START TIME: _____

EXAMINERS CUE: 1-SI-0-4, Appendix D, pages 46, 47, 51, 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

STEP 1: **Item 4 (Page 46), values for SG 1 Pressure.** STANDARD: ___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-PI-1-2A and 1-PI-1-1C are outside the channel check MCD of 80 psig. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2. **Item 7 (Page 47), value for 1-PI-68-336C PZR PRESS.** STANDARD: ___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. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 3. **Item 13 (Page 51), values for 1-TI-68-43C LOOP 3 HL TEMP.** STANDARD: Applicant evaluates data provided and determines that the reading for 1-TI-68-43C in the Auxiliary Control Room (1-L-10) is outside the channel check MCD of 30°F. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: **Item 25 (Page 54), value for 1-FI-62-93A CHARGING FLOW.** STANDARD: 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). ***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.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: **Item 29 (Page 54), value for 1-PI-62-81C LP LETDOWN PRESS.** STANDARD: 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 psig MCD value. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 6: Applicant reports items that are out-of-limits per 1-SI-0-4. STANDARD: The applicant indicates that the following actions are required (in no particular order) for **each** of the 5 items identified: 1. SM/Unit SRO must be notified of each item that exceeds limits. 2. A Work Order (WO) or Service Request (SR) must be prepared for each item that exceeds limits. COMMENTS:	___ SAT ___ UNSAT

STOP TIME _____

3 R

KEY

DO NOT HAND TO APPLICANT

NRC EXAM MATERIAL -JPM 3 R KEY

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-PI-1-2A and 1-PI-1-1C are outside the channel check MCD of 80 psig.

Appendix D
(Page 5 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page ____ 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
4	SR 3.3.3.1-24 SR 3.3.4.1-4.c SR 3.3.4.1-4.e	1, 2, 3 1, 2, 3	(5) (6) (7)	SG 1 Press	1-M-4	1-PI-1-2A	990	1-L-10	1-PI-1-1C	1080	psig	80 psig
						1-PI-1-2B	1005					
				SG 2 Press	1-M-4	1-PI-1-9A	1000	1-L-10	1-PI-1-8C	1060		
						1-PI-1-9B	1010					
				SG 3 Press	1-M-4	1-PI-1-20A	1015	1-L-10	1-PI-1-19C	1050		
						1-PI-1-20B	1010					
				SG 4 Press	1-M-4	1-PI-1-27A	1010	1-L-10	1-PI-1-26C	1050		
						1-PI-1-27B	1020					
5	SR 3.3.3.1-14	1, 2, 3	N/A	SG 1 WR LEVEL	1-M-4	1-LI-3-43A	57	N/A	N/A	N/A	%	N/A
				SG 2 WR LEVEL	1-M-4	1-LI-3-56A	59					
				SG 3 WR LEVEL	1-M-4	1-LI-3-98A	58					
				SG 4 WR LEVEL	1-M-4	1-LI-3-111A	58					
					Operator's Initials		DAH	Operator's Initials		DAH		

(5) Verification is performed by reading and recording the indication of the SG press indicators for each SG, two on 1-M-4 and one 1-L-10.
(6) The SG Pressure indicators are dual scale with pressure on the right and Saturation Temperature on the left. Data for this parameter is to be taken on the right side indication.
(7) SG press indication on 1-L-10 is used as a dual purpose indicator. It will be used to determine SG Tsat indication as required for SR 3.3.4.1-4e

Remarks: _____

Appendix D
(Page 6 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page ____ 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
6	SR 3.3.3.1-13 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	57	%	6.0%
						1-LI-68-335A	59		1-LI-68-326C	61		
						1-LI-68-320	61		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	2165	psig	50 psig
						1-PI-68-334	2240					
						1-PI-68-323	2225		1-PI-68-337	2235		
						1-PI-68-322	2240					
			(9)	PZR-COLD CAL PRESS	1-M-5	1-PI-68-342A	2250	1-L-10	1-PI-68-342C	2250	psig	200 psig
			(10)	LOOP 4 HL PRESS	1-M-6	1-PI-68-70	2320	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	2315		N/A	N/A		
					Operator's Initials		DAH	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, Instrument Maintenance is to be notified to perform 1-SI-68-88.

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

NRC EXAM MATERIAL -JPM 3 R KEY

Appendix D
(Page 10 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page ____ of ____ Date Today

1.0 REMOTE SHUTDOWN AND PAM CHANNEL CHECKLIST (continued)

Mode 1

Applicant evaluates data provided and determines that the reading for 1-TI-68-43C in the Auxiliary Control Room (1-L-10) is outside the channel check MCD of 30F

ITEM NO.	REFERENCE NUMBER	REQUIRED MODE	NOTES	DESCRIPTION	LOC	INST NO	READING	LOC	INST NO	READING	DATA UNITS	MCD
13	SR 3.3.3.1-3 SR 3.3.4.1-4.a	1, 2, 3	N/A	LOOP 1 HL TEMP	1-M-5	1-TI-68-1	610	1-L-10	1-TI-68-1C	630	°F	30°F
				LOOP 2 HL TEMP	1-M-5	1-TI-68-24A	615		1-TI-68-24C	637		
				LOOP 3 HL TEMP	1-M-5	1-TI-68-43	610		1-TI-68-43C	641		
				LOOP 4 HL TEMP	1-M-5	1-TI-68-65	615		1-TI-68-65C	626		
14	SR 3.3.3.1-4	1, 2, 3	N/A	LOOP 1 CL TEMP	1-M-5	1-TI-68-18	555	N/A	N/A	N/A	°F	30°F
				LOOP 2 CL TEMP	1-M-5	1-TI-68-41	555		N/A	N/A		
				LOOP 3 CL TEMP	1-M-5	1-TI-68-60	560		N/A	N/A		
				LOOP 4 CL TEMP	1-M-5	1-TI-68-83	560		N/A	N/A		
15	SR 3.3.3.1-7	1, 2, 3	N/A	CNTMT SUMP LEVEL	1-M-6	1-LI-63-180	0	N/A	N/A	N/A	%	6.0%
						1-LI-63-181	0		N/A	N/A		
16	SR 3.3.3.1-23	1, 2, 3	N/A	RWST LEVEL	1-M-6	1-LI-63-50	98	N/A	N/A	N/A	%	6.0%
						1-LI-63-51	98		N/A	N/A		
17	SR 3.3.4.1-5.b	1, 2, 3	(24) (25)	RHR HX A TEMP °F	1-M-6	1-TR-74-14 P002 (Blue)	70	1-L-10	1-TI-74-38C	68	°F	50°F
				RHR HX B TEMP °F	1-M-6	1-TR-74-25 P002 (Blue)	68	1-L-10	1-TI-74-40C	70		
					Operator's Initials		DAH	Operator's Initials		DAH		

(24) MCR indications are recorded for comparison purposes only. Verification is made by comparing indications for each heat exchanger. Comparison between heat exchangers should NOT be performed.

(25) Descriptions for the Remote Shutdown board instruments:
A. 1-TI-74-38C, RHR HX A OUTLET TEMP.
B. 1-TI-74-40C, RHR HX B OUTLET TEMP.

Remarks: _____

NRC EXAM MATERIAL -JPM 3 R KEY

Appendix D
(Page 13 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page ____ 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
24	SR 3.3.3.1-25	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	N/A N/A	in.	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	110	gpm	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	psig	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	gpm	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	95	°F	6°F
29	LCO 3.3.4	1, 2, 3	(32)	LP LETDOWN PRESS	1-M-6	1-PI-62-81	320	1-L-10	1-PI-62-81C	365	psig	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	60	%	6%
31	LCO 3.3.4	1, 2, 3	(32) (33)	1A ERCW SUP HDR FLOW	0-M-27A	1-FI-67-61	2500	1-L-10	1-FI-67-61C	2000	gpm	1000 gpm
				1B ERCW SUP HDR FLOW	0-M-27A	1-FI-67-62	1000	1-L-10	1-FI-67-62C	1250		
				2A ERCW SUP HDR FLOW	0-M-27A	2-FI-67-61	8500	2-L-10	2-FI-67-61C	8200		
				2B ERCW SUP HDR FLOW	0-M-27A	2-FI-67-62	9500	2-L-10	2-FI-67-62C	9200		
					Operator's Initials		DAH	Operator's Initials		DAH		

(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: _____

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)

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 psig MCD value.

3 R

Handout Package for Applicant

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 46, 47, 51 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.

RAISE YOUR HAND to inform the EXAMINER when you have completed your review and your list of actions has been developed.

Surveillance Task Sheet (STS)

Work Order #: 114411692

PM#: P0496
Procedure: 1-SI-0-4
Title: 1-SI-0-4 MONTHLY SURVEILLANCES

Data Sheets Attached:

Perf Grp: OPS **Unit:** 1 **Loop/Div:** /
Test Reason: Periodic
Due Date: 08/17/13
Frequency: 28 DAYS **Tech Spec:** Y **ASME XI:**
Applicable Modes: 1,2,3,4,5,6,0 **Perf Modes:** 1,2,3,4,5,6,0
Clearance Required: N **EQ:** **LCO Entered:** N
Dry-Cask Storage: N

Page ____ of ____

Authorization to Begin: SRO	Date & Time
	Today

Start Date & Time	Completion Date & Time
Today	Today

Was this a complete or partial performance?
(Explain "Partial" in Remarks below) Complete [ ] Partial [X]

Performed By:

Print Name	Signature	Initial	Section
(AUO)			
(UO)			

Were all Tech Spec / Tech Req / ISFSI CoC / ODCM / Fire Protection Req / AMSAC* acceptance criteria satisfied?
Yes [ ] No [ ] N/A [ ]

Were all other acceptance criteria satisifed?
Yes [ ] No [ ] N/A [ ]

If all Tech Spec / Tech Req / ISFSI CoC / ODCM / Fire Protection Req / AMSAC* criteria were not satisfied, was an LCO / TR / ODCM / OR action required? (Explain in Remarks)
Yes [ ] No [ ] N/A [ ]

Service Request #:

Alert Work Control Required? [ ]

*PWR only.

Subsequent Reviews:

Group	Signature	Date

Permanent Comments:

Copy of STS sent to Work Control (next business day)

Initials	Date
	/

Test Coord/Lead	Date

Acceptance Criteria Review: SRO	Date & Time

Independent Reviewer	Date & Time

Remarks: Partial performance page 5, 6 10 and 13 of Appendix D Only in support of Engineering Data Gathering.

Watts Bar Nuclear Plant

Unit 1

Surveillance Instruction

1-SI-0-4

Monthly Surveillances

Revision 0029

Quality Related

Level of Use: Continuous Use

VFH
Today
DATE

Effective Date: 05-14-2013

Responsible Organization: OPS, Operations

Prepared By: Travis Uptegrove

Approved By: Ryan Nessell

Data Package: Page ____ of ____ Date Today

3.0 PRECAUTIONS AND LIMITATIONS

None

4.0 PREREQUISITE ACTIONS

4.1 Preliminary Actions

[1] **RECORD** start date and time on Surveillance Task Sheet. DAH

[2] **RECORD** current plant operating mode: 1. DAH

[3] IF required, **THEN**

OBTAIN RWP. DAH

End of Section

4.2 Approvals and Notifications

[1] **OBTAIN** SM/Unit SRO approval on the Surveillance Task Sheet to perform this Instruction. DAH

End of Section

5.0 ACCEPTANCE CRITERIA

5.1 Test Acceptance Criteria

A. Specific quantitative or qualitative requirements that are intended to be verified by this Instruction are listed by each item where the verifying data is recorded.

5.2 Notifications and Actions

A. Noncompliance with Acceptance Criteria requires Unit SRO notification as soon as safely possible.

6.0 PERFORMANCE

6.1 Performance Requirements

A. The performer is required to initial at the bottom of each page of Appendixes D through I as the appendix page is completed.

B. Ensure meters are read consistently from same angle. Use gage face mirrors (if present) and ensure gage needle and it reflection are in alignment. If gage has no mirror in the face, read gage from as close to perpendicular to gage face as possible.

C. To meet MCD limits, data for individual instrument channels are required to be compared for deviation.

D. Pegged High or Low meters:

1. If a meter indication is pegged high (or pegged low), a defensible channel deviation cannot be determined because of the uncertainty of the parameter being measured - the value could actually be greater (or less than) the pegged high or pegged low value.

2. In order for potential problems to be identified early, if the meter approaches to within two meter divisions of full scale high (or low), the Unit Supervisor should be notified so that the condition can be evaluated and appropriate corrective actions taken.

3. For any meter pegged high or low, ensure a WO is initiated. The operability of this meter and any alarm, control, or protective functions of the associated loop should also be evaluated.

E. In order for potential problems to be identified early, if any channel deviation exceeds 80% of the MCD limit, the Unit Supervisor should be notified so that the condition can be evaluated and appropriate corrective actions taken.

F. For better consistency and since the MCR unit operators perform MCD determinations more frequently, unit operators should perform the instrument readings for MCD for those instruments that are in the Aux Control Room.

6.1 Performance Requirements (continued)

G. When the MCD column limits are exceeded, the following are to be performed:

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

2. SM/Unit SRO is to determine if channel is to be declared INOP. The operability of this meter and any alarm, control, or protective functions of the associated loop should also be evaluated.

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

H. Items that require channel check that have N/A in the MCD column are to be considered acceptable when the following requirements are met:

1. Equipment is energized.

2. Indication is displaying a value consistent with present plant conditions (For radiation monitors, indication must be displaying at least background).

I. Any work requests generated during performance of Data Sheets require documentation in Remarks at the bottom of the appropriate data sheet.

J. Inoperable instruments (instruments with OOS tags on them) are required to have INOP entered in the appropriate data space.

K. Data spaces for instruments in modes which do **NOT** apply can have N/A entered in them.

L. Instruments, equipment, and systems that are **NOT** in service can have N/A entered in them.

Data Package: Page ____ of ____ **Date** Today

6.2 **General**

[1] **ENSURE** prerequisite actions in Section 4.0 have been met. DAH

NOTE

Appendix A contains an explanation of each surveillance requirement covered by 1-SI-0-4.

[2] **COMPLETE** Appendix B and C, Seismic Monitoring Instrumentation Channel Check Data Sheet. N/A

NOTE

Exception to operability guidelines in Step 6.2[3] will be listed in Appendix A and/or Appendix D.

[3] **COMPLETE** Appendix D, Remote Shutdown and PAM Channel Check Data Sheet, **AND**

DETERMINE operability using the following guidelines:

[3.1] **COMPARE** Remote Shutdown indications [1-L-10], **AND**

CHECK readings are within MCD values.

[3.2] **COMPARE** PAM indications [MCR], **AND**

CHECK readings are within MCD values.

[3.3] **COMPARE** Remote Shutdown indications [1-L-10] **AND** PAM indications [MCR Panels], **AND**

CHECK readings are within MCD values.[C.1]

[3.4] **IF** parameter has only one indication to be checked,

THEN

VERIFY operability by obtaining a reading that reflects present plant conditions. _____

Data Package: Page ____ of ____ **Date _____**

7.0 POST PERFORMANCE ACTIVITIES

[1] **VERIFY** all Acceptance Criteria have been met **OR** appropriate corrective action has been taken. _____

[2] **NOTIFY** SM/Unit SRO that this Instruction is complete. _____

[3] **RECORD** completion date and time on Surveillance Task Sheet. _____

End of Section

Appendix D
(Page 5 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page ____ 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
4	SR 3.3.3.1-24 SR 3.3.4.1-4.c SR 3.3.4.1-4.e	1, 2, 3 1, 2, 3	(5) (6) (7)	SG 1 Press	1-M-4	1-PI-1-2A	990	1-L-10	1-PI-1-1C	1080	psig	80 psig
						1-PI-1-2B	1005					
				SG 2 Press	1-M-4	1-PI-1-9A	1000	1-L-10	1-PI-1-8C	1060		
						1-PI-1-9B	1010					
				SG 3 Press	1-M-4	1-PI-1-20A	1015	1-L-10	1-PI-1-19C	1050		
						1-PI-1-20B	1010					
				SG 4 Press	1-M-4	1-PI-1-27A	1010	1-L-10	1-PI-1-26C	1050		
						1-PI-1-27B	1020					
5	SR 3.3.3.1-14	1, 2, 3	N/A	SG 1 WR LEVEL	1-M-4	1-LI-3-43A	57	N/A	N/A	N/A	%	N/A
				SG 2 WR LEVEL	1-M-4	1-LI-3-56A	59					
				SG 3 WR LEVEL	1-M-4	1-LI-3-98A	58					
				SG 4 WR LEVEL	1-M-4	1-LI-3-111A	58					
					Operator's Initials		DAH	Operator's Initials		DAH		

(5) Verification is performed by reading and recording the indication of the SG press indicators for each SG, two on 1-M-4 and one 1-L-10.
(6) The SG Pressure indicators are dual scale with pressure on the right and Saturation Temperature on the left. Data for this parameter is to be taken on the right side indication.
(7) SG press indication on 1-L-10 is used as a dual purpose indicator. It will be used to determine SG Tsat indication as required for SR 3.3.4.1-4e

Remarks: _____

Appendix D
(Page 6 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page ____ 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
6	SR 3.3.3.1-13 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	57	%	6.0%
						1-LI-68-335A	59		1-LI-68-326C	61		
						1-LI-68-320	61		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	2165	psig	50 psig
						1-PI-68-334	2240					
						1-PI-68-323	2225		1-PI-68-337C	2235		
						1-PI-68-322	2240					
			(9)	PZR-COLD CAL PRESS	1-M-5	1-PI-68-342A	2250	1-L-10	1-PI-68-342C	2250	psig	200 psig
			(10)	LOOP 4 HL PRESS	1-M-6	1-PI-68-70	2320	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	2315		N/A	N/A		
					Operator's Initials		DAH	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, Instrument Maintenance is to be notified to perform 1-SI-68-88.

Appendix D
(Page 10 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page ____ 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
13	SR 3.3.3.1-3 SR 3.3.4.1-4.a	1, 2, 3	N/A	LOOP 1 HL TEMP	1-M-5	1-TI-68-1	610	1-L-10	1-TI-68-1C	630	°F	30°F
				LOOP 2 HL TEMP	1-M-5	1-TI-68-24A	615		1-TI-68-24C	637		
				LOOP 3 HL TEMP	1-M-5	1-TI-68-43	610		1-TI-68-43C	641		
				LOOP 4 HL TEMP	1-M-5	1-TI-68-65	615		1-TI-68-65C	626		
14	SR 3.3.3.1-4	1, 2, 3	N/A	LOOP 1 CL TEMP	1-M-5	1-TI-68-18	555	N/A	N/A	N/A	°F	30°F
				LOOP 2 CL TEMP	1-M-5	1-TI-68-41	555		N/A	N/A		
				LOOP 3 CL TEMP	1-M-5	1-TI-68-60	560		N/A	N/A		
				LOOP 4 CL TEMP	1-M-5	1-TI-68-83	560		N/A	N/A		
15	SR 3.3.3.1-7	1, 2, 3	N/A	CNTMT SUMP LEVEL	1-M-6	1-LI-63-180	0	N/A	N/A	N/A	%	6.0%
						1-LI-63-181	0		N/A	N/A		
16	SR 3.3.3.1-23	1, 2, 3	N/A	RWST LEVEL	1-M-6	1-LI-63-50	98	N/A	N/A	N/A	%	6.0%
						1-LI-63-51	98		N/A	N/A		
17	SR 3.3.4.1-5.b	1, 2, 3	(24) (25)	RHR HX A TEMP °F	1-M-6	1-TR-74-14 P002 (Blue)	70	1-L-10	1-TI-74-38C	68	°F	50°F
				RHR HX B TEMP °F	1-M-6	1-TR-74-25 P002 (Blue)	68	1-L-10	1-TI-74-40C	70		
					Operator's Initials		DAH	Operator's Initials		DAH		

(24) MCR indications are recorded for comparison purposes only. Verification is made by comparing indications for each heat exchanger. Comparison between heat exchangers should NOT be performed.

(25) Descriptions for the Remote Shutdown board instruments:
A. 1-TI-74-38C, RHR HX A OUTLET TEMP.
B. 1-TI-74-40C, RHR HX B OUTLET TEMP.

Remarks: _____

Appendix D
(Page 13 of 15)

Remote Shutdown and PAM Channel Check Data Sheet

Data Package: Page ____ 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
24	SR 3.3.3.1-25	1, 2, 3	N/A	AB PASSIVE SUMP LEVEL	1-M-15	0-LI-77-134	12.5	N/A	N/A	N/A	in.	4.8 in. WC
						0-LI-77-135	12.5		N/A	N/A		
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	110	gpm	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	psig	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	gpm	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	95	°F	6°F
29	LCO 3.3.4	1, 2, 3	(32)	LP LETDOWN PRESS	1-M-6	1-PI-62-81	320	1-L-10	1-PI-62-81C	365	psig	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	60	%	6%
31	LCO 3.3.4	1, 2, 3	(32) (33)	1A ERCW SUP HDR FLOW	0-M-27A	1-FI-67-61	2500	1-L-10	1-FI-67-61C	2000	gpm	1000 gpm
				1B ERCW SUP HDR FLOW	0-M-27A	1-FI-67-62	1000	1-L-10	1-FI-67-62C	1250		
				2A ERCW SUP HDR FLOW	0-M-27A	2-FI-67-61	8500	2-L-10	2-FI-67-61C	8200		
				2B ERCW SUP HDR FLOW	0-M-27A	2-FI-67-62	9500	2-L-10	2-FI-67-62C	9200		
					Operator's Initials		DAH	Operator's Initials		DAH		

(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: _____

Watts Bar Nuclear Plant

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Administrative JPM **3 S**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
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EVALUATION SHEET

Task: DETERMINE RISK LEVEL, CDF AND LERF MULTIPLIERS USING EOOS SOFTWARE.

Alternate Path: n/a

Facility JPM #: New

Safety Function: 2.2 **Title:** Equipment Control.

K/A 2.2.14 Knowledge of the process for controlling equipment configuration or status.

Rating(s): 3.9/4.3 **CFR:** 41.10/43.3/45.13

Evaluation Method: Simulator _____ In-Plant _____ **Classroom** **X**

References: NPG-SPP-09.11.1, "Equipment Out of Service (EOOS) Management," Rev. 6.
WBN EOOS Computer Program

Task Number: STA-119-SPP-9.11-001 **Title:** Determine Risk for Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) using EOOS software.

Task Standard: The applicant determines:

1. Removing the 1A-A Diesel Generator from service in the WBN EOOS program results in a CDF of 4.36, a LERF of 4.57, and RISK remains GREEN for CDF and LERF.
2. Removing the 2B-B ERCW Strainer from service in addition to the 1A-A Diesel Generator in the WBN EOOS program results in a CDF of 25.9, Risk changes to ORANGE, and the LERF changes to 8.1, and Risk changes to YELLOW.

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

Tools/Equipment/Procedures Needed:

- **Laptop Computer with WBN EOOS installed.**

- ***NRC REFERENCE DISK***.

***NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the NRC REFERENCE DISK.**

SPECIAL INSTRUCTIONS

After each applicant performs this JPM, ENSURE that the 1A-A Diesel Generator and the 2B-B ERCW Strainer are returned to service in the WBN EOOS program, and that the "Calculate Risk Measures" icon is pressed. These actions will return the CDF and LERF Multiplier values to 1.0, and the RISK COLOR to GREEN.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
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NRC EXAM 2013-302
DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. 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:

Unit 1 is in MODE 1, 100% power.

INITIATING CUES:

You are to use the EOOS computer program to complete the following tasks.

LOG IN INFORMATION: USERNAME "ops" and PASSWORD "opseoos."

PART 1

The 1A-A Diesel Generator has just been reported to have failed its surveillance, and you are to determine the RISK COLOR, Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) Multiplier which result from removing the 1A-A Diesel Generator from service. Enter the values for CDF and LERF, and CIRCLE the appropriate color.

CDF = _____ **LERF = _____**

RISK COLOR (circle one)	RISK COLOR (circle one)
GREEN	GREEN
YELLOW	YELLOW
ORANGE	ORANGE
RED	RED

Part 2 on next page

PART 2

A problem has developed that has rendered the 2B-B ERCW Strainer inoperable. You are to determine the RISK COLOR, the RISK COLOR, Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) Multiplier which result from removing the 1A-A Diesel Generator and the 2B-B ERCW Strainer from service. Enter the values for CDF and LERF, and CIRCLE the appropriate color.

CDF = _____	LERF = _____
RISK COLOR (circle one)	**RISK COLOR (circle one)**
GREEN	**GREEN**
YELLOW	**YELLOW**
ORANGE	**ORANGE**
RED	**RED**

STEP/STANDARD	SAT/UNSAT
START TIME: _____	
STEP 1: From appropriately installed location, access EOOS for the desired plant and unit. STANDARD: Applicant locates a copy of the WBN EOOS program on the computer. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Log in using the assigned User Name and Password which are available from the Corporate PRA Group. STANDARD: Applicant enters the appropriate user name and password to log in to the EOOS program. COMMENTS:	___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 3: Remove the 1A-A Diesel generator from service in the WBN EOOS program. STANDARD: Applicant locates the 1A-A Diesel Generator on the EOOS screen. Applicant selects the 1A-A Diesel Generator and uses the mouse to enter the related drop down menu. Applicant selects "Take Item OOS' using the mouse. Applicant ensures 1A-A DG appears in the "Active Items" window. COMMENTS:	___ SAT ___ UNSAT
STEP 4: Ensure the list of components/FEGs out of service matches the current unit configuration or make updates as necessary. STANDARD: Applicant ensures 1A-A DG appears in the "Active Items" window. COMMENTS:	___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 5: Calculate Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) Multiplier for the unit configuration using EOOS (Calculate Risk Measure(s) Button). STANDARD: Applicant locates the Calculate Risk Measures ICON (resembles a calculator) and selects the icon using the mouse. Applicant writes down the Core Damage Frequency multiplier **4.36** and indicates the **RISK is GREEN**. Applicant writes down the Large Early Release Frequency multiplier **4.57** and indicates the **RISK is GREEN**. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Part 2. Removes the 2B-B ERCW Strainer from service in the WBN EOOS program. STANDARD: Applicant locates the "2B-B Strainer" under the ERCW system on the EOOS screen. Applicant selects the "2B-B Strainer" and uses the mouse to enter the related drop down menu. Applicant selects "Take Item OOS' using the mouse. Applicant ensures 2B-B ERCW Strainer appears in the "Active Items" window, in addition to the 1A-A Diesel Generator. COMMENTS:	___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 7: Calculate Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) Multiplier for the unit configuration using EOOS (Calculate Risk Measure(s) Button). STANDARD: Applicant locates the Calculate Risk Measures ICON (resembles a calculator) and selects the icon using the mouse. Applicant writes down the Core Damage Frequency multiplier **25.9** and indicates the **RISK is ORANGE**. Applicant writes down the Large Early Release Frequency multiplier **8.1** and indicates the **RISK is YELLOW**. COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME _____

3 S

Key

DO NOT HAND TO APPLICANT

NRC EXAM MATERIAL
JPM 3 - S KEY

PART 1

The 1A-A Diesel Generator has just been reported to have failed its surveillance, and you are to determine the RISK COLOR, Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) Multiplier which result from removing the 1A-A Diesel Generator from service. Enter the values for CDF and LERF, and CIRCLE the appropriate color.

CDF = 4.36 **LERF = 4.57**

RISK COLOR	(circle one)	RISK COLOR	(circle one)
GREEN		GREEN	
YELLOW		YELLOW	
ORANGE		ORANGE	
RED		RED	

PART 2

A problem has developed that has rendered the 2B-B ERCW Strainer inoperable. You are to determine the RISK COLOR, the RISK COLOR, Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) Multiplier which result from removing the 1A-A Diesel Generator and the 2B-B ERCW Strainer from service. Enter the values for CDF and LERF, and CIRCLE the appropriate color.

CDF = 25.9 **LERF = 8.1**

RISK COLOR	(circle one)	RISK COLOR	(circle one)
GREEN		GREEN	
YELLOW		YELLOW	
ORANGE		ORANGE	
RED		RED	

3 S

Handout Package for Applicant

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 is in MODE 1, 100% power.

INITIATING CUES:

You are to use the EOOS computer program to complete the following tasks.

LOG IN information: USERNAME "ops" and PASSWORD "opseoos."

PART 1

The 1A-A Diesel Generator has just been reported to have failed its surveillance, and you are to determine the RISK COLOR, Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) Multiplier which result from removing the 1A-A Diesel Generator from service. Enter the values for CDF and LERF, and CIRCLE the appropriate color.

CDF = _____		LERF = _____	
RISK COLOR	**(circle one)**	**RISK COLOR**	**(circle one)**
GREEN		**GREEN**	
YELLOW		**YELLOW**	
ORANGE		**ORANGE**	
RED		**RED**	

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

PART 2

A problem has developed that has rendered the 2B-B ERCW Strainer inoperable. You are to determine the RISK COLOR, the RISK COLOR, Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) Multiplier which result from removing the 1A-A Diesel Generator and the 2B-B ERCW Strainer from service. Enter the values for CDF and LERF, and CIRCLE the appropriate color.

CDF = _____	LERF = _____
RISK COLOR (circle one)	RISK COLOR (circle one)
GREEN	GREEN
YELLOW	YELLOW
ORANGE	ORANGE
RED	RED

Watts Bar Nuclear Plant

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Administrative JPM **4 R**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
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EVALUATION SHEET

Task: CALCULATE STAY TIME FOR EMERGENCY EXPOSURE

Alternate Path: n/a

Facility JPM #: Modified

Safety Function: 2.3 **Title:** Radiation Control

K/A 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions.

Rating(s): 3.2/3.7 **CFR:** 41.12/43.4/45.10

Evaluation Method: Simulator _____ In-Plant _____ **Classroom** **X**

References: EPIP-15, Emergency Exposure Guidelines," Rev. 15.

Task Number: AUO-119-SSP-5.01-001 **Title:** Control personnel radiation exposure.

Task Standard: The applicant:

1. Calculates the total dose received performing the assigned tasks to be 19.8 Rem TEDE and 180 REM to the hands. (**Acceptable Range 19.6 - 19.8, Hands 180 REM).**
2. Determines the additional requirements contained in EPIP-15, Emergency Exposure Guidelines," Section 3.1.4, "Post Exposure Evaluations," are to be applied to the AB AUO.

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

Tools/Equipment/Procedures Needed:

NRC REFERENCE DISK
Calculator

NOTE: This JPM is designed to be performed in a classroom with a computer and the NRC REFERENCE DISK available for each applicant

WATTS BAR NUCLEAR PLANT
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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. 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. **Automatic swap over to the containment sump has failed to occur.**
3. **In order to establish and maintain a safe shutdown, the TSC has recommended that the Auxiliary Building AUO be dispatched to perform the following tasks:**

#	TASK	TIME	DOSE RATE
1	Go to task performance area.	9 minutes	2 Rem/hr
2	Manually open 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT.	36 minutes	32 Rem/hr TEDE 300 Rem/hr to HANDS
3	Return from task performance area.	9 minutes	2 Rem/hr

4. **Authorization to exceed occupational dose limits to enable transfer to the containment sump has been approved by the Shift Manager (SED) for the Auxiliary Building AUO.**

INITIATING CUES:

The Auxiliary Building (AB) AUO has completed Tasks 1, 2 and 3 in the time listed.

You are to determine:

1. **The exposure expected to be received by the AB AUO during the completion of Tasks 1 through 3**
2. **What additional requirements, if any, will be in effect after the AB AUO performs the task?**

-

STEP/STANDARD	SAT/UNSAT
START TIME: _____	
STEP 1: Determine dose received performing Tasks 1through 3. STANDARD: Applicant calculates dose to complete Task 1 as: 9 min. /60 min/hr x 2 Rem/hr = 0.3 Rem. **Acceptable Range 0.3 Rem.** Applicant calculates dose to complete Task 2 TEDE as: 36 min./60 min/hr. X 32 Rem/hr = 19.2 Rem **Acceptable Range 19 to 19.2 Rem.** Applicant calculates dose to complete Task 2 HAND DOSE as: 36 min./60 min/hr. X 300 Rem/hr = 180 Rem **Acceptable Range 180 Rem.** Applicant calculates dose to complete Task 3 as: (SAME CALCULATION AND DOSE AS Task 1, or 0.3 Rem.) Total for Tasks 1, 2 and 3 is 19.8 Rem TEDE **Acceptable Range 19.6 - 19.8 Rem.** Total for Tasks 2 is 180 Rem To the Extremities (Hands) **Acceptable Range 180 Rem.** **Step is critical to determine the total dose for the assigned tasks, and to determine that the Emergency Dose Limits are NOT exceeded.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 2: What additional requirements, if any, will be in effect after the AB AUO performs the task? STANDARD: **From EPIP-15.** **3.1.4 POST-EXPOSURE EVALUATIONS** A. Personnel receiving emergency or accident exposures should be restricted from further occupational exposure pending the outcome of exposure evaluations and, if necessary, medical surveillance. B. An exposure evaluation shall be performed to determine the individual dose. RP shall conduct post exposure dose assessments for exposed individuals, with particular attention to determining the adequacy of administrative dosimeter correction factors for TEDE doses resulting from internal and external exposures. This evaluation should be based on observed area dose rates, airborne activity measurements, and dosimetry results. The evaluation shall be documented in an appropriate format and filed with the individual's exposure records. Appropriate reports shall be submitted to RP and the US NRC. C. Any exposures above **5 Rem** TEDE shall be reported to a TVA physician or designee. It is the responsibility of the physician to determine appropriate medical evaluations and required care. Cross reference guidance is in EPIP- 10. **Step is critical to determine the restrictions associated with the dose received, even though the Emergency Dose limit of 25 Rem is not exceeded.** COMMENTS: **END OF TASK**	**CRITICAL TASK** ___ SAT ___ UNSAT

STOP TIME _____

4 R

KEY

DO NOT HAND TO APPLICANT

3.1.4 POST-EXPOSURE EVALUATIONS

A. Personnel receiving emergency or accident exposures should be restricted from further occupational exposure pending the outcome of exposure evaluations and, if necessary, medical surveillance.

B. An exposure evaluation shall be performed to determine the individual dose. RP shall conduct post exposure dose assessments for exposed individuals, with particular attention to determining the adequacy of administrative dosimeter correction factors for TEDE doses resulting from internal and external exposures. This evaluation should be based on observed area dose rates, airborne activity measurements, and dosimetry results. The evaluation shall be documented in an appropriate format and filed with the individual's exposure records. Appropriate reports shall be submitted to RP and the US NRC.

C. Any exposures above **5 Rem** TEDE shall be reported to a TVA physician or designee. It is the responsibility of the physician to determine appropriate medical evaluations and required care. Cross reference guidance is in EPIP-10.

3.1.5 EMERGENCY DOSE EXTENSIONS

A. In REP emergency situations, planned doses to radiological workers can be extended beyond the TVA administrative limits to the 10 CFR 20 regulatory limits.

3.1.6 ADDITIONAL INSTRUCTIONS

A. Refer to Appendix A and B of this procedure.

4 R

Handout Package for Applicant

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. **A loss of coolant accident is in progress.**
2. **Automatic swap over to the containment sump has failed to occur.**
3. **In order to establish and maintain a safe shutdown, the TSC has recommended that the Auxiliary Building AUO be dispatched to perform the following tasks:**

#	TASK	TIME	DOSE RATE
1	Go to task performance area.	9 minutes	2 Rem/hr
2	Manually open 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT.	36 minutes	32 Rem/hr TEDE 300 Rem/hr to HANDS
3	Return from task performance area.	9 minutes	2 Rem/hr

4. **Authorization to exceed occupational dose limits to enable transfer to the containment sump has been approved by the Shift Manager (SED) for the Auxiliary Building AUO.**

INITIATING CUES:

The Auxiliary Building (AB) AUO has completed Tasks 1, 2 and 3 in the time listed.

You are to determine:

1. **The exposure expected to be received by the AB AUO during the completion of Tasks 1 through 3**
2. **What additional requirements, if any, will be in effect after the AB AUO performs the task?**

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Administrative JPM 4 **S**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
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EVALUATION SHEET

Task: DETERMINE REQUIREMENTS FOR AUTHORIZING EMERGENCY EXPOSURE.

Alternate Path: n/a

Facility JPM #: Modified

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

K/A 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions.

Rating(s): 3.2/3.7 **CFR:** 41.12/43.4/45.10

Evaluation Method: Simulator _____ In-Plant _____ **Classroom** **X**

References: EPIP-15, "Emergency Exposure Guidelines," Rev. 15.

Task Number: AUO-119-SSP-5.01-001 **Title:** Control personnel radiation exposure.

Task Standard: The applicant determines:

1. The exposure expected to be received by the AB AUO during the completion of Tasks 1 through 3 to be 19.8 REM TEDE and 180 REM Extremities.
2. The Shift Manager as the SED must authorize the exposure in writing using EPIP-15, "Emergency Exposure Guidelines," Appendix B, "Authorization to Exceed Occupational Dose Limits Form."
3. Determines the additional requirements contained in EPIP-15, Emergency Exposure Guidelines," Section 3.1.4, "Post Exposure Evaluations," are to be applied to the AB AUO.

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

Tools/Equipment/Procedures Needed:

NRC REFERENCE DISK

Calculator

NOTE: This JPM is designed to be performed in a classroom with a computer and the NRC REFERENCE DISK available for each applicant

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
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NRC EXAM 2013-302

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. 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. **Automatic swap over to the containment sump has failed to occur.**

3. **In order to establish and maintain a safe shutdown, the TSC has recommended that the Auxiliary Building AUO be dispatched to perform the following tasks:**

#	TASK	TIME	DOSE RATE
1	Go to task performance area.	9 minutes	2 Rem/hr
2	Manually open 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT.	36 minutes	32 Rem/hr TEDE 300 Rem/hr to HANDS
3	Return from task performance area.	9 minutes	2 Rem/hr

INITIATING CUES:

You are the Site Emergency Director and are to determine:

1. **The exposure expected to be received by the AB AUO during the completion of Tasks 1 through 3**

2. **The specific approval required for the expected exposure to the AB AUO**

3. **What additional requirements, if any, will be in effect after the AB AUO performs the task?**

-

STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: The exposure expected to be received by the AB AUO during the completion of Tasks 1 through 3. STANDARD: Applicant calculates dose to complete Task 1 as: 9 min. /60 min/hr x 2 Rem/hr = 0.3 Rem. Applicant calculates dose to complete Task 2 TEDE as: 36 min./60 min/hr. X 32 Rem/hr = 19.2 Rem **Acceptable Range 19 to 19.2 Rem.** Applicant calculates dose to complete Task 2 HAND DOSE as: 36 min./60 min/hr. X 300 Rem/hr = 180 Rem **Acceptable Range is 180 Rem.** Applicant calculates dose to complete Task 3 as: (SAME CALCULATION AND DOSE AS Task 1, or 0.3 Rem.) 9 min. /60 min/hr x 2 Rem/hr = 0.3 Rem. The TOTAL for all of the tasks (Tasks 1, 2 and 3) is 19.8 Rem TEDE **Acceptable Range 19.6 - 19.8 Rem.** Total to the Extremities (Hands) is 180 Rem **Acceptable Range is 180 Rem.** **Step is critical to determine the total dose for the assigned tasks, and to determine that the Emergency Dose Limits are NOT exceeded.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 2: Determine that the SITE EMERGENCY DIRECTOR is the ONLY person that can authorize the Emergency Exposure. STANDARD: **From EPIP-15, Section 3.0, INSTRUCTIONS.** A. The **Site Emergency Director (SED)** is the **only** individual responsible for authorizing Emergency dose limits in excess of TVA Administrative dose limits and 10 CFR 20.1201. Appendix A and B **shall** be used to provide written authorization. The applicant determines that EPIP-15, APPENDIX B, General Instructions for Emergency Exposures, Page 4 Authorization To Exceed Occupational Dose Limits Form is required for written authorization. **Step is critical to determine the authorization associated with the dose received.** COMMENTS:	**CRITICAL TASK** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 3: What additional requirements, if any, will be in effect after the AB AUO performs the task? STANDARD: **From EPIP-15.** **3.1.4 POST-EXPOSURE EVALUATIONS** A. Personnel receiving emergency or accident exposures should be restricted from further occupational exposure pending the outcome of exposure evaluations and, if necessary, medical surveillance. B. An exposure evaluation shall be performed to determine the individual dose. RP shall conduct post exposure dose assessments for exposed individuals, with particular attention to determining the adequacy of administrative dosimeter correction factors for TEDE doses resulting from internal and external exposures. This evaluation should be based on observed area dose rates, airborne activity measurements, and dosimetry results. The evaluation shall be documented in an appropriate format and filed with the individual's exposure records. Appropriate reports shall be submitted to RP and the US NRC. C. Any exposures above **5 Rem** TEDE shall be reported to a TVA physician or designee. It is the responsibility of the physician to determine appropriate medical evaluations and required care. Cross reference guidance is in EPIP- 10. **Step is critical to determine the restrictions associated with the dose received.** COMMENTS: **END OF TASK**	**CRITICAL TASK** ___ SAT ___ UNSAT

STOP TIME _____

4 S

KEY

DO NOT HAND TO APPLICANT

3.0 INSTRUCTIONS

NOTE

Specific definitions as used in this procedure are contained in Appendix D.

A. The **Site Emergency Director (SED)** is the **only** individual responsible for authorizing Emergency dose limits in excess of TVA Administrative dose limits and 10 CFR 20.1201. Appendix A and B **shall** be used to provide written authorization.

NOTE

As defined by the emergency situation, this approval may be relayed verbally and documented later.

B. The Radiation Protection (RP) Group is responsible for completing Appendix B-1, "Authorization to Exceed Occupational Dose Limits," obtaining the Site Emergency Director's approval and will perform radiological surveys or other assessments to estimate the radiation doses.

C. In all cases, the site RP Manager shall be informed of any emergency exposure immediately so that a determination of the total quarterly exposure can be made. Based on the results of the determination, the worker may be restricted from further dose.

3.1 EXPOSURE LIMITATIONS

3.1.1 ACTIONS FOR LIFE SAVING OR PROTECTION OF THE PUBLIC

A. For immediate activities up to **25 Rem** which are necessary to:

1. **Save** Human Life.

   For lifesaving operations situations may occur in which a dose in **excess** of **25 Rem** would be required. It is not possible to prejudge the risk that one person should be allowed to take to save the life of another. However, persons undertaking an emergency mission in which the dose would **exceed 25 Rem** to the whole body should do so only on a voluntary basis and with full awareness of the risks involved.

2. **Restore** equipment necessary to maintain critical safety functions or to establish and maintain a safe shutdown,

3. **Prevent** or **Mitigate** a release of radioactivity to the environment for which off-site protective measures may be required. For these activities, the TEDE of personnel directly involved shall not exceed **25 Rem.** This limit is applicable only if actions establishing adequate or equivalent protection, with less dose, are not readily available.

B. Limit for lens of eye is **75 Rem**, or three (3) times the TEDE value.

C. Limit for any other organ (including skin and body extremities) is **250 Rem**, or ten (10) times the TEDE value.

3.1.2 ACTIONS FOR IMMEDIATE REPAIR OR TO PREVENT THE FAILURE OF EQUIPMENT

A. For activities performed on an immediate basis to **prevent** the failure of equipment necessary to protect the public health and safety, the TEDE of personnel directly involved shall not exceed **10 Rem**. This limit is applicable only if actions establishing adequate or equivalent protection, with a less dose consequence, are not readily available.

B. Limit for lens of eye of **30 Rem**, three (3) times the TEDE limit.

C. Limit for any other organ (including skin and body extremities) of **100 Rem**, or ten (10) times the TEDE limit.

3.1.3 INTERNAL EXPOSURE (EMERGENCY WORKERS)

A. Guidelines for internal exposure controls of WBN emergency workers are provided in Appendix C.

3.1.4 POST-EXPOSURE EVALUATIONS

A. Personnel receiving emergency or accident exposures should be restricted from further occupational exposure pending the outcome of exposure evaluations and, if necessary, medical surveillance.

B. An exposure evaluation shall be performed to determine the individual dose. RP shall conduct post exposure dose assessments for exposed individuals, with particular attention to determining the adequacy of administrative dosimeter correction factors for TEDE doses resulting from internal and external exposures. This evaluation should be based on observed area dose rates, airborne activity measurements, and dosimetry results. The evaluation shall be documented in an appropriate format and filed with the individual's exposure records. Appropriate reports shall be submitted to RP and the US NRC.

C. Any exposures above **5 Rem** TEDE shall be reported to a TVA physician or designee. It is the responsibility of the physician to determine appropriate medical evaluations and required care. Cross reference guidance is in EPIP-10.

3.1.5 EMERGENCY DOSE EXTENSIONS

A. In REP emergency situations, planned doses to radiological workers can be extended beyond the TVA administrative limits to the 10 CFR 20 regulatory limits.

3.1.6 ADDITIONAL INSTRUCTIONS

A. Refer to Appendix A and B of this procedure.

Appendix B
(Page 4 of 4)

Authorization To Exceed Occupational Dose Limits Form

The persons listed below are authorized to exceed the TVA dose limits for the whole body and extremities during the evaluation or mitigation of an emergency situation. Emergency limits are in excess of 10 CFR 20.1201 limits.

The persons listed below acknowledge they have volunteered for this assignment, and have been briefed on the emergency situation, and have been made aware of possible consequences of the estimated radiation dose(s).

Hand carry or FAX to the TSC for SED Signature

	NAME	EMPLOYEE ID#	SIGNATURE	DOSE LIMIT (REM)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

RP Survey No. (If Applicable): _____

Emergency Location(s) _____

Estimated Doses _____

Remarks: _____

_____

Prepared by: _____

Authorized by: _____

_____

Site Emergency Director

Hand carry or FAX to the OSC after SED signs.

4 S

Handout Package for Applicant

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. **A loss of coolant accident is in progress.**

2. **Automatic swap over to the containment sump has failed to occur.**

3. **In order to establish and maintain a safe shutdown, the TSC has recommended that the Auxiliary Building AUO be dispatched to perform the following tasks:**

#	TASK	TIME	DOSE RATE
1	Go to task performance area.	9 minutes	2 Rem/hr
2	Manually open 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT.	36 minutes	32 Rem/hr TEDE 300 Rem/hr to HANDS
3	Return from task performance area.	9 minutes	2 Rem/hr

INITIATING CUES:

You are the Site Emergency Director and are to determine:

1. **The exposure expected to be received by the AB AUO during the completion of Tasks 1 through 3**

2. **The specific approval required for the expected exposure to the AB AUO**

3. **What additional requirements, if any, will be in effect after the AB AUO performs the task?**

Watts Bar Nuclear Plant

NRC EXAM 2013-302

Administrative JPM **5**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE

5

NRC EXAM 2013-302

EVALUATION SHEET

Task: CLASSIFY THE EVENT.

Alternate Path: n/a

Facility JPM #: A.4-1 SRO (2009-11 NRC EXAM)

Safety Function: 2.4 **Title:** Emergency Procedures / Plan

K/A 2.4.40 Knowledge of SRO responsibilities in emergency plan implementation.

Rating(s): 2.5/3.3 **CFR:** 41.10 / 43.5 / 45.11

Evaluation Method: Simulator _____ In-Plant _____ **Classroom** **X***

References:

EPIP-1 “Emergency Plan Classification Flowpath”, Rev. 37.

EPIP-2, “Notification of Unusual Event,” Rev. 31.

EPIP-3 "Alert", Rev. 37.

EPIP-4, “Site Area Emergency,” Rev. 35.

EPIP-5 “General Emergency”, Rev. 41.

Task Number: SRO-119-SPP-3.5-001 **Title:** Determine when immediate notifications are required and make notifications to the NRC or other Regulatory Agencies as appropriate.

Task Standard: The applicant :

1.) Within 15 minutes, classifies the event as a GENERAL EMERGENCY per EALs 1.1.2 Loss, 1.2.2, Potential Loss and 1.3.2 Loss.

2.) INITIATES EPIP-5, “GENERAL EMERGENCY” Appendix A, “General Emergency Initial Notification Form,” and completes:

a. Item 3. - EAL Designators - 1.1.2 Loss, 1.2.2, Potential Loss and 1.3.2 Loss.

b. Item 4. - Brief Description of the Event - Fuel Clad barrier breach, with a concurrent loss of coolant greater than the capacity of the CCP and indications of a LOCA Outside Containment. (Applicant description will vary)

c. Item 5. - Radiological Conditions - EITHER “Minor releases within federally approved limits” OR “Release Information not known” checked or otherwise indicated on form.

d, Item 6. - Time that applicant declared the event and the date.

e. Item 7. - Meteorological Conditions. Wind Speed and direction correctly entered. (15 mph and 125 degrees).

f. Item 8. - Recommendation 2 selected, and the proper area to be evacuated indicated on the form (110-170 degrees indicated).

3.) INITIATES EPIP-5, “GENERAL EMERGENCY” Appendix H, “Initial - Protective Action Recommendations,” and determines that RECOMMENDATION 2 is applicable.

Validation Time: 20 minutes **Time Critical:** Yes **X** No _____

==========

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
5
NRC EXAM 2013-302
EVALUATION SHEET

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

Performance Rating: SAT ____ UNSAT ____ Performance Time ___

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

Tools/Equipment/Procedures Needed:

- ***NRC REFERENCE DISK***.

***NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the NRC REFERENCE DISK.**

EXAMINER: Multiple copies of each of the following forms will be available for use by the applicants:

EPIP-2, "Notification of Unusual Event," Appendix A, "Notification of Unusual Event Initial Notification Form," and Appendix B, "State of Tennessee Notification."

EPIP-3, "Alert," Appendix A, "Alert Notification Form," and Appendix B, "State of Tennessee Notification."

EPIP-4, "Site Area Emergency," Appendix A, "Site Area Emergency Initial Notification Form," and Appendix B, "State of Tennessee Notification."

EPIP-5, "General Emergency," Appendix A, "General Emergency Initial Notification Form," Appendix B, "State of Tennessee Notification," and Appendix H, "Initial - Protective Action Recommendations."

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
5
NRC EXAM 2013-302
READ TO THE APPLICANT:

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. 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 shut down due to increasing RCS activity.**
2. **Indications of a primary system leak developed during the shutdown.**
3. **A safety injection was manually initiated during the performance of AOI-6, "Small Reactor Coolant System Leak" due to a imminent loss of pressurizer level with charging flow at 150 gpm and letdown isolated.**
4. **The operators are performing actions of E-0, "Reactor Trip or Safety Injection."**
5. **The following conditions currently exist:**
   a. **Containment pressure is +0.11 psid and steady.**
   b. **Containment Sump level is not increasing.**
   c. **Several RHR/CVCS Pipe Break Status lights are now LIT.**
   d. **0-RM-90-101B, AUX BLDG VENT is increasing rapidly.**
   e. **Several Area Rad Monitors on elevation 692 and 713 are in Hi Rad.**
   f. **Chemistry reports a step rise in the RCS activity to 311 µCi/gm dose equivalent Iodine 131.**
   g. **Wind is from 125 degrees, and speed is 15 mph.**
6. **You are the Site Emergency Director.**

INITIATING CUES:

DO NOT USE SED JUDGEMENT AS A BASIS FOR CLASSIFICATION.

1. **Based on the information provided to you, classify the event. Record your EAL(s) in the space below. RAISE YOUR HAND when your classification is complete.**
2. **Complete the associated TVA Initial Classification form.**
3. **Determine what, if any, Protective Action Recommendations are required.**
4. **RAISE YOUR HAND when you have completed the notification form.**

Element(s) of this task is/are time critical.

STEP/STANDARD	SAT/UNSAT

START TIME: _____

STEP 1: Determines that a GENERAL EMERGENCY must be classified per EALs 1.1.2 Loss, 1.2.2, Potential Loss and 1.3.2 Loss. STANDARD: Applicant refers to EPIP-1, “Emergency Plan Classification Logic,” and determines that conditions require the declaration of a GENERAL EMERGENCY. ***1.1.2 LOSS, “RCS sample activity is greater than 300 µCi/gm dose equivalent I-131.”*** ***1.2.2 POTENTIAL LOSS, "Non Isolatable RCS leak exceeding the capacity of one charging pump in the normal charging alignment.”*** ***1.3.2 LOSS, “Containment pressure or sump level not increasing with a LOCA in progress.”*** 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. **Step is critical for the EALs to be correctly identified and the declaration made within 15 minutes.** **RECORD time that declaration was made:_____** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP/STANDARD	SAT/UNSAT
STEP 2: INITIATES EPIP-5, "GENERAL EMERGENCY" Appendix A, "General Emergency Initial Notification Form." STANDARD: Applicant completes EPIP-5, Appendix A, ""General Emergency Initial Notification Form," within 15 minutes of initial event classification. **Critical elements that must appear on Appendix A form:** **Item 3. - EAL Designators - 1.1.2 Loss, 1.2.2, Potential Loss and 1.3.2 Loss.** **Item 4. - Brief Description of the Event - Fuel Clad barrier breach, with a concurrent loss of coolant greater than the capacity of the CCP and indications of a LOCA Outside Containment. (Applicant description will vary)** **Item 5. - Radiological Conditions - EITHER "Minor releases within federally approved limits" OR "Release Information not known" checked or otherwise indicated on form.** **Item 6. - Time that applicant declared the event and the date.** **Item 7. - Meteorological Conditions. Wind Speed and direction correctly entered. (15 mph and 125 degrees).** **Item 8. - Recommendation 2 selected, and the proper area to be evacuated indicated on the form (110-170 degrees indicated).** COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

STOP TIME _____

5 S KEY

DO NOT HAND TO APPLICANT

Attachment 1
(Page 1 of 4)

Fission Product Barrier Matrix (Modes 1-4)

FISSION PRODUCT BARRIER MATRIX (Modes 1-4) — 1

1.1 Fuel Clad
1.2 RCS
1.3 Containment

SYSTEM DEGRADATION — 2

2.1 Loss of Instrumentation
2.2 Loss of Function/Communication
2.3 Failure of Reactor Protection
2.4 Fuel Clad Degradation
2.5 RCS Unidentified Leakage
2.6 RCS Identified Leakage
2.7 Uncontrolled Cool Down
2.8 Turbine Failure
2.9 Technical Specification
2.10 Safety Limit

LOSS OF POWER — 3

3.1 Loss of AC (Power Ops)
3.2 Loss of AC (Shutdown)
3.3 Loss of DC

HAZARDS and SED JUDGMENT — 4

4.1 Fire
4.2 Explosion
Table 4-1
Figure 4-A
4.3 Flammable Gas
4.4 Toxic Gas
Table 4-2
Figure 4-B
4.5 Control Room Evacuation
4.6 Security
4.7 SED Judgment

DESTRUCTIVE PHENOMENON — 5

5.1 Earthquake
5.2 Tornado
5.3 Aircraft/Projectile
Crash Figure 5-A
Table 5-1
5.4 River Level High
5.5 River Level Low
5.6 Watercraft Crash

SHUTDOWN SYSTEM DEGRADATION — 6

6.1 Loss of Shutdown Systems
6.2 Loss of AC (Shutdown)
6.3 Loss of DC (Shutdown)

RADIOLOGICAL — 7

7.1 Gaseous Effluent
7.2 Liquid Effluent
Table 7-1
Figure 7-A
7.3 Radiation Levels
7.4 Fuel Handling
Table 7-2

Attachment 1
(Page 2 of 4)

UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY and GENERAL **EMERGENCY**: (see SED Judgment 4.7).

BOMB: An explosive device (See EXPLOSION).

CIVIL DISTURBANCE: A group of twenty (20) or more persons violently protesting station operations or activities at the site.

CREDIBLE SITE-SPECIFIC -The determination is made by WBN senior plant management through use of information found in the Safeguards Contingency Plan.

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six **CSFs**: Sub-criticality, Core Cooling, Heat Sink, Pressurized Thermal Shock, Integrity (Containment) and Inventory (RCS).

EVENT: Assessment of an **EVENT** commences when recognition is made that one or more of the conditions associated with the event exist. Implicit in this definition is the need for timely assessment, i.e. within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): The demarcation of the area surrounding the WBN units in which postulated FSAR accidents will not result in population doses exceeding the criteria of 10 CFR Part 100. Refer to Figure 7-A.

EXPLOSION: A rapid, violent, unconfined combustion or a catastrophic failure of pressurized equipment that potentially imparts significant energy to near-by structures and materials.

EXTORTION: An attempt to cause an action at the station by threat of force.

FAULTED: (Steam Generator) Existence of secondary side leakage (i.e., steam or feed line break) that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE: Combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

FLAMMABLE GAS: Combustible gases maintained at concentrations less than the **LOWER EXPLOSIVE LIMIT (LEL)** will not explode due to ignition.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

HOSTILE ACTION: An act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidates the licensee to achieve an end. This includes attack by air, land, or water; using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should NOT be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the nuclear power plant. Non-terrorism-based EALs should be used to address such activities, (e.g., violent acts between individuals in the owner controlled area.)

HOSTILE FORCE: Individual(s) involved with a HOSTILE ACTION. One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

INEFFECTIVE: The specified restoration action(s) does not result in a reduction in the level of severity of the RED PATH condition within 15 minutes from identification of the Core Cooling CSF Status Tree RED PATH.
A reduction in the level of severity is an improvement in the applicable parameters, e.g., Increasing Trend in Reactor Vessel Water Level (Full RVLIS) and/or Decreasing Trend on Core Thermocouple Temperatures.

INITIATING CONDITIONS: Plant Parameters, radiation monitor readings or personnel observations that identify an Event for purposes of Emergency Plan Classification.

INTRUSION/INTRUDER: Suspected hostile individual present in a protected area without authorization.

ODCM: Offsite Dose Calculation Manual.

ORANGE PATH: Monitoring of one or more CSFs by FR-0 which indicates that the CSF(s) is under severe challenge.

PROJECTILE: An object ejected, thrown, or launched towards a plant structure. The source of the projectile may be onsite or offsite. Damage is sufficient to cause concern regarding the integrity of the affected structure or the operability or reliability of safety equipment contained therein.

PROTECTED AREA: Encompasses all owner controlled areas within the security protected area fence as shown on Figure 4-A.

RED PATH: Monitoring of one or more CSFs by the FR-0 which indicates that the CSF(s) is under extreme challenge; prompt operator action is required.

RUPTURED: (Steam Generator) Existence of primary to secondary leakage of a magnitude greater than charging pump capacity.

SABOTAGE: Deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable.

SECURITY CONDITION- Any Security Event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel, or a potential degradation to the level of safety of the plant. A SECURITY CONDITION does not involve a HOSTILE ACTION.

SIGNIFICANT TRANSIENT: An UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 15% thermal reactor power; (2) Electrical load rejection > 25% full electrical load; (3) Reactor Trip or (4) Safety Injection System Activation.

SITE PERIMETER: Encompasses all owner controlled areas in the immediate site environs as shown on Figures 4-A and 7-A.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on TVA. The STRIKE ACTION must threaten to interrupt normal plant operations.

TOXIC GAS: A gas that is dangerous to life or limb by reason of inhalation or skin contact (e.g., chlorine).

UNPLANNED: An event or action that is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

UNPLANNED: (With specific regard to radioactivity releases) A release of radioactivity is UNPLANNED if the release has not been authorized by a Discharge Permit (DP). Implicit in this definition are unintentional releases, unmonitored releases, or planned releases that exceed a condition specified on the DP, e.g., alarm setpoints, minimum dilution flow, minimum release times, maximum release rates, and/or discharge of incorrect tank.

VALID: An indication or report or condition is considered to be VALID when it is conclusively verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel. Implicit in this definition is the need for timely assessment, i.e., within 15 minutes.

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and/or paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included.

VITAL AREA: Is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

Attachment 1
(Page 3 of 4)

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 Not in Service)
-OR-	
2. Primary Coolant Activity Level	
LOSS	**Potential LOSS**
RCS sample activity is Greater Than 300 µCi/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: 293 R/hr On 1-RM-90-271 and 272 **OR** 261 R/hr On 1-RM-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 **Not** 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.	

Attachment 1
(Page 4 of 4)

1.3. _ CNTMT Barrier

1. Critical Safety Function Status

LOSS	Potential LOSS
Not Applicable	Containment (FR-Z.1) Red **OR** 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 **OR** Containment pressure or Sump level **Not** increasing (with LOCA in progress)	Containment Hydrogen Increases to >4% by volume **OR** 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) **AND** a Release Path to the Environment Exists	Not Applicable

-OR-

4. Containment Bypass

LOSS	Potential LOSS
RUPTURED S/G is also FAULTED outside CNTMT **OR** 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: 5290 R/hr on 1-RM-90-271 and 1-RM-90-272 **OR** 4710 R/hr on 1-RM-90-273 and 1-RM-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 a soon as this determination is made.

1. 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**.
2. For each of the three barriers, identify if any **LOSS** or Potential **LOSS INITIATING CONDITIONS** have been MET.
3. 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.
4. Compare the barrier losses and potential losses to the **EVENTS** below and make the appropriate declaration.
5. Containment High Range Radiation Monitors (HRRMs) are temperature sensitive and can be affected by both temperature induced currents and insulation resistance temperature effects. Following the initial increase in containment temperature the HRRM monitors can give erratic indication for up to 1 minute. Steady state temperature effects on cable insulation resistance for the HRRM signal cable is dependent on containment temperature and could result in a shift in monitor output indication. With a containment excursion temperature to 327 °F (HELB), the output of the HRRMs could potentially have up to a 25 R/hr indicated offset for duration of 10 minutes until the containment air return fans are started and temperature starts to reduce. (**Caution: Should the containment air return fans not start, containment temperatures could remain elevated resulting in potential false HRRM indicated readings).**

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

FISSION PRODUCT BARRIER MATRIX U1

Appendix A
(Page 1 of 1)

General Emergency Initial Notification Form

1. ☒ This is a Drill ☐ This is an Actual Event - Repeat - This is an Actual Event
2. APPLICANT'S NAME, the SED at **Watts Bar** has declared a **GENERAL EMERGENCY** — CRITICAL
3. **EAL Designator(s):** 1.1.2L, 1.2.2P, 1.3.2L (Use three EAL designators when using the Fission Product Barrier Matrix.) — CRITICAL
4. Brief Description of the Event: Fuel Clad Barrier breach with a concurrent loss of coolant greater than the capacity of the CCP and indications of a LOCA outside containment. — CRITICAL
5. **Radiological Conditions:** (Check one under both Airborne and Liquid column.) — CRITICAL

Airborne Releases Offsite	**Liquid** Releases Offsite
Acceptable to select either of the items checked	Acceptable to select either of the items checked
☑ Minor releases within federally approved limits[1]	☑ Minor releases within federally approved limits[1]
☐ Releases above federally approved limits[1]	☐ Releases above federally approved limits[1]
☑ Release information not known	☑ Release information not known
([1]Tech Specs/ODCM)	([1]Tech Specs/ODCM)

6. **Event Declared:** Time: Time applicant declared Date: Today's date — CRITICAL
7. **The Meteorological Conditions are:** (Use 46 meter data from the Met Tower. IF data is NOT available from the MET tower, contact the National Weather Service by dialing 9-1-423-586-8400. The National Weather Service will provide wind direction and wind speed.)

Wind Direction is FROM: 125 degrees (15 minute average) — CRITICAL

Wind Speed: 15 m.p.h (15 minute average) — CRITICAL

8. Provide Protective Action Recommendation utilizing Appendix H: (Check either 1 or 2 or 3)

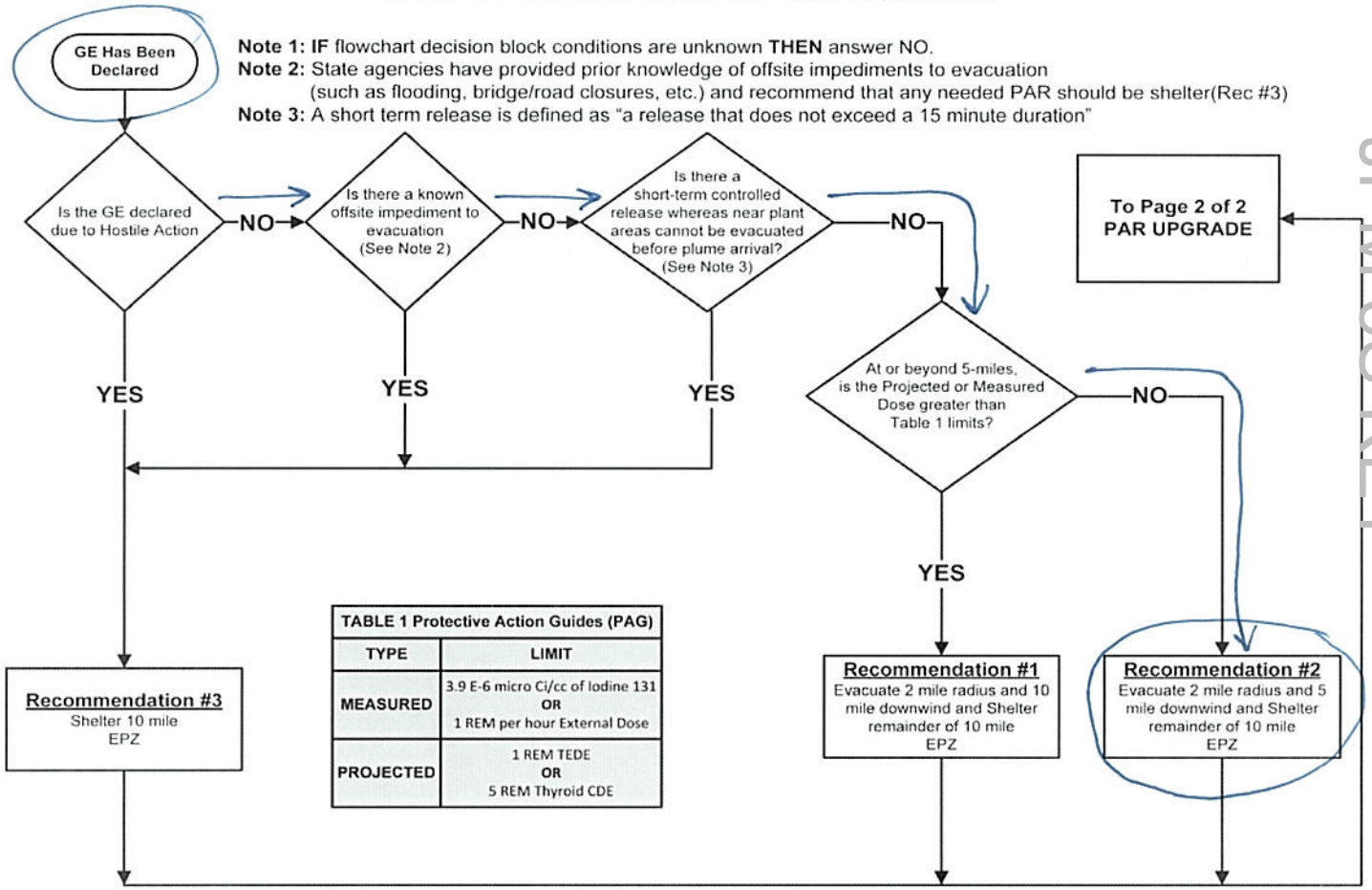
☐ **Recommendation 1** • EVACUATE LISTED SECTORS (2 mile Radius and 10 miles downwind) • SHELTER remainder of 10 mile EPZ • CONSIDER issuance of POTASSIUM IODIDE in accordance with the State Plan	RECOMENDATION 1	**WIND FROM DEGREES** (Mark wind direction from step 7)	RECOMENDATION 2	☑ **Recommendation 2** • EVACUATE LISTED SECTORS (2 mile Radius and 5 miles downwind) • SHELTER remainder of 10 mile EPZ • CONSIDER issuance of POTASSIUM IODIDE in accordance with the State Plan
A1, B1, C1, D1, C7, C9, D2, D4, D5, D6, D7, D8, D9		From 26-68		A1, B1, C1, D1, C7, D2, D4, D5
A1, B1, C1, D1, A3, A4, D2, D3, D4, D5, D6, D7, D8, D9		From 69-110		A1, B1, C1, D1, A3, D2, D4, D5
A1, B1, C1, D1, A2, A3, A4, A5, A6, A7, D2, D3, D5, D6		From 111-170	X	A1, B1, C1, D1, A2, A3, D2, D5 — CRITICAL
A1, B1, C1, D1, A2, A3, A5, A6, A7, B2, B3, B4, B5, C2		From 171-230		A1, B1, C1, D1, A2, A3, B2, B4, C2
A1, B1, C1, D1, B2, B3, B4, B5, C2, C3,		From 231-270		A1, B1, C1, D1, B2, B4, C2
A1, B1, C1, D1, B2, B3, C2, C3, C4, C5, C6, C11		From 271-325		A1, B1, C1, D1, B2, C2, C4, C5,
A1, B1, C1, D1, C2, C4, C5, C6, C7, C8, C9, C10, C11, D4, D9		From 326-25		A1, B1, C1, D1, C2, C4, C5, C7, C8, D4

☐ **Recommendation 3**
• SHELTER all sectors
• CONSIDER issuance of POTASSIUM IODIDE in accordance with the State Plan

Completed by APPLICANT NAME **Approved by (SED)** APPLICANT'S NAME

Appendix H
(Page 1 of 2)

Initial - Protective Action Recommendations



Appendix H
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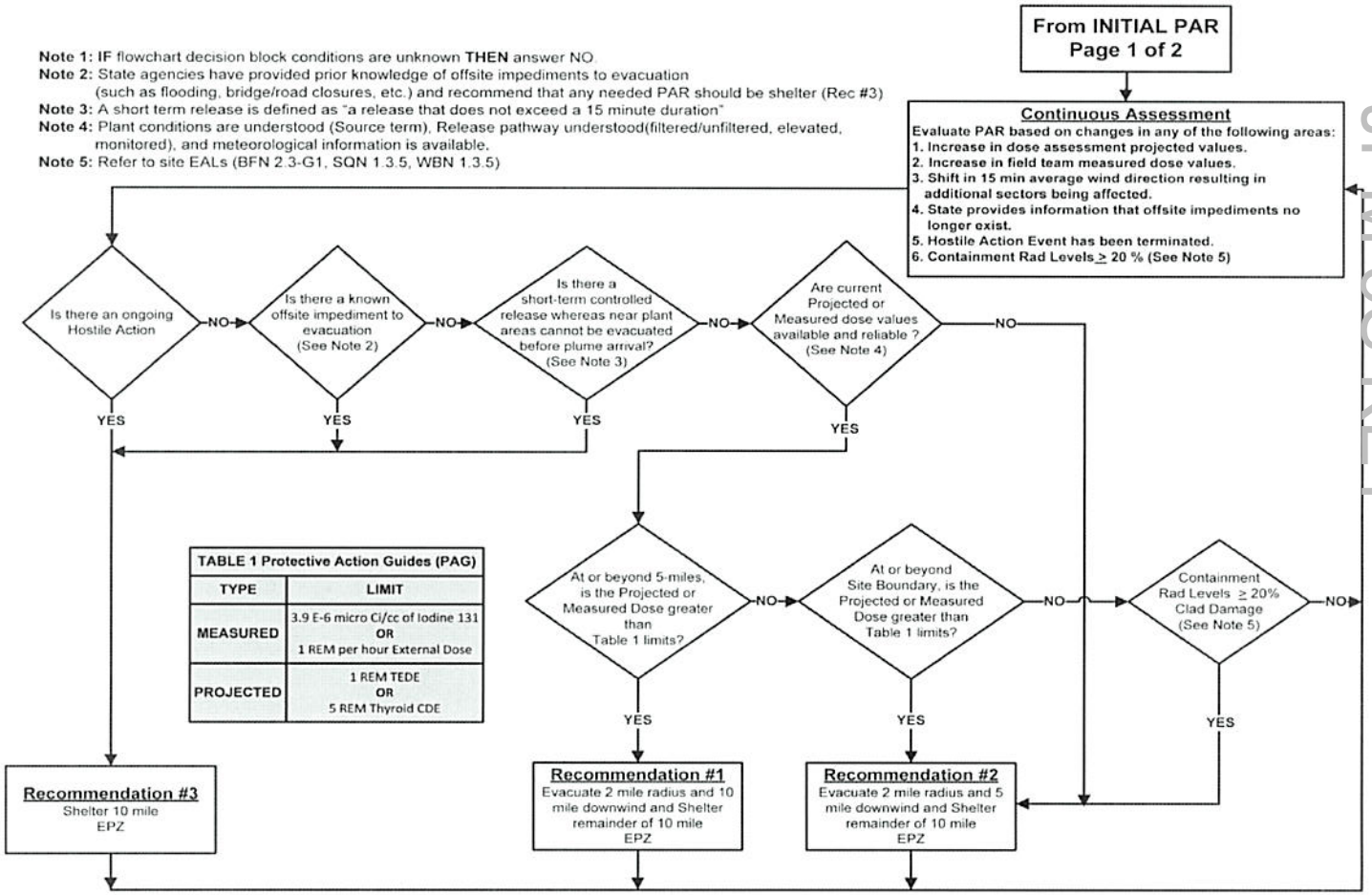
Initial - Protective Action Recommendations



5 S

BLANK FORMS

Appendix A
(Page 1 of 1)

Notification of Unusual Event Initial Notification Form

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

2. _____ the SED at **Watts Bar** has declared a **NOTIFICATION OF UNUSUAL EVENT.**

3. **EAL Designator:** _____(USE ONLY ONE EAL DESIGNATOR)

4. **Brief Description of the Event:**
_____
_____
_____
_____

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

Airborne Releases Offsite	**Liquid** Releases Offsite
☐ Minor releases within federally approved limits[1]	☐ Minor releases within federally approved limits[1]
☐ Releases above federally approved limits[1]	☐ Releases above federally approved limits[1]
☐ Release information not known ([1]Tech Specs/ODCM)	☐ Release information not known ([1]Tech Specs/ODCM)

6. **Event Declared:** Time:_____ Date:_____
Eastern Time

7. **Protective Action Recommendation:** ☒ None

Completed By : _____

Approved By: _____

Appendix A
(Page 1 of 1)
Alert Initial Notification Form

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

2. _____, the SED at **Watts Bar** has declared an **ALERT**

3. **EAL Designator:** _____

4. **Brief Description of the Event:**
_____
_____
_____
_____

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

Airborne Releases Offsite	**Liquid** Releases Offsite
☐ Minor releases within federally approved limits[1]	☐ Minor releases within federally approved limits[1]
☐ Releases above federally approved limits[1]	☐ Releases above federally approved limits[1]
☐ Release information not known ([1]Tech Specs/ODCM)	☐ Release information not known ([1]Tech Specs/ODCM)

6. **Event Declared:** Time:_____ Date:_____
Eastern Time

7. **Protective Action Recommendation:** ☒ None

Completed by: _____

Approved by: _____

Appendix A
(Page 1 of 1)

Site Area Emergency Initial Notification Form

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

2. _____ the SED at **Watts Bar** has declared a **Site Area Emergency**

3. **EAL Designator:** _____

4. **Brief Description of the Event:**
_____
_____
_____
_____

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

Airborne Releases Offsite	**Liquid** Releases Offsite
☐ Minor releases within federally approved limits[1]	☐ Minor releases within federally approved limits[1]
☐ Releases above federally approved limits[1]	☐ Releases above federally approved limits[1]
☐ Release information not known ([1]Tech Specs/ODCM)	☐ Release information not known ([1]Tech Specs/ODCM)

6. **Event Declared:** Time:_____ Date:_____
Eastern Time

7. **Provide Protective Action Recommendation:** ☒ None

Completed By: _____

Approved By: _____

Appendix A
(Page 1 of 1)

General Emergency Initial Notification Form

1. ☐ This is a Drill ☐ This is an Actual Event - Repeat - This is an Actual Event
2. _____,the SED at **Watts Bar** has declared a **GENERAL EMERGENCY**
3. **EAL Designator(s):**_____(Use three EAL designators when using the Fission Product Barrier Matrix.)
4. Brief Description of the Event:_____
_____

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

Airborne Releases Offsite	**Liquid** Releases Offsite
☐ Minor releases within federally approved limits[1]	☐ Minor releases within federally approved limits[1]
☐ Releases above federally approved limits[1]	☐ Releases above federally approved limits[1]
☐ Release information not known	☐ Release information not known
([1]Tech Specs/ODCM)	([1]Tech Specs/ODCM)

6. **Event Declared:** Time:_____ Date:_____

7. **The Meteorological Conditions are:** (Use 46 meter data from the Met Tower. IF data is NOT available from the MET tower, contact the National Weather Service by dialing 9-1-423-586-8400. The National Weather Service will provide wind direction and wind speed.)
   Wind Direction is FROM:_____degrees (15 minute average) Wind Speed: _____m.p.h (15 minute average)

8. Provide Protective Action Recommendation utilizing Appendix H: (Check either 1 or 2 or 3)

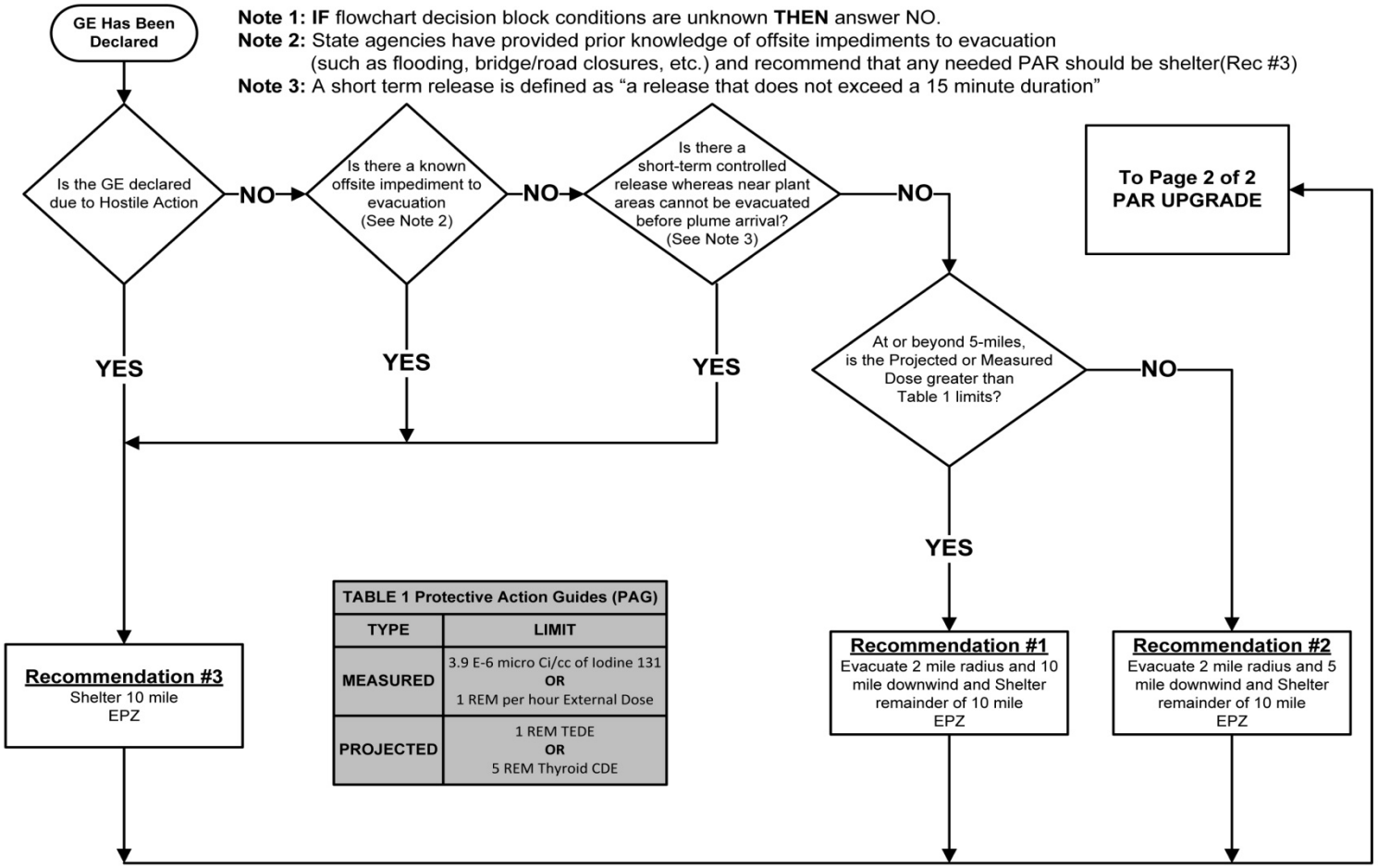
☐ **Recommendation 1** ● EVACUATE LISTED SECTORS (2 mile Radius and 10 miles downwind) ● SHELTER remainder of 10 mile EPZ ● CONSIDER issuance of POTASSIUM IODIDE in accordance with the State Plan	RECOMENDATION 1	**WIND FROM DEGREES** (Mark wind direction from step 7)	RECOMENDATION 2	☐ **Recommendation 2** ● EVACUATE LISTED SECTORS (2 mile Radius and 5 miles downwind) ● SHELTER remainder of 10 mile EPZ ● CONSIDER issuance of POTASSIUM IODIDE in accordance with the State Plan
A1, B1, C1, D1, C7, C9, D2, D4, D5, D6, D7, D8, D9		From 26-68		A1, B1, C1, D1, C7, D2, D4, D5
A1, B1, C1, D1, A3, A4, D2, D3, D4, D5, D6, D7, D8, D9		From 69-110		A1, B1, C1, D1, A3, D2, D4, D5
A1, B1, C1, D1, A2, A3, A4, A5, A6, A7, D2, D3, D5, D6		From 111-170		A1, B1, C1, D1, A2, A3, D2, D5
A1, B1, C1, D1, A2, A3, A5, A6, A7, B2, B3, B4, B5, C2		From 171-230		A1, B1, C1, D1, A2, A3, B2, B4, C2
A1, B1, C1, D1, B2, B3, B4, B5, C2, C3,		From 231-270		A1, B1, C1, D1, B2, B4, C2
A1, B1, C1, D1, B2, B3, C2, C3, C4, C5, C6, C11		From 271-325		A1, B1, C1, D1, B2, C2, C4, C5,
A1, B1, C1, D1, C2, C4, C5, C6, C7, C8, C9, C10, C11, D4, D9		From 326-25		A1, B1, C1, D1, C2, C4, C5, C7, C8, D4

☐	**Recommendation 3**
●	SHELTER all sectors
●	CONSIDER issuance of POTASSIUM IODIDE in accordance with the State Plan

Completed by _____ Approved by (SED)_____

Appendix H
(Page 1 of 2)

Initial - Protective Action Recommendations



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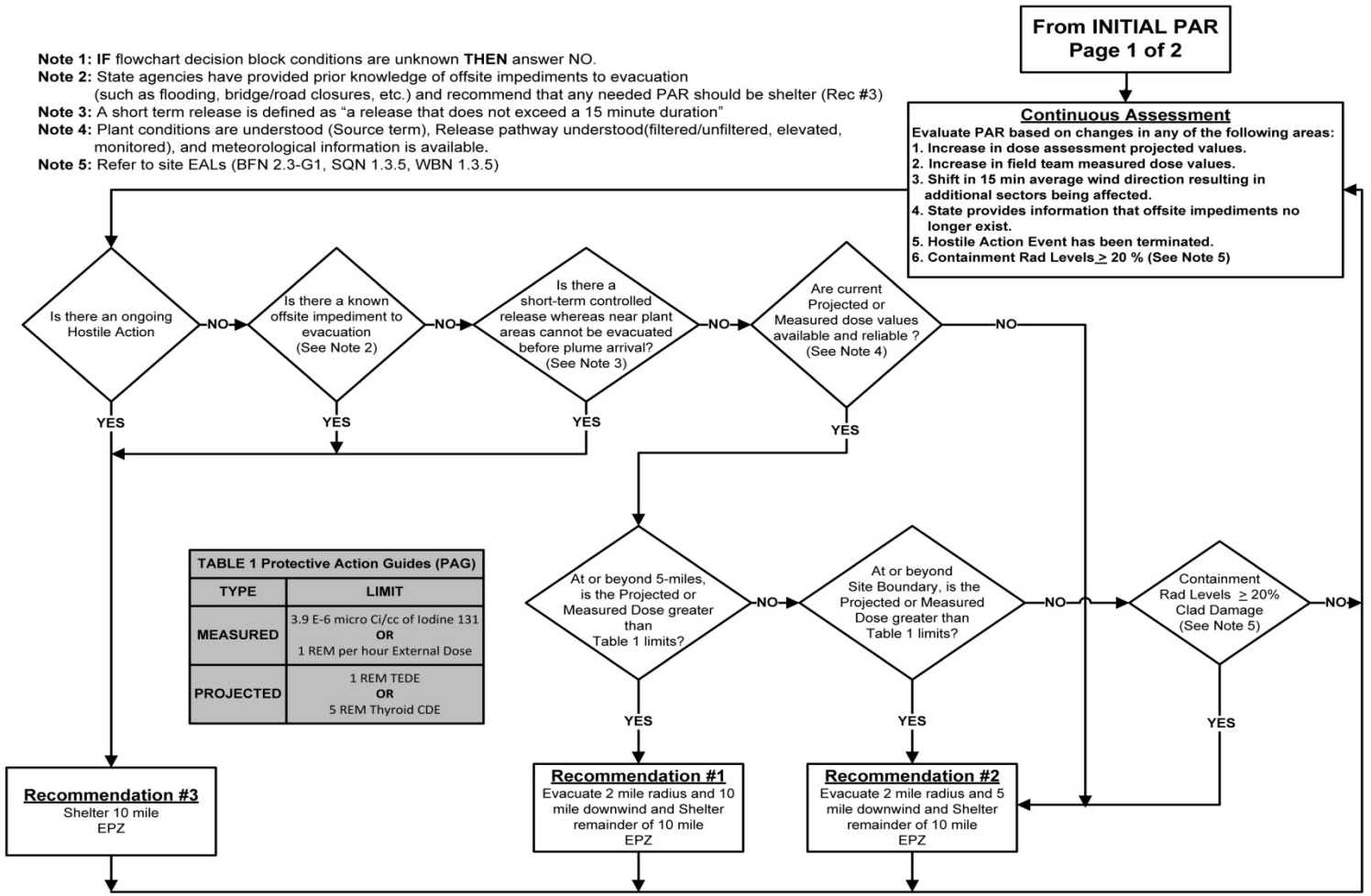
Initial - Protective Action Recommendations



5 S

Handout Package for Applicant

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

1. **Unit 1 was shut down due to increasing RCS activity.**
2. **Indications of a primary system leak developed during the shutdown.**
3. **A safety injection was manually initiated during the performance of AOI-6, "Small Reactor Coolant System Leak" due to a imminent loss of pressurizer level with charging flow at 150 gpm and letdown isolated.**
4. **The operators are performing actions of E-0, "Reactor Trip or Safety Injection."**
5. **The following conditions currently exist:**
   a. **Containment pressure is +0.11 psid and steady.**
   b. **Containment Sump level is not increasing.**
   c. **Several RHR/CVCS Pipe Break Status lights are now LIT.**
   d. **0-RM-90-101B, AUX BLDG VENT is increasing rapidly.**
   e. **Several Area Rad Monitors on elevation 692 and 713 are in Hi Rad.**
   f. **Chemistry reports a step rise in the RCS activity to 311 µCi/gm dose equivalent Iodine 131.**
   g. **Wind is from 125 degrees, and speed is 15 mph.**
6. **You are the Site Emergency Director.**

INITIATING CUES:

DO NOT USE SED JUDGEMENT AS A BASIS FOR CLASSIFICATION.

1. **Based on the information provided to you, classify the event. Record your EAL(s) in the space below. RAISE YOUR HAND when your classification is complete.**
2. **Complete the associated TVA Initial Classification form.**
3. **Determine what, if any, Protective Action Recommendations are required.**
4. **RAISE YOUR HAND when you have completed the notification form.**

Element(s) of this task is/are time critical.

CLASSIFICATION (EAL(s) _____ **EXAMINERS INITIALS** _____ **TIME** _____

APPENDIX A COMPLETION TIME _____ **EXAMINERS INITIALS** _____