

FACILITY NAME: Watts Bar

Section 6

REPORT NUMBER: 2009-302

DRAFT ADMINISTRATIVE JPMS

CONTENTS:

☒ Draft ADMIN JPMS

Location of Electronic Files:

Submitted By: Edwin J. [Signature] Verified By: Mark J. Riches [Signature]

WATTS BAR NUCLEAR PLANT
A.1-1 RO/SRO
Nov. 2009 NRC Exam

A.1-1 RO/SRO
Determine License Status

WATTS BAR NUCLEAR PLANT

A.1-1 RO/SRO

Nov. 2009 NRC Exam

Task: Determine License Status Active / Inactive

Alternate Path: N/A

Facility JPM #: None

Safety Function: **Title:**

K/A 2.1.1 Knowledge of conduct of operations requirements

Rating(s): 3.8 / 4.2 **CFR:** 41.10 / 45.13

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator ☒ In-Plant ☐ Perform ☒ Simulate ☐

References: OPDP-10, "License Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions," Rev. 1

Task Number: RO-119-PAI-2.07-001 **Title:** Maintain active NRC License

Task Standard: Candidate determines the correct status of each of the three Reactor Operator licenses. Operator A and C are active, Operator B is Inactive

Validation Time: 10 minutes **Time Critical:** Yes ☐ No ☒

Applicant: _____ **NAME** _____ **SSN** _____ **Time Start:** _____
Time Finish: _____

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

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

COMMENTS

WATTS BAR NUCLEAR PLANT

A.1-1 RO/SRO

Nov. 2009 NRC Exam

DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Three Reactor Operators have the following history:
2. All three have off-shift assignments at the plant, are current in License Operator Regualification Training, and have had a medical examination in the past 2 years.
3. None of the 3 has worked any shift since 12/01/09.
4. Active/Inactive status and time on shift since October 1, 2009 is as follows for each of the Reactor Operators:

Operator A	License was active on October 1, 2009.	
	10/02/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/03/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/04/09	Worked 0700-1900 shift in the Tagging Office.
	10/05/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/06/09	Worked 0700-1900 shift as Unit 1 OAC.
	11/14/09	Worked 1900-0700 shift as Unit 1 OAC.
	11/17/09	Worked 1900-0700 shift as Unit 1 CRO.
Operator B	License was active on October 1, 2009.	
	10/01/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/02/09	Worked 0700-1900 shift in the Tagging Office.
	10/03/09	Worked 0700-1900 shift as Unit 1 CRO.
	10/05/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/14/09	Worked 1900-0700 shift as Unit 1 OAC.
	11/02/09	Worked 0700-1900 shift in the Tagging Office.
Operator C	License was inactive on October 1, 2009.	
	10/5/09 thru 10/09/09 worked 40 hours under the direction of the Unit 1 OAC and completed all requirements for license reactivation.	
	11/12/09	Worked 0700-1900 shift as Unit 1 OAC.
	11/13/09	Worked 0700-1900 shift as Unit 1 OAC.
	11/15/09	Worked 0700-1900 shift as Unit 1 OAC.
	11/16/09	Worked 1900-0700 shift as Unit 1 OAC.
	11/21/09	Worked 1900-0700 shift as Unit 1 OAC.

INITIATING CUES:

1. You are to determine if each of the Reactor Operators is eligible to work the Unit 1 OAC position on the 0700 - 1900 shift on January 31, 2010.

WATTS BAR NUCLEAR PLANT
A.1-1 RO/SRO
Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p><u>STEP 1.:</u> Determine the Active / Inactive status of Operator A license.</p> <p><u>STANDARD:</u></p> <p>Candidate determines the license is <u>Active</u> because the operator worked the required 5 twelve hour shifts in a license position during the previous quarter.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 2.:</u> Determine the Active / Inactive status of Operator B license.</p> <p><u>STANDARD:</u></p> <p>Candidate determines the license is <u>Inactive</u> because the operator did not work the required 5 twelve hour shifts in a license position during the previous quarter.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT
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STEP/STANDARD	SAT/UNSAT
<p><u>STEP 3.:</u> Determine the Active / Inactive status of Operator C license.</p> <p><u>STANDARD:</u></p> <p>Candidate determines the license is <u>Active</u> because the license was reactivated in the previous quarter and that the required 5 twelve hour shifts in a license position during the quarter have also been completed.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
END OF TASK	

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. Three Reactor Operators have the following history:
2. All three have off-shift assignments at the plant, are current in License Operator Requalification Training, and have had a medical examination in the past 2 years.
3. None of the 3 has worked any shift since 12/01/09.
4. Active/Inactive status and time on shift since October 1, 2009 is as follows for each of the Reactor Operators:

Operator A	License was active on October 1, 2009.	
	10/02/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/03/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/04/09	Worked 0700-1900 shift in the Tagging Office.
	10/05/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/06/09	Worked 0700-1900 shift as Unit 1 OAC.
	11/14/09	Worked 1900-0700 shift as Unit 1 OAC.
	11/17/09	Worked 1900-0700 shift as Unit 1 CRO.
Operator B	License was active on October 1, 2009.	
	10/01/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/02/09	Worked 0700-1900 shift in the Tagging Office.
	10/03/09	Worked 0700-1900 shift as Unit 1 CRO.
	10/05/09	Worked 0700-1900 shift as Unit 1 OAC.
	10/14/09	Worked 1900-0700 shift as Unit 1 OAC.
	11/02/09	Worked 0700-1900 shift in the Tagging Office.
Operator C	License was inactive on October 1, 2009.	
	10/5/09 thru 10/09/09 worked 40 hours under the direction of the Unit 1 OAC and completed all requirements for license reactivation.	
	11/12/09	Worked 0700-1900 shift as Unit 1 OAC.
	11/13/09	Worked 0700-1900 shift as Unit 1 OAC.
	11/15/09	Worked 0700-1900 shift as Unit 1 OAC.
	11/16/09	Worked 1900-0700 shift as Unit 1 OAC.
	11/21/09	Worked 1900-0700 shift as Unit 1 OAC.

INITIATING CUES:

1. You are to determine if each of the Reactor Operators is eligible to work the Unit 1 OAC position on the 0700 - 1900 shift on January 31, 2010.



NPG Standard
Department
Procedure

TITLE

**License Status Maintenance,
Reactivation and Proficiency for
Non-Licensed Positions**

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Rev. 0001
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Quality Related ☒ Yes ☐ No

Effective Date 05-07-2009

Responsible Peer Team/Working Group: Operations

Approved by: _____

O. J. Miller

Corporate Functional Manager

5-6-09

Date

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Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0	02/29/08	All	Initial issue. This procedure removed from OPDP-1 Revision 8 Appendix O titled "License Status - Active/Inactive License". Form OPDP-1-4 moved into OPDP-10 renumbered as Form OPDP-10-1.
1	05/07/09	All	General revision. Re-wrote procedure to make it as generic as possible for all of NPG, and changed wording for clarification through-out procedure. Appendixes combined and reorganized and some were deleted. Form OPDP-10-1 deleted and incorporated into Appendix A.

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1.0 PURPOSE

The purpose of this procedure is to provide instructions for the maintenance of NRC SRO and RO licenses and for reactivation of SRO and RO licenses if inactive at Nuclear Power Group (NPG) sites and for proficiency requirements for STA position and AUO position.

2.0 SCOPE

This procedure applies to the reactivation and maintenance of Senior Reactor Operator and Reactor Operator licenses in accordance with 10CFR55.53 and to SRO limited Fuel Handling License activation at NPG sites. (Maintenance of proficiency for STAs and AUOs is contained in TRN-11.6 and TRN-11.1.)

3.0 PROCESS

3.1 Active License Status Maintenance

- A. To maintain an active status, the licensee shall actively perform the functions of an operator or senior operator for a minimum of seven 8 hour shifts a calendar quarter or five 12 hour shifts a calendar quarter. It is the licensee's responsibility to maintain cognizance of his/her license status.
- B. Each site will ensure a listing of "Active" license status is provided to the SM at the end of each quarter. If an individual's license is currently listed as being "Inactive" (not on the active list), it is imperative that he or she not perform in a TS licensed position.

3.2 NUCLEAR PLANT REQUIREMENTS FOR MAINTAINING ACTIVE LICENSE STATUS

3.2.1 PURPOSE

The purpose of this section is to provide administrative instructions in order to comply with 10CFR55.53 (e), ... "actively performing the functions of an operator or senior operator."

3.2.2 REFERENCES/BACKGROUND

- A. References
 1. 10 CFR 50.54(m)(2)(i)
 2. 10 CFR 55.4
 3. 10 CFR 55.53(e)
 4. NUREG-1262 - Preface; pages 71-80
 5. NUREG-1021 - ES-605
 6. Technical Specification

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3.2.2 REFERENCES/BACKGROUND (continued)

- B. To maintain active status, per 55.53(e), Conditions of License, the licensee shall actively perform the functions of an operator or senior operator on a minimum of seven (7) 8-hour or five (5) 12-hour shifts per calendar quarter.
- C. Actively performing the functions of an operator or senior operator means that an individual has a position on the shift crew that requires the individual to be licensed as defined in Technical Specification, and that the individual carries out and is responsible for the duties covered by that position.
- D. Technical Specifications and 10 CFR 50.54 specify the minimum requirement per shift.
- E. Licensed personnel who do not meet these requirements are designated as inactive licensees.

3.2.3 RESPONSIBILITIES

- A. All licensed personnel who maintain an active license shall comply with these requirements.
- B. All licensed personnel who maintain an active license and are OFF SHIFT (not part of a rotating shift) shall provide on-shift documentation quarterly to the Operations Superintendent. [Appendix C].
- C. The Operations Superintendent is responsible for administering this program and documentation.

3.2.4 INSTRUCTIONS

- A. Individuals assigned to the following positions, AND NO OTHERS, on each shift, are considered to be actively performing the functions of an operator or senior operator in order to maintain active license status:
 - 1. Shift Manager
 - 2. Unit Supervisor [Control Room SRO]
 - 3. Licensed Unit Operators assigned Control Room duties.
- B. To be granted credit for a shift, the individual will be present from shift turnover thru shift turnover. Short absences from the Control Room are acceptable (i.e., rest room visits, pre-job briefs, plant tours, supervising activities). Absences from the Control Room for extended periods (i.e., Fitness-for-Duty testing) will not count towards shift functions. For these type of cases, the time absence will be made up by working additional time on another shift or an additional shift.
- C. The shift period is defined by the schedule worked by the rotating shift crews. Either 12-hour or 8-hour shifts is the normal. If a 12-hour shift rotation is used, then a minimum of five (5) shifts in a licensed position per quarter, or if an 8-hour shift rotation is used, then a minimum of seven (7) shifts in a licensed position per quarter is required in order to remain "active."

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3.2.4 INSTRUCTIONS (continued)

- D. Technical Specifications / 10CFR50 for each site contains the requirement for the minimum number of licenses required. However, only the positions listed for the applicable site as listed in 3.2.4A above qualify for license maintenance.
- E. If the operating crews convert from an 8-hour to a 12-hour, or a 12-hour to an 8-hour shift rotation schedule during a calendar quarter, then the number of shifts required to be worked in a licensed position to be credited for active license maintenance on the combination of shifts (8's and 12's) will be in accordance with the following:

8-Hour Shifts	TO	12-Hour Shifts	12-Hour Shifts	TO	8-Hour Shifts
# Shifts Completed Prior to Change		# Additional Shifts Needed On New Schedule	# Shifts Completed Prior to Change		# Additional Shifts Needed On New Schedule
6		1	4		2
5		2	3		3
4		3	2		5
3		3	1		6
2		4	0		7
1		5	-		-
0		5	-		-

- F. The individual assigned to one of the positions designated for maintaining an active license, shall log "in" and "out" on the Narrative Log for each shift worked.
- G. The Shift Manager on each shift shall verify that the data entered into the "Shift Staffing Log" in the Narrative Log is correct for their shift.
- H. A Shift Manager shall actively perform the functions of a Shift Manager a minimum of seven 8-hour or five 12-hour shifts per calendar quarter to remain current as a Shift Manager.

3.2.5 DOCUMENTATION

- A. Appendix C contains the form "Active Licensed Maintenance for Off-Shift Personnel, Quarterly On-Shift Time Documentation" that is submitted by active off-shift licensed individuals each quarter to the Operations Superintendent.
- B. The Control Room logs are the legal record of watchstander assignment.

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3.3 NUCLEAR PLANT REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

3.3.1 PURPOSE

This section is intended to provide guidance, to return a licensed individual to an active status.

3.3.2 REFERENCES/BACKGROUND

A. The Code of Federal Regulation, 10 CFR55.53 f(2) specifies returning a license to active status. The intent of the code is to ensure proficiency in the conduct of licensed activities prior to assuming licensed duties. The following requirements are addressed as part of this code:

1. The qualifications and status of the licensee are current and valid. This requirement ensures the licensee has completed all required requalification training, including plant modifications and industry events; and secondly, that all conditions of his/her license are still being met.
2. This licensee has completed a minimum of 40 hours of shift functions under the direction of a reactor operator or senior operator, as appropriate, and in the position to which the individual will be assigned. This ensures that an active license is directing or performing the manipulations of plant controls, and allows the inactive individual to obtain proficiency at his/her watch station. Included within the minimum of 40 hours is the following:
 - a. A complete review of turnover procedures by the reactor operator or senior reactor operator as appropriate for the position, to ensure that the licensee is familiar with current shift turnover practices.
 - b. A complete tour of the plant, to ensure the individual is aware of changing plant conditions that have occurred since he/she has been inactive. The individual performing the tour will be accompanied by an active Licensed Reactor Operator or an active Licensed Senior Reactor Operator, as appropriate.

3.3.3 RESPONSIBILITIES

A. All licensed personnel who maintain a license shall comply with these requirements to return to active status. The Operations Superintendent is responsible for administering the process.

3.3.4 INSTRUCTIONS

A. The following guidelines are to be used when reactivating a license:

1. Prior to standing the minimum of 40 hours of shift functions, the licensed individual shall meet with the Operation Training Manager and the Operations Superintendent to discuss his/her current status and any standards and/or expectations. For certain individuals, additional requirements may be imposed (greater than those required by code) if directed by the Operations Superintendent.

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3.3.4 INSTRUCTIONS (continued)

2. The following positions are the only ones that qualify for reactivation of a license:
 - a. Shift Manager
 - b. Unit Supervisor [Control Room SRO]
 - c. Licensed Unit Operators assigned Control Room duties.
3. The individual shall be under the direct supervision of an active licensed individual in the position to which the individual will be assigned. To receive credit for a shift, the individual will be present from shift turnover thru shift turnover. Short absences from the Control Room are acceptable (i.e., rest room visits, pre-job briefs, plant tours, supervising activities); however, the total re-activation time under supervision will total at least 40 hours.
4. The individual shall make a Narrative log entry at the start of the shift which will include the following at a minimum:
 - a. Name and time of assuming shift
 - b. Shift Position (as identified in 3.3.4.A.2) assumed under direction
 - c. Name of the operators (Board and Desk), Control Room SRO, or Shift Manager providing supervision.
5. The individual shall make a Narrative Log entry at the end of the shift indicating they have completed the shift under supervision. A copy of the Narrative log for each shift worked shall be obtained for processing after the break-in is complete. This will be the entire log for the shift worked and not selected entries.
6. The individual shall complete Appendix A, page 2, for each shift listing unit, shift, position assuming, along with the activities the individual was personally involved in. Time, Position, Unit, Activity, and Date must be filled out for each activity performed. The position the individual is holding must be one of the three indicated in step 3.3.4.A.2. Appendix A is to be used to account for a plant tour and shift turnover briefing. Appendix A is required to be signed by the Operations Superintendent ensuring that all appendix pages have been reviewed and once reviewed, these pages will be submitted with the reactivation documentation and will become part of the individuals training record. Attach a copy of security door printouts for both the licensed individual reactivating and the supervising active license for each reactivation shift.
7. If an individual moves from one unit to another unit during the same shift for the purpose of breaking-in on the other unit, the individual shall make an log entry indicating that they are moving to the other unit to continue their break-in. Another entry, to include the areas in 3.3.4.A.4, will be made when the individual goes under instruction on the new unit. This requirement is not applicable to an individual being re-activated as a Shift Manager since the break-in would still be under the same individual.

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3.3.4 INSTRUCTIONS (continued)

8. The individual shall review the turnover procedures with an active reactor operator or senior reactor operator, as applicable. The Plant Operations Manager, Operations Superintendent, and/or Operations Support Superintendent will determine the minimum procedures to be reviewed.
9. As a minimum, the following shall be completed to satisfy the plant tour requirement:
 - a. Review of Control Room logs and equipment status in order to ascertain current plant status and configuration.
 - b. Review of radiological conditions in the plant.
 - c. Tour of accessible plant areas as listed in Appendix A, pages 5, 6 or 7, with special attention if safety-related systems are involved.
 - (1) Prior to beginning the tour, a discussion should be held with the Shift Manager to obtain guidance on which areas to focus on during the plant tour.
 - (2) Document the tour on Appendix A, page 4.
 - (3) The plant tour will be performed by the individual accompanied by an active Licensed Reactor Operator or an active Senior Reactor Operator, as applicable, and logged in the Narrative Log.

B. Returning an Inactive Shift Manager to active Status

1. Before resumption of independent Shift Manager duties, the Plant Manager or designee will certify the following: (In addition to Section 3.3.4A)
 - a. The individual has completed 40 hours of break-in under a currently active Shift Manager.
 - b. Documentation of completion shall be forwarded to Operations Training Manager for retention.

3.3.5 DOCUMENTATION

The completed Appendix A with Narrative logs, and all required signatures on the "Return To Active Status Checklist" (Appendix A) shall be completed prior to being reactivated. The "Return To Active Status Checklist" form, Appendices A, and the narrative logs will then become part of the individual's training record.

For the Shift Manager, the log of activities outside of the Control Room will also become part of the individual's training record, if applicable.

Complete and Attach Appendix A Page 1 of 7, Licensee Documentation Form (SRO & RO), as the cover-sheet for this record.

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3.4 STA and AUO Proficiency

- A. The STA will remain active by complying with Section 3.4 of TRN-11.6.
- B. The AUO will remain active by complying with requirements of TRN-11.1.

4.0 RECORDS

4.1 QA Records

Appendix A, "Return to Active Status Checklist"

Appendix B, "Activation of SRO License Limited to Fuel Handling"

4.2 Non-QA Records

Appendix C, "Active Licensed Maintenance for Off-Shift Personnel Quarterly On-Shift Time Documentation"

5.0 DEFINITIONS

None

6.0 REQUIREMENTS AND REFERENCES

Requirements and References are contained in the "OPDP-10 REQ & REF" document.

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**Appendix A
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Return to Active Status Checklist

LICENSEE DOCUMENTATION FORM COVER SHEET (SRO & RO)	
A.	License Status Current Licensee SRO <input type="checkbox"/> RO <input type="checkbox"/> (check one)
B.	40 Hours on Shift <ul style="list-style-type: none"> • Attach copy of Operating Log for each shift.
C.	Tour of Plant (Check box below when complete) <input type="checkbox"/> Appendix A
D.	Shift Turnover <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> 1. Attended shift turnover briefings </div> <div style="width: 35%;"> No. of Times _____ </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 60%;"> 2. Observed shift turnover </div> <div style="width: 35%;"> No. of Times _____ </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 60%;"> 3. Reviewed shift turnover checklist applicable to the position </div> <div style="width: 35%;"> Date _____ </div> </div> <div style="text-align: right; margin-top: 20px;"> _____ Printed Name </div> <div style="text-align: right; margin-top: 10px;"> _____ Licensee's Signature </div>
E.	Licensee qualifications current and valid including: <ul style="list-style-type: none"> • A physical in the last two years. • Satisfactory completion of license operator requalification training. <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 60%;"> _____ Operations Training Manager/Designee </div> <div style="width: 35%;"> _____ Date </div> </div>
F.	Documentation <ul style="list-style-type: none"> • Attach copies of applicable forms from Appendix A.
G.	Licensee meets reactivation requirements in Appendix A and is reinstated to active status. <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 60%;"> _____ Operations Superintendent/Designee </div> <div style="width: 35%;"> _____ Date </div> </div>

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**Appendix A
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Return to Active Status Checklist

Licensee _____

The licensed individual has completed a minimum of 40 hours of shift functions under the direction of an active licensed operator of qualifications equal to or above the position to which the individual will be assigned. This instruction shall be one on one. SRO-licensed individuals assuming a SRO position shall perform the actions and responsibilities of the Unit Supervisor (US) or Shift Manager (SM). SRO or RO-licensed individuals assuming an RO position shall perform the actions of a Unit Operator (UO). Active SROs are fully qualified to perform RO duties. The 40 hours must have included a complete review of all required shift turnover procedures. One complete on-coming shift turnover and one complete off-going shift turnover including briefing, board walkdown, etc. is required for license re-activation. SRO licensed individuals who reactivate their license solely to allow watchstanding in the UO must complete 40 hours of shift functions as a Unit UO under the directions of a UO prior to being assigned to the position. Attach a copy of security door printouts for both the licensed individual reactivating and the supervising license for each date listed below

Narrative Log Entry made including the following: Name & time assuming shift	Licensee	_____
Shift Position assumed under direction, Name of operator providing supervision	Supervisor	_____

Date Completed	Hrs/ Total	Reactivation Activities Performed Each Shift/Unit #	Position (circle one)	Supervising Licensee
	/		SRO/RO	
	/		SRO/RO	
	/		SRO/RO	
	/		SRO/RO	
	/		SRO/RO	

	On-coming Shift Turnover	SRO/RO	
	Off-Going Shift Turnover	SRO/RO	

Total hours of Reactivation Activities at the end of this shift. (Required 40)	____HRS
--	---------

Narrative Log Entry made for completion of shift	Licensee _____
Copy of Completed Narrative Logs attached to this form	Licensee _____
Licensed individual has reviewed the required reading, standing orders, and ODMIs for the period of absence or for the most recent requalification cycle to present date whichever is shorter and the current standing orders.	Licensee _____
Shift Manager has reviewed this form	(SM) _____

Verified by: _____ Date _____
Superintendent - Shift Operations

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**Appendix A
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Return to Active Status Checklist

To: Operations Training Manager

From: Operations Superintendent

Date

NAME: _____

- A. Licensee requalification training is current, including a simulator evaluation within the past 12 months in the position(s) to be assumed and the licensee has had a physical in the last two years. (To be verified prior to standing the 40 hours of shift functions under instruction.)

_____ Date: ____ / ____ / ____
Operational Training Manager

- B. The qualifications and status of the licensed individual listed above are current and valid, and Standards and Expectations have been discussed, prior to standing the 40 hours of shift functions under instruction.

_____ Date: ____ / ____ / ____
Operational Superintendent

- C. If the licensee has a medical restriction requiring corrective lenses, the licensee will verify that he/she has the proper corrective lenses required to Don SCBA available while performing license duties (N/A if corrective lenses are not required).

_____ Date: ____ / ____ / ____
Licensee

- D. The above licensed individual has completed at least 40 hours of shift functions under the direction of an operator or senior operator, as appropriate, including a complete tour of the plant accompanied by an active licensed RO or SRO, as applicable, and review of all required shift turnover procedures.

_____	Date: ____ / ____ / ____
Licensee	
_____	Date: ____ / ____ / ____
Shift Manager	
_____	Date: ____ / ____ / ____
Operations Superintendent	
_____	Date: ____ / ____ / ____
Operations Manager	

- E. The above licensed individual is authorized to resume licensed activities.

_____ Date: ____ / ____ / ____
Plant Manager

- F. Complete and Attach Appendix A Page 1, Licensee Documentation Form (SRO & RO) as the cover sheet for this documentation.

_____ Date: ____ / ____ / ____
Licensee

cc: Operations Manager
Training File
REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

NPG Standard Department Procedure	License Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions	OPDP-10 Rev. 0001 Page 14 of 20
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**Appendix A
(Page 4 of 7)**

Return to Active Status Checklist

(Completed ONCE per Reactivation)

NAME: _____
Licensee

Date: _____

- Areas discussed with the Shift Manager to Tour in addition to the required areas specified on Appendix A pages 5, 6 or 7.

As a minimum they should include

Review Control Room Logs

Radiological Conditions in the plant

Significant Modifications and major maintenance activities.

(Shift Manager)

-
- Areas other than those listed on Appendix A pages 5, 6 or 7 that were toured with another Licensed Operator and discussed with the Shift Manager
-

-
- Licensed Operator verified Tour.

(Tour Verifier)

- Plant Tour discussed with Shift Manager

(Shift Manager)

- Narrative Log Entry made for completion of tour as well as being logged in as break-in for the tour duration.

(Licensee)

- Shift Turnover Procedure Reviewed

NOTE: ROs CANNOT sign for SROs.

(Licensed Operator)

- Required amount of shifts have been completed
(5-12 hour or 7-8 hours shifts)

(Licensee)

Appendix A
(Page 5 of 7)

Return to Active Status Checklist

BFN Tour Checklist

During the minimum of 40 hours of shift functions, the licensed individual has completed a plant tour including all areas listed below (excluding high radiation areas) under the direction of an operator (active license) or senior operator (active license) as appropriate. Tours will include a review of all required NLO shift turnover procedures. Attach a copy of the security door printouts for both the licensed individual reactivating and the supervising licensee for each date listed below. From NUREG-1021 - ES-605, "If a utility has developed a checklist of areas to tour, it is generally inappropriate to skip plant areas and mark the items as non-applicable unless there is sufficient justification (e.g., personnel or radiation hazard)."

Date	Time	List Areas Toured	Supervising Licensee
		All elevations of Reactor Building including the Refuel Floor	
		All elevations of Turbine Building	
		All elevations of Control Building	
		Units 1 & 3 Diesel Generator Buildings	
		All elevations of the Intake Pumping Station including RHRSW/EECW Pump Rooms	
		Outside areas including the Stack, Off Gas Building, Transformer Yard, Switchyard, and Dry Cask Storage	
		Review AUO Shift Turnovers	

Verified by: _____
Superintendent - Shift Operations _____ Date _____

NPG Standard Department Procedure	License Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions	OPDP-10 Rev. 0001 Page 18 of 20
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**Appendix B
(Page 1 of 2)**

Activation of SRO License Limited to Fuel Handling

Licensed Individual/EIN _____

NOTE

Personnel who activate their SRO License Limited to Fuel Handling MAY NOT stand watch in the Main Control Room or any other position that requires an active licensed SRO.

The above named licensed individual has successfully completed the following:

Uninterrupted participation in the Licensed Operator Requalification Program or met with the Superintendent - Operations Training or Designee to discuss the material from all requalification sessions which were missed.

Verified by: _____
Operations Training Manager or Designee Date

Work for one shift, (12 hours) moving fuel under the direction of an active licensed SRO***.

Date*	Position Moving Fuel	Moving Fuel Hours**	Active Licensed SRO***

*Should include shift turnover.

**Must include a total of 12 hours moving fuel under the direction of an active licensed SRO. In accordance with 10CFR50.54(m)(2)(iv) the individual reactivating and the active license holder shall be assigned no other duties.

***Active SRO or Active SRO Limited to Fuel Handling.

NPG Standard Department Procedure	License Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions	OPDP-10 Rev. 0001 Page 19 of 20
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Appendix B
(Page 2 of 2)

Activation of SRO License Limited to Fuel Handling

The licensed individual has completed a tour of fuel handling areas with an active Senior Licensed Operator*** including all levels of the Fuel Handling Area, (excluding high radiation areas) and the Reactor Containment Building (if fuel handling activities are in progress).

Verified by: _____
Superintendent - Shift Operations Date

I certify the requirements for returning to active status, limited to fuel handling, as listed in OMM-001, Section 5.5.2, have been met for the above named licensed individual.

Verified by: _____
Superintendent - Shift Operations _____ Date _____

***Active SRO or Active SRO Limited to Fuel Handling.

After receiving the final review signature, this checklist becomes a QA RECORD and should be submitted to Management Services.

NPG Standard Department Procedure	License Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions	OPDP-10 Rev. 0001 Page 20 of 20
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**Appendix C
(Page 1 of 1)**

**Active Licensed Maintenance for Off-Shift Personnel
Quarterly On-Shift Time Documentation**

NAME: _____

Station: BFN SQN WBN (circle the appropriate one)

I certify that on the dates listed below, I performed the licensed duties as defined in 10 CFR 55 for a minimum of five (5) 12-hour shifts, seven (7) 8-hour shifts, or combination as described in this procedure.

Covering Quarter: ☐ Jan - March ☐ April - June ☐ July - Sept ☐ Oct - Dec

	DATE	Start Time of Shift	UNIT	POSITIONS
Shift 1:				
Shift 2:				
Shift 3:				
Shift 4:				
Shift 5 ⁽²⁾				
Shift 6 ^{(1) (2)}				
Shift 7 ^{(1) (2)}				

NOTE: (1) The Day 6 & 7 slot is to be used if one does not complete a full shift on one of the previous days.

NOTE: (2) Once the form is completed, forward to Operations Superintendent. Do not retain form until the end of the quarter.

Signature: _____

Date: _____

WATTS BAR NUCLEAR PLANT

A.1-2 RO

Nov. 2009 NRC Exam

A.1-2 RO

Perform RCS Deboration Calculation

WATTS BAR NUCLEAR PLANT

A.1-2 RO

Nov. 2009 NRC Exam

EVALUATION SHEET

Task: Perform RCS Deboration Calculation.

Alternate Path: N/A

Facility JPM #: None

Safety Function: **Title:**

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 / 45.13

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator ☒ In-Plant ☐ Perform ☒ Simulate ☐

References: SOI-62.04, "CVCS Purification System," Rev. 53
TI-59, "Boron Tables," Rev. 7

Task Number: RO-062-TI-59-001 **Title:** Perform boron concentration change calculations.

Task Standard: Applicant calculates the amount of time required to reduce RCS boron concentration from 50 ppm to 45 ppm using SOI-62.04, "CVCS Purification System," Appendix B, "RCS Deboration Calculation" and TI-59, "Boron Tables."

Validation Time: 10 minutes **Time Critical:** Yes ☐ No ☒

Applicant: _____
NAME SSN Time Start: _____
Time Finish: _____

Performance Rating: SAT ☐ UNSAT ☐ Performance Time _____

Examiner: _____
NAME SIGNATURE DATE

COMMENTS

WATTS BAR NUCLEAR PLANT

A.1-2 RO

Nov. 2009 NRC Exam

DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. The unit is in Mode 1 coasting down prior to refueling.
2. Current RCS C_B is 50 ppm.
3. Current RCS temperature is 575°F.
4. Mixed Bed A contains fresh, unborated resin.
5. Maximum letdown flow will be used during this evolution.
6. You are an extra operator.

INITIATING CUES:

1. The Unit SRO has directed you to perform SOI-62.04, "CVCS Purification System,: Appendix B "RCS Deboron Calculation," to estimate the time that CVCS Mixed Bed Demineralizer must be in service in order to reduce RCS boron concentration to 45 ppm.
2. Report the results of your calculation to the Unit SRO.

WATTS BAR NUCLEAR PLANT

A.1-2 RO

Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
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START TIME: _____

<p>STEP 1: [1] INDICATE Mixed Bed for which this calculation is being performed (CHECK ONLY ONE.)</p> <p style="margin-left: 40px;">Mixed Bed A _____ OR Mixed Bed B _____</p> <p>STANDARD:</p> <p>From INITIAL CONDITIONS, the applicant checks Mixed Bed A.</p> <p>COMMENTS:</p> 	<p>___ SAT</p> <p>___ UNSAT</p>
<p>NOTE This calculation is based on the Mixed Bed being a fresh unborated bed, all letdown flow being directed through the mixed bed being placed in service, and the following:</p> $C_f = C_o e^{-\frac{QT}{V}}$ <p>Where: C_f = Final Boron Concentration C_o = Initial Boron Concentration Q = Mixed Bed Flow Rate (Letdown Flow in gpm) V = RCS Volume at operating temperature (gals) T = Time (minutes)</p>	

WATTS BAR NUCLEAR PLANT
A.1-2 RO
Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 2:</u> [2] RECORD current RCS Temperature:</p> <p><u>STANDARD:</u></p> <p>From INITIAL CONDITIONS, applicant records 575°F as the current RCS temperature.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> [3] RECORD RCS Volume (V) based on current RCS Temp using TI-59 (first page of App D through App N, as appropriate.)</p> <p><u>STANDARD:</u></p> <p>Applicant locates TI-59, and selects Appendix L, and records 87813.5 as the RCS volume.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT

A.1-2 RO

Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p>STEP 4: [4] PERFORM the following calculation to estimate time in service:</p> $\text{Time} = \frac{-\ln (C_f/C_o) V}{Q} = \frac{-\ln (\text{ ______ ppm / ______ ppm }) \text{ ______ gals}}{\text{ ______ gpm}}$ <p>Time = ______ minutes</p> <p>STANDARD:</p> <p>Applicant enters letdown flow of 120 gpm, since the INITIAL CONDITIONS requires letdown flow to be at maximum, and RCS volume of 87813.5 gallons. Applicant calculates time of 73 to 80 minutes.</p> <p>Applicant reports the results of the calculation to the Unit Supervisor.</p> <p>EVALUATOR'S CUE: <i>When the applicant reports the result of the calculation to the Unit Supervisor, acknowledge using repeat back. State that "another operator will complete Step 5 of Appendix B."</i></p> <p>COMMENTS:</p> <p style="text-align: center;">END OF TASK</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME ______

KEY

KEY

WBN 1	CVCS PURIFICATION SYSTEM	SOI-62.04 Revision 53 Page 77 of 85
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APPENDIX B

Page 1 of 1

RCS DEBORATION CALCULATION

- [1] **INDICATE** Mixed Bed for which this Calculation is being performed
(CHECK ONLY ONE.)

Mixed Bed A ☒ OR Mixed Bed B ☐

(From Initial Conditions)

NOTE

This calculation is based on the Mixed Bed being a fresh unborated bed, all letdown flow being directed through the mixed bed being placed in service, and the following:

$$C_f = C_o e^{-\frac{QT}{V}}$$

Where: C_f = Final Boron Concentration

C_o = Initial Boron Concentration

Q = Mixed Bed Flow Rate (Letdown Flow in gpm)

V = RCS Volume at operating temperature (gals)

T = Time (minutes)

- [2] **RECORD** current RCS Temperature:

575°F RCS Temp

- [3] **RECORD** RCS Volume (V) based on current RCS Temp
using TI-59 (first page of App D through App N,
as appropriate.)

87,813.5 RCS Volume

- [4] **PERFORM** the following calculation to estimate time in service:

$$\text{Time} = \frac{-\ln(C_f/C_o) V}{Q} = \frac{-\ln(45 \text{ ppm} / 50 \text{ ppm}) 87,813.5 \text{ gals}}{120 \text{ gpm}}$$

Time = 77.1 minutes Allow 73 to 80 minutes

- [5] **RECORD** Mixed Bed Run times for which this Calculation is being performed (Times can be obtained from Attachment 1 for the associated demin).

	1	2	3	4	5	6	7	8
Run time								
Total time								
Initials								

KEY

KEY

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. The unit is in Mode 1 coasting down prior to refueling.
2. Current RCS C_B is 50 ppm.
3. Current RCS temperature is 575°F.
4. Mixed Bed A contains fresh, unborated resin.
5. Maximum letdown flow will be used during this evolution.
6. You are an extra operator.

INITIATING CUES:

1. The Unit SRO has directed you to perform SOI-62.04, "CVCS Purification System, Appendix B "RCS Deboronation Calculation," to estimate the time the CVCS mixed bed demineralizer must be in service in order to reduce RCS boron concentration to 45 ppm.
2. Report the results of your calculation to the Unit SRO.

WBN 1	CVCS PURIFICATION SYSTEM	SOI-62.04 Revision 53 Page 77 of 85
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APPENDIX B

Page 1 of 1

RCS DEBORATION CALCULATION

- [1] **INDICATE** Mixed Bed for which this Calculation is being performed (CHECK ONLY ONE.)

Mixed Bed A _____ OR Mixed Bed B _____

NOTE This calculation is based on the Mixed Bed being a fresh unborated bed, all letdown flow being directed through the mixed bed being placed in service, and the following:

$$C_f = C_o e^{-\frac{QT}{V}}$$

Where: C_f = Final Boron Concentration

C_o = Initial Boron Concentration

Q = Mixed Bed Flow Rate (Letdown Flow in gpm)

V = RCS Volume at operating temperature (gals)

T = Time (minutes)

- [2] **RECORD** current RCS Temperature:

_____ RCS Temp

- [3] **RECORD** RCS Volume (V) based on current RCS Temp using TI-59 (first page of App D through App N, as appropriate.)

_____ RCS Volume

- [4] **PERFORM** the following calculation to estimate time in service:

$$\text{Time} = \frac{-\ln(C_f/C_o) V}{Q} = \frac{-\ln(\text{_____ ppm/_____ ppm}) \text{_____ gals}}{\text{_____ gpm}}$$

Time = _____ minutes

- [5] **RECORD** Mixed Bed Run times for which this Calculation is being performed (Times can be obtained from Attachment 1 for the associated demin).

	1	2	3	4	5	6	7	8
Run time								
Total time								
Initials								

WATTS BAR NUCLEAR PLANT

A.1-2 SRO

Nov. 2009 NRC Exam

A.1-2 SRO

**Review of Estimated Critical Position
Calculation**

WATTS BAR NUCLEAR PLANT
A.1-2 SRO
Nov. 2009 NRC Exam

EVALUATION SHEET

Task: Review of Estimated Critical Position Calculation.

Alternate Path: None

Facility JPM #: 3-OT-JPM ADA 1.6

K/A Rating(s): 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (3.9/4.2)

Task Standard: Prior to taking the reactor critical, verify estimated critical position calculation in accordance with 1-SI-0-11, "Estimated Critical Position."

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator _____ Classroom X Perform X Simulate _____

References: 1-SI-0-11, "Estimated Critical Position," Rev 14
WCAP-16880-P, NuPOP for WBN Unit 1, Cycle 9
Nuclear Operating Book (NOB) Sheet A-5, "Negative MTC Withdrawal Limit Curve," Rev. 3
Core Operating Limit Report (COLR), Figure 1, "Control Bank Insertion Limit Versus Thermal Power Four Loop Operation," Rev. 1

Task Number: SRO-085-SI-0-11-001 **Applicable for:** RO _____ SRO X

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

=====

Applicant: _____ **NAME** _____ **SSN** _____ **Time Start:** _____
Time Finish: _____

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

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

=====

COMMENTS

WATTS BAR NUCLEAR PLANT

A.1-2 SRO

Nov. 2009 NRC Exam

DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. The unit is in Mode 3 making preparations to startup following refueling.
2. Current RCS C_B is 2870 ppm.
3. Current RCS temperature is 557°F.
4. Unit startup will be via control rods.
5. PET 107 performance data predicts ARO Critical C_B as 1700 ppm.
6. Desired Control Bank D rod position at criticality is 160 steps.
7. Initial startup following refueling is scheduled for next shift.
8. The extra operator assigned to the shift has performed 1-SI-0-11, "Estimated Critical Position," Section 6.5, "ECP Hand Calculation Following a Refueling Outage."

INITIATING CUES:

As the Unit Supervisor, you are to review 1-SI-0-11, "Estimated Critical Position," Section 6.5, "ECP Hand Calculation Following a Refueling Outage," and identify any and all errors in the calculation.

WATTS BAR NUCLEAR PLANT

A.1-2 SRO

Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
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START TIME: _____

NOTE TO EVALUATOR: A marked-up copy of 1-SI-0-11, "Estimated Critical Position," is provided to the applicant for review and approval. This information is in the JPM package AFTER the APPLICANT CUE SHEET.

A key is also provided which indicates the erroneous entries to be identified by the applicant. The key is located BEFORE the APPLICANT CUE SHEET.

STEP 1: [1] **RECORD** the following from NuPOP Table 4-8:

A. All Rods Out (ARO) Critical Cb: _____ ppm.

B. Differential Boron Worth (DBW) at the ARO Critical Cb:
_____ pcm/ppm.

STANDARD:

ERRORS TO BE IDENTIFIED:

Applicant refers to NuPOP Table 4-8, III. Boron Endpoint Data and determines that the 1482 entry is incorrect.

Applicant determines that the -6.2 pcm/ppm entry is also incorrect.

COMMENTS:

**CRITICAL
STEP**

____ SAT

____ UNSAT

WATTS BAR NUCLEAR PLANT

A.1-2 SRO

Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 2:</u> [2] RECORD the desired Control Bank D rod position for initial criticality (i.e. ECP):</p> <p style="margin-left: 40px;">ECP = _____ steps</p> <p><u>STANDARD:</u></p> <p>Applicant determines that correct rod position of 160 was entered in the blank for desired Control Bank D rod position.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3.</u> [3] RECORD the inserted integral rod worth for the desired critical rod position (Step 6.5[2]) from NuPOP Table 7-30:</p> <p style="margin-left: 40px;">Inserted Rod Worth = _____ pcm</p> <p><u>STANDARD:</u></p> <p>Applicant refers to Table 7-30 and determines that the correct value of 254.3 was inserted in the Inserted Rod Worth blank.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT
A.1-2 SRO
Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 4:</u> [4] IF performing a dilute-to-critical, THEN CALCULATE the critical boron concentration at the ECP as follows:</p> <p><u>STANDARD:</u></p> <p>Applicant determines that this step is not applicable since the INITIAL CONDITIONS state that the startup will be conducted using the "pull-to-critical" method.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> [5] IF performing a pull-to-critical, THEN PERFORM the following sub-steps:</p> <p>A. RECORD the ARO Critical Cb inferred by the Sub-Critical Rod Worth Measurement from PET-107:</p> <p style="padding-left: 40px;">Inferred ARO Cb = _____ ppm</p> <p><u>STANDARD:</u></p> <p>From the INITIAL CONDITIONS, the applicant determines that the correct value of 1700 was entered.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT

A.1-2 SRO

Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 6:</u> [5] IF performing a pull-to-critical, THEN PERFORM the following sub-steps:</p> <p style="padding-left: 40px;">B. CALCULATE the critical boron concentration at the ECP as follows:</p> $\begin{array}{lclclcl} \text{ECC Cb} & = & \text{Inferred ARO Cb} & + & (\text{Inserted Rod Worth} & \div & \text{DBW}) \\ \text{ECC Cb} & = & \text{_____ ppm} & + & \text{_____ ppm} & \div & \text{_____ pcm/ppm} \\ & & (\text{Step 6.5[5]A}) & & (\text{Step 6.5[3]}) & & (\text{Step 6.5[1]B}) \\ \text{ECC Cb} & = & \text{_____ ppm} & & \text{for Bank D at _____ steps} & & \end{array}$ <p><u>STANDARD:</u></p> <p>ERRORS TO BE IDENTIFIED:</p> <p>Applicant determines that the <u>differential boron worth value entered is incorrect, and the sign applied to the value in this step is incorrect.</u></p> <p>Applicant determines that the <u>calculated ECC Cb is incorrect.</u></p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">CRITICAL STEP</p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>
<p><u>STEP 6:</u> [6] VERIFY ECP is above the Control Bank Insertion Limits in the COLR (Acceptance Criteria 5.1A).</p> <p><u>STANDARD:</u></p> <p>Applicant reviews COLR, Figure 1, "Control Bank Insertion Limits Versus Thermal Power Four Loop Operation" and determines that the 0 power insertion limit is <u>64 steps on Control Bank C.</u></p> <p><u>COMMENTS:</u></p>	<p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>

WATTS BAR NUCLEAR PLANT

A.1-2 SRO

Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p>STEP 7: [7] IF applicable, THEN VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.4[2] D (Acceptance Criteria 5.1B).</p> <p><u>STANDARD:</u></p> <p>Applicant determines that the Negative MTC Withdrawal Limit is not applicable by referring to Nuclear Operating Book (NOB) Sheet A-5 Negative MTC Withdrawal Limit Curve and marks the step N/A.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>NOTE The 1000 pcm lower limit may be used for Mode 2 entry call.</p>	
<p>NOTE TO EVALUATOR: JPM Steps 8 through 13 are all associated with 0-SI-0-11 Step 8.</p>	
<p>STEP 8: [8] CALCULATE, AND RECORD the UPPER and LOWER Acceptance Bands:</p> <p style="margin-left: 40px;">A. DETERMINE the Upper 1000 pcm Limit from NuPOP Table 7-30:</p> <p style="margin-left: 80px;">Step 6.5[3] - 1000 pcm = _____ pcm</p> <p style="margin-left: 80px;">Bank C at _____ steps & Bank D at _____ steps</p> <p><u>STANDARD:</u></p> <p>Applicant determines that the -745.7 pcm value for the Upper 1000 pcm limit is satisfied with Control Banks C and D at 228 steps.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT
A.1-2 SRO
Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p>STEP 9: [8] CALCULATE, AND RECORD the UPPER and LOWER Acceptance Bands:</p> <p style="margin-left: 40px;">B. DETERMINE the Lower 1000 pcm Limit from NuPOP Table 7-30:</p> <p style="margin-left: 80px;">Step 6.5[3] + 1000 pcm = _____ pcm</p> <p style="margin-left: 80px;">Bank C at _____ steps & Bank D at _____ steps</p> <p>STANDARD:</p> <p>Applicant determines that the 1254.3 pcm value for the Lower 1000 pcm limit is satisfied with Control Banks C at 162 steps and D at 46 steps.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 10: [8] CALCULATE, AND RECORD the UPPER and LOWER Acceptance Bands:</p> <p style="margin-left: 40px;">C. DETERMINE the Upper 750 pcm Limit from NuPOP Table 7-30:</p> <p style="margin-left: 80px;">Step 6.5[3] - 750 pcm = _____ pcm</p> <p style="margin-left: 80px;">Bank C at _____ steps & Bank D at _____ steps</p> <p>STANDARD:</p> <p>Applicant determines that the -495.7 pcm value for the Upper 1000 pcm limit is satisfied with Control Banks C and D at 228 steps.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT
A.1-2 SRO
Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 11:</u> [8] CALCULATE, AND RECORD the UPPER and LOWER Acceptance Bands:</p> <p>D. DETERMINE the Lower 750 pcm Limit from NuPOP Table 7-30:</p> <p>Step 6.5[3] + 750 pcm = _____ pcm</p> <p>Bank C at _____ steps & Bank D at _____ steps</p> <p><u>STANDARD:</u></p> <p>Applicant determines that the 1004.3 pcm value for the Lower 1000 pcm limit is satisfied with Control Banks C at 182 steps and D at 66 steps.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 12:</u> [8] CALCULATE, AND RECORD the UPPER and LOWER Acceptance Bands:</p> <p>E. DETERMINE the Upper 500 pcm Limit from NuPOP Table 7-30:</p> <p>Step 6.5[3] - 500 pcm = _____ pcm</p> <p>Bank C at _____ steps & Bank D at _____ steps</p> <p><u>STANDARD:</u></p> <p>Applicant determines that the -245.7 pcm value for the Upper 1000 pcm limit is satisfied with Control Banks C and D at 228 steps.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT
A.1-2 SRO
Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 13:</u> [8] CALCULATE, AND RECORD the UPPER and LOWER Acceptance Bands:</p> <p style="margin-left: 40px;">F. DETERMINE the Lower 500 pcm Limit from NuPOP Table 7-30:</p> <p style="margin-left: 80px;">Step 6.5[3] + 500 pcm = _____ pcm</p> <p style="margin-left: 80px;">Bank C at _____ steps & Bank D at _____ steps</p> <p><u>STANDARD:</u></p> <p>Applicant determines that the 754.3 pcm value for the Lower 1000 pcm limit is satisfied with Control Banks C at 204 steps and D at 88 steps.</p> <p><u>COMMENTS:</u></p>	<p>____ SAT</p> <p>____ UNSAT</p>
<p><u>STEP 14:</u> [9] RECORD the following:</p> <p style="margin-left: 40px;">A. Date of calculation: ____/____/____</p> <p style="margin-left: 40px;">B. Time of calculation: ____:____</p> <p><u>STANDARD:</u></p> <p>Applicant determines that the date and time are entered in the appropriate blanks.</p> <p><u>COMMENTS:</u></p>	<p>____ SAT</p> <p>____ UNSAT</p>
<p>NOTE: A technical review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.</p>	

WATTS BAR NUCLEAR PLANT
A.1-2 SRO
Nov. 2009 NRC Exam

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 14:</u> [10] OBTAIN review of calculations and results by task qualified individual. An STA or SRO may also perform this review.</p> <p><u>STANDARD:</u></p> <p>Applicant states that the package contains errors and must be returned to the individual who performed the calculations for corrections. Applicant DOES NOT sign at Step 10.</p> <p><u>CUE:</u></p> <p><u>COMMENTS:</u></p> <p style="text-align: right; margin-top: 20px;">END OF TASK</p>	<p style="text-align: center;">CRITICAL STEP</p> <p style="text-align: center;">___ SAT</p> <p style="text-align: center;">___ UNSAT</p>

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. The unit is in Mode 3 making preparations to startup following refueling.
2. Current RCS C_B is 2870 ppm.
3. Current RCS temperature is 557°F.
4. Unit startup will be via control rods.
5. PET 107 performance data predicts ARO Critical C_B as 1700 ppm.
6. Desired Control Bank D rod position at criticality is 160 steps.
7. Initial startup following refueling is scheduled for next shift.
8. The extra operator assigned to the shift has performed 1-SI-0-11, Estimated Critical Position, Section 6.5, ECP Hand Calculation Following a Refueling Outage.

INITIATING CUES:

As the Unit Supervisor, you are to review 1-SI-0-11, "Estimated Critical Position," Section 6.5, ECP Hand Calculation Following a Refueling Outage, and identify any and all errors in the calculation.

KEY

KEY

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 25 of 69
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Data Package: Page 1 of 4Date

6.5 ECP Hand Calculation Following a Refueling Outage

~~[1]~~ **RECORD** the following from NuPOP Table 4-8:

~~A.~~ All Rods Out (ARO) Critical C_b : 1482 ppm. (ERROR: Should be 1695 ppm)

~~B.~~ Differential Boron Worth (DBW) at the ARO Critical C_b :
6.20 pcm/ppm. (ERROR: Should be -6.15)

~~[2]~~ **RECORD** the desired Control Bank D rod position for initial criticality (i.e. ECP):

ECP = 160 steps

~~[3]~~ **RECORD** the inserted integral rod worth for the desired critical rod position (Step 6.5[2]) from NuPOP Table 7-30:

Inserted Rod Worth = 254.3 pcm

~~[4]~~ **IF** performing a dilute-to-critical, **THEN**

CALCULATE the critical boron concentration at the ECP as follows:

$$ECC C_b = ARO C_b + (\text{Inserted Rod Worth} \div DBW)$$

$$ECC C_b = \frac{\text{ppm}}{(\text{Step 6.5[1]A})} + \frac{\text{pcm}}{(\text{Step 6.5[3]})} \div \frac{\text{pcm/ppm}}{(\text{Step 6.5[1]B})}$$

$$ECC C_b = \text{ppm} \text{ for Bank D at } \text{steps}$$

~~[5]~~ **IF** performing a pull-to-critical, **THEN**

PERFORM the following sub-steps:

~~A.~~ **RECORD** the ARO Critical C_b inferred by the Sub-Critical Rod Worth Measurement from PET-107:

Inferred ARO C_b = 1700 ppm

KEY

KEY

KEY

KEY

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 26 of 69
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Date ____

6.5 ECP Hand Calculation Following a Refueling Outage (continued)

~~B.~~ **CALCULATE** the critical boron concentration at the ECP as follows:

$$\text{ECC } C_b = \text{Inferred ARO } C_b + (\text{Inserted Rod Worth} \div \text{DBW})$$

(ERROR: value should be -6.14)

$$\text{ECC } C_b = \underline{1700} \text{ ppm (Step 6.5[5]A)} + \underline{254.3} \text{ pcm (Step 6.5[3])} + \underline{6.2} \text{ pcm/ppm (Step 6.5[1]B)}$$

$$\text{ECC } C_b = \underline{1741} \text{ ppm for Bank D at } \underline{160} \text{ steps}$$

ERROR:
should be
1658

~~[6]~~ **VERIFY** ECP is above the Control Bank Insertion Limits in the COLR (Acceptance Criteria 5.1A).

~~[7]~~ **IF** applicable, **THEN**

VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.4[2]D (Acceptance Criteria 5.1B).

NOTE

The 1000 pcm lower limit may be used for Mode 2 entry call.

~~[8]~~ **CALCULATE, AND RECORD** the UPPER and LOWER Acceptance Bands:

~~A.~~ **DETERMINE** the Upper 1000 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} - 1000 \text{ pcm} = \underline{-746} \text{ pcm}$$

Bank C at 228 steps & Bank D at 228 steps

~~B.~~ **DETERMINE** the Lower 1000 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} + 1000 \text{ pcm} = \underline{1254} \text{ pcm}$$

Bank C at 162 steps & Bank D at 46 steps

KEY

KEY

KEY

KEY

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Date _____

6.5 ECP Hand Calculation Following a Refueling Outage (continued)

~~C.~~ DETERMINE the Upper 750 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} - 750 \text{ pcm} = \underline{-495} \text{ pcm}$$

Bank C at 228 steps & Bank D at 228 steps

~~D.~~ DETERMINE the Lower 750 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} + 750 \text{ pcm} = \underline{1004} \text{ pcm}$$

Bank C at 182 steps & Bank D at 66 steps

~~E.~~ DETERMINE the Upper 500 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} - 500 \text{ pcm} = \underline{-245} \text{ pcm}$$

Bank C at 228 steps & Bank D at 228 steps

~~F.~~ DETERMINE the Lower 500 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} + 500 \text{ pcm} = \underline{754} \text{ pcm}$$

Bank C at 204 steps & Bank D at 88 steps

~~[9]~~ RECORD the following:

A. Date of calculation: 2/2/2

B. Time of calculation: 2:2

~~NOTE~~

A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.

~~[10]~~ OBTAIN review of calculations and results by task qualified individual. An STA or SRO may also perform this review.

KEY

KEY

KEY

KEY

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Data Package: Page ____ of ____

Date _____

6.5 ECP Hand Calculation Following a Refueling Outage (continued)[11] **OBTAIN** SM/US review and approval of ECP._____
SM/US

KEY

KEY

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. The unit is in Mode 3 making preparations to startup following refueling.
2. Current RCS C_B is 2870 ppm.
3. Current RCS temperature is 557°F.
4. Unit startup will be via control rods.
5. PET 107 performance data predicts ARO Critical C_B as 1700 ppm.
6. Desired Control Bank D rod position at criticality is 160 steps.
7. Initial startup following refueling is scheduled for next shift.
8. The extra operator assigned to the shift has performed 1-SI-0-11, Estimated Critical Position, Section 6.5, ECP Hand Calculation Following a Refueling Outage.

INITIATING CUES:

As the Unit Supervisor, you are to review 1-SI-0-11, "Estimated Critical Position," Section 6.5, ECP Hand Calculation Following a Refueling Outage, and identify any and all errors in the calculation.

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Date

6.5 ECP Hand Calculation Following a Refueling Outage

~~[1]~~ **RECORD** the following from NuPOP Table 4-8:

~~A~~ All Rods Out (ARO) Critical C_b : 1482 ppm.

~~B~~ Differential Boron Worth (DBW) at the ARO Critical C_b :
-6.20 pcm/ppm.

NA

~~[2]~~ **RECORD** the desired Control Bank D rod position for initial criticality (i.e. ECP):

ECP = 160 steps

NA

~~[3]~~ **RECORD** the inserted integral rod worth for the desired critical rod position (Step 6.5[2]) from NuPOP Table 7-30:

Inserted Rod Worth = 254.3 pcm

NA

~~[4]~~ **IF** performing a dilute-to-critical, **THEN**

CALCULATE the critical boron concentration at the ECP as follows:

$$ECC C_b = ARO C_b + (Inserted Rod Worth \div DBW)$$

$$ECC C_b = \frac{\text{ppm}}{\text{(Step 6.5[1]A)}} + \frac{\text{pcm}}{\text{(Step 6.5[3])}} \div \frac{\text{pcm/ppm}}{\text{(Step 6.5[1]B)}}$$

$$ECC C_b = \text{ppm} \text{ for Bank D at } \text{steps}$$

N/A

~~[5]~~ **IF** performing a pull-to-critical, **THEN**

PERFORM the following sub-steps:

NA

~~A~~ **RECORD** the ARO Critical C_b inferred by the Sub-Critical Rod Worth Measurement from PET-107:

Inferred ARO C_b = 1700 ppm

NA

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Date mm

6.5 ECP Hand Calculation Following a Refueling Outage (continued)

~~B.~~ **CALCULATE** the critical boron concentration at the ECP as follows:

$$\text{ECC } C_b = \text{Inferred ARO } C_b + (\text{Inserted Rod Worth} \div \text{DBW})$$

$$\text{ECC } C_b = \frac{1703}{(\text{Step 6.5[5]A})} \text{ ppm} + \frac{254.3}{(\text{Step 6.5[3]})} \text{ pcm} + \frac{6.2}{(\text{Step 6.5[1]B})} \text{ pcm/ppm}$$

$$\text{ECC } C_b = \underline{1741} \text{ ppm} \quad \text{for Bank D at } \underline{160} \text{ steps}$$

OK

~~[6]~~ **VERIFY** ECP is above the Control Bank Insertion Limits in the COLR (Acceptance Criteria 5.1A).

OK

~~[7]~~ **IF** applicable, **THEN**

VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.4[2]D (Acceptance Criteria 5.1B).

OK

NOTE

The 1000 pcm lower limit may be used for Mode 2 entry call.

~~[8]~~ **CALCULATE, AND RECORD** the UPPER and LOWER Acceptance Bands:

~~A.~~ **DETERMINE** the Upper 1000 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} - 1000 \text{ pcm} = \underline{746} \text{ pcm}$$

Bank C at 228 steps & Bank D at 228 steps

~~B.~~ **DETERMINE** the Lower 1000 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} + 1000 \text{ pcm} = \underline{1254} \text{ pcm}$$

Bank C at 162 steps & Bank D at 46 steps

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Date MM

6.5 ECP Hand Calculation Following a Refueling Outage (continued)

~~C.~~ DETERMINE the Upper 750 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} - 750 \text{ pcm} = -495 \text{ pcm}$$

Bank C at 228 steps & Bank D at 228 steps

~~D.~~ DETERMINE the Lower 750 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} + 750 \text{ pcm} = 1004 \text{ pcm}$$

Bank C at 182 steps & Bank D at 66 steps

~~E.~~ DETERMINE the Upper 500 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} - 500 \text{ pcm} = -245 \text{ pcm}$$

Bank C at 228 steps & Bank D at 228 steps

~~F.~~ DETERMINE the Lower 500 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} + 500 \text{ pcm} = 754 \text{ pcm}$$

Bank C at 204 steps & Bank D at 88 steps

~~[9]~~ RECORD the following:

A. Date of calculation: 11/13/11

B. Time of calculation: 11:11

NOTE

A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.

[10] OBTAIN review of calculations and results by task qualified individual. An STA or SRO may also perform this review.

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Date _____

6.5 ECP Hand Calculation Following a Refueling Outage (continued)

[11] OBTAIN SM/US review and approval of ECP.

SM/US



Watts Bar Nuclear Plant

Unit 1

Surveillance Instruction

1-SI-0-11

Estimated Critical Position

Revision 0014

Quality Related

Level of Use: Continuous Use

Effective Date: 09-16-2009

Responsible Organization: RXE, Reactor Engineering

Prepared By: Lukus S. Barnes

Approved By: C. Dale Greer

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Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
Rev 10	10/25/04	2, 29	NON-INTENT change to add steps in Section 7.0 to manually place the shutdown monitors in the shutdown monitor mode after performance of ICRR using 1/M mode.
Rev 11	08/26/2005	1 - 5, 7, 11 - 14, 15, 17, 18, 21, and 26 - 30	REVISION to address Reactivity Management issues for WBN PER 84170. Updated references, deleted Reactor Trip Data Book, added Technical Reviewer sign-off, calculated +/- 500 pcm administrative limit band, and added 500 pcm review criteria. 10CFR50.59 Screening Review is NOT required.
Rev 12	08/25/2006	All	REVISION to allow adjustments to the ECC due to anticipated CIPS effects per WBN PER 105805. Allow Sub-Critical Rod Worth Measurement results to be used as ECC for startup after a refueling. Also, editorial changes to improve the ICRR figure and to add additional administrative criteria (750 pcm), add additional provisions for ICRR data collection for other than control banks, add additional ICRR Data Sheet and fix typos.
Rev. 13	03/17/08	All	REVISION to add guidance on BEACON General 3D Calc method for determining ECC. Added guidance on BEACON ECC method for determining ECC. Added adjustments to ECC boron concentration to account for CIPS and B-10 changes. Added guidance to use BEACON to predict the ICRR plots at the various criticality limits. Incorporates new bank overlap per DCN 52265. This procedure has been converted from Word 95 to Word XP using Rev. 12 by the Conversion Team.
Rev. 14	09/16/09	All	NON-INTENT change to clarify qualification and requirements of post-performance reviewer for ECP calculations (PER 169236). Re-ordered prerequisite steps.

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1.0 INTRODUCTION

1.1 Purpose

This instruction provides detailed steps for predicting the rod position or RCS boron concentration (C_b) at which reactor criticality will be achieved. This instruction also provides guidance for monitoring the approach to criticality.

1.2 Scope

1.2.1 Operability Tests to be Performed

This instruction calculates the estimated critical conditions (ECC) i.e. critical rod position and boron concentration given existing conditions. The control rod position is then verified to be above rod insertion limits and below administrative rod withdrawal limits for maintaining a negative moderator temperature coefficient (if applicable). This instruction also monitors the approach to critical with collection and analysis of Inverse Count Rate Ratio (ICRR) data¹.

1.2.2 Surveillance Requirements Fulfilled and Modes

Performance of this Instruction satisfies the following Surveillance Requirement (SR):

SURVEILLANCE REQUIREMENT	APPLICABLE MODES	PERFORMANCE MODES
SR 3.1.7.1	1,2 ¹	2 ² , 3

(1) with $K_{eff} \geq 1$

(2) with $K_{eff} < 1$

1.3 Frequency and Conditions

This Instruction is to be initiated within 4 hours of achieving criticality.

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2.0 REFERENCES

2.1 Performance References

- A. Core Operations Limit Report (COLR).
- B. Nuclear Operating Book (NOB), Sheet A-5, Negative MTC Withdrawal Limit Curve.
- C. Nuclear Parameters and Operations Package (NuPOP) for the applicable unit/cycle.
- D. PET-201, Initial Criticality and Low Power Physics Testing.
- E. Computer Program REACTW Version WB2.0 and REACTW Computer Program User's Guide.
- F. Computer Program REACTINW Version 2.0 and REACTINW Computer Program User's Guide.
- G. TI-54, Xenon Worth.
- H. TI-55, Samarium Worth.
- I. PCT-05-529, Axial Offset Validity Criteria Revision 3; June 30, 2005
- J. TI-7.014, Estimated Critical Condition (ECC) B-10 Adjustments

2.2 Developmental References

- A. SPP-10.4, Reactivity Management Program.
- B. Unit 1 Technical Specifications, Section 3.1.7.
- C. BEACON Users Manual.

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3.0 PRECAUTIONS AND LIMITATIONS

- A. When using REACTW, REACTINW, or BEACON, this instruction requires an individual qualified in the use of the computer program, as defined in RXE Qualification Standard Practical Factor ESP320.311, ESP320.333, or ESP320.338, as applicable.
- B. The same method should be used to determine both previous and current parameters to ensure accurate estimates of reactivity changes.
- C. When using REACTW to calculate estimated critical rod positions or estimated critical boron concentration, the computer inputs should be verified against the data tables from the NuPOP to ensure the input is within the range of the tables. (Done automatically when REACTINW is used).
- D. The NuPOP for the applicable unit and cycle must be used when performing this Instruction. Care must be taken to use the tables for the correct burnup range. The burnup ranges are defined in NuPOP, Section 8.3.
- E. Xenon and its associated precursors may be in error after a reboot/startup of the plant computer. Guidance for updating these values can be obtained from Reactor Engineering.
- F. Samarium worth must be estimated by Reactor Engineering for each case when 10 days of power history is **NOT** available.
- G. The 1000 pcm lower limit must be greater than COLR Rod Insertion Limit at zero power.
- H. Criticality must be anticipated at any time when positive reactivity is being added to the core.²
- I. Personnel responsible for monitoring ICRR data are to immediately advise the Unit SRO of any unanticipated or unexplained response.
- J. If ICRR data indicates that criticality will occur outside of the +/-750 pcm Allowable Tolerance Band of the estimated critical position with the ICRR value < 0.2, the Unit SRO is to be advised that the startup must be stopped.
- K. The ICRR curve "general trend" must be monitored to ensure the curve does **NOT** exhibit any abnormalities.
- L. Following incremental additions of reactivity, a pause of 1 to 4 minutes should occur prior to ICRR data collection. This will allow subcritical multiplication to increase thermal neutron flux to approximately its equilibrium value. As criticality is approached (i.e., keff approaches 1.0), neutron flux stabilization time should become longer prior to data collection. This approach permits a more accurate determination to be made of core reactivity changes, and predicted critical condition.³

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

- M. When the Scalar/Timer is used, the count period (ΔT) for ICRR monitoring may be adjusted at the discretion of the Test Director (minimum of 10 seconds or at least 1000 counts/ ΔT period).
- N. It is permissible to re-normalize ICRR plots to 1.0 at any time at the discretion of the Test Director OR when the ICRR value has decreased to a point where it is difficult to establish ICRR trends (e.g., re-normalize when the ICRR reaches 0.2). An acceptable method for re-normalization is to use the most recent count rate (C_i) value as the new base count rate (C_0).
- O. A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations by task qualified RXE or SRO/STA.

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Date _____

4.0 PREREQUISITE ACTIONS

4.1 Preliminary Actions

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

NOTES

- 1) A primary method for performance of this instruction is use of the computer codes REACTINW or REACTW (which are verified and validated personal computer codes). A backup method is to use another computer with the verified and validated codes. These codes are installed on the TVA network and at least one personal computer in the Main Control Room.
- 2) The use of BEACON is the other primary method.
- 3) Hand calculations may also be performed as a backup method.

[2] **IF** REACTW or REACTINW are to be used, **THEN**

OBTAIN PC with REACTW and/or REACTINW software installed in accordance with Release Memorandums. _____

[3] **IF** BEACON is to be used, **THEN**

ACCESS the BEACON software via the HP workstation or through a PC with either Hummingbird Exceed, BlueZone, or other approved ethernet software installed. _____

NOTE

Reference 2.1.I contains guidance in performing the CIPS adjustment.

[4] **IF** an adjustment to the ECC is desired to account for CIPS effects, **THEN**

PERFORM the following. **OTHERWISE, MARK** this step N/A.

A. **INTEGRATE** the Actual to Predicted Axial Offset differences over the cycle life.

$$\int \Delta AO * d BU = \text{_____} \% * MWD/MTU$$

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Date _____

4.1 Preliminary Actions (continued)

B. **DETERMINE** the increase in HZP reactivity from Figure 2.

$$\Delta \rho^{CIPS} = \text{_____ pcm}$$

C. **DETERMINE** the equivalent boron concentration increase by dividing the Step 4.1[4]B value by the absolute difference of the differential boron worth from NuPOP Figure 6-22.

$$\Delta C_b^{CIPS} = \Delta \rho^{CIPS} / |DBW| = \text{_____} / |\text{_____}|$$

$$\Delta C_b^{CIPS} = (+) \text{_____}$$

NOTE

If the initial RCS B-10 concentration was significantly less than 19.78% and significant dilutions and/or borations were made to the RCS since the BEACON K bias was calibrated, then the ECC should be adjusted to account for B-10 concentration changes. Examples of significant dilutions or borations include the following:

1. At MOL at 800 ppm and 18% B-10, a dilution of 6,000 gal of Primary Water can result in a reactivity effect of up to 10 ppm.
2. At MOL at 800 ppm and 18% B-10, a boration of 9,000 gal of Boric Acid can result in a reactivity effect of up to 10 ppm.
3. At MOL at 800 ppm and 18% B-10, an RCS cooldown to Mode 5 results in significant RCS makeup due to shrinkage.

[5] **IF** an adjustment to the ECC is desired to account for B-10 concentration changes, **THEN**

PERFORM TI-7.014 and **RECORD** the net change in the ECC boron concentration due to the B-10 adjustment:

$$\Delta C_b^{B-10} = (-) \text{_____ ppm}$$

4.2 Approvals and Notification

None

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5.0 ACCEPTANCE CRITERIA

5.1 TECHNICAL SPECIFICATION ACCEPTANCE CRITERIA

- A. Estimated Critical Rod Position (ECP) is above the Control Bank Insertion Limits specified in the COLR.
- B. Estimated critical rod position is below the Negative MTC Withdrawal Limit Curve in the NOB (if applicable).

5.2 OTHER ACCEPTANCE CRITERIA

- A. Estimated Critical Rod Position (ECP) was within 1000 pcm of the actual critical conditions.
- B. Estimated Critical Rod Position (ECP) was within 750 pcm of the actual critical conditions. (If the ICRR projects criticality outside 750 pcm of the ECP with the ICRR value < 0.2, then the reactor startup is to be aborted.)
- C. NIS Source Range channels are within one half ($\frac{1}{2}$) decade of each other.

5.3 REVIEW CRITERIA

Estimated Critical Rod Position (ECP) was within 500 pcm of the actual critical conditions. (If the ECP was outside 500 pcm of the actual critical conditions, then a WBN PER is to be generated.)

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6.0 PERFORMANCE

6.1 Sections to be Performed

- [1] **ENSURE** Precautions and Limitations in Section 3.0 have been reviewed. _____
- [2] **ENSURE** Prerequisite Actions in Section 4.0 have been met. _____

NOTES

- 1) Familiarization with the User's Guides and release memorandums for REACTW and REACTINW will allow proper use of the computer programs and input of data.
- 2) Use of Zero Power method is discouraged when the startup burnup is 3 EFPD greater than the previous startup's burnup.

[3] **INDICATE** sections to be performed:

- A. Section 6.2, REACTW/REACTINW ECP Calculation Using Previous At-Power Data. ☐
- B. Section 6.3, REACTW/REACTINW ECP Calculation Using Previous Zero Power Data. ☐
- C. Section 6.4, ECP Hand Calculation Using Previous At-Power Data. ☐
- D. Section 6.5, ECP Hand Calculation Following a Refueling Outage. ☐
- E. Section 6.6, ECP Calculation Using BEACON General 3D Calc. ☐
- F. Section 6.7, ECP Calculation Using BEACON ECC ☐
- G. Section 6.8, Detector Reliability and/or Base Count Rate Determination. ☐
- H. Section 6.9, ICRR Monitoring. ☐
- I. Section 6.10, Critical Data Evaluation. ☐

[4] **PERFORM** selected section(s). _____

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6.2 ECP REACTW/REACTINW Calculation Using Previous At-Power Data

NOTE

The following data can be obtained from the ICS Reactor Engineering Data Log.

- [1] **RECORD** the following data from the last stable at-power condition before shutdown and values expected for the reactor startup for input into the REACTW or REACTINW computer program:

A. Reactor power prior to shutdown: _____ % RTP.

B. Samarium (Sm) parameters for ECP. Select one:

- Input Effective Samarium Power: _____ % ☐
- Input last 10 days' at power' power history. ☐
- Input Sm effective worth (See TI-55). ☐

C. Core average burnup: _____ MWD/MTU.

D. Boron Concentration (C_b): _____ ppm.

E. Bank D Position: _____ steps.

F. Delta Flux ($\delta\Phi$): _____ %.

G. Weighted Average Delta Flux ($\delta\Phi$): _____ %
(Reactor Trip Report or NuPOP Table 7-28)

H. Shutdown Date and Time: ____/____/____ ____:____

Length of time since plant shutdown: _____ hrs.

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6.2 ECP REACTW/REACTINW Calculation Using Previous At-Power Data (continued)

I. Xenon and Iodine values at shutdown for ECP. Select one.

1. No Xe. ☐

2. Equilibrium Xe and I - use STEADY STATE Tables ☐

Equilibrium Rx Power for Xe _____%

3. Input Xe and I - use TI-54 (NIX Tables) ☐

% of Full Power Equilibrium concentration for Xe _____%

% of Full Power Equilibrium concentration for I _____%

4. Use Xe and I - from LAST Xenon Run ☐

% of Full Power Equilibrium concentration for Xe _____%

% of Full Power Equilibrium concentration for I _____%

J. Expected core avg. temperature at startup: _____°F. _____

NOTE

If adjustments to the ECC will be made to account for CIPS or B-10 concentration changes, then the expected boron concentration at startup used as input into REACTINW in the following step should subtract the value(s) for ΔC_b^{CIPS} and ΔC_b^{B-10} recorded in Steps 4.1[4] and 4.1[5], respectively. The ΔC_b^{CIPS} and ΔC_b^{B-10} values will be added back in later.

K. Expected boron concentration at startup: _____ ppm. _____

L. Negative Moderator Temperature Coefficient Withdrawal Limit on Bank D (from NOB Sheet A-5, if applicable):
_____ steps. _____

[2] **RUN REACTW or REACTINW ECC program, AND**

PRINT the output file. _____

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6.2 ECP REACTW/REACTINW Calculation Using Previous At-Power Data (continued)

- [3] **ENSURE** input data is correct and within the range of the data tables in the NuPOP **AND**

NOTIFY Reactor Engineering of any data outside the range for evaluation (**NOT** required if REACTINW is used). _____

- [4] **IF** the 1000 pcm lower limit is less than the COLR Rod Insertion Limit, **THEN**

RE-PERFORM ECP for different conditions until the 1000 pcm lower limit is above the COLR Rod Insertion Limit. _____

- [5] **VERIFY** ECP is above the Control Bank Insertion Limits in the COLR (**Acceptance Criteria 5.1A**). _____

- [6] **IF** applicable, **THEN**

VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.2[1]L (**Acceptance Criteria 5.1B**). _____

- [7] **COMPLETE** required entries on the REACTW output data sheets. _____

- [8] **RECORD** 1000 pcm lower limit:

Bank D at _____ steps.

Bank C at _____ steps. _____

- [9] **ATTACH** computer printouts to Data Package. _____

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6.2 ECP REACTW/REACTINW Calculation Using Previous At-Power Data (continued)

[10] IF an adjustment to the ECC is desired to account for either CIPS or B-10 concentration change effects, **THEN**

PERFORM the following:

A. **DETERMINE** the adjusted ECC boron concentration by adding Step 4.1[4]C and 4.1[5] values to the estimated critical boron concentration from the REACTW or REACTINW output.

$$\text{ECC } C_b = \Delta C_b^{\text{REACTW}} + \Delta C_b^{\text{CIPS}} + \Delta C_b^{\text{B-10}}$$

$$\text{ECC } C_b = \frac{\text{ppm}}{(\text{REACTW})} + \frac{\text{ppm}}{(\text{Step 4.1[4]C})} + \frac{\text{ppm}}{(\text{Step 4.1[5]})}$$

$$\text{ECC } C_b = \text{ppm}$$

B. **ANNOTATE** the REACTW or REACTINW output to reflect the adjusted ECC boron concentration.

NOTE

A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.

[11] **OBTAIN** review of calculations and results by task qualified individual. An STA or SRO may also perform this review.

[12] **OBTAIN** SM/US review and approval of ECP.

SM/US

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6.3 REACTW/REACTINW ECP Calculation Using Previous Zero Power Data

NOTES

- 1) The following data can be obtained from the ICS Reactor Engineering Data Log.
- 2) Use of Zero Power method is discouraged when the startup burnup is 3 EFPD or more greater than the previous startup's burnup.

[1] **RECORD** the following data from a previous reactor startup for input into the REACTW or REACTINW computer program:

A. Core average burnup: _____ MWD/MTU.

B. Core average temperature: _____ °F.

C. Boron Concentration (C_b): _____ ppm.

D. Xenon and Effective Samarium values at startup:

- Xenon Worth: (-) _____ PCM.
- Eff. Samarium Worth: (-) _____ PCM.

E. Delta Axial Offset: _____ %.

F. Bank D Position: _____ steps.

[2] **RECORD** the following data for input into the REACTW or REACTINW computer program from last stable at-power condition before shutdown:

A. Reactor (Rx) power prior to shutdown: _____ %.

B. Sm parameters for ECP. Select one.

- Input Effective Samarium Power: _____ % ☐
- Input last 10 days 'at power' power history. ☐
- Input Sm effective worth (See TI-55). ☐

C. Core average burnup: _____ MWD/MTU.

D. Boron Concentration (C_b): _____ ppm.

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6.3 REACTW/REACTINW ECP Calculation Using Previous Zero Power Data (continued)

E. Bank D Position: _____ steps.

F. Delta Flux ($\delta\Phi$): _____ %.

G. Weighted Average Delta Flux ($\delta\Phi$): _____ %.
(Reactor Trip Report or NuPOP Table 7-28)

H. Shutdown Date and Time: ____/____/____ : ____

Length of time since plant shutdown: _____ hrs.

I. Xenon and Iodine values at shutdown for ECP. Select one.

1. No Xe. ☐

2. Equilibrium Xe and I - use STEADY STATE Tables ☐
Equilibrium Rx Power for Xe _____ %

3. Input Xe and I - use TI-54 (NIX Tables) ☐
% of Full Power Equilibrium concentration for Xe _____ %
% of Full Power Equilibrium concentration for I _____ %

4. Use Xe and I - from LAST Xenon Run ☐
% of Full Power Equilibrium concentration for Xe _____ %
% of Full Power Equilibrium concentration for I _____ %

J. Expected core avg. temperature at startup: _____ °F.

K. Expected critical boron concentration at startup:
_____ ppm.

L. Negative Moderator Temperature Coefficient Withdrawal Limit on Bank D from NOB Sheet A-5 (if applicable):
_____ steps.

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6.3 REACTW/REACTINW ECP Calculation Using Previous Zero Power Data (continued)

[3] **RUN** REACTW or REACTINW ECC program, **AND**

PRINT the output file. _____

[4] **ENSURE** input data is correct and within the range of the data tables in the NuPOP **AND**

NOTIFY Reactor Engineering of any data outside the range for evaluation (**NOT** required if REACTINW is used). _____

[5] **IF** the 1000 pcm lower limit is less than the COLR Rod Insertion Limit, **THEN**

RE-PERFORM ECP for different conditions until the 1000 pcm lower limit is above the COLR Rod Insertion Limit. _____

[6] **VERIFY** ECP is above the Control Bank Insertion limits in the COLR (**Acceptance Criteria 5.1A**). _____

[7] **IF** applicable, **THEN**

VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.3[2]L (**Acceptance Criteria 5.1B**). _____

[8] **COMPLETE** required entries on the REACTW output data sheets. _____

[9] **ATTACH** computer printouts to Data Package. _____

[10] **RECORD** the 1000 pcm lower limit:

Bank D at _____ steps.

Bank C at _____ steps. _____

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**6.3 REACTW/REACTINW ECP Calculation Using Previous Zero
Power Data (continued)**

NOTE

A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.

[11] **OBTAIN** review of calculations and results by task qualified individual. An STA or SRO may also perform this review.

[12] **OBTAIN** SM/US review and approval of ECP.

SM/US

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6.4 ECP Hand Calculation Using Previous At-Power Data

[1] **RECORD** the following data from the last stable at-power condition before shutdown for input into a copy of NuPOP Table 7-16:

- A. Shutdown Date and Time: ____/____/____ : ____
- B. Reactor power before shutdown: _____ %.
- C. Effective Samarium Power (i.e. last 10 days 'at power' power history average): _____ %.
- D. Core average burnup: _____ MWD/MTU.
- E. Boron Concentration (C_b): _____ ppm.
- F. Bank D Position: _____ steps.
- G. Delta Flux ($\delta\Phi$): _____ %.
- H. Weighted Average Delta Flux: _____ %.
(Reactor Trip Report or NuPOP Table 7-28)

[2] **RECORD** the following:

- A. Expected Date and Time of criticality: ____/____/____ : ____
Time since plant shutdown: _____ hrs
- B. Expected Core average temperature at startup:
_____ °F

NOTE

If adjustments to the ECC will be made to account for CIPS or B-10 concentration changes, then the expected boron concentration at startup in the following step should subtract the value(s) for ΔC_b^{CIPS} and ΔC_b^{B-10} recorded in Steps 4.1[4]C and 4.1[5], respectively. The ΔC_b^{CIPS} and ΔC_b^{B-10} values will be added back in later.

- C. Expected boron concentration at startup: _____ ppm
- D. Negative Moderator Temperature Coefficient Withdrawal Limit on Bank D from NOB Sheet A-5 (if applicable):
_____ steps

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6.4 ECP Hand Calculation Using Previous At-Power Data (continued)

- [3] **CALCULATE** ECP using NuPOP ECP calculation worksheets from Table 7-16, **AND**

RECORD signature and date on each data sheet. _____

- [4] **IF** an adjustment to the ECC is desired to account for either CIPS or B-10 concentration change effects, **THEN**

PERFORM the following:

- A. **DETERMINE** the adjusted ECC boron concentration by adding Steps 4.1[4]C and 4.1[5] values to the estimated critical boron concentration from the NuPOP Table 7-16 worksheet:

$$\text{ECC } C_b = \Delta C_b^{\text{NuPOP}} + \Delta C_b^{\text{CIPS}} + \Delta C_b^{\text{B-10}}$$

$$\text{ECC } C_b = \frac{\text{____ ppm}}{(\text{NuPOP})} + \frac{\text{____ ppm}}{(\text{Step 4.1[4]C})} + \frac{\text{____ ppm}}{(\text{Step 4.1[5]})}$$

$$\text{ECC } C_b = \text{____ ppm}$$

- B. **ANNOTATE** the NuPOP Table 7-16 worksheet to reflect the adjusted ECC boron concentration. _____

NOTE

The 1000 pcm lower limit may be used for Mode 2 entry call.

- [5] **RECORD** Total Reactivity Change (Step E.1 of NuPOP Table 7-16 worksheet) = _____ pcm.

- [6] **CALCULATE AND RECORD** the administrative ECC-ACC limits from NuPOP Table 7-29 using the ΔAO from NuPOP Table 7-16 Step D.13 and reactivity values listed below:

- A. Upper 1000 pcm limit:

$$\text{Step 6.4[5]} - 1000 \text{ pcm} = \text{____ pcm.}$$

Bank C at _____ steps & Bank D at _____ steps

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6.4 ECP Hand Calculation Using Previous At-Power Data (continued)

B. Lower 1000 pcm limit:

Step 6.4[5] + 1000 pcm = _____ pcm.

Bank C at _____ steps & Bank D at _____ steps

C. Upper 750 pcm limit:

Step 6.4[5] - 750 pcm = _____ pcm.

Bank C at _____ steps & Bank D at _____ steps

D. Lower 750 pcm limit:

Step 6.4[5] + 750 pcm = _____ pcm.

Bank C at _____ steps & Bank D at _____ steps

E. Upper 500 pcm threshold:

Step 6.4[5] - 500 pcm = _____ pcm.

Bank C at _____ steps & Bank D at _____ steps

F. Lower 500 pcm threshold:

Step 6.4[5] + 500 pcm = _____ pcm.

Bank C at _____ steps & Bank D at _____ steps

[7] IF the 1000 pcm lower limit is less than the COLR Rod Insertion Limits, **THEN**

RE-PERFORM ECP for different conditions until the 1000 pcm lower limit is above the COLR Rod Insertion Limits.

[8] **ATTACH** ECP worksheets to Data Package.

[9] **VERIFY** ECP is above the Control Bank Insertion Limits in the COLR (**Acceptance Criteria 5.1A**).

[10] IF applicable, **THEN**

VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.4[2]D (**Acceptance Criteria 5.1B**).

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6.4 ECP Hand Calculation Using Previous At-Power Data (continued)

[11] **RECORD** the following:

A. Date of calculation: ____/____/____

B. Time of calculation: ____:____ _____

NOTE

A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.

[12] **OBTAIN** review of calculations and results by task qualified individual. An STA or SRO may also perform this review. _____

[13] **OBTAIN** SM/US review and approval of ECP. _____

SM/US

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6.5 ECP Hand Calculation Following a Refueling Outage

[1] **RECORD** the following from NuPOP Table 4-8:

A. All Rods Out (ARO) Critical C_b : _____ ppm.

B. Differential Boron Worth (DBW) at the ARO Critical C_b :
_____ pcm/ppm. _____

[2] **RECORD** the desired Control Bank D rod position for initial criticality (i.e. ECP):

ECP = _____ steps _____

[3] **RECORD** the inserted integral rod worth for the desired critical rod position (Step 6.5[2]) from NuPOP Table 7-30:

Inserted Rod Worth = _____ pcm _____

[4] **IF** performing a dilute-to-critical, **THEN**

CALCULATE the critical boron concentration at the ECP as follows:

$ECC C_b = ARO C_b + (Inserted Rod Worth \div DBW)$

$ECC C_b = \frac{\text{_____ ppm}}{\text{(Step 6.5[1]A)}} + \frac{\text{_____ pcm}}{\text{(Step 6.5[3])}} \div \frac{\text{_____ pcm/ppm}}{\text{(Step 6.5[1]B)}}$

$ECC C_b = \text{_____ ppm}$ for Bank D at _____ steps _____

[5] **IF** performing a pull-to-critical, **THEN**

PERFORM the following sub-steps: _____

A. **RECORD** the ARO Critical C_b inferred by the Sub-Critical Rod Worth Measurement from PET-107:

Inferred ARO $C_b = \text{_____ ppm}$ _____

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6.5 ECP Hand Calculation Following a Refueling Outage (continued)

B. **CALCULATE** the critical boron concentration at the ECP as follows:

$$\text{ECC } C_b = \text{Inferred ARO } C_b + (\text{Inserted Rod Worth} \div \text{DBW})$$

$$\text{ECC } C_b = \frac{\text{____ ppm}}{(\text{Step 6.5[5]A})} + \frac{\text{____ pcm}}{(\text{Step 6.5[3]})} \div \frac{\text{____ pcm/ppm}}{(\text{Step 6.5[1]B})}$$

$$\text{ECC } C_b = \text{____ ppm} \quad \text{for Bank D at ____ steps}$$

[6] **VERIFY** ECP is above the Control Bank Insertion Limits in the COLR (**Acceptance Criteria 5.1A**). _____

[7] **IF** applicable, **THEN** _____

VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.4[2]D (**Acceptance Criteria 5.1B**). _____

NOTE

The 1000 pcm lower limit may be used for Mode 2 entry call.

[8] **CALCULATE, AND RECORD** the UPPER and LOWER Acceptance Bands:

A. **DETERMINE** the Upper 1000 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} - 1000 \text{ pcm} = \text{____ pcm}$$

Bank C at ____ steps & Bank D at ____ steps

B. **DETERMINE** the Lower 1000 pcm Limit from NuPOP Table 7-30:

$$\text{Step 6.5[3]} + 1000 \text{ pcm} = \text{____ pcm}$$

Bank C at ____ steps & Bank D at ____ steps

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6.5 ECP Hand Calculation Following a Refueling Outage (continued)

- C. **DETERMINE** the Upper 750 pcm Limit from NuPOP Table 7-30:

Step 6.5[3] - 750 pcm = _____ pcm

Bank C at _____ steps & Bank D at _____ steps

- D. **DETERMINE** the Lower 750 pcm Limit from NuPOP Table 7-30:

Step 6.5[3] + 750 pcm = _____ pcm

Bank C at _____ steps & Bank D at _____ steps

- E. **DETERMINE** the Upper 500 pcm Limit from NuPOP Table 7-30:

Step 6.5[3] - 500 pcm = _____ pcm

Bank C at _____ steps & Bank D at _____ steps

- F. **DETERMINE** the Lower 500 pcm Limit from NuPOP Table 7-30:

Step 6.5[3] + 500 pcm = _____ pcm

Bank C at _____ steps & Bank D at _____ steps _____

- [9] **RECORD** the following:

A. Date of calculation: ____/____/____

B. Time of calculation: ____:____ _____

NOTE

A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.

- [10] **OBTAIN** review of calculations and results by task qualified individual. An STA or SRO may also perform this review. _____

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6.5 ECP Hand Calculation Following a Refueling Outage (continued)

[11] **OBTAIN** SM/US review and approval of ECP.

SM/US

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6.6 ECP Calculation using BEACON General 3D Calc

NOTE

Familiarization with BEACON User's Guides will enable proper use of BEACON.

[1] **PERFORM** the following to obtain the Reference Statepoint:

A. **START** BEACON for the current unit and cycle. _____

B. **SELECT** *BEACON Analysis > Function > General 3D Calc.* _____

NOTE

Up until the last depletion step, "**Boron**" searches may be performed. The input of the actual RCS boron concentration and the "**None**" search need only be performed in the last depletion step.

C. **DEplete** a BEACON model to the exact conditions of a stable plant condition just prior to the plant shutdown using a "**Criticality Search**" of "**None**" and "**Time Step**" depletions. _____

D. **RECORD** the following information:

Model: _____

Power: _____ rel (actual)

Tin: _____ °F (actual)

Burnup: _____ MWD/MTU (actual)

K eff: _____ (calculated)

Boron: _____ ppm (actual)

D Bank: _____ steps (actual)

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

[2] **PERFORM** the following to obtain the Shutdown Statepoint:

NOTE

It does not matter that "**Desired K**" defaults to 1.00000 in the following depletions.

A. **DEplete** the BEACON model created in Step 6.6[1]C to mimic reactor operations from the time of the Reference Statepoint to the time of the reactor shutdown using a "**Criticality Search**" of "**Boron**" and "**Time Step**" depletions.

B. **RECORD** the following information:

Model: _____

Power: 0 rel (defined)

Tin: 557 °F (defined)

Burnup: _____ MWD/MTU (calculated)

Time: _____ hr (calculated)

Shutdown Date and Time: ____/____/____ at ____:____

NOTE

If a "**Rods**" search will be performed in the following step **AND** if adjustments to the ECC will be made to account for CIPS or B-10 concentration changes, then the expected boron concentration at startup used as input into BEACON should subtract the value(s) for ΔC_b^{CIPS} and ΔC_b^{B-10} recorded in Steps 4.1[4]C and 4.1[5], respectively. The ΔC_b^{CIPS} and ΔC_b^{B-10} values will be added back in later.

[3] **PERFORM** the following to obtain the Startup Statepoint:

A. **DEplete** the BEACON Model created in Step 6.6[2]A to the conditions for the reactor startup with the "K eff" from Step 6.6[1]D entered as "**Desired K**" and using a "**Time Step**" depletion. A "**Criticality Search**" of either "**Boron**" or "**Rods**" may be used depending upon which parameter is desired to remain fixed.

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

B. **RECORD** the following information:

Model: _____

Power: 0 rel (defined)

Tin: 557 °F (defined)

Burnup: _____ MWD/MTU (same)

Time: _____ hr (calculated)

K eff: _____ (from Step 6.6[1]D)

Boron: _____ ppm

Xe Worth: _____ pcm (calculated)

Sm Worth: _____ pcm (calculated)

D Bank: _____ steps

Startup Date and Time: ____/____/____ at ____:____

[4] **ADJUST** the ECC boron concentration for CIPS or B-10 concentration change effects by adding Steps 4.1[4]C and 4.1[5] values to the estimated critical boron concentration from Step 6.6[3]B, as applicable:

$$\text{ECC } C_b = \Delta C_b^{\text{BEACON}} + \Delta C_b^{\text{CIPS}} + \Delta C_b^{\text{B-10}}$$

$$\text{ECC } C_b = \frac{\text{ppm}}{(\text{Step 6.6[3]B})} + \frac{\text{ppm}}{(\text{Step 4.1[4]C})} + \frac{\text{ppm}}{(\text{Step 4.1[5]})}$$

$$\text{ECC } C_b = \text{ppm}$$

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

[5] **PERFORM** the following to obtain the K eff value with Control Banks Inserted (CBI):

A. **DEplete** the BEACON Model created in Step 6.6[3]A with Control Banks Inserted (CBI) using a "**Criticality Search**" of "**None**" and a "**Time Step**" depletion of 0 hours.

B. **RECORD** the following information:

Model: _____

K eff: _____ (calculated)

D Bank: _____ 0 steps (defined)

C Bank: _____ 0 steps (defined)

B Bank: _____ 0 steps (defined)

A Bank: _____ 0 steps (defined)

[6] **PERFORM** the following to obtain the K eff value with control banks at the Rod Insertion Limit (RIL):

A. **DEplete** the BEACON Model created in Step 6.6[5]A with control banks at the Rod Insertion Limit (RIL) using a "**Criticality Search**" of "**None**" and a "**Time Step**" depletion of 0 hours.

B. **RECORD** the following information:

Model: _____

K eff: _____ (calculated)

D Bank: _____ 0 steps (defined)

C Bank: _____ steps (COLR)

B Bank: _____ steps (COLR)

A Bank: _____ 228 steps (defined)

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

[7] **PERFORM** the following to obtain the K eff value with control banks at the Full Out Rod Position:

A. **DEplete** the BEACON Model created in Step 6.6[6]A with control banks at the Full Out Rod Position using a "**Criticality Search**" of "**None**" and a "**Time Step**" depletion of 0 hours.

B. **RECORD** the following information:

Model: _____

K eff: _____ (calculated)

D Bank: _____ steps (NOB Sh A-7)

C Bank: _____ steps (NOB Sh A-7)

B Bank: _____ steps (NOB Sh A-7)

A Bank: _____ steps (NOB Sh A-7)

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

NOTE

A facsimile of Appendix B Table 1 may be completed and attached to the data package in place of Appendix B Table 1.

[8] **PERFORM** the following to obtain the bank positions associated with the conditions listed in Appendix B Table 1 with the reactor critical (ICRR = 0):

A. **RECORD** the reference effective multiplication factor, $K_{\text{eff}}^{\text{Ref}}$, for each condition in Table 1 from the "K eff" value recorded in earlier steps as specified. _____

B. **CALCULATE AND RECORD** the effective multiplication factor, Desired K, for each condition in Table 1 using the applicable values from Table 1 according to the following equation: _____

$$\text{Desired K} = \frac{K_{\text{eff}}^{\text{Ref}}}{1 - K_{\text{eff}}^{\text{Ref}} \cdot \left(\frac{\text{Limit}}{100,000} \right)}$$

C. **DEplete** the previous BEACON Model for each "Desired K" in Appendix B Table 1 using a "**Criticality Search**" of "**Rods**" and a "**Time Step**" depletion of 0 hours **AND** _____

RECORD the Control Bank positions in Appendix B Table 1. _____

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

NOTE

If it is not desired to predict the ICRR plots for the ECC or the various administrative limits, then Step 6.6[9] through 6.6[11] may be marked N/A.

NOTE

A facsimile of Appendix B Table 2 may be completed and attached to the data package in place of Appendix B Table 2.

- [9] **PERFORM** the following to obtain the bank positions associated with the conditions listed in Appendix B Table 2 with the ICRR at the 8-Fold point (ICRR = 0.125):
- RECORD** the reference effective multiplication factor, $K_{\text{eff}}^{\text{Ref}}$, for each condition in Table 2 from the "K eff" value recorded in earlier steps as specified.
 - CALCULATE and RECORD** the effective multiplication factor, Desired K, for each condition in Table 2 using the "K eff" value from Step 6.6[5]B as $K_{\text{eff}}^{\text{CBI}}$ and the applicable values from Table 2 according to the following equation:

$$\text{Desired K} = K_{\text{eff}}^{\text{CBI}} + \frac{7}{8} \cdot \left[\left(\frac{K_{\text{eff}}^{\text{Ref}}}{1 - K_{\text{eff}}^{\text{Ref}} \cdot \left(\frac{\text{Limit}}{100,000} \right)} \right) - K_{\text{eff}}^{\text{CBI}} \right]$$

- DEplete** the previous BEACON Model for each "Desired K" in Appendix B Table 2 using a "**Criticality Search**" of "**Rods**" and a "**Time Step**" depletion of 0 hours and **RECORD** the Control Bank positions in Appendix B Table 2.

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

NOTE

A facsimile of Appendix B Table 3 may be completed and attached to the data package in place of Appendix B Table 3.

[10] **PERFORM** the following to obtain the bank positions associated with the conditions listed in Appendix B Table 3 with the ICRR at the 4-Fold point (ICRR = 0.25):

- A. **RECORD** the reference effective multiplication factor, $K_{\text{eff}}^{\text{Ref}}$, for each condition in Table 3 from the "K eff" value recorded in earlier steps as specified.
- B. **CALCULATE and RECORD** the effective multiplication factor, Desired K, for each condition in Table 3 using the "K eff" value from Step 6.6[5]B as $K_{\text{eff}}^{\text{CBI}}$ and the applicable values from Table 3 according to the following equation:

$$\text{Desired K} = K_{\text{eff}}^{\text{CBI}} + \frac{3}{4} \cdot \left[\left(\frac{K_{\text{eff}}^{\text{Ref}}}{1 - K_{\text{eff}}^{\text{Ref}} \cdot \left(\frac{\text{Limit}}{100,000} \right)} \right) - K_{\text{eff}}^{\text{CBI}} \right]$$

- C. **DEplete** the previous BEACON Model for each "Desired K" in Appendix B Table 3 using a "**Criticality Search**" of "**Rods**" and a "**Time Step**" depletion of 0 hours **AND**

RECORD the Control Bank positions in Appendix B Table 3.

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

[11] **PLOT** the projected ICRRs (i.e. 0.0, 0.125, and 0.25) for each condition specified in the tables of Appendix B as a function of the recorded rod positions. _____

[12] **RECORD** the following information:

A. Expected Date & Time of Criticality:

____/____/____ at ____:____ _____

B. Expected Critical Rod Position on Bank D (Step 6.6[3]B):

_____ steps _____

C. Expected Critical C_b (Step 6.6[4]): _____ ppm _____

D. Negative Moderator Temperature Coefficient Withdrawal Limit on Bank D (from NOB Sheet A-5, if applicable):

_____ steps _____

NOTE

The 1000 pcm lower limit may be used for Mode 2 entry call.

[13] **IF** the 1000 pcm lower limit is less than the COLR Rod Insertion Limits, **THEN**

RE-PERFORM ECP for different conditions until the 1000 pcm lower limit is above the COLR Rod Insertion Limits. _____

[14] **VERIFY** ECP is above the Control Bank Insertion Limits in the COLR (**Acc Crit**). _____

[15] **IF** applicable, **THEN**

VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.6[12]D (**Acc Crit**). _____

[16] **RECORD** the following:

A. Date of calculation: ____/____/____

B. Time of calculation: ____:____ _____

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6.6 ECP Calculation using BEACON General 3D Calc (continued)

NOTE

A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.

[17] **OBTAIN** review of calculations and results by task qualified individual.

[18] **OBTAIN** SM/US review and approval of ECP.

SM/US

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6.7 ECP Calculation using BEACON ECC

NOTE

Familiarization with BEACON User's Guides will enable proper use of BEACON.

[1] **PERFORM** the following to obtain the Reference Statepoint:

[1.1] **START BEACON** for the current unit and cycle. _____

NOTE

The input model shall mimic the core conditions for the last 120 hours of operating history and shall be properly calibrated to a flux map per TI-7.020 and have a calibrated K bias per TI-7.020. The "*current*" model is preferred, although it may be manually depleted to a convenient reference time. The "*trip*" model may be used, but must be validated prior to use.

[1.2] **IF** the "*trip*" model file is being considered for the ECC model input file, **THEN**

VALIDATE by performing the following: _____

otherwise proceed to Step 6.7[1.3]

A. **SELECT** *BEACON Monitor > Function > Cycle History Data*. _____

B. **SELECT** "**Table**" as the "**Data Display Format**" from the "**Plant History Data Selection**" pop-up window. _____

C. **SELECT** a "**Time Interval**" that includes the reactor shutdown. _____

D. **SELECT** "**Calendar Time**" from the "**Exposure**" tab. _____

E. **SELECT** "**AO Rod Value**" from the "**Table Only**" tab. _____

F. **SELECT** any other parameter(s) useful in identifying the reactor shutdown. _____

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6.7 ECP Calculation using BEACON ECC (continued)

G. **SELECT** the "Display" button. _____

H. **REVIEW** the "AO Rod Values" subsequent to the reactor shutdown from the "History Data" pop-up window. _____

I. **IF** the value remains stable at approximately the value that existed prior to the reactor shutdown, **AND** its absolute value remains less than 0.001, **THEN**

CONCLUDE the "trip" model is acceptable **AND** **CONTINUE** with Step 6.7[1.3]. _____

J. **IF** further evaluation of the "trip" model file is necessary, **THEN**

PERFORM the following. **OTHERWISE** **CONTINUE** with Step 6.7[1.3]. _____

K. **SELECT** *BEACON Analysis > Function > General 3D Calc.* _____

L. **SELECT** the "trip" "Model Input File". _____

M. **DEplete** the model to a convenient time. _____

N. **OPEN** the "Model Output File" generated in Step 6.7[1.2]M using Personal Files (blue barn) from /wbn1/beacon/wbr1c#/output directory. _____

O. **IF** the value for "Axial Offset Corrector" on the "E-COR Core Summary - Predicted" edit of the output file is approximately equal to the "AO Rod Value" prior to the reactor shutdown, **AND** its absolute value is less than 0.001, **THEN**

CONCLUDE the "trip" model is acceptable. _____

[1.3] **OBTAIN** a calibrated BEACON model for a desired reference time. _____

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6.7 ECP Calculation using BEACON ECC (continued)

[1.4] **RECORD** the following information:

Model: _____

Reference Time: ____:____ ____/____/____

Power: _____ rel (actual)

Burnup: _____ MWD/MTU (actual)

K eff: _____ (calculated)

Boron: _____ ppm (actual)

D Bank: _____ steps (actual)

[2] **PERFORM** the following to initiate the ECC calculations:

[2.1] **SELECT** *BEACON Analysis > Function > ECC*.

[2.2] **SELECT** the desired "**Model Input File**" from 6.7[1.3]

[2.3] **ENTER** the desired "**Summary Results File**".

[2.4] **ENSURE** the appropriate "**Calibration File**".

[2.5] **RECORD** what was entered:

Model Input File:	
Summary Results File:	
Calibration File:	

[2.6] **SELECT** the desired "**Calculation Type**" on the "**Calc Options**" tab.

[2.7] **SELECT** the desired "**Time Frame**" on the "**Calc Options**" tab.

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6.7 ECP Calculation using BEACON ECC (continued)

[2.8] **RECORD** what was selected:

Calculation Type

- ☐ Boron vs. Time
- ☐ Rods vs. Time
- ☐ Boron vs. Rods

Time Frame:

- ☐ 0-16 Hours
- ☐ 12-36 Hours
- ☐ 1-4 Days
- ☐ 3-31 Days
- ☐ User Defined

Start Time: hr

Time Step: hr

Number of Steps:

[2.9] **IF** the reactor startup will be performed via a "pull-to-critical", **THEN**

SELECT the "Acceptance Band Search" of "Rods" on the "Band Options" tab.

[2.10] **IF** the reactor startup will be performed via a "dilute-to-critical", **THEN**

SELECT the "Acceptance Band Search" of "Boron" on the "Band Options" tab.

NOTE

The BEACON ECC will need to be performed 3 times; once each for the ± 500 pcm, ± 750 pcm, and ± 1000 pcm bands.

[2.11] **ENTER** the appropriate "Acceptance Band Bias" on the "Band Options" tab.

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6.7 ECP Calculation using BEACON ECC (continued)

[2.12] **RECORD** what was selected:

Acceptance Band Search:

☐ Rods

☐ Boron

[2.13] **VERIFY** the "**Model Type**" of "**3D**" is selected on the "**Model Geometry**" tab.

[2.14] **SELECT** the appropriate "**Radial Geometry**" on the "**Model Geometry**" tab.

NOTE

The A/O Correction (AOROD) adjustment performed by the BEACON Monitor function is specifically designed to adjust the ANC-based prediction of the core axial power distribution to account for true core conditions, such as Crud Induced Power Shift (CIPS), as determined during the last calibration. The impact of this adjustment can be selectively removed. The removal of this correction may effectively simulate the behavior of the CIPS mechanism following a reactor trip. **IF** CIPS adjustments are desired, **THEN** the A/O Correction should be de-selected.

[2.15] **IF** CIPS effects are to be modeled for this ECC, **THEN**

DE-SELECT the "**A/O Correction**" of the "**Model Geometry**" tab.

[2.16] **RECORD** what was selected:

Model Type:

☐ 3D

☐ 1D

Radial Geometry:

☐ Full Core

☐ Quarter/Eighth Core

☐ Use A/O Correction

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6.7 ECP Calculation using BEACON ECC (continued)

- [2.17] **VERIFY** the "Use Depleted B-10" box is **not** selected on the "Core Conditions" tab. _____

NOTE

If a "Rods" search will be performed in the following step **AND** if adjustments to the ECC will be made to account for B-10 concentration changes, then the expected boron concentration at startup used as input into BEACON should subtract the value for ΔC_b^{B-10} recorded in Step 4.1[5]. The ΔC_b^{B-10} value will be added back in later.

- [2.18] **IF** "Rods vs, Time" was selected as the "Calculation Type" in Step 6.7[2.6], **THEN**

ENTER the desired "Nominal Boron" on the "Core Conditions" tab. _____

- [2.19] **VERIFY** the desired K-bias value on the "Core Conditions" tab corresponds to the current K-bias from the applied model calibration. _____

- [2.20] **RECORD** what was entered:

Nominal Boron: ppm (N/A if Boron vs. Time)

Desired K-bias:

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6.7 ECP Calculation using BEACON ECC (continued)

NOTE

The "Use Rod Overlap" box may need to be de-selected if the Full Out Position for the quarter does not correspond to the nominal Full Out Position assumed in the cycle design.

[2.21] IF "Boron vs. Time" was selected as the "Calculation Type" in Step 6.7[2.6], THEN

ENTER the desired rod positions on the "Rod Positions" tab AND

RECORD what was entered:

D Bank:	<input type="text"/>	steps
C Bank:	<input type="text"/>	steps
B Bank:	<input type="text"/>	steps
Full Out Position:	<input type="text"/>	steps

[2.22] SELECT the "Calculate" button at the bottom of the "BEACON Analysis-ECC" window.

[2.23] WHEN the calculation is complete, THEN

SELECT the "OK" button on the "BEACON Calculation Messages" pop-up window AND

SELECT the "Review" button at the bottom of the "BEACON Analysis-ECC" window.

[2.24] OBTAIN a copy of the output.

[3] PERFORM the following to complete the ECC calculations:

[3.1] RECORD the following values in Appendix C Table 1 for each desired time step from the output obtained in Step 6.7[2.24]:

- Time since Input Model
- D Bank Position
- RCS Boron Concentration (C_b)

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6.7 ECP Calculation using BEACON ECC (continued)

[3.2] **RECORD** the ΔC_b^{B-10} value from Step 4.1[5] into Appendix C Table 1 for each time step. _____

[3.3] **ADJUST** the ECC boron concentration for B-10 concentration change effects by adding the ΔC_b^{B-10} values to the RCS Boron Concentration (C_b) for each time step in Appendix C Table 1. _____

[3.4] **RECORD** the Calendar Date and Time in Appendix C Table 1 for each time step. _____

[4] **RECORD** the following information for the ECC Time step to be used for the Reactor Startup from Appendix C Table 1:

- Expected Date & Time of Criticality:
____/____/____ at ____:____
- Expected Critical Rod Position on Bank D: _____ steps
- Expected Critical C_b : _____ ppm _____

[5] **RECORD** the Negative Moderator Temperature Coefficient Withdrawal Limit on Bank D (from NOB Sheet A-5, if applicable): _____ steps _____

NOTE

The 1000 pcm lower limit may be used for Mode 2 entry call.

[6] **IF** the 1000 pcm lower limit is less than the COLR Rod Insertion Limits, **THEN**

RE-PERFORM ECP for different conditions until the 1000 pcm lower limit is above the COLR Rod Insertion Limits. _____

[7] **VERIFY** ECP is above the Control Bank Insertion Limits in the COLR (**Acceptance Criteria 5.1A**). _____

[8] **IF** applicable, **THEN**

VERIFY ECP is below the Negative MTC Withdrawal Limit from Step 6.7[5] (**Acceptance Criteria 5.1B**). _____

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6.7 ECP Calculation using BEACON ECC (continued)

[9] **RECORD** the UPPER and LOWER Acceptance Bands from the output obtained in Step 6.7[2.24] for the ECC Time step to be used for the Reactor Startup:

- A. Upper 1000 pcm Limit
Bank C at _____ steps & Bank D at _____ steps
- B. Lower 1000 pcm Limit
Bank C at _____ steps & Bank D at _____ steps
- C. Upper 750 pcm Limit
Bank C at _____ steps & Bank D at _____ steps
- D. Lower 750 pcm Limit
Bank C at _____ steps & Bank D at _____ steps
- E. Upper 500 pcm Threshold
Bank C at _____ steps & Bank D at _____ steps
- F. Lower 500 pcm Threshold
Bank C at _____ steps & Bank D at _____ steps

[10] **RECORD** the following:

- A. Date of calculation: ____/____/____
- B. Time of calculation: ____:____

NOTE

A review of the ECP during the performance of this instruction should be performed prior to performing any associated reactivity manipulations.

[11] **OBTAIN** review of calculations and results by task qualified individual.

[12] **OBTAIN** SM/US review and approval of the ECP.

SM/US

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6.8 Detector Reliability and/or Base Count Rate Determination

NOTE

Section 6.8 must be performed prior to initiating ICRR monitoring.

- [1] **RECORD** N-131 Count Rate (CR) _____ cps _____
- [2] **MULTIPLY** Step 6.8[1] by $10^{(1/2)}$ _____ cps _____
- [3] **MULTIPLY** Step 6.8[1] by $10^{(-1/2)}$ _____ cps _____
- [4] **RECORD** N-132 Count Rate (CR) _____ cps _____
- [5] **VERIFY** STEP 6.8[4] falls within the range or equal to Steps 6.8[2] and 6.8[3] (**Other Acceptance Criteria 5.2C**). _____
- [6] IF channel count rates are **NOT** within $\pm 1/2$ decade, **THEN**
NOTIFY SM/SRO. _____
- [7] **RECORD** the Base Count Rate information for channel(s) of interest on Appendix A, as appropriate. _____
- [8] **CHECK** source range detector Audio Count Rate circuit CHANNEL SELECTOR switch is set to desired position (N-31 or N-32), is operating, and emitting a detectable tone.³ _____
- [9] **CHECK** Startup Rate (SUR) Meters on 1-M-13 selected to a Source Range Detector. _____
- [10] IF switch positions needs changing, as determined by the Test Director, **THEN**
REQUEST Operations to select appropriate positions for Step 6.8[8] and 6.8[9] above. _____

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**6.8 Detector Reliability and/or Base Count Rate Determination
(continued)**

CAUTION

Placing Shutdown Monitor to 1/M mode will disable Shutdown Monitoring and bring in the High Flux at Shutdown alarm; therefore, this step should be performed after High Flux At Shutdown is BLOCKED.

- [11] **IF** High Flux At Shutdown has been BLOCKED and it is desired to place the Source Range Shutdown Monitoring Panels to 1/M mode, **THEN**

REQUEST Unit SRO to place the Source Range Shutdown Monitoring Panels to 1/M mode by PRESSING the button marked 1/M.

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6.9 ICRR Monitoring

NOTES

- 1) Section 6.8 must be performed prior to initiating ICRR monitoring to collect base count rate data and to set the Shutdown Monitor to the 1/M mode.
- 2) The Test Director will have determined which detector or detectors are to be used for ICRR monitoring based on the evolution.

- [1] **VERIFY** the estimated critical control bank position is within the limits specified in the COLR:

	Yes	No	N/A
ABOVE the Control Bank Insertion Limits (Acceptance Criteria 5.1.A)	<input type="checkbox"/>	<input type="checkbox"/>	
BELOW the Negative MTC Withdraw Limit in NOB Sheet A-5 (Acceptance Criteria 5.1.B, if applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

AND

RECORD the date and time:

____/____/____ :____

- [2] **DETERMINE**, based on the evolution being performed, the method to be used for determining ICRR (1/M) information and prepare the appropriate data sheets from Appendix A. _____
- [3] **DETERMINE** which ICRR Plot(s) are to be made, data collection frequency / time duration for the ICRR monitoring based on the evolution being performed. _____
- [4] **ENSURE** information at the top of appropriate ICRR Monitoring Sheets (Appendix A) is filled in. _____

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6.9 ICRR Monitoring (continued)

NOTE

Data and place keeping for Steps 6.9[5] through 6.9[10] are recorded on Appendix A.

[5] IF desired and time permits and not already performed, THEN

CALCULATE the desired ICRR values that would be expected if criticality were to occur at the Acceptance and Review Criteria limits per Step 6.6 and **ANNOTATE** the ICRR plots accordingly.

NOTES

- 1) The following steps are GENERIC for all ICRR monitoring and will be repeated numerous times.
- 2) When the Scalar/Timer is used, the count period (ΔT) may be adjusted at the discretion of the Test Director (minimum of 10 seconds and at least 1000 counts/ ΔT period).
- 3) Following incremental additions of reactivity, a pause of 1 to 4 minutes should occur prior to ICRR data collection to allow subcritical multiplication to increase thermal neutron flux to approx. its equilibrium value. As criticality is approached (i.e., k_{eff} approaches 1.0), neutron flux stabilization time should become longer prior to data collection. This approach permits a more accurate determination to be made of core reactivity changes, and predicted critical condition.

[6] **OBTAIN** and **RECORD**, at the data collection frequency determined by the Test Director, count, count rate or 1/M data for applicable detector(s).

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6.9 ICRR Monitoring (continued)

[7] **COMPUTE** and **RECORD** the ICRR for applicable detector(s):

$$\text{ICRR} = \frac{\text{Base Count Rate}}{\text{Count Rate}} = \frac{(C_0)}{(C_i)}$$

NOTES

- 1) The Test Director will determine which ICRR plots are required based on the evolution.
- 2) It is **NOT** required to use the figures provided in Appendix A for plotting ICRR data. Larger graph paper or a computer can be used at the discretion of the Test Director.

[8] **PLOT** the resultant ICRR for applicable detector(s) as a function of the parameter specified by the Test Director.

Examples:

- A. ICRR vs Control Bank Position.
- B. ICRR vs Time.
- C. ICRR vs Gallons of Primary Water Added.
- D. ICRR vs RCS Boron Concentration.

[9] **DETERMINE** the predicted critical condition by straight line extrapolation of the two most recent ICRR data points on the graph to an ICRR value of zero at the axis, **AND**

REVIEW the plotted ICRR data with the Unit Supervisor for trends which indicate reactivity abnormalities AND for criticality predictions within the next withdrawal sequence.

[10] **IF** ICRR performance is for OTHER than approach to criticality, AND criticality is predicted before the next ICRR, **THEN** ⁴

- A. **STOP** positive reactivity additions, **AND**
- B. **NOTIFY** the SRO, **AND**
- C. **CONTINUE** to monitor ICRR verses time, **AND**
- D. **EVALUATE** to determine the cause before proceeding. _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 53 of 69
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Data Package: Page ____ of ____

Date _____

6.9 ICRR Monitoring (continued)

NOTES

- 1) **IF** criticality is predicted close to the next planned hold point **OR**

IF the control rods are passing through a region of especially high worth, **THEN**

The recommendation of a sooner hold point should be considered.
- 2) The reactor startup should **NOT** be aborted until the ICRR becomes less than 0.2. If the ICRR data is **NOT** behaving as expected, additional hold points should be used to confirm criticality will be achieved within the 750 pcm Review Criteria.

[11] **IF** criticality is predicted before the next ICRR, **THEN** ⁴

A. **EVALUATE** the ECP for:

- Time of calculation
- +/- 500 pcm Review Criteria
- +/- 750 pcm Other Acceptance Criteria
- +/- 1000 pcm Acceptance Criteria

B. **IF** advisable, **THEN**

RECOMMEND to the SRO continued startup.

[12] **CONTINUE** monitoring ICRR data by repeating Steps 6.9[6] through 6.9[12] until directed by the Test Director to stop.

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 54 of 69
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Data Package: Page ____ of ____

Date _____

6.10 Critical Data Evaluation

[1] **RECORD** the following critical data, **AND**

EVALUATE against the ECP.⁴

A. Date and time for ECP: ____/____/____ ____:____

B. Date and time of criticality: ____/____/____ ____:____

C. Core average temperature: _____°F.

D. Control bank position: _____ steps.

E. C_b: _____ ppm.

[2] **VERIFY** the elapsed time from Step 6.9[1] to Step 6.10[1]B was less than 4 hours.

[3] **VERIFY** ECP was within 1000 pcm of actual criticality (**Other Acceptance Criteria 5.2A**).

[4] **VERIFY** ECP was within 750 pcm of actual criticality (**Other Acceptance Criteria 5.2B**).

[5] **VERIFY** ECP was within 500 pcm of actual criticality (**Review Criteria 5.3**).

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 55 of 69
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Data Package: Page ____ of ____

Date _____

7.0 POST PERFORMANCE ACTIVITY

[1] **NOTIFY** SM/Unit SRO that this instruction is field complete. _____

[2] **RECORD** completion date & time on Surveillance Task Sheet. _____

[3] **IF** ECP was **NOT** within 500 pcm of actual criticality, **THEN** _____

ENSURE the ECP differences are documented in a WBN PER
in accordance with the Corrective Action Program. _____

NOTE

Placing Shutdown Monitor to Shutdown Monitor mode will enable Shutdown Monitoring; therefore, this step should be performed after the Source Range drawer has been de-energized.

[4] **REQUEST** Unit SRO to place the Source Range N-31
Shutdown Monitor Panel to Shutdown Monitor mode by
PRESSING the button marked 1/M on panel 1-NI-92-133-D.
(May be NA'd if 1/M mode **NOT** used.) _____

[5] **ENSURE** high flux Alarm LED on panel 1-NI-92-133-D is **NOT**
LIT. _____

[6] **ENSURE** HIGH FLUX AT SHUTDOWN bistable on CH I
NEUTRON MON SOURCE RNG DWR, 1-NI-92-131-D, is **NOT**
LIT. _____

[7] **REQUEST** Unit SRO to place the Source Range N-32
Shutdown Monitor Panel to Shutdown Monitor mode by
PRESSING the button marked 1/M on panel 1-NI-92-134-E.
(May be NA'd if 1/M mode **NOT** used.) _____

[8] **ENSURE** high flux Alarm LED on panel 1-NI-92-134-E is **NOT**
LIT. _____

[9] **ENSURE** HIGH FLUX AT SHUTDOWN bistable on CH II
NEUTRON MON SOURCE RNG DWR, 1-NI-92-132-E, is **NOT**
LIT. _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 56 of 69
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Data Package: Page ____ of ____

Date _____

7.0 POST PERFORMANCE ACTIVITY (continued)

NOTE

Starting the exposure calculation on the ICS is performed from the CORE EXPOSURE FUNCTION MENU (turn on code "corx"). To start the calculations the previous cycle's exposure calculations must have been turned OFF or it may be turned off at this time prior to starting the function. A YES answer is required to be entered in the ICS when queried.

[10] **IF** this is the initial startup after a refueling, **THEN**

ENSURE the Core Exposure function on the ICS Computer is started for the cycle.. _____

8.0 RECORDS

8.1 QA Records

The Data Package is a QA record, is handled in accordance with the Document Control and Records Management Program, and contains the following:

- A. Completed parts of Sections 4.0, 6.0, and 7.0
- B. Section 5.0.
- C. Surveillance Task Sheet.
- D. Completed Appendix Data Sheets.
- E. Other sheets added during performance.

8.2 Non-QA Records

None

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 58 of 69
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**Appendix A
(Page 2 of 6)**

ICRR Monitoring

ICRR Monitoring Using Shutdown Monitor 1/M Display VS. ROD POSITION

SOURCE RANGE CHANNEL: N-131, and N-132

Bank ID	Bank Position (Steps)	ICRR [1/M] Channel N-131	ICRR [1/M] Channel N-132	Initial
CBA	50			
CBA	100			
CBA/B	150/34			
CBA/B	200/84			
CBB/C	134/18			
CBB/C	184/68			
CBC/D	118/2			
CBC/D	168/52			
CBC/D				
CBD				
CBD				
CBD				
CBD				
CBD				
CBD				

Reviewed By: _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 59 of 69
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**Appendix A
(Page 3 of 6)**

ICRR Monitoring

Data Package: Page ____ of ____

Date _____

ICRR MONITORING USING COUNT RATE METER

SOURCE RANGE CHANNEL: N-131 ☐, or N-132 ☐

Bank ID	Bank Position (Steps)	Count Rate (C _i) [Counts/ΔT]	Base Count Rate (C ₀) (cps)	ICRR [C ₀ /C _i]	Initial
Initial C ₀					
CBA	50				
CBA	100				
CBA/B	150/34				
CBA/B	200/84				
CBB/C	134/18				
CBB/C	184/68				
CBC/D	118/2				
CBC/D	168/52				
CBC/D					
CBD					
CBD					
CBD					
CBD					
CBD					
CBD					

Reviewed By: _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 60 of 69
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**Appendix A
(Page 4 of 6)**

ICRR Monitoring

Data Package: Page ____ of ____

Date _____

ICRR MONITORING USING SCALAR TIMER

SOURCE RANGE CHANNEL: N-131 ☐, or N-132 ☐

Bank ID	Bank Position (Steps)	Counts	Count Period [ΔT] (sec)	Count Rate (C _i) [Counts/ΔT] (cps)	Base Count Rate (C ₀) (cps)	ICRR [C ₀ /C _i]	Initial
Initial ΔT and C ₀							
CBA	50						
CBA	100						
CBA/B	150/34						
CBA/B	200/84						
CBB/C	134/18						
CBB/C	184/68						
CBC/D	118/2						
CBC/D	168/52						
CBC/D							
CBD							
CBD							
CBD							
CBD							
CBD							
CBD							

Reviewed By: _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 63 of 69
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**Appendix B
(Page 1 of 3)
Predicted ICRRs**

Data Package: Page ____ of ____

Date _____

Table 1

ROD POSITIONS AT CRITICALITY (ROD SEARCH)

	(Step 6.6[8]A)		(Step 6.6[8]B)	(Step 6.6[8]C)	
Condition	K_{eff}^{Ref}	Limit (pcm)	Desired K	C Bank (steps)	D Bank (steps)
Rod Insertion Limit	(Step 6.6[6]B)	0			
Lower 1000 pcm Limit	(Step 6.6[1]D)	-1000			
Lower 750 pcm Limit	(Step 6.6[1]D)	-750			
Lower 500 pcm Threshold	(Step 6.6[1]D)	-500			
Estimated Critical Condition	(Step 6.6[1]D)	0			
All Rods Out	(Step 6.6[7]B)	0			
Upper 500 pcm Threshold	(Step 6.6[1]D)	500			
Upper 750 pcm Limit	(Step 6.6[1]D)	750			
Upper 1000 pcm Limit	(Step 6.6[1]D)	1000			

Performed By: _____

Reviewed By: _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 64 of 69
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**Appendix B
(Page 2 of 3)
Predicted ICRRs**

Table 2

ROD POSITIONS AT 8-Fold (ROD SEARCH)

Condition	(Step 6.6[9]A)	Limit (pcm)	(Step 6.6[9]B)	(Step 6.6[9]C)	
	K_{eff}^{Ref}		Desired K	C Bank (steps)	D Bank (steps)
Rod Insertion Limit	(Step 6.6[6]B)	0			
Lower 1000 pcm Limit	(Step 6.6[1]D)	-1000			
Lower 750 pcm Limit	(Step 6.6[1]D)	-750			
Lower 500 pcm Threshold	(Step 6.6[1]D)	-500			
Estimated Critical Condition	(Step 6.6[1]D)	0			
All Rods Out	(Step 6.6[7]B)	0			
Upper 500 pcm Threshold	(Step 6.6[1]D)	500			
Upper 750 pcm Limit	(Step 6.6[1]D)	750			
Upper 1000 pcm Limit	(Step 6.6[1]D)	1000			

Performed By: _____

Reviewed By: _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 65 of 69
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**Appendix B
(Page 3 of 3)**

Predicted ICRRs

Table 3

ROD POSITIONS AT 4-Fold (ROD SEARCH)

Condition	(Step 6.6[10]A)	Limit (pcm)	(Step 6.6[10]B)	(Step 6.6[10]C)	
	K_{eff}^{Ref}		Desired K	C Bank (steps)	D Bank (steps)
Rod Insertion Limit	(Step 6.6[6]B)	0			
Lower 1000 pcm Limit	(Step 6.6[1]D)	-1000			
Lower 750 pcm Limit	(Step 6.6[1]D)	-750			
Lower 500 pcm Threshold	(Step 6.6[1]D)	-500			
Estimated Critical Condition	(Step 6.6[1]D)	0			
All Rods Out	(Step 6.6[7]B)	0			
Upper 500 pcm Threshold	(Step 6.6[1]D)	500			
Upper 750 pcm Limit	(Step 6.6[1]D)	750			
Upper 1000 pcm Limit	(Step 6.6[1]D)	1000			

Performed By: _____

Reviewed By: _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 66 of 69
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**Appendix C
(Page 1 of 1)**

BEACON ECC

Data Package: Page ____ of ____

Date _____

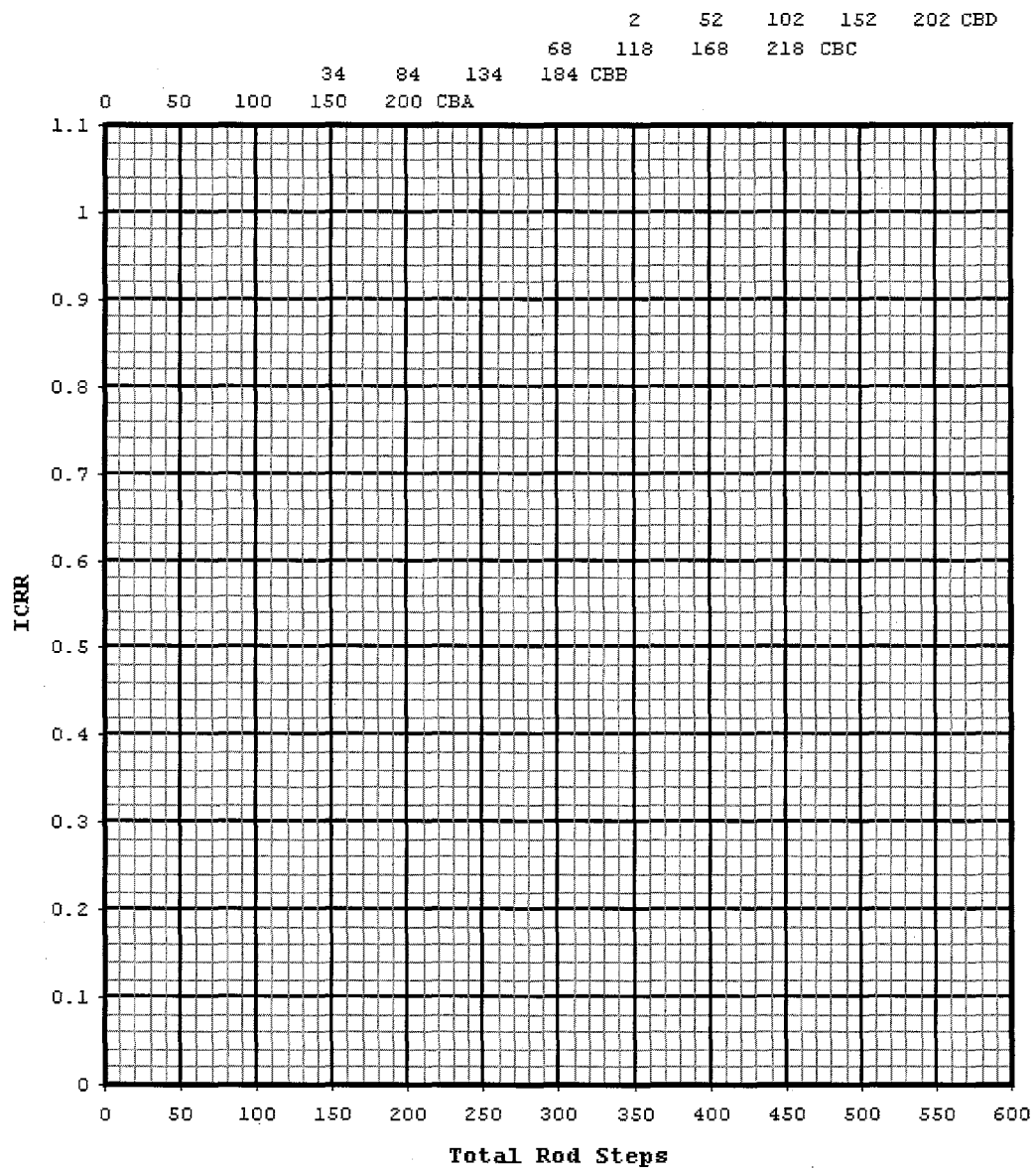
Time Since Input Model (hrs)	D Bank Position (steps)	C _b (ppm)	ΔC_b^{B-10} (ppm)	ECC C _b (ppm)	Calendar Date and Time
Step 6.7[3.1]	Step 6.7[3.1]	Step 6.7[3.1]	Step 6.7[3.2]	Step 6.7[3.3]	Step 6.7[3.4]

Performed by: _____ Reviewed by: _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 67 of 69
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**Figure 1
(Page 1 of 1)**

ICCR VS Control Bank Position

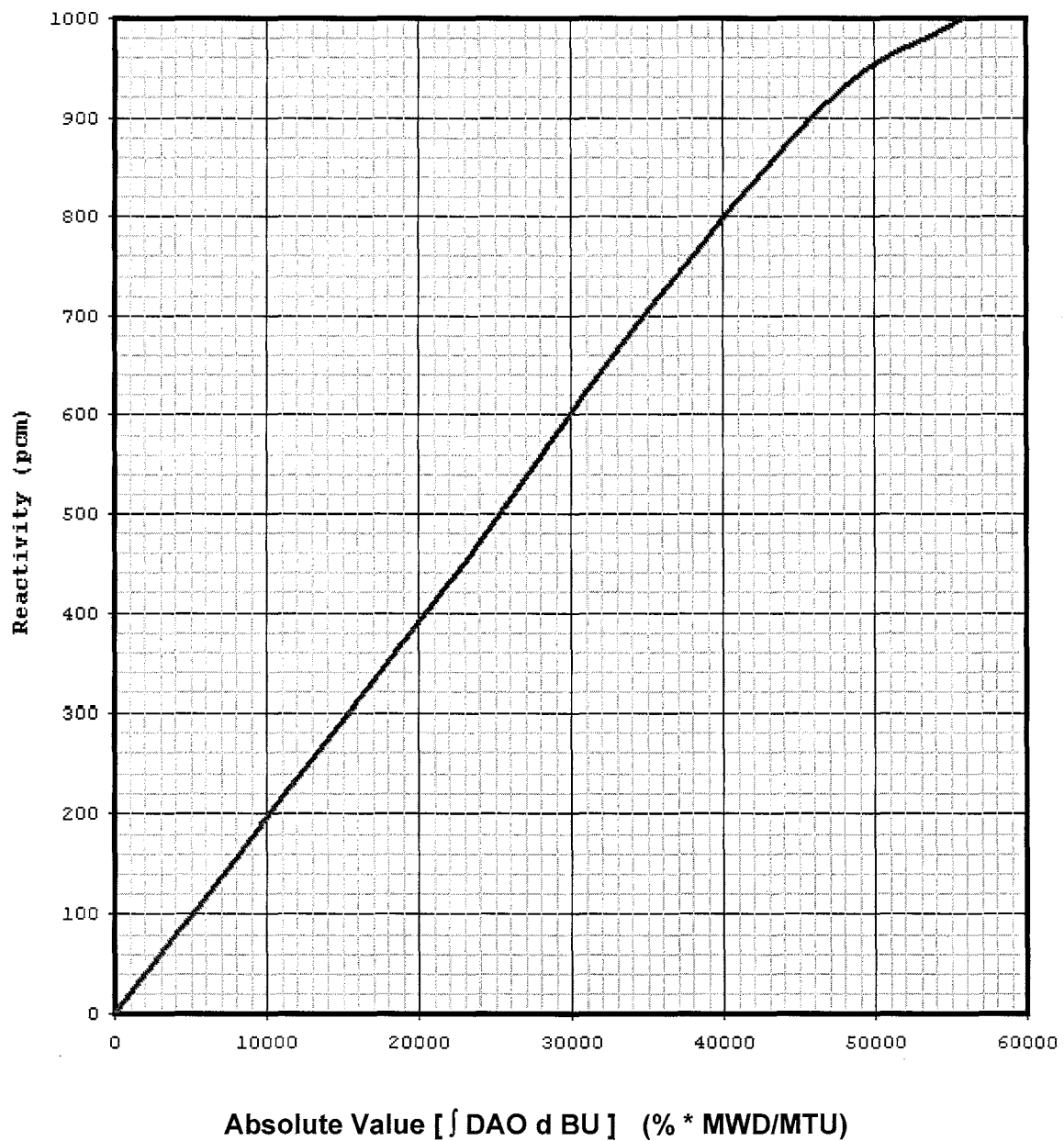


CONTROL BANK POSITION, Steps (Assuming Bank Overlap)

Performed By: _____ Reviewed By: _____

WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 68 of 69
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Figure 2
(Page 1 of 1)
CIPS Adjustment



WBN Unit 1	Estimated Critical Position	1-SI-0-11 Rev. 0014 Page 69 of 69
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**Source Notes
(Page 1 of 1)**

Requirements Statement	Source Document	Implementing Statement
Requires 1/M monitoring	SOER 88-002, Recommendation 2	1
Criticality must be expected anytime positive reactivity is being added to the core.	SOER 84-002, Recommendation 8	2
Requires periodic pauses during rod withdrawal to allow neutron level stabilization and the use of the Audio Count Rate Speaker.	SOER 88-002 Recommendation 6	3
Premature Criticality Events During Reactor Startup.	SOER 88-002 Rec. 7	4

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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A.2-1 RO

**Perform 1-SI-0-2A-03, "1900-0700 Shift and
Daily Surveillance Log Mode Three."**

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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EVALUATION SHEET

Task: Perform 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three."

Alternate Path: N/A

Facility JPM #: New

Safety Function: N/A **Title:** N/A

K/A 2.2.12 Knowledge of surveillance procedures.

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

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator ☒ Classroom ☐ Perform ☒ Simulate ☐

References: 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three," Rev. 30.

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

Task Standard: Applicant performs data collection for Data Sheet 1, pages 1 through 4 of 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three." and identifies instruments that do not meet the acceptable range identified in the instruction.

Validation Time: _____ minutes **Time Critical:** Yes ☐ No ☒

Applicant: _____ **NAME** _____ **SSN** _____ **Time Start:** _____ **Time Finish:** _____

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

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

COMMENTS

WATTS BAR NUCLEAR PLANT
A.2-1 RO
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DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. The Unit is in Mode 3, with no LCO entries at this time.
2. Portions of the field data have been entered by NAUOs.
3. You are the Unit Operator responsible to perform and review 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three."

INITIATING CUES:

1. You are to complete 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three," Data Sheet 1, pages 1 through 4 of 15. Another Unit Operator will complete the remainder of Data Sheet 1.
2. When you have finished performing the assigned pages of Data Sheet 1, and addressed any deviations, notify the Unit Supervisor that you have completed your task.

WATTS BAR NUCLEAR PLANT
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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Right click on 319, and then select RESET.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. ENSURE the following information appears on the Director Summary Screen:

	Key		Type	Event	Delay	Inserted	Ramp	Initial	Final	Value
	pi-1-2a	05150 sg #1 stm hdr ch 1	O		00:00:00	00:00:00	00:00:00		1055	1074.1
	pi-1-2b	05150 sg #1 stm hdr ch 2	O		00:00:00	00:00:00	00:00:00		1055	1074.1
	pi-1-5	05150 sg #1 main stm hdr	O		00:00:00	00:00:00	00:00:00		1100	1074.1
	li-3-55	05050 sg #2 level ind	O		00:00:00	00:00:00	00:00:00		30	37.8133
	li-68-335a	05350 rcs przr lvl(m-4)	O		00:00:00	00:00:00	00:00:00		32	27.1232
	li-63-52	09030 sis rwst level ind	O		00:00:00	00:00:00	00:00:00		90	98.1359

6. Place simulator in RUN and acknowledge any alarms.
7. Place simulator in FREEZE until Examiner cue is given.

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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STEP/STANDARD	SAT/UNSAT
---------------	-----------

START TIME: _____

EXAMINERS CUE: Provide a marked-up copy of 1-SI-0-2A-03 to applicant. The following are the items to be marked:

Ref 8 , SR Neutron Mon CH 1 and CH II - enter 2 cps

Ref. 16, 480V Rx MOV Boards - enter check mark for 1-BKR-63-1A OR 1-BKR-63-1B, 1-BKR-63-22A OR 1-BKR-63-22B.

Ref. 20, CNTMT Press - Enter check mark for 1-PDI-30-42, and enter "0" in the Data column. Enter check mark for 1-PDI-30-43, and enter "0" in the Data column. Enter check mark for 1-PDI-30-44, and enter "0" in the Data column. Enter check mark for 1-PDI-30-45, and enter "0" in the Data column.

STEP 1: **PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 1, Reference 3 data collection and determine if Acceptance Criteria are met.**

___ SAT

___ UNSAT

3	1-M-2 Pnl 0-L-209 T15M/708	CST A Level	1-LI-2-230A <input type="checkbox"/> OR 1-LI-2-230B <input type="checkbox"/>	≥ 200,000 gallons	gallons	Perform Data Sheet 3 of 1-SI-0-2-00 "CST Level"
---	----------------------------------	-------------	--	----------------------	---------	--

STANDARD:

Applicant enters value for either 1-LI-2-230A or 1-LI-2-230B whichever was selected.

If applicant selects **1-LI-2-230A**, approximately **390,000** gallons is entered in the Data column.

If applicant selects **1-LI-2-230B**, approximately **300,000** gallons is entered in the Data column.

Applicant determines that the ≥200,000 gallon acceptance criterion is met.

COMMENTS:

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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STEP/STANDARD							SAT/UNSAT
STEP 2. PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 1, Reference 4 data collection and determine if Acceptance Criteria are met.							CRITICAL STEP ___ SAT ___ UNSAT
4	1-M-4	SG 1 Press SG 2 Press SG 3 Press SG 4 Press	1-PI-1-2A 1-PI-1-2B 1-PI-1-5 1-PI-1-9A 1-PI-1-9B 1-PI-1-12 1-PI-1-20A 1-PI-1-20B 1-PI-1-23 1-PI-1-27A 1-PI-1-27B 1-PI-1-30	Operable, Channel Check, and MCD ≤ 90 psig	psig psig psig psig psig psig psig psig psig psig psig	Contact SRO to consult Tech Specs.	
STANDARD: Applicant obtains current readings for SG Pressure and records them on the data sheet, and determines that SG 1 Pressure channel 1-PI-1-5 is NOT within Maximum Channel Deviation (MCD) of 90 psig.							
EXAMINER'S CUE: If asked about 1-PI-1-5 indication, acknowledge receipt of the information and direct the applicant to complete data taking as assigned.							
EXAMINER'S CUE: If asked to review previous shift's SI-2 Data, state that the Unit Supervisor will retrieve data. If pursued further, then say that the Unit Supervisor reviewed data and all instrumentation was within MCD.							
COMMENTS:							

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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STEP/STANDARD						SAT/UNSAT
STEP 3: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 1, Reference 5 data collection and determine if Acceptance Criteria are met.						CRITICAL STEP ___ SAT ___ UNSAT
5	1-M-4	SG 1 Level	1-LI-3-42	Operable at $\geq 32\%$ NR [for OPERABLE loops], Channel Check, and MCD $\leq 6.0\%$	%	Contact SRO to consult Tech Specs.
			1-LI-3-39		%	
			1-LI-3-38		%	
		SG 2 Level	1-LI-3-55		%	
			1-LI-3-52		%	
			1-LI-3-51		%	
		SG 3 Level	1-LI-3-97		%	
			1-LI-3-94		%	
			1-LI-3-93		%	
		SG 4 Level	1-LI-3-110		%	
			1-LI-3-107		%	
			1-LI-3-106		%	
STANDARD: Applicant obtains current readings for SG Level and records them on the data sheet, and determines that SG 3 Level channel 1-LI-3-55 is NOT within MCD is within $\leq 6.0\%$. EXAMINER'S CUE: If asked about 1-LI-3-55 indication, acknowledge receipt of the information and direct the applicant to complete data taking as assigned. EXAMINER'S CUE: If asked to review previous shift's SI-2 Data, state that the Unit Supervisor will retrieve data. If pursued further, then say that the Unit Supervisor reviewed data and all instrumentation was within MCD. COMMENTS:						

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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STEP/STANDARD						SAT/UNSAT
STEP 4: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 2, Reference 8 data collection and determine if Acceptance Criteria are met.						___ SAT ___ UNSAT
8	1-M-4	SR Neutron Mon CH I	1-NI-92-131A	Operable, Channel Check, and MCD value is plus or minus 1/2 decade [0.3CR1 < CR2 < 3.0CR1].	CPS ⁽²⁾	Contact SRO to consult Tech Specs.
		SR Neutron Mon CH II	1-NI-92-132A	Reading should be the average value observed over a 30 second period	CPS ⁽²⁾	
STANDARD: Applicant determines that the Source Range Monitors are Operable and within the MCD tolerance.						
COMMENTS:						

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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STEP/STANDARD						SAT/UNSAT	
STEP 5: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 2, Reference 9 data collection and determine if Acceptance Criteria are met.						CRITICAL STEP ___ SAT ___ UNSAT	
9	1-M-4	PZR Level	1-LI-68-339A 1-LI-68-335A 1-LI-68-320	Operable, less than or equal to 80%, Channel Check, and MCD \leq 6.0%	% % %		Contact SRO to consult Tech Specs.
STANDARD: Applicant obtains current readings for PZR Level and records them on the data sheet, determines that PZR level channel 1-LI-68-335A is NOT within MCD is within \leq 6.0%.							
EXAMINER'S CUE: If asked about 1-LI-68-335A indication, acknowledge receipt of the information and direct the applicant to complete data taking as assigned. EXAMINER'S CUE: If asked to review previous shift's SI-2 Data, state that the Unit Supervisor will retrieve data. If pursued further, then say that the Unit Supervisor reviewed data and all instrumentation was within MCD. COMMENTS:							

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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STEP/STANDARD						SAT/UNSAT
STEP 6: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 2, Reference 10 data collection and determine if Acceptance Criteria are met.						___ SAT ___ UNSAT
10	1-M-5	PZR Press	1-PI-68-340A	Operable channel check, greater than or equal to 2214psig and MCD ≤ 55 psig.	psig	Contact SRO to consult Tech Specs
			1-PI-68-334		psig	
			1-PI-68-323		psig	
			1-PI-68-322		psig	
STANDARD: Applicant enters data and determines that all PZR Pressure channels meet acceptance criteria.						
COMMENTS:						

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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STEP/STANDARD						SAT/UNSAT
STEP 7: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 2, Reference 15 data collection and determine if Acceptance Criteria are met.						<p>___ SAT</p> <p>___ UNSAT</p>
15	1-M-5	RCS Loops 1, 2, 3, 4	RCP Status		RCP 1 2 3 4 ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Contact SRO to consult Tech Spec s.
		RCP 1	1-HS-68-8AA 1-HS-68-8BA	Two loops operable; two loops in operation if capable of rod withdrawal (one loop if NOT)	(1)	
		RCP 2	1-HS-68-31AA 1-HS-68-31BA		(1)	
		RCP 3	1-HS-68-50AA 1-HS-68-50BA		(1)	
		RCP 4	1-HS-68-73AA 1-HS-68-73BA		(1)	
<u>STANDARD:</u> Applicant enters data for the RCPs and determines that acceptance criteria are met.						
<u>COMMENTS:</u>						

WATTS BAR NUCLEAR PLANT

A.2-1 RO

Nov. 2009 NRC Exam

STEP/STANDARD							SAT/UNSAT																																
<p>STEP 8: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 3, Reference 16 data collection and determine if Acceptance Criteria are met.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 5%;">Ref</th> <th style="width: 10%;">Location</th> <th style="width: 20%;">Description</th> <th style="width: 15%;">Instrument #</th> <th style="width: 10%;">T S Limit</th> <th style="width: 15%;">Data</th> <th style="width: 35%;">Acc NOT Met</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center; vertical-align: middle;">16</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">1-M-6</td> <td>RWST to RHR ECCS Suction</td> <td>1-FCV-63-1 (1-HS-63-1A)</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">OPEN</td> <td>OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/></td> <td rowspan="8" style="text-align: center; vertical-align: middle;">Contact SRO to consult Tech Specs.</td> </tr> <tr> <td>SI Pumps to CL 1, 2, 3, 4</td> <td>1-FCV-63-22 (1-HS-63-22A)</td> <td>OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/></td> </tr> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">480V Rx MOV Boards</td> <td>Shunt BKR 1A1-A c/2E1</td> <td>1-BKR-63-1A OR 1-BKR-63-1B</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">At least one breaker OFF</td> <td>OFF <input type="checkbox"/> ON <input type="checkbox"/></td> </tr> <tr> <td>Breaker 1A1-A c/10A</td> <td></td> <td>OFF <input type="checkbox"/> ON <input type="checkbox"/></td> </tr> <tr> <td>Shunt BKR 1B1-B c/2F2</td> <td>1-BKR-63-22A OR 1-BKR-63-22B</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">At least one breaker OFF</td> <td>OFF <input type="checkbox"/> ON <input type="checkbox"/></td> </tr> <tr> <td>Breaker 1B1-B c/11D</td> <td></td> <td>OFF <input type="checkbox"/> ON <input type="checkbox"/></td> </tr> </tbody> </table>							Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met	16	1-M-6	RWST to RHR ECCS Suction	1-FCV-63-1 (1-HS-63-1A)	OPEN	OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	Contact SRO to consult Tech Specs.	SI Pumps to CL 1, 2, 3, 4	1-FCV-63-22 (1-HS-63-22A)	OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	480V Rx MOV Boards	Shunt BKR 1A1-A c/2E1	1-BKR-63-1A OR 1-BKR-63-1B	At least one breaker OFF	OFF <input type="checkbox"/> ON <input type="checkbox"/>	Breaker 1A1-A c/10A		OFF <input type="checkbox"/> ON <input type="checkbox"/>	Shunt BKR 1B1-B c/2F2	1-BKR-63-22A OR 1-BKR-63-22B	At least one breaker OFF	OFF <input type="checkbox"/> ON <input type="checkbox"/>	Breaker 1B1-B c/11D		OFF <input type="checkbox"/> ON <input type="checkbox"/>	<p>___ SAT</p> <p>___ UNSAT</p>
Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met																																	
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480V Rx MOV Boards	Shunt BKR 1A1-A c/2E1	1-BKR-63-1A OR 1-BKR-63-1B	At least one breaker OFF	OFF <input type="checkbox"/> ON <input type="checkbox"/>																																			
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	Breaker 1B1-B c/11D			OFF <input type="checkbox"/> ON <input type="checkbox"/>																																			
<p><u>STANDARD:</u></p> <p>Applicant enters data from 1-M-6 and determines that all acceptance criteria are met for 1-FCV-63-1 and 1-FCV-63-22.</p> <p><u>EXAMINER'S NOTE:</u></p> <p>Local information will be marked on the Data Sheet provided to the applicant, as indicated in the INITIAL CONDITIONS.</p> <p><u>COMMENTS:</u></p>																																							

WATTS BAR NUCLEAR PLANT

A.2-1 RO

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STEP/STANDARD							SAT/UNSAT
STEP 9: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 3, Reference 17 data collection and determine if Acceptance Criteria are met.							CRITICAL STEP ___ SAT ___ UNSAT
17	1-M-6	CNTMT Sump Level	1-LI-63-180	Operable, Channel check, and MCD ≤6.0%	%	Contact SRO to consult Tech Specs	
			1-LI-63-181		%		
			1-LI-63-182		%		
			1-LI-63-183		%		
		RWST Level	1-LI-63-50	Operable, Channel check, and MCD ≤ 7.0%	%		
			1-LI-63-51		%		
			1-LI-63-52		%		
			1-LI-63-53		%		
STANDARD: Applicant enters data and determines that CNTMT SUMP channels meet acceptance criteria. Applicant enters data and determines that 1-LI-63-52, RWST Level channel does NOT meet acceptance criteria. EXAMINER'S CUE: If asked about 1-LI-63-52 indication, acknowledge receipt of the information and direct the applicant to complete data taking as assigned. EXAMINER'S CUE: If asked to review previous shift's SI-2 Data, state that the Unit Supervisor will retrieve data. If pursued further, then say that the Unit Supervisor reviewed data and all instrumentation was within MCD. COMMENTS:							

WATTS BAR NUCLEAR PLANT

A.2-1 RO

Nov. 2009 NRC Exam

STEP/STANDARD						SAT/UNSAT
STEP 10: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 3, Reference 18 data collection and determine if Acceptance Criteria are met.						___ SAT ___ UNSAT
18	1-M-6	CL Accum 1 Outlet	1-FCV-63-118 (1-HS-63-118A)	Valves Open-when Pzr pressure >1000 psig.	OPEN <input type="checkbox"/>	Contact SRO to consult Tech Specs.
					CLOSED <input type="checkbox"/>	
		CL Accum 2 Outlet	1-FCV-63-98 (1-HS-63-98A)		OPEN <input type="checkbox"/>	
					CLOSED <input type="checkbox"/>	
		CL Accum 3 Outlet	1-FCV-63-80 (1-HS-63-80A)		OPEN <input type="checkbox"/>	
					CLOSED <input type="checkbox"/>	
		CL Accum 4 Outlet	1-FCV-63-67 (1-HS-63-67A)		OPEN <input type="checkbox"/>	
					CLOSED <input type="checkbox"/>	
STANDARD: Applicant enters data and determines that all valves are in their required positions and meet acceptance criteria.						
COMMENTS:						

WATTS BAR NUCLEAR PLANT

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STEP/STANDARD						SAT/UNSAT																																																								
STEP 11: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 4, Reference 19 data collection and determine if Acceptance Criteria are met.						<p>___ SAT</p> <p>___ UNSAT</p>																																																								
19	1-M-6	<table border="1"> <thead> <tr> <th>Ref</th> <th>Location</th> <th>Description</th> <th>Instrument #</th> <th>T S Limit</th> <th>Data</th> <th>Acc NOT Met</th> </tr> </thead> <tbody> <tr> <td rowspan="14"></td> <td rowspan="14"></td> <td>CL Accum 1 Lvl</td> <td>1-LI-63-129</td> <td rowspan="6">≥7630 and ≤8000 gal and MCD ≤ 96 gal. Chemistry is to be notified to perform 1-SI-63-6 within 6 hours if tank level is increased ≥ 75 gal and tank NOT filled from RWST.⁽¹⁾</td> <td>gal</td> <td rowspan="14">Check operability by acceptable deviation between redundant level and pressure channels when pressurizer pressure is above 1000 psig. If deviation limit is exceeded, determine the channel inoperable AND record only the operable channel. This channel check is NOT a technical specification requirement.</td> </tr> <tr> <td></td> <td>1-LI-63-119</td> <td>gal</td> </tr> <tr> <td>CL Accum 2 Lvl</td> <td>1-LI-63-109</td> <td>gal</td> </tr> <tr> <td></td> <td>1-LI-63-99</td> <td>gal</td> </tr> <tr> <td>CL Accum 3 Lvl</td> <td>1-LI-63-89</td> <td>gal</td> </tr> <tr> <td></td> <td>1-LI-63-81</td> <td>gal</td> </tr> <tr> <td>CL Accum 4 Lvl</td> <td>1-LI-63-82</td> <td rowspan="8">≥610 and ≤660 psig and MCD ≤ 30 psig ⁽¹⁾</td> <td>gal</td> </tr> <tr> <td></td> <td>1-LI-63-60</td> <td>gal</td> </tr> <tr> <td>CL Accum 1 Press</td> <td>1-PI-63-128</td> <td>psig</td> </tr> <tr> <td></td> <td>1-PI-63-126</td> <td>psig</td> </tr> <tr> <td>CL Accum 2 Press</td> <td>1-PI-63-108</td> <td>psig</td> </tr> <tr> <td></td> <td>1-PI-63-106</td> <td>psig</td> </tr> <tr> <td>CL Accum 3 Press</td> <td>1-PI-63-88</td> <td>psig</td> </tr> <tr> <td></td> <td>1-PI-63-86</td> <td>psig</td> </tr> <tr> <td>CL Accum 4 Press</td> <td>1-PI-63-62</td> <td>psig</td> </tr> <tr> <td></td> <td>1-PI-63-61</td> <td>psig</td> </tr> </tbody> </table>	Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met			CL Accum 1 Lvl	1-LI-63-129	≥7630 and ≤8000 gal and MCD ≤ 96 gal. Chemistry is to be notified to perform 1-SI-63-6 within 6 hours if tank level is increased ≥ 75 gal and tank NOT filled from RWST. ⁽¹⁾	gal	Check operability by acceptable deviation between redundant level and pressure channels when pressurizer pressure is above 1000 psig. If deviation limit is exceeded, determine the channel inoperable AND record only the operable channel. This channel check is NOT a technical specification requirement.		1-LI-63-119	gal	CL Accum 2 Lvl	1-LI-63-109	gal		1-LI-63-99	gal	CL Accum 3 Lvl	1-LI-63-89	gal		1-LI-63-81	gal	CL Accum 4 Lvl	1-LI-63-82	≥610 and ≤660 psig and MCD ≤ 30 psig ⁽¹⁾	gal		1-LI-63-60	gal	CL Accum 1 Press	1-PI-63-128	psig		1-PI-63-126	psig	CL Accum 2 Press	1-PI-63-108	psig		1-PI-63-106	psig	CL Accum 3 Press	1-PI-63-88	psig		1-PI-63-86	psig	CL Accum 4 Press	1-PI-63-62	psig		1-PI-63-61	psig
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	1-PI-63-61	psig																																																												
STANDARD: Applicant enters data and determines that all Cold Leg accumulator level and pressure channels meet acceptance criteria.																																																														
COMMENTS:																																																														

WATTS BAR NUCLEAR PLANT

A.2-1 RO

Nov. 2009 NRC Exam

STEP/STANDARD						SAT/UNSAT											
STEP 12: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 4, Reference 20 data collection and determine if Acceptance Criteria are met.						___ SAT ___ UNSAT											
20	1-M-6 or ICS	CNTMT Press	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">1-PDI-30-42 or Point P1000A</td> <td style="width: 10%; text-align: center;"><input type="checkbox"/></td> <td rowspan="4" style="width: 30%;"> Operable, Channel Check, and MCD of the following: MCD ≤ 1.0 psig (Ind) MCD ≤ 0.8 psig (mixed) MCD ≤ 0.5 psig (computer) </td> <td style="width: 10%; text-align: center;">psig ⁽²⁾</td> <td rowspan="4" style="width: 20%; text-align: center; vertical-align: middle;">Contact SRO to consult Tech Specs</td> </tr> <tr> <td>1-PDI-30-43 or Point P1001A</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">psig ⁽²⁾</td> </tr> <tr> <td>1-PDI-30-44 or Point P1002A</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">psig ⁽²⁾</td> </tr> <tr> <td>1-PDI-30-45 or Point P1003A</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">psig ⁽²⁾</td> </tr> </table>	1-PDI-30-42 or Point P1000A	<input type="checkbox"/>	Operable, Channel Check, and MCD of the following: MCD ≤ 1.0 psig (Ind) MCD ≤ 0.8 psig (mixed) MCD ≤ 0.5 psig (computer)	psig ⁽²⁾	Contact SRO to consult Tech Specs	1-PDI-30-43 or Point P1001A	<input type="checkbox"/>	psig ⁽²⁾	1-PDI-30-44 or Point P1002A	<input type="checkbox"/>	psig ⁽²⁾	1-PDI-30-45 or Point P1003A	<input type="checkbox"/>	psig ⁽²⁾
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1-PDI-30-45 or Point P1003A	<input type="checkbox"/>		psig ⁽²⁾														
STANDARD: Applicant enters data and determines that all channels meet acceptance criteria.																	
COMMENTS: 																	

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. The Unit is in Mode 3, with no LCO entries at this time.
2. Portions of the field data have been entered by NAUOs.
3. You are the Unit Operator responsible to perform and review 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three."

INITIATING CUES:

1. You are to complete 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three," Data Sheet 1, pages 1 through 4 of 15. Another Unit Operator will complete the remainder of Data Sheet 1.
2. When you have finished performing the assigned pages of Data Sheet 1, and addressed any deviations, notify the Unit Supervisor that you have completed your task.



Watts Bar Nuclear Plant

Unit 1

Surveillance Instruction

1-SI-0-2A-03

1900 - 0700

Shift And Daily Surveillance Log
Mode Three

Revision 0030

Quality Related

Level of Use: Continuous Use

Effective Date: 03-19-2008

Responsible Organization: OPS, Operations

Prepared By: Scot Newell

Approved By: Kathy Keefer

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 2 of 39
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Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
26	02/01/06	2, 3,14,15 23 32	Added additional MCD guidance (PER 74382). Revised Ref. 21 and 22 to reflect Tech Spec change Package WBN-TS-04-17, which contains requirements for opening the penetrations in the Shield Bldg. Dome during Cycle 7 operation. Added 1-FI-90-400 for Shield Building Flow indication. Added capability to use 1-FI-90-400 in Attachment 1.
27	08/04/06	All All 7, 9, 18, 36	This procedure has been converted from Word 95 to Word 2002 XP using rev 26, by Austin Norris. Changed verify to check or ensure. Moved Freq requirements to Step 1.2.2A. Changed all footnote references to superscript. Deleted FRP references and footnotes ♣, ♦, and (14) for Step 1.2.2E; PER 74137. Changed step 6.1.M bullets to 6.1.N - P. Changed containment temperature to ICS on Data Sheet 2.
28	10/18/06	2, 22,	Technical Specification change, WBN-TS-05-06 for Steam Generator secondary side water level.
		26	Deleted Notes on Ref 21 and 22 to remove Tech Spec change WBN-TS-04-17, Shield Bldg Hatches.
		29	TACF 1-05-0004-090, RM-90-106 & 112 alert and alarm setpoints returned to normal.
29	09/14/07	2, 29	TACF 1-07-0006-090 allows rad monitor aligned to lower containment to have background setpoint adjusted from NE SSD setpoint due to RCS leak inside containment.
30	03/19/08	2, 29	Deleted foot note 1 for reference 25 for TACF 1-07-0006-090 RTN.

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 3 of 39
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WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 5 of 39
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1.0 INTRODUCTION

1.1 Purpose

This Instruction provides directions for the following:

- A. Recording data required by Surveillance Requirements that can be satisfied on a log type data sheet on a shift and daily log.
- B. Initiation of appropriate actions for abnormal conditions.

1.2 Scope

1.2.1 Operability Tests to be Performed

The following verifications are performed by this Instruction:

1. Annulus ΔP Channel Checks:
 - a. Annulus to Atmospheric ΔP Channel Check.
 - b. Annulus to Containment ΔP Channel Check.
2. Condensate Storage Tank (CST) Volume.
3. CNTMT Pressure Channel Check.
4. CNTMT Purge Air Exhaust Channel Check.
5. CNTMT Sump Level Channel Check.
6. CNTMT Radiation Monitor Channel Check.
7. Control Room Air Intake Radiation Monitor Channel Check.
8. Emergency Core Cooling System (ECCS) Channel Checks:
 - a. ECCS subsystems operable.
 - b. ECCS Cold Leg (CL) Accumulators Isolation Valve Alignment.
 - c. ECCS CL Accumulators Level Channel Check.
 - d. ECCS CL Accumulators Pressure Channel Check.
9. Fuel Pool Area Radiation Monitor Channel Check.
10. Ice Condenser Door Position Channel Check.

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 6 of 39
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1.2.1 Operability Tests to be Performed (continued)

11. Ice Bed Temperature Channel Check.
12. Neutron Flux Instrumentation Channel Check.
13. Pressurizer (Pzr) Level Channel Check.
14. Pressurizer Pressure Channel Check.
15. RCW and ERCW Pump Run Times.
16. Refueling Water Storage Tank (RWST) Level Channel Check
17. SG Narrow Range Water Level Channel Check.
18. Steam Line Pressure Channel Check.

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1.2.2 Surveillance Requirements Fulfilled

A. The following designators are used in the "Freq" column:

- 1 At least once per hour
- 4 At least once per 4 hours
- 8 At least once per 8 hours
- D At least once per 24 hours
- S At least once per 12 hours
- P Completed prior to each release

B. Performance of this Instruction satisfies the following Surveillance Requirements (SRs):

SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
SR p3.3.1.1-5	2 ⁽¹⁾ , 3 ^{(2),(3)} 4 ^{(2),(3)} , 5 ^{(2),(3)}	2, 3, 4, 5, 6	8	S
SR p3.3.2.1-1.c	1,2,3	1,2,3	20	S
SR p3.3.2.1-1.d	1,2,3 ⁽⁴⁾	1,2,3	10	S
SR p3.3.2.1-1.e	1,2,3 ⁽⁴⁾	1,2,3	4	S
SR p3.3.2.1-2.c	1,2,3	1,2,3	20	S
SR p3.3.2.1-3.b.(3)	1,2,3	1,2,3	20	S
SR p3.3.2.1-4.c	1,2 ⁽⁵⁾ , 3 ⁽⁵⁾	1,2,3	20	S
SR p3.3.2.1-4.d.(1)	1, 2 ⁽⁵⁾ , 3 ^{(4),(5)}	1,2,3	4	S
SR p3.3.2.1-4.d.(2)	3 ^{(5),(6)}	3	4	S
SR p3.3.2.1-5.b	1,2 ⁽⁷⁾ , 3 ⁽⁷⁾	1,2,3	5	S
SR p3.3.2.1-6.b	1,2,3	1,2,3	5	S
SR p3.3.2.1-7.b	1,2,3,4	1,2,3,4	17	S
SR p3.3.2.1-8.b.(1)	1,2,3	1,2,3	10	S
SR p3.3.2.1-8.b.(2)	1,2,3	1,2,3	10	S

* The more conservative Tech Spec Operability Limit provided by the applicable Setpoint and Scaling document (SSD) is used instead of the Tech Spec value.

- (1) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
- (2) With RTBs closed and Rod Control System capable of rod withdrawal.
- (3) With RTBs open. In this condition, source range function does **NOT** provide reactor trip but does provide indication.
- (4) Above P-11 (Pressurizer Pressure) interlock.
- (5) Except when all MSIVs are closed & deactivated.
- (6) Function automatically blocked above P-11 (Pressurizer Interlock) setpoint and is enabled below P-11 when safety injection on Steam Line Pressure Low is manually blocked.
- (7) Except when all MFIVs, MFRVs, and their bypass valves are closed and deactivated or isolated by a closed manual valve.
- (8) **NOT** Used.

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 8 of 39
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1.2.2 Surveillance Requirements Fulfilled (continued)

SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
SR p3.3.6.1-3	1,2,3, 4 ⁽⁹⁾	1,2,3,4,5,6	29	S
SR p3.3.7.1-2	All ⁽¹⁰⁾	All	27	S
SR p3.3.8.1-2	All ⁽¹¹⁾	All ⁽¹¹⁾	26	S
SR p3.4.9.1♣	1,2,3	1,2,3	9	S
SR p3.4.15.1	1,2,3,4	1,2,3,4	25	S
SR p3.4.5.1	3	3	15	S
SR p3.4.5.2♣	3	3	5	S
SR p3.5.1.1	1,2,3 ⁽¹²⁾	1,2,3	18	S
SR p3.5.1.2	1,2,3 ⁽¹²⁾	1,2,3	19	S
SR p3.5.1.3	1,2,3 ⁽¹²⁾	1,2,3	19	S
SR p3.5.2.1	1,2,3	1,2,3	16	S
SR p3.6.4.1♣	1,2,3,4	1,2,3,4	21	S
SR p3.6.11.1♣	1,2,3,4	1,2,3,4	24	S
SR p3.6.12.1	1,2,3,4	1,2,3,4	23	S
SR p3.6.15.1♣	1,2,3,4	1,2,3,4	22	S
SR p3.7.6.1	1,2,3,4 ⁽¹³⁾	1,2,3,4	3	S
LCO p3.6.12 Action B.1	1,2,3,4	1,2,3,4	24	4
LCO p3.7.6 Action A1	1,2,3,4 ⁽¹³⁾	1,2,3,4	3	4&S

♣ The more conservative Tech Spec Operability Limit provided by the applicable Setpoint and Scaling document (SSD) is used instead of the Tech Spec value.

(9) During movement of irradiated fuel assemblies within containment.

(10) Required in Modes 1 through 6, AND during movement of irradiated fuel assemblies.

(11) During movement of irradiated fuel assemblies within the fuel handling area.

(12) With pressurizer pressure greater than 1000 psig.

(13) When steam generator is relied upon for heat removal.

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1.2.2 Surveillance Requirements Fulfilled (continued)

C. Performance of this Instruction satisfies or partially (p) satisfies the following Technical Surveillance Requirements (TSR):

SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
TSR p3.1.2.1	1, 2, 3	1,2,3	65	S
TSR p3.6.1.1*	1,2,3,4	1,2,3,4	24	S
TSR p3.6.2.1	1,2,3,4	1,2,3,4	23	S
TSR p3.6.2.3	1,2,3,4	1,2,3,4	23	S
TSR p3.7.5.1	All	All	65	S
TR p3.6.1 Action B.1.1	1,2,3,4	1,2,3,4	24	1&S
TR p3.6.1 Action B.1.2	1,2,3,4	1,2,3,4	24	1
TR p3.6.1 Action B.1.3	1,2,3,4	1,2,3,4	24	1&S
TR p3.6.1 Action C.1.1	1,2,3,4	1,2,3,4	24	1&S
TR p3.6.1 Action C.1.2	1,2,3,4	1,2,3,4	24	1
TR p3.6.2 Action A.1	1,2,3,4	1,2,3,4	24	4

* The more conservative Tech Spec Operability Limit provided by the applicable Setpoint and Scaling document (SSD) is used instead of the Tech Spec value.

D. Performance of this Instruction satisfies the following Offsite Dose Calculation Manual Surveillance Requirements (OSRs):

ODCM SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
OSR p2.1.2-3.f	All ⁽²⁰⁾	All ⁽²⁰⁾	59	D
OSR p2.1.2-4.e	All	All	59	D

(20) Both Unit 1 and 2 Shield Building Exhaust System equipment must meet the minimum channel OPERABLE requirement.

E. Fulfillment of special conditions will initiate the following requirements:

SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
TR p3.6.1 Action A.1	1,2,3,4	1,2,3,4	24	S

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1.3 Frequency and Conditions

- A. This Instruction is to be performed every 1900 - 0700 shift when unit is in Mode 3. This instruction should be performed in Mode 4 prior to Mode 3 entry to ensure Mode 3 requirements are met.

1.3.1 Performance Definitions

- A. **Channel Check** - The qualitative assessment by observation of channel behavior during operation. This determination includes, where possible, comparison of the channel indication and status with other indications or status derived from independent instrument channels measuring the same parameter.
- B. **Maximum Channel Deviation (MCD)** - The difference between the highest channel indication of a parameter and the lowest channel indication of the same parameter. MCD units are the same as the applicable measured parameter units unless otherwise stated in applicable requirement. If deviation limit is exceeded, determine which channel is inoperable AND Record only the operable channel unless stated otherwise. Instrument Maintenance/Engineering shall assist in determining if operability limits have been exceeded.
- C. **Operable or Operability** - A system, subsystem, train, component, or device is operable or has operability when it is capable of performing its specified function(s) and when all necessary attendant instrumentation, controls, electrical power (normal or emergency), cooling, and seal water, lubrication, or other auxiliary equipment required for the system, subsystem, train, component, or device to perform its specified function(s) is also capable of performing its related support function(s).

1.3.2 MCD Calculation Methods

See 1-SI-0-2-00 for explanation of MCD Calculations.

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2.0 REFERENCES

2.1 Performance References

- A. Core Operating Limits Report.
- B. Nuclear Operating Book (NOB),
 - 1. Sheet A-1, Target Band VS Power Level.
 - 2. Sheet A-5, Negative MTC Withdrawal Limit Curve.
- C. SOI-90.02, Gaseous Process Radiation Monitors.

2.2 Developmental References

2.2.1 TVA Procedures

- A. 1-ODI-90-2, Steam Generator Blowdown Release
- B. 1-ODI-90-25, Condenser Vacuum Exhaust Release.
- C. 1-SI-63-6, Cold Leg Accumulators Boron Determination.
- D. 1-SI-68-25, Recalibration of Channel I Reactor Coolant System Flow Loops.
- E. 1-SI-68-26, Recalibration of Channel II Reactor Coolant System Flow Loops.
- F. 1-SI-68-27, Recalibration of Channel III Reactor Coolant System Flow Loops.
- G. 1-SI-68-31, Reactor Coolant System Total Flow Measurement.
- H. 1-SI-68-32, Reactor Coolant System Water Inventory Balance.
- I. 1-SI-68-68, 18 Month Channel Calibration RCS Loop 1 Wide Range Hot Leg Temperature Loop 1-LPT-68-1 (T-413A).
- J. 1-SI-90-25, Inoperable Lower Containment Radiation Monitor.
- K. ECI-1.0, NPDES Plant Effluents.
- L. Backup Ice Condenser Temperature Monitoring.

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2.2.1 TVA Procedures (continued)

- M. Offsite Dose Calculation Manual (ODCM).
- N. SOI-14.03, Condensate Demineralizer Waste Disposal.
- O. SOI-15.01, Steam Generator Blowdown (SGBD) System.
- P. SOI-77.01, Liquid Waste Disposal.

2.2.2 Vendor Manuals

- A. VM-0745, Vendor (Technical) Manual for Tracor Westronics Equipment.
- B. VM-0165, Vendor (Technical) Manual for Loose Parts Monitoring System.

2.2.3 Other

NOTE

Setpoint and Scaling Documents referenced for Technical Specification Operability Limit clarification.

- A. Fire Protection Report, Part II, Fire Protection Plan, Section 14.1.
- B. II-S-92-011 R1, Indicated Low Reactor Coolant System Flow. (TROI ID: SQN II-S-92-011 R1).
- C. N3-61-4001, System Description for the Ice Condenser System.
- D. Nuclear Operating Book (NOB), Sheet A-5.
- E. 1-45W-605-242, Electrical Tech Spec Compliance Tables.
- F. 1-45W-605-243, Electrical Tech Spec Compliance Tables.
- G. SQPER930138, Generic Applicability to Watts Bar Steam Generator Pressure/Temperature Limitations SQN LCO 3.7.2/WBN TR 3.7.1.
- H. Unit 1 Technical Requirements Manual 3.1.2.1, 3.6.1, 3.6.2, 3.7.1.
- I. Unit 1 Technical Specification 3.1.5, 3.1.6, 3.1.7, 3.3.1, 3.3.2, 3.3.6, 3.3.7, 3.3.8, 3.4.1, 3.4.4, 3.4.9, 3.4.15, 3.5.1, 3.5.2, 3.6.4, 3.6.11, 3.6.12, 3.6.15, 3.7.6.
- J. LER 97-013 D/G Operability with D/G exhaust or panel fan out of service.
- K. Annulus Differential Pressure Analysis, RIMS number T69 050321 003.

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3.0 PRECAUTIONS AND LIMITATIONS

- A. When BOTH a radiation monitor and recorder are listed, checking the recorder does **NOT** satisfy the Tech Spec requirement. The monitor must be read to satisfy the requirement.

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Date _____

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4.0 PREREQUISITE ACTIONS

4.1 Preliminary Actions

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

[2] **IF** required, **THEN**

OBTAIN RWP.

4.2 Approvals and Notifications

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

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5.0 ACCEPTANCE CRITERIA

5.1 Test Acceptance Criteria

- A. Specific quantitative or qualitative requirements that are intended to be checked by this Instruction are listed by each item where the data is recorded.
- B. All data must be completed within four hours of shift relief to ensure 1.25 frequency is met.

5.2 Notifications and Actions

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

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6.0 PERFORMANCE

6.1 Performance Requirements

- A. Prior to making any mode changes which are more restrictive, review of the shift and daily data sheets is required to ensure compliance with applicable surveillance requirements for that mode. Starting new data sheets for the appropriate mode must be considered.
- B. To meet MCD limits, data for individual instrument channels are required to be compared for deviation.
- C. Items that require channel check that do **NOT** have an MCD listed in Tech Spec Limits column are to be considered acceptable when the following requirements are met:
 1. Equipment is energized.
 2. Indication is reading a value consistent with present plant conditions.
(For radiation monitors, indication must be reading at least background.)
- D. Exceeding the MCD column limits when performing Channel Checks may require considering the channel(s) inoperable unless stated otherwise. Contact Instrument Maintenance/Engineering for operability determination.
- E. Ensure meters are read consistently from same angle. Use gage face mirrors (if present) and ensure gage needle and its reflection are in alignment. If gage has no mirror in the face, read gage from as close to perpendicular to gage face as possible.
- F. 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.
- G. 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.

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6.1 Performance Requirements (continued)

- H. Any work orders generated during performance of Data Sheets require documentation in Remarks at the bottom of the appropriate data sheet.
- I. Inoperable instruments are required to have INOP entered in the appropriate data space.
- J. Data spaces for instruments in modes which do **NOT** apply can have **N/A** entered in them.
- K. The following are guidelines for radiation monitors and recorders:

CAUTION

When source checking to determine operability, care should be used to prevent actuation of any high level trip or isolation function initiated by a radiation monitor.

1. Radiation levels are to be compared to data taken on the previous shift.
2. Any questionable monitor may be source checked to aid in determining operability. A slight deflection of the indicator is all that is necessary to confirm source check response.
3. A radiation monitoring channel is to be considered operable if it responds to a source check, monitor is in service, and instrument malfunction annunciation due to low flow is clear.
4. Radiation recorders are to be considered operable if operating properly, inking clearly, legible, and running on time.
5. If gas or particulate sampler flow rotameter is inoperable, the respective monitor is also inoperable.
6. Inoperable instruments are to be reported to SRO.
7. Chemistry is to be notified as follows:
 - a. If a monitor is inoperable and a release is being made via this pathway, Chemistry is to be notified to perform applicable ODI until monitor is declared operable.
 - b. If a conditional SI is required, Chemistry is to be notified to perform appropriate SI.
8. Tech Specs are to be referenced for applicable actions.

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6.1 Performance Requirements (continued)

9. A WO is to be initiated and the WO number noted in Remarks.
 10. The applicable Inoperable Radiation Monitor/Recorder Data Table, is to be completed for inoperable monitor(s) or recorder(s).
- L. The following are guidelines for inoperable flow rate measuring devices
1. SRO is to be notified that device is inoperable.
 2. A Work Order to have flow rate measuring device repaired is to be initiated and WO number recorded in Remarks.
 3. Applicable tracking data sheet is to be completed.
 4. Original date and time flow rate device was declared inoperable is to be recorded on each day's data sheet so the 30 day time limit for inoperable monitors is **NOT** exceeded.
 5. Chemistry is to be notified as follows:
 - a. If an iodine sampler flow rotameter is inoperable and requires a portable sampler in accordance with the ODCM, Chemistry is to be notified to install a temporary backup sampler AND perform applicable ODI.
 - b. If a special SI is required, Chemistry is to be notified to perform appropriate SI.
 6. If a flow rate device is declared inoperable, readings for flow rate devices are to be recorded on applicable Inoperable Flow Rate Measuring Device Data Table every 4 hours.
- M. M&TE (Measuring and Test Equipment) may be substituted for installed permanent plant instrumentation as long as the M&TE is at least as accurate as the permanent plant instrumentation.
- N. M&TE to be installed and removed by WO (or TACF), which shall also configure valves to place M&TE in-service (or out-of-service).
- O. Evaluate LCO entry whenever connecting/disconnecting M&TE or whenever M&TE is aligned to plant systems or left unattended. LCO entry may **NOT** be required if the M&TE is installed as a TACF per SPP-9.5.
- P. Document the M&TE substitution, including the WO number (or TACF number) and M&TE ID number on the appropriate data sheet in the remarks section.

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6.2 GENERAL

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

NOTE

Information on specific items in the data sheets is contained in 1-SI-0-2-00 reference appendix with an associated reference number.

- [2] **PERFORM** Data Sheet 1 & 2.
- [3] **ENSURE** Data Sheet 1 & 2 have been completed and Acceptance Criteria reviewed within four hours of assuming shift.

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7.0 POST PERFORMANCE ACTIVITIES

- [1] **ENSURE** all Acceptance Criteria have been met OR appropriate corrective action has been taken.
- [2] **NOTIFY** SM/Unit SRO that this Instruction is complete.
- [3] **PRESENT** completed data sheets for SRO review.
- [4] **RECORD** completion date and time on Surveillance Task Sheet.

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8.0 RECORDS

8.1 QA Records

The Data Package is a QA record, is handled in accordance with the Document Control and Records Management Program, and contains the following:

Completed Data Package.

8.2 Non-QA Records

None

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Data Sheet 1
(Page 1 of 15)

Mode 3 Surveillance Log: 1900-0700

Date _____

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Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
3	1-M-2 Pnl 0-L-209 T15M/708	CST A Level	1-LI-2-230A <input type="checkbox"/> OR 1-LI-2-230B <input type="checkbox"/>	≥ 200,000 gallons	gallons	Perform Data Sheet 3 of 1-SI-0-2-00 "CST Level"
4	1-M-4	SG 1 Press	1-PI-1-2A	Operable, Channel Check, and MCD ≤ 90 psig	psig	Contact SRO to consult Tech Specs.
			1-PI-1-2B		psig	
			1-PI-1-5		psig	
		SG 2 Press	1-PI-1-9A		psig	
			1-PI-1-9B		psig	
			1-PI-1-12		psig	
		SG 3 Press	1-PI-1-20A		psig	
			1-PI-1-20B		psig	
			1-PI-1-23		psig	
		SG 4 Press	1-PI-1-27A		psig	
			1-PI-1-27B		psig	
			1-PI-1-30		psig	
5	1-M-4	SG 1 Level	1-LI-3-42	Operable at ≥ 32% NR [for OPERABLE loops], Channel Check, and MCD ≤ 6.0%	%	Contact SRO to consult Tech Specs.
			1-LI-3-39		%	
			1-LI-3-38		%	
		SG 2 Level	1-LI-3-55		%	
			1-LI-3-52		%	
			1-LI-3-51		%	
		SG 3 Level	1-LI-3-97		%	
			1-LI-3-94		%	
			1-LI-3-93		%	
		SG 4 Level	1-LI-3-110		%	
			1-LI-3-107		%	
			1-LI-3-106		%	

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

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Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

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Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
8	1-M-4	SR Neutron Mon CH I	1-NI-92-131A	Operable, Channel Check, and MCD value is plus or minus 1/2 decade [0.3CR1<CR2 <3.0CR1].	2 CPS ⁽²⁾	Contact SRO to consult Tech Specs.
		SR Neutron Mon CH II	1-NI-92-132A	Reading should be the average value observed over a 30 second period	2 CPS ⁽²⁾	
9	1-M-4	PZR Level	1-LI-68-339A	Operable, less than or equal to 80%, Channel Check, and MCD ≤ 6.0%	%	Contact SRO to consult Tech Specs.
			1-LI-68-335A		%	
			1-LI-68-320		%	
10	1-M-5	PZR Press	1-PI-68-340A	Operable channel check, greater than or equal to 2214psig and MCD ≤ 55 psig.	psig	Contact SRO to consult Tech Specs.
			1-PI-68-334		psig	
			1-PI-68-323		psig	
			1-PI-68-322		psig	
15	1-M-5	RCS Loops 1, 2, 3, 4	RCP Status	Two loops operable; two loops in operation if capable of rod withdrawal (one loop if NOT)	RCP 1 2 3 4 ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Contact SRO to consult Tech Specs.
		RCP 1	1-HS-68-8AA 1-HS-68-8BA		(1)	
		RCP 2	1-HS-68-31AA 1-HS-68-31BA		(1)	
		RCP 3	1-HS-68-50AA 1-HS-68-50BA		(1)	
		RCP 4	1-HS-68-73AA 1-HS-68-73BA		(1)	

(1) Loop status is to be written in data space (Operable (O), Running (R), or INOP).

(2) See 1-SI-0-2-00 Ref. 8 if indication is less than 0.2 CPS.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

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Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

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Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
16	1-M-6	RWST to RHR ECCS Suction	1-FCV-63-1 (1-HS-63-1A)	OPEN	OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/>	
		SI Pumps to CL 1, 2, 3, 4	1-FCV-63-22 (1-HS-63-22A)		OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/>	
	480V Rx MOV Boards	Shunt BKR 1A1-A c/2E1	1-BKR-63-1A OR 1-BKR-63-1B	At least one breaker OFF	OFF <input checked="" type="checkbox"/> ON <input type="checkbox"/>	Contact SRO to consult Tech Specs.
		Breaker 1A1-A c/10A			OFF <input checked="" type="checkbox"/> ON <input type="checkbox"/>	
		Shunt BKR 1B1-B c/2F2	1-BKR-63-22A OR 1-BKR-63-22B	At least one breaker OFF	OFF <input checked="" type="checkbox"/> ON <input type="checkbox"/>	
		Breaker 1B1-B c/11D			OFF <input checked="" type="checkbox"/> ON <input type="checkbox"/>	
17	1-M-6	CNTMT Sump Level	1-LI-63-180	Operable, Channel check, and MCD ≤6.0%	%	Contact SRO to consult Tech Specs
			1-LI-63-181		%	
			1-LI-63-182		%	
			1-LI-63-183		%	
		RWST Level	1-LI-63-50	Operable, Channel check, and MCD ≤ 7.0%	%	
			1-LI-63-51		%	
			1-LI-63-52		%	
			1-LI-63-53		%	
18	1-M-6	CL Accum 1 Outlet	1-FCV-63-118 (1-HS-63-118A)	Valves Open-when Pzr pressure >1000 psig.	OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	Contact SRO to consult Tech Specs.
		CL Accum 2 Outlet	1-FCV-63-98 (1-HS-63-98A)		OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	
		CL Accum 3 Outlet	1-FCV-63-80 (1-HS-63-80A)		OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	
		CL Accum 4 Outlet	1-FCV-63-67 (1-HS-63-67A)		OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

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**Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

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Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
19	1-M-6	CL Accum 1 Lvl	1-LI-63-129	≥7630 and ≤8000 gal and MCD ≤ 96 gal. Chemistry is to be notified to perform 1-SI-63-6 within 6 hours if tank level is increased ≥ 75 gal and tank NOT filled from RWST. ⁽¹⁾	gal	Check operability by acceptable deviation between redundant level and pressure channels when pressurizer pressure is above 1000 psig. If deviation limit is exceeded, determine the channel inoperable AND record only the operable channel. This channel check is NOT a technical specification requirement.
			1-LI-63-119		gal	
		CL Accum 2 Lvl	1-LI-63-109		gal	
			1-LI-63-99		gal	
		CL Accum 3 Lvl	1-LI-63-89		gal	
			1-LI-63-81		gal	
		CL Accum 4 Lvl	1-LI-63-82		gal	
			1-LI-63-60		gal	
		CL Accum 1 Press	1-PI-63-128	≥610 and ≤660 psig and MCD ≤ 30 psig ⁽¹⁾	psig	
			1-PI-63-126		psig	
		CL Accum 2 Press	1-PI-63-108		psig	
			1-PI-63-106		psig	
		CL Accum 3 Press	1-PI-63-88		psig	
			1-PI-63-86		psig	
		CL Accum 4 Press	1-PI-63-62		psig	
			1-PI-63-61		psig	
20	1-M-6 or ICS	CNTMT Press	1-PDI-30-42 or Point P1000A	Operable, Channel Check, and MCD of the following: MCD ≤ 1.0 psig (Ind) MCD ≤ 0.8 psig (mixed) MCD ≤ 0.5 psig (computer)	⊖ psig ⁽²⁾	Contact SRO to consult Tech Specs
			1-PDI-30-43 or Point P1001A		⊖ psig ⁽²⁾	
			1-PDI-30-44 or Point P1002A		⊖ psig ⁽²⁾	
			1-PDI-30-45 or Point P1003A		⊖ psig ⁽²⁾	

(1) When Pzr pressure greater than 1000 psig.

(2) Instrument used for data is to be checked. PDI is preferred instrument.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 26 of 39
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Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

Date _____

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Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
21	1-M-9	CNTMT-ANN ΔP	1-PDI-30-133 <input type="checkbox"/> or 1-PDI-30-30C <input type="checkbox"/>	ΔP between -0.07 and 0.27 psid	psid ⁽²⁾	Contact SRO to consult Tech Specs.
22	1-M-9	Annulus ΔP	1-PDI-30-126	More negative than or equal value on Attachment 1 " H ₂ O ⁽¹⁾ and MCD ≤ 0.7 "H ₂ O	_____ " H ₂ O ⁽⁴⁾	
			1-PDI-30-127		_____ " H ₂ O ⁽⁴⁾	
	ICS 1-M-9	Shield Building Flow	point Y2203A <input type="checkbox"/> or 1-FI-90-400 <input type="checkbox"/> or Data Sheet 37 ⁽³⁾ <input type="checkbox"/>	N/A-used for Attachment 1	SCFM	
		Tech Spec Acceptance value from Attachment 1		_____ " H ₂ O ⁽⁴⁾		

- (1) 1-PDI-30-126 and 1-PDI-30-127 have a range of 0 - 10" H₂O and indicate negative pressure relative to atmosphere (e.g. an indication of 6" H₂O is more negative than negative 5.5" H₂O)
- (2) 1-PDI-30-30C on 1-L-10 may be substituted for 1-PDI-30-133 to check Tech Spec compliance.
- (3) Perform data sheet 37 of 1-SI-0-2-00 to determine shield building flow if ICS point and 1-FI-90-400 are unavailable whenever shield building exhaust stack has flow. This flow is required in order to determine Tech Spec value for Annulus ΔP on Attachment 1.
- (4) N/A during venting operations, required annulus entries, or Aux Bldg isolations not exceeding 1 hour in duration.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 27 of 39
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**Data Sheet 1
(Page 6 of 15)**

Mode 3 Surveillance Log: 1900-0700

Ret	Location	Description	Instrument #	TS Limit	Data	Acc NOT Met
23	1-M-10	Ice Cndnsr Door Status Position Monitoring System	1-XI-61-187	Operable, all doors closed, and Channel Check	(√)	Contact SRO to consult Tech Specs and perform data sheet 23.
24	1-M-10	Ice Bed Temperature Monitoring System	1-TR-61-138	Operable, ≤ 25.2°F, Channel Check, and minimum of two RTDs per group operable. ⁽¹⁾	Table below	If 1-TR-61-138 and Local Ice Cond Temp monitoring panel are inoperable, perform Data Sheet 24 of 1-SI-0-2-00 "Inoperable Ice Bed Monitoring System"

- (1) At least two RTDs are to be verified operable per group and two highest readings from each group recorded. All readings should be recorded to one decimal position and should **NOT** be rounded. If 1-TR-61-138 is inoperable, MIG is to be notified to perform IMI-15 once every 12 hours to fulfill TR 3.6.1 Action A.11.
- (2) Fulfills LCO 3.6.12 Action B.1 or TR 3.6.2 Action A.1, when maximum ice bed temp ≤ 25.2°F once every four hours.
- (3) Fulfills TR 3.6.1 Action B.1.2 and/or Action C.1.2, when required by INOP Ice Bed Temp Monitoring System.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 28 of 39
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**Data Sheet 1
(Page 7 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

	TE	PT	Data		TE	PT	Data		TE	PT	Data
EL 801 Group 7 ⁽¹⁾⁽²⁾	138	1		EL 776 Group 4 ⁽¹⁾⁽²⁾	139	16		EL 756 Group 1 ⁽¹⁾⁽²⁾	N/A	N/A	N/A
	141	2			142	17			143	31	
	144	3			145	18			146	32	
	147	4			148	19			149	33	
	150	5			151	20			152	34	
Two Highest Temps			1	Two Highest Temps			1	Two Highest Temps			1
			2				2				2
Sum of 1 and 2				Sum of 1 and 2				Sum of 1 and 2			
EL 801 Group 8 ⁽¹⁾⁽²⁾	153	6		EL 776 Group 5 ⁽¹⁾⁽²⁾	154	21		EL 756 Group 2 ⁽¹⁾⁽²⁾	155	35	
	156	7			157	22			N/A	N/A	N/A
	159	8			160	23			161	36	
	165	9			166	24			167	37	
	183	10			184	25			185	38	
Two Highest Temps			1	Two Highest Temps			1	Two Highest Temps			1
			2				2				2
Sum of 1 and 2				Sum of 1 and 2				Sum of 1 and 2			
EL 801 Group 9 ⁽¹⁾⁽²⁾	168	11		EL 776 Group 6 ⁽¹⁾⁽²⁾	169	26		EL 756 Group 3 ⁽¹⁾⁽²⁾	170	39	
	171	12			172	27			173	40	
	174	13			175	28			176	41	
	177	14			178	29			179	42	
	180	15			181	30			N/A	N/A	N/A
Two Highest Temps			1	Two Highest Temps			1	Two Highest Temps			1
			2				2				2
Sum of 1 and 2				Sum of 1 and 2				Sum of 1 and 2			
TOTAL OF SUMS	TOTALS + 18			MEAN ICE BED TEMP ⁽³⁾	OPTIMUM MEAN ICE BED TEMP			PERFORMER INITIALS	REVIEWER INITIALS		
	+ 18				15°F TO 20°F						

- (1) At least two RTDs are to be verified operable per group and two highest readings from each group recorded. All readings should be recorded to one decimal position and should **NOT** be rounded. If 1-TR-61-138 is inoperable, MIG is to be notified to perform IMI-15 once every 12 hours to fulfill TR 3.6.1 Action A.11.
- (2) Fulfills LCO 3.6.12 Action B.1 or TR 3.6.2 Action A.1, when maximum ice bed temp ≤ 25.2°F once every four hours.
- (3) Fulfills TR 3.6.1 Action B.1.2 and/or Action C.1.2, when required by INOP Ice Bed Temp Monitoring System.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 29 of 39
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**Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
25	0-M-12 or ICS	Lower and Upper CNTMT Gas and Particulate	1-RM-90-106A <input type="checkbox"/>	Operable and Channel Check	cpm	If monitor aligned to Lower Containment is inoperable, the other monitor is to be re- aligned using SOI-90.02. If both monitors are inoper- able, SRO is to be notified, 1-SI-68-32 is to be performed, and Chemistry Count- room is to be notified to perform 1-SI-90-25.
			or point R1012A <input type="checkbox"/>		cpm	
			1-RM-90-106B <input type="checkbox"/>		cpm	
			or point R1013A <input type="checkbox"/>		cpm	
			1-RM-90-112A <input type="checkbox"/>	Operable	cpm	
			or point R1015A <input type="checkbox"/>		cpm	
			1-RM-90-112B <input type="checkbox"/>	Operable	cpm	
			or point R1016A <input type="checkbox"/>		cpm	
			1-RR-90-106	Operable	(√)	
			1-RR-90-112		(√)	
26	0-M-12 or ICS	Spend Fuel Pit Area	0-RM-90-102 <input type="checkbox"/>	Operable and Channel Check	mr/hr	Contact SRO to consult Tech Specs
			or point R9011A <input type="checkbox"/>		mr/hr	
			0-RM-90-103 <input type="checkbox"/>	Operable and Channel Check	mr/hr	
			or point R9012A <input type="checkbox"/>		mr/hr	
27	0-M-12 or ICS	MCR Intake	0-RM-90-125 <input type="checkbox"/>	Operable and Channel Check	cpm	Contact SRO to consult Tech Specs. See Section 6.1K.
			or point R1025A <input type="checkbox"/>		cpm	
			0-RM-90-126 <input type="checkbox"/>		cpm	
			or point R1026A <input type="checkbox"/>		cpm	
			0-RR-90-125	Operable	(√)	
			0-RR-90-126		(√)	

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 30 of 39
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**Data Sheet 1
(Page 9 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____

Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
28	0-M-12 or ICS	CCS Hx A Out Liquid	1-RM-90-123 <input type="checkbox"/> or point R1023A <input type="checkbox"/>	Operable and Channel Check (Info Only-T.S. N/A)	cpm	Contact SRO. See Section 6.1K.
29	AUX BLDG A2U/713 or ICS	CNTMT Purge Air Exh Radiation Monitor	1-RM-90-130A <input type="checkbox"/> or point R1027A <input type="checkbox"/>	Operable and Channel Check	cpm	Contact SRO to consult Tech Specs. See Section 6.1K. IF both monitors inoperable, suspend purge flow immediately per ODCM table 1.1.2-6.a
			1-RM-90-131A <input type="checkbox"/> or point R1028A <input type="checkbox"/>		cpm	

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 31 of 39
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**Data Sheet 1
(Page 10 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
59	AEB 729	Unit 1 Shield Bldg Exhaust Tritium Flow Rate Monitor	1-SMPL-90-801	Operable	(√)	If Tritium flow rate measuring device is inoperable, SRO and Chemistry are to be notified. Initiate WO and record number in remarks section.
	AEB 729	Unit 2 Shield Bldg Exhaust Tritium Flow Rate Monitor	2-SMPL-90-801	Operable	(√)	
	AUX BLDG 786	Aux Bldg and Fuel Handling Exhaust Tritium Flow Rate Monitor	0-SMPL-90-800	Operable	(√)	
67	N/A	1-SI-0-10 ⁽¹⁾	N/A	Tech Specs per 1-SI-0-10	Completed or in progress for the required performance frequency interval <input type="checkbox"/> (√)	N/A

⁽¹⁾ Conditional performance cannot be substituted for periodic performance.

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 32 of 39
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**Data Sheet 1
(Page 11 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument	T S Limit	Data	Acc NOT Met
Control Building						
NORMAL LIMITS						
65	Control Room South Wall el 755		0-TI-30-5219	≤ 80°F	°F	Readings on this page may be taken in any order.
	Control Room across from 1-M-9 el 755		0-TI-30-5220	≤ 80°F	°F	
	Next to 480V SD BD Transformer 1A2-A el 772		0-TI-30-5201	≤ 104°F	°F	
	Next to 480V SD BD Transformer 1B1-B el 772		0-TI-30-5202	≤ 104°F	°F	In all sections of Ref 65, use of Fluke 52 digital thermometer or equivalent is acceptable for temperature indicators not present or inoperable.
	Next to 480V Rx MOV Bd 1A2-A el 772		0-TI-30-5203	≤ 83°F	°F	
	Behind 125V Vital Batt Charger 6-S el 772		0-TI-30-5204	≤ 83°F	°F	
	Next to 480V Rx MOV Bd 2A2-A el 772		0-TI-30-5205	≤ 83°F	°F	
	Next to 480V SD BD Transformer 2A2-A el 772		0-TI-30-5206	≤ 104°F	°F	
	Next to 480V SD BD Transformer 2B2-B el 772		0-TI-30-5207	≤ 104°F	°F	Contact SRO to consult Technical Requirements section 3.7.5.1. SRO should evaluate normal AND abnormal limits. Perform Data Sheets 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".
	Next to 480V Rx MOV Bd 2B2-B el 772		0-TI-30-5208	≤ 83°F	°F	
	U1 Mech Equip Rm el 772		0-TI-30-5209	≤ 91°F	°F	
	SD BD Rm U1 behind stairs S-A3 el 757		0-TI-30-5210	≤ 85°F	°F	
	SD BD Rm U2 behind stairs S-A13 el 757		0-TI-30-5211	≤ 85°F	°F	
	Refuel Floor U1 beside Aux Boration Makeup Tank el 757		0-TI-30-5212	≤ 104°F	°F	
	Computer room at center of the room el 708		0-TI-30-5226	≤ 74°F	°F	
	Aux Instrument Room el 708		0-TI-30-5233	≤ 90°F	°F	

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 33 of 39
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**Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
Auxiliary Building						
				Normal Limits		
65	U1 outside supply fan room el 737	0-TI-30-5213	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Readings on this page may be taken in any order. In all sections of Ref 65, use of Fluke 52 digital thermometer or equivalent is acceptable for temperature indicators not present or inoperable.	
	South steam vault room U1 el 730	0-TI-30-5228	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$		
	North steam vault room U1 el 730	0-TI-30-5227	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Between UHI Accumulators el 729	0-TI-30-5218	$\leq 92^{\circ}\text{F}$	$^{\circ}\text{F}$		
	U1 across from AFW pumps el 713	0-TI-30-5214	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	U1 outside AFW pump room door el 692	0-TI-30-5215	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.7.5.1. SRO should evaluate normal AND abnormal limits. Perform Data Sheets 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".	
	U2 near Boric Acid con-concentrate filter vault el 692	0-TI-30-5216	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Next to 0-L-629 el 676	0-TI-30-5217	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	U1 Blender Station South Wall el 713	1-TI-62-240	$\geq 63^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.1.1.1 &/or 3.1.2.1 Perform Data Sheet 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".	
	Behind BAT A el 713	1-TI-62-239	$\geq 63^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Behind BAT B el 713	2-TI-62-239	$\geq 63^{\circ}\text{F}$	$^{\circ}\text{F}$		

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 34 of 39
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**Data Sheet 1
(Page 13 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____

Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
Outside						
				Normal Limits		
65	1A-A D/G Rm near D/G set el 742	0-TI-30-5229	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$	Readings on this page may be taken in any order.	
	1B-B D/G Rm near D/G set el 742	0-TI-30-5230	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$	In all sections of Ref 65, use of Fluke 52 digital thermometer or equivalent is acceptable for temperature indicators not present or inoperable.	
	2A-A D/G Rm near D/G set el 742	0-TI-30-5231	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$		
	2B-B D/G Rm near D/G set el 742	0-TI-30-5232	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$		
	2B-B D/G Rm on wall by bat-tery charger el 742	0-TI-30-5221	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.7.5.1. SRO should evaluate normal AND abnormal limits. Perform Data Sheet 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".	
	Next to 480V Diesel Aux Bd 2B1-B el 760.5	0-TI-30-5222	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	C-S D/G Rm on wall near D/G set el 742	TI-36	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$	C-S D/G temp only taken IF C-S D/G declared Operable. N/A if NOT operable Perform Data Sheet 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature"	
Pumping Station (IPS)						
65	Next to 480V IPS bd & trans-former (A bus) el 711	0-TI-30-5223	NORMAL LIMITS $\geq 50^{\circ}\text{F}$ & $\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.7.5.1. SRO should evaluate normal AND abnormal limits. Perform Data Sheet 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".	
	In B train ERCW pump rm el 741	0-TI-30-5224	$\leq 120^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Next to 480V IPS bd & trans-former (B bus) el 711	0-TI-30-5225	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Mech Equip Rm A near ERCW & HPFP instru sense lines el 722	0-TI-30-5245	$\geq 50^{\circ}\text{F}$ & $\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Mech Equip Rm B near ERCW & HPFP instru sense lines el 722	0-TI-30-5246	$\geq 50^{\circ}\text{F}$ & $\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		

Initials indicate acc met OR action in "Acc not Met" column initiated.		Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 35 of 39
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**Data Sheet 1
(Page 14 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
Outside						
66	Various D/G Electrical Bd. Rooms	See following table	Bkrs & HS in required position	See following table	Notify SRO of need to evaluate D/G operability using Data Sheet 66 of 1-SI-0-2-00	
NOMENCLATURE		LOCATION 480V Diesel Auxiliary Bd.	BKR POSITION	HS POSITION	UNID	Bkr & HS in Required Position ?
DG 1A-A RM EXH FAN 1 (1-FAN-30-447)		1A1-A C/2B	ON	PULL STANDBY	1-BKR-30-447 / 1-HS-30-447C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1A-A RM GEN/PNL VENT FAN (1-FAN-30-491)		1A1-A C/4D	ON	N/A	1-BKR-30-491	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1A-A ELEC BOARD ROOM EXH FAN (1-FAN-30-459)		1A1-A C/4E	ON	P-AUTO	1-BKR-30-459 / 1-HS-30-459C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1A-A RM EXH FAN 2 (1-FAN-30-451)		1A2-A C/2B	ON	P-AUTO	1-BKR-30-451 / 1-HS-30-451C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2A-A RM EXH FAN 1 (2-FAN-30-448)		2A1-A C/2B	ON	PULL STANDBY	2-BKR-30-448 / 2-HS-30-448C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2A-A ROOM GEN/PANEL VENT FAN (2-FAN-30-492)		2A1-A C/4D	ON	N/A	2-BKR-30-492	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2A-A ELEC BOARD ROOM EXH FAN (2-FAN-30-460)		2A1-A C/4E	ON	P-AUTO	2-BKR-30-460 / 2-HS-30-460C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2A-A RM EXH FAN 2 (2-FAN-30-452)		2A2-A C/2B	ON	P-AUTO	2-BKR-30-452 / 2-HS-30-452C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1B-B ROOM EXH FAN 1 (1-FAN-30-449)		1B1-B C/2B	ON	PULL STANDBY	1-BKR-30-449 / 1-HS-30-449C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1B-B RM GEN/PNL VENT FAN (1-FAN-30-493)		1B1-B C/4D	ON	N/A	1-BKR-30-493	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1B-B ELEC BOARD ROOM EXH FAN (1-FAN-30-461)		1B1-B C/4E	ON	P-AUTO	1-BKR-30-461 / 1-HS-30-461C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1B-B ROOM EXH FAN 2 (1-FAN-30-453)		1B2-B C/2B	ON	P-AUTO	1-BKR-30-453 / 1-HS-30-453C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2B-B ROOM EXH FAN 1 (2-FAN-30-450)		2B1-B C/2B	ON	PULL STANDBY	2-BKR-30-450 / 2-HS-30-450C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2B-B ROOM GEN/PNL VENT FAN (2-FAN-30-494)		2B1-B C/4D	ON	N/A	2-BKR-30-494	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2B-B ELEC BOARD ROOM EXH FAN (2-FAN-30-462)		2B1-B C/4E	ON	P-AUTO	2-BKR-30-462 / 2-HS-30-462C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2B-B RM EXH FAN 2 (2-FAN-30-454)		2B2-B C/2B	ON	P-AUTO	2-BKR-30-454 / 2-HS-30-454C	<input type="checkbox"/> YES <input type="checkbox"/> NO

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 37 of 39
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Data Sheet 2
(Page 1 of 1)

Inoperable Components

Date _____

Page _____ of _____

IF any of the following components are inoperable (when required OPERABLE) during the 1900 - 0700 shift, **THEN** the applicable Data Sheets from 1-SI-0-2-00 are to be performed and attached to this package:

INOPERABLE COMPONENT

1-SI-0-2-00 DATA SHEET

CST Level	Data Sheet 3	<input type="checkbox"/>
Inoperable Ice Condenser Inlet Door Monitoring System	Data Sheet 23	<input type="checkbox"/>
Inoperable Ice Bed Monitoring System	Data Sheet 24	<input type="checkbox"/>
Inoperable Unit 1 Shield Building Stack Flow Monitor	Data Sheet 37	<input type="checkbox"/>
Inoperable Diffuser Discharge Effluent Flow Monitor	Data Sheet 38	<input type="checkbox"/>
Inoperable CVES Flow Monitor	Data Sheet 45	<input type="checkbox"/>
Inoperable Auxiliary Building Stack Flow Monitor	Data Sheet 51	<input type="checkbox"/>
Inoperable Liquid Radwaste Effluent Line Flow Monitor	Data Sheet 55	<input type="checkbox"/>
Inoperable Condensate Demin Effluent Flow Monitor	Data Sheet 58	<input type="checkbox"/>
Inoperable SGBD to CTBD Flow Monitor	Data Sheet 60	<input type="checkbox"/>
Inoperable Service Building Stack Flow Monitor	Data Sheet 62	<input type="checkbox"/>
ICS	Data Sheet 63	<input type="checkbox"/>
Out Of Limit Hourly Temperature	Data Sheet 65	<input type="checkbox"/>
Periodic Temperature Check from DG Bldg Roof	Data Sheet 66	<input type="checkbox"/>

INITIALS _____

Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 38 of 39
-----------------------	--	---

**Attachment 1
(Page 1 of 1)**

Determining Annulus ΔP T/S Limit

SHIELD VENT STACK FLOW ICS Point Y2203A (SCFM))	ADJUSTED Annulus ΔP T/S Limit (IN WC)
0	-5.50
500	-5.50
1000	-5.50
1500	-5.50
2000	-5.51
2500	-5.51
3000	-5.52
3500	-5.52
4000	-5.53
4500	-5.53
5000	-5.54
5500	-5.55
6000	-5.55
6500	-5.56
7000	-5.57
7500	-5.58
8000	-5.59
8500	-5.61
9000	-5.62
9500	-5.63
10000	-5.65
10500	-5.66
11000	-5.67
11500	-5.69
12000	-5.71
12500	-5.72
13000	-5.74
13500	-5.76
14000	-5.78

SHIELD VENT STACK FLOW ICS Point Y2203A (SCFM)	ADJUSTED Annulus ΔP T/S Limit (IN WC)
14500	-5.80
15000	-5.82
15500	-5.84
16000	-5.86
16500	-5.88
17000	-5.91
17500	-5.93
18000	-5.95
18500	-5.98
19000	-6.01
19500	-6.03
20000	-6.06
20500	-6.09
21000	-6.12
21500	-6.14
22000	-6.17
22500	-6.20
23000	-6.24
23500	-6.27
24000	-6.30
24500	-6.33
25000	-6.37
25500	-6.40
26000	-6.44
26500	-6.47
27000	-6.51
27500	-6.55
28000	-6.58

NOTES

- 1) Shield Bldg Vent Stack Flow reading to be taken from ICS log pt Y2203A or 1-FI-90-400. IF ICS point and flow indicator are unavailable, perform Data Sheet 37 of 1-SI-0-2-00 to determine shield building flow.
- 2) If flow reading is between two values, use next higher flow value.

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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A.2-1 SRO

**Review 1-SI-0-2A-03, "1900-0700 Shift and
Daily Surveillance Log Mode Three."**

WATTS BAR NUCLEAR PLANT
A.2-1 SRO
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EVALUATION SHEET

Task: Review 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three."

Alternate Path: N/A

Facility JPM #: New

Safety Function: N/A **Title:** N/A

K/A 2.2.12 Knowledge of surveillance procedures

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

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator ☒ Classroom Perform ☒ Simulate

References: 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three," Rev. 30.

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

Task Standard: Applicant reviews data collected for Data Sheet 1, pages 1 through 4 of 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three." identifies instruments that do not meet the acceptable range identified in the instruction, and implements the corrective actions for the identified instruments.

Validation Time: minutes **Time Critical:** Yes No ☒

Applicant: NAME SSN Time Start: Time Finish:

Performance Rating: SAT UNSAT Performance Time

Examiner: NAME SIGNATURE DATE

COMMENTS

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A.2-1 SRO

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DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. The Unit is in Mode 3 with RCS temperature controlled by the Steam Dumps at 557°F, with no LCO entries at this time.
2. Portions of the field data have been entered by ROs and NAUOs.
3. You are the Unit Supervisor and the Shift Manager assigned to review 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three" for discrepancies and take appropriate action(s), if any, once the review is complete.

INITIATING CUES:

1. You are to review 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three," Data Sheet 1, pages 1 through 4 (of 15.)
2. When you have finished reviewing the assigned pages of Data Sheet 1, address any deviations and identify any required actions.

WATTS BAR NUCLEAR PLANT

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. Right click on 319, and then select RESET.
3. Enter the password.
4. Select "Yes" on the INITIAL CONDITION RESET pop-up window.
5. ENSURE the following information appears on the Director Summary Screen:

	Key		Type	Event	Delay	Inserted	Ramp	Initial	Final	Value
	pi-1-2a	05150 sg #1 stm hdr ch 1	O		00:00:00	00:00:00	00:00:00		1055	1074.1
	pi-1-2b	05150 sg #1 stm hdr ch 2	O		00:00:00	00:00:00	00:00:00		1055	1074.1
	pi-1-5	05150 sg #1 main stm hdr	O		00:00:00	00:00:00	00:00:00		1100	1074.1
	li-3-55	05050 sg #2 level ind	O		00:00:00	00:00:00	00:00:00		30	37.8133
	li-68-335a	05350 rcs przr lv(m-4)	O		00:00:00	00:00:00	00:00:00		32	27.1232
	li-63-52	09030 sis rwst level ind	O		00:00:00	00:00:00	00:00:00		90	98.1359

6. Place simulator in RUN and acknowledge any alarms.
7. Place simulator in FREEZE until Examiner cue is given.

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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STEP/STANDARD	SAT/UNSAT
---------------	-----------

START TIME: _____

EXAMINERS CUE: Provide a marked-up copy of 1-SI-0-2A-03 to applicant.

STEP 1: **PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 1, Reference 3 data collection and determine if Acceptance Criteria are met.**

___ SAT
___ UNSAT

3	1-M-2 Pnl 0-L-209 T15M/708	CST A Level	1-LI-2-230A <input type="checkbox"/> OR 1-LI-2-230B <input type="checkbox"/>	$\geq 200,000$ gallons	gallons	Perform Data Sheet 3 of 1-SI-0-2-00 "CST Level"
---	----------------------------------	-------------	--	---------------------------	---------	--

STANDARD:

Applicant determines that 1-LI-2-230A reading, approximately **390,000** gallons, is within acceptance criteria.

COMMENTS:

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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STEP/STANDARD							SAT/UNSAT
STEP 2. PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 1, Reference 4 data collection and determine if Acceptance Criteria are met.							CRITICAL STEP ___ SAT ___ UNSAT
4	1-M-4	SG 1 Press	1-PI-1-2A	Operable, Channel Check, and MCD ≤ 90 psig	psig	Contact SRO to consult Tech Specs.	
			1-PI-1-2B		psig		
			1-PI-1-5		psig		
		SG 2 Press	1-PI-1-9A		psig		
			1-PI-1-9B		psig		
			1-PI-1-12		psig		
		SG 3 Press	1-PI-1-20A		psig		
			1-PI-1-20B		psig		
			1-PI-1-23		psig		
		SG 4 Press	1-PI-1-27A		psig		
			1-PI-1-27B		psig		
			1-PI-1-30		psig		
STANDARD: Applicant determines that SG 1 Pressure channel 1-PI-1-5 is NOT within MCD of 90 psig. The applicant CIRCLES the 1100 psig value for 1-PI-1-5, identifies the associated Tech Specs and writes the Tech Specs in the space provided at the bottom of the data sheet page. EVALUATOR NOTE: The applicant may determine the need to write a Work Order to troubleshoot and repair the channel. This is NOT REQUIRED to satisfy the CRITICAL STEP. Applicable Tech Specs: 3.3.2, Function 1. e. Condition D - 72 hrs to place channel in trip. 3.3.2, Function 4. d. (1), Condition D - 72 hrs to place channel in trip. COMMENTS:							

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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STEP/STANDARD							SAT/UNSAT																																					
<p>STEP 3: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 1, Reference 5 data collection and determine if Acceptance Criteria are met.</p>							<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>																																					
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td rowspan="16" style="width: 5%; vertical-align: middle;">5</td> <td rowspan="16" style="width: 10%; vertical-align: middle;">1-M-4</td> <td rowspan="3" style="width: 10%;">SG 1 Level</td> <td style="width: 15%;">1-LI-3-42</td> <td rowspan="16" style="width: 15%; vertical-align: middle;">Operable at ≥ 32% NR [for OPERABLE loops], Channel Check, and MCD ≤ 6.0%</td> <td style="width: 10%;">%</td> <td rowspan="16" style="width: 20%; vertical-align: middle;">Contact SRO to consult Tech Specs.</td> </tr> <tr><td>1-LI-3-39</td><td>%</td></tr> <tr><td>1-LI-3-38</td><td>%</td></tr> <tr><td>1-LI-3-55</td><td>%</td></tr> <tr><td>1-LI-3-52</td><td>%</td></tr> <tr><td>1-LI-3-51</td><td>%</td></tr> <tr><td>1-LI-3-97</td><td>%</td></tr> <tr><td>1-LI-3-94</td><td>%</td></tr> <tr><td>1-LI-3-93</td><td>%</td></tr> <tr><td>1-LI-3-110</td><td>%</td></tr> <tr><td>1-LI-3-107</td><td>%</td></tr> <tr><td>1-LI-3-106</td><td>%</td></tr> <tr><td>SG 2 Level</td><td></td><td></td></tr> <tr><td>SG 3 Level</td><td></td><td></td></tr> <tr><td>SG 4 Level</td><td></td><td></td></tr> </table>								5	1-M-4	SG 1 Level	1-LI-3-42	Operable at ≥ 32% NR [for OPERABLE loops], Channel Check, and MCD ≤ 6.0%	%	Contact SRO to consult Tech Specs.	1-LI-3-39	%	1-LI-3-38	%	1-LI-3-55	%	1-LI-3-52	%	1-LI-3-51	%	1-LI-3-97	%	1-LI-3-94	%	1-LI-3-93	%	1-LI-3-110	%	1-LI-3-107	%	1-LI-3-106	%	SG 2 Level			SG 3 Level			SG 4 Level	
5	1-M-4	SG 1 Level	1-LI-3-42	Operable at ≥ 32% NR [for OPERABLE loops], Channel Check, and MCD ≤ 6.0%	%	Contact SRO to consult Tech Specs.																																						
			1-LI-3-39		%																																							
			1-LI-3-38		%																																							
		1-LI-3-55	%																																									
		1-LI-3-52	%																																									
		1-LI-3-51	%																																									
		1-LI-3-97	%																																									
		1-LI-3-94	%																																									
		1-LI-3-93	%																																									
		1-LI-3-110	%																																									
		1-LI-3-107	%																																									
		1-LI-3-106	%																																									
		SG 2 Level																																										
		SG 3 Level																																										
		SG 4 Level																																										
		<p>STANDARD:</p> <p>Applicant determines that SG 3 Level channel 1-LI-3-55 is NOT within MCD ≤ 6.0%: The applicant CIRCLES the 29% value for 1-LI-3-55, identifies the associated Tech Specs and writes the Tech Specs in the space provided at the bottom of the data sheet page.</p> <p>EVALUATOR NOTE: The applicant may determine the need to write a Work Order to troubleshoot and repair the channel. This is NOT REQUIRED to satisfy the CRITICAL STEP.</p> <p>Applicable Tech Specs:</p> <p>3.3.2, Function 5. b, Condition I - 72 hrs to place channel in trip.</p> <p>3.3.2, Function 6. b, Condition M - 72 hrs to place channel in trip..</p> <p>3.3.3, Function 16, Condition A - Restore channel within 30 days.</p> <p>COMMENTS:</p>																																										

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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STEP/STANDARD						SAT/UNSAT
STEP 4: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 2, Reference 8 data collection and determine if Acceptance Criteria are met.						___ SAT ___ UNSAT
8	1-M-4	SR Neutron Mon CH I	1-NI-92-131A	Operable, Channel Check, and MCD value is plus or minus 1/2 decade [0.3CR1<CR2 <3.0CR1].	CPS ⁽²⁾	Contact SRO to consult Tech Specs.
		SR Neutron Mon CH II	1-NI-92-132A	Reading should be the average value observed over a 30 second period	CPS ⁽²⁾	
STANDARD: Applicant determines that the Source Range Monitors are Operable and within the MCD tolerance.						
COMMENTS:						

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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STEP/STANDARD						SAT/UNSAT						
STEP 5: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 2, Reference 9 data collection and determine if Acceptance Criteria are met.						CRITICAL STEP ___ SAT ___ UNSAT						
9	1-M-4	PZR Level	<table border="1"> <tr> <td>1-LI-68-339A</td> <td rowspan="3">Operable, less than or equal to 80%, Channel Check, and MCD ≤ 6.0%</td> <td>%</td> <td rowspan="3">Contact SRO to consult Tech Specs.</td> </tr> <tr> <td>1-LI-68-335A</td> <td>%</td> </tr> <tr> <td>1-LI-68-320</td> <td>%</td> </tr> </table>	1-LI-68-339A	Operable, less than or equal to 80%, Channel Check, and MCD ≤ 6.0%		%	Contact SRO to consult Tech Specs.	1-LI-68-335A	%	1-LI-68-320	%
1-LI-68-339A	Operable, less than or equal to 80%, Channel Check, and MCD ≤ 6.0%	%	Contact SRO to consult Tech Specs.									
1-LI-68-335A		%										
1-LI-68-320		%										
STANDARD: Applicant determines that PZR Level channel 1-LI-68-335A is NOT within MCD (≤ 6.0%). The applicant CIRCLES the value for 1-LI-68-335A identifies the associated Tech Specs and writes the Tech Specs in the space provided at the bottom of the data sheet page. EVALUATOR NOTE: The applicant may determine the need to write a Work Order to troubleshoot and repair the channel. This is NOT REQUIRED to satisfy the CRITICAL STEP. Applicable Tech Specs: 3.3.3, Function 16, Condition A - 30 days. COMMENTS:												

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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STEP/STANDARD						SAT/UNSAT
STEP 6: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 2, Reference 10 data collection and determine if Acceptance Criteria are met.						___ SAT ___ UNSAT
10	1-M-5	PZR Press	1-PI-68-340A 1-PI-68-334 1-PI-68-323 1-PI-68-322	Operable channel check, greater than or equal to 2214psig and MCD ≤ 55 psig.	psig psig psig psig	Contact SRO to consult Tech Spec s
STANDARD: <p>Applicant determines that all PZR Pressure channels meet acceptance criteria. However, the difference between 1-PI-68-340A and 1-PI-68-334 is 47 psig, which is greater than 80% of the MCD, and requires that a Work Order be written.</p>						
COMMENTS:						

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STEP/STANDARD						SAT/UNSAT
STEP 7: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 2, Reference 15 data collection and determine if Acceptance Criteria are met.						___ SAT ___ UNSAT
15	1-M-5	RCS Loops 1, 2, 3, 4	RCP Status		RCP 1 2 3 4 ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Contact SRO to consult Tech Spec s.
		RCP 1	1-HS-68-8AA 1-HS-68-8BA	Two loops operable; two loops in operation if capable of rod withdrawal (one loop if NOT)	(1)	
		RCP 2	1-HS-68-31AA 1-HS-68-31BA		(1)	
		RCP 3	1-HS-68-50AA 1-HS-68-50BA		(1)	
		RCP 4	1-HS-68-73AA 1-HS-68-73BA		(1)	
STANDARD: Applicant determines that acceptance criteria are met.						
COMMENTS:						

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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STEP/STANDARD							SAT/UNSAT																																						
<p>STEP 8: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 3, Reference 16 data collection and determine if Acceptance Criteria are met.</p>							<p>___ SAT</p> <p>___ UNSAT</p>																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">Ref</th> <th style="width: 10%;">Location</th> <th style="width: 20%;">Description</th> <th style="width: 15%;">Instrument #</th> <th style="width: 10%;">T S Limit</th> <th style="width: 10%;">Data</th> <th style="width: 10%;">Acc NOT Met</th> </tr> </thead> <tbody> <tr> <td rowspan="8" style="text-align: center; vertical-align: middle;">16</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">1-M-6</td> <td>RWST to RHR ECCS Suction</td> <td>1-FCV-63-1 (1-HS-63-1A)</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">OPEN</td> <td>OPEN <input type="checkbox"/></td> <td rowspan="8" style="text-align: center; vertical-align: middle;">Contact SRO to consult Tech Specs.</td> </tr> <tr> <td></td> <td></td> <td>CLOSED <input type="checkbox"/></td> </tr> <tr> <td></td> <td>SI Pumps to CL 1, 2, 3, 4</td> <td>1-FCV-63-22 (1-HS-63-22A)</td> <td>OPEN <input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td>CLOSED <input type="checkbox"/></td> </tr> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">480V Rx MOV Boards</td> <td>Shunt BKR 1A1-A c/2E1</td> <td>1-BKR-63-1A OR 1-BKR-63-1B</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">At least one breaker OFF</td> <td>OFF <input type="checkbox"/></td> </tr> <tr> <td>Breaker 1A1-A c/10A</td> <td></td> <td>ON <input type="checkbox"/></td> </tr> <tr> <td>Shunt BKR 1B1-B c/2F2</td> <td>1-BKR-63-22A OR 1-BKR-63-22B</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">At least one breaker OFF</td> <td>OFF <input type="checkbox"/></td> </tr> <tr> <td>Breaker 1B1-B c/11D</td> <td></td> <td>ON <input type="checkbox"/></td> </tr> </tbody> </table>							Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met	16	1-M-6	RWST to RHR ECCS Suction	1-FCV-63-1 (1-HS-63-1A)	OPEN	OPEN <input type="checkbox"/>	Contact SRO to consult Tech Specs.			CLOSED <input type="checkbox"/>		SI Pumps to CL 1, 2, 3, 4	1-FCV-63-22 (1-HS-63-22A)	OPEN <input type="checkbox"/>			CLOSED <input type="checkbox"/>	480V Rx MOV Boards	Shunt BKR 1A1-A c/2E1	1-BKR-63-1A OR 1-BKR-63-1B	At least one breaker OFF	OFF <input type="checkbox"/>	Breaker 1A1-A c/10A		ON <input type="checkbox"/>	Shunt BKR 1B1-B c/2F2	1-BKR-63-22A OR 1-BKR-63-22B	At least one breaker OFF	OFF <input type="checkbox"/>	Breaker 1B1-B c/11D		ON <input type="checkbox"/>
Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met																																							
16	1-M-6	RWST to RHR ECCS Suction	1-FCV-63-1 (1-HS-63-1A)	OPEN	OPEN <input type="checkbox"/>	Contact SRO to consult Tech Specs.																																							
					CLOSED <input type="checkbox"/>																																								
		SI Pumps to CL 1, 2, 3, 4	1-FCV-63-22 (1-HS-63-22A)	OPEN <input type="checkbox"/>																																									
			CLOSED <input type="checkbox"/>																																										
	480V Rx MOV Boards	Shunt BKR 1A1-A c/2E1	1-BKR-63-1A OR 1-BKR-63-1B	At least one breaker OFF	OFF <input type="checkbox"/>																																								
		Breaker 1A1-A c/10A			ON <input type="checkbox"/>																																								
		Shunt BKR 1B1-B c/2F2	1-BKR-63-22A OR 1-BKR-63-22B	At least one breaker OFF	OFF <input type="checkbox"/>																																								
		Breaker 1B1-B c/11D			ON <input type="checkbox"/>																																								
<p>STANDARD:</p> <p>Applicant determines that all acceptance criteria are met for 1-FCV-63-1 and 1-FCV-63-22.</p> <p>EXAMINER'S CUE:</p> <p>Local information will be marked on the Data Sheet provided to the applicant, as indicated in the INITIAL CONDITIONS.</p> <p>COMMENTS:</p>																																													

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

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STEP/STANDARD						SAT/UNSAT																			
<p>STEP 9: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 3, Reference 17 data collection and determine if Acceptance Criteria are met.</p>						<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>																			
17	1-M-6	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">CNTMT Sump Level</td> <td style="text-align: center;">1-LI-63-180</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">Operable, Channel check, and MCD ≤6.0%</td> <td style="text-align: center;">%</td> <td rowspan="8" style="text-align: center; vertical-align: middle;">Contact SRO to consult Tech Specs</td> </tr> <tr> <td style="text-align: center;">1-LI-63-181</td> <td style="text-align: center;">%</td> </tr> <tr> <td style="text-align: center;">1-LI-63-182</td> <td style="text-align: center;">%</td> </tr> <tr> <td style="text-align: center;">1-LI-63-183</td> <td style="text-align: center;">%</td> </tr> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">RWST Level</td> <td style="text-align: center;">1-LI-63-50</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">Operable, Channel check, and MCD ≤ 7.0%</td> <td style="text-align: center;">%</td> </tr> <tr> <td style="text-align: center;">1-LI-63-51</td> <td style="text-align: center;">%</td> </tr> <tr> <td style="text-align: center;">1-LI-63-52</td> <td style="text-align: center;">%</td> </tr> <tr> <td style="text-align: center;">1-LI-63-53</td> <td style="text-align: center;">%</td> </tr> </table>	CNTMT Sump Level	1-LI-63-180	Operable, Channel check, and MCD ≤6.0%		%	Contact SRO to consult Tech Specs	1-LI-63-181	%	1-LI-63-182	%	1-LI-63-183	%	RWST Level	1-LI-63-50	Operable, Channel check, and MCD ≤ 7.0%	%	1-LI-63-51	%	1-LI-63-52	%	1-LI-63-53	%	
CNTMT Sump Level	1-LI-63-180	Operable, Channel check, and MCD ≤6.0%		%		Contact SRO to consult Tech Specs																			
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	1-LI-63-182			%																					
	1-LI-63-183		%																						
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	1-LI-63-51		%																						
	1-LI-63-52		%																						
	1-LI-63-53		%																						
<p>STANDARD:</p> <p>Applicant determines that CNTMT SUMP channels meet acceptance criteria.</p> <p>Applicant determines that 1-LI-63-53 RWST Level channel does NOT meet acceptance criteria, and requires that a Work Order be written. The applicant CIRCLES the value for 1-LI-63-53. This channel is NOT a PAM designated channel.</p> <p>EVALUATOR NOTE: This channel is NOT a PAM designated channel.</p> <p>EVALUATOR NOTE: The applicant may determine the need to write a Work Order to troubleshoot and repair the channel. This is NOT REQUIRED to satisfy the CRITICAL STEP.</p> <p>Applicable Tech Specs:</p> <p>3.3.2, Function 7.b, Condition K, Place channel in BYPASS within 72 hours.</p> <p>COMMENTS:</p>																									

WATTS BAR NUCLEAR PLANT
A.2-1 SRO
Nov. 2009 NRC Exam

STEP/STANDARD						SAT/UNSAT
STEP 10: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 3, Reference 18 data collection and determine if Acceptance Criteria are met.						____ SAT ____ UNSAT
18	1-M-6	CL Accum 1 Outlet	1-FCV-63-118 (1-HS-63-118A)	Valves Open-when Pzr pressure >1000 psig.	OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	Contact SRO to consult Tech Specs.
		CL Accum 2 Outlet	1-FCV-63-98 (1-HS-63-98A)		OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	
		CL Accum 3 Outlet	1-FCV-63-80 (1-HS-63-80A)		OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	
		CL Accum 4 Outlet	1-FCV-63-67 (1-HS-63-67A)		OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>	
STANDARD: Applicant determines that all valves are in their required positions and meet acceptance criteria.						
COMMENTS: <div style="height: 100px;"></div>						

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

Nov. 2009 NRC Exam

STEP/STANDARD						SAT/UNSAT																																																	
STEP 11: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 4, Reference 19 data collection and determine if Acceptance Criteria are met.						____ SAT ____ UNSAT																																																	
19	1-M-6	<table border="1"> <thead> <tr> <th>Ref</th> <th>Location</th> <th>Description</th> <th>Instrument #</th> <th>T S Limit</th> <th>Data</th> <th>Acc NOT Met</th> </tr> </thead> <tbody> <tr> <td rowspan="12"></td> <td rowspan="12"></td> <td rowspan="2">CL Accum 1 Lvl</td> <td>1-LI-63-129</td> <td rowspan="12"> ≥ 7630 and ≤ 8000 gal and MCD ≤ 96 gal. Chemistry is to be notified to perform 1-SI-63-6 within 6 hours if tank level is increased ≥ 75 gal and tank NOT filled from RWST.⁽¹⁾ </td> <td>gal</td> <td rowspan="12"> Check operability by acceptable deviation between redundant level and pressure channels when pressurizer pressure is above 1000 psig. If deviation limit is exceeded, determine the channel inoperable AND record only the operable channel. This channel check is NOT a technical specification requirement. </td> </tr> <tr> <td>1-LI-63-119</td> <td>gal</td> </tr> <tr> <td rowspan="2">CL Accum 2 Lvl</td> <td>1-LI-63-109</td> <td>gal</td> </tr> <tr> <td>1-LI-63-99</td> <td>gal</td> </tr> <tr> <td rowspan="2">CL Accum 3 Lvl</td> <td>1-LI-63-89</td> <td>gal</td> </tr> <tr> <td>1-LI-63-81</td> <td>gal</td> </tr> <tr> <td rowspan="2">CL Accum 4 Lvl</td> <td>1-LI-63-82</td> <td>gal</td> </tr> <tr> <td>1-LI-63-60</td> <td>gal</td> </tr> <tr> <td rowspan="2">CL Accum 1 Press</td> <td>1-PI-63-128</td> <td rowspan="12"> ≥ 610 and ≤ 660 psig and MCD ≤ 30 psig⁽¹⁾ </td> <td>psig</td> </tr> <tr> <td>1-PI-63-126</td> <td>psig</td> </tr> <tr> <td rowspan="2">CL Accum 2 Press</td> <td>1-PI-63-108</td> <td>psig</td> </tr> <tr> <td>1-PI-63-106</td> <td>psig</td> </tr> <tr> <td rowspan="2">CL Accum 3 Press</td> <td>1-PI-63-88</td> <td>psig</td> </tr> <tr> <td>1-PI-63-86</td> <td>psig</td> </tr> <tr> <td rowspan="2">CL Accum 4 Press</td> <td>1-PI-63-62</td> <td>psig</td> </tr> <tr> <td>1-PI-63-61</td> <td>psig</td> </tr> </tbody> </table>	Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met			CL Accum 1 Lvl	1-LI-63-129	≥ 7630 and ≤ 8000 gal and MCD ≤ 96 gal. Chemistry is to be notified to perform 1-SI-63-6 within 6 hours if tank level is increased ≥ 75 gal and tank NOT filled from RWST. ⁽¹⁾	gal	Check operability by acceptable deviation between redundant level and pressure channels when pressurizer pressure is above 1000 psig. If deviation limit is exceeded, determine the channel inoperable AND record only the operable channel. This channel check is NOT a technical specification requirement.	1-LI-63-119	gal	CL Accum 2 Lvl	1-LI-63-109	gal	1-LI-63-99	gal	CL Accum 3 Lvl	1-LI-63-89	gal	1-LI-63-81	gal	CL Accum 4 Lvl	1-LI-63-82	gal	1-LI-63-60	gal	CL Accum 1 Press	1-PI-63-128	≥ 610 and ≤ 660 psig and MCD ≤ 30 psig ⁽¹⁾	psig	1-PI-63-126	psig	CL Accum 2 Press	1-PI-63-108	psig	1-PI-63-106	psig	CL Accum 3 Press	1-PI-63-88	psig	1-PI-63-86	psig	CL Accum 4 Press	1-PI-63-62	psig	1-PI-63-61	psig	
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	1-PI-63-61	psig																																																					
STANDARD:																																																							
Applicant determines that all Cold Leg accumulator level and pressure channels meet acceptance criteria.																																																							
COMMENTS:																																																							

WATTS BAR NUCLEAR PLANT

A.2-1 SRO

Nov. 2009 NRC Exam

STEP/STANDARD						SAT/UNSAT
STEP 12: PERFORM 1-SI-0-2A-03, Data Sheet 1, Page 4, Reference 20 data collection and determine if Acceptance Criteria are met.						___ SAT ___ UNSAT
20	1-M-6 or ICS	CNTMT Press	1-PDI-30-42 or Point P1000A <input type="checkbox"/> 1-PDI-30-43 or Point P1001A <input type="checkbox"/> 1-PDI-30-44 or Point P1002A <input type="checkbox"/> 1-PDI-30-45 or Point P1003A <input type="checkbox"/>	Operable, Channel Check, and MCD of the following: MCD \leq 1.0 psig (Ind) MCD \leq 0.8 psig (mixed) MCD \leq 0.5 psig (computer)	psig ⁽²⁾ psig ⁽²⁾ psig ⁽²⁾ psig ⁽²⁾	Contact SRO to consult Tech Specs
STANDARD: _____ Applicant determines that all channels meet acceptance criteria.						
COMMENTS: _____						

STOP TIME _____

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

- 1. The Unit is in Mode 3 with RCS temperature controlled by the Steam Dumps at 557°F, with no LCO entries at this time.**
- 2. Portions of the field data have been entered by ROs and NAUOs.**
- 3. You are the Unit Supervisor and the Shift Manager assigned to review 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three" for discrepancies and take appropriate action(s), if any, once the review is complete.**

INITIATING CUES:

- 1. You are to review 1-SI-0-2A-03, "1900-0700 Shift and Daily Surveillance Log Mode Three," Data Sheet 1, pages 1 through 4 (of 15.)**
- 2. When you have finished reviewing the assigned pages of Data Sheet 1, address any deviations and identify any required actions.**



Watts Bar Nuclear Plant

Unit 1

Surveillance Instruction

1-SI-0-2A-03

1900 - 0700

**Shift And Daily Surveillance Log
Mode Three**

Revision 0030

Quality Related

Level of Use: Continuous Use

Effective Date: 03-19-2008

Responsible Organization: OPS, Operations

Prepared By: Scot Newell

Approved By: Kathy Keefer

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 2 of 39
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Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
26	02/01/06	2, 3,14,15 23 32	Added additional MCD guidance (PER 74382). Revised Ref. 21 and 22 to reflect Tech Spec change Package WBN-TS-04-17, which contains requirements for opening the penetrations in the Shield Bldg. Dome during Cycle 7 operation. Added 1-FI-90-400 for Shield Building Flow indication. Added capability to use 1-FI-90-400 in Attachment 1.
27	08/04/06	All All 7, 9, 18, 36	This procedure has been converted from Word 95 to Word 2002 XP using rev 26, by Austin Norris. Changed verify to check or ensure. Moved Freq requirements to Step 1.2.2A. Changed all footnote references to superscript. Deleted FRP references and footnotes ♣, ♦, and (14) for Step 1.2.2E; PER 74137. Changed step 6.1.M bullets to 6.1.N - P. Changed containment temperature to ICS on Data Sheet 2.
28	10/18/06	2, 22,	Technical Specification change, WBN-TS-05-06 for Steam Generator secondary side water level.
		26	Deleted Notes on Ref 21 and 22 to remove Tech Spec change WBN-TS-04-17, Shield Bldg Hatches.
		29	TACF 1-05-0004-090, RM-90-106 & 112 alert and alarm setpoints returned to normal.
29	09/14/07	2, 29	TACF 1-07-0006-090 allows rad monitor aligned to lower containment to have background setpoint adjusted from NE SSD setpoint due to RCS leak inside containment.
30	03/19/08	2, 29	Deleted foot note 1 for reference 25 for TACF 1-07-0006-090 RTN.

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 3 of 39
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1.0 INTRODUCTION

1.1 Purpose

This Instruction provides directions for the following:

- A. Recording data required by Surveillance Requirements that can be satisfied on a log type data sheet on a shift and daily log.
- B. Initiation of appropriate actions for abnormal conditions.

1.2 Scope

1.2.1 Operability Tests to be Performed

The following verifications are performed by this Instruction:

1. Annulus ΔP Channel Checks:
 - a. Annulus to Atmospheric ΔP Channel Check.
 - b. Annulus to Containment ΔP Channel Check.
2. Condensate Storage Tank (CST) Volume.
3. CNTMT Pressure Channel Check.
4. CNTMT Purge Air Exhaust Channel Check.
5. CNTMT Sump Level Channel Check.
6. CNTMT Radiation Monitor Channel Check.
7. Control Room Air Intake Radiation Monitor Channel Check.
8. Emergency Core Cooling System (ECCS) Channel Checks:
 - a. ECCS subsystems operable.
 - b. ECCS Cold Leg (CL) Accumulators Isolation Valve Alignment.
 - c. ECCS CL Accumulators Level Channel Check.
 - d. ECCS CL Accumulators Pressure Channel Check.
9. Fuel Pool Area Radiation Monitor Channel Check.
10. Ice Condenser Door Position Channel Check.

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 6 of 39
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1.2.1 Operability Tests to be Performed (continued)

11. Ice Bed Temperature Channel Check.
12. Neutron Flux Instrumentation Channel Check.
13. Pressurizer (Pzr) Level Channel Check.
14. Pressurizer Pressure Channel Check.
15. RCW and ERCW Pump Run Times.
16. Refueling Water Storage Tank (RWST) Level Channel Check
17. SG Narrow Range Water Level Channel Check.
18. Steam Line Pressure Channel Check.

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1.2.2 Surveillance Requirements Fulfilled

A. The following designators are used in the "Freq" column:

- 1 At least once per hour
- 4 At least once per 4 hours
- 8 At least once per 8 hours
- D At least once per 24 hours
- S At least once per 12 hours
- P Completed prior to each release

B. Performance of this Instruction satisfies the following Surveillance Requirements (SRs):

SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
SR p3.3.1.1-5	2 ⁽¹⁾ , 3 ^{(2),(3)} 4 ^{(2),(3)} , 5 ^{(2),(3)}	2, 3, 4, 5, 6	8	S
SR p3.3.2.1-1.c	1,2,3	1,2,3	20	S
SR p3.3.2.1-1.d	1,2,3 ⁽⁴⁾	1,2,3	10	S
SR p3.3.2.1-1.e	1,2,3 ⁽⁴⁾	1,2,3	4	S
SR p3.3.2.1-2.c	1,2,3	1,2,3	20	S
SR p3.3.2.1-3.b.(3)	1,2,3	1,2,3	20	S
SR p3.3.2.1-4.c	1,2 ⁽⁵⁾ , 3 ⁽⁵⁾	1,2,3	20	S
SR p3.3.2.1-4.d.(1)	1, 2 ⁽⁵⁾ , 3 ^{(4),(5)}	1,2,3	4	S
SR p3.3.2.1-4.d.(2)	3 ^{(5),(6)}	3	4	S
SR p3.3.2.1-5.b	1,2 ⁽⁷⁾ , 3 ⁽⁷⁾	1,2,3	5	S
SR p3.3.2.1-6.b	1,2,3	1,2,3	5	S
SR p3.3.2.1-7.b	1,2,3,4	1,2,3,4	17	S
SR p3.3.2.1-8.b.(1)	1,2,3	1,2,3	10	S
SR p3.3.2.1-8.b.(2)	1,2,3	1,2,3	10	S

* The more conservative Tech Spec Operability Limit provided by the applicable Setpoint and Scaling document (SSD) is used instead of the Tech Spec value.

- (1) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
- (2) With RTBs closed and Rod Control System capable of rod withdrawal.
- (3) With RTBs open. In this condition, source range function does **NOT** provide reactor trip but does provide indication.
- (4) Above P-11 (Pressurizer Pressure) interlock.
- (5) Except when all MSIVs are closed & deactivated.
- (6) Function automatically blocked above P-11 (Pressurizer Interlock) setpoint and is enabled below P-11 when safety injection on Steam Line Pressure Low is manually blocked.
- (7) Except when all MFIVs, MFRVs, and their bypass valves are closed and deactivated or isolated by a closed manual valve.
- (8) **NOT** Used.

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 8 of 39
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1.2.2 Surveillance Requirements Fulfilled (continued)

SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
SR p3.3.6.1-3	1,2,3, 4 ⁽⁹⁾	1,2,3,4,5,6	29	S
SR p3.3.7.1-2	All ⁽¹⁰⁾	All	27	S
SR p3.3.8.1-2	All ⁽¹¹⁾	All ⁽¹¹⁾	26	S
SR p3.4.9.1♣	1,2,3	1,2,3	9	S
SR p3.4.15.1	1,2,3,4	1,2,3,4	25	S
SR p3.4.5.1	3	3	15	S
SR p3.4.5.2♣	3	3	5	S
SR p3.5.1.1	1,2,3 ⁽¹²⁾	1,2,3	18	S
SR p3.5.1.2	1,2,3 ⁽¹²⁾	1,2,3	19	S
SR p3.5.1.3	1,2,3 ⁽¹²⁾	1,2,3	19	S
SR p3.5.2.1	1,2,3	1,2,3	16	S
SR p3.6.4.1♣	1,2,3,4	1,2,3,4	21	S
SR p3.6.11.1♣	1,2,3,4	1,2,3,4	24	S
SR p3.6.12.1	1,2,3,4	1,2,3,4	23	S
SR p3.6.15.1♣	1,2,3,4	1,2,3,4	22	S
SR p3.7.6.1	1,2,3,4 ⁽¹³⁾	1,2,3,4	3	S
LCO p3.6.12 Action B.1	1,2,3,4	1,2,3,4	24	4
LCO p3.7.6 Action A1	1,2,3,4 ⁽¹³⁾	1,2,3,4	3	4&S

♣ The more conservative Tech Spec Operability Limit provided by the applicable Setpoint and Scaling document (SSD) is used instead of the Tech Spec value.

(9) During movement of irradiated fuel assemblies within containment.

(10) Required in Modes 1 through 6, AND during movement of irradiated fuel assemblies.

(11) During movement of irradiated fuel assemblies within the fuel handling area.

(12) With pressurizer pressure greater than 1000 psig.

(13) When steam generator is relied upon for heat removal.

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 9 of 39
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1.2.2 Surveillance Requirements Fulfilled (continued)

C. Performance of this Instruction satisfies or partially (p) satisfies the following Technical Surveillance Requirements (TSR):

SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
TSR p3.1.2.1	1, 2, 3	1,2,3	65	S
TSR p3.6.1.1*	1,2,3,4	1,2,3,4	24	S
TSR p3.6.2.1	1,2,3,4	1,2,3,4	23	S
TSR p3.6.2.3	1,2,3,4	1,2,3,4	23	S
TSR p3.7.5.1	All	All	65	S
TR p3.6.1 Action B.1.1	1,2,3,4	1,2,3,4	24	1&S
TR p3.6.1 Action B.1.2	1,2,3,4	1,2,3,4	24	1
TR p3.6.1 Action B.1.3	1,2,3,4	1,2,3,4	24	1&S
TR p3.6.1 Action C.1.1	1,2,3,4	1,2,3,4	24	1&S
TR p3.6.1 Action C.1.2	1,2,3,4	1,2,3,4	24	1
TR p3.6.2 Action A.1	1,2,3,4	1,2,3,4	24	4

* The more conservative Tech Spec Operability Limit provided by the applicable Setpoint and Scaling document (SSD) is used instead of the Tech Spec value.

D. Performance of this Instruction satisfies the following Offsite Dose Calculation Manual Surveillance Requirements (OSRs):

ODCM SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
OSR p2.1.2-3.f	All ⁽²⁰⁾	All ⁽²⁰⁾	59	D
OSR p2.1.2-4.e	All	All	59	D

(20) Both Unit 1 and 2 Shield Building Exhaust System equipment must meet the minimum channel OPERABLE requirement.

E. Fulfillment of special conditions will initiate the following requirements:

SURVEILLANCE REQUIREMENTS	APPLICABLE MODES	PERFORMANCE MODES	Ref	Freq
TR p3.6.1 Action A.1	1,2,3,4	1,2,3,4	24	S

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 10 of 39
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1.3 Frequency and Conditions

- A. This Instruction is to be performed every 1900 - 0700 shift when unit is in Mode 3. This instruction should be performed in Mode 4 prior to Mode 3 entry to ensure Mode 3 requirements are met.

1.3.1 Performance Definitions

- A. **Channel Check** - The qualitative assessment by observation of channel behavior during operation. This determination includes, where possible, comparison of the channel indication and status with other indications or status derived from independent instrument channels measuring the same parameter.
- B. **Maximum Channel Deviation (MCD)** - The difference between the highest channel indication of a parameter and the lowest channel indication of the same parameter. MCD units are the same as the applicable measured parameter units unless otherwise stated in applicable requirement. If deviation limit is exceeded, determine which channel is inoperable AND Record only the operable channel unless stated otherwise. Instrument Maintenance/Engineering shall assist in determining if operability limits have been exceeded.
- C. **Operable or Operability** - A system, subsystem, train, component, or device is operable or has operability when it is capable of performing its specified function(s) and when all necessary attendant instrumentation, controls, electrical power (normal or emergency), cooling, and seal water, lubrication, or other auxiliary equipment required for the system, subsystem, train, component, or device to perform its specified function(s) is also capable of performing its related support function(s).

1.3.2 MCD Calculation Methods

See 1-SI-0-2-00 for explanation of MCD Calculations.

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2.0 REFERENCES

2.1 Performance References

- A. Core Operating Limits Report.
- B. Nuclear Operating Book (NOB),
 - 1. Sheet A-1, Target Band VS Power Level.
 - 2. Sheet A-5, Negative MTC Withdrawal Limit Curve.
- C. SOI-90.02, Gaseous Process Radiation Monitors.

2.2 Developmental References

2.2.1 TVA Procedures

- A. 1-ODI-90-2, Steam Generator Blowdown Release
- B. 1-ODI-90-25, Condenser Vacuum Exhaust Release.
- C. 1-SI-63-6, Cold Leg Accumulators Boron Determination.
- D. 1-SI-68-25, Recalibration of Channel I Reactor Coolant System Flow Loops.
- E. 1-SI-68-26, Recalibration of Channel II Reactor Coolant System Flow Loops.
- F. 1-SI-68-27, Recalibration of Channel III Reactor Coolant System Flow Loops.
- G. 1-SI-68-31, Reactor Coolant System Total Flow Measurement.
- H. 1-SI-68-32, Reactor Coolant System Water Inventory Balance.
- I. 1-SI-68-68, 18 Month Channel Calibration RCS Loop 1 Wide Range Hot Leg Temperature Loop 1-LPT-68-1 (T-413A).
- J. 1-SI-90-25, Inoperable Lower Containment Radiation Monitor.
- K. ECI-1.0, NPDES Plant Effluents.
- L. Backup Ice Condenser Temperature Monitoring.

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2.2.1 TVA Procedures (continued)

- M. Offsite Dose Calculation Manual (ODCM).
- N. SOI-14.03, Condensate Demineralizer Waste Disposal.
- O. SOI-15.01, Steam Generator Blowdown (SGBD) System.
- P. SOI-77.01, Liquid Waste Disposal.

2.2.2 Vendor Manuals

- A. VM-0745, Vendor (Technical) Manual for Tracor Westronics Equipment.
- B. VM-0165, Vendor (Technical) Manual for Loose Parts Monitoring System.

2.2.3 Other

NOTE

Setpoint and Scaling Documents referenced for Technical Specification Operability Limit clarification.

- A. Fire Protection Report, Part II, Fire Protection Plan, Section 14.1.
- B. II-S-92-011 R1, Indicated Low Reactor Coolant System Flow. (TROI ID: SQN II-S-92-011 R1).
- C. N3-61-4001, System Description for the Ice Condenser System.
- D. Nuclear Operating Book (NOB), Sheet A-5.
- E. 1-45W-605-242, Electrical Tech Spec Compliance Tables.
- F. 1-45W-605-243, Electrical Tech Spec Compliance Tables.
- G. SQPER930138, Generic Applicability to Watts Bar Steam Generator Pressure/Temperature Limitations SQN LCO 3.7.2/WBN TR 3.7.1.
- H. Unit 1 Technical Requirements Manual 3.1.2.1, 3.6.1, 3.6.2, 3.7.1.
- I. Unit 1 Technical Specification 3.1.5, 3.1.6, 3.1.7, 3.3.1, 3.3.2, 3.3.6, 3.3.7, 3.3.8, 3.4.1, 3.4.4, 3.4.9, 3.4.15, 3.5.1, 3.5.2, 3.6.4, 3.6.11, 3.6.12, 3.6.15, 3.7.6.
- J. LER 97-013 D/G Operability with D/G exhaust or panel fan out of service.
- K. Annulus Differential Pressure Analysis, RIMS number T69 050321 003.

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3.0 PRECAUTIONS AND LIMITATIONS

- A. When BOTH a radiation monitor and recorder are listed, checking the recorder does **NOT** satisfy the Tech Spec requirement. The monitor must be read to satisfy the requirement.

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Date_____

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4.0 PREREQUISITE ACTIONS

4.1 Preliminary Actions

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

[2] **IF** required, **THEN**

OBTAIN RWP.

4.2 Approvals and Notifications

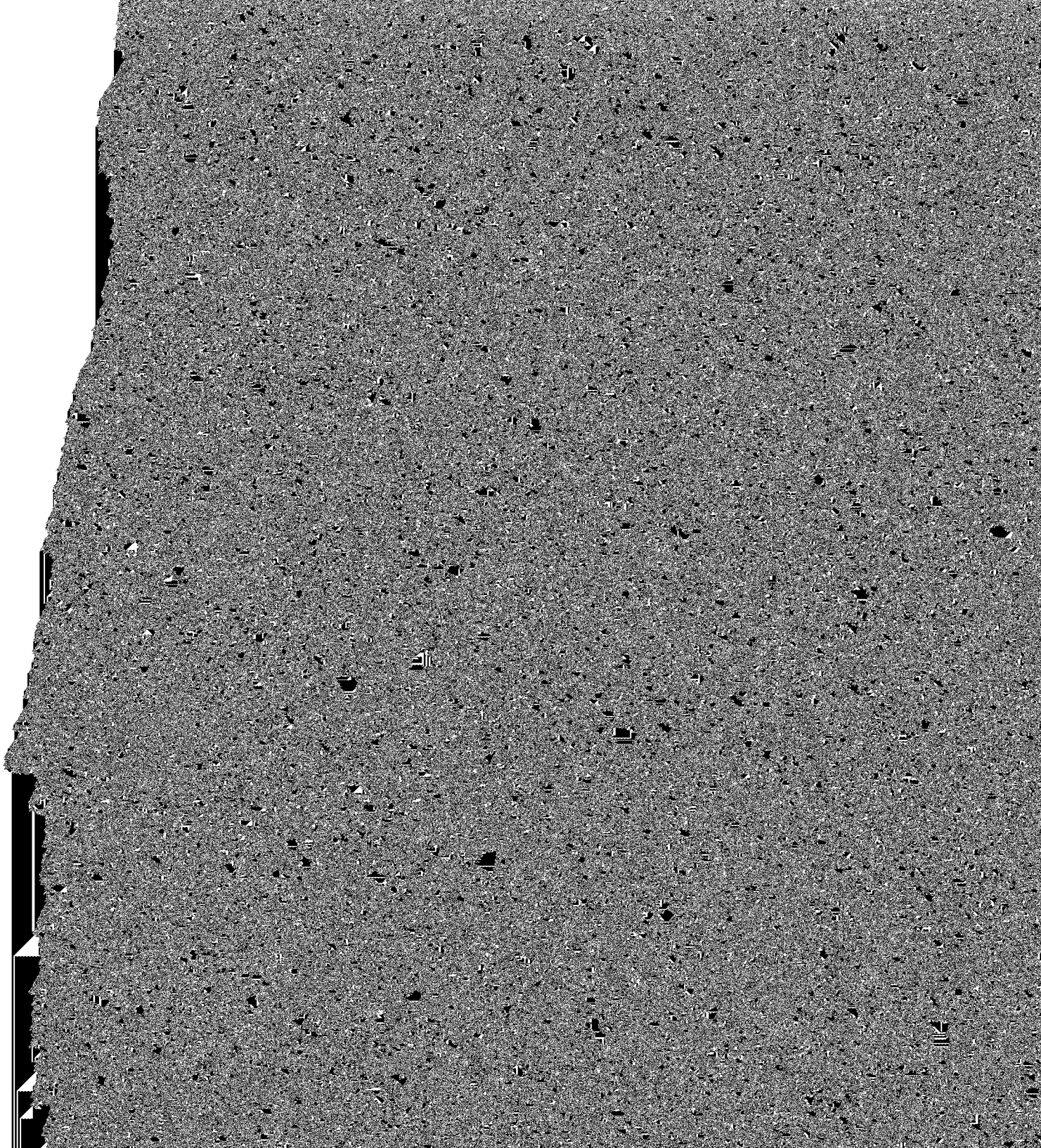
[1] **OBTAIN** SM/Unit SRO approval on the Surveillance Task Sheet to perform this Instruction.

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5.0 ACCEPTANCE CRITERIA

5.1 Test Acceptance Criteria

A. Specific quantitative or qualitative requirements that are intended to be checked



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6.0 PERFORMANCE

6.1 Performance Requirements

- A. Prior to making any mode changes which are more restrictive, review of the shift and daily data sheets is required to ensure compliance with applicable surveillance requirements for that mode. Starting new data sheets for the appropriate mode must be considered.
- B. To meet MCD limits, data for individual instrument channels are required to be compared for deviation.
- C. Items that require channel check that do **NOT** have an MCD listed in Tech Spec Limits column are to be considered acceptable when the following requirements are met:
 - 1. Equipment is energized.
 - 2. Indication is reading a value consistent with present plant conditions.
(For radiation monitors, indication must be reading at least background.)
- D. Exceeding the MCD column limits when performing Channel Checks may require considering the channel(s) inoperable unless stated otherwise. Contact Instrument Maintenance/Engineering for operability determination.
- E. Ensure meters are read consistently from same angle. Use gage face mirrors (if present) and ensure gage needle and its reflection are in alignment. If gage has no mirror in the face, read gage from as close to perpendicular to gage face as possible.
- F. 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.
- G. 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.

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6.1 Performance Requirements (continued)

- H. Any work orders generated during performance of Data Sheets require documentation in Remarks at the bottom of the appropriate data sheet.
- I. Inoperable instruments are required to have INOP entered in the appropriate data space.
- J. Data spaces for instruments in modes which do **NOT** apply can have **N/A** entered in them.
- K. The following are guidelines for radiation monitors and recorders:

CAUTION

When source checking to determine operability, care should be used to prevent actuation of any high level trip or isolation function initiated by a radiation monitor.

1. Radiation levels are to be compared to data taken on the previous shift.
2. Any questionable monitor may be source checked to aid in determining operability. A slight deflection of the indicator is all that is necessary to confirm source check response.
3. A radiation monitoring channel is to be considered operable if it responds to a source check, monitor is in service, and instrument malfunction annunciation due to low flow is clear.
4. Radiation recorders are to be considered operable if operating properly, inking clearly, legible, and running on time.
5. If gas or particulate sampler flow rotameter is inoperable, the respective monitor is also inoperable.
6. Inoperable instruments are to be reported to SRO.
7. Chemistry is to be notified as follows:
 - a. If a monitor is inoperable and a release is being made via this pathway, Chemistry is to be notified to perform applicable ODI until monitor is declared operable.
 - b. If a conditional SI is required, Chemistry is to be notified to perform appropriate SI.
8. Tech Specs are to be referenced for applicable actions.

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6.1 Performance Requirements (continued)

9. A WO is to be initiated and the WO number noted in Remarks.
 10. The applicable Inoperable Radiation Monitor/Recorder Data Table, is to be completed for inoperable monitor(s) or recorder(s).
- L. The following are guidelines for inoperable flow rate measuring devices
1. SRO is to be notified that device is inoperable.
 2. A Work Order to have flow rate measuring device repaired is to be initiated and WO number recorded in Remarks.
 3. Applicable tracking data sheet is to be completed.
 4. Original date and time flow rate device was declared inoperable is to be recorded on each day's data sheet so the 30 day time limit for inoperable monitors is **NOT** exceeded.
 5. Chemistry is to be notified as follows:
 - a. If an iodine sampler flow rotameter is inoperable and requires a portable sampler in accordance with the ODCM, Chemistry is to be notified to install a temporary backup sampler AND perform applicable ODI.
 - b. If a special SI is required, Chemistry is to be notified to perform appropriate SI.
 6. If a flow rate device is declared inoperable, readings for flow rate devices are to be recorded on applicable Inoperable Flow Rate Measuring Device Data Table every 4 hours.
- M. M&TE (Measuring and Test Equipment) may be substituted for installed permanent plant instrumentation as long as the M&TE is at least as accurate as the permanent plant instrumentation.
- N. M&TE to be installed and removed by WO (or TACF), which shall also configure valves to place M&TE in-service (or out-of-service).
- O. Evaluate LCO entry whenever connecting/disconnecting M&TE or whenever M&TE is aligned to plant systems or left unattended. LCO entry may **NOT** be required if the M&TE is installed as a TACF per SPP-9.5.
- P. Document the M&TE substitution, including the WO number (or TACF number) and M&TE ID number on the appropriate data sheet in the remarks section.

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Date _____

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6.2 GENERAL

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

NOTE

Information on specific items in the data sheets is contained in 1-SI-0-2-00 reference appendix with an associated reference number.

- [2] **PERFORM** Data Sheet 1 & 2.
- [3] **ENSURE** Data Sheet 1 & 2 have been completed and Acceptance Criteria reviewed within four hours of assuming shift.

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Date _____

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7.0 POST PERFORMANCE ACTIVITIES

- [1] **ENSURE** all Acceptance Criteria have been met OR appropriate corrective action has been taken.
- [2] **NOTIFY** SM/Unit SRO that this Instruction is complete.
- [3] **PRESENT** completed data sheets for SRO review.
- [4] **RECORD** completion date and time on Surveillance Task Sheet.

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8.0 RECORDS

8.1 QA Records

The Data Package is a QA record, is handled in accordance with the Document Control and Records Management Program, and contains the following:

Completed Data Package.

8.2 Non-QA Records

None

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Data Sheet 1
(Page 1 of 15)

Mode 3 Surveillance Log: 1900-0700

Date Today

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Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
3	1-M-2 Pnl 0-L-209 T15M/708	CST A Level	1-LI-2-230A <input type="checkbox"/> OR 1-LI-2-230B <input type="checkbox"/>	≥ 200,000 gallons	390,000 gallons	Perform Data Sheet 3 of 1-SI-0-2-00 "CST Level"
4	1-M-4	SG 1 Press	1-PI-1-2A	Operable, Channel Check, and MCD ≤ 90 psig	1050 psig	Contact SRO to consult Tech Specs.
			1-PI-1-2B		1050 psig	
			1-PI-1-5		1150 psig	
		SG 2 Press	1-PI-1-9A		1070 psig	
			1-PI-1-9B		1070 psig	
			1-PI-1-12		1060 psig	
		SG 3 Press	1-PI-1-20A		1070 psig	
			1-PI-1-20B		1060 psig	
			1-PI-1-23		1070 psig	
		SG 4 Press	1-PI-1-27A		1070 psig	
			1-PI-1-27B		1070 psig	
			1-PI-1-30		1070 psig	
5	1-M-4	SG 1 Level	1-LI-3-42	Operable at ≥ 32% NR [for OPERABLE loops], Channel Check, and MCD ≤ 6.0%	39 %	Contact SRO to consult Tech Specs.
			1-LI-3-39		39 %	
			1-LI-3-38		38 %	
		SG 2 Level	1-LI-3-55		29 %	
			1-LI-3-52		38 %	
			1-LI-3-51		38 %	
		SG 3 Level	1-LI-3-97		37 %	
			1-LI-3-94		37 %	
			1-LI-3-93		37 %	
		SG 4 Level	1-LI-3-110		39 %	
			1-LI-3-107		39 %	
			1-LI-3-106		39 %	

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	APD	Performer's Initials	SRO's Initials
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Remarks: _____

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Data Sheet 1
(Page 2 of 15)

Mode 3 Surveillance Log: 1900-0700

Date Today Page 2 of 15

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
8	1-M-4	SR Neutron Mon CH I	1-NI-92-131A	Operable, Channel Check, and MCD value is plus or minus 1/2 decade [0.3CR1 < CR2 < 3.0CR1].	<u>2</u> CPS ⁽²⁾	Contact SRO to consult Tech Specs.
		SR Neutron Mon CH II	1-NI-92-132A	Reading should be the average value observed over a 30 second period	<u>2</u> CPS ⁽²⁾	
9	1-M-4	PZR Level	1-LI-68-339A	Operable, less than or equal to 80%, Channel Check, and MCD ≤ 6.0%	<u>26</u> %	Contact SRO to consult Tech Specs.
			1-LI-68-335A		<u>32</u> %	
			1-LI-68-320		<u>25</u> %	
10	1-M-5	PZR Press	1-PI-68-340A	Operable channel check, greater than or equal to 2214psig and MCD ≤ 55 psig.	<u>2265</u> psig	Contact SRO to consult Tech Specs.
			1-PI-68-334		<u>2218</u> psig	
			1-PI-68-323		<u>2220</u> psig	
			1-PI-68-322		<u>2230</u> psig	
15	1-M-5	RCS Loops 1, 2, 3, 4	RCP Status	Two loops operable; two loops in operation if capable of rod withdrawal (one loop if NOT)	RCP 1 2 3 4 ON <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Contact SRO to consult Tech Specs.
		RCP 1	1-HS-68-8AA 1-HS-68-8BA		<u>R</u> (1)	
		RCP 2	1-HS-68-31AA 1-HS-68-31BA		<u>R</u> (1)	
		RCP 3	1-HS-68-50AA 1-HS-68-50BA		<u>R</u> (1)	
		RCP 4	1-HS-68-73AA 1-HS-68-73BA		<u>R</u> (1)	

- (1) Loop status is to be written in data space (Operable (O), Running (R), or INOP).
(2) See 1-SI-0-2-00 Ref. 8 if indication is less than 0.2 CPS.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	<u>ARD</u> Performer's Initials	SRO's Initials
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Remarks: _____

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Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

Date Today

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Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
16	1-M-6	RWST to RHR ECCS Suction	1-FCV-63-1 (1-HS-63-1A)	OPEN	OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/>	
		SI Pumps to CL 1, 2, 3, 4	1-FCV-63-22 (1-HS-63-22A)		OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/>	
	480V Rx MOV Boards	Shunt BKR 1A1-A c/2E1	1-BKR-63-1A OR 1-BKR-63-1B	At least one breaker OFF	OFF <input type="checkbox"/> ON <input checked="" type="checkbox"/>	Contact SRO to consult Tech Specs.
		Breaker 1A1-A c/10A			OFF <input checked="" type="checkbox"/> ON <input type="checkbox"/>	
		Shunt BKR 1B1-B c/2F2	1-BKR-63-22A OR 1-BKR-63-22B	At least one breaker OFF	OFF <input type="checkbox"/> ON <input checked="" type="checkbox"/>	
		Breaker 1B1-B c/11D			OFF <input checked="" type="checkbox"/> ON <input type="checkbox"/>	
17	1-M-6	CNTMT Sump Level	1-LI-63-180	Operable, Channel check, and MCD $\leq 6.0\%$	0 %	Contact SRO to consult Tech Specs
			1-LI-63-181		0 %	
			1-LI-63-182		0 %	
			1-LI-63-183		0 %	
		RWST Level	1-LI-63-50	Operable, Channel check, and MCD $\leq 7.0\%$	98 %	
			1-LI-63-51		96 %	
			1-LI-63-52		99 %	
			1-LI-63-53		90 %	
18	1-M-6	CL Accum 1 Outlet	1-FCV-63-118 (1-HS-63-118A)	Valves Open-when Pzr pressure >1000 psig.	OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/>	Contact SRO to consult Tech Specs.
		CL Accum 2 Outlet	1-FCV-63-98 (1-HS-63-98A)		OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/>	
		CL Accum 3 Outlet	1-FCV-63-80 (1-HS-63-80A)		OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/>	
		CL Accum 4 Outlet	1-FCV-63-67 (1-HS-63-67A)		OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/>	

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials <u>ALD</u>	SRO's Initials
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Remarks:

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Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

Date Today

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Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
19	1-M-6	CL Accum 1 Lvl	1-LI-63-129	≥7630 and ≤8000 gal and MCD ≤ 96 gal. Chemistry is to be notified to perform 1-SI-63-6 within 6 hours if tank level is increased ≥ 75 gal and tank NOT filled from RWST. ⁽¹⁾	7815 gal	Check operability by acceptable deviation between redundant level and pressure channels when pressurizer pressure is above 1000 psig. If deviation limit is exceeded, determine the channel inoper-able AND record only the operable channel. This channel check is NOT a technical specification re-quirement.
			1-LI-63-119		7820 gal	
		CL Accum 2 Lvl	1-LI-63-109		7810 gal	
			1-LI-63-99		7815 gal	
		CL Accum 3 Lvl	1-LI-63-89		7810 gal	
			1-LI-63-81		7810 gal	
		CL Accum 4 Lvl	1-LI-63-82		7810 gal	
			1-LI-63-60		7810 gal	
		CL Accum 1 Press	1-PI-63-128	≥610 and ≤660 psig and MCD ≤ 30 psig ⁽¹⁾	620 psig	
			1-PI-63-126		635 psig	
		CL Accum 2 Press	1-PI-63-108		640 psig	
			1-PI-63-106		635 psig	
		CL Accum 3 Press	1-PI-63-88		650 psig	
			1-PI-63-86		625 psig	
		CL Accum 4 Press	1-PI-63-62		630 psig	
			1-PI-63-61		650 psig	
20	1-M-6 or ICS	CNTMT Press	1-PDI-30-42 or Point P1000A	Operable, Channel Check, and MCD of the following: MCD ≤ 1.0 psig (Ind) MCD ≤ 0.8 psig (mixed) MCD ≤ 0.5 psig (computer)	0 psig ⁽²⁾	Contact SRO to consult Tech Specs
			1-PDI-30-43 or Point P1001A		0 psig ⁽²⁾	
			1-PDI-30-44 or Point P1002A		0 psig ⁽²⁾	
			1-PDI-30-45 or Point P1003A		0 psig ⁽²⁾	

(1) When Pzr pressure greater than 1000 psig.

(2) Instrument used for data is to be checked. PDI is preferred instrument.

Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

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Data Sheet 1
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Mode 3 Surveillance Log: 1900-0700

Date _____

Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
21	1-M-9	CNTMT-ANN ΔP	1-PDI-30-133 <input type="checkbox"/> or 1-PDI-30-30C <input type="checkbox"/>	ΔP between -0.07 and 0.27 psid	psid ⁽²⁾	Contact SRO to consult Tech Specs.
22	1-M-9	Annulus ΔP	1-PDI-30-126	More negative than or equal value on Attachment 1 " H ₂ O ⁽¹⁾	_____ " H ₂ O ⁽⁴⁾	
			1-PDI-30-127	and MCD ≤ 0.7 "H ₂ O	_____ " H ₂ O ⁽⁴⁾	
	ICS 1-M-9	Shield Building Flow	point Y2203A <input type="checkbox"/> or 1-FI-90-400 <input type="checkbox"/> or Data Sheet 37 ⁽³⁾ <input type="checkbox"/>	N/A-used for Attachment 1	SCFM	
		Tech Spec Acceptance value from Attachment 1		_____ " H ₂ O ⁽⁴⁾		

- (1) 1-PDI-30-126 and 1-PDI-30-127 have a range of 0 - 10" H₂O and indicate negative pressure relative to atmosphere (e.g. an indication of 6" H₂O is more negative than negative 5.5" H₂O)
- (2) 1-PDI-30-30C on 1-L-10 may be substituted for 1-PDI-30-133 to check Tech Spec compliance.
- (3) Perform data sheet 37 of 1-SI-0-2-00 to determine shield building flow if ICS point and 1-FI-90-400 are unavailable whenever shield building exhaust stack has flow. This flow is required in order to determine Tech Spec value for Annulus ΔP on Attachment 1.
- (4) N/A during venting operations, required annulus entries, or Aux Bldg isolations not exceeding 1 hour in duration.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

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Mode 3 Surveillance Log: 1900-0700

Ret	Location	Description	Instrument #	TS Limit	Data	Acc NOT Met
23	1-M-10	Ice Cndnsr Door Status Position Monitoring System	1-XI-61-187	Operable, all doors closed, and Channel Check	(√)	Contact SRO to consult Tech Specs and perform data sheet 23.
24	1-M-10	Ice Bed Temperature Monitoring System	1-TR-61-138	Operable, $\leq 25.2^{\circ}\text{F}$, Channel Check, and minimum of two RTDs per group operable. ⁽¹⁾	Table below	If 1-TR-61-138 and Local Ice Cond Temp monitoring panel are inoperable, perform Data Sheet 24 of 1-SI-0-2-00 "Inoperable Ice Bed Monitoring System"

- (1) At least two RTDs are to be verified operable per group and two highest readings from each group recorded. All readings should be recorded to one decimal position and should **NOT** be rounded. If 1-TR-61-138 is inoperable, MIG is to be notified to perform IMI-15 once every 12 hours to fulfill TR 3.6.1 Action A.11.
- (2) Fulfills LCO 3.6.12 Action B.1 or TR 3.6.2 Action A.1, when maximum ice bed temp $\leq 25.2^{\circ}\text{F}$ once every four hours.
- (3) Fulfills TR 3.6.1 Action B.1.2 and/or Action C.1.2, when required by INOP Ice Bed Temp Monitoring System.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 28 of 39
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**Data Sheet 1
(Page 7 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

	TE	PT	Data		TE	PT	Data		TE	PT	Data
EL 801 Group 7 ⁽¹⁾⁽²⁾	138	1		EL 776 Group 4 ⁽¹⁾⁽²⁾	139	16		EL 756 Group 1 ⁽¹⁾⁽²⁾	N/A	N/A	N/A
	141	2			142	17			143	31	
	144	3			145	18			146	32	
	147	4			148	19			149	33	
	150	5			151	20			152	34	
Two Highest Temps		1		Two Highest Temps		1		Two Highest Temps		1	
		2				2				2	
Sum of 1 and 2				Sum of 1 and 2				Sum of 1 and 2			
EL 801 Group 8 ⁽¹⁾⁽²⁾	153	6		EL 776 Group 5 ⁽¹⁾⁽²⁾	154	21		EL 756 Group 2 ⁽¹⁾⁽²⁾	155	35	
	156	7			157	22			N/A	N/A	N/A
	159	8			160	23			161	36	
	165	9			166	24			167	37	
	183	10			184	25			185	38	
Two Highest Temps		1		Two Highest Temps		1		Two Highest Temps		1	
		2				2				2	
Sum of 1 and 2				Sum of 1 and 2				Sum of 1 and 2			
EL 801 Group 9 ⁽¹⁾⁽²⁾	168	11		EL 776 Group 6 ⁽¹⁾⁽²⁾	169	26		EL 756 Group 3 ⁽¹⁾⁽²⁾	170	39	
	171	12			172	27			173	40	
	174	13			175	28			176	41	
	177	14			178	29			179	42	
	180	15			181	30			N/A	N/A	N/A
Two Highest Temps		1		Two Highest Temps		1		Two Highest Temps		1	
		2				2				2	
Sum of 1 and 2				Sum of 1 and 2				Sum of 1 and 2			
TOTAL OF SUMS	TOTALS + 18			MEAN ICE BED TEMP ⁽³⁾	OPTIMUM MEAN ICE BED TEMP			PERFORMER INITIALS	REVIEWER INITIALS		
	÷ 18				15°F TO 20°F						

- (1) At least two RTDs are to be verified operable per group and two highest readings from each group recorded. All readings should be recorded to one decimal position and should **NOT** be rounded. If 1-TR-61-138 is inoperable, MIG is to be notified to perform IMI-15 once every 12 hours to fulfill TR 3.6.1 Action A.11.
- (2) Fulfills LCO 3.6.12 Action B.1 or TR 3.6.2 Action A.1, when maximum ice bed temp ≤ 25.2°F once every four hours.
- (3) Fulfills TR 3.6.1 Action B.1.2 and/or Action C.1.2, when required by INOP Ice Bed Temp Monitoring System.

	Initials INDICATE acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 29 of 39
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Data Sheet 1
(Page 8 of 15)

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
25	0-M-12 or ICS	Lower and Upper CNTMT Gas and Particulate	1-RM-90-106A <input type="checkbox"/>	Operable and Channel Check	cpm	If monitor aligned to Lower Containment is inoperable, the other monitor is to be re- aligned using SOI-90.02. If both monitors are inoper- able, SRO is to be notified, 1-SI-68-32 is to be performed, and Chemistry Count- room is to be notified to perform 1-SI-90-25.
			or point R1012A <input type="checkbox"/>		cpm	
			1-RM-90-106B <input type="checkbox"/>		cpm	
			or point R1013A <input type="checkbox"/>		cpm	
			1-RM-90-112A <input type="checkbox"/>		cpm	
			or point R1015A <input type="checkbox"/>		cpm	
			1-RM-90-112B <input type="checkbox"/>		cpm	
26	0-M-12 or ICS	Spend Fuel Pit Area	or point R1016A <input type="checkbox"/>	Operable	(v)	Contact SRO to consult Tech Specs
			1-RR-90-106		(v)	
			1-RR-90-112		(v)	
27	0-M-12 or ICS	MCR Intake	0-RM-90-102 <input type="checkbox"/>	Operable and Channel Check	mr/hr	Contact SRO to consult Tech Specs. See Section 6.1K.
			or point R9011A <input type="checkbox"/>		mr/hr	
			0-RM-90-103 <input type="checkbox"/>		cpm	
			or point R9012A <input type="checkbox"/>		cpm	
			0-RM-90-125 <input type="checkbox"/>		(v)	
27	0-M-12 or ICS	MCR Intake	or point R1025A <input type="checkbox"/>	Operable and Channel Check	(v)	Contact SRO to consult Tech Specs. See Section 6.1K.
			0-RM-90-126 <input type="checkbox"/>		(v)	
			or point R1026A <input type="checkbox"/>		(v)	
27	0-M-12 or ICS	MCR Intake	0-RR-90-125	Operable and Channel Check	(v)	Contact SRO to consult Tech Specs. See Section 6.1K.
			0-RR-90-126		(v)	

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 30 of 39
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**Data Sheet 1
(Page 9 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____

Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
28	0-M-12 or ICS	CCS Hx A Out Liquid	1-RM-90-123 or point R1023A <input type="checkbox"/>	Operable and Channel Check (Info Only-T.S. N/A)	cpm	Contact SRO. See Section 6.1K.
29	AUX BLDG A2U/713 or ICS	CNTMT Purge Air Exh Radiation Monitor	1-RM-90-130A or point R1027A <input type="checkbox"/>	Operable and Channel Check	cpm	Contact SRO to consult Tech Specs. See Section 6.1K. IF both monitors inoperable, suspend purge flow immediately per ODCM table 1.1.2-6.a
			1-RM-90-131A or point R1028A <input type="checkbox"/>		cpm	

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 31 of 39
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Data Sheet 1
(Page 10 of 15)

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
59	AEB 729	Unit 1 Shield Bldg Exhaust Tritium Flow Rate Monitor	1-SMPL-90-801	Operable	(√)	If Tritium flow rate measuring device is inoperable, SRO and Chemistry are to be notified. Initiate WO and record number in remarks section.
	AEB 729	Unit 2 Shield Bldg Exhaust Tritium Flow Rate Monitor	2-SMPL-90-801	Operable	(√)	
	AUX BLDG 786	Aux Bldg and Fuel Handling Exhaust Tritium Flow Rate Monitor	0-SMPL-90-800	Operable	(√)	
67	N/A	1-SI-0-10 ⁽¹⁾	N/A	Tech Specs per 1-SI-0-10	Completed or in progress for the required performance frequency interval <input type="checkbox"/> (√)	N/A

⁽¹⁾ Conditional performance cannot be substituted for periodic performance.

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 32 of 39
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**Data Sheet 1
(Page 11 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument	T S Limit	Data	Acc NOT Met
Control Building						
				NORMAL LIMITS		
65	Control Room South Wall	el 755	0-TI-30-5219	$\leq 80^{\circ}\text{F}$	$^{\circ}\text{F}$	Readings on this page may be taken in any order.
	Control Room across from	1-M-9 el 755	0-TI-30-5220	$\leq 80^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Next to 480V SD BD	Transformer 1A2-A el 772	0-TI-30-5201	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Next to 480V SD BD	Transformer 1B1-B el 772	0-TI-30-5202	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	In all sections of Ref 65, use of Fluke 52 digital thermometer or equivalent is acceptable for temperature indicators not present or inoperable.
	Next to 480V Rx MOV	Bd 1A2-A el 772	0-TI-30-5203	$\leq 83^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Behind 125V Vital Batt	Charger 6-S el 772	0-TI-30-5204	$\leq 83^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Next to 480V Rx MOV	Bd 2A2-A el 772	0-TI-30-5205	$\leq 83^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Next to 480V SD BD	Transformer 2A2-A el 772	0-TI-30-5206	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Next to 480V SD BD	Transformer 2B2-B el 772	0-TI-30-5207	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.7.5.1. SRO should evaluate normal AND abnormal limits. Perform Data Sheets 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".
	Next to 480V Rx MOV	Bd 2B2-B el 772	0-TI-30-5208	$\leq 83^{\circ}\text{F}$	$^{\circ}\text{F}$	
	U1 Mech Equip Rm	el 772	0-TI-30-5209	$\leq 91^{\circ}\text{F}$	$^{\circ}\text{F}$	
	SD BD Rm U1 behind stairs	S-A3 el 757	0-TI-30-5210	$\leq 85^{\circ}\text{F}$	$^{\circ}\text{F}$	
	SD BD Rm U2 behind stairs	S-A13 el 757	0-TI-30-5211	$\leq 85^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Refuel Floor U1 beside Aux	Boration Makeup Tank el 757	0-TI-30-5212	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Computer room at center of	the room el 708	0-TI-30-5226	$\leq 74^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Aux Instrument Room	el 708	0-TI-30-5233	$\leq 90^{\circ}\text{F}$	$^{\circ}\text{F}$	

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 33 of 39
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**Data Sheet 1
(Page 12 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____

Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
Auxiliary Building						
				Normal Limits		
65	U1 outside supply fan room el 737	0-TI-30-5213	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Readings on this page may be taken in any order. In all sections of Ref 65, use of Fluke 52 digital thermometer or equivalent is acceptable for temperature indicators not present or inoperable.	
	South steam vault room U1 el 730	0-TI-30-5228	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$		
	North steam vault room U1 el 730	0-TI-30-5227	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Between UHI Accumulators el 729	0-TI-30-5218	$\leq 92^{\circ}\text{F}$	$^{\circ}\text{F}$		
	U1 across from AFW pumps el 713	0-TI-30-5214	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	U1 outside AFW pump room door el 692	0-TI-30-5215	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.7.5.1. SRO should evaluate normal AND abnormal limits. Perform Data Sheets 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".	
	U2 near Boric Acid con-concentrate filter vault el 692	0-TI-30-5216	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Next to 0-L-629 el 676	0-TI-30-5217	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$		
	U1 Blender Station South Wall el 713	1-TI-62-240	$\geq 63^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.1.1.1 &/or 3.1.2.1 Perform Data Sheet 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".	
	Behind BAT A el 713	1-TI-62-239	$\geq 63^{\circ}\text{F}$	$^{\circ}\text{F}$		
	Behind BAT B el 713	2-TI-62-239	$\geq 63^{\circ}\text{F}$	$^{\circ}\text{F}$		

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 34 of 39
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**Data Sheet 1
(Page 13 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
Outside						
				Normal Limits		
65	1A-A D/G Rm near D/G set el 742		0-TI-30-5229	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$	Readings on this page may be taken in any order. In all sections of Ref 65, use of Fluke 52 digital thermometer or equivalent is acceptable for temperature indicators not present or inoperable.
	1B-B D/G Rm near D/G set el 742		0-TI-30-5230	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$	
	2A-A D/G Rm near D/G set el 742		0-TI-30-5231	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$	
	2B-B D/G Rm near D/G set el 742		0-TI-30-5232	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$	
	2B-B D/G Rm on wall by bat-tery charger el 742		0-TI-30-5221	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.7.5.1. SRO should evaluate normal AND abnormal limits. Perform Data Sheet 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".
	Next to 480V Diesel Aux Bd 2B1-B el 760.5		0-TI-30-5222	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	
	C-S D/G Rm on wall near D/G set el 742		TI-36	$\geq 50^{\circ}\text{F}$	$^{\circ}\text{F}$	C-S D/G temp only taken IF C-S D/G declared Operable. N/A if NOT operable Perform Data Sheet 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature"
Pumping Station (IPS)						
65	Next to 480V IPS bd & trans-former (A bus) el 711		0-TI-30-5223	NORMAL LIMITS $\geq 50^{\circ}\text{F}$ & $\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	Contact SRO to consult Technical Requirements section 3.7.5.1. SRO should evaluate normal AND abnormal limits. Perform Data Sheet 65 of 1-SI-0-2-00 "Out of Limit Hourly Temperature".
	In B train ERCW pump rm el 741		0-TI-30-5224	$\leq 120^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Next to 480V IPS bd & trans-former (B bus) el 711		0-TI-30-5225	$\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Mech Equip Rm A near ERCW & HPFP instru sense lines el 722		0-TI-30-5245	$\geq 50^{\circ}\text{F}$ & $\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	
	Mech Equip Rm B near ERCW & HPFP instru sense lines el 722		0-TI-30-5246	$\geq 50^{\circ}\text{F}$ & $\leq 104^{\circ}\text{F}$	$^{\circ}\text{F}$	

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 35 of 39
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**Data Sheet 1
(Page 14 of 15)**

Mode 3 Surveillance Log: 1900-0700

Date _____ Page _____ of _____

Ref	Location	Description	Instrument #	T S Limit	Data	Acc NOT Met
Outside						
66	Various D/G Electrical Bd. Rooms	See following table	Bkrs & HS in required position	See following table	Notify SRO of need to evaluate D/G operability using Data Sheet 66 of 1-SI-0-2-00	
NOMENCLATURE		LOCATION 480V Diesel Auxiliary Bd.	BKR POSITION	HS POSITION	UNID	Bkr & HS in Required Position ?
DG 1A-A RM EXH FAN 1 (1-FAN-30-447)		1A1-A C/2B	ON	PULL STANDBY	1-BKR-30-447 / 1-HS-30-447C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1A-A RM GEN/PNL VENT FAN (1-FAN-30-491)		1A1-A C/4D	ON	N/A	1-BKR-30-491	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1A-A ELEC BOARD ROOM EXH FAN (1-FAN-30-459)		1A1-A C/4E	ON	P-AUTO	1-BKR-30-459 / 1-HS-30-459C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1A-A RM EXH FAN 2 (1-FAN-30-451)		1A2-A C/2B	ON	P-AUTO	1-BKR-30-451 / 1-HS-30-451C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2A-A RM EXH FAN 1 (2-FAN-30-448)		2A1-A C/2B	ON	PULL STANDBY	2-BKR-30-448 / 2-HS-30-448C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2A-A ROOM GEN/PANEL VENT FAN (2-FAN-30-492)		2A1-A C/4D	ON	N/A	2-BKR-30-492	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2A-A ELEC BOARD ROOM EXH FAN (2-FAN-30-460)		2A1-A C/4E	ON	P-AUTO	2-BKR-30-460 / 2-HS-30-460C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2A-A RM EXH FAN 2 (2-FAN-30-452)		2A2-A C/2B	ON	P-AUTO	2-BKR-30-452 / 2-HS-30-452C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1B-B ROOM EXH FAN 1 (1-FAN-30-449)		1B1-B C/2B	ON	PULL STANDBY	1-BKR-30-449 / 1-HS-30-449C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1B-B RM GEN/PNL VENT FAN (1-FAN-30-493)		1B1-B C/4D	ON	N/A	1-BKR-30-493	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1B-B ELEC BOARD ROOM EXH FAN (1-FAN-30-461)		1B1-B C/4E	ON	P-AUTO	1-BKR-30-461 / 1-HS-30-461C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 1B-B ROOM EXH FAN 2 (1-FAN-30-453)		1B2-B C/2B	ON	P-AUTO	1-BKR-30-453 / 1-HS-30-453C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2B-B ROOM EXH FAN 1 (2-FAN-30-450)		2B1-B C/2B	ON	PULL STANDBY	2-BKR-30-450 / 2-HS-30-450C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2B-B ROOM GEN/PNL VENT FAN (2-FAN-30-494)		2B1-B C/4D	ON	N/A	2-BKR-30-494	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2B-B ELEC BOARD ROOM EXH FAN (2-FAN-30-462)		2B1-B C/4E	ON	P-AUTO	2-BKR-30-462 / 2-HS-30-462C	<input type="checkbox"/> YES <input type="checkbox"/> NO
DG 2B-B RM EXH FAN 2 (2-FAN-30-454)		2B2-B C/2B	ON	P-AUTO	2-BKR-30-454 / 2-HS-30-454C	<input type="checkbox"/> YES <input type="checkbox"/> NO

	Initials indicate acc met OR action in "Acc not Met" column initiated.	Performer's Initials	SRO's Initials
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Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 36 of 39
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**Data Sheet 1
(Page 15 of 15)**

Mode 3 Surveillance Log: 1900-0700

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**Data Sheet 2
(Page 1 of 1)**

Inoperable Components

Date _____

Page _____ of _____

IF any of the following components are inoperable (when required OPERABLE) during the 1900 - 0700 shift, **THEN** the applicable Data Sheets from 1-SI-0-2-00 are to be performed and attached to this package:

INOPERABLE COMPONENT

1-SI-0-2-00 DATA SHEET

CST Level	Data Sheet 3	<input type="checkbox"/>
Inoperable Ice Condenser Inlet Door Monitoring System	Data Sheet 23	<input type="checkbox"/>
Inoperable Ice Bed Monitoring System	Data Sheet 24	<input type="checkbox"/>
Inoperable Unit 1 Shield Building Stack Flow Monitor	Data Sheet 37	<input type="checkbox"/>
Inoperable Diffuser Discharge Effluent Flow Monitor	Data Sheet 38	<input type="checkbox"/>
Inoperable CVES Flow Monitor	Data Sheet 45	<input type="checkbox"/>
Inoperable Auxiliary Building Stack Flow Monitor	Data Sheet 51	<input type="checkbox"/>
Inoperable Liquid Radwaste Effluent Line Flow Monitor	Data Sheet 55	<input type="checkbox"/>
Inoperable Condensate Demin Effluent Flow Monitor	Data Sheet 58	<input type="checkbox"/>
Inoperable SGBD to CTBD Flow Monitor	Data Sheet 60	<input type="checkbox"/>
Inoperable Service Building Stack Flow Monitor	Data Sheet 62	<input type="checkbox"/>
ICS	Data Sheet 63	<input type="checkbox"/>
Out Of Limit Hourly Temperature	Data Sheet 65	<input type="checkbox"/>
Periodic Temperature Check from DG Bldg Roof	Data Sheet 66	<input type="checkbox"/>

INITIALS

Remarks: _____

WBN Unit 1	1900 - 0700 Shift And Daily Surveillance Log Mode Three	1-SI-0-2A-03 Rev. 0030 Page 38 of 39
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**Attachment 1
(Page 1 of 1)**

Determining Annulus ΔP T/S Limit

SHIELD VENT STACK FLOW ICS Point Y2203A (SCFM))	ADJUSTED Annulus ΔP T/S Limit (IN WC)
0	-5.50
500	-5.50
1000	-5.50
1500	-5.50
2000	-5.51
2500	-5.51
3000	-5.52
3500	-5.52
4000	-5.53
4500	-5.53
5000	-5.54
5500	-5.55
6000	-5.55
6500	-5.56
7000	-5.57
7500	-5.58
8000	-5.59
8500	-5.61
9000	-5.62
9500	-5.63
10000	-5.65
10500	-5.66
11000	-5.67
11500	-5.69
12000	-5.71
12500	-5.72
13000	-5.74
13500	-5.76
14000	-5.78

SHIELD VENT STACK FLOW ICS Point Y2203A (SCFM)	ADJUSTED Annulus ΔP T/S Limit (IN WC)
14500	-5.80
15000	-5.82
15500	-5.84
16000	-5.86
16500	-5.88
17000	-5.91
17500	-5.93
18000	-5.95
18500	-5.98
19000	-6.01
19500	-6.03
20000	-6.06
20500	-6.09
21000	-6.12
21500	-6.14
22000	-6.17
22500	-6.20
23000	-6.24
23500	-6.27
24000	-6.30
24500	-6.33
25000	-6.37
25500	-6.40
26000	-6.44
26500	-6.47
27000	-6.51
27500	-6.55
28000	-6.58

NOTES

- 1) Shield Bldg Vent Stack Flow reading to be taken from ICS log pt Y2203A or 1-FI-90-400. IF ICS point and flow indicator are unavailable, perform Data Sheet 37 of 1-SI-0-2-00 to determine shield building flow.
- 2) If flow reading is between two values, use next higher flow value.

WATTS BAR NUCLEAR PLANT

A.3 RO/SRO

Nov. 2009 NRC Exam

A.3 RO/SRO

**Determine Potential Total Dose for Valve
Alignment.**

WATTS BAR NUCLEAR PLANT
A.3 RO/SRO
Nov. 2009 NRC Exam

EVALUATION SHEET

Task: Determine Potential Total Dose For Valve Alignment.

Alternate Path: N/A

Facility JPM #: JPMRADMIN A.3

K/A Rating(s): 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions. 3.2/3.7

Task Standard: Determine total dose which will occur while aligning 1-FCV-63-11, and based on that determination, state whether the administrative dose limit will be exceeded.

Preferred Evaluation Location:

Simulator X Classroom X

Preferred Evaluation Method:

Perform X Simulate

References:

Task Number: AUO-119-SSP-5.01-001

Applicable for: RO X SRO X

Validation Time: 10 minutes

Time Critical: Yes No X

Applicant:
NAME

SSN

Time Start:
Time Finish:

Performance Rating: SAT UNSAT

Performance Time

Examiner:
NAME

 /
SIGNATURE DATE

COMMENTS

**WATTS BAR NUCLEAR PLANT
A.3 RO/SRO
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ENSURE the applicant has a copy of the survey map for elevation 713' areas of interest.

DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

A survey map is available for elevation 713' of the auxiliary building, showing dose rates and projected travel times to reach 1-FCV-63-11 and open it manually.

RADCON personnel are currently unavailable to provide assistance.

INITIATING CUES:

You have been directed to perform the alignment of 1-FCV-63-11.

Your total dose for the year to date is 715 mr.

Calculate your estimated total dose to perform this job using the attached survey map.

Determine if you can perform this job without exceeding your administrative dose limit. Show all work.

WATTS BAR NUCLEAR PLANT

A3 RO/SRO

STEP/STANDARD	SAT/UNSAT
---------------	-----------

START TIME: _____

NOTE TO EVALUATOR: If the applicant asks if this is a planned special exposure, respond that the applicant should read initiating cues.

Examinee must calculate 2 way travel time thru all transit areas. Allowable values are +0%, -10%.

<u>STEP 1:</u> Calculate exposure during transit thru the sample room and penetration room to the valve and return.		CRITICAL STEP ___ SAT ___ UNSAT
<u>STANDARD:</u>		
<u>Sample Room</u>	$(500\text{mr/hr})(0.5 \text{ min})(2)(\text{hr}/60\text{min}) = \underline{8.33 \text{ mr}}$	
<u>Pen Room to STEP OFF PAD</u>	$(0.5 \text{ in})(2)(120\text{mr/hr})(\text{hr}/60\text{min}) = \underline{2 \text{ mr}}$	
<u>Hot Spot</u>	$(45\text{sec})(2)(\text{min}/60\text{sec})2800\text{mr/hr})(\text{hr}/60\text{min}) = \underline{70 \text{ mr}}$	
<u>Past BIT</u>	$(3\text{min})(2)(800\text{mr/hr})(\text{hr}/60\text{min}) = \underline{80 \text{ mr}}$	
<u>Transit to valve</u>	$(7\text{min})(2)(325\text{mr/hr})(\text{hr}/60\text{min}) = \underline{75.83 \text{ mr}}$	
<u>Operate valve</u>	$(19\text{min})(325\text{mr/hr})(\text{hr}/60\text{min}) = \underline{102.9 \text{ mr}}$	
<u>COMMENTS:</u>		

WATTS BAR NUCLEAR PLANT

A3 RO/SRO

STEP/STANDARD	SAT/UNSAT
<p>NOTE to examiner – Some rounding of numbers is allowed as long as the examinee follows sound mathematical standards. The acceptable total is 305.154 to 339.03 mrem. (–10% +0%)</p>	
<p><u>STEP 2:</u> Calculate the total exposure received while performing the task.</p> <p><u>STANDARD:</u></p> <p>Individual doses received are added up.</p> <p>8.33 mr + 2 mr + 70 mr + 80 mr + 75.83 mr + 102.9 mr = <u>339.06mr.</u></p> <p>Rounding values</p> <p>8 + 2+ 70 +80 +76 + 103 = <u>339 mr</u></p> <p>Acceptable Range - <u>330-350 mrem</u></p> <p>Step is critical to avoid exceeding dose limits.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT

A3 RO/SRO

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 3.</u> Applicant calculates his/her total estimated exposure.</p> <p><u>STANDARD:</u></p> <p>Total dose calculated in previous step is added to applicant's total dose for the year: 715 mr (total dose to date) + 339 mr (minimum total dose for this job [-10% margin]) = 1054 mrem.</p> <p>Acceptable range of answer <u>1045 to 1065 mrem.</u></p> <p>Critical step to calculate dose accurately in order to avoid exceeding dose limits.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> Applicant determines admin dose limit will be exceeded if the job is performed. Applicant notifies supervisor of findings, stating that admin dose limit will be exceeded.</p> <p><u>STANDARD:</u></p> <p>Admin dose limit for the year is 1000 mrem. Potential dose received is 330 to 350 mrem. Total is 1045 to 1065 mrem, exceeding admin limit.</p> <p>Evaluator cue: When notified of applicant's findings, acknowledge report using repeat back, and state that this JPM is completed. Have applicant turn in all paperwork & calculations.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

STOP TIME _____

KEY
DO NOT HAND TO APPLICANT

SURVEY DATA:

- 1-FCV 63-11 is shown on the Survey map.
- Travel time from the sample room door thru the sample room is 30 seconds.
- Travel time from the sample room door thru the penetration room to the step off pad is 30 seconds.
- Travel time from the step off pad past the Hot Spot to the lower radiation area around the BIT is 45 seconds due to obstructions in the area.
- Travel time from the BIT area into the piping area is 180 seconds.
- Travel time thru the piping area to the valve is 420 seconds.
- Estimated time at valve is 19 minutes.
- General Area Dose rates are listed on the survey map.

RESULTS:

Sample Room and back	$(500\text{mr/hr})(0.5\text{ min})(2)(\text{hr}/60\text{min})$	<u>2 mr</u>
Pen Room to STEP OFF PAD and back	$(0.5\text{ in})(2)(120\text{mr/hr})(\text{hr}/60\text{min})$	<u>8.33 mr or 8 mr</u>
Hot Spot and back	$(45\text{sec})(2)(\text{min}/60\text{sec})2800\text{mr/hr})(\text{hr}/60\text{min})$	<u>70 mr</u>
Past BIT and back	$(3\text{min})(2)(800\text{mr/hr})(\text{hr}/60\text{min})$	<u>80 mr</u>
Transit to valve and back	$(7\text{min})(2)(325\text{mr/hr})(\text{hr}/60\text{min})$	<u>75.83 mr or 76 mr</u>
Operate valve	$(19\text{min})(325\text{mr/hr})(\text{hr}/60\text{min})$	<u>102.9 mr or 103 mr</u>

Accept 330-to350 mr as dose expected to perform task.

When added to current dose for the year of 715 mr, the administrative dose limit of 1000 mrem WILL BE EXCEEDED (total 1045-1065 mrem).

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

A survey map is available for elevation 713' of the auxiliary building, showing dose rates and projected travel times to reach 1-FCV-63-11 and open it manually.

RADCON personnel are currently unavailable to provide assistance.

INITIATING CUES:

You have been directed to perform the alignment of 1-FCV-63-11.

Your total dose for the year to date is 715 mr.

Calculate your estimated total dose to perform this job using the attached survey map.

Determine if you can perform this job without exceeding your administrative dose limit. Show all work.

APPLICANT CUE SHEET

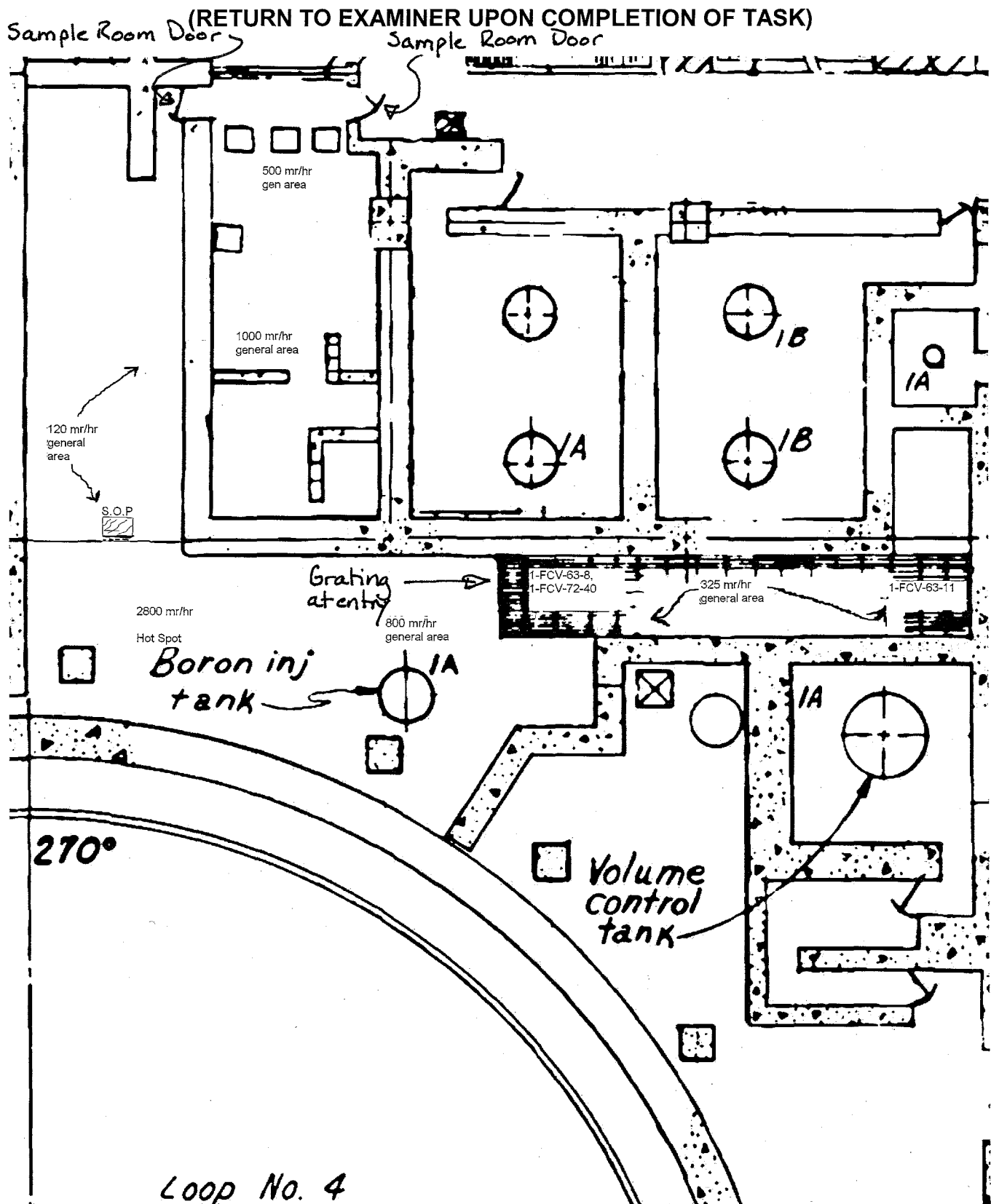
(RETURN TO EXAMINER UPON COMPLETION OF TASK)

SURVEY DATA:

- 1-FCV 63-11 is shown on the Survey map.
- Travel time from the sample room door thru the sample room is 30 seconds.
- Travel time from the sample room door thru the penetration room to the step off pad is 30 seconds.
- Travel time from the step off pad past the Hot Spot to the lower radiation area around the BIT is 45 seconds due to obstructions in the area.
- Travel time from the BIT area into the piping area is 180 seconds.
- Travel time thru the piping area to the valve is 420 seconds.
- Estimated time at valve is 19 minutes.
- General Area Dose rates are listed on the survey map.

RESULTS:

APPLICANT CUE SHEET



WATTS BAR NUCLEAR PLANT

A.4-1 SRO

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A.4-SRO

CLASSIFY THE EVENT AND DETERMINE PAR.

WATTS BAR NUCLEAR PLANT

A.4-1 SRO

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EVALUATION SHEET

Task: Classify the Event and determine PAR.

Alternate Path: N/A

Facility JPM #: New

K/A Rating(s): 2.4.40 Knowledge of SRO responsibilities in emergency plan implementation.
[2.5/3.3] (CFR: 41.10 / 43.5 / 45.11)

2.4.41 Knowledge of the emergency action level thresholds and classifications.
[2.9/4.6] (CFR: 41.10 / 43.5 / 45.11)

Task Standard: The event is classified as a GENERAL EMERGENCY based on "Loss of Any Two Barriers and Potential Loss of Third Barrier" within 15 minutes of starting the evaluation. Protective Action Recommendation determined is Recommendation 2.

Preferred Evaluation Location:

Preferred Evaluation Method:

Simulator _____ Classroom X Perform X Simulate _____

References: EPIP-1 "Emergency Plan Classification Flowpath," Rev. 30;
EPIP-5 "GENERAL EMERGENCY," Rev. 37

Task Number: SRO-113-EPIP-001 **Applicable for:** RO _____ SRO X

Validation Time: 15 minutes **Time Critical:** Yes _____ No X

Applicant: _____
NAME SSN Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____
NAME SIGNATURE DATE

COMMENTS

WATTS BAR NUCLEAR PLANT
A.4-1 SRO
Nov. 2009 NRC Exam

THIS JPM IS PERFORMED IN A CLASSROOM SETTING.

REQUIRED MATERIALS:

EPIP-1 through EPIP-5

Tools/Equipment/Procedures Needed:

Copies of the WBN EIPs for each applicant.

WATTS BAR NUCLEAR PLANT
A.4-1 SRO
Nov. 2009 NRC Exam

READ TO APPLICANT

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

1. A Unit 1 shutdown was initiated prior to reaching the Tech Spec limit for RCS activity being elevated and increasing.
2. After starting the shutdown, indications of a primary system leak developed.
3. AOI-6, "Small Reactor Coolant System Leak" has been implemented.
4. The operators are attempting to identify the source of the leak.

INITIATING CUES:

1. The US has informed you, the SED, of the leak.
2. The operators have not identified the leak source but, AOI-6 is in progress at this time.
3. Using the following parameters provided, classify the event according to the EIPs and determine what, if any, Protective Action Recommendations are required.
 - a. PZR level is 58% and dropping at a rate of 0.5% per minute.
 - b. Charging flow is 140 gpm.
 - c. Letdown flow is 0 gpm.
 - d. Containment pressure is +0.2 psid and steady.
 - e. Containment Sump level is not increasing.
 - f. RHR Pipe Break White Lights have just illuminated.
 - g. Auxiliary Building Vent 0-RM-90-101B is increasing.
 - h. Several Area Rad Monitors on EI 692 and 713 are in Hi Rad.
 - i. Chemistry reports a step rise in the RCS activity to 410 $\mu\text{Ci/gm}$ dose equivalent Iodine 131.

WATTS BAR NUCLEAR PLANT

A.4-1 SRO

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START TIME: _____

<p>STEP 1: Refers to EPIP-1 to determine level of event.</p> <p>STANDARD:</p> <p>Applicant refers to EPIP-1, Section 1, "Fission Product Barrier Matrix."</p> <p>Applicant determines that they have met the conditions of:</p> <p>1.1.2 Loss, "RCS sample activity is greater than 300 $\mu\text{Ci/gm}$ dose equivalent I131"</p> <p>1.2.2 Potential Loss, "Non Isolatable RCS leak exceeding the capacity of one charging pump in the normal charging alignment"</p> <p>1.3.2 Loss, "Containment pressure or sump level not increasing with a LOCA in progress"</p> <p>Based on "Emergency Class Criteria", the applicant determines the need to declare a General Emergency, based on Loss of two barriers and potential loss of the third barrier.</p> <p>NOTE TO EXAMINER:</p> <p>RECORD time that declaration was made: _____</p> <p>COMMENTS:</p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>
<p>STEP 2: Refers to EPIP-5, "GENERAL EMERGENCY."</p> <p>STANDARD: EPIP-5, GENERAL EMERGENCY, is referred to for determining PAR.</p> <p>COMMENTS:</p>	<p>___ SAT</p> <p>___ UNSAT</p>

WATTS BAR NUCLEAR PLANT

A.4-1 SRO

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<p><u>STEP 3:</u> [STEP 1] IF the onsite emergency centers are not staffed, THEN DIRECT Shift Personnel to activate the Emergency Paging System (EPS) to staff the Technical Support Center (TSC) and Operations Support Center (OSC). Shift Personnel should confirm activation and provide the 20 minute printed report to the SM for review.</p> <p> a. IF the EPS system fails, call the ODS, ringdown or (5-751-1700) and DIRECT him to activate the EPS.</p> <p> b. IF the above methods of activating the EPS fail, THEN DIRECT Shift Personnel to use the Watts Bar Nuclear Plant Emergency Response Call-List to staff the TSC and OSC. (This list is located in the EPS Manual near the terminal.)</p> <p><u>STANDARD:</u> Per the INITIATING CUES, the applicant DOES NOT need to address this step.</p> <p><u>COMMENTS:</u></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> [STEP 2] IF the TSC has <u>not</u> been activated, THEN</p> <p> a. INITIATE Appendix A and B, Initial Notification Form for GENERAL EMERGENCY and Protective Action Recommendations.</p> <p><u>STANDARD:</u> Applicant refers to Appendix A, and then accurately completes Appendix B by selecting <u>RECOMMENDATION 2.</u></p> <p>NOTE TO EVALUATOR: Underlined portion is the critical part.</p> <p>CUE: Provide the applicant with the following data from the 46 meter MET TOWER: Wind speed is 10 mph from 180°.</p> <p><u>COMMENTS:</u></p>	<p>CRITICAL STEP</p> <p>___ SAT</p> <p>___ UNSAT</p>

TIME STOP: _____

APPLICANT HANDOUT SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO APPLICANT:

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

INITIAL CONDITIONS:

5. A Unit 1 shutdown was initiated prior to reaching the Tech Spec limit for RCS activity being elevated and increasing.
6. After starting the shutdown, indications of a primary system leak developed.
7. AOI-6, "Small Reactor Coolant System Leak" has been implemented.
8. The operators are attempting to identify the source of the leak.

INITIATING CUES:

4. The US has informed you, the SED, of the leak.
5. The operators have not identified the leak source but, AOI-6 is in progress at this time.
6. Using the following parameters provided, classify the event according to the EIPs and determine what, if any, Protective Action Recommendations are required.
 - a. PZR level is 58% and dropping at a rate of 0.5% per minute.
 - b. Charging flow is 140 gpm.
 - c. Letdown flow is 0 gpm.
 - d. Containment pressure is +0.2 psid and steady.
 - e. Containment Sump level is not increasing.
 - f. RHR Pipe Break White Lights have just illuminated.
 - g. Auxiliary Building Vent 0-RM-90-101B is increasing.
 - h. Several Area Rad Monitors on EI 692 and 713 are in Hi Rad.
 - i. Chemistry reports a step rise in the RCS activity to 410 $\mu\text{Ci/gm}$ dose equivalent Iodine 131.

KEY

KEY

KEY

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FISSION PRODUCT BARRIER MATRIX (Modes 1-4)

- 1.1 Fuel Clad
- 1.2 RCS
- 1.3 Containment

1

SYSTEM DEGRADATION

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

2

LOSS OF POWER

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

3

HAZARDS and SED JUDGMENT

- | | | |
|---------------|-------------------|-----------------------------|
| 4.1 Fire | 4.3 Flammable Gas | 4.5 Control Room Evacuation |
| 4.2 Explosion | 4.4 Toxic Gas | 4.6 Security |
| Table 4-1 | Table 4-2 | 4.7 SED Judgment |
| Figure 4-A | Figure 4-B | Table 4-3 |

4

DESTRUCTIVE PHENOMENON

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

5

SHUTDOWN SYSTEM DEGRADATION

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

6

RADIOLOGICAL

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

7

KEY

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1.1. Fuel Clad Barrier

1. Critical Safety Function Status

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

-OR-

2. Primary Coolant Activity Level

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

-OR-

3. Incore TCs Hi Quad Average

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

-OR-

4. Reactor Vessel Water Level

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

-OR-

5. Containment Radiation Monitors

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

-OR-

6. Site Emergency Director Judgment

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

1.2. RCS Barrier

1. Critical Safety Function Status

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

-OR-

2. RCS Leakage/LOCA

LOSS	Potential LOSS
RCS Leak results in Loss of subcooling (<65°F Indicated), [85°F ADV]	Non Isolatable RCS Leak Exceeding The Capacity of <u>One</u> Charging Pump (CCP) In the Normal Charging Alignment. <u>OR</u> 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 <u>OR</u> 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.

KEY

KEY

KEY

KEY

KEY

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1.3. CNTMT Barrier

1. Critical Safety Function Status

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

-OR-

2. Containment Pressure/Hydrogen

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

-OR-

3. Containment Isolation Status

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

-OR-

4. Containment Bypass

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

-OR-

5. Significant Radioactivity in Containment

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

-OR-

6. Site Emergency Director Judgment

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

Modes: 1, 2, 3, 4

INSTRUCTIONS

NOTE: A condition is considered to be MET if, in the judgment of the Site Emergency Director, the condition will be MET imminently (i.e., within 1 to 2 hours, in the absence of a viaible success path). The classification shall be made as 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 Radiation Monitors are temperature sensitive and can be affected by temperature induced currents. Following a rapid increase or decrease in containment temperature, testing has shown rad monitors to give unreliable indication for up to 2 minutes.

EVENTS

UNUSUAL EVENT	ALERT
Loss <u>or</u> Potential LOSS of Containment Barrier	Any LOSS <u>or</u> Potential LOSS of Fuel Clad barrier <u>OR</u> Any LOSS <u>or</u> Potential LOSS of RCS barrier
SITE AREA EMERGENCY	GENERAL EMERGENCY
LOSS <u>or</u> Potential LOSS of any two barriers	LOSS of any two barriers <u>and</u> Potential LOSS of third barrier

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KEY

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KEY

KEY

KEY

WBN	GENERAL EMERGENCY	EPIP-5
-----	-------------------	--------

APPENDIX A

(Page 1 of 1)

TVA INITIAL NOTIFICATION FORM FOR GENERAL EMERGENCY

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

2. This is _____
Watts Bar has declared a **GENERAL EMERGENCY** affecting Unit 1

3. EAL Designator(s): 1.1.2 L, 1.2.2 PL, 1.3.2L

4. Brief Description of the Event: RCS leak outside containment greater than the capacity of one CCP and high RCS activity (or words to this effect)

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

Airborne Releases Offsite	Liquid Releases Offsite
<input type="checkbox"/> Minor releases within federally approved limits ¹	<input type="checkbox"/> Minor releases within federally approved limits ¹
<input type="checkbox"/> Releases above federally approved limits ¹	<input type="checkbox"/> Releases above federally approved limits ¹
<input checked="" type="checkbox"/> Release information not known (¹ Tech Specs)	<input checked="" type="checkbox"/> Release information not known (¹ Tech Specs)

6. Event Declared: Time: Now Date: Today

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

Wind Direction is FROM: 180 degrees Wind Speed: 10 m.p.h

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

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

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

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

10. Time and Date this information was provided. Time: Now Date: Today

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

KEY

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WBN	GENERAL EMERGENCY	EPIP-5
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APPENDIX B

(Page 1 of 1)

PROTECTIVE ACTION RECOMMENDATIONS

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

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

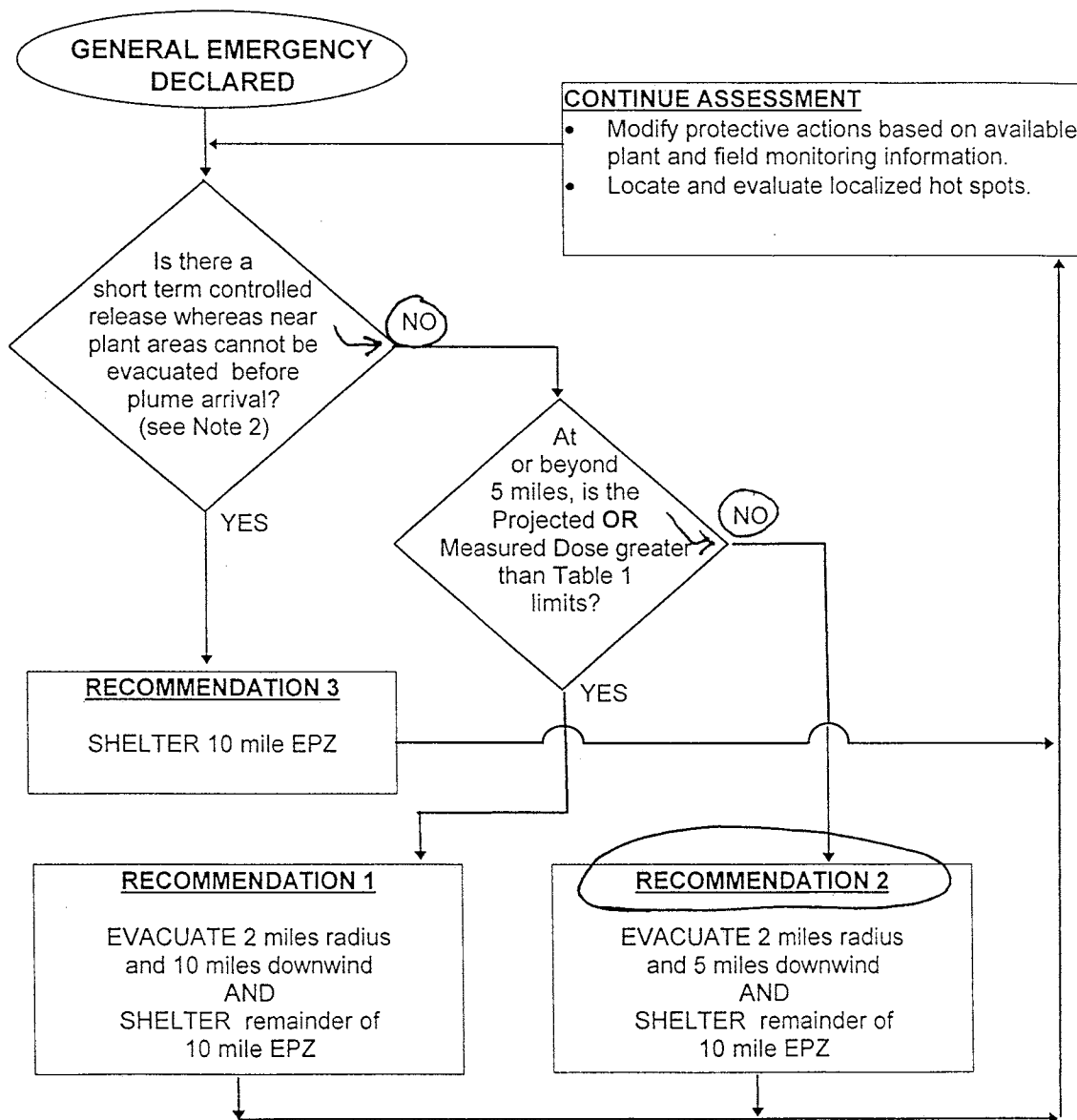


TABLE 1 Protective Action Guides (PAG)	
TYPE	LIMIT
Measured	3.9 E-6 micro Ci/cc of Iodine 131 or 1 REM per hour External Dose
Projected	1 REM TEDE or 5 REM Thyroid CDE

KEY

KEY

FISSION PRODUCT BARRIER MATRIX (Modes 1-4)

- 1.1 Fuel Clad
- 1.2 RCS
- 1.3 Containment

1

SYSTEM DEGRADATION

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

2

LOSS OF POWER

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

3

HAZARDS and SED JUDGMENT

- | | | |
|---------------|-------------------|-----------------------------|
| 4.1 Fire | 4.3 Flammable Gas | 4.5 Control Room Evacuation |
| 4.2 Explosion | 4.4 Toxic Gas | 4.6 Security |
| Table 4-1 | Table 4-2 | 4.7 SED Judgment |
| Figure 4-A | Figure 4-B | Table 4-3 |

4

DESTRUCTIVE PHENOMENON

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

5

SHUTDOWN SYSTEM DEGRADATION

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

6

RADIOLOGICAL

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

7

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 imparts energy of sufficient force to potentially damage permanent structures required for safe operation.

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.

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.

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) <u>OR</u> Heat Sink Red (FR-H.1) (RHR <u>Not</u> in Service)

-OR-

2. Primary Coolant Activity Level

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

-OR-

3. Incore TCS Hi Quad Average

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

-OR-

4. Reactor Vessel Water Level

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

-OR-

5. Containment Radiation Monitors

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

-OR-

6. Site Emergency Director Judgment

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

1.2. RCS Barrier

1. Critical Safety Function Status

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

-OR-

2. RCS Leakage/LOCA

LOSS	Potential LOSS
RCS Leak results in Loss of subcooling (<65°F Indicated), [85°F ADV]	Non Isolatable RCS Leak Exceeding The Capacity of One Charging Pump (CCP) In the Normal Charging Alignment. <u>OR</u> 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 <u>OR</u> 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.

1.3. CNTMT Barrier	
1. Critical Safety Function Status	
LOSS	Potential LOSS
Not Applicable	Containment (FR-Z.1) <u>Red</u> <u>OR</u> Actions of FR-C.1 (Red Path) are INEFFECTIVE (i.e.: core TCs trending up)
-OR-	
2. Containment Pressure/Hydrogen	
LOSS	Potential LOSS
Rapid unexplained decrease following initial increase <u>OR</u> Containment pressure or Sump level Not increasing (with LOCA in progress)	Containment Hydrogen Increases to >4% by volume <u>OR</u> Pressure >2.8 PSIG (Phase B) with < One full train of Containment spray
-OR-	
3. Containment Isolation Status	
LOSS	Potential LOSS
Containment Isolation is Incomplete (when required) 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 <u>OR</u> Prolonged (>4 Hours) Secondary Side release outside CNTMT from a S/G with a SGTL > T/S Limits	Unexplained VALID increase in area or ventilation RAD monitors in areas adjacent to CNTMT (with LOCA in progress)
-OR-	
5. Significant Radioactivity in Containment	
LOSS	Potential LOSS
Not Applicable	VALID Reading increase of Greater Than: 108 R/hr on 1-RE-90-271 and 1-RE-90-272 <u>OR</u> 86 R/hr on 1-RE-90-273 and 1-RE-90-274 (see instruction note 5)
-OR-	
6. Site Emergency Director Judgment	
Any condition that, in the Judgment of the SM/SED, Indicates Loss or Potential Loss of the CNTMT Barrier Comparable to the Conditions Listed Above.	

Modes: 1, 2, 3, 4

INSTRUCTIONS

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

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

EVENTS

<u>UNUSUAL EVENT</u>	<u>ALERT</u>
Loss <u>or</u> Potential LOSS of Containment Barrier	Any LOSS <u>or</u> Potential LOSS of Fuel Clad barrier <u>OR</u> Any LOSS <u>or</u> Potential LOSS of RCS barrier
<u>SITE AREA EMERGENCY</u>	<u>GENERAL EMERGENCY</u>
LOSS <u>or</u> Potential LOSS of any two barriers	LOSS of any two barriers and Potential LOSS of third barrier

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WBN	GENERAL EMERGENCY	EPIP-5
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APPENDIX A

(Page 1 of 1)

TVA INITIAL NOTIFICATION FORM FOR GENERAL EMERGENCY

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

2. This is _____

Watts Bar has declared a **GENERAL EMERGENCY** affecting Unit 1

3. EAL Designator(s): _____

4. Brief Description of the Event: _____

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

Airborne Releases Offsite

- ☐ Minor releases within federally approved limits¹
- ☐ Releases above federally approved limits¹
- ☐ Release information not known
(¹Tech Specs)

Liquid Releases Offsite

- ☐ Minor releases within federally approved limits¹
- ☐ Releases above federally approved limits¹
- ☐ Release information not known
(¹Tech Specs)

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

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

Wind Direction is FROM: _____ degrees Wind Speed: _____ m.p.h

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

<input type="checkbox"/> Recommendation 1 ⇒EVACUATE LISTED SECTORS (2 mile Radius and 10 miles downwind) ⇒SHELTER remainder of 10 mile EPZ. ⇒CONSIDER issuance of Potassium Iodide in accordance with the State Plan.	* R E C 1	WIND FROM ⁰ (Mark)	* R E C 2	<input type="checkbox"/> Recommendation 2 ⇒EVACUATE LISTED SECTORS (2 mile radius and 5 mile downwind) ⇒SHELTER remainder of 10 mile EPZ. ⇒CONSIDER issuance of Potassium Iodide in accordance with the State Plan.
A-1, B-1, C-1, D-1, C-7, -9, D-2, -4, -5, -6, -7, -8, -9		26-68		A-1, B-1, C-1, D-1, C-7, D-2, -4, -5
A-1, B-1, C-1, D-1, A-3, -4, D-2, -3, -4, -5, -6, -7, -8, -9		69-110		A-1, B-1, C-1, D-1, A-3, D-2, -4, -5
A-1, B-1, C-1, D-1, A-2, -3, -4, -5, -6, -7, D-2, -3, -5, -6		111-170		A-1, B-1, C-1, D-1, A-2, -3, D-2, -5
A-1, B-1, C-1, D-1, A-2, -3, -5, -6, -7, B-2, -3, -4, -5, C-2		171-230		A-1, B-1, C-1, D-1, A-2, -3, B-2, -4, C-2
A-1, B-1, C-1, D-1, B-2, -3, -4, -5, C-2, -3,		231-270		A-1, B-1, C-1, D-1, B-2, -4, C-2
A-1, B-1, C-1, D-1, B-2, -3, C-2, -3, -4, -5, -6, -11		271-325		A-1, B-1, C-1, D-1, B-2, C-2, -4, -5,
A-1, B-1, C-1, D-1, C-2, -4, -5, -6, -7, -8, -9, -10, -11, D-4, -9		326-25		A-1, B-1, C-1, D-1, C-2, -4, -5, -7, -8, D-4

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

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

10. Time and Date this information was provided. Time: _____ Date: _____

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

APPENDIX B

(Page 1 of 1)

PROTECTIVE ACTION RECOMMENDATIONS

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

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

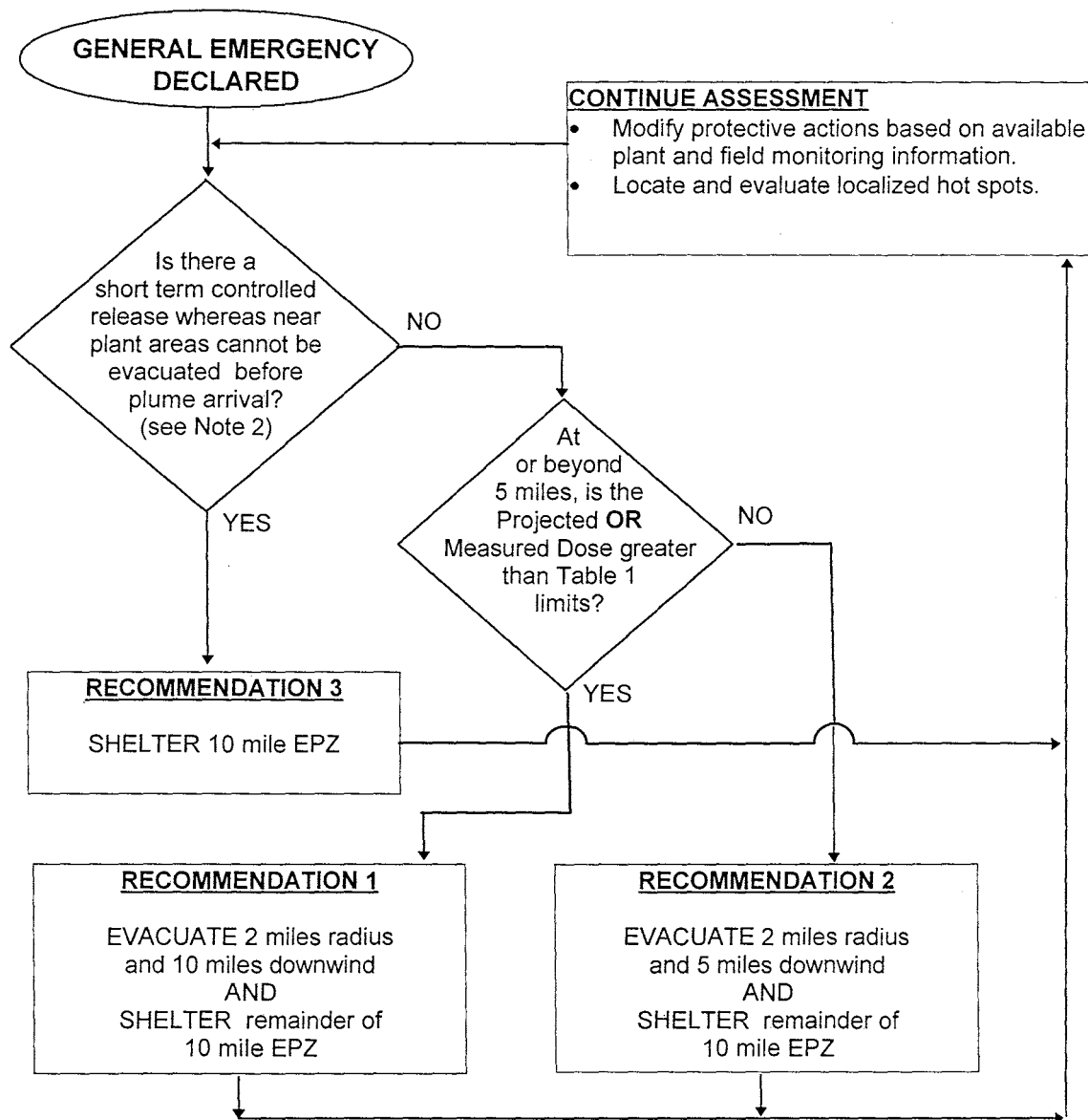


TABLE 1 Protective Action Guides (PAG)	
TYPE	LIMIT
Measured	3.9 E-6 micro Ci/cc of Iodine 131 or 1 REM per hour External Dose
Projected	1 REM TEDE or 5 REM Thyroid CDE