JPM RO Ala

OPERATOR: _____

RO _____ DATE:

JPM NUMBER: RO A1a

TASK NUMBER: Conduct of Operations

Work Hour Limitations TASK TITLE:

K/A RATING: RO 2.9 K/A NUMBER: 2.1.5

TASK STANDARD: Determine Work Hour limitations were exceeded

LOCATION OF PERFORMANCE: Class Room

REFERENCES/PROCEDURES NEEDED: NPG-SPP 3.21

VALIDATION TIME: 25 minutes

PERFORMANCE TIME:

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

SATISFACTORY ____ UNSATISFACTORY ____ RESULTS:

SIGNATURE: ______ EXAMINER

DATE:



INITIAL CONDITIONS: You are a Reactor Operator

INITIATING CUES: Given two different work hour schedules, review hours worked and determine your compliance with Fatigue Rules.

Assume NO work prior to April 7th

(

Class Room

INITIAL CONDITIONS: You are a Reactor Operator

INITIATING CUES: Given two different work hour schedules, review hours worked and determine your compliance with Fatigue Rules.

Assume NO work prior to April 7th

START TIME

3.2.1 10 Code of Federal Regulations (CFR) 26 Overtime Limits [R.21]

A. The following limits apply to covered individuals regardless of unit status [R22, 23]:

- 1. No more than 16 work hours in any 24 hour period
- 2. No more than 26 work hours in any 48 hour period
- 3. No more than 72 work hours in any 7 day period
- 4. At least a 10 hour break between successive work periods.
- 5. A continuous break of at least 34 hours in any 9 day period.

Standard:

Evaluates Schedules and determines RO1 is NOT in compliance with Fatigue Rule. RO 1 exceeded 72 work hours in any 7 day period.

SAT__ UNSAT__ N/A __COMMENTS:_____

Performance Step 2:

Critical \underline{X} Not Critical

C. Outage Requirements [R.25]

1. While working on an outage unit, and without issuance of a waiver, an individual's required days off shall adhere to the requirements listed in Table 2 below (not an average):

Table 2. Required Minimum Days Off (MDO) for Outages									
Group	8 Hour Shift Days Off	10 Hour Shift Days Off	12 Hour Shift Days Off						
Maintenance	1 day off per week	1 day off per week	1 day off per week						
Operations, Radiation Protection, Chemistry, Fire Brigade (Incident Commander)	3 days off in each successive (i.e., non-rolling) 15 day period	3 days off in each successive (i.e., non-rolling) 15 day period	3 days off in each successive (i.e., non-rolling) 15 day period						

Standard:

Evaluates Schedules and determines RO1 is NOT in compliance with Fatigue Rule. Evaluates Schedule and determines that RO1 did NOT meet 3 days off in a 15 day period.

SAT__ UNSAT__ N/A __COMMENTS:_____

CUE: When applicant determines that they are not in compliance with a work hour guideline have applicant identify what guidelines they have violated.

Performance Step 3:

Critical \underline{X} Not Critical

If you are NOT in compliance with the work hour limit guidelines designate what guidelines you are NOT on compliance with?

Standard:

Determines that they are NOT in compliance with NPG-SPP-03.21 Step 3.21 A and C OR 10CFR26 Overtime Limits R.22, 23 and R.25.

SAT__ UNSAT__ N/A __COMMENTS:_____

END OF TASK

STOP TIME ____

Work Schedule ONE for Reactor Operator 1

You are a Reactor Operator on Unit 2 for the outage. Unit 2 is in day 22 of a scheduled 45 day refueling outage that commenced on April 7^{th} .

Unit 1 and 3 are operating at 100%.

Below is the work schedule you worked as Reactor Operator 1.

Sun	Mon	Tues	Wed	Thu	Fri	Sat
4/7	4/8	4/9	4/10	4/11	4/12	4/13
0700-1900	0700-1900	0700-1900	0700-1900	0700-1900	0700-1900) Off
Sun	Mon	Tues	Wed	Thu	Fri	*Sat
4/14	4/15	4/16	4/17	4/18	4/19	4/20
0700-1900	0700-1900	0700-1900	0700-1900	0700-1500	0700-1500	0700-1900
Sun	Mon	Tues	Wed	Thu	Fri	Sat
4/21	4/22	4/23	4/24	4/25	4/26	4/27
Off	0700-1900	0700-1900	0700-1900	0700-1900	0700-1900	0700-1900

*On Saturday 4/20 you were scheduled OFF but you were called in to be the Board operator on Unit 2.

Work Schedule TWO for Reactor Operator 2

You are a Reactor Operator on Unit 2. All three units are operating at 100%.

Below is the work schedule you worked as Reactor Operator 2.

Sun	Mon	Tues	Wed	Thu	Fri	*Sat
4/7	4/8	4/9	4/10	4/11	4/12	4/13
Off	0700-1700	0700-1700	0700-1700	0700-1700	Off	0700-1900
*Sun	Mon	Tues	Wed	Thu	Fri	Sat
4/14	4/15	4/16	4/17	4/18	4/19	4/20
0700-1900	0700-1900	0700-1900	0700-1900	0700-190	00 Off	Off
Sun	Mon	Tues	Wed	Thu	Fri	Sat
4/21	4/22	4/23	4/24	4/25	4/26	4/27
Off	Off	Off	Off	Off 1	1900-0700	1900-0700

Week of 4/8 to 4/11 you attended Requal Training

*On 4/13 and 4/14 you were scheduled OFF but you were called in to be the Desk operator on Unit 1.

JPM RO A3

OPERATOR:	
RO	DATE:
JPM NUMBER:	Admin RO A3
TASK NUMBER:	Radiation Control
TASK TITLE:	Calculate Airborne Effluent Release Rate IAW 0-SI-4.8.b.1.a.1
K/A NUMBER: 2.3.	11 K/A RATING: RO 3.8 SRO 4.3
PRA:	
TASK STANDARD	: Calculate Building Ventilation Release Fraction and determine acceptance criteria met. Calculate Stack Release Fraction and determine that acceptance criteria NOT met. Calculate Total Site Release Fraction and determine acceptance criteria met.
LOCATION OF PER	RFORMANCE: Classroom
REFERENCES/PRC	CEDURES NEEDED: 0-SI-4.8.B.1.a.1
VALIDATION TIM	E: 15 minutes
PERFORMANCE T	IME:
COMMENTS:	
Additional comment	sheets attached? YES NO
RESULTS: SATI	SFACTORY UNSATISFACTORY
SIGNATURE:	DATE:

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INITIAL CONDITIONS: You are an extra operator on Dayshift Friday. The Control Bay AUO has partially completed the appropriate Attachments of 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate.

INITIATING CUE: The Shift Manager directs you to complete the remainder 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate, starting at [10.2] and stopping at [12], calculate all three release rate fractions ONLY.

NOTE: The Control Bay AUO has gathered all required data; therefore, some subsequent steps after [10.2] may be completed.

JPM RO A3

Classroom

INITIAL CONDITIONS: You are an extra operator on Dayshift Friday. The Control Bay AUO has partially completed the appropriate Attachments of 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate.

INITIATING CUE: The Shift Manager directs you to complete the remainder 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate, starting at [10.2] and stopping at [12], calculate all three release rate fractions ONLY.

NOTE: The Control Bay AUO has gathered all required data; therefore, some subsequent steps after [10.2] may be completed.

START TIME

Performance Step 1:

Critical \underline{X} Not Critical

- [10.2] For each monitor, USE Attachments 3 and 5 and DETERMINE the release factor based on fan status. **RECORD** the release factors from attachment 5 in the appropriate columns on Attachment 4.
- [10.3] **MULTIPLY** the release rate by the release factor and **RECORD** the answer under the column labeled "Actual Rate" on Attachment 4.

Standard:

Determines the release factor for each building based on fan status using attachments 3 and 5 and records in the release factor column on attachment 4.

Multiplies the Release Rate from the RM-90-250, RM-90-249, and the RM-90-251 by the Release Factor to determine the Actual Rate; candidate will perform this action for each Unit as well as the Radwaste Building (0-RM-90-252) and record the data on Attachment 4. Refer to Answer Sheet for correct values or see below.

Unit 1	Unit 2	Unit 3	Radwaste
$\frac{\text{Reactor Building}}{(1-\text{RM}-90-250)}$ 4000 x 0.64 = 2560	<u>Reactor Building</u> (2-RM-90-250) 3400 x 0.73 = 2482	Reactor Building (3-RM-90-250) 3100 x 0.69 = 2139	
Turbine Building (1-RM-90-249)	Turbine Building (2-RM-90-249)	Turbine Building (3-RM-90-249)	0-RM-90-252 226 x 0.62 = 140
500 x 0.75 = 375 (1-RM-90-251) 910 x 0.80 = 728	840 x 1.00 = 840 (2-RM-90-251) 2200 x 1.00 = 2200	$1600 \times 0.40 = 640$ (3-RM-90-251) 1900 $\times 0.75 = 1425$	

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 2:

Critical \underline{X} Not Critical

[10.4] For each unit, **SUM** the actual rates for the RM-90-249, RM-90-250, and RM-90-251 monitors.

RECORD the unit total release rates in the appropriate columns on Attachment4.

Standard:

Sums the Actual Rates from the RM-90-249, RM-90-250, and RM-90-251 monitors for each Unit and records the Total Release Rate for each Unit on Attachment 4. Refer to Answer Sheet for correct values or see below.

Unit 1	Unit 2	Unit 3
2560 + 375 + 728 = 3663	2482 + 840 + 2200 = 5522	2139 + 640 + 1425 = 4204

SAT___UNSAT___N/A ___COMMENTS:_____

Performance Step 3:

Critical \underline{X} Not Critical

[10.5] **SUM** the three unit total release rates and the 0-RM-90-252 actual rate. **RECORD** the building ventilation release rate on Attachment 4.

Standard:

Sums each Units Total Release Rate and the Radwaste Building Actual Release Rate (0-RM-90-252) and records the Building Ventilation Release Rate on Attachment 4. Refer to Answer Sheet for correct value or see below.

	<u>Unit 1</u> 3663	+	<u>Unit 2</u> 5522	+	<u>Unit 3</u> 4204	+	<u>Radwas</u> 140	<u>te</u> =	<u>Total</u> 13529	
SAT_	_UNSA	.T	_N/A	COM	MENTS:					

NOTE

For reporting purposes, the release fraction should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded as 0.123. A release fraction of 0.00012 should be recorded as 0.000.

[10.6] DETERMINE the building ventilation release fraction by dividing the total building ventilation release rate by 1.50 E+05 (or 150,000) μCi/sec. RECORD the fraction on both Attachment 2 and Attachment 4.

Standard:

Divides the Total Building Ventilation Release Rate by 150,000 μ Ci/sec and determines the Building Ventilation Release Fraction; records on Attachment 2 and 4. Refer to Answer Sheet for correct value or see below.

13529 / 150,000 = **0.090**

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 5:

Critical X Not Critical

[10.7] **VERIFY** the acceptance criteria as given in Step 6.0B.1 has been met. The building ventilation release fraction must be less than or equal to 0.90. **IF** the acceptance criteria have failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

Standard:

Determines Building Ventilation Release Fraction is less than 0.90 and **MEETS** acceptance criteria.

SAT___UNSAT___N/A ___COMMENTS:_____

Performance Step 6:

Critical Not Critical \underline{X}

- [11] **DETERMINE** the elevated (stack) noble gas release rate once per shift by completing the following steps:
 - [11.1] RECORD the highest noble gas count rates (counts per second, cps) for the 0-RM-90-147 and 0-RM-90-148 monitors in the appropriate columns of Attachment 6 in accordance with one of the following steps:
 - [11.1.1] IF both the 0-RR-90-147 and at least one of the radiation monitors are operable, THEN OBTAIN the necessary information from 0-RR-90-147 on Panel 9-2. IF applicable, THEN RECORD "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

Standard:

Steps [11.1] and [11.1.1] have already been completed and the data has been recorded on Attachment 6. Steps [11.1.2] and [11.2.3] are not applicable and will not be performed

SAT__ UNSAT__ N/A ___COMMENTS:_____

JPM RO A3

Performance Step 7:

Critical Not Critical X

NOTE

If 0-SI-4.8.B.1.a.2 is in effect for the stack monitors, the Chemical Laboratory will report the stack release rate in μ Ci/sec for each grab sample. The reported release rate will assume a maximum flow rate and will yield a conservative (high) release value. In this case, Steps 7.0[11.2] and 7.0[11.3] are **NOT** applicable.

- [11.2] **DETERMINE** the stack flow rate and **RECORD** in the appropriate column of Attachment 6.
 - [11.2.1] **IF** 0-FI-90-271 on Panel 1-9-53 is operable, **THEN RECORD** the stack flow in standard cubic feet per minute (scfm).

Standard:

Steps [11.2] and [11.2.1] have already been completed and the data has been recorded on Attachment 6. Steps [11.2.2] and [11.2.3] are not applicable and will not be performed

SAT__ UNSAT__ N/A __COMMENTS:_____

Performance Step 8:

Critical \underline{X} Not Critical

[11.3] DETERMINE the stack release rate by using the gross count rate and total stack flow in accordance with the following equation. When there are two gross count rate readings, USE the highest gross count rate. IF both monitors (0-RM-90-147/8) are INOP, THEN

CONTINUE with Step 7.0[11.4].

Total Stack Flow (scfm) x Gross Count Rate (cps) x 1.23 E-03 [(µCi/sec)/(cps-scfm)]

Standard:

Determines that the Highest Gross Count Rate is the 0-RM-90-147 (Red Pen) and records this reading on Attachment 6; calculates the Stack Release Rate by multiplying Total Stack Flow, the Highest Gross Count Rate, and 1.23 E-03 [(μ Ci/sec) together. Refer to Answer Sheet for correct value or see below.

22700 x 4.55×10^5 x $1.23 \times 10^{-3} = 1.27 \times 10^7$

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 9:

Critical \underline{X} Not Critical

[11.4] **RECORD** in the appropriate column of Attachment 6 either the release rate calculated in Step 7.0[11.3] or as reported by the Chemical Laboratory for an inoperable monitor.

Standard:

Records the Stack Release Rate calculated in previous step on Attachment 6.

SAT_UNSAT__N/A __COMMENTS:_____

Performance Step 10:

Critical Not Critical \underline{X}

NOTE

Alternative sampling for the WRGERM monitor is satisfied by taking readings from the normal stack release monitors, 0-RM-90-147 and/or 0-RM-90-148, when operable or by manual sampling in accordance with 0-SI-4.8.B.1.a.2 when the normal stack monitors are inoperable. This alternate sampling succession satisfies the requirement for a preplanned alternate method as required in TABLE 3.3.5-1 of the TRM.

- [11.5] Wide Range Gaseous Effluent Radiation Monitor (WRGERM), 0-RM-90-306, Panel 2-9-10.
 - [11.5.1] IF the monitor is inoperable, THEN

RECORD "INOP" in the appropriate column of Attachment 6 and CONTINUE with Step 7.0[11.6]. Otherwise, CONTINUE with Step 7.0[11.5.2].

- [11.5.2] ENSURE 0-RM-90-306 is in the Sample Mode.
- [11.5.3] RECORD the noble gas release rate in μ Ci/sec in the appropriate column of Attachment 6. RECORD results to two decimal places (e.g., 2.95E 00).

Standard:

Step [11.5], [11.5.2], and [11.5.3] have already been completed and the data has been recorded on Attachment 6; steps [11.5.1] and [11.6] are not applicable and will not be performed

SAT__UNSAT__N/A __COMMENTS:_

JPM RO A3

Performance Step 11:

Critical Not Critical \underline{X}

[11.7] **IF** all release streams to the stack are isolated, **THEN**

USE a release rate factor of 0.00. Otherwise, **USE** 1.00. **RECORD** the release rate factor in the appropriate column of Attachment 6.

Standard:

Step [11.7] has already been completed and a Release Rate Factor of 1.00 has already been recorded on Attachment 6.

SAT__ UNSAT___ N/A ___COMMENTS:_____

Performance Step 12:

 $Critical \underline{X} \quad Not Critical$

[11.8] CALCULATE the actual release rate by multiplying the highest release rate (0-RM-90-147/148 or 0-RM-90-306) by the release factor. RECORD the information in the Actual Release Rate column on Attachment 6.

Standard:

Records the Highest Stack Release Rate (Stack Release) on Attachment 6; calculates the Actual Release Rate by multiplying the Highest Stack Release Rate (Stack Release) by the Release Rate Factor (1.00) determined in previous step; records on Attachment 6. Refer to Answer Sheet for correct value or see below.

 1.27×10^7 x $1.00 = 1.27 \times 10^7$

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 13:

Critical \underline{X} Not Critical

NOTE

For reporting purposes, the release fractions should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded only as 0.123. A release fraction of 0.00012 should be recorded only as 0.000.

[11.9] CALCULATE the stack release fraction by dividing the actual release rate by 1.44 E+07 (or 14,400,000) μCi/sec. RECORD this information on both Attachment 2 and Attachment 6.

Standard:

Calculates the Stack Release Fraction by dividing the Actual Release Rate determined in previous step by 14,400,000 μ Ci/sec; records this data on Attachment 2 and 6. Refer to Answer Sheet for correct value or see below.

 1.27×10^7 / 1.44×10^7 = **.882**

SAT__UNSAT___N/A ___COMMENTS:_____

JPM RO A3

Performance Step 14:

Critical \underline{X} Not Critical

[11.10] **VERIFY** the acceptance criteria as given in Step 6.0B.2 has been met. The stack release fraction must be less than or equal to 0.10. IF the acceptance criterion has failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

Standard:

Determines that the Stack Release Fraction DOES NOT MEET the Acceptance Criteria

SAT__ UNSAT__ N/A __COMMENTS:_____

Performance Step 15:

 $Critical \underline{X} \quad Not Critical$

[12] **CALCULATE** the total site release fraction by adding the building ventilation and stack release fractions on Attachment 2. **VERIFY** the site release fraction acceptance criteria as given in Step 6.0B.3 has been met. **IF** the acceptance criterion has failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

Standard:

Calculates the Total Site Release Fraction by adding the Building Ventilation Release Rate Fraction and the Stack Release Rate Fraction; records this data on Attachment 2. Refer to Answer Sheet for correct value or see below. Determines that it **MEETS** Acceptance Criteria.

0.090 + .882 = .972

SAT__ UNSAT__ N/A __COMMENTS:_____

STOP TIME

END OF TASK

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 30 of 56

Attachment 2 (Page 1 of 1)

Site Effluent Release Rate Summary

Week From ToDAY To

n	9	SLS	TEP	Read	tor Power (N	/WT)	Building				Init	ials
A Y	н н ғ	7 0(0)	7 0(7)	Unit 1	Unit 2	Unit 3	Ventilation Release Rate Fraction 7.0[10.6]	Stack Release Rate Fraction 7.0[11.9]	Total Site Release Rate Fraction 7.0[12]	Acceptance Criteria	AUO	Unit Supervisor
	<u> </u>	7.0[0]		1.0[0.1]	7451	2454	09	882	.972	≤ 1.00	AUD	
FRI		OP	OF	2622	375a	3/3/				≤ 1.00		
	N									≤ 1.00		
SAT	<u> </u>									≤ 1.00		
	N									≤ 1.00		
SUN	D									≤ 1.00		
	N			ļ		<u> </u>				≤ 1.00		
MON	D									≤ 1.00		
	N		<u> </u>							≤ 1.00		
TUE	D									< 1.00		
	N				ļ	<u> </u>				< 1.00		
WED	D					ļ		<u> </u>		< 1.00		
	N									\$ 1.00		
THU	D									\$ 1.00		
	N		1					<u> </u>	<u> </u>	≤ 1.00	<u> </u>	

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Initials added as a result of BFPER 960634.

ANSWER KEY

BFN Airborne Effluent Release Rate 0-SI-4.8.B.1.a.1 Unit 0 Rev. 0056 Page 34 of 56
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Attachment 4 (Page 1 of 4)

Building Effluent Release Rate Log

Week From <u>ToDAY</u> To _____ Unit 1

	s	Reactor Building 1-RM-90-250			Turbine Building						Initials	
					1-RM-90-249			1-RM-90-251				
D A Y	H F	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit
•	Т	(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note			Supervisor
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	4000	.64	2560	500	.75	375	910	,80	728	AOP	
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N		İ			· ·						
THU	D											
	N											

ANSWER KEY

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 35 of 56
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Attachment 4 (Page 2 of 4)

Week From <u>____</u>A√ To _____ Unit 2

			Reactor Building	1			Turbine	Building				nitiale
	S	2-RM-90-250				2-RM-90-249			2-RM-90-251		it inclus	
D A V	H	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit
•	Ť	(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note			Supervisor
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	3400	.73	2482	840	1.0	840	2200	1.0	2200	AUD	
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D								l			
	Ν											
TUE	D											
	N											
WED	D											
	N											
THU												
,	N	······										

ANSWER KEY

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 36 of 56
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Attachment 4 (Page 3 of 4)

Week From <u>ToDAY</u> To _____ Unit 3

			Reactor Building	1			Turbine	Building		-		nitiale
	s	3-RM-90-250				3-RM-90-249			3-RM-90-251		in indicio	
DA		Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (µCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AU0	Unit
T	T	(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note			Supervisor
	l •	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	3100	,69	2139	1600	.46	640	1900	.75	1425	AOP	
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N			•								
тни	D											
	N											

ANSWER KEY

BFN Airborne Effluent Release Rate Unit 0	0-SI-4.8.B.1.a.1 Rev. 0056 Page 37 of 56
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Attachment 4 (Page 4 of 4)

Week From _____ To _____ Unit 0

D	S	Radwaste Building		Unit Total Release Rates			Building	Building	Acceptance	1	nitials	
A	н		0-RM-90-252			(µCi/sec)		Ventilation Release Rate	Release	Chteria		
Y	l F	Release Rate (µCi/sec)	Release Factor	Actual Rate (μCi/sec)	Unit 1	Unit 2	Unit 3	(µCi/sec)	Fraction		AUO	Unit Supervisor
	1		See Note									
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.4]	7.0[10.4]	7.0[10.4]	7.0[10.5]	7.0[10.6]			
FRI	D	226	.42	140	3663	5522	4204	13529	, 09	≤ 0.90	AVO	
	N									≤ 0.90		
SAT	D									≤ 0.90		
••••	N									≤ 0.90		
SUM	<u> </u>			· · · · · · · · · · · · · · · · · · ·						≤ 0.90		
3014	N									≤ 0.90		
MON	0									≤ 0.90		
MON				<u></u>						≤ 0.90		
	N									≤ 0.90		
IUE	0									< 0.90		
	N									< 0.00		
WED	D									<u> </u>		
	N									50.90		
THU	D									≤ 0.90		
	N									≤ 0.90		1

ANSWER KEY

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056
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Attachment 6 (Page 1 of 2)

Elevated Effluent Release Rate Log

Week From _____ To _____

D A Y	S H I F T	0-RM-90-147 Red Pen GROSS COUNT RATE (CPS) 7.0[11.1]	0-RM-90-148 Green Pen GROSS COUNT RATE (CPS) 7.0[11.1]	HIGHEST GROSS COUNT RATE (CPS)	STACK FLOW RATE 0-FI-90-271 INOP<16,366 (NOTES 1 & 3) OR ATTACH 7 7.0[11.2]	CONVERSION FACTOR	STACK RELEASE RATE (NOTE 2) (μCi/SEC) 7.0[11.3] & 7.0[11.4]
F	D	4.55 × 105	9,75 x 104	4.55 × 105	22700	1.23E-03	1.27 × 107
R	N					1.23E-03	
S	D					1.23E-03	
A	N					1.23E-03	
S	D					1.23E-03	
υ	N					1.23E-03	
М	D			•		1.23E-03	
0	N					1.23E-03	
Т	D					1.23E-03	
U	N					1.23E-03	
w	D					1.23E-03	
Ε	N			-		1.23E-03	
T	D					1.23E-03	
н	N					1.23E-03	

1 Minimum acceptable flowrate for 0-fi-90-271 operability is 16,366 SCFM (See note 3)

2 Data from manual sampling results or 0-90-147/148[(Stack flow) X (Highest gross count rate) X 1.23E-03].

3 The minimum stack flow rate was revised to 16,366 SCFM (BFPER980545).

ANSWER KEY

BFN Airborne Effluent Release Rat Unit 0	e 0-SI-4.8.B.1.a.1 Rev. 0056 Page 41 of 56
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Attachment 6 (Page 2 of 2)

Week From TODAY To

	e		WRGERMS						Į.	nitials
A Y	3 H F T	DATA RECORDED IN STEP 7.0[11.4]	Noble Gas Release Rate 0-RM-90-306 (μCi/sec) 7.0[11.5]	Highest Stack Release Rate (µCi/sec) Note 1.	Release Rate Factor (0.00 or 1.00) 7.0[11.7]	Actual Release Rate (μCi/sec) 7.0[11.8]	Stack Release Fraction Note 2 7.0[11.9]	Acceptance Criteria	AUO	Unit Supervisor
FRI	D	1.27 × 107	1.29 × 106	1.27×107	1,00	1.27×107	.882	≤ 0.10	AUU	
	N							≤ 0.10		
SAT	D							≤ 0.10	ļ	
	N							≤ 0.10		
CUN	0	· · · · · · · · · · · · · · · · · · ·						≤ 0.10		
5014								≤ 0.10		
								≤ 0.10		
MON				+				≤ 0.10		
L	N							≤ 0.10		1
TUE	D							≤ 0.10		
	N							< 0.10		
WED	D		· · · · · · · · · · · · · · · · · · ·					< 0.10		
	N							20.10		<u> </u>
THU	D							≤ 0.10		
1	N							≤ 0.10		<u> </u>

1 Use the higher of the Stack release rate or the WRGERMS release rate.

2 Divide actual Stack release rate (μ Ci/sec) by 1.44E+07 μ Ci/sec.

ANSWER KEY

STREET, ST	
8 K VA 4	
I. 6. / 6. 1	
1	

Surveillance Task Sheet (STS) Work Order #: 114084714

James .			VV	ork Uraer	#: 114084/14			
(PM#: P1470							
	Procedure: 0-SI-4 Title: 0-SI-4.8.B.1.A.1	.8.B.1.A.1 - AIRBORNE EFFLUEN	RELEASE	RATE	Authorization to Begin: SRO	TODAY Date & Time		
	Data Sheets Attached:							
	Perf Grp: OPS Test Reason: Periodic	Unit: 0	Loop/Di	v: /NA	Start Date & Time	Completion Date & Time		
	Due Date: 06/07/13	Due Date: 06/07/13 Frequency: 7 DAYS Tech Spec: Y						
	Applicable Modes:	f Modes:		Maximo dates verified: SI	Date & Time			
	Clearance Required: Dry-Cask Storage:	N EQ: N	LCO E	intered: N	Costainator			
•	Performed By: Print Name Signature		Initial	Section	Was this a Complete or Partial Performance	?		
•	OPERATOR	Deerater	40	095	(Explain Partial in REMARKS below) Co) Complete [] Partial []		
					Were all Tech Spec/Tech Req/ISFSI/CoC/OD AMSAC* acceptance criteria satisfied?	CM/Fire Prot reg/ Yes [] No [] N/A []		
•					Were all other acceptance criteria satisifed?	Yes [] No [] N/A []		
- - -					If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/ criteria were not satisfied, was as LCO/ODC (Explain in REMARKS below)	/Fire Prot req/AMSAC* CM action required? Yes [] No [] N/A []		
					Alert Work Contol Required?	Yes [] No [] N/A []		
					*PWR only.			
	Subsequent Reviews: Group:	Signatu	re <u>Date</u>		Copy of STS sent to Work Control AND SI Coordinator (next Bus. Day)			
		CE			_	initiais Date		
				ana ka 4 a ka 2 a ka	Test Director/Lead Performer	Date		
					Acceptance Criteria Review: SRO	Date & Time		
	PERMANENT COMME	NTS:						
	Frequency Notes: ONC RATE INFO,ONCE PEF Frequency Notes: ONC RATE INFO,ONCE PEF SHALL DEMONSTRAT INSTRI IMENTATION &	E PER WEEK & ONCE F C DAY, EACH EFFLUENT E PER WEEK & ONCE F C DAY, EACH EFFLUENT E THE OPERABILITY OF ASSOCIATED SAMPLE	PER SHIFT, RADIATIO PER SHIFT, RADIATIO ITS SAMP FLOW ALA	RELEASE N MONITOR - RELEASE N MONITOR PLING RATE RMS.	Independent Reviewer REMARKS:	Date & Time		
(i 18		ATAN ININI MATA KATAN MANI MANI			





Browns Ferry Nuclear Plant

Unit 0

Surveillance Instruction

0-SI-4.8.B.1.a.1

Airborne Effluent Release Rate

Revision 0056

Quality Related

Level of Use: Reference Use

Level of Use or Other Information: Key Number P1470

Effective Date: 05-24-2012 Responsible Organization: CEM, Chemistry Prepared By: J. Mike Marshall Approved By: Johnnie S. Black

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Current Revision Description

Pages Affected 9, 11, 22, 42-46.

Type of Change: Revision

Tracking Number: 065

PER N/A DCN 70285

Added Annotations on pages 44 & 46. PCR 12000782

Changed recorder designation from FR-066-0111 to XR-66-103 in several places due to changes made by DCN 70285.

Also changed H2R-66-96 to XR-66-103.

Changed the wording in step 7.0[13.4], for clarification.

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1.0 INTRODUCTION

1.1 Purpose

This Surveillance Instruction (SI) is used by Browns Ferry Operations and Radiochemical Laboratory personnel to satisfy the following Technical Requirements Manual (TRM) requirements, ODCM requirements, and data recording functions:

- Airborne effluent release rates in accordance with ODCM Surveillance Requirement 2.2.2.1.1.a.
- The instrumentation checks required by ODCM Table 2.1-2.
- The Wide Range Gaseous Effluent Radiation Monitor (WRGERMS), 0-RM-90-306, inoperability requirements in accordance with TABLE 3.3.5-1 of the TRM.
- The WRGERMS instrumentation check required by TABLE 3.3.5-1 of the TRM.
- Attachment 11 is used to record data during EOI's and REP conditions.

1.2 Scope

- ODCM Control 1.2.2.1 requires that the general public dose rate from noble gas effluents to be limited to less than 500 mRem per year to the total body and less than 3000 mRem per year to the skin. The Off site Dose Calculation Manual (ODCM) describes the methodology by which the dose rate limits are converted to plant process variables such as the stack noble gas radioactive release rate limit. The limiting release rates for the authorized effluent release points have been calculated as 0.15 curies (Ci) per second for the building level release points and 14.4 Ci per second for the stack.
- To ensure compliance with ODCM Control 1.2.2.1, each airborne effluent release point is required to be continuously monitored while actively releasing an airborne stream. This is usually accomplished by in-line process instrumentation which has Control Room alarm capabilities. If a monitor is inoperable, releases via that gas stream may continue provided compensatory sampling measures are initiated. Compensatory sampling is accomplished by having the Radiochemical Laboratory personnel obtain and analyze grab samples at a prescribed frequency.
- Technical Instruction (TI) 15 provides the engineering basis for establishing instrumentation alarm set points, monitor sampling rates, and release point allocation factors for the various plant radiation monitors. The conservative parameters prescribed by TI-15 ensure ODCM Control 1.2.2.1 limits are satisfied.

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1.2 Scope (continued)

 Instrumentation checks will be used to provide a reasonable assurance that an unmonitored release does NOT go undetected. The instrument checks will be performed on the required monitoring instrumentation at a frequency such that a failed monitor is readily detected. The instrument checks will usually consist of data acquisition/instrument readings of such a detail that they will permit the calculation of the total site release rate.

NOTE

The source check formerly in this SI (Rev. 40 and previous Revs) are now in 0-SI-2.1-2.

• Additionally, this SI provides the pre-planned alternate monitoring instructions for the WRGERMS instrumentation, 0-RM-90-306 and 0-RR-90-360, in the event that the minimum number of operable instrument channels is less than the required number as given in TABLE 3.3.5-1 in the TRM.

1.3 Frequency

The normal performance band for this SI is one week. The procedure will typically start at 0700 Friday and end 0659 the following Friday.

Once per shift, the following checks will be made:

- Release rate information will be obtained for each effluent stream having continuous monitoring capabilities.
- The overall site release rate will be calculated from the release rate information.
- Offgas pretreatment and post-treatment monitors, offgas flow rate, and offgas hydrogen concentration will be recorded during main condenser and offgas treatment systems operations.
- The WRGERMS instrumentation operability will be demonstrated by an instrumentation check.

Once per day, each effluent radiation monitor shall demonstrate the operability of its sampling rate instrumentation and associated sample flow alarms.

2.0 **REFERENCES**

Browns Ferry Nuclear Plant Technical Requirements Manual (TRM).

Updated Final Safety Analysis Report (UFSAR)

- Section 7.12, Process Radiation Monitoring.
- Section 9.5, Gaseous Radwaste System (Modified).

Operating Instructions (OI)

• 1-, 2-, and 3-OI-90, Radiation Monitoring System

Surveillance Instructions (SI)

- 0-SI-2.1-2, Airborne Effluent Radiation Monitor Source Checks.
- 0-SI-4.8.B.1.a.2, Airborne Effluent Release Rate by Manual Sampling when a Gaseous Effluent Monitor is Inoperable.
- 1-, 2-, and 3-SI-4.8.B.1.a.3, Off Gas Post-Treatment Release Rate by Manual Sampling.
- 1-, 2-, and 3-SI-4.8.B.5.a, Off Gas Hydrogen Concentration by Manual Sampling.

Technical Instructions (TI)

- TI-15, Radioactive Gaseous Effluent Engineering Calculations and Measurements.
- 0-TI-336, Continuous Air Monitor Flow Regulator Adjustment.

Offsite Dose Calculation Manual (ODCM).

Part 302 to Title 40 of the Code of Federal Regulations (40 CFR 302), Designation, Reportable Quantities, and Notification.

Memorandum from John W. Sabados to Masoud Bajestani, Subject: Sampling Set points for the Eberline Continuous Air Monitor (R46 901116 823).

Date TODAY

2.0 **REFERENCES** (continued)

Controlled Vendor Manuals (CVM)

- Technical Manual for the 250 CAM Monitoring System, BFN-CVM-2083.
- Technical Manual for the 252 CAM Monitoring System, BFN-CVM-2084.
- Technical Manual for the 249-251 CAM Monitoring System, BFN-CVM-2085.
- Technical and Operating Manual for the CT-2B(s) Control Terminal, BFN-CVM-2090.

Memorandum from M. Bajestani to J. W. Sabados, Subject: Steam Packing Exhauster flow (R40 911018 914).

Stack Post Mod. Test for DCN W17999 (PMT-256) 20 April, 1993.

Technical Requirements Manual

Memorandum from Rick Givens to Phil Chadwell, Subject: Stack Flow Requirements (R70 980730 843) [BFPER980545].

NPG-SPP-06.9.2 Surveillance Test Program



PRECAUTIONS AND LIMITATIONS

[NRC/C] Radiation monitors may be removed from service for maintenance, calibration, or testing for periods **NOT** to exceed 4 hours. If it becomes apparent that a monitor cannot be returned to service within the 4 hours, the Unit Supervisor shall be immediately notified to ensure compensatory sampling has been initiated. [LER 260/89021]

The night shifts and day shifts are defined by the day on which the shift begins. (i.e., Friday dayshift is Friday 0700-1900, Friday night shift is Friday 1900 to Saturday 0700.)



PREREQUISITES



VERIFY this copy of the procedure is the most current revision.

OP



OBTAIN a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P1470)


5.0 SPECIAL TOOLS AND EQUIPMENT RECOMMENDED

None

6.0 ACCEPTANCE CRITERIA

- A. Responses which fail to meet the acceptance criteria constitute unsatisfactory surveillance instruction results and require immediate notification of the Unit Supervisor at the time of failure. Failure of release rate acceptance criteria requires notification of the Chemistry Manager. Failure of release rate acceptance criteria will require a National Response Center reportability determination in accordance with Part 302 to Title 40 of the Code of Federal Regulation (40 CFR 302).
- B. The noble gas release rate must be limited such that the off site dose and dose rates are in compliance with ODCM Control 1.2.2.1. This will be accomplished by establishing release rate limits for the building/ground and the stack/elevated release points. The corresponding release rate limits will be checked in accordance with the values listed below.
 - 1. The sum of the building release rate fraction must be less than or equal to 0.90. The building release rate fraction is defined as the radioactive noble gas release rate at each monitored building release point divided by the ODCM building release limit of 1.50 E+05 μ Ci/sec.
 - 2. The stack release rate fraction must be less than or equal to 0.10. The stack release rate fraction is defined as the radioactive noble gas release rate at the stack divided by the ODCM release rate limit of 1.44 E+07 μ Ci/sec.
 - 3. The total site release rate fraction must be less than or equal to 1.00. The total site release rate fraction is defined as the sum of the building and stack release rate fractions.
 - 4. Compensatory sampling measures must be initiated whenever a radiation monitor is out of service and effluent releases are continuing via that release point.

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6.0 ACCEPTANCE CRITERIA (continued)

- C. The radioactive gaseous effluent instrumentation operability shall be demonstrated by performance of shiftly and/or daily instrument checks as noted below.
 - 1. Shiftly Checks. The following instrumentation checks must be accomplished at least once per shift during the noted periods of required operability. These instrumentation checks will be used to satisfy ODCM Surveillance Requirements in 2.2.2.1.1.a, Table 2.1-2, TRM Table 3.3.5-1, and TRM TSR 3.3.9.1 (noble gas monitor and hydrogen analyzer daily requirements only).

Monitor(s)	Required Period of Operability
1-, 2-, 3-RM-90-249, 1-, 2-, 3-RM-90-250, 1-, 2-, 3-RM-90-251, and 0-RM-90-252	When actively releasing an airborne effluent stream (i.e., vents are open and the ventilation fans are on).
0-RM-90-147 and/or 148	When actively releasing an airborne effluent stream.
0-RM-90-306, and 0-RR-90-360	When one or more of the site units are in either MODES 1 or 2.
1-, 2-, 3-RM-90-265, and/or 1-, 2-, 3-RM-90-266	When actively processing an off gas stream (i.e., unit FCV-66-28 is open).
1-, 2-, 3-XR-66-103 (low or high range indicators)	During main condenser offgas treatment system operations.

The shiftly checks shall be accomplished by recording the release rates or release concentrations as displayed on the appropriate control room recorders. If a monitor is out of service during a required period of operability, compensatory sampling measures will be initiated in accordance with the instructions given in Steps 7.0[9.5], 7.0[10.1.3], and/or 7.0[11.1.3].

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6.0 ACCEPTANCE CRITERIA (continued)

2. Daily Checks. The following instrumentation checks must be accomplished at least once per day during the noted periods of required operability. These instrumentation checks will be used to satisfy ODCM surveillance requirements in Table 2.1-2 (sample flow instrumentation and sample flow annunciators only).

Instrumentation	Required Period of Operability
1-, 2-, 3-RM-90-249, 1-, 2-, 3-RM-90-250, 1-, 2-, 3-RM-90-251, and 0-RM-90-252 sample flow instrumentation	When actively releasing an airborne effluent stream (i.e., vents are open and the ventilation fans are on).
0-RM-90-147/148 sample flow rate and 0-FA-90-150 flow abnormal alarm	When actively releasing an airborne effluent stream.
1-, 2-, 3-PA-90-262 sample pressure abnormal alarm	When actively processing an off gas stream (i.e., unit FCV-66-28 is open).

The daily checks shall be accomplished by recording the sample flow rates from the appropriate control room instrumentation and/or testing the alarm annunciator condition. Satisfactory sample flow rate checks must fall within the range specified in the following table. Satisfactory annunciator test results will consist of a simple "go/no-go" test.

If a monitor is out of service during a required period of operability, compensatory sampling measures will be initiated in accordance with the instructions given in Steps 7.0[9.5], 7.0[10.1.3], and/or 7.0[11.1.3]. Compensatory sample flow rate measurements are required to be made every four hours, but are **NOT** required to satisfy the sample rate limits in the following table.

Monitor	Sample Flow (scfm)	
wontor	Low	High
1-, 2-, 3-RM-90-249 1-, 2-, 3-RM-90-251	1.73	2.27
0-RM-90-252	1.12	1.87
1-, 2-, 3-RM-90-250	3.6	4.4
0-RM-90-147/148	1.1	1.5

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6.0 ACCEPTANCE CRITERIA (continued)

- D. The concentration of hydrogen gas in the off gas shall be less than or equal to 4 percent by volume (TRM LCO 3.7.2) as measured by the applicable unit XR-66-103 Hydrogen Analyzer or as determined from off gas grab samples.
- E. Acceptance criteria determination steps will be designated by (AC).
- F. The off gas pretreatment radiation levels (1-, 2-, and 3-RM-090-0157) and the off gas flow rate (1-XR-066-103, 2-XR-66-103, and 3-XR-66-103) instrumentation readings are required for monitoring system performance and for failed fuel performance calculations. There is no Technical Specification surveillance requirements associated with these observations. The observation will be made shiftly during periods of main condenser/offgas treatment system operation.
- G. In the event that 1-, 2-, or 3-PA-090-0262 is inoperable, but 1-, 2, or 3 RM-090-0265 or 0266 is operable, the off gas post treatment flow must be recorded at least once every 4 hours and the flow must be at least 0.06 cfm. If both 1-, 2, or 3 RM-090-0265 and 0266 are inoperable a flow is not required. If the flow acceptance criteria is not met, declare 1-, 2, or 3 RM-090-0265 and 0266 inoperable and notify Chemistry to initiate1-, 2, or 3-SI-4.8.B.1.a.3.

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Date TODAY

PROCEDURE STEPS

 All notes Each sta attachme Attachme the comp 	NQLES , remarks, and comments are to be recorded on Attachment 1. tement is to be numbered and cross-referenced to the appropriate ent or SI step. ents NOT used in the performance of this SI do NOT need to be inclu- bleted SI package.	uded in
ŒS	OBTAIN permission from the Unit 1 Unit Supervisor to perform this instruction.	<u>Gus</u> U1
(130)	OBTAIN permission from the Unit 2 Unit Supervisor to perform this instruction.	<u>MG</u> U2
Ø	OBTAIN permission from the Unit 3 Unit Supervisor to perform this instruction.	DK U3
(H)	[NRC/C] NOTIFY the Unit Operator (U2) of the intent to begin this instruction. [RPT 82-16, LER 259/8232]	DH
J.	On the Surveillance Task Sheet (STS)	
/	RECORD the Start Date & Time.	OP
	NOTE	
SI step performance and acceptance criteria verification are to be noted on the appropriate SI attachments for Steps 7.0/6/ through 7.0/15]		propriate



REVIEW the Precautions and Limitations in Section 3.0. **INITIAL** on Attachment 2.



ENSURE that all Prerequisites in Section 4.0 have been met. **INITIAL** on Attachment 2.

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Date TODAY

7.0 PROCEDURE STEPS (continued)

(B) **OBTAIN** the following information.

1621

191

Once per shift, **RECORD** on Attachment 2 each unit's 8 hour average power level in megawatts thermal (MWT). IF shutdown, THEN

ENTER 0.

Due to variations in required performance frequency and to minimize impact on personnel, Steps 7.0[9], 7.0[10], and 7.0[11] through 7.0[15] can be completed independently. If the stack flow instrumentation (0-FI-90-271) is inoperable or out of service and 0-FI-90-348 is **NOT** used, Attachment 7 must be completed before Step 7.0[11] can be completed.

Fan Status Determination

RM-90-249

Once per shift: **RECORD** on Attachment 3 the operating status of each ventilation fan monitored by this CAM. The status shall be indicated with "X" in the appropriate ON/OFF column.



Once per day (night shift): **IF** all fans serviced by this CAM are off and the monitor is out of service, **THEN**

VERIFY the exhausts' fan control switches are tagged out of service and **VERIFY** the fan dampers are closed.

RM-90-250

Once per shift: **CHECK** the status of each fan contributing flow to the ventilation path monitored by the RM-90-250 CAM. **USE** an "A" or "B" to denote which fan is operating. **INDICATE** the fan status by using the "O" column for all fans off (if applicable), the "S" column for fans on slow, or the "F" column for fans on fast.

RM-90-251

Once per shift: **RECORD** on Attachment 3 the operating status of each ventilation fan monitored by this CAM. The status shall be indicated with "X" in the appropriate ON/OFF column.

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7.0 PROCEDURE STEPS (continued)



[9.42]

Once per day (Night shift): **IF** all fans serviced by this CAM are off and the monitor is out of service, **THEN**

ENSURE the exhausts' fan control switches are tagged out of service and **VERIFY** the fan dampers are closed.

(9*A*)

- 0-RM-90-252 (Unit 1 Only)
 - Once each shift: **RECORD** the operating status of fans monitored by this CAM with an "X" in the appropriate column of Attachment 3. **USE** column "0" for all fans off, column "1" for one fan on, or column "2" for two fans on.



IF any of the indicated fans (stack dilution or CAM) are operating and the corresponding monitor is declared inoperable, **THEN**

CONTACT the Chemical Laboratory and **ENSURE** that compensatory sampling in accordance with 0-SI-4.8.B.1.a.2 is being conducted.



Prior to 0659 Friday morning, **TOTAL** the number of shifts each column of Attachment 3 was marked. **RECORD** the totals at the bottom of Attachment 3.

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Date TODAY

7.0 PROCEDURE STEPS (continued)

DETERMINE the building ventilation noble gas release rate once per shift by completing the following steps and **VERIFY** that all monitors with an open release path are **OPERABLE**:



For each monitor listed on Attachment 4, **COMPLETE** one of the **FOLLOWING** four steps:

- From the CONTINUOUS AIR MONITORING SYSTEM OPERATOR CONSOLE, 0-CONS-90-361, **PANEL 1-9-2**, **OBTAIN** the noble gas release rate by **USING** the touchscreen options on the console. **SELECT** the noble gas option on the screen (NGAS). **RECORD** the noble gas release rate (μCi/sec) in the appropriate columns of Attachment 4 for each operable building ventilation radiation monitor. The radiation monitor should register a positive release rate; **OTHERWISE**, **DECLARE** the monitor inoperable. This recording is performed as an Instrument Check (CHANNEL CHECK).
- [10.1.2] **IF** the operator console 0-CONS-90-361 is **NOT** available and the CAMs are operating, **THEN**
 - NA **OBTAIN** the release rate data from the local display on each CAM by **SELECTING** channel 1 with the thumb wheel or directly reading the Chemistry CAM display. The radiation monitor should register a positive release rate; **OTHERWISE**, **DECLARE** the monitor inoperable. This recording is performed as an Instrument Check (CHANNEL CHECK).

BFN Airbon Unit 0	ffluent Release Rate 0-SI-4.8.B.1.a.1 Rev. 0056 Page 16 of 56
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Date TODAY

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C

PROCEDURE STEPS (continued)

NOTE								
If 0-SI-4.8.B.1.a.2 is in effect for the CAMs, the Chemical Laboratory will report the release rate in μ Ci/sec for each grab sample. The reported release rate will assume a maximum flow rate and will yield a conservative (high) release value.								
[10.1]	.3] For out of service and/or inoperable CAMs with ventilation system in service, CONTACT the Chemical Laboratory and ENSURE that							
NH	0-SI-4.8.B.1.a.2. RECORD on Attachment 4 the release rate for each inoperable CAM as reported by the Chemical Laboratory.							
[10.1 NIA	 .4] IF the ventilation system for a CAM is totally isolated (i.e., no environmental releases occurring), THEN 							
1 / 1 /	RECORD "OOS" in all three columns on Attachment 4.							
[10.2]	For each monitor, USE Attachments 3 and 5 and DETERMINE the release factor based on fan status. RECORD the release factors from attachment 5 in the appropriate columns on Attachment 4.							
[10.3]	MULTIPLY the release rate by the release factor and RECORD the answer under the column labeled "Actual Rate" on Attachment 4.							
[10.4]	For each unit, SUM the actual rates for the RM-90-249, RM-90-250, and RM-90-251 monitors. RECORD the unit total release rates in the appropriate columns on Attachment 4.							
[10.5]	SUM the three unit total release rates and the 0-RM-90-252 actual rate. RECORD the building ventilation release rate on Attachment 4.							

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7.0 PROCEDURE STEPS (continued)

NOTE

For reporting purposes, the release fraction should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded as 0.123.

A release fraction of 0.00012 should be recorded as 0.000.

- [10.6] **DETERMINE** the building ventilation release fraction by dividing the total building ventilation release rate by 1.50 E+05 (or 150,000) μ Ci/sec. **RECORD** the fraction on both Attachment 2 and Attachment 4.
- [10.7] **VERIFY** the acceptance criteria as given in Step 6.0B.1 has been met. The building ventilation release fraction must be less than or equal to 0.90. **IF** the acceptance criteria have failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

Date TODAY

7.0 PROCEDURE STEPS (continued)

DETERMINE the elevated (stack) noble gas release rate once per shift by completing the following steps:



RECORD the highest noble gas count rates (counts per second, cps) for the 0-RM-90-147 and 0-RM-90-148 monitors in the appropriate columns of Attachment 6 in accordance with one of the following steps:

- [11.1.1] **IF** both the 0-RR-90-147 and at least one of the radiation monitors are operable, **THEN**
 - NA OBTAIN the necessary information from 0-RR-90-147 on Panel 9-2. IF applicable, THEN

RECORD "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

[11.1.2] **IF** 0-RR-90-147 is inoperable and at least one of the radiation monitors is operable, **THEN**

NA

OBTAIN the necessary data from the 0-RM-90-147B and/or 0-RM-90-148B monitors located on Panel 1-9-10. **IF** applicable, **THEN**

RECORD "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

[11.1.3] IF both monitors are inoperable, THEN

CONTACT the Chemical Laboratory and **ENSURE** that manual sampling has been initiated in accordance with 0-SI-4.8.B.1.a.2. **RECORD** "OOS" in the appropriate columns of Attachment 6.

NA

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7.0 PROCEDURE STEPS (continued)

NOTE									
If 0-SI-4.8.B.1.a.2 is in effect for the stack monitors, the Chemical Laboratory will report the stack release rate in μ Ci/sec for each grab sample. The reported release rate will assume a maximum flow rate and will yield a conservative (high) release value. In this case, Steps 7.0[11.2] and 7.0[11.3] are NOT applicable.									
	DETERMINE the stack flow rate and RECORD in the appropriate column of Attachment 6.								
[1]2.]	IF 0-FI-90-271 on Panel 1-9-53 is operable, THEN								
	RECORD the stack flow in standard cubic feet per minute (scfm).								
[11.2.2]	If 0-FI-90-271 on Panel 1-9-53 is inoperable, the flow can be determined from 0-FI-90-348 on Panel 25-412 in the WRGERMS building. IF 0-FI-90-348 is used for the flow, THEN								
1	MAKE a note in the remarks log that 0-FI-90-348 was used.								
[11.2.3]	IF 0-FI-90-271 on Panel 1-9-53 is inoperable and 0-FI-90-348 is NOT used, THEN								
NA	ESTIMATE the stack flow every four hours using Attachment 7. RECORD the total stack flow in scfm on Attachment 7. RECORD on Attachment 6 the most current value of the 4 hour observations from Attachment 7.								
[11.3] DE tota are bot	TERMINE the stack release rate by using the gross count rate and I stack flow in accordance with the following equation. When there two gross count rate readings, USE the highest gross count rate. IF h monitors (0-RM-90-147/8) are INOP, THEN								
со	NTINUE with Step 7.0[11.4].								
Total Stack Flow	/ (scfm) x Gross Count Rate (cps) x 1.23 E-03 [(μCi/sec)/(cps-scfm)]								

[11.4] **RECORD** in the appropriate column of Attachment 6 either the release rate calculated in Step 7.0[11.3] or as reported by the Chemical Laboratory for an inoperable monitor.

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7.0 PROCEDURE STEPS (continued)

Alternative sampling for the WRGERM monitor is satisfied by taking readings from the normal stack release monitors, 0-RM-90-147 and/or 0-RM-90-148, when operable or by manual sampling in accordance with 0-SI-4.8.B.1.a.2 when the normal stack monitors are inoperable. This alternate sampling succession satisfies the requirement for a preplanned alternate method as required in TABLE 3.3.5-1 of the TRM.

Wide Range Gaseous Effluent Radiation Monitor (WRGERM), 0-RM-90-306, Panel 2-9-10.

[11.5.1] IF the monitor is inoperable, THEN



RECORD "INOP" in the appropriate column of Attachment 6 and **CONTINUE** with Step 7.0[11.6]. Otherwise, **CONTINUE** with Step 7.0[11.5.2].



2 **ENSURE** 0-RM-90-306 is in the Sample Mode.

RECORD the noble gas release rate in µCi/sec in the appropriate column of Attachment 6. RECORD results to two decimal places (e.g., 2.95E 00).

[11.6] **IF** the WRGERM monitor is inoperable for a period greater than one day, **THEN**

CONTACT the Chemistry Manager. **IF** the monitor remains inoperable for a period of seven days, **THEN**

INITIATE a Problem Evaluation Report within 24 hours in accordance with TRM Table 3.3.5-1 (Action E.2).



IF all release streams to the stack are isolated, THEN

USE a release rate factor of 0.00. Otherwise, **USE** 1.00. **RECORD** the release rate factor in the appropriate column of Attachment 6.

[11.8] **CALCULATE** the actual release rate by multiplying the highest release rate (0-RM-90-147/148 or 0-RM-90-306) by the release factor. **RECORD** the information in the Actual Release Rate column on Attachment 6.

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7.0 PROCEDURE STEPS (continued)

NOTE

For reporting purposes, the release fractions should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded only as 0.123.

A release fraction of 0.00012 should be recorded only as 0.000.

- [11.9] **CALCULATE** the stack release fraction by dividing the actual release rate by 1.44 E+07 (or 14,400,000) μ Ci/sec. **RECORD** this information on both Attachment 2 and Attachment 6.
- [11.10] **VERIFY** the acceptance criteria as given in Step 6.0B.2 has been met. The stack release fraction must be less than or equal to 0.10. **IF** the acceptance criterion has failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

[12] **CALCULATE** the total site release fraction by adding the building ventilation and stack release fractions on Attachment 2. **VERIFY** the site release fraction acceptance criteria as given in Step 6.0B.3 has been met. **IF** the acceptance criterion has failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

 NOTE

 Verify 2-FCV-66-28 is unrestrained, open and locked.

 NA
 [13]
 Once per shift, RECORD the Unit 1, 2, and 3 offgas instrumentation readings on Attachment 8.

 [13.1]
 In the "FCV-66-28" column, PLACE an "X" in the appropriate box (open or closed).

 [13.2]
 IF the unit's FCV-66-28 is CLOSED, THEN

 RECORD all other offgas readings as "N/A" (NOT applicable). CONTINUE with Step7.0[13.8].

8.0 ILLUSTRATIONS/ATTACHMENTS

- Attachment 1: Independent Review and Remarks Log
- Attachment 2: Site Effluent Release Rate Summary
- Attachment 3: Fan Status Report
- Attachment 4: Building Effluent Release Rate Log
- Attachment 5: Building Ventilation System Release Factors
- Attachment 6: Elevated Effluent Release Rate Log
- Attachment 7: Airborne Effluent for Total Stack Flow Rates
- Attachment 8: Offgas Instrumentation Log
- Attachment 9: Airborne Effluent Release Rate
- Attachment 10: Sample Flow Abnormal Log
- Attachment 11: EPIP Release Rate Log

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Attachment 1 (Page 1 of 2)

Independent Review and Remarks Log

Independent Review (STA or SRO) performed for each shift.

ſ	DAY	SHIFT	NIGHT SHIFT		
DAY	Initial Time		Initial	Time	
FRIDAY					
SATURDAY					
SUNDAY					
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					

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Remarks Log

Week From _____ To _____

(

Remark Number	Attachment or Step	Remarks	Time	Date	Initials
		- Million - Andrew - Million - Andrew -			
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Attachment 2 (Page 1 of 1)

Site Effluent Release Rate Summary

Week From TODAY To

D	S	SI STEP		Reactor Power (MWT)			Building				Init	iais
A	н						Ventilation		Total Site			
Y	1			11.21.4	Limit O	Linit 2	Release Rate	Stack Release Rate Fraction	Fraction	Acceptance		Unit
	F	7 0(6)	7 0171		7 018 1)	7 018 11	7.0[10.6]	7.0[11.9]	7.0[12]	Criteria	AUO	Supervisor
		7.0[0]		2465	7451	2454				≤ 1.00		
FKI		UP	L OL	2675	Sisa	2/2/				≤ 1.00		
CAT-	או			<u> </u>						≤ 1.00		
SAT										≤ 1.00		
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SUN										≤ 1.00		
				<u> </u>						≤ 1.00		
NON				<u> </u>						≤ 1.00		
										≤ 1.00		
TUE								<u> </u>		≤ 1.00		
			<u> </u>							≤ 1.00		
WED			<u> </u>			<u> </u>				≤ 1.00		
	N -			<u> </u>						≤ 1.00		
THU	D		<u> </u>							< 1.00		
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Initials added as a result of BFPER 960634.

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 31 of 56
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Attachment 3 (Page 1 of 3)

Fan Status Report

Week From TODAY To

Unit 1	S H	<u></u>	Reactor Building															Tur	bine	Build	ling								Ra	dwas	ste	
A	ï			1	-RM	1-90	-250)						1-	RM-	90-25	51		_				1-	RM-9	90-24	9					9	AUO
Ŷ	F	R	efue	2	Re	act	or	Τι	ırbir	ne	F	1	E	3	(;	C)	E		F	-	G	3	ł	1		J	0-R	M-90-	252	Init
	Т	0	s	F	0	S	F	0	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	0	1	2	
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BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 32 of 56
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Week From <u>____</u>___ То _____

Unit 2	S		Reactor Building											med of			Tur	bine	Build	ing									
D	Н					1_00	-250	<u>,</u>						2.	RM-9	30-25	1				[RM-9	. 30-24	9			
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Attachment 3 (Page 3 of 3)

Week From TODAY To

Unit 3	S		Reactor Building													Tu	bine	Build	ling										
D	H					1 00	-25(<u> </u>					3	-RM-	90-25	51		-	[<u></u> .,,,		3-	-RM-9	90-24	9				
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Attachment 4 (Page 1 of 4) Building Effluent Release Rate Log

Week From <u>TODAY</u> To _____ Unit 1

			Reactor Building				Turbine	Building				nitials
	s		1-RM-90-250			1-RM-90-249			1-RM-90-251			
D A	Ĥ	Release Rate	Release	Actual Rate	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit
Y	F	(uCi/sec)	See Note	(100,000)	(µCi/sec)	See Note		(µCi/sec)	See Note		100	Supervisor
	'	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	4000			500			910			ļ	
	N	1000										
SAT	D											
	N											
SUN	D											
	N										<u> </u>	
MON	D											
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1 See Attachment 5 for Release Factor.

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Attachment 4 (Page 2 of 4)

Week From <u>To DAY</u> To _____ Unit 2

			Reactor Building				Turbine	Building				nitials
	s		2-RM-90-250			2-RM-90-249			2-RM-90-251			
D A	H I E	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit
Y i	Г	(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note	7 0/40 03		Supervisor
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	3400			840			2200				
	N											
SAT	D											
	N								<u> </u>			
SUN	D								<u> </u>			
	N					<u> </u>					+	
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TUE	D										<u> </u>	
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WED	D											
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1 See Attachment 5 for Release Factor.

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Week From <u>TODAY</u> To _____ Unit 3

			Reactor Building				Turbine	Building				nitials
	s		3-RM-90-250			3-RM-90-249			3-RM-90-251			
D A	H I F	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit
Ŷ		(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note	7 0/40 01		Supervisor
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	ļ	
FRI	D	3100			1600			1900				
	N											
SAT	D										 	
	N											
SUN	D										 	
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1 See Attachment 5 for Release Factor.

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Attachment 4 (Page 4 of 4)

Week From <u>TODAY</u> To _____ Unit 0

D	S	Radwaste Building 0-RM-90-252		Unit	Total Release R	ates	Building	Building	Acceptance	Acceptance Initials		
Ā	н			(μCi/sec)		Polosse Rate	Release	Cinteria				
Y	l F	Release Rate (uCi/sec)	Release Factor	Actual Rate (μCi/sec)	Unit 1	Unit 2	Unit 3	(µCi/sec)	Fraction		AUO	Unit Supervisor
	Т		See Note							<u> </u>	<u> </u>	
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.4]	7.0[10.4]	7.0[10.4]	7.0[10.5]	7.0[10.6]			
FRI	D	226								≤ 0.90		
	N	<u> </u>								≤ 0.90		<u> </u>
- OAT										≤ 0.90		
SAI										≤ 0.90		
	N									≤ 0.90		
SUN	D									≤ 0.90		
	N									< 0.90	<u> </u>	
MON	D									< 0.00		
	N									\$ 0.30		
TUE	D									<u>≤0.90</u>	-	
	N									≤ 0.90	Ļ	
WED										≤ 0.90		
							1			≤ 0.90		
	N				+					≤ 0.90		
THU				·		1				≤ 0.90		
ļ	I N	1					l	I	I			

1 See Attachment 5 for Release Factor.

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Attachment 5 (Page 1 of 2)

Building Ventilation System Release Factors

NOTE

If one or more of the fans are off and one or more of the fans are on, assume off fans are on "slow". (This will cover the case where the fans are off, off, slow; off, slow, off; etc.)

1-, 2-, and 3- RM-90-250								
	Fan Status (Note)	1	Release Facto	r			
Refuel	Reactor	Turbine	Unit 1	Unit 2	Unit 3			
Off	Off	Off	0.00	0.00	0.00			
Slow	Slow	Stow	0.49	0.53	0.49			
Fast	Slow	Slow	0.63	0.60	0.59			
Slow	Fast	Slow	0.64	0.73	0.69			
Slow	Siow	Fast	0.72	0.73	0.71			
Fast	Fast	Slow	0.77	0.80	0.78			
Fast	Stow	Fast	0.86	0.80	0.81			
Slow	Fast	Fast	0.87	0.94	0.91			
Fast	Fast	Fast	1.00	1.00	1.00			

0-RM-90-252							
Number Fans On	0	1	2 Fans				
Release Factor	0.00	0.62	1.00				

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Attachment 5 (Page 2 of 2)

Turbine Floor CAM Release Factors

1-RM-90-249, 2-RM-90-249, and 3-RM-90-251						
Number Fans On	0	1	2	3	4	
Release Factor	0.00	0.25	0.50	0.75	1.00	

1-RM-90-251, 2-RM-90-251, and 3-RM-90-249							
Number Fans On	0	1	2	3	4	5	
Release Factor	0.00	0.20	0.40	0.60	0.80	1.00	

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 40 of 56
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Attachment 6 (Page 1 of 2)

Elevated Effluent Release Rate Log

Week From TODAY To

D A Y	S H F T	0-RM-90-147 Red Pen GROSS COUNT RATE (CPS)	0-RM-90-148 Green Pen GROSS COUNT RATE (CPS)	HIGHEST GROSS	STACK FLOW RATE 0-FI-90-271 INOP<16,366 (NOTES 1 & 3) OR ATTACH 7 7,0[11,2]	CONVERSION FACTOR	STACK RELEASE RATE (NOTE 2) (μCi/SEC) 7.0[11.3] & 7.0[11.4]
	╘┷┹┥	7.0(11.1)	0.75		22700	1.23E-03	
- <u>F</u>	무	4.55 × 103	יטאכויב		- <u>~~</u>	1.23E-03	
к						1.23E-03	
<u> </u>						1.23E-03	
A	N N					1.23E-03	
S						1.23E-03	
U	N					1.23E-03	
M						1.23E-03	
0	N					1.23E-03	
						1.23E-03	
U	N					1,23E-03	
W	D					1.23E-03	
Е	N					1 23E-03	
T	D					1 23E-03	
н	N	4 L	1 I	•		1.250-05	

1 Minimum acceptable flowrate for 0-fi-90-271 operability is 16,366 SCFM (See note 3)

2 Data from manual sampling results or 0-90-147/148[(Stack flow) X (Highest gross count rate) X 1.23E-03].

3 The minimum stack flow rate was revised to 16,366 SCFM (BFPER980545).

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 41 of 56
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Attachment 6 (Page 2 of 2)

Week From TODAY To

	6		WRGERMS						11	nitials
A Y	о Н F Т	DATA RECORDED IN STEP 7.0[11.4]	Noble Gas Release Rate 0-RM-90-306 (μCi/sec) 7.0[11.5]	Highest Stack Release Rate (μCi/sec) Note 1.	Release Rate Factor (0.00 or 1.00) 7.0[11.7]	Actual Release Rate (μCi/sec) 7.0[11.8]	Stack Release Fraction Note 2 7.0[11.9]	Acceptance Criteria	AUO	Unit Supervisor
FRI	D		1.29× 106		1.00			≤ 0.10		
	N							≤ 0.10		
SAT	D							≤ 0.10		
0,11	N							≤ 0.10		
SUN								≤ 0.10		
	N							≤ 0.10		
MON								≤ 0.10		
WON								≤ 0.10		
								≤ 0.10		
IUE								≤ 0.10		
	N							≤ 0.10	1	
WED	D							≤ 0.10		
	N							< 0.10		
THU	D							20.10		
1	N							<u> </u>	<u> </u>	<u>I</u>

1 Use the higher of the Stack release rate or the WRGERMS release rate.

2 Divide actual Stack release rate (μ Ci/sec) by 1.44E+07 μ Ci/sec.

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 42 of 56
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Attachment 7 (Page 1 of 2)

Airborne Effluent for Total Stack Flow Rates

NOTE

ENTER given flow rate values for individual equipment in operation into blank columns. Total stack flow rate equals sum of values in Columns 1 through 12.

WEEK FROM_____TO_____

.

	Date			 		
	Time:					
	1 SGTS A = 9145 scfm (m) B = 9048 scfm (m) C = 9500 scfm (m)					
	2	FC Exhaust A = 3600 scfm (m) B = 4775 scfm (m)				
UNIT1	3	Off Gas Flow Rate Rate () scfm (m) 1-XR-66-103				
UNIT 1	4	Dilution Fan A = 7370 scfm (m) B = 7033 scfm (m)				
UNIT 1	5	Steam Packing Exhauster Flow = 1410 scfm (o)				
UNIT 2	6	Off gas Flow Rate () scfm (m) 2-XR-66-103				
UNIT 2	7	Dilution Fan A = $6594 \text{ scfm}(m)$ B = $6766 \text{ scfm}(m)$				

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056
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Attachment 7 (Page 2 of 2)

UNIT 2	8	Steam Packing Exhauster Flow = 1410 scfm (o)	
UNIT 3	Q	Off Gas Flow Bate () scfm (m)	
	0	3-XR-66-103	\square
UNIT 3		Dilution Fan	
	10	A = 6375 scfm (m)	
		B = 6055 scfm (m)	_
UNIT 3	4.4	Steam Packing Exhauster	
		Flow = 1410 scfm (0)	\square
	40	Off Gas Treatment Building	
	12	Exhaust Flow = 1708scfm(m)	
	40	Total (scfm)	
	13	(1-12)	
·····		AUO Initials	
		Unit Supervisor's Initials	

Remarks:_____

NOTES

1) (m) Measured Flows.

2) (o) Based on average flow measurements.

1

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 44 of 56
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Attachment 8 (Page 1 of 3)

Offgas Instrumentation Log

Week From _____ To _____

Unit 1 Off Gas Instrumentation Readings (SI Step 7.0[13])

D A Y	S H F T	Pretreat- Monitor RM-90-157 (mR/hr)	FCV-66-28 Position X appr col		1-XR-66-103 rate Off Gas Flow rate	Post Treatment Monitor (cps)		1-XR- Hydrogen F (Perce	66-103 Recombiner ent H2)	Acceptance Criteria for	Initials	
			Open ⁽¹⁾	Closed	66-111A or 66-111B	RM-90-266 Red Pen	RM-90-265 Green Pen	01-H2T-1067 Red Screen	02-H2T-1068 Green Screen	Percent H2	AUO	Unit Supervisor
FRI	D									≤ 4.0%		
	N									≤ 4.0%		
SAT	D									≤ 4.0%		
	N									≤ 4.0%		
SUN	D									≤ 4.0%		
	N									≤ 4.0%		
MON	D									≤ 4.0%		
	N									≤ 4.0%		
TUE	D									≤ 4.0%		
	N									≤ 4.0%		
WED	D									≤ 4.0%		
	N									≤ 4.0%		
THU	D									≤ 4.0%		
	N			1						≤ 4.0%		

⁽¹⁾ Verify 1-FCV-66-28 is unrestrained, open and locked (if not in this configuration, notify Operations Shift Manager).

Attachment 8 (Page 2 of 3)

Week From _____ To _____

Unit 2 Off Gas Instrumentation Readings (SI Step 7.0[13])

D A Y	S H I F T	Pretreat- Monitor RM-90-157 (mR/hr)	FCV-66-28 Position X appr col		2-XR-66-103 Off Gas Flow rate	Post Treatment Monitor (cps)		2-XR- Hydrogen (Perce	66-103 Recombiner ent H2)	Acceptance	Initials	
			Open ⁽¹⁾	Closed	(scrm) 66-111A or 66-111B	RM-90-266 Red Pen	RM-90-265 Green Pen	66-1067 Red Screen	66-1068 Green Screen	Criteria for Percent H2	AUO	Unit Supervisor
FRI	D									≤ 4.0%		
	N									≤ 4.0%		
SAT	D	· · · · · · · · · · · · · · · · · · ·								≤ 4.0%		
	N									≤ 4.0%		
SUN	D									≤ 4.0%		
	N					······································				≤ 4.0%		
MON	D									≤ 4.0%		
	N									≤ 4.0%		
TUE	D									≤ 4.0%		
										≤ 4.0%		
WED										≤ 4.0%		
				1						≤ 4.0%		
ТНП		<u>.</u>								≤ 4.0%		
	N									≤ 4.0%		

⁽¹⁾ Verify 2-FCV-66-28 is unrestrained, open and locked (if not in this configuration, notify Operations Shift Manager).

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 46 of 56
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Attachment 8 (Page 3 of 3)

Week From _____ To _____

Unit 3 Off Gas Instrumentation Readings (SI Step 7.0[13])

D A Y	S H I F T	Pretreat- Monitor RM-90-157 (mR/hr)	FCV-66-28 Position X appr col		3-XR-66-103 Off Gas Flow rate	Post Treatment Monitor (cps)		3-XR- Hydrogen I (Perce	66-103 Recombiner ent H2)	Acceptance	Initials	
			Open ⁽¹⁾	Closed	66-111A or 66-111B	RM-90-266 Red Pen	RM-90-265 Green Pen	66-1067 Red Screen	66-1068 Green Screen	Percent H2	AUO	Unit Supervisor
FRI	D	······································								≤ 4.0%		
	N									≤ 4.0%		
SAT	D									≤ 4.0%		
	N									≤ 4.0%		
SUN	D									≤ 4.0%		
	N	·····								≤ 4.0%		
MON	D			1						≤ 4.0%		
	N									≤ 4.0%		
							au			≤ 4.0%		
	N		<u> </u>							≤ 4.0%		
WED										≤ 4.0%		
										≤ 4.0%		
тып										≤ 4.0%		
	N									≤ 4.0%		

⁽¹⁾ Verify 3-FCV-66-28 is unrestrained, open and locked (if not in this configuration, notify Operations Shift Manager).

Attachment 9 (Page 1 of 1)

Airborne Effluent Release Rate

REN	Radiation Monitor	AC F	lange⁵				Day	y of the	Week			
Unit	Annunciator	Low	High	Units	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Note
0	RM-90-147	1.1	1.5	scfm								1
0	RM-90-252	1.12	1.87	scfm								2
	FA-90-150	Yes	••••••	N/A								3
1	RM-90-249	1.73	2.27	scfm								2
1	RM-90-250	3.6	4.4	scfm								2
1	RM-90-251	1.73	2.27	scfm								2
	PA-90-262		Yes									4
2	RM-90-249	1.73	2.27	scfm								2
2	RM-90-250	3.6	4.4	scfm								2
2	RM-90-251	1.73	2.27	scfm								2
	PA-90-262	Yes	Yes									4
3	RM-90-249	1.73	2.27	scfm								2
3	RM-90-250	3.6	4.4	scfm								2
3	RM-90-251	1.73	2.27	scfm								2
	PA-90-262	Yes		N/A								4
Acceptance Criteria Satisfied			AU	O Initials								
		U	Unit Supervisor Init]

- 1 Reference SI Step 7.0[14.1]. Actual reading from 0-FIT-90-153. If 0-FIT-90-153 is inoperable, compensatory sampling must be initiated in accordance with 0-SI-4.8.B.1.a.2.
- 2 Reference SI Step 7.0[14.2]. If the sample flow rate is **NOT** available for any CAM, compensatory sampling must be initiated in accordance with 0-SI-4.8.B.1.a.2.
- 3 Reference SI Step 7.0[14.3]. If the annunciator fails and 0-RM-90-147/148 is operable, the sample flow rate must be recorded every four hours on Attachment 10.
- 4 Reference SI Step 7.0[14.4]. If the annunciator fails and RM-90-265/266 is operable, the sample rate must be recorded every four hours on Attachment 10.
- 5 Acceptance range changed for BFPER960679.

Week From

То

Attachment 10 (Page 1 of 1)

Sample Flow Abnormal Log

WEEK FROM_____TO_____

MONITOR ID: _____

Date/Time	Flow	Init.	Post Treatment (AC)	Date/Time	Flow	Init.	Post Treatment (AC)
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
		-	> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM
			> 0.06 CFM				> 0.06 CFM

This logsheet is to be used if the stack sample flow abnormal (FA-090-0150) or an offgas post treatment sample flow abnormal (PA-090-0262) is inoperable while the applicable monitor is operable. A separate attachment must be used for each monitor. Sample flow shall be recorded each four hours from the applicable flow instrument: For the GE stack monitor use FIT-090-0153 and for an offgas post treatment monitor use FI-090-0268.
BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056
		Page 49 of 56

Attachment 11 (Page 1 of 8)

EPIP Release Rate Log

NOTES

- 1) This attachment is used to record data during EOIs and REP conditions.
- 2) Page 2 of 8 is similar to Attachment 2. 3 of 8 through 6 of 8 are similar to Attachment 4, and 7 of 8 and 8 of 8 are similar to Attachment 6.
- 3) Pages from this attachment may be used to document plant release data on as frequent a basis as needed.
- 4) Multiple copies of forms from this attachment may be used as needed.
- 5) Any entries on this form may be NA'ed as needed.

Special Instructions for this attachment.

- A. **RECORD** the "From To" dates.
- B. **RECORD** the day of the month (under DAY) and time on each line as needed.
- C. Instructions for recording the data for each item are as given in the main body of the SI.

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 50 of 56
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Attachment 11 (Page 2 of 8)

Site Effluent Release Rate Summary

From _____ To _____

D	Т	SI S	STEP	F	Reactor Power (M	IWT)			Total Site
A Y	l M			Unit 1	Unit 2	Unit 3	Building Ventilation Release Rate Fraction	Stack Release Rate Fraction	Release Rate Fraction
	E	7.0[6]	7.0[7]	7.0[8.1]	7.0[8.1]	7.0[8.1]	7.0[10.6]	7.0[11.9]	7.0[12]

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 51 of 56
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Attachment 11 (Page 3 of 8)

Building Effluent Release Rate Log - Unit 1

From _____ To _____

Unit 1

D	Т		Reactor Building		Turbine Building					
A	1		1-RM-90-250		1-RM-90-249			1-RM-90-251		
Ŷ	E	Release Rate		Actual Rate	Release Rate		Actual Rate	Release Rate		Actual Rate
		(µCi/sec)	Release Factor	(µCi/sec)	(µCi/sec)	Release Factor	(μCi/sec)	(µCi/sec)	Release Factor	(µCi/sec)
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]
						-				
		· · · · · · · · · · · · · · · · · · ·								

Attachment 11 (Page 4 of 8)

Building Effluent Release Rate Log - Unit 2

From _____ To _____

Unit 2

D	Т		Reactor Building		Turbine Building					
A	1	ANNUN	2-RM-90-250		2-RM-90-249 2-RM-90-251					
Y	M E	Release Rate		Actual Rate	Release Rate		Actual Rate	Release Rate		Actual Rate
		(μCi/sec)	Release Factor	(µCi/sec)	(µCi/sec)	Release Factor	(µCi/sec)	(µCi/sec)	Release Factor	(µCi/sec)
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]

Unit 0 Rev. 0056 Page 53 of 56	BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 53 of 56
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Attachment 11 (Page 5 of 8)

Building Effluent Release Rate Log - Unit 3

From _____ To _____

Unit 3

D	т		Reactor Building			Turbine Building						
A	l		3-RM-90-250		3-RM-90-249			3-RM-90-251				
E	E	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate (μCi/sec)	Release Factor	Actual Rate (μCi/sec)	Release Rate (μCi/sec)	Release Factor	Actual Rate (μCi/sec)		
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
					· · · · · · · · · · · · · · · · · · ·							

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 54 of 56
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Attachment 11 (Page 6 of 8)

Building Effluent Release Rate Log - Unit 0

From _____ To _____

D	Т		Radwaste Bui	ilding	Unit	Total Release F	Rates				
A	l M		0-RM-90-2	52	(µCi/sec)			Duilding Ventiletion			
Y	E	Release Rate (μCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (μCi/sec) 7.0[10.3]	Unit 1 7.0[10.4]	Unit 2 7.0[10.4]	Unit 3 7.0[10.4]	Building Ventilation Release Rate (μCi/sec) 7.0[10.5]	Building Ventilation Release Fraction 7.0[10.6]		
							•···				

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 55 of 56
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Attachment 11 (Page 7 of 8)

From _____ To _____

Elevated Effluent Release Rate Log

D A Y	T I M E	0-RM-90-147 Red Pen GROSS COUNT RATE (CPS) 7.0[11.1]	0-RM-90-148 Green Pen GROSS COUNT RATE (CPS) 7.0[11.1]	HIGHEST GROSS COUNT RATE (CPS)	STACK FLOW RATE 0-FI-90-271 INOP<16,366 (NOTE 1) -OR- ATT 7 7.0[11.2]	CONVERSION FACTOR	STACK RELEASE RATE (NOTE 2) (μCi/SEC) 7.0[11.3] & 7.0[11.4]
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	

1 Minimum acceptable flow rate for 0-FI-90-271 operability is 16,366 SCFM (See note 3).

2 Data from manual sampling results or 0-90-147/148 [(Stack Flow) X Highest Gross Count X 1.23E-03].

3 The minimum acceptable flow rate was revised to 16,366 SCFM (BFPER980545).

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 56 of 56
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Attachment 11 (Page 8 of 8)

Building Effluent Release Rate Log - Unit 0

From _____ To _____

DAY	TIME	WRGERMS Noble Gas Release Rate 0-RM-90-306 (µCi/sec) 7.0[11.5]	Highest Stack Release Rate (μCi/sec) (Note 1).	Release Rate Factor (0.00 or 1.00) 7.0[11.7]	Actual Release Rate (μCi/sec) 7.0[11.8]	Stack Release Fraction (Note 2) 7.0[11.9]

1 Use the higher of the Stack release rate or the WRGERMS release rate.

2 Divide actual Stack release rate (μ Ci/sec) by 1.44E+07 μ Ci/sec.

OPERATOR:	
RO	DATE:
JPM NUMBER:	RO A2
TASK NUMBER:	S-000-AD-55
TASK TITLE:	Condensate Booster Pump 2B Isolation Boundary
K/A NUMBER: 2.2.4	41 K/A RATING: RO 3.5
TASK STANDARD	Determine the clearance boundary for Condensate Booster Pump 2B
LOCATION OF PER	FORMANCE: Class Room / Unit 2 Simulator
REFERENCES/PRC	CEDURES NEEDED:
VALIDATION TIM	E: 30 minutes
PERFORMANCE T	IME:
COMMENTS:	
Additional comment	sheets attached? YES NO
RESULTS: SATI	SFACTORY UNSATISFACTORY
SIGNATURE:	DATE:

EXAMINER

C

for the second s

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INITIAL CONDITIONS: Condensate Booster Pump 2B has a failed lube oil cooler (tube leaks).

Given:

- NPG Request for Clearance
- Page one of Completing Clearance

INITIATING CUE: The Unit Supervisor directs you as a Reactor Operator to write a clearance to drain and allow the repair work on Condensate Booster Pump 2B lube oil cooler.

ESOMs is not currently working, use the completing clearance form in Appendix B (page 8 of 11). On Appendix B (page 8 of 11) complete columns 18, 20, 21, and 22 for each identified component.

Class Room

INITIAL CONDITIONS: Condensate Booster Pump 2B has a failed lube oil cooler (tube leaks).

Given:

- NPG Request for Clearance
- Page one of Completing Clearance

INITIATING CUE: The Unit Supervisor directs you as a Reactor Operator to write a clearance to drain and allow the repair work on Condensate Booster Pump 2B lube oil cooler.

ESOMs is not currently working, use the completing clearance form in Appendix B (page 8 of 11). On Appendix B (page 8 of 11) complete columns 18, 20, 21, and 22 for each identified component.

START TIME

Review prints to determine required isolation boundary: 2-45E721, 0-45E763-3, 2-47E804-1 and 2, 2-47E610-2-1B, 2-45E753-3, and 2-47E844-1

Standard:

Locates and reviews prints for 2B Condensate Booster Pump lube oil cooler

SAT__ UNSAT___ N/A ___COMMENTS:_____

Performance Step 2:

Determines Isolation boundary

Standard:

2B Condensate Booster Pump Handswitch 2-HS-002-0062A, Danger Tag, Stop, and place sequence is ONE or TWO.

SAT__UNSAT__N/A __COMMENTS:_____

Performance Step 3:

Critical X Not Critical

Critical X Not Critical

Determines Isolation boundary

Standard:

2B 4KV Unit BD Compartment 8, 2B Condensate Booster Pump Power Supply, Danger Tag, Racked Out, and place sequence is ONE or TWO. No other components shall be identified before breaker except for Condensate Booster Pump Handswitch.

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 4:

Critical \underline{X} Not Critical

Determines Isolation boundary

Standard:

2-SHV-024-0631B RCW to Condensate Booster Pump 2B and 2-SHV-024-0632B RCW from Condensate Booster Pump 2B, Danger Tags, Closed, and place sequence is after Condensate Booster Pump Breaker.

SAT__UNSAT___N/A ___COMMENTS:_____

Performance Step 5:

Critical \underline{X} Not Critical

Determines Isolation boundary

Standard:

2B 480V TMOV BD Compartment 12A, Condensate Booster Pump 2B Auxiliary Oil Pump Power Supply, Danger Tag, Off, and place sequence is after Condensate Booster Pump Breaker.

SAT__ UNSAT__ N/A __COMMENTS:_____

Performance Step 6:

Critical \underline{X} Not Critical

Determines Isolation boundary

Standard:

2B Auxiliary Oil Pump Handswitch 2-HS-002-0140, Danger Tag, Stop, and place sequence is after Condensate Booster Pump Breaker.

SAT___UNSAT___N/A ___COMMENTS:_____

Performance Step 7:

Critical \underline{X} Not Critical

Determines Isolation boundary

Standard:

2-DRV-024-674B RCW to Condensate Booster Pump 2B Drain, Danger Tag OR NO Tag, Open, and place sequence is LAST.

SAT__ UNSAT__ N/A __COMMENTS:_____

END OF TASK

STOP TIME ____

AnswerKeyUNIT 2NPG Standard
Programs and
ProcessesClearance Procedure to Safely Control
EnergyNPG-SPP-10.2
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Appendix B (Page 8 of 11)

Completing Clearance

Tennessee Valley Authority

Clearance Tag List and Operational Steps

Clearance Sheet						Clearance No. (1)					Page of (2)		
Apparatus: (3)			والانتقالة القابي بيرين										
Equipment ID Equipment Description Equipment Location	Tag Serial No.	Tag Typo	Placo. Seq.	Place. Config.	Place. 1st Verifier	Place. 2nd Verifier	Rest. Seq.	Restore Config.	As left Cenfig.	Restore 1st Verifier	Restore 2nd Verifier	Tag Notes	
(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	
2-HS-002-0062A, CBP2B VELEZ-9-(-	DANGER	1	STOP									
Comor 2- B2R-002-0062,28 4KV VB, 8	-	DANGER	(مر)	RA460 U~T									
2-544-24-6328, RCW FROM CBP 2B	-	OANLER	3	Closed									
2-544-6313, REW TO													
CBP 2B		DANGAR	ک	Closed									
2-45-2-140, CBP 23 Aux	-	BANGER	3	STOP									
OIL FYME MANDAWITCH													

	* ANSWER KEY UNIT	2 *
NPG Standard Programs and Processes	Clearance Procedure to Safely Control Energy	NPG-SPP-10.2 Rev. 0005 Page 49 of 80

Appendix B (Page 8 of 11)

Completing Clearance

Tennessee Valley Authority

Clearance Tag List and Operational Steps

Clearance Sheet	arance Sheet						Clearance No. (1)					Page of (2)		
Apparatus: (3)						-			·····					
Equipment ID Equipment Description Equipment Location	Tag Serial No.	Tag Type	Piaco. Seq.	Piace. Config.	Place. 1st Verifier	Place. 2nd Verifier	Rest. Seq.	Restore Config.	As loft Config.	Restore 1st Verifier	Restore 2nd Verifier	Tag Notes		
(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)		

7-BER.002-140,2B 4801 TMOV BD COMPT 12A	-	DANGER	3	OFF										
J-DRV-024. 674B, RLW	-	NOTAL	r 4	OPEN										
						1								
					 									
									+					
						1	1							

PG Standard	Clearance Proce		ely Contro	I NFO	SFF-10.2	
rograms and Processes	E	nergy		Page	41 of 80	
		Appendix (Page 3 of	(A f 3)			
	NPG F	Request for	Clearance	e		
	NPG	i Request for	Clearance			
Remeste	Date of Request:	TODAY	6 5555	Work Ords Requester's	TNO.: NRC	ExAm
I Drie st	Date and time work to begin:	NAXT WEE	.1<	Outage Planned O	Work: Ves	NK
Date a	Duration:		<u></u>	Forced O	utage: Ves	
Equipment can b	e returned to service in emergency:	🗋 Yes	No No	CIVILITIES INCL	1000-00 El 163	
Time Equipment/System	required to return to service:					
to be cleared:	CONDENSATE	<u>= 130057</u>	TER PJ	<u>mp 28</u>	3	
Detailed description/	cope of work to be performed	d: 	4	0		aler
Drain Do	d repair T-b	r lears	on T	5 C 10		41.5
	(• –				
for Con	densite Boo	ster P	ump 2	ß		
for Con	densate Boo	ster P		ß		
For Con	CAs, marked up to show rea	ster P	arance bound	B lary: NO		
For Con	CAs, marked up to show rea	ster P	arance bound	B lary: <u>NO</u>		
For Con Attached drawings/D Potential adverse affec Other systems affec	CAs, marked up to show rea	oster P	arance bound	.B lary: <u>NO</u>		
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings	CAs, marked up to show rea	ster P	arance bound	. [3 lary: <u>NO</u>		
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings	CAs, marked up to show real CAs, marked up to show real as: ted: Barricade Permit Required: Score Permit Required:	oster P commended cles	arance bound	. [3 lary: <u>NO</u>		
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings	CAs, marked up to show real CAs, marked up to show real ted: Barricade Permit Required: Scaffold Permit Required:	oster P commended cles	ビーアン arance bound 図 No 図 No	. [3 lary: <u>NO</u>		
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings	CAs, marked up to show red as: ted: Barricade Permit Required: Scaffold Permit Required:	oster P commended cles	arance bound	. [3 ary: <u>NO</u>		
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings	CAs, marked up to show real CAs, marked up to show real ted: Barricade Permit Required: Scaffold Permit Required:	oster P commended cles	arance bound	. [3 lary: <u>NO</u>		
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review:	CAs, marked up to show red as: ted: Barricade Permit Required: Scaffold Permit Required:	oster P commended cles 2 Yes 2 Yes	arance bound	. [3 lary: <u>NO</u>		
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review:	CAs, marked up to show real OCAs, marked up to show real as: ted: Barricade Permit Required: Scaffold Permit Required: Signature	commended cles	arance bound	. [3 ary: <u>NO</u>	Date	
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review:	CAs, marked up to show real CAs, marked up to show real ted: Barricade Permit Required: Scaffold Permit Required: Signature ral for GSA or Grounding Pla	an (ff required):	arance bound	. [3 lary: <u>NO</u>	Date	
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review: Management approv	CAs, marked up to show red as: ted: Barricade Permit Required: Scaffold Permit Required: Signature ral for GSA or Grounding Pla NA	an (if required):	arance bound	. [3 lary: <u>NO</u>	Date	
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review: Management approv	CAs, marked up to show real CAs, marked up to show real its: ted: Barricade Permit Required: Scaffold Permit Required: Signature ral for GSA or Grounding Plan NA Signature	an (if required):	Arance bound	. [3 ary: <u>NO</u>	Date	
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review: Management approv	Clearance Number Issued:	ster (frequired):	arance bound	Assigned by:	Date Date Date Date	
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review: Management approv	CAs, marked up to show real Activity (GSA) Required: Signature Clearance Number Issued: Activity (GSA) Required:	an (if required):	Arance bound	. [3] lary:NO Assigned by: 	Date Date Date Date	
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review: Management approv	CAs, marked up to show real Signature Signature A for GSA or Grounding Plan NA Signature Clearance Number Issued: Activity (GSA) Required: ce Temporary Lift Required:	an (if required):	arance bound	Assigned by: No No	Date Date Date Date	
For Con Attached drawings/D Potential adverse affec Other systems affec Reference drawings Operations Review: Management approv Generating Sensitive Clearan Other clearances requ	CAs, marked up to show real Activity (GSA) Required: Signature Clearance Number Issued: Activity (GSA) Required: Clearance Number Issued: Activity (GSA) Required: ce Temporary Lift Required: the beld for this work:	an (if required):		Assigned by: No No	Date Date Date Date	

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Appendix B (Page 7 of 11)

Completing Clearance

Tennessee Valley Authority

Clearance Coversheet

Clearance Sheet	Clearance No. (1)	Page	of(2)							
Component To Be Worked: (3) C DUDG-SANG	Bourer Pupp 28 Plant:	(4) BEN U	2							
Requested By: (5)										
Ground Discs Issued? (6)		🗆 Yes								
Remarks: (7)										
Drain and repair take	leaks in Cond	nsofe								
Booster Pump 2B Lube (D.I Cooler.									
MAINTENANCE Narily bo	inderies prion	to wo	k							
1										
Placement Instructions: (8)										
Prior to placing clearance	e, operations.	ver ly	28							
CONDENSATE BODSTA ren	noved from S	vervice	- IAW							
2-01-1										
NA										
Release Instructions: (10)										
		·								
Prepared By: (11)	Date);	Time:							
Placement Review: (12)	Date	:	Time:							
Placement Approved: (13)	Date):	Time:							
Issued Status: (14)	Date):	Time:							
Release Modified: (15)	Date):	Time:							
Release Reviewed & Approved: (16)	Date):	Time:							
Released: (17)	Date	≥:	Time:							

OPERATOR:	
RO	DATE:
JPM NUMBER:	RO A2
TASK NUMBER:	S-000-AD-55
TASK TITLE:	Condensate Booster Pump 3B Isolation Boundary
K/A NUMBER: 2.2.4	41 K/A RATING: RO 3.5
TASK STANDARD	: Determine the clearance boundary for Condensate Booster Pump 3B
LOCATION OF PER	RFORMANCE: Class Room / Unit 3 Simulator
REFERENCES/PRC	CEDURES NEEDED:
VALIDATION TIM	E: 30 minutes
PERFORMANCE T	IME:
COMMENTS:	
Additional comment	sheets attached? YES NO
RESULTS: SATI	SFACTORY UNSATISFACTORY
SIGNATURE:	DATE: EXAMINER

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INITIAL CONDITIONS: Condensate Booster Pump 3B has a failed lube oil cooler (tube leaks).

Given:

- NPG Request for Clearance
- Page one of Completing Clearance

INITIATING CUE: The Unit Supervisor directs you as a Reactor Operator to write a clearance to drain and allow the repair work on Condensate Booster Pump 3B lube oil cooler.

ESOMs is not currently working, use the completing clearance form in Appendix B (page 8 of 11). On Appendix B (page 8 of 11) complete columns 18, 20, 21, and 22 for each identified component.

Class Room

INITIAL CONDITIONS: Condensate Booster Pump 3B has a failed lube oil cooler (tube leaks).

Given:

- NPG Request for Clearance
- Page one of Completing Clearance

INITIATING CUE: The Unit Supervisor directs you as a Reactor Operator to write a clearance to drain and allow the repair work on Condensate Booster Pump 3B lube oil cooler.

ESOMs is not currently working, use the completing clearance form in Appendix B (page 8 of 11). On Appendix B (page 8 of 11) complete columns 18, 20, 21, and 22 for each identified component.

START TIME

Review prints to determine required isolation boundary: 3-45E721, 0-45E763-3, 3-47E804-1, 3-47E610-2-1B, 3-45E753-3, and 3-47E844-1

Standard:

Locates and reviews prints for 3B Condensate Booster Pump lube oil cooler

SAT__UNSAT__N/A __COMMENTS:_____

Performance Step 2:

Critical X Not Critical

Determines Isolation boundary

Standard:

3B Condensate Booster Pump Handswitch 3-HS-002-0062A, Danger Tag, Stop, and place sequence is either ONE or TWO.

SAT__UNSAT__N/A __COMMENTS:_____

Performance Step 3:

Critical X Not Critical

Determines Isolation boundary

Standard:

3B 4KV Unit BD Compartment 8, 3B Condensate Booster Pump Power Supply, Danger Tag, Racked Out, and place sequence is ONE or TWO. No other components shall be identified before breaker except for Condensate Booster Pump Handswitch.

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 4:

Critical \underline{X} Not Critical

Determines Isolation boundary

Standard:

3-SHV-024-0631B RCW to Condensate Booster Pump 3B **and** 3-SHV-024-0632B RCW from Condensate Booster Pump 3B, Danger Tags, Closed, and place sequence is after Condensate Booster Pump Breaker.

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 5:

Critical \underline{X} Not Critical

Determines Isolation boundary

Standard:

3B 480V TMOV BD Compartment 11E, Condensate Booster Pump 3B Auxiliary Oil Pump Power Supply, Danger Tag, Off, and place sequence is after Condensate Booster Pump Breaker.

SAT___UNSAT___N/A ___COMMENTS:_____

Performance Step 6:

Critical X Not Critical

Determines Isolation boundary

Standard:

3B Auxiliary Oil Pump Handswitch 3-HS-002-0140, Danger Tag, Stop, and place sequence is after Condensate Booster Pump Breaker.

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 7:

Critical \underline{X} Not Critical

Determines Isolation boundary

Standard:

3-DRV-024-674B RCW to Condensate Booster Pump 3B Drain, Danger Tag OR NO Tag, Open, and place sequence is LAST.

SAT__ UNSAT__ N/A __COMMENTS:_____

END OF TASK

STOP TIME ____

X ANSWER KEYUNIT 3 XNPG Standard
Programs and
ProcessesClearance Procedure to Safely Control
EnergyNPG-SPP-10.2
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Completing Clearance

Tennessee Valley Authority

Clearance Tag List and Operational Steps

Clearance Sheet	earance Sheet						Clearance No. (1)					Page of (2)		
Apparatus: (3)														
Equipment ID Equipment Description Equipment Location	Tag Serial No.	Tag Type	Place. Seq.	Place. Config.	Place. 1st Verifier	Place. 2nd Verifier	Rest. Seq.	Rostore Config.	As left Config.	Restore 1st Verifier	Restore 2nd Verifier	Tag Notes		
(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)		
3- HS- 2- 4062A, CBP3B V3 CR24-6	-	DANGER	1	Tap										
Campr 3-BKR-2-0062, 3B4KVUB B	-	OANLER	lor Z	RACES							ļ			
3-544-6318, RGWTO	بد	Druker	3	C)osect										
3-54-24-632B, RCW FROM		DANCER	3	Closed										
3-H5-2-140, 3B ANO.1	-	0.410	3	STOP				+						
PUMP HAINOSWITCH		MATEL												
1	1	1			1			1		1	1	L		

Appendix B (Page 8 of 11)

Completing Clearance

Tennessee Valley Authority

Clearance Tag List and Operational Steps

Clearance Sheet	earance Sheet							Clearance No. (1)					(2)
Apparatus: (3)													
Equipment ID Equipment Description Equipment Location	Tag Serial No.	Tag Type	Place. Seq.	Place. Config.	Place. 1st Verifier	Place. 2nd Verifier	Rost. Søq.	Restore Config.	As left Config.	Restoro 1st Verifier	Restore 2nd Verifier		Tag Notos
(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	
3-B2R-2-140,38 4800 TMONBD SOMET 11E	-	DANGE A	3	0FF									
3-DRV-24-6743, RCW TO CBP 38 DRAIN	- 43	NO TAG DAVIER	4	OPEN									
	+								<u> </u>				
				1									
							1						
						+	1	1					
		+											

NPG Standard Programs and Processes	Clearance Procedure Energ	to Safely Control	NPG-SPP-10.2 Rev. 0005 Page 41 of 80							
	Ar (Pa	opendix A age 3 of 3)								
	NPG Requ	lest for Clearance								
	NPG Req	uest for Clearance								
Requester D Date an Equipment can be Time	Date of Request: 's name and phone number: hate and time work to begin: d time work to be complete: Duration: returned to service in emergency: required to return to service:	DAY NTENDES SISS R TWEEL Yes No Gi	Work Order No.: NAC E ~ A ~ Requester's Org.: Outage Work: Outage Work: Yes Planned Outage: Yes Forced Outage: Yes Outage Required: Yes Yes No							
Equipment/System to be cleared:	CONDENSATE B	DAVSTER Pump	36							
Detailed descriptions Drain and for Cond	Detailed description/scope of work to be performed: Drain and repair tabeliaks on the Labe all Cooler for Condensate Bouster Pump 3B.									
Attached drawings/D	CAs, marked up to show recomm	ended clearance boundary:	<u> </u>							
Potential adverse affect Other systems affect Reference drawings:	s:									
	Barricade Permit Required:	Yes 🖌 No Yes 🗭 No	na na mana ang kana na mang kana							
Operations Review:										
	Signature		Date							
Management approv	al for GSA or Grounding Plan (if r	equired):								
	NA		line .							
	Signature		Date:							
Generating Sensitive A Clearance	Clearance Number Issued: Activity (GSA) Required: e Temporary Lift Required:	Yes Assignment of the second s	med by: No No							
Other clearances roma	red to be held for this work:									
Other cremanous requ										

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Appendix B (Page 7 of 11)

Completing Clearance

Tennessee Valley Authority

Clearance Coversheet

Clearance Sheet	Clearance No. (1)	Page	of(2)							
Component To Be Worked: (3) Cubiac and B	Nasces Pime 30 Plant	: (4) BEN 1	INIT 3							
Requested By: (5) O ANTE NAME C										
Ground Discs Issued? (6)		🗆 Yes								
Remarks: (7)										
Drain and repair tube leaks	in Condensate	Booster	Rmp							
3B Lube O.I Cooler.	3B Lubroll Cooler.									
MAINTENANCE VERING BOUNDORIES prion to work.										
Placement Instructions: (8)	<u>{</u>	<u> </u>								
Prior to placing clearance	operations ver	ity JBC	on dens Atte							
Boostar Pump removed from	- service IA	ت 3-02	-2							
Caution Tag Information: (9)										
NA										
Release instructions: (10)										
NONE										
Prepared By: (11)	Da	ate:	Time:							
Placement Review: (12)	Da	ate:	Time:							
Placement Approved: (13)	Da	ate:	Time:							
Issued Status: (14)	D	ate:	Time:							
Release Modified: (15)	D	ate:	Time:							
Release Reviewed & Approved: (16)	D	ate:	Time:							
Released: (17)	D	ate:	Time:							

OPERATOR:	

RO ____ DATE:_____

JPM NUMBER: Admin RO A1b

TASK NUMBER: Conduct of Operations

TASK TITLE: 2-SR-2

K/A NUMBER: 2.1.18 K/A RATING: RO 3.6 SRO 3.8

PRA: N/A

TASK STANDARD: Perform Operator logs in accordance with 2-SR-2 Instrument Checks and Observations for log tables 4.1 through 4.7. Verify acceptance criteria are satisfied in accordance with notes.

LOCATION OF PERFORMANCE: Unit 2 Simulator

REFERENCES/PROCEDURES NEEDED: 2-SR-2

VALIDATION TIME: 20 minutes

PERFORMANCE TIME:

COMMENTS:

Additional	comment	sheets	attached?	YES	NO	

RESULTS:	SATISFACTORY	UNSATISFACTORY	

SIGNATURE:		DATE:	
	EXAMINER		

INITIAL CONDITIONS: You are a Unit Operator assigned to Unit 2, and it is Friday evening at 2000. 2-SR-2, Instrument Checks and Observations, is being performed.

The plant is in MODE 5.

- Vessel Head is removed
- Reactor Water Level is greater than 22 feet above the RPV Flange
- Refuel gates are removed
- Core Alterations are scheduled to start Saturday evening
- NO Tech Spec Special Operations are in progress
- Signal to Noise Ratio 2-SR-3.3.1.2.4, was last performed on dayshift Friday at 0800.

INITIATING CUE: The Unit Supervisor directs you as the Unit Operator to complete a portion of 2-SR-2 night shift checks and observations Attachment 3 Surveillance Procedure Data Package Mode 4 and 5 (pages 18 of 36 to 26 of 36) for Friday at 2000.

All readings that are already completed are correct and need not be checked by you.

Simulator

INITIAL CONDITIONS: You are a Unit Operator assigned to Unit 2, and it is Friday evening at 2000. 2-SR-2, Instrument Checks and Observations, is being performed.

The plant is in MODE 5.

- Vessel Head is removed
- Reactor Water Level is greater than 22 feet above the RPV Flange
- Refuel gates are removed
- Core Alterations are scheduled to start Saturday evening
- NO Tech Spec Special Operations are in progress
- Signal to Noise Ratio 2-SR-3.3.1.2.4, was last performed on dayshift Friday at 0800.

INITIATING CUE: The Unit Supervisor directs you as the Unit Operator to complete a portion of 2-SR-2 night shift checks and observations Attachment 3 Surveillance Procedure Data Package Mode 4 and 5 (pages 18 of 36 to 26 of 36) for Friday at 2000.

All readings that are already completed are correct and need not be checked by you.

START TIME____

JPM RO A1b

Refers to 2-SR-2, Instrument Checks and Observations, table 4.1

TABLE 4.1	IRM INS	TRUMENTATIO	UMENTATION					WEEK: to					
APPLICABILITY:		Mode 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies. OR Mode 4 when in Special Operations LCO 3.10.4											
Surveillance Requ	irements:	3.3.1.1.1 (f1.a)					····		**********				
LOCATION:		Panel 2-9-5								Revie	w Initials		
				IRM F (ENTER 1 T (No	RANGE HROUGH 10) hte 1)				MAX DEV				
	A	С	E	G	В	D	F	н	(Note 2) (AC)	uo	Unit Supvr		
Friday											1		
Saturday								Τ	1		1		
Sunday							[1	1				
Monday								1	2 Ranges with conditions of				
Tuesday			1					1	Note 1 satisfied				
Wednesday			Γ					1	1		1		
Thursday								1	1				

(1) IRM's must be full in and onscale (i.e., $25 \le IRM$ value ≤ 75) excluding downscale (i.e., IRM value ≤ 25) on range 1.

(2) During operation under SPECIAL OPERATIONS LCO 3.10.5, "Single CRD Removal - Refueling," MAX DEV acceptance criteria is not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.5).

Standard:

Record a 1 under each IRM. Initials under UO. NA is also acceptable since the applicability is NOT met.

SAT	UNSAT	` N/A	COMMENTS:
-----	-------	-------	-----------

JPM RO A1b

Performance Step 2:

Critical \underline{X} Not Critical

Refers to 2-SR-2, Instrument Checks and Observations, table 4.2

TABLE 4.2	SRM	INSTRU	IMENTA'	TION			1	IIGHT SH	IIFT	WEEK: _		10		
APPLICABILITY	<i>t</i> :	Mox Cot	de 4 & 5 Int Rate	will be rea	corded at	all times								
Surveillance Re	quirement	s: 3.3.	1.2.1, 3.	3.1.2.2, 3	.3.1.2.3, 3	3.3.1.2.4, 3.3.1.2.5	&6			T	SRs: 3	34183353		
LOCATION:		Pan	el 2-9-5										Revie	w Initials
	S	RM Cour	nt Rate (i	cps) Note	1	LIMITS (AC)	MAX (AC)	SRM	System R 2-SR-3 SAT / INC	Signal to atio 3.3, 1.2.4)P (Note	Noise	All Data SAT/ UNSAT		
Eriday	2000	A	<u> </u>	<u> </u>	U	Note 2	Note 3	A	<u> </u>	В	D	(Note 5)	UO	Unit Supyr
Saturday	2000		<u> </u>	1				<u> </u>		<u> </u>	<u> </u>		······	
Sunday	2000			1		OPERABLE	OPERABLE	<u> </u>	<u> </u>	<u> </u>			·	
Monday	2000			1		SRMs count	SRMs count	[1		<u> </u>			
Tuesday	2000			1	1	rate must be	rate must be $< 15^{\circ}$ cms	<u> </u>	f	1	<u> </u>			1
Wednesday	2000					≥ 5 cps	s (e ups	<u> </u>	1	1	1			1
Thursday	2000								1	1	1			1

(1) Count Rate should be recorded with SRM's fully inserted.

(2) LIMITS are not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant.

- (3) IRM/SRM overlap should occur before SRMs > 1 E5 cps (should occur between 1 E4 cps & 1 E5 cps). Unexpected deviations from this relationship and excessive noise spikes shall be investigated.
- (4) Signal to Noise Ratio is required to be determined by performing 2-SR-3.3.1.2.4 as follows: (SRM's will become INOP after the SR's specified Frequency has been exceeded.)

• SAT A. MODE 4 • Every 24 Hours. (This may be N/A'ed if the SR was performed SAT on the previous shift.) • Prior to going to Mode 2 or 3 from Mode 4.

- B. MODE 5 "DURING Core Alterations" Every 12 Hours.
 - Every 24 Hours (This may be N/A'ed if the SR was performed SAT on the previous shift and no Core Alterations in progress and not expected to be performed in the next 12 hours.)
 - Prior to going to Mode 2 or 3 from Mode 5

• INOP An SRM fails its Signal to Noise Ratio section of 2-SR-3.3.1.2.4.

(5) The All Data UNSAT column is UNSAT, if one or more SRM's are inoperable. Refer to Tech Spec 3.3.1.2.

Standard:

Records less than 3 cps for SRM A and an UNSAT in the all data column due to SRM A being INOPERABLE. Records a count rate for SRM B, C and D of between 150 and 300 cps. Initials under UO. Records NA or a SAT in signal to noise ratio column for SRMs B, C, and D.

```
SAT___UNSAT____N/A ____COMMENTS:______
```

CUE: Acknowledge communication that SRM A in Inoperable. Continue with 2-SR-2

Refers to 2-SR-2, Instrument Checks and Observations, table 4.3

TABLE 4.3	REACTOR WATER LEVI (COMPENSATED)	EL INSTRUMENTATION - I	NARROW RANGE NIG	HT SHIFT WEEK:	to)					
APPLICABILITY:	Reactor Water Level in Narrow Instrument Range										
Criteria Source:	FSAR 7.10.4										
LOCATION:	Panel 2-9-5		· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	Revie	w Initials				
Reference Leg	A	B	С	D			T				
	2-LI-3-53 (in.)	2-L1-3-60 (in.)	2-LI-3-206 (in_)	2-L1-3-253 (in.)	MAX DEV	uo	Unit Supvr				
Friday							-				
Saturday					1						
Sunday											
Monday					3.0 inches						
Tuesday					-						
Wednesday											
Thursday											

(1) Refer to Attachment 4 during off-normal operating conditions.

Standard:

Records the level reading from the above instruments, records 69 to 71 inches for each indicator. Initials under UO.

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 4:

Critical \underline{X} Not Critical

Refers to 2-SR-2, Instrument Checks and Observations, table 4.4.a

TABLE 4.4.a	cc	NTROL RODS	NIGHT S	HIFT	WEEK:	to				
APPLICABILIT	Υ:	Mode 5 OR Mode 4 wh	en in Special Operations LCO 3.10.4							
Surveillance R	Surveillance Requirements: 3.9.3.1, 3.9.5.2, (Reference 3.9.4.1)									
LOCATION:		Panel 2-9-5 Full Core D ICS Control Rod Positio	isplay And/Or Four Rod Display with Applicable Co in Indication, Local HCU Accumulator Pressure Ind	ntrol Ro cators (d Selected and/o Reactor Building	r Elevation 565)	Review	Initials		
		COL A	COL B							
		Verify Control Rod Positions ALL RODS FULL-IN/	Verify HCU Scram Accumulator Pressure ≥ 940 psig and Position Indication has no full-in indication (no Green LEDs) for each withdrawn Control Rod. (Notes 1, 2, 3)		LIM	ITS		Unit		
	TIME	ROD WITHDRAWN	SAT / UNSAT / N/A		(A	C)	UO	Supvr		
Friday	2000				de Full-lo when k	ading Eucl Assemblies				
Saturday	2000			701100	into the Co	re (Note 4)				
Sunday	2000				and and 00	ad				
Monday	2000			HCU	Scram Accumulat	for Pressure \geq 940 psig				
Tuesday	2000				ar	nd				
Wednesday	2000			No	full-in indication	(no Green LEDs) for				
Thursday	2000			e	ach withdrawn Co	ontrol Rod (Note 2)				

- (1) Technical Specification LCO 3.9.5 requires a Control Rod to be OPERABLE (e.g., accumulator ≥ 940 psig) before withdrawal in Mode 5. Technical Specification SR 3.9.4.1 requires verification of the absence of full-in indication (no Green LEDs) each time a Control Rod is withdrawn from the full-in position in Mode 5. To reinforce the awareness of these requirements and provide additional verification of operability, currently this surveillance requires verification of accumulator pressure and absence of full-in indication of each withdrawn Control Rod every 12 hours. This surveillance satisfies the periodic verification of SR 3.9.5.2 (Technical Specification frequency for SR 3.9.5.2 is every 7 days). This surveillance does not satisfy SR 3.9.4.1.
- (2) Column B should be marked "N/A" when "All Rods Full-In" and during operation under SPECIAL OPERATIONS LCO 3.10.5, "Single CRD Removal - Refueling," or LCO 3.10.6, "Multiple Control Rod Withdrawal - Refueling." During operation under these SPECIAL OPERATIONS LCOs the LIMITS for Column B are not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.5 or LCO 3.10.6 as applicable).
- (3) Verification of HCU Scram Accumulator pressure shall include observation of Local HCU Accumulator Pressure Indicator.
- (4) When operating under SPECIAL OPERATIONS LCO 3.10.6, the LIMIT "All Rods Full-In when loading Fuel Assemblies into the Core" is not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.6).

Standard:

Column A - Records ALL RODS FULL IN and for Column – B records NA. Initials under UO.

SAT__UNSAT___N/A ___COMMENTS:_____

NOTE: Table 4.4.b is NA

Refers to 2-SR-2, Instrument Checks and Observations, table 4.5

TABLE 4.5	REA	CTOR MODE SWITCH - REFUEL POSITION NIGHT	r shift	WEEK:	to		
APPLICABILITY	<i>':</i>	Mode 5 with the Reactor Mode Switch in the Refuel Position and any Co	ntrol Rod	withdrawn OR Mode 4 whe	n in Special	Operations L	CO 3.10.4
Surveillance Re	quirement	is: 3.9.2.1					
LOCATION:		Panel 2-9-5				Revie	w Initials
	TIME	Reactor Mode Switch 2-HS-99-5A-S1 Locked in Refuel Position SAT / UNSAT / N/A		LIMITS (AC)		υo	Unit Supvr
Friday	2000						
Saturday	2000						
Sunday	2000		1				
Monday	2000		Rea	ctor Mode Switch Veniled L Refuel Position	ocked in		1
Tuesday	2000			SAI			
Wednesday	2000		7				1
Thursday	2000		7				
Thursday	2000						

Standard:

Records NA. Initials under UO. SAT is also acceptable since the Mode Switch is Locked in the Refuel position.

SAT___UNSAT___N/A ___COMMENTS:_____
Performance Step 6:

Critical \underline{X} Not Critical

Refers to 2-SR-2, Instrument Checks and Observations, table 4.6

TABLE 4.6	REACTOR	COOLANT CONDUCTIVITY	NIGHT SHIFT WEEK: to to						
APPLICABILITY:	Modes 4 &	5							
Criteria Source:	Technical R	equirements Manual TSR-3.4.1.1							
LOCATION:	Panel 2-9-4	Panel 2-9-4							
	TIME	2-CR-43-11A/12A Ch 1 (μmho) (Note 1)	MAX (AC)	uo	Unit Supvr				
	2000				T				
Fnday	0200								
Coturday	2000		1						
Saturday	0200]		1				
Sunday	2000				1				
Sunday	0200		Prior to startup and at steaming rates < 100,000 lb/hr:		1				
Monday	2000		2.0 μmho		I				
Manaay	0200		Reactor not Pressurized With Fuel In Reactor Vessel, Except		T				
Tuesday	2000		Less than or equal to 10.0 µmho		1				
Tuesday	0200				T				
Modporday	2000			1					
Wednesday 0200		1							
Thursday	2000			[
mursday	0200			[T				

(1) Whenever there is fuel in the reactor vessel and the continuous conductivity monitor is inoperable, periodic analysis of reactor coolant samples are required by the Technical Requirements Manual. If the reactor coolant continuous conductivity monitor becomes inoperable, notify the Chemistry to sample according to 2-SI-4.6.B.1-4.

Standard:

Records Reactor Coolant Conductivity reading of between 3 and 5 µmho. Initials under UO.

SAT__UNSAT___N/A ___COMMENTS:_____

Performance Step 7:

Critical \underline{X} Not Critical

Refers to 2-SR-2, Instrument Checks and Observations, table 4.7 part 1

TABLE 4.7 part 1	RHR SHUTDO	WN COOLING S	UBSYSTEM AND	RECIRCULATION I	PUMP N	IGHT SHIFT	WEEK:		to	
APPLICABILITY:	Mo	des 4 & 5 (Notes	1, 2)							
Surveillance Requ	irements: 3.4	.8.1, 3.9.7.1, and	3.9.8.1							
LOCATION:		Panel 2-9-4 Panel 2-9-3				2-9-3		REQUIREMENTS	Review Initials	
		Recirc P (Not	'ump I/S e 3)	RHR Shutdown Cooling Subsystem I/S (Note 3)			S	(Note 1) Initials		
DAY	TIME	A	8	A	B	С	D	(AC)	uo	Unit Supvr
Friday	2000									1
Saturday	2000									1
Sunday	2000									1
Monday	2000									1
Tuesday	2000									1
Wednesday	2000									1
Thursday	2000									1

The following notes for RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION are from the previous page:

- (1) Initials signify that the requirements listed below, for the unit conditions are met.
 - A. In mode 4, LCO 3.4.8 requires two RHR Shutdown Cooling Subsystems be operable, and with NO Recirc pump in operation, at least One RHR Shutdown Cooling Subsystem SHALL be in operation. SR-3.4.8.1 requires verifying one required RHR Shutdown Cooling Subsystem OR Recirc pump is operating.
 - B. In mode 5, with water level ≥ 22 feet above the top of the RPV flange, LCO 3.9.7 requires One RHR Shutdown Cooling Subsystem to be operable and in operation. SR-3.9.7.1 requires verifying one RHR Shutdown Cooling Subsystem is operating.
 - C. In mode 5, with water level < 22 feet above the top of the RPV flange, LCO 3.9.8 requires two RHR Shutdown Cooling Subsystems to be operable and One RHR Shutdown Cooling Subsystem in operation. SR-3.9.8.1 requires verifying one RHR Shutdown Cooling Subsystem is operating.
 - D. In the event the requirements stated above cannot be met, verify the appropriate LCO Action Statement is entered and documented by recording hourly Reactor Coolant Temperature And Pressure in the narrative log.
- (2) During operation in MODE 4 under SPECIAL OPERATIONS LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," the requirements of LCO 3.4.8 are suspended.
- (3) Place an "X" in the column of the pumps that are in service. To be considered as In Service, the RHR System and its associated Shutdown Cooling Subsystems must be in the Shutdown Cooling Mode alignment with RHR SD CLG FLOW LOW annunciator (2-XA-55-3D, Window 11) is reset.

Standard:

Determines that running RHR Pump is NOT considered in service due to RHR SD CLG FLOW LOW alarm in and flow less than 3700 gpm. Does NOT initial under Requirements (note 1). Initials under UO.

SAT__ UNSAT__ N/A ___COMMENTS:_____

CUE: Acknowledge communication that acceptance criteria is NOT met due to Low Flow on Shutdown Cooling. Continue with 2-SR-2

Performance Step 8:

Critical Not Critical \underline{X}

Refers to 2-SR-2, Instrument Checks and Observations, table 4.7 part 2

LOCATION:		[Panel 2-9-4	7; 2-TR-56-4			Panel	2-9-5		
		COL	A	CO	LB	COL C				
		Rx Dr to RWCU 2-TE-56-9 <u>Qr</u> Rx Bottom Head 2-TE-56-29		FW Nozzle Temp 2-TE-56-13 2-TE-56-14 2-TE-56-15 2-TE-56-16		(COL A-COL B)	Rx Pressure (psig) 2-PI-3-54 <u>or</u> 2-PI-3-61			
		(Notes	4 & 5)	(No	te 4)	(Note 6)	(Notes	486)	Reviet	w Initials
DAY	TIME	Instrument used	۰F	Instrument used	۴F		Instrument used	PSIG	υo	Unit Supyr
Friday	2000									1
Saturday	2000						1			1
Sunday	2000						T			1
Monday	2000									
Tuesday	2000									T
Wednesday	2000									
Thursday	2000									

The following notes for RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION are from the previous page:

- (4) [NRC/C] These parameters provide monitoring to assist in the determination of Reactor Vessel water temperature stratification. [IE Circular 81-11] Only one indication for the parameters are required to be recorded. Record the Indicator used and the reading obtained in the appropriate columns.
- (5) [NER/C] For thermal stratification monitoring, Reactor Drain to RWCU temperature indication is preferred when there is flow in the line. [GE SIL 251 and 430]
- (6) Differential temperatures (COL A COL B) of 50°F or greater or Reactor pressure greater than atmospheric pressure when reactor coolant temperature indications are less than 212°F indicate potential inadequate mixing and stratification of the water in the RPV. Note that Reactor pressure indications may read slightly positive due to instrument inaccuracies; however, any unexpected upward trend in pressure should be addressed. Reactor Pressure indication should be N/A'd when head is removed. With RCS temperature ≤ 100°F in Mode 4, 2-SR-3.4.9.5-7 must be initiated to monitor reactor vessel flange and head flange temperatures.

Standard:

In Column C records differential temperature of 9.2 °F. Initials under UO. Reactor Pressure reading with head removed should record NA, may record 0 psig.

SAT	UNSAT	N/A	COMMENTS:

Examiner NOTE: Examiners gather applicant SR-2 package and keep for review

END OF TASK

STOP TIME ____

* ANSWER KEY *

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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.1	IRM INST	RUMENTATION	I			NIGHT	SHIFT W	/EEK: <u>ToC</u>	187to		
APPLICABILITY:		Mode 5 with any OR Mode 4 when in	control rod w Special Oper	ithdrawn from ations LCO 3.1	a core cell con 0.4	taining one or	more fuel ass	semblies.			
Supeillance Reg	irements:	3.3.1.1.1 (f1.a)									
	Panel 2-9-5									Reviev	/ Initials
	IRM RANGE (ENTER 1 THROUGH 10) (Note 1)								MAX DEV (Note 2)		
	A	С	E	G	В	D	F	н	(AC)	UO	Unit Supvr
Friday	1	1	١	۱	7	1	1	1		OP	
Saturday								_			
Sunday									2 Ranges with		
Monday									conditions of		
Tuesday					1				NOLE & SAUSILEU		
Tuesday		-							1		
Wednesday									1		
Thursday						<u> </u>			l	J	1

(1) IRM's must be full in and onscale (i.e., 25 ≤ IRM value ≤ 75) excluding downscale (i.e., IRM value < 25) on range 1.

(2) During operation under SPECIAL OPERATIONS LCO 3.10.5, "Single CRD Removal - Refueling," MAX DEV acceptance criteria is not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.5).

* ANSWER KEY X

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Surveillance Procedure Data Package - Modes 4 & 5

TARIE 4 2	SRM	INSTRU	JMENTAT					NIGHT SH	IFT Y	NEEK:	Toc	$\Delta \gamma_{to}$		
APPLICABILITY	:	Mo	de 4 & 5											
		Cou	unt Rate v	vill be rec	orded at	all times.	86			TS	SRs: 3.	3.4.1 & 3.3.5.3		
Surveillance Rec	quirement	<u>s: 3.3</u>	<u>.1.2.1, 3.3</u>	3.1.2.2, 3.	3.1.2.3, 3	.3. 1.2.4, 3.3. 1.2.3						ſ	Revie	w Initials
LOCATION:	r	Par	nel 2-9-5					SRM	System S	Signal to	Noise			T
	s	RM Cou	nt Rate (o	ps) Note	1	LIMITS (AC)	MAX (AC)	S	Ra 2-SR-3 AT / INO	tio .3.1.2.4 P (Note 4	4)	Ali Data SAT/ UNSAT		
	TIME	A	С	В	D	Note 2	Note 3	A	C	В	D	(Note 5)	0	
Friday	2000	ł	150-300	10-300	150-300			NA	NA	NA	NA	JNSAT		+
Saturday	2000													
Sunday	2000					SRMs count	SRMs count				<u> </u>			-
Monday	2000					rate must be	rate must be							
Tuesday	2000					≥ 3 cps	< 1 E ⁶ cps							1
Wednesday	2000				<u> </u>									
Thursday	2000									L	J			

Count Rate should be recorded with SRM's fully inserted. (1)

LIMITS are not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. (2)

IRM/SRM overlap should occur before SRMs > 1 E5 cps (should occur between 1 E⁴ cps & 1 E⁵ cps). Unexpected deviations from this relationship and excessive noise (3) spikes shall be investigated.

Signal to Noise Ratio is required to be determined by performing 2-SR-3.3.1.2.4 as follows: (SRM's will become INOP after the SR's specified Frequency has been (4) exceeded.)

- Every 24 Hours. (This may be N/A'ed if the SR was performed SAT on the previous shift.) A. MODE 4
 - Prior to going to Mode 2 or 3 from Mode 4. •

B. MODE 5

• SAT

- "DURING Core Alterations" Every 12 Hours. • Every 24 Hours (This may be N/A'ed if the SR was performed SAT on the previous shift and no Core Alterations in progress and not • expected to be performed in the next 12 hours.)
- Prior to going to Mode 2 or 3 from Mode 5. •
- An SRM fails its Signal to Noise Ratio section of 2-SR-3.3.1.2.4.

INOP • The All Data UNSAT column is UNSAT, if one or more SRM's are inoperable. Refer to Tech Spec 3.3.1.2. (5)

Attachment 3

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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.3	REACTOR WATER LEV (COMPENSATED)	EL INSTRUMENTATION - N	NARROW RANGE NIG	HT SHIFT WEEK:	TODAY 10		
APPLICABILITY:	Reactor Water Level in N	larrow Instrument Range					
Criteria Source:	FSAR 7.10.4						
LOCATION:	Panel 2-9-5					Review	v Initials
Reference Leg	A	В	с	D			
	2-LI-3-53 (in.)	2-LI-3-60 (in.)	2-Ll-3-206 (in.)	2-Ll-3-253 (in.)	MAX DEV	UO	Unit Supvr
Friday	(9-7)	69-71	69-71	69-71		90	
Saturday							
Sunday							
Monday					3.0 inches		
Tuesday]		
Madaaaday					1		
vvednesday					1		
Thursday						1	

(1) Refer to Attachment 4 during off-normal operating conditions.

* ANSWER KEY *

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Surveillance Procedure Data Package - Modes 4 & 5

	~~~		NIGHT S	HIFT	WEEK:	<u>&gt;DAY0_</u>				
TABLE 4.4.a	<u>.</u>	Mode 5 OR Mode 4 who	en in Special Operations LCO 3.10.4							
APPLICABILIT	Arrelicability and a second se									
Surveillance Re	squirerne	Banel 2-9-5 Full Core D	isplay And/Or Four Rod Display with Applicable Co	ontrol Roo	d Selected and/	or	Review Initials			
LOCATION:		ICS Control Rod Positio	n Indication, Local HCU Accumulator Pressure Indi	icators (F	Reactor Building	Elevation 565)				
		COL A	COL B							
		Verify Control Rod	Verify HCU Scram Accumulator Pressure							
		Positions	≥ 940 psig and Position Indication has no full-in							
			indication (no Green LEDs) for each withdrawn	1				Linit		
		ALL RODS FULL-IN/	Control Rod. (Notes 1, 2, 3)			MITS AC)	110	Supyr		
	TIME	ROD WITHDRAWN	SAT / UNSAT / N/A	<b> </b>		R0)	7-4			
Friday	2000	All ROOS FUIL-IN	NA	All Ro	All Rods Full-In when loading Fuel Assemblies into the Core (Note 4) <u>and</u> HCU Scram Accumulator Pressure ≥ 940 psig and					
Saturday	2000									
Sunday	2000									
Monday	2000									
Tuesday	2000			No full-in indication (no Green LEDs) for						
Wednesday	2000			each withdrawn Control Rod (Note 2)						
Thursday	2000							<u>.</u>		
TABLE 4.4.b	ML	JLTIPLE CONTROL ROD WIT	HDRAWAL - REFUELING							
APPLICABILIT	Y:	Mode 5 when operating	under SPECIAL OPERATIONS LCO 3.10.6				Deview	Initiala		
Surveillance R	equireme	ents: 3.10.6.1, 3.10.6.2, 3.10	.6.3				Neview	/ It luais		
		Multiple	Control Rod Withdrawal - Refueling 2-SR-3.10.6			SR Performed	UO	Supvr		
Eriday										
Finday										
Saturday										
Sunday		When ope	erating under SPECIAL OPERATIONS LCO 3.10.6,	,						
Monday		Verify	SR is being performed on a 24 hour frequency.							
Tuesday										
Wednesda	У				1					
Thursday							-			

NOTES ON NEXT PAGE

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#### Surveillance Procedure Data Package - Modes 4 & 5

NIGHT SHIFT WEEK: _____OAY_____

Notes For "Control Rods" Are From The Previous Page.

- (1) Technical Specification LCO 3.9.5 requires a Control Rod to be OPERABLE (e.g., accumulator ≥ 940 psig) before withdrawal in Mode 5. Technical Specification SR 3.9.4.1 requires verification of the absence of full-in indication (no Green LEDs) each time a Control Rod is withdrawn from the full-in position in Mode 5. To reinforce the awareness of these requirements and provide additional verification of operability, currently this surveillance requires verification of accumulator pressure and absence of full-in indication of each withdrawn Control Rod every 12 hours. This surveillance satisfies the periodic verification of SR 3.9.5.2 (Technical Specification frequency for SR 3.9.5.2 is every 7 days). This surveillance does not satisfy SR 3.9.4.1.
- (2) Column B should be marked "N/A" when "All Rods Full-In" and during operation under SPECIAL OPERATIONS LCO 3.10.5, "Single CRD Removal Refueling," or LCO 3.10.6, "Multiple Control Rod Withdrawal - Refueling." During operation under these SPECIAL OPERATIONS LCOs the LIMITS for Column B are not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.5 or LCO 3.10.6 as applicable).
- (3) Verification of HCU Scram Accumulator pressure shall include observation of Local HCU Accumulator Pressure Indicator.
- (4) When operating under SPECIAL OPERATIONS LCO 3.10.6, the LIMIT "All Rods Full-In when loading Fuel Assemblies into the Core" is not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.6).

	* ANSWER KEY K	
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# Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.5	REAC	TOR MODE SWITCH - REFUEL POSITION NI	GHT SHIFT	WEEK: 100A-/ to	)	
APPLICABILITY	APPLICABILITY: Mode 5 with the Reactor Mode Switch in the Refuel Position and any Control Rod withdrawn OR Mode 4 when in Special Operations LCO 3.10.4					
Surveillance Red	quirements	: 3.9.2.1				
LOCATION:		Panel 2-9-5			Review	v Initials
	TIME	Reactor Mode Switch 2-HS-99-5A-S1 Locked in Refuel Position SAT / UNSAT / N/A		LIMITS (AC)	UO	Unit Supvr
Friday	2000	NA SAT			OP	
Saturday	2000					
Sunday	2000			we the de Owiteb Marifford Lookod in		
Monday	2000		Re	Refuel Position		
Tuesday	2000					
Wednesday	2000					
Thursday	2000					

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# Surveillance Procedure Data Package - Modes 4 & 5

	PEACTOR							
ADDUCADIUTY	TV: Modes 4 & 5							
APPLICADILITT:	Technical F	Pequirements Manual TSR-3 4.1.1						
Criteria Source:				Revie	w Initials			
LOCATION:	Panel 2-9-4		MAX	UO	Unit Supvr			
	TIME	2-CR-43-11A/12A Ch 1 (µmho) (Note 1)	(AC)					
	2000	3 TO 5		op				
Friday	0200							
	2000							
Saturday	0200		1					
	2000							
Sunday	2000		Prior to startup and at steaming rates $\leq 100.000$ lb/br:					
· · · · · · · · · · · · · · · · · · ·	0200		2.0 µmho					
	2000							
Monday	0200		Reactor not Pressurized with Fuel In Reactor Vessel, Except During Startup Condition:		<u> </u>			
	2000		Less than or equal to 10.0 µmho					
Tuesday	0200							
	2000		1					
Wednesday	0200							
	2000		4					
Thursday	2000		4					
indisody	0200							

(1) Whenever there is fuel in the reactor vessel and the continuous conductivity monitor is inoperable, periodic analysis of reactor coolant samples are required by the Technical Requirements Manual. If the reactor coolant continuous conductivity monitor becomes inoperable, notify the Chemistry to sample according to 2-SI-4.6.B.1-4.

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# Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.7 part 1	RHR SHUTD	OWN COOLING S	SUBSYSTEM AND	RECIRCULATION	IPUMP	NIGHT SHIFT	WEEK:	TODAY	_ to	
APPLICABILITY:	M	odes 4 & 5 (Notes	1, 2)							
Surveillance Requi	irements: 3.4	4.8.1, 3.9.7.1, and	3.9.8.1						Raviau	/ Initials
LOCATION:		Pane	12-9-4		Pane	12-9-3		REQUIREMENTS	T GVION	
		Recirc F (No	Pump I/S ite 3)	F	RHR Shutdown Co (No	ooling Subsystem I/ ote 3)	5	(Note 1) Initials		Linit Cumur
DAY	TIME	A	В	A	В	C	D	(AC)	00	
Friday	2000								OP_	
Saturday	2000									
Sunday	2000									
Monday	2000			1						
Tuesday	2000									
Wednesday	2000									
Thursday	2000				L	1	L			

TABLE 4.7 part 2							Denal	205	T	
LOCATION:			Panel 2-	9-47: 2-TR-56-4		4	Panei	2-3-0	4	
T		С	OL A	CC	DL B	COLC				
		Rx Dr 2-T Rx Bol 2-Ti	to RWCU E-56-8 <u>or</u> ttom Head E-56-29	FW Noz 2-TE 2-TE 2-TE 2-TE 2-TE	zle Temp -56-13 -56-14 -56-15 -56-16	(COL A-COL B)	Rx Press 2-PI- <u>0</u> 2-PI- (bletco	ure (psig) 3-54 <u>[</u> 3-61	Rovie	w Initials
		(Note	es 4 & 5)	(No	ote 4)	(Note 6)	livoles	4 8 0)	T T T T T T T T T T T T T T T T T T T	T
DIV	TIME	Instrument	٩E	Instrument used	쿠아		Instrument used	PSIG	UO	Unit Supvr
DAY			NU K	7.56.51.13	103.7	9.2	NA	NA	60	
Friday	2000	2-TE - 56- 8	1 74.3	C. 18-10 13	110011					
Saturday	2000				<u> </u>	-				
Sunday	2000									
Monday	2000						_			
Tuesday	2000									
Wednesday	2000						-			
Thursday	2000					L			<u> </u>	

NOTES ON THE NEXT PAGE.

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#### Surveillance Procedure Data Package - Modes 4 & 5

# The following notes for RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION are from the previous page:

- (1) Initials signify that the requirements listed below, for the unit conditions are met.
  - A. In mode 4, LCO 3.4.8 requires two RHR Shutdown Cooling Subsystems be operable, and with NO Recirc pump in operation, at least One RHR Shutdown Cooling Subsystem SHALL be in operation. SR-3.4.8.1 requires verifying one required RHR Shutdown Cooling Subsystem OR Recirc pump is operating.
  - B. In mode 5, with water level ≥ 22 feet above the top of the RPV flange, LCO 3.9.7 requires One RHR Shutdown Cooling Subsystem to be operable and in operation. SR-3.9.7.1 requires verifying one RHR Shutdown Cooling Subsystem is operating.
  - C. In mode 5, with water level < 22 feet above the top of the RPV flange, LCO 3.9.8 requires two RHR Shutdown Cooling Subsystems to be operable and One RHR Shutdown Cooling Subsystem in operation. SR-3.9.8.1 requires verifying one RHR Shutdown Cooling Subsystem is operating.
  - D. In the event the requirements stated above cannot be met, verify the appropriate LCO Action Statement is entered and documented by recording hourly Reactor Coolant Temperature And Pressure in the narrative log.
- (2) During operation in MODE 4 under SPECIAL OPERATIONS LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," the requirements of LCO 3.4.8 are suspended.
- (3) Place an "X" in the column of the pumps that are in service. To be considered as In Service, the RHR System and its associated Shutdown Cooling Subsystems must be in the Shutdown Cooling Mode alignment with RHR SD CLG FLOW LOW annunciator (2-XA-55-3D, Window 11) is reset.
- (4) [NRC/C] These parameters provide monitoring to assist in the determination of Reactor Vessel water temperature stratification. [IE Circular 81-11] Only one indication for the parameters are required to be recorded. Record <u>the Indicator used and the reading obtained in the appropriate columns</u>.
- (5) [NER/C] For thermal stratification monitoring, Reactor Drain to RWCU temperature indication is preferred when there is flow in the line. [GE SIL 251 and 430]
- (6) Differential temperatures (COL A COL B) of 50°F or greater or Reactor pressure greater than atmospheric pressure when reactor coolant temperature indications are less than 212°F indicate potential inadequate mixing and stratification of the water in the RPV. Note that Reactor pressure indications may read slightly positive due to instrument inaccuracies; however, any unexpected upward trend in pressure should be addressed. Reactor Pressure indication should be N/A'd when head is removed. With RCS temperature ≤ 100°F in Mode 4, 2-SR-3.4.9.5-7 must be initiated to monitor reactor vessel flange and head flange temperatures.



Browns Ferry Nuclear Plant

Unit 2

Surveillance Procedure

#### 2-SR-2

#### **Instrument Checks and Observations**

**Revision 0077** 

**Quality Related** 

Level of Use: Continuous Use

Level of Use or Other Information: Key Number P2020

Effective Date: 05-10-2013 Responsible Organization: OPS, Operations Prepared By: John C. Duncan Approved By: Keith W. Benefield

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#### **Current Revision Description**

078

Type of Change: Enhancement Tracking Number:

PCRs: 13001909

PERs:

DCN:

PCR 13001909

Changed the word (operable to functional) in Note 2 of Attachments 2 (Table 2.42) and Attachment 3 (Table 4.21).

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#### 1.0 INTRODUCTION

#### 1.1 Purpose

This Procedure ensures most instrument checks and observations, as required by the Technical Specifications (TS), are performed. This Procedure also ensures performance of some instrument checks and observations required by the Technical Requirements Manual (TRM), Offsite Dose Calculation Manual (ODCM), and Final Safety Analysis Report (FSAR). The majority of the instrument checks and observations are required on a 12 hour, 24 hour, or 7 day frequency and a separate Procedure is not warranted to govern their performance.

SR-2 fulfills specific requirements, but may contain instrumentation which serves multiple purposes and the related functional requirements. Therefore, regarding the Surveillance Requirements and Applicability statements (rows) at the top of the tables, these listed Surveillance Requirements are for operator information and cross-reference use. They are listings, or aids, which tell the operator where in Tech Specs, TRM, ODCM, and if applicable, Fire Protection Report, the associated instrument may have functional requirements. Should a specific instrument indicate abnormally, each of these reference areas should be referred to. Using this and other pertinent information will ensure all applicable LCOs are addressed. Note however, these listings are not to be construed as either the only or the all-inclusive LCOs if there is a problem with the instrument. Rather, these listings provide the recognized references which need to be looked at if there is a problem with the instrumentation to verify the applicability, or possibility, of an LCO. On-shift, licensed Operations personnel maintain the ultimate responsibility for ensuring all Technical Specification, TRM, ODCM, and Appendix R LCOs are addressed for inoperable equipment.

#### 1.2 Scope

This procedure fulfills most 12 hour, 24 hour, and 7 day instrument checks and observations required by the Technical Specifications. This procedure also fulfills some instrument checks and observations required by the TRM, ODCM, and FSAR. Attachment 5 provides a cross reference of TS, TRM, ODCM, and FSAR which implements the requirement and the section of this Surveillance Procedure.

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#### 1.3 Frequency

This Procedure will be performed once per week. The required frequencies for individual surveillance items are addressed within this procedure to fulfill Technical Specification, Technical Requirements Manual, and Regulatory Commitment Requirements.

#### 1.4 Applicability

The applicability requirements for individual surveillance items are listed in the surveillance tables in Attachment 6. The applicability listed in the table for a surveillance item is based on the combination of applicability's of all TS Surveillance Requirements and Criteria Sources addressed by the table.

#### 2.0 REFERENCES

#### 2.1 Technical Specifications

Unit 2

LCO 3.7.1.2 for Unit 3

#### 2.2 Technical Requirements Manual

Unit 2

#### 2.3 Offsite Dose Calculation Manual

Sections 1/2.1.1 and 1/2.2.2

#### 2.4 Final Safety Analysis Report

Sections 1.6, 3.3, 3.4, 3.6, 3.7, 3.8,4.2 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 5.2, 5.3, 6.4, 6.5, 6.6, 7.2, 7.3, 7.4, 7.5,7.6, 7.7, 7.8, 7.9, 7.10, 7.11, 7.12, 7.14, 7.16, 7.18, 7.19, 8.4, 8.5, 9.5, 10.3, 10.5, 10.7, 10.9, 10.12, 11.5, 13.6,13.9, 14.5, 14.6, Appendix F.6, F.7, and Appendix H

#### 2.5 Holtec

Holtec C of C Technical Specifications 3.1.2.1

Holtec Certificate of Compliance No. 1041

#### 2.6 Site Standard Practices

NPG-SPP-06.1, Work Order Process Initiation

NPG-SPP-06.9.1, Conduct of Testing

NPG-SPP-06.9.2, Surveillance Test Program

#### 2.7 Technical Instructions

2-TI-18, Enriched Sodium Pentaborate (SPB) Solution Preparation Procedure for the Standby Liquid Control (SLC) System

2-TI-82, Drywell Atmospheric Cooling System

2-TI-149, Reactor Water Level Measurement

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### 2.8 Operating Instructions

2-01-64	Primary Containment System
2-OI-85	Control Rod Drive System
2-01-92	Source Range Monitors
OPDP-1	Conduct of Operations

### 2.9 Abnormal Operating Instructions

2-AOI-74-1	Loss of Shutdown Cooling
2-AOI-78-1	Fuel Pool Cleanup System Failure

#### 2.10 Surveillances

2-SR-3.1.6.1	BPWS Compliance Verification
2-SR-3.1.7.1	Conditional for Standby Liquid Control (SLC) Solution Level Check
2-SR-3.3.1.2.4	Source Range Monitor System Count Rate and Signal to Noise Ratio Check
2-SR-3.4.5.B.1	Coolant Leakage-Drywell Air Sampling System Inoperable (2-RM-90-256)
2-SR-3.4.2.1	Jet Pump Mismatch and Operability
2-SR-3.4.4.1	Manual Calculation of Identified and Unidentified Leakage
2-SR-3.4.4.1-a	Calculation of Drywell Leakage Rates with Equipment Sump Overflowing into the Floor Drain Sump
2-SR-3.4.9.5-7	RPV Head Temperature Monitoring
2-SR-3.6.2.1.1	Suppression Chamber Water Check
2-SR-3.6.3.2.1	Primary Containment Atmosphere Oxygen Concentration Determination when Drywell and / or Torus Sensors are Inoperable
2-SR-3.10.6	Verification of Surveillance Requirements for Multiple Control Rod Withdrawal-Refueling
2-SI-4.6.B.1-4	Reactor Coolant Chemistry
2-SI-4.7.A.2.a	Primary Containment Nitrogen Consumption and Leakage
2-SI-4.7.F.2	Primary Containment Purge System In-Place Leak Test
2-SI-4.7.F.3	Primary Containment Purge System Halogenated Hydrocarbon Test
2-SI-4.7.F.4	Primary Containment Purge System lodine Removal Efficiency
2-SI-4.7.F.5	Primary Containment Purge System Flow Rate Test
0-SR-DCS3.1.2.1	Spent Fuel Storage Inspection

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#### 2.11 Mechanical Drawings

47W605-1	Mechanical Layout of Control Boards
47W605-1A	Mechanical Layout of Control Boards
47W600-0	Mechanical Instruments and Controls
47W600-0A	Mechanical Instruments and Controls
47W600-0B	Mechanical Instruments and Controls

#### 2.12 Other Documents

Unit 2 Current Cycle Core Operating Limits Report

NRC/C RPT 50-260/85-15, Reactor Water Level Instrument Checks Shall Include Instrument Agreement Criteria and Comparison of Instruments Which are Independent

BFPER 951914

SEOPR 96-0-075-2, CS Sparger Line Break Detection

GE SIL No. 106, Suppression Pool Temperature Monitoring and Control

GE SIL No. 251, Control of RPV Bottom Head Temperatures

GE SIL No. 430, Reactor Pressure Vessel Temperature Monitoring

IE Circular 81-11, Inadequate Decay Heat Removal During Reactor Shutdown

TVA-BFN-TS-384, Technical Specification (TS) Change TS-384 - Request for License Amendment for Power Uprate Operation (RIMS R08-980316-888)

GE-NE-B13-01866-39, Summary of System Evaluations and Proposed Changes to Design Criteria Documents (RIMS W79-980827-003)

BFN-IPIP-Task 35, Computer Process Alarm Limits (W79-980619-002)

#### 3.0 PRECAUTIONS AND LIMITATIONS

#### 3.1 General Precautions

- A. If the performance of this Surveillance Procedure indicates a need for instrument maintenance, a Service Request/Work Order (WO) will be generated in accordance with NPG-SPP-06.1.
- B. Attachment 2 and 3 consists of two data packages; one for each shift.
  - 1. Some data is required to be recorded at specified times. These times are listed next to the day in the tables. Time specific data should be recorded as close to the specified time as plant conditions/operators ability will allow. The remainder of the data packages for each shift must be completed as indicated below in order to meet the frequency requirements for the specific requirements.
  - 2. DAY SHIFT data package must be completed daily between 0700-1100 hours.
  - 3. NIGHT SHIFT data package must be completed daily between 1900-2300 hours.
- C. The night shifts and day shifts are defined by the day on which the shift begins. (i.e., Friday dayshift is Friday 0700-1900, Friday night shift is Friday 1900 to Saturday 0700.). Actual starting times for Operations may vary based upon turnovers, but the time periods for obtaining data are as listed above.
- D. The data packages contain surveillance item tables which are identified by table numbers. These table numbers are cross referenced to the Tech Specs and/or Technical Requirements and applicability in attachments 5 and 6.
- E. An Independent Review (STA or SRO) is performed on a "once per shift" basis and does not require a separate Review after the completion of the Procedure. If an independent SRO is used, then he/she shall not be the same SRO that signed for the Unit Supervisor review in the Data Packages for that shift. If a qualified STA is used, then he/she will perform the IQR on a "once per shift" basis. This will ensure an independent review of the shift's Data.
- F. Due to the possibility of instrumentation or recorders being out of service, the associated readings may be obtained from another location after verifying the correct instrument. The instrument or recorder used should be annotated in the Post Test Remarks if different from the one specified. (i.e. If a 2-RM-90-133 (Channel 1) on 2-RR-90-134 is out of service and then 2-RM-90-133D may be used and documented.)

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#### 3.1 General Precautions (continued)

G. Maximum expected times have been established for RHR to be in Suppression Pool Cooling for the Probability Risk Assessment (PRA). The Time Limits in Table 1.41 and Table 2.41 are set at 75% of the PRA Maximum Limit depending on either Dual Loop or Single Loop Operation.

Each shift, each mode of operation will be calculated and the totals maintained for the calendar year using the following guidelines when in modes 1, 2, and 3. [PER 227324]

- 1. Single Loop Operation
  - a. An individual loop is defined as A single Loop of RHR aligned to the Suppression Pool for Suppression Pool Cooling or Testing. This does not include if a Loop of RHR is in Shutdown Cooling when in Mode 3.
  - b. RHR Time Inservice calculation Calculated at the end of each shift for each RHR Loop meeting the Single Loop Operation criteria and recorded in Columns A and B of Table 1.41a or Table 2.41a.
  - c. Single Loop Operation Total Run Time Is calculated at the end of each shift by adding both RHR Loop's Single Loop Operation Run times in Column C of Table 1.41a or Table 2.41a.
  - d. Previous Shifts Total Individual Run Time (Column 1 Table 1.41b and Table 2.41b) This Field is Column 3 from the previous shifts Table 1.41b or Table 2.41b.
  - e. Total Single Operation Run Time is calculated at the end of the shift using Total Individual Run Time from Column C of Table 1.41a or Table 2.41a for the shift and adding it to the Previous Shifts Total Individual Run Time in Column 1 Table 1.41b and Table 2.41b.
  - f. The Total Individual Run Time is re-zeroed at the end of the year. For the Day Shift on January 1st the Previous Shift Total Individual Run Time will be entered as "0".
  - g. Table 1.41b and Table 2.41b Limit of 197.1 hours is 75% Limit of the PRA Maximum limit for individual loop. If this limit is exceeded then notify System Engineering and initiate a PER stating that the 75% PRA Limit has been exceeded on SR-2.
  - h. The PRA maximum expected time individual loops of RHR may be in service is 262.8 hours. If this limit is exceeded then notify System Engineering and initiate a PER stating that the PRA Limit has been exceeded. (The PER will evaluate whether a PRA update is required.)

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#### 3.1 General Precautions (continued)

- i. Exceeding either the 75% or the PRA Limit does not affect the operability of either RHR Loops. This is only used for the PRA calculations only.
- 2. Dual Loop Operation
  - a. The Dual Loop Operation Total Run Time is not to be included into the Single Loop Operation Total Run Time for the individual pumps. The Total Run Times for each mode are completely separate.
  - b. A Dual Loop Operation is defined as Both RHR Loop I and RHR Loop II aligned to the Suppression Pool for Suppression Pool Cooling or Testing at the same time.
  - c. Dual Loop Operation Total Run Time is calculated at the end of the shift when the Dual Loop Operation Criteria is met and will be recorded in Column D of Table 1.41a or Table 2.41a.
  - d. Previous Shifts Total Dual Loop Operation Run Time (Column 4 Table 1.41b or Table 2.41b) This Field is Column 6 from the previous shifts Table 1.41b or Table 2.41b.
  - e. Dual Loop Operation Current Shift Run Time Hours -(Column 5 Table 1.41b or Table 2.41b) is the end of Shift Total Dual Loop Operation Run Time reading from Column D on Table 1.41a or Table 2.41a.
  - f. Total Dual Loop Operation Run Time (Column 6 Table 1.41b or Table 2.41b) - is calculated by adding the Dual Loop Operation Current Shift Run Time Hours -(Column 5 Table 1.41b or Table 2.41b) and the Previous Shifts Total Dual Loop Operation Run Time (Column 4 on Table 1.41b and Table 2.41b).
  - g. Table 1.41b and Table 2.41b Limit of 32.9 hours is the 75% Limit of the PRA Maximum limit for Dual Loop Operation. If this limit is exceeded, then notify System Engineering and initiate a PER stating that the 75% PRA Limit has been exceeded on SR-2.
  - h. The PRA maximum expected time for Dual Loop Operation of RHR is 43.8 hours. If this limit is exceeded, then notify System Engineering and initiate a PER stating that the PRA Limit has been exceeded.
  - i. Exceeding either the 75% or the PRA Limit does not affect the operability of either RHR Loop. This is only used for the PRA calculations only.

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#### 3.2 Operability and LCO's

- A. If readings for inoperable instruments are marked as "INOP," the required channel checks must be performed prior to declaring the instruments OPERABLE.
- Β. SR-2 fulfills specific requirements, but may contain instrumentation which serves multiple purposes and the related functional requirements. Therefore, regarding the Surveillance Requirements and Applicability statements (rows) at the top of the tables, these listed Surveillance Requirements are for operator information and cross-reference use. They are listings, or aids, which tell the operator where in Tech Specs, TRM, ODCM, and if applicable, Fire Protection Report, the associated instrument may have functional requirements. Should a specific instrument indicate abnormally, each of these reference areas should be referred to. Using this and other pertinent information will ensure all applicable LCOs are addressed. Note however, these listings are not to be construed as either the only or the all-inclusive LCOs if there is a problem with the instrument. Rather, these listings provide the recognized references which need to be looked at if there is a problem with the instrumentation to verify the applicability, or possibility, of an LCO. On-shift, licensed Operations personnel maintain the ultimate responsibility for ensuring all Technical Specification, TRM, ODCM, and Appendix R LCOs are addressed for inoperable equipment.

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#### 3.3 Equipment

- A. Parameter Limits are denoted by the annotation "LIMITS". Channel check criteria are denoted by "MIN," "MAX," and "MAX DEV". If the agreement criteria between the channels (MAX DEV) are not satisfied, it may be an indication of excessive instrument drift in one of the channels or something more serious. When MAX DEV criteria cannot be met during required applicability, instrument operability must be evaluated.
- B. For the Post Accident Range Reactor Water Level Instrumentation, 2-LIS-3-62A (52), 2-LI-3-62A (52), 2-LR-3-62, the failure modes for the instrument, electrical, reference leg failure or variable leg failure, will be readily apparent either by their indication or other instruments fed from the same reference leg.
  - 1. Electrical Downscale
  - 2. Variable Leg Downscale
  - 3. Reference Leg Upscale along with other indication on the same reference leg changing
- C. The Channel Check for IRMs is satisfied by maintaining the IRMs onscale and within 2 ranges of each other and does not determine the operability of the IRMs. The following are some things the Unit Supervisor should address prior to declaring operability. This is not an all inclusive list.
  - 1. Proper Overlap
  - 2. All appropriate surveillances performed
  - 3. IRM's must be full in and onscale (i.e., 25 ≤ IRM value ≤ 75) excluding downscale (i.e., IRM value < 25) on range 1
  - 4. IRM unbypassed

#### 3.4 Initiation/Isolation/Trips

None

3.5 Interlocks

None

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#### 3.6 Performance Testing

- A. Data for all of the parameters in Attachment 2 shall be taken at all times when in Modes 1, 2, & 3 regardless of applicability. Even though the parameter may not be applicable for the current Mode, the readings shall be recorded to ensure when the Mode is entered, the readings will exist and the associated channel checks required by Tech Specs for that mode are complied with.
  - 1. In cases where there is more than one way to obtain the required parameter reading, at least one of the parameters readings shall be recorded, the others may be marked as N/A.
  - 2. LCO 3.0.4 is only applicable when entering Mode 3 from 4, Mode 2 from Mode 3 or 4, or Mode 1 from Mode 2. Furthermore, LCO 3.0.4 is applicable when entering any other specified condition in the applicability only when in Mode 1, 2, or 3. LCO 3.0.4 is not applied in Modes 4 or 5. (refer to Attachment 5 and TS SR 3.0.4.)
  - 3. Parameters that have "ALL DATA SAT/UNSAT" columns will be marked for the current plant condition. If the parameters are UNSAT, then log in Post Test Remarks the reason for being UNSAT.

SAT/UNSAT Data Applies to Surveillance Requirements listed in SR-2. Instruments may be Tech Spec operable, but UNSAT for the "SAT/UNSAT" column in SR-2. Example would be one instrument or channel in by-pass or removed from service as allowed by Tech Specs, but <u>UNSAT</u> in the "ALL DATA SAT/UNSAT" column (with a note in Remarks) for SR-2.

- 4. Do not N/A parameters that allows the use of N/A's until the end of the shift. This will ensure plant conditions did not change requiring the readings or tests to be performed.
- B. Readings for inoperable instruments may be marked "INOP" and the reason for inoperability condition noted in the data package with the following exceptions.
  - 1. At least two instruments in the comparison group must remain available for readings evaluated against "MAX DEV" criteria during required applicability.
  - 2. At least one instrument must remain available for determination of the parameter for readings with "LIMITS" criteria during required applicability. This limitation does not apply to the SRM readings with "LIMITS" criteria since in this case each SRM is evaluated against the "LIMITS" criteria to determine the SRM's OPERABILITY.

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#### 3.6 Performance Testing (continued)

C. The Forebay Temperature indicator 0-TI-27-0144, has a live indication at 85 °F. This means that the instrument will not drive downscale when forebay temperatures are less than 85 °F. Due to the inaccuracy of the temperature indicator (as found ± 1.2 °F) the indicator may read from 85 °F to 86.2 °F when actual forebay temperature is known to be below 85 °F. Therefore, when actual temperatures are below 85 °F, logging ≤ 86.2 °F is acceptable. Operations will continue to record the higher of the three instruments associated with the Ultimate Heat Sink. This is the conservative reading in the summer when the instrument is needed for Tech Spec Compliance. If the instrument is recalibrated to drive downscale at less than 85 °F, the accuracy is diminished at the upper end where it is needed to be accurate for Tech Spec Compliance. The Tech Spec requirements are to verify Ultimate Heat Sink is less than 91 °F.

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#### 4.0 PREREQUISITES

This copy of 2-SR-2 is verified the most current revision.

#### 5.0 SPECIAL TOOLS AND EQUIPMENT RECOMMENDED

#### 5.1 Recommended Tools

Calculator

#### 5.2 Recommended Measuring And Test Equipment (M&TE)

None

#### 6.0 ACCEPTANCE CRITERIA

- A. The Acceptance Criteria for each surveillance item is designated by (AC) in the applicable surveillance item table(s) of Attachments 2 & 3.
- B. The Acceptance Criteria for a surveillance item is only required to be satisfied during the indicated applicability denoted on the associated table.
- C. Corrective Actions

The failure of any surveillance item to meet its acceptance criteria during its applicability shall constitute a Corrective Action which shall be documented as described by NPG-SPP-06.9.1. The Unit Operator will immediately notify the Unit Supervisor if any acceptance criteria is not satisfied.

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#### 7.0 PROCEDURE STEPS

#### 7.1 Initial Requirements and Notifications

- (II
- **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P2020)
- [2]

On the Surveillance Task Sheet (STS)

**OBTAIN** Authorization Signature and Date/Time from the Unit Supervisor to perform this surveillance.

P

00

00

<u>0</u>P



On the Surveillance Task Sheet (STS) **RECORD** the Start Date & Time.

**VERIFY** that each page of the data package displays the correct beginning and end dates for the week.



#### 7.2 Weekly Data Collection

#### 7.2.1 Weekly Data Carryover

Transfer all necessary data for the corresponding data packages from the previous weeks data. (e.g. previous days Drywell Sump discharge totalizer readings, etc.)

#### 7.2.2 Data Package



 $\checkmark$  **PRIOR** to obtaining Data for the current shift,

**VERIFY** the requirements and initial Section 1.0 of Attachment 1 by the Unit Operator.

BY COMPLETE each surveillance item contained in each data package. There is no specific order in which the items must be completed within a data package.

Ð.

**CHECK** the value or status of each surveillance item against its requirement as delineated in the data package. Items are clarified as required by numbered footnotes appearing at the bottom of the data sheet in which the surveillance item is recorded.

The Unit Operator and Unit Supervisor shall review the Surveillance Procedure data package for completeness and satisfaction of Technical Specification requirements. This review shall be documented by initialing each data sheet of the package in the space designated.

#### 7.2.3 Independent (STA or SRO) Shift Review

An Independent Review (STA or SRO) shall be performed and documented on Section 2.0 of Attachment 1, by a qualified Shift Technical Advisor (STA) or an independent SRO separate from the one signing as the Unit Supervisor for the data taken in the procedure, for each shift completed data package.

B. The Review of the completed Shift Data Package shall be checked for completeness, technical accuracy, regulatory compliance, and overall component operability (i.e., Acceptance Criteria, LCO's ...).

#### 7.3 Completion of the Weekly Data Packages

After completion of the weekly data packages for all shifts, the surveillance package is sent to the Work Control Group, who should route the original package to Site Engineering.

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#### 7.4 Completion and Notifications

- [1] On the Surveillance Task Sheet (STS)
  - A. **RECORD** the Completion Date & Time.
  - B. **REVIEW** and **COMPLETE** the Surveillance Task Sheet (STS) through the Test Director/Lead Perform & Date fields.

#### 8.0 ILLUSTRATION/ATTACHMENTS

Attachment 1: Unit Operator and Independent Review (STA or SRO) Shift Reviews

Attachment 2: Surveillance Procedure Data Package-Modes 1, 2, & 3

Attachment 3: Surveillance Procedure Data Package-Modes 4 & 5

Attachment 4: Reactor Water Level Indication Correction

Attachment 5: Criteria Source Reference Table

Attachment 6: Surveillance Item Applicability Reference Table

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#### Attachment 1 (Page 1 of 2)

Unit Operator and Independent Review (STA or SRO) Shift Reviews

DAY SHIFT WEEK: TOPAL to

#### 1.0 UNIT OPERATOR REVIEWS PRIOR TO OBTAINING DATA

- [1] **CHECK** that the following initial conditions are satisfied and **INITIAL** in the table below at the beginning of each shift:
  - Precautions and Limitations in Section 3.0 have been reviewed.
  - Prerequisites listed in Section 4.0 are met.
  - **VERIFY** that the correct data package from Attachment 2 or 3 is being used for the current shift. (Reference Step 3.1B).

	DAY	SHIFT	NIGHT SHIFT				
DAY	UO Initial	Time	UO Initial	Time			
FRIDAY	υP	TUDAY	UP	TODAY			
SATURDAY		1					
SUNDAY							
MONDAY							
TUESDAY							
WEDNESDAY							
THURSDAY							

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#### Unit Operator and Independent Review (STA or SRO) Shift Reviews

# 1.0 UNIT OPERATOR REVIEWS PRIOR TO OBTAINING DATA (continued)

DAY SHIFT WEEK: TODAY to_____

#### 2.0 INDEPENDENT REVIEW (STA OR SRO) PERFORMED FOR EACH SHIFT.

- [1] The review should be performed as close to the end of the shift as practical to all units are reviewed.
- [2] The Review of the completed Shift Data Package shall be checked for completeness, technical accuracy, regulatory compliance, and overall component operability (i.e., Acceptance Criteria, LCO's ...).

	DAY	SHIFT	NIGHT SHIFT			
DAY	Initial	Initial Time		Time		
FRIDAY	oP	TOORY				
SATURDAY						
SUNDAY						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						

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# Surveillance Procedure Data Package - Modes 4 & 5

	IRM INS	TRUMENTATION	N			NIGHT						
APPLICABILITY:	irements:	Mode 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies.    OR   Mode 4 when in Special Operations LCO 3.10.4   ements: 3.3.1.1.1 (f1.a)										
LOCATION:		Panel 2-9-5								Reviev	v Initials	
	A	С	E	G	В	D	F	н	(AC)	UO	Unit Supvr	
Friday												
Saturday									-			
Sunday									2 Ranges with			
Monday									conditions of Note 1 satisfied			
Tuesday												
Wednesday	+											
Thursday												

(1) IRM's must be full in and onscale (i.e., 25 ≤ IRM value ≤ 75) excluding downscale (i.e., IRM value < 25) on range 1.

(2) During operation under SPECIAL OPERATIONS LCO 3.10.5, "Single CRD Removal - Refueling," MAX DEV acceptance criteria is not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.5).

# Attachment 3

#### (Page 19 of 36)

### Surveillance Procedure Data Package - Modes 4 & 5

									IFT	WEEK:	TOD	A to		
TABLE 4.2	SRM	INSTRU	MENTAT	TION				MOIT SI						
APPLICABILITY	':	Mod	le 4 & 5											
		Cou	int Rate v	vill be rec	orded at	all times.	80			TS	SRs' 3	3.4.1 & 3.3.5.3		
Surveillance Re	quirement	<u>s: 3.3.</u>	<u>1.2.1, 3.3</u>	3.1.2.2, 3.	3.1.2.3, 3	3.3.1.2.4, 3.3.1.2.5	<u>ă0</u>	·····			<u></u>	<u>r</u>	Revie	w Initials
LOCATION:		Pan	el 2-9-5						0	Olevel 40	Maina			
	SRM Count Rate (cps) Note 1				1	LIMITS (AC)	SRM System Signal to Noise Ratio MAX 2-SR-3.3.1.2.4 (AC) SAT / INOP (Note 4)			All Data SAT/ UNSAT	All Data SAT/ UNSAT	Unit Supyr		
	TIME	Α	С	В	D	Note 2	Note 3	<u> </u>	C	L B		(Note 5)	0	
Friday	2000													
Saturday	2000								ļ					
Sunday	2000					SRMs count	SRMs count							1
Monday	2000					rate must be	rate must be		<u> </u>		┨─────			1
Tuesday	2000					≥ 3 cps	< 1 E ⁶ cps							
Wednesday	2000			Ι		1			Į	<u> </u>	<u> </u>	1		-
Thursday	2000								L	<u> </u>				

Count Rate should be recorded with SRM's fully inserted. (1)

LIMITS are not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant.

IRM/SRM overlap should occur before SRMs > 1 E5 cps (should occur between 1 E⁴ cps & 1 E⁵ cps). Unexpected deviations from this relationship and excessive noise (2) (3)

spikes shall be investigated. Signal to Noise Ratio is required to be determined by performing 2-SR-3.3.1.2.4 as follows: (SRM's will become INOP after the SR's specified Frequency has been (4) exceeded.)

- Every 24 Hours. (This may be N/A'ed if the SR was performed SAT on the previous shift.)
- A. MODE 4 Prior to going to Mode 2 or 3 from Mode 4. •
- "DURING Core Alterations" Every 12 Hours. B. MODE 5 •

.

SAT •

- Every 24 Hours (This may be N/A'ed if the SR was performed SAT on the previous shift and no Core Alterations in progress and not
- expected to be performed in the next 12 hours.) Prior to going to Mode 2 or 3 from Mode 5.
- . An SRM fails its Signal to Noise Ratio section of 2-SR-3.3.1.2.4.

INOP • The All Data UNSAT column is UNSAT, if one or more SRM's are inoperable. Refer to Tech Spec 3.3.1.2. (5)
BFN Instrument Checks and Observations 2-SR-2	77
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## Attachment 3 (Page 20 of 36)

# Surveillance Procedure Data Package - Modes 4 & 5

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TABLE 4.3	REACTOR WATER LEVEL INSTRUMENTATION - NARROW RANGE NIGHT SHIFT WEEK: 100049 to							
APPLICABILITY:	Reactor Water Level in Narrow Instrument Range							
Criteria Source:	FSAR 7.10.4							
LOCATION:	Panel 2-9-5					Reviev	v Initials	
Reference Leg	A	В	С	D				
	2-LI-3-53 (in.)	2-LI-3-60 (in.)	2-LI-3-206 (in.)	2-Ll-3-253 (in.)	MAX DEV	UO	Unit Supvr	
Friday								
Saturday								
Sunday								
Monday					3.0 inches		<u> </u>	
Tuesday								
Wednesday								
Thursday								

(1) Refer to Attachment 4 during off-normal operating conditions.

## Attachment 3 (Page 21 of 36)

# Surveillance Procedure Data Package - Modes 4 & 5

	to					
TABLE 4.4.a CONTROL RODS Mode 5 OR Mode 4 when in Special Operations LCO 3.10.4						
APPLICABILITY: Mode 5 OK Mode 4 With in Openia Openiation 200 and 200						
Surveillance Requirements. 5.5.5.1, 5.5.5.2, (receiving even in/)		Review	Initials			
LOCATION. ICS Control Rod Position Indication, Local HCU Accumulator Pressure Indicators (Reactor Building Elevation 565)						
COL A COL B						
Verify Control Rod Verify HCU Scram Accumulator Pressure						
Positions ≥ 940 psig and Position Indication has no full-in						
indication (no Green LEDs) for each withorawn			Unit			
ALL RODS FULL-IN/ Control Rod. (Notes 1, 2, 3)		UO	Supvr			
TIME ROD WITHURAWN SAT / ONOAT / N/A						
Friday 2000 All Rods Full-III when loading F						
Saturday 2000 and						
Sunday 2000 HCU Scram Accumulator Pressure ≥ 940	) psig 📃					
Monday 2000 and	_ L					
No full-in indication (no Green LEDs)	for					
each withdrawn Control Rod (Note 2	<u>)</u>					
Thursday 2000 1 A CONTROL POD WITHDRAWAL - REFUELING						
TABLE 4.4.0 MOLTIPLE CONTROL ROD WITH DRAWAE THE OPERATIONS LCO 3.10.6						
APPLICABILITY: Mode 5 when operating under or Low 2 or List when be a start and a start and a start a start and a start a star		Review	Initials			
Surveillance Requirements. 3.10.0.1, 3.10.0.2, 5.10.0.5			Unit			
Multiple Control Rod Withdrawal - Refueling 2-SR-3.10.6 SR Performe	<u>d</u>	00	Supvr			
Friday						
Saturday						
When operating under SPECIAL OPERATIONS LC0 3.10.0,						
Tuesday Verify SR is being performed on a 24 hour frequency.						
Nodpoeday						
Thursday			<u> </u>			

NOTES ON NEXT PAGE

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#### Attachment 3 (Page 22 of 36)

# Surveillance Procedure Data Package - Modes 4 & 5

NIGHT SHIFT WEEK: TODAY to

## Notes For "Control Rods" Are From The Previous Page.

- (1) Technical Specification LCO 3.9.5 requires a Control Rod to be OPERABLE (e.g., accumulator ≥ 940 psig) before withdrawal in Mode 5. Technical Specification SR 3.9.4.1 requires verification of the absence of full-in indication (no Green LEDs) each time a Control Rod is withdrawn from the full-in position in Mode 5. To reinforce the awareness of these requirements and provide additional verification of operability, currently this surveillance requires verification of accumulator pressure and absence of full-in indication of each withdrawn Control Rod every 12 hours. This surveillance satisfies the periodic verification of SR 3.9.5.2 (Technical Specification frequency for SR 3.9.5.2 is every 7 days). This surveillance does not satisfy SR 3.9.4.1.
- (2) Column B should be marked "N/A" when "All Rods Full-In" and during operation under SPECIAL OPERATIONS LCO 3.10.5, "Single CRD Removal Refueling," or LCO 3.10.6, "Multiple Control Rod Withdrawal - Refueling." During operation under these SPECIAL OPERATIONS LCOs the LIMITS for Column B are not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.5 or LCO 3.10.6 as applicable).
- (3) Verification of HCU Scram Accumulator pressure shall include observation of Local HCU Accumulator Pressure Indicator.
- (4) When operating under SPECIAL OPERATIONS LCO 3.10.6, the LIMIT "All Rods Full-In when loading Fuel Assemblies into the Core" is not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.6).

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# Attachment 3 (Page 23 of 36)

# Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.5	REAC	TOR MODE SWITCH - REFUEL POSITION NIG	HT SHIFT	WEEK: TODA-	>				
APPLICABILITY: Mode 5 with the Reactor Mode Switch in the Refuel Position and any Control Rod withdrawn OR Mode 4 when in Special Operations LCO 3.10.4									
Surveillance Re	quirements	s: 3.9.2.1							
LOCATION:		Panel 2-9-5			Review	w Initials			
	ТІМЕ	Reactor Mode Switch 2-HS-99-5A-S1 Locked in Refuel Position SAT / UNSAT / N/A		LIMITS (AC)	UO	Unit Supvr			
Friday	2000								
Saturday	2000								
Sunday	2000			actor Mode Switch Verified Locked in					
Monday	2000			Refuel Position SAT					
Tuesday	2000								
Wednesday	2000								
Thursday	2000								

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#### Attachment 3 (Page 24 of 36)

# Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4 6	REACTOR	COOLANT CONDUCTIVITY			
APPLICABILITY:	Modes 4 &	5			
Criteria Source:	Technical F	Requirements Manual TSR-3.4.1.1			
LOCATION:	Panel 2-9-4	•		Review	
	TIME	2-CR-43-11A/12A Ch 1 (μmho) (Note 1)	MAX (AC)	00	
	2000				
Friday	0200				
	2000				
Saturday	0200				
	2000				-
Sunday	0200		Prior to startup and at steaming rates < 100,000 lb/hr:		
	2000		2.0 μπησ		
Monday	0200		Reactor not Pressurized With Fuel In Reactor Vessel, Except		
	2000		Less than or equal to 10.0 µmho		
Tuesday	0200		1		
	2000		1		
Wednesday	0200		1		T
	0200		1		1
Thursday	2000		4	<u> </u>	+
mulsudy	0200			L	<u> </u>

(1) Whenever there is fuel in the reactor vessel and the continuous conductivity monitor is inoperable, periodic analysis of reactor coolant samples are required by the Technical Requirements Manual. If the reactor coolant continuous conductivity monitor becomes inoperable, notify the Chemistry to sample according to 2-SI-4.6.B.1-4.

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# Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.7 part 1	RHR SHUTD	OWN COOLING SU	IBSYSTEM AND	RECIRCULATION		IIGHT SHIFT	WEEK	TODAY	to	
APPLICABILITY:	M	odes 4 & 5 (Notes 1	, 2)							
Surveillance Redu	irements: 3.4	4.8.1. 3.9.7.1, and 3	.9.8.1							
LOCATION		Panel	2-9-4		Panel	2-9-3		REQUIREMENTS	Revie	v Initials
LOCATION.		Recirc Pu (Note	imp I/S 3)	F	RHR Shutdown Cooling Subsystem I/S (Note 3)			(Note 1) Initials		
DAY	TIME	A	B	A	В	С	D	(AC)	00	Unit Supvr
Friday	2000									
Saturday	2000									-
Sunday	2000									
Monday	2000									
Tuesday	2000									
Wednesday	2000									+
Thursday	2000							1		

TABLE 4.7 part 2

LOCATION:	OCATION:		Panel 2-9-47; 2-TR-56-4			Panel 2-9-5		2-9-5		
200711.011		CC	DL A	CC	DL B	COL C				
		Rx Dr to 2-TE Rx Botto 2-TE	5 RWCU -56-8 50 50 Head -56-29	FW Nozzle Temp 2-TE-56-13 2-TE-56-14 2-TE-56-15 2-TE-56-16		(COL A-COL B)	Rx Press 2-Pl- <u>9</u> 2-Pl-	ure (psig) 3-54 <u>r</u> 3-61		
		(Notes	4 & 5)	(No	ote 4)	(Note 6)	(Notes	4 & 6)	Review Initials	
DAY	ТІМЕ	Instrument used	٩°	Instrument used	٩F		Instrument used	PSIG	UO	Unit Supvr
Friday	2000	2-12-56-8	94.5	2-16-56-13	103.7					
Saturday	2000									ļ
Sunday	2000									
Monday	2000				ļ					
Tuesday	2000									
Wednesday	2000									
Thursday	2000						J			<u></u>

NOTES ON THE NEXT PAGE.

# Attachment 3

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### Surveillance Procedure Data Package - Modes 4 & 5

# The following notes for RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION are from the previous page:

- (1) Initials signify that the requirements listed below, for the unit conditions are met.
  - A. In mode 4, LCO 3.4.8 requires two RHR Shutdown Cooling Subsystems be operable, and with NO Recirc pump in operation, at least One RHR Shutdown Cooling Subsystem SHALL be in operation. SR-3.4.8.1 requires verifying one required RHR Shutdown Cooling Subsystem OR Recirc pump is operating.
  - B. In mode 5, with water level ≥ 22 feet above the top of the RPV flange, LCO 3.9.7 requires One RHR Shutdown Cooling Subsystem to be operable and in operation. SR-3.9.7.1 requires verifying one RHR Shutdown Cooling Subsystem is operating.
  - C. In mode 5, with water level < 22 feet above the top of the RPV flange, LCO 3.9.8 requires two RHR Shutdown Cooling Subsystems to be operable and One RHR Shutdown Cooling Subsystem in operation. SR-3.9.8.1 requires verifying one RHR Shutdown Cooling Subsystem is operating.
  - D. In the event the requirements stated above cannot be met, verify the appropriate LCO Action Statement is entered and documented by recording hourly Reactor Coolant Temperature And Pressure in the narrative log.
- (2) During operation in MODE 4 under SPECIAL OPERATIONS LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," the requirements of LCO 3.4.8 are suspended.
- (3) Place an "X" in the column of the pumps that are in service. To be considered as In Service, the RHR System and its associated Shutdown Cooling Subsystems must be in the Shutdown Cooling Mode alignment with RHR SD CLG FLOW LOW annunciator (2-XA-55-3D, Window 11) is reset.
- (4) [NRC/C] These parameters provide monitoring to assist in the determination of Reactor Vessel water temperature stratification. [IE Circular 81-11] Only one indication for the parameters are required to be recorded. Record <u>the Indicator used and the reading obtained in the appropriate columns</u>.
- (5) [NER/C] For thermal stratification monitoring, Reactor Drain to RWCU temperature indication is preferred when there is flow in the line. [GE SIL 251 and 430]
- (6) Differential temperatures (COL A COL B) of 50°F or greater or Reactor pressure greater than atmospheric pressure when reactor coolant temperature indications are less than 212°F indicate potential inadequate mixing and stratification of the water in the RPV. Note that Reactor pressure indications may read slightly positive due to instrument inaccuracies; however, any unexpected upward trend in pressure should be addressed. Reactor Pressure indication should be N/A'd when head is removed. With RCS temperature ≤ 100°F in Mode 4, 2-SR-3.4.9.5-7 must be initiated to monitor reactor vessel flange and head flange temperatures.

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# Attachment 4

(Page 1 of 1)

#### **Reactor Water Level Indication Correction**

The Reactor Water Level Instrumentation tables in Attachment 2 are arranged such that only instruments in the same compensation group are compared. However, determination of corrected level indication may be required during operation at off-normal conditions or if desired to compare instruments from different compensation groups.

Corrected level indication may be used for satisfying MAX DEV criteria provided the following are observed:

- The parameter correction is appropriately applied to all instruments being compared.
- Both the indicated and corrected level indications are recorded and annotated in Attachment 2 along with the bases for the corrected level indication.

Corrected level indication can be determined from the following table which provides commonly needed corrections or from Technical Instruction 2-TI-149. The following table presents Reactor Water Level as: indicated, corrected for Reactor Vessel Temperature 100°F, and corrected for Reactor Vessel Temperature 212°F for various water level instruments. Enter the indicated Rx water level and find the correct instrument column and use the closest Rx vessel temperature. (Matching corrected levels between instruments and subtracting the associated indicated levels will yield an approximate deviation value in inches between those instruments. i.e., If the Narrow Range Compensated Instrument is reading 38", the corrected level would be 32". Also, using a corrected value of 32" in the Narrow Range Uncompensated column shows the instrument should be reading 47". Therefore, a deviation of approximately 9" would be expected between the Narrow Range Compensated instrument and the Narrow Range Uncompensated instrument.)

Indicated Reactor Water Level	Narrow Range CompensatedNarrow Range Uncompensated2-LIS-3-53(60)2-LIS-3-184, (206) (253)(206) (253)185,203(A-D), 208(A-D) Level			Wide I 2-LI-3-{ 2-LIS-3 Le	Range 58A(B), -56A(D) vel	Post A 2-LR 2-LI/LI 2-LI/LIS Le	ccident -3-62 S-3-52 S-3-62A vel	Floo 2-Ll- Lev	dup 3-55 vel	Wide Range 2-LI-3-46A(B) Level		
	100°	212°	100°	212°	100°	212°	100°	212°	100°	212°		
50	40.5	42.5	34.5	36					48.5	50		
48	39	41	33	35					46.5	48		
46	37.5	39.5	31.5	33					44.5	46		
44	36	38	30	32					42.5	44		
42	35	36.5	28.5	30.5					40.5	42	No Calculated	
40	33.5	35	27	29	Note 1	Noto 2	No Cal	iculated	38.5	40	Correction Value	
38	32	34	26	27.5	NOLE 1	NOLE Z	Correcti	on Value	36.5	38		
36	30.5	32.5	24.5	26					34.5	35.5		
34	29	31	23	24.5	]				32.5	33.5		
32	28	29.5	21.5	23	]				30.5	31.5		
30	26.5	28	20	21.5		1			28.5	29.5		
28	25	26.5	19	20					26.5	27.5		

Indicates > 60" if actual Water Level is > 5".

(1) (2) Indicates > 60" if actual Water Level is > 11.5".

JPM RO A1b

OPERATOR: _____

RO DATE:

JPM NUMBER: Admin RO A1b

TASK NUMBER: Conduct of Operations

TASK TITLE: 3-SR-2

K/A NUMBER: 2.1.18 K/A RATING: RO 3.6 SRO 3.8

PRA: N/A

TASK STANDARD: Perform Operator logs in accordance with 3-SR-2 Instrument Checks and Observations for log tables 4.1 through 4.7. Verify acceptance criteria are satisfied in accordance with notes.

LOCATION OF PERFORMANCE: Unit 3 Simulator

**REFERENCES/PROCEDURES NEEDED: 3-SR-2** 

VALIDATION TIME: 20 minutes

**PERFORMANCE TIME:** 

COMMENTS: _____

Additional comment sheets attached? YES NO

**RESULTS:** SATISFACTORY UNSATISFACTORY

SIGNATURE: _____

DATE:

_____ EXAMINER

**INITIAL CONDITIONS**: You are a Unit Operator assigned to Unit 3, and it is Friday evening at 2000. 3-SR-2, Instrument Checks and Observations, is being performed.

The plant is in MODE 5.

- Vessel Head is removed
- Reactor Water Level is greater than 22 feet above the RPV Flange
- Refuel gates are removed
- Core Alterations are scheduled to start Saturday evening
- NO Tech Spec Special Operations are in progress
- Signal to Noise Ratio 3-SR-3.3.1.2.4, was last performed on dayshift Friday at 0800.

**INITIATING CUE**: The Unit Supervisor directs you as the Unit Operator to complete a portion of 3-SR-2 night shift checks and observations Attachment 3 Surveillance Procedure Data Package Mode 4 and 5 (pages 17 of 36 to 25 of 36) for Friday at 2000.

All readings that are already completed are correct and need not be checked by you.

#### Simulator

**INITIAL CONDITIONS**: You are a Unit Operator assigned to Unit 3, and it is Friday evening at 2000. 3-SR-2, Instrument Checks and Observations, is being performed.

The plant is in MODE 5.

- Vessel Head is removed
- Reactor Water Level is greater than 22 feet above the RPV Flange
- Refuel gates are removed
- Core Alterations are scheduled to start Saturday evening
- NO Tech Spec Special Operations are in progress
- Signal to Noise Ratio 3-SR-3.3.1.2.4, was last performed on dayshift Friday at 0800.

**INITIATING CUE**: The Unit Supervisor directs you as the Unit Operator to complete a portion of 3-SR-2 night shift checks and observations Attachment 3 Surveillance Procedure Data Package Mode 4 and 5 (pages 17 of 36 to 25 of 36) for Friday at 2000.

All readings that are already completed are correct and need not be checked by you.

#### START TIME_____

# 

Performance Step 1:

Critical Not Critical  $\underline{X}$ 

#### Refers to 3-SR-2, Instrument Checks and Observations, table 4.1

TABLE 4.1	IRM INST	RUMENTATION	4			NIGHT	SHIFT WE	EK:	to	·	
APPLICABILITY:		Mode 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies. OR Mode 4 when in Special Operations LCO 3.10.4 (Refer To P&L Step 3 6A)									
Surveillance Requi	rements:	3.3.1.1.1 (f1.a)									
LOCATION: Panel 3-9-5										Review	v Initials
				IRM I (ENTER 1 T No	RANGE THROUGH 10) pte 1				MAX		
	A	С	E	G	B	D	F	н	(AC)	υo	Unit Supvr
Friday											
Saturday											
Sunday									2 Ranges with		Γ
Monday									Note 1 satisfied		1
Tuesday									Note 2		1
Wednesday											1
Thursday											1

- (1) IRM's must be full in and onscale (i.e.,  $25 \le IRM$  value  $\le 75$ ) excluding downscale (i.e., IRM value  $\le 25$ ) on range 1.
- (2) During operation under SPECIAL OPERATIONS LCO 3.10.5, "Single CRD Removal Refueling," MAX DEV acceptance criteria is not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.5).

#### Standard:

Record a 1 under each IRM. Initials under UO. NA is also acceptable since the applicability is NOT met.

SAT__UNSAT___N/A ___COMMENTS:_____

JPM RO A1b

#### Performance Step 2:

#### Critical $\underline{X}$ Not Critical

#### Refers to 3-SR-2, Instrument Checks and Observations, table 4.2

TABLE 4.2	SRM	INSTRU	IMENTA	TION			N	IIGHT SH	IFT	WEEK: _		to		
APPLICABILITY	:	Mod	te 4 & 5											
		(Re	fer To P&	SL Step 3	.6A)									
Surveillance Ree	quirement	<u>s: 3.3.</u>	1.2.1.3.3	3.1.2.2.3	.3.1.2.3, 3	3.3.1.2.4, 3.3.1.2.5	&6			T	SRs: 3.	3.4.1 & 3.3.5.3		
LOCATION:		Pan	el 3-9-5										Review	w Initials
	SRM Count Rate (cps) Note 1						MAX Note 3	SRM F	System 5 atio 3-SF (Not) AT / UN5	Signal to R-3.3.1.2 le 4) SAT/ INO	Noise 4 P	All Data (Note 5)		
	TIME	Α	С	В	D	(AC)	(AC)	А	С	В	D	SAT/ UNSAT	UO	Unit Supvr
Friday	2000													T
Saturday	2000					00001010						1		1
Sunday	2000					OPERABLE	OPERABLE				1			1
Monday	2000					SRMS COUNT	SKMS COUNT							1
Tuesday	2000					and must be	c 1 E ^d cne				<u> </u>			1
Wednesday	2000					± o cps	i i c cps				1			1
Thursday	2000													1

- (1) Count Rate should be recorded with SRM's fully inserted.
- (2) LIMITS are not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant.
- (3) IRM/SRM overlap should occur before SRMs > 1 E5 cps (should occur between 1 E4 cps & 1 E5 cps). Unexpected deviations from this relationship and excessive noise spikes shall be investigated.
- (4) Signal to Noise Ratio is required to be determined by performing 3-SR-3.3.1.2.4 as follows: (SRM's will become INOP after the SR's specified Frequency has been exceeded.)
  - SAT A. MODES 4 Every 24 Hours. (This may be N/A'ed if the SR was performed SAT on the previous shift.) • Prior to going to Mode 2 or 3 from Mode 4.
    - B. MODE 5 "DURING Core Alterations" Every 12 Hours.
      - Every 24 Hours (This may be N/A'ed if the SR was performed SAT on the previous shift and
      - no Core Alterations in progress and not expected to be performed in the next 12 hours.)
      - Prior to going to Mode 2 or 3 from Mode 5.
  - INOP An SRM fails its Signal to Noise Ratio section of 3-SR-3.3.1.2.4.
- (5) The All Data UNSAT column is UNSAT, if one or more SRM's are inoperable. Refer To Tech Spec 3.3.1.2.

#### Standard:

Records less than 3 cps for SRM A and an UNSAT in the all data column due to SRM A being INOPERABLE. Records a count rate for SRM B, C and D of between 150 and 300 cps. Initials under UO. Records NA or a SAT in signal to noise ratio column for SRMs B, C, and D.

SAT__ UNSAT___ N/A ___COMMENTS:_____

CUE: Acknowledge communication that SRM A in Inoperable

Refers to 3-SR-2, Instrument Checks and Observations, table 4.3

TABLE 4.3	REACTOR WATER LEVE (COMPENSATED)	EL INSTRUMENTATION - N	ARROW RANGE NIG	HT SHIFT WEEK:	te	·	
APPLICABILITY:	Reactor Water Level in N	arrow instrument Range (R	efer To P&L Slep 3.6A)	*****			
Criteria Source:	FSAR 7.10.4			······			·······
LOCATION:	Panel 3-9-5					Revie	w Initials
Reference Leg	A	В	С	D			
	3-LI-3-53 (in.)	3-L1-3-60 (in.)	3-LI-3-206 (in.)	3-L1-3-253 (in.)	MAX DEV	UO	Unit Supvr
Friday							
Saturday							
Sunday							-
Monday					3.0 inches		
Tuesday					1		
Wednesday					1		
Thursday					1		

(1) Refer To Attachment 4 during off-normal operating conditions.

#### Standard:

Records the level reading from the above instruments, records 69 to 71 inches for each indicator. Initials under UO.

SAT___UNSAT___N/A ___COMMENTS:_____

# JPM RO A1b

#### Performance Step 4:

#### Critical $\underline{X}$ Not Critical

#### Refers to 3-SR-2, Instrument Checks and Observations, table 4.4a

TABLE 4.4.a	CO	NTROL RODS	NIGHT SHI	FT	WEEK: (	o	
APPLICABILIT	IY:	Mode 5 or Mode 4 when	n in Special Operations LCO 3.10.4 (Refer To P&L Ste	ep 3.6/	A)		
Surveillance R	equireme	nts: 3.9.3.1, 3.9.5.2, (Refere	nce 3.9.4.1)		······································		
LOCATION:		Panel 3-9-5 Full Core D ICS Control Rod Positio	isplay And/Or Four Rod Display with Applicable Contr in Indication, Local HCU Accumulator Pressure Indica	rol Roc itors (F	I Selected and/or Reactor Building Elevation 565)	Reviev	/ Initials
		COL A	COL B			1	
		Control Rod Positions	HCU Scram Accumulator Pressure ≥ 940 psig and Position Indication has no full-in indication (no Green LEDs) for each withdrawn Control Rod				
		ALL RODS FULL-IN/	(Notes 1, 2, 3)		LIMITS		
	TIME	ROD WITHDRAWN	SAT / UNSAT / N/A		(AC)	UO	Unit Supvr
Friday	2000			A	VI Rods Full-In when loading Fuel	1	
Saturday	2000			A I	Assemblies into the Core (Note 4)		
Sunday	2000			1	AND		·
Monday	2000			<b>і</b> н	ICU Scram Accumulator Pressure		
Tuesday	2000			1	≥ 940 psig		
Wednesday	2000			No	ANU Will in Indication (on Group I EDe) for		t
Thursday	2000			ea	ch withdrawn Control Rod (Note 2)		

- (1) Technical Specification LCO 3.9.5 requires a Control Rod to be OPERABLE (e.g., accumulator ≥ 940 psig) before withdrawal in Mode 5. Technical Specification SR 3.9.4.1 requires verification of the absence of full-in indication (no Green LEDs) each time a Control Rod is withdrawn from the full-in position in Mode 5. To reinforce the awareness of these requirements and provide additional verification of operability, currently this surveillance requires verification of accumulator pressure and absence of full-in indication of each withdrawn Control Rod every 12 hours. This surveillance satisfies the periodic verification of SR 3.9.5.2 (Technical Specification frequency for SR 3.9.5.2 is every 7 days). This surveillance does not satisfy SR 3.9.4.1.
- (2) Column B should be marked "N/A" when "All Rods Full-In" and during operation under SPECIAL OPERATIONS LCO 3.10.5, "Single CRD Removal - Refueling," or LCO 3.10.6, "Multiple Control Rod Withdrawal - Refueling." During operation under these SPECIAL OPERATIONS LCOs the LIMITS for Column B are not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.5 or LCO 3.10.6 as applicable).
- (3) Verification of HCU Scram Accumulator pressure shall include observation of Local HCU Accumulator Pressure Indicator.
- (4) When operating under SPECIAL OPERATIONS LCO 3.10.6, the LIMIT "All Rods Full-In when loading Fuel Assemblies into the Core" is not required to be met (alternate requirements and surveillances must be implemented in accordance with LCO 3.10.6).

#### Standard:

Column A - Records ALL RODS FULL IN and for Column – B records NA. Initials under UO.

SAT___UNSAT___N/A ___COMMENTS:_____

NOTE: Table 4.4.b is NA

Refers to 3-SR-2, Instrument Checks and Observations, table 4.5

TABLE 4.5	REAC	CTOR MODE SWITCH - REFUEL POSITION	NIGHT SHIFT	WEEK:	io	
APPLICABILITY	<i>t</i> :	Mode 5 with the Reactor Mode Switch in the Refuel Position (Refer To P&L Step 3 6A)	and any Control Rod	withdrawn OR Mode 4 when in Specia	I Operations LO	CO 3.10.4
Surveillance Re	quirement	s: 3.9.2.1	<u>.,</u>			
LOCATION:		Panel 3-9-5			Review	v Initials
	TIME	Reactor Mode Switch 3-HS-99-5A-S1 Locked in Refuel F SAT / UNSAT / N/A	Position	LIMITS (AC)	UO	Unit Supvr
Friday	2000					
Saturday	2000					
Sunday	2000					
Monday	2000		Rea	Refuel Position performed		
Tuesday	2000			SAL		T
Wednesday	2000					1
Thursday	2000					

#### Standard:

Records NA. Initials under UO. SAT is also acceptable since the Mode Switch is Locked in the Refuel position.

SAT__ UNSAT__ N/A ___COMMENTS:_____

# JPM RO A1b

Performance Step 6:

Critical  $\underline{X}$  Not Critical

Refers to 3-SR-2, Instrument Checks and Observations, table 4.6

TABLE 4.6	REACTOR CO	OLANT CONDUCTIVITY	NIGHT SHIFT WEEK: to		
APPLICABILITY:	Modes 4 & 5 (R	Refer To P&L Step 3.6A)			
Criteria Source:	Technical Requ	irements Manual TSR-3.4,1,1			
LOCATION:	Panel 3-9-4			Revie	w Initials
	TIME	3-CR-43-11A/12A Ch 1 (Note 1) (µmho)	MAX (AC)	UQ	Unit Supvr
Friday	2000				
	0200				1
Saturday	2000				-
	0200				1
Sunday	2000				1
	0200		Prior To Startup and at Steaming Rates < 100,000 lb/hr:		1
Monday	2000		2.0 µmho		1
	0200		Reactor not Pressurized With Fuel In Reactor Vessel, Except		1
Tuesday	2000		Less than or equal to 10.0 µmho		
	0200				
Wednesday	2000				
	0200				
Thursday	2000				1
	0200				

(1) Whenever there is fuel in the reactor vessel and the continuous conductivity monitor is inoperable, periodic analysis of reactor coolant samples are required by the Technical Requirements Manual. If the reactor coolant continuous conductivity monitor becomes inoperable, notify Chemistry to sample according to 3-SI-4.6.B.1-4.

Standard:

Records Reactor Coolant Conductivity reading of between 4 and 6 µmho. Initials under UO.

SAT__ UNSAT__ N/A ___COMMENTS:_____

#### Refers to 3-SR-2, Instrument Checks and Observations, table 4.7 part 1

TABLE 4.7 part 1	RHR SHUTD OPERATION	OWN COOLING S	SUBSYSTEM AND	RECIRCULATION	PUMP I	NGHT SHIFT	WEEK:		to	
APPLICABILITY:	Ma	odes 4 & 5 (Notes	1, 2) (Refer To P8	L Step 3.6A)						
Surveillance Requ	rements: 3.4	1.6.1. 3.9.7.1, and	3.9.8,1							
LOCATION:		Pane	13-9-4	1	Pane	13-9-3		RECHIREMENTS	Review	v Initials
		Recirc   (No	(Note 3) (Note 3)			Initials (Note 1)		1		
DAY	TIME	A	B	A	8	C	D	(AC)	uo	Unit Supyr
Friday	2000						1			
Saturday	2000					1	1			-
Sunday	2000		Γ			I	1			1
Monday	2000		1			1	1			1
Tuesday	2000		[	1			1			
Wednesday	2000		[			1	1			t
Thursday	2000									

The following notes for RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION are from the previous page:

- (1) Initials signify that the requirements listed below, for the unit conditions are met.
  - A. In mode 4, LCO 3.4.8 requires two RHR Shutdown Cooling Subsystems be operable, and with NO Recirc pump in operation, at least One RHR Shutdown Cooling Subsystem SHALL be in operation. SR-3.4.8.1 requires verifying one required RHR Shutdown Cooling Subsystem OR Recirc pump is operating.
  - B. In mode 5, with water level ≥ 22 feet above the top of the RPV flange, LCO 3.9.7 requires One RHR Shutdown Cooling Subsystem to be operable and in operation. SR-3.9.7.1 requires verifying one RHR Shutdown Cooling Subsystem is operating.
  - C. In mode 5, with water level < 22 feet above the top of the RPV flange, LCO 3.9.8 requires two RHR Shutdown Cooling Subsystems to be operable and One RHR Shutdown Cooling Subsystem in operation. SR-3.9.8.1 requires verifying one RHR Shutdown Cooling Subsystem is operating.
  - D. In the event the requirements stated above cannot be met, verify the appropriate LCO Action Statement is entered and documented by recording hourly Reactor Coolant Temperature And Pressure in the narrative log.
- (2) During operation in MODE 4 under SPECIAL OPERATIONS LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," the requirements of LCO 3.4.8 are suspended.
- (3) Place an "X" in the column of the pumps that are in service. To be considered as In Service, the RHR System and its associated Shutdown Cooling Subsystems must be in the Shutdown Cooling Mode alignment with RHR SD CLG FLOW LOW annunciator (3-XA-55-3D, Window 11) is reset.

#### Standard:

Determines that running RHR Pump is NOT considered in service due to RHR SD CLG FLOW LOW alarm in and flow less than 3700 gpm. Does NOT initial under Requirements (note 1). Initials under UO.

SAT__ UNSAT__ N/A ___COMMENTS:_____

CUE: Acknowledge communication that acceptance criteria is NOT met due to Low Flow on Shutdown Cooling.

#### Performance Step 8:

#### Critical Not Critical $\underline{X}$

#### Refers to 3-SR-2, Instrument Checks and Observations, table 4.7 part 2

TABLE 4.7 part 2

LOCATION:			Panel 3-9-4	7; 3-TR-56-4		1	Panel	3-9-5		
		COL	. A	CC	XL B	COL C				
		Rx Dr to RWCU 3-TE-56-8 OR Rx Bottom Head 3-TE-56-29		FW Nozzle Temp 3-TE-56-13 3-TE-56-14 3-TE-56-15 3-TE-56-16		(COL A-COL B)	Rx Pressure (psig) 3-PI-3-54 OR 3-PI-3-61			
		(Notes 4 & 5)		(Note 4)		(Note 6)	(Notes 4 & 6)		Review initials	
DAY	TIME	Instrument used	۰F	instrument used	۶F		Instrument used	PSIG	υο	Unit Supyr
Friday	2000				1					
Saturday	2000				1	[	1			
Sunday	2000				1	1				1
Monday	2000				T	1	1			1
Tuesday	2000				T	1				1
Wednesday	2000				1					1
Thursday	2000									1

The following notes for RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION are from the previous page:

- (4) [NRC/C] These parameters provide monitoring to assist in the determination of Reactor Vessel water temperature stratification. [IE Circular 81-11] Only one indication for the parameters are required to be recorded. Record the Indicator used and the reading obtained in the appropriate columns.
- (5) [NER/C] For thermal stratification monitoring, Reactor Drain to RWCU temperature indication is preferred when there is flow in the line. [GE SIL 251 and 430]
- (6) Differential temperatures (COL A COL B) of 50°F or greater or Reactor pressure greater than atmospheric pressure when reactor coolant temperature indications are less than 212°F indicate potential inadequate mixing and stratification of the water in the RPV. Note that Reactor pressure indications may read slightly positive due to instrument inaccuracies; however, any unexpected upward trend in pressure should be addressed. Reactor Pressure indication should be N/A'd when head is removed. With RCS temperature ≤ 100°F in Mode 4, 3-SR-3.4.9.5-7 must be initiated to monitor reactor vessel flange and head flange temperatures.

#### Standard:

In Column C records differential temperature of 10.9 °F. Initials under UO. Reactor Pressure reading with head removed should record NA, may record 0 psig.

SAT__ UNSAT__ N/A ___COMMENTS:_____

Examiner NOTE: Examiners gather applicant SR-2 package and keep for review

END OF TASK

STOP TIME ____

	JPM SRO Ala
OPERATOR:	
SRO	DATE:
JPM NUMBER:	SRO Ala
TASK NUMBER:	Conduct of Operations
TASK TITLE:	Work Hour Limitations
K/A NUMBER: 2.1.5	K/A RATING: SRO 3.9
TASK STANDARD:	Determine Work Hour limitations were exceeded and determine actions required due to violations of fatigue rule NPG-SPP 3.21.
LOCATION OF PERI	FORMANCE: Class Room
REFERENCES/PROC	CEDURES NEEDED: NPG-SPP 3.21, Technical Specifications
VALIDATION TIME	: 30 minutes
PERFORMANCE TIM	ME:
COMMENTS:	
Additional comment s	heets attached? YES NO
RESULTS: SATIS	FACTORY UNSATISFACTORY
SIGNATURE:	EXAMINER DATE:

#### **INITIAL CONDITIONS**: You are a Senior Reactor Operator

#### **INITIATING CUES:**

Given two different work hour schedules of Reactor Operators, review hours worked and identify the date /time at which compliance with the Fatigue Rules was violated and which fatigue rule guideline(s) was(were) violated.

Identify ALL required actions for any violations of fatigue rules.

### Assume NO work prior to April 7th

**Assume Minimum Shift Staffing** 

#### **Class Room**

#### **INITIAL CONDITIONS:** You are a Senior Reactor Operator

#### **INITIATING CUES**:

Given two different work hour schedules of Reactor Operators, review hours worked and identify the date /time at which compliance with the Fatigue Rules was violated and which fatigue rule guideline(s) was(were) violated.

Identify ALL required actions for any violations of fatigue rules.

Assume NO work prior to April 7th

Assume Minimum Shift Staffing

#### START TIME

### 3.2.1 10 Code of Federal Regulations (CFR) 26 Overtime Limits [R.21]

A. The following limits apply to covered individuals regardless of unit status [R22, 23]:

- 1. No more than 16 work hours in any 24 hour period
- 2. No more than 26 work hours in any 48 hour period
- 3. No more than 72 work hours in any 7 day period
- 4. At least a 10 hour break between successive work periods.
- 5. A continuous break of at least 34 hours in any 9 day period.

#### Standard:

Evaluates Schedules and determines RO1 is NOT in compliance with Fatigue Rule. RO 1 exceeded 72 work hours in any 7 day period. RO1 is not in compliance with this part of the fatigue rule at 1500 on 4/20.

SAT__ UNSAT___ N/A ___COMMENTS:_____

#### 

Performance Step 2:

Critical  $\underline{X}$  Not Critical

C. Outage Requirements [R.25]

1. While working on an outage unit, and without issuance of a waiver, an individual's required days off shall adhere to the requirements listed in Table 2 below (not an average):

Table 2. Required Minimum Days Off (MDO) for Outages									
Group	8 Hour Shift Days Off	10 Hour Shift Days Off	12 Hour Shift Days Off						
Maintenance	1 day off per week	1 day off per week	1 day off per week						
Operations, Radiation Protection, Chemistry, Fire Brigade (Incident Commander)	3 days off in each successive (i.e., non-rolling) 15 day period	3 days off in each successive (i.e., non-rolling) 15 day period	3 days off in each successive (i.e., non-rolling) 15 day period						

Standard:

Evaluates Schedules and determines RO1 is NOT in compliance with Fatigue Rule. Evaluates Schedule and determines that RO1 did NOT meet 3 days off in a 15 day period. The date and time that the RO1 was not in compliance with the fatigue rule was 0700 on 4/20. When RO1 arrived for work on 4/20.

SAT__ UNSAT___ N/A ___COMMENTS:_____

# 

Performance Step 3:

Critical X Not Critical

If you are NOT in compliance with the work hour limit guidelines designate what guidelines you are NOT on compliance with?

Standard:

Determines that they are NOT in compliance with NPG-SPP-03.21 Step 3.21 A and C OR 10CFR26 Overtime Limits R.22, 23 and R.25.

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 4:

Critical  $\underline{X}$  Not Critical

#### 3.1.2 Individual

9. Notifying the appropriate Department Nuclear Fatigue Rule (NFR) Administrator, appropriate Department Head, and Site NFR Subject Matter Expert in the event that a violation has occurred or appears to have occurred.

Standard:

Identifies that Operations Department Nuclear Fatigue Rule (NFR) Administrator, Operations Manager and Site NFR Subject Matter Expert must be notified.

SAT__ UNSAT__ N/A ___COMMENTS:_____

#### 

Performance Step 5:

Critical  $\underline{X}$  Not Critical

#### 3.2.3 Work Hour Scheduling [R.3]

F. Deviations from 10 CFR 26 overtime limits may occur as the result of administrative errors or unforeseen circumstances. A problem evaluation report (PER) shall be generated, in accordance with NPG-SPP-03.1, Corrective Action Program for each individual when this occurs.

#### Standard:

Identifies that a problem evaluation report is required.

SAT__ UNSAT__ N/A ___COMMENTS:_____

CUE: Can the RO be credited towards the minimum shift staffing? What actions are required?

#### 

Performance Step 6:

Critical  $\underline{X}$  Not Critical

5.2.2 Unit Staff

The unit staff organization shall include the following:

b. Shift crew composition may be less than the minimum requirement of 10 CFR 50.54(m)(2)(i) and Specifications 5.2.2.a and 5.2.2.f for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements.

#### Standard:

RO 1 **cannot** be credited toward minimum shift staffing. Identifies that RO1 must be replaced and the SRO has 2 hours to fill the position.

SAT___UNSAT___N/A ___COMMENTS:_____

END OF TASK

STOP TIME ____

Work Schedule ONE for Reactor Operator 1.

Reactor Operator on Unit 2 for the outage. Unit 2 is in day 22 of a scheduled 45 day refueling outage that commenced on April 7th.

Unit 1 and 3 are operating at 100%.

Below is the work schedule for Reactor Operator 1.

Sun	Mon	Tues	Wed	Thu	Fri	Sat
4/7	4/8	4/9	4/10	4/11	4/12	4/13
0700-1900	0700-1900	0700-1900	0700-1900	0700-1900	0700-1900	) Off
Sun	Mon	Tues	Wed	Thu	Fri	*Sat
4/14	4/15	4/16	4/17	4/18	4/19	4/20
0700-1900	0700-1900	0700-1900	0700-1900	0700-1500	0700-1500	0700-1900
Sun	Mon	Tues	Wed	Thu	Fri	Sat
4/21	4/22	4/23	4/24	4/25	4/26	4/27
Off	0700-1900	0700-1900	0700-1900	0700-1900	0700-1900	0700-1900

*4/20 was a scheduled OFF day, but the RO was called in to be a Board operator on Unit 2.

Work Schedule TWO Reactor Operator 2

Reactor Operator on Unit 2. All three units are operating at 100%.

Below is the work schedule for Reactor Operator 2.

Sun	Mon	Tues	Wed	Thu	Fri	*Sat
4/7	4/8	4/9	4/10	4/11	4/12	4/13
Off	0700-1700	0700-1700	0700-1700	0700-1700	Off	0700-1900
*Sun	Mon	Tues	Wed	Thu	Fri	Sat
4/14	4/15	4/16	4/17	4/18	4/19	4/20
0700-1900	0700-1900	0700-1900	0700-1900	0700-190	00 Off	Off
Sun	Mon	Tues	Wed	Thu	Fri	Sat
4/21	4/22	4/23	4/24	4/25	4/26	4/27
Off	Off	Off	Off	Off	1900-0700	1900-0700

Week of 4/8 to 4/11 you attended Requal Training

*4/13 and 4/14 were scheduled OFF days, but the RO was called in to be a Desk operator on Unit 1.

OPERATOR:					
SRO	DATE:				
JPM NUMBER:	A1b				
TASK NUMBER:	U-068-SU-05				
TASK TITLE:	2-SR-3.4.2.1	Jet Pump Mismat	ch and O	perability	
K/A NUMBER:	2.1.7	K/A RATING:	RO 4.4	SRO 4.7	
TASK STANDARD: Complete a surveillance requirement on Reactor Recirculation System Je Pump Mismatch and Operability, determines that an Engineering review required and determines that the Acceptance Criteria is NOT met. Determines Tech Spec actions based on failure of 2-SR-3.4.2.1.				Reactor Recirculation System Jet nines that an Engineering review is ance Criteria is NOT met. failure of 2-SR-3.4.2.1.	
PERFORMANCE LOCATION: Unit 2 Simulator					
REFERENCES/PRO	CEDURES NI	EEDED: 2-SR-3.4	4.2.1		
VALIDATION TIME: 25 minutes					
PERFORMANCE TIME:					
COMMENTS:					
Additional comment	sheets attached	? YES NO _			
RESULTS: SATISFACTORY UNSATISFACTORY					
SIGNATURE:	EXAMINER	]	DATE:		

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**INITIAL CONDITIONS:** You are a Unit 2 Operator. Unit 2 is operating near 100% power with core near middle of life.

#### ICS is NOT Available.

2-SR-3.4.2.1, Jet Pump Mismatch and Operability, is in progress and complete up to Step 7.2.

#### **INITIATING CUE:**

The Unit Supervisor directs you to complete 2-SR-3.4.2.1 starting at step 7.2 and inform him of the results and identify required actions, if any based on results.

Provide a copy of 2-SR-3.4.2.1 completed up to step 7.2

#### START TIME _____

******

#### Performance Step 1:

*Critical X Not Critical

#### 7.2 Data Collections

#### 7.2.1 Core Power and Flow Readings

- [1] **RECORD** the Core thermal power from Core Power and Flow Log. (N/A if ICS is not available) Point CALC002 _____ CMWT
- *[2] **RECORD** the Core plate differential pressure from ICS point 68-52 or 2-XR-68-50 (Green Pen). (N/A if not available).

Core Press Drop 68-52 _____ PSID

*[3] **RECORD** the Total Core flow.

Total Core Flow 2-XR-68-50 (Red Pen) _____ Mlb/hr

#### Standard:

Records the following: Core Thermal Power NA ICS is NOT Available. Core plate differential pressure 14 psid, Total Core Flow 83.8 Mlb/hr.

SAT__ UNSAT__ N/A __COMMENTS:_____

#### **EXAMINER NOTE: Do NOT allow applicant to use ICS**

#### NOTES

- 1) If a Recirculation Pump is not in service then the associated instrumentations can be marked as N/A.
- 2) Use the 1-SI-96-61 (or ICS PT 96-61) if both 1-SI-68-59 and 1-SIT-68-59 are not available for the 1A Pump Motor and log the reason in post test Remarks.
- 3) Use the 1-SI-96-73 (or ICS PT 96-73) if both 1-SI-68-71 and 1-SIT-68-71 are not available for the 1B Pump Motor and log the reason in post test Remarks.

#### 7.2.2 Recirculation Pump Loops

[1] **RECORD** the Recirc Pump 2A and 2B Mtr Speeds for operating Recirc Pumps and **MARK** instrumentation used.

Pump Mtr 2A	Pump Mtr 2B
2-SI-68-59	2-SI-68-71
2-SIT-068-0059	2-SIT-068-0071
2-SI-96-61	2-SI-96-73
RPM	RPM

[2] **RECORD** the Recirc Pump Discharge flows.

Loop 2A	Loop 2B
2-FI-68-5	2-FI-68-81
gpm X 1000	gpm X 1000

[3] **RECORD** the Recirc loop 2A and 2B Jet Pump Flow.

Loop 2A	Loop 2B
2-FI-68-46	2-FI-68-48
Mlb/hr	Mlb/hr

#### Standard:

Record the following: Motor Speed 2A 1298 rpm if 68-59 is used and 1295 to 1299 if 96-61 is used. Motor Speed 2B 1230 rpm if 68-71 is used and 1227 to 1231 if 96-73 is used. Discharge flow for Loop 2A from 68-5 is 41.5 gpm with a band of 41 to 42 gpm and for Loop 2B from 68-81 is 38 gpm. Jet Pump Flow for Loop 2A from 68-46 is 44.5 Mlb/hr with a band of 44 to 45 and for Loop 2B from 68-48 is 40 Mlb/hr.

SAT__UNSAT__N/A __COMMENTS:_____

### NOTE

If a Recirculation Pump is not in service then the associated instrumentations can be marked as N/A.

#### 

#### Performance Step 3:

Critical X Not Critical

#### 7.2.3 Jet Pump Loops

Loop 1A		Loop 1B			
INSTRUMENT	JET PUMP	PSID	INSTRUMENT	JET PUMP	PSID
2-PDI-68-38	11		2-PDI-68-15	1	
2-PDI-68-39	12		2-PDI-68-18	2	
2-PDI-68-40	13		2-PDI-68-19	3	
2-PDI-68-42	14		2-PDI-68-21	4	
2-PDI-68-43	15		2-PDI-68-22	5	
2-PDI-68-07	16		2-PDI-68-25	6	
2-PDI-68-08	17		2-PDI-68-26	7	
2-PDI-68-10	18		2-PDI-68-28	8	
2-PDI-68-11	19		2-PDI-68-29	9	
2-PDI-68-13	20		2-PDI-68-30	10	

[1] **RECORD** the following Differential Pressure readings below:

#### Standard:

Records Jet Pump Differential Pressure readings: Jet Pumps 11 - 8.5 to 9, 12 - 8.5 to 9, 13 - 8.5 to 9, 14 - 9 to 9.25, 15 - 8.5 to 9, 16 - 9, 17 - 9.5 to 10, 18 - 8.5 to 9, 19 - 8.5 to 9, 20 - 9.5 to 10.

Jet Pumps 1 – 7 to 7.5, 2 – 7.5 to 8, 3 – 7 to 7.5, 4 – 7-7.5, 5 – 7 to 7.5, 6 – 7 to 7.5, 7 – 7 to 7.5, 8 - 7.5 to 8, 9 – 7.5, and 10 – 7 to 7.5.

SAT__UNSAT__N/A __COMMENTS:_____

#### NOTES

- 1) Section 7.3 is performed when both Recirculation Pumps are in service. This section should be N/A'ed when in Single Loop Operation.
- 2) To satisfy procedure Acceptance Criteria, either Step 7.3[3] or Step 7.3[4] must be satisfied.

Performance Step 4:

Critical  $\underline{X}$  Not Critical

#### 7.3 Tech Spec 3.4.1.1 - Recirculation Loop Mismatch Verification With Both Recirculation Loops In Operation Checks

[1] **CALCULATE** percent of rated core flow (%WT) using data obtained in Section 7.2.1[3] as follows

(Step 7.2.1[3] ÷102.5) X 100=	% Core Flow
(÷102.5) X 100 =	

[2] **CALCULATE** the absolute value for Recirculation Loop Jet Mismatch using data obtained in Section 7.2.2[3] as follows.

```
2-FI-68-46 - 2-FI-68-48 = Mismatch
```

Mlb/hr - Mlb/hr = Mlb/hr

#### Standard:

Calculates a Core Flow % of >70% (81 to 82%) and calculates a core flow mismatch of 4.5 Mlb/hr with a band from 4.0 to 5.0.

SAT__UNSAT__N/A __COMMENTS:_____

******

Performance Step 5:

Critical  $\underline{X}$  Not Critical

[3] IF %WT is < 70% as recorded in Step 7.3[1], THEN

**VERIFY** Recirculation Loop Jet Pump Flow Mismatch recorded in Step 7.3[2] is  $\leq 10.25$  Mlb/hr. (Otherwise N/A) (AC)

[4] IF %WT is  $\geq$  70% as recorded in Step 7.3[1], THEN

**VERIFY** Recirculation Loop Jet Pump Flow Mismatch recorded in Step 7.3[2] is  $\leq 5.12$  Mlb/hr. (Otherwise N/A) ____(AC)

### Standard:

Marks Step [3] N/A due to > 70% AND Initials steps [4] mismatch is less than 5.12 Mlb/hr.

SAT___UNSAT___N/A ___COMMENTS:_____

### NOTES

- 1) Jet Pump Operability is not required to be performed until 4 hours after associated recirculation loop is in operation and then only within 24 hours after RTP is > 25%.
- 2) If a Recirculation Pump is not in service, then the associated steps can be marked as NO.
- 3) If Data falls on or outside the bold lines on the graph, then the step can be marked as NO.
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Performance Step 6:

Critical  $\underline{X}$  Not Critical

- 7.4 Tech Spec 3.4.2.1 Part A Jet Pump Performance Checks
- 7.4.1 Loop 2A Recirculation Pump and Jet Pump Flow to Recirculation Pump Speed
  - [1] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2A Pump Flow recorded in Step 7.2.2[2]:

**CHECK** that the plot falls between the two bold lines on Illustration 1 and **RECORD** below.

Plot falls between	the bold lines	Yes	X	No	

[2] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2A Jet Pump Flow in Step 7.2.2[3]:

**CHECK** that the plot falls between the two bold lines on Illustration 2 and **RECORD** below.

Plot falls between the bold lines Yes $X$ No $\Box$
-----------------------------------------------------

[3] Using Steps 7.4.1[1] and 7.4.1[2] from above:

**DETERMINE** if the Jet Pump Loop 2A criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Loop 2A criteria is satisfied Yes X No  $\Box$ 

# Standard:

Marks Steps [1] **YES** for a pump speed of 1298 the illustration 1 band at this point is 37.5 to 42.5, the applicant should have a flow of 41.5 within a band of 41 to 42, [2] **YES** for a pump speed of 1298 the illustration 2 band at this point is 42 to 46, the applicant should have a flow of 44.5 within a band of 44 to 45, and [3] **YES** after Checking the plot does fall between the bold lines on Illustration 1 and 2 for step 7.4.1[1 and 2].

SAT__UNSAT__N/A __COMMENTS:_____

************

Performance Step 7:

Critical  $\underline{X}$  Not Critical

- 7.4.2 Loop 2B Recirculation Pump and Jet Pump Flow to Recirculation Pump Speed
  - [1] Using the 2B Pump Speed recorded in Step 7.2.2[1] and 2B Pump Flow recorded in Step 7.2.2[2]:

**CHECK** that the plot falls between the two bold lines on Illustration 3 and **RECORD** below.

Plot falls between the bold lines	Yes	X	No		

[2] Using the 2B Pump Speed recorded in Step 7.2.2[1] and 2B Jet Pump Flow recorded in Step 7.2.2[3]:

**CHECK** that the plot falls between the two bold lines on Illustration 4 and **RECORD** below.

Plot falls between the bold lines Y	es		No	X
-------------------------------------	----	--	----	---

[3] Using Steps 7.4.2[1] and 7.4.2[2] from above:

**DETERMINE** if the Jet Pump Loop 2B criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Loop 2B criteria is satisfied Yes  $\Box$  No X

# Standard:

Marks Steps [1] **YES** for a pump speed of 1230 the illustration 3 band at this point is 35 to 39, the applicant should have a flow of 38, [2] **NO** for a pump speed of 1230 the illustration 4 band at this point is 40.5 to 44.5, the applicant should have a flow of 40, and [3] **NO** after Checking the plot does NOT fall between the bold lines on Illustration 4 for step 7.4.2[2].

SAT__UNSAT__N/A __COMMENTS:_____

******

Performance Step 8:

Critical  $\underline{X}$  Not Critical

# 7.4.3 Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification:

[1] Using the individual 2A Jet Pump DP's recorded in Step 7.2.3[1]

**CHECK** that each individual Jet Pump DP recorded fall between the two bold lines on Illustration 5 for the recorded Total Flow in step 7.2.1[3] and **RECORD** results below.

2A Individual DP's are between<br/>the bold lines.Yes□NoX

[2] Using the individual 2B Jet Pump DP's recorded in Step 7.2.3[1]

**CHECK** that each individual Jet Pump DP recorded fall between the two bold lines on Illustration 6 for the recorded Total Flow in step 7.2.1[3] and **RECORD** results below.

2B Individual DP's are between	ı				
the bold lines.	Yes	X	No		

[3] Using Steps 7.4.3[1] and 7.4.3[2]

**DETERMINE** whether the Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Diffuser to Lower				
Plenum Differential Pressure				
Verification criteria is satisfied	Yes	No	Χ	

# Standard:

Marks Steps [1] **NO** for a core flow of 83.8 Mlb/hr the illustration 5 band for 2A Jet Pump DP at this point is approximately 6.25 to 9.25, Jet Pumps 17 and 20 should have a DP of between 9.5 and 10. [2] **YES** for a core flow of 83.8 Mlb/hr the illustration 6 band for 2B jet Pump DP at this point is approximately 6.25 to 9.25 all Jet Pumps fall between this band, and [3] **NO** after VERIFING DP is **NOT** between the two lines on Illustration 5 for step 7.4.3[1] and VERIFING DP is between the two lines on Illustration 6 for step 7.4.3[2].

SAT___UNSAT___N/A ___COMMENTS:__

# CAUTION

An Engineering Judgment/Review may only be utilized until relationships between core flow, jet pump flow, and Recirculation loop flow have been established following a refueling outage or during the initial weeks of extended single loop operation. Engineering judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure. (Reference SR 3.4.2.1 bases)

***************************************
-----------------------------------------

Performance Step 9:

Critical  $\underline{X}$  Not Critical

# 7.4.4 Engineering Judgement/Review Criteria

- [1] **IF** any of the following conditions apply:
  - Following Refueling Outage. (See Caution above)

OR

• The Reactor is in Single Loop Operation (See Caution above)

OR

• If point(s) plotted in sections 7.4.1, 7.4.2 and 7.4.3 fall outside the bolded lines, to determine if the graphs need updating, **THEN** 

**PERFORM** Attachment 1, Engineering Judgment/Review: (Otherwise N/A if not required.)

# Standard:

Both recirc loops are I/S but Steps 7.4.2[3] and 7.4.3[3] do not fall within the lines on the graphs, this Step shall be **initialed** and Attachment 1 completed.

SAT__ UNSAT__ N/A __COMMENTS:_____

#### CUE:

IF Applicant requests an Engineering Judgment Review / Evaluation ASK applicant why Review is being requested.

To verify applicant has identified Jet Pump 17 and 20 problems by checking step 7.4.3[3] as NO and by checking 7.4.2[3] as NO

#### 

Performance Step 10:

Critical  $\underline{X}$  Not Critical

# Attachment 1

Engineering Judgement/Review

	Date:
	CAUTIONS
1)	Engineering Judgment Evaluation may only be utilized until relationships between Core Flow, Jet Pump Flow, and Recirculation Loop Flow have been established:
	<ul> <li>During the initial weeks of extended Single Loop Operation</li> </ul>
	• Following a Refueling Outage until Engineering has provided or determined that the current graphs are good. (At least one evaluation must be performed following a Refueling Outage.)
2)	Engineering Judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a Jet Pump failure. (Reference SR 3.4.2.1 bases)
	[1] Mark the condition that applies:

Following Refueling Outage.	
The Reactor is in Single Loop Operation	
Point(s) plotted in sections 7.4.1, or 7.4.2 or 7.4.3	
fall outside the bolded lines	

[2] **REQUEST** System Engineering to perform an Engineering Judgement/Review.

# Standard:

Marks third box for step [1] and initials and initials step [2].

SAT__ UNSAT__ N/A ___COMMENTS:_____

CUE:

When Applicant has correctly identified the reason for Engineering Review provide applicant the statement BELOW.

State that the "Engineering Evaluation has determined that Jet Pumps 17 and 20 do not meet acceptance criteria".

******

Performance Step 11:

Critical  $\underline{X}$  Not Critical

# 7.4.5 Operability Determination

[1] **MARK** the appropriate criteria results for the following. (N/A any criteria not performed.)

Steps	Criteria Results	Yes	No	N/A
7.4.1[3] and 7.4.2[3]	Both Jet Pump Loops steps are marked as YES			
7.4.3[3]	Jet Pump DP to criteria is marked as YES.			
Attachment 1	Engineering Evaluation is marked as YES.			

# Standard:

Marks 7.4.1[3] and 7.4.2[3] NO, 7.4.3[3] NO and ATT 1 NO (after Operator is given completed attachment 2).

SAT__ UNSAT___ N/A ___COMMENTS:_____

*************

Performance Step 12:

Critical X Not Critical

[2] Using the Criteria Results in Step 7.4.5[1]

**VERIFY** at least one Criteria Results is satisfied and marked as YES.

# Standard:

Does NOT Initial for acceptance criteria.

SAT___UNSAT___N/A ___COMMENTS:_____

******

Performance Step 13:

*Critical  $\underline{X}$  Not Critical

# 7.5 Completion and Notifications

[1] **IF** an Engineering Judgment/Review was performed, **THEN** 

**VERIFY** the Engineering Judgment/Review documentation is attached to this SR. (Otherwise N/A)

- [2] On the Surveillance Task Sheet (STS),
  - [2.1] **RECORD** the Completion Date & Time.
  - [2.2] REVIEW and COMPLETE the Surveillance Task Sheet (STS) through the Test Director/Lead Perform & Date fields.
- [3] **NOTIFY** the Unit Supervisor that this test is complete.

Standard:

Marks the STS sheet:

*1) Were all Tech Spec acceptance criteria satisfied? NO

2) Were all other acceptance criteria satisfied? NA

*3) If all Tech Spec were not satisfied, was an LCO action required? YES

SAT___UNSAT____N/A ___COMMENTS:_____

*********

Performance Step 14:

Critical  $\underline{X}$  Not Critical

# LCO Action

# NOTE

If either condition in Step 6.0C.1, 6.0C.2 or 6.0C.3 exists, the Tech Spec Acceptance Criteria would be satisfied. However, failure of either Step 6.0C.1 or 6.0C.2 of the criteria may be an indication of Jet Pump degradation and shall be immediately reported to the Unit Supervisor.

- C. Jet Pump operation shall be checked by verifying that at least one of the following criteria (Step 6.0C.1 or 6.0C.2) is satisfied for each of the operating Recirculation Loops:
  - 1. Recirculation Pump flow to speed ratio differs by  $\leq 5\%$  from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by  $\leq 5\%$  from established patterns.
  - 2. Each Jet Pump diffuser to lower plenum differential pressure differs by  $\leq 20\%$  from established patterns.
- 3.4.2 Jet Pumps
- LCO 3.4.2 All jet pumps shall be OPERABLE.
- APPLICABILITY: MODES 1 and 2.

CONDITION	Required Action	COMPLETION TIME
A. One or more jet pumps inoperable	A.1 Be in Mode 3	12 hours

Standard:

Determines Jet Pumps 17 and 20 are inoperable and Unit 2 must be in Mode 3 in 12 hours.

SAT___UNSAT___N/A ___COMMENTS:_____

CUE: That completes this task.

# **END OF TASK**

STOP TIME: _____

**INITIAL CONDITIONS:** You are a Unit 2 Operator. Unit 2 is operating near 100% power with core near middle of life.

# ICS is NOT Available.

2-SR-3.4.2.1, Jet Pump Mismatch and Operability, is in progress and complete up to Step 7.2.

# **INITIATING CUE:**

The Unit Supervisor directs you to complete 2-SR-3.4.2.1 starting at step 7.2 and inform him of the results and identify required actions, if any based on results.

		W	ork Order	#: 114084884	
PM#: P2383					
Procedure: 2-SR-3. Title: 2-SR-3.4.2.1 - JE	4.2.1 T PUMP MISMATCH &	OPERABILI	TY	Authorization to Begin: SRO	T つDA Date & Time
Data Sheets Attached:					
Perf Grp: OPS Test Reason: Periodic	Unit: 2	Loop/Di	<b>v: /NA</b>	<u></u>	Completion Date & Tim
Due Date: 06/05/13					
Frequency: 1 DAYS	Tech Spec: Y	ASME >	<b>(</b> ]:	Maximo dates verified: SI	Date & Time
Applicable Modes: Clearance Required: N Dry-Cask Storage: N	Pei I EQ: I	LCO E	Entered: N	Coordinator	
Performed By: Print Name	Signature	Initial	Section	Was this a Complete or Partial Performance	)? omolete [] Partia
DPERATOR	Opento	OP	OPS		
				<ul> <li>Were all Tech Spec/Tech Req/ISFSI/CoC/OD</li> <li>AMSAC* acceptance criteria satisfied?</li> </ul>	CM/Fire Prot req/ Yes [] No [] N/A
				Were all other acceptance criteria satisifed?	Yes [] No [] N/A
				If all Tech Spec/Tech Req/ISFSI/CoC/ODCM criteria were not satisfied, was as LCO/ODC (Explain in REMARKS below)	/Fire Prot req/AMSAC* CM action required? Yes [] No [] N/#
				Alert Work Contol Required?	Yes [] No [] N/A
				*PWR only.	
Subsequent Reviews: Group:	<u>Signatu</u>	ire .	Date	Copy of STS sent to Work Control AND SI Coordinator (next Bus. Day)	/ Initials Date
INC				Test Director/Lead Performer	Date
				-	
				Acceptance Criteria Review: SRO	Date & Time
PERMANENT COMMEN	TS:				
Remarks: NOT REQD UI	NTIL 24 HRS AFTER B	OTH RECIR	C LOOPS ARE	Independent Reviewer	Date & Time
Applicability Notes:MODI	ES 1 & 2			REMARKS:	
Frequency Notes: ONCE NOT REQ'D UNTIL 4 HR OPERATION	PER 24 HRS SAFTER ASSOCIATE: AFTER > 25% RTP -	D RECIRC L	-OOP IN		
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
				_	





Browns Ferry Nuclear Plant

Unit 2

Surveillance Procedure

# 2-SR-3.4.2.1

# Jet Pump Mismatch and Operability

**Revision 0035** 

**Quality Related** 

Level of Use: Continuous Use

Level of Use or Other Information: Key Number P2383

Effective Date: 02-12-2013 Responsible Organization: OPS, Operations Prepared By: Charles D. Patrick Approved By: Jeffery D. Morrison

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# **Current Revision Description**

Type of Change: Enhancement

Tracking Number: 036

PCR's 13000445

Documentation None

# PCR-12001467:

Changed Illustrations 1 through 6 to reflect current system flow characteristics based on System Engineering information. The Illustrations are typically updated every 8 months. Changed the "Good Thru Date" to 10-13-2013.

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#### 1.0 INTRODUCTION

#### 1.1 Purpose

- This pump operability test is performed to verify recirculation loop jet pump flow mismatch for the Recirculation loops which are in service in conformance with the requirements specified in Technical Specification 3.4.1.1 for dual Recirculation loop operation.
- Also this test will determine the integrity of the jet pumps of the Reactor Recirculation System in conformance with the requirements specified in Technical Specifications 3.4.2.1.

# 1.2 Scope

- This SR is designed to verify jet pump mismatch and to detect significant degradation in jet pump performance that precedes jet pump failure.
- This SR is required to be performed only when the loop has forced recirculation flow.
- The jet pump failure of concern is complete mixer displacement due to jet pump beam failure. Jet pump plugging is also of concern since it adds flow resistance to the recirculation loop.
- This procedure satisfies both SR 3.4.1.1 and SR 3.4.2.1 for dual Recirculation loop operation.
- This procedure satisfies <u>only</u> SR 3.4.2.1 for single Recirculation loop operation.
- The procedure 2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation, satisfies Technical Specification 3.4.1 during single Recirculation loop operation.

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# NOTES

- 1) SR 3.4.1.1 is <u>not</u> required to be performed until 24 hours after both recirculation loops are in operation.
- 2) SR 3.4.2.1 is <u>not</u> required to be performed until:
  - 4 hours after associated recirculation loop is in operation.

# 

• 24 hours after > 25% RTP

# 1.3 Frequency

- A. Recirculation Loop Jet Pump Flow Mismatch (SR 3.4.1.1) if both Recirculation loops are in operation.
  - 1. Once per 24 hours
- B. Jet Pump Operability (SR 3.4.2.1)
  - 1. Once per 24 hours

# 1.4 Applicability

Modes 1 and 2.

BFN Jet Pump Mismatch and Operability Unit 2	2-SR-3.4.2.1 Rev. 0035 Page 7 of 29
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#### 2.0 REFERENCES

### 2.1 Technical Specifications

Sections 3.4.1, Recirculation Loops Operating

Sections 3.4.2, Jet Pumps

# 2.2 Final Safety Analysis Report

Sections 3.3.4, Description (Reactor Vessel Internals Mechanical Design)

Sections 4.3, Reactor Recirculation System

Sections 7.8.5, Description (Reactor Vessel Instrumentation)

Sections 14.6.3, Loss of Coolant Accident (LOCA)

#### 2.3 Plant Instructions

2-OI-68, Reactor Recirculation System

2-GOI-100-1A, Rx Startup from Cold Shutdown to Power Operations (Unit Startup and Power Operation)

2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation.

2-SR-3.4.1(DLO), Reactor Recirculation System Dual Loop Operation.

NPG-SPP-06.9.2, Surveillance Test Program

# 2.4 TVA Drawings

2-47E610-68 Series, Mechanical Control Diagram, Reactor Water Recircn System

2-47E817-1 & 2, Flow Diagram, Reactor Water Recirculation

2-47E600-60, Mechanical Instruments and Controls

# 2.5 Miscellaneous Documents

General Electric SIL 330 and SIL 330 Addenda - Jet Pump Beam Cracks

NUREG/CR - 3052, Closeout of IE Bulletin 80-07: BWR Jet Pump Assembly Failure

Technical Specification Change No. 387, Single Loop Operation (SLO)

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# 3.0 PRECAUTIONS AND LIMITATIONS

#### 3.1 General Precautions

No Recirc Pump speed changes or Control Rod manipulations are to be made during the performance of this procedure.



Improper instrument calibration can severely affect the data and cause unnecessary failures of the test in this SR.

Refueling activities such as fuel assembly replacement or shuffle, modifications to fuel support, orifice size or core plate bypass flow can affect the relationship between core flow and recirculation loop flow. These relationships may need to be re-established each cycle. During initial weeks of operation under such conditions, while baselining new "established patterns," Engineering Judgment of daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.

# 3.2 Operability and LCO's

Technical Specification SR 3.4.2.1 criteria c will <u>not</u> be used in this instruction (Each jet pump flow differs by  $\leq$  10% from established patterns). This criteria use individual jet pump flows which is <u>not</u> available at BFN. Criteria b is used for plants with differential pressure instrumentation.

# 3.3 Equipment

The Robicon VFD for each pump and displayed on 2-SI-96-61 (Pump 2A) and 2-SI-96-73 (Pump 2B) or ICS points 96-61 and 96-73. The VFD control system calculates speed indications using the VFD output frequency and motor (pump) load. Based on these parameters the actual motor speed for any output frequency and load can be calculated. Since the speeds are calculated they should be used only if the two actual speed indications provide by the Bentley-Nevada system cannot be obtained.

#### 3.4 Initiation/Isolation/Trips

None

3.5 Interlocks

None

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### 3.6 Performance Testing

Turbulence in the Jet Pump diffuser causes the differential pressure signal to be noisy when the pump is in operation. The proper method for recording differential pressure is to take the average of the high and low readings.



Browns Ferry has <u>not</u> operated in single loop for a significant period of time. Therefore, not enough single loop operating data has been obtained. Until operation under such conditions and a baseline data has been obtained the engineering judgment of daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.



System Engineering should be notified to create new graphs when conditions are such that the end of the plotted area is reached.



The illustration graphs in this procedure are created using the data from the computer. During the Operation Cycle, the graphs used in the Illustrations of this procedure changes based upon the core's life.

- 1. As this occurs an Engineering Judgment/Review should be performed when the graphs fall outside the illustrations to meet the Acceptance Criteria.
- 2. The Engineering Judgment/Review should establish new graphs to be incorporated into the procedure as time permits.



Step 4.0[5] is used to ensure the Current graphs are updated on a regular basis.

System Engineering should be notified prior to the "Good Thru Date" on any Illustration being exceeded. This will allow System Engineering time to generate new graphs. This date represents 8 months from the date the graphs were created. The graphs can still be used if the "Good Thru Date" is exceeded. The Eight (8) months is used as a guideline and the graphs can be updated more frequently if desired.

J/s

During startup following a Refueling Outage, the Illustrations are used as a guideline and when enough data is obtained System Engineering will create new Illustrations. If <u>no</u> work has been performed on the Recirc Pumps or Jet Pumps then the graphs may be provided prior to Startup and verified by system engineering following the Refuel Outage. The graphs should be used in conjunction with the Engineering Judgment/Review processes until new graphs are provided or the graphs provided prior to Startup are validated by Engineering.

	BFN Unit 2	Jet Pump Mi	smatch and Operability	2-SR-3.4.2.1 Rev. 0035 Page 10 of 29	1
	0 <u>000000000000000000000000000000</u>			Date:	TODAY
4.0	PRERE	EQUISITES			/
		VERIFY this proced	dure is the most current revi	sion.	_ OP
	JEP :	<b>OBTAIN</b> a Surveilla and Work Activity.	ance Task Sheet (STS) for t (Key Number P2383)	his procedure	_ 6P_
	(13)	VERIFY Reactor re accordance with 2-	circulation system is in ope OI-68, Reactor Recirculation	ration in n System.	<u> </u>
	(JA)	VERIFY the listed of this Surveillance pr	qualified personnel are avail rocedure.	able to perform	I
		UO <u>1</u>			<u>_0P</u>
	(151)	Using the following	Illustration graphs:		
	Y	Illustration 1	- 2A Recirculation Loop Pu Recirculation Pump Flow	ump Speed VS	
		Illustration 2	- 2A Recirculation Pump S	Speed VS Jet	
		Illustration 3	- 2B Recirculation Loop P	ump Speed VS	
		Illustration 4	- 2B Recirculation Pump S	, Speed VS Jet	
		Illustration 5	<ul> <li>2A Jet Pump Differential</li> <li>Total Core Flow</li> </ul>	Pressure VS	
		Illustration 6	<ul> <li>2B Jet Pump Differential Total Core Flow</li> </ul>	Pressure VS	
		PERFORM the fol	lowing:		
	(15.	1) IF RTP is > performed,	25% or Section 7.4 is requii <b>FHEN</b>	red to be	
		VERIFY the follows: (Oth	graphs on the Illustrations a nerwise N/A)	are good as	
		VERIFY has not	<b>Y</b> the "Good Thru Date" on a been exceeded.	all Illustrations	
		<u>OR</u>			
		IF the "	'Good Thru Date" is exceed	ed on any	

Illustrations, THEN

.

**NOTIFY** System Engineering to provide updated Illustration graphs to Operations Procedure.



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# 5.0 SPECIAL TOOLS AND EQUIPMENT

None

#### 6.0 ACCEPTANCE CRITERIA

- A. Responses which fail to meet the following Acceptance Criteria constitute unsatisfactory Surveillance procedure results and require immediate notification of the Unit Supervisor at the time of failure.
- B. Recirculation Loop Jet Pump flow mismatch with both Recirculation Loops in operation shall be verified by the following criteria [2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation, satisfies Technical Specification 3.4.1 during single Recirculation Loop operation]:
  - 1.  $\leq$ 10% of rated core flow when operating at < 70% of rated core flow ( $\leq$  10.25 Mlb/hr).
  - 2.  $\leq$  5% of rated core flow when operating at  $\geq$  70% of rated core flow ( $\leq$  5.12 Mlb/hr).

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# 6.0 ACCEPTANCE CRITERIA (continued)

#### NOTE

If either condition in Step 6.0C.1, 6.0C.2 or 6.0C.3 exists, the Tech Spec Acceptance Criteria would be satisfied. However, failure of either Step 6.0C.1 or 6.0C.2 of the criteria may be an indication of Jet Pump degradation and shall be immediately reported to the Unit Supervisor.

- C. Jet Pump operation shall be checked by verifying that at least one of the following criteria (Step 6.0C.1 or 6.0C.2) is satisfied for each of the operating Recirculation Loops:
  - Recirculation Pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns.
  - 2. Each Jet Pump diffuser to lower plenum differential pressure differs by  $\leq$  20% from established patterns.
  - 3. Since Refueling activities such as fuel assembly replacement or shuffle, modifications to fuel support, orifice size or core plate bypass flow can affect the relationship between core flow, and recirculation loop flow, these relationships may need to be re-established each cycle.
    - a. During initial weeks of operation under such conditions, while baselining new "established patterns," an Engineering Evaluation of daily Surveillance results may be used to meet the Acceptance Criteria for conditions Steps 6.0C.1 and 6.0C.2 above.
    - b. This evaluation is to conclude that daily surveillance results do <u>not</u> indicate significant abnormalities or Jet Pump failure.
  - 4. After the new baselining has been completed and new "Established Patterns" have been set, methodology for determining the Acceptance Criteria as being Completed Satisfactorily, as stipulated in Step 6.0C.3 will not be allowed.
- D. Steps which determine the above criteria are designated by (AC) next to the initials blank.

	BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0035 Page 13 of 29	
			Date: <u></u>	DAY
7.0	PROC	EDURE STEPS		,
7.1	Initial	<b>Requirements and Notifications</b>		
	Ð	<b>VERIFY</b> Precautions and Limitations in Section reviewed.	n 3.0 have been	<u>_0P</u>
	B	<b>VERIFY</b> Prerequisites listed in Section 4.0 are satisfied.		<u> </u>
	(III)	On the Surveillance Task Sheet (STS)		
	/-	<b>OBTAIN</b> Authorization Signature and Date/Tin Supervisor to perform this surveillance.	ne from the Unit	OP
	(H)	IF RTP is less than or equal to 25%, THEN		
		MARK Section 7.4 as N/A. (Otherwise N/A thi	s step)	<u>DP</u>
	(ST)	[NRC/C] <b>NOTIFY</b> the Unit Operator (UO) that commencing. [RPT 82-16, LER 259/8232]	this test is	
	(OI)	On the Surveillance Task Sheet (STS)		
	/	RECORD the Start Date & Time.		OP

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BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0035 Page 14 of 29
		Date:

#### 7.2 Data Collections

# 7.2.1 Core Power and Flow Readings

[1] **RECORD** the Core Thermal Power from Core Power and Flow Log. (N/A if ICS is not available)

Point CALC002 CMWT

[2] **RECORD** the Core Plate Differential Pressure from ICS point 68-52 or 2-XR-68-50 (Green Pen). (N/A if not available).

Core Press Drop 68-52 PSID

[3] **RECORD** the Total Core Flow.

Total Core Flow (Red Pen) 2-XR-68-50 ______ Mlb/hr

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0035
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Date: ____

#### NOTES

- 1) If 2-SIT-68-59/71 (RB. EI 565 R-9 S-Line Local Panel) is used, log the reason in the Remarks section of the Surveillance Task Sheet (STS).
- 2) Use the 2-SI-96-61 (or ICS PT 96-61) if both 2-SI-68-59 and 2-SIT-68-59 are <u>not</u> available for the2A Pump Motor and log the reason in the Remarks section of the Surveillance Task Sheet (STS).
- 3) Use the 2-SI-96-73 (or ICS PT 96-73) if both 2-SI-68-71 and 2-SIT-68-71 are <u>not</u> available for the 2B Pump Motor and log the reason in the Remarks section of the Surveillance Task Sheet (STS).
- 4) If a Recirculation Pump is <u>not</u> in service then the associated instrumentations can be marked as N/A.

#### 7.2.2 Recirculation Pump Loops

[1] **RECORD** the Recirc Pump 2A and 2B Mtr Speeds for operating Recirc Pumps and **MARK** instrumentation used.

Pump Motor 2A	$\checkmark$	Pump Motor 2B	$\checkmark$
2-SI-68-59		2-SI-68-71	
2-SIT-068-0059		2-SIT-068-0071	
2-SI-96-61 □		2-SI-96-73	
RPM		RPM	

[2] **RECORD** the Recirc Pump Discharge flows.

Loop 2A	Loop 2B
2-FI-68-5	2-FI-68-81
gpm X 1000	gpm X 1000

[3] **RECORD** the Recirc Loop 2A and 2B Jet Pump Flow.

Loop 2A	Loop 2B
2-FI-68-46	2-FI-68-48
Mlb/hr	Mlb/hr

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0035 Page 16 of 29
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Date:

# NOTE

If a Recirculation Pump is <u>not</u> in service, then the associated instrumentations can be marked as N/A.

# 7.2.3 Jet Pump Loops

[1]	<b>RECORD</b> the following Differential Pressure readings below:
	Loop 2A

Loop 2A Loop 2B					
INSTRUMENT	JET PUMP	PSID	INSTRUMENT	JET PUMP	PSID
2-PDI-68-38	11		2-PDI-68-15	1	
2-PDI-68-39	12		2-PDI-68-18	2	
2-PDI-68-40	13		2-PDI-68-19	3	
2-PDI-68-42	14		2-PDI-68-21	4	
2-PDI-68-43	15		2-PDI-68-22	5	
2-PDI-68-07	16		2-PDI-68-25	6	
2-PDI-68-08	17		2-PDI-68-26	7	
2-PDI-68-10	18		2-PDI-68-28	8	
2-PDI-68-11	19		2-PDI-68-29	9	
2-PDI-68-13	20		2-PDI-68-30	10	

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---------------	---------------	-----------------------------------	--------------------------------------------

Date:

(AC)

#### NOTES

- 1) Section 7.3 is performed when both Recirculation Pumps are in service. This section should be marked N/A when in Single Loop Operation.
- 2) To satisfy procedure Acceptance Criteria, either Step 7.3[3] or Step 7.3[4] must be satisfied.

#### 7.3 Tech Spec 3.4.1.1 - Recirculation Loop Mismatch Verification With Both Recirculation Loops In Operation Checks

[1] **CALCULATE** percent of Rated Core Flow (%WT) using data obtained in Section 7.2.1[3] as follows.

(Step 7.2.1[3] ÷ 102.5) X 100 =	% Core Flow
(÷ 102.5) X 100 =	

[2] **CALCULATE** the absolute value for Recirculation Loop Jet Pump Flow Mismatch using data obtained in Section 7.2.2[3] as follows.

2-FI-68-46 - 2-FI-68-48 = Mismatch

Mlb/hr _____ Mlb/hr _____ Mlb/hr

[3] IF %WT is < 70% as recorded in Step 7.3[1], THEN

**VERIFY** Recirculation Loop Jet Pump Flow Mismatch recorded in Step 7.3[2] is  $\leq$  10.25 Mlb/hr. (Otherwise N/A)

[4] IF %WT is  $\geq$  70% as recorded in Step 7.3[1], THEN

VERIFY Recirculation Loop Jet Pump Flow Mismatch recordedin Step 7.3[2] is  $\leq$  5.12 Mlb/hr. (Otherwise N/A)

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Date: ____

#### NOTES

- 1) Jet Pump Operability is <u>not</u> required to be performed until 4 hours after associated Recirculation Loop is in operation and then only within 24 hours after RTP is > 25%.
- 2) If a Recirculation Pump is <u>not</u> in service, then the associated steps can be marked as NO.
- 3) If Data falls on <u>or</u> outside the bold lines on the graph, then the step can be marked as NO.

# 7.4 Tech Spec 3.4.2.1 - Part A -Jet Pump Performance Checks

# 7.4.1 Loop 2A Recirculation Pump and Jet Pump Flow to Recirculation Pump Speed

[1] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2A Pump Flow recorded in Step 7.2.2[2]:

**CHECK** the plot falls between the two bold lines on Illustration 1 and **RECORD** below.

Plot falls between the bold lines	Yes		No		
-----------------------------------	-----	--	----	--	--

[2] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2A Jet Pump Flow in Step 7.2.2[3]:

**CHECK** the plot falls between the two bold lines on Illustration 2 and **RECORD** below.

Plot falls between the bold lines Yes  $\Box$  No  $\Box$ 

[3] Using Steps 7.4.1[1] and 7.4.1[2] from above:

**DETERMINE** if the Jet Pump Loop 2A criteria is satisfied by marking below if both steps are marked as Yes.

let Pump Loop 2A criteria is satisfied	Yes	No	

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Date:

#### NOTES

- 1) If a Recirculation Pump is <u>not</u> in service, then the associated steps can be marked as NO.
- 2) If Data falls on <u>or</u> outside the bold lines on the graph, then the step can be marked as NO.

# 7.4.2 Loop 2B Recirculation Pump and Jet Pump Flow to Recirculation Pump Speed

[1] Using the 2B Pump Speed recorded in Step 7.2.2[1] and 2B Pump Flow recorded in Step 7.2.2[2]:

**CHECK** the plot falls between the two bold lines on Illustration 3 and **RECORD** below.

Plot falls between the bold lines	Yes	No	

[2] Using the 2B Pump Speed recorded in Step 7.2.2[1] and 2B Jet Pump Flow recorded in Step 7.2.2[3]:

**CHECK** the plot falls between the two bold lines on Illustration 4 and **RECORD** below.

Plot falls between the bold lines Yes  $\Box$  No  $\Box$ 

[3] Using Steps 7.4.2[1] and 7.4.2[2] from above:

**DETERMINE** if the Jet Pump Loop 2B criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Loop 2B criteria is satisfied Yes □ No □

BFN	Jet Pump Mismatch and Operability	2-SR-3.4.2.1
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Date: _____

# NOTES

- 1) If a Recirculation Pump is <u>not</u> in service, then the associated steps can be marked as NO.
- 2) If Data falls on <u>or</u> outside the bold lines on the graph, then the step can be marked as NO.

# 7.4.3 Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification:

[1] Using the individual 2A Jet Pump DP's recorded in Step 7.2.3[1]

**CHECK** each individual Jet Pump DP recorded fall between the two bold lines on Illustration 5 for the recorded Total Flow in Step 7.2.1[3] and **RECORD** results below.

2A Individual DP's are between			
the bold lines.	Yes	No	

[2] Using the individual 2B Jet Pump DP's recorded in Step 7.2.3[1]

**CHECK** each individual Jet Pump DP recorded fall between the two bold lines on Illustration 6 for the recorded Total Flow in Step 7.2.1[3] and **RECORD** results below.

2B Individual DP's are between			
the bold lines.	Yes	No	

[3] Using Steps 7.4.3[1] and 7.4.3[2]

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-

**DETERMINE** whether the Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Diffuser to Lower			
Plenum Differential Pressure			
Verification criteria is satisfied	Yes	No	

BFN	Jet Pump Mismatch and Operability	2-SR-3.4.2.1
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Date: _____

(AC)

# CAUTION

An Engineering Judgment/Review may only be utilized until relationships between Core Flow, Jet Pump Flow, and Recirculation Loop Flow have been established following a Refueling Outage or during the initial weeks of extended Single Loop operation. Engineering Judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a Jet Pump failure. Refer to SR 3.4.2.1 bases.

# 7.4.4 Engineering Judgment/Review Criteria

- [1] **IF** any of the following conditions apply:
  - Following Refueling Outage. (See Caution above)

<u>OR</u>

• The Reactor is in Single Loop Operation (See Caution above)

 If point(s) plotted in Sections 7.4.1 or 7.4.2, <u>AND</u> 7.4.3 fall on <u>or</u> outside the bolded lines, to determine if the graph(s) need updating, **THEN**

**PERFORM** Attachment 1, Engineering Judgment/Review: (Otherwise N/A this step.)

# 7.4.5 Operability Determination

[1] **MARK** the appropriate criteria results for the following. (N/A any criteria <u>not</u> performed.)

Steps	Criteria Results	Yes	No	N/A
7.4.1[3] and 7.4.2[3]	Both Jet Pump Loops steps are marked as YES			
7.4.3[3]	Jet Pump DP to criteria is marked as YES.			
Attachment 1	Engineering Evaluation is marked as YES.			

[2] Using the Criteria Results in Step 7.4.5[1]

**VERIFY** at least one Criteria Results is satisfied and marked as YES.

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Date:	

#### 7.5 Completion and Notifications

[1] IF an Engineering Judgment/Review was performed, THEN

**VERIFY** the Engineering Judgment/Review documentation is attached to this SR. (Otherwise N/A)

- [2] On the Surveillance Task Sheet (STS)
  - A. **RECORD** the Completion Date & Time.
  - B. **REVIEW** and **COMPLETE** the Surveillance Task Sheet (STS) through the Test Director/Lead Performer & Date fields.
- [3] **NOTIFY** the Unit Supervisor that this test is complete.

# 8.0 ILLUSTRATIONS/ATTACHMENTS

Attachment 1	-	Engineering Judgment/Review
Illustration 1	-	2A Recirculation Loop Pump Speed VS Recirculation Pump Flow
Illustration 2	-	2A Recirculation Pump Speed VS Jet Pump Flow
Illustration 3	-	2B Recirculation Loop Pump Speed VS Recirculation Pump Flow
Illustration 4	-	2B Recirculation Pump Speed VS Jet Pump Flow
Illustration 5	-	2A Jet Pump Differential Pressure VS Total Core Flow
Illustration 6	-	2B Jet Pump Differential Pressure VS Total Core Flow

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# Attachment 1 (Page 1 of 1)

# Engineering Judgment/Review

Date:

#### CAUTIONS

- 1) Engineering Judgment Evaluation may only be utilized until relationships between Core Flow, Jet Pump Flow, and Recirculation Loop Flow have been established:
  - During the initial weeks of extended Single Loop Operation
  - Following a Refueling Outage until Engineering has provided or determined that the current graphs are good. (At least one evaluation must be performed following a Refueling Outage.)
- 2) Engineering Judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a Jet Pump failure. (Reference SR 3.4.2.1 bases)
  - [1] **MARK** the condition that applies:

•	Following Refueling Outage.	
•	The Reactor is in Single Loop Operation	
•	Point(s) plotted in Sections 7.4.1 or 7.4.2, AND 7.4.3 fall on <u>or</u> outside the bolded lines	

- [2] **REQUEST** System Engineering to perform an Engineering Judgment/Review.
- [3] **IF** the Engineering Judgment/Review was performed following a Refueling Outage or during Single Loop Operation, **THEN**

**DETERMINE** if the Jet Pump Criteria is satisfied and <u>no</u> significant abnormalities which could indicate a Jet Pump failure are indicated and **RECORD** the results below. (Otherwise N/A)

Jet Pump Criteria is satisfied. Yes 🛛 No 🔾

[4] **IF** the Engineering Judgment/Review was performed to determine if the graphs needs updated, **THEN** 

**REQUEST** System Engineering to: (Otherwise N/A)

- A. **SUPPLY** Operations with new graphs to Ops Procedures.
- B. **RECORD** below if Jet Pump Criteria is satisfied.

Jet Pump Criteria is satisfied. Yes D No D

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# 2A Recirculation Loop Pump Speed VS Recirculation Pump Flow Unit 2 Cycle 16 Good Thru 10-13-2013



2A RECIRC PUMP SPEED VS PUMP FLOW TWO LOOP OPERATION



BFN Jet Pump Mismatch and Operability Unit 2	2-SR-3.4.2.1 Rev. 0035 Page 25 of 29
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Date:

2A RECIRC SPEED VS JET PUMP FLOW TWO LOOP OPERATION



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Illustration 3 (Page 1 of 1)

2B Recirculation Loop Pump Speed VS Recirculation Pump Flow Unit 2 Cycle 16 Good Thru 10-13-2013

Date:

2B RECIRC PUMP SPEED VS PUMP FLOW TWO LOOP OPERATION



2B RECIRC PUMP SPEED (RPM)
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2B RECIRC PUMP SPEED (RPM)

Notice of Contract 






2A TOTAL CORE FLOW VS JET PUMP DP TWO LOOP OPERATION



,







TOTAL CORE FLOW (MIb/Hr)

JPM SRO A2 Unit 1

OPERATOR: _____

SRO ____ DATE:_____

SRO A2 JPM NUMBER:

TASK NUMBER: S-000-AD-27

LCO Tracking Log Entry for an active LCO TASK TITLE:

K/A NUMBER: 2.2.23 K/A RATING: SRO 4.3

TASK STANDARD: Complete LCO Tracking Log entries for Inoperable Primary Containment Isolations Valves 1-FCV-69-2

LOCATION OF PERFORMANCE: Class Room

REFERENCES/PROCEDURES NEEDED: OPDP-8, Tech Spec 3.6.1.3, and 1-SR-3.6.1.3.5 (RWCU)

VALIDATION TIME: 30 minutes

**PERFORMANCE TIME:** 

COMMENTS:

Additional comment sheets attached? YES ____ NO ____

SATISFACTORY ____ UNSATISFACTORY ____ **RESULTS:** 

SIGNATURE: ______ EXAMINER

DATE:

#### **INITIAL CONDITIONS:**

Unit 1 is In Mode 1. Timing of RWCU valves in accordance with 1-SR-3.6.1.3.5(RWCU) RWCU System PCIV Operability Test is complete.

#### **INITIATING CUE:**

Complete the surveillance 1-SR-3.6.1.3.5, start at step 5.2[1] in Appendix A for 1-FCV-69-1, and Appendix B for 1-FCV-69-2.

When this is completed raise hand and tell proctor whether the Acceptance criteria is MET or NOT MET.

JPM SRO A2 Unit 1

******

#### **Class Room**

******

#### **INITIAL CONDITIONS:**

Unit 1 is In Mode 1. Timing of RWCU values in accordance with 1-SR-3.6.1.3.5(RWCU) RWCU System PCIV Operability Test is complete.

#### **INITIATING CUE:**

Complete the surveillance 1-SR-3.6.1.3.5, start at step 5.2[1] in Appendix A for 1-FCV-69-1, and Appendix B for 1-FCV-69-2.

When this is completed raise hand and tell proctor whether the Acceptance criteria is MET or NOT MET.

#### START TIME

Performance Step 1:

Critical  $\underline{X}$  Not Critical

#### 5.2 Review of Data from Periodic Tests

- [1] **IF** the As Found stroke time (Closing) for 1-FCV-69-1 recorded in the Section 1.0 Stroke Time Data Table is in Stroke Time Code Criteria, **THEN PERFORM** the following:
  - [1.1] **MARK** Stroke Time Acceptance Criteria Satisfied as "Yes" in the Section 1.0 Stroke Time Data Table.

#### **1.0 1-FCV-69-1 TEST DATA**

#### 1-FCV-69-1, RWCU INBD SUCT ISOLATION VALVE

Stroke Time Acceptance Criteria Satisfied Yes 
No

#### Standard:

Marks YES for stroke time acceptance criteria satisfied

SAT__ UNSAT__ N/A __COMMENTS:_____

********

#### Performance Step 2:

Critical Not Critical  $\underline{X}$ 

[1.2] MARK remaining steps in Section 5.2 N/A.

Standard:

Marks steps in section 5.2 as NA

SAT__ UNSAT__ N/A __COMMENTS:_____

*****

#### Performance Step 3:

Critical  $\underline{X}$  Not Critical

#### 2.0 1-FCV-69-2 AS FOUND STROKE TIME

- [8] IF the As Found Measured Stroke Time for 1-FCV-69-2 recorded in Section 1.0 Stroke Time Data Table is greater than the Limiting Value listed, THEN PERFORM the following:
  - [8.1] **DECLARE** valve 1-FCV-69-2 INOPERABLE.

#### Standard:

Declares valve 1-FCV-69-2 Inoperable

SAT__UNSAT___N/A ___COMMENTS:_____

******

Performance Step 4:

Critical  $\underline{X}$  Not Critical

[8.2] **INITIATE** the appropriate LCO actions.

#### Standard:

Initiates appropriate LCO actions by evaluating Technical Specifications and OPDP-8. Determines that LCO Tracking Log entries are required.

SAT___UNSAT___N/A ___COMMENTS:_____

CUE: Direct applicant to make a computerized entry into the eSOMs BFN Action Tracking Training data base and provide applicant with the password. *******

Performance Step 5:

Critical  $\underline{X}$  Not Critical

- [8.3] MARK Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table and the STS.
- 2.0 1-FCV-69-2 TEST DATA

#### 1-FCV-69-2, RWCU OUTBD SUCT ISOLATION VALVE

Stroke Time Acceptance Criteria Satisfied Yes D No D

Standard:

Marks NO for stroke time acceptance criteria satisfied

SAT___UNSAT___N/A ___COMMENTS:_____

#### JPM SRO A2 Unit 1

*****

Performance Step 6:

Critical  $\underline{X}$  Not Critical

Logs on to Action Tracking Program and completes a log entry for 1-FCV-69-2

#### Standard:

The following elements must be entered into the eSOMs Action Tracking Training data base IAW OPDP-8 (see answer key)

- LCO Tracking Number
- Applicable Tech Spec LCO number
- Tech Spec 3.6.1.3 Action Statements A.1 and A.2
- Date and Time of entry
- Date and Time when completion time expires
- Correct BFN Unit

SAT__ UNSAT__ N/A ___COMMENTS:_____

CUE: Once this is complete, have applicant go to print, go to actions sheet and select preview. Print document.

NOTE: Exit LCO, once exited log back in and delete the LCO that was entered.

CUE: Ask Applicant: How will Tech Spec Action Statement A.1 be met?

#### JPM SRO A2 Unit 1

# 

Performance Step 7:

Critical  $\underline{X}$  Not Critical

How will Tech Spec Action Statement A.1 be met?

Standard:

1-FCV-69-1 OR 1-FCV-69-2 will be closed and deactivated under a clearance.

SAT__UNSAT__N/A __COMMENTS:_____

END OF TASK

STOP TIME ____



ANSWER KEY.

		Wa	ork Order	#: 114456234	
PM#: P195	DRWC	and the second			an na para sy panya panya na
Procedure: 1-SR-	-3.6.1.3.5(RWCU)				
Title: 1-SR-3.6.1.3.5(	RWCU) - RWCU SYSTE	I PCIV OPE	RABILITY TEST	Omit Superioran	TODAY
				Authorization to Begin: SRO	Date & Time
Data Sheets Attached:					
Perf Grp: OPS	Unit: 1	Loop/Div	r: /NA	TODAY	
Test Reason: Periodic	;			Start Date & Time	Completion Date & Time
Due Date: 06/14/1	3				
Frequency: 91 DAYS	Tech Spec: Y	ASME X	1:		
Applicable Modes:	Pe	f Modes:		Maximo dates verified: SI	Date & Time
Clearance Required:	N EQ:	LCO E	ntered: N	o continator	
Dry-Cask Storage:	N				
Performed Bv:					
Print Name	Signature	Initial	Section	Was this a Complete or Partial Performan	ce?
OPERATOR	Ocerata	OP	OPS	(Explain Partial in REMARKS below)	Complete [ ] Partial
	f				
				AMSAC* acceptance criteria satisfied?	Yes [] No [] N/A
				]	
•				Were all other acceptance	N P.7 N- P.7 M/A
				criteria satisited?	Tes [] NO [] N/A
				If all Tech Spec/Tech Req/ISFSI/CoC/ODC	M/Fire Prot req/AMSAC*
				criteria were not satisfied, was as LCO/O	OCM action required?
	T			(Explain in REMARKS below)	Yes [] No [] N/A
				Alert Work Contol Required?	Yes [] No [] N/A
				1	
				*PWR only.	
Subsequent Reviews:				Copy of STS sent to Work Control AND	ș,
Group:	Signatu	<u>ire</u>	Date	Coordinator (next Bus. Day)	Initials Date
	IST				
				Test Directoril and Derform	Deta
				lest Directon Lead Performa	n Date
				Acceptance Criteria Review: SRO	Date & Time
				1	
PERMANENT COMME	NTS:				
	E PER 92 DAYS - Key E Notes: MODES 1.2.3 - T	vents: SUSut S 5.5.6/ASM	pport Required: E SECT XI	Independent Reviewer	Date & Time
Frequency Notes: ONC	SME SECTION YI FUN	TIONS: MO	DES 1,2,3LCO	DEMADKS.	
Frequency Notes: ONC 1-OP, 1-OCApplicability FUNCTIONSTS 5.5.6//	IODED 4 0 00 E	/ NOIES: UNC	/E PEK 92		
Frequency Notes: ONC 1-OP, 1-OCApplicability FUNCTIONSTS 5.5.6// 3.6.1.5 FUNCTIONS: M DAYS	ODES 1,2,&3 Frequency				
Frequency Notes: ONC 1-OP, 1-OCApplicability FUNCTIONSTS 5.5.6// 3.6.1.5 FUNCTIONS: M DAYS	ODES 1,2,&3 Frequency				
Frequency Notes: ONC 1-OP, 1-OCApplicability FUNCTIONSTS 5.5.6// 3.6.1.5 FUNCTIONS: M DAYS	IODES 1,2,&3 Frequency				
Frequency Notes: ONC 1-OP, 1-OCApplicability FUNCTIONSTS 5.5.6// 3.6.1.5 FUNCTIONS: M DAYS	AODES 1,2,83 Frequency				
Frequency Notes: ONC 1-OP, 1-OCApplicability FUNCTIONSTS 5.5.6// 3.6.1.5 FUNCTIONS: N DAYS	IODES 1,2,&3 Frequency				
Frequency Notes: ONC 1-OP, 1-OCApplicability FUNCTIONSTS 5.5.6// 3.6.1.5 FUNCTIONS: M DAYS	AODES 1,2,&3 Frequenc				
Frequency Notes: ONC 1-OP, 1-OCApplicability FUNCTIONSTS 5.5.6// 3.6.1.5 FUNCTIONS: M DAYS	IODES 1,2,83 Frequenc				

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**Browns Ferry Nuclear Plant** 

Unit 1

Surveillance Procedure

### 1-SR-3.6.1.3.5(RWCU)

# **RWCU System PCIV Operability Test**

**Revision 0001** 

**Quality Related** 

Level of Use: Continuous Use

Level of Use or Other Information: Key Number P1950RWC

Effective Date: 02-01-2013 Responsible Organization: OPS, Operations Prepared By: Tracy McEown Approved By: Jeffery D. Morrison

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#### **Current Revision Description**

Pages Affected: N/A

Type of Change: Enhancement

Tracking Number: 002

Added Surveillance Task Sheet Key Number, these changes are administrative and nonintent in nature.

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Appendix B:	1-FCV-69-2 Operational	Readiness 31
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#### 1.0 INTRODUCTION

#### 1.1 Purpose

This procedure provides the detailed steps to assess operational readiness of valves listed in Section 1.2.1A as required by the Inservice Testing (IST) program.

#### 1.2 Scope

#### 1.2.1 Operability Tests to be Performed

A. IST-related Power Operated valve tests in scope of this SR are shown in the table below:

UNID	Description	Exercise / Stroke Time	Fail Safe
1-FCV-69-1	RWCU INBD SUCT ISOLATION VALVE	Close	N/A
1-FCV-69-2	RWCU OUTBD SUCT ISOLATION VALVE	Close	N/A

- B. This surveillance procedure verifies the isolation time (closure time) of certain power operated, automatic Primary Containment Isolation Valve (PCIV) as required by Technical Specification (Tech Specs) Surveillance Requirement (SR) 3.6.1.3.5 for 1-FCV-69-1 and 1-FCV-69-2.
- C. This surveillance procedure fully satisfies testing requirements for 1-FCV-69-1 and 1-FCV-69-2 specified in the BFN Fire Protection Report, Volume 1, by verifying that the valves can be closed from the Control Room.
- D. This procedure may be used to for Post Maintenance / Modification Testing purposes.

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#### 1.2.2 Surveillance Requirements Fulfilled

Technical Specification surveillance requirements fully or partially fulfilled are shown in the table below:

<b>Operability Test</b>	<b>Technical Specification</b>	Full / Partial
1.2.1A	5.5.6	Partial
1.2.1B	SR 3.6.1.3.5	Partial

#### 1.2.3 Modes

Technical Specification applicable modes and performance modes are shown in the table below:

Technical Specification	Applicable Modes	Performance Modes
5.5.6	1, 2, 3	All
3.6.1.3	1, 2, 3 ^(a)	All

^(a) and when associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation."

#### 1.3 Frequency and Conditions

Valve test frequencies and required conditions are shown in the table below:

Operability Test	Frequency	<b>Required Conditions</b>
1.2.1A	Quarterly (92 days)	N/A
1.2.1B	Quarterly (92 days)	N/A

#### 2.0 **REFERENCES**

#### 2.1 Performance Requirements

- A. NPG-SPP-06.9.1, Conduct of Testing
- B. NPG-SPP-10.3, Independent Verification
- C. 0-TI-383, Evaluation of Test Results for the ASME OM Code Inservice Testing Program
- D. BFN Unit 1 Technical Specifications
  - 1. Section 3.6.1.3, Primary Containment Isolation Valves (PCIVs)
  - 2. Section 5.5.6, Inservice Testing Program

#### 2.2 Developmental References

#### 2.2.1 Procedures and Plant Instructions

- A. 1-OI-69, Reactor Water Cleanup System
- B. 0-TI-360, Containment Leak Rate Programs
- C. 0-TI-362, Inservice Testing of Pumps and Valves
- D. 1-SI-3.2.1, Inservice Testing and Augmented Inservice Testing Valve Performance
- E. NPG-SPP-06.9.2, Surveillance Test Program

#### 2.2.2 Plant Drawings

- A. 1-47E610-69-1, Mechanical Control Diagram Reactor Water Cleanup System
- B. 1-47E810-1, Flow Diagram Reactor Water Cleanup System

#### 2.2.3 Other

- A. Operator Notification LER, RPT 82-16, LER 259/8232
- B. BFN Fire Protection Report, Volume 1
- C. BFN Updated Final Safety Analysis Report
  - 1. Section 4.12, Inservice Inspection and Testing
  - 2. Section 5.2, Primary Containment System
  - 3. Table 5.2-2, Principle Primary Containment Penetrations and Associated Isolation Valves
  - 4. Section 6.6, Inspection and Testing

#### 3.0 PRECAUTIONS AND LIMITATIONS

#### 3.1 General

- A. All valves are returned to their initial position upon completion of this test, unless otherwise specified by Operations.
- B. If maintenance other than what is provided in this Surveillance Procedure becomes necessary, a Service Request/Work Order should be generated.
- C. Should it become necessary to change test equipment during the performance of this Surveillance Procedure, the identification number, calibration due date for the new test equipment, and the step number in which it is to be first used shall be noted in the "Remark" section of the Surveillance Task Sheet (STS).
- D. Problems during performance of this procedure shall be addressed in accordance with NPG-SPP-06.9.1, Conduct of Testing.
- E. The measured stroke times as displayed on the digital stopwatch shall be recorded in this procedure (e.g., hundredths of second with no rounding).

#### 3.2 Technical Specifications and LCOs

A. The following LCO may be applicable due to the performance of this procedure.

LCO	Plant Mode(s)
3.6.1.3	1, 2, 3 ^(a)

⁽a) and when associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation."

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### 4.0 PREREQUISITES

		NOTE	
The	Surveilla	nce Task Sheet (STS) may be completed as information becomes a	vailable.
4.1	Preli	minary Actions	
	Ø	<b>VERIFY</b> this copy of 1-SR-3.6.1.3.5(RWCU) is the most current revision.	<u>0P</u>
	Ø	<b>OBTAIN</b> a STS for this procedure and Work Activity. (Key Number P1950RWC)	OP
	(J3)	<b>VERIFY</b> the Primary Containment Isolation System is not generating an isolation signal.	OP
	Æ	INDICATE the reason for test performance, AND	
	E.	<b>RECORD</b> any pertinent information (WO requiring PMT, reason for test, required Appendices, etc.) in the "Remarks" section below:	
		Deriodic performance	
		Post Maintenance / Modification Test performance	
		Other Test Performance	
		Remarks: No~E	
			<u> </u>
	(5T)	IF reason for this test is PERIODIC performance, THEN	
		<b>MARK</b> "Test Required" for ALL valves / appendices listed in Step 6.0[7]. (Otherwise N/A)	٩٥

	BFN Unit 1	RWCU System PCIV Operability Test	1-SR-3.6.1.3. Rev. 0001 Page 11 of 4	5(RWCU) 2
			Date	TODAY
4.1	Prelimina	ary Actions (continued)		

(B)

#### IF reason for this test is POST MAINTENANCE / MODIFICATION / OTHER performance, THEN

**MARK** "Test Required" for ONLY those valves / appendices required in Step 6.0[7]. (Otherwise N/A)

NA

op

OP

oP



[8]

5	<b>DISCARD</b> all appendices NOT marked as "Test Required" in Step 6.0[7].	
/		

**VERIFY** the minimum number of qualified personnel listed below are available to perform this procedure: (This does not include IV's or Peer Checks)

UO: <u>1</u>

# 4.2 Special Tools, Measuring and Test Equipment, Parts and Supplies

		NOTÉ	
The	digital st	opwatch M&TE ID number is recorded in each Appendix as it is per	rformed.
. <u></u>	ØD	OBTAIN digital stopwatch(es).	٥P
4.3	Аррі	rovals and Notifications	
	Ð	<b>OBTAIN</b> on the STS Authorization Signature and Date/Time from the Unit Supervisor (US) to perform this surveillance.	<u></u> 0P
	$\sim$		



[NRC/C] **NOTIFY Unit 1 Unit Operator this test is commencing**. [NRC Inspection Report 82-16, LER 259/8232]

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#### 5.0 ACCEPTANCE CRITERIA

- A. Specific quantitative or qualitative requirements that are intended to be verified by this test are noted in the action steps where the verifying action is performed and recorded.
- B. Acceptance Criteria is satisfied when:
  - 1. As Found stroke times are in Stroke Time Code Criteria, **OR**
  - An As Found stroke time in Low Alert or High Alert AND all 1st and 2nd Restroke times are in Stroke Time Code Criteria, OR
  - 3. As Found stroke times are in High Alert or Low Alert **AND** 1st or 2nd Restroke time is in High Alert or Low Alert **AND** an Engineering Evaluation has been completed which concludes the stroke times represent acceptable operation.
- C. If a valve stroke time is greater than the Limiting Value the valve shall be declared inoperable. An SR/PER shall be initiated to begin corrective actions and the effects on system operability shall be evaluated in accordance with the applicable Technical Specifications.
- D. An As Found stroke time in High Alert or Low Alert AND ALL 1st and 2nd Restroke times in Stroke Time Code Criteria are considered acceptable. An SR/PER shall be initiated to ensure a follow-up Engineering Evaluation is performed to analyze the stroke time deviations.
- E. As Found stroke time in High Alert or Low Alert AND ANY 1st or 2nd Restroke time in High Alert or Low Alert requires an SR/PER to be initiated and one of the following actions to be taken:
  - 1. Declare the valve inoperable, **OR**
  - 2. Complete an Engineering Evaluation within the most limiting time frame of 96 hours or applicable LCO to verify the stroke times represent acceptable valve operation.
- F. Any abnormal or erratic action observed during valve testing is considered acceptable. An SR/PER shall be initiated to ensure a follow-up Engineering Evaluation is performed to determine the need for corrective action.

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### 5.0 ACCEPTANCE CRITERIA (continued)

C

G. The reference value(s) for valve(s) tested to satisfy Post Maintenance/Post Modification purposes shall be reconfirmed or new reference value(s) shall be determined by the IST Program engineer.

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#### 6.0 PERFORMANCE

	<b>VERIFY</b> Precautions and Limitations in Section 3.0 have been reviewed.	AP	
(E)	VERIFY Prerequisites listed in Section 3.1 are satisfied.		
B	<b>RECORD</b> the Start Date & Time on the STS.	<u>0</u> P	
(IAT)	<b>RECORD</b> the initial position of RWCU INBD SUCT ISOLATION VALVE, 1-FCV-69-1.		
	Initial Position: OPEN CLOSE COPEN (check one)	<u>0</u> P	
(II)	<b>RECORD</b> the initial position of RWCU OUTBD SUCT ISOLATION VALVE, 1-FCV-69-2.		
	Initial Position: OPEN Ø CLOSE D (check one)	<u> </u>	
(Iai)	IF RWCU system is in service, THEN		
~	<b>SHUT DOWN</b> the RWCU system in accordance with 1-OI-69. (Otherwise N/A)	_0P	

Appendices in the following step may be performed in any order provided the steps within each appendix are performed in the order specified.

 $\bigcirc$ 

PERFORM the Appendices marked "Test Required", AND

MARK "Test Complete" for each Appendix as it is completed.

Valve(s)	Appendix	Test Required	Test Complete
1-FCV-69-1	А	ø	
1-FCV-69-2	В	Ø	

est 1-SR-3.6.1.3.5(RWCU) Rev. 0001 Page 15 of 42

#### 7.0 POST-PERFORMANCE ACTIVITY

#### 7.1 Test Completion

[1] **IF** ANY valve in Step 6.0[7] is **NOT** marked "Test Complete", **THEN** 

MARK STS as "Partial Performance." (Otherwise N/A)

[2] **IF** ALL valves in Step 6.0[7] are marked as "Test Complete", **THEN** 

MARK STS as "Complete Performance." (Otherwise N/A)

[3] **IF** reason for test is marked as "Periodic performance" in Step 4.1[4] **AND** ANY valve in Step 6.0[7] is **NOT** marked "Test Complete", **THEN** 

**PERFORM** the following actions: (Otherwise N/A)

- [3.1] **ENSURE** SI Scheduling has issued a conditional package to complete the untested components.
- [3.2] IF component was not tested due to a hold order, THEN

**COORDINATE** with OPS tagging to add the conditional test package to the applicable hold order section release instructions. (Otherwise N/A)

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#### 7.1 Test Completion (continued)

[4] **IF** ANY valve is marked as "Engineering Evaluation Required" in the table below, **THEN** 

**VERIFY** all requested evaluations of stroke time deviations have been received from Engineering and attached to this procedure. (Otherwise N/A)

	Engineerin	g Evaluation			
Valve UNID	New Stroke Time Represents Acceptable Operation	Cause of Initial Stroke Time Deviation	Abnormal/ Erratic Action Need for Corrective Action	Reference Value Reconfirm or Determine Required	SR/PER Number
1-FCV-69-1	٥				
1-FCV-69-2			D		

- [5] **NOTIFY** the Unit 1 Unit Operator that this Surveillance Procedure is complete.
- [6] **NOTIFY** the Unit Supervisor that this Surveillance Procedure is complete.
- [7] **RECORD** the Completion Date & Time on the STS, **AND**

**REVIEW** and **COMPLETE** the STS through the Test Director/Lead Performer & Date fields.

[8] **RECORD** the Completion Date & Time in Maximo.

BFN Unit 1	RWCU System PCIV Operability Test	1-SR-3.6.1.3.5(RWCU) Rev. 0001 Page 17 of 42	
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Date TODA-

#### 7.2 IST Engineer Results Review

#### NOTES

- Formal test package review and acceptance is completed by Operations in accordance with Section 7.1 and NPG-SPP-06.9.2. The completed test package is then made available to the IST Engineer for subsequent review. Steps in Section 7.2 document administrative duties for the IST Engineer to ensure test data collected by this test package are reviewed and trended.
- 2) Steps in Section 7.2 may be performed in any order.
  - [1] **REVIEW** Test Data, **AND**

ENTER Test Data into IST Database.

IST Engineer

Date

[2] **IF** ANY valve is marked as "Reference Value Reconfirm or Determine Required" in the previous table of Step 7.1[4], **THEN** 

**RECORD** the applicable Valve UNID in the table below, AND

**MARK** Reference Value Reconfirmed OR New Reference Values Determined with reference to the Reference Worksheet Number. (Otherwise N/A)

Valve UNID	Reference Value Reconfirmed	New Reference Values Determined	Reference Worksheet No	

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#### 8.0 RECORDS

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

- A. Surveillance Task Sheet
- B. Sections 4.0, 5.0, 6.0, and 7.0.
- C. Completed Appendices
- D. Other sheets added during performance.

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#### Appendix A (Page 1 of 12)

#### (Fage 10112)

### 1-FCV-69-1 Operational Readiness

Date Toony

#### 1.0 1-FCV-69-1 TEST DATA

# NOTE

The Stroke Time Data Table below will be completed as data becomes available during performance of Appendix A.

#### Stroke Time Data Table

# 1-FCV-69-1, RWCU INBD SUCT ISOLATION VALVE

Ref. Worksheet Number: BFN-IST-2012-417 Date: 08-01-2012

Ref. Value	Measured Stroke Time (seconds)		Low Alert	Stroke Time Code Criteria	High Alert	Limiting Value	Abno or Eri actio	rmal ratic on?	
	Step	$O \rightarrow C$ (Clos	sing Time)	<21.68	21.68 to 29.32	>29.32	>30.00	No	Yes
	2.0[5]	As Found	28.34		ø			þ	
25.50	3.0[3]	1st Restroke			۵				
	3.0[6]	2nd Restroke			D				
	Step	$C \rightarrow O$ (Ope	ning Time)	N/A	N/A	N/A	N/A	No	Yes
	N/A	As Found	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	1st Restroke	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	2nd Restroke	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comments:									
	Sti	roke Time Acc	eptance Crite	eria Satis	fied Yes		N	o 🗆	

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#### Appendix A (Page 2 of 12)

# 1-FCV-69-1 Operational Readiness

Date

TODAY

# CAUTION

If the reactor is pressurized, the time that 1-FCV-69-1 and 1-FCV-69-2 are closed should be minimized to ensure RWCU piping remains charged.

### NOTE

Sections 2.0 and 3.0 are performed on Panel 1-9-4 unless otherwise noted.

#### 2.0 1-FCV-69-1 AS FOUND STROKE TIME



Ø

RECORD the stopwatch M&TE ID number:

	M&TE: STOPWATCH	<u> </u>
6	VERIFY Steps 6.0[4], 6.0[5], and 6.0[6] have been completed.	<u> </u>
Þ	VERIFY OPEN 1-FCV-69-1, using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1.	OP

# NOTES

- 1) The next step starts a timed sequence. Stroke time measurement starts when the handswitch is placed to CLOSE, and stops when the Green light at the handswitch illuminates and the Red light extinguishes.
- 2) Observation of handswitch lights to detect abnormal or erratic action of the valve is required during valve stroke time testing.
  - ØD

(FD

**CLOSE** and **TIME** 1-FCV-69-1 using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1.

OP

**RECORD** the As Found Measured Stroke Time (Closing) for 1-FCV-69-1 in Section 1.0 Stroke Time Data Table.

OP

Appendix A (Page 3 of 12) 1-FCV-69-1 Operational Readiness Date 2.0 1-FCV-69-1 AS FOUND STROKE TIME (continued) COMPARE the As Found Measured Stroke Time (Closing) for 1-FCV-69-1 with criteria specified in Section 1.0 Stroke Time Data Table, AND	<u>&gt;~</u>	
1-FCV-69-1 Operational Readiness         Date         2.0       1-FCV-69-1 AS FOUND STROKE TIME (continued)         Image: Compare the As Found Measured Stroke Time (Closing) for 1-FCV-69-1 with criteria specified in Section 1.0 Stroke Time Data Table, AND	<u>&gt;~</u>	
Date       Toc         2.0       1-FCV-69-1 AS FOUND STROKE TIME (continued)         Image: Compare the As Found Measured Stroke Time (Closing) for 1-FCV-69-1 with criteria specified in Section 1.0 Stroke Time Data Table, AND	<u>&gt;AY</u>	
2.0 1-FCV-69-1 AS FOUND STROKE TIME (continued) COMPARE the As Found Measured Stroke Time (Closing) for 1-FCV-69-1 with criteria specified in Section 1.0 Stroke Time Data Table, AND		
COMPARE the As Found Measured Stroke Time (Closing) for 1-FCV-69-1 with criteria specified in Section 1.0 Stroke Time Data Table, AND		
MARK the applicable box for each valve stroke.	OP	
MARK the applicable box (No / Yes) for EACH As Found valve stroke in Section 1.0 Stroke Time Data Table for 1-FCV-69-1 to indicate any abnormal or erratic valve action, AND		
<b>DESCRIBE</b> ANY observed abnormal or erratic condition(s) in Section 1.0 Stroke Time Data Table Comments section.	f	
IF the As Found Measured Stroke Time for 1-FCV-69-1 recorded in Section 1.0 Stroke Time Data Table is greater than the Limiting Value listed, THEN		
<b>PERFORM</b> the following: (Otherwise N/A)		
[8.1] <b>DECLARE</b> valve 1-FCV-69-1 INOPERABLE	NA	
[8.2] INITIATE the appropriate LCO actions.		
[8.3] <b>MARK</b> Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table and the STS.		
IF reason for test marked in step 4.1[4] of main body of procedure is "Post Maintenance/Post Modification Test", THEN		
MARK remaining steps in Section 2.0 N/A. (Otherwise N/A)	NA_	
<b>IF</b> the As Found stroke time recorded in the Section 1.0 Stroke Time Data Table is in Stroke Time Code Criteria, <b>THEN</b>		
PERFORM the following: (Otherwise N/A)		
MARK substeps in Step 2.0[11] N/A.	66	
[102] MARK Section 3.0 of this appendix N/A.	08	

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Appendix A (Page 4 of 12)

#### 1-FCV-69-1 Operational Readiness

Date TODA

#### 2.0 1-FCV-69-1 AS FOUND STROKE TIME (continued)



[11.4] MARK Section 3.0 of this appendix "N/A."

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## Appendix A

# (Page 5 of 12)

#### 1-FCV-69-1 Operational Readiness

Date TODAY

N/1

NA

#### 3.0 1-FCV-69-1 RESTROKE TIMES

[1] **OPEN** 1-FCV-69-1 using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1.

#### NOTES

- 1) The next step starts a timed sequence. Stroke time measurement starts when the handswitch is placed to CLOSE, and stops when the Green light at the handswitch illuminates and the Red light extinguishes.
- Observation of handswitch lights to detect abnormal or erratic action of the valve is required during valve stroke time testing.
  - [2] **CLOSE** and **TIME** 1-FCV-69-1 using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1.
  - [3] **RECORD** the 1st Restroke Measured Stroke Time (Closing) for 1-FCV-69-1 in Section 1.0 Stroke Time Data Table.
  - [4] **OPEN** 1-FCV-69-1 using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1.

#### NOTES

- The next step starts a timed sequence. Stroke time measurement starts when the handswitch is placed to CLOSE, and stops when the Green light at the handswitch illuminates and the Red light extinguishes.
- Observation of handswitch lights to detect abnormal or erratic action of the valve is required during valve stroke time testing.
  - [5] **CLOSE** and **TIME** 1-FCV-69-1 using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1.
  - [6] **RECORD** the 2nd Restroke Measured Stroke Time (Closing) for 1-FCV-69-1 in Section 1.0 Stroke Time Data Table.
|           | BFN<br>Unit 1 | RWCU System PCIV Operability Test                                                                                                                               | 1-SR-3.6.1.3.5<br>Rev. 0001<br>Page 24 of 42           | 6(RWCU) |
|-----------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------|
|           |               | Appendix A<br>(Page 6 of 12)                                                                                                                                    |                                                        |         |
|           |               | 1-FCV-69-1 Operational Reading                                                                                                                                  | ess                                                    |         |
|           |               |                                                                                                                                                                 | Date                                                   | TODAY   |
| <b>.0</b> | 1-FCV         | /-69-1 RESTROKE TIMES (continued)                                                                                                                               |                                                        |         |
|           | [7]           | <b>COMPARE</b> the 1st Restroke Measured Stroke<br>2nd Restroke Measured Stroke Time for 1-FC<br>criteria specified in Section 1.0 Stroke Time Da               | e Time AND the<br>V-69-1 with<br>ata Table, <b>AND</b> |         |
|           |               | MARK the applicable box for each valve strok                                                                                                                    | e.                                                     | NA      |
|           | [8]           | <b>MARK</b> the applicable box (No / Yes) for EACH<br>in Section 1.0 Stroke Time Data Table for 1-Fe<br>indicate any abnormal or erratic valve action, <i>i</i> | H valve restroke<br>CV-69-1 to<br><b>AND</b>           |         |
|           |               | <b>DESCRIBE</b> ANY observed abnormal or erration<br>the Section 1.0 Stroke Time Data Table Comr                                                                | c condition(s) in                                      |         |

### 4.0 **RESTORATION**

**RETURN** 1-FCV-69-1, to the initial position recorded in procedure main body Step 6.0[4] using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1. (N/A if system will remain out of service)



IF NO further RWCU testing is to be performed, THEN

**RETURN** the RWCU system to operation as required by plant conditions in accordance with 1-OI-69. (N/A if 1-FCV-69-2 testing will be performed.)

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BFN RWCU System PCIV Operability Test 1-SR-3.6.1.3.5(RW Unit 1 Rev. 0001 Page 25 of 42	CU)
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5.1

Appendix A (Page 7 of 12)

# 1-FCV-69-1 Operational Readiness

				Date	TOD	<u>ay</u>
5.0	DATA	A REV	/IEW			
5.1	Gene	eral Re	eview			
	Ø	IF re proc	eason for test marked in step 4.1[4] of main body o edure is "Periodic", <b>THEN</b>	əf		
		MAF	<b>RK</b> Section 5.3 N/A. (Otherwise N/A)			DP
	(E)	IF re proc	eason for test marked in step 4.1[4] of main body o edure is NOT "Periodic", <b>THEN</b>	of		
		MAR	RK Section 5.2 N/A. (Otherwise N/A)		<u></u>	NA
5.2	Revie	ew of	Data from Periodic Tests			
		IF th in th Cod	ne As Found stroke time (Closing) for 1-FCV-69-1 ne Section 1.0 Stroke Time Data Table is in Stroke le Criteria, <b>THEN</b>	recorde Time	ed	
		PEF	RFORM the following: (Otherwise N/A)			
	[1	1.1]	MARK Stroke Time Acceptance Criteria Satisfic "Yes" in the Section 1.0 Stroke Time Data Table	ed as e.		
	[1	1.2]	MARK remaining steps in Section 5.2 N/A.			

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#### Appendix A (Page 8 of 12)

#### 1-FCV-69-1 Operational Readiness

Date

TODA

### 5.2 Review of Data from Periodic Tests (continued)

[2] **IF** the 1st Restroke OR 2nd Restroke Measured Stroke Time (Closing) for 1-FCV-69-1 recorded in Section 1.0 Stroke Time Data Table is in Low Alert or High Alert, **THEN** 

**PERFORM** Step 5.2[2.1] OR Step 5.2[2.2] as follows: (Otherwise N/A)

[2.1] DECLARE valve 1-FCV-69-1 INOPERABLE, AND

**INITIATE** the appropriate LCO actions, **AND** 

**INITIATE SR/PER** to begin corrective actions.

- [2.2] **NOTIFY** Duty Engineer that the ASME IST Program owner must perform an evaluation of test results within the most limiting timeframe of;
  - ____hrs per Tech Spec LCO _____

OR

□ Within 96 hours

Evaluation Time Restriction					
Start: Date/Time	End: Date/Time				

#### AND

**INITIATE** SR/PER to ensure an Engineering Evaluation is performed to verify stroke times represent acceptable operation, **AND** 

**MARK** table in Step 7.1[4] of main body of procedure for 1-FCV-69-1 to indicate an Engineering Evaluation to verify new stroke times represent acceptable operation.

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		1

# Appendix A

### (Page 9 of 12)

### 1-FCV-69-1 Operational Readiness

Date **Review of Data from Periodic Tests (continued)** 5.2 IF BOTH of the 1st Restroke and 2nd Restroke Measured [3] Stroke Times (Closing) for 1-FCV-69-1 recorded in Section 1.0 Stroke Time Data Table are in the Stroke Time Code Criteria, THEN PERFORM the following: (Otherwise N/A) **INITIATE SR/PER to ensure a follow-up Engineering** [3.1] Evaluation is performed to analyze the deviation between as found and restroke stroke times. MARK table in Step 7.1[4] of main body of procedure for [3.2] 1-FCV-69-1 to indicate an Engineering Evaluation of stroke time deviation is required. IF "Yes" was marked for ANY observation for abnormal or [4] erratic valve action, THEN **PERFORM** the following: (Otherwise N/A) **INITIATE SR/PER to ensure a follow-up Engineering** [4.1] Evaluation is performed to determine the need for corrective action MARK table in Step 7.1[4] of main body of procedure for [4.2] 1-FCV-69-1 to indicate an Engineering Evaluation to determine the need for corrective action is required.

#### NOTE

The remainder of the procedure may be performed while waiting on evaluation of valve stroke test results in the following step.

IF the evaluation of test results is not completed within the [5] timeframe of the Evaluation Time Restriction of Step 5.2[2.2] above OR the evaluation determines the valve stroke times are unacceptable, THEN

PERFORM the following: (Otherwise N/A)

l	BFN Jnit 1	RWCU System PCIV Operability Test	1-SR-3.6.1.3.5(R) Rev. 0001 Page 28 of 42	WCU)
		Appendix A (Page 10 of 12)		
		1-FCV-69-1 Operational Readine	SS	
			Date	Τοραγ
5.2	Review o	f Data from Periodic Tests (continued)		
	[5.1]	DECLARE valve-1-FCV-69-1 INOPERA	BLE.	
	[5.2]	PERFORM appropriate LCO action.		••••
	[6] IF	ONE of the following conditions is satisfied:		
	٠	The As Found Stroke time (Closing) recorn Section 1.0 Stroke Time Data Table is in the Code Criteria, <b>OR</b>	ded in Stroke Time	
	٠	The As Found stroke time (Closing) is in I Alert <b>AND</b> BOTH 1st and 2nd Restroke ti are in Stroke Time Code Criteria, <b>OR</b>	High Alert or Low mes (Closing)	
	٠	The As Found stroke time (Closing) is in Alert <b>AND</b> ANY 1st or 2nd Restroke time or Low Alert <b>AND</b> an Engineering Evalua completed which concludes the stroke tin acceptable valve operation, <b>THEN</b>	High Alert or Low is in High Alert tion has been nes represent	
	M	ARK the condition satisfied above, AND		

٦

**MARK** Acceptance Criteria Satisfied as "Yes" in Section 1.0 Stroke Time Data Table and the STS. (Otherwise N/A)

Unit 1 Rev. 0001 Page 29 of 42	BFN Unit 1	RWCU System PCIV Operability Test	1-SR-3.6.1.3.5(RWCU) Rev. 0001 Page 29 of 42
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#### 1-FCV-69-1 Operational Readiness

	Date	TODAY
ata from Periodic Tests (continued)		
p 5.2[6] above is marked N/A, <b>THEN</b>		
<b>ORM</b> the following: (Otherwise N/A)		
DECLARE valve 1-FCV-69-1 INOPERABLE.		-

[7.2]	<b>INITIATE</b> the appropriate LCO actions.

**Review of Data from Periodic Tests (continued)** 

IF Step 5.2[6] above is marked N/A, THEN

PERFORM the following: (Otherwise N/A)

- **INITIATE SR/PER to begin corrective actions.** [7.3]
- MARK Acceptance Criteria Satisfied as "No" in the [7.4] Section 1.0 Stroke Time Data Table.

#### **Review of Data from PMT / Other Tests** 5.3

5.2

[7]

[7.1]

IF ALL stroke times (Closing) for 1-FCV-69-1 recorded in [1] Section 1.0 Stroke Time Data Table are in the Stroke Time Code Criteria, THEN

**PERFORM** the following actions: (Otherwise N/A)

- MARK Acceptance Criteria Satisfied as "Yes" in [1.1] Section 1.0 Stroke Time Data Table and the STS.
- MARK table in Step 7.1[4] in the main body of this [1.2] procedure for 1-FCV-69-1 to indicate reference value reconfirmation or determination is required.
- MARK remaining steps in Section 5.3 N/A. [1.3]

BFN RWCU System PCIV Operability Test 1-SR-3.6.1.3.5(RWCU) Unit 1 Rev. 0001 Page 30 of 42	
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#### Appendix A (Page 12 of 12)

#### 1-FCV-69-1 Operational Readiness

Date

TODA

NA

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### 5.3 Review of Data from PMT / Other Tests (continued)

[2] **IF** ANY stroke time (Closing) for 1-FCV-69-1 recorded in Section 1.0 Stroke Time Data Table is in Low Alert, High Alert, or Limiting Value, **THEN** 

**PERFORM** the following actions: (Otherwise N/A)

- [2.1] **NOTIFY** engineering to perform an evaluation to determine acceptability of new stroke times.
- [2.2] **MARK** table in Step 7.1[4] in the main body of this procedure for 1-FCV-69-1 to indicate reference value reconfirmation or determination is required.

#### NOTE

The remainder of the procedure may be performed while waiting on evaluation of valve stroke test results in the following step.

[3] **ENSURE** engineering evaluation of stroke times is complete.

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### Appendix B

### (Page 1 of 12)

### 1-FCV-69-2 Operational Readiness

Date TODA

### 1.0 1-FCV-69-2 TEST DATA

NOTE

The Stroke Time Data Table below will be completed as data becomes available during performance of Appendix B.

#### Stroke Time Data Table

# 1-FCV-69-2, RWCU OUTBD SUCT ISOLATION VALVE

Ref. Worksheet Number: BFN-IST-20120418 Date: 08-01-2012

Ref. Value	Measu	red Stroke Time	(seconds)	Low Alert	Stroke Time Code Criteria	High Alert	Limiting Value	Abnor or En actic	rmal ratic on?
	Step	$0 \rightarrow C$ (Clos	sing Time)	<16.24	16.24 to 21.96	>21.96	>30.00	No	Yes
	2.0[5]	As Found	30,03				Þ	ø	
19.10	3.0[3]	1st Restroke							
	3.0[6]	2nd Restroke							
N/A	Step	$C \rightarrow O$ (Opening Time)		N/A	N/A	N/A	N/A	No	Yes
	N/A	As Found	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	1st Restroke	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	2nd Restroke	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comments: NONE									
	Stroke Time Acceptance Criteria Satisfied Yes D No								

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# Appendix B

(Page 2 of 12) 1-FCV-69-2 Operational Readiness

Date

TODAY

# CAUTION

If the reactor is pressurized, the time that 1-FCV-69-1 and 1-FCV-69-2 are closed should be minimized to ensure RWCU piping remains charged.

# NOTE

Sections 2.0 and 3.0 are performed on Panel 1-9-4 unless otherwise noted.

## 2.0 1-FCV-69-2 AS FOUND STROKE TIME

(H)

**(**4)

(Ø

RECORD the stopwatch M&TE ID number:

	M&TE: <u>STOPWATCH</u>	OP
Þ	<b>VERIFY</b> procedure main body Steps 6.0[4], 6.0[5], and 6.0[6] have been completed.	<u></u> OP
Ê	VERIFY OPEN 1-FCV-69-2, using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A.	<u> </u>



**CLOSE** and **TIME** 1-FCV-69-2 using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A.

or

**RECORD** the As Found Measured Stroke Time (Closing) for 1-FCV-69-2 in Section 1.0 Stroke Time Data Table.

OP

	B Ur	FN nit 1	RWCU System PCIV Operability Test	1-SR-3.6.1.3.5(RWCU) Rev. 0001 Page 33 of 42
			Appendix B (Page 3 of 12)	
			1-FCV-69-2 Operational Readine	ess
				Date TODAY
	2.0	1-FCV-69	-2 AS FOUND STROKE TIME (continued)	
	(	67 CO 1-1 Da	<b>DMPARE</b> the As Found Measured Stroke Tir FCV-69-2 with criteria specified in Section 1. ata Table, <b>AND</b>	me (Closing) for 0 Stroke Time
		M	ARK the applicable box for each valve stroke	e. <u>of</u>
	Ç	M. sti to	ARK the applicable box (No / Yes) for EACH roke in Section 1.0 Stroke Time Data Table f indicate any abnormal or erratic valve actior	l As Found valve for 1-FCV-69-2 n, <b>AND</b>
		Di Se	ESCRIBE ANY observed abnormal or erratic ection 1.0 Stroke Time Data Table Comment	condition(s) in ts section.
C	(	[8] IF re th	the As Found Measured Stroke Time for 1-I corded in Section 1.0 Stroke Time Data Tab e Limiting Value listed, <b>THEN</b>	FCV-69-2 le is greater than
		Р	ERFORM the following: (Otherwise N/A)	
		[8.1]	DECLARE valve 1-FCV-69-2 INOPERA	\BLE
		[8.2]	<b>INITIATE</b> the appropriate LCO actions.	
		[8.3]	<b>MARK</b> Acceptance Criteria Satisfied as Section 1.0 Stroke Time Data Table and	"No" in the d the STS.
		p p	reason for test marked in step 4.1[4] of mai rocedure is "Post Maintenance/Post Modifica	in body of ation Test", <b>THEN</b>
		N	IARK remaining steps in Section 2.0 N/A. (C	Otherwise N/A) <u>NA</u>
		[10] <b>II</b> T	the As Found stroke time recorded in the S ime Data Table is in Stroke Time Code Crite	Section 1.0 Stroke eria, T <b>HEN</b>
		F	<b>ERFORM</b> the following: (Otherwise N/A)	
		[10.1	MARK substeps in Step 2.0[11] N/A.	
		[10.2	2] MARK Section 3.0 of this appendix N/A	A

•

BFN Unit 1	<b>RWCU System PCIV Operability Test</b>	1-SR-3.6.1.3.5(RWCU) Rev. 0001 Page 34 of 42
		I age of or the

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#### 1-FCV-69-2 Operational Readiness

Date _

TODAY

# 2.0 1-FCV-69-2 AS FOUND STROKE TIME (continued)

[11.4]

### 

MARK Section 3.0 of this appendix "N/A."

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# Appendix B

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### 1-FCV-69-2 Operational Readiness

Date _

TODAY

### 3.0 1-FCV-69-2 RESTROKE TIMES

[1] **OPEN** 1-FCV-69-2 using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A.

### NOTES

- 1) The next step starts a timed sequence. Stroke time measurement starts when the handswitch is placed to CLOSE, and stops when the Green light at the handswitch illuminates and the Red light extinguishes.
- 2) Observation of handswitch lights to detect abnormal or erratic action of the valve is required during valve stroke time testing.
  - [2] **CLOSE** and **TIME** 1-FCV-69-2 using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A.
  - [3] **RECORD** the 1st Restroke Measured Stroke Time (Closing) for 1-FCV-69-2 in Section 1.0 Stroke Time Data Table.
  - [4] **OPEN** 1-FCV-69-2 using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A.

#### NOTES

- 1) The next step starts a timed sequence. Stroke time measurement starts when the handswitch is placed to CLOSE, and stops when the Green light at the handswitch illuminates and the Red light extinguishes.
- 2) Observation of handswitch lights to detect abnormal or erratic action of the valve is required during valve stroke time testing.
  - [5] **CLOSE** and **TIME** 1-FCV-69-2 using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A.
  - [6] **RECORD** the 2nd Restroke Measured Stroke Time (Closing) for 1-FCV-69-2 in Section 1.0 Stroke Time Data Table.

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#### Appendix B (Page 6 of 12)

### 1-FCV-69-2 Operational Readiness

Date <u>TOPA</u>
1-FCV-69-2 RESTROKE TIMES (continued)
[7] COMPARE the 1st Restroke Measured Stroke Time AND the 2nd Restroke Measured Stroke Time for 1-FCV-69-2 with criteria specified in Section 1.0 Stroke Time Data Table, AND
MARK the applicable box for each valve stroke.
[8] MARK the applicable box (No / Yes) for EACH valve restroke in Section 1.0 Stroke Time Data Table for 1-FCV-69-2 to indicate any abnormal or erratic valve action, AND
DESCRIBE ANY observed abnormal or erratic condition(s) in the Section 1.0 Stroke Time Data Table Comments section.

#### 4.0 **RESTORATION**

3.0

- RETURN 1-FCV-69-2, to the initial position recorded in procedure main body Step 6.0[4] using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A. (N/A if system will remain out of service)
- [2] IF NO further RWCU testing is to be performed, THEN

**RETURN** the RWCU system to operation as required by plant conditions in accordance with 1-OI-69. (N/A if 1-FCV-69-1 testing will be performed.)

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# 1-FCV-69-2 Operational Readiness

	Date _	TODAY
DATA F	REVIEW	
Genera	I Review	
۲ ۲	F reason for test marked in step 4.1[4] of main body of procedure is "Periodic", <b>THEN</b>	
R	MARK Section 5.3 N/A. (Otherwise N/A)	oP
	F reason for test marked in step 4.1[4] of main body of procedure is NOT "Periodic", <b>THEN</b>	
ľ	MARK Section 5.2 N/A. (Otherwise N/A)	NA
Review	of Data from Periodic Tests	
[1] I i	IF the As Found stroke time (Closing) for 1-FCV-69-2 recorded in the Section 1.0 Stroke Time Data Table is in Stroke Time Code Criteria, <b>THEN</b>	
I	PERFORM the following: (Otherwise N/A)	
[1.1	] MARK Stroke Time Acceptance Criteria Satisfied as "Yes" in the Section 1.0 Stroke Time Data Table.	
[1.2	MARK remaining steps in Section 5.2 N/A.	

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#### 1-FCV-69-2 Operational Readiness

Date

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# 5.2 Review of Data from Periodic Tests (continued)

[2] **IF** the 1st Restroke OR 2nd Restroke Measured Stroke Time (Closing) for 1-FCV-69-2 recorded in Section 1.0 Stroke Time Data Table is in Low Alert or High Alert, **THEN** 

**PERFORM** Step 5.2[2.1] OR Step 5.2[2.2] as follows: (Otherwise N/A)

[2.1] DECLARE valve 1-FCV-69-2 INOPERABLE, AND

**INITIATE** the appropriate LCO actions, **AND** 

**INITIATE SR/PER to begin corrective actions.** 

- [2.2] **NOTIFY** Duty Engineer that the ASME IST Program owner must perform an evaluation of test results within the most limiting timeframe of;
  - ____hrs per Tech Spec LCO _____

OR

□ Within 96 hours

Evaluation Time Restriction			
Start: Date/Time End: Date/Time			

#### AND

**INITIATE** SR/PER to ensure an Engineering Evaluation is performed to verify stroke times represent acceptable operation, **AND** 

**MARK** table in Step 7.1[4] of main body of procedure for 1-FCV-69-2 to indicate an Engineering Evaluation to verify new stroke times represent acceptable operation.

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1-FCV-69-2 Operational Readiness					
	Date	roody			
Review of	Review of Data from Periodic Tests (continued)				
[3] IF BOTH of the 1st Restroke and 2nd Restroke Measured Stroke Times (Closing) for 1-FCV-69-2 recorded in Section 1.0 Stroke Time Data Table are in the Stroke Time Code Criteria, THEN					
PER	<b>FORM</b> the following: (Otherwise N/A)				
[3.1]	<b>INITIATE</b> SR/PER to ensure a follow-up Engineering Evaluation is performed to analyze the deviation between as found and restroke stroke times.				
[3.2]	<b>MARK</b> table in Step 7.1[4] of main body of procedure for 1-FCV-69-2 to indicate an Engineering Evaluation of stroke time deviation is required.				
[4] IF "Yes" was marked for ANY observation for abnormal or erratic valve action, THEN					
<b>PERFORM</b> the following: (Otherwise N/A)					
[4.1]	<b>INITIATE</b> SR/PER to ensure a follow-up Engineering Evaluation is performed to determine the need for corrective action				
[4.2]	<b>MARK</b> table in Step 7.1[4] of main body of procedure for 1-FCV-69-2 to indicate an Engineering Evaluation to determine the need for corrective action is required.				

### NOTE

The remainder of the procedure may be performed while waiting on evaluation of valve stroke test results in the following step.

IF the evaluation of test results is not completed within the [5] timeframe of the Evaluation Time Restriction of Step 5.2[2.2] above OR the evaluation determines the valve stroke times are unacceptable, THEN

PERFORM the following: (Otherwise N/A)

an ^{ina k} a Nazarti	BFN Unit 1	RWCU System PCIV Operability Test	1-SR-3.6.1.3.5(RWCU) Rev. 0001 Page 40 of 42
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# 1-FCV-69-2 Operational Readiness

			Date _	TODAY
5.2	Revi	ew of	f Data from Periodic Tests (continued)	/
	[5	5.1]	DECLARE valve-1-FCV-69-2 INOPERABLE.	
	[5	5.2]	PERFORM appropriate LCO action.	
	[6]	IF (	ONE of the following conditions is satisfied:	
		•	The As Found Stroke time (Closing) recorded in Section 1.0 Stroke Time Data Table is in Stroke Time Code Criteria, <b>OR</b>	
		٠	The As Found stroke time (Closing) is in High Alert or Low Alert <b>AND</b> BOTH 1st and 2nd Restroke times (Closing) are in Stroke Time Code Criteria, <b>OR</b>	
		e	The As Found stroke time (Closing) is in High Alert or Low Alert <b>AND</b> ANY 1st or 2nd Restroke time is in High Alert or Low Alert <b>AND</b> an Engineering Evaluation has been completed which concludes the stroke times represent acceptable valve operation, <b>THEN</b>	
		M	ARK the condition satisfied above, AND	
		M/ Sti	<b>ARK</b> Acceptance Criteria Satisfied as "Yes" in Section 1.0 roke Time Data Table and the STS. (Otherwise N/A)	

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5.3

# Appendix B (Page 11 of 12)

# 1-FCV-69-2 Operational Readiness

	Date	TODAY		
Review of	Data from Periodic Tests (continued)	1		
[7] IF St	tep 5.2[6] above is marked N/A, <b>THEN</b>			
PER	FORM the following: (Otherwise N/A)			
[7.1]	DECLARE valve 1-FCV-69-2 INOPERABLE.			
[7.2]	<b>INITIATE</b> the appropriate LCO actions.	<u></u>		
[7.3]	<b>INITIATE SR/PER to begin corrective actions.</b>	<u></u>		
[7.4]	<b>MARK</b> Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table.			
Review of	Data from PMT / Other Tests			
[1] IF A Sect Cod	LL stroke times (Closing) for 1-FCV-69-2 recorded in tion 1.0 Stroke Time Data Table are in the Stroke Time e Criteria, <b>THEN</b>			
<b>PERFORM</b> the following actions: (Otherwise N/A)				
[1.1]	<b>MARK</b> Acceptance Criteria Satisfied as "Yes" in Section 1.0 Stroke Time Data Table and the STS.	NA		
[1.2]	<b>MARK</b> table in Step 7.1[4] in the main body of this procedure for 1-FCV-69-2 to indicate reference value reconfirmation or determination is required.			
[1.3]	MARK remaining steps in Section 5.3 N/A.	<u> </u>		

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# Appendix B

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### 1-FCV-69-2 Operational Readiness

Date _

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#### 5.3 Review of Data from PMT / Other Tests (continued)

[2] **IF** ANY stroke time (Closing) for 1-FCV-69-2 recorded in Section 1.0 Stroke Time Data Table is in Low Alert, High Alert, or Limiting Value, **THEN** 

**PERFORM** the following actions: (Otherwise N/A)

- [2.1] **NOTIFY** engineering to perform an evaluation to determine acceptability of new stroke times.
- [2.2] **MARK** table in Step 7.1[4] in the main body of this procedure for 1-FCV-69-2 to indicate reference value reconfirmation or determination is required.

#### NOTE

The remainder of the procedure may be performed while waiting on evaluation of valve stroke test results in the following step.

[3] **ENSURE** engineering evaluation of stroke times is complete.

OPERATOR: _____

SRO _____ DATE:_____

SRO A2 JPM NUMBER:

S-000-AD-27 TASK NUMBER:

LCO Tracking Log Entry for an active LCO TASK TITLE:

K/A NUMBER: 2.2.23 K/A RATING: SRO 4.3

TASK STANDARD: Complete LCO Tracking Log entries for Inoperable Primary Containment Isolations Valves 2-FCV-69-2

LOCATION OF PERFORMANCE: Class Room

REFERENCES/PROCEDURES NEEDED: OPDP-8, Tech Spec 3.6.1.3, and 2-SR-3.6.1.3.5 (RWCU)

VALIDATION TIME: 30 minutes

**PERFORMANCE TIME:** 

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

SATISFACTORY ____ UNSATISFACTORY ____ **RESULTS**:

SIGNATURE: _____

DATE:

EXAMINER

#### **INITIAL CONDITIONS:**

Unit 2 is In Mode 1. Timing of RWCU valves in accordance with 2-SR-3.6.1.3.5(RWCU) RWCU System PCIV Operability Test is complete.

#### **INITIATING CUE:**

ł.

Complete the surveillance 2-SR-3.6.1.3.5, start at step 5.2[1] in Appendix A for 2-FCV-69-1, and Appendix B for 2-FCV-69-2.

When this is completed raise hand and tell proctor whether the Acceptance criteria is MET or NOT MET.

*****

#### **Class Room**

******

#### **INITIAL CONDITIONS:**

Unit 2 is In Mode 1. Timing of RWCU valves in accordance with 2-SR-3.6.1.3.5(RWCU) RWCU System PCIV Operability Test is complete.

#### **INITIATING CUE:**

Complete the surveillance 2-SR-3.6.1.3.5, start at step 5.2[1] in Appendix A for 2-FCV-69-1, and Appendix B for 2-FCV-69-2.

When this is completed raise hand and tell proctor whether the Acceptance criteria is MET or NOT MET.

#### START TIME_____

Performance Step 1:

Critical  $\underline{X}$  Not Critical

#### 5.2 Review of Data from Periodic Tests

- [1] **IF** the As Found stroke time (Closing) for 2-FCV-69-1 recorded in the Section 1.0 Stroke Time Data Table is in Stroke Time Code Criteria, **THEN PERFORM** the following:
  - [1.1] **MARK** Stroke Time Acceptance Criteria Satisfied as "Yes" in the Section 1.0 Stroke Time Data Table.

#### **1.0 2-FCV-69-1 TEST DATA**

#### 2-FCV-69-1, RWCU INBD SUCT ISOLATION VALVE

Stroke Time Acceptance Criteria Satisfied Yes D No D

#### Standard:

Marks YES for stroke time acceptance criteria satisfied

SAT__ UNSAT__ N/A ___COMMENTS:_____

********

Performance Step 2:

Critical Not Critical  $\underline{X}$ 

[1.2] MARK remaining steps in Section 5.2 N/A.

Standard:

Marks steps in section 5.2 as NA

SAT__UNSAT__N/A __COMMENTS:_____

*********

Performance Step 3:

Critical X Not Critical

#### 2.0 2-FCV-69-2 AS FOUND STROKE TIME

- [8] **IF** the As Found Measured Stroke Time for 2-FCV-69-2 recorded in Section 1.0 Stroke Time Data Table is greater than the Limiting Value listed, **THEN PERFORM** the following:
  - [8.1] **DECLARE** valve 2-FCV-69-2 INOPERABLE.

#### Standard:

Declares valve 2-FCV-69-2 Inoperable

SAT__ UNSAT__ N/A __COMMENTS:_____

Performance Step 4:

Critical  $\underline{X}$  Not Critical

[8.2] **INITIATE** the appropriate LCO actions.

Standard:

Initiates appropriate LCO actions by evaluating Technical Specifications and OPDP-8. Determines that LCO Tracking Log entries are required.

SAT__UNSAT___N/A ___COMMENTS:_____

CUE: Direct applicant to make a computerized entry into the eSOMs BFN Action Tracking Training data base and provide applicant with the password.

#### 

Performance Step 5:

Critical  $\underline{X}$  Not Critical

- [8.3] MARK Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table and the STS.
- 2.0 2-FCV-69-2 TEST DATA

### 2-FCV-69-2, RWCU OUTBD SUCT ISOLATION VALVE

Stroke Time Acceptance Criteria Satisfied Yes D No D

Standard:

Marks NO for stroke time acceptance criteria satisfied

SAT UNSAT N/A COMMENTS:

#### ***********

Performance Step 6:

Critical  $\underline{X}$  Not Critical

Logs on to Action Tracking Program and completes a log entry for 2-FCV-69-2

### Standard:

The following elements must be entered into the eSOMs Action Tracking Training data base IAW OPDP-8 (see answer key)

- LCO Tracking Number
- Applicable Tech Spec LCO number
- Tech Spec 3.6.1.3 Action Statements A.1 and A.2
- Date and Time of entry
- Date and Time when completion time expires
- Correct BFN Unit

SAT__ UNSAT__ N/A ___COMMENTS:_____

CUE: Once this is complete, have applicant go to print, go to actions sheet and select preview. Print document.

NOTE: Exit LCO, once exited log back in and delete the LCO that was entered.

CUE: Ask Applicant: How will Tech Spec Action Statement A.1 be met?

# 

Performance Step 7:

Critical  $\underline{X}$  Not Critical

How will Tech Spec Action Statement A.1 be met?

Standard:

2-FCV-69-1 OR 2-FCV-69-2 will be closed and deactivated under a clearance.

SAT__ UNSAT__ N/A __COMMENTS:_____

END OF TASK

STOP TIME ____

OPERATOR: _____

SRO _____ DATE:_____

JPM NUMBER: SRO A2

TASK NUMBER: S-000-AD-27

LCO Tracking Log Entry for an active LCO TASK TITLE:

K/A RATING: SRO 4.3 K/A NUMBER: 2.2.23

TASK STANDARD: Complete LCO Tracking Log entries for Inoperable Primary Containment Isolations Valves 3-FCV-69-2

LOCATION OF PERFORMANCE: Class Room

REFERENCES/PROCEDURES NEEDED: OPDP-8, Tech Spec 3.6.1.3, and 3-SR-3.6.1.3.5 (RWCU)

**VALIDATION TIME: 30 minutes** 

PERFORMANCE TIME:

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

SATISFACTORY UNSATISFACTORY **RESULTS**:

SIGNATURE: _____

DATE: _____

EXAMINER

#### **INITIAL CONDITIONS:**

Unit 3 is In Mode 1. Timing of RWCU valves in accordance with 3-SR-3.6.1.3.5(RWCU) RWCU System PCIV Operability Test is complete.

#### **INITIATING CUE:**

Complete the surveillance 3-SR-3.6.1.3.5, start at step 5.2[1] in Appendix A for 3-FCV-69-1, and Appendix B for 3-FCV-69-2.

When this is completed raise hand and tell proctor whether the Acceptance criteria is MET or NOT MET.

*****

#### **Class Room**

***********

#### **INITIAL CONDITIONS:**

Unit 3 is In Mode 1. Timing of RWCU values in accordance with 3-SR-3.6.1.3.5(RWCU) RWCU System PCIV Operability Test is complete.

#### **INITIATING CUE:**

Complete the surveillance 3-SR-3.6.1.3.5, start at step 5.2[1] in Appendix A for 3-FCV-69-1, and Appendix B for 3-FCV-69-2.

When this is completed raise hand and tell proctor whether the Acceptance criteria is MET or NOT MET.

#### START TIME

#### 5.2 Review of Data from Periodic Tests

- [1] **IF** the As Found stroke time (Closing) for 3-FCV-69-1 recorded in the Section 1.0 Stroke Time Data Table is in Stroke Time Code Criteria, **THEN PERFORM** the following:
  - [1.1] **MARK** Stroke Time Acceptance Criteria Satisfied as "Yes" in the Section 1.0 Stroke Time Data Table.

### 1.0 3-FCV-69-1 TEST DATA

#### **3-FCV-69-1, RWCU INBD SUCT ISOLATION VALVE**

Stroke Time Acceptance Criteria Satisfied Yes D No D

#### Standard:

Marks YES for stroke time acceptance criteria satisfied

SAT__ UNSAT__ N/A ___COMMENTS:_____

*******

Performance Step 2:

Critical Not Critical  $\underline{X}$ 

[1.2] MARK remaining steps in Section 5.2 N/A.

Standard:

Marks steps in section 5.2 as NA

SAT__UNSAT___N/A __COMMENTS:_____

#### 

#### Performance Step 3:

Critical X Not Critical

#### 2.0 3-FCV-69-2 AS FOUND STROKE TIME

- IF the As Found Measured Stroke Time for 3-FCV-69-2 recorded in Section 1.0 Stroke [8] Time Data Table is greater than the Limiting Value listed, THEN PERFORM the following:
  - [8.1] **DECLARE** valve 3-FCV-69-2 INOPERABLE.

#### Standard:

Declares valve 3-FCV-69-2 Inoperable

SAT__UNSAT__N/A __COMMENTS:_____

Performance Step 4:

Critical X Not Critical

[8.2] **INITIATE** the appropriate LCO actions.

Standard:

Initiates appropriate LCO actions by evaluating Technical Specifications and OPDP-8. Determines that LCO Tracking Log entries are required.

SAT__UNSAT__N/A __COMMENTS:_____

CUE: Direct applicant to make a computerized entry into the eSOMs BFN Action Tracking Training data base and provide applicant with the password.

************

Performance Step 5:

Critical  $\underline{X}$  Not Critical

- [8.3] **MARK** Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table and the STS.
- 2.0 3-FCV-69-2 TEST DATA

#### 3-FCV-69-2, RWCU OUTBD SUCT ISOLATION VALVE

Stroke Time Acceptance Criteria Satisfied Yes 🗆 No 🗆

Standard:

Marks NO for stroke time acceptance criteria satisfied

SAT__ UNSAT__ N/A ___COMMENTS:_____

#### ***************

Performance Step 6:

Critical  $\underline{X}$  Not Critical

Logs on to Action Tracking Program and completes a log entry for 3-FCV-69-2

#### Standard:

The following elements must be entered into the eSOMs Action Tracking Training data base IAW OPDP-8 (see answer key)

- LCO Tracking Number
- Applicable Tech Spec LCO number
- Tech Spec 3.6.1.3 Action Statements A.1 and A.2
- Date and Time of entry
- Date and Time when completion time expires
- Correct BFN Unit

SAT__ UNSAT___ N/A ___COMMENTS:_____

CUE: Once this is complete, have applicant go to print, go to actions sheet and select preview. Print document.

NOTE: Exit LCO, once exited log back in and delete the LCO that was entered.

CUE: Ask Applicant: How will Tech Spec Action Statement A.1 be met?

### 

Performance Step 7:

Critical  $\underline{X}$  Not Critical

# How will Tech Spec Action Statement A.1 be met? <u>Standard:</u>

3-FCV-69-1 OR 3-FCV-69-2 will be closed and deactivated under a clearance.

SAT__ UNSAT__ N/A __COMMENTS:_____

END OF TASK

STOP TIME ____

# JPM SRO A3

0	PERATOR:	· · · · · · · · · · · · · · · · · · ·
SI	RO	DATE:
JF	PM NUMBER:	Admin SRO A3
T.	ASK NUMBER:	Radiation Control
T	ASK TITLE:	Calculate Airborne Effluent Release Rate IAW 0-SI-4.8.b.1.a.1
K	A NUMBER: 2.3.	11 K/A RATING: RO 3.8 SRO 4.3
P	RA:	
T.	ASK STANDARD:	Calculate Building Ventilation Release Fraction and determine acceptance criteria met. Calculate Stack Release Fraction and determine that acceptance criteria NOT met. Calculate Total Site Release Fraction and determine acceptance criteria met.
$\mathbf{L}$	OCATION OF PER	FORMANCE: Classroom
R	EFERENCES/PRO	CEDURES NEEDED: 0-SI-4.8.B.1.a.1, ODCM
V	ALIDATION TIME	E: 15 minutes
P	ERFORMANCE TI	ME:
С	COMMENTS:	
A	Additional comment	sheets attached? YES NO
R	ESULTS: SATI	SFACTORY UNSATISFACTORY
S	IGNATURE:	DATE:

C

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**INITIAL CONDITIONS:** You are an extra operator on Dayshift Friday. The Control Bay AUO has partially completed the appropriate Attachments of 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate.

**INITIATING CUE:** The Shift Manager directs you to complete the remainder 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate, starting at [10.2] and stopping at [12]; calculate all three release rate fractions and identify if any further actions are required.

**NOTE:** The Control Bay AUO has gathered all required data; therefore, some subsequent steps after [10.2] may be completed.

à.

#### JPM SRO A3

Classroom

**INITIAL CONDITIONS:** You are an extra operator on Dayshift Friday. The Control Bay AUO has partially completed the appropriate Attachments of 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate.

**INITIATING CUE:** The Shift Manager directs you to complete the remainder 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate, starting at [10.2] and stopping at [12]; calculate all three release rate fractions and identify if any further actions are required.

**NOTE:** The Control Bay AUO has gathered all required data; therefore, some subsequent steps after [10.2] may be completed.

#### JPM SRO A3

#### START TIME

#### 

#### Performance Step 1:

Critical  $\underline{X}$  Not Critical

- [10.2] For each monitor, USE Attachments 3 and 5 and DETERMINE the release factor based on fan status. **RECORD** the release factors from attachment 5 in the appropriate columns on Attachment 4.
- [10.3] **MULTIPLY** the release rate by the release factor and **RECORD** the answer under the column labeled "Actual Rate" on Attachment 4.

#### Standard:

Determines the release factor for each building based on fan status using attachments 3 and 5 and records in the release factor column on attachment 4.

Multiplies the Release Rate from the RM-90-250, RM-90-249, and the RM-90-251 by the Release Factor to determine the Actual Rate; candidate will perform this action for each Unit as well as the Radwaste Building (0-RM-90-252) and record the data on Attachment 4. Refer to Answer Sheet for correct values or see below.

Unit 1	Unit 2	Unit 3	Radwaste
$\frac{\text{Reactor Building}}{(1-\text{RM-90-250})}$ 4000 x 0.64 = 2560	$\frac{\text{Reactor Building}}{(2-\text{RM}-90-250)}$ <b>3400 x 0.73 = 2482</b>	Reactor Building (3-RM-90-250) 3100 x 0.69 = 2139	
Turbine Building $(1-RM-90-249)$ $500 \times 0.75 = 375$ $(1-RM-90-251)$ $910 \times 0.80 = 728$	$\frac{\text{Turbine Building}}{(2-\text{RM-90-249})}$ 840 x 1.00 = 840 (2-RM-90-251) 2200 x 1.00 = 2200	Turbine Building           (3-RM-90-249)           1600 x 0.40 = 640           (3-RM-90-251)           1900 x 0.75 = 1425	0-RM-90-252 226 x 0.62 = 140

SAT__ UNSAT___ N/A ___COMMENTS:_____

#### 

[10.4] For each unit, **SUM** the actual rates for the RM-90-249, RM-90-250, and RM-90-251 monitors.

**RECORD** the unit total release rates in the appropriate columns on Attachment4.

#### Standard:

Sums the Actual Rates from the RM-90-249, RM-90-250, and RM-90-251 monitors for each Unit and records the Total Release Rate for each Unit on Attachment 4. Refer to Answer Sheet for correct values or see below.

Unit 1	Unit 2	Unit 3		
2560 + 375 + 728 = 3663	2482 + 840 + 2200 = 5522	2139 + 640 + 1425 = 4204		

SAT__ UNSAT__ N/A ___COMMENTS:_____

#### ******

Performance Step 3:

 $Critical \underline{X} \quad Not Critical$ 

[10.5] **SUM** the three unit total release rates and the 0-RM-90-252 actual rate. **RECORD** the building ventilation release rate on Attachment 4.

#### Standard:

Sums each Units Total Release Rate and the Radwaste Building Actual Release Rate (0-RM-90-252) and records the Building Ventilation Release Rate on Attachment 4. Refer to Answer Sheet for correct value or see below.

 $\frac{\text{Unit 1}}{3663} + \frac{\text{Unit 2}}{5522} + \frac{\text{Unit 3}}{4204} + \frac{\text{Radwaste}}{140} = \frac{\text{Total}}{13529}$ SAT UNSAT N/A COMMENTS:

#### 

#### NOTE

For reporting purposes, the release fraction should only be recorded to three decimal places.

### EXAMPLES

A release fraction of 0.12345 should be recorded as 0.123. A release fraction of 0.00012 should be recorded as 0.000.

[10.6] DETERMINE the building ventilation release fraction by dividing the total building ventilation release rate by 1.50 E+05 (or 150,000) μCi/sec. RECORD the fraction on both Attachment 2 and Attachment 4.

#### Standard:

Divides the Total Building Ventilation Release Rate by  $150,000 \mu$ Ci/sec and determines the Building Ventilation Release Fraction; records on Attachment 2 and 4. Refer to Answer Sheet for correct value or see below.

13529 / 150,000 = **0.090** 

SAT__ UNSAT__ N/A ___COMMENTS:_____

# JPM SRO A3

Performance Step 5:

Critical  $\underline{X}$  Not Critical

[10.7] **VERIFY** the acceptance criteria as given in Step 6.0B.1 has been met. The building ventilation release fraction must be less than or equal to 0.90. **IF** the acceptance criteria have failed, **THEN** 

#### **IMMEDIATELY CONTACT** the Unit Supervisors. (AC)

#### Standard:

Determines Building Ventilation Release Fraction is less than 0.90 and **MEETS** acceptance criteria.

SAT__ UNSAT__ N/A ___COMMENTS:_____

**********************

Performance Step 6:

Critical Not Critical X

- [11] **DETERMINE** the elevated (stack) noble gas release rate once per shift by completing the following steps:
  - [11.1] RECORD the highest noble gas count rates (counts per second, cps) for the 0-RM-90-147 and 0-RM-90-148 monitors in the appropriate columns of Attachment 6 in accordance with one of the following steps:
    - [11.1.1] IF both the 0-RR-90-147 and at least one of the radiation monitors are operable, THEN OBTAIN the necessary information from 0-RR-90-147 on Panel 9-2. IF applicable, THEN RECORD "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

Standard:

Steps [11.1] and [11.1.1] have already been completed and the data has been recorded on Attachment 6. Steps [11.1.2] and [11.2.3] are not applicable and will not be performed

SAT__UNSAT___N/A ___COMMENTS:_____

#### 

Performance Step 7:

Critical Not Critical  $\underline{X}$ 

#### NOTE

If 0-SI-4.8.B.1.a.2 is in effect for the stack monitors, the Chemical Laboratory will report the stack release rate in  $\mu$ Ci/sec for each grab sample. The reported release rate will assume a maximum flow rate and will yield a conservative (high) release value. In this case, Steps 7.0[11.2] and 7.0[11.3] are **NOT** applicable.

- [11.2] **DETERMINE** the stack flow rate and **RECORD** in the appropriate column of Attachment 6.
  - [11.2.1] **IF** 0-FI-90-271 on Panel 1-9-53 is operable, **THEN RECORD** the stack flow in standard cubic feet per minute (scfm).

#### Standard:

Steps [11.2] and [11.2.1] have already been completed and the data has been recorded on Attachment 6. Steps [11.2.2] and [11.2.3] are not applicable and will not be performed

SAT__ UNSAT__ N/A ___COMMENTS:_____

JPM SRO A3

Performance Step 8:

Critical  $\underline{X}$  Not Critical

[11.3] DETERMINE the stack release rate by using the gross count rate and total stack flow in accordance with the following equation. When there are two gross count rate readings, USE the highest gross count rate. IF both monitors (0-RM-90-147/8) are INOP, THEN

**CONTINUE** with Step 7.0[11.4].

Total Stack Flow (scfm) x Gross Count Rate (cps) x 1.23 E-03 [(µCi/sec)/(cps-scfm)]

Standard:

Determines that the Highest Gross Count Rate is the 0-RM-90-147 (Red Pen) and records this reading on Attachment 6; calculates the Stack Release Rate by multiplying Total Stack Flow, the Highest Gross Count Rate, and 1.23 E-03 [( $\mu$ Ci/sec) together. Refer to Answer Sheet for correct value or see below.

22700 x  $4.55 \times 10^5$  x  $1.23 \times 10^{-3} = 1.27 \times 10^7$ 

SAT__ UNSAT__ N/A ___COMMENTS:_____

Performance Step 9:

Critical  $\underline{X}$  Not Critical

[11.4] **RECORD** in the appropriate column of Attachment 6 either the release rate calculated in Step 7.0[11.3] or as reported by the Chemical Laboratory for an inoperable monitor.

Standard:

Records the Stack Release Rate calculated in previous step on Attachment 6.

SAT__UNSAT__N/A __COMMENTS:_____

	JPM SRO A3
*********	******

Performance Step 10:

Critical Not Critical X

#### NOTE

Alternative sampling for the WRGERM monitor is satisfied by taking readings from the normal stack release monitors, 0-RM-90-147 and/or 0-RM-90-148, when operable or by manual sampling in accordance with 0-SI-4.8.B.1.a.2 when the normal stack monitors are inoperable. This alternate sampling succession satisfies the requirement for a preplanned alternate method as required in TABLE 3.3.5-1 of the TRM.

- [11.5] Wide Range Gaseous Effluent Radiation Monitor (WRGERM), 0-RM-90-306, Panel 2-9-10.
  - [11.5.1] IF the monitor is inoperable, THEN

RECORD "INOP" in the appropriate column of Attachment 6 and CONTINUE with Step 7.0[11.6]. Otherwise, CONTINUE with Step 7.0[11.5.2].

- [11.5.2] ENSURE 0-RM-90-306 is in the Sample Mode.
- [11.5.3] RECORD the noble gas release rate in  $\mu$ Ci/sec in the appropriate column of Attachment 6. RECORD results to two decimal places (e.g., 2.95E 00).

#### Standard:

Step [11.5], [11.5.2], and [11.5.3] have already been completed and the data has been recorded on Attachment 6; steps [11.5.1] and [11.6] are not applicable and will not be performed

SAT__ UNSAT__ N/A ___COMMENTS:_____

#### 

[11.7] **IF** all release streams to the stack are isolated, **THEN** 

**USE** a release rate factor of 0.00. Otherwise, **USE** 1.00. **RECORD** the release rate factor in the appropriate column of Attachment 6.

#### Standard:

Step [11.7] has already been completed and a Release Rate Factor of 1.00 has already been recorded on Attachment 6.

SAT__ UNSAT__ N/A __COMMENTS:_____

Performance Step 12:

Critical  $\underline{X}$  Not Critical

[11.8] CALCULATE the actual release rate by multiplying the highest release rate (0-RM-90-147/148 or 0-RM-90-306) by the release factor. RECORD the information in the Actual Release Rate column on Attachment 6.

Standard:

Records the Highest Stack Release Rate (Stack Release) on Attachment 6; calculates the Actual Release Rate by multiplying the Highest Stack Release Rate (Stack Release) by the Release Rate Factor (1.00) determined in previous step; records on Attachment 6. Refer to Answer Sheet for correct value or see below.

 $1.27 \times 10^7$  x  $1.00 = 1.27 \times 10^7$ 

SAT__UNSAT__N/A __COMMENTS:_____

#### 

#### NOTE

For reporting purposes, the release fractions should only be recorded to three decimal places.

#### EXAMPLES

A release fraction of 0.12345 should be recorded only as 0.123. A release fraction of 0.00012 should be recorded only as 0.000.

[11.9] CALCULATE the stack release fraction by dividing the actual release rate by 1.44 E+07 (or 14,400,000) μCi/sec. RECORD this information on both Attachment 2 and Attachment 6.

#### Standard:

Calculates the Stack Release Fraction by dividing the Actual Release Rate determined in previous step by 14,400,000  $\mu$ Ci/sec; records this data on Attachment 2 and 6. Refer to Answer Sheet for correct value or see below.

 $1.27 \times 10^7$  /  $1.44 \times 10^7$  = **.882** 

SAT__UNSAT___N/A ___COMMENTS:_____

# JPM SRO A3

Performance Step 14:

Critical X Not Critical

[11.10] VERIFY the acceptance criteria as given in Step 6.0B.2 has been met. The stack release fraction must be less than or equal to 0.10. IF the acceptance criterion has failed, THEN

#### **IMMEDIATELY CONTACT** the Unit Supervisors. (AC)

#### Standard:

Determines that the Stack Release Fraction DOES NOT MEET the Acceptance Criteria

SAT__UNSAT__N/A __COMMENTS:_____

************

Performance Step 15:

Critical Not Critical  $\underline{X}$ 

#### **6.0 ACCEPTANCE CRITERIA**

- B. The noble gas release rate must be limited such that the off site dose and dose rates are in compliance with ODCM Control 1.2.2.1. This will be accomplished by establishing release rate limits for the building/ground and the stack/elevated release points. The corresponding release rate limits will be checked in accordance with the values listed below.
  - 2. The stack release rate fraction must be less than or equal to 0.10. The stack release rate fraction is defined as the radioactive noble gas release rate at the stack divided by the ODCM release rate limit of 1.44 E+07 µCi/sec.

#### Standard:

Refers to the acceptance criteria given is Section 6.0 B.2.

SAT___UNSAT___N/A ___COMMENTS:_____

# JPM SRO A3

Performance Step 16:

Critical  $\underline{X}$  Not Critical

1/2.2 RADIOACTIVE EFFLUENTS

1/2.2.2 GASEOUS EFFLUENTS

#### 1/2.2.2.1 DOSE RATE

#### CONTROLS

- 1.2.2.1 In accordance with BFN Technical Specification 5.5.4.g, the dose rate at any time to areas at and beyond the SITE BOUNDARY (see Figure 3.1) due to radioactivity released in gaseous effluents from the site shall be limited to the following values:
  - a. The dose rate limit for noble gases shall be < 500 mrem/yr to the total body and < 3000 mrem/yr to the skin, and
  - b. The dose rate limit for I-131, I-133, H-3 and particulates with greater than eight day half-lives shall be < 1500 mrem/yr to any organ.

APPLICABILITY: At all times.

ACTION: a. If the limits above are exceeded, appropriate corrective action shall be immediately initiated to bring the release within limits. Report all deviations in the Annual Radioactive Effluent Release Report.

#### Standard:

Determines ODCM Control action "A" is applicable. Corrective actions shall be immediately initiated to bring the release within limits.

SAT__ UNSAT___ N/A ___COMMENTS:_____

#### 

Performance Step 17:

Critical X Not Critical

[12] **CALCULATE** the total site release fraction by adding the building ventilation and stack release fractions on Attachment 2. **VERIFY** the site release fraction acceptance criteria as given in Step 6.0B.3 has been met. **IF** the acceptance criterion has failed, **THEN** 

**IMMEDIATELY CONTACT** the Unit Supervisors. (AC)

#### Standard:

Calculates the Total Site Release Fraction by adding the Building Ventilation Release Rate Fraction and the Stack Release Rate Fraction; records this data on Attachment 2. Refer to Answer Sheet for correct value or see below. Determines that it **MEETS** Acceptance Criteria.

0.090 + .882 = .972

SAT__ UNSAT__ N/A __COMMENTS:_____

STOP TIME _____

END OF TASK

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 30 of 56

### Attachment 2 (Page 1 of 1)

# Site Effluent Release Rate Summary

Week From TODAY To

D	s	SI S	TEP	Read	tor Power (N	1WT)	Building				Inil	ials
A Y	H I F	7.0(0)	7 0[7]	Unit 1	Unit 2	Unit 3 7 0[8 1]	Ventilation Release Rate Fraction 7.0[10.6]	Stack Release Rate Fraction 7.0[11.9]	Total Site Release Rate Fraction 7.0[12]	Acceptance Criteria	AUO	Unit Supervisor
	<u> </u>	1.0[0]	1.0[7]	11155	7451	2454	09	.882	.972	≤ 1.00	AUD	
FRI		00	OF	2732	<u>312a</u>	<u> 3/3 /</u>	<u> </u>			≤ 1.00		
										≤ 1.00		
SAT										≤ 1.00		
	N			<u> </u>						≤ 1.00		
SUN	D					<u> </u>				≤ 1.00		
	<u>N</u>									≤ 1.00		
MON	D									≤ 1.00		
	N		<u> </u>							≤ 1.00		
TUE	D									< 1.00		
	N									< 1.00		
WED	D					<u> </u>				<u> </u>		
	N									≤ 1.00		
THU	D									≤ 1.00		<u> </u>
	N				1					≤ 1.00	<u> </u>	<u> </u>

Initials added as a result of BFPER 960634.

ANSWER KEY

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056
		Page 34 of 56

# Attachment 4 (Page 1 of 4)

# **Building Effluent Release Rate Log**

Week From <u>ToDAY</u> To _____ Unit 1

		Reactor Building					Turbine Building					
	S		1-RM-90-250		1-RM-90-249				1-RM-90-251			
D A	H	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate μCi/sec		Unit
Ŷ		(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note		700	Supervisor
	•	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	4000	,64	2560	500	.75	375	910	,80	728	AOP	
	N											
SAT	D											
	N											_
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

ANSWER KEY

BFN Airborne Effluent Release Rate Unit 0	0-SI-4.8.B.1.a.1 Rev. 0056 Page 35 of 56
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Attachment 4 (Page 2 of 4)

Week From <u>TODAY</u> To _____ Unit 2

			Reactor Building			Turbine Building						nitiale
	s	2-RM-90-250				2-RM-90-249		2-RM-90-251			in mucho	
D A Y	H	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit
•	Τ	(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note			Supervisor
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	3400	.73	2482	840	1,0	840	2200	1.0	2200	AUD	
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
тни	D											
	N											

ANSWER KEY

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 36 of 56
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Attachment 4 (Page 3 of 4)

Week From <u>TODAY</u> To _____ Unit 3

		Reactor Building				Turbine Building						nitials	
	s		3-RM-90-250			3-RM-90-249			3-RM-90-251	1			
D A	H	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit	
Ť	T	(µCi/sec)	See Note	-	(µCi/sec)	See Note		(µCi/sec)	See Note		7.00	Supervisor	
	•	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]			
FRI	D	3100	,69	2139	1600	.46	640	1900	.75	1425	A6P		
	Ν												
SAT	D												
	Ν												
SUN	D							_					
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MON	D												
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TUE	D												
	N												
WED	D		, <u></u>										
	N												
THU	D												
	N									l			

ANSWER KEY

BFN Airborne Effluent Release Rate Unit 0	0-SI-4.8.B.1.a.1 Rev. 0056 Page 37 of 56
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### Attachment 4 (Page 4 of 4)

Week From _____ To _____ Unit 0

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AUO	Unit Supervisor
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	90 AWO 90 90 90 90 90 90 90 90 90 90 90 90 90 9

ANSWER KEY

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056
		Page 40 of 56

#### Attachment 6 (Page 1 of 2)

#### **Elevated Effluent Release Rate Log**

Week From _____ To _____

D A Y	S H I F T	0-RM-90-147 Red Pen GROSS COUNT RATE (CPS) 7.0[11.1]	0-RM-90-148 Green Pen GROSS COUNT RATE (CPS) 7.0[11.1]	HIGHEST GROSS COUNT RATE (CPS)	STACK FLOW RATE 0-FI-90-271 INOP<16,366 (NOTES 1 & 3) OR ATTACH 7 7.0[11.2]	CONVERSION FACTOR	STACK RELEASE RATE (NOTE 2) (µCi/SEC) 7.0[11.3] & 7.0[11.4]
F	D	4.55 × 105	9.75 × 104	4.55 × 105	22700	1.23E-03	1.27 × 107
R	N					1.23E-03	
S	D					1.23E-03	
A	N					1.23E-03	
S	D					1.23E-03	
<u> </u>	N					1.23E-03	
M	D			•		1.23E-03	
0	N					1.23E-03	
T	D					1.23E-03	
- <u>i</u> -	N					1.23E-03	
w	D					1.23E-03	
F						1.23E-03	
	<u> </u>					1.23E-03	And a second
н	N			<u> </u>		1.23E-03	

1 Minimum acceptable flowrate for 0-fi-90-271 operability is 16,366 SCFM (See note 3)

2 Data from manual sampling results or 0-90-147/148[(Stack flow) X (Highest gross count rate) X 1.23E-03].

3 The minimum stack flow rate was revised to 16,366 SCFM (BFPER980545).

ANSWER KEY

BFN Unit 0	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1 Rev. 0056 Page 41 of 56

# Attachment 6 (Page 2 of 2)

Week From TODAY To

			WPGERMS						_ lr	nitials
A Y	S H F T	DATA RECORDED IN STEP 7.0[11.4]	Noble Gas Release Rate 0-RM-90-306 (μCi/sec) 7.0[11.5]	Highest Stack Release Rate (μCi/sec) Note 1.	Release Rate Factor (0.00 or 1.00) 7.0[11.7]	Actual Release Rate (μCi/sec) 7.0[11.8]	Stack Release Fraction Note 2 7.0[11.9]	Acceptance Criteria	AUO	Unit Supervisor
FRI	D	1.27 × 107	1.29 × 106	1.27 ×107	1.00	1.27×107	,882	≤ 0.10	AUU	
	N							≤ 0.10		
SAT								≤ 0.10		
	N							≤ 0.10		
								≤ 0.10		
SUN				<b></b>				≤ 0.10		
								≤ 0.10		
MON	U							≤ 0.10		
	N							≤ 0.10	1	
TUE	D							≤ 0.10	1	
	N							< 0.10	1	
WED	D							< 0.10	+	
	N							≤ 0.10	+	+
THU	D							≤ 0.10	<b></b>	
	N							≤ 0.10	<u></u>	L

1 Use the higher of the Stack release rate or the WRGERMS release rate.

2 Divide actual Stack release rate ( $\mu$ Ci/sec) by 1.44E+07  $\mu$ Ci/sec.

ANSWER KEY

PMS:       P1470         Procedure:       0-S14.8.8.1.A.1         Title:       0-S14.8.8.1.A.1         Data Sheets Attached:       Perfor:         Perf Op:       Unit:       0         LoopfDiv:       //A         Test Reason:       Periodic         Duo Date:       0607/13         Frequency:       7.0X/S         Toch Spec:       Y         Astheritation to Begin:       Start Date & Time         Clearance Required:       N         Expranded Works:       Performance?         Clearance Required:       N         Expranded By:       Print Name         Signature       Initial         Section       Wars all Tach Spec/Tech Regit/SFUCC/ODCM/Fire Prot reg/         AMS: And Start Date & Time       Coordinator         Clearance Required:       Wars all Tach Spec/Tech Regit/SFUCC/ODCM/Fire Prot reg/         AMS: And Start Date & Time       Coordinator         Clear Date & Start Date & Time       Coordinator         Clear Date & Start Date & Start Date & Time       Coordinator         Clear Date & Start Date & Start Date & Time       Coordinator         Performed By:       Signature       Coordinator         Perint Name       Signature			Wo	ork Order	#: 114084714	
Procedure:       0-SI-4.8.B.1.A.1         Title:       0-SI-4.8.B.1.A.1 - ARBORNE EFFLUENT RELEASE RATE         Data Sheets Attached:       Authorization to Begin: SRO         Perf Grp:       Unit:       0         Last Reason:       Perf Modes:         Clearance Required:       N         Dy-Cask Storage:       N         Performed By:       Perf Modes:         Clearance Required:       N         Dy-Cask Storage:       N         Performed By:       Initial         Print Name       Signature         Initial       Section         Ware all Tech Spec/Tech Reg/ISFSWCoC/ODCM/Fire Prot reg/         AMSAC* acceptance       riteria satisfied; was as LCO/ODCM/Fire Prot reg/         AMSAC* acceptance       riteria satisfied; was as LCO/ODCM/Fire Prot reg/AMSAC*         citeria were not satisfied; was as LCO/ODCM/Fire Prot reg/AMSAC*         citeria were not satisfied; was as LCO/ODCM/Fire Prot reg/AMSAC*         citeria were not satisfied; was as LCO/ODCM/Fire Prot reg/AMSAC*         citeria were not satisfied; was as LCO/ODCM/Fire Prot reg/AMSAC*         citeria were not satisfied; was as LCO/ODCM/Fire Prot reg/AMSAC*         citeria were not satisfied; was as LCO/ODCM/Fire Prot reg/AMSAC*         citeria were not satisfied; was as LCO/ODCM/Fire Prot reg/AMSAC*	<b>PM#:</b> P1470					
Title: 0.51-6.8.0.1.4.1 - AIRBORNE EFFLUENT RELEASE RATE Data Sheets Attached: Perf Grp: OPS Unit: 0 Loop/Div: //A Test Reason: Periodic Dub tate: 0.6017/13 Frequency: 7 DAYS Tech Spec: Y ASME XI: Applicable Modes: Perf Perf Perf Perf Perf Perf Perf Perf	Procedure: 0-SI-4.8	J.B.1.A.1				
Data Sheets Attached:       Authorization to Begin: SRO       Date & Time         Perf Grop: OPS       Unit: 0       Loop/Div: /NA         Test Reason: Periodic       Due Date:       06/07/13         Drequency: 7 DAYS       Tach Spec: Y       ASME XI:         Authorization to Begin: SRO       Date & Time         Clearance Required: N       EQ:       LCO Entered: N         Print Name       Signature       Initial       Section         Print Name       Signature       Initial       Section         Clearance Required: N       EQ:       LCO Entered: N       Date & Time         Print Name       Signature       Initial       Section       Coordinator         Date & Time       Coordinator       Date & Time       Coordinator         Dire data Sheets Attached: N       Explain Partial In REMARKS below)       Complete [1]       Partial         Dire data Sheets Attached: N       Explain In REMARKS below)       Coordinator       Yes [] No [] N/A         Dire data Sheets Attached: N       Explain In REMARKS below)       Yes [] No [] N/A         Dire data Sheets Attached: N       Explain In REMARKS below)       Yes [] No [] N/A         Subsequent Reviews:       Signature       Date & Time         Group:       Signature	Title: 0-SI-4.8.B.1.A.1 -	AIRBORNE EFFLUENT	RELEASE	RATE		
Data Sheets Attached:					Authorization to Begin: SRO	Date & Time
Performed By: P	Data Sheets Attached:					
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Jue Date:       06/07/13         regency:       70/3         Tech Spec:       Y         Association       EQ:         Loco Entered:       N         Print Name       Signature         Initial       Section         Print Name       Signature         Initial       Section         Was this a Complete or Partial Performance?         (Explain Partial in REMARKS below)       Complete []         Partial       Partial         Image:       Image:         Image:       Image:      <	est Reason: Periodic					·
riequency: 7 DAYS       Tech Spec: Y       ASME 20:         Applicable Modes:       Perf Modes:       Coordinator         Discance Required:       N       EQ:       LCO Entered:       N         Print Name       Signature       Initial       Section       Was this a Complete or Partial Performance?         Print Name       Signature       Initial       Section       Was this a Complete or Partial Performance?         Print Name       Signature       Initial       Section       Was this a Complete or Partial Performance?         Print Name       Signature       Initial       Section       Was this a Complete or Partial Performance?         Print Name       Initial       Section       Was this a Complete or Partial Performance?       Perfault         Initial       Section       Maximo distes verified: SI       Was this a Complete or Partial Performance?       Perfault         Initial       Section       Maximo distes dependent       Maximo distes dependent       Perfault         Initial       Section       Initial       Maximo distes dependent       Perfault         Initial       Section       Initial       Perfault       Perfault       Perfault         Initial       Section       Initial       Perfault       Perfault       Perfault <td>Due Date: 06/07/13</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Due Date: 06/07/13					
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Test Director/Lead Performer       Date         Date       Acceptance Criteria Review: SRO       Date & Time         Acceptance Criteria Review: SRO       Date & Time         PERMANENT COMMENTS:       Independent Review: SRO       Date & Time         RATE INFO, ONCE PER DAY, EACH EFFLUENT RADIATION MONITOR - Frequency Notes: ONCE PER WEEK & ONCE PER SHIFT, RELEASE       Independent Reviewer       Date & Time         RATE INFO, ONCE PER DAY, EACH EFFLUENT RADIATION MONITOR - Frequency Notes: ONCE PER DAY, EACH EFFLUENT RADIATION MONITOR - SHALL DEMONSTRATE THE OPERABILITY OF ITS SAMPLING RATE INSTRUMENTATION & ASSOCIATED SAMPLE FLOW ALARMS.       REMARKS:		CE				
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ARTE INFO, ONCE PER ABILITY OF ITS SAMPLING RATE SHALL DEMONSTRATE THE OPERABILITY OF ITS SAMPLING RATE INSTRUMENTATION & ASSOCIATED SAMPLE FLOW ALARMS.	Frequency Notes: ONCE	PER WEEK & ONCE P	PER SHIFT, I	RELEASE N MONITOR	REMARKS:	
INSTRUMENTATION & ASSOCIATED SAMPLE FLOW ALARMS.	SHALL DEMONSTRATE	THE OPERABILITY OF	ITS SAMP	LING RATE		
	INSTRUMENTATION &	ASSOCIATED SAMPLE	FLOW ALA	RMS.		
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**Browns Ferry Nuclear Plant** 

Unit 0

Surveillance Instruction

0-SI-4.8.B.1.a.1

# **Airborne Effluent Release Rate**

**Revision 0056** 

**Quality Related** 

Level of Use: Reference Use

Level of Use or Other Information: Key Number P1470

Effective Date: 05-24-2012 Responsible Organization: CEM, Chemistry Prepared By: J. Mike Marshall Approved By: Johnnie S. Black

BFN	Airborne Effluent Release Rate	0-SI-4.8.B.1.a.1
Unit 0		Rev. 0056
		Page 2 of 56

#### **Current Revision Description**

Pages Affected 9, 11, 22, 42-46.

Type of Change: Revision

Tracking Number: 065

PER N/A DCN 70285

Added Annotations on pages 44 & 46. PCR 12000782

Changed recorder designation from FR-066-0111 to XR-66-103 in several places due to changes made by DCN 70285.

Also changed H2R-66-96 to XR-66-103.

Changed the wording in step 7.0[13.4], for clarification.

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#### 1.0 INTRODUCTION

#### 1.1 Purpose

This Surveillance Instruction (SI) is used by Browns Ferry Operations and Radiochemical Laboratory personnel to satisfy the following Technical Requirements Manual (TRM) requirements, ODCM requirements, and data recording functions:

- Airborne effluent release rates in accordance with ODCM Surveillance Requirement 2.2.2.1.1.a.
- The instrumentation checks required by ODCM Table 2.1-2.
- The Wide Range Gaseous Effluent Radiation Monitor (WRGERMS), 0-RM-90-306, inoperability requirements in accordance with TABLE 3.3.5-1 of the TRM.
- The WRGERMS instrumentation check required by TABLE 3.3.5-1 of the TRM.
- Attachment 11 is used to record data during EOI's and REP conditions.

#### 1.2 Scope

- ODCM Control 1.2.2.1 requires that the general public dose rate from noble gas effluents to be limited to less than 500 mRem per year to the total body and less than 3000 mRem per year to the skin. The Off site Dose Calculation Manual (ODCM) describes the methodology by which the dose rate limits are converted to plant process variables such as the stack noble gas radioactive release rate limit. The limiting release rates for the authorized effluent release points have been calculated as 0.15 curies (Ci) per second for the building level release points and 14.4 Ci per second for the stack.
- To ensure compliance with ODCM Control 1.2.2.1, each airborne effluent release point is required to be continuously monitored while actively releasing an airborne stream. This is usually accomplished by in-line process instrumentation which has Control Room alarm capabilities. If a monitor is inoperable, releases via that gas stream may continue provided compensatory sampling measures are initiated. Compensatory sampling is accomplished by having the Radiochemical Laboratory personnel obtain and analyze grab samples at a prescribed frequency.
- Technical Instruction (TI) 15 provides the engineering basis for establishing instrumentation alarm set points, monitor sampling rates, and release point allocation factors for the various plant radiation monitors. The conservative parameters prescribed by TI-15 ensure ODCM Control 1.2.2.1 limits are satisfied.

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#### 1.2 Scope (continued)

 Instrumentation checks will be used to provide a reasonable assurance that an unmonitored release does NOT go undetected. The instrument checks will be performed on the required monitoring instrumentation at a frequency such that a failed monitor is readily detected. The instrument checks will usually consist of data acquisition/instrument readings of such a detail that they will permit the calculation of the total site release rate.

#### NOTE

The source check formerly in this SI (Rev. 40 and previous Revs) are now in 0-SI-2.1-2.

 Additionally, this SI provides the pre-planned alternate monitoring instructions for the WRGERMS instrumentation, 0-RM-90-306 and 0-RR-90-360, in the event that the minimum number of operable instrument channels is less than the required number as given in TABLE 3.3.5-1 in the TRM.

#### 1.3 Frequency

The normal performance band for this SI is one week. The procedure will typically start at 0700 Friday and end 0659 the following Friday.

Once per shift, the following checks will be made:

- Release rate information will be obtained for each effluent stream having continuous monitoring capabilities.
- The overall site release rate will be calculated from the release rate information.
- Offgas pretreatment and post-treatment monitors, offgas flow rate, and offgas hydrogen concentration will be recorded during main condenser and offgas treatment systems operations.
- The WRGERMS instrumentation operability will be demonstrated by an instrumentation check.

Once per day, each effluent radiation monitor shall demonstrate the operability of its sampling rate instrumentation and associated sample flow alarms.

#### 2.0 **REFERENCES**

Browns Ferry Nuclear Plant Technical Requirements Manual (TRM).

Updated Final Safety Analysis Report (UFSAR)

- Section 7.12, Process Radiation Monitoring.
- Section 9.5, Gaseous Radwaste System (Modified).

Operating Instructions (OI)

• 1-, 2-, and 3-OI-90, Radiation Monitoring System

Surveillance Instructions (SI)

- 0-SI-2.1-2, Airborne Effluent Radiation Monitor Source Checks.
- 0-SI-4.8.B.1.a.2, Airborne Effluent Release Rate by Manual Sampling when a Gaseous Effluent Monitor is Inoperable.
- 1-, 2-, and 3-SI-4.8.B.1.a.3, Off Gas Post-Treatment Release Rate by Manual Sampling.
- 1-, 2-, and 3-SI-4.8.B.5.a, Off Gas Hydrogen Concentration by Manual Sampling.

Technical Instructions (TI)

- TI-15, Radioactive Gaseous Effluent Engineering Calculations and Measurements.
- 0-TI-336, Continuous Air Monitor Flow Regulator Adjustment.

Offsite Dose Calculation Manual (ODCM).

Part 302 to Title 40 of the Code of Federal Regulations (40 CFR 302), Designation, Reportable Quantities, and Notification.

Memorandum from John W. Sabados to Masoud Bajestani, Subject: Sampling Set points for the Eberline Continuous Air Monitor (R46 901116 823).

Date TODAY

#### 2.0 **REFERENCES** (continued)

Controlled Vendor Manuals (CVM)

- Technical Manual for the 250 CAM Monitoring System, BFN-CVM-2083.
- Technical Manual for the 252 CAM Monitoring System, BFN-CVM-2084.
- Technical Manual for the 249-251 CAM Monitoring System, BFN-CVM-2085.
- Technical and Operating Manual for the CT-2B(s) Control Terminal, BFN-CVM-2090.

Memorandum from M. Bajestani to J. W. Sabados, Subject: Steam Packing Exhauster flow (R40 911018 914).

Stack Post Mod. Test for DCN W17999 (PMT-256) 20 April, 1993.

**Technical Requirements Manual** 

Memorandum from Rick Givens to Phil Chadwell, Subject: Stack Flow Requirements (R70 980730 843) [BFPER980545].

NPG-SPP-06.9.2 Surveillance Test Program

# **GO** PRECAUTIONS AND LIMITATIONS

[NRC/C] Radiation monitors may be removed from service for maintenance, calibration, or testing for periods **NOT** to exceed 4 hours. If it becomes apparent that a monitor cannot be returned to service within the 4 hours, the Unit Supervisor shall be immediately notified to ensure compensatory sampling has been initiated. [LER 260/89021]

The night shifts and day shifts are defined by the day on which the shift begins. (i.e., Friday dayshift is Friday 0700-1900, Friday night shift is Friday 1900 to Saturday 0700.)



# PREREQUISITES



**VERIFY** this copy of the procedure is the most current revision.





**OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P1470)

02

#### 5.0 SPECIAL TOOLS AND EQUIPMENT RECOMMENDED

None

#### 6.0 ACCEPTANCE CRITERIA

- A. Responses which fail to meet the acceptance criteria constitute unsatisfactory surveillance instruction results and require immediate notification of the Unit Supervisor at the time of failure. Failure of release rate acceptance criteria requires notification of the Chemistry Manager. Failure of release rate acceptance criteria will require a National Response Center reportability determination in accordance with Part 302 to Title 40 of the Code of Federal Regulation (40 CFR 302).
- B. The noble gas release rate must be limited such that the off site dose and dose rates are in compliance with ODCM Control 1.2.2.1. This will be accomplished by establishing release rate limits for the building/ground and the stack/elevated release points. The corresponding release rate limits will be checked in accordance with the values listed below.
  - 1. The sum of the building release rate fraction must be less than or equal to 0.90. The building release rate fraction is defined as the radioactive noble gas release rate at each monitored building release point divided by the ODCM building release limit of 1.50 E+05  $\mu$ Ci/sec.
  - 2. The stack release rate fraction must be less than or equal to 0.10. The stack release rate fraction is defined as the radioactive noble gas release rate at the stack divided by the ODCM release rate limit of 1.44 E+07  $\mu$ Ci/sec.
  - 3. The total site release rate fraction must be less than or equal to 1.00. The total site release rate fraction is defined as the sum of the building and stack release rate fractions.
  - 4. Compensatory sampling measures must be initiated whenever a radiation monitor is out of service and effluent releases are continuing via that release point.

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#### 6.0 ACCEPTANCE CRITERIA (continued)

- C. The radioactive gaseous effluent instrumentation operability shall be demonstrated by performance of shiftly and/or daily instrument checks as noted below.
  - 1. Shiftly Checks. The following instrumentation checks must be accomplished at least once per shift during the noted periods of required operability. These instrumentation checks will be used to satisfy ODCM Surveillance Requirements in 2.2.2.1.1.a, Table 2.1-2, TRM Table 3.3.5-1, and TRM TSR 3.3.9.1 (noble gas monitor and hydrogen analyzer daily requirements only).

Monitor(s)	Required Period of Operability
1-, 2-, 3-RM-90-249, 1-, 2-, 3-RM-90-250, 1-, 2-, 3-RM-90-251, and 0-RM-90-252	When actively releasing an airborne effluent stream (i.e., vents are open and the ventilation fans are on).
0-RM-90-147 and/or 148	When actively releasing an airborne effluent stream.
0-RM-90-306, and 0-RR-90-360	When one or more of the site units are in either MODES 1 or 2.
1-, 2-, 3-RM-90-265, and/or 1-, 2-, 3-RM-90-266	When actively processing an off gas stream (i.e., unit FCV-66-28 is open).
1-, 2-, 3-XR-66-103 (low or high range indicators)	During main condenser offgas treatment system operations.

The shiftly checks shall be accomplished by recording the release rates or release concentrations as displayed on the appropriate control room recorders. If a monitor is out of service during a required period of operability, compensatory sampling measures will be initiated in accordance with the instructions given in Steps 7.0[9.5], 7.0[10.1.3], and/or 7.0[11.1.3].

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#### 6.0 ACCEPTANCE CRITERIA (continued)

2. Daily Checks. The following instrumentation checks must be accomplished at least once per day during the noted periods of required operability. These instrumentation checks will be used to satisfy ODCM surveillance requirements in Table 2.1-2 (sample flow instrumentation and sample flow annunciators only).

Instrumentation	Required Period of Operability
1-, 2-, 3-RM-90-249, 1-, 2-, 3-RM-90-250, 1-, 2-, 3-RM-90-251, and 0-RM-90-252 sample flow instrumentation	When actively releasing an airborne effluent stream (i.e., vents are open and the ventilation fans are on).
0-RM-90-147/148 sample flow rate and 0-FA-90-150 flow abnormal alarm	When actively releasing an airborne effluent stream.
1-, 2-, 3-PA-90-262 sample pressure abnormal alarm	When actively processing an off gas stream (i.e., unit FCV-66-28 is open).

The daily checks shall be accomplished by recording the sample flow rates from the appropriate control room instrumentation and/or testing the alarm annunciator condition. Satisfactory sample flow rate checks must fall within the range specified in the following table. Satisfactory annunciator test results will consist of a simple "go/no-go" test.

If a monitor is out of service during a required period of operability, compensatory sampling measures will be initiated in accordance with the instructions given in Steps 7.0[9.5], 7.0[10.1.3], and/or 7.0[11.1.3]. Compensatory sample flow rate measurements are required to be made every four hours, but are **NOT** required to satisfy the sample rate limits in the following table.

	Sample Flow (scfm)		
Monitor	Low	High	
1-, 2-, 3-RM-90-249 1-, 2-, 3-RM-90-251	1.73	2.27	
0-RM-90-252	1.12	1.87	
1-, 2-, 3-RM-90-250	3.6	4.4	
0-RM-90-147/148	1.1	1.5	

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#### 6.0 ACCEPTANCE CRITERIA (continued)

- D. The concentration of hydrogen gas in the off gas shall be less than or equal to 4 percent by volume (TRM LCO 3.7.2) as measured by the applicable unit XR-66-103 Hydrogen Analyzer or as determined from off gas grab samples.
- E. Acceptance criteria determination steps will be designated by (AC).
- F. The off gas pretreatment radiation levels (1-, 2-, and 3-RM-090-0157) and the off gas flow rate (1-XR-066-103, 2-XR-66-103, and 3-XR-66-103) instrumentation readings are required for monitoring system performance and for failed fuel performance calculations. There is no Technical Specification surveillance requirements associated with these observations. The observation will be made shiftly during periods of main condenser/offgas treatment system operation.
- G. In the event that 1-, 2-, or 3-PA-090-0262 is inoperable, but 1-, 2, or 3 RM-090-0265 or 0266 is operable, the off gas post treatment flow must be recorded at least once every 4 hours and the flow must be at least 0.06 cfm. If both 1-, 2, or 3 RM-090-0265 and 0266 are inoperable a flow is not required. If the flow acceptance criteria is not met, declare 1-, 2, or 3 RM-090-0265 and 0266 inoperable and notify Chemistry to initiate1-, 2, or 3-SI-4.8.B.1.a.3.

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Date TODAY

# PROCEDURE STEPS

 $( \$ 

NOTES		
All notes, remarks, and comments are to be recorded on Attachment 1. Each statement is to be numbered and cross-referenced to the appropriate attachment or SI step.		
2) Attachme the comp	ents <b>NOT</b> used in the performance of this SI do <b>NOT</b> need to be inclubleted SI package.	uded in
(JEX)	<b>OBTAIN</b> permission from the Unit 1 Unit Supervisor to perform this instruction.	<u>Gus</u> U1
(30)	<b>OBTAIN</b> permission from the Unit 2 Unit Supervisor to perform this instruction.	<u>MG</u> U2
Ø	<b>OBTAIN</b> permission from the Unit 3 Unit Supervisor to perform this instruction.	DK U3
(H)	[NRC/C] <b>NOTIFY</b> the Unit Operator (U2) of the intent to begin this instruction. [RPT 82-16, LER 259/8232]	DH
(5)	On the Surveillance Task Sheet (STS)	
/	RECORD the Start Date & Time.	<u> </u>
NOTE		
SI step performance and acceptance criteria verification are to be noted on the appropriate SI attachments for Steps 7.0[6] through 7.0[15]		



**REVIEW** the Precautions and Limitations in Section 3.0. **INITIAL** on Attachment 2.



**ENSURE** that all Prerequisites in Section 4.0 have been met. **INITIAL** on Attachment 2.

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### 7.0 PROCEDURE STEPS (continued)

**OBTAIN** the following information.

1821

Once per shift, **RECORD** on Attachment 2 each unit's 8 hour average power level in megawatts thermal (MWT). IF shutdown, THEN

### ENTER 0.

Due to variations in required performance frequency and to minimize impact on personnel, Steps 7.0[9], 7.0[10], and 7.0[11] through 7.0[15] can be completed independently. If the stack flow instrumentation (0-FI-90-271) is inoperable or out of service and 0-FI-90-348 is **NOT** used, Attachment 7 must be completed before Step 7.0[11] can be completed.

NOTE

19D

10/1

Fan Status Determination

RM-90-249

Once per shift: **RECORD** on Attachment 3 the operating status of each ventilation fan monitored by this CAM. The status shall be indicated with "X" in the appropriate ON/OFF column.



Once per day (night shift): IF all fans serviced by this CAM are off and the monitor is out of service, THEN

**VERIFY** the exhausts' fan control switches are tagged out of service and **VERIFY** the fan dampers are closed.

RM-90-250

Once per shift: **CHECK** the status of each fan contributing flow to the ventilation path monitored by the RM-90-250 CAM. **USE** an "A" or "B" to denote which fan is operating. **INDICATE** the fan status by using the "O" column for all fans off (if applicable), the "S" column for fans on slow, or the "F" column for fans on fast.

# RM-90-251

Once per shift: **RECORD** on Attachment 3 the operating status of each ventilation fan monitored by this CAM. The status shall be indicated with "X" in the appropriate ON/OFF column.

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#### 7.0 PROCEDURE STEPS (continued)

9.3**Z** 

Once per day (Night shift): IF all fans serviced by this CAM are off and the monitor is out of service, THEN

**ENSURE** the exhausts' fan control switches are tagged out of service and **VERIFY** the fan dampers are closed.



- 0-RM-90-252 (Unit 1 Only)
- [9.41] Once each shift: RECORD the operating status of fans monitored by this CAM with an "X" in the appropriate column of Attachment 3. USE column "0" for all fans off, column "1" for one fan on, or column "2" for two fans on.



IF any of the indicated fans (stack dilution or CAM) are operating and the corresponding monitor is declared inoperable, **THEN** 

**CONTACT** the Chemical Laboratory and **ENSURE** that compensatory sampling in accordance with 0-SI-4.8.B.1.a.2 is being conducted.



Prior to 0659 Friday morning, **TOTAL** the number of shifts each column of Attachment 3 was marked. **RECORD** the totals at the bottom of Attachment 3.
|--|

Date TODAY

#### 7.0 PROCEDURE STEPS (continued)

DETERMINE the building ventilation noble gas release rate once per shift by completing the following steps and VERIFY that all monitors with an open release path are OPERABLE:



- For each monitor listed on Attachment 4, **COMPLETE** one of the **FOLLOWING** four steps:
- From the CONTINUOUS AIR MONITORING SYSTEM OPERATOR CONSOLE, 0-CONS-90-361, **PANEL 1-9-2**, **OBTAIN** the noble gas release rate by **USING** the touchscreen options on the console. **SELECT** the noble gas option on the screen (NGAS). **RECORD** the noble gas release rate (μCi/sec) in the appropriate columns of Attachment 4 for each operable building ventilation radiation monitor. The radiation monitor should register a positive release rate; **OTHERWISE**, **DECLARE** the monitor inoperable. This recording is performed as an Instrument Check (CHANNEL CHECK).
- [10.1.2] **IF** the operator console 0-CONS-90-361 is **NOT** available and the CAMs are operating, **THEN** 
  - NA **OBTAIN** the release rate data from the local display on each CAM by **SELECTING** channel 1 with the thumb wheel or directly reading the Chemistry CAM display. The radiation monitor should register a positive release rate; **OTHERWISE**, **DECLARE** the monitor inoperable. This recording is performed as an Instrument Check (CHANNEL CHECK).

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Date TODAY

Ø

PROCEDURE STEPS (continued)

	NOTE
If 0-SI-4.8.B.1.a.2 is rate in $\mu$ Ci/sec for early flow rate and will yie	in effect for the CAMs, the Chemical Laboratory will report the release ach grab sample. The reported release rate will assume a maximum Id a conservative (high) release value.
[10.1. NA	3] For out of service and/or inoperable CAMs with ventilation system in service, <b>CONTACT</b> the Chemical Laboratory and <b>ENSURE</b> that manual sampling is being accomplished in accordance with 0-SI-4.8.B.1.a.2. <b>RECORD</b> on Attachment 4 the release rate for each inoperable CAM as reported by the Chemical Laboratory.
[10.1. NJA	<ul> <li>IF the ventilation system for a CAM is totally isolated (i.e., no environmental releases occurring), THEN</li> </ul>
1 / 1 /	<b>RECORD</b> "OOS" in all three columns on Attachment 4.
[10.2]	For each monitor, <b>USE</b> Attachments 3 and 5 and <b>DETERMINE</b> the release factor based on fan status. <b>RECORD</b> the release factors from attachment 5 in the appropriate columns on Attachment 4.
[10.3]	<b>MULTIPLY</b> the release rate by the release factor and <b>RECORD</b> the answer under the column labeled "Actual Rate" on Attachment 4.
[10.4]	For each unit, <b>SUM</b> the actual rates for the RM-90-249, RM-90-250, and RM-90-251 monitors. <b>RECORD</b> the unit total release rates in the appropriate columns on Attachment 4.
[10.5]	<b>SUM</b> the three unit total release rates and the 0-RM-90-252 actual rate. <b>RECORD</b> the building ventilation release rate on Attachment 4.

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#### NOTE

For reporting purposes, the release fraction should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded as 0.123.

A release fraction of 0.00012 should be recorded as 0.000.

- [10.6] **DETERMINE** the building ventilation release fraction by dividing the total building ventilation release rate by 1.50 E+05 (or 150,000)  $\mu$ Ci/sec. **RECORD** the fraction on both Attachment 2 and Attachment 4.
- [10.7] VERIFY the acceptance criteria as given in Step 6.0B.1 has been met. The building ventilation release fraction must be less than or equal to 0.90. IF the acceptance criteria have failed, THEN

**IMMEDIATELY CONTACT** the Unit Supervisors. (AC)

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**DETERMINE** the elevated (stack) noble gas release rate once per shift by completing the following steps:



**RECORD** the highest noble gas count rates (counts per second, cps) for the 0-RM-90-147 and 0-RM-90-148 monitors in the appropriate columns of Attachment 6 in accordance with one of the following steps:

- [11.1.1] **IF** both the 0-RR-90-147 and at least one of the radiation monitors are operable, **THEN** 
  - NA OBTAIN the necessary information from 0-RR-90-147 on Panel 9-2. IF applicable, THEN

**RECORD** "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

[11.1.2] **IF** 0-RR-90-147 is inoperable and at least one of the radiation monitors is operable, **THEN** 

NA

**OBTAIN** the necessary data from the 0-RM-90-147B and/or 0-RM-90-148B monitors located on Panel 1-9-10. **IF** applicable, **THEN** 

**RECORD** "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

[11.1.3] **IF** both monitors are inoperable, **THEN** 

**CONTACT** the Chemical Laboratory and **ENSURE** that manual sampling has been initiated in accordance with 0-SI-4.8.B.1.a.2. **RECORD** "OOS" in the appropriate columns of Attachment 6.

NH

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NOTE If 0-SI-4.8.B.1.a.2 is in effect for the stack monitors, the Chemical Laboratory will report the stack release rate in µCi/sec for each grab sample. The reported release rate will assume a maximum flow rate and will yield a conservative (high) release value. In this case, Steps 7.0[11.2] and 7.0[11.3] are NOT applicable. DETERMINE the stack flow rate and RECORD in the appropriate column of Attachment 6. IF 0-FI-90-271 on Panel 1-9-53 is operable, THEN RECORD the stack flow in standard cubic feet per minute (scfm). If 0-FI-90-271 on Panel 1-9-53 is inoperable, the flow can be [11.2.2] determined from 0-FI-90-348 on Panel 25-412 in the WRGERMS building. IF 0-FI-90-348 is used for the flow, THEN NA MAKE a note in the remarks log that 0-FI-90-348 was used. IF 0-FI-90-271 on Panel 1-9-53 is inoperable and 0-FI-90-348 is [11.2.3] **NOT** used. THEN **ESTIMATE** the stack flow every four hours using Attachment 7. NA **RECORD** the total stack flow in scfm on Attachment 7. **RECORD** on Attachment 6 the most current value of the 4 hour observations from Attachment 7. [11.3] **DETERMINE** the stack release rate by using the gross count rate and total stack flow in accordance with the following equation. When there are two gross count rate readings, USE the highest gross count rate. IF both monitors (0-RM-90-147/8) are INOP, THEN

CONTINUE with Step 7.0[11.4].

Total Stack Flow (scfm) x Gross Count Rate (cps) x 1.23 E-03 [(µCi/sec)/(cps-scfm)]

[11.4] **RECORD** in the appropriate column of Attachment 6 either the release rate calculated in Step 7.0[11.3] or as reported by the Chemical Laboratory for an inoperable monitor.

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NOTE

Alternative sampling for the WRGERM monitor is satisfied by taking readings from the normal stack release monitors, 0-RM-90-147 and/or 0-RM-90-148, when operable or by manual sampling in accordance with 0-SI-4.8.B.1.a.2 when the normal stack monitors are inoperable. This alternate sampling succession satisfies the requirement for a preplanned alternate method as required in TABLE 3.3.5-1 of the TRM.

Wide Range Gaseous Effluent Radiation Monitor (WRGERM), 0-RM-90-306, Panel 2-9-10.

[11.5.1] IF the monitor is inoperable, THEN



**RECORD** "INOP" in the appropriate column of Attachment 6 and **CONTINUE** with Step 7.0[11.6]. Otherwise, **CONTINUE** with Step 7.0[11.5.2].



ENSURE 0-RM-90-306 is in the Sample Mode.

**RECORD** the noble gas release rate in  $\mu$ Ci/sec in the appropriate column of Attachment 6. **RECORD** results to two decimal places (e.g., 2.95E 00).

[11.6] **IF** the WRGERM monitor is inoperable for a period greater than one day, **THEN** 

**CONTACT** the Chemistry Manager. **IF** the monitor remains inoperable for a period of seven days, **THEN** 

**INITIATE** a Problem Evaluation Report within 24 hours in accordance with TRM Table 3.3.5-1 (Action E.2).



IF all release streams to the stack are isolated, THEN

**USE** a release rate factor of 0.00. Otherwise, **USE** 1.00. **RECORD** the release rate factor in the appropriate column of Attachment 6.

[11.8] **CALCULATE** the actual release rate by multiplying the highest release rate (0-RM-90-147/148 or 0-RM-90-306) by the release factor. **RECORD** the information in the Actual Release Rate column on Attachment 6.

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#### NOTE

For reporting purposes, the release fractions should only be recorded to three decimal places.

#### EXAMPLES

A release fraction of 0.12345 should be recorded only as 0.123. A release fraction of 0.00012 should be recorded only as 0.000.

- [11.9] **CALCULATE** the stack release fraction by dividing the actual release rate by 1.44 E+07 (or 14,400,000)  $\mu$ Ci/sec. **RECORD** this information on both Attachment 2 and Attachment 6.
- [11.10] **VERIFY** the acceptance criteria as given in Step 6.0B.2 has been met. The stack release fraction must be less than or equal to 0.10. **IF** the acceptance criterion has failed, **THEN**

**IMMEDIATELY CONTACT** the Unit Supervisors. (AC)

[12] **CALCULATE** the total site release fraction by adding the building ventilation and stack release fractions on Attachment 2. **VERIFY** the site release fraction acceptance criteria as given in Step 6.0B.3 has been met. **IF** the acceptance criterion has failed, **THEN** 

#### **IMMEDIATELY CONTACT** the Unit Supervisors. (AC)

			NOTE
Verify	2-FCV-	66-28	is unrestrained, open and locked.
NA	[13]	Once on At	e per shift, <b>RECORD</b> the Unit 1, 2, and 3 offgas instrumentation readings ttachment 8.
	[1:	3.1]	In the "FCV-66-28" column, <b>PLACE</b> an "X" in the appropriate box (open or closed).
$\checkmark$	[1:	3.2]	IF the unit's FCV-66-28 is CLOSED, THEN
NA			<b>RECORD</b> all other offgas readings as <b>"N/A" (NOT</b> applicable). <b>CONTINUE</b> with Step7.0[13.8].

#### 8.0 ILLUSTRATIONS/ATTACHMENTS

- Attachment 1: Independent Review and Remarks Log
- Attachment 2: Site Effluent Release Rate Summary
- Attachment 3: Fan Status Report
- Attachment 4: Building Effluent Release Rate Log
- Attachment 5: Building Ventilation System Release Factors
- Attachment 6: Elevated Effluent Release Rate Log
- Attachment 7: Airborne Effluent for Total Stack Flow Rates
- Attachment 8: Offgas Instrumentation Log
- Attachment 9: Airborne Effluent Release Rate
- Attachment 10: Sample Flow Abnormal Log
- Attachment 11: EPIP Release Rate Log

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### Attachment 1 (Page 1 of 2)

### Independent Review and Remarks Log

Independent Review (STA or SRO) performed for each shift.

	DAY	SHIFT	NIGHT SHIFT	
DAY	Initial	Time	Initial	Time
FRIDAY				
SATURDAY				
SUNDAY				
MONDAY				
TUESDAY				
WEDNESDAY		·		
THURSDAY				

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### Attachment 1 (Page 1 of 2)

### Independent Review and Remarks Log

Independent Review (STA or SRO) performed for each shift.

	DAY	SHIFT	NIGHT	SHIFT
DAY	Initial	Time	Initial	Time
FRIDAY				
SATURDAY				
SUNDAY				
MONDAY				
TUESDAY				
WEDNESDAY				
THURSDAY				

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### Attachment 1 (Page 2 of 2)

Remarks Log

Week From ______ To _____

Remark Number	Attachment or Step	Remarks	Time	Date	Initials
			1	-	
				<u> </u>	
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					<u> </u>
			_		

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### Attachment 2 (Page 1 of 1)

# Site Effluent Release Rate Summary

Week From To To

D	S	SI S	TEP	Read	tor Power (N	/WT)	Building					
A	н						Ventilation		Total Site			
Y	1						Release Rate	Stack Release	Release Rate	Accontance		Unit
	F			Unit 1	Unit 2		Fraction	7 0/11 9]	7 0[12]	Criteria	AUO	Supervisor
	Т	7.0[6]	7.0[7]	7.0[8.1]	7.0[8.1]	7.0[8.1]	7.0[10.0]	7.0[11.8]	7.0[12]	< 1.00		· · · · · · · · · · · · · · · · · · ·
FRI	D	OP	OP	3455	3452	3454				< 1.00		
	N									< 1.00		
SAT	D									≤ 1.00		
	N									≤ 1.00		
CUN										≤ 1.00		
SUN										≤ 1.00		
	N									≤ 1.00		
MON			<u> </u>							≤ 1.00		
	N									≤ 1.00		
TUE	D			<u> </u>						< 1.00		
	N							<u> </u>		< 1.00		
WED	D					<u> </u>				< 1.00		1
	N									<u> </u>		
тип	- n									≤ 1.00		
						1				≤ 1.00		<u> </u>

Initials added as a result of BFPER 960634.

BFN Airborne Effluent Releas Unit 0	e Rate 0-SI-4.8.B.1.a.1 Rev. 0056 Page 31 of 56
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# Attachment 3 (Page 1 of 3)

### Fan Status Report

Week From TODAY To

Unit 1	S H			Re	eacto	or Bu	uildii	ng										Tur	bine	Build	ling								Ra	dwas uildin	ste	
A	1			1	-RN	1-90	-250	)						1-	RM-	90-25	51						1-	RM-9	90-24	9				ancan	9	AUO
Ŷ	F	R	ofue	-	Re	act	or	Τι	urbir	ne	ŀ	1	E	3	C	;	E	)	E		F	-	G	; ]	ł	1	,	J	0-R	M-90-3	252	Init
	Т		s	F		S	F	0	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Ott	On	Off	On	Off	On	Off	0	1	2	
Fri	n	-	a	•	Ť	Ť	Δ		a		X			X	X		X		X		X		X		X			$\times$		X		AOP
* **	N				-																											
Sat																		_														
Gui	N																															
Sun	n						_																									
Cull	N																															
Mon	D																															
	N								$\square$																							
Тие																		_														
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Thu																					<u> </u>											
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Tota	1								<u> </u>																							

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### Attachment 3 (Page 2 of 3)

Week From TODAY To

Unit 2	S н			Re	acto	or Bu	uildii	ng										Tur	bine	Build	ling								
	1				-RM	1-90	-250	)					•	2.	-RM-9	90-25	1						2-	RM-9	90-24	9			
Ŷ	F	R	efue		Re	act	or	Tu	Irbir	ie	F	1	E	3	C	;	נ	)	E	Ξ	F		G	ò		1			AUO
	Т	0	s	F	0	S	F	0	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	Init
Fri	D		ß				A		A		X		X		$\times$		X		$\times$		$\times$		X		X		$\times$		AOP
	Ν																												
Sat	D												L																
	Ν												ļ																
Sun	D																		ļ		<u> </u>								
	N																			┼───									
Mon	D							<b>—</b>					<b> </b>																
	N														<u> </u>				<u> </u>	╂───									
Tue							<u> </u>		<b> </b>																				
	N					<b>_</b>					<u> </u>				├──														
Wed										<u> </u>				-			<u> </u>		<u> </u>	1									
<b></b>						<u> </u>			$\vdash$																				
Inu	H.	<u> </u>		<u> </u>			<u> </u>		<u> </u>	┝──					$\square$					1									
Total			-	┝─					$\vdash$	┢──					1														

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### Attachment 3 (Page 3 of 3)

Week From TODAY To

Unit 3	S			Re	acto	or Bu	uildii	ng										Tur	bine	Build	ing								
D	н					1.00	250						3	.RM-9	90-25	;1		)	[			3-	RM-9		.9				
	F		- 6	<u>.                                    </u>	5-KIV	4-90	-20L		whin		Δ	<u> </u>	F	2		<u>.</u>		,	F E	:	F	; ]	G	3	ŀ	1	J	1	AUO
	т			╩╤┤					101	Ē		, Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	Init.
		9	2		4	3		$\vdash$				$\overline{\mathbf{v}}$										$\mathbf{x}$	$\mathbf{\mathbf{x}}$		X			X	ADP
Fri	D		H				Б		H	$\square$					$\vdash \frown$	┞──┤	$\square$	┞───┤		P		$\sim$	$\sim$		Ύ				
	Ν												└───┤			<b>├</b> ──┤	<b>└───</b> ┤	┞───┤	<b>├</b> ──1	H				┝──┤					
Sat	D																<b>—</b>						└──┤			┞───┨	└		
	Ν													<u> </u>	<b> </b>			<b> </b>		<b>├</b> ──┤	┣──┥					┞───┤			
Sun	D													L	ļ								┞───┤		<b>├</b> ──┤				
	N																												
Mon	D																		ļ			L		——————————————————————————————————————			ļ		
	N																				L				i	<b></b>			
Tue	D					Γ		Γ																			L		
	N						$\square$		Γ	T																			
Wed						<u> </u>	<del> </del>		1	<u> </u>			T																
1150						┼──	$\vdash$	┼──	<del>                                      </del>	<u>†</u>	<b> </b>	<u> </u>	$\square$	<u> </u>	<u>†                                    </u>	1													
The						┢──	+-	┼──	┢──	┼──	<u> </u>	<u> </u>	<del> </del>	<del>                                     </del>	$\mathbf{t}$	<u>†                                    </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	1								
inu		<u> </u>	<u> </u>			┣──	┼──	┼──	┝──	$\vdash$	┼───	<u> </u>	+	†	<del> </del>	+	<u>†                                    </u>	<u>†                                    </u>	<u>†                                    </u>	<u> </u>	<u> </u>								
	LN	<b> </b>	L	<b> </b>	ļ	┣	–	─	┣─	┣─		───	┼───	╂───	+	+	<del> </del>	┼───	<del>                                     </del>	<u>+</u>	<del> </del>								
Total			I	1		1	1			L			L	<u> </u>	L	L		L	L	L	L	L	L	<b>i</b>	l	L	L	L	L

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# Attachment 4 (Page 1 of 4)

### **Building Effluent Release Rate Log**

Week From <u>TODAY</u> To _____ Unit 1

			Reactor Building				Turbine	Building				nitials
	S		1-RM-90-250			1-RM-90-249			1-RM-90-251			
D A	H I	Release Rate	Release Factor	Actual Rate (uCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate μCi/sec	AUO	Unit
Y	F	(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note		1,000	Supervisor
		7 0[10,1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	4000			500			910			ļ	
	N											
SAT	D											
0.11												
SUN	D											
0011	N		· · · · · · · · · · · · · · · · · · ·								ļ	
MON											<b></b>	
	N											
THE									_			
102	N											
WED												
WLU												
TUU					1	1						
		<u> </u>	<u></u>									
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### Attachment 4 (Page 2 of 4)

Week From <u>TODAY</u> To _____ Unit 2

			Reactor Building	1			Turbine	Building				nitials
	s		2-RM-90-250			2-RM-90-249			2-RM-90-251			
D A	Ĥ	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (µCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit
Ý		(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note	7.0140.03	-	Supervisor
	'	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	3400			840			2200			<u> </u>	
ŧ	N									<u> </u>		
SAT	D											
	N								· · · · · · · · · · · · · · · · · · ·	<u> </u>		
SUN	D										<u> </u>	
	N											
MON	D						L					
	N						<u> </u>					
TUE	D										<b></b>	<u> </u>
	N											<u></u>
WED	D											
	N								<u> </u>		<u> </u>	
THU	D										<b></b>	<u> </u>
	N	1							<u> </u>		<u> </u>	<u> </u>

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Week From <u>ToDAY</u> To _____ Unit 3

		r	Reactor Building				Turbine	Building				nitials
	s		3-RM-90-250			3-RM-90-249			3-RM-90-251			
D A	H I F	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate (μCi/sec)	Release Rate	Release Factor	Actual Rate µCi/sec	AUO	Unit
Ŷ		(µCi/sec)	See Note		(µCi/sec)	See Note		(µCi/sec)	See Note	7.0140.01	ł	Supervisor
	'	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.1]	7.0[10.2]	7.0[10.3]		
FRI	D	3100			1600			1900				
	N											
SAT	D										ļ	
	N										<u> </u>	
SUN												
	N											
MON											<u> </u>	
	N		<u> </u>									
TUE												L
WED												
WED	<del>ا ا</del>				-							
L		<u> </u>										
THU						<u> </u>			1			
	I N		1		1			<u></u>		1		

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### Attachment 4 (Page 4 of 4)

Week From <u>TODAY</u> To _____ Unit 0

D	s	F	Radwaste Building	]	Unit	Total Release R	lates	Building	Building	Acceptance		nitials
Ā	Ĥ	0-RM-90-252				(µCi/sec)		Release Rate	Release	Cilicina		
Y	 F	Release Rate (uCi/sec)	Release Factor	Actual Rate (µCi/sec)	Unit 1	Unit 2	Unit 3	(µCi/sec)	Fraction		AUO	Unit Supervisor
	Т		See Note					7 0/40 51	7 0(40 6)			
		7.0[10.1]	7.0[10.2]	7.0[10.3]	7.0[10.4]	7.0[10.4]	7.0[10.4]	7.0[10.5]	7.0[10.0]	< 0.00		
FRI	D	226								50.90		
	N									≤ 0.90		
CAT.	<u> </u>									≤ 0.90		
J SAI										≤ 0.90		
										≤ 0.90		
SUN	D									≤ 0.90		
	N									≤ 0.90		
MON	D				<u> </u>					< 0.90		
	N									< 0.90		
TUE	D									< 0.00		
	N									<u>\$0.90</u>		
WED	D									≤ 0.90	<u> </u>	
	- NI									≤ 0.90		
					<u> </u>					≤ 0.90		
THU										≤ 0.90		
	1 N	1	1	1		<u> </u>	1	<u>I</u>	1			

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#### Attachment 5 (Page 1 of 2)

# **Building Ventilation System Release Factors**

### NOTE

If one or more of the fans are off and one or more of the fans are on, assume off fans are on "slow". (This will cover the case where the fans are off, off, slow; off, slow, off; etc.)

1-, 2-, and 3- RM-90-250									
	Fan Status (Note	)	Release Factor						
Refuel	Reactor	Turbine	Unit 1	Unit 2	Unit 3				
Off	Off	Off	0.00	0.00	0.00				
Slow	Slow	Slow	0.49	0.53	0.49				
Fast	Slow	Slow	0.63	0.60	0.59				
Slow	Fast	Slow	0.64	0.73	0.69				
Slow	Slow	Fast	0.72	0.73	0.71				
Fast	Fast	Slow	0.77	0.80	0.78				
Fast	Slow	Fast	0.86	0.80	0.81				
Slow	Fast	Fast	0.87	0.94	0.91				
Fast	Fast	Fast	1.00	1.00	1.00				

	252		
Number Fans On	0	1	2 Fans
Release Factor	0.00	0.62	1.00

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### Attachment 5 (Page 2 of 2)

Turbine	Floor	CAM	Release	Factors
---------	-------	-----	---------	---------

1-RM-90-249, 2-RM-90-249, and 3-RM-90-251								
Number Fans On	0	1	2	3	4			
Release Factor	0.00	0.25	0.50	0.75	1.00			

1-RM-90-251, 2-RM-90-251, and 3-RM-90-249							
Number Fans On 0 1 2 3 4 5							
Release Factor	0.00	0.20	0.40	0.60	0.80	1.00	

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### Attachment 6 (Page 1 of 2)

### **Elevated Effluent Release Rate Log**

Week From TODAY To

D A Y	S H F T	0-RM-90-147 Red Pen GROSS COUNT RATE (CPS) 7.0[11.1]	0-RM-90-148 Green Pen GROSS COUNT RATE (CPS) 7.0[11.1]	HIGHEST GROSS COUNT RATE (CPS)	STACK FLOW RATE 0-FI-90-271 INOP<16,366 (NOTES 1 & 3) OR ATTACH 7 7.0[11.2]	CONVERSION FACTOR	STACK RELEASE RATE (NOTE 2) (µCi/SEC) 7.0[11.3] & 7.0[11.4]
F	D	4.55 × 105	9.75×104		22700	1.23E-03	
R	Ν					1.202-00	
S	D					1.23E-03	
A	N					1.23E-03	
S	D					1.23E-03	
	N					1.23E-03	
						1.23E-03	
M						1.23E-03	
<u> </u>	, N					1.23E-03	
						1.23E-03	
U	N					1 23E-03	
W	D					1 23 5-03	
E	Ν					4 005 00	
т	D					1.23E-03	
Н	N					1.23E-03	

1 Minimum acceptable flowrate for 0-fi-90-271 operability is 16,366 SCFM (See note 3)

2 Data from manual sampling results or 0-90-147/148[(Stack flow) X (Highest gross count rate) X 1.23E-03].

3 The minimum stack flow rate was revised to 16,366 SCFM (BFPER980545).

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### Attachment 6 (Page 2 of 2)

Week From TODAY To

	6		WRGERMS	T					1	nitials
A Y	5 H F T	DATA RECORDED IN STEP 7.0[11.4]	Noble Gas Release Rate 0-RM-90-306 (μCi/sec) 7.0[11.5]	Highest Stack Release Rate (µCi/sec) Note 1.	Release Rate Factor (0.00 or 1.00) 7.0[11.7]	Actual Release Rate (μCi/sec) 7.0[11.8]	Stack Release Fraction Note 2 7.0[11.9]	Acceptance Criteria	AUO	Unit Supervisor
FRI	D		1.29×106		1.00			≤ 0.10		
,,,,	N	· · · · · · · · · · · · · · · · · · ·						≤ 0.10		
SAT	D							<u>≤ 0.10</u>		
	N							<u>≤ 0.10</u>		
SUN								≤ 0.10		
0011	N							≤ 0.10		
MON								≤ 0.10		
	N							≤ 0.10		
			1					≤ 0.10		
IUE								≤ 0.10		
								≤ 0.10		
WED								≤ 0.10		
	N				1			≤ 0.10		
THU				1				< 0.10		
1	I N	I					1	1		

1 Use the higher of the Stack release rate or the WRGERMS release rate.

2 Divide actual Stack release rate ( $\mu$ Ci/sec) by 1.44E+07  $\mu$ Ci/sec.

OPERATOR:	
SRO	DATE:
JPM NUMBER:	SRO A4
TASK NUMBER:	S-000-EM-21 (SRO ONLY)
TITLE:	Follow Up Notification for General Emergency and PAR Upgrade
K/A NUMBER:	2.4.44 K/A RATING: SRO 4.4
TASK STANDARD Designator 2	: Follow up Notification Appendix F and J are completed with EAL .3-G2, PAR is recommendation 2, from 283° - 326°
LOCATION OF PE	RFORMANCE: Simulator or Class Room
REFERENCES/PRO	OCEDURES NEEDED: EPIP 1, EPIP 5
VALIDATION TIM	E: 30 minutes
PERFORMANCE T	TIME:
COMMENTS:	
Additional comment	t sheets attached? YES NO
RESULTS: SAT	ISFACTORY UNSATISFACTORY
SIGNATURE:	DATE: EXAMINER

reispali

**Class Room** 

**INITIAL CONDITIONS**: You are the SHIFT MANAGER. A General Emergency was declared 45 minutes ago 2.1-G for Unit 1, the Initial Notification form is attached. NRC notification is complete. On Site accountability is complete, Site Evacuation is complete. CECC is NOT staffed.

Current conditions are:

Reactor Power	All Rods In
Reactor Level	-175 inches and currently stable
Reactor Pressure	50 psig
DW Pressure	35 psig and lowering rapidly, after venting was NOT successful in
DW Radiation	2-RE-90-272A 22,000 R/HR and 273A 23,000 R/Hr

Projected Dose Assessments at 5 miles is 500 mRem/hr TEDE and 2500 mRem/hr Thyroid CDE.

Measured Dose at Site Boundary is 2000 mRem/hr TEDE.

Wind Speed18 mphWind Direction323°

**INITIATING CUE:** Evaluate current conditions and complete any required actions in accordance with Emergency Plan Implementing Procedures.

JPM is TIME Critical

#### START TIME

Refers to EPIP 1 for additional General Emergency EAL designators.

Standard:

SHIFT MANAGER refers to EPIP 1 and determines that an additional EAL is 2.3-G2.

SAT__ UNSAT___ N/A ___COMMENTS:_____

Performance Step 2:

Critical  $\underline{X}$  Not Critical

Refers to EPIP-5 GENERAL EMERGENCY appendix E

Standard:

SHIFT MANAGER determines that Appendix F requires completion of a Follow Up Notification.

SAT__ UNSAT__ N/A __COMMENTS:_____

*******

Performance Step 3:

Critical  $\underline{X}$  Not Critical

Completes Appendix F of EPIP 5

Standard:

Shift Manager completes Appendix F of EPIP 5. The following are Critical portions of Appendix F: PAR is recommendation 2 with wind direction of 323° and wind speed of 18 mph.

SAT__ UNSAT__ N/A __COMMENTS:_____

****************

Performance Step 4:

Critical  $\underline{X}$  Not Critical

Completes Appendix J of EPIP 5

Standard:

Shift Manager completes Appendix J of EPIP 5. The following are Critical portions of Appendix J: PAR Upgrade based on Increase in field team measured dose values is checked OR PAR Upgrade based on Increase in dose assessment projected values, PAR is recommendation 2 with wind direction of 323° and wind speed of 18 mph. Check under Recommendation 2 next to From 283° - 326°. Evacuate sectors A2, B2, F2, G2, B5, E5.

SAT__UNSAT___N/A ___COMMENTS:_____

STOP TIME_____

**END OF TASK** 

**INITIAL CONDITIONS**: You are the SHIFT MANAGER. A General Emergency was declared 45 minutes ago 2.1-G for Unit 1, the Initial Notification form is attached. NRC notification is complete. On Site accountability is complete, Site Evacuation is complete. CECC is NOT staffed.

Current conditions are:

Reactor Power	All Rods In
Reactor Level	-175 inches and currently stable
Reactor Pressure	50 psig
DW Pressure	35 psig and lowering rapidly, after venting was NOT successful in maintaining Suppression Chamber pressure less than 55 psig.
DW Radiation	2-RE-90-272A 22,000 R/HR and 273A 23,000 R/Hr

Projected Dose Assessments at 5 miles is 500 mRem/hr TEDE and 2500 mRem/hr Thyroid CDE.

Measured Dose at Site Boundary is 2000 mRem/hr TEDE.

Wind Speed	18 mph
Wind Direction	323°

**INITIATING CUE:** Evaluate current conditions and complete any required actions in accordance with Emergency Plan Implementing Procedures.

JPM is TIME Critical

### Conditions for the Initial Classification of 2.1-G

### 45 minutes ago

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Reactor Power	15%
Reactor Level	-145 inches just prior to ED
Reactor Pressure	300 psig, Emergency Depressurization in progress
DW Pressure Suppression Chamber Pressure	56 psig and stable with Appendix 13 in progress 56 psig and stable with Appendix 13 in progress
DW Radiation	2-RE-90-272A 22,000 R/HR and 273A 23,000 R/Hr
Dose Assessment information	not available to SED

.

Wind	Speed	18 mph
Wind	Direction	323°

C	BFN Unit 0	GEN	ERA	AL EMERGENCY			EPIP- 5 Rev 0043 Page 8 of 26		
58.2.4 1	APPENDIX A Page 1 of 1 GENERAL EMERGENCY INITIAL NOTIFICATION FORM								
	1. X This is a Drill This is an Actual Event - Repeat - This is an Actual Event								
	2. <u>Guy Smith</u> the SED at Browns Ferry has declared a GENERAL EMERGENCY. 3. EAL Designator: <u>2,1-6</u> (USE ONLY ONE EAL DESIGNATOR) 4. Brief Description of the Event: <u>Suppression Chamber pressure</u> <u>CAN NOT be maintained below 55 psig</u>								
	5. Radiological Conditions: (Check one under both Airborne and Liquid column.) <u>Airborne Releases Offsite</u> ☐ Minor releases within federally approved limits ¹ ⊠ Releases above federally approved limits ¹ ☐ Release information not known         ( ¹ Tech Specs/ODCM)								
	<ul> <li>6. Event Declared: Time: <u>15 minutes 99</u> (Central Time) Date: <u>TODAY</u></li> <li>7. The Meteorological Conditions are: (Use 91 meter data from the Met Tower. If data is not available from the MET tower, contact the National Weather Service by dialing 9-1-256-890-8505 or 9-1-205-621-5650. The National Weather Service will provide wind direction and wind speed.)</li> </ul>								
C	Wind Direction (15 min averag	n is FROM: <u>32.3</u> e)		degrees	Wir (15	nd Speed: min average)	<u>/8</u> m.p.h		
	STEP MUS 8. Provide Protectiv	T BE COMPLETE	E <b>D</b> atior	BY THE SITE utilizing Appendi	Е <b>Г</b> х Н:	NERGEN (Check eith	CY DIRECTOR er 1 or 2 or 3)		
	Recommendati     EVACUATE LIST     (2 mile Radius & 1     Shelter remainder	ion 1 ED SECTORS 10 miles downwind) of 10 mile EPZ.	RECOMMENDA	WIND FROM DEGREES	RECOMMENDA	Recom     EVACU     (2 mile     SHELT	<b>mendation 2</b> ATE LISTED SECTORS radius & 5 mile downwind) ER remainder of 10 mile EPZ.		
	Consider issuance in accordance with	e of POTASSIUM IODIDE h the State Pian.	TION-1	(Mark wind direction from Step 7)	tion-2 📫	<ul> <li>Conside IODIDE Plan.</li> </ul>	er issuance of POTASSIUM in accordance with the State		
	A2, B2, F2, G2, E5,E	10, F5, F10, G5, G10		From 4° - 40°		A2, B2, F2,	G2, E5, F5, G5		
	A2, B2, F2, G2, F5, F	-10, G5, G10, H10	ļ	From 41°- 73°	<b> </b>	A2, B2, F2,	G2, F5, G5		
	A2, B2, F2, G2, G5,	<u>G10, H10, I10</u>	<u> </u>	From 74° - 92°		A2, B2, F2,	G2, G5		
	A2, B2, F2, G2, A5,	G5, H10, I10, J10, K10	<b> </b>	From 93° - 137°	<u> </u>	A2, 62, F2,	G2, A0, G0		
	A2, B2, F2, G2, A5,	A10, I10, J10, K10	<b> </b>	From 138° - 203°	┣	AZ, BZ, F2,	G2 A5 P5		
	A2, B2, F2, G2, A5, A	A10, B5, B10	_	From 204° - 282°		A2 82 52	G2, A0, D0		
	A2, B2, F2, G2, B5,	D10 E5 E40 E5 E10	┼──	From 327° - 30	$\vdash$	A2 B2 F2	G2. E5. F5		
	A2, B2, F2, G2, C10	tion 3	L_ DE i	n accordance with the	stal	te Plan.			
$\bigcirc$	Completed by	1: <u>Guy Smi</u>	ŢΗ	Approv	ved	by	ke Jones		

BFN Unit 0	GENE	RAL EMERGENCY		EPIP- 5 Rev 0043 Page 16 of 26
	GENERAL EMERGENC	APPENDIX F Page 1 of 1 Y <u>FOLLOW-UP</u> INFC	RMATION FORM	
1. X THIS IS A	DRILL		S AN ACTUAL EV	ENT
2. NAME	the SED at <b>Browr</b>	<b>is Ferry</b> has decla	red an GENERAL	EMERGENCY
3. Reactor Status:				
Unit 1: 🛛 Sh Unit 2: 🔤 Sh Unit 3: 🔄 Sh	utdown At Power utdown At Power utdown At Power	Refueling Refueling Refueling Refueling	N/A    N/A    N/A	
4. Additional EAL	Designator(s) _2	.3 - G2	<u></u>	
5. Significant cha	nges in plant condit	ons:		
	055 DE PRIM	HARY CONT	AINMENT	
6. Significant cha	nges in Radiologica	Conditions:		
6. Significant cha	nges in Radiologica	NDARY 20	00 mRen/HR	
6. Significant cha Doci 7. Off-site Protect (UTILIZE APPEND	nges in Radiologica <u>AT SITE 30</u> tive Action Recomm IX J FOR MAKING AND	l Conditions: ୦୦୦ ହେନୁ ପୁତ endations: communicating P	AR UPGRADES)	
6. Significant cha Dose 7. Off-site Protect (UTILIZE APPEND □ Recommend	nges in Radiologica <u>AT SITE ほ</u> tive Action Recomm IX J FOR MAKING AND lation 1 図 Rec	l Conditions: אין אין אין endations: COMMUNICATING P. commendation 2	<u>אר שישר אר /u>	mmendation 3
<ul> <li>6. Significant cha</li> <li>○▷▷▷⊆</li> <li>7. Off-site Protection</li> <li>(UTILIZE APPEND</li> <li>□ Recommend</li> <li>8 Onsite Protection</li> </ul>	nges in Radiologica	I Conditions: <u>א מאלי</u> endations: commendation 2 commendation 2 ly/Accountability cuation	AR UPGRADES)	mmendation 3 d XComplete
<ul> <li>6. Significant cha</li> <li>○ ▷ ▷ ▷ ⊆</li> <li>7. Off-site Protection</li> <li>(UTILIZE APPENDING)</li> <li>8 Onsite Protection</li> <li>8 Onsite Protection</li> <li>9. The Meteoroloo (Use 91 meter data or data o</li></ul>	nges in Radiologica AT SITE 30 tive Action Recomm IX J FOR MAKING AND lation 1 Recomm ve Actions: Assemb Site Eva gical Conditions are the Met Tower & 15 Minute Av	I Conditions:	AR UPGRADES)  AR UPGRADES)  No Initiate No Initiate No Initiate d: <u>18</u> m.p tion is from: <u>32.3</u>	mmendation 3 d XComplete d XComplete h.h. degrees
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<ul> <li>6. Significant cha</li> <li>Desc</li> <li>7. Off-site Protection</li> <li>(UTILIZE APPEND</li> <li>Recommend</li> <li>8 Onsite Protection</li> <li>8 Onsite Protection</li> <li>9. The Meteoroloo (Use 91 meter data or 10. Please repeat</li> <li>11. Fax to applicat CECC (5-751-1)</li> </ul>	nges in Radiologica <u>AT_SITE</u> <u>30</u> tive Action Recommon ix J FOR MAKING AND lation 1 Reconserved Actions: Assemb Site Evan gical Conditions are the Met Tower & 15 Minute And the information you h ble contact after rep 682), ODS (5-751-86	endations: endations: COMMUNICATING P commendation 2 y/Accountability cuation Wind Spee rerages) Wind Direct ave received to en orting following- 20) or State of Ala	AR UPGRADES)  AR UPGRADES)  Recon  No Initiate No Initiate d: <u>18</u> m.p tion is from: <u>32.3</u> sure accuracy.  up information: abama (9-1-205-2)	mmendation 3 d XCompleted d XCompleted h. b. degrees 80-2495).
<ul> <li>6. Significant cha</li> <li>Desc</li> <li>7. Off-site Protection</li> <li>(UTILIZE APPEND</li> <li>Recommend</li> <li>8 Onsite Protection</li> <li>8 Onsite Protection</li> <li>9. The Meteorolo (Use 91 meter data or 10. Please repeat 11. Fax to applicat CECC (5-751-10)</li> <li>Completed by:</li> </ul>	nges in Radiologica AT SITE 30 tive Action Recommon Dix J FOR MAKING AND lation 1 Ref ve Actions: Assemb Site Eva gical Conditions are the Met Tower & 15 Minute Av the information you h ble contact after rep 682), ODS (5-751-86	I Conditions:	AR UPGRADES)  AR UPGRADES)  Record  No Initiate No Initiate d: <u>18</u> m.p tion is from: <u>32.3</u> sure accuracy.  up information: abama (9-1-205-2) e/Time	mmendation 3 d XComplete d XComplete h. b. degrees 80-2495).

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BFN Unit 0	GEN	ERA	L EMERGENCY			EPIP- 5 Rev 0043 Page 26 of 26
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	FORADE - I ROTER					
1. 🔀 This is a 🛙	Drill 🔲 TI	his is	s an Actual Event - I	Repe	eat - This is an	Actual Event
2. Browns Ferry has	declared a GENERAL	EME	RGENCY			
Browne Formie D	acking a PAP HPGRADI	E ha	sed upon the followi	ina c	riteria:	
Increase i	in dose assessment pro	ojeci	ted values.			
🔀 Increase i	in field team measured	dos	e values.			
Shift in 1	5 min average wind dire	ectio	on resulting in addi	ition	al sectors be	ing affected.
State prov	vided information that	offsi	te impediments no	lon	ger exist.	
🗌 Hostile A	ction Event has been te	ermi	nated.			
Containm	ent Rad Levels $\geq$ 20 %					
4 The Meteorologic	al Conditions are: (Use	e 91	meter data from the	Me	Tower. If dat	a is not available from
the MET tower, co	ntact the National Weath	ier S	ervice by dialing 9-1	1-250	6- <b>890-8505 or</b>	9-1-205-621-5650. T
National Weather	Service will provide wind	dire	ction and wind spee	ed.)		
	233	noh	roop Win	d Sr	beed:	/8 m.p.h
Wind Direction is h		uey	1962 4411	u op		
Wind Direction is F (15 min average)	-ROW:	ueg	(15)	min	average)	•••••••••••••••••
(15 min average)	ro Action Recommenda	_uey	(15 i utilizing Appendi	min x H:	average) (Check either	r 1 or 2 or 3)
Wind Direction is F (15 min average) 5. Provide Protectiv	ve Action Recommenda	atior	utilizing Appendi	min x H:	average) (Check eithe	r 1 or 2 or 3)
Wind Direction is F (15 min average) 5. Provide Protectiv	ve Action Recommenda	atior	utilizing Appendi	min x H:	average) (Check eithe	r 1 or 2 or 3)
Wind Direction is F (15 min average) 5. Provide Protectiv STEP MUS	re Action Recommenda	atior	(15 n utilizing Appendia BY THE SITE	min x H: El\	average) (Check either /IERGENC	r 1 or 2 or 3)
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Wind Direction is F (15 min average) 5. Provide Protectiv STEP MUS 8. Provide Protectiv	re Action Recommenda T BE COMPLETE ve Action Recommenda	ation	(15 n utilizing Appendix BY THE SITE n utilizing Appendi	E C F min x H: E C	average) (Check either /ERGENC (Check eithe X Recomm	r 1 or 2 or 3) CY DIRECTOR r 1 or 2 or 3) mendation 2
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<ul> <li>Wind Direction is F (15 min average)</li> <li>5. Provide Protectiv</li> <li>STEP MUS</li> <li>8. Provide Protectiv</li> <li>6. Provide Protectiv</li> <li>1. Recommendati</li> <li>• EVACUATE LIST (2 mile Radius &amp; 2)</li> </ul>	re Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind)	ation	(15 n utilizing Appendix BY THE SITE n utilizing Appendi WIND FROM	min x H: E H: x H: RECOMMEN	Average) (Check either (Check either (Check either Mecomm • EVACUA (2 mile ra	r 1 or 2 or 3) CY DIRECTOR r 1 or 2 or 3) nendation 2 TE LISTED SECTORS idius & 5 mile downwind
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<ul> <li>Wind Direction is F (15 min average)</li> <li>5. Provide Protectiv</li> <li>STEP MUS</li> <li>8. Provide Protectiv</li> <li>Recommendati</li> <li>EVACUATE LIST (2 mile Radius &amp; 2</li> <li>Shelter remainder</li> <li>Consider issuance in accordance wit</li> <li>A2, B2, F2, G2, E5, F</li> <li>A2, B2, F2, G2, F5, F</li> </ul>	re Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10		(15 n utilizing Appendix BY THE SITE utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 4° - 73°	m H:	Average) (Check either (Check either (Check either EVACUA (2 mile ra • SHELTER • Consider IODIDE i Plan. A2, B2, F2, C	r 1 or 2 or 3) CY DIRECTOR r 1 or 2 or 3) mendation 2 TE LISTED SECTORS adius & 5 mile downwind R remainder of 10 mile B issuance of POTASSIU n accordance with the S G2, E5, F5, G5 G2, F5, G5
<ul> <li>Wind Direction is F (15 min average)</li> <li>5. Provide Protectiv</li> <li>STEP MUS</li> <li>8. Provide Protectiv</li> <li>Recommendati</li> <li>EVACUATE LIST (2 mile Radius &amp; 2</li> <li>Shelter remainder</li> <li>Consider issuance in accordance wite</li> <li>A2, B2, F2, G2, E5, F</li> <li>A2, B2, F2, G2, G5, F</li> </ul>	re Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10 G10, H10, I10	ation	(15 n n utilizing Appendix BY THE SITE n utilizing Appendix WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41° - 73° From 74° - 92°	THE THE RECOMMENDATION-2	Average) (Check either (Check either (Check either EVACUA (2 mile ra • SHELTEI • Consider IODIDE i Plan. A2, B2, F2, C A2, B2, F2, C	r 1 or 2 or 3) CY DIRECTOR r 1 or 2 or 3) mendation 2 TE LISTED SECTORS idius & 5 mile downwind R remainder of 10 mile B issuance of POTASSIU n accordance with the S 32, E5, F5, G5 32, G5 32, G5
<ul> <li>Wind Direction is F (15 min average)</li> <li>5. Provide Protective</li> <li>STEP MUS</li> <li>8. Provide Protective</li> <li>Brecommendati</li> <li>EVACUATE LISTIC (2 mile Radius &amp; 2 mile Radius &amp;</li></ul>	re Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10 G10, H10, I10 G5, H10, I10, J10, K10	ation	(15 n nutilizing Appendix BY THE SITE nutilizing Appendix WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41° - 73° From 74° - 92° From 93° - 137°	THE HERCOMMENDATION-2	Average) (Check either (Check either (Check either EVACUA (2 mile ra • SHELTEI • Consider IODIDE i Plan. A2, B2, F2, C A2, B2, F2, C A2, B2, F2, C A2, B2, F2, C	r 1 or 2 or 3) CY DIRECTOR r 1 or 2 or 3) mendation 2 TE LISTED SECTORS idius & 5 mile downwind R remainder of 10 mile B issuance of POTASSIU n accordance with the S 32, E5, F5, G5 32, G5 32, A5, G5 32, A5
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<ul> <li>Wind Direction is F (15 min average)</li> <li>5. Provide Protective</li> <li>STEP MUS</li> <li>8. Provide Protective</li> <li>Recommendati</li> <li>EVACUATE LIST (2 mile Radius &amp; 2)</li> <li>Shelter remainder</li> <li>Consider issuance in accordance wite</li> <li>A2, B2, F2, G2, E5, E A2, B2, F2, G2, A5, E A2, B2, F2, G2, C10</li> </ul>	Action Recommenda           T BE COMPLETE           ve Action Recommenda           to a 1           ED SECTORS           10 miles downwind)           r of 10 mile EPZ.           e of POTASSIUM IODIDE           h the State Plan.           E10, F5, F10, G5, G10           F10, G5, G10, H10           G5, H10, I10, J10, K10           A10, I10, J10, K10           A10, E5, B10           B10, C10, D10, E5, F10	ation	(15 n (15 n utilizing Appendix BY THE SITE nutilizing Appendix WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41°- 73° From 41°- 73° From 74° - 92° From 93° - 137° From 327° - 3°		Average) (Check either (Check either (Check either EVACUA (2 mile ra • SHELTEI • Consider IODIDE i Plan. A2, B2, F2, C A2, B2, F2, C	r 1 or 2 or 3) CY DIRECTOR r 1 or 2 or 3) mendation 2 TE LISTED SECTORS idius & 5 mile downwind R remainder of 10 mile B issuance of POTASSIU n accordance with the S G2, E5, F5, G5 G2, A5, G5 G2, A5, G5 G2, A5, B5 G2, B5, E5 G2, E5, F5
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9. Utilize Appendix C to communicate PAR Upgrade.

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### **BROWNS FERRY NUCLEAR PLANT**

Unit 0

# **Emergency Plan Implementing Procedure**

### EPIP-5

### GENERAL EMERGENCY

Revision 0043 Quality Related Level of Use: Reference Use

Effective Date: June 14, 2012

Responsible Organization: Radiological Emer. Prep.

PREPARED BY: BRAD TIDWELL

APPROVED BY: S. M. BONO

#### BFN Unit 0

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#### GENERAL EMERGENCY

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#### Revision Log (Only maintain one page of log)

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
43	06-14-2012	ALL	<ul> <li>Revision 43 represents a comprehensive change, amendment and enhancement to EPIP-5. The major revision attributes are; 1) Fleet Standardization, 2) rigid attention to reducing Shift Manager burden, 3) State Notification Enhancement, 4) ERO Activation Enhancement, 5) Human Error Reduction Tool applications with focus on notification accuracy. 6) PER Closure for the following: 455551 Clarify the purpose statement to more effective state that classification is made using EPIP-1 and EPIP 2-5 implements Classification Actions. (Implemented) 455560 Clarify that NRC Notifications are to be completed as soon as possible not to exceed 60 minutes. (Implemented)</li> <li>455564 Review and determine if Met conditions should be included in initial notification forms for EPIP-2, 3, and 4. The NPG-EPWG determined that Met conditions will not be added to the initial notification forms for EPIP-2, 3, and 4.</li> <li>470225 Response to IER 11-39 enhance ERO Notification methods. The revision provides for the activation of the new TVA TEENS automatic personnel notification system. (Implemented)</li> <li>In accordance with NPG-SPP-01.2 the following is a procedure change summary and reason for changes.</li> <li>Formatting along with editorial changes were included into this revision, some examples of changes are: 1) Single lines surrounding boxes around notes and cautions, versus double lines 2) Defining Operations personnel versus indicating "Licensed Personnel", 3) Removal of the "checkboxes" in the right hand margins versus the standardized "circle/clash" place keeping system. Utilizing "circle/clash and check boxes have boxes lead to some placing keeping confusion.</li> <li>The procedure was revised to incorporate requests of the Operations Peer Team to reduce Shift Manager Burden.</li> <li>The procedure was revised to terminate the use of the ODS as the point of contact to the State during State notification. Notifications will originate from the Main Control Room.</li> <li>For a more comprehensive line-in, line-out</li></ul>

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#### 1.0 INTRODUCTION

#### 1.1 Purpose

The purpose of this procedure is to provide for the timely notification of appropriate individuals or organizations when the Shift Manager or the Site Emergency Director (SED) has determined through the use of EPIP-1 that an event has occurred which is classified as a General Emergency. Additionally, this procedure provides for periodic evaluation of the current situation by the Shift Manager/SED to determine whether the General Emergency should be terminated, continued, or upgraded to a higher emergency classification.

Upon completion of classification utilizing EPIP-1, all initial classification steps are conducted from the body of this instruction. Classifications upgrades made following the Technical Support Center becoming operational are accomplished from <u>Appendix G</u> of this procedure.

The steps of this procedure can be completed concurrently. The order or sequencing of the steps is suggested but if the step cannot be completed timely or is delegated, continue through all steps, periodically reviewing all steps not completed. Continue review of the procedure until all steps are completed. Two functions of this procedure are time critical. These "timed actions" are "Notification of the State" (15 minutes from classification declaration) and "Notification of the NRC" (as soon as possible not to exceed 60 minutes from classification declaration).

#### 2.0 REFERENCES

#### 2.1 Industry Documents

- A. NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"
- B. 10 CFR 50.47, Code of Federal Regulations
- C. 10 CFR 72.75, Code of Federal Regulations

#### 2.2 Plant Instructions

- A. TVA Radiological Emergency Plan
- B. EPIP 1, "Emergency Classification Procedure"
- C. EPIP 2, "Notification of Unusual Event"
- D. EPIP 3, "Alert"
- E. EPIP 4, "Site Area Emergency"
- F. EPIP -16, "Termination and Recovery Procedure"
| BFN    |
|--------|
| Unit 0 |

## 3.0 EMERGENCY CLASSIFICATION ACTIONS

WHEN... the TSC SED has assumed the responsibilities from the SM SED

THEN... CONTINUE in this procedure at <u>Appendix G</u>.

Otherwise continue in this procedure.



CAUTION

Ongoing or anticipated security events or severe weather may present a danger to normal staffing and other Emergency Plan implementation processes. Observed all procedural steps carefully during security related events.

## 3.1 Activation of the Emergency Response Organization (ERO)



**DIRECT** a RO or SRO to implement EPIP-5, <u>Appendix B</u>, "Activation of the Emergency Response Organization (ERO)" utilizing a notification listed below:



EMERGENCY STAGING AREA (If events are on-going or anticipated that may present a danger to normal emergency center staffing such as security related issues.)

- DRILL STAGING AREA (If events are on-going or anticipated that may present a danger to normal emergency center staffing such as security related issues AND a drill is in progress.)

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## 3.2 BFN Risk County and State of Alabama Notification

# NOTE

Notification of the Risk Counties / State of Alabama is required to be completed within 15 minutes from the time of emergency classification declaration.

- Ø
- **DIRECT**... a qualified SRO Communicator to **COMPLETE** <u>Appendix A</u> (Initial Notification Form) OR complete <u>Appendix A</u>.

**DIRECT** a RO / SRO to **COMPLETE** <u>Appendix C</u> (State of Alabama Notification) utilizing a completed <u>Appendix A</u> OR **COMPLETE** <u>Appendix C</u>.

# 3.3 Evacuation of Non-Emergency Responders

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IF... any of the following conditions exists:



A severe weather condition is currently in progress or is projected on-site, such as a tornado.

## OR

An on-site security risk condition exists that may present a danger to site personnel during the Assembly / Accountability process as determined by SED/Nuclear Security.

## OR



Rapid Evacuation of the Protected Area (REPA) has been conducted.

THEN...DO NOT initiate the Evacuation Process

## AND

**CONTINUE** in this procedure at Step 3.4

Otherwise continue in this procedure.



**DIRECT** Nuclear Security at extension 3238 or 2219 to commence evacuation of Non-Emergency Responders by initiating Assembly / Accountability, utilizing <u>EPIP-8</u>, Appendix C

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## 3.4 Notification of the Nuclear Regulatory Commission (NRC)

# NOTE

Notification of the NRC is required to be completed as soon as possible not to exceed 60 minutes from declaration.



**DIRECT** a SRO/STA to **COMPLETE** <u>Appendix D</u>, "Notification of the NRC" or **COMPLETE** <u>Appendix D</u>.

## 3.5 Maintaining communications with the NRC

- When the TSC is staffed, the open and continuous line of communications with the NRC may be transferred to the NRC Coordinator position.
  - Ð

3.6

IF **REQUESTED** by the NRC, **DIRECT** a member of the Operations staff (SRO if Available) to maintain an open and continuous line of communications as directed by NRC.

## Monitor / Re-evaluate the Event

[1] Monitoring and reevaluation of plant events along with communicating significant changes should be performed continuously as a function of the emergency response. Methods used to communicate significant changes are not formalized and may vary depending upon staffing levels as well as availability of personnel or equipment.

<u>Appendix E</u> provides a systematic approach to monitoring/re-evaluation and the communication of significant changes in plant conditions.

<u>Appendix F</u> is used to communicate Follow-Up information. Continue to conduct State Follow-Ups until the CECC has assumed State Communications responsibilities.

[2] Reevaluation of significant changes must additionally include Protective Action Recommendation Upgrades (PAR). PAR Upgrades are determined through the continuous assessment of <u>Appendix H</u>. When it has been determined that a PAR Upgrade is applicable, then utilize <u>Appendix J</u> to communicate the Upgrade to the State. Continue to assess PARs until the CECC has assumed PAR responsibilities.

## 3.7 Review of Procedure

**DIRECT** a member of the staff to review this procedure ensuring that all place keeping rules have been utilized.

## 4.0 DOCUMENTATION

#### 4.1 QA Records

None

#### 4.2 Non-QA Records

## [1] Emergency Records

The records generated due to declaration of an emergency classification are considered Lifetime Retention Non-QA records. These records shall be forwarded to the BFN EP Manager. The records necessary to demonstrate performance are then submitted to the Corporate EP Manager for storage.

## [2] Drill and Exercise Records

The records deemed necessary to demonstrate performance of key actions during drills are considered Non-QA records. These records shall be forwarded to the BFN EP Manager. The BFN EP Manager shall retain records necessary to demonstrate six-year plan requirements for six years. The BFN EP Manager shall retain other records in this category for three years.

## 5.0 ILLUSTRATIONS / APPENDICES

- Appendix A General Emergency Initial Notification Form
- Appendix B Activation of the Emergency Response Organization (ERO)
- Appendix C State of Alabama Notification
- Appendix D Notification of the Nuclear Regulatory Commission (NRC)

Appendix E - Monitor / Re-evaluate the Event

Appendix F - General Emergency Follow-up Information Form

Appendix G -Technical Support Center General Emergency Classification Instruction

Appendix H - Protective Action Recommendation Flowchart

Appendix I - Activation of the Emergency Paging System (EPS)

Appendix J - Upgrade - Protective Action Recommendation

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		A	PPENDIX A			
		I	Page 1 of 1			
	GENERAL EMERG	ENC	CY INITIAL NOTIFIC	AT	ION FORM	
1. 🔲 This is a D	rill 🔄 This is ar	۱ Ac	tual Event - Repeat	- Th	iis is an Actua	al Event
2.	the SED at	Bro	wns Ferry has dec	are	d a <b>GENER</b>	AL EMERGENCY.
3. EAL Designator:			USE ONLY (	ONE	EAL DESIGNAT	OR)
4. Brief Description	of the Event:					
5. Radiological Con <u>Airborne Rel</u> Minor releases wit Releases above fe Release informatio ( ¹ Tech Specs/ODCM)	ditions: (Check one und eases Offsite hin federally approved lir ederally approved limits ¹ on not known	ler b nits ¹	ooth Airborne and Lie Liqu Minor rele Releases Release i ( ¹ Tech Specs	quid id F ase abc nfor /OD	column.) Releases Offs s within feder ove federally a mation not kn CM)	<u>ite</u> rally approved limits ¹ approved limits ¹ nown
6 Event Declared:	Time: (Cen	itral	Time) Date:			
7. The Meteorologic from the MET towe The National Weat	cal Conditions are: ( er, contact the National V ther Service will provide v	Use Veat winc	91 meter data from her Service by dialir direction and wind	the 1g 9 spe	Met Tower.   -1-256-890-8 ed.)	f data is not available 505 or 9-1-205-621-5650.
Wind Direction (15 min averag	is FROM: e)		degrees	Wir (15	nd Speed: min average)	m.p.h
STEP MUS 8. Provide Protectiv	T BE COMPLETE	ED ation	BY THE SITE n utilizing Appendi	Е <b>Г</b> х н:	MERGEN (Check eith	CY DIRECTOR er 1 or 2 or 3)
Recommendati     EVACUATE LISTI     (2 mile Radius & 1	i <b>on 1</b> ED SECTORS 10 miles downwind) of 10 mile EPZ	RECOMMEND	WIND FROM DEGREES	RECOMMEND	Recom     EVACU     (2 mile     SHELTI	mendation 2 ATE LISTED SECTORS radius & 5 mile downwind) ER remainder of 10 mile EPZ
Consider issuance in accordance with	e of POTASSIUM IODIDE h the State Plan.	ATION-1	(Mark wind direction from Step 7)	ATION-2	• Conside IODIDE Plan.	er issuance of POTASSIUM in accordance with the State
A2, B2, F2, G2, E5,E	10, F5, F10, G5, G10		From 4° - 40°		A2, B2, F2,	G2, E5, F5, G5
A2, B2, F2, G2, F5, I	=10, G5, G10, H10		From 41°- 73°		A2, B2, F2,	<u>G2, F5, G5</u>
A2, B2, F2, G2, G5,	G10, H10, I10		From 74° - 92°		A2, B2, F2,	G2, G5
A2, B2, F2, G2, A5,	G5, H10, I10, J10, K10	ļ	From 93° - 137°		A2, B2, F2,	G2, A5, G5
A2, B2, F2, G2, A5,	A10, I10, J10, K10	<b> </b>	From 138° - 203°	ļ	AZ, B2, F2,	GZ, A5
A2, B2, F2, G2, A5,	A10, B5, B10	<b> </b>	From 204° - 282°		AZ, BZ, F2,	62, AD, BD
A2, B2, F2, G2, B5,	B10, C10, D10, E5,E10	┢	From 283°-326°	<u> </u>	A2, B2, F2,	G2 E5 E5
A2, B2, F2, G2, C10 <b>Recommendat</b> • SHELTER all sect	, D10, E5,E10, F5, F10 lion 3 ors	1	<b>From 327 - 3</b>	I	<u>, 72, 02, 72,</u>	02, 40, 10
<ul> <li>CONSIDER issuar</li> </ul>	nce of POTASSIUM IODI	DE	in accordance with the	Sta	te Plan.	

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#### APPENDIX B Page 1 of 3 Activation of the Emergency Response Organization (ERO)

## 1.0 Activation of the Emergency Response Organization

# CAUERON

Ongoing or anticipated security events may present a danger to site personnel. Do not conduct the notification of site personnel PA message during an ongoing or anticipated security event. All pertinent site personnel PA messages will be conducted per 0-AOI-100-8 "Security Event Response" for security events.



**CONDUCT** a Plant PA announcement similar to the following: (Dial 687 to obtain the Plant PA)

"Attention All Personnel. Attention All Personnel.

A GENERAL EMERGENCY has been declared.

The Browns Ferry Emergency Plan is being implemented at this time.

Further updates will follow." (Repeat Message)



TVA Enterprise Emergency Notification System (TEENS)

**DIRECT** the ODS at 5-751-1700 or 5-751-2495 to **ACTIVATE** TEENS utilizing the notification as instructed by the SED



- EMERGENCY STAGING AREA (If events are on-going or anticipated that may present a danger to normal emergency center staffing such as security related issues.)
- DRILL STAGING AREA (If events are on-going or anticipated that may present a danger to normal emergency center staffing such as security related issues AND a drill is in progress).

## APPENDIX B

#### Page 2 of 3 Activation of the Emergency Response Organization (ERO)



IF... unable to establish contact with the ODS

THEN... continue to perform Step 1.0 [2] for 5 minutes



IF... unable to establish contact with the ODS after 5 minutes

THEN... **IMPLEMENT** <u>Appendix 1</u>, "Activation of the Emergency Paging System" concurrently with this Appendix beginning at Step 2.0.

## 2.0 Dose Assessment Evaluation



**CONTACT** the Site Emergency Director and determined if a Dose Assessment Evaluation is warranted.



IF emergency circumstances warrant dose assessment, **CONTACT** Radiation Protection at 7865 and **REQUEST** the implementation of EPIP-13 for dose assessment.

Otherwise continue in this Appendix

## 3.0 Notify On Shift Unit Supervisors of the emergency.

## 4.0 Conduct Notification of Site Personnel

Ø

**OBTAIN** a copy of EPIP-5, <u>Appendix A</u> used for the State Notification and available affected Unit Control Room logs



FAX copies to the TSC at 3742

FAX copies to the CECC at 5-751-1682

## APPENDIX B

Page 3 of 3

Activation of the Emergency Response Organization (ERO)



IF... The emergency has been declared based upon a security related event

THEN...

- A. DELAY making notification steps 4.0 [5] through 4.0 [8].
- B. NOTIFY the Shift Manager of the delay
- C. Periodically **MONITOR** the event until such time that the Shift Manager determines the present danger has subsided

#### OR

The Shift Manager suspends notification steps 4.0 [5] through 4.0 [8].

Otherwise continue in this procedure

**NOTIFY** Nuclear Security (NS) Shift Supervisor at Plant Extension 3238 or 2219, **INFORM** NS that a "General Emergency HAS BEEN DECLARED" **AND DIRECT** NS to activate <u>EPIP-11</u>, "Security and Access Control".

**NOTIFY** the Chemistry Lab at Plant Extension 2367 or 2368, **INFORM** Chemistry Lab personnel that a "General Emergency HAS BEEN DECLARED" **AND DIRECT** Chemistry Lab personnel to prepare to implement as applicable <u>TI-331</u>, "Post Accident Sampling Procedure" and <u>CI-900</u> series, "Analysis Procedures".



**NOTIFY** the Radiological Protection Lab at Plant Extension 7865 or 3104, **INFORM** RP Lab personnel that a "General Emergency HAS BEEN DECLARED" **AND DIRECT** RP Lab personnel to implement as applicable EPIP-14, "Radiological Control Procedure".



**NOTIFY** the "On-Call" NRC Resident at Plant Extension 2572 (Secretary) or from Weekly Duty List, **INFORM** NRC Resident that a "General Emergency HAS BEEN DECLARED"

# 5.0 Notify Site Emergency Director when <u>Appendix B</u> is completed.

#### APPENDIX C Page 1 of 1 State of Alabama Notification

## 1.0 State Notification



BFN Unit 0	GEI	NERAL EMERGENCY		EPIP- 5 Rev 0043 Page 13 of 26
No	otification of the Nu (NRC EVEN	APPENDIX D Page 1of 1 J <b>clear Regulatory</b> T NOTIFICATION WOR	<b>Commission (NR</b> RKSHEET)	C)
Utilize the NRC Enunavailable utilize a Ensure prior to ma communicated. Fa officially communic Utilize completed A COMPLETE ta UTILIZE the for Main Backup 1 Backup 2 Backup 3 Fax Region IV PROVIDE the NRC based up	hergency Notification Sy any plant telephone. king this notification tha ast breaking plant condition the stated. Appendix A for determine able below blowing telephone number 800-532-3469 800-449-3694 301-415-0550 301-415-0553 301-816-5151 (alternate site) following information to bon the event.	NOTES vstem (ENS) when avai- t all previously made en- tions may have resulted ing information below. Ders when making this in OR 301-816-510 OR 301-951-055 817-860-810 NRC. Be prepared to	lable or if the NRC EN mergency classificatio d in classifications that notification. (9-1 may 1 00 50	IS is inoperable or ns have been t have not been be required)
Time NRC Notified	Facility BFN	Affected Unit	TVA Contact Sh, A-Manacer	NRC Contact
Time of Classification <u>45 minutes</u> /Central	Classification Date	Power/Mode Before 	Power/Mode After 	Call Back Number ENS Telephone 256-729-2273 TVA Contact 256-729- <u>2783</u>
Emergency Classification GENERAL EMERGENCY	Emergency Action Level Designator	Brief Description of <u>Sepression</u> <u>maintaine</u>	Emergency Action I	evel <u>e const</u> be ps.g
Protective Action Re	ecommendations	Comments		

NONE

(GE ONLY) When Staffed PAR developed by CECC.

**RETURN** the completed <u>Appendix D</u> to the Site Emergency Director.

____

4.00

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BFN	
Unit 0	

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#### APPENDIX E Page 1 of 2 MONITOR / RE-EVALUATE THE EVENT

## 1.0 MONITOR/RE-EVALUATE

- [1] IF significant changes in plant conditions occur, **DIRECT** a SRO to **COMPLETE** <u>Appendix F</u> (GE <u>Follow-Up</u> Information Form)
- [2] **COMMUNICATE** as applicable <u>Appendix F</u> information to:
  - A. On-Site Emergency Centers
  - B. Plant personnel through PA announcements (if applicable)
  - C. CECC (5-751-1614)
  - D. ODS (5-751-1700 or 5-751-2495), when the CECC is NOT activated
  - E. State of Alabama when the CECC is NOT activated

24 Hours Primary: 9-1-205-280-2310 Backup: 9-1-800-843-0699 Backup: 9-1-334-324-0076

F. Nuclear Regulatory Commission (utilize <u>Appendix D</u>)

Otherwise Continue in this Appendix.

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Unit 0	

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#### APPENDIX E Page 2 of 2 MONITOR / RE-EVALUATE THE EVENT

## 2.0 Evacuation of Non-Emergency Responders

- [1] IF... any of the following conditions exists:
  - A. A severe weather condition is currently in progress or is projected on-site, such as a tornado.

OR

B. An on-site security risk condition exists that may present a danger to site personnel during the Assembly / Accountability process as determined by SED/Nuclear Security.

#### OR

C. Rapid Evacuation of the Protected Area (REPA) has been conducted.

THEN...DO NOT initiate the Evacuation Process

#### AND

**CONTINUE** in this procedure at Step 3.0.

Otherwise continue in this procedure.

[2] **DIRECT** Nuclear Security at extension 3238 or 2219 to commence Evacuation of Non-Emergency Responders by initiating Assembly / Accountability, utilizing <u>EPIP-8</u>, Appendix C

## 3.0 TERMINATION / RECOVERY

[1] IF conditions warrant termination of the emergency classification,

THEN ENTER, EPIP-16, "Termination and Recovery Procedure" and exit this procedure.

BFN Unit 0	GENERAL EMERGENCY	Rev 0043 Page 16 of 26
	APPENDIX F Page 1 of 1 GENERAL EMERGENCY <u>FOLLOW-UP</u> INFORMATION FORM	м
1. 🔲 THIS IS A	DRILL THIS IS AN ACTUAL	EVENT
2	the SED at Browns Ferry has declared an GENER	RAL EMERGENC
3. Reactor Status:		
Unit 1: Shu Unit 2: Shu Unit 3: Shu	utdown At Power Refueling N/A utdown At Power Refueling N/A utdown At Power Refueling N/A	
4. Additional EAL	Designator(s)	
5. Significant char	nges in plant conditions:	
6. Significant chai	nges in Radiological Conditions:	
<ul> <li>6. Significant chai</li> <li>7. Off-site Protect</li> </ul>	nges in Radiological Conditions:	
<ul> <li>6. Significant char</li> <li>7. Off-site Protect (UTILIZE APPEND</li> <li>Recommend</li> </ul>	Inges in Radiological Conditions:	ecommendation 3
6. Significant char	Inges in Radiological Conditions:         tive Action Recommendations:         IX J FOR MAKING AND COMMUNICATING PAR UPGRADES)         Iation 1       Recommendation 2         Iation 1       Recommendation 2         Ve Actions:       Assembly/Accountability         Site Evacuation       No	ecommendation 3 tiated Comple
6. Significant char 7. Off-site Protect (UTILIZE APPEND Recommend 8 Onsite Protectiv 9. The Meteorolog (Use 91 meter data on	Inges in Radiological Conditions:         tive Action Recommendations:         IX J FOR MAKING AND COMMUNICATING PAR UPGRADES)         lation 1       Recommendation 2         lation 1       Recommendation 2         ve Actions:       Assembly/Accountability         Site Evacuation       No         lot on ditions are       Wind Speed:         the Met Tower & 15 Minute Averages)       Wind Direction is from:	ecommendation 3 tiated Comple tiated Comple m.p.h. degrees
<ul> <li>6. Significant char</li> <li>7. Off-site Protect (UTILIZE APPEND</li> <li>Recommend</li> <li>8 Onsite Protectiv</li> <li>9. The Meteorolog (Use 91 meter data on</li> <li>10. Please repeat</li> </ul>	Inges in Radiological Conditions:         tive Action Recommendations:         IX J FOR MAKING AND COMMUNICATING PAR UPGRADES)         Iation 1       Recommendation 2         Init       Site Evacuation         Init       No         Init       Init         Init       Site Evacuation         Init       Wind Speed:         Init       Wind Direction is from:         Ithe Met Tower & 15 Minute Averages)       Wind Direction is from:         Ithe information you have received to ensure accuracy	ecommendation 3 tiated Comple tiated Comple m.p.h. degrees
<ul> <li>6. Significant char</li> <li>7. Off-site Protect (UTILIZE APPEND</li> <li>Recommend</li> <li>8 Onsite Protective</li> <li>9. The Meteorolog (Use 91 meter data on</li> <li>10. Please repeat</li> <li>11. Fax to applical CECC (5-751-1)</li> </ul>	Inges in Radiological Conditions:         tive Action Recommendations:         IX J FOR MAKING AND COMMUNICATING PAR UPGRADES)         lation 1       Recommendation 2         lation 2       How 2         lation 3       Recommendation 2         lation 4       Init         lation 5       Recommendation 3         lation 4       I	ecommendation 3 tiated Comple tiated Comple m.p.h. degrees n: p5-280-2495).
<ul> <li>6. Significant char</li> <li>7. Off-site Protect (UTILIZE APPEND</li> <li>Recommend</li> <li>8 Onsite Protectiv</li> <li>9. The Meteorolog (Use 91 meter data on</li> <li>10. Please repeat</li> <li>11. Fax to applica CECC (5-751-1)</li> <li>Completed by:</li> </ul>	nges in Radiological Conditions: tive Action Recommendations: IX J FOR MAKING AND COMMUNICATING PAR UPGRADES) lation 1 Recommendation 2 Re ve Actions: Assembly/Accountability No Init Site Evacuation No Init gical Conditions are Wind Speed: the Met Tower & 15 Minute Averages) Wind Direction is from: the information you have received to ensure accuracy ble contact after reporting following-up information 682), ODS (5-751-8620) or State of Alabama (9-1-20 , Date/Time	ecommendation 3 tiated Comple tiated Comple m.p.h. degrees n: 95-280-2495).

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## APPENDIX G

## Page 1 of 5 TECHNICAL SUPPORT CENTER

## GENERAL EMERGENCY CLASSIFICATION INSTRUCTION

#### NOTE

- Procedure steps can be performed concurrently.
- Procedure Step 1.0 [1] A or Step 1.0 [1] D CANNOT be delegated, except as prescribed. All other procedure steps can be delegated.
- All procedure steps must be completed and remain under the direct oversight of the SED.
- Step 1.0 (15 Minutes) and Step 5.0 (as soon as possible not to exceed 60 minutes from
- classification declaration.) are time critical.

#### CAUTION

Ongoing or anticipated security events or severe weather may present a danger to normal staffing and other Emergency Plan implementation processes. Observe all procedural steps carefully during security related events.

## 1.0 Notification of State of Alabama

- [1] **CECC Notification** 
  - A. **RECORD** the following information:
    - GE Classification EAL Designator:
    - GE Classification declared at time:
    - Site Emergency Director: (Name)
  - B. CONTACT the CECC Director utilizing the CECC "Direct Ring-Down" telephone or at extension 5-751-1614, COMMUNICATE the information recorded in step 1.0 [1] A.
  - C. IF the CECC Director was contacted, the State of Alabama notification action is complete. **RE-ENTER** this appendix at Step 2.0.
  - D. IF the CECC Director was **NOT** contacted, **COMPLETE** <u>Appendix A</u> and **DIRECT** a member of the TSC Staff (Ops Communicator / Ops Manager / EP Manager) to complete <u>Appendix C</u>, "State of Alabama Notification"

#### OR

#### COMPLETE Appendix C

BFN Unit 0

#### **GENERAL EMERGENCY**

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#### APPENDIX G Page 2 of 5 TECHNICAL SUPPORT CENTER GENERAL EMERGENCY CLASSIFICATION INSTRUCTION

### 2.0 NOTIFICATION OF SITE PERSONNEL

## CAUTION

Ongoing or anticipated security events may present a danger to site personnel. Do not conduct the notification of site personnel PA message during an ongoing or anticipated security event. All pertinent site personnel PA messages will be conducted per 0-AOI-100-8 "Security Event Response" for security events.

[1] **DIRECT** a member of the TSC to **CONDUCT** a Plant PA announcement similar to the following: (Dial 687 to obtain the Plant PA)

"Attention All Personnel. Attention All Personnel."

A General Emergency Classification has been declared.

The Browns Ferry Emergency Plan is being implemented at this time.

Further updates will follow."

(Repeat Message)

BFN	l
Unit	0

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#### APPENDIX G Page 3 of 5 TECHNICAL SUPPORT CENTER GENERAL EMERGENCY CLASSIFICATION INSTRUCTION

## 3.0 Evacuation of Non-Emergency Responders

- [1] IF any of the following conditions exists:
  - A. A severe weather condition is currently in progress or is projected on-site, such as a tornado.

## OR

B. An on-site security risk condition exists that may present a danger to site personnel during the Assembly / Accountability process as determined by SED/Nuclear Security.

#### OR

C. Rapid Evacuation of the Protected Area (REPA) has been conducted.

THEN **DO NOT** initiate the Evacuation Process

#### AND

**CONTINUE** in this procedure at Step 4.0.

Otherwise continue in this procedure.

[2] **DIRECT** TSC Nuclear Security or Nuclear Security at extension 3238 or 2219 to commence Evacuation of Non-Emergency Responders by initiating Assembly / Accountability, utilizing <u>EPIP-8</u>, <u>Appendix C</u>

BFN	
Unit	0

**GENERAL EMERGENCY** 

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#### APPENDIX G Page 4 of 5 TECHNICAL SUPPORT CENTER GENERAL EMERGENCY CLASSIFICATION INSTRUCTION

## 4.0 Dose Assessment Evaluation

[1] IF emergency circumstances warrant dose assessment, **CONTACT**, TSC Radiation Protection AND **DIRECT** Radiation Protection to implement <u>EPIP-13</u> "Dose Assessment".

# 5.0 Notification of the Nuclear Regulatory Commission (NRC)

# **NOTE** Notification of the NRC is required to be completed within 60 minutes from the time of emergency classification declaration.

[1] **DIRECT** the TSC NRC Coordinator to implement <u>Appendix D</u>, "Notification of the NRC".

## 6.0 Maintaining communications with the NRC

#### NOTE

When the TSC is staffed, the open and continuous line of communications with the NRC is managed by the TSC NRC Coordinator position.

[1] IF **REQUESTED** by the NRC to maintain an open and continuous line of communications, **DIRECT** TSC NRC Coordinator to maintain and or manage an open and continuous line of communications as directed by NRC.

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#### APPENDIX G Page 5 of 5 TECHNICAL SUPPORT CENTER GENERAL EMERGENCY CLASSIFICATION INSTRUCTION

## 7.0 Monitor / Re-evaluate the event

Monitoring and re-evaluation of plant events along with communicating significant changes should be performed continuously as a function of the emergency response. Methods used to communicate significant changes are not formalized and may vary depending upon staffing levels as well as availability of personnel or equipment.

<u>Appendix E</u> provides a systematic approach to monitoring/re-evaluation and the communication of significant changes in plant conditions.

<u>Appendix F</u> to communicate Follow-Up information. Continue to conduct State Follow-Ups until the CECC has assumed State Communications responsibilities.

Reevaluation of significant changes must additionally include Protective Action Recommendation (PAR) Upgrades. PAR Upgrades are determined through the continuous assessment of <u>Appendix H</u>. When it has been determined that a PAR Upgrade is applicable, then utilize <u>Appendix J</u> to communicate the Upgrade to the State. Continue to assess PARs until the CECC has assumed PAR responsibilities.

#### 8.0 Procedure Review

**DIRECT** a member of the staff to review this procedure ensuring that all place keeping rules have been utilized.





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#### APPENDIX I Page 1 of 2

#### ACTIVATION OF THE EMERGENCY PAGING SYSTEM ALTERNATE ERO ACTIVATION

## NOTE

- The Emergency Paging System (EPS) consists of a dedicated touch screen CRT. Activation of any screen feature requires the user place their fingertip within the boundary of the select button and leave it there for at least 1 second. The CRT Screen will normally display a large rectangle that indicates that the paging system is available but currently inactive.
- If the EPS fails to operate, contact the SM/SED immediately. Request that the ODS be contacted to initiate the notification system (TEENS is preferred EPS is Alternate) from their location.

## 1.0 Activate the Emergency Paging System (EPS)

- [1] **PRESS** the EPS CRT screen once to activate the paging options
- [2] **PRESS** the appropriate option as instructed by the SED
  - DRILL
  - EMERGENCY
  - STAGING AREA
- [3] **PRESS** the START button to initiate the option

OR

PRESS the ABORT button to deny the option request

- [4] IF the EPS fails to operate locally, **CONTACT** the ODS at 5-751-1700 or 5-751-2495 and **DIRECT** the ODS to activate the notification system (TEENS is preferred; EPS is Alternate) for BFN.
- [5] IF the EPS FAILS to operate either locally or by the ODS, exit this step and re-enter this Appendix at Step 2.0

Otherwise continue in this procedure.

**GENERAL EMERGENCY** 

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#### APPENDIX I Page 2 of 2 ACTIVATION OF THE EMERGENCY PAGING SYSTEM ALTERNATE ERO ACTIVATION

[6] **MONITOR** the Paging System Terminal Display

#### NOTE

Monitor ERO positions through OSC Document Control. Positions below OSC Document Control are courtesy pages and are not subject to call-out requirements.

A. IF... A "NO" response is observed,

#### OR

The position being paged has not responded promptly or within approximately 20 minutes,

- THEN... **UTILIZE** the Weekly Duty List and attempt to contact the position representative with available information. (No Fitness for Duty question is required.)
- B. IF...The individual cannot be reached utilizing the Weekly Duty List,
  - THEN...**UTILIZE** the Call-Out List and attempt to contact an alternate position representative. (Fitness for Duty question is required when utilizing the Call-Out List.)

# 2.0 ALTERNATE BACKUP ERO ACTIVATION - Manual Call-Out

- [1] **UTILIZE** the current Weekly Duty List and contact positions as listed. (No Fitness for Duty question is required.)
- [2] If a position cannot be reached from the current Weekly Duty list, then refer to the Call-out List as applicable to fill all vacant positions. (Fitness for Duty question is required when utilizing the Call-Out List.)
- [3] **CONTINUE** until all positions have been filled.

Unit 0	GEN	ERA	L EMERGENCY		EPIP- 5 Rev 0043 Page 26 of 26
U	PGRADE - PROTEC	م ۱ ۱ <b>۲۲:</b>	PPENDIX J Page 1 of 1 <b>/E ACTION REC</b>	:ON	
1.	Drill	nis is	s an Actual Event - I	Repe	eat - This is an Actual Event
2 Browns Ferry has	declared a GENERAL E	EME	RGENCY		
3. Browns Ferry is r Increase Shift in 1 State pro Hostile A	naking a PAR UPGRADI in dose assessment pro- in field team measured 5 min average wind dire vided information that o ction Event has been te nent Rad Levels ≥ 20 %	E ba ojec dos ectic offsi ermi	sed upon the follow ted values. e values. on resulting in addi ite impediments no nated.	ing c ition o lon	criteria: nal sectors being affected. nger exist.
4. The Meteorologic the MET tower, co National Weather	cal Conditions are: (Use ntact the National Weath Service will provide wind	e 91 er S dire	meter data from the ervice by dialing 9- ction and wind spee	Me [•] 1-25 ed.)	t Tower. If data is not available from 6-890-8505 or 9-1-205-621-5650.
Wind Direction is I	FROM:	deg	rees Win (15 I	d Sp min	peed: m.p.h average)
5. Provide Protectiv	ve Action Recommenda	tion	utilizing Appendi	x H:	(Check either 1 or 2 or 3)
<ul> <li>5. Provide Protectiv</li> <li>STEP MUS</li> <li>8. Provide Protectiv</li> <li>Recommendat <ul> <li>EVACUATE LIST</li> <li>(2 mile Radius &amp;</li> <li>Sheiter remainde</li> <li>Consider issuance in accordance with</li> </ul> </li> </ul>	ve Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan.		WIND FROM DEGREES (Mark wind direction from Step 7)		(Check either 1 or 2 or 3) MERGENCY DIRECTOR (Check either 1 or 2 or 3) Recommendation 2 • EVACUATE LISTED SECTORS (2 mile radius & 5 mile downwind • SHELTER remainder of 10 mile • Consider issuance of POTASSII IODIDE in accordance with the S Plan.
<ul> <li>5. Provide Protective</li> <li>STEP MUS</li> <li>8. Provide Protective</li> <li>Recommendate</li> <li>EVACUATE LIST (2 mile Radius &amp;</li> <li>Shelter remainder</li> <li>Consider issuance in accordance with</li> </ul>	ve Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 E10, C5, G10, H10		BY THE SITE Utilizing Appendit Utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41°- 73°		(Check either 1 or 2 or 3) MERGENCY DIRECTOR (Check either 1 or 2 or 3) Recommendation 2 • EVACUATE LISTED SECTORS (2 mile radius & 5 mile downwind • SHELTER remainder of 10 mile • Consider issuance of POTASSII IODIDE in accordance with the S Plan. A2, B2, F2, G2, E5, F5, G5 A2, B2, F2, G2, F5, G5
<ul> <li>5. Provide Protective</li> <li>STEP MUS</li> <li>8. Provide Protective</li> <li>Recommendate</li> <li>EVACUATE LIST (2 mile Radius &amp;</li> <li>Shelter remainder</li> <li>Consider issuance in accordance with</li> <li>A2, B2, F2, G2, E5, IA2, B2, F2, G2, F5, IA3, B2, F2, F2, F2, F2, F2, F2, F2, F2, F2, F</li></ul>	ve Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10 G10, H10, T10	tion	BY THE SITE BY THE SITE Utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41° - 73° From 74° - 92°		(Check either 1 or 2 or 3) MERGENCY DIRECTOR (Check either 1 or 2 or 3) Recommendation 2 • EVACUATE LISTED SECTORS (2 mile radius & 5 mile downwind • SHELTER remainder of 10 mile • Consider issuance of POTASSII IODIDE in accordance with the Second Plan. A2, B2, F2, G2, E5, F5, G5 A2, B2, F2, G2, G5
<ul> <li>5. Provide Protective</li> <li>STEP MUS</li> <li>8. Provide Protective</li> <li>Recommendate</li> <li>EVACUATE LIST (2 mile Radius &amp;</li></ul>	ve Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10 G10, H10, I10 G5 H10, I10, J10, K10		a utilizing Appendit BY THE SITE a utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41° - 73° From 74° - 92° From 93° - 137°		(Check either 1 or 2 or 3) MERGENCY DIRECTOR (Check either 1 or 2 or 3) Recommendation 2 • EVACUATE LISTED SECTORS (2 mile radius & 5 mile downwing • SHELTER remainder of 10 mile • Consider issuance of POTASSII IODIDE in accordance with the 3 Plan. A2, B2, F2, G2, E5, F5, G5 A2, B2, F2, G2, G5 A2, B2, F2, G2, A5, G5
<ul> <li>5. Provide Protectiv</li> <li>STEP MUS</li> <li>8. Provide Protecti</li> <li>Recommendat</li> <li>EVACUATE LIST (2 mile Radius &amp;</li> <li>Shelter remainde</li> <li>Consider issuance in accordance with</li> <li>A2, B2, F2, G2, E5, A2, B2, F2, G2, A5, A2, B2, F2, G2, A5,</li> </ul>	ve Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10 G10, H10, I10 G5, H10, I10, J10, K10 A10, T10, J10, K10	D OT RECOMMENDATION-1	BY THE SITE BY THE SITE utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41°- 73° From 74° - 92° From 93° - 137° From 138° - 203°		<ul> <li>(Check either 1 or 2 or 3)</li> <li>MERGENCY DIRECTOR (Check either 1 or 2 or 3)</li> <li>□ Recommendation 2 <ul> <li>EVACUATE LISTED SECTORS (2 mile radius &amp; 5 mile downwing)</li> <li>SHELTER remainder of 10 mile</li> <li>Consider issuance of POTASSII IODIDE in accordance with the S Plan.</li> </ul> </li> <li>A2, B2, F2, G2, E5, F5, G5</li> <li>A2, B2, F2, G2, G5</li> <li>A2, B2, F2, G2, A5, G5</li> <li>A2, B2, F2, G2, A5</li> </ul>
<ul> <li>5. Provide Protective</li> <li>STEP MUS</li> <li>8. Provide Protective</li> <li>Recommendate</li> <li>EVACUATE LIST (2 mile Radius &amp;</li> <li>Shelter remainde</li> <li>Consider issuance in accordance with</li> <li>A2, B2, F2, G2, E5,</li> <li>A2, B2, F2, G2, G5,</li> <li>A2, B2, F2, G2, A5,</li> </ul>	ve Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10 G10, H10, I10 G5, H10, I10, J10, K10 A10, B5, B10		BY THE SITE Utilizing Appendit Utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41°- 73° From 74° - 92° From 93° - 137° From 138° - 203° From 204° - 282°		<ul> <li>(Check either 1 or 2 or 3)</li> <li>/IERGENCY DIRECTOR (Check either 1 or 2 or 3)</li> <li>Recommendation 2 <ul> <li>EVACUATE LISTED SECTORS (2 mile radius &amp; 5 mile downwing</li> <li>SHELTER remainder of 10 mile</li> <li>Consider issuance of POTASSII (DDIDE in accordance with the 3 Plan.</li> </ul> </li> <li>A2, B2, F2, G2, E5, F5, G5 <ul> <li>A2, B2, F2, G2, A5, G5</li> <li>A2, B2, F2, G2, A5, B5</li> </ul> </li> </ul>
<ul> <li>5. Provide Protectiv</li> <li>STEP MUS</li> <li>8. Provide Protecti</li> <li>☐ Recommendat <ul> <li>EVACUATE LIST</li> <li>(2 mile Radius &amp;</li> <li>Shelter remainde</li> <li>Consider issuance in accordance with</li> </ul> </li> <li>A2, B2, F2, G2, E5, A2, B2, F2, G2, A5, A2, B2, F2, G2, A5,</li> </ul>	ve Action Recommenda <b>T BE COMPLETE</b> ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. <b>E10, F5, F10, G5, G10</b> F10, G5, G10, H10 <b>G10, H10, I10</b> G5, H10, I10, J10, K10 A10, I10, J10, K10 A10, B5, B10 B10, C10, D10, E5,E10		BY THE SITE Utilizing Appendit Utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41°- 73° From 74° - 92° From 93° - 137° From 138° - 203° From 204° - 282° From 283°-326°		(Check either 1 or 2 or 3) ✓IERGENCY DIRECTOR (Check either 1 or 2 or 3) ☐ Recommendation 2 <ul> <li>EVACUATE LISTED SECTORS (2 mile radius &amp; 5 mile downwind)</li> <li>SHELTER remainder of 10 mile</li> <li>Consider issuance of POTASSII IODIDE in accordance with the 3 Plan.</li> </ul> A2, B2, F2, G2, E5, F5, G5 <ul> <li>A2, B2, F2, G2, A5, G5</li> <li>A2, B2, F2, G2, A5, B5</li> <li>A2, B2, F2, G2, A5, B5</li> <li>A2, B2, F2, G2, B5, E5</li> </ul>
<ul> <li>5. Provide Protectiv</li> <li>STEP MUS</li> <li>8. Provide Protecti</li> <li>Recommendat         <ul> <li>EVACUATE LIST (2 mile Radius &amp;</li> <li>Shelter remainde</li> <li>Consider issuanc in accordance with</li> </ul> </li> <li>A2, B2, F2, G2, E5, I</li> <li>A2, B2, F2, G2, A5, A2, B2, F2, G2, C10</li> </ul>	ve Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10 G10, H10, I10 G5, H10, I10, J10, K10 A10, I10, J10, K10 A10, B5, B10 B10, C10, D10, E5, E10 , D10, E5, E10, F5, F10		BY THE SITE BY THE SITE utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41°- 73° From 74° - 92° From 93° - 137° From 138° - 203° From 204° - 282° From 283°-326° From 327° - 3°		(Check either 1 or 2 or 3) MERGENCY DIRECTOR (Check either 1 or 2 or 3) ■ Recommendation 2 <ul> <li>EVACUATE LISTED SECTORS (2 mile radius &amp; 5 mile downwing)</li> <li>SHELTER remainder of 10 mile</li> <li>Consider issuance of POTASSII IODIDE in accordance with the 3 Plan.</li> </ul> A2, B2, F2, G2, E5, F5, G5 <ul> <li>A2, B2, F2, G2, A5, G5</li> <li>A2, B2, F2, G2, A5, G5</li> <li>A2, B2, F2, G2, A5, B5</li> <li>A2, B2, F2, G2, B5, E5</li> <li>A2, B2, F2, G2, E5, F5</li> </ul>
<ul> <li>5. Provide Protective</li> <li>STEP MUS</li> <li>8. Provide Protective</li> <li>Recommendate</li> <li>EVACUATE LIST (2 mile Radius &amp;</li> <li>Shelter remainde</li> <li>Consider issuance in accordance with</li> <li>A2, B2, F2, G2, E5, A2, B2, F2, G2, A5, A2, B2, F2, G2, C100</li> <li>Recommendate</li> <li>SHELTER all section</li> <li>CONSIDER issuance</li> </ul>	ve Action Recommenda T BE COMPLETE ve Action Recommenda ion 1 ED SECTORS 10 miles downwind) r of 10 mile EPZ. e of POTASSIUM IODIDE h the State Plan. E10, F5, F10, G5, G10 F10, G5, G10, H10 G10, H10, I10 G10, H10, J10, K10 A10, I10, J10, K10 A10, B5, B10 B10, C10, D10, E5, E10 b, D10, E5, E10, F5, F10 tion 3 ors nce of POTASSIUM IODI	DE DE	a utilizing Appendix BY THE SITE a utilizing Appendi WIND FROM DEGREES (Mark wind direction from Step 7) From 4° - 40° From 41°- 73° From 74° - 92° From 93° - 137° From 74° - 92° From 93° - 137° From 204° - 282° From 283°-326° From 283°-326° From 327° - 3°	H:	(Check either 1 or 2 or 3) MERGENCY DIRECTOR (Check either 1 or 2 or 3) ■ Recommendation 2 <ul> <li>EVACUATE LISTED SECTORS (2 mile radius &amp; 5 mile downwing)</li> <li>SHELTER remainder of 10 mile</li> <li>Consider issuance of POTASSII IODIDE in accordance with the 3 Plan.</li> </ul> A2, B2, F2, G2, E5, F5, G5 <ul> <li>A2, B2, F2, G2, A5, G5</li> <li>A2, B2, F2, G2, A5, G5</li> <li>A2, B2, F2, G2, A5, B5</li> <li>A2, B2, F2, G2, B5, E5</li> <li>A2, B2, F2, G2, E5, F5</li> </ul>

9. Utilize Appendix C to communicate PAR Upgrade.

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