JPM RO A1a

OPERATOR: _____

RO ____ DATE:_____

JPM NUMBER: RO A1a

TASK NUMBER: Conduct of Operations

TASK TITLE: Work Hour Limitations

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

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 ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

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_____

****

Performance Step 1: Critical X Not Critical

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 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 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 7th.

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	0700-1900	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

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

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 PERFORMANCE: Classroom

REFERENCES/PROCEDURES NEEDED: 0-SI-4.8.B.1.a.1

VALIDATION TIME: 15 minutes

PERFORMANCE TIME:

COMMENTS: _____

_____

_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

Reid 5/22/

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.

****

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 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
Reactor Building (1-RM-90-250) **4000 x 0.64 = 2560**	Reactor Building (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) **500 x 0.75 = 375** (1-RM-90-251) **910 x 0.80 = 728**	Turbine Building (2-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:_____

_____

****

Performance Step 2: Critical 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 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.

Unit 1		Unit 2		Unit 3		Radwaste		Total
3663	+	5522	+	4204	+	140	=	**13529**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 4: Critical X Not Critical

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 μCi/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 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 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 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.

[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 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 [(μCi/sec) together. Refer to Answer Sheet for correct value or see below.

22700 **x** 4.55×10^{5} **x** 1.23×10^{-3} = **1.27×10^{7}**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 9: Critical 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 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 µCi/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:_____

_____

****

Performance Step 11: Critical Not Critical 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 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.

$1.27x10^7$ x 1.00 = **$1.27x10^7$**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 13: Critical 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 µCi/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:_____

_____

****

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 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

Attachment 2
(Page 1 of 1)

Site Effluent Release Rate Summary

Week From TODAY To _____

DAY	SHIFT	SI STEP		Reactor Power (MWT)			Building 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	Initials	
		7.0[6]	7.0[7]	Unit 1 7.0[8.1]	Unit 2 7.0[8.1]	Unit 3 7.0[8.1]					AUO	Unit Supervisor
FRI	D	OP	OP	3455	3452	3454	.09	.882	.972	≤ 1.00	AUO	
	N									≤ 1.00		
SAT	D									≤ 1.00		
	N									≤ 1.00		
SUN	D									≤ 1.00		
	N									≤ 1.00		
MON	D									≤ 1.00		
	N									≤ 1.00		
TUE	D									≤ 1.00		
	N									≤ 1.00		
WED	D									≤ 1.00		
	N									≤ 1.00		
THU	D									≤ 1.00		
	N									≤ 1.00		

Initials added as a result of BFPER 960634.

ANSWER KEY

*

Attachment 4
(Page 1 of 4)

Building Effluent Release Rate Log

Week From TODAY To _____
Unit 1

DAY	SHIFT	Reactor Building 1-RM-90-250			Turbine Building 1-RM-90-249			Turbine Building 1-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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											

1 See Attachment 5 for Release Factor.

ANSWER KEY

*

Attachment 4
(Page 2 of 4)

Week From TODAY To _____
Unit 2

DAY	SHIFT	Reactor Building 2-RM-90-250			Turbine Building 2-RM-90-249			Turbine Building 2-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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	AUO	
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

ANSWER KEY

*

Attachment 4
(Page 3 of 4)

Week From TODAY To _____
Unit 3

DAY	SHIFT	Reactor Building 3-RM-90-250			Turbine Building 3-RM-90-249			Turbine Building 3-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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	.40	640	1900	.75	1425	AOP	
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

ANSWER KEY

*

Attachment 4 (Page 4 of 4)

Week From _____ To _____
Unit 0

DAY	SHIFT	Radwaste Building 0-RM-90-252			Unit Total Release Rates (µCi/sec)			Building Ventilation Release Rate (µCi/sec)	Building Ventilation Release Fraction	Acceptance Criteria	Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Unit 1	Unit 2	Unit 3				AUO	Unit Supervisor
		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	.62	140	3663	5522	4204	13529	.09	≤ 0.90	AWO	
	N									≤ 0.90		
SAT	D									≤ 0.90		
	N									≤ 0.90		
SUN	D									≤ 0.90		
	N									≤ 0.90		
MON	D									≤ 0.90		
	N									≤ 0.90		
TUE	D									≤ 0.90		
	N									≤ 0.90		
WED	D									≤ 0.90		
	N									≤ 0.90		
THU	D									≤ 0.90		
	N									≤ 0.90		

1 See Attachment 5 for Release Factor.

ANSWER KEY

*

Attachment 6
(Page 1 of 2)
Elevated Effluent Release Rate Log

Week From _____ To _____

DAY	SHIFT	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	4.55×10^5	9.75×10^4	4.55×10^5	22700	1.23E-03	1.27×10^7
R	N					1.23E-03	
S	D					1.23E-03	
A	N					1.23E-03	
S	D					1.23E-03	
U	N					1.23E-03	
M	D					1.23E-03	
O	N					1.23E-03	
T	D					1.23E-03	
U	N					1.23E-03	
W	D					1.23E-03	
E	N					1.23E-03	
T	D					1.23E-03	
H	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

*

Attachment 6
(Page 2 of 2)

Week From TODAY To _____

DAY	SHIFT	DATA RECORDED IN STEP 7.0[11.4]	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]	Acceptance Criteria	Initials	
									AUO	Unit Supervisor
FRI	D	1.27×10^7	1.29×10^6	1.27×10^7	1.00	1.27×10^7	.882	≤ 0.10	AUO	
	N							≤ 0.10		
SAT	D							≤ 0.10		
	N							≤ 0.10		
SUN	D							≤ 0.10		
	N							≤ 0.10		
MON	D							≤ 0.10		
	N							≤ 0.10		
TUE	D							≤ 0.10		
	N							≤ 0.10		
WED	D							≤ 0.10		
	N							≤ 0.10		
THU	D							≤ 0.10		
	N							≤ 0.10		

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

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

ANSWER KEY

*

Surveillance Task Sheet (STS)

Work Order #: 114084714

PM#: P1470

Procedure: 0-SI-4.8.B.1.A.1

Title: 0-SI-4.8.B.1.A.1 - AIRBORNE EFFLUENT RELEASE RATE

Data Sheets Attached:

Perf Grp: OPS **Unit:** 0 **Loop/Div:** /NA

Test Reason: Periodic

Due Date: 06/07/13

Frequency: 7 DAYS **Tech Spec:** Y **ASME XI:**

Applicable Modes: **Perf Modes:**

Clearance Required: N **EQ:** **LCO Entered:** N

Dry-Cask Storage: N

Unit Supervisor — Authorization to Begin: SRO

TODAY — Date & Time

TODAY — Start Date & Time

Completion Date & Time

Maximo dates verified: SI Coordinator

Date & Time

Performed By:

Print Name	Signature	Initial	Section
OPERATOR	Operator	OP	OPS

Was this a Complete or Partial Performance?
(Explain Partial in REMARKS below) Complete [ ] Partial [ ]

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

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

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* criteria were not satisfied, was as LCO/ODCM action required?
(Explain in REMARKS below) Yes [ ] No [ ] N/A [ ]

Alert Work Contol Required? Yes [ ] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date
CE		

Copy of STS sent to Work Control AND SI Coordinator (next Bus. Day)

Initials / Date

Test Director/Lead Performer — Date

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

Frequency Notes: ONCE PER WEEK & ONCE PER SHIFT, RELEASE RATE INFO,ONCE PER DAY, EACH EFFLUENT RADIATION MONITOR - Frequency Notes: ONCE PER WEEK & ONCE PER SHIFT, RELEASE RATE INFO,ONCE PER DAY, EACH EFFLUENT RADIATION MONITOR SHALL DEMONSTRATE THE OPERABILITY OF ITS SAMPLING RATE INSTRUMENTATION & ASSOCIATED SAMPLE FLOW ALARMS.

REMARKS:

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

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.

Table of Contents

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.

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

3.0 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.)

4.0 PREREQUISITES

[1] **VERIFY** this copy of the procedure is the most current revision. OP

[2] **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P1470) OP

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 μCi/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 μCi/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.

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].

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)	
	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

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.

Date TODAY

7.0 PROCEDURE STEPS

NOTES

1. 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. Attachments **NOT** used in the performance of this SI do **NOT** need to be included in the completed SI package.

[1] **OBTAIN** permission from the Unit 1 Unit Supervisor to perform this instruction. GW U1

[2] **OBTAIN** permission from the Unit 2 Unit Supervisor to perform this instruction. MG U2

[3] **OBTAIN** permission from the Unit 3 Unit Supervisor to perform this instruction. DK U3

[4] [NRC/C] **NOTIFY** 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. DP

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]

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

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

Date TODAY

7.0 PROCEDURE STEPS (continued)

[8] **OBTAIN** the following information.

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

ENTER 0.

NOTE

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.

[9] Fan Status Determination

[9.1] RM-90-249

[9.1.1] 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.

[9.1.2] 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.

[9.2] RM-90-250

[9.2.1] 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.

[9.3] RM-90-251

[9.3.1] 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.

7.0 PROCEDURE STEPS (continued)

[9.3.2] 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.

[9.4] 0-RM-90-252 (Unit 1 Only)

[9.4.1] 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.

[9.5] **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.

[9.6] 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)

[10] **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**:

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

[10.1.1] 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)**.

Date TODAY

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 µCi/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 manual sampling is being accomplished in accordance with 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.

NA

[10.1.4] **IF** the ventilation system for a CAM is totally isolated (i.e., no environmental releases occurring), **THEN**

NA

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.

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) µCi/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)

[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**

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**

NA **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.

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 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.

[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).

[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**

NA

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] **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.

7.0 PROCEDURE STEPS (continued)

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**

NA **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 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).

[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.

[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.

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) µCi/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**

NA **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

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				

Attachment 1
(Page 2 of 2)

Remarks Log

Week From __________ To __________

Remark Number	Attachment or Step	Remarks	Time	Date	Initials

Attachment 2
(Page 1 of 1)

Site Effluent Release Rate Summary

Week From TODAY To _____

DAY	SHIFT	SI STEP		Reactor Power (MWT)			Building 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	Initials	
		7.0[6]	7.0[7]	Unit 1 7.0[8.1]	Unit 2 7.0[8.1]	Unit 3 7.0[8.1]					AUO	Unit Supervisor
FRI	D	OP	OP	3455	3452	3454				≤ 1.00		
	N									≤ 1.00		
SAT	D									≤ 1.00		
	N									≤ 1.00		
SUN	D									≤ 1.00		
	N									≤ 1.00		
MON	D									≤ 1.00		
	N									≤ 1.00		
TUE	D									≤ 1.00		
	N									≤ 1.00		
WED	D									≤ 1.00		
	N									≤ 1.00		
THU	D									≤ 1.00		
	N									≤ 1.00		

Initials added as a result of BFPER 960634.

Attachment 3
(Page 1 of 3)

Fan Status Report

Week From TODAY To _____

Unit 1 DAY	SHIFT	Reactor Building									Turbine Building																Radwaste Building			AUO Init
		1-RM-90-250									1-RM-90-251										1-RM-90-249								0-RM-90-252			
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J					
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	0	1	2	
Fri	D		B				A		A		X			X	X		X		X		X		X		X			X		X		AOP
	N																														
Sat	D																														
	N																														
Sun	D																														
	N																														
Mon	D																														
	N																														
Tue	D																														
	N																														
Wed	D																														
	N																														
Thu	D																														
	N																														
Total																															

Attachment 3
(Page 2 of 3)

Week From TODAY To _____

Unit 2 DAY	SHIFT	Reactor Building									Turbine Building																		AUO Init
		2-RM-90-250									2-RM-90-251										2-RM-90-249								
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J		
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	
Fri	D		B				A		A		X		X		X		X		X		X		X		X		X		AoP
	N																												
Sat	D																												
	N																												
Sun	D																												
	N																												
Mon	D																												
	N																												
Tue	D																												
	N																												
Wed	D																												
	N																												
Thu	D																												
	N																												
Total																													

Attachment 3
(Page 3 of 3)

Week From TODAY To _____

Unit 3 DAY	SHIFT	Reactor Building									Turbine Building																		AUO Init.
		3-RM-90-250									3-RM-90-251								3-RM-90-249										
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J		
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	
Fri	D		A				B		A			X	X		X		X			X		X	X		X			X	AOP
	N																												
Sat	D																												
	N																												
Sun	D																												
	N																												
Mon	D																												
	N																												
Tue	D																												
	N																												
Wed	D																												
	N																												
Thu	D																												
	N																												
Total																													

Attachment 4
(Page 1 of 4)

Building Effluent Release Rate Log

Week From TODAY To _____
Unit 1

DAY	SHIFT	Reactor Building 1-RM-90-250			Turbine Building 1-RM-90-249			Turbine Building 1-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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				
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

Attachment 4
(Page 2 of 4)

Week From TODAY To _____
Unit 2

DAY	SHIFT	Reactor Building 2-RM-90-250			Turbine Building 2-RM-90-249			Turbine Building 2-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

Attachment 4
(Page 3 of 4)

Week From TODAY To _____
Unit 3

DAY	SHIFT	Reactor Building 3-RM-90-250			Turbine Building 3-RM-90-249			Turbine Building 3-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

Attachment 4
(Page 4 of 4)

Week From TODAY To _____
Unit 0

DAY	SHIFT	Radwaste Building 0-RM-90-252			Unit Total Release Rates (µCi/sec)			Building Ventilation Release Rate (µCi/sec)	Building Ventilation Release Fraction	Acceptance Criteria	Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Unit 1	Unit 2	Unit 3				AUO	Unit Supervisor
		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									≤ 0.90		
SAT	D									≤ 0.90		
	N									≤ 0.90		
SUN	D									≤ 0.90		
	N									≤ 0.90		
MON	D									≤ 0.90		
	N									≤ 0.90		
TUE	D									≤ 0.90		
	N									≤ 0.90		
WED	D									≤ 0.90		
	N									≤ 0.90		
THU	D									≤ 0.90		
	N									≤ 0.90		

1 See Attachment 5 for Release Factor.

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

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

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

Attachment 6
(Page 1 of 2)

Elevated Effluent Release Rate Log

Week From TODAY To _____

DAY	SHIFT	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	4.55×10^5	9.75×10^4		22700	1.23E-03	
R	N					1.23E-03	
S	D					1.23E-03	
A	N					1.23E-03	
S	D					1.23E-03	
U	N					1.23E-03	
M	D					1.23E-03	
O	N					1.23E-03	
T	D					1.23E-03	
U	N					1.23E-03	
W	D					1.23E-03	
E	N					1.23E-03	
T	D					1.23E-03	
H	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).

Attachment 6
(Page 2 of 2)

Week From TODAY To _____

DAY	SHIFT	DATA RECORDED IN STEP 7.0[11.4]	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]	Acceptance Criteria	Initials	
									AUO	Unit Supervisor
FRI	D		1.29×10^6		1.00			≤ 0.10		
	N							≤ 0.10		
SAT	D							≤ 0.10		
	N							≤ 0.10		
SUN	D							≤ 0.10		
	N							≤ 0.10		
MON	D							≤ 0.10		
	N							≤ 0.10		
TUE	D							≤ 0.10		
	N							≤ 0.10		
WED	D							≤ 0.10		
	N							≤ 0.10		
THU	D							≤ 0.10		
	N							≤ 0.10		

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

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

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 scfm (m) B = 6766 scfm (m)								

Attachment 7
(Page 2 of 2)

UNIT 2	8	Steam Packing Exhauster Flow = 1410 scfm (o)								
UNIT 3	9	Off Gas Flow Rate (_____) scfm (m) 3-XR-66-103								
UNIT 3	10	Dilution Fan A = 6375 scfm (m) B = 6055 scfm (m)								
UNIT 3	11	Steam Packing Exhauster Flow = 1410 scfm (0)								
	12	Off Gas Treatment Building Exhaust Flow = 1708scfm(m)								
	13	Total (scfm) (1-12)								
		AUO Initials								
		Unit Supervisor's Initials								

Remarks:_____

_____

NOTES

1) (m) Measured Flows.
2) (o) Based on average flow measurements.

Attachment 8
(Page 1 of 3)

Offgas Instrumentation Log

Week From _____ To _____

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

DAY	SHIFT	Pretreat-Monitor RM-90-157 (mR/hr)	FCV-66-28 Position		1-XR-66-103 rate Off Gas Flow rate (scfm) 66-111A or 66-111B	Post Treatment Monitor (cps)		1-XR-66-103 Hydrogen Recombiner (Percent H2)		Acceptance Criteria for Percent H2	Initials	
			X appr col								AUO	Unit Supervisor
			Open[1]	Closed		RM-90-266 Red Pen	RM-90-265 Green Pen	01-H2T-1067 Red Screen	02-H2T-1068 Green Screen			
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									≤ 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])

DAY	SHIFT	Pretreat-Monitor RM-90-157 (mR/hr)	FCV-66-28 Position X appr col		2-XR-66-103 Off Gas Flow rate (scfm) 66-111A or 66-111B	Post Treatment Monitor (cps)		2-XR-66-103 Hydrogen Recombiner (Percent H2)		Acceptance Criteria for Percent H2	Initials	
			Open[1]	Closed		RM-90-266 Red Pen	RM-90-265 Green Pen	66-1067 Red Screen	66-1068 Green Screen		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									≤ 4.0%		

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

Attachment 8
(Page 3 of 3)

Week From _____ To _____

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

DAY	SHIFT	Pretreat-Monitor RM-90-157 (mR/hr)	FCV-66-28 Position		3-XR-66-103 Off Gas Flow rate (scfm)	Post Treatment Monitor (cps)		3-XR-66-103 Hydrogen Recombiner (Percent H2)		Acceptance Criteria for Percent H2	Initials	
			X appr col									
			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		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									≤ 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

Week From _____To_____

BFN Unit	Radiation Monitor Annunciator	AC Range[5] Low	AC Range[5] High	Units	Day of the Week Fri	Sat	Sun	Mon	Tue	Wed	Thu	Note
O	RM-90-147	1.1	1.5	scfm								1
O	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		N/A								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		N/A								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		AUO Initials										
		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.

Attachment 10
(Page 1 of 1)

Sample Flow Abnormal Log

WEEK FROM_____TO_____

MONITOR ID: _____

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

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

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.

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.

Attachment 11
(Page 2 of 8)

Site Effluent Release Rate Summary

From _____ To _____

DAY	TIME	SI STEP		Reactor Power (MWT)			Building Ventilation Release Rate Fraction	Stack Release Rate Fraction	Total Site Release Rate Fraction
		7.0[6]	7.0[7]	Unit 1 7.0[8.1]	Unit 2 7.0[8.1]	Unit 3 7.0[8.1]	7.0[10.6]	7.0[11.9]	7.0[12]

Attachment 11
(Page 3 of 8)

Building Effluent Release Rate Log - Unit 1

From _____ To _____

Unit 1

DAY	TIME	Reactor Building			Turbine Building					
		1-RM-90-250			1-RM-90-249			1-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]

Attachment 11
(Page 4 of 8)

Building Effluent Release Rate Log - Unit 2

From _____ To _____

Unit 2

DAY	TIME	Reactor Building			Turbine Building					
		2-RM-90-250			2-RM-90-249			2-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]

Attachment 11
(Page 5 of 8)

Building Effluent Release Rate Log - Unit 3

From _____ To _____

Unit 3

DAY	TIME	Reactor Building			Turbine Building					
		3-RM-90-250			3-RM-90-249			3-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]

Attachment 11
(Page 6 of 8)

Building Effluent Release Rate Log - Unit 0

From _____ To _____

DAY	TIME	Radwaste Building 0-RM-90-252			Unit Total Release Rates (µCi/sec)			Building Ventilation Release Rate (µCi/sec) 7.0[10.5]	Building Ventilation Release Fraction 7.0[10.6]
		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]		

Attachment 11
(Page 7 of 8)

From _____ To _____

Elevated Effluent Release Rate Log

DAY	TIME	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).

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 (µCi/sec) by 1.44E+07 µCi/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: 2.2.41 K/A RATING: RO 3.5

TASK STANDARD: Determine the clearance boundary for Condensate Booster Pump 2B

LOCATION OF PERFORMANCE: Class Room / Unit 2 Simulator

REFERENCES/PROCEDURES NEEDED:

VALIDATION TIME: 30 minutes

PERFORMANCE TIME:

COMMENTS: _____

_____

_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

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_____

****

Performance Step 1: Critical Not Critical X

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: Critical X Not Critical

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

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 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 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 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 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 ___

* Answer Key Unit 2 *

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)

Equipment ID Equipment Description Equipment Location	Tag Serial No.	Tag Type	Place. Seq.	Place. Config.	Place. 1st Verifier	Place. 2nd Verifier	Rest. Seq.	Restore 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)
2-HS-002-006A, CBP2B VCCB2-9-C	—	DANGER	1	STOP								
2-BKR-002-006, 2B 4kV VB, COMPT 8	-	DANGER	1 or 2	RACKED OUT								
2-SHV-24-632B, RCW FROM CBP 2B	-	DANGER	3	closed								
2-SHV-24-631B, RCW TO CBP 2B	-	DANGER	3	closed								
2-HS-2-140, CBP 2B AUX OIL PUMP HANDSW: TC14	-	DANGER	3	STOP								

* ANSWER KEY UNIT 2 *

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)

Equipment ID Equipment Description Equipment Location	Tag Serial No.	Tag Type	Place. Seq.	Place. Config.	Place. 1st Verifier	Place. 2nd Verifier	Rest. Seq.	Restore 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)
2-BKR-002-140, 2B 480V TMOV BD COMPT 12A	–	DANGER	3	OFF								
2-DRV-024-674B, RCW TO CBP 2B DRAIN	–	NO TAG OR DANGER	4	OPEN								

Appendix A
(Page 3 of 3)

NPG Request for Clearance

NPG Request for Clearance

Date of Request: TODAY
Requester's name and phone number: MAINTENANCE 5555
Date and time work to begin: NEXT WEEK
Date and time work to be complete:
Duration:
Equipment can be returned to service in emergency: ☐ Yes ☒ No
Time required to return to service:

Work Order No.: NRC EXAM
Requester's Org.:
Outage Work: ☐ Yes ☒ No
Planned Outage: ☐ Yes ☒ No
Forced Outage: ☐ Yes ☒ No
Grounds Required: ☐ Yes ☒ No

Equipment/System to be cleared: CONDENSATE BOOSTER PUMP 2B

Detailed description/scope of work to be performed:
Drain and repair tube leaks on the Lube oil Cooler for Condensate Booster Pump 2B

Attached drawings/DCAs, marked up to show recommended clearance boundary: NO

Potential adverse affects:
Other systems affected:
Reference drawings:

Barricade Permit Required: ☐ Yes ☒ No
Scaffold Permit Required: ☐ Yes ☒ No

Operations Review:

Signature _____ *Date* _____

Management approval for GSA or Grounding Plan (if required):

NA
Signature _____ *Date* _____

Date:
Clearance Number Issued: _____ Assigned by:
Generating Sensitive Activity (GSA) Required: ☐ Yes ☐ No
Clearance Temporary Lift Required: ☐ Yes ☐ No
Other clearances required to be held for this work:

Special instructions or notes associated with this clearance:

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) CONDENSATE BOOSTER PUMP 2B	Plant: (4) BFN U2	
Requested By: (5) MAINTENANCE		
Ground Discs Issued? (6)	☐ Yes	
Remarks: (7) Drain and repair tube leaks in Condensate Booster Pump 2B Lube Oil Cooler. MAINTENANCE verify boundaries prior to work		
Placement Instructions: (8) Prior to placing clearance, operations verify 2B CONDENSATE Booster removed from Service IAW 2-OI-2		
Caution Tag Information: (9) NA		
Release Instructions: (10) NONE		

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: 2.2.41 K/A RATING: RO 3.5

TASK STANDARD: Determine the clearance boundary for Condensate Booster Pump 3B

LOCATION OF PERFORMANCE: Class Room / Unit 3 Simulator

REFERENCES/PROCEDURES NEEDED:

VALIDATION TIME: 30 minutes

PERFORMANCE TIME:

COMMENTS: _____

_____

_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____

EXAMINER

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_____

****

Performance Step 1: Critical Not Critical X

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 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 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 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 ___

* ANSWER KEY UNIT 3 *

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)

Equipment ID Equipment Description Equipment Location	Tag Serial No.	Tag Type	Place. Seq.	Place. Config.	Place. 1st Verifier	Place. 2nd Verifier	Rest. Seq.	Restore 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, CBP 3B V3 CR3-6	-	DANGER	1	STOP								
3-BKR-2-0062, 3B 4kV UB Compt B	-	DANGER	1 or 2	RACKED OUT								
3-SHV-24-681B, RCW TO CBP 3B	-	DANGER	3	Closed								
3-SHV-24-632B, RCW FROM CBP 3B	-	DANGER	3	Closed								
3-HS-2-140, 3B AUX O.I PUMP HAND SWITCH	-	DANGER	3	STOP								

* Answer Key Unit 3 *

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)

Equipment ID Equipment Description Equipment Location	Tag Serial No.	Tag Type	Place. Seq.	Place. Config.	Place. 1st Verifier	Place. 2nd Verifier	Rest. Seq.	Restore 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-BKR-2-14D, 3B 480V TMOV BD COMPT 11E	–	DANGER	3	OFF								
3-DRV-24-674B, RCW TO CBP 3B DRAIN	–	NO TAG DANGER	4	OPEN								

Appendix A
(Page 3 of 3)
NPG Request for Clearance

NPG Request for Clearance

Date of Request: TODAY
Requester's name and phone number: MAINTENANCE 5555
Date and time work to begin: NEXT WEEK
Date and time work to be complete:
Duration:
Equipment can be returned to service in emergency: ☐ Yes ☒ No
Time required to return to service:

Work Order No.: NRC EXAM
Requester's Org.:
Outage Work: ☐ Yes ☒ No
Planned Outage: ☐ Yes ☒ No
Forced Outage: ☐ Yes ☒ No
Grounds Required: ☐ Yes ☒ No

Equipment/System to be cleared: CONDENSATE BOOSTER PUMP 3B

Detailed description/scope of work to be performed:
Drain and repair tube leaks on the Lube oil Cooler for Condensate Booster Pump 3B.

Attached drawings/DCAs, marked up to show recommended clearance boundary: NO

Potential adverse affects:
Other systems affected:
Reference drawings:

Barricade Permit Required: ☐ Yes ☒ No
Scaffold Permit Required: ☐ Yes ☒ No

Operations Review:

Signature *Date*

Management approval for GSA or Grounding Plan (if required):

NA
Signature *Date*

Date:
Clearance Number Issued: Assigned by:
Generating Sensitive Activity (GSA) Required: ☐ Yes ☐ No
Clearance Temporary Lift Required: ☐ Yes ☐ No
Other clearances required to be held for this work:

Special instructions or notes associated with this clearance:

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) CONDENSATE BOOSTER PUMP 3B	Plant: (4) BFN UNIT 3	
Requested By: (5) MAINTENANCE		
Ground Discs Issued? (6)	☐ Yes	
Remarks: (7) Drain and repair tube leaks in Condensate Booster Pump 3B Lube Oil Cooler. MAINTENANCE Verify Boundaries prior to work.		
Placement Instructions: (8) Prior to placing clearance, operations verify 3B CONDENSATE Booster Pump removed from service IAW 3-OI-2		
Caution Tag Information: (9) NA		
Release Instructions: (10) NONE		

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: 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_____

****

Performance Step 1: Critical Not Critical X

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

TABLE 4.1 IRM INSTRUMENTATION **NIGHT SHIFT** 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 Requirements:	3.3.1.1.1 (f1.a)										
LOCATION:	Panel 2-9-5									Review Initials	
	IRM RANGE (ENTER 1 THROUGH 10) (Note 1)								MAX DEV (Note 2) (AC)		
	A	C	E	G	B	D	F	H		UO	Unit Supvr
Friday									2 Ranges with conditions of Note 1 satisfied		
Saturday											
Sunday											
Monday											
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).

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:_____

_____

****

Performance Step 2: Critical X Not Critical

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

TABLE 4.2 SRM INSTRUMENTATION NIGHT SHIFT WEEK: _____ to _____

APPLICABILITY:	Mode 4 & 5 Count Rate will be recorded at all times.														
Surveillance Requirements:	3.3.1.2.1, 3.3.1.2.2, 3.3.1.2.3, 3.3.1.2.4, 3.3.1.2.5&6						TSRs: 3.3.4.1 & 3.3.5.3								
LOCATION:	Panel 2-9-5													Review Initials	
	SRM Count Rate (cps) Note 1					LIMITS (AC) Note 2	MAX (AC) Note 3	SRM System Signal to Noise Ratio 2-SR-3.3.1.2.4 SAT / INOP (Note 4)				All Data SAT/ UNSAT (Note 5)			
	TIME	A	C	B	D			A	C	B	D			UO	Unit Supvr
Friday	2000					OPERABLE SRMs count rate must be ≥ 3 cps	OPERABLE SRMs count rate must be < 1 E^5 cps								
Saturday	2000														
Sunday	2000														
Monday	2000														
Tuesday	2000														
Wednesday	2000														
Thursday	2000														

(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

****

Performance Step 3: Critical Not Critical X

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

TABLE 4.3 REACTOR WATER LEVEL INSTRUMENTATION - NARROW RANGE (COMPENSATED) **NIGHT SHIFT** WEEK: _____ to _____

APPLICABILITY:	Reactor Water Level in Narrow Instrument Range						
Criteria Source:	FSAR 7.10.4						
LOCATION:	Panel 2-9-5					Review Initials	
Reference Leg	A	B	C	D			
	2-LI-3-53 (in.)	2-LI-3-60 (in.)	2-LI-3-206 (in.)	2-LI-3-253 (in.)	MAX DEV	UO	Unit Supvr
Friday					3.0 inches		
Saturday							
Sunday							
Monday							
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 X Not Critical

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

TABLE 4.4.a CONTROL RODS **NIGHT SHIFT** WEEK: _____ to _____

APPLICABILITY:	Mode 5 OR Mode 4 when in Special Operations LCO 3.10.4					
Surveillance Requirements:	3.9.3.1, 3.9.5.2, (Reference 3.9.4.1)					
LOCATION:	Panel 2-9-5 Full Core Display And/Or Four Rod Display with Applicable Control Rod Selected and/or ICS Control Rod Position Indication, Local HCU Accumulator Pressure Indicators (Reactor Building Elevation 565)				Review Initials	
		COL A	COL B			
	TIME	Verify Control Rod Positions ALL RODS FULL-IN/ ROD WITHDRAWN	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) SAT / UNSAT / N/A	LIMITS (AC)	UO	Unit Supvr
Friday	2000			All Rods Full-In when loading Fuel Assemblies into the Core (Note 4) and HCU Scram Accumulator Pressure ≥ 940 psig and No full-in indication (no Green LEDs) for each withdrawn Control Rod (Note 2)		
Saturday	2000					
Sunday	2000					
Monday	2000					
Tuesday	2000					
Wednesday	2000					
Thursday	2000					

(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

****

Performance Step 5: Critical Not Critical X

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

TABLE 4.5 REACTOR MODE SWITCH - REFUEL POSITION **NIGHT SHIFT** WEEK: _____ to _____

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 Requirements:		3.9.2.1			
LOCATION:		Panel 2-9-5		Review 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		Reactor Mode Switch Verified Locked in Refuel Position SAT		
Saturday	2000				
Sunday	2000				
Monday	2000				
Tuesday	2000				
Wednesday	2000				
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 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 _____

APPLICABILITY:	Modes 4 & 5				
Criteria Source:	Technical Requirements Manual TSR-3.4.1.1				
LOCATION:	Panel 2-9-4			Review Initials	
	TIME	2-CR-43-11A/12A Ch 1 (µmho) (Note 1)	MAX (AC)	UO	Unit Supvr
Friday	2000		Prior to startup and at steaming rates < 100,000 lb/hr: 2.0 µmho Reactor not Pressurized With Fuel In Reactor Vessel, Except During Startup Condition: Less than or equal to 10.0 µmho		
	0200				
Saturday	2000				
	0200				
Sunday	2000				
	0200				
Monday	2000				
	0200				
Tuesday	2000				
	0200				
Wednesday	2000				
	0200				
Thursday	2000				
	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.

Standard:

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

SAT___ UNSAT___ N/A ___COMMENTS:_____

****

Performance Step 7: Critical X Not Critical

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

TABLE 4.7 part 1 RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION NIGHT SHIFT WEEK: _____ to _____

APPLICABILITY:	Modes 4 & 5 (Notes 1, 2)									
Surveillance Requirements:	3.4.8.1, 3.9.7.1, and 3.9.8.1									
LOCATION:	Panel 2-9-4		Panel 2-9-3				REQUIREMENTS (Note 1) Initials	Review Initials	
	Recirc Pump I/S (Note 3)		RHR Shutdown Cooling Subsystem I/S (Note 3)						
DAY / TIME	A	B	A	B	C	D	(AC)	UO	Unit Supvr
Friday 2000									
Saturday 2000									
Sunday 2000									
Monday 2000									
Tuesday 2000									
Wednesday 2000									
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 (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 X

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

TABLE 4.7 part 2

LOCATION:		Panel 2-9-47; 2-TR-56-4					Panel 2-9-5			
		COL A		COL B		COL C				
		Rx Dr to RWCU 2-TE-56-8 or 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 or 2-PI-3-61		Review Initials	
		(Notes 4 & 5)		(Note 4)		(Note 6)	(Notes 4 & 6)			
DAY	TIME	Instrument used	°F	Instrument used	°F		Instrument used	PSIG	UO	Unit Supvr
Friday	2000									
Saturday	2000									
Sunday	2000									
Monday	2000									
Tuesday	2000									
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 *

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.1 IRM INSTRUMENTATION **NIGHT SHIFT** WEEK: TODAY 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 Requirements:	3.3.1.1.1 (f1.a)										
LOCATION:	Panel 2-9-5									Review Initials	
	IRM RANGE (ENTER 1 THROUGH 10) (Note 1)								MAX DEV (Note 2) (AC)	UO	Unit Supvr
	A	C	E	G	B	D	F	H			
Friday	1	1	1	1	1	1	1	1	2 Ranges with conditions of Note 1 satisfied	DP	
Saturday											
Sunday											
Monday											
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).

* ANSWER KEY *

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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.2 SRM INSTRUMENTATION NIGHT SHIFT WEEK: TODAY to _____

APPLICABILITY:	Mode 4 & 5 Count Rate will be recorded at all times.													
Surveillance Requirements:	3.3.1.2.1, 3.3.1.2.2, 3.3.1.2.3, 3.3.1.2.4, 3.3.1.2.5&6						TSRs: 3.3.4.1 & 3.3.5.3					Review Initials		
LOCATION:	Panel 2-9-5													
	SRM Count Rate (cps) Note 1					LIMITS (AC) Note 2	MAX (AC) Note 3	SRM System Signal to Noise Ratio 2-SR-3.3.1.2.4 SAT / INOP (Note 4)				All Data SAT/ UNSAT (Note 5)	UO	Unit Supvr
	TIME	A	C	B	D			A	C	B	D			
Friday	2000	1	150-300	150-300	150-300	OPERABLE SRMs count rate must be ≥ 3 cps	OPERABLE SRMs count rate must be < 1 E^6 cps	NA	NA	NA	NA	UNSAT	OP	
Saturday	2000													
Sunday	2000													
Monday	2000													
Tuesday	2000													
Wednesday	2000													
Thursday	2000													

(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 E^4 cps & 1 E^5 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.

* ANSWER KEY *

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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.3 REACTOR WATER LEVEL INSTRUMENTATION - NARROW RANGE (COMPENSATED) **NIGHT SHIFT** WEEK: TODAY to _____

APPLICABILITY:	Reactor Water Level in Narrow Instrument Range						
Criteria Source:	FSAR 7.10.4						
LOCATION:	Panel 2-9-5					Review Initials	
Reference Leg	A	B	C	D			
	2-LI-3-53 (in.)	2-LI-3-60 (in.)	2-LI-3-206 (in.)	2-LI-3-253 (in.)	MAX DEV	UO	Unit Supvr
Friday	69 - 71	69 - 71	69 - 71	69 - 71	3.0 inches	OP	
Saturday							
Sunday							
Monday							
Tuesday							
Wednesday							
Thursday							

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

* Answer Key *

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.4.a CONTROL RODS — NIGHT SHIFT — WEEK: TODAY to _____

					Review Initials	
APPLICABILITY:	Mode 5 OR Mode 4 when in Special Operations LCO 3.10.4					
Surveillance Requirements:	3.9.3.1, 3.9.5.2, (Reference 3.9.4.1)					
LOCATION:	Panel 2-9-5 Full Core Display And/Or Four Rod Display with Applicable Control Rod Selected and/or ICS Control Rod Position Indication, Local HCU Accumulator Pressure Indicators (Reactor Building Elevation 565)					
	TIME	COL A: Verify Control Rod Positions — ALL RODS FULL-IN/ ROD WITHDRAWN	COL B: 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) SAT / UNSAT / N/A	LIMITS (AC)	UO	Unit Supvr
Friday	2000	All Rods Full-In	NA	All Rods Full-In when loading Fuel Assemblies into the Core (Note 4) and HCU Scram Accumulator Pressure ≥ 940 psig and No full-in indication (no Green LEDs) for each withdrawn Control Rod (Note 2)	DP	
Saturday	2000					
Sunday	2000					
Monday	2000					
Tuesday	2000					
Wednesday	2000					
Thursday	2000					

TABLE 4.4.b MULTIPLE CONTROL ROD WITHDRAWAL - REFUELING

			Review Initials	
APPLICABILITY:	Mode 5 when operating under SPECIAL OPERATIONS LCO 3.10.6			
Surveillance Requirements:	3.10.6.1, 3.10.6.2, 3.10.6.3			
	Multiple Control Rod Withdrawal - Refueling 2-SR-3.10.6	SR Performed	UO	Unit Supvr
Friday	When operating under SPECIAL OPERATIONS LCO 3.10.6, Verify SR is being performed on a 24 hour frequency.			
Saturday				
Sunday				
Monday				
Tuesday				
Wednesday				
Thursday				

NOTES ON NEXT PAGE

* Answer Key *

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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).

* ANSWER KEY *

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.5 REACTOR MODE SWITCH - REFUEL POSITION **NIGHT SHIFT** WEEK: TODAY to _____

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 Requirements:	3.9.2.1				
LOCATION:	Panel 2-9-5			Review 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 or SAT	Reactor Mode Switch Verified Locked in Refuel Position SAT	OP	
Saturday	2000				
Sunday	2000				
Monday	2000				
Tuesday	2000				
Wednesday	2000				
Thursday	2000				

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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.6 REACTOR COOLANT CONDUCTIVITY **NIGHT SHIFT** WEEK: TODAY to _____

APPLICABILITY: Modes 4 & 5

Criteria Source: Technical Requirements Manual TSR-3.4.1.1

LOCATION: Panel 2-9-4

	TIME	2-CR-43-11A/12A Ch 1 (µmho) (Note 1)	MAX (AC)	Review Initials UO	Review Initials Unit Supvr
Friday	2000	3 TO 5	Prior to startup and at steaming rates < 100,000 lb/hr: 2.0 µmho Reactor not Pressurized With Fuel In Reactor Vessel, Except During Startup Condition: Less than or equal to 10.0 µmho	OP	
	0200				
Saturday	2000				
	0200				
Sunday	2000				
	0200				
Monday	2000				
	0200				
Tuesday	2000				
	0200				
Wednesday	2000				
	0200				
Thursday	2000				
	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.

* ANSWER KEY *

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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.7 part 1 RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION **NIGHT SHIFT** WEEK: TODAY to _____

APPLICABILITY:	Modes 4 & 5 (Notes 1, 2)									
Surveillance Requirements:	3.4.8.1, 3.9.7.1, and 3.9.8.1									
LOCATION:		Panel 2-9-4		Panel 2-9-3				REQUIREMENTS (Note 1) Initials (AC)	Review Initials	
		Recirc Pump I/S (Note 3)		RHR Shutdown Cooling Subsystem I/S (Note 3)						
DAY	TIME	A	B	A	B	C	D		UO	Unit Supvr
Friday	2000								OP	
Saturday	2000									
Sunday	2000									
Monday	2000									
Tuesday	2000									
Wednesday	2000									
Thursday	2000									

TABLE 4.7 part 2

LOCATION:		Panel 2-9-47; 2-TR-56-4				COL C	Panel 2-9-5		Review Initials	
		COL A		COL B						
		Rx Dr to RWCU 2-TE-56-8 or 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 or 2-PI-3-61			
		(Notes 4 & 5)		(Note 4)		(Note 6)	(Notes 4 & 6)			
DAY	TIME	Instrument used	°F	Instrument used	°F		Instrument used	PSIG	UO	Unit Supvr
Friday	2000	2-TE-56-8	94.5	2-TE-56-13	103.7	9.2	NA	NA	OP	
Saturday	2000									
Sunday	2000									
Monday	2000									
Tuesday	2000									
Wednesday	2000									
Thursday	2000									

NOTES ON THE NEXT PAGE.

* Answer Key *

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

NIGHT SHIFT WEEK: TODAY to _____

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 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.

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

Current Revision Description

Type of Change: Enhancement Tracking Number: 078

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).

Table of Contents

Table of Contents (continued)

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.

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

2.8 Operating Instructions

2-OI-64	Primary Containment System
2-OI-85	Control Rod Drive System
2-OI-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 Iodine 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

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.)

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.)

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.

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.

B. 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.

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., $25 \leq$ 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

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 UNSAT 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.

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 re-calibrated 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.

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.

7.0 PROCEDURE STEPS

7.1 Initial Requirements and Notifications

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

[2] On the Surveillance Task Sheet (STS)

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

[3] On the Surveillance Task Sheet (STS)

RECORD the Start Date & Time. OP

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

7.2 Weekly Data Collection

7.2.1 Weekly Data Carryover

A. 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

A. **PRIOR** to obtaining Data for the current shift,

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

B. **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.

C. **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.

D. 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

A. 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

A. 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.

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

Attachment 1
(Page 1 of 2)

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

DAY SHIFT WEEK: TODAY 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	UP	TODAY	UP	TODAY
SATURDAY				
SUNDAY				
MONDAY				
TUESDAY				
WEDNESDAY				
THURSDAY				

Attachment 1
(Page 2 of 2)

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**	**Time**	**Initial**	**Time**
FRIDAY	OP	TODAY		
SATURDAY				
SUNDAY				
MONDAY				
TUESDAY				
WEDNESDAY				
THURSDAY				

Attachment 3
(Page 18 of 36)

Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.1 IRM INSTRUMENTATION **NIGHT SHIFT** WEEK: TODAY 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 Requirements:	3.3.1.1.1 (f1.a)										
LOCATION:	Panel 2-9-5									Review Initials	
	IRM RANGE (ENTER 1 THROUGH 10) (Note 1)								MAX DEV (Note 2) (AC)	UO	Unit Supvr
	A	C	E	G	B	D	F	H			
Friday									2 Ranges with conditions of Note 1 satisfied		
Saturday											
Sunday											
Monday											
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

TABLE 4.2 SRM INSTRUMENTATION **NIGHT SHIFT** WEEK: TODAY to _____

APPLICABILITY:	Mode 4 & 5 Count Rate will be recorded at all times.													
Surveillance Requirements:	3.3.1.2.1, 3.3.1.2.2, 3.3.1.2.3, 3.3.1.2.4, 3.3.1.2.5&6						TSRs: 3.3.4.1 & 3.3.5.3					Review Initials	
LOCATION:	Panel 2-9-5												
	SRM Count Rate (cps) Note 1					LIMITS (AC) Note 2	MAX (AC) Note 3	SRM System Signal to Noise Ratio 2-SR-3.3.1.2.4 SAT / INOP (Note 4)				All Data SAT/ UNSAT (Note 5)	UO	Unit Supvr
	TIME	A	C	B	D			A	C	B	D			
Friday	2000					OPERABLE SRMs count rate must be ≥ 3 cps	OPERABLE SRMs count rate must be < 1 E^6 cps							
Saturday	2000													
Sunday	2000													
Monday	2000													
Tuesday	2000													
Wednesday	2000													
Thursday	2000													

(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 E^4 cps & 1 E^5 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.

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.3 REACTOR WATER LEVEL INSTRUMENTATION - NARROW RANGE (COMPENSATED) **NIGHT SHIFT** WEEK: TODAY to _____

APPLICABILITY:	Reactor Water Level in Narrow Instrument Range						
Criteria Source:	FSAR 7.10.4						
LOCATION:	Panel 2-9-5					Review Initials	
Reference Leg	A	B	C	D			
	2-LI-3-53 (in.)	2-LI-3-60 (in.)	2-LI-3-206 (in.)	2-LI-3-253 (in.)	MAX DEV	UO	Unit Supvr
Friday					3.0 inches		
Saturday							
Sunday							
Monday							
Tuesday							
Wednesday							
Thursday							

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

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.4.a CONTROL RODS — NIGHT SHIFT — WEEK: TODAY to _____

					Review Initials	
APPLICABILITY:	Mode 5 OR Mode 4 when in Special Operations LCO 3.10.4					
Surveillance Requirements:	3.9.3.1, 3.9.5.2, (Reference 3.9.4.1)					
LOCATION:	Panel 2-9-5 Full Core Display And/Or Four Rod Display with Applicable Control Rod Selected and/or ICS Control Rod Position Indication, Local HCU Accumulator Pressure Indicators (Reactor Building Elevation 565)					
	TIME	COL A: Verify Control Rod Positions — ALL RODS FULL-IN/ ROD WITHDRAWN	COL B: 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) SAT / UNSAT / N/A	LIMITS (AC)	UO	Unit Supvr
Friday	2000			All Rods Full-In when loading Fuel Assemblies into the Core (Note 4) and HCU Scram Accumulator Pressure ≥ 940 psig and No full-in indication (no Green LEDs) for each withdrawn Control Rod (Note 2)		
Saturday	2000					
Sunday	2000					
Monday	2000					
Tuesday	2000					
Wednesday	2000					
Thursday	2000					

TABLE 4.4.b MULTIPLE CONTROL ROD WITHDRAWAL - REFUELING

			Review Initials	
APPLICABILITY:	Mode 5 when operating under SPECIAL OPERATIONS LCO 3.10.6			
Surveillance Requirements:	3.10.6.1, 3.10.6.2, 3.10.6.3			
	Multiple Control Rod Withdrawal - Refueling 2-SR-3.10.6	SR Performed	UO	Unit Supvr
Friday	When operating under SPECIAL OPERATIONS LCO 3.10.6, Verify SR is being performed on a 24 hour frequency.			
Saturday				
Sunday				
Monday				
Tuesday				
Wednesday				
Thursday				

NOTES ON NEXT PAGE

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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).

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.5 REACTOR MODE SWITCH - REFUEL POSITION **NIGHT SHIFT** WEEK: TODAY to _____

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 Requirements:	3.9.2.1				
LOCATION:	Panel 2-9-5			Review 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		Reactor Mode Switch Verified Locked in Refuel Position SAT		
Saturday	2000				
Sunday	2000				
Monday	2000				
Tuesday	2000				
Wednesday	2000				
Thursday	2000				

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.6 REACTOR COOLANT CONDUCTIVITY NIGHT SHIFT WEEK: TODAY to _____

APPLICABILITY:	Modes 4 & 5				
Criteria Source:	Technical Requirements Manual TSR-3.4.1.1			Review Initials	
LOCATION:	Panel 2-9-4			UO	Unit Supvr
	TIME	2-CR-43-11A/12A Ch 1 (µmho) (Note 1)	MAX (AC)		
Friday	2000		Prior to startup and at steaming rates < 100,000 lb/hr: 2.0 µmho Reactor not Pressurized With Fuel In Reactor Vessel, Except During Startup Condition: Less than or equal to 10.0 µmho		
	0200				
Saturday	2000				
	0200				
Sunday	2000				
	0200				
Monday	2000				
	0200				
Tuesday	2000				
	0200				
Wednesday	2000				
	0200				
Thursday	2000				
	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.

Attachment 3
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Surveillance Procedure Data Package - Modes 4 & 5

TABLE 4.7 part 1 RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION **NIGHT SHIFT** WEEK: TODAY to _____

APPLICABILITY:	Modes 4 & 5 (Notes 1, 2)									
Surveillance Requirements:	3.4.8.1, 3.9.7.1, and 3.9.8.1									
LOCATION:		Panel 2-9-4		Panel 2-9-3				REQUIREMENTS (Note 1) Initials (AC)	Review Initials	
		Recirc Pump I/S (Note 3)		RHR Shutdown Cooling Subsystem I/S (Note 3)						
DAY	TIME	A	B	A	B	C	D		UO	Unit Supvr
Friday	2000									
Saturday	2000									
Sunday	2000									
Monday	2000									
Tuesday	2000									
Wednesday	2000									
Thursday	2000									

TABLE 4.7 part 2

LOCATION:		Panel 2-9-47; 2-TR-56-4				COL C	Panel 2-9-5		Review Initials	
		COL A		COL B						
		Rx Dr to RWCU 2-TE-56-8 or 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 or 2-PI-3-61			
		(Notes 4 & 5)		(Note 4)		(Note 6)	(Notes 4 & 6)			
DAY	TIME	Instrument used	°F	Instrument used	°F		Instrument used	PSIG	UO	Unit Supvr
Friday	2000	2-TE-56-8	94.5	2-TE-56-13	103.7					
Saturday	2000									
Sunday	2000									
Monday	2000									
Tuesday	2000									
Wednesday	2000									
Thursday	2000									

NOTES ON THE NEXT PAGE.

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Surveillance Procedure Data Package - Modes 4 & 5

NIGHT SHIFT WEEK: TODAY to _____

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 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.

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 LEVEL	CORRECTED LEVEL										
Indicated Reactor Water Level	Narrow Range Compensated 2-LIS-3-53(60) (206) (253) Level		Narrow Range Uncompensated 2-LIS-3-184, 185,203(A-D), 208(A-D) Level		Wide Range 2-LI-3-58A(B), 2-LIS-3-56A(D) Level		Post Accident 2-LR-3-62 2-LI/LIS-3-52 2-LI/LIS-3-62A Level		Floodup 2-LI-3-55 Level		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	Note 1	Note 2	No Calculated Correction Value		48.5	50	No Calculated Correction Value
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	
40	33.5	35	27	29					38.5	40	
38	32	34	26	27.5					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					28.5	29.5	
28	25	26.5	19	20					26.5	27.5	

(1) Indicates > 60" if actual Water Level is > 5".
(2) Indicates > 60" if actual Water Level is > 11.5".

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 X

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

TABLE 4 1 IRM INSTRUMENTATION **NIGHT SHIFT** 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 (Refer To P&L Step 3 6A)										
Surveillance Requirements:	3.3.1.1 1 (f1.a)										
LOCATION:	Panel 3-9-5									Review Initials	
	IRM RANGE (ENTER 1 THROUGH 10) Note 1								MAX DEV (AC)		
	A	C	E	G	B	D	F	H		UO	Unit Supvr
Friday									2 Ranges with conditions of Note 1 satisfied Note 2		
Saturday											
Sunday											
Monday											
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).

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:_____

_____

****

Performance Step 2: Critical X Not Critical

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

TABLE 4.2 SRM INSTRUMENTATION NIGHT SHIFT WEEK: _____ to _____

APPLICABILITY:	Mode 4 & 5 (Refer To P&L Step 3.6A)														
Surveillance Requirements:	3.3.1.2.1, 3.3.1.2.2, 3.3.1.2.3, 3.3.1.2.4, 3.3.1.2.5&6						TSRs: 3.3.4.1 & 3.3.5.3								
LOCATION:	Panel 3-9-5													Review Initials	
	SRM Count Rate (cps) Note 1					LIMITS Note 2 (AC)	MAX Note 3 (AC)	SRM System Signal to Noise Ratio 3-SR-3.3.1.2.4 (Note 4) SAT / UNSAT/ INOP				All Data (Note 5) SAT/ UNSAT			
	TIME	A	C	B	D			A	C	B	D			UO	Unit Supvr
Friday	2000					OPERABLE SRMs count rate must be ≥ 3 cps	OPERABLE SRMs count rate must be < 1 E^6 cps								
Saturday	2000														
Sunday	2000														
Monday	2000														
Tuesday	2000														
Wednesday	2000														
Thursday	2000														

(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

****

Performance Step 3: Critical Not Critical X

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

TABLE 4.3 REACTOR WATER LEVEL INSTRUMENTATION - NARROW RANGE (COMPENSATED) **NIGHT SHIFT** WEEK: _____ to _____

APPLICABILITY:	Reactor Water Level in Narrow Instrument Range (Refer To P&L Step 3.6A)						
Criteria Source:	FSAR 7.10.4						
LOCATION:	Panel 3-9-5					Review Initials	
Reference Leg	A	B	C	D			
	3-LI-3-53 (in.)	3-LI-3-60 (in.)	3-LI-3-206 (in.)	3-LI-3-253 (in.)	MAX DEV	UO	Unit Supvr
Friday					3.0 inches		
Saturday							
Sunday							
Monday							
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 X Not Critical

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

TABLE 4.4.a CONTROL RODS **NIGHT SHIFT** WEEK: _____ to _____

APPLICABILITY:		Mode 5 or Mode 4 when in Special Operations LCO 3.10.4 (Refer To P&L Step 3.6A)				
Surveillance Requirements:		3.9.3.1, 3.9.5.2, (Reference 3.9.4.1)				
LOCATION:		Panel 3-9-5 Full Core Display And/Or Four Rod Display with Applicable Control Rod Selected and/or ICS Control Rod Position Indication, Local HCU Accumulator Pressure Indicators (Reactor Building Elevation 565)			Review Initials	
	TIME	COL A Control Rod Positions ALL RODS FULL-IN/ ROD WITHDRAWN	COL B 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) SAT / UNSAT / N/A	LIMITS (AC)	UO	Unit Supvr
Friday	2000			All Rods Full-In when loading Fuel Assemblies into the Core (Note 4) AND HCU Scram Accumulator Pressure ≥ 940 psig AND No full-in indication (no Green LEDs) for each withdrawn Control Rod (Note 2)		
Saturday	2000					
Sunday	2000					
Monday	2000					
Tuesday	2000					
Wednesday	2000					
Thursday	2000					

(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

****

Performance Step 5: Critical Not Critical X

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

TABLE 4.5 REACTOR MODE SWITCH - REFUEL POSITION **NIGHT SHIFT** WEEK: _____ to _____

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 (Refer To P&L Step 3 6A)			
Surveillance Requirements:		3.9.2.1			
LOCATION:		Panel 3-9-5		Review Initials	
	TIME	Reactor Mode Switch 3-HS-99-5A-S1 Locked in Refuel Position SAT / UNSAT / N/A	LIMITS (AC)	UO	Unit Supvr
Friday	2000		Reactor Mode Switch Verified Locked in Refuel Position performed SAT		
Saturday	2000				
Sunday	2000				
Monday	2000				
Tuesday	2000				
Wednesday	2000				
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 X Not Critical

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

TABLE 4.6 REACTOR COOLANT CONDUCTIVITY **NIGHT SHIFT** WEEK: _____ to _____

APPLICABILITY:	Modes 4 & 5 (Refer To P&L Step 3.6A)				
Criteria Source:	Technical Requirements Manual TSR-3.4.1.1				
LOCATION:	Panel 3-9-4			Review Initials	
	TIME	3-CR-43-11A/12A Ch 1 (Note 1) (µmho)	MAX (AC)	UO	Unit Supvr
Friday	2000		Prior To Startup and at Steaming Rates < 100,000 lb/hr: 2.0 µmho Reactor not Pressurized With Fuel In Reactor Vessel, Except During Startup Condition: Less than or equal to 10.0 µmho		
	0200				
Saturday	2000				
	0200				
Sunday	2000				
	0200				
Monday	2000				
	0200				
Tuesday	2000				
	0200				
Wednesday	2000				
	0200				
Thursday	2000				
	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:_____

_____

****

Performance Step 7: Critical X Not Critical

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

TABLE 4.7 part 1 RHR SHUTDOWN COOLING SUBSYSTEM AND RECIRCULATION PUMP OPERATION NIGHT SHIFT WEEK: _____ to _____

APPLICABILITY:		Modes 4 & 5 (Notes 1, 2) (Refer To P&L Step 3.6A)								
Surveillance Requirements:		3.4.8.1, 3.9.7.1, and 3.9.8.1								
LOCATION:		Panel 3-9-4		Panel 3-9-3				REQUIREMENTS Initials (Note 1) (AC)	Review Initials	
		Recirc Pump I/S (Note 3)		RHR Shutdown Cooling Subsystem I/S (Note 3)						
DAY	TIME	A	B	A	B	C	D		UO	Unit Supvr
Friday	2000									
Saturday	2000									
Sunday	2000									
Monday	2000									
Tuesday	2000									
Wednesday	2000									
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 X

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

TABLE 4.7 part 2

LOCATION:		Panel 3-9-47; 3-TR-56-4					Panel 3-9-5			
		COL A		COL 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			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	°F	Instrument used	°F	(COL A-COL B)	Instrument used	PSIG	UO	Unit Supvr
Friday	2000									
Saturday	2000									
Sunday	2000									
Monday	2000									
Tuesday	2000									
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, 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 A1a

OPERATOR: _____

SRO ____ DATE:_____

JPM NUMBER: SRO A1a

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 PERFORMANCE: Class Room

REFERENCES/PROCEDURES NEEDED: NPG-SPP 3.21, Technical Specifications

VALIDATION TIME: 30 minutes

PERFORMANCE TIME:

COMMENTS: _____

_____

_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

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

JPM SRO A1a

****

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_____

****

Performance Step 1: Critical X Not Critical

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 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 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 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 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	0700-1900	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 Mismatch and Operability

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 Jet Pump Mismatch and Operability, determines that an Engineering review is required and determines that the Acceptance Criteria is NOT met. Determines Tech Spec actions based on failure of 2-SR-3.4.2.1.

PERFORMANCE LOCATION: Unit 2 Simulator

REFERENCES/PROCEDURES NEEDED: 2-SR-3.4.2.1

VALIDATION TIME: 25 minutes

PERFORMANCE TIME:

COMMENTS: _____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

neid 5/22/13

****

Classroom

****

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.

****

Performance Step 2: Critical X Not Critical

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-SIT-068-0059 2-SI-96-61	2-SI-68-71 2-SIT-068-0071 2-SI-96-73
_____ RPM	_____ RPM

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

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

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

Loop 2A 2-FI-68-46	Loop 2B 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

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

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**	

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 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 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 ≤ 10.25 Mlb/hr. (Otherwise N/A) _____(AC)

[4] **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 ≤ 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.

****

Performance Step 6: Critical 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 Step7.2.2[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 ☐

[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 ☐

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 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 Step7.2.2[3]:

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

Plot falls between the bold lines	Yes ☐	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 ☐	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 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 the bold lines.	Yes	☐	No	**X**

[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 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	**X**

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 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 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:
   - 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 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 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 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 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.

Surveillance Task Sheet (STS)

Work Order #: 114084884

PM#: P2383
Procedure: 2-SR-3.4.2.1
Title: 2-SR-3.4.2.1 - JET PUMP MISMATCH & OPERABILITY

Data Sheets Attached:

Perf Grp: OPS **Unit:** 2 **Loop/Div:** /NA
Test Reason: Periodic
Due Date: 06/05/13
Frequency: 1 DAYS **Tech Spec:** Y **ASME XI:**
Applicable Modes: **Perf Modes:**
Clearance Required: N **EQ:** **LCO Entered:** N
Dry-Cask Storage: N

Unit Supervisor — Authorization to Begin: SRO
TODAY — Date & Time

TODAY — Start Date & Time
Completion Date & Time

Maximo dates verified: SI Coordinator
Date & Time

Performed By:

Print Name	Signature	Initial	Section
OPERATOR	Operator	OP	OPS

Was this a Complete or Partial Performance?
(Explain Partial in REMARKS below) Complete [ ] Partial [ ]

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

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

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* criteria were not satisfied, was as LCO/ODCM action required?
(Explain in REMARKS below) Yes [ ] No [ ] N/A [ ]

Alert Work Contol Required? Yes [ ] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date
NSSS		

Copy of STS sent to Work Control AND SI Coordinator (next Bus. Day)
/
Initials Date

Test Director/Lead Performer — Date

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

Remarks: NOT REQD UNTIL 24 HRS AFTER BOTH RECIRC LOOPS ARE IN OPERATION

Applicability Notes:MODES 1 & 2

Frequency Notes: ONCE PER 24 HRS
NOT REQ'D UNTIL 4 HRS AFTER ASSOCIATED RECIRC LOOP IN OPERATION
NOT REQD UNTIL 24HR AFTER > 25% RTP -

REMARKS:

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

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.

Table of Contents

Table of Contents (continued)

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 only 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.

NOTES

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

     OR
   - 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.

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)

3.0 PRECAUTIONS AND LIMITATIONS

3.1 General Precautions

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

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

C. 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

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

3.3 Equipment

A. 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

3.6 Performance Testing

A. 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.

B. 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.

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

D. 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.

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

F. 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.

G. 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.

Date: TODAY

4.0 PREREQUISITES

[1] **VERIFY** this procedure is the most current revision. OP

[2] **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P2383) OP

[3] **VERIFY** Reactor recirculation system is in operation in accordance with 2-OI-68, Reactor Recirculation System. OP

[4] **VERIFY** the listed qualified personnel are available to perform this Surveillance procedure.

UO 1 OP

[5] Using the following Illustration graphs:

- 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

PERFORM the following:

[5.1] **IF** RTP is > 25% or Section 7.4 is required to be performed, **THEN**

VERIFY the graphs on the Illustrations are good as follows: (Otherwise N/A)

• **VERIFY** the "Good Thru Date" on all Illustrations has not been exceeded.

OR

• **IF** the "Good Thru Date" is exceeded on any Illustrations, **THEN**

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

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. ≤10% of rated core flow when operating at < 70% of rated core flow (≤ 10.25 Mlb/hr).

2. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow (≤ 5.12 Mlb/hr).

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:

1. 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 ≤ 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 <u>not</u> be allowed.

D. Steps which determine the above criteria are designated by (AC) next to the initials blank.

Date: TODAY

7.0 PROCEDURE STEPS

7.1 Initial Requirements and Notifications

[1] **VERIFY** Precautions and Limitations in Section 3.0 have been reviewed. OP

[2] **VERIFY** Prerequisites listed in Section 4.0 are satisfied. OP

[3] On the Surveillance Task Sheet (STS)

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

[4] **IF** RTP is less than or equal to 25%, **THEN**

MARK Section 7.4 as N/A. (Otherwise N/A this step) OP

[5] [NRC/C] **NOTIFY** the Unit Operator (UO) that this test is commencing. [RPT 82-16, LER 259/8232] OP

[6] On the Surveillance Task Sheet (STS)

RECORD the Start Date & Time. OP

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

_____

Date: _____

NOTES

1) If 2-SIT-68-59/71 (RB. El 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 not 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 not 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 not 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	√	Pump Motor 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 2-FI-68-5	Loop 2B 2-FI-68-81
_____ gpm X 1000	_____ gpm X 1000

_____

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

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

_____

Date: _____

NOTE

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

7.2.3 Jet Pump Loops

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

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	

_____

Date: _____

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 ≤ 10.25 Mlb/hr. (Otherwise N/A) _____(AC)

[4] **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 ≤ 5.12 Mlb/hr. (Otherwise N/A) _____(AC)

Date: _____

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.

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 ☐	No ☐

_____

[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 ☐	No ☐

_____

Date: _____

NOTES

1) If a Recirculation Pump is not in service, then the associated steps can be marked as NO.
2) If Data falls on or 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 ☐	No ☐

_____

[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 ☐

_____

Date: _____

NOTES

1) If a Recirculation Pump is not in service, then the associated steps can be marked as NO.
2) If Data falls on or 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]

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	☐

_____

Date: _____

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)

  OR

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

  OR

- If point(s) plotted in Sections 7.4.1 or 7.4.2, AND 7.4.3 fall on or 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 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.	☐	☐	☐

_____

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

VERIFY at least one Criteria Results is satisfied and marked as YES. _____(AC)

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

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 or 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 no 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 ☐ No ☐ _____

Illustration 1
(Page 1 of 1)

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

Date: _____

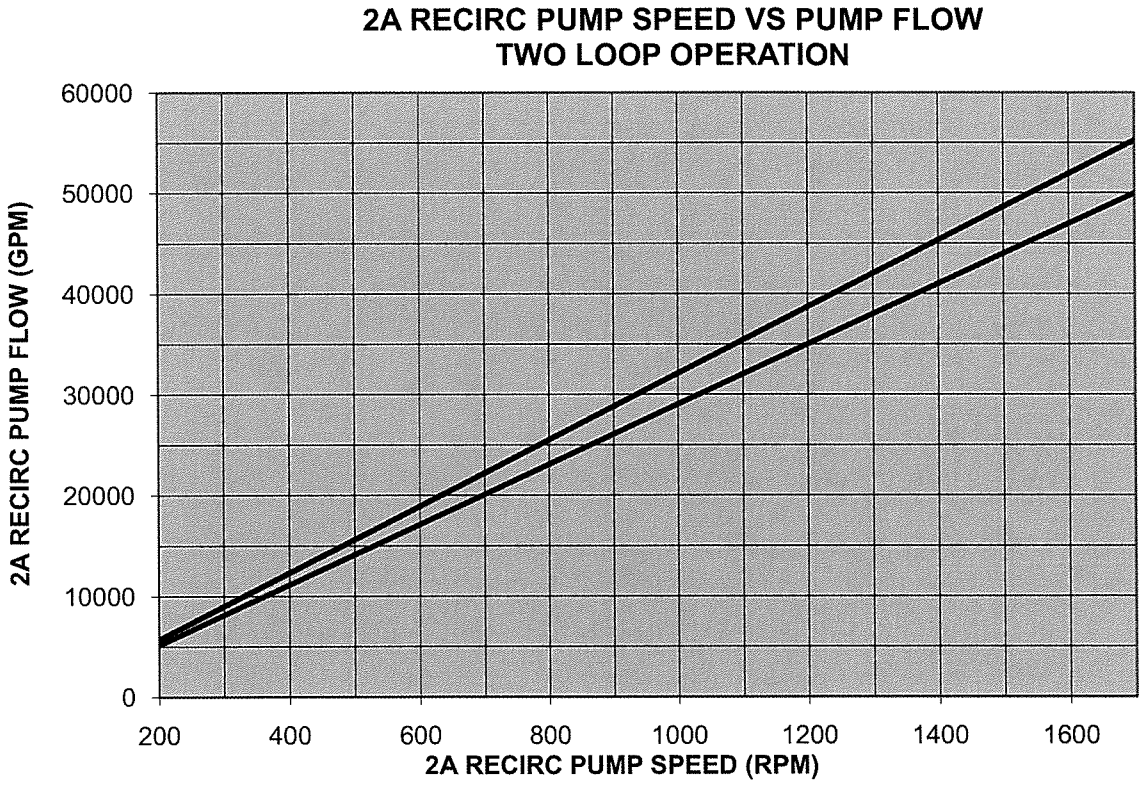


Illustration 2
(Page 1 of 1)

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

Date: _____

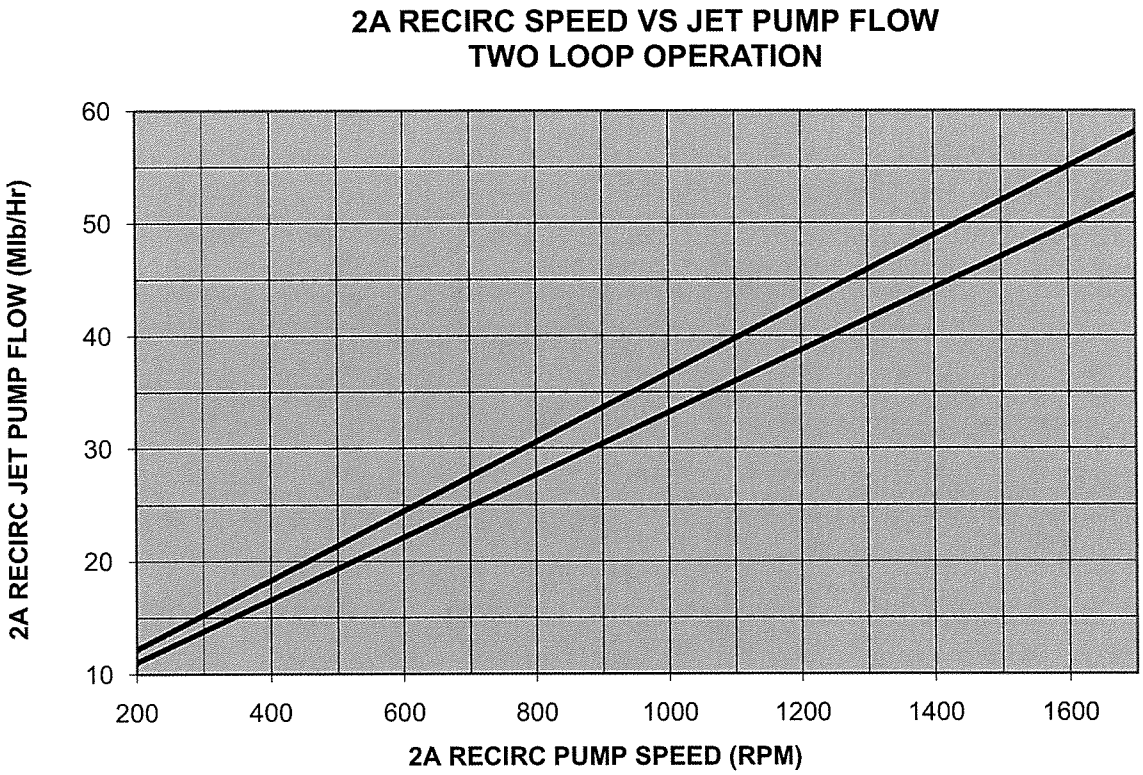


Illustration 3
(Page 1 of 1)

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

Date: _____

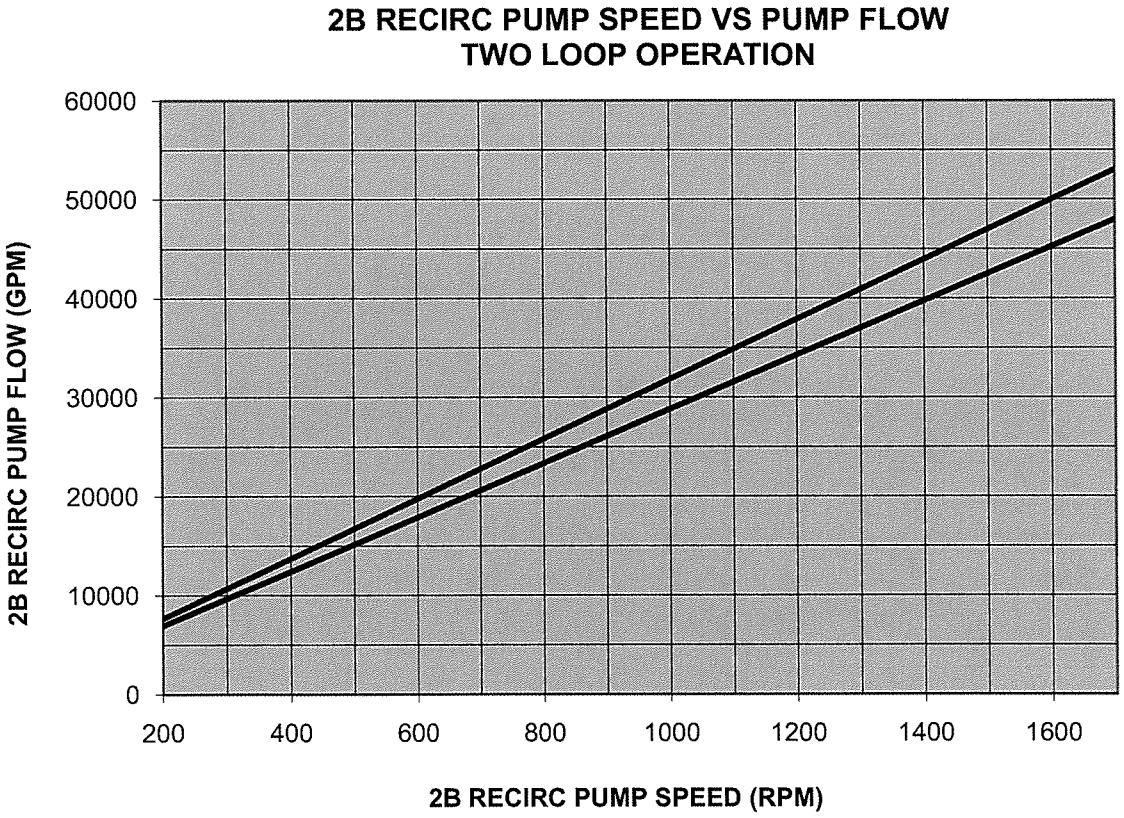


Illustration 4
(Page 1 of 1)

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

Date: _____

2B RECIRC PUMP SPEED VS JET PUMP FLOW
TWO LOOP OPERATION

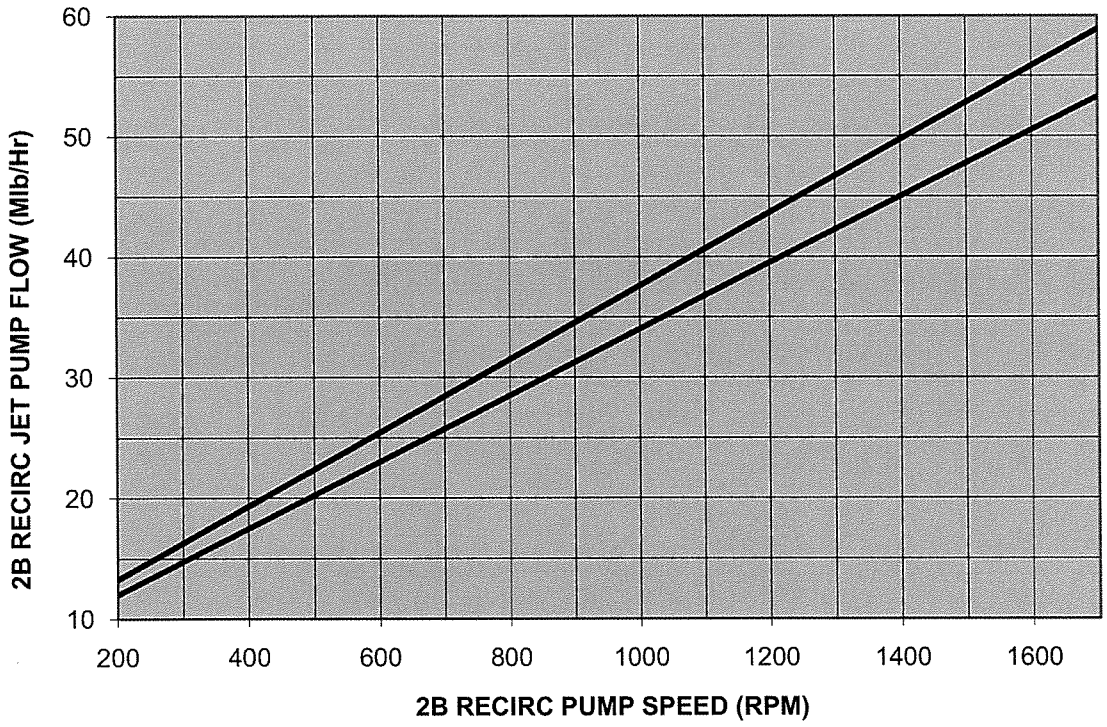


Illustration 5
(Page 1 of 1)

2A Jet Pump Differential Pressure VS Total Core Flow
Unit 2 Cycle 16
Good Thru 10-13-2013

Date: _____

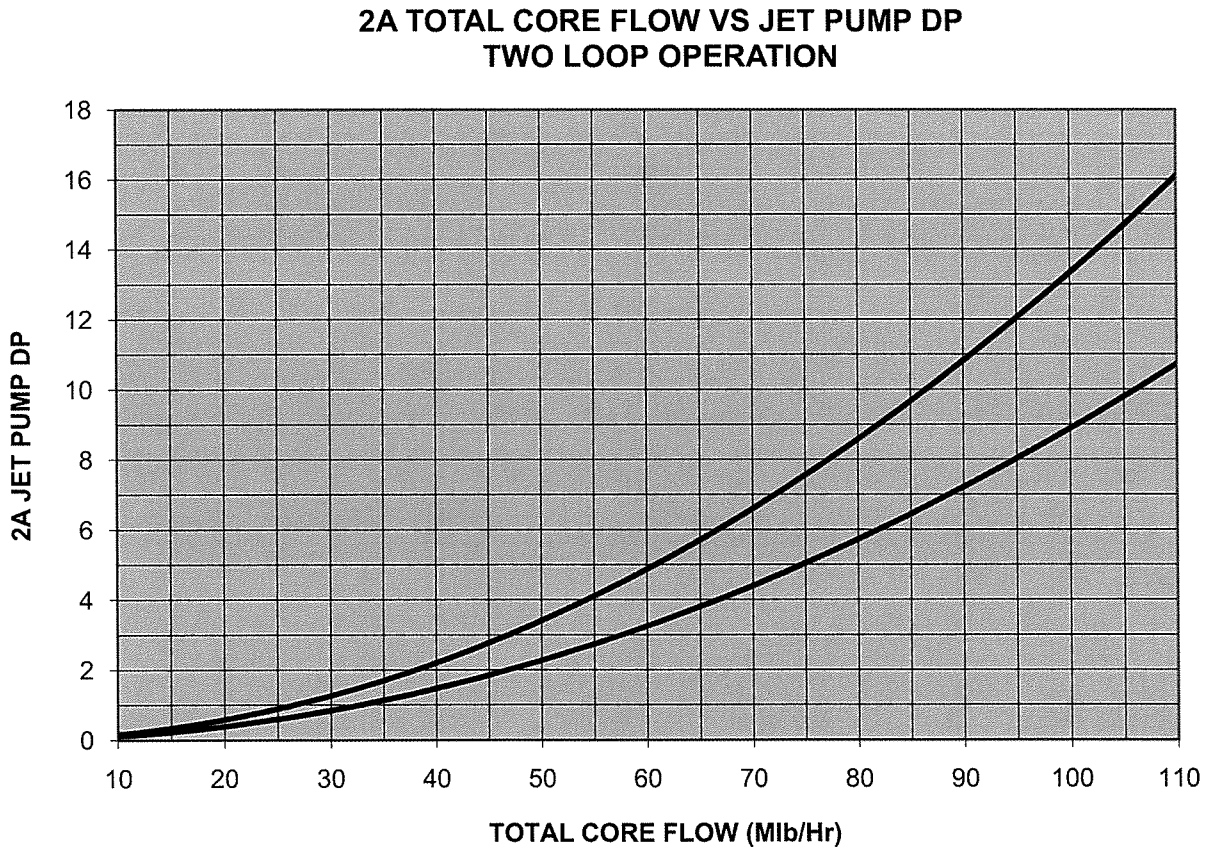
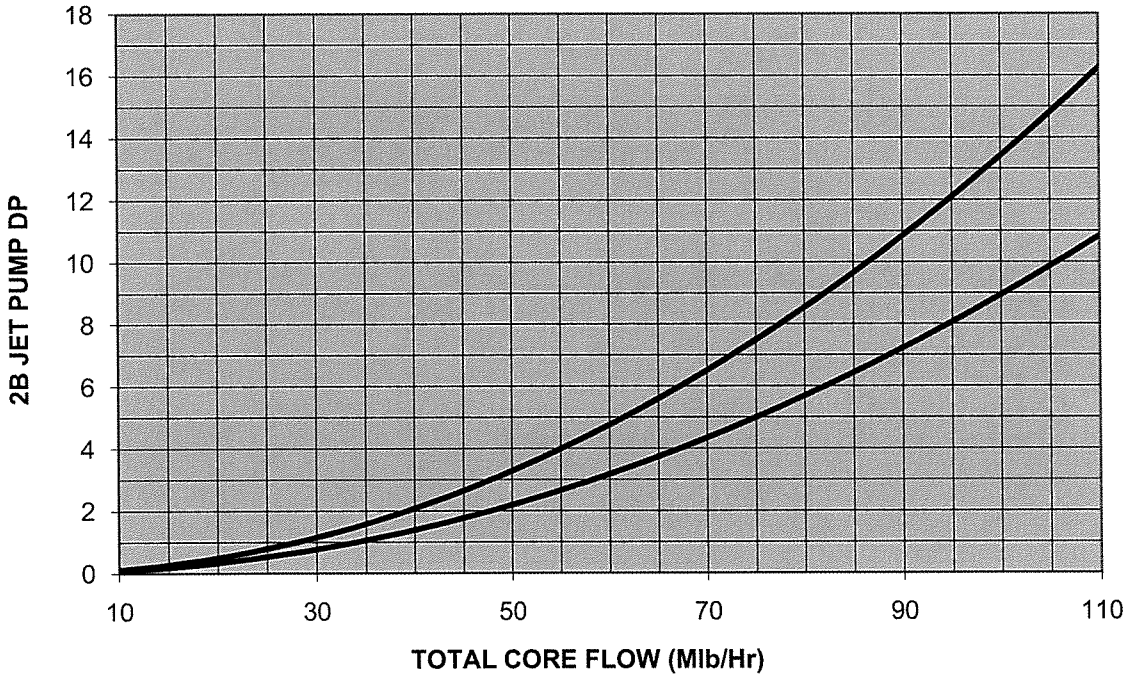


Illustration 6
(Page 1 of 1)

2B Jet Pump Differential Pressure VS Total Core Flow
Unit 2 Cycle 16
Good Thru 10-13-2013

Date: _____

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



OPERATOR: _____

SRO ____ DATE:_____

JPM NUMBER: SRO A2

TASK NUMBER: S-000-AD-27

TASK TITLE: LCO Tracking Log Entry for an active LCO

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 ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

neil 5/2013

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.

****

Class Room

****

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.

START TIME_____

****

Performance Step 1: Critical 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 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 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 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 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 □ No □

Standard:

Marks NO for stroke time acceptance criteria satisfied

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 6: Critical 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?

****

Performance Step 7: Critical 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 ___

Actions for
ACTIVE Technical Specifications, Unit 1, LCOTR #: 1-069-TS -2013-0003 → CRITICAL 5/13/201 :27

Action Statement: TS, 1, 3.6.1.3, A (0)

	Action	Timing Description	Entry	Action	Admin	Complete	Action Note	Recurring Timing	Applicable in Mode?
>	Isolate(1) the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.	Within 4 hours except for main steam lines	5/13/2013 15:23 Hakenewerth,	5/13/2013 19:23 Hakenewerth, Dou	5/13/2013 19:23 Hakenewerth,				☑
>	Verify(1) the affected penetration flow path is isolated.	Once per 31 days for isolation devices outside primary containment.	5/13/2013 15:23 Hakenewerth,	6/13/2013 15:23 Hakenewerth, Dou	6/13/2013 15:23 Hakenewerth,		Isolation devices in high radiation areas may be verified by use of administrative means.	Once per 31 days for isolation devices outside primary containment.	☑

Critical

Critical

* ANSWER KEY *

Surveillance Task Sheet (STS)

Work Order #: 114456234

PM#: P1950RWC

Procedure: 1-SR-3.6.1.3.5(RWCU)

Title: 1-SR-3.6.1.3.5(RWCU) - RWCU SYSTEM PCIV OPERABILITY TEST

Data Sheets Attached:

Perf Grp: OPS **Unit:** 1 **Loop/Div:** /NA

Test Reason: Periodic

Due Date: 06/14/13

Frequency: 91 DAYS **Tech Spec:** Y **ASME XI:**

Applicable Modes: **Perf Modes:**

Clearance Required: N **EQ:** **LCO Entered:** N

Dry-Cask Storage: N

Unit Supervisor — Authorization to Begin: SRO

TODAY — Date & Time

TODAY — Start Date & Time

Completion Date & Time

Maximo dates verified: SI Coordinator

Date & Time

Performed By:

Print Name	Signature	Initial	Section
OPERATOR	Operator	OP	OPS

Was this a Complete or Partial Performance?
(Explain Partial in REMARKS below) Complete [ ] Partial [ ]

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

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

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* criteria were not satisfied, was as LCO/ODCM action required?
(Explain in REMARKS below) Yes [ ] No [ ] N/A [ ]

Alert Work Contol Required? Yes [ ] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date
IST		

Copy of STS sent to Work Control AND SI Coordinator (next Bus. Day)

/
Initials Date

Test Director/Lead Performer — Date

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

Frequency Notes: ONCE PER 92 DAYS - Key Events: SUSupport Required: 1-OP, 1-OCApplicability Notes:MODES 1,2,3 - TS 5.5.6/ASME SECT XI FUNCTIONSTS 5.5.6/ASME SECTION XI FUNCTIONS: MODES 1,2,3LCO 3.6.1.5 FUNCTIONS: MODES 1,2,&3 Frequency Notes: ONCE PER 92 DAYS

REMARKS:

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

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 non-intent in nature.

Table of Contents

Table of Contents (continued)

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.

1.2.2 Surveillance Requirements Fulfilled

Technical Specification surveillance requirements fully or partially fulfilled are shown in the table below:

Operability Test	Technical Specification	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	Required Conditions
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."

Date TODAY

4.0 PREREQUISITES

NOTE

The Surveillance Task Sheet (STS) may be completed as information becomes available.

4.1 Preliminary Actions

[1] **VERIFY** this copy of 1-SR-3.6.1.3.5(RWCU) is the most current revision. OP

[2] **OBTAIN** a STS for this procedure and Work Activity. (Key Number P1950RWC) OP

[3] **VERIFY** the Primary Containment Isolation System is not generating an isolation signal. OP

[4] **INDICATE** the reason for test performance, **AND**

RECORD any pertinent information (WO requiring PMT, reason for test, required Appendices, etc.) in the "Remarks" section below:

- ☑ Periodic performance
- ☐ Post Maintenance / Modification Test performance
- ☐ Other Test Performance

Remarks: NONE

OP

[5] **IF** reason for this test is **PERIODIC** performance, **THEN**

MARK "Test Required" for ALL valves / appendices listed in Step 6.0[7]. (Otherwise N/A) OP

Date Today

4.1 Preliminary Actions (continued)

[6] **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

[7] **DISCARD** all appendices NOT marked as "Test Required" in Step 6.0[7]. OP

[8] **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: 1 OP

4.2 Special Tools, Measuring and Test Equipment, Parts and Supplies

NOTE

The digital stopwatch M&TE ID number is recorded in each Appendix as it is performed.

[9] **OBTAIN** digital stopwatch(es). OP

4.3 Approvals and Notifications

[11] **OBTAIN** on the STS Authorization Signature and Date/Time from the Unit Supervisor (US) to perform this surveillance. OP

[12] [NRC/C] **NOTIFY** Unit 1 Unit Operator this test is commencing.
[NRC Inspection Report 82-16, LER 259/8232] OP

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

2. 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.

5.0 ACCEPTANCE CRITERIA (continued)

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.

Date TODAY

6.0 PERFORMANCE

[1] **VERIFY** Precautions and Limitations in Section 3.0 have been reviewed. OP

[2] **VERIFY** Prerequisites listed in Section 3.1 are satisfied. OP

[3] **RECORD** the Start Date & Time on the STS. OP

[4] **RECORD** the initial position of RWCU INBD SUCT ISOLATION VALVE, 1-FCV-69-1.

Initial Position: OPEN ☑ CLOSE ☐ (check one) OP

[5] **RECORD** the initial position of RWCU OUTBD SUCT ISOLATION VALVE, 1-FCV-69-2.

Initial Position: OPEN ☑ CLOSE ☐ (check one) OP

[6] **IF** RWCU system is in service, **THEN**

SHUT DOWN the RWCU system in accordance with 1-OI-69. (Otherwise N/A) OP

NOTE

Appendices in the following step may be performed in any order provided the steps within each appendix are performed in the order specified.

[7] **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	A	☑	☐	
1-FCV-69-2	B	☑	☐	

Date TODAY

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) _____

Date TODAY

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)

Valve UNID	Engineering Evaluation Required			Reference Value Reconfirm or Determine Required	SR/PER Number
	New Stroke Time Represents Acceptable Operation	Cause of Initial Stroke Time Deviation	Abnormal/ Erratic Action Need for Corrective Action		
1-FCV-69-1	☐	☐	☐	☐	
1-FCV-69-2	☐	☐	☐	☐	

[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. _____

Date TODAY

7.2 IST Engineer Results Review

NOTES

1) 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
	☐	☐	
	☐	☐	

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.

Appendix A
(Page 1 of 12)

1-FCV-69-1 Operational Readiness

Date TODAY

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	Abnormal or Erratic action?	
25.50	**Step**	**O → C (Closing Time)**		<21.68	21.68 to 29.32	>29.32	>30.00	No	Yes
	2.0[5]	As Found	28.36	☐	☒	☐	☐	☒	☐
	3.0[3]	1st Restroke		☐	☐	☐	☐	☐	☐
	3.0[6]	2nd Restroke		☐	☐	☐	☐	☐	☐
N/A	**Step**	**C → 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 ☐ No ☐

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1-FCV-69-1 Operational Readiness

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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

[1] **RECORD** the stopwatch M&TE ID number:

M&TE: STOPWATCH OP

[2] **VERIFY** Steps 6.0[4], 6.0[5], and 6.0[6] have been completed. OP

[3] **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.

[4] **CLOSE** and **TIME** 1-FCV-69-1 using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1. OP

[5] **RECORD** the As Found Measured Stroke Time (Closing) for 1-FCV-69-1 in Section 1.0 Stroke Time Data Table. OP

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1-FCV-69-1 Operational Readiness

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2.0 1-FCV-69-1 AS FOUND STROKE TIME (continued)

[6] **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

[7] **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**

DESCRIBE ANY observed abnormal or erratic condition(s) in Section 1.0 Stroke Time Data Table Comments section. OP

[8] **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**

PERFORM the following: (Otherwise N/A)

[8.1] **DECLARE** valve 1-FCV-69-1 INOPERABLE. NA

[8.2] **INITIATE** the appropriate LCO actions.

[8.3] **MARK** Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table and the STS.

[9] **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

[10] **IF** the As Found stroke time recorded in the Section 1.0 Stroke Time Data Table is in Stroke Time Code Criteria, **THEN**

PERFORM the following: (Otherwise N/A)

[10.1] **MARK** substeps in Step 2.0[11] N/A. OP

[10.2] **MARK** Section 3.0 of this appendix N/A. OP

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1-FCV-69-1 Operational Readiness

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2.0 1-FCV-69-1 AS FOUND STROKE TIME (continued)

NOTE

Section 3.0 of this appendix restrokes the valve two additional times.

[11] **IF** 1-FCV-69-1 cannot be restroked due to mechanical failure or other reason(s), **THEN**

PERFORM the following actions: (Otherwise N/A)

[11.1] **DECLARE** valve 1-FCV-69-1 INOPERABLE. NA

[11.2] **INITIATE** the appropriate LCO actions.

[11.3] **MARK** Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table.

[11.4] **MARK** Section 3.0 of this appendix "N/A."

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3.0 1-FCV-69-1 RESTROKE TIMES

[1] **OPEN** 1-FCV-69-1 using RWCU INBD SUCT ISOLATION VALVE, 1-HS-69-1. N/A

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-69-1 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

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-69-1 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. NA

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1-FCV-69-1 Operational Readiness

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3.0 1-FCV-69-1 RESTROKE TIMES (continued)

[7] **COMPARE** the 1st Restroke Measured Stroke Time AND the 2nd Restroke Measured Stroke Time 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. NA

[8] **MARK** the applicable box (No / Yes) for EACH valve restroke in Section 1.0 Stroke Time Data Table for 1-FCV-69-1 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

[1] **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) OP

[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-69-2 testing will be performed.) NA

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1-FCV-69-1 Operational Readiness

Date TODAY

5.0 DATA REVIEW

5.1 General Review

[1] **IF** reason for test marked in step 4.1[4] of main body of procedure is "Periodic", **THEN**

MARK Section 5.3 N/A. (Otherwise N/A) DP

[2] **IF** reason for test marked in step 4.1[4] of main body of procedure is NOT "Periodic", **THEN**

MARK Section 5.2 N/A. (Otherwise N/A) NA

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: (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-69-1 Operational Readiness

Date Today

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-FCV-69-1 Operational Readiness

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5.2 Review of Data from Periodic Tests (continued)

[3] **IF** BOTH of the 1st Restroke and 2nd Restroke Measured Stroke Times (Closing) for 1-FCV-69-1 recorded in Section 1.0 Stroke Time Data Table are in the Stroke Time Code Criteria, **THEN**

PERFORM the following: (Otherwise N/A)

[3.1] **INITIATE** SR/PER to ensure a follow-up Engineering Evaluation is performed to analyze the deviation between as found and restroke stroke times. _____

[3.2] **MARK** table in Step 7.1[4] of main body of procedure for 1-FCV-69-1 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**

PERFORM the following: (Otherwise N/A)

[4.1] **INITIATE** SR/PER to ensure a follow-up Engineering Evaluation is performed to determine the need for corrective action _____

[4.2] **MARK** table in Step 7.1[4] of main body of procedure for 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.

[5] **IF** the evaluation of test results is not completed within the 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)

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1-FCV-69-1 Operational Readiness

Date TODAY

5.2 Review of Data from Periodic Tests (continued)

[5.1] **DECLARE** valve-1-FCV-69-1 INOPERABLE. _____

[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,
  OR ☐

- The As Found stroke time (Closing) is in High Alert or Low Alert **AND** BOTH 1st and 2nd Restroke times (Closing) are in Stroke Time Code Criteria,
  OR ☐

- The As Found stroke time (Closing) is in High Alert or Low Alert **AND** ANY 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 valve operation, **THEN** ☐

MARK the condition satisfied above, **AND**

MARK Acceptance Criteria Satisfied as "Yes" in Section 1.0 Stroke Time Data Table and the STS. (Otherwise N/A) _____

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1-FCV-69-1 Operational Readiness

Date TODAY

5.2 Review of Data from Periodic Tests (continued)

[7] **IF** Step 5.2[6] above is marked N/A, **THEN**

PERFORM the following: (Otherwise N/A)

[7.1] **DECLARE** valve 1-FCV-69-1 INOPERABLE. _____

[7.2] **INITIATE** the appropriate LCO actions. _____

[7.3] **INITIATE** SR/PER to begin corrective actions. _____

[7.4] **MARK** Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table. _____

5.3 Review of Data from PMT / Other Tests

[1] **IF** ALL 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 actions: (Otherwise N/A)

[1.1] **MARK** Acceptance Criteria Satisfied as "Yes" in Section 1.0 Stroke Time Data Table and the STS. NA

[1.2] **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. _____

[1.3] **MARK** remaining steps in Section 5.3 N/A. _____

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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. NA

[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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1-FCV-69-2 Operational Readiness

Date TODAY

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	Measured Stroke Time (seconds)			Low Alert	Stroke Time Code Criteria	High Alert	Limiting Value	Abnormal or Erratic action?	
19.10	**Step**	**O → C (Closing Time)**		<16.24	16.24 to 21.96	>21.96	>30.00	No	Yes
	2.0[5]	As Found	30.03	☐	☐	☐	☒	☒	☐
	3.0[3]	1st Restroke		☐	☐	☐	☐	☐	☐
	3.0[6]	2nd Restroke		☐	☐	☐	☐	☐	☐
N/A	**Step**	**C → 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 ☐ No ☐

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1-FCV-69-2 Operational Readiness

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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

[1] **RECORD** the stopwatch M&TE ID number:

M&TE: STOP WATCH OP

[2] **VERIFY** procedure main body Steps 6.0[4], 6.0[5], and 6.0[6] have been completed. OP

[3] **VERIFY OPEN** 1-FCV-69-2, using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A. 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.

[4] **CLOSE** and **TIME** 1-FCV-69-2 using RWCU OUTBD SUCT ISOLATION VALVE, 1-HS-69-2A. OP

[5] **RECORD** the As Found Measured Stroke Time (Closing) for 1-FCV-69-2 in Section 1.0 Stroke Time Data Table. OP

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2.0 1-FCV-69-2 AS FOUND STROKE TIME (continued)

[6] **COMPARE** the As Found Measured Stroke Time (Closing) 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. OP

[7] **MARK** the applicable box (No / Yes) for EACH As Found valve stroke 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 Section 1.0 Stroke Time Data Table Comments section. OP

[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: (Otherwise N/A)

[8.1] **DECLARE** valve 1-FCV-69-2 INOPERABLE. _____

[8.2] **INITIATE** the appropriate LCO actions. _____

[8.3] **MARK** Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table and the STS. _____

[9] **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

[10] **IF** the As Found stroke time recorded in the Section 1.0 Stroke Time Data Table is in Stroke Time Code Criteria, **THEN**

PERFORM the following: (Otherwise N/A)

[10.1] **MARK** substeps in Step 2.0[11] N/A. _____

[10.2] **MARK** Section 3.0 of this appendix N/A. _____

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1-FCV-69-2 Operational Readiness

Date TODAY

2.0 1-FCV-69-2 AS FOUND STROKE TIME (continued)

NOTE

Section 3.0 of this appendix restrokes the valve two additional times.

[11] **IF** 1-FCV-69-2 cannot be restroked due to mechanical failure or other reason(s), **THEN**

PERFORM the following actions: (Otherwise N/A)

[11.1] **DECLARE** valve 1-FCV-69-2 INOPERABLE. _____

[11.2] **INITIATE** the appropriate LCO actions. _____

[11.3] **MARK** Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table. _____

[11.4] **MARK** Section 3.0 of this appendix "N/A." _____

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1-FCV-69-2 Operational Readiness

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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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1-FCV-69-2 Operational Readiness

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3.0 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

[1] **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

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5.0 DATA REVIEW

5.1 General Review

(1) **IF** reason for test marked in step 4.1[4] of main body of procedure is "Periodic", **THEN**

MARK Section 5.3 N/A. (Otherwise N/A) OP

(2) **IF** reason for test marked in step 4.1[4] of main body of procedure is NOT "Periodic", **THEN**

MARK Section 5.2 N/A. (Otherwise N/A) NA

5.2 Review of Data from Periodic Tests

[1] **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, **THEN**

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

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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

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5.2 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**

PERFORM the following: (Otherwise N/A)

[3.1] **INITIATE** SR/PER to ensure a follow-up Engineering Evaluation is performed to analyze the deviation between as found and restroke stroke times. _____

[3.2] **MARK** 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**

PERFORM the following: (Otherwise N/A)

[4.1] **INITIATE** SR/PER to ensure a follow-up Engineering Evaluation is performed to determine the need for corrective action _____

[4.2] **MARK** 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.

[5] **IF** the evaluation of test results is not completed within the 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)

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1-FCV-69-2 Operational Readiness

Date TODAY

5.2 Review of Data from Periodic Tests (continued)

[5.1] **DECLARE** valve-1-FCV-69-2 INOPERABLE. _____

[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,
  OR ☐
- The As Found stroke time (Closing) is in High Alert or Low Alert **AND** BOTH 1st and 2nd Restroke times (Closing) are in Stroke Time Code Criteria,
  OR ☐
- The As Found stroke time (Closing) is in High Alert or Low Alert **AND** ANY 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 valve operation, **THEN** ☐

MARK the condition satisfied above, **AND**

MARK Acceptance Criteria Satisfied as "Yes" in Section 1.0 Stroke Time Data Table and the STS. (Otherwise N/A) _____

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1-FCV-69-2 Operational Readiness

Date TODAY

5.2 Review of Data from Periodic Tests (continued)

[7] **IF** Step 5.2[6] above is marked N/A, **THEN**

PERFORM the following: (Otherwise N/A)

[7.1] **DECLARE** valve 1-FCV-69-2 INOPERABLE. _____

[7.2] **INITIATE** the appropriate LCO actions. _____

[7.3] **INITIATE** SR/PER to begin corrective actions. _____

[7.4] **MARK** Acceptance Criteria Satisfied as "No" in the Section 1.0 Stroke Time Data Table. _____

5.3 Review of Data from PMT / Other Tests

[1] **IF** ALL 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**

PERFORM the following actions: (Otherwise N/A)

[1.1] **MARK** Acceptance Criteria Satisfied as "Yes" in Section 1.0 Stroke Time Data Table and the STS. NA

[1.2] **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. ↓

[1.3] **MARK** remaining steps in Section 5.3 N/A. _____

Appendix B
(Page 12 of 12)

1-FCV-69-2 Operational Readiness

Date TODAY

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. NA

[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:_____

JPM NUMBER: SRO A2

TASK NUMBER: S-000-AD-27

TASK TITLE: LCO Tracking Log Entry for an active LCO

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 ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

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:

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 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 □ No □

Standard:

Marks YES for stroke time acceptance criteria satisfied

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 2: Critical Not Critical 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 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 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 □ No □

Standard:

Marks NO for stroke time acceptance criteria satisfied

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 6: Critical 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 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

TASK TITLE: LCO Tracking Log Entry for an active LCO

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 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 ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

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 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.

START TIME_____

****

Performance Step 1: Critical X Not Critical

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 □ No □

Standard:

Marks YES for stroke time acceptance criteria satisfied

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 2: Critical Not Critical 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

[8] **IF** the As Found Measured Stroke Time for 3-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 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 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 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 X Not Critical

How will Tech Spec Action Statement A.1 be met?

Standard:

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 ___

OPERATOR: _____

SRO ____ DATE: _____

JPM NUMBER: Admin SRO 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 PERFORMANCE: Classroom

REFERENCES/PROCEDURES NEEDED: 0-SI-4.8.B.1.a.1, ODCM

VALIDATION TIME: 15 minutes

PERFORMANCE TIME:

COMMENTS: _____

_____

_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

Rec'd 5/2/11

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.

****

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.

START TIME_____

****

Performance Step 1: Critical 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
Reactor Building (1-RM-90-250) **4000 x 0.64 = 2560**	Reactor Building (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) **500 x 0.75 = 375** (1-RM-90-251) **910 x 0.80 = 728**	Turbine Building (2-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:_____

_____

****

Performance Step 2: Critical 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 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.

Unit 1		Unit 2		Unit 3		Radwaste		Total
3663	+	5522	+	4204	+	140	=	**13529**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 4: Critical X Not Critical

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 µCi/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 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 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 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.

[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 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 [(μCi/sec) together. Refer to Answer Sheet for correct value or see below.

22700 **x** 4.55×10^{5} **x** 1.23×10^{-3} = **1.27×10^{7}**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 9: Critical 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 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 μCi/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:_____

_____

****

Performance Step 11: Critical Not Critical 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 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.

$1.27x10^7$ x 1.00 = **$1.27x10^7$**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 13: Critical 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 µCi/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:_____

_____

****

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 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:_____

_____

****

Performance Step 16: Critical 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

Attachment 2
(Page 1 of 1)

Site Effluent Release Rate Summary

Week From TODAY To _____

DAY	SHIFT	SI STEP		Reactor Power (MWT)			Building 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	Initials	
		7.0[6]	7.0[7]	Unit 1 7.0[8.1]	Unit 2 7.0[8.1]	Unit 3 7.0[8.1]					AUO	Unit Supervisor
FRI	D	OP	OP	3455	3452	3454	.09	.882	.972	≤ 1.00	AUO	
	N									≤ 1.00		
SAT	D									≤ 1.00		
	N									≤ 1.00		
SUN	D									≤ 1.00		
	N									≤ 1.00		
MON	D									≤ 1.00		
	N									≤ 1.00		
TUE	D									≤ 1.00		
	N									≤ 1.00		
WED	D									≤ 1.00		
	N									≤ 1.00		
THU	D									≤ 1.00		
	N									≤ 1.00		

Initials added as a result of BFPER 960634.

ANSWER KEY

*

Attachment 4
(Page 1 of 4)

Building Effluent Release Rate Log

Week From TODAY To _____
Unit 1

DAY	SHIFT	Reactor Building 1-RM-90-250			Turbine Building 1-RM-90-249			Turbine Building 1-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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											

1 See Attachment 5 for Release Factor.

ANSWER KEY

*

Attachment 4
(Page 2 of 4)

Week From TODAY To _____
Unit 2

DAY	SHIFT	Reactor Building 2-RM-90-250			Turbine Building 2-RM-90-249			Turbine Building 2-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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	AUO	
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

ANSWER KEY

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Attachment 4
(Page 3 of 4)

Week From TODAY To _____
Unit 3

DAY	SHIFT	Reactor Building 3-RM-90-250			Turbine Building 3-RM-90-249			Turbine Building 3-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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	.40	640	1900	.75	1425	AOP	
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

ANSWER KEY

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Attachment 4
(Page 4 of 4)

Week From _____ To _____
Unit 0

DAY	SHIFT	Radwaste Building 0-RM-90-252			Unit Total Release Rates (µCi/sec)			Building Ventilation Release Rate (µCi/sec)	Building Ventilation Release Fraction	Acceptance Criteria	Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Unit 1	Unit 2	Unit 3				AUO	Unit Supervisor
		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	.62	140	3663	5522	4204	13529	.09	≤ 0.90	AUO	
	N									≤ 0.90		
SAT	D									≤ 0.90		
	N									≤ 0.90		
SUN	D									≤ 0.90		
	N									≤ 0.90		
MON	D									≤ 0.90		
	N									≤ 0.90		
TUE	D									≤ 0.90		
	N									≤ 0.90		
WED	D									≤ 0.90		
	N									≤ 0.90		
THU	D									≤ 0.90		
	N									≤ 0.90		

1 See Attachment 5 for Release Factor.

ANSWER KEY

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Attachment 6
(Page 1 of 2)

Elevated Effluent Release Rate Log

Week From _____ To _____

DAY	SHIFT	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	4.55×10^5	9.75×10^4	4.55×10^5	22700	1.23E-03	1.27×10^7
R	N					1.23E-03	
S	D					1.23E-03	
A	N					1.23E-03	
S	D					1.23E-03	
U	N					1.23E-03	
M	D					1.23E-03	
O	N					1.23E-03	
T	D					1.23E-03	
U	N					1.23E-03	
W	D					1.23E-03	
E	N					1.23E-03	
T	D					1.23E-03	
H	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

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Attachment 6
(Page 2 of 2)

Week From TODAY To _____

DAY	SHIFT	DATA RECORDED IN STEP 7.0[11.4]	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]	Acceptance Criteria	Initials	
									AUO	Unit Supervisor
FRI	D	1.27×10^7	1.29×10^6	1.27×10^7	1.00	1.27×10^7	.882	≤ 0.10	AUO	
	N							≤ 0.10		
SAT	D							≤ 0.10		
	N							≤ 0.10		
SUN	D							≤ 0.10		
	N							≤ 0.10		
MON	D							≤ 0.10		
	N							≤ 0.10		
TUE	D							≤ 0.10		
	N							≤ 0.10		
WED	D							≤ 0.10		
	N							≤ 0.10		
THU	D							≤ 0.10		
	N							≤ 0.10		

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

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

ANSWER KEY

*

Surveillance Task Sheet (STS)

Work Order #: 114084714

PM#: P1470
Procedure: 0-SI-4.8.B.1.A.1
Title: 0-SI-4.8.B.1.A.1 - AIRBORNE EFFLUENT RELEASE RATE

Data Sheets Attached:

Perf Grp: OPS **Unit:** 0 **Loop/Div:** /NA
Test Reason: Periodic
Due Date: 06/07/13
Frequency: 7 DAYS **Tech Spec:** Y **ASME XI:**
Applicable Modes: **Perf Modes:**
Clearance Required: N **EQ:** **LCO Entered:** N
Dry-Cask Storage: N

Authorization to Begin: SRO _____ Date & Time _____

Start Date & Time _____ Completion Date & Time _____

Maximo dates verified: SI Coordinator _____ Date & Time _____

Performed By:

Print Name	Signature	Initial	Section

Was this a Complete or Partial Performance?
(Explain Partial in REMARKS below) Complete [ ] Partial [ ]

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

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

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* criteria were not satisfied, was as LCO/ODCM action required?
(Explain in REMARKS below) Yes [ ] No [ ] N/A [ ]

Alert Work Contol Required? Yes [ ] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date
CE		

Copy of STS sent to Work Control AND SI Coordinator (next Bus. Day) _____ / _____
Initials Date

Test Director/Lead Performer _____ Date _____

Acceptance Criteria Review: SRO _____ Date & Time _____

Independent Reviewer _____ Date & Time _____

PERMANENT COMMENTS:

Frequency Notes: ONCE PER WEEK & ONCE PER SHIFT, RELEASE RATE INFO,ONCE PER DAY, EACH EFFLUENT RADIATION MONITOR - Frequency Notes: ONCE PER WEEK & ONCE PER SHIFT, RELEASE RATE INFO,ONCE PER DAY, EACH EFFLUENT RADIATION MONITOR SHALL DEMONSTRATE THE OPERABILITY OF ITS SAMPLING RATE INSTRUMENTATION & ASSOCIATED SAMPLE FLOW ALARMS.

REMARKS: _____

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

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.

Table of Contents

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.

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

3.0 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.)

4.0 PREREQUISITES

[1] **VERIFY** this copy of the procedure is the most current revision. OP

[2] **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P1470) OP

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 μCi/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 μCi/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.

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].

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)	
	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

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.

Date TODAY

7.0 PROCEDURE STEPS

NOTES

1. 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. Attachments **NOT** used in the performance of this SI do **NOT** need to be included in the completed SI package.

[1] **OBTAIN** permission from the Unit 1 Unit Supervisor to perform this instruction. GW U1

[2] **OBTAIN** permission from the Unit 2 Unit Supervisor to perform this instruction. MG U2

[3] **OBTAIN** permission from the Unit 3 Unit Supervisor to perform this instruction. DK U3

[4] [NRC/C] **NOTIFY** 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. 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]

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

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

Date TODAY

7.0 PROCEDURE STEPS (continued)

[8] **OBTAIN** the following information.

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

ENTER 0.

NOTE

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.

[9] Fan Status Determination

[9.1] RM-90-249

[9.1.1] 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.

[9.1.2] 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.

[9.2] RM-90-250

[9.2.1] 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.

[9.3] RM-90-251

[9.3.1] 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.

7.0 PROCEDURE STEPS (continued)

[9.3.2] 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.

[9.4] 0-RM-90-252 (Unit 1 Only)

[9.4.1] 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.

[9.5] **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.

[9.6] 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)

[10] **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**:

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

[10.1.1] 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)**.

Date TODAY

7.0 **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 µCi/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 manual sampling is being accomplished in accordance with 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.

NA

[10.1.4] **IF** the ventilation system for a CAM is totally isolated (i.e., no environmental releases occurring), **THEN**

NA

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.

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) µCi/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)

[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**

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**

NA **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.

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 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.

[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).

[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**

NA

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] **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.

7.0 PROCEDURE STEPS (continued)

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**

NA **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 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).

[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.

[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.

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) µCi/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**

NA **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

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				

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				

Attachment 1
(Page 2 of 2)

Remarks Log

Week From _____ To _____

Remark Number	Attachment or Step	Remarks	Time	Date	Initials

Attachment 2
(Page 1 of 1)

Site Effluent Release Rate Summary

Week From TODAY To _____

DAY	SHIFT	SI STEP		Reactor Power (MWT)			Building 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	Initials	
		7.0[6]	7.0[7]	Unit 1 7.0[8.1]	Unit 2 7.0[8.1]	Unit 3 7.0[8.1]					AUO	Unit Supervisor
FRI	D	OP	OP	3455	3452	3454				≤ 1.00		
	N									≤ 1.00		
SAT	D									≤ 1.00		
	N									≤ 1.00		
SUN	D									≤ 1.00		
	N									≤ 1.00		
MON	D									≤ 1.00		
	N									≤ 1.00		
TUE	D									≤ 1.00		
	N									≤ 1.00		
WED	D									≤ 1.00		
	N									≤ 1.00		
THU	D									≤ 1.00		
	N									≤ 1.00		

Initials added as a result of BFPER 960634.

Attachment 3
(Page 1 of 3)

Fan Status Report

Week From TODAY To _____

Unit 1 DAY	SHIFT	Reactor Building									Turbine Building																		Radwaste Building			AUO Init
		1-RM-90-250									1-RM-90-251										1-RM-90-249								0-RM-90-252			
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J					
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	0	1	2	
Fri	D		B				A		A		X			X	X		X		X		X		X		X			X		X		BOP
	N																															
Sat	D																															
	N																															
Sun	D																															
	N																															
Mon	D																															
	N																															
Tue	D																															
	N																															
Wed	D																															
	N																															
Thu	D																															
	N																															
Total																																

Attachment 3
(Page 2 of 3)

Week From TODAY To _____

Unit 2 DAY	SHIFT	Reactor Building									Turbine Building																		AUO Init
		2-RM-90-250									2-RM-90-251										2-RM-90-249								
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J		
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	
Fri	D		B				A		A		X		X		X		X		X		X		X		X		X		AoP
	N																												
Sat	D																												
	N																												
Sun	D																												
	N																												
Mon	D																												
	N																												
Tue	D																												
	N																												
Wed	D																												
	N																												
Thu	D																												
	N																												
Total																													

Attachment 3
(Page 3 of 3)

Week From TODAY To _____

Unit 3 DAY	SHIFT	Reactor Building									Turbine Building																		AUO Init.
		3-RM-90-250									3-RM-90-251										3-RM-90-249									
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J		
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	
Fri	D		A				B		A			X	X		X		X			X		X	X		X			X	AOP
	N																												
Sat	D																												
	N																												
Sun	D																												
	N																												
Mon	D																												
	N																												
Tue	D																												
	N																												
Wed	D																												
	N																												
Thu	D																												
	N																												
Total																													

Attachment 4
(Page 1 of 4)

Building Effluent Release Rate Log

Week From TODAY To _____
Unit 1

DAY	SHIFT	Reactor Building 1-RM-90-250			Turbine Building 1-RM-90-249			Turbine Building 1-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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				
	N											
SAT	D											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

Attachment 4
(Page 2 of 4)

Week From TODAY To _____
Unit 2

DAY	SHIFT	Reactor Building 2-RM-90-250			Turbine Building 2-RM-90-249			Turbine Building 2-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

Attachment 4
(Page 3 of 4)

Week From TODAY To _____
Unit 3

DAY	SHIFT	Reactor Building 3-RM-90-250			Turbine Building 3-RM-90-249			Turbine Building 3-RM-90-251			Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Release Rate (µCi/sec)	Release Factor See Note	Actual Rate µCi/sec	AUO	Unit 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											
	N											
SUN	D											
	N											
MON	D											
	N											
TUE	D											
	N											
WED	D											
	N											
THU	D											
	N											

1 See Attachment 5 for Release Factor.

Attachment 4
(Page 4 of 4)

Week From TODAY To _____
Unit 0

DAY	SHIFT	Radwaste Building 0-RM-90-252			Unit Total Release Rates (µCi/sec)			Building Ventilation Release Rate (µCi/sec)	Building Ventilation Release Fraction	Acceptance Criteria	Initials	
		Release Rate (µCi/sec)	Release Factor See Note	Actual Rate (µCi/sec)	Unit 1	Unit 2	Unit 3				AUO	Unit Supervisor
		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									≤ 0.90		
SAT	D									≤ 0.90		
	N									≤ 0.90		
SUN	D									≤ 0.90		
	N									≤ 0.90		
MON	D									≤ 0.90		
	N									≤ 0.90		
TUE	D									≤ 0.90		
	N									≤ 0.90		
WED	D									≤ 0.90		
	N									≤ 0.90		
THU	D									≤ 0.90		
	N									≤ 0.90		

1 See Attachment 5 for Release Factor.

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

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

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

Attachment 6
(Page 1 of 2)

Elevated Effluent Release Rate Log

Week From TODAY To _____

DAY	SHIFT	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	4.55×10^5	9.75×10^4		22700	1.23E-03	
R	N					1.23E-03	
S	D					1.23E-03	
A	N					1.23E-03	
S	D					1.23E-03	
U	N					1.23E-03	
M	D					1.23E-03	
O	N					1.23E-03	
T	D					1.23E-03	
U	N					1.23E-03	
W	D					1.23E-03	
E	N					1.23E-03	
T	D					1.23E-03	
H	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).

Attachment 6
(Page 2 of 2)

Week From TODAY To _____

DAY	SHIFT	DATA RECORDED IN STEP 7.0[11.4]	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]	Acceptance Criteria	Initials	
									AUO	Unit Supervisor
FRI	D		1.29×10^6		1.00			≤ 0.10		
	N							≤ 0.10		
SAT	D							≤ 0.10		
	N							≤ 0.10		
SUN	D							≤ 0.10		
	N							≤ 0.10		
MON	D							≤ 0.10		
	N							≤ 0.10		
TUE	D							≤ 0.10		
	N							≤ 0.10		
WED	D							≤ 0.10		
	N							≤ 0.10		
THU	D							≤ 0.10		
	N							≤ 0.10		

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

2 Divide actual Stack release rate (µCi/sec) by 1.44E+07 µCi/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: Follow up Notification Appendix F and J are completed with EAL Designator 2.3-G2, PAR is recommendation 2, from 283° - 326°

LOCATION OF PERFORMANCE: Simulator or Class Room

REFERENCES/PROCEDURES NEEDED: EPIP 1, EPIP 5

VALIDATION TIME: 30 minutes

PERFORMANCE TIME:

COMMENTS: _____

_____

_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

Rec'd 5/2/11

****

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 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

START TIME_____

****

Performance Step 1: Critical Not Critical X

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 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 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 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

Reactor Power	15%
Reactor Level	-145 inches just prior to ED
Reactor Pressure	300 psig, Emergency Depressurization in progress
DW Pressure	56 psig and stable with Appendix 13 in progress
Suppression Chamber Pressure	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°

APPENDIX A
Page 1 of 1

GENERAL EMERGENCY INITIAL NOTIFICATION FORM

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

2. GUY SMITH the SED at **Browns Ferry** has declared a **GENERAL EMERGENCY.**

3. **EAL Designator:** 2.1-G (USE ONLY ONE EAL DESIGNATOR)

4. **Brief Description of the Event:** Suppression Chamber pressure CAN NOT be maintained below 55psig

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

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

6. **Event Declared:** Time: 45 minutes ago (Central Time) Date: TODAY

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.)

Wind Direction is FROM: 323 degrees **(15 min average)** Wind Speed: 18 m.p.h **(15 min average)**

STEP MUST BE COMPLETED BY THE SITE EMERGENCY DIRECTOR

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

☐ **Recommendation 1** • EVACUATE LISTED SECTORS (2 mile Radius & 10 miles downwind) • Shelter remainder of 10 mile EPZ. • Consider issuance of POTASSIUM IODIDE in accordance with the State Plan.	RECOMMENDATION-1 ↓	WIND FROM DEGREES (Mark wind direction from Step 7)	RECOMMENDATION-2 ↓	☐ **Recommendation 2** • EVACUATE LISTED SECTORS (2 mile radius & 5 mile downwind) • SHELTER remainder of 10 mile EPZ. • Consider issuance of POTASSIUM IODIDE in accordance with the State Plan.
A2, B2, F2, G2, E5,E10, F5, F10, G5, G10		**From 4° - 40°**		**A2, B2, F2, G2, E5, F5, G5**
A2, B2, F2, G2, F5, F10, G5, G10, H10		From 41°- 73°		A2, B2, F2, G2, F5, G5
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		From 93° - 137°		A2, B2, F2, G2, A5, G5
A2, B2, F2, G2, A5, A10, I10, J10, K10		**From 138° - 203°**		**A2, B2, F2, G2, A5**
A2, B2, F2, G2, A5, A10, B5, B10		From 204° - 282°		A2, B2, F2, G2, A5, B5
A2, B2, F2, G2, B5, B10, C10, D10, E5,E10		**From 283°-326°**		**A2, B2, F2, G2, B5, E5**
A2, B2, F2, G2, C10, D10, E5,E10, F5, F10		From 327° - 3°		A2, B2, F2, G2, E5, F5

☒ **Recommendation 3**
- SHELTER all sectors
- CONSIDER issuance of POTASSIUM IODIDE in accordance with the State Plan.

Completed by: GUY SMITH **Approved by** MIKE JONES

* ANSWER KEY *

APPENDIX F
Page 1 of 1

GENERAL EMERGENCY FOLLOW-UP INFORMATION FORM

1. ☒ THIS IS A DRILL ☐ THIS IS AN ACTUAL EVENT

2. NAME the SED at **Browns Ferry** has declared an **GENERAL EMERGENCY**

3. **Reactor Status:**

Unit 1:	☒ Shutdown	☐ At Power	☐ Refueling	☐ N/A
Unit 2:	☐ Shutdown	☐ At Power	☐ Refueling	☐ N/A
Unit 3:	☐ Shutdown	☐ At Power	☐ Refueling	☐ N/A

4. **Additional EAL Designator(s)** 2.3-G2

5. **Significant changes in plant conditions:**

LOSS OF PRIMARY CONTAINMENT

6. **Significant changes in Radiological Conditions:**

DOSE AT SITE BOUNDARY 2000 mRem/HR

7. **Off-site Protective Action Recommendations:**
(UTILIZE APPENDIX J FOR MAKING AND COMMUNICATING PAR UPGRADES)

☐ Recommendation 1 ☒ Recommendation 2 ☐ Recommendation 3

8 **Onsite Protective Actions:**

Assembly/Accountability	☐ No	☐ Initiated	☒ Completed
Site Evacuation	☐ No	☐ Initiated	☒ Completed

9. **The Meteorological Conditions are**
(Use 91 meter data on the Met Tower & 15 Minute Averages)
Wind Speed: 18 m.p.h.
Wind Direction is from: 323 degrees

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

11. **Fax to applicable contact after reporting following-up information:**
CECC (5-751-1682), ODS (5-751-8620) or State of Alabama (9-1-205-280-2495).

Completed by: _____, **Date/Time** _____
Central Time

* ANSWER KEY *

APPENDIX J
Page 1 of 1

UPGRADE - PROTECTIVE ACTION RECOMMENDATION

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

2. **Browns Ferry** has declared a **GENERAL EMERGENCY**

3. **Browns Ferry** is making a **PAR UPGRADE** based upon the following criteria:
   - ☐ **Increase in dose assessment projected values.**
   - ☒ **Increase in field team measured dose values.**
   - ☐ **Shift in 15 min average wind direction resulting in additional sectors being affected.**
   - ☐ **State provided information that offsite impediments no longer exist.**
   - ☐ **Hostile Action Event has been terminated.**
   - ☐ **Containment Rad Levels ≥ 20 %**

4. **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.)

   Wind Direction is FROM: 323 degrees **(15 min average)** ..... Wind Speed: 18 m.p.h **(15 min average)**

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

STEP MUST BE COMPLETED BY THE SITE EMERGENCY DIRECTOR

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

☐ **Recommendation 1** • EVACUATE LISTED SECTORS (2 mile Radius & 10 miles downwind) • Shelter remainder of 10 mile EPZ. • Consider issuance of POTASSIUM IODIDE in accordance with the State Plan.	RECOMMENDATION-1 ⬇	WIND FROM DEGREES (Mark wind direction from Step 7)	RECOMMENDATION-2 ⬇	☒ **Recommendation 2** • EVACUATE LISTED SECTORS (2 mile radius & 5 mile downwind) • SHELTER remainder of 10 mile EPZ. • Consider issuance of POTASSIUM IODIDE in accordance with the State Plan.
A2, B2, F2, G2, E5,E10, F5, F10, G5, G10		**From 4° - 40°**		**A2, B2, F2, G2, E5, F5, G5**
A2, B2, F2, G2, F5, F10, G5, G10, H10		From 41°- 73°		A2, B2, F2, G2, F5, G5
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		From 93° - 137°		A2, B2, F2, G2, A5, G5
A2, B2, F2, G2, A5, A10, I10, J10, K10		**From 138° - 203°**		**A2, B2, F2, G2, A5**
A2, B2, F2, G2, A5, A10, B5, B10		From 204° - 282°		A2, B2, F2, G2, A5, B5
A2, B2, F2, G2, B5, B10, C10, D10, E5,E10		**From 283°-326°**	☒	**A2, B2, F2, G2, B5, E5**
A2, B2, F2, G2, C10, D10, E5,E10, F5, F10		From 327° - 3°		A2, B2, F2, G2, E5, F5

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

Completed by: _____ **Approved by** _____

9. **Utilize Appendix C to communicate PAR Upgrade.**

LAST PAGE

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

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	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) 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. 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) In accordance with NPG-SPP-01.2 the following is a procedure change summary and reason for changes. 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. The procedure was revised to incorporate requests of the Operations Peer Team to reduce Shift Manager Burden. 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. For a more comprehensive line-in, line-out reviews of procedure changes see applicable Screening or Effectiveness Evaluations.

TABLE OF CONTENTS

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 Appendix G 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"

3.0 EMERGENCY CLASSIFICATION ACTIONS

WHEN... the TSC SED has assumed the responsibilities from the SM SED

THEN... **CONTINUE** in this procedure at Appendix G.

Otherwise continue in this procedure.

NOTE

- Procedure steps can be performed concurrently.
- Appendix A, Step 8 CANNOT be delegated, but all other procedure steps within the body of this procedure can be delegated.
- All procedure steps must be completed
- All procedure appendices must be returned to the SED.
- Step 3.2 (15 Minutes) and Step 3.4 (as soon as possible not to exceed 60 minutes from classification declaration) are time critical.
- A STA or SRO should peer check Appendix A completion

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)

[1] **DIRECT** a RO or SRO to implement EPIP-5, Appendix B, "Activation of the Emergency Response Organization (ERO)" utilizing a notification listed below:

- ☐ EMERGENCY
- ☐ 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
- ☐ 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.)

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.

[1] **DIRECT**... a qualified SRO Communicator to **COMPLETE** Appendix A (Initial Notification Form) OR complete Appendix A.

[2] **DIRECT** a RO / SRO to **COMPLETE** Appendix C (State of Alabama Notification) utilizing a completed Appendix A OR **COMPLETE** Appendix C.

3.3 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 3.4

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 EPIP-8, Appendix C

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.

[1] **DIRECT** a SRO/STA to **COMPLETE** Appendix D, "Notification of the NRC" or **COMPLETE** Appendix D.

3.5 Maintaining communications with the NRC

NOTE

When the TSC is staffed, the open and continuous line of communications with the NRC may be transferred to the NRC Coordinator position.

[1] 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.

3.6 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.

Appendix E provides a systematic approach to monitoring/re-evaluation and the communication of significant changes in plant conditions.

Appendix F 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 Appendix H. When it has been determined that a PAR Upgrade is applicable, then utilize Appendix J 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

APPENDIX A
Page 1 of 1

GENERAL EMERGENCY INITIAL NOTIFICATION FORM

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

2. _____ the SED at **Browns Ferry** has declared a **GENERAL EMERGENCY.**

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

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

_____

_____

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

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

6. **Event Declared:** Time: _____(Central Time) Date: _____

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.)

Wind Direction is FROM: _____degrees **(15 min average)** Wind Speed: _____ m.p.h **(15 min average)**

STEP MUST BE COMPLETED BY THE SITE EMERGENCY DIRECTOR

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

☐ **Recommendation 1** • EVACUATE LISTED SECTORS (2 mile Radius & 10 miles downwind) • Shelter remainder of 10 mile EPZ. • Consider issuance of POTASSIUM IODIDE in accordance with the State Plan.	RECOMMENDATION-1 ⇩	WIND FROM DEGREES (Mark wind direction from Step 7)	RECOMMENDATION-2 ⇩	☐ **Recommendation 2** • EVACUATE LISTED SECTORS (2 mile radius & 5 mile downwind) • SHELTER remainder of 10 mile EPZ. • Consider issuance of POTASSIUM IODIDE in accordance with the State Plan.
A2, B2, F2, G2, E5,E10, F5, F10, G5, G10		**From 4° - 40°**		**A2, B2, F2, G2, E5, F5, G5**
A2, B2, F2, G2, F5, F10, G5, G10, H10		From 41°- 73°		A2, B2, F2, G2, F5, G5
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		From 93° - 137°		A2, B2, F2, G2, A5, G5
A2, B2, F2, G2, A5, A10, I10, J10, K10		**From 138° - 203°**		**A2, B2, F2, G2, A5**
A2, B2, F2, G2, A5, A10, B5, B10		From 204° - 282°		A2, B2, F2, G2, A5, B5
A2, B2, F2, G2, B5, B10, C10, D10, E5,E10		**From 283°-326°**		**A2, B2, F2, G2, B5, E5**
A2, B2, F2, G2, C10, D10, E5,E10, F5, F10		From 327° - 3°		A2, B2, F2, G2, E5, F5

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

Completed by: _____ **Approved by**_____

APPENDIX B
Page 1 of 3
Activation of the Emergency Response Organization (ERO)

1.0 Activation of the Emergency Response Organization

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] **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)

[2] **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
- ☐ 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
- ☐ 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)

[3] IF... unable to establish contact with the ODS

THEN... continue to perform Step 1.0 [2] for 5 minutes

[4] IF... unable to establish contact with the ODS after 5 minutes

THEN... **IMPLEMENT** Appendix I, "Activation of the Emergency Paging System" concurrently with this Appendix beginning at Step 2.0.

2.0 Dose Assessment Evaluation

[1] **CONTACT** the Site Emergency Director and determined if a Dose Assessment Evaluation is warranted.

[2] 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

[1] **OBTAIN** a copy of EPIP-5, Appendix A used for the State Notification and available affected Unit Control Room logs

[2] **FAX** copies to the TSC at 3742

[3] **FAX** copies to the CECC at 5-751-1682

APPENDIX B
Page 3 of 3
Activation of the Emergency Response Organization (ERO)

[4] 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

[5] **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 EPIP-11, "Security and Access Control".

[6] **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 TI-331, "Post Accident Sampling Procedure" and CI-900 series, "Analysis Procedures".

[7] **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".

[8] **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 Appendix B is completed.

APPENDIX C
Page 1 of 1

State of Alabama Notification

1.0 State Notification

NOTE

Notification of the Risk Counties / State of Alabama is required to be completed within 15 minutes from the time of emergency declaration.

(1) **REPORT** the information recorded on completed Appendix A to the BFN Risk Counties

A. Limestone County (after hours) 9-1-256-232-2631 9-1-256-232-0111 Person Contacted Limestone

B. Morgan County (after hours) 9-1-256-351-4620 9-1-256-353-2515 Option 0 Person Contacted Morgan

C. Lawrence County (after hours) 9-1-256-974-7641 9-1-256-974-7911 Person Contacted Lawrence

D. Lauderdale County (after hours) 9-1-256-760-6363 9-1-256-760-9117 Person Contacted Lauderdale

(2) **REPORT** the information recorded on completed Appendix A to the State of Alabama

A. **FAX** a copy of completed Appendix A to the State of Alabama at 9-1-205-280-2495.

B. **REPORT** to the State of Alabama the information on Appendix A utilizing:

24 Hours
Primary: 9-1-205-280-2310
Backup: 9-1-800-843-0699
Backup: 9-1-334-324-0076

Name of Person Notified ALABAMA (Name)

Date and Time of Notification Today (Date) 35 minutes ago (Time)

(3) **REQUEST** that the State representatives repeat back the information you have provided from Appendix A.

(4) Return the completed Appendix C and Appendix A to the SED.

APPENDIX D
Page 1of 1

Notification of the Nuclear Regulatory Commission (NRC)

(NRC EVENT NOTIFICATION WORKSHEET)

NOTES

1. Utilize the NRC Emergency Notification System (ENS) when available or if the NRC ENS is inoperable or unavailable utilize any plant telephone.
2. Ensure prior to making this notification that all previously made emergency classifications have been communicated. Fast breaking plant conditions may have resulted in classifications that have not been officially communicated.
3. Utilize completed Appendix A for determining information below.

1.0 **COMPLETE** table below

2.0 **UTILIZE** the following telephone numbers when making this notification. (9-1 may be required)

- Main 800-532-3469 **OR** 301-816-5100
- Backup 1 800-449-3694 **OR** 301-951-0550
- Backup 2 301-415-0550
- Backup 3 301-415-0553
- Fax 301-816-5151
- Region IV (alternate site) 817-860-8100

3.0 **PROVIDE** the following information to NRC. Be prepared to answer other questions directed from the NRC based upon the event.

Time NRC Notified	Facility	Affected Unit	TVA Contact	NRC Contact
TODAY	BFN	1	Shift Manager	Resident
Time of Classification	**Classification Date**	**Power/Mode Before**	**Power/Mode After**	**Call Back Number**
45 minutes /Central	TODAY	100% / 1	0% / 3	**ENS Telephone** 256-729-2273 **TVA Contact** 256-729- 2783
Emergency Classification	**Emergency Action Level Designator**	**Brief Description of Emergency Action Level**		
☑ **GENERAL EMERGENCY**	2.1 - G	Suppression Chamber pressure cannot be maintained below 55psig		
Protective Action Recommendations (GE ONLY) When Staffed PAR developed by CECC. 3		**Comments** NONE		

4.0 **RETURN** the completed Appendix D to the Site Emergency Director.

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** Appendix F (GE Follow-Up Information Form)

[2] **COMMUNICATE** as applicable Appendix F 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 Appendix D)

Otherwise Continue in this Appendix.

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 EPIP-8, 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.

APPENDIX F
Page 1 of 1

GENERAL EMERGENCY FOLLOW-UP INFORMATION FORM

1. ☐ THIS IS A DRILL ☐ THIS IS AN ACTUAL EVENT

2. _____ the SED at **Browns Ferry** has declared an **GENERAL EMERGENCY**

3. **Reactor Status:**

Unit 1:	☐ Shutdown	☐ At Power	☐ Refueling	☐ N/A
Unit 2:	☐ Shutdown	☐ At Power	☐ Refueling	☐ N/A
Unit 3:	☐ Shutdown	☐ At Power	☐ Refueling	☐ N/A

4. **Additional EAL Designator(s)** _____

5. **Significant changes in plant conditions:**

_____
_____
_____

6. **Significant changes in Radiological Conditions:**

_____
_____
_____

7. **Off-site Protective Action Recommendations:**
(UTILIZE APPENDIX J FOR MAKING AND COMMUNICATING PAR UPGRADES)

☐ Recommendation 1 ☐ Recommendation 2 ☐ Recommendation 3

8 **Onsite Protective Actions:**

Assembly/Accountability	☐ No	☐ Initiated	☐ Completed
Site Evacuation	☐ No	☐ Initiated	☐ Completed

9. **The Meteorological Conditions are**
(Use 91 meter data on the Met Tower & 15 Minute Averages)
Wind Speed: _____ m.p.h.
Wind Direction is from: _____ degrees

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

11. **Fax to applicable contact after reporting following-up information:**
CECC (5-751-1682), ODS (5-751-8620) or State of Alabama (9-1-205-280-2495).

Completed by: _____, **Date/Time** _____
Central Time

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** Appendix A and **DIRECT** a member of the TSC Staff (Ops Communicator / Ops Manager / EP Manager) to complete Appendix C, "State of Alabama Notification"

OR

COMPLETE Appendix C

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)

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 EPIP-8, Appendix C

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 EPIP-13 "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 Appendix D, "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.

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.

Appendix E provides a systematic approach to monitoring/re-evaluation and the communication of significant changes in plant conditions.

Appendix F 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 Appendix H. When it has been determined that a PAR Upgrade is applicable, then utilize Appendix J 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.

APPENDIX H

Page 1 of 2

INITIAL - PROTECTIVE ACTION RECOMMENDATIONS

Note 1: IF flowchart decision block conditions are unknown **THEN** answer NO.

Note 2: State agencies have provided prior knowledge of offsite impediments to evacuation (such as flooding, bridge/road closures, etc.) and recommend that any needed PAR should be shelter(Rec #3)

Note 3: A short term release is defined as "a release that does not exceed a 15 minute duration"

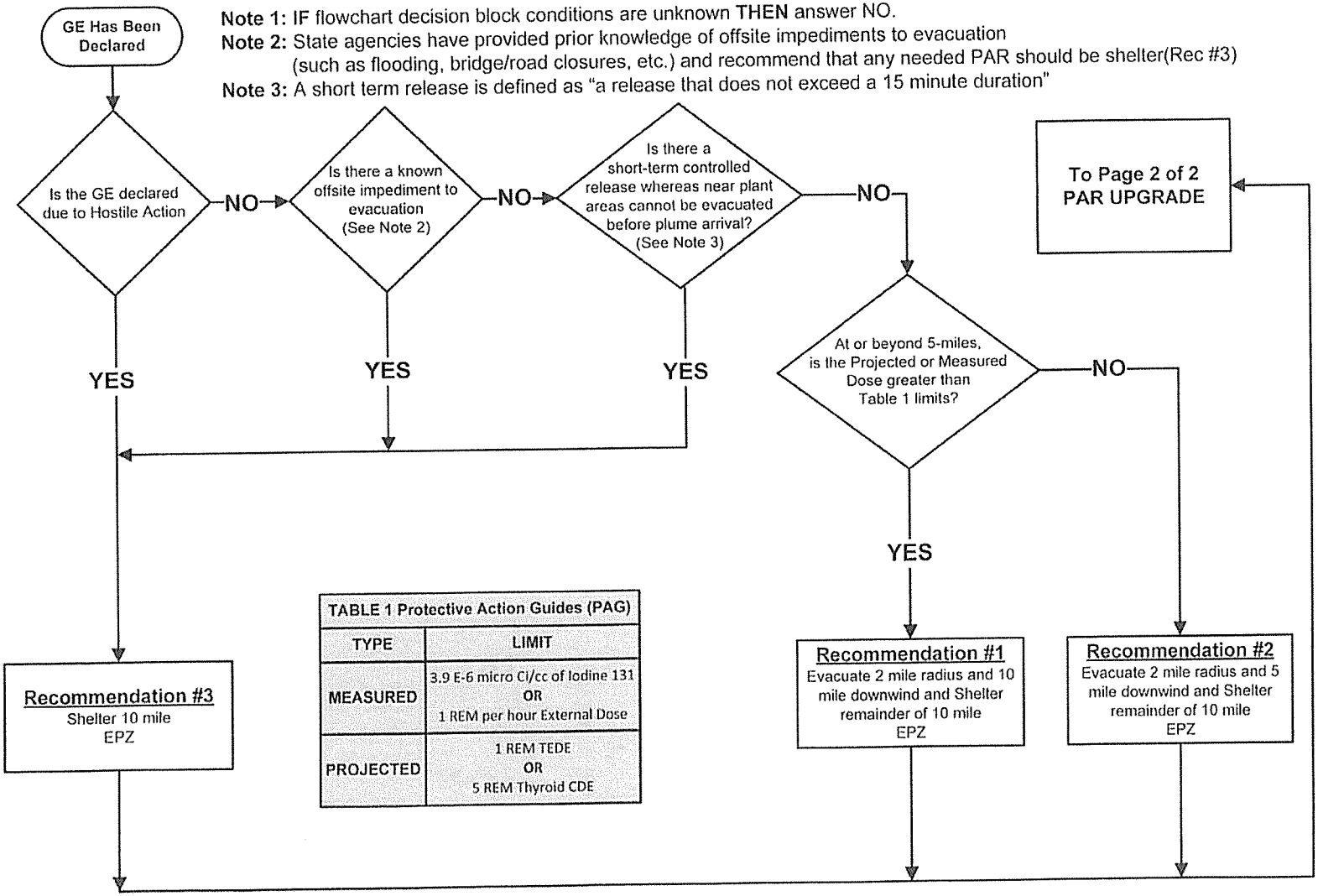
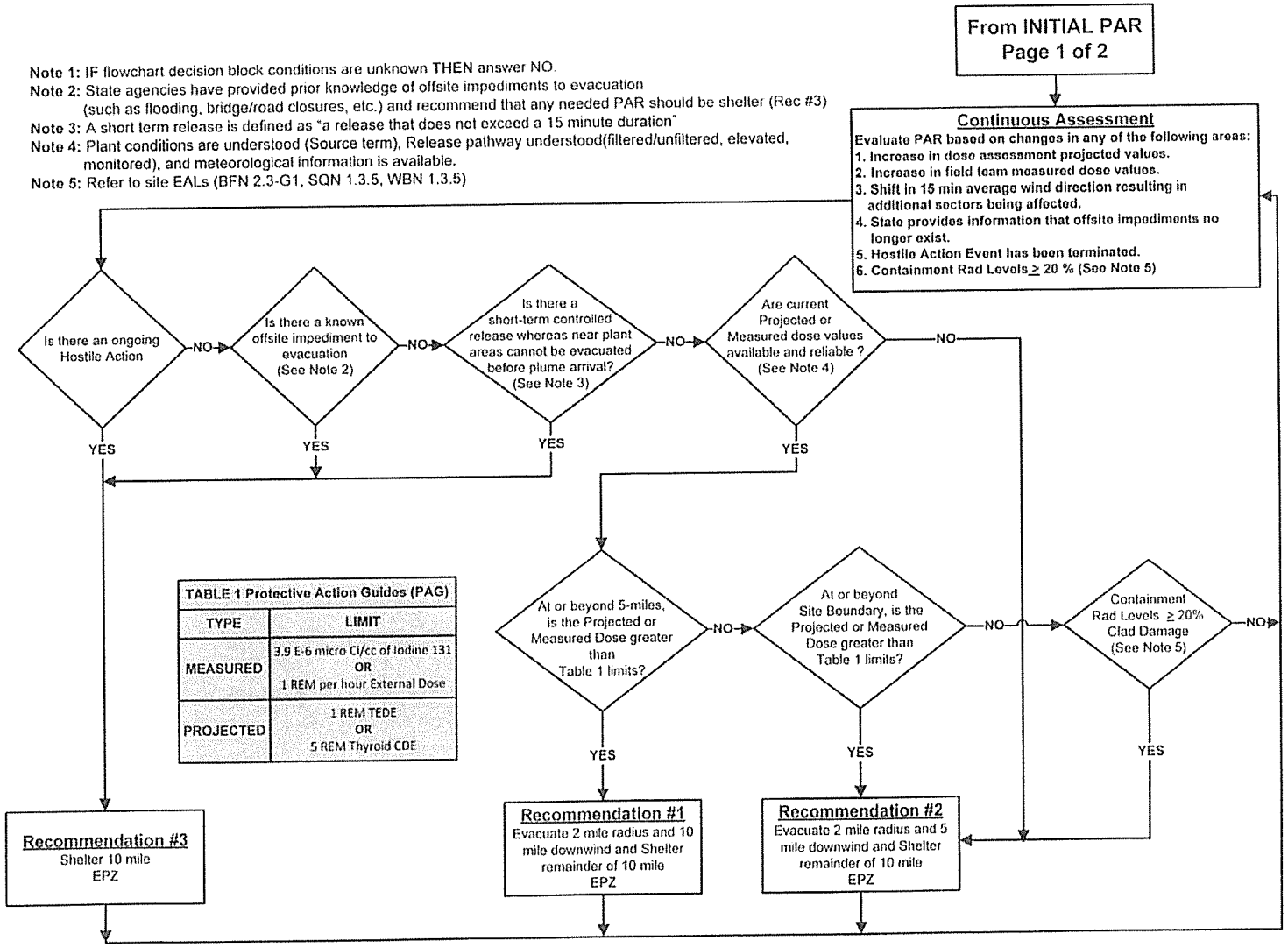


TABLE 1 Protective Action Guides (PAG)	
TYPE	LIMIT
MEASURED	3.9 E-6 micro Ci/cc of Iodine 131 OR 1 REM per hour External Dose
PROJECTED	1 REM TEDE OR 5 REM Thyroid CDE

APPENDIX H
Page 2 of 2

UPGRADE - PROTECTIVE ACTION RECOMMENDATIONS



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.

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.

APPENDIX J
Page 1 of 1

UPGRADE - PROTECTIVE ACTION RECOMMENDATION

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

2. **Browns Ferry** has declared a **GENERAL EMERGENCY**

3. **Browns Ferry** is making a **PAR UPGRADE** based upon the following criteria:
   - ☐ **Increase in dose assessment projected values.**
   - ☐ **Increase in field team measured dose values.**
   - ☐ **Shift in 15 min average wind direction resulting in additional sectors being affected.**
   - ☐ **State provided information that offsite impediments no longer exist.**
   - ☐ **Hostile Action Event has been terminated.**
   - ☐ **Containment Rad Levels ≥ 20 %**

4. **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.)

   Wind Direction is FROM: _____degrees **(15 min average)** ..... Wind Speed: _____ m.p.h **(15 min average)**

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

STEP MUST BE COMPLETED BY THE SITE EMERGENCY DIRECTOR

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

☐ **Recommendation 1** • EVACUATE LISTED SECTORS (2 mile Radius & 10 miles downwind) • Shelter remainder of 10 mile EPZ. • Consider issuance of POTASSIUM IODIDE in accordance with the State Plan.	RECOMMENDATION-1 ➡	WIND FROM DEGREES (Mark wind direction from Step 7)	RECOMMENDATION-2 ➡	☐ **Recommendation 2** • EVACUATE LISTED SECTORS (2 mile radius & 5 mile downwind) • SHELTER remainder of 10 mile EPZ. • Consider issuance of POTASSIUM IODIDE in accordance with the State Plan.
A2, B2, F2, G2, E5,E10, F5, F10, G5, G10		**From 4° - 40°**		**A2, B2, F2, G2, E5, F5, G5**
A2, B2, F2, G2, F5, F10, G5, G10, H10		From 41°- 73°		A2, B2, F2, G2, F5, G5
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		From 93° - 137°		A2, B2, F2, G2, A5, G5
A2, B2, F2, G2, A5, A10, I10, J10, K10		**From 138° - 203°**		**A2, B2, F2, G2, A5**
A2, B2, F2, G2, A5, A10, B5, B10		From 204° - 282°		A2, B2, F2, G2, A5, B5
A2, B2, F2, G2, B5, B10, C10, D10, E5,E10		**From 283°-326°**		**A2, B2, F2, G2, B5, E5**
A2, B2, F2, G2, C10, D10, E5,E10, F5, F10		From 327° - 3°		A2, B2, F2, G2, E5, F5

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

Completed by: _____ **Approved by**_____

9. **Utilize Appendix C to communicate PAR Upgrade.**

LAST PAGE