ES-301

## Administrative Topics Outline Revision 0

Form ES-301-1

Facility: ANO-1		Date of Examination: 8-29-2011		
Examination Level: RO X	SRO 🛄	Operating Test Number: <u>2011-1</u>		
Administrative Topic (see Note)	Type Code*	Describe activity to be performed		
Conduct of Operations A1. 2.1.23 (Imp 4.3)	D/R	A1JPM-RO-RCS3: Perform RCS leak rate determination when RCS leakage is being returned to RCS. Ability to perform specific system and integrated plant procedures during all modes of plant operation.		
Conduct of Operations A2. 2.1.19	D/S	A1JPM-RO-PMS3: Operate the plant computer (disable point from alarm).		
(Imp 3.9)		Ability to use plant computers to evaluate system or component status.		
Equipment Control A3. 2.2.13	N/R	A1JPM-RO-HCRD4: Perform independent review of a prepared tagout.		
(Imp 4.1)		Knowledge of tagging and clearance procedures.		
Radiation Control	D/P/R	A1JPM-NRC-ADMINRWP1: Review RWP and determine maximum stay time.		
(Imp 3.5)		Ability to comply with radiation work permit requirements during normal or abnormal conditions.		
Emergency				
Procedures/Plan				
A5.	N/A	N/A		
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.				
<ul> <li>* Type Codes &amp; Criteria:</li> <li>(C)ontrol room, (S)imulator, or Class(R)oom</li> <li>(D)irect from bank (≤ 3 (3) for ROs; ≤ 4 for SROs &amp; RO retakes)</li> <li>(N)ew or (M)odified from bank (≥ 1) (1)</li> <li>(P)revious 2 exams (≤ 1; randomly selected) (1)</li> </ul>				

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Facility: <u>ANO-1</u>		Date of Examination: 8-29-2011			
	J SKU A	Operating Test Number: <u>2011-1</u>			
Administrative Topic (see Note)	e Type Code*	Describe activity to be performed			
Conduct of Operations		A1JPM-SRO-IS1: Determine stay time for workers in hot environment.			
A1. 2.1.26	N/R	Knowledge of industrial safety procedures (such as			
(Imp 3.6)		rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).			
Conduct of Operations	,	A1JPM-SRO-TREND: Perform a quarterly check of			
A2. 2.1.25		trend data.			
(Imp 4.2)		Ability to interpret reference materials, such as graphs, curves, tables, etc.			
Equipment Control		A1.IPM-SRO-HCRD4 <sup>,</sup> Authorize a tagout			
A3. 2.2.13	N/R	Knowledge of tagging and clearance procedures.			
(Imp 4.3)					
Radiation Control		A1JPM-NRC-ADMINRWP1: Review RWP and			
A4. 2.3.7	D/P/R	Ability to experimentation of the second second			
(Imp 3.6)		requirements during normal or abnormal conditions.			
Emergency Procedures/Plan		A1JPM-SRO-PAR2: Determine a protective action recommendation.			
A5. 2.4.44	M/R	Knowledge of emergency protective action			
(Imp 4.4)		recommendations.			
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.					
* Type Codes & Criteria:       (C)ontrol room, (S)imulator, or Class(R)oom         (D)irect from bank (≤ 3 for ROs; ≤ 4 (2) for SROs & RO retakes)         (N)ew or (M)odified from bank (≥ 1) (3)         (P)revious 2 exams (≤ 1; randomly selected) (1)					

Admin JPM AL-RO

RCS3

TUOI: A1JPM-RO-RCS3				Page 1 of 5
UNIT: <u>1</u> REV # <u>1</u>	DATE:			
TUOI NUMBER: A1JPM-RO-RCS3				
SYSTEM/DUTY AREA: ADMINISTR	ATIVE TOPIC - CONDU	CT OF OPERATIONS	6	
TASK: PERFORM RCS LEAK RATE	DETERMINATION WH	EN RCS LEAKAGE IS	BEING RETU	JRNED TO RCS
JTA#: <u>ANO1-RO-RCS-SURV-37</u>				
KA VALUE RO: 3.9 SR	O: <u>4.0</u> KA REF	ERENCE: 2.1.23		_
APPROVED FOR ADMINISTRATIO	N TO: RO: <u>X</u>	SRO:X		
TASK LOCATION: INSIDE CR: X	OUTSIDE CR:	BOTH:	-	
SUGGESTED TESTING ENVIRON	MENT AND METHOD (P	ERFORM OR SIMULA	ATE):	
PLANT SITE:	SIMULATOR:PEF	RFORMLAB:		
POSITION EVALUATED: RO:	SRO:			
ACTUAL TESTING ENVIRONMENT	SIMULATOR: X	PLANT SITE:	LAB:	-
TESTING METHOD: SIMULATE:	PERFORM:	de aktoleten berdeten i marren mende aktoren ander		
APPROXIMATE COMPLETION TIM	E IN MINUTES:15	MINUTES		<u></u>
REFERENCE(S): <u>1103.013, Chg. 03</u>	4, Supplement 2			-
EXAMINEE'S NAME:		SSN		
EVALUATOR'S NAME:				
THE EXAMINEE'S PERFORMANCE CONTAINED IN THIS JPM AND IS [	E WAS EVALUATED AGA DETERMINED TO BE:	AINST THE STANDA	RDS	
SATISFACTORY:		UNSATISFACTOR	Y:	
PERFORMANCE CHECKLIST COM	IMENTS:			
Start Time	Stop Time	Total <sup>-</sup>	Time	
SIGNED	DATE:			
SIGNATURE INDICATES THIS JPM	I HAS BEEN COMPAREI	D TO ITS APPLICABL	E PROCEDU	RE BY A

QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

#### TUOI: A1JPM-RO-RCS3

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#### THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: The plant is at 100% power operations. RCS leak rate Determination per

1103.013, Supplement 2, RCS Leak Rate Determination When RCS Losses Are Being Returned To RCS is in

progress. Plant computer program "LKRT1" is inoperable. Plant computer tabular log "RCS Leak Rate Data" is

active. The leak rate determination was commenced on the previous shift at 0016. All initial data has been

obtained and recorded.

TASK STANDARD: The examinee has correctly calculated non-returnable leak rate per 1103.013. Supp. 2.

TASK PERFORMANCE AIDS: 1103.013 Supplement 2 and plant computer "RCS Leak Rate

Data" tabular log sheet.

NOTE: This JPM is a modified version of A1JPM-RO-RCS2.

#### TUOI: A1JPM-RO-RCS3

#### INITIATING CUE:

The CRS has directed you to complete the calculation for non-returnable leak rate in accordance with 1103.013, Supplement 2, Steps 2.1.3 through 2.1.10 using a stop time of 0939:38.

## CRITICAL ELEMENTS (C): 5, 6, 7

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
NOTE comp	: Provide examinee with a copy of 1103. uter tabular log sheet "RCS Leak Rate D	013, Supplement 2, with initial data re Data".	corded ar	nd plant	
	<ol> <li>Select and enter final data from plant computer tabular log sheet in Table 2.1.1.</li> </ol>	Data for L1001B, XTAVE, L1248 and XPP at time 0115 selected from computer tabular log sheet and entered in Table 2.1.1.			
	2. Compute INITIAL and FINAL "Reactor Power Squared" values and enter in Table 2.1.1.	Calculated reactor power squared values: INITIAL VALUE = 9997.2 Task Standard: 9990 to 10000 FINAL VALUE: 9985.8 Task Standard: 9950 to 10000 Data entered in Table 2.1.1.			
NOTE	: Provide examinee with T-111 running	timer value of 021999.			
	3. Calculate CHANGE in each variable and enter in Table 2.1.1.	Calculated change in: Pressurizer level: 1.576 Tave:06 MU Tank Level: 2.731 Rx Power: 0.057 Rx Power Squared: 11.4 T-111 timer 563 Data entered in Table 2.1.1.			
NOTE	: Provide examinee with last valid T-111	fill rate of 0.045 gpm.			
	4. Multiply CHANGE values by CONVERSION FACTOR and enter under EQUIVALENT LOSS in Table 2.1.1.	Calculated Equivalent Loss: Pressurizer level: 19.542 Tave: 6.0864 MU Tank Level: 84.279 Rx Power: -0.5216 Rx Power Squared: 0.9462 T-111 timer-25.335 - 25.335 Data entered in Table 2.1.1.			

## TUOI: A1JPM-RO-RCS3

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(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT		
(C)	5. Add EQUIVALENT LOSS values algebraically to determine TOTAL LOSSES and enter in Table 2.1.1.	<u>⊥</u> 29⊥ 10/11/11 Total Losses: <del>135.67</del> 85.056 Task Standard: 1 <del>33.75 to 137.85</del> 19/17 82.976 +₀ 87.236	£				
(C)	<ol> <li>Determine test Delta T in minutes and enter in table.</li> </ol>	Calculated total test time of 563 minutes and entered in Delta T blank on Table 2.1.1.					
(C)	7. Find non-returnable leak rate.	Used formula to calculate non- returnable leak rate. (ASA 19/11/11 Leak rate = <del>0.241 gpm</del> (0.151 gpm Task standard 0 <del>:237 to 0:245 gpm</del> 13/14 0.147+0 0.166 gpm					
	8. Enter total RCS losses in Section 3.0.	Data entered in Section 3.0.	-				
NOTE JPM I	NOTE: Inform examinee that Plant Computer Tabular Log "RCS Leak Rate Data" is deactivated. JPM is complete.						

END

TUOI: A1JPM-RO-RCS3

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## EXAMINEE'S COPY

## JPM INITIAL TASK CONDITIONS:

- The plant is at 100% power operations.
- RCS leak rate determination per 1103.013, Supplement 2, RCS Leak Rate Determination When RCS Losses Are Being Returned To RCS, is in progress.
- Plant computer program "LKRT1" is inoperable.
- Plant computer tabular log "RCS Leak Rate Data" is active.
- The leak rate determination was commenced on the previous shift at 0016. All initial data has been obtained and recorded.

## **INITIATING CUE:**

The CRS has directed you to complete the calculation for non-returnable leak rate in accordance with 1103.013, Supplement 2, Steps 2.1.3 through 2.1.10 using a stop time of 09:39:38.

The last valid T-111 fill rate is 0.045 gpm.

The final T-111 running timer value is 021999.

DATE:	TODAY TI	ME: 10:	05	ARKAN	SAS NUCLE UNIT NO	AR ONE (A) 0. 1	NO) - UNIT TA	l BULAR LOG LEAK
TIME	L1001B	XTAVE	L1248	XPP	L1002B	TAVE	РР	L1051
09:25:35	215.840	578.66	68.168	100.021	220.267	578.89	100.052	5876.89
09:26:36	214.046	578.66	68.920	100.021	220.503	578.63	100.008	5874.91
09:27:36	214.257	578.66	68.357	100.021	220.982	578.66	100.178	5874.46
09:28:36	214.028	578.66	69.807	100.021	221.191	578.53	100.177	5875.89
09:29:36	214.027	578.66	69.143	100.021	221.745	578.54	100.125	5874.69
09:30:36	215.160	578.65	69.010	100.021	221.883	578.59	100.121	5876.83
09:31:36	215.903	578.65	69.896	99.994	221.641	578.70	99.949	5876.53
09:32:37	216.298	578.65	69.795	99.994	220.857	578.74	99.911	5875.56
09:33:37	216.816	578.65	69.183	99.994	220.872	578.73	99.782	5876.72
09:34:37	215.104	578.65	69.276	99.994	220.826	578.78	99.839	5874.82
09:35:37	215.422	578.71	69.152	99.994	221.223	578.81	99.803	5876.90
09:36:37	215.968	578.71	68.021	99.994	221.426	578.72	99.914	5877.11
09:37:37	216.400	578.71	68.895	99.929	220.183	578.64	99.824	5875.28
09:38:38	216.775	578.71	68.788	99.929	219.625	578.58	99.797	5877.13
09:39:38	216.017	578.71	68.663	99.929	219.323	578.57	100.083	5875.31
09:40:38	216.419	578.71	68.558	99.929	219.482	578.51	99.797	5874.66
09:41:38	215.856	578.71	68.446	99.929	220.221	578.53	99.887	5875.99
09:42:38	215.721	578.77	68.340	99.929	220.687	578.62	99.947	5874.77
09:43:38	214.464	578.77	68.307	100.033	221.087	578.57	99.923	5876.31
09:44:39	214.985	578.77	68.714	100.033	221.387	578.66	99.886	5876.79
09:45:39	214.186	578.77	68.871	100.033	221.864	578.63	99.820	5876.51
09:46:39	214.583	578.77	67.634	100.033	221.286	578.75	99.846	5876.09
09:47:39	215.781	578.77	67.796	100.033	220.677	578.80	99.897	5874.51
09:48:39	215.367	578.77	67.659	100.033	221.167	578.81	100.025	5874.82
09:49:39	215.450	578.61	68.527	99.888	221.387	578.83	100.071	5875.25
09:50:40	216.185	578.61	68.402	99.888	220.607	578.86	100.028	5874.63
09:51:40	216.463	578.61	68.277	99.888	220.270	578.85	100.147	5874.88
09:52:40	216.461	578.61	69.151	99.888	220.085	578.82	100.037	5874.99
09:53:40	215.484	578.61	69.013	99.888	219.926	578.83	100.128	5875.59
09:54:40	215.062	578.61	69.903	99.888	220.267	578.80	100.012	5875.12
09:55:40	215.060	578.64	69.177	99.997	220.503	578.81	100.014	5875.08

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	ENTE	RGY OPERATIONS IN ARKANSAS NUCLE	NCORPORATE AR ONE	ED	
TITLE: RCS LEAK D	ETECTION	N	DOCUMENT NO. 1103.013	СНА	NGE NO. 034
		1	WORK PLAN EXP	DATE	
SET #		1	SAFETY-RELATE		E YES 🖾NO
			TEMP MOD		EL OF USE
				EXCLUSION F	PER EN-LI-100
When you see the	ese <u>TR/</u>	APS	Get these T	OOLS	
	Time Pre	essure	Effec	tive Commu	unication
	Distracti	on/Interruption	Ques	stioning Atti	tude
	Multiple	Tasks	Place	ekeeping	
8	Over Cor	nfidence	Self	Check	
	Vague or	r Interpretive Guidance	Peer	Check	
	First Shif	ft/Last Shift	Knov	wledge	
	Peer Pre	ISSUITE	Proc	edures	
	Change/	Off Normal	Job F	Briefing	
	Physical	Environment	Coac	hing	
	Mental S	tress (Home or Work)	Turne	over	
VERIFIED BY		DATE		TIM	E
VEI	RIFICATIC	ON COVER SHEET		ORM NO. 1000.006A	CHANGE NO. 054

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# RCS LEAK RATE DETERMINATION WHEN RCS LOSSES ARE BEING RETURNED TO RCS

This procedure assures the RCS leak rate is within Tech Spec limits by satisfying the criteria of section 3.0. Leakage exceeding the limits of section 3.0, evaluated as unsafe or non-isolable shall immediately be reported to the Shift Manager and a Condition Report written. Reference TS 3.4.13 and TRM 3.4.5 for Required Actions. This supplement (or Supplement 1) is performed once per calendar day and will satisfy SR 3.4.13.1. This supplement is not required to be performed until 12 hours after establishment of steady state operation at or near operating pressure per SR 3.4.13.1.

1.0 INITI

INITIAL CONDITIONS



Verify water is <u>not</u> being added to or removed from RCS or MU System by the following:

Makeup or Chemical Addition from sources outside of the MU System or Reactor Coolant System, except for Zinc Injection.



Venting or draining from the RCS or MU System.

Changing RCS, MU System, or Zinc Injection components in-service, i.e., pumps, filters, coolers, pump stroke, etc.



Boration or dilution.

Verify at least one of the following, listed in order of preference, available to provide leak rate data:

Plant Computer OR SPDS available for data gathering.

The following indications operable:

Any Power Range Indicator (NI-5, NI-6, NI-7 or NI-8)

Controlling T-Ave Indicator (TI-1032)

- PZR Level Indicator (LIS-1002)
- MU Tank Level Recorder (LR-1248)

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IF Zinc Injection is in-service, THEN obtain current Zinc Inj rate from Station Log, Plant Status Board OR Chemistry, OTHERWISE, enter zero for Zinc Inj rate at steps 2.1.9 AND 2.1 22.

IF recorded in GPH, 1.3.1 THEN divide Zinc Inj rate by 60 to obtain GPM.

Record Zinc Inj rate in gpm in steps 2.1.9 AND 2.1.22. 1.3.2



Review the following limits and precautions.

RCS, MU System, and Zinc Injection components in-service shall NOT be changed during leak rate determination, and these systems shall be maintained in steady state condition.

To insure the most accurate determination of the RCS leak rate, the following requirements should be met:

The initial and final values of reactor power, RCS T-ave and pressurizer level, should be as close to identical as possible.



Digital values using the same signal source for initial and final values should be used if available.



Routine daily leak rate determinations shall be performed over the maximum time practical, 6-7 hours where possible, but for at least one hour.



Changes to Reactor Building Ventilation should NOT be performed.

If practical, 12 hours should elapse from the time pressurizer boron equalization is terminated until the beginning of the leakrate determination.

1103.013	PROCEDURE/WORK PLAN TI RCS			PAGE: CHANGE:	62 of 74 034
~ ~	<b>.</b>	SUPPLEMENT 2		Pa	are 3 of 1
2. TEST METH	IOD				go o or .
62	PCG Ionk Pata Datarmi	nation			
Fix	KCS Leak Rate Determi				
Plant	computer is the prefe	erred source for	following data	recordin	gs.
Ć	2.1.1 Enter init "Table 2.1 Check (🗸)	ial data required .1 - Total Losses data source used	in Data."		
	Pressurizer Level	( 🗸 )	<u>T-ave</u>		( 🗸 )
	Preferred: L1001B		Preferred: >	TAVE	V
	Backup: L1002B		Backup: SPDS	5 TAVRC1	
	SPDS LPZR1G		Controlling	T-ave	
	SPDS LPZR1R PZR Level (LIS-1002)		Indicator (1	CI-1032)	
	Makeup Tank Level	( 🗸 )	Reactor Powe	er	(••)
	Preferred: L1248	$\checkmark$	Preferred: >	(PP	V
	Backup: SPDS L1248		Backup: SPI	DS NI1LP	
	Level Recorder for		SPDS NI2LP		
	MU Tank (LR-1248)		Any Power Ra	ange	
2	Quench Tank Level	( 🗸 )	Indicator (NNI-6, NI-7 (	NI-5, or NI-8)	
	Preferred: L1051	V			
1	Backup: SPDS L1051				
	Quench Tank Level Indicator (LIS-1051)				
[		NOTE			



WHEN following conditions have been met, THEN pump Quench Tank to Makeup Tank to achieve a FINAL Quench Tank volume which is equal to INITIAL volume:



Pressurizer level, T-ave, and Rx power values are approximately equal to initial values.

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## RCS LEAK DETECTION

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Allow Vacuum Degasifier Drain Pumps (P-43A, P-43B) to pump down to automatic cutoff point, then enter data under FINAL column in Table 2.1.1.

Table 2.1.1 — Total Losses Data							
Start Date/Time: Today / 0016 Stop Date/Time: Today / 0939 $\Delta T = 563$ Min.							
/ VARIABLE	INITIAL	FINAL	CHANGE	CONVERSION FACTOR	EQUIV LOSS	ALENT (GAL)	
Pressurizer Level ("H <sub>2</sub> O)	(217.593) -	( ) =		(+12.40)			
TAV (°F)	(578.65) -	( ) =		(-102.44)			
MU Tank Level ("H <sub>2</sub> O)	(71.394) -	( ) =		(+30.86)			
Reactor Power (%)	(99.986) -	( ) =		(-9.15)			
Reactor Power Squared (P <sup>2</sup> )	(9997.2) -	( ) =		(+0.083)			
T-111 running timer	(021436) -	() =		last valid T-111 fill rate			
Quench Tank	(N/A) -	() =	Should be zero				
			TOTAL LOSSES				

- 2.1.4 Compute INITIAL and FINAL "Reactor Power Squared" values and enter in Table 2.1.1
- 2.1.5 Calculate CHANGE in each variable and enter in Table 2.1.1.
- 2.1.6 Multiply CHANGE values by CONVERSION FACTOR and enter under EQUIVALENT LOSS.
- 2.1.7 Add EQUIVALENT LOSS values algebraically to determine TOTAL LOSSES.
- 2.1.8 Determine test  $\Delta T$  in minutes and enter in the following locations:
  - Table 2.1.1.
  - Section 3.0
- 2.1.9 Find non-returnable leak rate AND account for Zinc Injection as follows:

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2.1.10 Enter non-returnable leak rate value in section 3.0.

2.1.11 Obtain known leakage from the following source(s) and enter in Table 2.1.2 as applicable:

#### NOTE

RCP seal leakage is <u>not</u> considered because it is being returned to RCS via Quench Tank.

- A. Identified leakage sources from "RCS Leak Test", Supplement 5 to Plant Preheatup and Precritical Checklist (1102.001), performed during most recent plant startup. Do not use leakages <0.01 gpm.</p>
- B. Leakage sources >0.01 gpm which have been identified since the last plant startup and evaluated per Supplement 3 to this procedure.
- C.  $\underline{IF}$  Red Train HPI is in-service,  $\underline{THEN}$  include known leakage through P-36A/B Suction Stop Check Isol From BWST (BW-3).
- D. <u>IF</u> Green Train HPI is in-service, <u>THEN</u> BW-3 known leakage is 0.0 gpm.

Table 2.1.2 — Known Leakage Data	
Location	Measured Rate
Leakage via BW-3	
(IF Green Train HPI in-service, THEN 0.0 gpm)	gpm
Other sources (explain)	
	gpm
	gpm
	gpm
TOTAL KNOWN LEAK RATE:	gpm

2.1.12 Add MEASURED RATE values to determine TOTAL KNOWN LEAK RATE and enter in Table 2.1.2.

2.1.13 Find Unidentified leak rate as follows:

Non-returnable leak rate (section 3.0)	(	gpm)	
Total known leak rate (Table 2.1.2)	- (	gpm)	
Unidentified leak rate	(	gpm)	

2.1.14 Enter Unidentified leak rate in section 3.0.

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2.1.15 Calculate Unidentified leak Rate - TS, for comparison to the 1.0 gpm Tech Spec limit.

Unidentified leak rate (step 2.1.13) ( gpm) Leakage via BW-3 (Table 2.1.2) <u>+ ( gpm)</u> Unidentified leak rate - TS ( gpm)

2.1.16 Enter Unidentified leak rate - TS, in section 3.0.

#### NOTE

Following steps determine total leak rate. Do not pump the Quench Tank to the Makeup Tank during this leak rate check.

2.1.17 Enter initial data required in "Table 2.1.3 - Total Losses Data." Check (✓) data source used:

Pressurizer Level	( 🗸 )	<u>T-ave</u>	( 🖌 )
Preferred: L1001B		Preferred: XTAVE	
Backup: L1002B SPDS LPZR1G SPDS LPZR1R PZR Level (LIS-1002)		Backup: SPDS TAVRC1 Controlling T-ave Indicator (TI-1032)	
Makeup Tank Level	( 🗸 )	Reactor Power	( 🗸 )
Preferred: L1248		Preferred: XPP	
Backup: SPDS L1248		Backup: SPDS NI1LP	
Level Recorder for		SPDS NI2LP	
MU IANK (LK-1240)		Any Power Range Indicator (NI-5, NI-6, NI-7 or NI-8)	

2.1.18 <u>WHEN</u> following conditions have been met, THEN enter FINAL data in Table 2.1.3:

- A. Leak rate determination has run for >1 hour.
- B. Pressurizer level, T-ave, and Rx power values are approximately equal to initial values.
- 2.1.19 Compute INITIAL and FINAL "Reactor Power Squared" values and enter in Table 2.1.3.

2.1.20 Calculate CHANGE in each variable and enter in Table 2.1.3.

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- 2.1.21 Multiply CHANGE values by CONVERSION FACTOR and enter under EQUIVALENT LOSS in Table 2.1.3.
- 2.1.22 Add EQUIVALENT LOSS values algebraically to determine TOTAL LOSSES.
- 2.1.23 Determine test  $\Delta T$  in minutes and enter in the following locations:
  - Table 2.1.3
  - Section 3.0

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Table 2.1.3 — Total Losses Data						
Start Stop Date/Time:				$\Delta T =$	Min.	
VARIABLE	IN	ITIAL	FINAL	CHANGE	CONVERSION FACTOR	EQUIVALENT LOSS (GAL)
Pressurizer Level ("H <sub>2</sub> O)	(	) - (	) =		(+12.40)	
TAV (°F)	(	) (	) =		(-102.44)	
MU Tank Level ("H <sub>2</sub> O)	(	) – (	) =		(+30.86)	
Reactor Power (%)	(	·) – (	) ==		(-9.15)	
Reactor Power Squared (P <sup>2</sup> )	(	) – (	) =		(+0.083)	
<u></u>				TOTAL LOSSES	5	

2.1.24 Find total RCS losses AND account for Zinc Injection as follows:

TOTAL LOSSES (	gal.) +	Zinc Inj (	gpm) = total	. RCS losses	( gpm)
$\Delta$ T (	min.)				

2.1.25 Enter total RCS losses in section 3.0.

1103.013

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CHANGE: 034

#### SUPPLEMENT 2

**RCS LEAK DETECTION** 

Page 8 of 11

2.2 RB Sump Fill Rate Determination

2.2.1 Update "RB Sump Fillrate.xls" (spreadsheet maintained by control room staff) with data from the most recent sump level step change from SPDS.

#### NOTE

A valid RB Sump fillrate must begin with initial data at least two step changes following a RB Sump draining evolution. May have to use a fillrate prior to a sump draining evolution.

- 2.3 RB Air Monitor Reading Evaluation from the previous 24 hours Unit 1 WCO Logsheet (OPS-A3), record the highest valid reading observed for the following in section 3.0:
  - RB ATMOS Particulate Monitor (RI-7460)
  - RB ATMOS Gaseous Monitor (RI-7461)

#### NOTE

RCS Leakrate Excel spreadsheet performs the necessary calculations and comparisons of RCS leakrate data and will provide a flag to the operator when an Action Level has been exceeded.

- 2.4 <u>IF</u> this is the daily leak rate, <u>THEN</u> record data from Section 3.0 in the RCS Leakrate Excel spreadsheet and continue this section. <u>IF</u> this is <u>not</u> the daily leak rate, <u>THEN</u> N/A steps 2.5 thru 2.7, and 2.9, and perform step 2.8.
- 2.5 <u>IF</u> RCS Leakrate Excel spreadsheet indicates that a Tier One, Tier Two or Tier Three Action Level has been exceeded, <u>THEN</u> refer to "RCS Leakage Trend Analysis" section for actions to be taken.

A. Record the most recent <u>valid</u> RB Sump fillrate in Section 3.0.

1103.013

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CHANGE: 034

SUPPLEMENT 2

Page 9 of 11

NOTE

5-day RB Sump averages are N/A until the 6th day that data is available (e.g. 6th day after an outage).

2.6 From the RCS Leakrate Excel spreadsheet, obtain RB Sump fill rate 5-day average: \_\_\_\_\_ gpm.

{4.3.1}

2.7 IF RB sump fill rate exceeds the 5-day average by >0.1 gpm, THEN perform the following:

- 2.7.1 Notify Chemistry to obtain RB sump sample in an effort to determine the source of the rise in fill rate.
- 2.7.2 <u>IF</u> sample results indicate source of the rise in fill rate is Service Water, <u>THEN</u> initiate steps to perform RB entry to inspect accessible areas.
- 2.7.3 Verify a Condition Report is initiated.
- 2.7.4 Determine whether performing Leakage Investigation in accordance with Attachment A of this procedure is appropriate.
- 2.8 SRO perform the following:
  - Review and verify correct all calculations entered in this supplement.
  - IF applicable, <u>THEN</u> review and verify correct all calculations on the RCS Leakrate <u>Excel</u> spreadsheet.
  - IF applicable, <u>THEN</u> run the Tier Action Level macro to check values on the RCS Leakrate Excel spreadsheet.

Reviewed and verified by (SRO) \_\_\_\_\_ Date \_\_\_\_\_

2.9 Review required trend data.

Reviewed by (SE/STA/SRO) \_\_\_\_\_ Date \_\_\_\_\_

PROC./WORK PLAN NO.	PROCEDURE/WORK PLAN TITLE:	PAGE:	69 of 74
1103.013	RCS LEAK DETECTION	CHANGE:	034
		6	

#### SUPPLEMENT 2

Page 10 of 11

#### 3.0 ACCEPTANCE CRITERIA

<sup>3.1</sup> Record values observed during leak rate determination and compare with "Limiting Range For Operability".

TEST QUANTITY	INSTRUMENT	MEASURED VALUES	LIMITING RANGE FOR OPERABILITY	IS DATA W LIMITING H (YES, NO, (	ITHIN RANGE? DR N/A)
Nonreturnable Leak Rate	N/A	gpm	<10 gpm	YES	NO
Unidentified Leak Rate	N/A	gpm	N/A	N/A	
Unidentified Leak Rate - TS	N/A	gpm	<1 gpm	YES	NO
RB Sump Fill Rate	N/A	gpm	N/A	N/A	
Total RCS Losses	N/A	gpm	<30 gpm	N/A	
Test <b>Δ</b> T	PMS computer or clock	min	>60 minutes	YES	NO
RI-7460 Daily High	RI-7460	cpm	N/A	N/A	
RI-7461 Daily High	RI-7461	cpm	N/A	N/A	

3.2 IF "NO" is circled in above table, OR there is any leakage evaluated as unsafe, OR non-isolable leakage from a Reactor Coolant System strength boundary, THEN immediately notify the Shift Manager and verify Condition Report initiated.

Performed by \_\_\_\_\_

Date/Time \_\_\_\_\_

Date/Time \_\_\_\_\_

Date/Time

PROC./WORK PLAN NO.		PROCEDURE/WORK PLAN TITLE: PAGE:	E: 70 of 7	
11	103.013	RCS LEAK DETECTION CHANGE	034	
		SUPPLEMENT 2 Pa	ige 11	of
4.0	SHIFT MAN	NAGER REVIEW AND ANALYSIS	circle	e on
	4.1	Has this RCS leak rate been shown to comply with Tech Spec requirements per the Acceptance Criteria section?	YES	NC
	4.2	IF answer to 4.1 is "NO", describe action taken below.		
	-			
	-			
	-			
	-			
	-	· · · · · · · · · · · · · · · · · · ·	ukangga	
	-		and can	
	-			
	~~			
	4.3 F k N s	dave all of the administrative requirements of this test been satisfied, i.e., all initial blocks initialed or N/A'd, all data entered, cal due dates listed, applicable signature spaces signed, etc.?	YES	NC

Admin JPM A2 - RO

# PMS 32

UNIT: _1 REV # _1 DATE:
TUOI NUMBER: A1JPM-RO-PMS32
SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – CONDUCT OF OPERATIONS
TASK: OPERATE THE PLANT COMPUTER
JTA#: ANO1-RO-PMS-NORM-7
KA VALUE RO: <u>3.0</u> SRO: <u>3.0</u> KA REFERENCE: <u>2.1.19</u>
APPROVED FOR ADMINISTRATION TO: RO: X SRO: X
TASK LOCATION: INSIDE CR: <u>X</u> OUTSIDE CR:BOTH:
SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):
PLANT SITE:SIMULATOR:PERFORMLAB:
POSITION EVALUATED: RO: SRO:
ACTUAL TESTING ENVIRONMENT: SIMULATOR: X PLANT SITE: LAB: LAB:
TESTING METHOD: SIMULATE: PERFORM:
APPROXIMATE COMPLETION TIME IN MINUTES: 5 MINUTES
REFERENCE(S): <u>1105.010</u>
EXAMINEE'S NAME: LOGON ID
EVALUATOR'S NAME:
THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:
SATISFACTORY: UNSATISFACTORY:
PERFORMANCE CHECKLIST COMMENTS:
Start Time Stop Time Total Time
SIGNED DATE:
SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

#### THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

Prior to administration, ensure the Examinee has been briefed using Appendix E of NUREG-1021.

JPM INITIAL TASK CONDITIONS: The plant is at 100% power operations.

TASK STANDARD: The examinee has disabled the CRD P-8 Motor Temperature computer point T1P08

from alarm per 1105.010.

TASK PERFORMANCE AIDS: 1105.010, Plant Monitoring System

#### INITIATING CUE:

The CRS directs you to disable from alarm plant computer point T1P08 for CRD P-8 Motor Temperature per 1105.010, Plant Computer Operation.

CRITICAL ELEMENTS (C): 2, 3, 4, 5

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT		
EXAN	EXAMINER NOTE: When asked, inform candidate permission is granted to disable point T1P08.						
	<ol> <li>Obtain CRS/SM permission to disable point.</li> </ol>	Obtained permission to disable computer point T1P08.					
EXAN comm	INER NOTE: An acceptable method to brir and 'DBM' and then 'Enter'. This action car	ng up the DATABASE MAINTENANCE so to be performed to accomplish the standa	creen is to rd for step	type in th s 1 & 2.	e expert		
(C)	<ol> <li>Type in Turn On Code DPFA and enter.</li> </ol>	Entered DPFA on the keyboard and depressed the enter key.					
(C)	3. Depress F2.	Depressed F2 (white keys) key.					
(C)	4. Type in desired point and enter.	Typed T1P08 and depressed the enter key.					
(C)	<ol> <li>Pressed Y and enter to save changes.</li> </ol>	Depressed the Y key and depressed the enter key on the keyboard to save changes.					
	<ol> <li>Print Points Disabled From Alarm report.</li> </ol>	<ul> <li>Printed Points Disabled From Alarm report as follows:</li> <li>A. Typed in Turn On Code PDFA and depressed enter key.</li> <li>B. Depressed enter key to send report to print queue.</li> <li>C. Stated he would update the PDFA report maintained in the Control Room.</li> </ul>					
	<ol> <li>Verify WR/WO submitted for repair/restoration of disabled point.</li> </ol>	Stated he would verify that a WR/WO was submitted for repair/restoration of point T1P08 and would include words to effect to restore point to alarm.					
EXAN	MINER NOTE: <u>WHEN</u> the "Enter work <u>THEN</u> Inform the candid	item number" prompt comes up, late to enter his initials and hit "Enter'.					

# **EXAMINEE'S COPY**

# JPM INITIAL TASK CONDITIONS:

The plant is at 100% power operations.

## **INITIATING CUE:**

The CRS directs you to disable from alarm plant computer point T1P08 for CRD P-8 Motor Temperature per 1105.010, Plant Computer Operation.

Admin JPM

A3-RO HCRD4

TUOI: A1JPM-RO-HCRD4	Page 1 of 4
UNIT: <u>1</u> REV # <u>2</u> DATE:	Ū
TUOI NUMBER: A1JPM-RO-HCRD4	
SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – EQUIPMENT CONTROL	4940004400440404444044444
TASK: Perform Independent Review of a Prepared Tagout	
JTA#: ENS-OPER-PTAG-ADMIN-3	
KA VALUE RO: <u>4.1</u> SRO: <u>4.3</u> KA REFERENCE: <u>2.2.13</u>	
APPROVED FOR ADMINISTRATION TO: RO: X SRO:	
TASK LOCATION: INSIDE CR: OUTSIDE CR: Classroom:X	
SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):	
PLANT SITE: SIMULATOR: Classroom:PERFORM	
POSITION EVALUATED: RO SRO:	
ACTUAL TESTING ENVIRONMENT:	
PLANT SITE: SIMULATOR: Classroom:PERFORM	
TESTING METHOD: SIMULATE: PERFORM:X	
APPROXIMATE COMPLETION TIME IN MINUTES: 30 MINUTES	
REFERENCE(S): EN-OP-102 Rev 13, OP-1106.016, P&ID M-204 Sh 2	-
EXAMINEE'S NAME: SSN	
EVALUATOR'S NAME:	-
THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:	
SATISFACTORY: UNSATISFACTORY:	
PERFORMANCE CHECKLIST COMMENTS:	
Start TimeStop TimeTotal Tim	le
SIGNED DATE:	
SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCE	EDURE BY A

QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

## TUOI: A1JPM-RO-HCRD4

Page 2 of 4

## THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

Prior to administration, ensure the Examinee has been briefed using Appendix E of NUREG-1021.

#### JPM INITIAL TASK CONDITIONS:

Main Feedwater Pump Seal Supply Strainer F-56A-1 needs to be tagged out for maintenance. The eSOMS Clearance Module is unavailable and the Shift Manager has authorized the use of paper forms for the tagout. The clearance for F-56A-1 was prepared on the previous shift.

Indus Assist Suite is unavailable also.

## TASK STANDARD:

The examinee has correctly identified critical task errors on the prepared tagout per EN-OP-102, Protective and Caution Tagging.

#### TASK PERFORMANCE AIDS:

EN-OP-102-01 Attach 9.2, Tagout Cover Sheet EN-OP-102-01 Attach 9.3, Tagout Tags Sheet Portion of M-204, sht. 2

## TUOI: A1JPM-RO-HCRD4

Page 3 of 4

#### **INITIATING CUE:**

You have been directed by the Shift Manager to perform an independent review of the prepared tagout forms. Identify all discrepancies (if any) noted in your review.

# **CRITICAL ELEMENTS** (C) 2

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNS AT
NOT Forn	E: Provide examinee with a copy n.	of 1000.027B Clearance Remov	al Autho	orizatior	ו
	1. Review the prepared Tagout Forms	Examinee reviewed Clearance Removal Authorization Form.			
(C)	2. Identify errors.	<ul> <li>Examinee identified the critical errors:</li> <li>1. Restoration sequence is incorrect. Drain valve CS-2908-2 is last manipulation instead of first. (critical)</li> <li>2. Outlet valve CS-121A-1 is restored to the OPEN position instead of CLOSED per the tagout coversheet and OP-1106.016 Att A. (critical)</li> <li>3. Drain valve CS-2908-1 is outside the isolation boundary and should not be included in tagout. (critical)</li> <li>4. The Attribute value for "Category E Component?" is marked Yes instead of No. (non-critical)</li> </ul>			

TUOI: A1JPM-RO-HCRD4

Page 4 of 4

# EXAMINEE'S COPY

## JPM INITIAL TASK CONDITIONS:

- Main Feedwater Pump Seal Supply Strainer F-56A-1 needs to be tagged out for maintenance.
- The eSOMS Clearance Module is unavailable and the Shift Manager has authorized the use of paper forms for the tagout.
- The clearance for F-56A-1 was prepared on the previous shift.
- Indus Assist Suite is unavailable also.

## **INITIATING CUE:**

You have been directed by the Shift Manager to perform an independent review of the prepared tagout forms. Identify all discrepancies (if any) you discover during your review.

.



INFORMATIONAL USE

**PAGE** 6 **OF** 27

REV.7

**Protective and Caution Tagging Forms & Checklist** 

#### ATTACHMENT 9.2

TAGOUT COVER SHEET

Clearance: MANUAL

Tagout: <u>CS-001-F-56A-1</u>

Component to be worked: FILTER F-56A-1 MAIN FW PUMP ST

#### Description:

Clean and/or replace F-56A-1.

References: M-204 Sht 2, P&ID Condensate and Feedwater

OP-1106.016, Condensate, Feedwater and Steam System Operation

#### **Placement Inst:**

Ensure F-56A-2 is in service before hanging tag out.

#### Hazards:

CRAFT: Strainer is a high energy system (greater than 500 psig condensate water) with only single valve isolation. There is a drain on the strainer housing that is tagged open.

OPS: Check boundaries are not leaking by before making tag out ready for work by verifying no water leaking from the drain.

#### **Restoration Inst:**

Verify no leaks on strainer housing when pressurizing system while clearing tags.

F-56A-2 will remain in service following maintenance on F-56A-1.

The inlet valve is restored OPEN and outlet valve is restored CLOSED.

Attribute Description	Attribute Value
Tagout Common per OP-102 Att 9.2 Sect 8?	No
System meets Definition of High Energy?	Yes – See Tagout Details
Category E Component?	Yes
Vent / Drain Required?	Yes – See Tagout Details
Tagout Walkdown per OP-102 Performed by	Preparer
Tech Spec Impact?	None
Compensatory Actions Reg?	Yes – See Tagout Details
Verify positions by controlled procedure	Yes

Work Order Number	Description
00234376-01	Clean and/or replace F-56A-1



INFORMATIONAL USE

REV.7

**PAGE** 7 **OF** 27

# **Protective and Caution Tagging Forms & Checklist**

Status	Description	User	Verification Date
Prepared	Prepared	Joe Sizzling	5/2/11
Technical Reviewed	Reviewed		
Approved	Approved		
Tags Verified Hung	Tags Verified Hung		
Removal Approved	Removal Approved		
Tags Verified Removed	Tags Verified Removed		

						I	T		T	1	······································
		Π	SCKIIST TAGOUT TAGS SHEET		Placement Removal Tag Notes	2					
REV. 7				TAGOUT TAGS SHI	Rest. 2nd Verif Date/Time			D			
	8 <b>oF</b> 27				Rest. 1st Verif Date/Time						
4-OP-102-01	PAGE	PAGE & Checklist			Restoration Configuration	Closed	Open	Open	Closed		
EN				4	Rest. Seq.	4	7	m	~		
NON-QUALITY RELATED		ng Forms		-001-F-56A	Place. 2nd Verif Date/Time						
	INFORMATIONAL USE	ion Taggi		GOUT: CS	Place. 1st Verif Date/Time						
		e and Cauti	TA	Placement Configuration	Open	Closed	Closed	Open			
		otectiv			Place. Seq.	ň	←	N	4		
Entergy MANUAL		Ā	CHMENT 9.3	CLEARANCE: MANUAL	quipment quipment Description quipment Location	5-2908-2 al Supply Filter F-56A-1 Drain -386 NW of A MFW Pump	-121A-1 al Supply Filter F-56A-1 Outlet -386 NW of A MFW Pump	a-120A-1 al Supply Filter F-56A-1 Inlet -386 NW of A MFW Pump	-2908-1 ain after CS-121A-2 -386 NW of A MFW Pump		
			ΑΤΤΑ	C	Tag E Type E	Danger CS Se TB	Danger CS Se TB	Danger CS Se TB	Danger CS Dr		
	1				Tag Serial No.	76	27	78	1		



Admin JPM

A4-RO

A8-5R0

RVP
#### A1JPM-NRC-ADMINRWP1

#### Page 1 of 4

#### ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: _1 REV # _1 DATE:
TUOI NUMBER: A1JPM-NRC-ADMINRWP1
SYSTEM/DUTY AREA: ADMINISTRATIVE TOPIC – Radiation Control
TASK: Ability to comply with radiation work permit requirements
JTA#: ANO1-RO-MUP-NORM-13
KA VALUE RO: <u>3.5</u> SRO: <u>3.6</u> KA REFERENCE: <u>2.3.7</u>
APPROVED FOR ADMINISTRATION TO: RO: X SRO: X
TASK LOCATION: INSIDE CR: X OUTSIDE CR: BOTH:
SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):
PLANT SITE: SIMULATOR: Classroom: X
POSITION EVALUATED: RO: X SRO: X
ACTUAL TESTING ENVIRONMENT: SIMULATOR: PLANT SITE: Classroom: X
TESTING METHOD: SIMULATE: PERFORM: X
APPROXIMATE COMPLETION TIME IN MINUTES: 10 MINUTES
REFERENCE(S): <u>RWP 2011-1002</u>
EXAMINEE'S NAME: SSN
EVALUATOR'S NAME:
THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:
SATISFACTORY: UNSATISFACTORY:
PERFORMANCE CHECKLIST COMMENTS:
Start Time Stop Time Total Time
SIGNED DATE:
SIGNATURE INDICATES THIS JPM HAS BEEN COMPARED TO ITS APPLICABLE PROCEDURE BY A QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

#### A1JPM-NRC-ADMINRWP1

#### ADMINISTRATIVE JOB PERFORMANCE MEASURE

#### THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

#### **INITIAL PLANT CONDITIONS**

- 100% power steady state.
- Maintenance requires your assistance in the lower T-36 Valve Gallery.
- Your total dose for the year is currently 1950 mR.
- The dose rate in the area is 105 mR/hr.

#### TASK STANDARD:

Use the attached RWP, 2011-1002 Task 1.

Using the above information determine your MAXIMUM stay time in the lower valve gallery.

#### TASK PERFORMANCE AIDS: RWP 2011-1002

SIMULATOR SETUP: NA

#### A1JPM-NRC-ADMINRWP1

#### ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

Use the attached RWP, 2011-1002 Task 1.

Using the above information determine your MAXIMUM stay time in the lower valve gallery.

#### CRITICAL ELEMENTS (C): 2 and 4

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	<ol> <li>Recognize the dose limit per the RWP is 20 mR.</li> </ol>	Examinee identifies that the RWP Dose Alarm is set at 20 mR			
		Student may also identify that the			
		Dose Rate Alarm is set at 200 mR/hr.			
(C)	<ul> <li>Determine stay time based on the given dose in the area not to exceed RWP limit of 20 mR</li> <li>20 mR X 60 min = 11.4 minutes</li> </ul>	Examinee determines that the RWP Dose Alarm limit is set at 20 mR which would allow him to stay 11.4 minutes.			
	105 mR/hr 1 hr				
		Student may also identify that the			
		Dose Rate Alarm is set at 200 mR/hr.			
	<ul> <li>3. Determine stay time based on the given dose in the area not to exceed annual dose limits.</li> <li><u>50 mR</u> X <u>60 min</u> = 28.5 minutes 105 mR/hr 1 hr</li> </ul>	Examinee determines stay time based on Annual Dose Limit of 2000 mR would allow him to stay for 28.5 minutes.			
(C)	<ol> <li>Determine maximum stay time based on the given dose in the area.</li> </ol>	Examinee identifies that the RWP Dose Alarm is the most limiting and the MAXIMUM stay time is 11.4 minutes.			

#### ADMINISTRATIVE JOB PERFORMANCE MEASURE

### EXAMINEE'S COPY

## JPM INITIAL TASK CONDITIONS:

- 100% power steady state.
- Maintenance requires your assistance in the lower T-36 Valve Gallery.
- Your total dose for the year is currently 1950 mR.
- The dose rate in the area is 105 mR/hr

## **INITIATING CUE:**

Use the attached RWP, 2011-1002 Task 1.

Using the above information determine your MAXIMUM stay time in the lower valve gallery.



# Entergy Arkansas Nuclear One

## RADIOLOGICAL WORK PERMIT

	OPERATIONS ACT	VITIES UNIT-1		<u>R</u> 20 F	WP No.: 0111002 Rev. 01	
Comments:				*201	11002*	
RWP Type	GENERAL		<b><u>RWP Status:</u></b>	Begin Date:	Close On Date:	
<b>Prepared B</b>	y: MCCULLAH, ARLI	S M	Job Supervisor:	Randall Watters		
Estimated I 825 mrem	<b>Dose:</b> <u>Es</u> 16.	stimated Hours: 875.00	Actual Dose: 0 mrem	Actual 4.81	Hours:	
	D. 11 W		Locations			
OW/ LEVEL	Buildings	El	evations	Room		
UW LEVEL	ACTE DUU DIVIG	NG 354		NON-LOCKED HIC AREA	<b>GH RADIATION</b>	
	ASTE BUILDING	354	NON-LOCKED HIGH AREA		H RADIATION	
	DNTROLLED ACCESS	ALL		OUTSIDE CONTROLLED ACCESS		
NITTAUX	ILIARY BUILDING	ALL	ALL NON-LOCKEI		ED HIGH RADIATION	
		Radiolo	gical Conditions			
escription	in 1. (100 - 2 - 1		Value	<u> </u>	Unit	
maral avan a	in dpm/100 cm2 unless	otherwise noted.	<1K - 40K		DPM/100CM2	
cherar area g	amma dose rates are in	mrem/hour unless othe	rwise 0.1 - 200	MI	LLIREM/HOUR	
ach			Tasks			
ask	Description				Status	
	OPERATIONS A	ACTIVITIES UNIT-1			Active	
	OPERATIONS I	RAINEE ACTIVITIES	5 UNIT-1		Active	
Doc	wiromont Cus	Re	quirements			
/A	furrement Groups		Requi	rement Descriptions		
struction 1:		Additio	nal Instructions			
struction 2:						
struction 3:						
struction 4:						
struction 5:						
prover Title		A	pprovals			
ARA REVIE	W	Name NACCOL	A FE A THE MOLES		Date	
P PREPARE	R	MCCU	LLAH, ARLIS M		01/04/2011	
SUPERVISC	)R	MCCU	JLAH, ARLIS M		01/04/2011	
		- MARV	CLJK, SLANLEY D		01/04/2011	
		4 . 7			01.0+-011	



Entergy

Arkansas Nuclear One

## **RADIOLOGICAL WORK PERMIT**

Task Number	<u>:</u> 1			<u>RW</u> 201 <u>Re</u>	/ <u>P No.:</u> 11002 v.: 01	
Task Description: OPERATI	<b>ONS ACTIVITIES UNIT</b>	-1 1	Task State	us: Activ	e	
Estimate Dose: 660.00		Estimate Hours: 13.5	500,00			
Hi-Rad: Yes	Hot Particle: No	Locked Hi-	Rad:	No	Hi-Contamination:	
	Alarm S	Settings				
Dose Alarm (mrem)	20.00	Dose Rate (mrer	n/hr)		200.00	
Part in the second s	Require	ements				
Requirement Groups		<u>Requirement I</u>	Descriptio	o <u>ns</u>		
	RP (with RP Supervis Radiologically Contro IF the RCA is a satelli radworker should perf	All materials are required to be surveyed in a small articles monitor or hand frisked by RP (with RP Supervisor approval) PRIOR TO unconditional release from a Radiologically Controlled Area. IF the RCA is a satellite RCA and a "Contamination Area" is entered, THEN the radworker should perform a which had. Gold				
	contamination monito IF the RCA is a satelli THEN the radworker s indicates contaminatio indicate the presence of	r (PCM-1B or equivaler te RCA with no whole t should: a) perform a har on is present, THEN con	nt). body contained and foo itact RP.	amination of frisk.	i monitor available. b) IF the frisk frisk DOES NOT	
	contamination monitor Notify RP prior to exp	contamination monitor and gamma sensitive monitor. Notify RP prior to exposing a contaminated surface or opening a contaminated system				
	Obey the monitoring in	nstructions posted at the	e RCA exi	t point		
	Use RP approved mats	or pads when kneeling.	, sitting o	r laying ir	i contaminated areas.	
	With RP approval, read surgeon's gloves OR ec- higher contamination, level side of the bound	With RP approval, reaching across a contamination boundary is permitted using surgeon's gloves OR cotton liners with rubber gloves. When reaching into the area of higher contamination, gloves must be removed when hands are returned to the lower level side of the boundary.				
Dosimetry Requirements	FOR WORK IN HIGI cause hearing impairm headset, etc.) THEN th	FOR WORK IN HIGH RADIATION AREAS - If your work conditions are in OR will cause hearing impairment (such as work in a high noise area, use of a communications headset, etc.) THEN the use of an EAD amplifying device (PAM) is required.				
	If an EAD dose alarm Notify RP.	If an EAD dose alarm occurs: 1) Secure Work. 2) Immediately leave the RCA. 3) Notify RP.				
	If an EAD dose rate al until the alarm clears. for further instructions.	If an EAD dose rate alarm occurs: 1) Secure Work. 2) Back out of the immediate area until the alarm clears. 3) Notify others in your work crew. 4) Immediately notify RP for further instructions.				
	Periodically check you areas where your ability Whole body DLR and 1	r EAD. This check sho. / to hear is diminished. EAD required for anter	uld be per	formed in	nore frequently in	
ingineering Controls	When using temporary labeled for radioactive s	hoses to vent or drain a system use only.	i radioacti	ive systen	i, ensure the hose is	
a na su an Dachard	When venting or drain does NOT exceed the ca	ing, monitor the rate of pacity of the floor drain	system dr 1.	ain to ens	sure the rate of drain	
xposure Keduction	Use Low Dose Waiting	Areas whenever possib	le to mini	mize exp	osure.	
fotective Requirements	All joints between Anti Entry into Contaminati	All joints between Anti-C gloves sleeves and Anti-C ankles booties must be taped. Entry into Contamination Areas require single Anti-Cs				
	Entry into High Contan	nination Areas require a	louble An	ti-Cs		



Entergy

Arkansas Nuclear One

## RADIOLOGICAL WORK PERMIT

Task Number:	1	<u>RWP No.:</u> 20111002 Box - 01
RP Coverage	A "Cat 3 Advanced Radworker" may ente	r posted High Radiation Areas using a
	gamma sensitive RP instrument to monitor appropriate survey instrument. LHRA/ VF	r dose rates. (NOTE: An EAD is NOT an TRA entry requires continuous RP coverage )
	Contact RP Supervisor or RP tech prior to contamination controls for your work activ	entry to verify adequate RP coverage and ity. RP is not required to be notified for
	Radiation Areas, Contamination Areas, ov	n routine activities that do not involve High- erhead entry or system breaches.
	Entry into High Radiation Areas requires a electronic alarming dosimeter (EAD) to me	a radiological brief from RP, AND an eet Tech Spec monitoring requirements.
	Notify RP when performing operations act conditions. For example venting/draining decay heat/shutdown cooling operations, or	ed for entry into High Radiation Areas. ivities which could change plant radiological radioactive systems, performing degas or
Radiological Conditions	Contact Radwaste Personnel for radiologic Radiological conditions should be reviewed work area. This information can be obtained personnel.	al conditions in the Radwaste Buildings. d to ensure awareness of conditions in your ed from either a Status Board or RP
Respiratory Protection	Based on historical and current data, the air of a DAC. Respiratory protection is not req Supervision.	rborne radioactivity is less than 30 percent juired unless otherwise directed by RP
Special Radiological Requirements	Critical Step - Prior to movement of irradia RP Shift Tech or RP Supervisor that movem to occur. DO NOT move fuel or irradiated of gate when the adjacent pit is drained as this	tted fuel or other irradiated materials, notify nent of fuel / irradiated components is going components near cask loading gate or tilt pit can result in high general area dose rates.
	The prerequisite for a secondary resin trans changes in pressure will not cause a spill. 2 ensure that hose connections and leak integr sufficient to contain the material being trans	fer include 1) Secure the fill head such that () Conduct a walkdown (pre-transfer) to rity is satisfactory. 3) Construct a berm sterred.
Stop Work Criteria	Critical Step - Indications either from local airborne radioactivity in quantities in excess	samples or remote indication (CAM) of of 30 percent of a DAC.
	Critical Step - Radiation dose rates in the in dose rate alarm set point.	nmediate area are greater than the EAD
	Ctitical Step - Work involving alpha contan dpm 100cm2 CAN NOT be worked on a Ger	nination greater than or equal to 100 neral RWP.

	Additional Instructions	
Instruction 1:	Auditional Instructions	
Instruction 2:		
mon action 2.		
To all		
Instruction 3:		
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Instruction 4:		
Instruction 5:		
	Attachments	
V A		
		•

Admin JPM

# 45 - 5RD

PROC2

A1JPM-SRO-IS1

UNIT: <u>1</u> REVISION # 0 DATE:						
TUOI NUMBER: A1JPM-SRO-IS1						
SYSTEM: A.1 – Conduct of Operations						
TASK: Determine stay time in a hot work environment.						
JTA: ANO-SRO-ADMIN-NORM-189						
KA VALUE RO <u>3.4</u> SRO <u>3.6</u> KA REFERENCE: <u>2.1.26</u>						
APPROVED FOR ADMINISTRATION TO: RO SRO						
SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):						
PLANT SITE: SIMULATOR:PERFORMLAB:						
REFERENCES: EN-IS-108						
EXAMINEE'S NAME: KCN:						
EXAMINEE'S NAME: KCN:						
EXAMINEE'S NAME: KCN: EVALUATOR'S NAME: THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:						
EXAMINEE'S NAME: KCN: EVALUATOR'S NAME: THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE: SATISFACTORY: UNSATISFACTORY:						
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EXAMINEE'S NAME: KCN: EVALUATOR'S NAME: THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE: SATISFACTORY: UNSATISFACTORY: PERFORMANCE CHECKLIST COMMENTS: START TIME: STOP TIME: TOTAL TIME:						
EXAMINEE'S NAME: KCN: EVALUATOR'S NAME: THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE: SATISFACTORY: UNSATISFACTORY: PERFORMANCE CHECKLIST COMMENTS: START TIME: STOP TIME: TOTAL TIME: SIGNED: MUM DATE: 2/25/10						

SIGNATURE INDICATES THIS JPM HAS BEEN COMPARTED TO ITS APPLICABLE PROCEDURE BY A QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.

ADMINISTATIVE JOB PERFORMANCE MEASURE

#### A1JPM-SRO-IS1

#### THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5 or NUREG-1021, Appendix E.

#### JPM INITIAL TASK CONDITIONS:

Two non-licensed operators are required to operate FW-6B, E-1B OUTLET VALVE.

This valve is considered difficult to operate.

The local temperature is 98°F (dry bulb).

An ice based cooling system will NOT be used.

# **TASK STANDARD**: The examinee has correctly determined this is a High Work Demand activity with a maximum stay time of 20 minutes per EN-IS-108.

TASK PERFORMANCE AIDS: Copy of EN-IS-108.

Page 2 of 4

#### INITIATING CUE:

Determine maximum stay times for working in a hot environment beginning at step 5.3[2] and complete the procedure through step 5.3[5], third bullet, of EN-IS-108, Working in Hot Environments (recovery time not required).

## CRITICAL ELEMENTS (C): 2, 3

(C)	PERFORMANCE CHECKLIST	STANDARDS	N/A	SAT	UNSAT
	1. Review EN-IS-108.	Examinee reviewed EN-IS- 108.			
(C)	<ol> <li>Determine work conditions per Attachment 9.2.</li> </ol>	Examinee determined with normal work clothes and a difficult manual valve alignment this is a HIGH WORK DEMAND task per Attachment 9.2.			
EXAMIN specialis	NER NOTE: When asked, inform examir st Ima B. Safe today at 0900.	nee the WBGT temperature for th	ie area is 102'	°F as determin	ed by safety
(C)	3. Determine stay time.	Examinee completed Attachment 9.1 through Section 3 (Recovery time not required) and determined using Attachment 9.4 the maximum stay time is 20 minutes.			

END

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ATTACHMENT 9.1								
Sh	eet 1 of 1	innen an inizianan a secondariana				1028-1019-0019-1010-0014-00-9-10-00-00		
	Heat Stress Ar	ea (Buildi	HEAT S	TRESS SURVEY FORI	M ZZJ E LA	<b>G</b> (11)		
	Heat Stress Area (Building, Elevation, Room) /urb (Blog, 372, E-1 B Fu Htr							
r T	Description of Work Operate FL)-6B, E-1B Outlet Value							
ectio	Scheduled Sta	rt Date/Tir	ne <u>8/29/11</u>	<u>/000</u> Durat	ion <u>~/ hour</u>			
ŵ	Work Group(s)	(Circle) I	&C ELEC MEC	H CHEM OPS RP EN	NG Other			
	Plant or System	n Status	Mode ?	)				
and the second						······································		
÷	WGBT: □ Histo	orical Data	aOF	R 🕅 Actual WBGT Read	1020F			
2	Survey Perform	ed By:	Ima R	S.C.	slande n	9 A A		
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	Remarks:		****					
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	Location	ſ	WBGT Readir	ng Dress Requiremen	Work Der ts (L,M,F	mand H)		
	Location $1)_{3}^{2} - 7$	n 2	WBGT Readir	ng Dress Requiremen	ts Work Der (L,M,t	mand H)		
	Location 1) 372' T. ( 2)	n Ş.	WBGT Readir ノ0み%	ng Dress Requiremen Normul Work	ts (L,M,t	nand 1)		
on 3	Location 1) 372' T. ( 2) 3)	ו ג	WBGT Readir ノのみのた	ng Dress Requiremen Normul Work	ts Work Der (L,M,H	nand 1)		
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Section 3	Location 1) 3721 7. [ 2) 3) Stay Time (Attch. 9.4)	n <u>}.</u> +	WBGT Readir ノクラッナ Stay Time (Attch. 9.7)	ng Dress Requiremen Normal Work = TOTAL Stay Tim	ts Work Der (L,M,H //other Recovery (Attch. S	Time 9.4)		
Section 3	Location 1) 372' T. [ 2) 3) Stay Time (Attch. 9.4) 1) 20 M:	n ?, + +	WBGT Readir ノクラッナ Stay Time (Attch. 9.7) みノA	ng Dress Requiremen Normul Work = TOTAL Stay Tim = 20 m	ts Work Der (L,M,H	Time 9.4)		
Section 3	Location 1) 3721 T. 1 2) 3) Stay Time (Attch. 9.4) 1) 20 m; 2)	n <u>}</u> + + +	WBGT Readir ノウラッチ Stay Time (Attch. 9.7) ルノA	ng Dress Requiremen Norm / Work = TOTAL Stay Tim = 20 m	Work Der (L,M,H (L,M,H (L,M,H (L,M,H)	mand H) Time Đ.4)		
Section 3	Location 1) 3721 7.1 2) 3) Stay Time (Attch. 9.4) 1) 20 M: 2) 3)	n <u>}</u> + + + +	WBGT Readir ノクラッチ Stay Time (Attch. 9.7) みノA	ng Dress Requiremen Normal Work = TOTAL Stay Tim = 20 m =	Work Der (L,M,H - Mother Recovery ne (Attch. S	mand 1) Time 9.4)		
ection 4 Section 3	Location 1) 372' 7. f 2) 3) Stay Time (Attch. 9.4) 1) 20 m; 2) 3) Thave briefed er Countermeasure heat stress envin medication(s) the	+ + + + + htrants on es. Addition ronment of ey may be	WBGT Readir	ng Dress Requiremen Normal Work = TOTAL Stay Tim = 20 M = = -Determination, Adequa tain the responsibility to with precautions or restr	Work Der (L,M,H (L,M,H (Atch. S (Attch. S (Attch. S (Attch. S (Attch. S (Attch. S (Attch. S (Attch. S (Attch. S (Attch. S) (Attch. S	mand +) Time 		



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ATTACHMENT 9.2

Sheet 1 of 1

WORK DEMAND / CLOTHING CHART

WORK DEMAND	ACTIVITY*
L LOW 180 Kcal/hr.	Sitting/monitoring Inspecting Walking Calibrating instruments/equipment Equipment operation (e.g., crane operations)
M MODERATE 300 Kcal/hr.	Sorting materials (e.g., clothing) Intermittent stair or ladder climbing Moderate or intermittent manual materials handling Installing insulation Manual valve alignment - easy Mopping/Sweeping
H HIGH 415 Kcal/hr.	Manual valve alignment - difficult Heavy or continuous manual material handling Manual decontamination Manual hoisting Scrubbing/brushing/scraping Hand sawing Shoveling/Digging Using tight fitting respirator

\*The listed activities are for example only. This list is not all-inclusive.

	Typical Clothing Ensembles
WC:	Work clothes (Example: work pants and shirt with open neck, or modesty garments)
SC:	Single coveralls with gloves and hood or regular work clothes with a lab coat and gloves. (Example: single PCs, lab coat)
DC:	Double coveralls with gloves and hood over modesty garments (e.g., double PCs).

CP: Vapor barrier suit with gloves and hood over modesty garments (e.g., full plastics).

Heat Stress Threshold Values (Dry bulb temperature)						
Clothing Ensemble	Work Demand					
	Light - Moderate Work	Heavy Work				
Work Clothes or Single Coveralls	90°F	80°F				
Double Coveralls or Single Coveralls Plus Plastics	85°F	75°F				

KEY



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#### ATTACHMENT 9.4

#### DETERMINING STAY TIMES AND RECOVERY TIME / STAY TIME CHART

#### Sheet 1 of 1

Worker stay times are determined as follows:

- 1. Find WBGT temperature of the Heat Stress Area in the left hand column of the Stay Time Chart
- 2. Follow this line to the right to the appropriate columns for clothing ensemble
- 3. Determine the Work Demand (low, medium or high) from within the clothing ensemble column. Refer to attachment 9.2 for guidance
- 4. The number within that box is the worker's maximum stay time in minutes.
- 5. <u>Recovery Time</u> = Time Spent in Heat Stress Area divided by assigned Stay Time multiplied by 60 minutes

	WOR	K CLO	THES	SI	NGLE	PCS	DO	UBLE	PCS	P	LASTIC	CS
	Wo	rk Den	nand	Wo	rk Der	nand	Wo	rk Dem	and	Wo	rk Dem	and
WBGT	LOW	MOD	HIGH	LOW	MOD	HIGH	LOW	MOD	HIGH	LOW	MOD	HIGH
$120^{\circ}\mathrm{F}$	20							1			1	<u> </u>
118°F	20							l				
116°F	25								1			1
114°F	25	15		13								
112°F	30	20		20					1		İ	1
110°F	35	20		25			20				1	
108°F	45	25		25	lõ		20			İ	1	<u> </u>
106°F	50	25		30	20		25	15				
104°F	60	30	15	35	20		25	20		15		
$102^{\circ}\mathrm{F}$	75	35	$\langle 20 \rangle$	45	25		30	20		20	<u> </u>	
100°F	90	40	20	50	25		40	20		25	15	
98°F	105	45	25	60	30	15	45	25		30	15	
96°F	130	50	35	75	35	20	55	-30		30	20	
94°F	165	55	40	90	40	20	70	30	20	40	20	
92°F	195	70	45	105	45	25	80	35	20	45	25	
90°F	230	85	55	130	50	35	100	40	25	55	30	
88°F	NL	110	70	165	55	40	120	45	30	65	-30	15
86°F	NL	170	85	195	70	45	150	50	35	80	35	20
84°F	NL	240	115	-230	85	55	180	60	40	100	40	25
82°F	NL	NL	180	NL	110	70	210	75	45	120	45	30
80°F	NL	NL	NL	NL	180	90	NL	95	65	150	50	35
78°F	NL	NL	NL	NL	NL	120	NL	150	80	180	60	40
76°F	NL	NL	NL	NL	NL	NL	NL	210	100	210	75	45
74°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	100	60
72°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	150	75
70°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	210	100
68°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	140
66°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	240

Table legend: NL = No limit on stay time

KEY

#### JPM INITIAL TASK CONDITIONS:

- Two non-licensed operators are required to operate FW-6B, E-1B OUTLET VALVE.
- This valve is considered difficult to operate.
- The local temperature is 98°F (dry bulb).
- Attachment 9.5 of EN-IS-108 has been completed for both operators and they are cleared to perform the task.
- Both operators' training is up to date.
- An ice based cooling system will NOT be used.

#### **INITIATING CUE:**

• Determine maximum stay times for working in a hot environment beginning at step 5.3[2] and complete the procedure through step 5.3[5], third bullet, of EN-IS-108, Working in Hot Environments (recovery time not required).

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#### Procedure Contains NMM REFLIB Forms: YES X NO Effective Procedure Owner: Wayne Rheaume Executive Sponsor: Russ Brian Date Title: Manager HU/IS Title: Operations VP 06/22/2010 Site: HQN Site: GGNS Exception Site Site Procedure Champion Title Date\* ANO Vicki Mills Safety Coordinator BRP Willie Dorsey Supt. HU/IS GGNS Joe Tarnabine Safety Coordinator IPEC **Terrence** Thivierge Supt, HU/IS JAF Chris Naum Safety Coordinator PLP Willie Dorsey Supt, HU/IS PNPS Larry Schrall Safety Coordinator RBS Jacque Courville Safety Coordinator VY Deb Tisdale Supt, HU/IS W3 Jeff Seeber Safety Coordinator NP HQN Wayne Rheaume Mgr Fleet HU/IS

Site and NMM Procedures Canceled or Superseded By This Revision None

#### Process Applicability Exclusion): All Sites:

Specific Sites: ANO 🛛 BRP 🗌 GGNS 🖾 IPEC 🖾 JAF 🗌 PLP 🖄 PNPS 🖾 RBS 🖾 VY 🗌 W3 🗌 NP 🗌

<u>Change Statement:</u> This editorial revision corrects the following procedural items: pagination, sequencing, indents, grammar, replacement of cross references, typos and replacement of data table elements inadvertently removed during the processing of Revision 8. Corrections were made to the following sections: 4.0[1], 4.0 [5], 5.3 [1] through [5], 5.4 [3] & [4], Attachment 9.2 and Page 1 Site Procedure Champion titles. Due to the simultaneous release of Rev 8 and Rev 9 for GGNS and VY the original Rev 8 rev bars were left in the document and the thicker rev bars indicate the Rev 9 editorial change locations.

NOTE: These are the original list of changes from Rev. 8 and are identified by thin lined rev bars with in the document. Original Rev. 8 Non-Editorial Changes:

- Added: 4.0[3] Verify employees have received training as outlined in Section 4.0[5]
- Added the following bullet in Section 4.0[5] to state: Shall have satisfactorily completed the computer based training module for working in hot environments.
- Corrected Attachment number in Section 5.2[2] from 9.4 to the 5.4
- Revised the following statement in Section 5.2[5]: Attachment 9.6 is an advisory for working in heat stress
  environments located inside buildings or outside areas. This advisory should be used for general inspections, tours,
  and routine light to moderate work in areas with elevated temperatures. Attachment 9.1 is not required if using the
  advisory table, (Attachment 9.6). However, employees must be briefed on the awareness/issues and actions
  delineated in the advisory table.
- Removed the Heat Stress Threshold Values Chart from Section 5.3[1] and added revised to state: "Prior to performing work, the work group supervisor shall determine whether heat stress conditions may be a factor:
- Added the following NOTE in Section 5.3[2]: NOTE: Attachment 9.1 does not need to be completed if the stay time associated with the temperature is listed as No Limit (NL).
- Revised Section 5.4[4] first bullet to state: "If a Blood pressure/pulse machine is used, supervisor or designee must witness the readings, check the box in Section 2 of Attachment 9.5 indicating that a blood pressure pulse machine was used and print, sign and date section 2."
- Revised Attachment 9.1, Section 4; added the following statement: "Plus that the entrants retain responsibility to verify that their entry into a heat stress environment does conflict with precautions or restrictions listed for medication(s) they may be taking." Revised Attachment 9.5 signature sections

\*Requires justification for the exception

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#### 1.0 <u>PURPOSE</u>

This procedure defines the required practices and precautions necessary to enter and work safely in hot environments.

It is <u>not</u> intended that this procedure includes fire fighting, fire fighting training, rescue, or rescue training activities. These activities have specific precautions that can be documented by completing a Job Safety Hazards Analysis.

This procedure was developed to ensure the safety of personnel exposed to hot work environments. Workers exposed to these environments may experience decreased physical performance and/or mental alertness. Sweating, fogging of eye and face protection, dizziness, and decreased mental functions can contribute to accidents while working in hot environments. The most common physical ailments associated with excessive exposure to heat are heat cramps, heat exhaustion, and heat stroke.

#### 2.0 <u>REFERENCES</u>

- [1] American Conference of Governmental Industrial Hygienists, Threshold Limit Value for Heat Stress and Strain. Documentation of the Threshold Limit Value. ACGIH 2007.
- [2] Electric Power Research Institute, Heat Stress Management Program for Power Plants (Rev. 1), August 1991.
- [3] G.D. and F.E. Clayton, Patty's Industrial Hygiene and Toxicology, Volume I: General Principles, 3rd Edition, 1978, p. 927-992.
- [4] National Institute for Occupational Safety and Health, Occupational Exposure to Hot Environments, April, 1986.
- [5] Occupational Safety And Health Standards, Title 29, Code of Federal Regulations, Part 1910 and 1926.
- [6] Guidelines for the Optimization of Protective Clothing: Heat Stress and Skin Contamination Protection, EPRI, Palo Alto, CA: 2003. 1002822.
- [7] Electric Power Research Institute, Guidelines for the Optimization of Protective Clothing, Heat Stress and Skin Contamination, Final Report, 2003.
- [8] NMM, EN-NS-112, Medical Program.

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#### 3.0 **DEFINITIONS**

- [1] <u>Acclimation</u> The body's physiological adaptation to a hot environment over a period of time. After acclimation has been achieved, the body sweats more while losing less salt and maintaining lower body temperatures and cardiovascular demands.
- [2] <u>Dry Bulb Temperature</u> Ambient air temperature (degrees Fahrenheit). It is called dry bulb because it is measured with a standard thermometer whose bulb is dry.
- [3] <u>Heat Exhaustion</u> Heat related illness caused by the failure to self-regulate body core temperature. Symptoms include: heavy sweating, fatigue, headache, pale, clammy skin, rapid pulse, dizziness, fainting, nausea, vomiting, muscle cramps. Threshold is generally considered to be body core temperature >100.4° F.
- [4] <u>Heat Stress</u> The net heat load to which a worker may be exposed from the combined contributions of:
  - (a) metabolic heat (the workload)
  - (b) environmental factors (air temperature, humidity, air movement, and radiant heat)
  - (c) clothing requirements (including PPE)

Heat stress is the generic term for physiological stress from exposure to hot environment and may collectively include any specific heat-related illness.

- [5] <u>Heat Stroke -</u> the most serious heat-related illness. It occurs when the ability to control body temperature is overcome: core temperature rises, and the ability to sweat and therefore cool down is lost. Body temperatures can rise to 106° F or higher within 10-15 minutes. Heatstroke can cause death or permanent disability if emergency treatment is not provided. Symptoms include an extremely high body temperature; red, hot, and dry skin (no sweating); a rapid, strong pulse; headache; dizziness; and nausea. Threshold is generally considered to be body core temperature >104° F.
- [6] <u>Heat Stress Environment</u> Hot environment with a designated maximum heat stress stay time as defined in attachment 9.4.
- [7] <u>High Heat Stress Environment</u> Environment with a heat stress stay time of  $\leq$  30 minutes.

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- [8] <u>Medical Examiner</u> A licensed physician or other licensed health care provider working under the license of the licensed physician as allowed by law. Knowledgeable in the area of occupational health and authorized by Entergy Nuclear to perform physical examinations and other occupational health functions.
- [9] <u>Medical Services</u> Generally, personnel who are trained and qualified at the level of Emergency Medical Technician – Basic (EMT-B) or above. If local or state Emergency Medical Service (EMS) protocols train personnel at the First Responder level to measure blood pressure, they would also be qualified as Medical Services.
- [10] <u>Recovery Time</u> The amount of time spent in the hot environment divided by the assigned Stay Time multiplied by 60 minutes.
- [11] <u>Self-Determination</u> The method by which an individual may begin to recognize the early warning signs of heat-related disorder and terminate the exposure. Self-Determination may shorten but never lengthen assigned Stay Times.
- [12] <u>Stay Time</u> The maximum amount of time a worker can remain in a Heat Stress Environment. Personnel are not compelled to remain in the hot environment for the entire assigned Stay Time and may leave at any time due to selfdetermination.
- [13] <u>Wet Bulb Globe Temperature (WBGT)</u> a heat exposure index that quantifies the environmental contribution to heat stress. WBGT is influenced by air temperature, radiant heat, air movement, and humidity.

#### 4.0 **RESPONSIBILITIES**

- [1] Medical personnel (Medical Examiner/Medical Services) are responsible for determining individual physical qualifications (see Attachment 9.5/9.5A) for working in a high heat stress environment.
- **MARKIN**

- [2] Industrial Safety -
  - Advisors to supervision and workers on heat stress management and may assist in heat stress measurements.
  - Assists work groups with JSHA's for routine/repetitive heat stress areas or situations that do not fit within the bounds of this procedure.
- [3] The work group supervisor -
  - Review dress requirements, work demand, and the job site conditions to determine if heat stress is a potential problem.
  - Determine appropriate heat stress countermeasures.
  - Ensure heat stress measurements are taken.

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- Brief the workers on heat stress, countermeasures, and maintaining adequate hydration before exposure to heat stress conditions.
- Enforce Stay Times/Recovery Times and other heat stress countermeasures.
- Review the High Heat Stress Physical Qualification Assessment (Attachment 9.5) when needed.
- Contact Industrial Safety for further assistance as needed.
- Verify employees have received training as outlined in Section 4.0[5]
- [4] Training Department shall provide training to all workers who will enter a heat stress environment.
- [5] Each individual who will work in a heat stress environment:
  - Shall have satisfactorily completed the computer based training module (FCBT-SAF-AOCWHE) for working in hot environments.
  - Shall be mentally and physically capable of performing duties in a safe and reliable manner
  - Shall not exceed the approved stay time in a heat stress environment.
  - Shall verify that their entry into a heat stress environment does not conflict with precautions or restrictions listed for medication(s) they may be taking.

#### 5.0 DETAILS

- 5.1 PRECAUTIONS AND PROCEDURE LIMITATIONS
- [1] Employees may leave at any time due to self-determination and are not required to remain in the hot environment for the entire assigned stay time.
- [2] Plant activities such as the removal of insulation or flooding of pools/canals can increase the humidity in already hot work environments. These changes should be evaluated as needed.
- [3] Employees must replenish fluids frequently when working in hot environments even if not thirsty.
- [4] Employees must be aware that the potential for a heat-related illness still exists despite compliance with Stay Times and other precautions. Individual job tasks, environments, dress apparel, physical conditioning, transient medical conditions and lifestyle behaviors are all important factors to be considered in evaluating the likelihood and severity of heat-related illness.
- [5] Personnel must leave the heat stress environment upon melting of an ice-based cooling garment.

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#### GENERAL REQUIREMENTS

Attachment 9.5 may be completed for entry into <u>any</u> heat stress environment, at the discretion of Industrial Safety or Supervision.

Attachment 9.5 shall be required for entries into High Heat Stress environments, per section 5.4.

If an individual refuses to provide the information requested in Attachment 9.5, then Management has the right to deny the individual entry into a potential High Heat Stress environment.

Heat stress shall be considered a potential hazard when temperatures are elevated, typically during the summer or when access to hot areas in plant facilities is required.

Attachment 9.6 is an advisory for working in heat stress environments located inside the buildings or outside areas. This advisory should be used for general inspections, tours, and routine light to moderate work in areas with elevated temperatures. Attachment 9.1 is not required if using the advisory table, (Attachment 9.6). However, employees must be briefed on the awareness/issues and actions delineated in the advisory table.

[6] Recovery Time should occur in an area that is subjectively cool (ambient temperatures less than 77°F, dry bulb). During the recovery period, only low work demand (see Attachment 9.2) tasks of a non-hazardous nature can be performed.

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If work area temperatures are anticipated to exceed or found to exceed 120°F WBGT or 135°F dry bulb, a job safety hazard analysis per EN-IS-124, including a rescue plan shall be required.

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5.3

Prior to performing work, the work group supervisor shall determine whether heat stress conditions may be a factor:

- [2] From Attachment 9.2
  - Select the appropriate work demand category from the table titled Work Demand
  - Select the appropriate clothing ensemble from table titled Typical Clothing Ensembles.
  - Determine if heat stress may be a factor by reviewing the table titled Heat Stress Threshold Values.
- [3] If the dry bulb temperature is greater than, or expected to be greater than those listed, heat stress <u>may</u> be a factor; obtain a WBGT or reference historical temperature readings.

#### NOTE

Attachment 9.1, Heat Stress Survey Form is not required if the stay time associated with the temperature is listed as No Limit (NL)

- [4] If the WBGT temperature obtained falls within the chart on Attachment 9.4, then a Heat Stress survey Form, Attachment 9.1, shall be completed.
- [5] The work group supervisor whose personnel must enter a Heat Stress Environment shall complete Attachment 9.1, Heat Stress Survey Form:
  - Complete Section 1, including work description, location and duration
  - Complete Section 2, by recording WBGT reading. Historical data may be used for initial entry in lieu of direct measurement as long as the location and plant conditions are similar.
  - Complete Section 3, Determine:
    - (1) Dress requirements and work demand using Attachment 9.2.
    - (2) Stay Times using Attachment 9.4.
  - Complete Section 4 of the Heat Stress Survey Form which requires ensuring the work crew has been briefed on Stay Times, Self-Determination, adequate hydration, heat stress counter measures and anticipated recovery time.
  - Assign an employee to track Stay Times.
  - Return form to Industrial Safety when complete, copy should remain with work package.

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- 5.4 HIGH HEAT STRESS ENVIRONMENTS
- [1] The use of personal cooling garments is recommended for exposures in High Heat Stress Environments.
- [2] When entering a high heat stress environment one or more of the following is required:
  - Two persons at a minimum
  - Radio, voice, or Gaitronics system communication
  - Visual/video coverage
- [3] All workers shall complete Attachment 9.5 and have their blood pressure and pulse checked prior to working in a High Heat Stress Environment. Individuals with blood pressure ≥ 160/100 or pulse rate ≥ 100 beats per minute shall not enter a high heat stress area. Blood pressure and pulse rate readings should be done as close as possible prior to the entry.
  - If a Blood pressure/pulse machine is used, supervisor or designee must witness the readings; check the box in Section 2 of Attachment 9.5 indicating that a blood pressure pulse machine was used and print, sign and date section 2.
- [4] Subsequent entries into High Heat Stress Environments require blood pressure and pulse verification documented on an Attachment 9.5A form.
  - If a Blood pressure/pulse machine is used, supervisor or designee must witness the readings; check the box in Section 2 of Attachment 9.5 indicating that a blood pressure pulse machine was used and print, sign and date section 2.
- [5] Supervisors shall confirm with employees that an Attachment 9.5 has been filled out; and the minimum recovery time requirements have been satisfied.

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#### 5.5 HEAT STRESS COUNTERMEASURES

- [1] Countermeasures are implemented to reduce heat stress exposures. First consideration shall be engineering controls, such as lowering environmental heat and humidity, and shall be implemented whenever feasible, followed by administrative controls such as employee rotation and stay times.
- [2] Other countermeasures to be considered are as follows:
  - Use of air conditioning
  - Use of body cooling garments
  - Increased ventilation/air motion
  - Reduced work scope
  - Reduced work demand levels
  - Reduced clothing requirements
  - Water/Electrolyte replacement fluids (consult with Radiation Protection in RCA/CAA)
- [3] Self-determination is an important heat stress countermeasure wherein an individual exits the hot environment immediately upon recognizing the early warning signs of heat illness.
- 5.6 EXTENSION OF STAY TIMES USING PERSONAL COOLING GARMETS
- [1] For individuals using personal frozen cooling garments, stay times determined via 5.3 [5] may be extended:

By an additional 15 minutes, <u>OR</u> By the amount of time determined via the formula in Attachment 9.7

[2] Stay times are unlimited for personnel using circulating cooled air systems or circulating cooled fluid systems that maintain body core temperature at thermal equilibrium.

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#### 6.0 INTERFACES

None

#### 7.0 <u>RECORDS</u>

None

#### 8.0 OBLIGATION AND REGULATORY COMMITMENT CROSS REFERENCES

Document	Document Section	Procedure Section	Site Applicability
None			

#### 9.0 ATTACHMENTS

- 9.1 HEAT STRESS SURVEY FORM
- 9.2 WORK DEMAND/CLOTHING CHART
- 9.3 SIGNS AND SYMPTOMS OF HEAT STRESS RELATED ILLNESSES
- 9.4 DETERMINING STAY TIME AND RECOVERY TIME / STAY TIME CHART
- 9.5 HIGH HEAT STRESS PHYSICAL QUALIFICATION ASSESSMENT
- 9.5A HIGH HEAT STRESS SUBSEQUENT ENTRY VERIFICATION FORM
- 9.6 HEAT STRESS ADVISORY TABLE
- 9.7 DETERMINING ADDITIONAL STAY TIMES FOR PERSONNEL USING ICE-BASED COOLING SYSTEMS

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	VVork Group(s)	(Circle) I&C ELEC ME	CH CHEM OPS	)RP ENG O	ther	
	Plant or Systen	n Status <u>Mode</u>	7			
	WGBT: □ Histo	orical Data	OR   Actual WBC	GT Reading		-
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	Location	n WBGT Rea	ding Requ	Dress Jirements	Work Derr (L.M.H	nand )
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	2)					
on 3	3)					
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-	(Attch. 9.4)	(Attch. 9.7	r) = s	Stay Time	(Attch. 9	.4)
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#### ATTACHMENT 9.2

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WORK DEMAND / CLOTHING CHART

WORK DEMAND	ACTIVITY*
L LOW 180 Kcal/hr.	Sitting/monitoring Inspecting Walking Calibrating instruments/equipment Equipment operation (e.g., crane operations)
M MODERATE 300 Kcal/hr.	Sorting materials (e.g., clothing) Intermittent stair or ladder climbing Moderate or intermittent manual materials handling Installing insulation Manual valve alignment - easy Mopping/Sweeping
H HIGH 415 Kcal/hr.	Manual valve alignment - difficult Heavy or continuous manual material handling Manual decontamination Manual hoisting Scrubbing/brushing/scraping Hand sawing Shoveling/Digging Using tight fitting respirator

The listed activities are for example only. This list is not all-inclusive.

#### **Typical Clothing Ensembles**

WC:	Work clothes (Example: work pants and shirt with open neck, or modesty garments)

- Single coveralls with gloves and hood or regular work clothes with a lab coat and gloves. SC: (Example: single PCs, lab coat)
- DC: Double coveralls with gloves and hood over modesty garments (e.g., double PCs).
- CP: Vapor barrier suit with gloves and hood over modesty garments (e.g., full plastics).

Heat Stress Threshold Values (Dry bulb temperature)					
Clothing Ensemble Work Demand					
	Light - Moderate Work	Heavy Work			
Work Clothes or Single Coveralls	90°F	80°F			
Double Coveralls or Single Coveralls Plus Plastics	85°F	75°F			

#### MODIZ DEMAND

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SIGNS AND SYMPTOMS OF HEAT RELATED ILLNESSES

Condition	Symptoms	Initial First Aid
Heat Stroke (MEDICAL EMERGENCY)	A life-threatening emergency that occurs when the body's temperature-regulating mechanisms fail during excessive exposure to heat. Skin is hot, usually dry, red or spotted. Victim is confused, delirious or may be unconscious.	Call the site emergency #. Attempt to provide cooling to the body, soak clothing with water and vigorously fan the body. Contact Medical
Heat Exhaustion	A mild form of shock caused by the loss of body fluids and minerals. Skin is clammy and moist, victim is pale and experiences fatigue, extreme weakness, giddiness, nausea or headache	Call the site emergency #. Get victim to cool place and give them plenty of liquid. Contact Medical
Heat Cramps	A cramping condition brought on by loss of body fluids and minerals due to profuse perspiration.	Get victim to cool place and give them plenty of liquid. Contact Medical
Heat Rash	Rash appears in areas that are persistently wet with un-evaporated sweat and where clothing is restrictive	Get worker to a cool environment, wash and dry skin in affected areas.
Heat Syncope	Sudden weakness or fatigue, pale skin, blurred vision, momentary blackouts normally caused by prolonged static postures with high environmental temperatures and vapor barrier clothing.	Have worker lie down or sit with their head between their knees, Provide drinking water or other replacement fluid as needed. Contact Medical

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#### ATTACHMENT 9.4

#### DETERMINING STAY TIMES AND RECOVERY TIME / STAY TIME CHART

#### Sheet 1 of 1

Worker stay times are determined as follows:

- 1. Find WBGT temperature of the Heat Stress Area in the left hand column of the Stay Time Chart
- 2. Follow this line to the right to the appropriate columns for clothing ensemble
- 3. Determine the Work Demand (low, medium or high) from within the clothing ensemble column. Refer to attachment 9.2 for guidance
- 4. The number within that box is the worker's maximum stay time in minutes.
- 5. <u>Recovery Time</u> = Time Spent in Heat Stress Area divided by assigned Stay Time multiplied by 60 minutes

	WORK CLOTHES			SINGLE PCS		DOUBLE PCS		PLASTICS				
	Woi	rk Den	nand	Work Demand Work Demand			and	Work Demand				
WBGT	LOW	MOD	HIGH	LOW	MOD	HIGH	LOW	MOD	HIGH	LOW	MOD	HIGH
120°F	20											
118°F	20											
116°F	25							·			[	<b></b>
114°F	25	15		1.5								
112°F	30	20		20								
110°F	35	20		25			20					
108°F	45	25		25	15		20		-			
106°F	50	25		-30	20		25	15				
104°F	60	30	15	35	20		25	20		15		
102°F	75	35	20	45	25		.30	20		20		
100°F	-90	40	20	50	25		40	20		25	15	
98°F	105	45	25	60	30	15	45	25		30	15	
96°F	130	50	35	75	35	20	55	- 30		- 30	20	· · · · · · · · · · · · · · · · · · ·
94°F	165	55	40	90	40	20	70	30	20	40	20	
92°F	195	70	45	105	45	25	80	35	20	45	25	
<u>90°</u> F	230	85	~ 55	130	50	35	100	40	25	55	30	
88°F	NL	110	70	165	55	40	120	45	30	65	30	15
86°F	NL	170	85	195	70	45	150	50	35	80	35	20
84° F	NL	240	115	230	85	55	180	60	40	100	-4()	25
$82^{\circ}F$	NL	NL	180	NL	110	70	210		45	120	4.5	30
80°F	NL	NL	NL	NL	180	90	NL	95	65	150	50	35
78°F	NL	NL	NL	NL	NL	120	NL	150	80	180	60	40
76°F	NL	NL	NL	NL	NL	NL	NL	210	100	210	75	45
74°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	100	60
72°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	150	75
70°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	210	100
68°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	140
66°F	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	240

Table legend: NL = No limit on stay time

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ATTACHMENT 9.5	ATTACHMENT 9.5 HIGH HEAT STRESS PHYSICAL QUALIFICATION ASSESSMENT						
Sheet 1 of 1 Section 1: Employee/Worker Information							
Employee Name: Department/Company							
Supervisor Name Questions 1-4 are VOLUNTARY: which may be completed by the worker prior to work in a High Heat Stress Area							
1 Do you have a history of high blood pressure (≥160/100), heart disease, diabetes, o Yes o No . anemia, kidney disease, impaired pulmonary function, thyroid disease, current acute infection, or other significant disease?							
2 Are you taking any prescription medications for high blood pressure, heart disease, o Yes o No diabetes, pain, thyroid disease, fluid retention, anxiety, or depression?					o No		
3 Are you more than 35% above your ideal weight? (Reference Table Below) o Yes					o No		
4 Have you had a previous severe heat illness/stroke? o Yes o No							

"YES" ANSWERS TO ANY QUESTION ABOVE REQUIRE AN EVALUATION BY A MEDICAL EXAMINER I decline to answer the questions above. \* Print name, sign and date below

Employee (Print Name)

Men Women HT Ideal WT+ WT+ HT Ideal HT Ideal WT+ HT Ideal WT (in.) WT 35% (in.) WT 35% (in.) WT 35% WT (in.) + (lbs) (lbs) (lbs) (lbs) 35% 236 

Signature

Date

Section 2: Blood Pressure/Pulse Check Acknowledgement

BP/pulse check machine used? o Yes o No (Supervisor or Designee signature required) BP/pulse checks obtained by someone meeting the definition of Medical Services? o Yes o No (Person meeting definition of Medical Services signature required)

Blood Pressure Reading: \_\_\_\_\_\_ (160/100 maximum), Pulse\_\_\_\_\_ (100 BPM maximum)

Supervisor/Designee OR Medical Services (Reference the questions in Section 2)

Print Name Section 3: Review and Approval to Work in a High	Date	
Supervisor's Approval: o Approved o Not Approv	ved o Medical Review Required	
Print Name Medical Examiners Review/Approval: o Approved	Signature o Not Approved o Not Applicable	Date
Print Name	Signature	Date

Enteroy	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-IS-108	REV. 9			
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Working in Hot Environments							

ATTACHMENT 9.5 A

HIGH HEAT STRESS SUBSEQUENT ENTRY VERIFICATION FORM

Sheet 1 of 1

#### Subsequent Entry Verification Form

Ensure Attachment 9.5, has been completed and approved.

Verify minimum Recovery Time with employee. o BPM = Blood pressure/pulse machine o S/D = Supervisor or Designee Date:

NAME	BLOOD	PULSE	RE-ENTRY	MEDICAL SERVICES/
	PRESSURE			SUPERVISOR/
	1		YES/NO	DESIGNEE
	<160/100	<100 ppu	120/110	DESIGNEE
	100/100	TIUU BPIM		INITIALS
				o BPM
				o S/D
	****			o BPM
				o S/D
				o BPM
				<u>0 S/U</u>
				o BPM
				00/0
				OBPM
				o S/D
				a BPM
				o S/D
				o BPM
				o S/D
				o BPM
				o S/D
				o BPM
				o S/D
				o BPM
				0 S/D
				o BPM
				o S/D
				o BPM
				o S/D
				o BPM
			+	o S/D
				o BPM
			++	<u> </u>
				o BPM
			++	0.5/U
				OBPM
			11	05/0

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		INFORMATIONAL USE	PAGE18 OF 19	

Working in Hot Environments

#### ATTACHMENT 9.6 Sheet 1 of 1

HEAT STRESS ADVISORY TABLE

#### HEAT STRESS ADVISORY TABLE

Use Attachment 9.3, Signs and Symptoms of Heat Related Illnesses, as needed for familiarization

Severity	Awareness/Issues & Actions
Levell	Ambient or Dry Bulb temperature range 90°-95°F
	<ul> <li>Continuous exposure should not exceed two hours</li> </ul>
	Replenish fluids frequently
	Pace work accordingly
	<ul> <li>Take breaks as needed in cool environment</li> </ul>
Level II	Ambient or Dry Bulb temperature range 96°-100°F
	<ul> <li>Continuous exposure should not exceed 1 ½ hours.</li> </ul>
	<ul> <li><u>Replenish</u> fluids frequently</li> </ul>
	Pace work accordingly
	<ul> <li>Take breaks frequently in a cool environment</li> </ul>
	<ul> <li>Be aware of early symptoms of heat illness</li> </ul>
	<ul> <li>Make use of appropriate external cooling devices as appropriate (cool vest, vortex suits, cool bandanas, hard hat liners etc.)</li> </ul>
Level III	Ambient or Dry Bulb Temperatures >100
	<ul> <li>Limit unnecessary tasks</li> </ul>
	<ul> <li>Establish exposure/break frequency with supervisor</li> </ul>
	Implement Actions for Level II

\*\*Continuous exposures are estimated for individual performing moderate work demand activities in work clothes.

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Working in Hot Environments							

ATTACHMENT 9.7 Sheet 1 of 1

DETERMINING ADDITIONAL STAY TIME FOR PERSONNEL USING ICE-BASED COOLING SYSTEMS

#### Additional Stay Time Allocation for Personal Using Ice-Based Cooling Systems

This calculation may be used to determine the additional stay time afforded by wearing an icebased personal cooling system. It does not apply to supplied air systems or those that do not use water ice as the heat sink. If a calculation for extended stay time is used, insert the calculation below. For simplicity, in lieu of the calculation, a 15 minute stay time extension may be used. If used, so designate below. Preparer or approver must sign and date below.

#### Step 1. Compute the Amount of Ice [kg] -- IW

Weigh or measure the water in liters. If in a gel formulation, multiply by 0.9 to determine the ice (versus starch/filler)

#### Step 2. Estimate Cooling Efficiency -- Eff

For an Ice Vest: Eff = 0.5 For a tube suit configuration: Eff = 0.8

#### Step 3. Estimate Average Metabolic Rate -- MR [kcal/hr]

Reference Attachment 9.2

Step 4. Estimate the Cooling Time -- tcool tcool [min] = 60 [min/hr] \* 80 [kcal/kg] \* Eff \* IW [kg] / MR [kcal/hr]

#### Step 5. Estimate Time Limit -- tlimit

 $t_{\text{limit}}[min] = t_{\text{cool}} + 15 min$ 

□ Default 15 minute additional stay time is used. □ Calculation is used for extended stay time. Insert calculation here:

#### Preparer / approver shall sign and date:

Thomas F Bernard University of South Florida College of Public Health Tampa FL 33612-3805

Version 1.0, 5 February 2007 © 2007 Thomas E. Bernard



TREND

#### ADMINISTRATIVE JOB PERFORMANCE MEASURE

TUOI: A1JPM-SRO-TREND		Page 1 of 4
UNIT: _1 REV # _1	DATE:	
TUOI NUMBER: A1JPM-SRO-TREND		
SYSTEM/DUTY AREA: ADMINISTRATIVE	TOPIC – CONDUCT OF OPERATIONS	
TASK: QUARTERLY CHECK OF TREND D	ATA	
JTA#: ANO-SRO-ADMIN-NORM-48		
KA VALUE RO: <u>3.9</u> SRO: <u>4</u>	.2KA REFERENCE: 2.1.25	······································
APPROVED FOR ADMINISTRATION TO: F	RO: SRO:_X	
TASK LOCATION: INSIDE CR:X	OUTSIDE CR: BOTH:	
SUGGESTED TESTING ENVIRONMENT A	ND METHOD (PERFORM OR SIMULATE):	
PLANT SITE: SIN	/ULATOR:LAB:	
POSITION EVALUATED: RO:	SRO:	
ACTUAL TESTING ENVIRONMENT: SIMUL	ATOR: X PLANT SITE: LAB:	
TESTING METHOD: SIMULATE:	PERFORM:	
APPROXIMATE COMPLETION TIME IN MI	NUTES:10 MINUTES	
REFERENCE(S): <u>1015.006</u> , Chg. 008		
EXAMINEE'S NAME:	LOGON ID	
EVALUATOR'S NAME:		······
THE EXAMINEE'S PERFORMANCE WAS E CONTAINED IN THIS JPM AND IS DETERM	EVALUATED AGAINST THE STANDARDS	
SATISFACTORY:	UNSATISFACTORY:	
PERFORMANCE CHECKLIST COMMENTS	:	
Start Time	Stop Time Total Time	
SIGNED	DATE:	
SIGNATURE INDICATES THIS JPM HAS BE	EEN COMPARED TO ITS APPLICABLE PROCEDUI	RE BY A

QUALIFIED INDIVIDUAL (NOT THE EXAMINEE) AND IS CURRENT WITH THAT REVISION.
#### TUOI: A1JPM-SRO-TREND

Page 2 of 4

#### THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS: The plant is at 100% power.

TASK STANDARD: The examinee has reviewed the attached Reactor Building Spray Pump Data, identified the

abnormal differential pressure trend, and identified that a condition report should be initiated as a minimum

corrective action.

TASK PERFORMANCE AIDS: Reactor Building Spray Pump P-35A trend data and 1015.006.

### TUOI: A1JPM-SRO-TREND

#### **INITIATING CUE:**

The Shift Manager directs you to conduct a Quarterly Review of Reactor Building Spray Pump P-35A data per 1015.006.

**CRITICAL ELEMENTS** (C) \_\_\_\_\_ 2, 3

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	<ol> <li>Review Reactor Building Spray Pump P-35A data.</li> </ol>	Examinee reviewed Reactor Building Spray Pump P-35A data.			
(C)	<ol> <li>Identify abnormal trend in pump differential pressure.</li> </ol>	<ol> <li>Examinee identified the drop of Reactor Building Spray Pump P- 35A differential pressure over the last 3 surveillance tests.</li> </ol>			
EXAN A dis	IINER NOTE: Once Candidate identifie cussion is all that is required. Candidat	es abnormal trend, cue Candidate to dis e only needs to identify technical issue	scuss col ss, not ec	rrective a litorial iss	ctions. sues.
(C)	3. Take appropriate corrective action.	<ul> <li>Examinee identified he would initiate a condition report (critical).</li> <li>Other corrective actions may be listed such as (non-critical):</li> <li>MAI for corrective maintenance (WR)</li> <li>Engineering Request (ER)</li> <li>Re-analysis of normal or limiting ranges per IST Program Implementation (5120.260)</li> <li>Expansion of trending program to other parameters, components or frequency</li> <li>Change in operating practice</li> <li>Upgrading test frequency</li> <li>Condition Report based on declining trend</li> <li>Contact System Engineer</li> </ul>			

TUOI: A1JPM-SRO-TREND

Page 4 of 4

#### **EXAMINEE'S COPY**

## JPM INITIAL TASK CONDITIONS:

The plant is at 100% power.

## **INITIATING CUE:**

The Shift Manager directs you to conduct a Quarterly Review of Reactor Building Spray Pump P-35A data per 1015.006.

1	ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE					
1						
	PROGRAM	1015.006	CHANGE NO. 008			
		N/A				
	SET#					
ļ			ION PER EN-LI-100			
I	When you see these <u>TRAPS</u>	Get these TOOLS	2			
I	Time Pressure	Effective Co	mmunication			
	Distraction/Interruption	Questioning	Attitude			
I	Multiple Tasks	Placekeeping	9			
I	Vague or Interpretive Guidance	Self Check				
	First Shift/Last Shift	Knowledge				
1	Peer Pressure	Procedures				
I	Change/Off Normal	Job Briefing				
I	Physical Environment	Coaching				
L	Mental Stress (Home or Work)	Turnover				
┝	VERIFIED BY DATE		TIME			
l						
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L						
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l						
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		FORM NO. 1000.000	6A CHANGE NO.			

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#### 1.0 PURPOSE

This procedure establishes guidelines and instructions for establishing and administering an Operations Department equipment trending program. Monitoring and review of equipment trends from surveillance and periodic tests is performed to indicate system degradation and potential equipment failure.

#### 2.0 SCOPE

The Operations equipment trending program may include the quantitative results of surveillance and periodic tests performed by the Operations Department on safety related equipment. This testing is dictated by the requirements of each unit's Technical Specifications and ASME OM Code. In addition other information or components may be included as deemed appropriate by the Operations Manager.

#### 3.0 REFERENCES

- 3.1 REFERENCES USED IN PROCEDURE PREPARATION
  - 3.1.1 ANO Unit Technical Specifications
  - 3.1.2 INPO Good Practice MA-302, Trend Analysis
  - 3.1.3 ASME OM Code, 2002 Edition, 2003 '81 Addenda (Unit 1)
  - 3.1.4 ASME OM Code, 2004 Edition (Unit 2)
- 3.2 REFERENCES USED IN CONJUNCTION WITH THIS PROCEDURE
  - 3.2.1 ASME OM Code, 2002 Edition, 2003 Edition, Winter '81 Addenda (Unit 1)
  - 3.2.2 ASME OM Code, 2004 Edition (Unit 2)
  - 3.2.3 ANO Unit 1 Technical Specifications
  - 3.2.4 ANO Unit 2 Technical Specifications
  - 3.2.5 1104 Series Operating Procedures
  - 3.2.6 1305 Series Operating Procedures
  - 3.2.7 1102.001, Plant Pre-Heatup and Pre-Critical Checklist
  - 3.2.8 1106.006, Emergency Feedwater System Operations
  - 3.2.9 2104 Series Operating Procedures
  - 3.2.10 2305 Series Operating Procedures
  - 3.2.11 2102.001, Plant Pre-Heatup and Pre-Critical Checklist
  - 3.2.12 2106.006, Emergency Feedwater System Operations
  - 3.2.13 1000.009, Surveillance Test Program Control
  - 3.2.14 1001.009, Master Test Control List

#### 3.3 NRC COMMITMENTS

NONE

#### 4.0 DEFINITIONS

4.1 Periodic Test

A test that must be performed at a specified time frequency.

4.2 Surveillance Test

A periodic test required by Technical Specifications or applicable ASME Code requirements. Also included are tests meeting other commitments or requirements or desired by Operations.

4.3 Test Frequency

Required or recommended time intervals for a specific test as determined by Technical Specifications, ASME Code or as desired by Operations.

#### 4.4 Trending

The observation and evaluation of data collected at specified time intervals to facilitate identification of deteriorating equipment.

#### 4.5 Abnormal Trend

An abnormal or degrading trend condition is defined as: "A change in measured or observed data that does not conform to expected/normal values after accounting for method of operation, seasonal environmental changes, or maintenance activity." Degrading trends can occur very rapidly or slowly depending on equipment related factors such as speed, size, load and the severity of possible damage. The reaction to an observed trend should be based on how rapidly it is occurring and whether it could affect the mission time of safety related equipment. Conservative and/or prudent responses in support of personnel, nuclear and equipment safety shall always be our goal.

#### 5.0 RESPONSIBILITIES

- 5.1 Operations Manager shall have overall responsibility for the application of this procedure to those Operations tests where trending would be expected to enhance system reliability.
- 5.2 In addition, Operations Manager shall be responsible for the following:
  - 5.2.1 Identification of components and their parameters for trending.
  - 5.2.2 Collection, compilation and analysis of data.
- 5.3 The on-shift SRO/SE shall be responsible for entering trended data acquired during his shift, evaluating that data for abnormalities and initiating corrective action based on data analysis. This action may be accomplished by his designee.

#### 6.0 REQUIREMENTS

- 6.1 Identification of components and parameters to be trended.
  - 6.1.1 Equipment required to be tested by the Operations Department per the unit's Technical Specifications and ASME Code shall be considered for inclusion in the trending program.
  - 6.1.2 Additional equipment components may be added as needs are demonstrated based on equipment performance.
  - 6.1.3 Parameters for pump trending include IST data. Typically this includes discharge pressure (or differential pressure), flow, bearing temperature, driver bearing temperatures.
  - 6.1.4 A typical parameter for valve trending under the IST program include stroke time to its emergency safeguards actuated position if deemed appropriate.
  - 6.1.5 Reactor coolant system and generator hydrogen leak rates shall also be considered for inclusion in the trending program.
  - 6.1.6 For diesel generators, typical parameters include engine starting time, key vibration points and other parameters from diesel logs that may indicate developing abnormalities.
  - 6.1.7 Attachments A and B specify the components and parameters required to be trended. Other components or parameters may be trended as deemed appropriate by operational experience.

	PROC./WORK PLAN NO.	PROCEDURE	WORK PLAN TITLE:	PAGE:	5 of 10			
	1015.006	OPE	RATIONS EQUIPMENT TRENDING PROGRAM	CHANGE:	008			
0		6.1.8	Primary emphasis should be placed on those have significant operational impact on the systems or components.	e paramete e function	ers which n of			
	6.2	Frequency	of Trending					
		6.2.1	The normal frequency shall be that requir Technical Specifications or ASME Code.	ed by the	unit's			
		6.2.2	$\underline{IF}$ post maintenance proof of operability are run, $\underline{THEN}$ the data gathered should be included	or specia	l tests			
			• <u>IF</u> maintenance or modifications resuch change in trended data, <u>THEN</u> make note of the maintenance or the trend chart.	ult in sig modifica	nificant tion on			
		6.2.3	IF no specific frequency is required, THEN it may be specified by the Operations Manager based similar equipment or demonstrated performance.					
		6.2.4	Trending should be accomplished prior to forwarding the surveillance or periodic test to the CRS or SM for review.					
	6.3							
$\bigcirc$		6.3.1	Trend charts (data plot forms) for the cu be maintained in a database (hard copy or available for review by control room pers	rrent yea electron onnel.	r should ic)			
		6.3.2	Charts shall indicate normal values and l where applicable (usually from the survei These values are specified for safety rel based on ASME Codes or Technical Specific for other equipment may be based on opera	imiting v llance pr ated equi ations. tional ex	alues ocedure). pment Limits perience.			
		6.3.3	Trend charts should be annotated with suf to explain any irregularities or changes	ficient c in data t	comments rends.			
	6.4	Review of	Data					
		6.4.1	Data should be entered by the on-shift se operator or the Shift Engineer.	enior reac	tor			
		6.4.2	Review of data should be performed as sur completed.	veillance	es are			

#### NOTE

Changes to the operating log limits for the minimum or maximum values on Tech Spec, Q, F or S equipment or their required support systems, can be modified to implement procedural limits, otherwise an Engineering Request (ER) is required.

- 6.4.3 Appropriate corrective action shall be taken based on reviews of trends. Typical corrective actions include, but are not limited to, the following:
  - WR/WO for corrective maintenance
  - Engineering Request (ER)
  - Re-analysis of normal or limiting ranges IAW Engineering Code Programs (EN-DC-120)
  - Expansion of trending program to other parameters, components or frequency
  - Change in operating practice
  - Upgrading test frequency
  - Condition Report based on declining trend

CHANGE: 008

#### ATTACHMENT A

Page 1 of 2

UNIT ONE TRENDED COMPONENTS							
	COMPONENT	PROCEDURE	PARAMETERS				
ID	Name						
P-36A	Primary Makeup Pump	1104.002 Supp 3	$\Delta$ P, Vibration				
P-36B	Primary Makeup Pump	1104.002 Supp 4	$\Delta$ P, Vibration				
P-36C	Primary Makeup Pump	1104.002 Supp 5	$\Delta$ P, Vibration				
P-34A	DH Removal Pump	1104.004 Supp 1	$\Delta$ P, Vibration				
P-34B	DH Removal Pump	1104.004 Supp 2	$\Delta$ P, Vibration				
P-35A	RB Spray Pump	1104.005 Supp 3	$\Delta$ P, Vibration				
P-35B	RB Spray Pump	1104.005 Supp 5	$\Delta$ P, Vibration				
P-4A	Service Water Pump	1104.029 Supp 1	$\Delta$ P, Flow, Vibration				
P-4B	Service Water Pump	1104.029 Supp 2	$\Delta$ P, Flow, Vibration				
P-4C	Service Water Pump	1104.029 Supp 3	$\Delta$ P, Flow, Vibration				
P-6A	Electric fire Pump	1104.032 Supp 1	Current, Discharge Pressure, Vibration				
P-6B	Diesel Fire Pump	1104.032 Supp 2	Oil Pressure, Temperature ,Discharge Pressure, Vibration				
P-7A	EFW Pump	1106.006 Supp 12	$\Delta$ P, Flow, Vibration				
P-7B	EFW Pump	1106.006 Supp 11	$\Delta P$ , Flow, Vibration				
EDG #1	Emerg. Diesel Gen.	1104.036 Supp 1	Fuel Pressure, Lube Oil Pressure, Temperature, Turbo Bearing Lube Oil Pressure, Fuel Filter $\Delta P$ , Start Time, Vibration, P16A(B) Vibrations				
 EDG #2	Emerg. Diesel Gen.	1104.036 Supp 2	Fuel Pressure, Lube Oil Pressure, Temperature, Turbo Bearing Lube Oil Pressure, Fuel Filter $\Delta$ P, Start Time, Vibration, P16A(B) Vibrations				
K-1	Main Generator	1106.002 Supp 1	Hydrogen Leakrate				

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CHANGE: 008

#### ATTACHMENT A

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COMPONENT		PROCEDURE	DADAMETEDS
ID	Name	PROCEDORE	FARADELERS
CV-2645	P-7A to SG-A	1106.006 Supp 12	Open/close stroke time
CV-2646	P-7B to SG-A	1106.006 Supp 11	Open/close stroke time
CV-2647	P-7A to SG-B	1106.006 Supp 12	Open/close stroke time
CV-2648	P-7B to SG-B	1106.006 Supp 11	Open/close stroke time
CV-1432	E-35B Bypass	1104.004 Supp 2	Close stroke time
CV-1433	E-35A Bypass	1104.004 Supp 1	Close stroke time
Se	curity Diesel	1104.046 Supp 2	Oil Pressure, Oil Temperature
RCS		1103.013	Leak Rate
	RB Sump	1103.013	Fill Rate





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Arkansas Nuclear One Unit 1





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Arkansas Nuclear One Unit 1

Admin JPM

# A7 - SRO

# HC RD4

IUOI: A1JPM-SRO-HCRD4		Page
UNIT: <u>1</u> REV # <u>1</u>	DATE:	
TUOI NUMBER: A1JPM-SRO-HCRD4		
SYSTEM/DUTY AREA: <u>ADMINISTRAT</u>	IVE TOPIC - EQUIPMENT CONTROL	
TASK:AUTHORIZE A TAGOU	Τ	
JTA#: ENS-OPSU-PTAG-ADMIN-4		
KA VALUE RO: 4.1 SRO:	4.3 KA REFERENCE: 2.2.13	
APPROVED FOR ADMINISTRATION 1	TO: RO: SRO:X	
TASK LOCATION: INSIDE CR:	OUTSIDE CR: Classroom: _	X
SUGGESTED TESTING ENVIRONME	NT AND METHOD (PERFORM OR SIMUL	ATE):
PLANT SITE: SIM	MULATOR: Classroom:F	PERFORM
POSITION EVALUATED: RO	SRO: <u>X</u>	
ACTUAL TESTING ENVIRONMENT:		
PLANT SITE: SIN	MULATOR: Classroom:	PERFORM
TESTING METHOD: SIMULATE:		
APPROXIMATE COMPLETION TIME I	N MINUTES: <u>30 MINUTES</u>	
REFERENCE(S): <u>EN-OP-102 Rev 13,</u>	OP-1106.016, P&ID M-204 Sh 2	
EXAMINEE'S NAME:	SSN	
EVALUATOR'S NAME:		
THE EXAMINEE'S PERFORMANCE WA	AS EVALUATED AGAINST THE STANDA ERMINED TO BE:	RDS
SATISFACTORY:	UNSATISFACTORY:	
PERFORMANCE CHECKLIST COMME	NTS:	
Start Time	Stop Time	_Total Time
SIGNED	DATE:	

#### TUOI: A1JPM-SRO-HCRD4

Page 2 of 4

## THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

Prior to administration, ensure the Examinee has been briefed using Appendix E of NUREG-1021.

#### JPM INITIAL TASK CONDITIONS:

Main Feedwater Pump Seal Supply Strainer F-56A-1 needs to be tagged out for maintenance. The eSOMS Clearance Module is unavailable and the Shift Manager has authorized the use of paper forms for the tagout.

The clearance for F-56A-1 was prepared and reviewed on the previous shift. Indus Assist Suite is unavailable also.

## TASK STANDARD:

The examinee has correctly identified critical task errors on the prepared tagout per EN-OP-102, Protective and Caution Tagging.

#### TASK PERFORMANCE AIDS:

EN-OP-102-01 Attach 9.2, Tagout Cover Sheet EN-OP-102-01 Attach 9.3, Tagout Tags Sheet Portion of M-204, sht. 2

## TUOI: A1JPM-SRO-HCRD4

Page 3 of 4

#### **INITIATING CUE:**

You have been directed by the Shift Manager to approve the prepared tagout forms. Identify all discrepancies (if any) found during your review.

## CRITICAL ELEMENTS (C) 2

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNS AT
NOT Form	E: Provide examinee with a copy n.	of 1000.027B Clearance Remov	al Auth	orizatio	n
	1. Review the Prepared Tagout Forms	Examinee reviewed Clearance Removal Authorization Form.			
(C)	2. Identify administrative errors.	<ul> <li>Examinee identified the critical errors:</li> <li>1. Restoration sequence is incorrect. Drain valve CS-2908-2 is last manipulation instead of first. (critical)</li> <li>2. Outlet valve CS-121A-1 is restored to the OPEN position instead of CLOSED per the tagout coversheet and OP-1106.016 Att A. (critical)</li> <li>3. Drain valve CS-2908-1 is outside the isolation boundary and should not be included in tagout. (critical)</li> <li>4. The Attribute value for "Category E Component?" is marked Yes instead of No. (non-critical)</li> </ul>			

TUOI: A1JPM-SRO-HCRD4

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## EXAMINEE'S COPY

#### JPM INITIAL TASK CONDITIONS:

- Main Feedwater Pump Seal Supply Strainer F-56A-1 needs to be tagged out for maintenance.
- The eSOMS Clearance Module is unavailable and the Shift Manager has authorized the use of paper forms for the tagout.
- The clearance for F-56A-1 was prepared and reviewed on the previous shift.
- Indus Assist Suite is unavailable also.

#### **INITIATING CUE:**

You have been directed by the Shift Manager to approve the prepared tagout forms. Identify all discrepancies (if any) noted during your review.

Entergy	,
---------	---

	_
NON-QUALITY	RELATED

INFORMATIONAL USE

EN-OP-102-01

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REV.7

**Protective and Caution Tagging Forms & Checklist** 

ATTACHMENT 9.2

TAGOUT COVER SHEET

Clearance: MANUAL

Tagout: \_\_\_\_CS-001-F-56A-1

Component to be worked: FILTER F-56A-1 MAIN FW PUMP ST

#### **Description:**

Clean and/or replace F-56A-1.

References: M-204 Sht 2, P&ID Condensate and Feedwater

OP-1106.016, Condensate, Feedwater and Steam System Operation

Placement Inst:

Ensure F-56A-2 is in service before hanging tag out.

#### Hazards:

CRAFT: Strainer is a high energy system (greater than 500 psig condensate water) with only single valve isolation. There is a drain on the strainer housing that is tagged open.

OPS: Check boundaries are not leaking by before making tag out ready for work by verifying no water leaking from the drain.

#### **Restoration Inst:**

Verify no leaks on strainer housing when pressurizing system while clearing

F-56A-2 will remain in service following maintenance on F-56A-1. The inlet valve is restored OPEN and outlet valve is restored CLOSED.

Attribute Description	
Tadout Common por OD 102 Att 0.0.0.	Attribute Value
Sustem much D (in the OP-102 Att 9.2 Sect 8?	No
System meets Definition of High Energy?	Yes – See Tagout Details
Category E Component?	Yes
Vent / Drain Required?	Voo Coo Too ID / II
Tadout Walkdown per OP 102 Defense II	res – See Tagout Details
Tooh Spealmanto	Preparer
rech spec impact?	None
Compensatory Actions Reg?	Yes - See Tagout Dataila
Verify positions by controlled procedure	Vee
	res

Work Order Number	Description
00234376-01	Clean and/or replace F-56A-1



NON-QUALITY RELATED	EN-OP-102-01

1

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REV.7

## **Protective and Caution Tagging Forms & Checklist**

INFORMATIONAL USE

Status	Description	User	Verification Date
Prepared	Prepared	Joe Sizzling	5/2/11
Technical Reviewed	Reviewed	Ben There	5/2/11
Approved	Approved		5/2/11
Tags Verified Hung	Tags Verified Hung		
Removal Approved	Removal Approved		
Tags Verified Removed	Tags Verified Removed		

					Volume and a second second	<b></b>	1	Т		T	T	Ţ
C		1	Π	ET		Placement/ Removal Tao Notes	2					
	REV. 7			IT TAGS SHI		Rest. 2nd Verif Date/Time						
		8 OF 27		TAGOU		Rest. 1st Verif Date/Time						
	4-OP-102-01	PAGE	ecklist			Restoration Configuration	Closed	Open	Open	Closed		
	Ē		s & Che		-1	Rest. Seq.	4	5	ю	-		
C	-		ng Form:	3-001-F-56/	Place. 2nd Verif Date/Time							
	JALITY RELATE	MATIONAL USE	on Taggi		GOUT: CS	Place. 1st Verif Date/Time	ł					
	NON-QI	INFOR	e and Cauti		TA	Placement Configuration	Open	Closed	Closed	Open		
			otectiv			Place. Seq.	e	-	N	4		
	MANAGEMENT		P.	г 9.3		nt nt Description nt Location	y Filter F-56A-1 Drain V of A MFW Pump	y Filter F-56A-1 Outlet V of A MFW Pump	y Filter F-56A-1 Inlet / of A MFW Pump	CS-121A-2 / of A MFW Pump		
	or or other	187		TACHMEN	CLEARAN	Equipmer Equipmer Equipmer	CS-2908-2 Seal Suppl TB-386 NM	CS-121A-1 Seal Suppl TB-386 NM	CS-120A-1 Seal Supply TB-386 NM	CS-2908-1 Drain after TB-386 NM		
	En Fin			AT		Tag Type	Danger	Danger	Danger	Danger		
L	<b>A</b> 10,					Tag Serial No.	76	17	78	62		



Admin JPM

# A9-SRO

PARZ

TUOI: A1JPM-SRO-PAR2				Page 1 of 5
				rage for
UNIT: <u>1</u> REV # _	<u>0</u> D/	ATE:		
TUOI NUMBER: A1JPM-SRO-P	AR2			
SYSTEM/DUTY AREA: ADMINI	STRATIVE TOPIC	- EMERGENC	Y PROCEDURES/PL	AN
TASK: DETERMINE A PROTEC	TIVE ACTION RE	COMMENDATI	ONN	
JTA#: <u>ANO-SRO-EPLAN-EMER</u>	G-301			
KA VALUE RO: 2.4	SRO: <u>4.4</u> K	A REFERENCE	2.4.44	
APPROVED FOR ADMINISTRA	TION TO: RO:	SI	RO: <u>X</u>	
TASK LOCATION: INSIDE CR:		CR:	BOTH:	
SUGGESTED TESTING ENVIR	ONMENT AND ME	ETHOD (PERFC	ORM OR SIMULATE)	r:
PLANT SITE: SIM	ULATOR: PI	ERFORM L/	\B:	
POSITION EVALUATED: RO:_	N/A SI	RO: <u>X</u>		
ACTUAL TESTING ENVIRONM	ENT: SIMULATOR	R: <u>X</u> PLAN	T SITE: LAB:	
TESTING METHOD: SIMULATE	E: PI	ERFORM:		
APPROXIMATE COMPLETION	TIME IN MINUTES	S: <u>15 MIN</u> U	JTES (TIME CRITIC	CAL)
REFERENCE(S): 1903.011 Chg	. 038			
EXAMINEE'S NAME:		LOGON	D	
EVALUATOR'S NAME:				
THE EXAMINEE'S PERFORMA CONTAINED IN THIS JPM AND	NCE WAS EVALU	ATED AGAINS	T THE STANDARDS	3
SATISFACTORY:	U	NSATISFACTO	RY:	
PERFORMANCE CHECKLIST	COMMENTS:			
Start Time	Stop Time		Total Time	-
SIGNED		DATE:		
SIGNATURE INDICATES THIS QUALIFIED INDIVIDUAL (NOT	JPM HAS BEEN C THE EXAMINEE)	OMPARED TO	ITS APPLICABLE P	PROCEDURE BY A

#### TUOI: A1JPM-SRO-PAR2

Page 2 of 5

## THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

#### JPM INITIAL TASK CONDITIONS:

- A large break LOCA has occurred on Unit One 30 minutes ago.
- The ENS has been activated but the TSC and the EOF are NOT operational.
- <u>A General Emergency has been declared per EAL 1.7, Loss of or challenge to all 3 Fission</u> Product Barriers, two minutes ago.
- This is NOT the first notification to the State of Arkansas.
- Fuel failure is estimated to be 20%.
- A release is in progress and the duration is projected to be greater than 1 hour.
- Wind direction is from 145 degrees.
- The Initial Dose Assessor reports dose rates are projected to be 2.7 Rem TEDE at 5 miles and 0.6 Rem TEDE at 6.5 miles.
- There are NO known impediments to evacuation.
- This is NOT a "fast breaker".

**TASK STANDARD**: Within 15 minutes, the examinee has correctly chosen to recommend PAR <u>4 with an evacuation of zones G K M N O P, PAR 2 with an evacuation of zones R Q (provided</u> <u>by Initial Dose Assessor), and the remainder of the 10 mile EPZ to go indoors and listen to</u> <u>emergency broadcasts.</u>

\_

TASK PERFORMANCE AIDS: 1903.011 Attachment 6

#### TUOI: A1JPM-SRO-PAR2

## **INITIATING CUE:**

You are the Shift Manager in the Control Room and as the EOF Director you must recommend a Protective Action Recommendation.

CRITICAL ELEMENTS (C) 2

(C)	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNS AT
	<ol> <li>Consult Attachment 6 of 1903.011, Emergency Response/Notifications.</li> </ol>	Turned to Attachment 6 of 1903.011, Protective Action Recommendations (PARs) for General Emergency.			
NOT point zone	E: Act as the Initial Dose Assessor , <u>THEN</u> hand to candidate the addit s R and Q will exceed EPA Protecti	for the candidate. <u>WHEN</u> candidate. <u>WHEN</u> candidate. ional cue sheet where the Initial D ve Action Guidelines (PAGs).	ate asks ose Ass	, or is al essor p	t this rojects
(C)	2. Recommend PAR based on event conditions.	Within 15 minutes of JPM start, selected PAR No. 4 and PAR No. 2 due to GE and EPA PAGs projected to be exceeded 5-10 miles downwind. Indicated, due to wind direction of 145°, zones G K M N O P, along with zones R Q (from Initial Dose Assessor) should be evacuated and zones in the remainder of the 10 mile EPZ should remain indoors and listen to emergency broadcasts.			

TUOI: A1JPM-SRO-PAR2

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## EXAMINEE'S COPY

# (HAND TO CANDIDATE WHEN CANDIDATE ASKS OR IS OBSERVED TO BE AT POINT OF IDENTIFYING ZONES)

CUE:

The Initial Dose Assessor projects zones R and Q will exceed EPA Protective Action Guidelines (PAGs).

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## EXAMINEE'S COPY

### JPM INITIAL TASK CONDITIONS:

- A large break LOCA has occurred on Unit One 30 minutes ago.
- The ENS has been activated but the TSC and EOF are NOT operational.
- A General Emergency has been declared per EAL 1.7, Loss of or Challenge to all 3 Fission Product Barriers, two minutes ago.
- This is NOT the first notification to the State of Arkansas.
- Fuel failure is estimated to be 20%.
- A release is in progress and the duration is projected to be greater than 1 hour.
- Wind direction is from 145 degrees.
- The Initial Dose Assessor reports dose rates are projected to be 2.7 Rem TEDE at 5 miles and 0.6 Rem TEDE at 6.5 miles.
- There are NO known impediments to evacuation.
- This is NOT a "fast breaker".

#### INITIATING CUE:

You are the Shift Manager in the Control Room and as the EOF Director you must recommend a Protective Action Recommendation.

NOTE: THIS IS A TIME CRITICAL JPM.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE					
TITLE: Emergency R	esponse/Notifications	DOCUMENT NO.       CHANGE NO.         1903.011       040         WORK PLAN EXP. DATE       REACTIVITY IMPAC         N/A       □YES □INPR ☑N         SAFETY-RELATED       IPTE         ☑YES □NO       □YES ☑N         TEMP MOD       LEVEL OF USE			
	TDADS			ONTINUOUS FERENCE FORMATIONAL FR EN-LI-100	
When you see the	ese <u><b>TRAPS</b></u> Time Pressure Distraction/Interruption Multiple Tasks Overconfidence Vague or Interpretive Guidance First Shift/Last Shift Peer Pressure Change/Off Normal Physical Environment Mental Stress (Home or Work)	Get these <u>TOOLS</u> Effective Communication Questioning Attitude Placekeeping Self Check Peer Check Knowledge Procedures Job Briefing Coaching			
	Y DATE		TIME		
FORM TITLE:	ERIFICATION COVER SHEET	FOF 10	RM NO. 000.006A	CHANGE NO. 055	

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#### ATTACHMENT 6

## PROTECTIVE ACTION RECOMMENDATIONS (PARs) FOR GENERAL EMERGENCY

## **Table of Contents**

PAGE	No.
------	-----

ANO Protective	Action Recommendation(s) Discussion/Guidance 2
PAR Flow Chart	t – A Guide for Determining PARs 3
PAR No. 1 –	Evacuate 2 Mile Radius and 2-5 Miles Downwind 4
PAR No. 2 -	Dose Assessment EPA PAGs (1 Rem TEDE; 5 Rem CT Dose) Exceeded Evacuate 2 Mile Radius and 2-5 Miles Downwind
PAR No. 3 –	Shelter 2 Mile Radius and 2-5 Miles Downwind 6
PAR No. 4 -	Dose Assessment EPA PAGs (1 Rem TEDE; 5 Rem CT Dose) Exceeded Evacuate 2 Mile Radius and 2-10 Miles Downwind7
PAR No. 5 –	Dose Assessment EPA PAGs (1 Rem TEDE; 5 Rem CT Dose) Exceeded Evacuate/Shelter Areas Outside the 10-mile EPZ
PAR No. 6 -	Wind Shift PAR Determination
1903.011

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### ATTACHMENT 6

# PROTECTIVE ACTION RECOMMENDATIONS (PARs) FOR GENERAL EMERGENCY

#### Discussion

This attachment provides instructions for the assessment and initiation of Protective Action Recommendations (PARs) following the declaration of a General Emergency classification. Offsite response agencies shall be notified of Protective Action Recommendation within 15 minutes. Revisions to Protective Action Recommendations may be based upon:

- <u>current plant conditions</u>
- projected offsite dose assessment
- forecasted/actual wind shifts

Evacuation is the preferred method for protecting the public within the ANO 10-mile Emergency Planning Zone (EPZ) as a result of a radiological emergency event at ANO. However, some circumstances may warrant a protective action of "shelter" when evacuation cannot be performed due to impediments and/or severe weather conditions. Individuals responsible for determining PARs at ANO should consider all circumstances when developing protective actions.

The Arkansas Department of Health (ADH) will be notified of the ANO protective action recommendations and are responsible for determining and issuing a Protective Action Advisory (PAA) to the County Judges (Conway, Johnson, Logan, Pope and Yell counties). Arkansas law places the responsibility for issuing protective actions to the public with the County Judges which will have both a Protective Action Recommendation and a Protective Action Advisory available for decision making. At a General Emergency classification, the Arkansas Department of Health, at a minimum, will issue a default Protective Action Advisory of "evacuate a 5-mile radius and evacuate 5-10 miles downwind and the remaining EPZ to remain indoors and listen to emergency broadcasts". At a General Emergency classification, ANO, at a minimum, will issue a default Protective Action Recommendation (PAR) of "evacuate a 2-mile radius and evacuate 2-5 miles downwind and the remaining EPZ to remain indoors and listen to emergency broadcasts". The ADH Protective Action Advisory encompasses a larger area than that recommended by federal guidance and the ANO General Emergency classification PAR. Be aware of this difference between the ANO protective action recommendation and the ADH protective action advisory should a question arise. ANO PARs meet all of the EPA/NRC recommended regulatory guidance and are consistent with the rest of the nuclear industry.

#### Guidance Involving Wind Shifts within the 10-mile EPZ

If wind shifts are occurring or are predicted to occur within the 10-mile EPZ, guidance is provided on PAR No. 6 within this attachment.

#### Use of the PAR Flowchart in Attachment 6

A PAR Flowchart is included on Page 3 of this attachment. This flowchart should be used initially and at the beginning of each PAR evaluation to help determine the correct PAR to issue based on plant conditions, release status, evacuation impediments and offsite dose assessment.

PROCEDURE/WORK PLAN TITLE:

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# ATTACHMENT 6

PROTECTIVE ACTION RECOMMENDATIONS (PARs) FOR GENERAL EMERGENCY

# **PAR Flow Chart**



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# ATTACHMENT 6

# PROTECTIVE ACTION RECOMMENDATIONS (PARs)

FOR

GENERAL EMERGENCY

# PAR No. 1 EVACUATE

# **NOTE**

State and local governments must be notified within 15 minutes of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

General Emergency Declared

2. <u>Recommend the following Protective Action Recommendations:</u>

PROCEDURE/WORK PLAN TITLE:

Recommend **evacuation** of 2 mile radius and 2-5 miles downwind. Recommend the remainder of the 10 mile EPZ to go indoors and listen to the emergency broadcast for this event. Include any previously evacuated zones with this PAR. **DO NOT** change any previously evacuated zones to "shelter" or "go indoors" on this PAR.

Determine the affected zones for the PAR from the chart given below.

Wind Direction (from)	Evacuate Zones	Zones "to go indoors"
348.75 to 11.25	GU	HIJKLMNOPQRST
11.25 to 33.75	GRU	HIJKLMNOPQST
33.75 to 56.25	GRU	HIJKLMNOPQST
56.25 to 78.75	GRU	HIJKLMNOPQST
78.75 to 101.25	GNOR	HIJKLMPQSTU
101.25 to 123.75	GNOR	HIJKLMPQSTU
123.75 to 146.25	GKNO	HIJLMPQRSTU
146.25 to 168.75	GKNO	HIJLMPQRSTU
168.75 to 191.25	GKN	HIJLMOPQRSTU
191.25 to 213.75	GK	HIJLMNOPQRSTU
213.75 to 236.25	GK	HIJLMNOPQRSTU
236.25 to 258.75	GHK	IJLMNOPQRSTU
258.75 to 281.25	GHK	IJLMNOPQRSTU
281.25 to 303.75	GHKU	IJLMNOPQRST
303.75 to 326.25	GHU	IJKLMNOPQRST
326.25 to 348.75	GHU	IJKLMNOPQRST

3. Reassess PARs every 15 minutes until downgrade or recovery phase is entered.

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# ATTACHMENT 6

PROTECTIVE ACTION RECOMMENDATIONS (PARs)

FOR GENERAL EMERGENCY

# PAR No. 2 EVACUATE

# <u>NOTE</u>

State and local governments must be notified within 15 minutes of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

General Emergency declared

<u>AND</u>

Dose Assessment projects EPA Protective Action Guidelines (PAGs) exceeded

# 1 Rem TEDE OR 5 Rem Child Thyroid CDE

2. <u>Recommend the following Protective Action Recommendation:</u>

PROCEDURE/WORK PLAN TITLE:

# NOTE

If there are known impediments to evacuation, then consider "sheltering" of the affected zones versus evacuation.

- 2.1 **IF** PAGs are exceeded at  $\geq$  5 miles **THEN** recommend the following PAR:
  - EVACUATE zones from PAR 4
  - EVACUATE any additional <sup>1</sup>ZONES projected by dose assessment to exceed the EPA PAGs (obtain from dose assessment).
  - Remainder of the 10 mile EPZ to go indoors and listen to the Emergency Broadcasts
- 2.2 **IF** PAGs are exceeded at < 5 miles,
  - THEN recommend the following PAR:
    - EVACUATE zones from PAR 1
    - EVACUATE any additional <sup>1</sup>ZONES projected by dose assessment to exceed the EPA PAGs (obtain from dose assessment).
    - Remainder of the 10 mile EPZ to go indoors and listen to the Emergency Broadcasts
- 3. Include any previously evacuated zones on this PAR. **DO NOT** change any previously evacuated zones to "shelter" or "go indoors" on this PAR.

Reassess PARs every 15 minutes until downgrade or recovery phase is entered.

<sup>1</sup>Dose assessment PARs will be initially provided by the Initial Dose Assessor in the Control Room. When the Dose Assessment Team (DAT) becomes operational in the EOF, the DAT will provide this information.

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# ATTACHMENT 6

PROTECTIVE ACTION RECOMMENDATIONS (PARs) FOR

**GENERAL EMERGENCY** 

# PAR No. 3 **Shelter**

# NOTE

State and local governments must be notified within 15 minutes of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

General Emergency declared AND Known Impediments to Evacuation exist. OR Offsite Release is a Puff Release (< 1 hour in duration)

PROCEDURE/WORK PLAN TITLE:

2. Recommend the following Protective Action Recommendation:

Recommend sheltering a 2 mile radius and 2-5 miles downwind. Recommend the remainder of the 10-mile EPZ to go indoors and listen to the emergency broadcast for this event. Determine the affected zones for the PAR from the chart given below. Include any zones recommended for evacuation by Dose Assessment. DO NOT change any previously evacuated zones to "shelter" or "go indoors" on this PAR.

Determine the affected zones for the PAR from the chart given below.

Wind Direction (from)	Shelter Zones	Zones "to go indoors"
348.75 to 11.25	GU	HIJKLMNOPQRST
11.25 to 33.75	GRU	HIJKLMNOPQST
33.75 to 56.25	GRU	HIJKLMNOPQST
56.25 to 78.75	GRU	HIJKLMNOPQST
78.75 to 101.25	GNOR	HIJKLMPQSTU
101.25 to 123.75	GNOR	HIJKLMPQSTU
123.75 to 146.25	GKNO	HIJLMPQRSTU
146.25 to 168.75	GKNO	HIJLMPQRSTU
168.75 to 191.25	GKN	HIJLMOPQRSTU
191.25 to 213.75	GK	HIJLMNOPQRSTU
213.75 to 236.25	GK	HIJLMNOPQRSTU
236.25 to 258.75	GHK	IJLMNOPQRSTU
258.75 to 281.25	GHK	IJLMNOPQRSTU
281.25 to 303.75	GHKU	IJLMNOPQRST
303.75 to 326.25	GHU	IJKLMNOPQRST
326.25 to 348.75	GHU	IJKLMNOPQRST

3. PARs must be reassessed every 15 minutes until downgrade or recovery phase is entered.

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## ATTACHMENT 6

# PROTECTIVE ACTION RECOMMENDATIONS (PARs)

FOR

GENERAL EMERGENCY

# PAR No. 4 EVACUATE

### NOTE

State and local governments must be notified within 15 minutes of PARs or changes to PARs using Form 1903.011-Y.

1. Entry Conditions

General Emergency Declared **AND** EPA Protective Action Guidelines (PAGs) are projected to be exceeded <u>5-10 miles downwind</u>.

1 Rem TEDE <u>OR</u> 5 Rem Child Thyroid CDE

2. <u>Recommend the following Protective Action Recommendation:</u>

Recommend **evacuation** of 2 mile radius <u>and</u> 2-10 miles downwind. Recommend that the remainder of the 10-mile EPZ go indoors and listen to the emergency broadcasts for this event. Include any previously evacuated zones with this PAR. **DO NOT** change any previously evacuated zones to "shelter" or "go indoors" on this PAR.

Determine the affected zones for the PAR from the chart given below.

Wind Direction (from)	Evacuate Zones	Zones "to go indoors"
348.75 to 11.25	GUST	HIJKLMNOPQR
11.25 to 33.75	GQRSU	HIJKLMNOPT
33.75 to 56.25	GQRSU	HIJKLMNOPT
56.25 to 78.75	GQRSU	HIJKLMNOPT
78.75 to 101.25	GNOPQR	HIJKLMSTU
101.25 to 123.75	GNOPQR	HIJKLMSTU
123.75 to 146.25	GKMNOP	HIJLQRSTU
146.25 to 168.75	GKMNOP	HIJLQRSTU
168.75 to 191.25	GKMNP	HIJLOQRSTU
191.25 to 213.75	GKLM	HIJNOPQRSTU
213.75 to 236.25	GJKLM	HINOPQRSTU
236.25 to 258.75	GHIJKLM	NOPQRSTU
258.75 to 281.25	GHIJKL	MNOPQRSTU
281.25 to 303.75	GHIJKU	LMNOPQRST
303.75 to 326.25	GHIJSTU	KLMNOPQR
326.25 to 348.75	GHISTU	JKLMNOPQR

- 3. Reasse
  - 3. Reassess PARs every 15 minutes until downgrade or recovery phase is entered.

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# ATTACHMENT 6

PROTECTIVE ACTION RECOMMENDATIONS (PARs) FOR

GENERAL EMERGENCY

# PAR No. 5 Outside the 10 Mile EPZ

## <u>NOTE</u>

Protective Action Recommendations beyond the 10-mile EPZ shall be coordinated with State and local government officials.

1. Entry Conditions

General Emergency declared **AND** 

EPA Protective Action Guidelines (PAGs) are projected to be exceeded outside the 10-mile EPZ.

1 Rem TEDE <u>OR</u> 5 Rem Child Thyroid CDE

2. <u>Recommend the following Protective Action Recommendation:</u>

Recommend **evacuation** of the affected areas. If known impediments to evacuation exist consider sheltering of the affected area.

Use dose assessment personnel to determine the affected sector(s) and downwind distances and then use the chart below to determine the affected area(s) to evacuate.

Affected Sector(s)	Evacuate/Shelter Sectors	Distance from Site
1	16, 1, 2	10 miles to (Determined by Dose Assessment)
2	1, 2, 3	10 miles to (Determined by Dose Assessment)
3	2, 3, 4	10 miles to (Determined by Dose Assessment)
4	3, 4, 5	10 miles to (Determined by Dose Assessment)
5	4, 5, 6	10 miles to (Determined by Dose Assessment)
6	5, 6, 7	10 miles to (Determined by Dose Assessment)
7	6, 7, 8	10 miles to (Determined by Dose Assessment)
8	7, 8, 9	10 miles to (Determined by Dose Assessment)
9	8, 9, 10	10 miles to (Determined by Dose Assessment)
10	9, 10, 11	10 miles to (Determined by Dose Assessment)
11	10, 11, 12	10 miles to (Determined by Dose Assessment)
12	11, 12, 13	10 miles to (Determined by Dose Assessment)
13	12, 13, 14	10 miles to (Determined by Dose Assessment)
14	13, 14, 15	10 miles to (Determined by Dose Assessment)
15	14, 15, 16	10 miles to (Determined by Dose Assessment)
16	15, 16, 1	10 miles to (Determined by Dose Assessment)

3. Reassess PARs every 15 minutes until downgrade or recovery phase is entered.

1903.011

**EMERGENCY RESPONSE/NOTIFICATIONS** 

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Attachment 6 – Protective Action Recommendations for General Emergency

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# PAR No. 6 Wind Shift PAR Determination

## NOTE

A wind shift is defined as any change in 10-minute averaged wind direction that affects new offsite protective action zones that are 2-5 or 5-10 miles downwind.

1. Entry Conditions

General Emergency Declared AND Previous PAR has been issued AND Actual/Forecasted Wind Shift

- 2. **IF** the conditions in A through C below are met, **THEN** revise PARs based on dose assessment results only. Go to Step 4.
  - A. Plant conditions are well understood and changes can be reasonably predicted.
  - B. Radiological releases have a high degree of predictability in terms of isotopic composition, release pathway, and release rate.
  - C. Meteorological conditions for the projected duration of the release are well understood.
- **IF** the conditions described in A through C above are <u>not</u> met **AND** an actual wind shift occurs **OR** is 3. forecasted to occur within 6 hours, THEN
  - **STEP 1** Wind Direction Transition Area: Evacuate any additional zones projected to exceed the EPA PAGs (obtain from dose assessment).
  - **STEP 2** <u>Final Wind Direction</u>: Revise the current PAR to include any downwind zones using the table below. If conditions warrant, evacuation out to 10 miles may be necessary. Refer to PAR 5, as needed, to determine those areas located outside of the 10-mile EPZ.

Wind Direction (from)	2-5 Miles Downwind Zones	5-10 Miles Downwind
348.75 to 11.25	U	Zones
11.25 to 33.75	RU	05
33.75 to 56.25	RU	05
56.25 to 78.75	RU	0.5
78.75 to 101.25	NOR	PO
101.25 to 123.75	NOR	P O
123.75 to 146.25	КЛО	MP
146.25 to 168.75	КЛО	MP
168.75 to 191.25	KN	MP
191.25 to 213.75	К	1 M
213.75 to 236.25	К	11 M
236.25 to 258.75	НК	
258.75 to 281.25	НК	
281.25 to 303.75	НКО	
303.75 to 326.25	HU	
326.25 to 348.75	HU	IST

4. Reassess PARs every 15 minutes until downgrade or recovery phase is entered.

ES-301

# Control Room/In-Plant Systems Outline

Form ES-301-2

Facility: Exam L	Arkansas Nuclear One – Unit 1 Date of Arkansas Nuclear One – Unit 1 Date of Arkansas Nuclear One – Unit 1 Opera	of Examination: ating Test No.: <u>1</u>	<u>08/29/2011</u>
Control	Room Systems <sup>@</sup> (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U,	including 1 ESF)	
	System / JPM Title	Type Code*	Safety Function
a.	A1JPM-RO-AOP37 Respond to Continuous Rod Withdrawal 001 AA1.05 (RO 4.3/SRO 4.2) SRO-U	A/L/N/S	1 Reactivity Control
b.	A1JPM-RO-RPS09 Respond to Annunciator K08-C3, "RPS TROUBLE", due to NI power supply failure 015 A2.01 (RO 3.5/SRO 3.9) SRO-U	EN/N/S	7 Instrumentation
C.	A1JPM-RO-MUP01 Isolate Letdown, Restore Makeup and Seal Injection 004 A4.06 (RO 3.6/SRO 3.1) SRO-U	A/D/EN/P/S	2 Reactor Coolant System Inventory Control
d.	A1JPM-RO-EOP15 Perform Reactor Trip Immediate Actions with a Loss of D01 058 AA1.01 (RO 3.4/SRO 3.5)	A/D/S	6 Electrical
e.	A1JPM-RO-HYD04 Place Hydrogen Recombiner M- 55B in Operation 028 A4.01 (RO 4.0/SRO 4.0)	M/S	5 Containment Integrity
f.	A1JPM-RO-PZR05 Respond to Low RCS Pressure due to Stuck Open Spray Valve 010 A3.02 (RO 3.6/SRO 3.5)	A/D/P/S	3 Reactor Pressure Control

Form ES-301-2

<b></b>				
g.	g. A1JPM-RO-EOP08 Perform Actions required to correct Degraded Power (EFW System Operation) 061 A1.02 (RO 3.3/SRO 3.6)		D/S	4 Heat Removal From Reactor Core (Secondary)
h.	h. A1JPM-RO-ICW02 Perform Switching of ICW Pumps (P-33A/B/C) 008 A2.01 (RO 3.3/SRO 3.6)		D/S	8 Plant Service Systems
In-Plan	t Systems <sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2	for SRO-U)		
i. A1JPM-RO-EFW02 Manual Control of Emergency Feedwater Pump P-7A at the Turbine 061 A2.05 (RO 3.1/SRO 3.4) SRO-U		of Emergency	D/E/R	4 Heat Removal From Reactor Core (Secondary)
j. A1JPM-RO-ED022 Inverter Y11 Shutdown with RS1 Supplied from Y-11 Alternate AC Source 062 A4.07 (RO 3.1/SRO 3.1) SRO-U		own with RS1 æ	D/E	6 Electrical
k. A1JPM-RO-GRW01 Commence Waste Gas Decay Tank Release 071.A4.26 (RO 3.1/SRO 3.9)		e Gas Decay	D/R	9 Reactivity Release
@	All RO and SRO-I control room (and in-plant) s functions; all 5 SRO-U systems must serve diffe overlap those tested in the control room.	ystems must be differ erent safety functions;	ent and serve diffe in-plant systems	erent safety and functions may
	* Type Codes	Criteria fo	r RO / SRO-I / SR	:O-U
(A)Iterna (C)ontrol (D)irect f (E)merge (EN)gine (L)ow-Pc (N)ew or (P)reviou (R)CA (S)imulat	path porm $4-6 (4)/4-6/2-3 (2)$ m bank cy or abnormal in-plant $\leq 9 (8) / \leq 8 / \leq 4 (3)$ $\geq 1 (1) / \geq 1 / \geq 1 (1)$ ed safety feature er / Shutdown M)odified from bank including 1(A) $-/ - / \geq 1 (2)$ $\geq 2 (3) / \geq 2 / \geq 1 (2)$ $\leq 3 (2)/ \leq 3 / \leq 2 (1)$ (randomly sel $\geq 1 (1) / \geq 1 / \geq 1 (2)$		trol room system) randomly selected)	

### JOB PERFORMANCE MEASURE

Unit:1	Rev #	1	Date:
JPM ID:	A1JPM-RO-AOP37		
System/Duty Area	a:Emergency and Abnorr	nal Operations	
Task: Respond	to Continuous Rod Withdrav	val	
JTA# <u>ANO1-R</u>	D-AOP-OFFNORM-15		
KA Value RO _4	.3 SRO4.2 KA F	eference: 001 AA1.05	
Approved For Adr	ministration To: RO	X SRO	Х
Task Location:	nside CRX	Outside CR	Both
Suggested Testin	g Environment and Method (	Perform or Simulate ):	
Plant Site:	Simulator:	Perform	Lab:
Position Evaluate	d: RO:		SRO:
Actual Testing En	vironment: Plant Site	Simulator	Lab
Testing Method:	Perform	Sim	ulate
Approximate Com	pletion Time in Minutes:		2 Minutes
Reference(s): <u>1</u>	203.003 Control Rod Malfun	ction Action	
S	ection 9 – Continuous Contr	ol Rod Motion	
Examinee's Name	:		KCN:
Evaluator's Namo			
The Examinee's n	erformanco was ovaluated s	goingt the standards as	ntoined in this IDM and is determined to here
Satisfactory:	enomiance was evaluated a		ntained in this JPW and is determined to be:
Galislaciory.			
Performance Cheo	cklist Comments:		
Start Time	Sto	) Time	Total Time
*Sianed		Date	
*Signature indicate	es this JPM has been compa	red to its applicable pro	cedure by a qualified individual (not the exan

and is current with that revision.

## JPM ID: A1JPM-RO-AOP37

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

### JPM INITIAL TASK CONDITIONS:

The reactor is ~5% power. ICS is in manual with CRD Diamond panel in AUTO. Control rods are withdrawing continuously.

### TASK STANDARD:

Actions taken as required to stop continuous rod motion as prescribed in AOP 1203.003 Section 9 – Continuous Rod Motion section.

### \*\*\*This is an ALTERNATE PATH JPM\*\*\*

TASK PERFORMANCE AIDS:

Copy of 1203.003 Section 9

Simulator Setup: 5% power The following commands active IMF RD269 (Continuous Rod Withdrawal) IOR DI\_ICC001919 FALSE IOR DO\_ICC0019G11 (1 0) FALSE IOR DO\_ICC0019W18 (1 0) TRUE Attach trigger 1 to desired button on remote control Simulator in FREEZE until examinee says ready to begin task.

# JPM ID: <u>A1JPM-RO-A0P37</u>

INITIATING CUE: The CRS/SM directs you to respond to a Continuous Control Rod Withdrawal per 1203.003 Section 9. Simulator in FREEZE until examinee ready to begin task.

С	PERFORMANCE CHECKLIST	STANDARDS	N/A	SAT	UNSAT
	<ol> <li>Verify the Reactor Demand H/A station MANUAL.</li> <li><u>POSITIVE CUE:</u> Reactor Demand H/A station in MANUAL (White Light On)</li> </ol>	On panel C03, ICS Reactor Demand H/A station verified in MANUAL			
С	<ol> <li>Verify the Diamond Panel in MANUAL</li> <li><u>POSITIVE CUE</u>: Diamond Panel station in MANUAL (MAN light backlit)</li> </ol>	On the Diamond panel the MAN-AUTO button is depressed and the MAN lamp is illuminated.			
	<ol> <li>Determine of Rod Motion stops</li> <li><u>POSITIVE CUE:</u> OUT motion light is OFF on the Diamond Panel. Group 7 Rods have stopped moving.</li> <li><u>NEGATIVE CUE</u>: OUT motion light is ON on the Diamond Panel. Group 7 Rods continue to travel inward.</li> </ol>	On Diamond panel, OUT motion light is checked and on C03 and/or C13, rod position is monitored and determined that rod motion continues.			
	<ol> <li>Check SY lamp energizing and de- energizing.</li> <li><u>POSITIVE CUE</u>: SY lamp is off</li> </ol>	On Diamond panel, status of SY lamp is checked			
	<ol> <li>Verify the Diamond Panel in MANUAL.</li> <li><u>POSITIVE CUE</u>: Diamond Panel station in MANUAL (MAN light backlit)</li> </ol>	On the Diamond panel MAN lamp is illuminated.			

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JPM ID: \_\_\_\_\_A1JPM-RO-AOP37

INSTI assign buttor	<b>RUCTOR'S CUE</b> – For this JPM, the GRC ned button on the simulator remote control n to provide the expected response (GROI	OUP-AUXIL button is defeated to provide the I must be depressed as the examinee depre UP lamp off and AUXIL lamp on)	desired re sses the G	sults. The ROUP-A	) UXIL
	<ol> <li>Set GROUP-AUXIL switch to AUXIL.</li> <li><u>POSITIVE CUE</u>: AUXIL lamp is backlit on the GROUP- AUXIL switch.</li> </ol>	On the Diamond panel, the GROUP- AUXIL button is depressed and the AUXIL lamp is illuminated			
	7. Set the SPEED SELECTOR to JOG <u>POSITIVE CUE</u> : Speed selector switch is selected to JOG.	On the Diamond Panel, the SPEED SELECTOR switch is rotated to the JOG position.			
	<ol> <li>Place the manual command switch in the INSERT position for ~3 seconds AND return the manual command to neutral</li> <li><u>POSITIVE CUE</u>: Manual command switch is placed in INSERT for ~3 seconds and returned to neutral.</li> </ol>	On the Diamond Panel, the manual command switch (T-Handle) is placed in insert for ~3 seconds and then returned to normal			
	<ul> <li>9. Determine of Rod Motion stops</li> <li><u>POSITIVE CUE:</u> OUT motion light is OFF on the Diamond Panel. Group 7 Rods have stopped moving.</li> <li><u>NEGATIVE CUE</u>: OUT motion light is ON on the Diamond Panel. Group 7 Rods continue to travel inward.</li> </ul>	On Diamond panel, OUT motion light is checked and on C03 and/or C13, rod position is monitored and determined that rod motion continues.			
С	10. Trip the Reactor. <u>POSITIVE CUE</u> : The reactor has been tripped	On panel C03, the reactor trip Pushbutton has been depressed.			
INSTR	<b>UCTOR'S CUE</b> – When the reactor is trip	oped, the instructor will notify the Examinee	the JPM is	complete	

JPM ID: A1JPM-RO-AOP37

# **INITIAL CONDITIONS:**

The reactor is ~5% power. ICS is in manual with CRD Diamond panel in AUTO. Control rods are withdrawing continuously.

# **INITIATING CUE:**

The CRS/SM directs you to respond to a Continuous Control Rod Withdrawal per 1203.003 Section 9.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE				
TITLE: CONTROL ROD ACTION	DRIVE MALFUNCTION	DOCUMENT NO. 1203.003 WORK PLAN EXP. DATE	CHANGE NO. 024	
SET #		N/A SAFETY-RELATED MYES NO TEMP MOD YES MNO PROGRAMMATIC EXCLUS	IPTE YES NO LEVEL OF USE CONTINUOUS REFERENCE INFORMATIONAL SION PER EN-LI-100	
When you see these	e <u>TRAPS</u>	Get these TOOLS	<u>S</u>	
т	ïme Pressure	Effective Co	mmunication	
ם	Distraction/Interruption	Questioning	Attitude	
N	Iultiple Tasks	Placekeepin	g	
C	Over Confidence	Self Check		
V	ague or Interpretive Guidance	Peer Check		
F	irst Shift/Last Shift	Knowledge		
Peer Pressure		Procedures		
c	Change/Off Normal	Job Briefing		
P	Physical Environment	Coaching		
N	lental Stress (Home or Work)	Turnover		
VERIFIED BY	DATE		TIME	
FORM TITLE:	IFICATION COVER SHEET	FORM NO 1000.0	0. CHANGE NO. 06A 054	

1203.003

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# SECTION 9 CONTINUOUS CONTROL ROD MOTION

#### 1. Verify the following:

- Reactor demand H/A station in MANUAL.
- **Diamond panel in MANUAL.** •
- Α. IF rod motion stops, THEN GO TO ICS Abnormal Operation (1203.001).

#### 2. IF SY lamp is energizing and de-energizing (indicating control rod or group motion), THEN set SPEED SELECTOR switch to RUN.

Α. IF control rod motion stops, THEN contact I&C and SYE for assistance.

#### 3. IF control rod motion continues, THEN perform the following:

- Verify diamond panel in MANUAL. Α.
- B. Set GROUP-AUXIL switch to AUXIL.
- C. Set SPEED SELECTOR switch to JOG.
- D. Place manual command switch in the INSERT for ~3 seconds AND return manual command to neutral.

#### 4. IF control rod motion continues THEN perform the following:

- Α. Trip reactor.
- Β. Refer to Emergency Operating Procedure (1202.XXX).

# END

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JOB PERFORMANCE MEASURE

Unit: <u>1</u> Rev # <u>1</u> Date:
JPM ID: A1JPM-RO-RPS09
System/Duty Area:Reactor Protection System
Task:Respond to Annunciator K08-C3, "RPS TROUBLE", due to NI power supply failure
JTA# _ ANO1-RO-AOP-OFFNORM-164
KA Value RO <u>3.5</u> SRO <u>3.9</u> KA Reference <u>015 A2.01</u>
Approved For Administration To: RO X SRO X
Task Location: Inside CR:    X    Outside CR:    Both:
Suggested Testing Environment And Method (Perform Or Simulate):
Plant Site: Simulator: Perform Lab:
Position Evaluated: RO: X SRO: X
Actual Testing Environment: Simulator: Plant Site: Lab
Testing Method: Simulate: Perform:
Approximate Completion Time In Minutes: 20 Minutes
Reference(S): 1202.012G, 1203.021, 1105.001
Examinee's Name: KCN:
Evaluator's Name:
The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:
Satisfactory: Unsatisfactory:
Performance Checklist Comments:
Start Time Total Time Total Time
*Signed Date:

\*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

### JPM ID: A1JPM-RO-RPS09

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

#### JPM INITIAL TASK CONDITIONS:

Plant is operating at 100% power. Annunciator alarm K08-C3 has just been received. NI5 indication on C03 is indicating 0%. All other power range indicators are reading normal at ~100%.

### TASK STANDARD:

Steps 1 and 2 of K08-C3 Annunciator Corrective Action in 1203.012G complete and 1203.021, Section 1 "Loss of Neutron Flux Distribution", complete through step 3.2.1.C.

#### TASK PERFORMANCE AIDS:

1203.012G, K08-C3 Annunciator Corrective Action 1203.021, Loss of Neutron Flux Indication 1105.001 Section 10.0, Placing a RPS Channel in Manual Bypass

### Simulator Setup:

- 100% Power
- Obtain RPS channel bypass key available
  - NOTE The key checkout process is not simulated in the simulator. The evaluator will have the RPS channel bypass key available and will provide it to the examinee when requested.
- Create batch files containing to following. (Substitute actual file names where appropriate.)

"Batch File #1"	"Batch File #2"
<ul> <li>^ NI-5 Power supply failure IMF NI236</li> <li>^ NI-5 FAILS Lo</li> <li>IOR AO_RPSA49 0</li> <li>^ NI-5 Power supply voltage goes to 0 VDC</li> <li>TRGSET 1 "ku2590r7"</li> <li>^ Set NI-5 PS reset toggle switch to trigger 1</li> <li>trg 1 "Batch File #2"</li> <li>^ NI-5 RESTORED and PS returns to 600VDC</li> </ul>	^ A1SPGRPS_PWR2.txt DOR AO_RPSA49 DMF NI236

- Initiate batch file #1 to activate failure
- Simulator may remain in run
- NI-5 power supply and NI-5 indication will return when the reset button on the power supply is depressed (Batch File #2).

JPM ID: A1JPM-RO-RPS09

INITIATING CUE: The CRS/SM directs you to respond to Annunciator K08-C3 and perform the required actions.

CRITICAL ELEMENTS (c): 2, 9, 11, 17

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EX	<ul> <li>AMINER NOTE:</li> <li>This JPM requires the examinee to use more than on the JPM.</li> </ul>	e procedure. Provide the procedures	s as they	are cue	din
	<ol> <li>Check nuclear instrumentation on C03 for low readings</li> <li><u>POSITIVE CUE:</u> NI5 reading 0%</li> </ol>	On panel C03, checked and determined that NI5 has failed to 0% and NI6-NI8 are all reading normal at ~100%.			
С	<ol> <li>Transition to 1203.021, Loss of Neutron Flux Indication AOP</li> <li><u>POSITIVE CUE</u>: Referred to 1203.021, Section 1.0, Loss of One or More Power Range NI Channels</li> </ol>	Stated leaving the ACA to perform the actions of 1203.021, Loss of Neutron Flux Indication, Section 1.0.			
EX	<ul> <li>AMINER CUE:</li> <li>Provide a copy of 1203.021, Loss of Neutron Flux Ind</li> </ul>	ication AOP to the examinee	<b>.</b>		
	<ol> <li>Verify the failed instrument does not affect reactor power input to ICS</li> <li><u>POSITIVE CUE</u>: Reactor power stable at &lt;100%</li> </ol>	On panel C03, checked reactor power stable and less than 100%.			
	<ul> <li>Check for normal supply voltage to failed power range channel at power supply module in associated RPS cabinet.</li> <li><u>NEGATIVE CUE</u>: The indicator is in the red zone and below 600VDC.</li> </ul>	In the "A" channel RPS left side cabinet, checked power supply voltage for NI 5. Identified that the voltage was reading below 600 VDC and in the red zone.			
EV	<ul> <li>ALUATOR NOTE:</li> <li>At this point, the operator may notify the CRS/SM of h</li> <li>As the CRS/SM, direct the operator to RESET the NI-3</li> </ul>	is findings. 5 power supply.	LI	I	
	<ol> <li>Place RPS "A" channel in "Channel Bypass" IAW 1105.001, "NI and RPS Operating Procedure".</li> </ol>	Referred to OP 1105.001, section 10.0, "Placing a RPS Channel in Manual Bypass".			
EX	<ul> <li>MINER CUE:</li> <li>Provide a copy of 1105.001, NI and RPS Operating Pr</li> </ul>	ocedure, Section 10 to the examine	e	I	

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	<ul> <li>6. Verify no other RPS Channel (B, C, D) in Manual Bypass.</li> <li>NOTE: <ul> <li>Due to the unique design in the U1 simulator, all channel indications are located in one RPS cabinet.</li> </ul> </li> <li><u>POSITIVE CUE</u>: <ul> <li>No manual (or channel) bypass lamps are lit or K08-D3 RPS Channel Bypass is NOT in alarm</li> </ul> </li> </ul>	Looked in the RPS cabinet in the back of the control room and verified no manual (or channel) bypass lamps are lit <u>or</u> verified that K08-D3 (RPS Channel Bypass) annunciator is clear.			
	<ul> <li>7. Verify no EFIC Channel in Maintenance Bypass that does <u>not</u> correspond to the RPS Channel to be placed in Manual Bypass.</li> <li><u>POSITIVE CUE</u>: Maintenance lamps dim (not flashing) for EFIC cabinets <u>or</u> K12-F7 EFIC CH MAINT BYPASS not in alarm.</li> </ul>	On the EFIC cabinets, verified that "Maintenance" lamps are dim (not flashing) for any channel <u>or</u> verified that K12-F7 (EFIC CH MAINT BYPASS) annunciator clear.			
	8. Compare Plant Computer point N1I56HI to N1I78HI. <u>POSITIVE CUE:</u> The difference between N1I56HI and N1I78HI is <1%.	Using PMS, compared Plant Computer point N1I56HI to N1I78HI.			
С	<ul> <li>9. Place the SASS Neutron Flux selector switch on C03 in the "Y" position.</li> <li><u>POSITIVE CUE:</u> ICS Selector Switch, Neutron Flux (HS-509) is selected to "Y" position.</li> </ul>	On panel C03, "ICS Selector Switch, Neutron Flux" switch (HS-509) in the "Y" position.			
	<ol> <li>Obtain the RPS Manual Bypass key from the SM.</li> <li><u>POSITIVE CUE</u>: Give the RPS Manual Bypass key to the examinee.</li> </ol>	Obtained the RPS Manual Bypass key.			
EXA	<ul> <li>MINER NOTE:</li> <li>When the examinee asks for the Manual Bypass key,</li> </ul>	provide it to the examinee.		LI	
С	<ul> <li>11. In the RPS cabinet, place the key switch for the appropriate channel on the selected Rx Trip module to the bypass position.</li> <li><u>POSITIVE CUE:</u></li> <li>"A" RPS Manual Bypass key switch in BYPASS POSITION.</li> </ul>	In the RPS cabinet, inserted the key into the key switch in the "A" Reactor Trip module and placed the switch in the bypass position.			
	<ul> <li>12. Verify the manual bypass lamps on the Rx Trip module and the indicating panel go on bright.</li> <li><u>POSITIVE CUE</u>: Rx Trip Module Manual Bypass lamps ON BRIGHT.</li> </ul>	Verified the Manual Bypass lamp on the Rx Trip Module went BRIGHT and the Manual Bypass lamp on the indicating panel for "A" RPS went BRIGHT.			
EXA	MINER NOTE: The RPS channel will not be tripped.			I.	

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT		
	13. Verify Auxiliary Relay lamps for Man. Bypass to EFIC <u>and</u> Man. Bypass to Ann. are on bright.	Verified Auxiliary Relay lamps for Manual Bypass to EFIC <u>and</u> Manual Bypass to annunciator					
	Manual Bypass to EFIC and Manual Bypass to Annunciator Auxiliary Relay lamps ON BRIGHT.	are on bright.					
	<ol> <li>Verify the associated EFIC channel Maintenance Bypass light is flashing.</li> </ol>	On the EFIC cabinet, the Maintenance Bypass light for the					
	POSITIVE CUE: "A" EFIC Maintenance Bypass Light is FLASHING.	be flashing.					
	<ol> <li>Verify annunciator RPS CHANNEL BYPASSED (K08-D3) is in alarm.</li> </ol>						
	<u>POSITIVE CUE</u> : K08-D3 is in alarm.	On K08, verified the annunciator is in alarm for RPS CHANNEL BYPASSED.					
	<u>NEGATIVE CUE</u> : K08-D3 is <u>NOT</u> in alarm.						
EXA	<ul> <li>AMINER NOTE:</li> <li>At this point the examinee should transition back to 12</li> </ul>	203.021.					
	16. Check power supply ON/OFF switch ON In the "A" RPS left side cabir checked that the power supp ON/OFF switch on the power						
	<u>POSITIVE CUE</u> : NI-5 power supply ON/OFF switch In the "ON" position	supply module labeled "Detector P.S. NI-5" in the "ON" position.					
С	<ol> <li>Depress power supply RESET switch to RESET position</li> <li>POSITIVE CUE:</li> </ol>	In the "A" RPS left side cabinet, depressed the power supply RESET switch on the power					
	NI-5 power supply "RESET" switch placed in "RESET"	supply module.					
EXA	<ul> <li>EXAMINER NOTE</li> <li>The examinee may check proper NI indication in multiple locations including NI-5 upper and lower chamber indications in the A RPS cabinet, NI-5 power indications on C03, or by observing the value of PMS point "N1I5". Any or all of these are acceptable.</li> </ul>						
	<ol> <li>Check that the power supply to NI5 is restored and NI5 is indicating properly.</li> </ol>	In the "A" RPS left side cabinet, checked the power supply module for NI5 is indicating					
	POSITIVE CUE: NI-5 power supply module is indicating ~600 VDC AND NI-5 Upper and Lower Chamber RPS Module indications read ~50% <u>OR</u> NI-5 indication on C03 is reading ~100% <u>OR</u> Plant Computer Point "N1I5" reads ~100%	between 590-610 VDC <u>AND</u> NI-5 Upper and Lower Chamber RPS Module indications read ~50% <u>OR</u> NI-5 indication on C03 is reading ~100% <u>OR</u> Plant Computer Point "N1I5" reads ~100%					
EXA	<ul> <li>MINER NOTE</li> <li>When the examinee has verified that NI-5 indications</li> </ul>	have returned to normal, inform the	examine	e that th	ne		

JPM is complete.

JPM ID: A1JPM-RO-RPS09

# **INITIAL CONDITIONS:**

- Plant is operating at 100% power.
- Annunciator alarm K08-C3 has just been received.
- NI5 indication on C03 is indicating 0%.
- All other power range indicators are reading normal at ~100%.

**INITIATING CUE:** 

The CRS/SM directs you to respond to Annunciator K08-C3 and perform the required actions.

>	ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE					
	TITLE: ANNUNCIATOR K08 CORRECTIVE ACTION	DOCUMENT NO. CHANGE NO. 1203.012G 038				
		WORK PLAN EXP. DATE				
	SET #	SAFETY-RELATED IPTE				
		TEMP MOD ☐YES ⊠NO ☐ REFERENCE ☐ INFORMATIONAL				
		PROGRAMMATIC EXCLUSION PER EN-LI-100				
	When you see these <u>TRAPS</u>	Get these <u>TOOLS</u>				
	Time Pressure	Effective Communication				
	Distraction/Interruption	Questioning Attitude				
	Multiple Tasks	Placekeeping				
	Over Confidence	Self Check				
	Vague or Interpretive Guidance	Peer Check				
	Pirst Shift/Last Shift					
	Physical Environment	Sob Briefing				
	Mental Stress (Home or Work)	Turnover				
ŀ	VERIFIED BY DATE	TIME				
	FORM TITLE: VERIFICATION COVER SHEET	FORM NO. CHANGE NO. 1000.006A 054				

1203.012G

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CHANGE: 038

Location: C13

Device and Setpoint: N/A



Alarm: K08-C3

#### 1.0 OPERATOR ACTIONS

- 1. Check nuclear instrumentation on CO3 for low readings.
  - Intermediate Range (NI-3, NI-4)
  - Power Range (NI-5 thru NI-8)
- <u>IF</u> power range is reading incorrectly <u>or</u> is failed <u>OR</u> intermediate range detector is reading incorrectly <u>or</u> is failed, <u>THEN</u> GO TO Loss of Neutron Flux Indication (1203.021).
- 3. Have I&C investigate and repair failed detector power supply.
- 4. <u>IF</u> power range is NOT failed low <u>AND</u> intermediate range channel is NOT failed low, <u>THEN</u> check for RPS channel trip as follows:
  - A. Observe trip lights at RPS cabinets. Amber light will be on bright for tripped RPS channel.
  - B. Determine condition that caused channel trip.
  - C. <u>IF</u> desired, <u>THEN</u> place tripped channel in manual bypass per "Placing a RPS Channel in Manual Bypass" section of NI & RPS Operating Procedure (1105.001).
  - D. Initiate steps, as required, to determine reason for channel trip.
  - E.  $\frac{\text{IF} \text{ necessary,}}{\text{THEN}}$  initiate steps to make repairs.
- 5. Reference TS 3.3.1 for operability requirements.
- 6. To clear alarm:
  - A. Restore high voltage to detector.
  - B. Place tripped channel in manual bypass per "Placing a RPS Channel in Manual Bypass" section of NI & RPS Operating Procedure (1105.001).
  - C. Reset tripped channel.

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CHANGE: 038

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### 2.0 PROBABLE CAUSES

**NOTE** This annunciator has reflash capability. If the alarm window is lit solid due to one cause and another cause actuates, the alarm will go to fast flash with an audible alarm.

- Any power range detector (NI-5 thru NI-8) power supply failure
- Any intermediate range (NI-3 or NI-4) detector power supply failure
- Any NI-3 or NI-4 auxiliary power supply failure
- Any RPS channel (1 thru 4) trip

#### 3.0 REFERENCES

Schematic Diagram Annunciator K08 (E-458, sheet 2)

)	ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE							
	TITLE: LOSS OF NEU	UTRON FLUX	DOCUMENT NO	D. CHA	NGE NO. 010			
				WORK PLAN EX	XP. DATE TC	EXP. DATE		
-	SET #			SAFETY-RELAT				
						EL OF USE		
						NFORMATIONAL		
					TIC EXCLUSION I	PER EN-LI-100		
	When you see the	se <u>TRAPS</u>	2	Get these	TOOLS			
		Time Pressu	re	Eff	ective Commu	inication		
		Distraction/Ir	nterruption	Qu	estioning Atti	tude		
		Multiple Tasl	KS	Placekeeping				
	Over Confidence			Self Check				
	Vague or Interpretive Guidance			Peer Check				
	First Shift/Last Shift			Knowledge				
	Peer Pressure			Pro	ocedures			
	Change/Off Normal			Job Briefing				
	Physical Environment			Coaching				
		Mental Stress	s (Home or Work)	lur	mover			
	VERIFIED BY		DATE		TIMI			
	4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1							
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	FORM TITLE:	RIFICATION	OVER SHEET		FORM NO. 1000.006A	CHANGE NO. 053		

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3.0 Loss of One or More Source Range NI Channels	in Modes 2 through 5	7

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#### SECTION 1

LOSS OF ONE OR MORE POWER RANGE NI CHANNELS

#### 1.0 SYMPTOMS

- 1.1 Power range indication reading incorrectly.
- 1.2 Annunciator alarm on any of the following:
  - A. RPS TROUBLE (K08-C3)
  - B. UNIT MASTER IN TRACK (K07-A1)
  - C. FEEDWATER IS REACTOR LIMITED (K07-C2)
- 1.3 Large neutron error indicated.
- 2.0 IMMEDIATE ACTION

NONE

- 3.0 FOLLOW-UP ACTIONS
  - 3.1 <u>IF NI failure affects reactor power input to ICS,</u> <u>THEN</u> perform the following:
    - 3.1.1 Place Diamond and Reactor Demand stations in MANUAL and stabilize reactor power at less than 100% using available nuclear instrumentation.
    - 3.1.2 Verify feedwater stabilizes T-ave while monitoring reactor coolant pressure.
  - 3.2 Check for normal supply voltage (590 to 610 VDC) to failed power range channel(s) at P.S. module in associated RPS cabinet.
    - 3.2.1 <u>IF normal voltage is not</u> indicated, THEN reset power supply for detector(s) as follows:
      - A. Place affected channel in channel bypass per NI & RPS Operating Procedure (1105.001), "Placing a RPS Channel in Manual Bypass" section. Refer to TS 3.3.1 Condition A.
      - B. Check power supply ON/OFF switch ON.

#### NOTE

Resetting power supply to power range detector(s) will cause voltage spikes and neutron power signal spikes, which may trip associated RPS channel.

C. Depress power supply RESET switch to RESET position.

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#### SECTION 1 LOSS OF ONE OR MORE POWER RANGE NI CHANNELS (Continued)

- D. <u>IF</u> power range indication returns to normal, <u>THEN</u> verify all trip bistables are reset per "Resetting RPS Channels After Channel Trip" section of 1105.001.
  - Return channel bypass to normal per "Removing a RPS Channel From Manual Bypass" section of 1105.001 and continue plant operations.

#### NOTE

If failed instrument has failed high, the output of the High Auctioneer to ICS will also be high. Failed input to the High Auctioneer can be removed by placing the Power Range Test Module to "Test Operate" position.

- 3.3 IF one power range channel has failed, <u>THEN</u> refer to Refer to TS 3.3.1 for guidance on bypassing or operation with an inoperable function.
  - 3.3.1 IF desired to place affected channel in channel bypass, <u>THEN</u> perform NI & RPS Operating Procedure (1105.001), "Placing a RPS Channel in Manual Bypass" section. Refer to TS 3.3.1 Condition A.
  - 3.3.2 IF the channel is bypassed, THEN the channel trip module may be reset as follows:
    - A. Place the Power Range Test Module in TEST OPERATE.
    - B. For all bistables with Output State and/or Output Memory lamps on bright, perform the following:
      - Depress and release the Output State switch.
      - Depress and release the Output Memory Reset switch.
    - C. Ensure the Building Pressure contact buffer is reset (both Input State lamps are off).
    - D. Reset the applicable Channel Reactor Trip Module.

SECTION 1 LOSS OF ONE OR MORE POWER RANGE NI CHANNELS

(Continued)

- Ε. On all RPS Channels, verify the applicable Subsystem lamps are on dim on the following:
  - Channel "A" Reactor Trip module
  - Channel "A" Cabinet Indicating Panel
  - Channel "B" Reactor Trip module ٠
  - Channel "B" Cabinet Indicating Panel •
  - Channel "C" Reactor Trip module
  - Channel "C" Cabinet Indicating Panel
  - Channel "D" Reactor Trip module •
  - Channel "D" Cabinet Indicating Panel •
- 3.4 IF two power range channels have failed, THEN place one of the affected RPS channels in a tripped condition per "Placing a channel in a tripped condition" section of 1105.001. Refer to TS 3.3.1 Condition B.
- 3.5 IF all power range channels have failed, AND no on-scale indication of neutron flux is available, THEN trip reactor and refer to Reactor Trip (1202.001).
- 3.6 IF three or more power range channels have failed, AND on-scale indication of neutron flux is available, THEN refer to TS 3.3.1 Conditions C and D.
- 3.7 Notify Shift Manager to implement Emergency Action Level Classification (1903.010).

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### SECTION 2

LOSS OF ONE OR MORE INTERMEDIATE RANGE NI CHANNELS IN MODE 2

- 1.0 SYMPTOMS
  - 1.1 Intermediate range indication reading incorrectly.
  - 1.2 RPS TROUBLE (K08-C3) alarm.
  - 1.3 CRD WITHDRAWAL INHIBITED (K08-A2) alarm.
- 2.0 IMMEDIATE ACTION

NONE

3.0 FOLLOW-UP ACTIONS

### NOTE

 $\underline{If}$  all 4 of the following conditions  $\overline{apply},$  there is no on-scale indication of neutron flux:

- Three of four power range instruments are  $\leq 5\%$  power,
- No intermediate range instrument is >10<sup>-10</sup> amps,
- No source range instrument is <10<sup>5</sup> cps,
- Reactor Power Wide Range Recorder (NR-502) is inoperable.
- 3.1  $\frac{\text{IF}}{\text{THEN}}$  no on-scale indication of neutron flux is available,  $\frac{\text{THEN}}{(1202.XXX \text{ Series})}$ .

#### CAUTION

Reactor condition must be such that delays which are necessary to perform the following steps will not result in reactor going critical due to xenon, etc.

- 3.2 Check the failed intermediate range channel(s) power supply voltages at detector P.S. modules in associated RPS cabinets:
  - Detector power supply: 595 to 605 VDC
  - Auxiliary power supply: 17 to 23 VDC
  - 3.2.1 IF normal voltage is not indicated, THEN reset power supplies as follows:
    - A. Check detector power supply toggle switch ON.
    - B. Check auxiliary power supply toggle switch ON.

1203.021

#### SECTION 2

LOSS OF ONE OR MORE INTERMEDIATE RANGE NI CHANNELS IN MODE 2 (Continued)

#### NOTE

Resetting intermediate range channel power supplies will cause voltage spikes and neutron power signal spikes, which may alarm annunciators CRD WITHDRAWAL INHIBITED (K08-A2) and HI SUR ROD HOLD (K08-B2).

- C. Depress both toggle switches to RESET position.
- D. IF intermediate range indication returns to normal, THEN continue plant operations.
- 3.3 IF only one intermediate range channel is operable, OR 2 of 4 power range instrument channels indicate >5% power, THEN continue plant operations (TS 3.3.10).
- 3.4 IF all three of the following conditions are met,
  - Both intermediate range channels have failed,
  - 3 of 4 power range instruments indicate ≤5%,
  - Reactor Power Wide Range Recorder (NR-502) is available,

THEN perform the following:

#### NOTE

Plant temperature changes which result in positive reactivity additions are allowed provided the temperature change is accounted for in the Shutdown Margin calculations (TS 3.3.10 Condition A).

- Refer to TS 3.3.10.
- Immediately suspend operations involving positive reactivity changes.
- Initiate a shutdown in order to have all CRD trip breakers open (Mode 3) within 1 hour.
- IF reactor power is  $\geq 2\%$ , THEN perform applicable steps of Power Reduction and Plant Shutdown (1102.016).
- Concurrently with reactor shutdown, monitor reactor power using NR-502.
  - A. WHEN ~1E-4 log reactor power on NR-502 is reached, \$\$THEN\$ observe that source range indicators come on scale.
- 3.5 Notify Shift Manager to implement Emergency Action Level Classification (1903.010).

#### SECTION 3

LOSS OF ONE OR MORE SOURCE RANGE NI CHANNELS IN MODES 2 THROUGH 5

- 1.0 SYMPTOMS
  - 1.1 Source range indication reading incorrectly.
  - 1.2 CRD WITHDRAWAL INHIBITED (K08-A2) alarm.
- 2.0 IMMEDIATE ACTION

NONE

3.0 FOLLOW-UP ACTIONS

#### NOTE

- $\underline{\text{If}}$  all 4 of the following conditions apply, there is no on-scale indication of neutron flux:
- Three of four power range instruments are ≤5% power,
- No intermediate range instrument is >10<sup>-10</sup> amps,
- No source range instrument is <10<sup>5</sup> cps,
- Reactor Power Wide Range Recorder (NR-502) is inoperable.
- 3.1 IF no on-scale indication of neutron flux is available, THEN trip reactor AND perform Reactor Trip (1202.001) in conjunction with this procedure.
- 3.2 IF only one source range channel is operable,  $\frac{OR}{OR}$  1 of 2 intermediate range channels indicates >10<sup>-10</sup> amps, <u>THEN</u> continue plant operations (TS 3.3.9).
- 3.3 IF both source range instruments fail, AND both intermediate range channels indicate  $\leq 10^{-10}$  amps, THEN perform the following:

#### NOTE

Plant temperature changes which result in positive reactivity additions are allowed provided the temperature change is accounted for in the Shutdown Margin calculations.

- 3.3.1 Refer to TS 3.3.9 Condition A.
- 3.3.2 Immediately suspend operations involving positive reactivity changes.
- 3.3.3 Immediately initiate a shutdown and insert all control rods.
- 3.3.4 Within 1 hour verify CRD trip breakers open.

#### SECTION 3

LOSS OF ONE OR MORE SOURCE RANGE NI CHANNELS IN MODES 2 THROUGH 5 (continued)

- 3.3.5 Within 1 hour and once per 12 hours thereafter, verify reactor >1.5%  $\Delta k/k$  shut down per Reactivity Balance Calculation (1103.015).
- 3.4 Notify Shift Manager to implement Emergency Action Level Classification (1903.010).

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE							
TITLE:	TITLE: NI & RPS OPERATING PROCEDURE			DOCUMEN 110 WORK PLA	T NO. 15.001 N EXP. DATE		NGE NO. 025 CTIVITY IMPACT
SET #	SET #			SAFETY-RE QYES TEMP MOD QYES			INCES NO EL OF USE ONTINUOUS EFERENCE
					MATIC EXCLUS	ION P	PER EN-LI-100
When	you see the	ese <u>TRA</u>	PS	Get thes	e <u>TOOLS</u>	S	
		Time Pres	sure		Effective Co	mmu	nication
	Distraction/Interruption				Questioning	Attit	ude
		Multiple T	asks		Placekeeping	g	
		Overconfi	dence	Self Check			
		First Shift	Interpretive Guidance	Peer Check			
	First Shift/Last Shift			Rhowledge			
1	Change/Off Normal			Job Briefing			
	Physical Environment			Coaching			
	Mental Stress (Home or Work)			Turnover			
	VERIFIED BY		DATE			TIME	
	TLE:						
	VE	RIFICATIO	N COVER SHEET		1000.00	6A	055
10.0 Placing a RPS Channel in Manual Bypass

NOTE

Only one RPS Channel may be placed in Manual Bypass at a time.

10.1 Determine which RPS Channel is to be placed in Manual Bypass AND verify no other RPS Channel in Manual Bypass.

#### CAUTION

Placing a RPS Channel in Manual Bypass will remove any non-corresponding EFIC Channel from Maintenance Bypass causing possible EFIC actuation.

# CRITICAL STEP

- 10.2 Verify no EFIC Channel in Maintenance Bypass that does NOT correspond to the RPS Channel to be placed in Manual Bypass.
- 10.3 Place SASS Neutron Flux selector switch (HS-509) on CO3 in the "X" or "Y" position as follows:
  - 10.3.1 Compare Plant Computer point N1I56HI to N1I78HI.
    - A. <u>IF</u> Plant Computer is NOT available, <u>THEN</u> compare the highest of NI-5 and NI-6 to the highest of NI-7 and NI-8 on CO3.
  - 10.3.2 <u>IF</u> the difference between the compared values is >1%, <u>THEN</u> place the following stations in manual per "Transferring ICS Control Stations to HAND" section of Integrated Control System (1105.004):
    - Diamond Panel
    - Rx Demand H/A station
  - 10.3.3 IF placing RPS Channel "A" OR "B" in Manual Bypass, THEN place Neutron Flux selector switch (HS-509) to the "Y" position.
  - 10.3.4 IF Placing RPS Channel "C" OR "D" in Manual Bypass, THEN place Neutron Flux selector switch (HS-509) to the "X" position.
  - 10.3.5 IF ICS H/A stations were placed in manual for this step, <u>THEN</u> stations may be returned to auto per ICS Operating Procedure (1105.004), "Transferring ICS Control Stations to Auto" section.
- 10.4 Obtain the RPS Manual Bypass key from the Shift Manager.

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1105.001	NI & RPS OPERATING PROCEDURE	CHANGE:	025

- 10.5 Place key switch on the selected Rx Trip module to the bypass position (rotate key switch clockwise).
  - 10.5.1 Check Manual Bypass lamps go on bright on the following:
    - Rx Trip Module
    - Indicating Panel
  - 10.5.2 <u>IF</u> the channel is tripped, THEN check the following:
    - Protective Subsystem Trip lamps on dim on the following:
      - Tripped RPS Cabinet Rx Trip module
      - Tripped RPS Cabinet Indicating Panel Protective Subsystem lamps
      - Remaining RPS Cabinets Rx Trip modules
      - Remaining RPS Cabinets Indicating Panel Protective Subsystem lamps
  - 10.5.3 Auxiliary Relay lamps on bright for the following:
    - Man. Bypass to EFIC
    - Man. Bypass to Ann.
  - 10.5.4 Associated EFIC channel Maintenance Bypass light is flashing.
  - 10.5.5 Annunciator RPS CHANNEL BYPASSED (K08-D3) in alarm.

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JOB PERFORMANCE MEASURE

Unit:1	Rev #	9		Date:	
JPM ID:	A1JPM-RO-MUP01				
System/Duty Area:	Makeup and Purifi	cation			
Task: Isolate Letdo	wn, Restore Makeup and	Seal Injection			
JTA# _ANO1-RO-E	OP-EMERG-55		to a second second second second second second second second second second second second second second second s		
KA Value RO 3.6	SRO KA Re	eference: 004	A4.06		
Approved For Admini	stration To: RO	Χ	SRO X		
Task Location: Insid	de CR X	Outside CR		Both	
Suggested Testing E	nvironment and Method (F	Perform or Simu	late ):		
Plant Site:	Simulator:	Perform	Lab:		
Position Evaluated: I	RO:		SRO:		
Actual Testing Enviro	onment: Plant Site		Simulator	Lab	
Testing Method: Pe	rform		Simulate		
Approximate Comple	tion Time in Minutes:		15	Minutes	
Reference(s): 1202	2.001 Reactor Trip (step 9	) and 1202.012	RT-1 Restore norm	al Makeup and Seal Injection	
Examinee's Name:			KCN		
Evaluator's Name:					
The Examinee's perf	ormance was evaluated a	gainst the stanc	lards contained in th	nis JPM and is determined to be:	
Satisfactory:		Unsatis	sfactory:		
Performance Checklist Comments:					
Start Time	S	top Time		Total Time	
*Signed			_ Date		
*Signature indicates	this JPM has been compared	ared to its applic	able procedure by a	a qualified individual (not the examinee)	

and is current with that revision.

## JPM ID: A1JPM-RO-MUP01

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

JPM INITIAL TASK CONDITIONS:

- The reactor has just tripped
- Immediate actions are complete

NOTE: The examinee is to check the operating HPI pump supplying normal Makeup and Seal Injection post reactor trip. The examinee will find that the operating HPI pump is off. The examinee will then have to perform the contingencies of 1202.001 Step 9.

SIMULATOR SETUP: Trip the reactor from any at power IC and then turn off the running (OP HPI) HPI pump.

### \*\*\* This is an ALTERNATE PATH JPM \*\*\*

#### TASK STANDARD:

Previously running HPI pump running with seal injection and normal makeup re-established per RT-1.

#### TASK PERFORMANCE AIDS:

Copy of 1202.001 step 9 (Check OP HPI pump supplying normal Makeup and Seal Injection) and 1202.012 RT-1 (Restore normal Makeup and Seal Injection).

# JPM ID: \_\_\_\_\_A1JPM-RO-MUP01

INITIATING CUE: The CRS/SM directs you to perform the required actions of 1202.001 Reactor Trip procedure starting at step 9.

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	<ol> <li>Check OP HPI pump supplying normal Makeup and Seal Injection.</li> <li><u>POSITIVE CUE:</u> OP HPI Pump is OFF.</li> </ol>	Identified that the Operating HPI pump is OFF.			
EXA	<ul> <li>If the Examinee attempts to perform other steps of the inform the examinee that another operator is performing</li> </ul>	e Reactor Trip EOP such as floating ng the task(s).	steps du	uring this	s JPM,
	<ol> <li>Isolate Letdown</li> <li><u>POSITIVE CUE</u>:</li> <li>CV-1221 green light only ON <u>or</u> CV-1214 and CV1216 green lights only ON.</li> </ol>	Isolated letdown by closing CV- 1221 (Letdown Coolers Outlet) using handswitch on C16 <u>or</u> by closing CV-1214 and CV-1216 using handswitches on C18 (Letdown Cooler Outlet valves).			
С	<ol> <li>Close RC Pump Seals Total INJ Flow control valve (CV-1207).</li> <li><u>POSITIVE CUE:</u> CV-1207 indicates closed.</li> </ol>	Placed in HAND by depressing the white pushbutton on C04 and closed CV-1207. Observed position indicator reads zero.			
С	4. Close Pressurizer Level Control valve (CV-1235). <u>POSITIVE CUE:</u> CV-1235 indicates closed.	Placed in HAND by depressing the white pushbutton on C04 and closed CV-1235. Observed valve demand reads zero.			
	5. Verify RCP Seal INJ Block CV-1206 closed. <u>POSITIVE CUE</u> : Green light only ON. <u>NEGATIVE CUE</u> : Red light ON.	On C04, verified CV-1206 closed.			
	<ul> <li>6. Verify RCS Makeup Block valves CV-1233 and CV-1234 open.</li> <li><u>POSITIVE CUE:</u> CV-1233 and CV-1234 red lights ON, green lights OFF.</li> </ul>	On C16 and C18 verified CV- 1233 and CV-1234 open.			

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	<ul> <li>7. Verify both HPI RECIRC valves CV-1300 and 1301 open or fully open CV-1235.</li> <li><u>POSITIVE CUE</u>: CV-1300 and CV-1301 red lights ON, green lights OFF.</li> </ul>	On C16 and C18, verified CV- 1300 and CV-1301 are open (also acceptable if fully opened CV-1235 instead).			
EX	<ul> <li>AMINER CUE:</li> <li>Inform Examinee to use the OP HPI Pump for restart.</li> </ul>				
	<ul> <li>8. Verify P-36B Bus Select MOD Control and P-64B Transfer Switch selected to energized bus (NOTE: this step may be N/A if P-36B is not the OP HPI Pump).</li> <li><u>POSITIVE CUE</u>:</li> <li>P-36B Bus Select MOD Control and P-64B Transfer Switch selected to energized bus.</li> </ul>	Verified P-36B Bus Select MOD Control and P-64B Transfer Switch on C18 selected to energized bus.			
с	9. Start AUX Lube Oil Pump for OP HPI pump (P-64A, B or C). <u>POSITIVE CUE</u> : Red light ON. <u>NEGATIVE CUE</u> : Green light ON.	Started AUX Lube Oil Pump for the OP HPI Pump (P64A, B or C) using handswitch on C16 or C18. Observed red light ON above handswitch.			
с	10. Start OP HPI Pump (P36A, B or C). <u>POSITIVE CUE:</u> Red light ON. <u>NEGATIVE CUE</u> : Green light ON.	Started OP HPI Pump (P36A, B, or C) using handswitch on C16 or C18. Observed red light ON above handswitch			
	<ul> <li>11. Stop AUX Lube Oil Pump for the OP HPI Pump just started (P-64A, B or C).</li> <li><u>POSITIVE CUE:</u> Green light ON.</li> </ul>	Stopped AUX Lube Oil Pump for the OP HPI Pump (P-64A, B or C) using handswitch on C16 or C18. Observed green light ON above handswitch.			
с	12. Place CV-1206 in OVRD. <u>POSITIVE CUE</u> : OVRD light ON.	Placed CV-1206 in OVRD using the NORMAL/OVRD pushbutton on C04. Observed OVRD light ON.			
с	13. Open CV-1206. <u>POSITIVE CUE</u> : Red light ON.	Opened CV-1206 using handswitch located on C04. Observed red light ON above handswitch.			

2

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EX	AMINER CUE:     If this JPM is being simulated, inform Examinee that F	RCP Seal Bleedoff temps are < 180°	F.		
С	<ul> <li>14. Open CV-1207 slowly to achieve 30-40 gpm RCP Seal Total INJ Flow.</li> <li><u>POSITIVE CUE:</u> CV-1207 indicates open, FLOW light ON.</li> <li><u>NEGATIVE CUE:</u> Flow light OFF.</li> <li><u>NOTE</u>: FLOW light should come ON above CV-1206 OVRD light when seal injection flow is ~22 gpm.</li> </ul>	Slowly opened CV-1207 using manual toggle switch on C04. Established ~30-40 gpm seal injection flow. Observed FLOW light ON.			
	15. Place CV-1207 in AUTO. <u>POSITIVE CUE</u> : Red light ON.	Placed CV-1207 in automatic position by depressing the red AUTO pushbutton on C04. Observed red light ON at CV- 1207 controller.			
С	16. Adjust Pressurizer Level Control Setpoint to 100". <u>POSITIVE CUE</u> : CV-1235 setpoint is 100".	Set CV-1235 (Pressurizer Level Control valve) setpoint to ~100" using the setpoint dial on C04.			
с	17. Place CV-1235 (Pressurizer Level Control valve) controller in AUTO position. <u>POSITIVE CUE:</u> Red AUTO light ON.	Placed CV-1235 in automatic position by depressing the red AUTO pushbutton on C04. Observed red light ON at valve controller.			

END

JPM ID: A1JPM-RO-MUP01

# INITIAL CONDITIONS:

- The reactor has just tripped.
- Immediate actions are complete

# INITIATING CUE:

The CRS/SM directs you to perform the required actions of 1202.001 Reactor Trip procedure starting at step 9.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE							
TITLE: REACTOR TE	RIP		DOCUMENT NO. 1202.00	. CHAN	GE NO. 031		
			WORK PLAN EX	P. DATE			
SET #			SAFETY-RELATI	ED IPTE NO □YE LEVE O	ES INO L OF USE DINTINUOUS FFERENCE		
	PROGRAMMATI	C EXCLUSION PE O	FORMATIONAL ER EN-LI-100				
When you see the	ese <u>TRAP</u>	S	Get these 7	TOOLS			
	Time Pressu	ire	Effe	ective Commur	nication		
Distraction/Interruption			Que	estioning Attitu	ıde		
	Multiple Tasks			cekeeping			
	Over Confidence			Self Check			
Vague or Interpretive Guidance			Peer Check				
	First Shift/Last Shift			Knowledge			
	Peer Pressure			Procedures Job Briefing			
	Physical En	vironment	Coaching				
	Mental Stres	ss (Home or Work)	Turnover				
VERIFIED BY	/	DATE		TIME			
		••••••					
FORM TITLE:	RIFICATION	COVER SHEET		FORM NO. 1000.006A	CHANGE NO. 054		

1202.001	REACTOR TRIP	CHANGE 031 PAGE 8 of 25				
	INSTRUCTIONS	CONTINGENCY ACTIONS				
8. (Continue	ed)	<b>CAUTION</b> The following step will result in load shed of non-vital 4160V buses A1 and A2.				
		NOTESU2 is considered available if <u>all</u> the following conditions are met:• AUTO X-FMR energized from 500KV• AUTO X-FMR aligned to SU2• No Unit 2 buses aligned to SU2• SU2 V REG 3% reduction disabledb) IF SU2 only is available, THEN energize bus from SU2 (use SYNC switch).(1) IF non-vital 4160V bus feeder breaker fails to close, THEN attempt to reset breaker anti-pump feature by taking handswitch to PULL-TO-LOCK AND releasing.				
9. Check Makeu	OP HPI pump supplying normal p and Seal Injection.	<ul> <li>9. Perform the following:</li> <li>A. Isolate Letdown by closing either: Letdown Coolers Outlet (CV-1221) <u>OR</u> Letdown Cooler Outlets (CV-1214 and 1216).</li> <li>B. Restore normal Makeup and Seal Injection (RT-1).</li> </ul>				

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE         TITLE: REPETITIVE TASKS       DOCUMENT NO. 1202.012       CHANGE NO. 009         WORK PLAN EXP. DATE N/A       WORK PLAN EXP. DATE N/A       IPTE         SET #       SAFETY-RELATED       IPTE         SYES       NO       YES       NO         PROGRAMMATIC EXCLUSION PER EN-LI-100       INFORMATIONAL         PROGRAMMATIC EXCLUSION PER EN-LI-100       INFORMATIONAL         When you see these       TRAPS       Get these         Time Pressure       Effective Communication         Distraction/Interruption       Questioning Attitude
TITLE: REPETITIVE TASKS       DOCUMENT NO. 1202.012       CHANGE NO. 009         SET #       WORK PLAN EXP. DATE N/A       N/A         SET #       SAFETY-RELATED YES       IPTE NO         YES       NO       YES         PROGRAMMATIC EXCLUSION PER EN-LI-100       INFORMATIONAL         PROGRAMMATIC EXCLUSION PER EN-LI-100       INFORMATIONAL         OWHEN YOU see these       TRAPS         Time Pressure       Effective Communication         Distraction/Interruption       Questioning Attitude
11122.012       009         WORK PLAN EXP. DATE       N/A         SAFETY-RELATED       IPTE         ØYES       NO         TEMP MOD       LEVEL OF USE         YES       NO         PROGRAMMATIC EXCLUSION PER EN-LI-100         YES       NO         When you see these       TRAPS         Time Pressure       Effective Communication         Distraction/Interruption       Questioning Attitude
SET #       N/A         SET #       SAFETY-RELATED       IPTE         Syss       NO       YES       NO         TEMP MOD       LEVEL OF USE       SCONTINUOUS         YES       NO       REFERENCE         INFORMATIONAL       PROGRAMMATIC EXCLUSION PER EN-LI-100         YES       SNO         When you see these       TRAPS         Time Pressure       Get these         Distraction/Interruption       Questioning Attitude
SET #       SAFETY-RELATED       IFTE         Set #       SAFETY-RELATED       IFTE         Set #       Set #       Set #         Set #       Set #       Set #         Set #       Set #       IFTE         Set #       Set #       IFTE         Set #       Set #       If Temp Mode         If Temp Mode       Level of Use         If Yes       Set #         Set #       Set #         Programmatic exclusion per en-Li-100       Informational         Programmatic exclusion per en-Li-100       Information         If Yes       Set these       Topology         When you see these       Transformation       Get these         Time Pressure       Effective Communication         Distraction/Interruption       Questioning Attitude
TEMP MOD       LEVEL OF USE         YES       ONO         PROGRAMMATIC EXCLUSION PER EN-LI-100         YES       ONO         When you see these       TRAPS         Time Pressure       Effective Communication         Distraction/Interruption       Questioning Attitude
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Multiple Tasks Placekeeping
Over Confidence Self Check
Vague or Interpretive Guidance Peer Check
First Shift/Last Shift Knowledge
Peer Pressure Procedures
Change/Off Normal Job Briefing
Physical Environment Coaching
Mental Stress (Home or Work) Turnover
VERIFIED BY DATE TIME
FORM TITLE:FORM NO.CHANGE NO.VERIFICATION COVER SHEET1000.006A054

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# RESTORE NORMAL MAKEUP AND SEAL INJECTION

- 1. Place RC Pump Seals Total INJ Flow (CV-1207) in HAND <u>AND</u> close.
- 2. Place Pressurizer Level Control (CV-1235) in HAND AND close.
- 3. Verify RCP Seal INJ Block (CV-1206) closed.
- 4. Verify RCS Makeup Blocks open:
  - CV-1233
  - CV-1234
- 5. Verify <u>one</u> of the following:
  - Both HPI Recirc Blocks open:
    - CV-1300
    - CV-1301
  - Pressurizer Level Control (CV-1235) fully open.
- 6. <u>IF HPI Pump (P36B) will be used,</u> <u>THEN verify the following selected to energized bus:</u>
  - P36B Bus Select MOD Control
  - P64B Transfer Switch
- 7. Start AUX Lube Oil pump for OP or STBY HPI pump.
- 8. Start OP or STBY HPI pump.
- 9. Stop AUX Lube Oil pump.
- 10. Place RCP Seal INJ Block (CV-1206) in OVRD AND open.
- IF RCP Seal Bleedoff temps are ≤ 180°F, <u>THEN</u> slowly open RC Pump Seals Total INJ Flow (CV-1207) until RCP Seals Total INJ Flow is 30 to 40 gpm.
  - A. Place RC Pump Seals Total INJ Flow (CV-1207) in AUTO.

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# RESTORE NORMAL MAKEUP AND SEAL INJECTION

- 12. IF RCP Seal Bleedoff temps are >180°F, <u>THEN</u> slowly open RC Pump Seals Total INJ Flow (CV-1207) until RCP Seals Total INJ Flow is 8 to 12 gpm.
  - A. Record current time \_\_\_\_\_.
  - B. Maintain 8 to 12 gpm total flow  $\geq$  30 minutes.
  - C. After 30 minutes, slowly open RC Pump Seals Total INJ Flow (CV-1207) until 30 to 40 gpm total flow is reached.
    - 1) Place RC Pump Seals Total INJ Flow (CV-1207) in AUTO.
- 13. <u>WHEN</u> RCP Seals Total INJ Flow light is on (above ~ 22 gpm), <u>THEN</u> return RCP Seal INJ Block (CV-1206) OVRD pushbutton to normal (OVRD light off).
- 14. Adjust Pressurizer Level Control Setpoint to 100".
  - A. <u>IF</u> HPI Recirc Blocks (CV-1300 and CV-1301) are open, <u>THEN</u> place Pressurizer Level Control (CV-1235) in AUTO.



1202.01	12
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JOB PERFORMANCE MEASURE

Unit:1	Rev #	6	Date:
JPM ID:	A1JPM-RO-EOP15		
System/Duty Area:	Abnormal and Emergency O	perations	
Task: Perform Reactor	Trip Immediate Actions with	a Loss of D01	
JTA# ANO1-RO-AOP-	OFFNORM-326		
KA Value RO	SRO 3.5 KA Reference	e: 058 AA1.01	
Approved For Administra	tion To: RO X	SRO	Χ
Task Location: Inside C	CR X Outside	e CR	Both
Suggested Testing Enviro	onment and Method (Perform	or Simulate ):	
Plant Site:	Simulator:	Perform	Lab:
Position Evaluated: RO:		SRO:	
Actual Testing Environme	ent: Plant Site	Simulator	Lab
Testing Method: Perform	n	Simulate	
Approximate Completion	Time in Minutes:	3	Minutes
Reference(s): 12	202.001 Reactor Trip and 120	03.036 Loss of 125V [	DC Section 1 – Loss of D01
Examinee's Name			KON
			KCN:
Evaluator's Name:			KCN:
Evaluator's Name: The Examinee's perform	ance was evaluated against	the standards contain	ed in this JPM and is determined to be:
Evaluator's Name: The Examinee's perform Satisfactory:	ance was evaluated against	the standards contain Unsatisfactory:	ed in this JPM and is determined to be:
Examinee's Name: Evaluator's Name: The Examinee's perform Satisfactory: Performance Checklist C	ance was evaluated against	the standards contain	ed in this JPM and is determined to be:
Examinee's Name: Evaluator's Name: The Examinee's perform Satisfactory: Performance Checklist C	ance was evaluated against	the standards contain Unsatisfactory:	ed in this JPM and is determined to be:
Examinee's Name: Evaluator's Name: The Examinee's perform Satisfactory: Performance Checklist C	ance was evaluated against	the standards contain Unsatisfactory:	KCN:
Examinee's Name: Evaluator's Name: The Examinee's perform Satisfactory: Performance Checklist C  Start Time	ance was evaluated against	the standards contain Unsatisfactory:	kCN:

\*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

### JPM INITIAL TASK CONDITIONS:

The reactor has just tripped from 100% power and you are the only control board operator present.

# TASK STANDARD:

Loss of DO1 recognized and D11 power swapped to emergency source. **This is a faulted JPM.** Alternate Success Path used due to loss of DO1.

### TASK PERFORMANCE AIDS:

1202.001 Reactor Trip immediate actions and 1203.036 Loss of 125V DC Section 1 – Loss of D01.

# SUGGESTED SIMULATOR SETUP:

Have the simulator at power operations (>55% power) and then insert malfunction for a Loss of D01. Freeze the simulator as soon as the reactor trips. Go to run when the examinee is ready to take his first action.

INITIATING CUE: The CRS/SM directs you to perform immediate actions for a Reactor Trip.

С	C PERFORMANCE CHECKLIST STANDARD		N/A	SAT	UN SAT
	<ol> <li>Manually trip the reactor. Verify all rods inserted and reactor power dropping.</li> <li><u>POSITIVE CUE</u>: All rod bottom lights ON for groups 1-7, reactor power lowering.</li> </ol>	Depressed reactor trip pushbutton on panel C03 and verified rods inserted/power dropping.			
с	<ul> <li>2. Manually trip the Turbine. Verify Turbine throttle and governor valves closed.</li> <li><u>FAULTED CUE</u>: Governor and throttle valves are all open. Turbine trip solenoid power available light is off. Breaker position indications on left side of C10 are off.</li> </ul>	Depressed turbine trip pushbutton on C01 and identified that the turbine did not trip due to a loss of D01.			
INS <sup>-</sup> Trar refe tran	TRUCTOR NOTE: Insferring D11 to the emergency power supply is a follow-u renced for this step. When the examinee identifies the los sfer D11 to its emergency power supply.	p action of 1203.036. Therefore, 120 ss of D01 act in the role of CRS to dir	03.036 r ect the	nay be examine	e to
c	<ol> <li>Transfer D11 to its emergency power supply.</li> <li><u>POSITIVE CUE</u>: D11 is powered from D02.</li> </ol>	At C10, transferred 125 VDC panel D11 to its emergency supply by momentarily placing 125 VDC Panel D11 Power Supply Select switch to EMERG position. (Rotate Switch in the Clockwise direction)			
	<ul> <li>4. If SG pressure is &lt;900 psig, then actuate MSLI for affected SG(s) AND actuate EFW.</li> <li><u>POSITIVE CUE</u>: SG pressures at 1000 psig.</li> </ul>	If SG pressure dropped below 900 psig, actuated MSLI for affected SG(s) and EFW on the remote matrices on C09.			

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT	
NOT whic over	NOTE: Step 4 above is NOT a critical step because EFIC will automatically actuate MSLI/EFW at 600 psig SG pressure which will terminate the overcooling event. IF the examinee transfers D11 to D02 the turbine will trip and terminate the overcooling event in step 3 of this JPM.					
	5. Check adequate sub cooling margin.       On panel C04 or on ICCMDS display on panel C19, observed/verified that SCM is adequate (>30°F).					
Note: The examiner should cue the JPM is over after SCM is verified adequate.						

END

# **INITIAL CONDITIONS:**

The reactor has just tripped from 100% power and you are the only control board operator present.

**INITIATING CUE:** 

The CRS/SM directs you to perform immediate actions for a Reactor Trip.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE					
TITLE: LOSS OF 125	5V DC	DOCUMENT NO.	CHAN	GE NO.	
		WORK PLAN EXP. DATE	REAC	TIVITY IMPACT	
SET #					
			FERENCE		
		PROGRAMMATIC EXCLU	SION PE	R EN-LI-100	
When you see the	ese <u>TRAPS</u>	Get these <u>TOOL</u>	<u>S</u>		
	Time Pressure	Effective Co	ommun	ication	
	Distraction/Interruption	Questionin	g Attitu	de	
	Multiple Tasks	Placekeepi	ng		
	Overconfidence	Self Check			
	Vague or Interpretive Guidance	Peer Check			
	First Shift/Last Shift				
	Procedures				
	Job Briefin	g			
		Coaching			
	Mental Stress (Mome or Work)	Turnover			
VERIFIED BY	7 DATE	l	TIME		
				<u></u>	
FORM TITLE: FORM NO. CHANGE NO. VERIFICATION COVER SHEET 1000.006A 055					

#### SECTION 1 -- LOSS OF DO1

#### 1.0 SYMPTOMS

1.1 Low DC voltage alarms: (alarms inoperable if generator output breakers open).

- D01 UNDERVOLTAGE (K01-A7)
- D11 LOSS OF VOLTAGE (K01-B7)
- RA1 LOSS OF VOLTAGE (K01-C7)
- D01 TROUBLE (K01-D7)
- H1 DC CONTROL POWER OFF (K02-B4)
- A1 DC CONTROL POWER OFF (K02-C6)
- A3 DC CONTROL POWER OFF (K02-D6)
- SU 1 L.O. RELAY DC FAILURE (K02-D1)
- SU 2 L.O. RELAY DC FAILURE (K02-E3)
- GENERATOR L.O. RELAY DC FAILURE (K04-D8)
- TURBINE L.O. RELAY DC FAILURE (K04-B5)
- EOS SYSTEM TROUBLE (K04-C5)
- 1.2 Loss of breaker position indicator lights for plant buses on left side of C10.
- 1.3 "Trip Solenoid Power Available" light on CO1 NOT lit.
- 2.0 IMMEDIATE ACTION

NONE

- 3.0 FOLLOW-UP ACTIONS
  - 3.1 At C10, transfer D11 to EMERG SUPPLY D02.
  - 3.2 IF reactor trips, THEN perform the following:
    - 3.2.1 IF SG pressure is <900 psig, THEN perform the following on BOTH SGs:
      - Actuate MSLI
      - Actuate EFW
    - 3.2.2 Perform RT-6.
    - 3.2.3 Perform Emergency Operating Procedures (1202.XXX) in conjunction with this procedure.

SECTION 1 -- LOSS OF D01 (continued)

- 3.3 Notify SM to implement Emergency Action Level Classification (1903.010).
- 3.4 <u>IF</u> transfer of D11 is **NOT** successful, THEN attempt local transfer of D11 to D02, while continuing.
- 3.5 <u>IF</u> reactor is <u>NOT</u> tripped, THEN GO TO step 7.0.
- 3.6 IF transfer of D11 is successful, THEN GO TO step 4.0.
- 3.7 IF transfer of Dll is **NOT** successful, THEN perform the following:
  - 3.7.1 Dispatch an operator to perform Attachment 1, while continuing.
  - 3.7.2 <u>IF</u> Generator Output bkrs (5114 and 5118) do <u>NOT</u> trip, THEN GO TO step 5.0.
  - 3.7.3 IF Generator Output bkrs (5114 and 5118) trip, THEN GO TO step 6.0.
- 4.0 <u>IF</u> transfer of D11 is successful, THEN perform the following:
  - 4.1 IF EFW actuates, THEN throttle P7B EFW Isolations as necessary to limit flow.

SG A				SG B
CV-2670	EFW	P7B	ISOL	CV-2626

4.1.1 Perform RT-5.

- 4.2 Verify Condenser Vacuum Pump (C-5A OR C-5B) running.
- 4.3 IF Spent Fuel Cooling is lost, <u>THEN</u> perform Unit 1 Spent Fuel Pool Emergencies (1203.050) in conjunction with this procedure. (INPO IER 11-2 Rec 4)
- 4.4 WHEN plant conditions stabilize, THEN GO TO step 7.0 for restoration.

#### SECTION 1 -- LOSS OF D01 (continued)

5.0 <u>IF</u> transfer of D11 is <u>NOT</u> successful <u>AND</u> Generator Output Breakers do <u>NOT</u> trip, <u>THEN</u> perform the following:

SU 1 is preferred.

•

5.1 At C10, transfer A2 and H2 to an available SU Xfmr as follows:

### NOTE

- SU 2 Load Shedding is inoperable during a loss of D01.
  - 5.1.1 IF SU 1 is available, THEN GO TO step 5.1.3.
  - 5.1.2 IF ONLY SU 2 is available, THEN perform the following:
    - Notify operator performing Attachment 1 that breaker operations from Control Room are commencing.
    - At C19, trip VCH-1B Power Supply breaker (A-208)
    - At CO2, trip Condensate Pump P-2B.
    - At C12, trip Circ Water Pumps P-3B AND P-3D.
    - At C12, trip Heater Drain Pump P-8B.
    - Refer to SU 2 Transformer Loading Restrictions, Attachment E of Electrical System Operations (1107.001).
    - Notify Unit 2 of intent to use SU 2.

SECTION 1 -- LOSS OF DO1 (continued)

- 5.1.3 Turn ON SYNC switch for desired SU Xfmr feeder to A2, either:
  - Startup Xfmr #1 Feed to A2 (A-213) OR
  - Startup Xfmr #2 Feed to A2 (A-211).
- 5.1.4 Verify synchroscope at 12 o'clock.

#### CAUTION

- High circulating currents may trip bus lockout relay if both feeder breakers remain closed.
- SYNC switch must be off to verify feeder breaker opens. With SYNC switch on, red light for feeder breaker position goes out even if breaker does **not** trip.

5.1.5 Perform the following:

- A. Close desired SU Xfmr feeder to A2 <u>AND</u> allow control switch to return to NORMAL-AFTER-CLOSE position.
- B. Turn OFF SYNC switch.
- C. Verify Unit Aux Xfmr Feed to A2 (A-212) trips.
  - 1. IF A-212 does  $\underline{NOT}$  immediately open, THEN trip it.
- 5.1.6 Turn ON SYNC switch for desired SU Xfmr feeder to H2, either:
  - Startup Xfmr #1 Feed to H2 (H-25)
  - Startup Xfmr #2 Feed to H2 (H-23).
- 5.1.7 Verify synchroscope at 12 o'clock.

#### SECTION 1 -- LOSS OF DO1 (continued)

## CAUTION

- High circulating currents may trip bus lockout relay if both feeder breakers remain closed.
- SYNC switch must be off to verify feeder breaker opens. With SYNC switch on, red light for feeder breaker position goes out even if breaker does <u>NOT</u> trip.

5.1.8 Perform the following:

- A. Close desired SU Xfmr feeder to H2 <u>AND</u> allow control switch to return to NORMAL-AFTER-CLOSE position.
- B. Turn OFF SYNC switch.
- C. Verify Unit Aux Xfmr Feed to H2 (H-24) trips.
  - 1. IF H-24 does  $\underline{NOT}$  immediately open, THEN trip it.
- 5.2 Manually transfer A1 to available SU Xfmr as follows.

#### CAUTION

Operation with the turbine tripped and generator motoring for extended period will result in turbine blade overheating.

- 5.2.1 Turn ON SYNC switch for desired SU Xfmr feeder to A1, either:
  - Startup Xfmr #1 Feed to A1 (A-113) OR
  - Startup Xfmr #2 Feed to A1 (A-111).
- 5.2.2 Verify RUNNING voltage and INCOMING voltage match.
- 5.2.3 Verify synchroscope at 12 o'clock position.

LOSS OF 125V DC

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CHANGE: 010

# SECTION 1 -- LOSS OF D01 (continued)

#### WARNING

Paralleling 4160V and 6900V power sources out of sync could cause personnel injury and severe equipment damage.

#### CAUTION

High circulating currents exist if both feeder breakers remain closed.

- 5.2.4 Coordinate with operator performing Attachment 1 to transfer A1 to desired SU Xfmr.
- 5.2.5 <u>WHEN</u> A1 is energized from SU Xfmr, THEN turn OFF SYNC switch for SU Xfmr feeder to A1.
- 5.3 Start available oil pumps for RCPs P-32A and P-32C.

### NOTE

Although position indication for 5114 and 5118 on CO1 is unavailable, CO1 handswitches will operate the breakers. C10 mimic bus should be used to verify breakers open.

- 5.4 At CO1, trip generator output breakers 5114 and 5118.
  - 5.4.1 Notify operator performing Attachment 1 that output breakers are open.
- 5.5 IF Spent Fuel Cooling is lost, <u>THEN</u> perform Unit 1 Spent Fuel Pool Emergencies (1203.050) in conjunction with this procedure. (INPO IER 11-2 Rec 4)
- 5.6 WHEN plant conditions stabilize, THEN GO TO step 7.0 for restoration.

PROC./WORK PLAN NO.	PROCEDURE/WORK PLAN TITLE:		8 of 44
1203.036	LOSS OF 125V DC	CHANGE:	010

#### SECTION 1 -- LOSS OF D01 (continued)

- 6.0 IF transfer of D11 is **NOT** successful AND Generator Output Breakers Trip, THEN perform the following:
  - 6.1 Check that DG-2 starts and energizes A4.
  - 6.2 Trip running RCPs.

## NOTE

Due to loss of inverters supplying RS1 and RS3, two ESAS Analog Channels trip and cause all even Digital Channels to trip. Odd Channels cannot trip, due to loss of power.

- 6.3 Override inadvertent ES actuation as follows:
  - 6.3.1 Check RCS press >1590 psig and RB press <4 psig (18.7 psia) to verify ES actuation is inadvertent.
  - 6.3.2 Override each actuated component using MAN pushbutton.
    - A. Stop RB Spray pump (P35B).
    - B. Stop LPI pump (P34B).
    - C. Place overridden components in desired position.
- 6.4 Place all RCP Seal Bleed off (Alternate Path to Quench Tank) handswitches in CLOSE (SV-1270, 1271, 1272, & 1273).
- 6.5 At C10, verify MCC B55 & 56 powered from B6.
- 6.6 Control RCS makeup as follows:
  - 6.6.1 IF P-36C OR P-36B from A4 was the OP HPI pump, THEN perform the following:
    - A. Override AND open RCS Makeup Block (CV-1234).
    - B. Slowly open PZR Level Control (CV-1235).
      - 1. Adjust setpoint to 100" AND place in AUTO.
  - 6.6.2 IF P-36C is ES HPI pump, <u>THEN</u> override <u>AND</u> operate HPI valves (CV-1228, 1227, 1284, & 1285) as necessary to maintain PZR level.

SECTION 1 -- LOSS OF DO1 (continued)

- 6.7 Verify a Service Water Pump (P-4B <u>OR</u> P-4C) restarts on A4.
- 6.8 Verify EFW P-7A operating with SG levels rising to Natural Circulation setpoint (312").
  - NOTE
- SU 2 Load Shedding is inoperable during a loss of D01.

• SU 1 is preferred.

- 6.9 At C10, transfer A2 and H2 to an available SU Xfmr as follows:
  - 6.9.1 IF SU 1 is available, THEN GO TO step 6.9.3.
  - 6.9.2 IF **ONLY** SU 2 is available, THEN perform the following:
    - Notify operator performing Attachment 1 that breaker operations from Control Room are commencing.
    - At C19, trip VCH-1B Power Supply breaker (A-208)
    - At CO2, trip Condensate Pump P-2B.
    - At C12, trip Circ Water Pumps P-3B AND P-3D.
    - At C12, trip Heater Drain Pump P-8B.
    - Refer to SU 2 Transformer Loading Restrictions, Attachment E of Electrical System Operations (1107.001).
    - Notify Unit 2 of intent to use SU 2 Xfmr.

6.9.3

SECTION 1 -- LOSS OF DO1 (continued)

Turn ON SYNC switch for desired SU Xfmr feeder to A2,

	either:
	<ul> <li>Startup Xfmr #1 Feed to A2 (A-213) OR</li> </ul>
	• Startup Xfmr #2 Feed to A2 (A-211)
6.9.4	Verify tripped Unit Aux Xfmr Feed to A2 (A-212).
6.9.5	Close desired SU Xfmr feeder to A2, either:
	• Startup Xfmr #1 Feed to A2 (A-213) OR
	• Startup Xfmr #2 Feed to A2 (A-211)
6.9.6	Turn OFF SYNC switch.
6.9.7	Restart ICW Pumps (P-33B on non-nuclear loop, P-33C on nuclear loop).
6.9.8	Verify Condenser Vacuum Pump (C-5A <u>OR</u> C-5B) running.
6.9.9	Turn ON SYNC switch for desired SU Xfmr feeder to H2, either:
	<ul> <li>Startup Xfmr #1 Feed to H2 (H-25) OR</li> </ul>
	• Startup Xfmr #2 Feed to H2 (H-23)
6.9.10	Verify tripped Unit Aux Xfmr Feed to H2 (H-24).
6.9.11	Close desired SU Xfmr feeder to H2.
6.9.12	Turn OFF SYNC switch.
6.9.13	WHEN RCP services are available, THEN refer to Reactor Coolant Pump and Motor Emergency (1203.031), "Simultaneous Loss of Seal Injection and Seal Cooling Flow" section to start RCPs (P-32B and P-32D).

# NOTE

Restoration of alternate source power to inverters supplying RS1 and RS3 will energize the odd ESAS digital channels, causing an inadvertent actuation of ES unless disabled.

- 6.10 Check RCS press >1590 psig and RB press <4 psig (18.7 psia) to verify ES actuation is **NOT** needed.
  - 6.10.1 <u>IF</u> ES is <u>NOT</u> needed, <u>THEN</u> disable odd ESAS digital channels by opening breaker for ESAS Digital Subsystem No. 1 (RS1-4).

SECTION 1 -- LOSS OF D01 (continued)

6.11	WHEN loads have been stripped from A1 and A3, THEN direct operator to manually close desired SU Xfmr feeder to A1, either:
	• Startup Xfmr #1 Feed to A1 (A-113) OR
	• Startup Xfmr #2 Feed to A1 (A-111).
6.12	Reset tripped ES Analog Subsystem Trip Bistables:
	• Analog CH 1 (C88)
	• Analog CH 2 (C89)
	• Analog CH 3 (C90)
6.13	Restore power to ES Digital Subsystem No. 1 by closing breaker RS1-4.
6.14	Reset tripped ES Digital Subsystems using reset PB(s) on CO4.
6.15	Direct operator to manually start a SW pump on A3:
	• Service Water Pump (P-4A) (A-302) OR
	• Service Water Pump (P-4B) (A-303)
6.16	IF P-36C is ES HPI pump, THEN restore RCP seal injection and PZR level control by aligning P-36C as the OP HPI pump per Makeup Purification System Operation (1104.002).
6.17	IF Spent Fuel Cooling is lost, THEN perform Unit 1 Spent Fuel Pool Emergencies (1203.050) in conjunction with this procedure. (INPO IER 11-2 Rec 4)
6.18	WHEN plant conditions stabilize, THEN GO TO step 7.0 for restoration.
Restorat	tion
7.1	Determine cause for loss of D01 and initiate corrective action.
7.2	Refer to Battery and 125V DC Distribution (1107.004) to determine equipment that has lost power.

7.3 Refer to Emergency Feedwater Initiation and Control (1105.005), "Operability" section for determining operability of EFW system.

7.0

#### SECTION 1 -- LOSS OF D01 (continued)

#### CAUTION

D11 power supply transfer results in a momentary loss of power to the distribution panel.

• IF operating, DG1 will trip.

• IF operating, condenser vacuum pump C-5A will trip.

- 7.4 WHEN power is restored to D01, THEN transfer D11 to NORMAL SUPPLY.
- 7.5 WHEN power is restored to D01, <u>THEN</u> return the following inverters to normal operation per Inverter and 120V Vital AC Distribution (1107.003).
  - Place Inverter Y11 OR Y15 in service supplying RS1
  - Place Inverter Y13 OR Y15 in service supplying RS3
- 7.6 Verify EOS Channel A (SY-6650) reset.
  - 7.6.1 Verify EOS SYSTEM TROUBLE (K04-C5) clear.

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JOB PERFORMANCE MEASURE

Unit: <u> </u>	¥1_		Date:			
TUOI NUMBER:A1JPM-RO-H	D04					
System/Duty Area:						
Task: Place Hydrogen Recombine	r M55B in Operation					
JA# _ANO1-RO-RBH2-NORM-1						
KA Value RO _4.0 SRO _4.	KA Reference 028	A4.01				
Approved For Administration To: R	) SF	xo 🔟				
Task Location: Inside CR:	Outside CR:		Both:			
Suggested Testing Environment An	Method (Perform Or Simu	ulate #):				
Plant Site: Simulator	#: Perform		Lab:			
Position Evaluated: RO:		SRO				
Actual Testing Environment: Simula	or #: Pla	int Site:	Lab			
Testing Method: Simulate:		Perform				
Approximate Completion Time In Mi	nutes:		15 Minutes			
Reference(s):1104.031, Chg. 024						
Examinee's Name:			KCN:			
Euclustede Nemer						
Evaluator's Name:	valuated against the stand	arda contain	ad in this IDM and is	determined to be:		
The Examinee's performance was e	Valuated against the stand	arus contain		determined to be.		
		ctory		<u></u>		
Performance Checklist Comments:						
			<u></u>			
Start Time	Stop Time		Total Time			
*Signed		Date:		idual (not the average a		
and is current with that revision.	en compared to its application	able procedi	are by a qualified indiv	noual (not the examinee		

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

# JPM INITIAL TASK CONDITIONS:

A LOCA has occurred. Containment hydrogen concentration is 2.1%. Both hydrogen recombiners are shutdown. Containment

pressure is 20.0 psia. Pre-LOCA containment temperature was 92°F.

# TASK STANDARD:

Hydrogen recombiner M55B in operation at power setting of 53.0 KW to 55.0 KW on JI-1001.\_

# TASK PERFORMANCE AIDS:

1104.031, section 8.0 and Att. B

# TUOI NUMBER: A1JPM-RO-HYD04

INITIATING CUE: The CRS/SM directs you to place both hydrogen recombiners (M55A/B) in standby and then place M55B in operation.

NOTE: Your task is complete when the power you have determined for recombiner operation is achieved.

# CRITICAL ELEMENTS (c): 2, 7, 8

с	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT	
	<ol> <li>Verify power adjust potentiometers are set at zero.</li> <li><u>POSITIVE CUE</u>: Power adjust potentiometers for M55A/B are set at zero on C26.</li> </ol>	Verified power adjust potentiometers set to zero on C26 (if not already at zero used knurled knob on power adjust potentiometers on C26 and turned to the left and set at zero using HS-7472 and HS-7473).				
с	<ol> <li>Turn hydrogen recombiners M55A and M55B on.</li> <li><u>POSITIVE CUE</u>: M55A/B red lights ON.</li> <li><u>NEGATIVE CUE:</u> M55A/B green lights ON.</li> </ol>	Turned on hydrogen recombiners M55A and M55B using HS-7470 and HS-7471 on C26.				
	<ol> <li>Select thermocouple #1, 2 or 3 to input to recombiner temperature indicators TI-2300 and TI- 2301.</li> <li><u>POSITIVE CUE</u>: Thermocouple #1, 2 or 3 selected as desired to input to TI-2300 and TI-2301.</li> </ol>	Thermocouple #1, 2 or 3 selected to input to TI-2300 and TI-2301 using handswitches HS- 7474 and HS-7475 on C26.				
	<ol> <li>Increase power to ~5 KW.</li> <li><u>POSITIVE CUE</u>: Power on JI-1000 and JI-1001 indicates 5KW.</li> </ol>	Slowly adjusted potentiometers clockwise until power on JI-1000 and JI-1001 on C26 indicated ~5 KW.				
INS	INSTRUCTOR NOTE:  Inform examinee that ten minutes have elapsed after one minute at 10 KW.					
	<ol> <li>Slowly increase power to 10 KW and record initial time.</li> <li><u>POSITIVE CUE</u>: Power is at 10 KW on JI-1000 and JI-1001.</li> </ol>	Increased power to ~10 KW using power adjust potentiometers on C26. Recorded time 10 KW was achieved.				
INS	<ul> <li>TRUCTOR NOTE:</li> <li>Inform examinee that taking data every 30 minutes on</li> </ul>	Attachment E will be simulated.	<b>L</b> enner, and a second s			
	<ul> <li>7. Slowly increase power to 20 KW on M55B and hold for 5 minutes.</li> <li><u>POSITIVE CUE</u>: Power at 20 KW on JI-1001.</li> </ul>	Increased power on M55B to ~20 KW using power adjust potentiometer on C26.				
INS	INSTRUCTOR NOTE:					

Inform examinee that five minutes have elapsed after one minute at 20 KW.

# TUOI NUMBER: \_A1JPM-RO-HYD04

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
с	<ol> <li>Determine power required from Attachment B based on containment pressure (20.0 psia and 92°F Pre-LOCA containment temperature).</li> </ol>	Determined Recombiner power to be from <b>53.0 to 55.0</b> KW using Attachment B of 1104.031.			
с	<ul> <li>9. Slowly increase power to 53.0-55.0 KW range.</li> <li><u>POSITIVE CUE</u>: Hydrogen concentration dropping on QI-7459 and M55B maintaining power at determined value.</li> <li><u>NEGATIVE CUE</u>: Hydrogen concentration rising or steady on QI-7459.</li> </ul>	Power increased to 53.0 to 55.0 KW range using power adjust potentiometer on C26.			

END

TUOI NUMBER: \_\_\_\_\_\_A1JPM-RO-HYD04\_\_\_\_

# **INITIAL CONDITIONS:**

- A LOCA has occurred.
- Containment hydrogen concentration is 2.1%.
- Both hydrogen recombiners are shutdown.
- Containment pressure is 20.0 psia.
- Pre-LOCA containment temperature was 92°F.

# **INITIATING CUE:**

The CRS/SM directs you to place both hydrogen recombiners (M55A/B) in standby and then place M55B in operation. Note: Your task is complete when the power you have determined for recombiner operation is achieved.

Page 1 of 5

JOB PERFORMANCE MEASURE

Unit:1 Rev #	3	Date:				
JPM ID:A1JPM-RO-PZR0	5					
System/Duty Area: PRESSURI	ZER					
Task: Respond to Low RCS Pressure d	ue to Stuck Open Spray \	/alve				
JTA# ANO1-RO-AOP-OFFMORM-115						
KA Value RO <u>3.6</u> SRO <u>3.5</u> H	KA Reference: 010 A3.0	2				
Approved For Administration To: RO	X SRO	X				
Task Location: Inside CR X	Outside CR	Both				
Suggested Testing Environment and Mether	nod (Perform or Simulate	):				
Plant Site: Simulator:	Perform	Lab:				
Position Evaluated: RO:		SRO:				
Actual Testing Environment: Plant Site	Simula	ator Lab				
Testing Method: Perform		Simulate				
Approximate Completion Time in Minutes		15 Minutes				
Reference(s): _1203.012H Annunciator I	K09 corrective Action K09	9-C1; 1203.015 Pressurizer systems Failure				
Examinee's Name:		KCN:				
The Examinee's performance was evalua	ted against the standards	contained in this JPM and is determined to be				
Satisfactory:	Setiefectory					
Performance Checklist Comments:						
Start Time	Stop Time	Total Time				
*Signed	Da	te				

\*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.
## JPM ID: A1JPM-RO-PZR05

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

# JPM INITIAL TASK CONDITIONS:

The Reactor is at ~38% power with 3 RCP's running, "D" RCP is secured.

SUGGESTED SIMULATOR SETUP: Have the Spray valve stuck open CV-1008 and have the spray valve isolation valve CV-1009 failed open. Spray valve should be open slightly and have RCS pressure going down slowly with all PZR heaters on. RCS pressure Hi/Lo alarm, K09-C1 should come in shortly after placing the simulator in "RUN".

# SETUP NOTE: REMOVE ANY CAUTION CARDS THAT MAY EXIST ON RCP OIL PUMP HANDSWITCHES PRIOR TO STARTING JPM.

Simulator should remain in "FREEZE" until candidate is ready. Then start simulator

### THIS IS AN ALTERNATE PATH JPM

TASK STANDARD:

Trip Reactor and Stop "C" RCP to stop RCS pressure decrease. Tripping the reactor must be performed prior to reaching the RPS low pressure set point. Stopping "C" RCP should be done prior to reaching ESAS trip set point of 1590 psig.

### TASK PERFORMANCE AIDS:

Copy of 1203.015 section 6 Pressurizer Spray Valve (CV-1008) and 1203.012H Annunciator K09 corrective action for K09-C1 window RCS Pressure Hi/Lo

JPM ID: \_\_\_\_\_A1JPM-RO-PZR05

INITIATING CUE: The CRS/SM directs you to respond to new Annunciator alarms.

CRITICAL ELEMENTS (c): 9, 14

c	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EX	<ul> <li>AMINER NOTE:</li> <li>This JPM requires the examinee to use more than on JPM.</li> <li>Annunciator K09-C1 will alarm shortly after placing the When asked, provide applicant the ACA procedure O</li> </ul>	e procedure. Provide the procedures e simulator in "RUN". NLY.	as they	are cue	ld in the
	<ol> <li>Confirm alarm by comparing RC pressure indications on C04.</li> <li><u>POSITIVE CUE:</u> All RCS pressure indicators are going down.</li> </ol>	Identified that all RCS pressure indicators are going down.			
	2. Refer to COLR figures for RC Pressure Limits.	COLR limits may not be referenced during Press Transient			
	POSITIVE CUE: RC Pressure Limits Checked.	Or COLR RC Press. Limits reviewed.			
	<ol> <li>Verify all Pressurizer heaters are on.</li> <li><u>POSITIVE CUE</u>:</li> <li>All pressurizer heaters are on.</li> </ol>	Identifies all Pressurizer heaters are on.			
	4. Verify Pressurizer Spray (CV 1008) closed. <u>NEGATIVE CUE:</u> Pressurizer Spray (CV 1008) open.	Identified Pressurizer Spray (CV- 1008) open. Attempted to close Pressurizer Spray (CV-1008) and valve will not close			
	5. Verify ERV (PSV-1000) closed. <u>POSITIVE CUE:</u> ERV (PSV-1000) closed.	Verified ERV (PSV-1000) closed.			
EXA	<ul> <li>WINER CUE:</li> <li>When asked, provide applicant AOP procedure.</li> </ul>	A	<b>.</b>		<b></b>
	<ol> <li>Refers to Pressurizer Systems failure 1203.015.</li> <li><u>POSITIVE CUE</u>: Hand student Pressurizer Systems failure 1203.015.</li> </ol>	Refers to Pressurizer Systems Failure 1203.015 Section 6 Pressurizer Spray valve (CV- 1008) Failure.			
	7. Close Pressurizer Spray Isolation valve CV-1009. <u>Negative CUE:</u> Pressurizer Spray Isolation valve CV-1009 open.	Attempted to close Pressurizer Spray isolation valve (CV 1009) and valve will not close.			
	8. Verify all Pressurizer heaters are on. POSITIVE CUE: All pressurizer heaters are on.	Verified all Pressurizer heaters on.		****	

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
с	9. Trip Reactor. <u>POSITIVE CUE</u> : Reactor tripped.	Student Trips Reactor verifies all rods are inserted and Reactor power is going down. This must be done prior to reaching an automatic RPS set point of low RCS pressure 1800 psig.			
	10. Verify Turbine is tripped. <u>POSITIVE CUE</u> : Turbine is tripped.	Verified all throttle and governor valves are shut.			
	11. Verify Sub Cooling Margin is adequate. <u>POSITIVE CUE:</u> SCM is adequate.	Verified SCM is >30 degrees F.			
	<ul> <li>12. Start "C" RCP HP Oil Lift pump (P63C).</li> <li><u>POSITIVE CUE:</u> RCP HP Oil Lift pump (P63C) starts and due to caution tag start P-80</li> </ul>	Starts "C" RCP HP Oil Lift pump P63C and due to caution tag start P-80			
	13. Start "C" RCP Backstop Lube Oil pump (P81C) <u>POSITIVE CUE</u> : RCP Backstop Lube Oil pump (P81C) starts.	Starts "C" RCP Backstop Lube Oil pump (P81C)			
с	14. Stop "C" RCP (P-32C). <u>POSITIVE CUE</u> : "C" RCP (P-32C) stops.	Stopped "C" RCP (P-32C) prior to RCS pressure drops below 1590 psig ESAS set point.			
EXA	<ul> <li>MINER NOTE :</li> <li>Tell student JPM is complete.</li> </ul>			:	

END

JPM ID: A1JPM-RO-PZR05

# **INITIAL CONDITIONS:**

The Reactor is at 38% power with 3 RCP's running, "D" RCP is secured.

**INITIATING CUE:** 

The CRS/SM directs you to respond to new Annunciator alarms.

			-			
ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE						
TITLE: CONTAINMENT HYDROGEN CONTROL	DOCUMENT NO. 1104.031	CHANGE NO. 024				
	WORK PLAN EXP. DATE N/A					
SET #	SAFETY-RELATED		0			
			NAL			
	PROGRAMMATIC EXCLU	JSION PER EN-LI-10	0			
When you see these <u>TRAPS</u>	Get these <u>TOOL</u>	<u>.S</u>				
Time Pressure	Effective C	ommunication				
Distraction/Interruption	Questionin	g Attitude				
Multiple Tasks	Placekeepi	ng				
Over Confidence	Self Check					
Vague or Interpretive Guidance	Peer Check					
Peer Pressure	Riconduras					
Change/Off Normal	Ich Briefing					
Physical Environment	Coaching					
Mental Stress (Home or Work)	Turnover					
VERIFIED BY DATE		TIME				
	FORM N 1000.0	0. CHANGE N 06A 054	<b>0</b> .			

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# CONTAINMENT HYDROGEN CONTROL

PAGE: 9 of 69 CHANGE: 024

#### CAUTION

Hydrogen recombiner, M55A or M55B, should be placed in operation following a LOCA as soon as time permits and must be in operation before hydrogen concentration reaches 3.0% as indicated on the highest reading H<sub>2</sub> analyzer.

8.0 Placing Hydrogen Recombiner (M55A or M55B) in Operation

# NOTE

- Both M55A and M55B are placed in standby, then either may be placed in operation.
- The term "slowly" used in this section means raising potentiometer settings slowly enough to witness KW rise without overshooting the target setting.
  - 8.1 Place both M55A and M55B in standby as follows.
    - 8.1.1 Place M55A in standby by performing the following:
      - A. Verify Power Adjust Potentiometer is set at zero for M55A.
      - B. Start M55A by placing HS-7470 in ON.
      - C. Select thermocouple #1, 2, or 3 (HS-7474) to input to M55A Temperature (TI-2300).
      - D. Slowly turn power adjust potentiometers clockwise to raise power to 5 KW as indicated on M55A Power (JI-1000).
      - E. Slowly raise power to 10 KW.
        - 1. Record initial time at 10 KW:
        - 2. Maintain 10 KW output for standby service.

PROC./WORK PLAN NO.	PROCEDURE/WORK PLAN TITLE:	PAGE	10 of 69
1104.031	CONTAINMENT HYDROGEN CONTROL		024
		OTANGE.	VL-1

- 8.1.2 Place M55B in standby by performing the following:
  - A. Verify Power Adjust Potentiometer is set at zero for M55B.
  - B. Start M55B by placing HS-7471 in ON.
  - C. Select thermocouple #1, 2, or 3 (HS-7475) to input to M55B Temperature (TI-2301).
  - D. Slowly turn power adjust potentiometers clockwise to raise power to 5 KW as indicated on M55B Power (JI-1001).
  - E. Slowly raise power to 10 KW.
    - 1. Record initial time at 10 KW:
    - 2. Maintain 10 KW output for standby service.

#### CAUTION

Hydrogen Recombiner, M55A or M55B, should be placed in operation following a LOCA as soon as time permits and must be in operation before hydrogen concentration reaches 3.0% as indicated on the highest reading H<sub>2</sub> analyzer.

- 8.2 Place recombiners in operation as follows:
  - 8.2.1 Place M55A in-service by performing the following:
    - A. During heatup, monitor and record all three thermocouple temperatures every 30 minutes on Attachment D.
    - B. Verify M55A has been at 10 KW for at least 10 minutes.
    - C. Slowly raise power to 20 KW AND hold for 5 minutes.
    - D. Determine power required from Recombiner Power (M-55A) Versus Containment Pressure, Attachment B of this procedure, page 1 of 2, based on containment pressure.

1. KW setting

#### CAUTION

Recombiner power >75 KW and temperature >1450°F may cause heater failure.

2. Slowly raise power to the value determined above.

E. Verify proper recombiner operation by observing the following:

#### NOTE

- Hydrogen concentration reduction is the long-term, primary method of verification.
- $H_2$  concentration reduction shall be used regardless of recombiner power or temperature indication as the verification of proper recombiner operation.
  - Hydrogen concentration stable or dropping at % Hydrogen (QI-7457 and QI-7459).
  - Recombiner maintaining power at value determined

#### NOTE

- Thermocouples are non-Q and will not be reliable indicators in a post-LOCA environment.
- Recombiner temperature can aid in trending recombiner operation. The following steps are provided as guidelines.
- Recombiner temperature may be plotted on Attachment C for verifying thermocouple operation and estimating time when recombination temperature will be reached.
  - F. Establish validity of temperature indication by comparing  $\Delta T$  between thermocouples.
    - 1. IF all three thermocouples fall within a 60°F band, THEN average the three temperatures.
    - 2. IF no two thermocouples are within 60°F of each other, THEN thermocouples should be considered inaccurate.
    - 3. IF difference of the three temperatures >60°F, AND two temperatures are within 60°F, THEN average the closest two.
  - G. Monitor for indication that recombiner operating temperature of 1225°F has been reached.

# CONTAINMENT HYDROGEN CONTROL

#### NOTE

Valid thermocouples show a ramp rise in temperature with  $\rm H_2$  concentration  $\geq \! 2\%$ , indicating recombination temperature has been reached and recombination is taking place.

- H. IF hydrogen concentration is  $\geq 2\%$ , THEN monitor for a ramp rise in temperature.
- After four hours of full power operation, log data in Attachment D once per hour.
- 8.2.2 Place M55B in-service by performing the following:
  - A. During heatup, monitor and record all three thermocouple temperatures every 30 minutes on Attachment E.
  - B. Verify M55B has been at 10 KW for at least 10 minutes.
  - C. Slowly raise power to 20 KW AND hold for 5 minutes.
  - D. Determine power required from Recombiner Power (M-55B) Versus Containment Pressure Attachment B of this procedure, page 2 of 2, based on containment pressure.
    - 1. KW setting

#### CAUTION

Recombiner power >75 KW and temperature >1450°F may cause heater failure.

- 2. Slowly raise power to the value determined above.
- E. Verify proper recombiner operation by observing the following:

#### NOTE

- Hydrogen concentration reduction is the long-term, primary method of verification.
- $H_2$  concentration reduction shall be used regardless of recombiner power or temperature indication as the verification of proper recombiner operation.
  - Hydrogen concentration stable or dropping at % Hydrogen (QI-7457 and QI-7459).
  - Recombiner maintaining power at value determined in step 8.2.2.D.

PROCEDURE/WORK PLAN TITLE:

CONTAINMENT HYDROGEN CONTROL

# NOTE Thermocouples are non-Q and will not be reliable indicators in a post-LOCA environment.

- Recombiner temperature can aid in trending recombiner operation. The following steps are provided as guidelines.
- Recombiner temperature may be plotted on Attachment C for verifying thermocouple operation and estimating time when recombination temperature will be reached.
  - F. Establish validity of temperature indication by comparing  $\Delta T$  between thermocouples.
    - 1. IF all three thermocouples fall within a 60°F band, THEN average the three temperatures.
    - <u>IF</u> no two thermocouples are within 60°F of each other, <u>THEN</u> thermocouples should be considered inaccurate.
    - 3. IF difference of the three temperatures  $>60^{\circ}F$ , AND two temperatures are within  $60^{\circ}F$ , THEN average the closest two.
  - G. Monitor for indication that recombiner operating temperature of 1225°F has been reached.

#### NOTE

Valid thermocouples show a ramp rise in temperature with  $\rm H_2$  concentration  $\geq 2\%$ , indicating recombination temperature has been reached and recombination is taking place.

- H. IF hydrogen concentration is  $\geq 2\%$ , THEN monitor for a ramp rise in temperature.
- After four hours of full power operation, log data in Attachment E once per hour.
- 8.2.3 IF proper power setting causes average valid temperature to exceed 1450°F OR in-service recombiner has insufficient capacity, THEN place standby recombiner in-service.
- 8.2.4 Do NOT lower recombiner power based on extreme temperature. Maintain power until standby recombiner is heated to operating temperature of ~1225°F.
- 8.3 Monitor Hydrogen Samplers (C178 and C179) to verify recombiner(s) maintaining or lowering hydrogen concentration.

# CONTAINMENT HYDROGEN CONTROL

PAGE: 14 of 69 CHANGE: 024

#### CAUTION

Recombiner power >75 KW and temperature >1450°F may cause heater failure.

#### NOTE

A power change of 4 KW will change temperature approximately 75°F.

8.3.1 IF  $H_2$  concentration has risen by >0.5% in 24 hours OR  $H_2$  concentration >3.0%, THEN raise recombiner power setting by 4 KW above the previous setting.

#### NOTE

A change in containment pressure will require an adjustment to recombiner power.

- 8.4 Monitor containment pressure.
  - 8.4.1 WHEN pressure changes, <u>THEN</u> adjust recombiner power to new value from Attachment B.
- 8.5 WHEN no longer required, THEN perform the following to secure Hydrogen Recombiner:
  - 8.5.1 Perform the following to secure M55A:
    - A. Lower power to zero.
    - B. Secure M55A by placing HS-7470 to OFF.
    - C. Leave a thermocouple selected as input to M55A Temperature (TI-2300).
  - 8.5.2 Perform the following to secure M55B:
    - A. Lower power to zero.
    - B. Secure M55B by placing HS-7471 to OFF.
    - C. Leave a thermocouple selected as input to M55B Temperature (TI-2301).

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ATTACHMENT B

Page 2 of 2



Note: Use pre- LOCA average Reactor Building Temperature from SPDS (TAVRB1) from history file if available. Otherwise use logs.

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JOB PERFORMANCE MEASURE

Unit:1 Rev #	3	Date:				
JPM ID:A1JPM-RO-PZR	05					
System/Duty Area: PRESSUR	RIZER					
Task: Respond to Low RCS Pressure	due to Stuck Open Spray	Valve				
JTA# _ANO1-RO-AOP-OFFMORM-11	5					
KA Value RO <u>3.6</u> SRO <u>3.5</u>	KA Reference: 010 A3.0	02				
Approved For Administration To: RO _	X SRO	Χ				
Task Location: Inside CRX	Outside CR	Both				
Suggested Testing Environment and Me	thod (Perform or Simulate	):				
Plant Site: Simulator:	Perform	Lab:				
Position Evaluated: RO:		SRO:				
Actual Testing Environment: Plant Site	Simula	ator Lab				
Testing Method: Perform		Simulate				
Approximate Completion Time in Minute	s:	15 Minutes				
Reference(s): <u>1203.012H Annunciator</u>	K09 corrective Action K0	9-C1; 1203.015 Pressurizer systems Failure				
Examinee's Name:		KCN:				
Evaluator's Name:						
The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:						
Satisfactory:	Unsatisfactor	<b>y</b> :				
Performance Checklist Comments:						
Start Time	_ Stop Time	Total Time				
*Signed	Da	te				

\*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

# JPM ID: A1JPM-RO-PZR05

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner shall review the "Briefing Checklist - System Walkthrough" portion of OP 1064.023 Attachment 6 with the examinee.

### JPM INITIAL TASK CONDITIONS:

The Reactor is at ~38% power with 3 RCP's running, "D" RCP is secured.

SUGGESTED SIMULATOR SETUP: Have the Spray valve stuck open CV-1008 and have the spray valve isolation valve CV-1009 failed open. Spray valve should be open slightly and have RCS pressure going down slowly with all PZR heaters on. RCS pressure Hi/Lo alarm, K09-C1 should come in shortly after placing the simulator in "RUN".

# SETUP NOTE: REMOVE ANY CAUTION CARDS THAT MAY EXIST ON RCP OIL PUMP HANDSWITCHES PRIOR TO STARTING JPM.

Simulator should remain in "FREEZE" until candidate is ready. Then start simulator

# THIS IS AN ALTERNATE PATH JPM

TASK STANDARD:

Trip Reactor and Stop "C" RCP to stop RCS pressure decrease. Tripping the reactor must be performed prior to reaching the RPS low pressure set point. Stopping "C" RCP should be done prior to reaching ESAS trip set point of 1590 psig.

### TASK PERFORMANCE AIDS:

Copy of 1203.015 section 6 Pressurizer Spray Valve (CV-1008) and 1203.012H Annunciator K09 corrective action for K09-C1 window RCS Pressure Hi/Lo

JPM ID: \_\_\_\_\_A1JPM-RO-PZR05

INITIATING CUE: The CRS/SM directs you to respond to new Annunciator alarms.

CRITICAL ELEMENTS (c): 9, 14

C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EX	<ul> <li>AMINER NOTE:</li> <li>This JPM requires the examinee to use more than one JPM.</li> <li>Annunciator K09-C1 will alarm shortly after placing the When asked, provide applicant the ACA procedure OI</li> </ul>	e procedure. Provide the procedures e simulator in "RUN". NLY.	as they	are cue	d in the
	<ol> <li>Confirm alarm by comparing RC pressure indications on C04.</li> <li><u>POSITIVE CUE:</u> All RCS pressure indicators are going down.</li> </ol>	Identified that all RCS pressure indicators are going down.			
	<ol> <li>Refer to COLR figures for RC Pressure Limits.</li> <li><u>POSITIVE CUE</u>: RC Pressure Limits Checked.</li> </ol>	COLR limits may not be referenced during Press Transient Or COLR RC Press. Limits reviewed.			
	<ol> <li>Verify all Pressurizer heaters are on.</li> <li><u>POSITIVE CUE</u>:</li> <li>All pressurizer heaters are on.</li> </ol>	Identifies all Pressurizer heaters are on.			
	4. Verify Pressurizer Spray (CV 1008) closed. <u>NEGATIVE CUE:</u> Pressurizer Spray (CV 1008) open.	Identified Pressurizer Spray (CV- 1008) open. Attempted to close Pressurizer Spray (CV-1008) and valve will not close			
	5. Verify ERV (PSV-1000) closed. <u>POSITIVE CUE:</u> ERV (PSV-1000) closed.	Verified ERV (PSV-1000) closed.			
EX	<ul> <li>MINER CUE:</li> <li>When asked, provide applicant AOP procedure.</li> </ul>				
	<ol> <li>Refers to Pressurizer Systems failure 1203.015.</li> <li><u>POSITIVE CUE</u>: Hand student Pressurizer Systems failure 1203.015.</li> </ol>	Refers to Pressurizer Systems Failure 1203.015 Section 6 Pressurizer Spray valve (CV- 1008) Failure.			
	7. Close Pressurizer Spray Isolation valve CV-1009. <u>Negative CUE:</u> Pressurizer Spray Isolation valve CV-1009 open.	Attempted to close Pressurizer Spray isolation valve (CV 1009) and valve will not close.			
	8. Verify all Pressurizer heaters are on. POSITIVE CUE: All pressurizer heaters are on.	Verified all Pressurizer heaters on.			

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
с	9. Trip Reactor. <u>POSITIVE CUE</u> : Reactor tripped.	Student Trips Reactor verifies all rods are inserted and Reactor power is going down. This must be done prior to reaching an automatic RPS set point of low RCS pressure 1800 psig.			
	10. Verify Turbine is tripped. <u>POSITIVE CUE</u> : Turbine is tripped.	Verified all throttle and governor valves are shut.			
	11. Verify Sub Cooling Margin is adequate. <u>POSITIVE CUE:</u> SCM is adequate.	Verified SCM is >30 degrees F.			
	<ul> <li>12. Start "C" RCP HP Oil Lift pump (P63C).</li> <li><u>POSITIVE CUE:</u> RCP HP Oil Lift pump (P63C) starts and due to caution tag start P-80</li> </ul>	Starts "C" RCP HP Oil Lift pump P63C and due to caution tag start P-80			
	13. Start "C" RCP Backstop Lube Oil pump (P81C) <u>POSITIVE CUE</u> : RCP Backstop Lube Oil pump (P81C) starts.	Starts "C" RCP Backstop Lube Oil pump (P81C)			
с	14. Stop "C" RCP (P-32C). <u>POSITIVE CUE</u> : "C" RCP (P-32C) stops.	Stopped "C" RCP (P-32C) prior to RCS pressure drops below 1590 psig ESAS set point.			
EXA	<ul> <li>MINER NOTE :</li> <li>Tell student JPM is complete.</li> </ul>				

END

JPM ID: \_\_\_\_\_A1JPM-RO-PZR05

# **INITIAL CONDITIONS:**

The Reactor is at 38% power with 3 RCP's running, "D" RCP is secured.

# **INITIATING CUE:**

The CRS/SM directs you to respond to new Annunciator alarms.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE						
TITLE: ANNUNCIAT	OR K09 COR	RECTIVE ACTION	DOCUMENT NO 1203.01	D. CH/ I <b>2H</b>	ANGE NO. 040	
SET #			N/A SAFETY-RELA YES		E YES ⊠NO	
					CONTINUOUS REFERENCE NFORMATIONAL	
when you see the	ese <u>IRAP</u>	<u>3</u>	Get these	IOOLS	mination	
	Distraction	/Interruption	CII	ective Commi estionina Atti	tude	
	Multiple Ta	sks	Pla	cekeeping		
	Over Confid	dence	Self Check			
	Vague or In	terpretive Guidance	Peer Check			
	First Shift/L	ast Shift	Knowledge			
	Peer Press	ure	Procedures			
	Change/On Physical Er	Normal Nironment	Job Briefing			
	Mental Stre	ss (Home or Work)	Turnover			
VERIFIED BY	/	DATE		TIM		
			-			
FORM TITLE:		COVER SHEET		FORM NO. 1000.006A	CHANGE NO. 054	

PAGE: 5 of 64 CHANGE: 040

Location: C14

Device and Setpoint: RC Pressure Loop A Narrow Range (PS-1023) ≥2255 psig <u>or</u> <2055 psig RC Pressure Loop B Narrow Range (PS-1038) ≥2255 psig Or <2055 psig

1.0 OPERATOR ACTIONS

The following indicators should read nearly alike except during three RCP operation.

- 1. Confirm alarm by comparing RC pressure indications on CO4.
  - RC Pressure Narrow Range Loop A recorder (PR-1023)
  - RC Pressure Narrow Range Loop B recorder (PR-1038)
  - RC Pressure Wide Range Loop B recorder (PI-1041)
  - RC Pressure Wide Range Loop B indicator (PR-1042)

A malfunctioning pressure instrument can insert an erroneous trip signal to the RPS.

- 2. Refer to COLR Figures for RC pressure limits.
- 3. IF RC pressure is confirmed  $\frac{1 \text{ow}}{1 \text{THEN}}$  perform the following:
  - A. Verify all pressurizer heaters on.
  - B. Verify Pressurizer Spray (CV-1008) closed.
  - C. Verify ERV (PSV-1000) closed.
  - D. Refer to Pressurizer Systems Failure (1203.015).
- <u>IF RC pressure is confirmed high</u>, <u>THEN</u> perform the following:
  - A. Verify Pressurizer Spray (CV-1008) open.
  - B. Verify all pressurizer heaters are off.
  - C. Refer to Pressurizer Systems Failure (1203.015).
- 5. <u>IF</u> transient is caused by ICS malfunction, <u>OR</u> ICS instrument failure <u>THEN</u> take manual control of affected H/A station AND refer to ICS Abnormal Operation (1203.001).
- 6. Refer to SASS MISMATCH K07-B4 (1203.012F)



Alarm: K09-C1

NOTE

Page 1 of 2

K09-C1 Page 2 of 2

#### 2.0 PROBABLE CAUSES

- Malfunctioning pressure instrument
- ICS malfunction

### 3.0 REFERENCES

Window Arrangement Annunciator K09 (E-459, sheets 1-4)

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE						
TITLE: PRESSURIZE	R SYSTEMS FAILUR	E	DOCUMENT N 1203.0	IO. CH	ANGE NO. 016	
				EXP. DATE		
SET #			SAFETY-RELA		E IYES INO VEL OF USE CONTINUOUS	
					REFERENCE	
		TIC EXCLUSION	PER EN-LI-100			
When you see the	se <u>TRAPS</u>		Get these	TOOLS		
	Time Pressure		Ef	fective Comm	unication	
	Distraction/Interrup	tion	Q	uestioning Att	itude	
	Multiple Tasks		PI	acekeeping		
	Over Confidence		Self Check			
	Vague or Interpretiv	e Guidance	Peer Check			
	First Shift/Last Shift	t	Knowledge			
	Peer Pressure		Procedures			
	Change/Off Normal		Job Briefing			
	Physical Environme	ent	Coaching			
	Mental Stress (Hom	e or Work)	Turnover			
VERIFIED BY		DATE		TIN	1E	
		<u></u>				
FORM TITLE:		SHEET		FORM NO. 1000.006A	CHANGE NO. 054	

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CHANGE 016 PAGE 16 of 24

SECTION 6 -- PRESSURIZER SPRAY VALVE (CV-1008) FAILURE

# **ENTRY CONDITIONS**

# One or more of the following:

• CV-1008 closed when it should be open.

-	Normal operation:	Opens - 2205 psig
		Closes - 2155 psig
-	Power >80% and MFP trip:	Opens - 2080 psig
		Closes - 2030 psig

- CV-1008 open when it should be closed.
- Abnormal change in RC pressure.
- RC pressure transmitter failure which is selected for RC pressure control.

CHANGE 016 PAGE 17 of 24

SECTION 6 -- PRESSURIZER SPRAY VALVE (CV-1008) FAILURE

### INSTRUCTIONS

## 1. IF failed open,

<u>THEN</u> place Pressurizer Spray Control switch in HAND AND attempt to close CV-1008 (modulating valve).

# NOTE

CV-1009 torque switch can be overridden in the OPEN or CLOSE direction by holding the hand switch in the respective position.

- A. <u>IF</u> CV-1008 will NOT close, <u>THEN</u> close Pressurizer Spray Isolation Valve (CV-1009).
- B. Verify Pressurizer heaters return RCS pressure to normal.

# CAUTION

Pressurizer spray shall <u>not</u> be used if the temperature difference between the Pressurizer and the spray fluid is >430°F (TRM 3.4.3). Closing CV-1009 isolates the CV-1008 bypass spray flow.

- C. <u>IF</u> necessary, <u>THEN</u> control spray flow by cycling Pressurizer Spray Isolation Valve (CV-1009) open and closed.
- D. <u>IF</u> both CV-1008 and CV-1009 do NOT close <u>AND</u> RCS pressure is dropping, <u>THEN</u> perform the following:
  - 1) Verify all PZR heaters ON.
  - 2) Immediately begin reducing load to 40% at 10%/min per Rapid Plant Shutdown (1203.045).
  - IF 4 RCPs are running
     AND BOTH of the following conditions are met:
    - Load is reduced to ≤675 MWe (≤75% load)
    - Reactor power is ≤75%,

**THEN** perform the following:

- a. Start "C" RCP HP Oil Lift Pump (P-63C) and "C" RCP Backstop Lube Oil Pump (P-81C).
- b. Stop "C" RCP (P-32C).
- c. <u>WHEN</u> zero speed is indicated, <u>THEN</u> stop P-63C and P-81C.

(continued)

SECTION 6 -- PRESSURIZER SPRAY VALVE (CV-1008) FAILURE

# NOTE

In Modes 1 and 2, operation with only one RCP in each loop causes entry into TS 3.4.4 Condition A.

- IF 3 RCPs running AND all of the following conditions are met:
  - Load is reduced to ≤360 MWe (≤40% load)
  - Reactor power is  $\leq$ 55%,
  - "C" and "D" RCPs in-service

**<u>THEN</u>** perform the following:

- a) Start "C" RCP HP Oil Lift Pump (P-63C) and "C" RCP Backstop Lube Oil Pump (P-81C).
- b) Stop "C" RCP (P-32C).
- c) <u>WHEN</u> zero speed is indicated, <u>THEN</u> stop P-63C and P-81C.
- d) Enter TS 3.4.4 Condition A.
- 5) <u>IF</u> 3 RCPs running, <u>AND</u> "D" RCP is secured, <u>THEN</u> perform the following:
  - a) Trip Reactor.
  - b) Secure P-32C as follows:
    - (1) Start "C" RCP HP Oil Lift Pump (P-63C) and "C" RCP Backstop Lube Oil Pump (P-81C).
    - (2) Stop "C" RCP (P-32C).
    - (3) <u>WHEN</u> zero speed is indicated, <u>THEN</u> stop P-63C and P-81C.
  - c) Perform Reactor Trip (1202.001) while continuing with this procedure.
  - d) Enter TS 3.4.5 Condition A.
- WHEN conditions permit a reactor building entry, THEN attempt to manually close either CV-1008 or CV-1009.
- E. Contact Ops Manager.

(continued)

SECTION 6 -- PRESSURIZER SPRAY VALVE (CV-1008) FAILURE

# 2. <u>IF</u> failed closed, <u>THEN</u> hold the plant at steady state conditions.

- A. <u>IF</u> CV-1008 is energized, <u>THEN</u> place Pressurizer Spray Control Mode switch in HAND AND attempt to cycle CV-1008 (a modulating valve) open and closed.
- B. Write a Condition Report to evaluate continued operation of the plant with inoperable Spray Valve.
- C. Contact Ops Manager AND consider one or both of the following:
  - <u>IF</u> CV-1008 will NOT open, <u>THEN</u> commence a shutdown per Power Reduction and Plant Shutdown (1102.016) and Plant Shutdown and Cooldown (1102.010).
    - To prevent lifting of relief valves, reduce power slowly while shutting down.
    - RC pressure can be regulated by manual control of Pressurizer heaters.
  - 2) <u>WHEN</u> conditions permit a reactor building entry, <u>THEN</u> perform the following:
    - a. Close CV-1009 from C04.
    - b. Attempt to manually open CV-1008 in reactor building.

# CAUTION

Pressurizer spray shall <u>not</u> be used if the temperature difference between the Pressurizer and the spray fluid is >430°F (TRM 3.4.3). Closing CV-1009 isolates the CV-1008 bypass spray flow.

- c. <u>IF</u> CV-1008 can be opened, <u>THEN</u> control RCS pressure and spray line temperature by cycling CV-1009 open and closed.
- 3. <u>IF</u> an RC pressure transmitter which is selected for control has failed or is failing, <u>THEN</u> GO TO Annunciator K07 Corrective Action (1203.012F), SASS Mismatch (K07-B4).
- 4. Refer to "RCS Pressure, Temperature and Flow DNB Surveillance Limits" of the ANO1 COLR (TS 3.4.1).

END

Page 1 of 5

#### JOB PERFORMANCE MEASURE

Unit:1	Rev #		4	Date:
JPM ID:	A1JPM-RO-EOP08			
System/Duty Area:	Emergency and Ab	normal Operatio	ons	
Task: Perform A	ctions required to corre	ect Degraded P	ower (EFW Sy	stem Operation)
JTA# _ANO1-RO	-EOP-EMERG-35 & A	NO1-SRO-EOP	-EMERG-32	
KA Value RO 3	.3 SRO	KA Reference	061 A1.02	
Approved For Adm	inistration To: RO	X	SRO	X
Task Location: Ins	ide CR: X	_ Outside C	R:	Both:
Suggested Testing	Environment And Me	thod (Perform o	r Simulate):	
Plant Site:	Simulator:	Pe	erform	Lab:
Position Evaluated	: RO:			RO:
Actual Testing Env	ironment: Simulator:		Plant Site:	Lab
Testing Method: Si	mulate:		Perf	orm:
Approximate Comp	pletion Time In Minutes	S:		10 Minutes
Reference(s):	1202.007 Degraded F	Power		
-				
Examinee's Name:				KCN:
Evaluator's Name:				
The Examinee's pe	rformance was evalua	ated against the	standards cor	tained in this JPM and is determined to be
Satisfactory:		Uns	satisfactory:	
Performance Chec	klist Comments:			
	Kilot Commenta.			
Start Time		Stop Time		Total Time
Signed		-	Date:	

Signature below indicates the material utilized during this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

# JPM ID: A1JPM-RO-EOP08

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

#### JPM INITIAL TASK CONDITIONS:

Degraded Power conditions exist. EFW is NOT available and HPI cooling is inadequate.

TASK STANDARD:

Both EFW pumps suction are aligned to the SW system AND EFW system aligned to feed OTSG's from the Service Water System.

TASK PERFORMANCE AIDS:

1202.007 Degraded Power Step 67A-F.

JPM ID: A1JPM-RO-EOP08

INITIATING CUE: The CRS/SM directs you to feed both OTSG's with Service Water per step 67 of 1202.007 Degraded Power.

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	<ol> <li>Direct an operator to close the minimum recirc isolation valves for P-7A and P-7B (FW-11A/B).</li> <li><u>POSITIVE CUE</u>: Operator reports that FW-11A and FW-11B are closed.</li> </ol>	Notified an operator to close FW-11A and FW-11B.			
с	2. Depressurize both OTSGs to zero psig. <u>POSITIVE CUE</u> : Both OTSG pressures are at 0 psig. <u>NEGATIVE CUE</u> : Both OTSGs are at 200 psig.	On C09, operated the ATM Dump Control System (Atmospheric Dump Isolation and Control Valves) to depressurize the OTSGs to 0 psig.			
	<ol> <li>Start third Service Water Pump.</li> <li><u>POSITIVE CUE</u>: ALL three-service water pumps in service. (Red lights indicated on panel C16 and C18.</li> <li><u>NEGATIVE CUE</u>: Green light on for one service water pump.</li> </ol>	Started third Service Water Pump.			
с	<ul> <li>4. Open the EFW Service Water Loop I and II Isolations (CV-3850 and CV-3851).</li> <li><u>POSITIVE CUE</u>: Red lights on.</li> <li><u>NEGATIVE CUE</u>: green lights on.</li> </ul>	On C09, opened CV-3850 and CV-3851. Indicated by the red lights ON and green lights OFF above HS-3850 and HS-3851.			
С	<ul> <li>5. Place P-7A and P-7B suction select switches to the SW position.</li> <li><u>POSITIVE CUE</u>: CV-2800 and CV-2802 green lights ON.</li> <li><u>NEGATIVE CUE</u>: lights for CV-2800, CV-2802, CV-2803 and CV-2806 did not change status.</li> </ul>	On C09, placed HS-2800 and HS-2802 to the SW position. Indicated by the green lights ON and red lights OFF for CV-2800 and CV-2802 AND the red lights ON and green lights OFF for CV-2803 and CV-2806.			
С	<ol> <li>Open EFW isolation valves (CV-2670 and CV-227 for SG "A." CV-2620 and CV-2626 for SG "B").</li> <li><u>POSITIVE CUE</u>: Red lights ON.</li> <li><u>NEGATIVE CUE</u>: Green light(s)ON.</li> </ol>	On C09, opened CV-2670, CV-2627, CV-2620 and CV- 2626 in manual. Indicated by red lights ON and green lights OFF above HS-2670, HS-2627, HS- 2620 and HS-2626.			

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
с	<ul> <li>7. Open EFW control valves (CV-2645 and CV-2646 for SG "A." CV-2647 and CV-2648 for SG "B").</li> <li><u>POSITIVE CUE</u>: EFW flow to both OTSGs indicated on C09.</li> <li><u>NEGATIVE CUE</u>: no flow indicated on C09. (K02-D4/F6).</li> </ul>	On C09, opened CV-2645, CV-2646, CV-2647 and CV- 2648 in manual. Indicated by 100% on scale above HIC-2645, HIC-2646, HIC-2647 and HIC-2648.			

When all EFW control valves are open, Notify the examinee that the JPM is complete

JPM ID: A1JPM-RO-EOP08

# **INITIAL CONDITIONS:**

**Degraded Power conditions exist.** 

EFW is NOT available AND HPI cooling is inadequate.

**INITIATING CUE:** 

The CRS/SM directs you to feed both OTSG's with Service Water per step 67 of 1202.007 Degraded Power.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE								
TITLE: DEGRADED	POWER		DOCUMENT N	10. CI	HANGE NO.			
			WORK PLAN E	EXP. DATE	009			
AFT 4			N/A SAFETY-RELA		TE			
SEI #			YES [					
					VEL OF USE CONTINUOUS REFERENCE			
			PROGRAMMA	TIC EXCLUSION	PER EN-LI-100			
When you see the	∍se <u>TRAPS</u>		Get these	TOOLS				
	Time Pressure		Ef	fective Comn	IPTE YES NO LEVEL OF USE CONTINUOUS REFERENCE INFORMATIONAL ION PER EN-LI-100 Attitude			
	Distraction/Interruption		Qı	uestioning At	titude			
	Multiple Tasks		Pl	acekeeping				
	Over Confidence		Se	elf Check				
	Vague or Interpretive Gui	dance	Peer Check					
	First Shift/Last Shift		Kr	nowledge				
	Peer Pressure		Pr	rocedures				
	Change/Off Normal		Jo	b Briefing				
	Physical Environment		Co	oaching				
	Mental Stress (Home or V	Vork)	Tu	urnover				
VERIFIED BY		TE		TI	ME			
FORM TITLE:				FORM NO.	CHANGE NO.			
VE	RIFICATION COVER SHEE	ET		1000.006A	054			

							CHANGE	]
	1202.007	DEGF	RADED POWE	R			009	PAGE 33 of 64
		<u>IN</u>	STRUCTIONS			CONTIN	GENCY AC	TIONS
65	5. <u>IF</u> CE <sup>-</sup>	T temps	are superheate	ed				
	movir	ig away f	from the satura	ation line,				
	<u>THEN</u> CORE	GO TO 1 COOLIN	I202.005, "INA IG" procedure	DEQUATE while				
	attem this p	pting to a rocedure	restore buses	per step 71 of				
66	6. <u>IF</u> EFV before <u>THEN</u>	V is expe CET ter RETURN	ected to becom nps indicate se I TO step 62.	ne available uperheated,				
				N				
•	Service V	Water fee	ed alone may or	nly slow the rate	of heatup.			
Ŀ	SG level	will <u>not</u> b	e established if	f feed is from ser	vice water			
67.	. <u>IF no</u> E <u>THEN</u> systen	EFW is a feed SGs n as follo	vailable, s with Service ows:	Water via EFW				
	A. Dis RE (FV	patch an CIRC ISC V-11A an	operator to clos DL for P-7A and d B).	se Minimum I B				
	B. Ope dep	erate ATN pressurize	M Dump Contro SGs to 0 psig.	I System to	B.	IF ATM Dum THEN dispat	ip ISOL valv tch an opera	e is de-energized, tor to hand jack
	S	G A		SG B		open (Refer	to Alternate	Shutdown
		2070		01/2019		(1203.002),	Exhibit A).	
		-2000	CNTRL	CV-2618				
	C. Per Ser	form the f vice Wate	following to star er pump:	rt the third	C.	GO TO step	67.D.	
	1)	I <u>F</u> ESAS THEN ve Crossties	has actuated, rify one pair of open.	Service Water				
	Ρ2 Ρ2	IA to P4E	B CV-3644 C CV-3640	& 3646 & 3642				
	2) \$	Start thirc	I Service Water	pump				
	D. Ope Isola	n EFW S itions (C\	ERV WTR Loo /-3850 and 385	p I and II i1).				
(67.	CONTIN	UED ON	NEXT PAGE)					

	202.007	DEGRADED POWER			CHANGE 009	PAGE	34 of	64
		INSTRUCTIONS			GENCY AC	TIONS		لي
67.	(Continue	d).						
	E. Take SW.	P-7A and B SUCT Select switches to						
	F. Oper valve flow t (mod	n all EFW ISOL and EFW CNTRL is in MANUAL while maintaining EFW to each SG ≤ 200 gpm. ulating valves).						
68.	Check C	ET temps begin to drop.	68.	Hold at this poir conditions is me buses per step	nt until one c et, while atte 71.	f the follo mpting to	wing restore	1
				A. <u>IF</u> EFW beck <u>THEN</u> GO T	omes availa <b>O step 70.</b>	ble,		
				B. <u>IF</u> CET temp <u>THEN</u> GO T COOLDOW buses per st	os begin to c F <b>O 1202.01</b> 1 N'' while atte ep 71 of this	lrop, I <b>, ''HPI</b> empting to s procedur	restor	е
				C. <u>IF</u> CET temp <u>AND</u> moving away <u>THEN</u> GO T CORE COO attempting to this procedu	os are super y from the sa O 1202.005 LING'' proce o restore bus re:	heated aturation h , <b>''INADEC</b> edure whil ses per sto	ine, <b>QUATE</b> e ep 71 o	: f
69.	GO TO 12 attemptir this proc	202.011, "HPI COOLDOWN" while ng to restore buses per step 71 of edure.						
70.	<u>IF</u> EFW b <u>THEN</u> per	ecomes available, rform the following:						
	A. Dispat RECIF (FW-1	ich an operator to open Minimum RC ISOL for P7A and B 1A and B).						
(70.	CONTINU	ED ON NEXT PAGE)						

r.

# JOB PERFORMANCE MEASURE

Unit: <u> </u>	Rev #		9	Date:
JPM ID:A1JPN	M-RO-ICW02			
System/Duty Area:	ntermediate Co	oling Water		
Task: Perform Swite	ching of ICW Pu	mps (P-33A/	B/C)	
JTA# ANO1-RO-ICW-NOF	RM-27			
KA Value RO <u>3.3</u> SR	0 <u>3.6</u> KA	Reference:	008 A2.01	
Approved For Administration	To: RO	Х	SRO	Χ
Task Location: Inside CR	X	Outside C	R	Both
Suggested Testing Environm	ent and Method	(Perform or	Simulate ):	
Plant Site: Sir	mulator:	Per	orm	Lab:
Position Evaluated: RO:			SF	RO:
Actual Testing Environment:	Plant Site		Simulator _	Lab
Testing Method: Perform _			Simu	late
Approximate Completion Tim	e in Minutes: _		1(	0 Minutes
Reference(s): <u>1104.028 Se</u>	ction 10.0			
Examinee's Name:				KCN:
Evaluator's Name <sup>.</sup>				
The Examinee's performance	was evaluated	against the s	tandards cont	ained in this JPM and is determined to have
Satisfactory:		l Ine	atisfactory	מחופע זה נחוש שר זא מחע זש עפנפוזווווופע נס DE:
,		01130		
Performance Checklist Comm	nents:			
Start Time	Sto	p Time		Total Time
*Signed			Date	

and is current with that revision.

# JPM ID: A1JPM-RO-ICW02

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

# JPM INITIAL TASK CONDITIONS:

Unit 1 is at 100% power steady state conditions. The IAO reports that P-33A has high vibrations and is making an unusual noise. P-33A and P-33C ICW Pumps are presently in service. P-33B ICW pump has NOT been drained.

TASK STANDARD:

P-33B ICW Pump supplying non-nuclear ICW, ICW Pump P-33A is secured.

TASK PERFORMANCE AIDS:

1104.028 Section 10.0

# JPM ID: A1JPM-RO-ICW02

INITIATING CUE: The CRS/SM directs you to start P-33B ICW Pump and then secure P-33A ICW pump using 1104.028 Section 10.0.

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
С	1. Open ICW Pumps (P-33A to P-33B) Suction Crossconnect valve CV-2240. <u>POSITIVE CUE</u> : CV-2240 has red light ON and green light OFF. <u>NEGATIVE CUE</u> : CV-2240 has green light ON and red light OFF.	Opened CV-2240 on panel C09.			
С	2. Open ICW Pumps (P-33A to P-33B) Discharge Crossconnect valve CV- 2238. <u>POSITIVE CUE</u> : CV-2238 has red light ON and green light OFF. <u>NEGATIVE CUE</u> : CV-2238 has green light on and red light off.	Opened CV-2238 on panel C09.			
INSTR	RUCTOR CUE: Inform Examinee that P-33	B ICW Pump has been vented.			
с	3. Start ICW Pump P-33B. <u>POSITIVE CUE</u> : Red light ON green light OFF for P-33B. <u>NEGATIVE CUE</u> : Green light ON red light OFF for P-33B.	Started ICW Pump P-33B using handswitch on panel C09.			
с	4. Stop ICW Pump P-33A. <u>POSITIVE CUE</u> : Green light ON red light OFF for P-33A. <u>NEGATIVE CUE</u> : Red light ON green light OFF for P-33A.	Waited ~3 minutes and then placed the handswitch for ICW Pump P-33A in the trip/stop position.			
	5. Verify flow is normal on ICW Coolers Inlet Flow Non-Nuc indicator (FI-2218) on C09. <u>POSITIVE CUE</u> : Flow is ~1800-2000 gpm on FI-2218.	Verified normal ICW flow on FI-2218 on C09 for the Non-Nuclear loop.			
JPM ID: A1JPM-RO-ICW02

# **INITIAL CONDITIONS:**

Unit 1 is at 100% power steady state conditions. The IAO reports that P-33A has high vibrations and is making an unusual noise. P-33A and P-33C ICW Pumps are presently in service. P-33B ICW pump has NOT been drained.

**INITIATING CUE:** 

The CRS/SM directs you to start P-33B ICW Pump and then secure P-33A ICW pump using 1104.028 Section 10.0.

JOB PERFORMANCE MEASURE

Unit:1 Rev #	10	Date:
JPM ID:A1JPM-RO-EFW02	2	
System/Duty Area: Emergency F	eedwater	
Task: Manual Control of Emergen	cy Feedwater Pump P-7A at th	e Turbine
JTA# _ ANO1-RO-EFW-NORM-7		
KA Value RO <u>3.1</u> SRO <u>3.4</u> F	KA Reference: 061 A2.05	
Approved For Administration To: RO	X SRO	X
Task Location: Inside CR	Outside CR X	Both
Suggested Testing Environment and Meth	nod (Perform or Simulate ):	
Plant Site:Simulate Simulator:		Lab:
Position Evaluated: RO:	SF	: :
Actual Testing Environment: Plant Site	X Simulator	Lab
Testing Method: Perform	Simul	ate
Approximate Completion Time in Minutes	:1(	) Minutes
Reference(s): _1106.006 EFW Pump Op	peration Exhibit C (Manual Cont	trol of EFW Pump P-7A)
Examinee's Name:		KCN:
Evaluator's Name:		
The Examinee's performance was evalua	ted against the standards conta	ained in this JPM and is determined to be:
Satisfactory:	Unsatisfactory:	
Performance Checklist Comments:	Stop Time	Total Time

and is current with that revision.

### THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

JPM INITIAL TASK CONDITIONS:

- EFW Pump Turbine K3 tripped on overspeed due to a loss of electric signal to the speed controller.
- Power is unavailable to the speed controller/turbine control cabinet.
- P-7A turbine has been reset per Exhibit A (EFW Pump P-7A Overspeed Trip Reset).

INSTRUCTOR NOTE: FYI EFW Pump Turbine K3 steam admission valves are closed and the trip throttle valve is opened in 1106.006 Exhibit A.

## TASK STANDARD:

EFW Pump P-7A running per section 1.0 of 1106.006 Exhibit C (at ~1400 discharge pressure).

## TASK PERFORMANCE AIDS:

Copy of 1106.006 Exhibit C (Manual Control of EFW Pump P-7A).

INITIATING CUE: The CRS/SM directs you to manually start EFW Pump P-7A and control at approximately 1400 psig discharge pressure per 1106.006 Exhibit C.

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
TRA	NSITION NOTE: Proceed to EFW pump room on 335' elevation in Con	trolled Access of Auxiliary Building.			
с	<ol> <li>Close EFW Turbine K3 Trip/Throttle Valve (CV- 6601A).</li> <li><u>POSITIVE CUE</u>: Handwheel does NOT move any further in the clockwise direction.</li> </ol>	Closed CV-6601A by rotating hand wheel in close direction (clockwise).			
С	<ol> <li>Request control room to open EFW Turbine K3 Steam Admission valve (CV-2613 or CV-2663).</li> <li><u>NEGATIVE CUE</u>: Control Room reports unable to open steam admission valves</li> </ol>	Called control room and requested CV-2613 or CV-2663 to be opened.			
INST	<ul> <li>When the operator simulates notifying the control room</li> <li>power available to CV-2613 or CV-2663 and direct him</li> </ul>	m to open CV-2613 or CV-2663, tell h m as the CRS to open CV-2613 man	him that ually.	there is	no
С	3. Open CV-2613 Manually <u>POSITIVE CUE:</u> CV-2613 indicates open locally	Engaged manual handwheel and rotated handwheel in the counter- clockwise direction until it stopped. Verified stem rises on the valve by observing the stem as the valve is opened.			
С	<ul> <li>4. Open EFW Turbine K3 Trip/Throttle valve (CV-6601A).</li> <li><u>POSITIVE CUE</u>: Pump discharge pressure is approximately 1400 psig.</li> <li><u>NEGATIVE CUE</u>: Pump discharge pressure is approximately 500 psig.</li> </ul>	Slowly opened CV-6601A (counter clockwise) until approximately 1400 psig discharge pressure was attained.			
	<ul> <li>5. Monitor turbine speed indication (if available) to ensure turbine does not exceed 3776 RPM or pump discharge pressure at ~1400 psig.</li> <li><u>POSITIVE CUE</u>: Turbine speed is ~ 3650 RPM or pump discharge pressure ~1400 psig.</li> </ul>	Checked turbine speed locally at approximately 3650 RPM <u>or</u> monitored pump discharge pressure indication and maintained at ~1400 psig.			

## **INITIAL CONDITIONS:**

- EFW Pump Turbine K3 tripped on over speed due to a loss of electric signal to the speed controller.
- Power is unavailable to the speed controller/turbine control cabinet.
- P-7A turbine has been reset per Exhibit A (EFW Pump P-7A Overspeed Trip Reset).

## **INITIATING CUE:**

The CRS/SM directs you to manually start EFW Pump P-7A and control at approximately 1400 psig discharge pressure per 1106.006 Exhibit C.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE					
TITLE: ICW SYSTEM	OPERATING	PROCEDURE	DOCUMENT 1104	NO. 1.028	CHANGE NO. 029
			WORK PLAN	EXP. DATE /A	
SET #			SAFETY-REL		IPTE
			TEMP MOD ⊠YES [	ОИС	LEVEL OF USE CONTINUOUS REFERENCE
				ATIC EXCLUSI ⊠NO	ON PER EN-LI-100
When you see the	ese <u>TRAPS</u>	<u>S</u>	Get these	• <u>TOOLS</u>	
	Time Pressu	Ire	E	Effective Con	nmunication
	Distraction/I	nterruption	C	Questioning	Attitude
	Multiple Tas	ks	P	Placekeeping	J
	Vague or Int	ence erpretive Guidance	5	Self Check	
	First Shift/La	erpretive Guidance	r k		
	Peer Pressu	re	P	Procedures	
	Change/Off I	Normal	J	ob Briefing	
	Physical Env	vironment	C	Coaching	
	Mental Stres	s (Home or Work)	т	urnover	
VERIFIED BY	/	DATE			TIME
VE		COVER SHEET		1000.000	6A 054

1104.028

## ICW SYSTEM OPERATING PROCEDURE

CHANGE: 029

## NOTE

Stopping an ICW pump can cause CRD SUPPLY FILTER  $\Delta \text{P}$  HI (K08-D1) and RCP MOTOR COOLING FLOW LO (K08-E6).

10.0 Switching ICW Pumps (P-33A, B, or C)

### CAUTION

When switching ICW Pump alignment, running both pumps in parallel for 3 minutes reduces the possibility of trapped air causing a system transient.

#### NOTE

The Non-Nuclear loop normally has a higher activity level than the nuclear loop. If both loops are crossconnected via the ICW Surge Tank drain line, Non-Nuclear loop process monitor activity will lower and nuclear loop process monitor activity will rise, possibly to the alarm setpoint.

10.1 IF desired to start P-33B AND secure P-33A, <u>WHEN</u> P-33A and P-33C are running, THEN perform the following:

## CAUTION

- During filling of P-33A ICW pump following maintenance, air entrained in the ICW system following venting was carried throughout the system resulting air binding of ICW components. CR-ANO-1-2006-00612
- Restoration of an ICW pump following maintenance with ONLY one train of CRD cooling available should be evaluated prior to starting. Air entrained in the ICW pump discharge can degrade CRD cooling flow.
- Leakage between ICW loops can foul CRD Filters. When there is leakage between loops, raise monitoring of CRD Pre-filters (F-61A & B) and CRD Cooling Water Filters (F-20A & B).
- Opening the ICW pump discharge cross-connect valve(s) prior to opening the suction cross-connect valve(s) can result in overflowing the Nuclear ICW Surge Tank due to pressure differences in the ICW loops.
  - 10.1.1 IF P-33B has been drained,  $\overline{\text{THEN}}$  perform the following:
    - A. Verify the following valves closed:
      - ICW Pump P-33B Disch Isol (ICW-3B)
      - ICW Pump P-33B Suct Isol (ICW-1B)
      - ICW Pump P-33B Vent (ICW-1191)
      - ICW Pump P-33B Disch Line Drain (ICW-1177A)
      - ICW Pump P-33B Suct Line Drain (ICW-1177B)
    - B. Periodically monitor ICW expansion tank level during refill.

1104.028	ICW	ORK PLAN TITLE:	PAGE: 32 of 118 CHANGE: 029
	C.	Slowly open ICW-1B.	· · · · · · · · · · · · · · · · · · ·
	D.	Throttle open ICW-1177A.	
	E.	WHEN air is vented, THEN close ICW-1177A.	
	F.	Open ICW-3B.	
	G.	Vent all of the CRD Cooling system of "Venting CRD Cooling System Component this procedure.	components per ts", exhibit of
10.1	$\frac{1F}{THEN}$	esired, install plug on the ICW surge tanks	drain line.
	Α.	Open the following valves:	
		• ICW Surge Tk T-37A Drn to Aux Bld	lg (ICW-130A)
		• ICW Surge Tk T-37B Drn to Aux Bld	lg (ICW-130B)
10.1	.3 Open	A/B crossconnect valves:	
	Α.	ICW Pumps Suction Crossconnect (CV-2	240).
	В.	ICW Pumps Discharge Crossconnect (CV	7-2238).
10.1	.4 Vent (ICW-	P-33B as necessary by opening ICW Pu -1191).	mp P-33B Vent
	A.	Close ICW-1191.	
10.1	.5 Star	t P-33B.	
	Α.	IF CRD cooling pumps indicate air bi lowering pump discharge pressure, fl standby pump start), THEN perform "Venting CRD Cooling Sy exhibit of this procedure.	nding (i.e. ow oscillations o stem Components",

- 10.1.6  $\frac{\text{WHEN}}{\text{THEN}}$  P-33B has run at least 3 minutes,  $\frac{\text{THEN}}{\text{THEN}}$  stop P-33A.
- 10.1.7 Verify flow is normal (~2000 gpm) on ICW Coolers Inlet Flow Non-Nuc (FI-2218) (CO9).
- 10.1.8 IF desired, <u>THEN</u> station operator to monitor ICW Surge Tanks for overflow.

PROCEDURE/WORK PLAN TITLE:

1104.028

10.2 IF desired to start ICW pump P-33B AND secure P-33C, WHEN P-33A and P-33C are running, THEN perform the following:

#### CAUTION

- During filling of P-33A ICW pump following maintenance, air entrained in the ICW system following venting was carried throughout the system resulting air binding of ICW components. CR-ANO-1-2006-00612
- Restoration of an ICW pump following maintenance with ONLY one train of CRD cooling available should be evaluated prior to starting. Air entrained in the ICW pump discharge can degrade CRD cooling flow.
- Leakage between ICW loops can foul CRD Filters. When there is leakage between loops, raise monitoring of CRD Pre-filters (F-61A & B) and CRD Cooling Water Filters (F-20A & B).
- Opening the ICW pump discharge cross-connect valve(s) prior to opening the suction cross-connect valve(s) can result in overflowing the Nuclear ICW Surge Tank due to pressure differences in the ICW loops.
  - 10.2.1 IF P-33B has been drained, THEN perform the following:
    - A. Verify the following valves closed:
      - ICW Pump P-33B Disch Isol (ICW-3B)
      - ICW Pump P-33B Suct Isol (ICW-1B)
      - ICW Pump P-33B Vent (ICW-1191)
      - ICW Pump P-33B Disch Line Drain (ICW-1177A)
      - ICW Pump P-33B Suct Line Drain (ICW-1177B)
    - B. Periodically monitor ICW expansion tank level during refill.
    - C. Slowly open ICW-1B.
    - D. Throttle open ICW-1177A.
    - E. <u>WHEN</u> air is vented, <u>THEN</u> close ICW-1177A.
    - F. Open ICW-3B.
    - G. Vent all of the CRD Cooling system components per "Venting CRD Cooling System Components", exhibit of this procedure.

#### 10.2.2 <u>IF</u> desired, THEN install plug on the ICW surge tanks drain line.

- A. Open the following valves:
  - ICW Surge Tk T-37A Drn to Aux Bldg (ICW-130A)
  - ICW Surge Tk T-37B Drn to Aux Bldg (ICW-130B)

PROC./WORK PLAN NO.	PROCEDURE/M	VORK PLAN TITLE:	PAGE:	34 of 118
1104.028	104.028 ICW SYSTEM OPERATING PROCEDURE		CHANGE:	029
10.2	2.3 Open	B/C crossconnect valves:		
	Α.	ICW Pumps Suction Crossconnect (CV-2	241)	
	в.	ICW Pumps Discharge Crossconnect (CV	-2239)	
10.2	2.4 Vent (ICW	P-33B as necessary by opening ICW Pu -1191).	mp P-33B '	Vent
	A.	Close ICW-1191.		
10.2	2.5 Star	t P-33B.		
	Α.	IF CRD cooling pumps indicate air bi lowering pump discharge pressure, fl standby pump start), THEN perform "Venting CRD Cooling Sy exhibit of this procedure.	nding (i. ow oscill stem Comp	e. ations or onents",
10.2	2.6 <u>WHEN</u> THEN	P-33B has run at least 3 minutes, stop P-33C.		
10.2	2.7 Veri Nucl	fy flow is normal (~2000 gpm) on ICW ear (FI-2219) (CO9).	Coolers I	nlet Flow
10.2	$\frac{1F}{THEN}$	esired, station operator to monitor ICW Surg flow.	e Tanks f	or
10.3 <u>IF</u> c <u>WHEN</u> THEN	desired to s N P-33B and N perform th	start ICW Pump P-33A AND secure P-33B, P-33C are running, he following:		

#### CAUTION

- During filling of P-33A ICW pump following maintenance, air entrained in the ICW system following venting was carried throughout the system resulting air binding of ICW components. CR-ANO-1-2006-00612
- Restoration of an ICW pump following maintenance with ONLY one train of CRD cooling available should be evaluated prior to starting. Air entrained in the ICW pump discharge can degrade CRD cooling flow.

10.3.1 IF P-33A has been drained, THEN perform the following:

- A. Verify the following valves closed:
  - ICW Pump P-33A Disch Isol (ICW-3A)
  - ICW Pump P-33A Suct Isol (ICW-1A)
  - ICW Pump P-33A Vent (ICW-1193)
  - ICW Pump P-33A Disch Line Drain (ICW-1176A)
  - ICW Pump P-33A Suct Line Drain (ICW-1176B)
- B. Periodically monitor ICW expansion tank level during refill.

PROC./WORK PLAN NO. 1104.028		NORK PLAN TITLE:	PAGE: CHANGE:	35 of 118 029
	с.	Slowly open ICW-1A.		
	D.	Throttle open ICW-1176A.		
	Ε.	WHEN air is vented, THEN close ICW-1176A.		

Open ICW-3A.

Vent (ICW-1193).

Start P-33A.

this procedure.

Close ICW-1193.

standby pump start),

exhibit of this procedure.

WHEN P-33A has run at least 3 minutes,

F.

G.

Α.

Α.

10.3.2

10.3.3

10.3.4

10.3.5 Verify flow is normal (~2000 gpm) on ICW Coolers Inlet Flow

THEN stop P-33B.

10.3.6 Close A/B crossconnect valves:

Non-Nuc (FI-2218)(C09).

- A. ICW Pumps Discharge Crossconnect (CV-2238)
- B. ICW Pumps Suction Crossconnect (CV-2240)
- 10.3.7 IF installed, THEN perform the following to remove the plug installed on the ICW surge tanks drain line:
  - A. Close the following valves:
    - ICW Surge Tk T-37A Drn to Aux Bldg (ICW-130A)

Vent all of the CRD Cooling system components per

Vent P-33A as necessary by opening Non-Nuc ICW Pump P-33A

IF CRD cooling pumps indicate air binding (i.e.

lowering pump discharge pressure, flow oscillations or

THEN perform "Venting CRD Cooling System Components",

"Venting CRD Cooling System Components", exhibit of

- ICW Surge Tk T-37B Drn to Aux Bldg (ICW-130B)
- B. Remove plug from ICW surge tanks drain line.

1104.028

10.4 IF desired to start ICW Pump P-33C AND secure P-33B, <u>WHEN</u> P-33A and P-33B are running, THEN perform the following:

#### CAUTION

During filling of P-33A ICW pump following maintenance, air entrained in the ICW system following venting was carried throughout the system resulting air binding of ICW components. CR-ANO-1-2006-00612

- 10.4.1 IF P-33C has been drained, THEN perform the following:
  - A. Verify the following valves closed:
    - ICW Pump P-33C Disch Isol (ICW-3C)
    - ICW Pump P-33C Suct Isol (ICW-1C)
    - ICW Pump P-33C Vent (ICW-1194)
    - ICW Pump P-33C Disch Line Drain (ICW-1178A)
    - ICW Pump P-33C Suct Line Drain (ICW-1178B)
  - B. Periodically monitor ICW expansion tank level during refill.
  - C. Slowly open ICW-1C.
  - D. Throttle open ICW-1178A.
  - E. <u>WHEN</u> air is vented, <u>THEN</u> close ICW-1178A.
  - F. Open ICW-3C.
  - G. Vent all of the CRD Cooling System Components per "Venting CRD Cooling System Components", exhibit of this procedure.

PROC./WORK PLAN NO.	PROCEDURE/WORK PLAN TITLE: ICW SYSTEM OPERATING PROCEDURE		PAGE:	37 of 118
1104.028			CHANGE:	029
10.4	l.2 Vent (ICW	P-33C as necessary by opening Nuc IC -1194).	W Pump P-	33C Vent
	Α.	Close ICW-1194.		
10.4	1.3 Star	t P-33C.		
	Α.	IF CRD cooling pumps indicate air bi lowering pump discharge pressure, fl standby pump start), THEN perform "Venting CRD Cooling Sy exhibit of this procedure	nding (i. ow oscill vstem Comp	e. ations or ponents",
10.4	4.4 <u>WHEN</u> THEN	P-33C has run at least 3 minutes, stop P-33B.		
10.4	4.5 Veri Nucl	fy flow is normal (~2000 gpm) on ICW ear (FI-2219)(C09).	Coolers I	nlet Flow
10.4	4.6 Clos	e B/C Crossconnect Valves:		
	Α.	ICW Pump Discharge Crossconnect (CV-	-2239)	
	в.	ICW Pump Suction Crossconnect (CV-22	241)	
10.4	$\begin{array}{c} \text{4.7} & \underline{\text{IF}} \text{ i} \\ & \underline{\text{THEN}} \\ & \text{the} \end{array}$	nstalled, perform the following to remove the ICW surge tanks drain line:	plug inst	alled on
	Α.	Close the following valves:		
		• ICW Surge Tk T-37A Drn to Aux Blo	dg (ICW-13	30A)
		• ICW Surge Tk T-37B Drn to Aux Blo	dg (ICW-13	30B)
	В.	Remove plug from ICW surge tanks dra	ain line.	

## JOB PERFORMANCE MEASURE

Unit: <u> </u>			
JPM ID:	A1JPM-RO-EFW02		
System/Duty Area:	Emergency Feedwar	ter	
Task: <u>Manı</u>	ual Control of Emergency Fee	dwater Pump P-7A at the	Turbine
JTA# <u>ANO1-RO</u>	-EFW-NORM-7		
KA Value RO _3.2	1 SRO _ <u>3.4</u> KA Refe	erence: _061 A2.05	
Approved For Adm	inistration To: RO	X SRO	Х
Task Location: In	side CR C	Dutside CRX	Both
Suggested Testing	Environment and Method (Pe	erform or Simulate ):	
Plant Site: Sim	ulate Simulator:		_ Lab:
Position Evaluated:	RO:	SR(	D:
Actual Testing Envi	ironment: Plant Site	X Simulator	Lab
Teating Mathod: E		- · · ·	
resting method. r	errorm	Simula	te
Approximate Comp	enorm	Simula 10	Minutes
Approximate Comp Reference(s): <u>11</u>	oletion Time in Minutes:	Simula 10 n Exhibit C (Manual Contr	Minutes ol of EFW Pump P-7A)
Approximate Comp Reference(s):	oletion Time in Minutes:	10 10 Exhibit C (Manual Contr	Minutes ol of EFW Pump P-7A)
Approximate Comp Reference(s): <u>11</u> Examinee's Name:	oletion Time in Minutes:	10 10 Exhibit C (Manual Contr	Minutes Minutes ol of EFW Pump P-7A) KCN:
Approximate Comp Reference(s): <u>11</u> Examinee's Name:	oletion Time in Minutes: 06.006 EFW Pump Operation	Simula 10 n Exhibit C (Manual Contr	te Minutes rol of EFW Pump P-7A) KCN:
Approximate Comp Reference(s): <u>11</u> Examinee's Name: Evaluator's Name: The Examinee's pe	oletion Time in Minutes: 06.006 EFW Pump Operation	10 n Exhibit C (Manual Contr	Minutes  Ol of EFW Pump P-7A)  KCN:  ined in this JPM and is determined to be:
Approximate Comp Reference(s): <u>11</u> Examinee's Name: Evaluator's Name: The Examinee's pe Satisfactory:	oletion Time in Minutes: 06.006 EFW Pump Operation	Simula 10 n Exhibit C (Manual Contr ainst the standards conta Unsatisfactory:	Minutes  Tol of EFW Pump P-7A)  KCN:  ined in this JPM and is determined to be:
Approximate Comp Reference(s): <u>11</u> Examinee's Name: Evaluator's Name: The Examinee's pe Satisfactory:	oletion Time in Minutes: 06.006 EFW Pump Operation	Simula 10 n Exhibit C (Manual Contr ainst the standards conta Unsatisfactory:	Minutes Minutes Minutes KCN: KCN: Minutes Minu
Approximate Comp Reference(s): <u>11</u> Examinee's Name: Evaluator's Name: The Examinee's pe Satisfactory: Performance Check	erform 06.006 EFW Pump Operation 06.006 eFW Pump Operation erformance was evaluated aga klist Comments:	Simula 10 a Exhibit C (Manual Contr ainst the standards conta Unsatisfactory:	Minutes  rol of EFW Pump P-7A) KCN: ined in this JPM and is determined to be:
Approximate Comp Reference(s): <u>11</u> Examinee's Name: Evaluator's Name: The Examinee's pe Satisfactory: Performance Check	errorm oletion Time in Minutes: 06.006 EFW Pump Operation  	Simula 10 n Exhibit C (Manual Contr ainst the standards conta Unsatisfactory:	Minutes  Tol of EFW Pump P-7A)  KCN:  ined in this JPM and is determined to be:
Approximate Comp Reference(s):11  Examinee's Name: Evaluator's Name: The Examinee's pe Satisfactory: Performance Check	erform oletion Time in Minutes: 06.006 EFW Pump Operation	Simula 10 a Exhibit C (Manual Contr ainst the standards conta Unsatisfactory:	Minutes  rol of EFW Pump P-7A) KCN: ined in this JPM and is determined to be:
Approximate Comp Reference(s):11 Examinee's Name: Evaluator's Name: The Examinee's pe Satisfactory: Performance Check Start Time	errorm	Simula 10 n Exhibit C (Manual Contr ainst the standards conta Unsatisfactory: Time	Minutes  Tol of EFW Pump P-7A)  KCN:  ined in this JPM and is determined to be:  Total Time
Approximate Comp Reference(s):11 Examinee's Name: Evaluator's Name: The Examinee's pe Satisfactory: Performance Check Start Time *Signed	errorm	Simula 10 n Exhibit C (Manual Contr ainst the standards conta Unsatisfactory: Time Date	Minutes         rol of EFW Pump P-7A)         KCN:         ined in this JPM and is determined to be:         Total Time

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

JPM INITIAL TASK CONDITIONS:

- EFW Pump Turbine K3 tripped on overspeed due to a loss of electric signal to the speed controller.
- Power is unavailable to the speed controller/turbine control cabinet.
- P-7A turbine has been reset per Exhibit A (EFW Pump P-7A Overspeed Trip Reset).

INSTRUCTOR NOTE: FYI EFW Pump Turbine K3 steam admission valves are closed and the trip throttle valve is opened in 1106.006 Exhibit A.

TASK STANDARD:

EFW Pump P-7A running per section 1.0 of 1106.006 Exhibit C (at ~1400 discharge pressure).

## TASK PERFORMANCE AIDS:

Copy of 1106.006 Exhibit C (Manual Control of EFW Pump P-7A).

INITIATING CUE: The CRS/SM directs you to manually start EFW Pump P-7A and control at approximately 1400 psig discharge pressure per 1106.006 Exhibit C.

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT			
EXA	<ul> <li>EXAMINER NOTE:</li> <li>Potential question that can be asked during this JPM</li> <li>Q - Where are emergency flashlights available?</li> <li>A - Alternate Shutdown Locker located in the Control Room Extension Foyer</li> </ul>							
TRA	NSITION NOTE: Proceed to EFW pump room on 335' elevation in Con	trolled Access of Auxiliary Building.		· .				
с	<ol> <li>Close EFW Turbine K3 Trip/Throttle Valve (CV- 6601A).</li> <li><u>POSITIVE CUE</u>: Handwheel does NOT move any further in the clockwise direction and plate is in contact with the upper limit switch.</li> </ol>	Closed CV-6601A by rotating hand wheel in close direction (clockwise).						
С	<ol> <li>Request control room to open EFW Turbine K3 Steam Admission valve (CV-2613 or CV-2663).</li> <li><u>NEGATIVE CUE</u>: Control Room reports unable to open steam admission valves</li> </ol>	Called control room and requested CV-2613 or CV-2663 to be opened.						
INST	RUCTOR CUE When the operator simulates notifying the control roor power available to CV-2613 or CV-2663 and direct hir	m to open CV-2613 or CV-2663, tell h n as the CRS to open CV-2613 manu	nim that ually.	there is	no			
С	3. Open CV-2613 Manually <u>POSITIVE CUE:</u> CV-2613 indicates open locally	Engaged manual handwheel and rotated handwheel in the counter- clockwise direction until it stopped. Verified stem rises on the valve by observing the stem as the valve is opened.						
С	<ul> <li>4. Open EFW Turbine K3 Trip/Throttle valve (CV-6601A).</li> <li><u>POSITIVE CUE</u>: Pump discharge pressure (PI-2911A) is approximately 1400 psig.</li> <li><u>NEGATIVE CUE</u>: Pump discharge pressure (PI-2911A) is approximately 500 psig.</li> </ul>	Slowly opened CV-6601A (counter clockwise) until approximately 1400 psig discharge pressure (PI- 2911A) was attained.						

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
	<ul> <li>5. Monitor turbine speed indication (if available) to ensure turbine does not exceed 3776 RPM or pump discharge pressure at ~1400 psig.</li> <li><u>POSITIVE CUE</u>: Turbine speed is ~ 3650 RPM as indicated on the REED TACHOMETER (SI-6602) and pump discharge pressure (PI-2911A) ~1400 psig. Speed indication on local panel (SI-6601A) indicates 0 rpm</li> </ul>	Checked turbine speed locally (SI- 6602) at approximately 3650 RPM <u>or</u> monitored pump discharge pressure indication (PI-2911A) and maintained at ~1400 psig.			

END

## INITIAL CONDITIONS:

- EFW Pump Turbine K3 tripped on over speed due to a loss of electric signal to the speed controller.
- Power is unavailable to the speed controller/turbine control cabinet.
- P-7A turbine has been reset per Exhibit A (EFW Pump P-7A) Overspeed Trip Reset).

## **INITIATING CUE:**

The CRS/SM directs you to manually start EFW Pump P-7A and control at approximately 1400 psig discharge pressure per 1106.006 Exhibit C.



ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE				
TITLE: EMERGENCY FEEDWATER PUMP OPERATION		DOCUMENT NO. 1106.006	CHANGE NO. 080	
		WORK PLAN EXP. DATE N/A	IPTE	
SET #				
		⊠YES □NO		
		PROGRAMMATIC EXCLU	JSION PER EN-LI-100	
When you see the	ese <u>TRAPS</u>	Get these TOOL	<u>.S</u>	
	Time Pressure	Effective C	ommunication	
	Distraction/Interruption	Questionir	ng Attitude	
	Multiple Tasks	Placekeep	ing	
	Over Confidence	Self Check		
	Vague or Interpretive Guidance	Peer Check		
	First Shift/Last Shift	Knowledge	9	
	Change/Off Normal	Procedure	S	
	Physical Environment		ıy	
	Mental Stress (Home or Work)	Turnover		
VERIFIED BY	DATE		TIME	
	÷			
	RIFICATION COVER SHEET	FORM 1000.	IO. CHANGE NO. 006A 054	

1106.006

CHANGE: 080

#### 1106.006

04/03/04

EXHIBIT C

Page 1 of 2

## MANUAL CONTROL OF EMERGENCY FEEDWATER PUMP P-7A

NOTE

Loss of electrical signal to the speed controller or loss of control oil pressure will allow EFW Turbine K3 Gov Servo (CV-6601B) to travel full open and cause an overspeed trip of the turbine.

1.0 <u>IF EFW Pump Turbine K3 tripped either on loss of electric signal to speed controller</u> <u>OR on loss of control oil pressure</u> <u>AND fault cannot be corrected</u>,

THEN turbine speed may be manually controlled as follows:

- 1.1 Reset trip per Exhibit A, "Emergency Feedwater Pump P-7A Overspeed Trip Reset".
- 1.2 Close EFW Turbine K3 Trip/Throttle Valve (CV-6601A) by turning handwheel fully clockwise.
- 1.3 Open EFW Pump Turbine K3 Steam Admission Valve (CV-2613 or CV-2663).
- 1.4 Slowly open CV-6601A by turning handwheel counterclockwise until desired turbine speed or discharge pressure is reached.

#### CAUTION

Exceeding turbine speed of 3776 RPM may result in excessive discharge pressure with P7A suction aligned to Service Water.

- 1.5 Monitor turbine speed OR pump discharge pressure.
  - 1.5.1 Throttle CV-6601A as necessary to maintain pump discharge pressure ~1400 psig at EFW P-7A Discharge Pressure (PI-2811A) OR as directed by control room personnel.
  - 1.5.2 IF turbine speed indication is available, THEN control turbine speed ~3650 RPM.
  - 1.5.3 <u>WHEN</u> failure is corrected, <u>THEN</u> slowly open CV-6601A fully while monitoring for proper speed control by the governor valve
    - A. Close CV-6601A 3/4 turn to prevent binding on heatup.
  - 1.5.4 Verify P-7A TURBINE TRIP (K12-B5) clear.

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#### 1106.006

#### EXHIBIT C

04/03/04

Page 2 of 2

#### MANUAL CONTROL OF EMERGENCY FEEDWATER PUMP P-7A

2.0 <u>IF</u> EFW Pump Turbine K3 is in operation, <u>AND</u> manual control is being taken to avoid loss of P-7A due to anticipated loss of control power, THEN perform the following:

NOTE

The following step will result in a P-7A TURBINE TRIP (K12-B5) alarm.

- 2.1 Slowly throttle closed on EFW Turbine K3 Trip/Throttle Valve (CV-6601A), until EFW Turbine K3 Gov Servo (CV-6601B) is full open, AND EFW P-7A Discharge Pressure (PI-2811A) drops slightly.
- 2.2 Notify control room personnel of the following:
  - Manual control of P-7A has been established
  - EFW P-7A Turbine Control Power breaker (D21-30) may be opened, if required

#### CAUTION

Exceeding turbine speed of 3776 RPM may result in excessive discharge pressure with P7A suction aligned to Service Water.

2.3 Monitor turbine speed or pump discharge pressure.

- 2.3.1 Throttle CV-6601A as necessary to maintain pump discharge pressure ~1400 psig at EFW P-7A Discharge Pressure (PI-2811A) OR as directed by control room personnel.
- 2.3.2 IF turbine speed indication is available, THEN control turbine speed  $\sim$ 3650 RPM.
- 2.4 WHEN failures are corrected AND control power is regained, THEN perform the following:
  - 2.4.1 Verify breaker D21-30 is closed.
  - 2.4.2 Slowly open CV-6601A fully while monitoring for proper speed control by the governor valve.
    - A. Close CV-6601A 3/4 turn to prevent binding on heatup.

## JOB PERFORMANCE MEASURE

Unit:1 Rev #	2	Date:			
JPM ID: A1JPM-RO-ED022					
System/Duty Area: Electrical Distribution S	ystem				
Task: Inverter Y11 Shutdown with RS1 Supp	lied from Y-11 Alternate AC S	Source			
JTA# _ANO1-RO-120AC-NORM-11					
KA Value RO SRO KA Re	eference: 062 A4.07				
Approved For Administration To: RO	X SRO	Х			
Task Location: Inside CR	Outside CR X	Both			
Suggested Testing Environment and Method (I	Perform or Simulate ):				
Plant Site:Simulate Simulator:	I	Lab:			
Position Evaluated: RO:	SRO:				
Actual Testing Environment: Plant Site	X Simulator	Lab			
Testing Method: Perform	Simulate	X			
Approximate Completion Time in Minutes:	10	Minutes			
Reference(s): 1107.003 Section 8.6					
Examinee's Name:		KCN:			
Evaluator's Name:					
The Examinee's performance was evaluated a	gainst the standards containe	d in this JPM and is determined to be:			
Satisfactory:	Unsatisfactory:				
Performance Checklist Comments:					
Stor	Time	Total Time			
Start Time					
*Signed	Date				

\*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

JPM INITIAL TASK CONDITIONS:

Plant is in Cold Shutdown MODE 5. Electricians are standing by in their shop if needed.

TASK STANDARD:

Inverter Y-11 is shutdown and inverter loads are being supplied from Alternate AC Power Source.

TASK PERFORMANCE AIDS:

1107.003 Inverter and 120V Vital AC Distribution, Section 8.6.

INITIATING CUE: The CRS/SM directs you to perform Inverter Y11 Shutdown with RS1 to remain in service supplied from Y11 Alternate Source. The CRS/SM has entered all applicable TS Conditions and associated time clocks.

CRITICAL STEPS: \_\_\_\_\_2, 4, 5, 6\_\_\_\_\_

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT
	1. Check Inverter Y11 UNIT IN SYNC light is ON and frequency is between 59.7 and 60.3 hertz.	Verified Y11 UNIT IN SYNC light ON and frequency between 59.7 and 60.3 hertz.			
	Y11 unit in Sync light (GREEN) is ON				
	and frequency on meter (E1) is 60 hertz.				
	2. Shift inverter Y11 to the alternate AC source.	Depressed Y11 ALTERNATE SOURCE TO LOAD push-button (PB-1101).			
C	POSITIVE CUE:				
	Inverter Y11 ALTERNATE SOURCE TO LOAD push-button (PB-1101) depressed.				
EXAM	INER NOTE: The following is additional	information, is not provided by the proce	dure, and i	s not part o	f the
standa	IN SYNC (groop) ON	ep, the Inverter should have this indication	on:		
	- INVERTER SUPPLYING L	OAD (areen) OFF			
	- ALT SOURCE SUPPLYING	G LOAD (amber) ON			
	- S1 IN ALT SOURCE POSI	TION (amber) OFF			
	<ul> <li>Y11 TO RS1 (amber) ON</li> </ul>				
	<ul> <li>ALL meters remain the san</li> </ul>	ne			
	· · · · · · · · · · · · · · · · · · ·	-			•
	3. At inverter Y11 verify ALTERNATE SOURCE SUPPLYING LOAD light ON and INVERTER SUPPLYING LOAD light OFF.	Verified alternate source supplying load by observing ALTERNATE SOURCE SUPPLYING LOAD light ON and INVERTER SUPPLYING LOAD light OFF.			
	POSITIVE CUE:				
	Alternate source supplying load light (AMBER) ON and inverter supplying load light (GREEN) OFF.				
	NEGATIVE CUE:				
	Inverter supplying load light (GREEN) ON and alternate source supplying load light (AMBER) OFF.				

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UNSAT			
EXAM standa	EXAMINER NOTE: The following is additional information, is not provided by the procedure, and is not part of the standard. After performance of the following step, the Inverter should have this indication:							
	- IN SYNC (green) ON							
	- S1 IN NORMAL SOURCE POSITION (green) OFF							
	<ul> <li>INVERTER SUPPLYING L</li> </ul>	OAD (green) OFF						
	- ALT SOURCE SUPPLYING	G LOAD (amber) ON						
	<ul> <li>S1 IN ALT SOURCE POSI</li> </ul>	TION (amber) ON						
	<ul> <li>Y11 TO RS1 (amber) ON</li> </ul>							
	<ul> <li>ALL meters remain the san</li> </ul>	ne						
с	4. Place Y11 manual selector switch (HS-1122) in the ALTERNATE SOURCE TO LOAD position.	Placed the Y11 manual selector switch (bottom switch) to the ALTERNATE SOURCE TO LOAD position.						
	POSITIVE CUE:							
	Y11 manual selector switch (HS-							
	1122) is in the ALTERNATE							
	SOURCE TO LOAD position.							
	INER NOTE: After performance of the fo	llowing step, Inverter indication does NC	OT change.					
			I		I			
	5. Open Inverter Y11 INVERTER OUTPUT breaker on front of Inverter Y11.	Inverter Y11 INVERTER OUTPUT breaker was moved to the open position.						
C	POSITIVE CUE							
	Inverter Output breaker (B2) indicates							
	open.							
EVAN	NER NOTE: The following is additional i	information is not provided by the proce	dure endi					
standa	rd. After performance of the following sta	ep, the Inverter should have this indication	on:	s not part o	r the			
	<ul> <li>All lights remain the same</li> </ul>							
	- Y11 120VDC INPUT goes	to zero						
	<ul> <li>Y11 FREQUENCY OUTPU</li> </ul>	IT might go to some value other than 60						
	<ul> <li>ALL other meters remain the same since they are downstream of the manual selector switch or indicate Alternate Source status.</li> </ul>							
	6 Open investor V11 DC INDUT	Inverter V11 DC INDUT breeker wee	1	1	I			
	breaker on front of Inverter Y11.	moved to the open position.						
C								
	POSITIVE CUE: DC INPLIT breaker (B1) indicates	·	*****					
	open and Inverter Output Volt Meter							
	(V2) indicates zero.							
L			1		L			

## **INITIAL CONDITIONS:**

Plant is in Cold Shutdown MODE 5. Electricians are standing by in their shop if needed.

## **INITIATING CUE:**

The CRS/SM directs you to perform Inverter Y11 Shutdown with RS1 to remain in service supplied from Y11 Alternate Source. The CRS/SM has entered all applicable TS Conditions and associated time clocks.

#### **INVERTER AND 120V VITAL AC DISTRIBUTION**

#### CAUTION

Improper breaker operation can result in loss of power to a vital 120V AC panel that could cause a plant trip or upset.

#### NOTE

- In Modes 1-4, maintaining RS1 energized from inverter Alternate Source requires entry into TS 3.8.7 Condition A.
- If in Mode 5 or 6, any TS component required by TS 3.8.10 which is supplied by an Inverter on Alternate Source, requires entry into TS 3.8.8 Condition A.
- Steps in this section are expected to bring in alarm RS1 INVERTER TROUBLE K01-A5.
- Due to past problems with inverter transfers, it is recommended that Electrical Maintenance personnel are present for routine inverter transfers.
  - 8.6 Inverter Y11 Shutdown with RS1 to Remain in Service Supplied from Y11 Alternate Source
    - 8.6.1 Enter applicable TS Condition and associated time clock.
    - 8.6.2 IF RS1 NOT on Y11 Alternate Source, <u>THEN</u> perform the following to transfer RS1 to Y11 Alternate Source:
      - A. Check Inverter Y11 UNIT IN SYNC light is ON by direct observation OR Electrical Maintenance verification.
      - B. Check Inverter Y11 frequency is between 59.7 and 60.3 hertz.

#### CAUTION

Transferring out of sync can cause loss of load. If UNIT IN SYNC light is NOT on, Electrical Maintenance assistance is required.

- C. Depress Y11 ALTERNATE SOURCE TO LOAD pushbutton (PB-1101).
- D. Check Y11 ALTERNATE SOURCE SUPPLYING LOAD light ON by direct observation OR Electrical Maintenance verification.
- E. Check Y11 INVERTER SUPPLYING LOAD light off.

## **INVERTER AND 120V VITAL AC DISTRIBUTION**

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CHANGE: 020

#### NOTE

- If ALTERNATE SOURCE SUPPLYING LOAD light is on, the load remains on Alternate Source regardless of position of manual selector switch.
- If manual selector switch is in ALTERNATE SOURCE TO LOAD position, the load remains on Alternate Source regardless of position of static switch.

8.6.3 Place Y11 manual selector switch (HS-1122) in ALTERNATE SOURCE TO LOAD position.

#### NOTE

- Idle inverters should be shut down to minimize extra heat generation in the room.
- Idle inverters may remain energized for maintenance activities.

8.6.4 Perform the following to shutdown Inverter Y11:

- A. Open Inverter Y11 INVERTER OUTPUT breaker on front of Inverter Y11.
- B. Open Inverter Y11 DC INPUT breaker on front of Inverter Y11.

Electrical or N/A

M ID:	A1JF	PM-RO-GRW01			
			JOB PERFORMA	NCE MEASUR	RE
Unit:	1	Rev #	2	2	Date:
JPM ID:		A1JPM-RO-GRW01			
System/Duty	Area:	Gaseous Radwaste	/ Radioactivity Re	lease	
Task: Com	mence V	Waste Gas Decay Tar	nk Release		
JA# ANO	1-WCO-	-GZ01-NORM-11			
KA Value RO	3.1	SRO K	A Reference 07	71 A4.26	
Approved For	Admini	stration To: RO	X	SRO	Χ
Task Locatior	n: Inside	e CR:	Outside CR:	Х	Both:
Suggested Te	esting E	nvironment And Meth	od (Perform Or Si	imulate #):	
Plant Site:	Simu	lateSimulator:			Lab:
Position Eval	uated: I	RO:		SRO:	
Actual Testing	g Envirc	onment: Simulator :		Plant Site:	X Lab
Testing Meth	od: Sim	ulate:	Х	Perform:	
Approximate	Comple	tion Time In Minutes:			15 Minutes
Reference(s)	: 110	04.022, Chg. 033-01-0	), Att. C		
Examinee's N	lame:				KCN:
	-				
Evaluator's N	ame:				
The Examine Satisfact	e's perf ory:	ormance was evaluat	ed against the sta Unsati	ndards contain sfactory:	ed in this JPM and is determined to be:
Performance	Checkli	ist Comments:			
Start Time			Stop Time		Total Time
*Signed				Date:	

\*Signature indicates this JPM has been compared to its applicable procedure by a qualified individual (not the examinee) and is current with that revision.

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

The examiner should verify that the examinee has been briefed per the JPM Examination Briefing Sheet EN-TQ-114 Attachment 9.5.

JPM INITIAL TASK CONDITIONS:

The Shift Chemist has returned Gaseous Release Permit 1GW-2011-002 to the Control Room for T-18A Waste Gas Decay Tank.

TASK STANDARD:

Release commenced per 1104.022, Att. C, at flow rate specified.

TASK PERFORMANCE AIDS:

1104.022, Att. C, Completed and place-kept through step 4.3.1.

INITIATING CUE: The CRS directs you to commence T-18A release beginning with step 4.3.2 of 1104.022, Att. C.

Ç	RITICAL ELEMENTS (c): 1, 3, 6 and 7				1 1 1 1
C	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	SAT
С	<ol> <li>Open T-18A outlet valve.</li> <li><u>POSITIVE CUE:</u></li> <li>GZ-13A open (stem out) and verified by second operator.</li> </ol>	Operator opened T-18A outlet valve, GZ-13A.			
	<ol> <li>Verify other decay tank outlet isolations closed.</li> <li><u>POSITIVE CUE:</u> GZ-13B/C/D closed.</li> </ol>	Operator verified outlet valves GZ-13B/C/D closed.			
EXA •	MINER NOTE: IF a Hold Card is present on GZ-15, tell the examinee to	ignore the Hold Card for the purpo	se of thi	s JPM.	
С	<ol> <li>Open CV-4820 outlet isolation GZ-15.</li> <li><u>POSITIVE CUE:</u> GZ-15 is open (stem out).</li> </ol>	Operator opened CV-4820 outlet isolation GZ-15.			
TR/	ANSITION NOTE: The examinee should proceed to the 354' elevation.				-
	<ol> <li>Notify control room of intent to begin release.</li> <li><u>POSITIVE CUE:</u> Control Room notified.</li> </ol>	Operator contacted control room and informed them of intent to begin release.			
	5. Record release data. <u>POSITIVE CUE:</u> Data recorded and chart recorders marked.	Operator recorded in Att. C Release number, start time, date and tank being released and marked chart recorders with same information. Operator will contact control room and have them mark RR-4830 (Process Radiation Monitor Effluent Recorder).			
EX/	AMINER CUE: Inform the examinee that annunciator K115-C5, WASTE	E GAS DECAY TK HDR PRESS HI	is in ala	rm.	
С	<ul> <li>6. Hold HS-4820 in the open position</li> <li><u>POSITIVE CUE:</u></li> <li>HS-4820 is held in the OPEN position</li> </ul>	Operator placed HS-4820 in OPEN position and held it.			

С	PERFORMANCE CHECKLIST	STANDARD	N/A	SAT	UN SAT
EX/ •	MINER CUE: When the examinee opens CV-4820 using HIC-4820 (w WASTE GAS DECAY TK HDR PRESS HI alarm is clea	/hile holding HS-4820), inform the e r. (at this point the examinee may re	xaminee elease H	that K1 S-4820)	15-C5,
С	<ul> <li>Open discharge header flow control valve.</li> <li><u>POSITIVE CUE:</u> CV-4820 (using HIC-4820 on C115) opened and data recorded. Annunciator K115-C5 is clear and HS-4820 has been released.</li> <li><u>NEGATIVE CUE:</u> Inform the examinee that the initial flow rate is greater than the allowed flow rate on the preliminary report. If negative cue provided then the examinee should adjust the flow controller (HIC-4820 on C115) for CV-4820 to throttle the valve closed and reduce the flow rate.</li> </ul>	Operator opened CV-4820 and established release flow rate listed on preliminary report.			
EX/	AMINER NOTE: Remaining steps are continuous action steps until relea	ase is complete.		- - -	

END

## **INITIAL CONDITIONS:**

- The Shift Chemist has returned Gaseous Release Permit 1GW-2011-002 to the Control Room for T-18A Waste Gas Decay Tank.
- A Pre-Job brief has been conducted and a second operator is available for verification of reach rod operated valves.

INITIATING CUE:

The CRS directs you to commence T-18A release beginning with step 4.3.2 of 1104.022, Att. C.

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE						
TITLE: GASEOUS R	ADWASTE SYSTEM	DOCUMENT NO. 1104 022	CHANGE NO. 035			
		WORK PLAN EXP. DATE				
SET#		N/A SAFETY-RELATED ⊠YES □NO TEMP MOD _	IPTE			
			CONTINUOUS			
When you see the	ese <u>TRAPS</u>	Get these <u>TOOL</u>	<u>S</u>			
	Time Pressure	Effective Co	ommunication			
	Distraction/Interruption	Questioning	g Attitude			
	Multiple Tasks	Placekeepi	ng			
	Over Confidence	Self Check				
	Vague or Interpretive Guidance	Peer Check				
First Shift/Last Shift		Knowledge				
Peer Pressure		Procedures	;			
Change/Off Normal		Job Briefing				
	Physical Environment	Coaching				
	Mental Stress (Home or Work)	Turnover				
VERIFIED BY	Y DATE		TIME			
FORM TITLE:	ERIFICATION COVER SHEET	FORM N 1000.0	0. CHANGE NO. )06A 054			

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PROC./WORK PLAN NO. 1104.022	PROCEDURE/WORK PLAN TITLE: GASEOUS RADWASTE SYSTEM	PAGE: CHANGE:	44 of 52 035
	ATTACHMENT C GASEOUS RELEASE PERMIT	Ρ	age 1 of 9
permit # <u>IGw</u>	2011-002 (Assigned by Chemistry) 7-29- Da	<u>201)</u> Ite	
A REQUEST	(Operations) Waste Gas Decay Tank (circle one):		Dik
(1.2)	T-18A T-18B T-18C T-18D Initial tank pressure <u>85</u> psig.		Del
If plant a held for a	NOTE M nd tank conditions permit, short-lived gaseous activ minimum of 30 days to allow for decay.	vity shou	ld be
(1.3)	Ensure tags have been hung on tank to be released pe "Waste Gas Decay Tanks (T18A thru D)" section of the procedure.	er is	Dul
	Date tags hung: $(c - 12 - 2011)$		
(1.4)	IF short-lived gaseous activity is present, THEN perform one of the following:		Δ
L A	Hold tank contents for a minimum of 30 days. A Explain why tank contents must be released in $<30$ N/A	0 days.	NA
(1.5)	Check Gaseous Radwaste Process Monitor (RI-4830) av by one of the following methods (ODCM App.1, 2.2-2.	ailable 1.a): verify e with a	N/A
Ç	1.5.2       IF monitor count rate >1000 cpm, THEN verify that count rate is <8.9E6.	ed, able for	DM N/A
PROCEDURE/WORK PLAN TITLE: PROC./WORK PLAN NO. PAGE: 45 of 52 GASEOUS RADWASTE SYSTEM 1104.022 035 CHANGE: ATTACHMENT C Page 2 of 9 Shift Manager/CRS Approval Submitted to Chemistry for analysis UL Date 7-29-11 Time 0430 bv: ANALYSIS (Chemistry) for gamma spectroscopy obtained 7-18A Sample of tank WAEV mm Record M&TE number CR0-026 Cal Expiration Date 10-21-11 NOTE If an independent sample and analysis is needed per step 2.4, independent sampling and analysis may be performed concurrently with the following steps. Wina man Gamma spectroscopy performed by: Gamma spectroscopy report reviewed by: Frank IF Gaseous Radwaste (RI-4830) is inoperable  $\overline{\text{OR}}$  is unavailable (per steps 1.5 or 3.5.1), THEN perform the following: OTHERWISE mark 2.4.1 and 2.4.2 N/A. (ODCM App.1, Table 2.2-1) An independent sample shall be obtained and analyzed. Independent sample and analysis performed by: Date N/A An independent verification of computer input data shall be performed. Independent verification performed by: Date Preliminary release report generated by: 1 UNNEW Tank pressure at which release is to be terminated psiq IUVNEV Brock by: SPING 2 setpoint value(s) adjusted per 1604.051 and Form 1604.051E VENER Brown by: <sup>°</sup> Preliminary report returned to operations Turner Brown Date 7-29-11 Time 0700 by:

1104.022

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## ATTACHMENT C Page 3 of 9 VERIFICATION OF TECH SPEC COMMITMENTS (Operations) Verify Waste Gas Decay Tank circled in step 1.1 is the same tank as: Tank that was sampled in step 2.1 and Same tank as listed on preliminary report. Verify appropriate signature on preliminary report. M Verify no other Unit 1 gaseous release in progress. Verify Radwaste Area Exhaust Fan (VEF-8A or VEF-8B) running (circle one). Verify SPING 2 Radwaste Area (RX-9825) status is "Normal" on RDACS (ODCM App. 1, 2.2-2.2.a, b, and c). IF Gaseous Radwaste (RI-4830) is operable AND is available, THEN verify proper operation of the associated interlocks and the Gaseous Waste DISCH Flow (FR-4831) as follows: (ODCM App.1, Table 2.2-1). OTHERWISE mark step 3.5 N/A and GO TO step 3.6. Check Gaseous Radwaste Process Monitor (RI-4830) available by one of the following methods (ODCM App.1, 2.2-2.1.a): ANA IF monitor count rate is ≤1000 cpm, THEN select CHECK SOURCE on RI-4830 AND verify that the monitor responds to check source with a count rate rise >100 cpm. IF monitor count rate >1000 cpm, THEN verify that count rate is <8.9E6. IF neither A nor B above can be satisfied, THEN RI-4830 shall be considered unavailable AND N/A the remainder of this step. Verify tank outlet valves closed: T-18A Outlet Isolation (GZ-13A) (JT-18B Outlet Isolation (GZ-13B) T-18C Outlet Isolation (GZ-13C) T-18D Outlet Isolation (GZ-13D) Verify Station Vent Discharge Valve (CV-4830) open. Verify FR-4831 indicates system flow from T-17 purge.

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PROCEDURE/WORK PLAN TITLE: PROC./WORK PLAN NO. 48 of 52 PAGE: GASEOUS RADWASTE SYSTEM 1104.022 035 CHANGE: ATTACHMENT C Page 5 of 9 Shift Manager/CRS approval to proceed with release: R NOTER Simultaneous radioactive gaseous releases are not permitted. SM/CRS Unit 1 SM/CRS Unit 2 RELEASE (Operations) 4.0 IF Gaseous Radwaste (RI-4830) is operable AND is available, THEN perform the following: AM Record RI-4830 pre-release, .1.2 as-found setpoint: <u>ZBE3</u> cpm. Record Setpoint from preliminary report: UN Setpoint: <u>3.4E5</u> cpm IF setpoint from preliminary report is <50,000 cpm, THEN 50,000 cpm should be used as this release setpoint. Adjust setpoint to 3.4E5 cpm (from preliminary report, or 50,000 cpm, whichever is greater). Licensed Operator, other than individual A who initially set RI-4830 setpoint independently verify correct RI-4830 setpoint from preliminary report. E Independent verification by INC Verify T-18s Discharge to Gaseous Radwaste Discharge Header Flow Control Valve (CV-4820) closed. Align T-18 for release as follows: MC Remove tag on the T-18 outlet valve. 4

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### ATTACHMENT C

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#### NOTE

The following step can cause the alarm "T-18 DISCHARGE LINE PRESSURE HIGH" and is expected for this alignment. Alarm should clear when release starts.

- 4.3.2 Open the outlet value of the tank to be released. Check the  $(\checkmark)$  value that is opened.
  - ( ) T-18A Outlet Isolation (GZ-13A)
    ( ) T-18B Outlet Isolation (GZ-13B)
    ( ) T-18C Outlet Isolation (GZ-13C)
    ( ) T-18D Outlet Isolation (GZ-13D)
- 4.3.3 Verify other outlet isolations closed.
- 4.3.4 IF Gaseous Radwaste (RI-4830) is inoperable OR is unavailable, THEN perform independent verification of step 4.3 (ODCM App.1, Table 2.2-1).

Independent verification \_\_\_\_\_

- 4.4 Open CV-4820 Outlet Isol (GZ-15).
- 4.5 Notify control room of intent to begin release.
- 4.6 Record the following data:
  - Release Permit Number
  - Release Start Time \_\_\_\_\_\_
  - Date \_\_\_\_\_

• Tank being released \_\_\_\_\_

4.6.1 Mark the same data on the following recorders:

- Gaseous Waste DISCH Flow (FR-4831)
- Process Radiation Monitoring Effluent Recorder (RR-4830)

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### ATTACHMENT C

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### NOTE

If "T-18 DISCHARGE LINE PRESSURE HIGH" alarm is present, then HS-4820 must be held in the open position while operating HIC-4820. When alarm is clear, then HS-4820 may be released.

- 4.7 While monitoring FR-4831, slowly operate HIC-4820 to open CV-4820 and establish the release flow rate listed on the preliminary report:  $\leq 10^{-10}$  cfm (ODCM App.1, 2.2-2.1.b).
- 4.8 IF CV-4830 trips closed during release due to high radiation, THEN this release shall be terminated per Waste Gas Discharge Line Radiation High (1203.006).

### NOTE

An empty and isolated T-18 can pressurize during a release due to pressure in the discharge header leaking back through a discharge valve that is not gas tight. To ensure that the second T-18 was pressurized from the releasing tank it must meet the following criteria:

- Initial T-18 pressure was ~0 psig.
- Pressure rise began when release path aligned.
- No other venting or no Waste Gas Compressor operation was in progress.
- No other T-18 experienced a coincident pressure drop.

Under this condition the release may continue.

- 4.9 WHEN tank pressure is ~ \_\_\_\_\_psig (value listed in step 2.6 of this attachment), THEN terminate release as follows:
  - 4.9.1 Close CV-4820.
  - 4.9.2 Verify flow rate on FR-4831 drops to the approximate flow setup for T-17 purge.
  - 4.9.3 Close CV-4820 Outlet Isol (GZ-15).

4.10 Notify control room that release is complete.

- 4.11 Record the following data:
  - Time release completed \_\_\_\_\_\_
  - Date \_\_\_\_\_
  - Release permit number \_\_\_\_\_\_
  - 4.11.1 Mark same data on the following recorders:
    - FR-4831
    - RR-4830

PROC./WORK PLAN NO. 1104.022	PROCEDURI	PAGE: CHANGE:	51 of 52 035	
		ATTACHMENT C	I	Page 8 of 9
4.12	Close outl Check (✔)	let valve of tank that was released. the valve that is closed:		
	( ) GZ-1 ( ) GZ-1 ( ) GZ-1 ( ) GZ-1	3A 3B 3C 3D		
4.13	Remove tag	g from inlet valve of tank that was release	ed.	
4.14	Record fir	nal tank pressurepsig.		
4.15	Pressurize	e tank released to ~2 psig with $N_2$ as follo	ws:	
	4.15.1	Place $N_2$ to T-18s regulator (PCV-4805) int service as follows:	20	
		A. Open the following valves:		
		• PCV-4805 Inlet Valve $(N_2-4805-1)$ • PCV-4805 Outlet Valve $(N_2-4805-2)$		
		B. Set PCV-4805 at ~15-18 psig.		
	4.15.2	Momentarily open $N_2$ supply to tank. Check ( $\checkmark$ ) the valve that is opened:		
		( ) T-18A $N_2$ Inlet Isol ( $N_2$ -15) ( ) T-18B $N_2$ Inlet Isol ( $N_2$ -16) ( ) T-18C $N_2$ Inlet Isol ( $N_2$ -17) ( ) T-18D $N_2$ Inlet Isol ( $N_2$ -18)		
		A. Close the T-18 $\ensuremath{\text{N}}_2$ Inlet Isol opened	above.	
	4.15.3	IF nitrogen to T-18s is no longer require $\frac{\text{THEN}}{\text{THEN}}$ close the following values:	ed,	
		• PCV-4805 Inlet Valve (N <sub>2</sub> -4805-1)		
		• PCV-4805 Outlet Valve (N2-4805-2)		

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		ATTACHMENT C	I	Page 9 of 9
4.16	Purge and	restore RE-4830 as follows:		
	4.16.1	Raise Waste Gas Surge Tank (T-17) pressur greater than atmospheric but below 16.9 p avoid start of Waste Gas Compressor (C-9A C-9B) by slightly opening PCV-4812 Bypass $(N_2-4812-3)$ .	e to sia to . or Valve	
	4.16.2	IF RE-4830 was operable for this release $\overline{\text{AND}}$ RE-4830 has been purged to minimum re $\overline{\text{THEN}}$ perform one of the following:	ading,	
		• Adjust alarm setpoint to the as-found setpoint recorded previously for this release, or		
		• Adjust to new setpoint by performing Radiation Monitoring System Check and (1305.001) Supplement 5 for RI-4830.	Test	
	4.16.3	Verify $N_2$ -4812-3 closed.		
	4.16.4	Check PCV-4812 maintains T-17 pressure gr than atmospheric pressure.	reater	
		A. <u>IF</u> PCV-4812 does NOT maintain adequation pressure, <u>THEN</u> verify WR/WO initiated to check setpoint.	ate T-17 K	
	Performed	by	Ops	
	Accepted b	by	SM/CRS	
4.17	Permit and final anal	d preliminary report returned to Chemistry lysis of data.	for	
5.0 SPING Re	estoration	(Chemistry)		
5.1	Adjust SPI	ING 2 setpoint per Form 1604.051E.		
	Chemistry	Supervisor Date		

**Simulator Outline** 

Form ES-D-1

Facility: ANO-1			Scenario No.: 1	Op-Test No.: 2011-1	
Examiners:			Operators:		
Initial ( • • • • • • •	Conditions: ~80% Power 250 EFPD Need to Drain RB RB fire alarm exhi <b>/er:</b> ~80% Power 250 EFPD Need to Drain RB required.	Sump bit posted Sump to 40%	. This is not the first drair	ning of the month and sampling is not	
Event No.	Malf. No.	Event Type*	Event Description		
1	CV4400	C-(BOP) C-(SRO) TS	Perform Draining of the Reactor Building Sump per 1104.014 with failure of CV-4400 to close. (Technical Specification 3.6.3, Reactor Building Isolation Valves)		
2	RC464	C-(ATC) C-SRO) TS	Small RCS leak in HPI line (C HPI Line) (Technical Specification 3.4.13, RCS Leakage.)		
3	DI_ICC0009R DI_ICC0009L	C-(ATC) C-(SRO)	Unit Load Demand fails to respond		
4		R-(ATC) N-(BOP)	Power reduction/ Plant	Shutdown	
5	DI_A113R	C-(BOP)	A112 fails to open automatically during transfer of auxiliaries		
6	RC464	M-(ALL) CT	RCS leakrate rises requiring Rx Trip and loss of Subcooling Margin. Trip all running Reactor Coolant Pumps within 2 minutes of a Loss of Subcooling Margin.		
7	CV063	C-(BOP) C-(SRO)ts CT	ES HPI pump trips post ESAS actuation (Technical Specification 3.5.2, ECCS – Operating)		
(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

## **Scenario 1- Objectives**

- 1) Evaluate individual ability to perform Draining of the Reactor Building Sump
- 2) Evaluate individual ability to identify and respond to excess RCS leakage inside the reactor building
- 3) Evaluate individual ability to perform a plant power reduction
- 4) Evaluate individual ability to identify and respond to Integrated Control System component failure
- 5) Evaluate individual ability to perform electrical breaker operations
- 6) Evaluate individual ability to identify and respond to failures associated with electrical breaker operations
- 7) Evaluate individual ability to identify and respond conditions requiring reactor trip based on RCS leakage
- 8) Evaluate individual ability to perform reactor trip immediate actions
- 9) Evaluate individual ability to identify and respond to a loss of subcooling margin
- 10) Evaluate individual ability to identify and respond to an ESAS actuation
- 11) Evaluate individual ability to identify and respond to a HPI pump trip
- 12) Evaluate individual ability to recognize when conditions require the entry into technical specifications conditions

# **SCENARIO 1 – NARRATIVE**

The crew will assume plant responsibility at 80% power. The SRO will direct draining of the Reactor Building Sump per 1104.014. Sump Drain valve CV-4400 will fail in the open position requiring the operator to close CV-4446 to stop the draining of the Reactor Building Sump. The inoperability of CV-4400 will require entry into a 48 completion time per Technical Specification 3.6.3 Condition A **C-(BOP) C-(SRO) TS** 

A small RCS leak will develop in the "C" HPI line and result in excessive leakage of reactor coolant into the reactor building. The crew should identify the excessive leakage and the SRO should enter 1203.039 Excess RCS Leakage AOP. This will require the crew to quantify the leakage and commence a plant shutdown to take the unit off line. The SRO will direct the power reduction using 1203.045, Rapid Plant Shutdown AOP. Technical Specification 3.4.13.A, RCS Operational LEAKAGE, should be referenced by the SRO due to unidentified leakage > 1 gpm. C-(ATC) C-(SRO) TS

When the ATC attempts to lower power using the Unit Load Demand HAND/AUTO station (ULD), the toggle on the ULD will fail to respond requiring the SG/Rx Demand HAND/AUTO station taken to HAND to reduce power. **C-(ATC) C-(SRO)** Rate of change for the power reduction will be directly controlled by the ATC. **R-(ATC)** 

When power is <50% the BOP should be directed to transfer auxiliaries to Startup #1 transformer (SU1). During the transfer, A-i 12, Unit Aux Feeder Breaker to AI Bus will fail to open automatically requiring the SOP to open it manually. **C-(BOP)** 

Prior to reactor shutdown, the leak in the RCS will get much larger resulting in an uncontrolled loss of RCS inventory. This will require the reactor to be tripped along with ESAS actuation and a loss of subcooling margin. **M-(ALL)** The crew will complete immediate actions of 1202.001 Reactor Trip EOP and the SRO will transition to 1202.002 Loss of Subcooling Margin EOP. Reactor Coolant Pumps must be tripped immediately upon loss of subcooling margin but at least within 2 minutes of the loss of subcooling margin. **C-(BOP) CT** 

After ESAS actuates the BOP will commence performance of RT-10 for verification of proper ESAS actuation.

The ES HPI pump will trip resulting in a single train of HPI in service. RCS pressure will be >600 # so in accordance with RT-10 guidance the highest HPI flow will be required to be throttled to within 20 gpm of the next highest flow rate. The SRO should reference Technical Specification 3.5.2.A, ECCS – Operating, due to loss of one train of ECCS. **C-(BOP) C-(SRO) TS, CT** 

	Simulator Instructions for Scenario I						
Recall Load b	Recall IC 2 Load batch file "R02011_1.txt" and use triggers to activate malfunctions.						
<sup>A</sup> ULD Fa IOR DI_I IOR DI_I <sup>A</sup> Unit Au: IOR DI_/ <sup>A</sup> Leak or IMF RC4 <sup>A</sup> Trip the IMF CV0 <sup>A</sup> CV-440 IMF CV4	<ul> <li><sup>A</sup>ULD Fails to Respond</li> <li>IOR DI_ICC0009R FALSE</li> <li>IOR DI_ICC0009L FALSE</li> <li><sup>A</sup>Unit Aux to A1 fails to open automatically during transfer of auxiliaries</li> <li>IOR DI_A113R FALSE</li> <li><sup>A</sup>Leak on "C" HPI line over 60 seconds (Trigger 1)</li> <li>IMF RC464 (1 0) 0.05 60</li> <li><sup>A</sup>Trip the "C" HPI Pump (Trigger 2)</li> <li>IMF CV063 (2 0)</li> <li><sup>A</sup>CV-4400 fails OPEN</li> </ul>						
Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description			
1	0	Trigger 3	1/ N/A	Perform Draining of the Reactor Building Sump per 1104.014 with failure of CV- 4400 to close.			
2	12 Min	Trigger 1	0.05/ 60 sec.	Small RCS leak in HPI line (C HPI Line)			
3	18 Min	Preloaded	FALSE/ N/A	Unit Load Demand fails to respond			
4	18 Min	N/A	N/A	Power reduction/ Plant Shutdown			
5	<50% pwr. 35 Min	Preloaded	FALSE/ N/A	A112 fails to open automatically during transfer of auxiliaries			
6	45 Min.	IMF RC464	2.5/ 10 sec.	RCS leakrate rises requiring Rx Trip			
7	55 Min	Trigger 2	N/A	ES HPI pump trips post ESAS actuation			

Form ES-D-2

Op-Test No.: 2011-1

Scenario No.: 1

Event No.: 1

Event Description: Drain RB sump to AB sump using 1104.014 step 8.1 and failure of CV-4400 to close.

Time	Position	Applicants Actions or Behavior				
T=0	BOP	Conduct pre-job brief with SRO				
	BOP	Notify RP of intent to drain RB sump.				
	BOP	Open the following valves: • RB Sump to AUX Sump (CV 4446) (HS-4446) • RB Sump to AUX Sump (CV 4400) (HS-4400)				
	BOP	When RB sump level reaches desired level (40%), close CV 4400 by placing HS-4400 in the close position.				
	BOP	Identify failure of CV-4400 to close and that sump level continues to lower. (Red light ON and Green Light OFF for CV-4400 and RB sump level continues to lower)				
	BOP	Report failure of CV-4400 to the SRO.				
	BOP	Close CV-4446 by placing HS-4446 in the close position and verify that CV- 4446 indicates closed by Red Light OFF and Green light ON and Reactor Building Sump level has stabilized.				
	SRO TS	Identify Technical Specification applicable (3.6.3 Condition A, due to failure of one Reactor Building penetration valve inoperable. [48 hour completion time to isolate the flow path.])				
This	EXAMINER NOTE This event is complete when CV-4446 is closed and Tech Spec action statement is entered OR As directed by the Lead Evaluator					

Op-Test No.: 2011-1		1 Scenario No.: 1	Event No.: 2	
Event Description: Small RCS leak in HPI line (C HPI Line)				
Time	Position	Applicants Actions or Behavior		
T=12	ATC	Identify and report annunciator K10 B2, "Process Monitor", is	s in alarm.	
	BOP	Identify the "Process Monitor" alarm as "RC Leak Detector" uplant computer.	using the	
	ATC/BOP	Estimate/Quantify the RCS leakage by performing a simple r balance	mass	
	SRO	Estimate/Quantify the RCS leakage by performing a simple r balance	mass	
	SRO	Direct the BOP to OPEN the BWST Outlet valve for the oper pump	ating HPI	
	BOP	On panel C18, OPEN the BWST Outlet valve CV1407 for the pump	e "A" HPI	
	SRO	Direct the ATC to reduce letdown flow.		
	ATC	On panel C04, Reduced letdown flow		
	SRO	Direct the BOP to perform RT-9 to maximize RB Cooling		
	BOP	Obtain and perform RT-9		
	SRO TS	Determine that plant shutdown is required based on RCS lea Reference Technical Specification 3.4.13.A, RCS Operation due to unidentified leakage > 1 gpm. (18 hour completion tin leakage within limits)	akage. al LEAKAGE, ne to reduce	
		EXAMINER NOTE This event will continue for the duration of the scenario OR As directed by the Lead Evaluator		

Form ES-D-2

ø

Op-Test No.: 2011-1

Scenario No.: 1

Event No.: 3 & 4

Event Description: Unit Load Demand fails to respond; Power reduction/ Plant Shutdown

Time	Position	Applicants Actions or Behavior		
	ATC	Determines that the ULD is not responding. Notifies the SRO that the ULD is not responding and that the SG/RX Demand station will have to be used to lower power. Places SG/RX Demand HAND/AUTO station in HAND and incrementally lowers power using the toggle switch on the SG/RX Demand.		
	BOP	At <75% stop Heater Drain Pumps (P8A and P8B) (SRO may elect to keep the P8's running based upon P8 flow.) If Heater Drain Pumps are secured then the SRO will direct: • Verify Hi LvI Dump Isolations open: • CV-3041A (at B-3252) • CV-3037A (at B-4252) • Verify Low Level Condenser Spray CV-2907 and CV-2868 (HS- 2907 on C02) open.		
	ATC	As time permits during the power reduction, refer to "Contingency Reactivity Plans" and Exhibit A (Operation of APSR Group) of Power Operation (1102.004) (This may not occur depending on operator response time and scenario time line.)		
	SRO	At <50%, direct the BOP operator to transfer plant auxiliaries to SU1 transformer NOTE: The next event will occur during the performance this action		
	SRO	Direct the ATC to remove one MFW pump from service.		
<ul> <li>Secure one MFW pump as follows:         <ul> <li>Verify Main Feedwater Block Valves (CV-2625 and CV-2575) closed.</li> <li>OPEN Feedwater Pumps Discharge Crosstie (CV-2827)</li> </ul> </li> <li>ATC Place desired MFW pump H/A station in "HAND".</li> <li>Slowly decelerate pump to minimum speed, verifying other MFWP is maintaining flow to both loops.</li> <li>TRIP the desired MFWP</li> <li>Close associated Feedpump Recirc valve.</li> </ul>				
	L	EXAMINER NOTE This event will continue until reactor is tripped OR As directed by the Lead Evaluator		

Op-Tes	t No.: 2011	-1 Scenario No.: 1	Event No.: 5			
Event [	Event Description: A112 fails to open automatically during transfer of auxiliaries					
Time	Position	Applicants Actions or Behavior				
T=35 (<50% PWR)	BOP	Obtain procedure 1107.001 for Startup Transformer Operation				
	BOP	BOP Verify breakers to be operated are in the remote position				
	BOP	Check that SU 1 Transformer is considered operable.				
	BOP	For breaker A-113, turn Synchronize switch on.				
	BOP	Verify synchroscope between 11 and 1 o'clock.				
	BOP	Close A-113 AND allow control switch to return to NORMAL-AFTER-CLOSE position.				
	BOP	Turn Synchronize switch off.				
	BOP	Verify breaker A-112 opens.				
	BOP Identify that breaker A-112 does not open automatically					
	BOP	Trip breaker A-112 using the handswitch on C10 before the fe trip due to timed overcurrent.	eeder breakers			
	BOP	Notify the SRO that breaker A-112 failed to open automatical	у			
	BOP	Continue the transfer of electrical buses from Unit Aux. Trans SU#1 Transformer	former to			
	EXAMINER NOTE This event is complete when A1, A2, H1, and H2 buses have been transferred OR As directed by the Lead Evaluator					

Op-Test No.: 2011	-1 Scenario No.: 1 Event No.: 6					
Event Description:	Event Description: RCS leakrate rises requiring Rx Trip					
Time Position	Applicants Actions or Behavior					
ATC	Identify and report the RCS leak rate has gotten worse					
ATC	Determine that HPI is needed to maintain RCS inventory					
SRO	Direct the crew to trip the Reactor and carryout immediate actions.					
ATC	Trip the reactor using the Manual Rx. Trip pushbutton on C03					
SRO	Obtain the Reactor Trip EOP and provide direction to the crew.					
ANY	Report that subcooling margin is inadequate					
SRO	Transition to the "Loss of Subcooling Margin" EOP					
BOP CT	<ul> <li>Check elapsed time since loss of adequate SCM AND perform the following:</li> <li>IF 2 minutes have elapsed, THEN trip all RCPs.</li> <li>Initiate full HPI (RT 3).</li> <li>(Criteria – RCP's must be tripped within 2 minutes of losing Subcooling Margin to prevent core uncovery if RCP's are lost.)</li> </ul>					
BOP	If ESAS actuation occurs prior to initiation of full HPI, Verify actuation per RT-1 0					
ATC	Verify proper EFW actuation and control per RT 5.					
EXAMINER NOTE This event will continue until termination OR As directed by the Lead Evaluator						
ATC SRO ATC ATC SRO ANY SRO BOP CT BOP CT	Determine that HPI is needed to maintain RCS inventory Direct the crew to trip the Reactor and carryout immediate actions. Trip the reactor using the Manual Rx. Trip pushbutton on C03 Obtain the Reactor Trip EOP and provide direction to the crew. Report that subcooling margin is inadequate Transition to the "Loss of Subcooling Margin" EOP Check elapsed time since loss of adequate SCM AND perform the following:     IF 2 minutes have elapsed, THEN trip all RCPs.     Initiate full HPI (RT 3). (Criteria – RCP's must be tripped within 2 minutes of losing Subcooling Margin to prevent core uncovery if RCP's are lost.) If ESAS actuation occurs prior to initiation of full HPI, Verify actuation per RT-1 0 Verify proper EFW actuation and control per RT 5. EXAMINER NOTE This event will continue until termination OR As directed by the Lead Evaluator					

## **Required Operator Actions**

Form ES-D-2

Op-Test No.: 2011-1

Scenario No.: 1

Event No.: 7

Event Description: ES HPI pump trips post ESAS actuation

Time	Position	Applicants Actions or Behavior			
T=55	ANY	Identify and report that the ES actuated HPI Pump has tripped.			
	BOP	Verify running HPI pump is still providing HPI flow to the RCS			
	BOP	Identify and report that HPI flow through the "C" HPI line is $> 20$ gpm higher than the remaining flows			
	SRO	Direct HPI flow be throttled in accordance with RT-10			
	BOP CT	After verification that RCS pressure is >600 psig, throttle the "C" HPI flow to within 20 gpm of the next highest flow by taking the HPI control valve to "MANUAL" and closing CV-1219 (modulating) to within 20 gpm of the next highest flow. (Criteria - With on HPI pump running and RCS pressure > 600 psig, the highest HPI flow must be throttled to within 20 gpm of the next highest flow to ensure adequate HPI flow to the core. This is done as part of RT-10, therefore this will be done prior to declaring RT-10 complete for successful completion of this task.)			
	SRO TS	Reference Technical Specification 3.5.2.A, ECCS – Operating, due to loss of one train of ECCS. (72 hour completion time to restore ECCS train to operable status)			
	TERMINATION CUE When HPI has been throttled on the "C" HPI line and RCS pressure is stable OR As directed by the Lead Evaluator				

End of Scenario 1

# RUN #2 AS-GIVEN

Append	lix D		Simulator Outline	Form ES-D-1
Facility	: ANO-1	ţ	Scenario No.: 1	Op-Test No.: 2011-1
-xum			Operators:	
Initial ( • • Turnov •	Conditions: ~80% Power 250 EFPD Need to Drain RB RB fire alarm exhi /er: ~80% Power 250 EFPD Need to Drain RB required.	Sump bit posted Sump to 40%.	This is not the first drainin	g of the month and sampling is not
Event No.	Malf. No.	Event Type*	C	Event Description
1	CV4400	M-(802) - C-(BOP) - C-(SRO)- - TS	Perform Draining of the F 1104.014 with failure of ( (Technical Specification 3.6	Reactor Building Sump per 2 <del>V-4400 to close.</del> <del>33, Reactor Building Isolation Valves)</del>
2	RC464	C-(ATC) C-SRO) TS	Small RCS leak in HPI lin (Technical Specification 3.4	ne (C HPI Line) .13, RCS Leakage.)
3	DI_ICC0009R DI_ICC0009L	C-(ATC) C-(SRO)	Unit Load Demand fails t	o respond
4		R-(ATC) N-(BOP)	Power reduction/ Plant S	hutdown
5	DI_A113R	C-(BOP)	A112 fails to open autom	atically during transfer of auxiliaries
6	RC464	M-(ALL) CT	RCS leakrate rises requir Margin. Trip all running R minutes of a Loss of Subo	ing Rx Trip and loss of Subcooling leactor Coolant Pumps within 2 cooling Margin.
7	CV063	C-(BOP) C-(SRO)TS CT	ES HPI pump trips post I (Technical Specification 3.5	ESAS actuation 5.2, ECCS – Operating)
i) (ا	N)ormal, (R)ea	ctivity, (I)ns	trument, (C)omponent	t, (M)ajor

### Scenario 1- Objectives

- 1) Evaluate individual ability to perform Draining of the Reactor Building Sump
- 2) Evaluate individual ability to identify and respond to excess RCS leakage inside the reactor building
- 3) Evaluate individual ability to perform a plant power reduction
- 4) Evaluate individual ability to identify and respond to Integrated Control System component failure
- 5) Evaluate individual ability to perform electrical breaker operations
- 6) Evaluate individual ability to identify and respond to failures associated with electrical breaker operations
- 7) Evaluate individual ability to identify and respond conditions requiring reactor trip based on RCS leakage
- 8) Evaluate individual ability to perform reactor trip immediate actions
- 9) Evaluate individual ability to identify and respond to a loss of subcooling margin
- 10) Evaluate individual ability to identify and respond to an ESAS actuation
- 11) Evaluate individual ability to identify and respond to a HPI pump trip
- 12) Evaluate individual ability to recognize when conditions require the entry into technical specifications conditions

# SCENARIO 1 – NARRATIVE

The crew will assume plant responsibility at 80% power. The SRO will direct draining of the Reactor Building Sump per 1104.014. Sump Drain valve CV-4400 will fail in the open position requiring the operator to close CV-4446 to stop the draining of the Reactor Building Sump. The inoperability of CV-4400 will require entry into a 48 completion time per Technical Specification 3.6.3 Condition A C-(BOP) C-(SRO) TS

A small RCS leak will develop in the "C" HPI line and result in excessive leakage of reactor coolant into the reactor building. The crew should identify the excessive leakage and the SRO should enter 1203.039 Excess RCS Leakage AOP. This will require the crew to quantify the leakage and commence a plant shutdown to take the unit off line. The SRO will direct the power reduction using 1203.045, Rapid Plant Shutdown AOP. Technical Specification 3.4.13.A, RCS Operational LEAKAGE, should be referenced by the SRO due to unidentified leakage > 1 gpm. C-(ATC) C-(SRO) TS

When the ATC attempts to lower power using the Unit Load Demand HAND/AUTO station (ULD), the toggle on the ULD will fail to respond requiring the SG/Rx Demand HAND/AUTO station taken to HAND to reduce power. C-(ATC) C-(SRO) Rate of change for the power reduction will be directly controlled by the ATC. R-(ATC)

When power is <50% the BOP should be directed to transfer auxiliaries to Startup #1 transformer (SU1). During the transfer, A-i 12, Unit Aux Feeder Breaker to AI Bus will fail to open automatically requiring the SOP to open it manually. **C-(BOP)** 

Prior to reactor shutdown, the leak in the RCS will get much larger resulting in an uncontrolled loss of RCS inventory. This will require the reactor to be tripped along with ESAS actuation and a loss of subcooling margin. **M-(ALL)** The crew will complete immediate actions of 1202.001 Reactor Trip EOP and the SRO will transition to 1202.002 Loss of Subcooling Margin EOP. Reactor Coolant Pumps must be tripped immediately upon loss of subcooling margin but at least within 2 minutes of the loss of subcooling margin. **C-(BOP) CT** 

After ESAS actuates the BOP will commence performance of RT-10 for verification of proper ESAS actuation.

The ES HPI pump will trip resulting in a single train of HPI in service. RCS pressure will be >600 # so in accordance with RT-10 guidance the highest HPI flow will be required to be throttled to within 20 gpm of the next highest flow rate. The SRO should reference Technical Specification 3.5.2.A, ECCS – Operating, due to loss of one train of ECCS. **C-(BOP) C-(SRO) TS, CT** 

Simulator Instructions for Scenario I							
Recall Load b	Recall IC 2 Load batch file "R02011_1.txt" and use triggers to activate malfunctions.						
<ul> <li><sup>A</sup>ULD Fails to Respond</li> <li>IOR DI_ICC0009R FALSE</li> <li>IOR DI_ICC0009L FALSE</li> <li><sup>A</sup>Unit Aux to A1 fails to open automatically during transfer of auxiliaries</li> <li>IOR DI_A113R FALSE</li> <li><sup>A</sup>Leak on "C" HPI line over 60 seconds (Trigger 1)</li> <li>IMF RC464 (1 0) 0.05 60</li> <li><sup>A</sup>Trip the "C" HPI Pump (Trigger 2)</li> <li>IMF CV063 (2 0)</li> <li><sup>A</sup>CV-4400 fails OPEN</li> </ul>							
Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description			
1	0	Trigger 3	1/ N/A	Perform Draining of the Reactor Building Sump per 1104.014 with failure of CV- 4400 to close. NOT DONE			
2	12 Min	Trigger 1	0.05/ 60 sec.	Small RCS leak in HPI line (C HPI Line)			
3	18 Min	Preloaded	FALSE/ N/A	Unit Load Demand fails to respond			
4	18 Min	N/A	N/A	Power reduction/ Plant Shutdown			
5	<50% pwr. 35 Min	Preloaded	FALSE/ N/A	A112 fails to open automatically during transfer of auxiliaries			
6	45 Min.	IMF RC464	2.5/ 10 sec.	RCS leakrate rises requiring Rx Trip			
7	55 Min	Trigger 2	N/A	ES HPI pump trips post ESAS actuation			

Form ES-D-2

close	Description: e.	Drain RB sump to AB sump using 1104.014 step 8.1 and failure of CV-4400
lime	Position	Applicants Actions or Behavior
T=0	BOP	Conduct pre-job brief with SRO
	BOP	Notify RP of intent to drain RB sump.
	BOP	Open the following valves: • RB Sump to AUX Sump (CV 4446) (HS-4446) • RB Sump to AUX Sump (CV 4400) (HS-4400)
	BOP	When RB sump level reaches desired level (40%), close CV 4400 by placing HS-4400 in the close position.
the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the	BOP	Identify failure of CV-4400 to close and that sump level continues to lower. (Red light ON and Green Light OFF for CV-4400 and RB sump level continues to lower)
	вор	Report failure of CV-4400 to the SRO.
	BOP	Close CV-4446 by placing HS-4446 in the close position and verify that CV- 4446 indicates closed by Red Light OFF and Green light ON and Reactor Building Sump level has stabilized.
Server and the second division of	<u>SRO</u>	Identify Technical Specification applicable
	TS	(3.6.3 Condition A, due to failure of one Reactor Building penetration value inoperable. [48 hour completion time to isolate the flow path.])
This	event is cor	EXAMINER NOTE mplete when CV-4446 is closed and Tech Spec action statement is entered OR As directed by the Lead Evaluator

NOT Don'é

Op-Tes	1 Scenario No.: 1 Event No.: 2				
Event [	Event Description: Small RCS leak in HPI line (C HPI Line)				
Time	Position	Applicants Actions or Behavior			
T=12	ATC	Identify and report annunciator K10 B2, "Process Monitor", is in alarm.			
	BOP	Identify the "Process Monitor" alarm as "RC Leak Detector" using the plant computer.			
	ATC/BOP	Estimate/Quantify the RCS leakage by performing a simple mass balance			
	SRO	Estimate/Quantify the RCS leakage by performing a simple mass balance			
SRO BOP		Direct the BOP to OPEN the BWST Outlet valve for the operating HPI pump			
		On panel C18, OPEN the BWST Outlet valve CV1407 for the "A" HPI pump			
	SRO	Direct the ATC to reduce letdown flow.			
	ATC	On panel C04, Reduced letdown flow			
	SRO	Direct the BOP to perform RT-9 to maximize RB Cooling			
	BOP	Obtain and perform RT-9			
	SRO TS	Determine that plant shutdown is required based on RCS leakage. Reference Technical Specification 3.4.13.A, RCS Operational LEAKAGE, due to unidentified leakage > 1 gpm. (18 hour completion time to reduce leakage within limits)			
	EXAMINER NOTE This event will continue for the duration of the scenario OR As directed by the Lead Evaluator				

Form ES-D-2

Op-Tes	t No.: 2011	-1 Scenario No.: 1	Event No.: 3 & 4
Event D	Description:	Unit Load Demand fails to respond; Power reduction/ Pla	nt Shutdown
Time	Position	Applicants Actions or Behavior	
	ATC	Determines that the ULD is not responding. Notifies the not responding and that the SG/RX Demand station will lower power. Places SG/RX Demand HAND/AUTO stati incrementally lowers power using the toggle switch on th	SRO that the ULD is have to be used to on in HAND and ne SG/RX Demand.
	BOP	At <75% stop Heater Drain Pumps (P8A and P8B) (SRO may elect to keep the P8's running based upon P8 If Heater Drain Pumps are secured then the SRO will dir Verify Hi LvI Dump Isolations open: CV-3041A (at B-3252) CV-3037A (at B-4252) Verify Low Level Condenser Spray CV-2907 and CV 2907 on C02) open.	8 flow.) rect: V-2868 (HS-
	ATC	As time permits during the power reduction, refer to "Co Reactivity Plans" and Exhibit A (Operation of APSR Gro Operation (1102.004) (This may not occur depending on operator response tin time line.)	ntingency up) of Power ne and scenario
	SRO	At <50%, direct the BOP operator to transfer plant auxili transformer NOTE: The next event will occur during the performance	aries to SU1 e this action
	SRO	Direct the ATC to remove one MFW pump from service.	
	ATC	<ul> <li>Secure one MFW pump as follows:</li> <li>Verify Main Feedwater Block Valves (CV-2625 a closed.</li> <li>OPEN Feedwater Pumps Discharge Crosstie (C</li> <li>Place desired MFW pump H/A station in "HAND</li> <li>Slowly decelerate pump to minimum speed, veri MFWP is maintaining flow to both loops.</li> <li>TRIP the desired MFWP</li> <li>Close associated Feedpump Recirc valve.</li> </ul>	ınd CV-2575) V-2827) ". fying other
	kennen en  EXAMINER NOTE This event will continue until reactor is tripped OR As directed by the Lead Evaluator		

## **Required Operator Actions**

Form ES-D-2

Op-Test No.: 2011-1 Scenario No.: 1			Event No.: 5		
Event Description: A112 fails to open automatically during transfer of auxiliaries					
Time	Position	Applicants Actions or Behavior			
T=35 (<50% PWR)	BOP	Obtain procedure 1107.001 for Startup Transformer Operation	) 		
	BOP	BOP Verify breakers to be operated are in the remote position	١		
	BOP	Check that SU 1 Transformer is considered operable.			
	BOP	For breaker A-113, turn Synchronize switch on.			
	BOP	Verify synchroscope between 11 and 1 o'clock.			
	BOP	Close A-113 AND allow control switch to return to NORMAL-AFTER-CLOSE position.			
	BOP	Turn Synchronize switch off.			
	BOP	Verify breaker A-112 opens.			
	BOP	Identify that breaker A-112 does not open automatically			
	BOP	Trip breaker A-112 using the handswitch on C10 before the f trip due to timed overcurrent.	eeder breakers		
	BOP	Notify the SRO that breaker A-112 failed to open automatical	lly		
	BOP	Continue the transfer of electrical buses from Unit Aux. Trans SU#1 Transformer	sformer to		
	EXAMINER NOTE This event is complete when A1, A2, H1, and H2 buses have been transferred OR As directed by the Lead Evaluator				

## **Required Operator Actions**

Form ES-D-2

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Op-Test No.: 2011-1		-1 Scenario No.: 1	Event No.: 6		
Event Description: RCS leakrate rises requiring Rx Trip					
Time	Time Position Applicants Actions or Behavior				
	ATC	Identify and report the RCS leak rate has gotten worse			
	ATC	Determine that HPI is needed to maintain RCS inventory			
	SRO	Direct the crew to trip the Reactor and carryout immediate ac	tions.		
	ATC	Trip the reactor using the Manual Rx. Trip pushbutton on C03	3		
SRO Obtai ANY Repo		Obtain the Reactor Trip EOP and provide direction to the cre	w.		
		Report that subcooling margin is inadequate			
	SRO	Transition to the "Loss of Subcooling Margin" EOP			
	BOP CT	Check elapsed time since loss of adequate SCM AND perfor following: IF 2 minutes have elapsed, THEN trip all RCPs. Initiate full HPI (RT 3). (Criteria – RCP's must be tripped within 2 minutes of losing Subcooling Marg uncovery if RCP's are lost.)	m the		
	BOP	If ESAS actuation occurs prior to initiation of full HPI, Verify a RT-1 0	actuation per		
	ATC	Verify proper EFW actuation and control per RT 5.			
	EXAMINER NOTE This event will continue until termination OR As directed by the Lead Evaluator				

## **Required Operator Actions**

Form ES-D-2

Op-Test No.: 2011-1

Scenario No.: 1

Event No.: 7

Event Description: ES HPI pump trips post ESAS actuation

Time	Position	Applicants Actions or Behavior			
T=55	ANY	Identify and report that the ES actuated HPI Pump has tripped.			
	BOP	Verify running HPI pump is still providing HPI flow to the RCS			
	BOP	Identify and report that HPI flow through the "C" HPI line is > 20 gpm higher than the remaining flows			
	SRO	Direct HPI flow be throttled in accordance with RT-10			
	BOP CT	After verification that RCS pressure is >600 psig, throttle the "C" HPI flow to within 20 gpm of the next highest flow by taking the HPI control valve to "MANUAL" and closing CV-1219 (modulating) to within 20 gpm of the next highest flow. (Criteria - With on HPI pump running and RCS pressure > 600 psig, the highest HPI flow must be throttled to within 20 gpm of the next highest flow to ensure adequate HPI flow to the core. This is done as part of RT-10, therefore this will be done prior to declaring RT-10 complete for successful completion of this task.)			
	SRO TS	Reference Technical Specification 3.5.2.A, ECCS – Operating, due to loss of one train of ECCS. (72 hour completion time to restore ECCS train to operable status)			
	TERMINATION CUE When HPI has been throttled on the "C" HPI line and RCS pressure is stable OR As directed by the Lead Evaluator				

End of Scenario 1

Scenario Outline

Form ES-D-1

Facility:	ANO-1	S	cenario No.: 2	Op-Test No.: 2011-1			
Examine	ers:		Operators:				
<ul> <li>Initial Conditions: <ul> <li>40% Power</li> <li>250 EFPD</li> <li>Both MEW Pumps in service</li> <li>Ready to commence power escalation</li> <li>P7B EFW pump fails to auto-start and cannot be manually started from handswitch</li> <li>RPS Reactor Trips Failed</li> </ul> </li> <li>Turnover: <ul> <li>40% Power</li> <li>250 EEPD</li> <li>Both MFW Pumps in service</li> <li>Need to Place P-36B in service and secure P-36A due to small oil leak on P-36A that is scheduled for repair</li> <li>Ready to commence power escalation</li> </ul> </li> </ul>							
Event No.	Malf. No.	Event Type*	Eve Descr	ent iption			
1	N/A	N-(BOP) N-(SRO)	Swap running makeup pumps. place P36A in standby.	. Place P36B in service and			
2	N/A	R-(ATC)	Power escalation				
3	CV6604	C-(BOP) C-(SRO)	Gland Seal Regulator Failure				
4	TR572	I-(ATC) I-(SRO)	SG Startup Range level instru	ment fails downscale slowly			
5	CO_P4C	C-(BOP) C-(SRO)TS	P-4C SW pump trips (Technical Specification 3.7.7.A, 0	One SWS loop inoperable.)			
6	TRPAMFW CV2827	M-(ALL) CT	MFW pump trip w/ failure of di open requires reactor trip. RPS a trip.	scharge cross-tie valve to S is failed and will not cause			
7	TRPBMFW CO_P7B FW617	C-(ATC) C-(SRO)TS	Remaining main feedwater pu actuation. Electric EFW pump not start from the handswitch. (Technical Specification 3.7.5.B, 0	mp trips resulting in EFW fails to autostart and will One EFW train inoperable)			
8	CV6601	M-(ALL) TS CT	EFW steam driven pump trips overheating condition. EFW pu flow restored. (Technical Specification 3.7.5.D,	on overspeed resulting in ump P7A reset and EFW Two EFW trains inoperable)			
*	(N)ormal, (R)ea	activity, (I)n	strument, (C)omponent, (	(M)ajor			

### Scenario 2- Objectives

- 1) Evaluate individual ability to perform placing the standby makeup pump in service and securing the operating makeup pump.
- 2) Evaluate individual ability to perform a plant power escalation.
- 3) Evaluate individual ability to recognize and respond to a failure of the Gland Seal Regulator.
- 4) Evaluate individual ability to recognize and respond to ICS input failure.
- 5) Evaluate individual ability to recognize and respond to Service Water Pump trip.
- 6) Evaluate individual ability to recognize and respond a loss of Steam Generator Feed.
- 7) Evaluate individual ability to identify and respond to conditions requiring reactor trip based on Loss of Steam Generator Feed
- 8) Evaluate individual ability to perform reactor trip immediate actions
- 9) Evaluate individual ability to perform verification of EFW actuation
- 10) Evaluate individual ability to identify and respond to EFW pump Trip/Autostart Failure
- 11) Evaluate individual ability to identify and respond to an overheating condition due to a loss of all feedwater.
- 12) Evaluate individual ability to perform recovery and restoration of Emergency Feedwater

# SCENARIO 2 – NARRATIVE

The crew will assume plant responsibility at 40% power. The SRO will direct swap of the operating makeup pump by placing P-36B in service and securing P-36A.

After the makeup pump swap is complete the SRO will direct power escalation using normal operations procedure 1102.004 Power Operations.

When the power escalation has commenced, the main gland seal regulator will fail resulting in loss of steam to the main turbine gland seals. This will require the BOP to respond using ACA 1203.012D for K05. This will result in a lowering condenser vacuum. The BOP will be required to throttle open the regulator bypass valve, CV-6606 to restore gland seal pressure.

During power escalation the "A" Steam Generator Startup Level (NNI-X) instrument will fail resulting in a false input signal to the ICS system. The SRO will direct required action using 1203.001 ICS Abnormal Operations AOP. The ATC will be required to place designated stations into HAND and stabilize the plant until a valid signal can be selected and ICS placed back into AUTO.

Once ICS is placed back into AUTO, the "C" service water (SW) pump will trip. The SRO will direct actions using 1203.01 21 K10 ACA. The BOP should verify the "B" SW pump aligned to the appropriate bus and then start the "B" SW pump to restore proper SW flows and pressures. The SRO should reference Technical Specification 3.7.7.A, One SWS loop inoperable.

After SW has been restored, the "A" Main Feedwater (MFW) pump will trip resulting in a plant runback to 40% power. The MFW pump discharge cross tie valve will fail to open resulting in total loss of feed to the "A" steam generator. The crew should recognize the loss of feed and the SRO should direct tripping the unit. RPS is failed and will not cause a reactor trip. The SRO will enter 1202.001, Reactor Trip EOP and the crew will perform reactor trip immediate actions.

Upon the reactor trip, the remaining feedwater pump (B) will trip resulting in a total loss of main feedwater. EFW should automatically initiate on loss of both MFW pumps. P-7B, electric driven EFW pump will fail to start and will not start manually. The crew should address P-7B failure using ACA 1203.012K. The ATC will verify EFW actuation using RT-5 of 1202.012. The SRO should reference Technical Specification 3.7.5.B, for one EFW train inoperable.

Shortly after starting, P-7A EFW pump will overspeed trip. The crew should recognize overheating entry conditions and the SRO should direct operations using 1202.004 Overheating EOP. The crew should dispatch the waste control operator (WCO) to investigate the status of P 7A. The WCO will report that the trip/throttle valve for P-7A is tripped but there are no obvious problems with P-7A. The crew should direct the WCO to reset P-7A using 1106.006 Exhibit "A". The SRO should reference Technical Specification 3.7.5.D, for two EFW trains inoperable.

When the WCO reports P-7A reset, the crew should restore EFW to both steam generators using RT-16 of 1202.012.

Scenario Outline

		•		
Recall IC	126			
Load bat	ch file "R02011_:	2.txt" and use trig	gers to activate ma	alfunctions.
^Feedwate	r Pump x-tie valve f	ailed closed		
IMF CV28	27 0			
^P-7B EFV	V Pump fails and wo	n't start		
IRF CO_P	7B OFF			
IMF FW61	7			
^RPS will i	not trip			
IMF RP24	6			
IMF RP24	7			
IMF RP24	8			
IMF RP24	9			
^P-7A will	trip on overspeed (T	rigger 6)		
IMF CV66	01 (6 0) 1			
^Fail GS F	egulator low (Trigge	er 1)		
IMF CV66	04 (1 0) 0.08 10			
^Fail "A" S	G SU range level in	st (X) low (Trigger 2)		
IMF TR57	2 (2 0) 0 30			
^Trip the "	C" SW pump (Trigge	er 3)		
IRF C0_P4	4C (3 0) OFF			
^Trip the "	A" MFW Pump (Trig	ger 4)		
IRF TRPA	MFW (4 0) TRIP			
^Trip the "	B" MFW Pump wher	n the reactor trips Trig	ger 5)	
IRF TRPB	MFW (5 0) TRIP			
TRGSET	4 "q32010ad"			
^Reset P-	7A Trip/Throttle Valv	ve (Trigger 7)		
IRF RESP	7A (7 0) RESET			
Event No.	Time	Malf. No.	Value/ Ramp Time	Event Description
1	0	N/A	N/A	Swap running makeup pumps. Pla

1	0	N/A	N/A	Swap running makeup pumps. Place P36B in service and place P36A in standby.
2	15 Min.	N/A	N/A	Power Escalation
3	25 Min.	Trigger 1	0.08/10 sec	Gland Seal Regulator Failure
4	30 Min.	Trigger 2	0/30 sec	SG Startup Range level instrument fails downscale slowly
5	50 Min.	Trigger 3	OFF/ N/A	P-4C SW Pump trips
6	60 Min.	Trigger 4 Preloaded	TRIP/ N/A	MFW pump trip w/failure of discharge cross- tie valve to open requires reactor trip/RPS fails.
7	60 Min.	Trigger 5 Preloaded	TRIP/ N/A	Remaining main feedwater pump trips resulting in EFW actuation. Electric EFW pump fails to autostart and will not start from the handswitch.
8	65 Min.	Trigger 6	RESET/ N/A	EFW steam driven pump trips on overspeed resulting in overheating condition. EFW pump P7A rest and EFW flow restored.

Form ES-D-2

Op-Test No.: 2011-1		-1 Scenario No.: 2	Event No.: 1
Event D	escription:	Swap running makeup pumps. Place P36B in service and plac standby.	e P36A in
Time	Position	Applicants Actions or Behavior	
T=0	SRO	Direct the BOP to shift running makeup pumps to P-36B runni P-36A "Standby Pump". (P-36C remains "ES Pump")	ing and
	BOP	Obtain procedure 1104.002 and refer to section 9.0 for Makeu Operation.	ıp Pump
	BOP	Contact field operator to check P-36B shaft stopped.	
	NOT	E: Check valve testing will not be required for this evolution	n
	BOP	Verify P-36B Bus MOD (A-8) selected to bus A-3.	
	BOP	<ul> <li>Verify P-64B Transfer Switch is selected to B57 by performing following:</li> <li>Observe indicating lights under P-645 handswitches.</li> <li>Contact field operator to locally verify red power supply sele indicated by the three-spoked manual operating lever on the P-64B disconnect (B-801).</li> </ul>	g the cted as left side of
	BOP	Start Aux Lube Oil Pump (P-64B) for P-36B.	
	BOP	WHEN P-64B has run for one minute, THEN start P-36B.	
	BOP	Stop P-64B.	

Event 1 Continued on Next Page

Form ES-D-2

7

Op-Tes	t No.: 2011	-1 Scenario No.: 2	Event No.: 1		
Event D	Description:	Swap running makeup pumps. Place P36B in service and plac standby	e P36A in		
Time	e Position Applicants Actions or Behavior				
	BOP	Start Aux Lube Oil Pump (P-64A) for P-36A.			
	BOP	Stop P-36A.			
	BOP	Contact the field operator to check P-36A shaft has stopped.			
	BOP	WHEN P-64A has run for at least one minute, THEN stop P-6	64A.		
	BOP	Change pump status tags as follows: • "OP Pump" tag above P-36B handswitch (C18). • "STBY Pump" tag above P-36A handswitch.			
	EXAMINER NOTE This event is complete when P-36B is running and P-36A is stopped OR As directed by the Lead Evaluator				

Op-Test No.: 2011-1 Scenario No.: 2 Event				
Event Description: Power escalation				
Time	Position	Applicants Actions or Behavior		
T=15	SRO	Direct the crew to begin power escalation at $\leq$ 30%/Hr.		
	ATC	Verify or set the ICS rate of change module for 0.5%/min.(30%/	nr) or less	
	ATC	Begin power escalation by raising the Unit Load Demand to des value	ired	
	ATC	Verify plant response (control rods, Rx. Power, feedwater dema flow)	nd and	
	BOP	Verify turbine load changes and maintains proper steam header	- pressure	
EXAMINER NOTE: Output memory lights in B, C & D RPS channels are not modeled.				
EXAMINER CUE: Notify the Examinee performing the RPS manipulations to assume the Output Memory Lamps have been reset for B, C & D channels and that the lamps are dim.				
	BOP	Verify RPS bistable reset for Turbine Trip < 43%		
EXAMINER NOTE This event is complete when the next event occurs OR As directed by the Lead Evaluator				

Form ES-D-2

Op-Test No.: 2011-1

Scenario No.: 2

Event No.:3

Time	Position	Applicants Actions or Behavior		
T=25	ANY	Identify and announce "Gland Seal Pressure #3, 4, 5, 6 Brng Lo" alarms on K05-B4, C4, D4, E4.		
	BOP	Obtain Annunciator Corrective Action 1203.012D for K05 and refer to any of the GS Pressure Lo corrective actions.		
	ANY	Report condenser vacuum lowering		
	SRO	Refer to Loss of Vacuum AOP, 1203.016 NOTE: Prompt action by the crew may resolve the vacuum issue using the Annunciator Corrective Action, and therefore the SRO may not refer to this procedure.		
	BOP	Open Gland Sealing Steam Main Regulator Bypass (CV-6606) located on panel C12 until alarms clear.		
	BOP	Monitor Gland Seal header pressure on panel C12 and make adjustments to the regulator bypass as necessary to control pressure at desired value.		
EXAMINER NOTE This event is complete when GS pressure is restored and condenser vacuum is recovering OR As directed by the Lead Evaluator				
Form ES-D-2

st No.: 2011-	1 Scenario No.: 1	Event No.: 4					
Event Description: SG Startup Range level instrument fails downscale slowly							
Time Position Applicants Actions or Behavior							
ATC	Identify and report annunciator K07 B4, SASS Mismatch, in	alarm,					
ATC/BOP	Identify the "A" SG Startup Level indication causing SASS N	1/M alarm					
SRO	Refer to 1203.012F, Annunciator Corrective Action for K07, 1203.001, "ICS Abnormal Operations".	or					
SRO	Direct the ATC to place the H/A station for the "A" MFW pun "HAND"	np in					
ATC	Place the "A" MFW pump H/A station in "HAND"						
SRO	Direct the ATC to place the startup and low load valve H/A s the "A" SG in "HAND"	stations for					
ATC	Place the H/A stations for the "A" SG startup and low load v "HAND"	alves in					
SRO TS	Identify Technical Specification applicable (3.7.3 Condition C and D due to One Low Load and One Startup Feedwa inoperable [72 hour completion time to close or isolate valves or restore	ater Control valve operability.])					
SRO	If desired, direct the ATC to place the FW Loop Demand H/ "HAND"	A stations to					
ATC	If directed, place the FW Loop Demand H/A stations to "HA	ND"					
	t No.: 2011- Description: S Position ATC ATC/BOP SRO SRO ATC SRO ATC SRO TS SRO TS	Scenario No.: 1   Description: SG Startup Range level instrument fails downscale slowly   Position Applicants Actions or Behavior   ATC Identify and report annunciator K07 B4, SASS Mismatch, in   ATC/BOP Identify the "A" SG Startup Level indication causing SASS M   SRO Refer to 1203.012F, Annunciator Corrective Action for K07, 1203.001, "ICS Abnormal Operations".   SRO Direct the ATC to place the H/A station for the "A" MFW pur "HAND"   ATC Place the "A" MFW pump H/A station in "HAND"   SRO Direct the ATC to place the startup and low load valve H/A st the "A" SG in "HAND"   ATC Place the H/A stations for the "A" SG startup and low load valve H/A st the "A" SG in "HAND"   SRO Direct the ATC to place the startup and low load valve H/A st the "A" SG in "HAND"   ATC Place the H/A stations for the "A" SG startup and low load valve H/A st the "A" SG in "HAND"   SRO Identify Technical Specification applicable   (3.7.3 Condition C and D due to One Low Load and One Startup Feedware inoperable [72 hour completion time to close or isolate valves or restore   SRO If desired, direct the ATC to place the FW Loop Demand H/   "HAND" T   ATC If desired, direct the ATC to place the FW Loop Demand H/					

Event 4 Continued on Next Page

Op-Test No.: 2011-1 S

Scenario No.: 2

Event No.: 4

Event Description: SG Startup Range level instrument fails downscale slowly

Time Position Applicants Actions or Behavior							
	SRO	Direct the ATC to select the good (Y) "A" SG Startup Level instrument for indication.					
ATC On panel C03, select the good (Y) instrument for "A" SG Startup indication.							
	ATC Verify the selected instrument indicates the proper startup level and t OTSG Level LO alarm clears.						
SRO Direct the ATC and BOP to place ICS in "AUTO" per 1105.004, IC Operations.							
EXAMINER NOTE This event is complete when the good SG Startup Level instrument (Y) has been selected and plant is stabilized OR As directed by the Lead Evaluator							

Form ES-D-2

Op-Test No.: 2011-1

Scenario No.: 2

Event Description: P-4C SW pump trips

Time	Position	Applicants Actions or Behavior
T=50	ANY	Identify and announce "Service water pump trip" alarm on K10.
	ANY	Dispatch the field operator to investigate the tripped pump and check strainer D/P status
	SRO/BOP	Refer to 1203.012I, Annunciator Corrective Action for K10-A3, "SERVICE WATER PUMP TRIP".
	BOP	Verify service water bay levels >332 feet using SPDS or PDS.
	SRO	Direct the BOP to start the standby SW pump (P-4B)
	BOP	Verify P-4B Bus Select MOD Control switch on panel C18 is selected to Bus A4.
	BOP	Verify P-4B MOD closed on bus A4.
	BOP	Verify P-4B to P-4C Crossties (CV-3640 and CV-3642) are open.
	BOP	Start standby pump P-4B from panel C16.
		Identify Technical Specification applicable
	SRO TS	(3.7.7 Condition A, due to one SWS loop inoperable. [72 hour completion time to restore SWS loop to operable status])
		Technical Specification action can be exited after P-4B SW pump is started.
	BOP	Place the P-4C handswitch in normal-after-stop or PULL_TO_LOCK position to clear the alarm

Form ES-D-2

Op-Test No.: 2011-1

Scenario No.: 2

Event No.: 5

Event Description: P-4C SW pump trips

Time	Position	Applicants Actions or Behavior					
	SRO	Refer to Service Water Operation procedure, 1104.029, for the current pump configuration alignment.					
	SRO	Direct the BOP to swap B55/B56 power to bus B6.					
	BOP	Swap B55/B56 to bus B6 using "ES Electrical System Operation", 1107.002.					
	SRO	Identify that Technical Specification 3.7.7 can be exited after P-4B Service Water Pump is started					
EXAMINER NOTE This event is complete when P-4B is started and alarm is cleared OR As directed by the Lead Evaluator							

Form ES-D-2

Op-Test No.: 2011-1

Scenario No.: 2

Event No.:6 & 7

Event Description: MFW pump trip w/ failure of discharge cross-tie valve to open requires reactor trip. RPS is failed. Remaining main feedwater pump trips resulting in EFW actuation. Electric EFW pump fails to autostart and will not start from the handswitch.

Time	Position	Applicants Actions or Behavior						
T=60	ANY	Identify and announce "'A' Main feedwater pump turbine trip" alarm on K07-A7						
	SRO	Refer to Loss of Steam Generator Feed (1203.027).						
	ATC	Verify the Feedwater Pumps Discharge Crosstie valve (CV-2827) is opening on panel C03						
	ATC	Attempt to open the Feedwater Pumps Discharge Crosstie valve (CV-2827) by momentarily placing hand switch (HS-2827) on C03 in the OPEN position						
	ANY	Report the Feedwater Pumps Discharge Crosstie valve (CV-2827) on panel C03 failed to open						
	SRO	Direct the ATC to "Trip the Reactor" and carryout immediate actions.						
	ATC CT	Trip the reactor by depressing the Rx. Trip PB on C03 prior to the RPS trip setpoint being reached. (Criteria – Due to RPS being failed, the reactor will not trip automatically. Loss of feedwater flow to the "B" SG, RCS pressure will begin to rapidly rise. The reactor should be tripped at an RCS pressure of $\leq$ 2355 psig to complete this task successfully.)						
	SRO	Refer to the "Reactor Trip" EOP, 1202.001, and provide direction to the crew.						
	SRO	Verify the immediate actions for the Rx. Trip have been performed.						
a.	ANY	Identify and report the remaining main feedwater pump has tripped						
	SRO	Direct the ATC to actuate EFW.						
	ATC	Manually actuate EFW at C09 using EFIC Train A and B matrices, both Bus 1 and 2						

Event 6 & 7 Continued on Next Page

Form ES-D-2

Op-Test No.: 2011-1

Scenario No.: 2

Event No.:6 & 7

Event Description: MFW pump trip w/ failure of discharge cross-tie valve to open requires reactor trip. RPS is failed. Remaining main feedwater pump trips resulting in EFW actuation. Electric EFW pump fails to autostart and will not start from the handswitch.

Time	Position	Applicants Actions or Behavior			
	ATC	Verify proper EFW actuation using RT-5			
	ATC	Identify and report that the electric driven EFW pump, P-7B, failed to Autostart			
	ATC	Verify EFW Pump, P-7A, running and the associated EFW flow control valves are opening.			
ATC Verify both EFW pushbuttons on both Train "A" Matrix AND Train " Matrix depressed					
	SRO TS	Identify Technical Specification applicable (3.7.5 Condition B, One EFW train inoperable AND "Operability" section of Emergency Feedwater Initiation and Control [1105.005] for EFW Pump [P-7A, P-7B] Operability Requirements. [72 hour completion time to restore EFW train to operable status])			
	ANY	Dispatch field operator to P-7B electrical cabinet, A-31 1, and check for tripped protection relays.			
NOTE: breake	Booth opera r A-311"	ator call as field operator and report "No protective relays tripped on			
	ATC	Attempt to start P-7B from C09 using the handswitch			
		EXAMINER NOTE This event will continue for the duration of the scenario			

Op-Test No.: 2011-1

Scenario No.: 2

Event No.:8

Event Description: EFW steam driven pump trips on overspeed resulting in overheating condition. EFW pump P7A reset and EFW flow restored.

Time	Position	Applicants Actions or Behavior
T=65	ANY	Identify and announce that P-7A, steam driven EFW pump, has tripped.
	SRO	Transition to "Overheating" EOP
	SRO	Dispatch field operator to reset P-7A overspeed trip using Emergency Feedwater Pump Operation (1106.006), Exhibit A.
	BOP	Reduce running RCPs to one per loop
	ATC/BOP	Close Main Feedwater Isolation valves to prevent feeding with Condensate pump as SG boils dry (CV-2630 and 2680).
	ATC/BOP	Place EFW CNTRL valves in "HAND" AND close
	ATC/BOP	Verify EFW Pump P7B in PULL-TO-LOCK
	ATC/BOP	Place EFW Pump Turbine K3 Steam Admission Valves (CV-2613 and CV-2663) in "MANUAL" AND close.
NOTE: been re	Booth opera	ator call as WCO and report that the steam driven EFW pump, P-7A has eady for start.
	SRO	Direct the ATC or BOP to perform RT-16 to refill dry steam generators.
	ATC/BOP	Open either EFW Pump Turbine K3 Steam Admission valve (CV-2613 or CV-2663).
	ATC/BOP	Place affected SG(s) EFW CNTRL valves in VECTOR OVERRIDE (CV-2645 and CV-2647)

Event 8 Continued on Next Page

Op-Test No.: 2011-1

Scenario No.: 2

Event No.: 8

Event Description: EFW steam driven pump trips on overspeed resulting in overheating condition. EFW pump P7A reset and EFW flow restored.

Time	Position	Applicants Actions or Behavior				
	ATC/BOP	Place affected SG(s) EFW ISOL valves in MANUAL AND verify open (modulating valves) (CV-2627 and CV-2620)				
	ATC/BOP CT	Adjust affected SG(s) EFW CNTRL valve(s) in HAND as necessary to maintain flow to each SG $\leq$ 450 gpm. (Criteria – Due to the steam generators being dry, manual control of the EFW control valves is necessary to prevent EFW from feeding at full flow. EFW must be manually throttled to a value of $\leq$ 450gpm to prevent overcooling the reactor coolant system.)				
	ATC	Operate Turbine Bypass Valves as necessary to stabilize RCS temperature or establish desired cooldown rate as directed by SRO.				
	SRO <b>TS</b>	Identify Technical Specification applicable (3.7.5 Condition D, Two EFW trains inoperable due EFW isolation valves placed in MANUAL [Immediate completion time to initiate action to restore EFW train to operable status ])				
TERMINATION CUE This scenario is complete when EFW is re-established to the SGs and primary to secondary heat transfer in progress OR As directed by the Lead Evaluator						

Facility: ANO-1	Date of Examination: 8/29/2011 Operating Test No.: 2011-1											
	APPLICANTS											
	RO (ATC)			RO (BOP)				SRO-U				
	SCENARIO			SCENARIO				SCENARIO				
Competencies	1	2	3	4	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions	2, 3, 6, 7	4, 5, 6, 7, 8	2, 3, 5, 6, 7		1, 2, 5, 6, 7	3, 5, 6, 7, 8	3, 4, 5, 6, 7		2, 3, 5, 6, 7	3, 4, 5, 6, 7, 8	2, 3, 4, 5, 6, 7	:
Comply With and Use Procedures (1)	2, 3, 4, 6, 7	2, 4, 6, 7, 8	2, 3, 5, 6, 7		1, 2, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 3, 4, 5, 6, 7		1, 2, 3, 4, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	2, 3, 4, 5, 6, 7	
Operate Control Boards (2)	2, 3, 4, 6	2, 4, 6, 7, 8	2, 3, 5, 6, 7		1, 2, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 3, 5, 6, 7					
Communicate and Interact	2, 3, 4, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 5, 6, 7		1, 2, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7		1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7	
Demonstrate Supervisory Ability (3)									1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7	
Comply With and Use Tech. Specs. (3)									1, 2, 7	5, 7, 8	5, 7	
Notes:(1)Includes Technical Specification compliance for an RO.(2)Optional for an SRO-U.(3)Only applicable to SROs.												

## Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.