STATION:	SALEM					
SYSTEM:	Reactor Coolant System					
TASK:	Measure Leakage to the Containmer	nt Sump				
TASK NUMBER:	N0020080101					
JPM NUMBER:	15-01 NRC RO A1-1					
ALTERNATE PATH:		A NUMBER: 2.1.25				
APPLICABILITY:		RO SRO				
EVALUATION SETTIN	G/METHOD: Classroom					
REFERENCES: Si Si (E	2.OP-AR.ZZ-0003, Overhead Annunciat 2.OP-SO.RC-0004, Identifying and Mea 3oth Rev checked 8-9-16)	ors Window C, Rev. 19 suring Leakage, Rev. 16				
TOOLS AND EQUIPM	ENT: Calculator					
VALIDATED JPM CON	IPLETION TIME: 10 min					
TIME PERIOD IDENTI	FIED FOR TIME CRITICAL STEPS:	N/A				
Developed By:	G Gauding Instructor	Date: 8-9-16				
Validated By:	R Evans / N Mulford SME or Instructor	Date: 9-22-16 / 9-29-16				
Approved By:	Operations Training Manager					
Approved By:	Operations Department	Date: /0/11/16				
ACTUAL JPM COMPL	ETION TIME:					
ACTUAL TIME CRITIC	AL COMPLETION TIME:					
PERFORMED BY: GRADE: SAT	UNSAT					
REASON, IF UNSATIS	FACTORY:					
EVALUATOR'S SIGNA	ATURE:	DATE:				

NAME:	
DATE:	

SYSTEM: Reactor Coolant System

 TASK:
 Measure Leakage to the Containment Sump

TASK NUMBER: N0020080101

SIMULATOR SETUP N/A

INITIAL CONDITIONS:

Unit 2 is operating at 100% power, steady state, BOL.

At 0015, OHA C-2 CNTMT SUMP PMP START unexpectedly annunciates, along with OHA A-41. The Aux typewriter shows 21 containment sump pump has started. 2 minutes later, OHA C-2 clears, OHA A-41 annunciates, and the Aux typewriter shows 21 containment sump pump has stopped. The plant remains stable, no indications of a RCS leak are apparent, and no operations have been performed which would cause containment sump level to rise.

INITIATING CUE:

You are the RO. Calculate the leak rate into the Containment Sump by performing Section 5.3 of S2.OP-SO.RC-0004, Identifying and Measuring Leakage.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. Calculate leakage into Containment Sump of 0.85-1.0 gpm.

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Reactor Coolant System

 TASK:
 Measure Leakage to the Containment Sump

		STEP			COMMENTS
	STEP	(*Denotes a Critical Step)		EVAL	(Required for UNSAT
*	NO.		STANDARD	S/U	Evaluation)
		Provide blank copy of S2.OP-SO.RC- 0004, and marked up copy of Attachment 1.			
*	SO.RC-4 5.3.1	 <u>IF</u> either Containment Sump Pump AUTO starts, <u>THEN</u> RECORD the following on Attachment 1, Section 2.0: Operating Containment Sump Pump Number Time of pump start 	Records <u>21 Cont Sump</u> Records time of pump start as <u>0015</u>		
*	SO.RC-4 5.3.2	CALCULATE elapsed time in minutes between start time and previous Containment Sump Pump stop time <u>AND</u> RECORD on Attachment 1, Section 2.0.	Calculates elapsed time in minutes between start time and previous Containment Sump Pump stop time and records on Attachment 1, Section 2.0 by using previous stop time of <u>1855</u> <u>yesterday</u> , and with cue of <u>0015</u> today determines elapsed time is <u>320</u> <u>minutes.</u>		
	SO.RC-4 5.3.3	ENSURE no draining, sampling, or liquid additions to Containment Sump have occurred during selected time frame.	Determines from initial conditions that no draining, sampling, or liquid additions to Containment Sump have occurred during selected time frame.		

JOB PERFORMANCE MEASURE

NAME: ______

SYSTEM: Reactor Coolant System

TASK: Measure Leakage to the Containment Sump

	STEP			COMMENTS
STEP	(*Denotes a Critical Step)		EVAL	(Required for UNSAT
* NO.		STANDARD	S/U	Evaluation)
SO.RC-4 5.3.4	CALCULATE Containment Sump Leak Rate using Attachment 3.	Calculates Containment Sump Leak Rate using Attachment 3 (page 1 of 2), and determines the <u>320 minute line</u> crosses the <u>0.9 gpm</u> leak rate line. Note : Due to no increment between 300 and 350 minutes, extrapolation of data may result in leak rate slightly above or below 0.9 gpm. However, the leakrate <u>MUST</u> be determined to be within the bounding numbers for actions required >0.85 gpm (to initiate Section 5.6) and >1.0 gpm (to initiate S2.OP-ST.RC-		
 SO.RC-4 5.3.5	RECORD Containment Sump Pump stop time and date on Attachment 1, Section 2.0.	0008) Records Containment Sump Pump stop time as 0017 and todays date on Attachment 1, Section 2.0.		
SO.RC-4 5.3.6	 <u>IF</u> leakage to Containment Sump exceeds 1.0 gpm <u>AND</u> Unit in Modes 1-4, <u>THEN</u>: A. INITIATE S2.OP-ST.RC-0008(Q), Reactor Coolant Water Inventory Balance. B. REFER to Technical Specification 3.4.7.2. 	Determines leakage to Containment Sump does not exceed 1.0 gpm		

Page 4 of 7 PSEG Restricted- Possession Requires Specific Permission From Nuclear Training

JOB PERFORMANCE MEASURE

NAME: _____

DATE:

SYSTEM: Reactor Coolant System

TASK: Measure Leakage to the Containment Sump

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	SO.RC-4 5.3.7	<u>IF</u> leakage to Containment Sump exceeds 0.85 gpm, <u>THEN</u> INITIATE Section 5.6 of this procedure.	Determines leakage to Containment Sump does exceed 0.85 gpm, and initiates Section 5.6 of procedure.		
			Terminate JPM when procedure is returned to evaluator.		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

$(\mathcal{V}$	MY	_1. Task description and number, JPM description and number are identified.
\sim	M 1	2. Knowledge and Abilities (K/A) references are included.
U	M	3. Performance location specified. (in-plant, control room, or simulator)
ζ	M	_4. Initial setup conditions are identified.
S	M	5. Initiating and terminating Cues are properly identified.
$\langle \gamma \rangle$	Mr	_6. Task standards identified and verified by SME review.
\checkmark	M	_7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
S	M	8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. <u>19</u> Date <u>9.22.16</u>
	M	9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
		10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
	<u> </u>	_11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	7
SME/Instructor:	N.M.Hard
SME/Instructor:	C

Date:	9-22-16
Date:	9/29/16
Date:	

INITIAL CONDITIONS:

Unit 2 is operating at 100% power, steady state, BOL.

At 0015, OHA C-2 CNTMT SUMP PMP START unexpectedly annunciates, along with OHA A-41. The Aux typewriter shows 21 containment sump pump has started. 2 minutes later, OHA C-2 clears, OHA A-41 annunciates, and the Aux typewriter shows 21 containment sump pump has stopped. The plant remains stable, no indications of a RCS leak are apparent, and no operations have been performed which would cause containment sump level to rise.

INITIATING CUE:

You are the RO. Calculate the leak rate into the Containment Sump by performing Section 5.3 of S2.OP-SO.RC-0004, Identifying and Measuring Leakage.

s2.OP-SO.RC-0004(Q)

ATTACHMENT 1 (Page 1 of 1)

PUMP DATA

1.0 Previous Pump Data

Date: Todau

Pump Name	Stop Time	Leak Rate	Date	Elapsed Run Time	Investigation Time (1)
RCDT	1927	20.25 gpm	4 deys ago	9,645 min	N/A
Cont Sump	1855	2 0.28 gpm	yesterday	11,319 min	7 days
RX Sump	0516	Baseline	2 months	Baseline	30 days

2.0 Daily Pump Data

Pump Name	Start Time	Stop Time	Date	Stop-Start Elapsed Time	Leak Rate (2)	Initials	IV Initials
Comments:							

- Investigation is required if AUTO pump run has not occurred in specified time frame: (1)
 - **ENSURE** OHA-C10 CONT SUMP OVRFLO not in alarm. <u>IF</u> C-10 can <u>NOT</u> be cleared IAW S2.OP-AR.ZZ-0003(Q), <u>THEN</u> containment entry is required to inspect sump level and annulus drain path for leakage. **ENSURE** OHA-C18 RX SUMP OVRFLO not in alarm, <u>AND</u> RX Sump requires inspection during next Containment Walkdown IAW S2.OP-PT.CAN-0001(Q). ٠
- IF pumps are manually started <u>OR</u> tank/sump is purposely filled, <u>THEN</u> ENTER "Baseline" in Leak Rate column. (2)

IF Containment Sump <u>OR</u> Reactor Sump Leakrate exceed 0.85 gpm, <u>THEN</u> **PERFORM** Section 5.6. (Applicable Modes 1-4)

IF RCDT Leak Rate exceeds 10.0 gpm, THEN REFER to Technical Specification 3.4.7.2d Action "b".

SM/CRS Review

Date

RETAIN a copy of this attachment with current Control Room Narrative Log.

s2.0p-s0.rc-0004(Q)

ATTACHMENT 3 (Page 1 of 2)



CONTAINMENT SUMP LEAK RATE LEAKAGE LESS THAN 1 GPM

Salem 2

TIME (MINUTES)

STATION:	SALEM	1976 - 774 - 776				
SYSTEM:	Conduct of Operations					
TASK:	Calculate Shutdown Margin	Calculate Shutdown Margin				
TASK NUMBER:	N1200030301					
JPM NUMBER:	15-01 NRC RO A1-2					
ALTERNATE PATH:		K/A NUMBER:	2.1.43			
APPLICABILITY:			RO SI	RO		
EVALUATION SETTING	G/METHOD: Classroom					
REFERENCES: SC	RE-ST.ZZ-0002(Q), Rev. 23 SHU		N CALCULATION			
TOOLS AND EQUIPME	NT: None					
VALIDATED JPM COM	PLETION TIME: 30 mir	<u>۱</u>				
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL STEPS:	50 m	inutes			
Developed By:	G Gauding Instructor	Date	: 8-9-16			
Validated By:	R Evans / N Mulford SME or Instructor	Date	: 9-22-16 / 9-29-16			
Approved By:	Training Department	Date	: ,0/11/10			
Approved By:	Operations Department	Date	: 10/11/1C			
ACTUAL JPM COMPLE	ETION TIME:					
ACTUAL TIME CRITIC	AL COMPLETION TIME:					
PERFORMED BY: GRADE: SAT	UNSAT					
REASON, IF UNSATIS	FACTORY:					
EVALUATOR'S SIGNA	TURE:		DATE:			
PSEG Restri	cted – Possession Requires Specifi	c Permission from	n Nuclear Training			

NAME:	
DATE:	

SYSTEM: Conduct of Operations

TASK: Calculate Shutdown Margin

TASK NUMBER: N1200030301

INITIAL CONDITIONS:

- Unit 2 Reactor Power is 100%.
 - All Control Rod Group Demand Counters are at 227 steps.
 - Current boron concentration is 300 ppm.
 - Current core burnup is 10,000 EFPH.
 - Control Rod 1D5 was been declared INOPERABLE at 1000 today due to not moving out during a rod exercise test. You have been directed to perform a Shutdown Margin Calculation IAW SC.RE-ST.ZZ-0002 to satisfy the action requirement of TSAS 3.1.3.1 Action c.3.
 - Control Rod 1D5 has been identified as **trippable** and is currently at 214 steps.

INITIATING CUE:

The current time is 1010.

This is a time critical JPM. Time will commence when you are provided with the applicable procedures.

When performing calculation, the CRS directs you to use only the tables as directed by SC.RE-ST.ZZ-0002, do not use Figures.

Successful Completion Criteria:

- 1. All critical steps completed
- 2. All sequential steps completed in order
- 3. All time-critical steps completed within allotted time
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. Perform SDM calculation and determine SDM is -2441 (+/- 5 pcm) and SAT.

JOB PERFORMANCE MEASURE

NAME:	
DATE:	_

System: Conduct of Operations

Task:	Calculate	Shutdown	Margin
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*	STEP NO.	STEP (* Denotes a Critical Step)	EVAL S/U	L COMMENTS J (Required for UNSAT evaluatio			
		Obtains copy of procedure SC.RE- ST.ZZ-0002(Q). Obtains copy of S2.RE-RA.ZZ-0016 Curve Book.	Provide <u>Rev. 23</u> of surveillance. Provide <u>Rev. 8</u> of Curve Book.				
			Evaluator: MARK start time of JPM:				
	3.0	Reviews and signs off Precautions and Limitations Section 3.0	Reviews Precautions & Limitations and signs off Steps 3.1 – 3.7.				
	5.1	SELECT the applicable step below (e.g. 5.1.1.A):	Determines 5.1.1.C is the correct step for the current conditions, which is to complete Attachment 3.				
	5.1.1.C	IF SDM is to be verified (per T/S 4.1.1.1.a) with reactor critical (Mode 1 or 2) and one or more control rods are inoperable, <u>THEN</u> COMPLETE Attachment 3.	Refers to Attachment 3.				
	Att. 3 2.1	The reactor is in Mode 1 or Mode 2 with $k_{eff} \ge 1.0$	Determines Unit is in Mode 1.		. ,		
	Att. 3 3.0	Precautions and Limitations: Section 3.0	Reviews and signs steps 3.1-3.5.				

JOB PERFORMANCE MEASURE

NAME:	 	
DATE:	 	

System: Conduct of Operations

Task:Calculate Shutdown Margin

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att. 3 Section 4.1	Section 4 contains the data points required and the calculations to determine shutdown margin.	Determines the following data and calculations: 4.1.1 100% 4.1.2 300 ppm 4.1.3 D @ 227 steps 4.1.4 10,000 EFPH 4.1.5 0 4.1.6 1		
*	Att. 3 Section 4.2		4.2.1 -3841 4.2.2 -3335 4.2.3 728 4.2.4 0 4.2.5 500 4.2.6 0 4.2.7 -5948		
*	Att. 3 Section 4.3		4.3.1 -5948 4.3.2 645 4.3.3 120 4.3.4 2742 4.3.5 -2441		

1

JOB PERFORMANCE MEASURE

NAME:			
DATE:			

System: Conduct of Operations

 Task:
 Calculate Shutdown Margin

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	4.4	Att 4 Acceptance Criteria	Reviews required SDM in MODE 1 or 2 of -1300 pcm and initials 4.4.1.		
*		4.4.1 IS THE SDM (Item 4.3.5) EQUAL TO OR MORE NEGATIVE THAN (-)1300 PCM?	Determines calculated SDM is SAT and initials SAT.		
			Evaluator: MARK stop time of		
*			JPM: when procedures are returned to proctor.		
			Total time from START to STOP is 50 minutes or less.		
			Terminating Cue: Once operator has returned procedures to proctor, terminate JPM.		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

M______1. Task description and number, JPM description and number are identified.
M______2. Knowledge and Abilities (K/A) references are included.
M______3. Performance location specified. (in-plant, control room, or simulator)
M______4. Initial setup conditions are identified.
M______5. Initiating and terminating Cues are properly identified.
M______6. Task standards identified and verified by SME review.
M______7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
M______7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
M______7. Procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 23 Date 9-22-16
M______8. Verify the JPM:

a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
I0. If the JPM cannot be performed as written with proper responses, then revise the JPM.
I1. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:
SME/Instructor: M.M. Iford
SME/Instructor:

Date: 5-22-16 Date: 9/29/16 Date:

INITIAL CONDITIONS:

- Unit 2 Reactor Power is 100%.
- All Control Rod Group Demand Counters are at 227 steps.
- Current boron concentration is 300 ppm.
- Current core burnup is 10,000 EFPH.
- Control Rod 1D5 was been declared INOPERABLE at 1000 today due to
- not moving out during a rod exercise test. You have been directed to perform a Shutdown Margin Calculation IAW SC.RE-ST.ZZ-0002 to satisfy the action requirement of TSAS 3.1.3.1 Action c.3.
- Control Rod 1D5 has been identified as <u>trippable</u> and is currently at 214 steps.

INITIATING CUE:

The current time is 1010.

This is a time critical JPM. Time will commence when you are provided with the applicable procedures.

When performing calculation, the CRS directs you to use only the Tables as directed by SC.RE-ST.ZZ-0002, do not use Figures.



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CURVE BOOK – Salem Unit 2 Cycle 22

Table G Data Points for Curvebook Figure 15

Salem Unit 2 Cycle 22 Total Control Bank Worth versus Core Exposure for HZP and CZP Conditions

Cycle Burnup	Con	trol Bank Worth (ocm)		
(EFPH)	FPH) 68 °F 350 °F				
0.0	2764	3125	3655		
100.0	2785	3148	3678		
1000.0	2779	3131	3649		
2000.0	2780	3121	3626		
3000.0	2813	3146	3644		
4000.0	2846	3171	3663		
5000.0	2878	3196	3682		
6000.0	2907	3221	3706		
7000.0	2936	3246	3729		
8000.0	2964	3272	3763		
9000.0	2990	3299	3801		
10000.0	3020	3328	3841		
11000.0	3056	3366	3884		
12000.0	3092	3404	3928		
12490.9	3110	3423	3949		



Figure 15

Total Control Bank Worth versus Core Exposure for HZP and CZP Conditions





CURVE BOOK – Salem Unit 2 Cycle 22

Table H Data Points for Curvebook Figure 16

Salem Unit 2 Cycle 22 Total Shutdown Bank Worth versus Core Exposure for HZP and CZP Conditions

Cycle Burnup	Shutc	(pcm)			
(EFPH)	68 °F	68 °F 350 °F			
0.0	2655	2785	2984		
100.0	2612	2745	2956		
1000.0	2744	2874	3073		
2000.0	2870	2998	3185		
3000.0	2897	3023	3208		
4000.0	2923	3047	3232		
5000.0	2949	3071	3253		
6000.0	2971	3090	3264		
7000.0	2993	3108	3274		
8000.0	3010	3123	3291		
9000.0	3025	3137	3311		
10000.0	3048	3158	3335		
11000.0	3092	3199	3370		
12000.0	3137	3240	3406		
12490.9	3159	3260	3424		



Figure 16

Total Shutdown Bank Worth versus Core Exposure for HZP and CZP Conditions 547 °F 350 °F 68 °F Shutdown Bank Worth (pcm)

Cycle Burnup (EFPH)

PSEG Nuclear LLC	Salem Unit 2	LEVEL 2 – REFERENCE USE	Page 102 of 111			
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CURVE BOOK - Salem Unit 2 Cycle 22						

Table 2-1 (Continued) Salem Unit 2 Cycle 22 Data Points for Curvebook Figure 17A EOL Total Power Defect (pcm) as a Function of Power and Boron Concentration Burnup = 11756.0 EFPH, Range = 8924.6 EFPH - EOL

Power							ADONO	n Concentr	ation (ppm)							
Level (%)	0	50	100	150	200	250	(300)	350	400	450	500	550	600	650	700	750
							$\mathbf{\nabla}$									
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	179	178	176	175	174	173	172	170	169	168	167	166	165	164	163	162
10	350	347	345	343	340	338	336	333	331	329	327	325	323	321	319	318
15	513	510	506	503	499	496	493	489	486	483	480	477	474	472	469	466
20	671	666	661	657	652	648	644	639	635	631	627	623	620	616	612	609
25	823	817	811	805	800	794	789	784	779	774	769	764	759	755	750	746
30	970	963	956	949	943	936	930	923	917	911	905	900	894	889	883	878
35	1113	1105	1097	1089	1081	1074	1066	1059	1052	1045	1038	1031	1025	1018	1012	1006
40	1253	1244	1235	1226	1217	1208	1199	1191	1183	1175	1167	1159	1151	1144	1137	1130
45	1391	1380	1370	1360	1349	1339	1330	1320	1311	1302	1293	1284	1275	1267	1258	1250
50	1527	1515	1503	1492	1480	1469	1458	1447	1437	1426	1416	1406	1396	1387	1377	1368
55	1662	1649	1635	1622	1609	1597	1584	1572	1560	1549	1537	1526	1515	1504	1494	1484
60	1797	1782	1767	1752	1738	1724	1710	1697	1683	1670	1658	1645	1633	1621	1609	1597
65	1932	1915	1898	1882	1866	1850	1835	1820	1805	1791	1777	1763	1749	1736	1723	1710
70	2067	2049	2030	2012	1995	1977	1960	1944	1927	1912	1896	1881	1866	1851	1836	1822
75	2204	2183	2163	2143	2124	2105	2086	2068	2050	2032	2015	1998	1982	1966	1950	1934
80	2342	2320	2298	2276	2255	2234	2213	2193	2173	2154	2135	2117	2099	2081	2064	2047
83	2426	2402	2379	2356	2334	2312	2290	2269	2248	2228	2208	2188	2169	2151	2132	2114
85	2483	2458	2434	2410	2387	2364	2342	2320	2298	2277	2257	2237	2217	2197	2178	2160
90	2626	2599	2572	2547	2521	2497	2472	2449	2425	2402	2380	2358	2337	2315	2295	2275
95	2771	2742	2714	2686	2659	2632	2605	2580	2554	2530	2505	2482	2458	2436	2413	2391
99	2890	2859	2829	2800	2771	2742	2714	2687	2660	2634	2608	2583	2558	2533	2510	2486
. (100)	2920	2889	2858	2828	2799	2770	2742	2714	2687	2660	2634	2608	2583	2558	2534	2510

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CURVE BOOK – Salem Unit 2 Cycle 22					

Table 2-1 (Continued) Salem Unit 2 Cycle 22 Data Points for Curvebook Figure 17A EOL Total Power Defect (pcm) as a Function of Power and Boron Concentration Burnup = 11756.0 EFPH, Range = 8924.6 EFPH - EOL

Power							Boro	n Concentr	ation (ppm)							
Level (%)	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	162	161	161	160	159	158	157	157	156	155	154	154	153	152	152	151
10	318	316	314	312	311	309	308	306	305	303	302	300	299	298	296	295
15	466	464	461	459	456	454	451	449	447	445	443	441	439	437	435	433
20	609	605	602	599	595	592	589	586	583	580	578	575	572	570	567	565
25	746	742	737	733	729	725	722	718	714	711	707	704	700	697	694	691
30	878	873	868	863	858	853	849	844	840	835	831	827	823	819	816	812
35	1006	1000	994	988	982	977	971	966	961	956	951	946	941	937	932	928
40	1130	1123	1116	1109	1103	1096	1090	1084	1078	1072	1066	1061	1055	1050	1045	1040
45	1250	1242	1234	1227	1219	1212	1205	1198	1191	1184	1178	1171	1165	1159	1153	1147
50	1368	1359	1350	1342	1333	1325	1317	1309	1301	1293	1286	1279	1272	1265	1258	1252
55	1484	1473	1464	1454	1444	1435	1426	1417	1408	1400	1391	1383	1375	1368	1360	1353
60	1597	1586	1575	1564	1554	1543	1533	1523	1513	1504	1495	1486	1477	1468	1460	1452
65	1710	1698	1685	1673	1662	1650	1639	1628	1617	1606	1596	1586	1576	1566	1557	1548
70	1822	1808	1795	1782	1769	1756	1743	1731	1719	1707	1696	1685	1674	1663	1653	1643
75	1934	1919	1904	1889	1875	1861	1847	1834	1821	1808	1795	1783	1771	1759	1748	1737
80	2047	2030	2013	1997	1982	1966	1951	1937	1922	1908	1894	1881	1868	1855	1842	1830
83	2114	2097	2080	2063	2046	2030	2014	1998	1983	1968	1954	1939	1926	1912	1899	1886
85	2160	2142	2124	2106	2089	2072	2056	2040	2024	2009	1993	1979	1964	1950	1937	1924
90	2275	2255	2235	2216	2198	2179	2161	2144	2127	2110	2093	2077	2062	2047	2032	2017
95	2391	2370	2349	2328	2308	2288	2269	2250	2231	2213	2195	2178	2161	2144	2128	2112
99	2486	2463	2441	2419	2398	2376	2356	2336	2316	2296	2277	2259	2241	2223	2206	2190
100	2510	2487	2464	2442	2420	2399	2378	2357	2337	2318	2298	2279	2261	2243	2226	2209

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CURVE BOOK – Salem Unit 2 Cycle 22

Table I Data Points for Curvebook Figure 14

Salem Unit 2 Cycle 22 Most Reactive Stuck Rod Worth versus Core Exposure for HZP and CZP Conditions

Cycle Burnup	Worst Stuck Rod Worth (pcm)					
(EFPH)	68 °F	350 °F	(547 °F)			
0.0	944	889	924			
100.0	890	907	950			
1000.0	948	861	870			
2000.0	998	817	791			
3000.0	981	802	765			
4000.0	964	788	739			
5000.0	947	774	712			
6000.0	930	759	686			
7000.0	942	767	689			
8000.0	956	777	695			
9000.0	982	796	707			
10000.0	1022	827	(728)			
11000.0	1061	858	748			
12000.0	1100	889	769			
12490.9	1120	904	779			

Salem Unit 2 Cycle 22 Most Reactive Stuck Rod Location versus Core Exposure for HZP and CZP Conditions

Cycle Burnup	Wor	t Stuck Rod Location			
(EFPH)	68 °F	350 °F	547 °F		
0.0	M-0 4	K-06	H-08		
91.4	M-04	K-06	H-08		
1827.9	M-04	M-04	K-06		
6093.1	M-04	M-04	K-06		
8530.3	M-04	M-04	K-06		
12490.9	M-04	M-04	H-06		



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CURVE BOOK – Salem Unit 2 Cycle 22

Figure 14

Most Reactive Stuck Rod Worth versus Core Exposure for HZP and CZP Conditions





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CURVE BOOK - Salem Unit 2 Cycle 22

Table 1-6 Salem Unit 2 Cycle 22 Summary of Control Rod Worths

HZP, No Xe

Burnup (EFPH)		Control Banks (pcm)	Shutdown Banks (pcm)	Control and Shutdown Banks (pcm)		
BOL	0.0	3654.1	2984.0	6638.1		
MRDS	1827.9	3622.0	3181.2	6803.2		
MOL	6093.1	3703.9	3265.3	6969.2		
LFPC	11756.0	3915.5	3393.8	7309.3		

Rod Worth Penalty to Use for Modes 1, 2

Event A	Rod Worth Penalty (pcm) BOL to < MOL (6093.1 EFPH)	Rod Worth Penalty (pcm) MOL (6093.1 EFPH) to EOL
One Untrippable RCCA	2195	2285

Event B	Rod Worth Penalty (pcm) BOL to EOL
Two or more Untrippable RCCAs	2285

Event C	Rod Worth Penalty (pcm)* BOL to EOL
Dropped RCCA	500

*In the event of a misaligned RCCA, apply dropped RCCA penalty.

Rod Worth Penalty to Use for Modes 3, 4, 5

Event D	Rod Worth Penalty (pcm) BOL to EOL
One or more Untrippable RCCA(s)	
OR	2715
One or more Failed IRPI Indication(s)	

Highest (ARI-1) Stuck Rod Worths for Cycle 22

Burnu	p (EFPH)	Rod Location	Temperature (°F)	Rod Worths (pcm)
BOL	0.0	H-08	547.0	1097.1*
MRDS	1827.9	K-06	547.0	907.9
MOL	6093.1	K-06	547.0	785.8
LFPC	11756.0	H-06	547.0	880.8

*Highest stuck rod worth for all conditions

The EFPH to MWD/MTU conversion factor is 1.64120 MWD/MTU/EFPH

PSEG Nuclear LLC	Salem Unit 2	LEVEL 2 – REFERENCE USE	Page 15 of 111		
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CURVE BOOK – Salem Unit 2 Cycle 22					

 Table P

 Salem Unit 2 Cycle 22

 Boron Concentration Requirements for IRPI Calibration and RCCA Drop Testing

	Boron Concentration (ppm)								
RCCA Configuration and Ref	Temperature								
	68 °F	200 °F	350 °F	450 °F	500 °F	547 °F			
ARO, 0.98	2150	2179	2223	2249	2264	2133			
Control Bank In, Shutdown Bank Out, 0.95	2197	2212	2228	2227	2223	2051			
Control Bank Out, Shutdown Bank In, 0.95	2327	2365	2425	2463	2482	2362			

NOTE: All boron concentration values except for 547 $^{\rm o}{\rm F}$ contain 100 ppm conservatism. NOTE: All boron concentration values were computed at zero power, no xenon conditions.

Page 1 of 1

STATION:	SALEM 1 & 2		
SYSTEM:	Chemical and Volume Con	trol	
TASK:	Demonstrate the Operabilit	y of the RWST and/or th	ne BASTs
TASK NUMBER:	N0040420201		
JPM NUMBER:	15-01 NRC RO Admin A2		
ALTERNATE PATH:		K/A NUMBER:	2.2.37
APPLICABILITY: EO			<u>3.6</u> <u>4.6</u> RO SRO
EVALUATION SETTING	G/METHOD: Simulator	- Perform	
S2 REFERENCES: Sa	.OP-ST.CVC-0010, Rev. 10 (lem Tech Specs	checked 9-28-16)	
TOOLS AND EQUIPME	NT: None		
VALIDATED JPM COM	PLETION TIME: 11	minutes	
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL S	TEPS:N	I/A
Developed By:	G Gauding Instructor	Date	: 8-9-16
Validated By:	S Harris / J Pierce SME or Instructor	Date	9-28-16
Approved By:	Training Department	L.H. Date	10/11/14
Approved By:	Operations Department	Date	10/11/16
ACTUAL JPM COMPLE	ETION TIME:		
ACTUAL TIME CRITICA	AL COMPLETION TIME:		
PERFORMED BY: GRADE: SAT			
REASON, IF UNSATIS	FACTORY:		
EVALUATOR'S SIGNA	TURE:		DATE:

NAME:	
DATE	

SYSTEM: Chemical and Volume Control

IC-249

TASK: Demonstrate the Operability of the RWST and/or the BASTs

TASK NUMBER: N0040420201

SIMULATOR SETUP:

Reset IC for each JPM and ensure Plant Computer is returned to a neutral screen.

RWST levels -	CHI	41.4
	CH II	41.4
	CH III	41.4
	CHIV	41.5
BAST levels -	21 BAST	49.5
	22 BAST	49.5

INITIAL CONDITIONS:

- Salem Unit 2 is at 100% power.
- 21 BAT pump developed a leak that went unnoticed until the cross-connected BAST's reached their low level alarm setpoint.
- 21 BAT pump, and the leak, are isolated.
- Chemistry reports current RWST and BAST boron concentrations are:
 - 21 BAST 6610 ppm
 - 22 BAST 6610 ppm
 - RWST 2350 ppm
- Off Normal and Off-Normal Tagged list review has been performed SAT.

INITIATING CUE:

You are the Reactor Operator. Perform S2.OP-ST.CVC-0010, Borated Water Sources.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. Complete Attachment 2 of S2.OP-ST.CVC-0010 per key and determine the Surveillance is SAT

NAME: ______ DATE: _____

SYSTEM: Chemical and Volume Control

Demonstrate the Operability of the RWST and/or the BASTs TASK:

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide marked up copy of S2.OP- ST.CVC-0010, Borated Water Sources.			
	3.0	Precautions and Limitations	Reads and initials steps.		
	5.1.1	 COMPLETE Attachment 2 per the following: RECORD Data. RECORD Test Results by initialing SAT or UNSAT column using the stated Acceptance Criteria. 	Completes Attachment 2 with the below data.		
*	Att. 2	RWST Level	Records RWST level with channel for which calibration data was obtained RWST levels are: CH I: 41.4 CH II: 41.4 CH III: 41.4 CH IV: 41.5 Initials SAT for RWST Level and inserts date.		
*	Att. 2	RWST Temp	Checks P-250 computer point T0650A and enters 70°F. Initials SAT for RWST Temp and inserts date.		

NAME: _____

DATE:

SYSTEM: Chemical and Volume Control

TASK: Demonstrate the Operability of the RWST and/or the BASTs

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att. 2	RWST Conc	Refers to initial conditions for RWST boron concentration and enters 2350 ppm. Initials SAT for RWST boron concentration and inserts date.		
*	Att. 2	21 BAST Vol <u>AND/OR</u> 22 BAST Vol	Records 21 and 22 BAST level indicated on control console from 2LI106 and 2LI102 respectively as 2LI106 – 49.5% 2LI102 - 49.5% Uses Tech Spec 3.1.2.6.a, 3.1.2.6.b, and Figure 3.1-2 and determines 21 BAST Vol <u>AND/OR</u> 22 BAST Vol is SAT . Initials SAT for BAST volume and inserts date.		
*	Att. 2	21 BAST Temp <u>AND/OR</u> 22 BAST Temp	Records 21 and 22 BAST temp indicated on control console from 2TI107 and 2TI103 respectively as: 2TI107 - 98.2 2TI103 - 97.1 Initials SAT for 21 BAST Temp <u>AND/OR</u> 22 BAST Temp and inserts date.		

NAME: ______ DATE: _____

SYSTEM: Chemical and Volume Control

Demonstrate the Operability of the RWST and/or the BASTs TASK:

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att. 2	21 BAST Conc <u>AND/OR</u> 22 BAST Conc	Refers to initial conditions for BAST boron concentrations and enters 6610 ppm for 21 BAST and 6610 ppm for 22 BAST.		
			Uses Tech Spec 3.1.2.6.a, 3.1.2.6.b, and Figure 3.1-2 and determines 21 and 22 BAST boron concentration is SAT . Initials and inserts date.		
	5.3.1	This surveillance is considered satisfactory when Attachments 2 and 3 (as applicable) are complete with components listed meeting Acceptance Criteria stated in each Attachment. OR	Initials step 5.3.1		
	5.3.2	 This surveillance is unsatisfactory. A. INITIATE Notification(s) to correct the unsatisfactory condition. B. RECORD Notification number(s) and reason for unsatisfactory completion on Attachment 4 in the Comments Section. 	N/A's 5.3.2.		
	5.4.1	COMPLETE Attachment 4, Sections 1.0 and 2.0, <u>AND</u> FORWARD this procedure to the SM/CRS for review.	Completes Attachment 4, Sections 1.0 and 2.0, and returns procedure to JPM Evaluator.		

NAME: ______ DATE: _____

SYSTEM: Chemical and Volume Control

Demonstrate the Operability of the RWST and/or the BASTs TASK:

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			JPM is complete when procedure is returned to evaluator.		

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 As a minimum, the following borated water source(s) shall be OPERABLE as required by Specifications 3.1.2.1 and 3.1.2.2:

- a. A boric acid storage system with:
 - 1. A contained volume of borated water in accordance with figure 3.1-2,
 - 2. A Boron concentration in accordance with Figure 3.1-2, and
 - A minimum solution temperature of 63°F.
- b. The refueling water storage tank with:
 - 1. A contained volume of between 364,500 and 400,000 gallons of water,
 - 2. A boron concentration of between 2,300 and 2,500 ppm, and
 - 3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With the boric acid storage system inoperable and being used as one of the above required borated water sources, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.
- b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.6 Each borated water source shall be demonstrated OPERABLE:

- a. For the boric acid storage system, when it is the source of borated water in accordance with the Surveillance Frequency Control Program by:
 - 1. Verifying the boron concentration in each water source.
 - 2. Verifying the water level of each water source, and
 - 3. Verifying the boric acid storage system solution temperature.
- b. For the refueling water storage tank by:
 - 1. Verifying the boron concentration in accordance with the Surveillance Frequency Control Program,
 - 2. Verifying the borated water volume in accordance with the Surveillance Frequency Control Program, and
 - 3. Verifying the solution temperature in accordance with the Surveillance Frequency Control Program when the outside air temperature is less than 35°F.



JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

\mathcal{A}		1. Task description and number, JPM description and number are identified.
\sim	A	2. Knowledge and Abilities (K/A) references are included.
\mathcal{C}	_M	3. Performance location specified. (in-plant, control room, or simulator)
5	A	4. Initial setup conditions are identified.
V	Ŋ	5. Initiating and terminating Cues are properly identified.
5	_ <u>y</u>	_6. Task standards identified and verified by SME review.
5	ß	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
S	4	8. Verify the procedure referenced by this JPM matches the most current revision of
V	Ŀ	9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
		_ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
		_11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.
	SME/Inst SME/Inst	ructor: Alandy for J. Pierce Date: <u>alzelic</u> ructor: <u>Alandy for S. Horris</u> Date: <u>alzelic</u>

SME/Instructor:_____

Date: 9/2016 Date: _____

Original checklist madvertantly discarded. A solulie

INITIAL CONDITIONS:

- Salem Unit 2 is at 100% power.
- 21 BAT pump developed a leak that went unnoticed until the cross-connected BAST's reached their low level alarm setpoint.
- 21 BAT pump, and the leak, are isolated.
- Chemistry reports current RWST and BAST boron concentrations are:
 - 21 BAST 6610 ppm
 - 22 BAST 6610 ppm
 - RWST 2350 ppm
- Off Normal and Off-Normal Tagged list review has been performed SAT.

INITIATING CUE:

You are the Reactor Operator. Perform S2.OP-ST.CVC-0010, Borated Water Sources Data.
PSEG Internal Use Only



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PSEG NUCLEAR L.L.C. SALEM/OPERATIONS

S2.OP-ST.CVC-0010(Q) - REV. 10

BORATED WATER SOURCES

USE CATEGORY : II

- ♦ Biennial Review Performed: Yes ____ No ____
- ♦ Change Package(s) and Affected Document Numbers incorporated into this revision: None
- The following OTSC(s) were incorporated into this revision: None

REVISION SUMMARY:

- ♦ Added P&L 3.2 for boron administrative limit for the RWST. [70152703]
- Added step 5.3.2.A which allows the user to skip writing a notification if this surveillance is UNSAT due to purposely changing boron concentration in the BASTs (and they are being tracked in the tech spec tracking log). [70152165]
- Revised the acceptance criteria for the RWST in Attachment 3 to match the actual requirements in Tech. Spec. 3.1.2.5. [70092142]

IMPLEMENTATION REQUIREMENTS

Effective Date: April 30, 2013

None

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BORATED WATER SOURCES

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1.0 PURPOSE

- 1.1 Provide instructions necessary to:
 - 1.1.1 Demonstrate operability of Refueling Water Storage Tank (RWST) <u>AND</u> Boric Acid Storage Tanks (BAST) in Modes 1-4 IAW Technical Specification 4.1.2.6.a.1, 4.1.2.6.a.2, 4.1.2.6.a.3, 4.1.2.6.b.1, 4.1.2.6.b.2, 4.5.5.a.1, and 4.5.5.a.2
 - 1.1.2 Demonstrate operability of RWST <u>OR</u> BAST in Modes 5 and 6 IAW Technical Specification 4.1.2.5.a.1, 4.1.2.5.a.2, 4.1.2.5.a.3, 4.1.2.5.b.1, and 4.1.2.5.b.2 [C0265]
- 1.2 This procedure is required at least once per 7 days in Modes 1-6.

2.0 **PREREQUISITES**

- 2.1 **IDENTIFY** sections of this procedure that are <u>NOT</u> to be performed with "N/A".
- 2.2 **REVIEW** Components "Off Normal and Off-Normal Tagged" List(s) for system and support system(s) associated with evolution to be performed in this procedure.
- 2.3 ENSURE calibration data for the instruments listed in Attachment 1, as applicable, is obtained. [C0289]
- <u>4</u> 2.4 **ENSURE** current RWST and BAST boron concentrations are obtained by Chemistry.

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Steps identified with dollar sign (\$) are those items required to meet Technical Specification acceptance criteria. Such steps, if not satisfactorily completed, may have reportability requirements and shall be brought to immediate attention of the SM/CRS.
- 3.2 In Modes 1-4 RWST boron concentration should be maintained within the administrative limits of 2328 2470 ppm. In Modes 5, 6, and Defueled boron concentration should be maintained > 2328 ppm.

4.0 EQUIPMENT/MATERIAL REQUIRED

None

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5.0 **PROCEDURE**

- 5.1) Borated Water Sources Modes 1-4
 - 5.1.1 **COMPLETE** Attachment 2 per the following:
 - **RECORD** Data.
 - **RECORD** Test Results by initialing SAT or UNSAT column using the stated Acceptance Criteria.
- 5.2 Borated Water Sources Modes 5-6



S

- 2.1 **COMPLETE** Attachment 3 per the following:
 - RECORD Data.
 - **RECORD** Test Results by initialing SAT or UNSAT column using the stated Acceptance Criteria.
- 5.3 Acceptance Criteria
- 5.3.1 This surveillance is considered satisfactory when Attachments 2 and 3
 (as applicable) are complete with components listed meeting Acceptance Criteria stated in each Attachment.

<u>OR</u>

- 5.3.2 This surveillance is unsatisfactory.
 - A. <u>IF</u> the cause of the UNSAT surveillance is due to BAST level being out of specification for expected conditions (e.g. outage preparations) <u>AND</u> this condition is being tracked in the Tech Spec Tracking Log <u>THEN</u> a notification is not required <u>AND</u> **GO TO** Section 5.4.
 - B. **INITIATE** Notification(s) to correct the unsatisfactory condition(s).
 - C. **RECORD** Notification number(s) and reason for unsatisfactory completion on Attachment 4 in the Comments Section.

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5.4 Completion and Review

- 5.4.1 **COMPLETE** Attachment 4, Sections 1.0 and 2.0, <u>AND</u> **FORWARD** this procedure to the SM/CRS for review.
- 5.4.2 SM/CRS **PERFORM** the following:
 - A. **REVIEW** this procedure with Attachments 1 through 4 for completeness and accuracy.
 - B. **COMPLETE** Attachment 4, Section 3.0.
 - C. <u>IF ANY</u> Evaluation Result is identified as UNSAT for applicable Mode, <u>THEN</u> ENTER applicable Technical Specification Action Statement(s).
 - D. COMPLETE Attachment 4, Section 4.0.
 - E. FORWARD completed procedure to Operations Staff.

END OF PROCEDURE SECTION

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6.0 **<u>RECORDS</u>**

6.1 Retain the following IAW RM-AA-101, Records Management Program:

Attachment 1 Attachment 2 (as applicable) Attachment 3 (as applicable) Attachment 4

7.0 **<u>REFERENCES</u>**

7.1 Updated Final Safety Analysis Report:

7.1.1 Section 9.3.4, Chemical and Volume Control System

7.2 Procedures:

7.2.1 SC.CH-TI.ZZ-0180(Q), Sampling Schedule and Chemistry Specifications

7.3 Drawings:

- 7.3.1 205328, Chemical & Volume Control Operation
- 7.3.2 205334, Safety Injection

7.4 <u>Cross-References</u>:

- 7.4.1 Technical Specifications Unit 2:
 - A. 3/4.1.2.5, Borated Water Sources Shutdown
 - B. 3/4.1.2.6, Borated Water Sources Operating
 - C. 3/4.5.5, Refueling Water Storage Tank
- 7.4.2 Procedures:
 - A. RM-AA-101, Records Management Program
 - B. S2.OP-TM.ZZ-0002(Q), Tank Capacity Data
- 7.4.3 Others:
 - A. DCP 2EC-3225, Boric Acid Concentration Reduction
 - B. Tech Spec Amendment No. 133

7.5 <u>Commitments</u>:

- 7.5.1 C0265 NSO LER 311/89-015-00
- 7.5.2 C0283 NRC VIOL 311/87-18-01

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ATTACHMENT 1 (Page 1 of 1)

INSTRUMENTATION AND TEST EQUIPMENT DATA

Instrument/Test Equipment	Description	Calibration Overdue Date	Initials
2LT960		4 months from	Å
2LT961	Sefet: Triaction Defauling Water		Ŋ
2LT962	Storage Tank Level Transmitter		Ņ
2LT963	(1)	\checkmark	Д
2LT106	21 BAST Level Channel	3 months from now	Ł
2LT102	22 BAST Level Channel	1	Ŕ
2TI107	21 BAST Temp Channel		Ņ
2TI103	22 BAST Temp Channel		Å
2TA3685 (T0650A)	RWST Temperature		Ŋ

(1) Calibration data required for at least one channel. Channel selected is utilized when recording data for this parameter.

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ATTACHMENT 2 (Page 1 of 1)

BORATED WATER SOURCES DATA MODES 1-4

				Test I	Results	
	Parameter	Data	Acceptance Criteria	SAT	UNSAT	Date
1 channel checked	RWST Level 2LT960 2LT961 2LT962 2LT963	lan væ any Channel 41.4 41.4 41.4 41.4 <u>41.5</u> ft	364,500 to 400,000 gals (≥40.5 ft ≤41.9 ft) (Note 2)	V		
	RWST Temp	_ 70 _°F °F	≥35°F	\checkmark		
	RWST Conc	<u>2350 ppm</u>	≥2,300 and ≤2,500 ppm	\checkmark		
	21 BAST Vol ANDOR 22 BAST Vol	<u>49.5</u> % (2LI106) <u>49.5</u> % (2LI102)	IAW Tech Spec 3.1.2.6.a and 3.1.2.6.b Figure 3.1-2 (Note 1)	\checkmark		
	21 BAST Temp <u>AND/OR</u> 22 BAST Temp	98.2 °F (2TI107) 97.1 °F (2TI103)	≥63°F	~		
	21 BAST Conc <u>AND/OR</u> 22 BAST Conc	<u>6610 ppm</u> (21 BAST) <u>6610 ppm</u> (22 BAST)	Tech Spec 3.1.2.6.a and 3.1.2.6.b Figure 3.1-2 (Note 1)	\checkmark		

 If one BAST is the borated water source, then level and concentration requirements must be maintained in acceptable operation region of figure 3.1-2. If two BASTs are the borated water source, then combine volumes are used to satisfy Tech Spec 3.1.2.6.a.

(2) Refer to S2.OP-TM.ZZ-0002(Q), Tank Capacity Data.

ATTACHMENT 3 (Page 1 of 1)

BORATED WATER SOURCES DATA MODES 5-6

1.0 RWST AS BORATED WATER SOURCE:

			Test	Results	
Parameter	Data	Acceptance Criteria	SAT	UNSAT	Date
RWST Level 2LT960 2LT961 2LT962 2LT963	ft	≥37,000 gals (≥1.9 ft)			
RWST Temp	<u></u>	≥35°F			
Boron Conc	ppm	≥2300 ppm			

2.0 BAST AS BORATED WATER SOURCE:

			Test	Results	D
Parameter	Data	Acceptance Criteria	SAT	UNSAT	Date
21 BAST Vol	<u>%</u>				
AND/OR	(2L1106) %	≥2600 gallons			
22 BAST Vol	(2LI102) ⁷⁰		-		
21 BAST Temp	°F				
AND/OR	(211107) °F	≥63°F			
22 BAST Temp	(2TI103) ¹				
21 BAST Conc	ppm	> 6560 mm			
AND/OR	ZIBASI	20300 ppm &			
22 BAST Conc	ppm 22 BAST	≤6990 ppm			

(1) One or two BASTs may be used as the Borated Water Source, if two BASTs are the Borated Water Source, then combined volumes are used to satisfy Tech Spec. Refer to BAST graph IAW S2.OP-TM.ZZ-0002(Q), Tank Capacity Data graph for % level to gallons conversion.

s2.0P-ST.cvc-0010(Q)

ATTACHMENT 4 (Page 1 of 2)

COMPLETION SIGN-OFF SHEET

1.0 **<u>COMMENTS</u>**: (Include test deficiencies and corrective actions.) 2.0 SIGNATURES:

Print	Initials	Signature	Date
G.Gauding	4	Alandi	Today
	·		æ
			<u></u>

,

s2.0P-ST.cvc-0010(Q)

ATTACHMENT 4 (Page 2 of 2)

COMPLETION SIGN-OFF SHEET

3.0 EVALUATION OF TEST RESULTS:

		Test Results		
Modes	Source(s)	SAT	UNSAT	
1-4	RWST and/or BAST are operable IAW Attachment 2 as required by Tech Spec 3.1.2.1 or 3.1.2.2.			
5-6	RWST is operable IAW Attachment 3, Section 1.0 <u>OR</u> BAST is operable IAW Attachment 3, Section 2.0			

4.0 SM/CRS FINAL REVIEW AND APPROVAL:

This procedure with Attachments 1-4 has been reviewed for completeness and accuracy. All deficiencies, including corrective actions, have been clearly recorded in COMMENTS Section above. Technical Specification compliance, procedure compliance, and Acceptance Criteria have been evaluated. [C0283]

.

Signature:

SM/CRS

Date:

STATION:	SALEM	- M		
SYSTEM:	ADMINISTRATIVE (ALARA)			
TASK:	Perform Stay Time Calculation for Er	mergency Condition.		
TASK NUMBER:	N1200100104			
JPM NUMBER:	15-01 NRC RO A3			
ALTERNATE PATH		UMBER: 2.3.4		
APPLICABILITY:		RO SRO		
EVALUATION SETT	ING/METHOD: Classroom			
REFERENCES: F	Radiological Survey Maps, RP-AA-203	Rev. 6, NC.EP-EP.ZZ-0304 Rev. 16		
TOOLS AND EQUIP	MENT: Calculator			
VALIDATED JPM C	OMPLETION TIME: 10 minutes	_		
TIME PERIOD IDEN	TIFIED FOR TIME CRITICAL STEPS:	N/A		
Developed By:	G Gauding Instructor	Date: 8-9-16		
Validated By:	R Evans / N Mulford SME or Instructor	Date: 9-22-16 / 9-29-16		
Approved By:	Training Department	Date: $10/11/16$		
Approved By:	Operations Department	Date: 10/11/16		
ACTUAL JPM COM	PLETION TIME:			
ACTUAL TIME CRIT	TICAL COMPLETION TIME:			
PERFORMED BY: GRADE: SAT				
REASON, IF UNSAT	TISFACTORY:			
EVALUATOR'S SIG	NATURE:	DATE:		

NAME: _____

DATE:

SYSTEM: ADMINISTRATIVE (ALARA)

TASK: Perform Stay Time Calculation for Emergency Condition.

TASK NUMBER: N1200100104

INITIAL CONDITIONS:

- 1. Unit 1 experienced Rx trip with a small RCS leak from 100% power.
- 2. The Rx failed to automatically trip on a valid trip demand, and was tripped successfully with the Rx trip handle.
- 3. Salem is currently in an Alert.
- 4. Your TEDE dose for the year is 1925 mrem.

INITIATING CUE:

You have been directed to perform a detailed inspection of 22 RHR pump room prior to starting the pump. You will <u>NOT</u> be going into the 22 RHR HX area. Your job is estimated to take 2 hours to complete.

Using the correct survey map, and conservatively using the <u>HIGHEST</u> dose rate anywhere in the pump room for your <u>ENTIRE</u> exposure, determine:

- 1. Can you complete the job without exceeding your current dose authorization
- 2. What would be your new TEDE dose for the year after performing the job (or as much as possible) **WITHOUT** exceeding your <u>current</u> dose authorization?

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion: Determines:

- 1. YES job can be performed
- 2. Calculates new TEDE dose of 2005 mrem.

NAME: _____ DATE: _____

SYSTEM: ADMINISTRATIVE (ALARA)

TASK: Determine Radiological Conditions For Personnel Exposure

I.

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide the attached survey maps of 21	Sologta the Suprey Man		
	1	and 22 RHR rooms, and S1 and S2 55 General area. Also have blank copies of RP-AA-203, Exposure Control and Authorization and NC.EP-EP.ZZ-0304, Operational Support Center (OSC) Radiation Protection Response if asked for.	"S2 AUX 045' 22 RHR ROOMS" Map # 21045Z2		
		START TIME:			
		If asked, provide NC.EP-EP.ZZ-0304, OSC Radiation Protection Response.	Note: Contains guidance for automatic increase in allowed dose to 4500 mrem. (Section 5.0 Note.)		
			Determines dose limit is automatically raised to 4500 mrem upon the declaration of an ALERT or higher Emergency.		

NAME: _____

DATE: _____

SYSTEM: ADMINISTRATIVE (ALARA)

TASK: Determine Radiological Conditions For Personnel Exposure

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	2	Determine highest dose rate in room.	Per the survey map, squares are dose rates in mrem/hr, and circles are smear locations. The highest square is located under the words "22RH37" on the map and indicates 40 mrem/hr. Note : The square with "250" inside it is in the RHR HX room, and is not in the area which the operator will go.		
*	3	Calculate TEDE dose for year	Subtracts year to date TEDE dose from Emergency Dose limit of 4,500 mrem, and gets 2575 mrem . Determines 2 hours of work will result in 80 mrem dose , and new TEDE dose is 2005 mrem , which does NOT exceed 4,500 mrem authorized in an Emergency.		
			Terminate JPM when candidate has returned paperwork.		
	4	STOP TIME:			

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

\mathcal{W}	My	1. Task description and number, JPM description and number are identified.
v	M ~	2. Knowledge and Abilities (K/A) references are included.
\lor	M ~	3. Performance location specified. (in-plant, control room, or simulator)
$(\mathcal{V}$	My	4. Initial setup conditions are identified.
\bigvee	My	5. Initiating and terminating Cues are properly identified.
\bigcirc	M 🖌	6. Task standards identified and verified by SME review.
\mathcal{V}	M	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
V	M -/	8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 6 Date 5-2 16
	M 7ª	 9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
		10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
		11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.
		9-72-16

SME/Instructor:	
SME/Instructor:	T.M. I ford

Date: _	7-	<i>CC ∓</i>
Date: _	٩	29/16

SME/Instructor:_____

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Date:

INITIAL CONDITIONS:

- 1. Unit 1 experienced Rx trip with a small RCS leak from 100% power.
- 2. The Rx failed to automatically trip on a valid trip demand, and was tripped successfully with the Rx trip handle.
- 3. Salem is currently in an Alert.
- 4. Your TEDE dose for the year is 1925 mrem.

INITIATING CUE:

You have been directed to perform a detailed inspection of 22 RHR pump room prior to starting the pump. You will <u>NOT</u> be going into the 22 RHR HX area. Your job is estimated to take 2 hours to complete.

Using the correct survey map, and conservatively using the <u>HIGHEST</u> dose rate anywhere in the pump room for your <u>ENTIRE</u> exposure, determine:

- 1. Can you complete the job without exceeding your current dose authorization
- 2. What would be your new TEDE dose for the year after performing the job (or as much as possible) **WITHOU**T exceeding your <u>current</u> dose authorization?





Location: S2 AUX 045' 21 RHR ROOMS Particle Particle <th>Salem Radio</th> <th>ological Survey</th> <th>MAP# 21045Z1</th>	Salem Radio	ological Survey	MAP# 21045Z1
Rediation Survey 1 Rediation Survey 1 Instrument Senalti M/A AM M/A Contamination Survey F./ B.7 Instrument Senalti M/A Contamination Survey F./ B.7 Instrument Senalti M/A Contamination B.Y K 1 C.K 2 2.K 3 1.K 4 C.K 2 K 4 C.K 2 C.K 3 1.K 4 C.K 2 C.K 1.6 C.K 2.6 S.K 4 C.K 2 C.K 1.6 C.K 1.7 C.K 2.8 S.K 3.9 K 4.1 K 2.1 C.C NA Modenting NA Soureyed Sign <	Location: S2 AUX 045' 21 RHR R	00MS Date 12/2	5/16 Time: RWP:
NA Other A Surveyed By: Print R. Doyle Eline Sign Robust Ministration COMMENTS: # HCA ON PUMP Eline FLEYATION POSTED: HRA, Image: Common sign point of the s	Location: S2 AUX 045' 21 RHR R Radiation Survey γ Instrument Serial# α Instrument Serial# <td></td> <td>S/16 Time: 14/15 RWP: 1 I I I I I I I I I I I I I I I I I I I</td>		S/16 Time: 14/15 RWP: 1 I I I I I I I I I I I I I I I I I I I
Technician Review Supervisor Review	Surveyed By: Print R. Doyle Sign Robust at Joyle Sign COMMENTS: * H (A ON PUMP FLEYATION POSTED: HRA, CA, NEWRAA, ACCESS IS FROM 55', DOOR & HATCH HOR MALLEY LOCKED Masslian results <1000 dpm/16cm ² on floors, Walls & equipment Verified Radiological postings, labels, marking, and barriers	Dose Rate, mRem/hr	O, Smear Location
NAME DADATE DATE	Technician Review	S	upervisor Review





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STATION:	SALEM
SYSTEM:	ADMINISTRATIVE
TASK:	Review a completed surveillance to demonstrate Operability of 21 CFCU
TASK NUMBER:	N1230300302
JPM NUMBER:	15-01 NRC SRO Admin A1-1
ALTERNATE PATH:	K/A NUMBER: 2.1.25
APPLICABILITY:	IMPORTANCE FACTOR: 4.2 RO SRO SRO X
EVALUATION SETTING	/METHOD: Classroom
REFERENCES: S2	OP-ST.CBV-0003, Rev. 19 (checked 8-10-16)
TOOLS AND EQUIPME	NT:
VALIDATED JPM COM	PLETION TIME: 12 min
TIME PERIOD IDENTIF	ED FOR TIME CRITICAL STEPS: N/A
Developed By:	G Gauding Date: 8-10-16 Instructor
Validated By:	R Boyer / P Williams Date: 9-28-16 / 10-4-16 SME or Instructor
Approved By:	Training Department
Approved By:	Operations Department Date: 10/11/11.
ACTUAL JPM COMPLE	TION TIME:
ACTUAL TIME CRITICA	L COMPLETION TIME:
PERFORMED BY: GRADE: SAT	UNSAT
REASON, IF UNSATISI	ACTORY:
EVALUATOR'S SIGNA	URE: DATE:
PSEG Rest	Page 1 of 5 icted - Possession Requires Specific Permission from Nuclear Training

NAME:	
DATE:	

SYSTEM:	Administrative
TASK:	Review a completed surveillance to demonstrate Operability of 21 CFCU
TASK NUMBER:	N1230300302
INITIAL CONDITIONS:	21 CFCU was returned from corrective maintenance. S2.OP-ST.CBV-0003, Containment Systems - Containment Cooling was performed for the Operability Retest.
INITIATING CUE:	You have been directed to review the surveillance for completeness and accuracy IAW Step 5.3.4.
	If any discrepancies are identified, note them and any actions that you would

take on Attachment 8, Section 1.0, Comments.

Successful Completion Criteria:

- 1. All critical steps completed
- 2. All sequential steps completed in order
- 3. All time-critical steps completed within allotted time
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

- 1. Identify that the Minimum Flow Rate recorded on Attachment 1, Section 3.0, for 87 psid is incorrectly recorded as 1592. Identify the correct Minimum Flow Rate should be 1638.
- 2. Identify that the actual Cooling Water Flow Rate (1625) is below the Minimum Flow Rate required as shown on Attachment 1 and Exhibit 1, and the surveillance is UNSAT vs SAT.

PSEG Restricted - Possession Requires Specific Permission from Nuclear Training

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME:	
DATE:	

System: ADMINISTRATIVE

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Provide completed S2.OP-ST.CBV-0003 surveillance.		
			Reviews procedure.		
*			Identifies that the Minimum Flow Rate recorded on Attachment 1, 21 CFCU Data Sheet, Section 3.0, for 87 psid is incorrectly recorded as 1592. (This was due to operator performing ST rounding down as opposed to rounding up IAW P&L 3.4.)		
*			Identifies correct value for Minimum Flow Required as 1638.		
			Cue : <u>IF</u> candidate only determines flow is wrong, <u>THEN</u> ask candidate to determine correct flow.		
*			Identifies that the actual Cooling Water Flow Rate of 1625 gpm is below the Minimum Flow Rate of 1638 as shown on Exhibit 1 and the ST is UNSAT.		
-	-		When candidate turns in JPM, ensure they have provided correct flow as per Cue above, then state JPM is complete.		

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TQ-AA-106-0303 Revision 4

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

1AO	1. Task description and number, JPM description and number are identified.		
100	2. Knowledge and Abilities (K/A) references are included.		
100	3. Performance location specified. (in-plant, control room, or simulator)		
100	4. Initial setup conditions are identified.		
100	5. Initiating and terminating Cues are properly identified.		
100	5. Task standards identified and verified by SME review.		
107	$\overline{7}$. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).		
43	8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. <u>19</u> Date <u>9/22/14</u>		
AS.	 Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate. 		
	10. If the JPM cannot be performed as written with proper responses, then revise the JPM.		
·	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.		
SME/Instru SME/Instru	ctor: 0/16/16 Date: 10/16 Date: 10/16		
	SME/Instru		

SME/Instructor:_____

Date: _____

INITIAL CONDITIONS:

e

21 CFCU was returned from corrective maintenance. S2.OP-ST.CBV-0003, Containment Systems - Containment Cooling was performed for the Operability Retest.

INITIATING CUE:

You have been directed to review the surveillance for completeness and accuracy IAW Step 5.3.4.

If any discrepancies are identified, note them and any actions that you would take on Attachment 8, Section 1.0, Comments.

PSEG NUCLEAR L.L.C. SALEM/OPERATIONS

S2.OP-ST.CBV-0003(Q) REV. 19

CONTAINMENT SYSTEMS - COOLING SYSTEMS

USE CATEGORY:

LICENSE RENEWAL RELATED

- ♦ Biennial Review Performed: Yes ____ No ____ NA _
- Packages and Affected Document Numbers incorporated into this revision: None
- The following OTSCs were incorporated into this revision: None
- The following OPEXs were incorporated into this revision: None

REVISION SUMMARY:

- Updated procedure to current Writer's Guide standards. (Rev bars not used)
- Page 5, Added additional place keeping lines to support place keeping and Human Performance when using procedure to run multiple CFCU's. [70172703-0020]
- Page 4, Updated Section 4.0 to reflect use of M&TE (Heise gauges and Handheld computer) in place of D/P gauge. [70147227-0020] [70094761-0010] [70133586-0010]
- Attachments 1-5, Updated Section 2.0 to reflect use of M&TE (Heise gauges and Handheld computer) in place of D/P gauge. [70147227-0020] [70094761-0010] [70133586-0010]
- Attachments 6 & 7, Updated Sections 1.0 & 2.0 to reflect use of M&TE (Heise gauges and Handheld computer) in place of D/P gauge. [70147227-0020] [70094761-0010] [70133586-0010]

IMPLEMENTATION REQUIREMENTS

Effective Date: June 12, 2015

None

CONTAINMENT SYSTEMS - COOLING SYSTEMS

TABLE OF CONTENTS

SECTION TITLE

1.0	PURPOSE
2.0	PREREQUISITES
3.0	PRECAUTIONS AND LIMITATIONS
4.0	EQUIPMENT/MATERIAL REQUIRED
5.0	PROCEDURE
	5.1CFCU Operability and Service Water Flow Verification55.2Acceptance Criteria65.3Completion and Review6
6.0 7.0	RECORDS

ATTACHMENTS

Attachment 1	21 CFCU Data Sheet
Attachment 2	22 CFCU Data Sheet
Attachment 3	23 CFCU Data Sheet
Attachment 4	24 CFCU Data Sheet
Attachment 5	25 CFCU Data Sheet
Attachment 6	21 SW HDR Differential Pressure (ΔP) Indicator Alignment
Attachment 7	22 SW HDR Differential Pressure (ΔP) Indicator Alignment
Attachment 8	Completion Sign-off Sheet 18

EXHIBITS

Exhibit 1	Minimum CFCU Flow Rates	. 19
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s2.0P-ST.CBV-0003(Q)

1.0 PURPOSE

[C0265]

- 1.1 Performance of procedure is used to satisfy the following Technical Specifications:
 - 4.6.2.3.b.1, demonstrating operability of each Containment Cooling Fan by starting (unless already operating) each fan from the Control Room in LOW SPEED.
 - 4.6.2.3.b.2, demonstrating operability of each Containment Cooling Fan by verifying that each fan operates for at least 15 minutes in LOW SPEED.
 - ♦ 4.6.2.3.b.3, demonstrating operability of each Containment Fan Coil Unit by verifying a cooling water flow rate ≥1465 gpm. The 1465 gpm value represents 1300 gpm as required by T/S 4.6.2.3.b.3 plus 165 gpm for Instrument Uncertainty.
- 1.2 Performance of procedure is used to partially satisfy T/S 4.7.4.a, by verifying that flow through valves 21-25SW58, 21-25SW72 and 21-25SW223 servicing 21-25 Containment Fan Coil Units is ≥ that required for operability consideration thus ensuring correct alignment.
- 1.3 Performance of procedure is required at least once per 31 days in Modes 1-3, prior to entry into Mode 3 if <u>NOT</u> previously performed in the last 31 days, <u>OR</u> as otherwise specified in post-maintenance operational retest requirements.
- 1.4 Procedure partially satisfies an NRC commitment for License Renewal Open-Cycle Cooling Water Aging Management Program (AMP) activities. **[CM-SC-2009-630]**



2.0 PREREQUISITES

- 2.1 **REVIEW** Components "Off Normal and Off Normal Tagged" List(s) for system <u>AND</u> support system(s) associated with evolution being performed in procedure.
- 2.2 RECORD applicable SAP Order number(s) AND Reason for Test in applicable Attachment(s), Section 1.0, for CFCU(s) being tested.
- 2.3 **RECORD** Calibration data for instruments listed in applicable Attachment(s), Section 2.0, for CFCU(s) being tested. **[C0289**]
- 2.4 (IE 21) 22 <u>OR</u> 23 CFCU being tested, <u>IHEN</u> INITIATE Attachment 6, Section 1.0, Aligning 21 SW HDR Differential Pressure (ΔP) Indicator For Service. A_{A} 2.5 (IE) 23, 24 <u>OR</u> 25 CFCU being tested,
- الم 2.5 (F)23, 24 <u>OR</u> 25 CFCU being tested, <u>THEN</u> INITIATE Attachment 7, Section 1.0, Aligning 22 SW HDR Differential Pressure (ΔP) Indicator For Service.

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Steps identified with a dollar sign (\$) are items required to meet Technical Specifications acceptance criteria. Identified steps, if <u>NOT</u> satisfactorily completed, may have reportability requirements <u>AND</u> are to be brought to immediate attention of CRS/SM.
- . 3.2 Testing will be performed during relatively stable SW Header Pressure conditions.
- 3.3 Containment Fan Coil Unit OPERABILITY is satisfied when Cooling Water Flow Rate is ≥1465 gpm (T/S 3.6.2.3) <u>AND</u> is ≥ Minimum Flow Rate specified in Exhibit 1 (S-C-SW-MDC-0475, Table A, Minimum CFCU Flow Rates).
 - Flow rates specified in Exhibit 1 are valid when using service water pressure taps SW822 and SW823. The use of alternate pressure tap locations shall be approved by Engineering.
- Δ 3.4 After recording Differential Pressure (Δ P) reading, select corresponding minimum flow value specified in Exhibit 1.
 - IF measured ΔP value is between ΔP values specified in Exhibit 1, <u>THEN</u> select minimum flow value for next higher ΔP value listed (e.g., if measured ΔP is 101 psid, use minimum flow required at 105 psid).
- 3.5 <u>WHEN</u> testing 23 CFCU with **both** Service Water Headers aligned, <u>THEN</u> two Differential Pressure (ΔP) measurements (21 SW HDR <u>AND</u> 22 SW HDR) are required. The higher of the two measurements shall be used to determine 23 CFCU OPERABILITY.
 - Only one Differential Pressure (ΔP) measurement (21 SW HDR <u>OR</u> 22 SW HDR) is required during a Service Water Header outage. Acceptable test results can be obtained with one service water header isolated.
 - 3.6 <u>IF</u> substitution of Measuring and Test Equipment (M&TE) is required, <u>THEN</u> Engineering has specified range, accuracy and documented substitution in the Comments Section of Attachment 8.

4.0 EQUIPMENT/MATERIAL REQUIRED

(Two if performing 23 CFCU)

- NOTE

 When testing 23 CFCU, Attachments 6 & 7 may be performed sequentially when only one indicator is available (Refer to Step 3.5).

 4

 4.1
 Two 0-200 psi HQS-2 Sensor Modules (Four if performing 23 CFCU) (Accuracy: ± 2% of Full Scale or better)

 4
 4.2

 0ne Hand Held Heise Pressure Calibrator Gauge, Model PTE-1Handheld Computer
- Salem 2

tested

5.0 **PROCEDURE**

5.1

Jul.	5.1.1	PERFORM test on each Containment Fan Coil Unit required to be IAW the following instruction:
4	NAA	A. ENSURE CFCU being tested is in LOW SPEED

CFCU Operability and Service Water Flow Verification

- IAW S2.OP-SO.CBV-0001(Q), Containment Ventilation Operation.
- B. **RECORD** Start Time in applicable Attachment(s), Section 3.0, for CFCU being tested.
- C. <u>WHEN</u> at least 15 minutes has elapsed, <u>THEN</u> **RECORD** the following in applicable Attachment, Section 3.0, for CFCU being tested:
 - A MAN ♦ Stop Time

<u>A</u> <u>NIM</u> ♦ Cooling Water Flow Rate (gpm)

D. (IF) n Mode 1-4 <u>AND</u> Service Water flow is <1465 gpm, <u>THEN</u> **REFER** to S2.OP-SO.SW-0005(Q), Service Water System Operation, Service Water System Operability Guidelines. [70090043] <u>ALIGN</u> CFCU as required to support current plant conditions IAW S2.OP-SO.CBV-0001(Q), Containment Ventilation Operation.

5.2 Acceptance Criteria



5.2.1 Surveillance is satisfactory when Attachments 1-5, as applicable, are completed with CFCU listed meeting Acceptance Criteria stated in Attachment.

 $M_{\rm NA}$ 5.2.2 Surveillance is unsatisfactory:

7---

A. **INITIATE** NOTF to correct unsatisfactory conditions.

 B. RECORD NOTF number AND reason for unsatisfactory completion on Attachment 8, Section 1.0.

5.3 Completion and Review

- 5.3.1 IF 21 SW HDR Differential Pressure (ΔP) Indicator was installed to support testing, <u>THEN</u> **COMPLETE** Attachment 6, Section 2.0, Removing 21 SW HDR Differential Pressure (ΔP) Indicator From Service.
- NALE 5.3.2 (F)22 SW HDR Differential Pressure (ΔP) Indicator was installed to support testing, <u>THEN</u> COMPLETE Attachment 7, Section 2.0, Removing 22 SW HDR Differential Pressure (ΔP) Indicator From Service.
 - 5.3.3 **COMPLETE** Attachment 8, Sections 1.0 and 2.0, <u>AND</u> **FORWARD** procedure to CRS/SM for review.
 - _____ 5.3.4 CRS/SM **PERFORM** the following:
 - A. **REVIEW** procedure with Attachments 1-8 for completeness <u>AND</u> accuracy.
 - B. **COMPLETE** Attachment 8, Section 3.0.
 - C. FORWARD completed procedure to Operations Staff.

END OF PROCEDURE SECTION

6.0 RECORDS

- 6.1 Retain the following IAW RM-AA-101, Records Management Program:
 - Attachments 1-7 (as applicable)
 - Attachment 8
- 6.2 **LICENSE RENEWAL** -Using designated separator page, separate License Renewal documents from non-License Renewal documents.

7.0 **REFERENCES**

7.1 Updated Final Safety Analysis Report:

- 7.1.1 6.2.2.2, Containment Fan Cooling System
- 7.1.2 9.4.4, Containment Ventilation Systems

7.2 Technical Specifications - Unit 2:

- 7.2.1 3.6.2.3, Containment Cooling System
- 7.2.2 3.7.4, Service Water System

7.3 Drawings:

- 7.3.1 205338, Reactor Containment Ventilation
- 7.3.2 205342, Service Water Nuclear Area

7.4 **PSBPs**:

7.4.1 139970, Technical Manual for Operation and Maintenance of Containment Building Fan - Coil Unit Safeguard Ventilation System

7.5 <u>Others</u>:

- 7.5.1 DCP 2EC-3294, Package 1
- 7.5.2 DCP 2EC-3590, 96-06 MOD CFCU Service Water Valve SW65 Position Setting
- 7.5.3 Setpoint Calculation SC-SW002-01, CFCU Service Water Flow Indication, Rev. 1
- 7.5.4 PR 961212131, Service Water Flow Requirements to CFCUs
- 7.5.5 PR 960823139, Testing May Not Be Done IAW Technical Specifications
- 7.5.6 Unit 2 Technical Specifications Amendment 180
- 7.5.7 S-C-SW-MEE-1449, Service Water Flow Requirements for CFCUs
- 7.5.8 70028270, Operability Determination for 22 CFCU
- 7.5.9 DCP 80089131, Unit 2 CFCU Fixed Flow Modification.
- 7.5.10 Engineering Calculation S-C-SW-MDC-0475, CFCU Fixed Resistance Flow.



7.6 Cross-References:

- 7.6.1 Technical Specifications Unit 2:
 - A. 4.6.2.3.b.1, Containment Systems Surveillance Requirements
 - B. 4.6.2.3.b.2, Containment Systems Surveillance Requirements
 - C. 4.6.2.3.b.3, Containment Systems Surveillance Requirements
 - D. 4.6.2.3.c.2, Containment Systems Surveillance Requirements
 - E. 4.7.4.a, Plant Service Water System Surveillance Requirements

7.6.2 Procedures:

A. S2.OP-SO.CBV-0001(Q), Containment Ventilation Operation

7.7 <u>Commitments</u>:

- 7.7.1 C0265 NSO LER 311/89-015-00
- 7.7.2 C0283 NRC VIOL 311/87-18-01
- 7.7.3 C0289 INSTRUMENT CALIBRATION REQUIREMENTS
- 7.7.4 CM-SC-2009-630, Salem UFSAR, Appendix B, Section A.2.1.11, Open-Cycle Cooling Water Program
- 7.8 License Renewal Documents, (DCRMS Records Management Type 3E.200)
 - 7.8.1 Records Management SH-PBD-AMP-XI.M20, Open-Cycle Cooling Water Program Basis Document

ATTACHMENT 1

21 CFCU DATA SHEET

1.0 Reason For Test

	Post-Maintenance Operability Retest?	Yes A	-	No
Date: Tod ay	SAP Order Number(s): 60102740			

2.0 Calibration Data

Instrument/Test Equipment Description	Calibration Due Date	ID Number	Initials
2FA5490, 21 CFCU Outlet Water Flow Indicator	6 months from now	2FA5490	Ľ.
مور Model HQS-2 Sensor Module 0-	6 months from now	Grange 1	Y
Model HQS-2 Sensor Module 0- <i>తిం</i> _psi	6 months from now	Gauge 2	1.J
Model PTE-1 Hand Held Heise Pressure Calibrator Gauge	6 months from now	Gauge 3	y

3.0 21 CFCU Performance Data

Commont	Test Data		Acceptance Criteria	Test Results	
Component				SAT	UNSAT
	Start Time	2000		A	
21 CFCU	Stop Time	2016			
	Cooling Water	1625	21 CFCU operated for at least 15 minutes in LOW SPEED at ≥1465 gpm.		
21SW58					
21SW72	Flow Rate				
21SW223					
21 SW HDR Δ (78' IPA - 21 S	P W Piping Room)	87	Cooling Water Flow Rate is ≥ the Minimum Flow Rate	Ą	
Minimum Flow (Exhibit 1)	Rate	1592	obtained in Exhibit 1 for ΔP specified.		
s2.OP-ST.CBV-0003(Q)

ATTACHMENT 6 (Page 1 of 2)

21 SW HDR DIFFERENTIAL PRESSURE (ΔP) INDICATOR ALIGNMENT

1.0 Aligning 21 SW HDR Differential Pressure (ΔP) Indicator For Service:

Instrument ID	Description Installation Points		Insta	talled	
Instrument ID	Description	Installa	tion Points	Initials	Date
Gauge 1	Range: 0-300 psid	Low Side:	21SW823	لحر	Today
Gauge 2	Accuracy: ±2% of Full Scale or better	High Side:	21SW822	N	Today
ENSURE Calibration Data is recorded in the applicable Attachment(s), Section					
2.0, for the CFCU(s)	2.0, for the CFCU(s) being tested.				

1.1 **ENSURE** CLOSED installation points:

1.1.1 21SW823, 2 SW 21, 22 & 23 CFCU RTN D/P TEST CONN.

1.1.2 21SW822, 2 SW 21, 22 & 23 CFCU SUP D/P TEST CONN.

- 1.2 INSTALL instrumentation to installation points (78' IPA 21 SW Piping Room).
- <u>パ</u> 1.3 Slowly **OPEN** 21SW823, 2 SW 21, 22 & 23 CFCU RTN D/P TEST CONN.
- 1.4 Slowly OPEN 21SW822, 2 SW 21, 22 & 23 CFCU SUP D/P TEST CONN.

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s2.0P-ST.CBV-0003(Q)

ATTACHMENT 6 (Page 2 of 2)

21 SW HDR DIFFERENTIAL PRESSURE (ΔP) INDICATOR ALIGNMENT

2.0 <u>Removing 21 SW HDR Differential Pressure (ΔP) Indicator From Service</u>:

- <u> </u>2.1 **CLOSE** 21SW822, 2 SW 21, 22 & 23 CFCU SUP D/P TEST CONN.
- 2.2 CLOSE 21SW823, 2 SW 21, 22 & 23 CFCU RTN D/P TEST CONN.
- \cancel{B} 2.3 **REMOVE** instrumentation from installation points.
- <u>A</u> 2.4 **DIRECT** second Operator to PERFORM Independent Verification of the following:

Component	Description	Normal Position	IV	Date
21SW822	2 SW 21, 22 & 23 CFCU SUP D/P TEST CONN	CLOSED	2	Today
21SW823 2 SW 21, 22 & 23 CFCU RTN D/P TEST CONN		CLOSED	0	Today

ATTACHMENT 7 (Page 1 of 2)

22 SW HDR DIFFERENTIAL PRESSURE (ΔP) INDICATOR ALIGNMENT

1.0 Aligning 22 SW HDR Differential Pressure (ΔP) Indicator For Service:

Instrument ID	Description	Installation Points		Install	ed	
instrument iD	Description	mstand	lion Points	Initials	Date	
	Range: 0-300 psid	Low Side:	22SW823			
	Accuracy: ±2% of Full Scale or better	High Side:	22SW822			
ENSURE Calibration	ENSURE Calibration Data is recorded in the applicable Attachment(s), Section					
2.0, for the CFCU(s)	2.0, for the CFCU(s) being tested.					

- 1.1 **ENSURE** CLOSED installation points:
 - ____ 1.1.1 22SW823, 2 SW 23, 24 & 25 CFCU RTN D/P TEST CONN.
 - 1.1.2 22SW822, 2 SW 23, 24 & 25 CFCU SUP D/P TEST CONN.
- 1.2 **INSTALL** instrumentation to installation points (178' IPA 22 SW Piping Room).
- _____ 1.3 Slowly **OPEN** 22SW823, 2 SW 23, 24 & 25 CFCU RTN D/P TEST CONN.
- ____ 1.4 Slowly **OPEN** 22SW822, 2 SW 23, 24 & 25 CFCU SUP D/P TEST CONN.

s2.0P-ST.CBV-0003(Q)

ATTACHMENT 7 (Page 2 of 2)

22 SW HDR DIFFERENTIAL PRESSURE (ΔP) INDICATOR ALIGNMENT

2.0 <u>Removing 22 SW HDR Differential Pressure (ΔP) Indicator From Service</u>:

- _____ 2.1 CLOSE 22SW822, 2 SW 23, 24 & 25 CFCU SUP D/P TEST CONN.
- _____ 2.2 CLOSE 22SW823, 2 SW 23, 24 & 25 CFCU RTN D/P TEST CONN.
- 2.3 **REMOVE** instrumentation from installation points.
- 2.4 **DIRECT** second Operator to PERFORM Independent Verification of the following:

Component	Description	Normal Position	IV	Date
22SW822	2 SW 23, 24 & 25 CFCU SUP D/P TEST CONN	CLOSED		
22SW823 2 SW 23, 24 & 25 CFCU RTN D/P TEST CONN		CLOSED		

s2.0P-ST.CBV-0003(Q)

ATTACHMENT 8

COMPLETION SIGN-OFF SHEET

1.0 **<u>COMMENTS</u>**:

(Include test deficiencies and corrective actions.)

2.0 SIGNATURES:

Print	Initials	Signature	Date
GGanding	M	Mauch	Today
B. fringster	B	-B.Spipl-	Eda
		······	
			<u></u>

3.0 CRS/SM FINAL REVIEW AND APPROVAL:

[C0283]

Date:

This procedure with Attachments 1-8 is reviewed for completeness and accuracy. All deficiencies, including corrective actions, are clearly recorded in the COMMENTS Section of this attachment. Technical Specification compliance, procedure compliance, and Acceptance Criteria are evaluated.

Signature:

SM/CRS

EXHIBIT 1

MINIMUM CFCU FLOW RATE

MINIMUM FLOW RATES (GPM)						
ΔP(1)	21 CFCU	22 CFCU	23 CFCU	24 CFCU	25 CFCU	
60	1338	1338	1338	1339	1339	
65	1392	1392	1393	1394	1394	
70	1445	1445	1446	1447	1447	
75	1495	1495	1496	1497	1497	
80	1545	1545	1545	1546	1546	
85	1592	1592	1593	1594	1594	
90	1638	1638	1639	1640	1640	
95	1683	1683	1684	1685	1685	
100	1727	1727	1728	1729	1729	
105	1769	1769	1771	1772	1772	
110	1811	1811	1812	1813	1813	
. 115	1852	1852	1853	1854	1854	
120	1892	1892	1893	1894	1894	
125	1931	1931	1932	1933	1933	
130	1969	1969	1970	1971	1971	
135	2006	2006	2008	2009	2009	
140	2043	2043	2044	2046	2046	
145	2079	2079	2081	2082	2082	
150	2115	2115	2116	2118	2118	
155	2150	2150	2151	2153	2153	
160	2184	2184	2186	2187	2187	
Reference: Eng	ineering Calculatio	on S-C-SW-MDC-	0475, Table A, Mi	nimum CFCU Flo	w Rates.	

(1) When the measured ΔP reading is between the specified ΔP values, use the higher ΔP value (e.g., if measured ΔP is 101 psid, use the minimum flow required at 105 psid).

STATION:	SALEM				
SYSTEM:	ADMINISTRATIVE				
TASK:Direct Actions for Spent Fuel Movement (Determine equipment allowed to be removed from service while SFP manipulations are in progress)TASK NUMBER:N1120760102					
JPM NUMBER:	15-01 NRC SRO A1-2				
ALTERNATE PATH:	K/A	NUMBER: 2.1.42 EFACTOR: 3.4			
		RO SRO			
EVALUATION SETTING	/METHOD: Classroom or Simulat	or			
REFERENCES: S2. Rev	OP-IO.ZZ-0010, Rev. 33 , S2.OP-SO.C / 42 S2.OP-SO.DG-0005, Rev. 6 (all re	H-0001 Rev 32, S2.OP-SO.SW-0005 v checked 8-10-16) Salem Tech Specs			
TOOLS AND EQUIPME	NT:				
VALIDATED JPM COMF	PLETION TIME: 30 min				
TIME PERIOD IDENTIFI	ED FOR TIME CRITICAL STEPS:	N/A			
Developed By:	G Gauding Instructor	Date: 8-10-16			
Validated By:	R Boyer / P Williams SME or Instructor	Date: 9-28-16 / 10-4-16			
Approved By:	Training Department	Date: 10/11/14			
Approved By:	Operations Department	Date: /0/11/14			
ACTUAL JPM COMPLETION TIME:					
ACTUAL TIME CRITICAL COMPLETION TIME:					
PERFORMED BY: GRADE: SAT UNSAT					
REASON, IF UNSATISF	ACTORY:				
EVALUATOR'S SIGNAT	URE:	DATE:			

Page 1 of 7 PSEG Restricted - Possession Requires Specific Permission from Nuclear Training

NAME:

n	Λ.Τ	с.
D.	A I	с.

SYSTEM:	Administrative				
TASK:	Direct Actions for Spent Fuel Movement (Determine equipment allowed to be removed from service while SFP manipulations are in progress)				
TASK NUMBER:	N1120760102				
INITIAL CONDITIONS:	 Salem Unit 2 is operating at 99% power, coasting down into a refueling outage which will start in 2 weeks. Irradiated fuel movement is in progress in the Spent Fuel Pool IAW S2.OP-IO.ZZ-0010, Spent Fuel Pool Manipulations, and will continue without interruption for the next 8 hours, at which time it will terminate. The unit has no active Tech Spec LCOs. 21 SW pump is C/T for emergent strainer work. The current time is 0800. 				
INITIATING CUE:	You have been directed to review the upcoming work for the shift and determine which activities may proceed as scheduled while continuing the fuel movement in the Spent Fuel Pool uninterrupted.				
	Work scheduled for today not be performed	Circle whether	each activity may or may		
	0900- 22 SW pump packing replacement	MAY	MAY NOT		
	1000- 2A EDG Monthly surveillance run MAY MAY NOT				
	1300- 21 Chiller compressor oil change MAY MAY NOT				
	1400- Delivery of New Fuel into the Fuel Handling Building for upcoming refueling outage.	MAY	MAY NOT		

Successful Completion Criteria:

1. All critical steps completed

2. All sequential steps completed in order

3. All time-critical steps completed within allotted time

4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. Determines that 22 SW pp work, 2A EDG surveillance, and 21 Chiller work MAY be performed.

2. Determines that New Fuel delivery may NOT be performed.

NAME:_____ DATE:_____

i.

JOB PERFORMANCE MEASURE

System: ADMINISTRATIVE

Task: Direct Actions for Spent Fuel Movement (Determine equipment allowed to be removed from service while SFP manipulations are in progress)

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide blank copies of:			
		S2.OP-IO.ZZ-0010, Spent Fuel Pool Manipulations.			
		S2.OP-SO.DG-0005, Preparation for Removing a Diesel Generator from Service.			
		S2.OP-SO.SW-0005, Service Water System Operation.			
		Provide copies of Tech Specs.			

NAME:_____ DATE:_____

JOB PERFORMANCE MEASURE

System: ADMINISTRATIVE

Task:	Direct Actions for Spent Fuel Movement	(Determine equipment allowed to be removed from service while SFP manipulations are
	in progress)	

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			 Notes: TSAS 3.8.1.2 applies during Modes 5 and 6 and during movement of irradiated fuel, and only requires two EDGs. Only one FHB exhaust fan is required to be backed by an operable EDG (IOP-10 P&L 3.7 and page 17) Operable SFP pumps only need one of them backed by operable EDG. (IOP-10 P&L 3.4 and page 17) TSAS 3.7.10 allows a chiller to be taken out of service if movement of irradiated fuel is already on-going, and gives 14 days to restore it. Two SW pumps are required to be operable, one of which is EDG backed. (IOP-10 page 18.) The four remaining SW pumps are powered from B and C vital and their EDGs remain operable. TSAS 3.7.4 will be entered for less than two operable SW loops, but is a 72 hour action. 		

NAME:_____ DATE:_____

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System: ADMINISTRATIVE

Task:	Direct Actions for Spent Fuel Movement	(Determine equipment allowed to be removed from service while SFP manipulations are
	in progress)	

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Notes: (cont) FHB Truck Bay Door is required to be closed. (IOP-10 page 19)		
			Determines that:		
*			22 SW pump work MAY be performed.		
*			2A EDG surveillance <u>MAY</u> be performed.		
*			21 Chiller oil replacement <u>MAY</u> be performed.	- 	
			New Fuel delivery may <u>NOT</u> be performed.		
			Evaluator ensure tear off sheet has candidates name and status for each of the four work activities, then terminate JPM.		

(

Name: ROBENT BOYCH

> TQ-AA-106-0303 Revision 4

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

$\underline{J}\underline{\beta'}\underline{\mathcal{O}}$. Task description and number, JPM description and number are identified.
2. Knowledge and Abilities (K/A) references are included.
3. Performance location specified. (in-plant, control room, or simulator)
4. Initial setup conditions are identified.
5. Initiating and terminating Cues are properly identified.
$\sqrt{\frac{2}{2}}$ 6. Task standards identified and verified by SME review.
Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
<u>MO9. Pilot</u> test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.
SME/Instructor: Date: 9/26/16 SME/Instructor: William Date: 10/4/46

SME/Instructor:_____

Date:	

Name:

INITIAL CONDITIONS:

.

Salem Unit 2 is operating at 99% power, coasting down into a refueling outage which will start in 2 weeks.

Irradiated fuel movement is <u>in progress</u> in the Spent Fuel Pool IAW S2.OP-IO.ZZ-0010, Spent Fuel Pool Manipulations, and will continue without interruption for the next 8 hours, at which time it will terminate.

The unit has no active Tech Spec LCOs.

21 SW pump is C/T for emergent strainer work. The current time is 0800.

INITIATING CUE:

You have been directed to review the upcoming work for the shift and determine which activities may proceed as scheduled while continuing the fuel movement in the Spent Fuel Pool uninterrupted.

Work scheduled for today	Circle whe	Circle whether each activity may or may not			
be performed					
0900- 22 SW pump packing replacement	MAY	MAY NOT			
1000- 2A EDG Monthly surveillance run	MAY	MAY NOT			
1300- 21 Chiller compressor oil change	MAY	MAY NOT			
1400- Delivery of New Fuel into the Fuel Handling Building for upcoming refueling outage.	MAY	MAY NOT			

STATION:	SALEM							
SYSTEM:	ADMINISTRATIVE							
TASK: Review a completed surveillance to calculate Shutdown Margin								
TASK NUMBER:	TASK NUMBER: 1200030301							
JPM NUMBER:	15-01 NRC SRO A2							
ALTERNATE PATH:		X/A NUMBER: 2.2.12 ICE FACTOR: 4 1						
APPLICABILITY:		RO SRO						
EVALUATION SETTIN	IG/METHOD: Classroom							
REFERENCES: S	C.RE-ST.ZZ-0002, Rev. 23 Shutdown 2.RE-RA.ZZ-0016, Rev. 8 Figures	Margin Calculation						
TOOLS AND EQUIPM	ENT: Calculator	GAG 3. 1.3. 1 MOVADIE CONTION ASSEMblies						
VALIDATED JPM CO	MPLETION TIME: 20 minutes	<u>S</u>						
TIME PERIOD IDENTI	FIED FOR TIME CRITICAL STEPS:	30 minutes						
Developed By:	G Gauding Instructor	Date: 8-10-16						
Validated:	R Boyer / P Williams SME or Instructor	Date: 9-28-16 / 10-4-16						
Approved By:	Training Department	Date: 10/11/14						
Approved By: Date: 10/11/16 Operations Representative								
ACTUAL JPM COMPLETION TIME:								
ACTUAL TIME CRITICAL COMPLETION TIME:								
PERFORMED BY: GRADE: SAT	PERFORMED BY: GRADE: SAT UNSAT							
REASON, IF UNSATIS	SFACTORY:							
EVALUATOR'S SIGN	ATURE:	DATE:						

NAME:	

SYSTEM: Administrative

DATE: _____

TASK: Review a completed surveillance to calculate Shutdown Margin

TASK 1200030301

NUMBER: INITIAL CONDITIONS:

- Unit 2 Reactor Power is 100%.
- All Control Rod Group Demand Counters are at 227 steps.
- Current boron concentration is 300 ppm.
- Current core burnup is 10,000 EFPH.
- Control Rod 1D5 was declared INOPERABLE at <u>1000 today</u> due to not moving out during a rod exercise test. A Shutdown Margin Calculation has been performed IAW SC.RE-ST.ZZ-0002, Shutdown Margin Calculation, to satisfy the action requirement of TSAS 3.1.3.1 Action c.3.
- Control Rod 1D5 has been identified as <u>trippable</u> and is currently at 214 steps.

INITIATING CUE:

- Review the attached SDM calculation procedure SC.RE-ST.ZZ-0002 for completeness and accuracy.
- 2. Note any discrepancies found by the review on Attachment 7.
- 3. Determine if SDM is SAT.

The current time is 1030. This is a time critical JPM. Time will start when procedures are given to you. Time will stop when procedures are returned to proctor.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made

Task Standard for Successful Completion:

- 1. Determines SDM is complete, accurate, and SAT.
- 2. Completes review within 30 minutes.

NAME:_	
DATE:_	

System: ADMINISTRATIVE

Fask:	Review a	completed	surveillance	to	calculate	Shutdown	Margin

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
			Note to Evaluator : The time critical aspect refers to the time required when the Shutdown Margin requirement of TSAS 3.1.3.1.c must be met.		
	1	Provide the marked up copy of SC.RE- ST.ZZ-0002 and copy of S2.RE-RA.ZZ- 0016, Curve Book. Time Start:	Ensures Sections 3 and 4 are completed.		
	2	Review Section 5 to ensure the correct Attachment was performed.	Reviews Section 5 and determines the correct Attachment (3) was performed.		
*	3	Review the completed Shutdown Margin Calculation:	Reviews SDM and determines it is complete and accurate.		

NAME:_____ DATE:_____

System: ADMINISTRATIVE

Task: F	Review a	completed	surveillance to	calculate	Shutdown Margin	1
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*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	4	Acceptance Criteria	Determines Acceptance Criteria are met.		
*		Time Stop:	Turns in procedures within 30 minutes of start time.		
			Total time to complete JPM MUST be 30 minutes or less.		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

$\Lambda \sim$
V $\angle \mu$ 2. Task description and number, JPM description and number are identified.
v LAD 2. Knowledge and Abilities (K/A) references are included.
w / 1 2 3. Performance location specified. (in-plant, control room, or simulator)
$\sqrt{2}$ 4. Initial setup conditions are identified.
$\sim 10^{-1}$ 5. Initiating and terminating Cues are properly identified.
v 1 A D 6. Task standards identified and verified by SME review.
✓ / 1 27. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
6/ 3. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 3.8 Date 10/1/14
9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
10. If the JPM cannot be performed as written with proper responses, then revise the JPM
11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.
SME/Instructor: 0/11/130/87 Date: 9/28/16
Sivil/Instructor//////

SME/Instructor:_____

F

Date:

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INITIAL CONDITIONS:

Name:

- Unit 2 Reactor Power is 100%.
- All Control Rod Group Demand Counters are at 227 steps.
- Current boron concentration is 300 ppm.
- Current core burnup is 10,000 EFPH.
- Control Rod 1D5 was declared INOPERABLE at <u>1000 today</u> due to not moving out during a rod exercise test. A Shutdown Margin Calculation has been performed IAW SC.RE-ST.ZZ-0002, Shutdown Margin Calculation, to satisfy the action requirement of TSAS 3.1.3.1 Action c.3.
- Control Rod 1D5 has been identified as <u>trippable</u> and is currently at 214 steps.

INITIATING CUE:

- 1. Review the attached SDM calculation procedure SC.RE-ST.ZZ-0002 for <u>completeness</u> and <u>accuracy</u>.
- 2. Note any discrepancies found by the review on Attachment 7.
- 3. Determine if SDM is SAT.

The current time is 1030. This is a time critical JPM. Time will start when procedures are given to you. Time will stop when procedures are returned to proctor.

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Page <u>1</u> of <u>1</u>

PSEG NUCLEAR L.L.C. SALEM GENERATING STATION/REACTOR ENGINEERING SC.RE-ST.ZZ-0002(Q) - REV. 23 SHUTDOWN MARGIN CALCULATION

USE CATEGORY:

- ♦ Biennial Review Performed: Yes No N/A X
- Packages and Affected Document Numbers incorporated into this revision: None
- The following OTSCs were incorporated into this revision: None

REVISION SUMMARY:

IAW Order 70163361:

Revised step 5.2.1 from "WHEN" to "IF" for proper phrasing of a conditional statement.

Added References 7.1.10 and 7.1.11 for DS2.5-0256 and WCAP-14762.

Revised Attachment 1, step 2.2 to change "operable" control rods to "trippable" control rods. Added step 4.5.7 to calculate the required increase in boron concentration if a plant shutdown occurs with an inoperable IRPI.

Revised Attachment 2 to add step 4.13.2 for guidance to determine the amount of boration required to achieve SDM in the event of an UNSAT SDM. Changed references to "BEACON" from "Reactor Engineer" for Xenon calculation in steps 4.6.2 and 4.6.5. Added step 4.11 and 4.12.7 to calculate a pcm penalty for an inoperable IRPI. Added step 4.13.2 to calculate required boron addition if SDM is UNSAT.

Revised Attachment 3 to differentiate between untrippable and dropped/misaligned control rods. Removed fuel burnup from precaution 3.3 as the calculation does take burnup into account. Added precaution 3.5 to highlight the difference between inoperable, untrippable, dropped and misaligned control rods. Added a note to clarify the untrippable RCCA penalties in Table 1-6 include the most reactive stuck rod worth. Added a 120 pcm penalty for rod misalignment relaxation based on WCAP-14762. Added step 4.4.2 to determine the power level at which SDM would be achieved in the event of an UNSAT SDM.

Revised Attachment 6 by moving step 4.1 to 4.2.5 to put steps in the proper order to ensure correct procedure use and adherence.

s**C**.RE-ST.ZZ-0002(Q)

SHUTDOWN MARGIN CALCULATION

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ATTACHMENTS

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1.0 PURPOSE

- 1.1 The purpose of this procedure is to provide instructions necessary to perform the following:
 - 1.1.1 To determine the boron concentration required for a desired temperature and rod configuration so that Shutdown Margin (SDM) can be maintained while going to that condition.
 - 1.1.2 To verify that the SDM requirements are met when the Reactor Coolant System (RCS) is borated concurrently with cooldown.
 - 1.1.3 To determine the amount of reactivity by which the reactor is subcritical (k_{eff}) and the amount of SDM available while at a specific reactor temperature and rod position.
 - 1.1.4 To verify that the SDM requirements are met in Modes 1 or 2.
 - 1.1.5 To verify that the SDM requirements are met at rod insertion limits prior to entering Mode 1 after a refueling outage.
 - 1.1.6 To determine the RCS and Refueling Canal boron concentration which will ensure adequate SDM is maintained during refueling operations.
- 1.2 According to Technical Specifications (T/S) this requirement is applicable as follows:
 - At least once per 24 hours.
 - Modes 3 & 4 T/S 4.1.1.1.1.e
 - Mode 5 T/S 4.1.1.2.b
 - Within 1 hour after detection of an inoperable control rod and at least once per 12 hours thereafter while rod is inoperable.
 - Mode 1 & 2 T/S 3.1.3.1 Action a and action c.3
 - Modes 1 4 T/S 4.1.1.1.1.a
 - Mode 5 T/S 4.1.1.2.a
 - Prior to initial operation above 5% rated thermal power after each fuel loading with control banks at the maximum insertion limit in the COLR.
 - Modes 2 4 T/S 4.1.1.1.1.d
 - Within 1 hour of detection of NO OPERABLE source range channels and at least once per 12 hours thereafter (Modes 3, 4, and 5).
 - Mode 3 5 T/S 3.3.1.1, Table 3.3-1 Action 5

- When boration is required for the following T/S LCO's:
 - Modes 1 3 T/S 3.1.2.2, Reactivity Control, Flow Paths
 - Modes 1 3 T/S 3.1.2.4, Reactivity Control, Charging Pumps
 - Modes 1 4 T/S 3.1.2.6, Reactivity Control, Borated Water Sources
- Prior to and during refueling operations
 - Mode 6 T/S 3.9.1
- Whenever a SDM calculation is needed to ensure the reactor has adequate SDM.

2.0 PREREQUISITES

None

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 The Reactor Engineering Manager may substitute reactivity worths on the work sheet at his/her discretion. This allows the use of the latest determined reactivity worths that might not be incorporated into the Figures. Reactivity substitutions of any type should be noted on Attachment 7 and should be initialed by the Reactor Engineering Manager and the Shift Manager/Control Room Supervisor (SM/CRS) prior to use in the SDM calculation.
- <u> \mathcal{A}_{-} </u> 3.2 SDM shall be ≥ 1300 pcm in Modes 1-4 (T/S 3.1.1.1).
- $\angle 2$ 3.3 SDM shall be ≥ 1000 pcm in Mode 5 (T/S 3.1.1.2).
 - $\frac{1}{2}$ 3.4 Maintaining SDM does **NOT** ensure that the reactor remains subcritical. Take note of k_{eff} to ensure against ACCIDENTAL CRITICALITY. Ensure that the required k_{eff} is maintained for the desired mode.
- 3.5 Since reactivity data will change with fuel exposure, use the most recent burn-up when reading reactivity data.
 - 3.6 Reactivity effects of samarium have not been included in this procedure. After a shutdown, samarium concentration always increases tending to further poison the core. Any SDM calculated by this procedure would actually be more conservative since no credit is taken for samarium.
 - 3.7 This procedure may be performed to verify SDM for current conditions or for the desired future conditions.

4.0 EQUIPMENT/MATERIAL REQUIRED

A 4.1 Excel Spreadsheets (i.e. S1(2)RE-STZZ-0002(Q).xls) (Optional)

s**C**.RE-ST.ZZ-0002(Q)

5.0 PROCEDURE

- A 5.1 Shutdown Margin Calculation
 - 5.1.1 SELECT the applicable step below (e.g., 5.1.1.A):
 - <u>الا الم</u>A. <u>IF</u> SDM is to be verified with no xenon credit (for Modes 3, 4, or 5), including IRPI Calibrations and/or Rod Drop Time Testing, <u>THEN</u> COMPLETE Attachment 1.
 - M = M = M B. IF calculating the amount of reactivity by which the reactor is subcritical (k_{eff}) and the amount of shutdown margin available in Modes 2, 3, 4 or 5 at any time in core life from a known critical condition <u>THEN</u> **COMPLETE** Attachment 2 (Detailed SDM Calculation).

<u>IF</u> SDM is to be verified (per T/S 4.1.1.1.a) with reactor critical (Modes 1 or 2) and one or more control rods are inoperable <u>THEN</u> **COMPLETE** Attachment 3.

- D. <u>IF</u> SDM is to be verified (per T/S 4.1.1.1.d) prior to initial operation above 5% rated thermal power following a refueling outage with control banks at the maximum insertion limit <u>THEN</u> **COMPLETE** Attachment 4.
- <u>M</u><u>N</u><u>IA</u> E. <u>IF</u> determining a Mode 6 boron concentration in the Reactor Coolant System, the fuel storage pool, the refueling canal, and the refueling cavity which ensures the most restrictive reactivity condition is met per T/S 3.9.1, THEN **COMPLETE** Attachment 5.
- F. <u>IF</u> the reactor is in Mode 3 with the shutdown banks and control banks fully inserted and SDM is to be verified for RCS boration concurrent with cooldown (Modes 3, 4 or 5) <u>THEN</u> COMPLETE Attachment 6.

s**C**.RE-ST.ZZ-0002(Q)



- 신 5.3.1 **COMPLETE** Attachment 7, Sections 1.0 and 2.0.
- 5.3.2 **DIRECT** a Qualified Individual to **PERFORM** a review of this procedure.
- 5.3.3 Reviewer PERFORM a review of this procedure. COMPLETE Attachment
 7, Section 3.0 and FORWARD this procedure to the Control Room
 Supervisor (CRS) for review.
- ____ 5.3.4 SM/CRS **PERFORM** the following:
 - _ A. **REVIEW** this procedure with all applicable attachments for completeness and accuracy.
 - B. **COMPLETE** Attachment 7, Sections 2.0 and 4.0.
 - C. **FORWARD** the completed procedure to Operations Staff. The most recently completed procedure should be maintained in the appropriate control room file. Ops Staff should **FORWARD** the previously completed procedure for records retention.

END OF PROCEDURE SECTION

6.0 RECORDS

RETAIN the following IAW RM-AA-101, Records Management Program:

Attachment 1 (as applicable)

Attachment 2 (as applicable)

Attachment 3 (as applicable)

Attachment 4 (as applicable)

Attachment 5 (as applicable)

Attachment 6 (as applicable)

Attachment 7

7.0 **REFERENCES**

7.1 Salem Common:

- 7.1.1 INPO SER 15-92, Loss of Shutdown Reactivity Margin
- 7.1.2 DEF DES-91-00778
- 7.1.3 NDR, The Nuclear Design and Startup Report of the Current Cycle for Salem 1 <u>OR</u> Salem 2 Nuclear Power Plant
- 7.1.4 LCR S00-04, Request for Change to Technical Specifications Position Indicating System-Shutdown, Salem Generating Station, Unit Nos. 1 and 2, Facility Operating License DPR-70 and DPR-75, Docket Nos. 50-272 and 50-311
- 7.1.5 LCR S02-12, Request for Change to Technical Specifications for Fuel Storage Pool Boron Concentration Fuel Assembly Storage in the Spent Fuel Pool, Salem Generating Station, Unit Nos. 1 and 2, Facility Operating License DPR-70 and DPR-75, Docket Nos. 50-272 and 50-311
- 7.1.6 DS1.8-0074, Relaxation of Keff During IRPI Calibration and Rod Drop Time Measurement
- 7.1.7 NFS 05-014, Considerations to Remove Administrative Shutdown Keff Requirement
- 7.1.8 NUTS 80086443, Relaxation of Keff During Lower Mode Control Rod Testing
- 7.1.9 Westinghouse Technical Bulletin TB-13-5, Calculation of Shutdown Margin for N-2 Configurations
- 7.1.10 DS2.5-0256, Inputs for Salem Technical Evaluation of Misaligned Rod ACE
- 7.1.11 WCAP-14762, Conditional Extension of the Rod Misalignment Technical Specification for Salem Units 1 and 2

7.2 <u>Salem 1:</u>

- 7.2.1 Safety Evaluation SECL-92-140, Salem Unit 1, Cycle 11 Operation with Increased Auxiliary Feedwater Flow
- 7.2.2 NFS 93-666, Salem Unit 1 cycle 12 Reload Safety Evaluation for Operation in Modes 5 through 1 and NRC Notification
- 7.2.3 DCP 1EC-3254, Boric Acid Concentration Reduction Program
- 7.2.4 Technical Specification Amendment No. 205
- 7.2.5 Technical Specification Amendment No. 232
- 7.2.6 Technical Specification Amendment No. 262

7.3 Salem 2:

- 7.3.1 NFU 92-155, Salem Unit 2 Administrative Shutdown Margin Requirements
- 7.3.2 NFU 92-181, Salem Unit 2 Cycle 7 Reload Safety Evaluation for Operation in all Modes and NRC Notification
- 7.3.3 DCP 2EC-3225, Boric Acid Concentration Reduction Program
- 7.3.4 NRC Docket No. 50-311, Amendment No. 197
- 7.3.5 Technical Specification Amendment No. 187
- 7.3.6 Technical Specification Amendment No. 213
- 7.3.7 Technical Specification Amendment No. 244

7.4 **Technical Specifications:**

- 7.4.1 3/4.1.1.1, Boration Control, Shutdown Margin Tavg > 200°F
- 7.4.2 3/4.1.1.2, Boration Control, Shutdown Margin Tavg ≤ 200°F
- 7.4.3 3/4.1.2.2, Reactivity Control, Flow Paths Operating7.4.4 3/4.1.2.4, Reactivity Control, Charging Pumps Operating
- 7.4.5 3/4.1.2.6, Reactivity Control, Borated Water Sources Operating
- 7.4.6 3/4.1.3.1. Reactivity Control, Movable Control Assemblies Group Height
- 7.4.7 3/4.1.3.5, Reactivity Control, Control Rod Insertion Limits
- 7.4.8 3/4.3.1.1, Instrumentation, Reactor Trip System Instrumentation
- 7.4.9 S1 3/4.4.9.1, S2 3/4.4.10.1 Pressure/Temperature Limits, Reactor Coolant System
- 7.4.10 3/4.9.1, Refueling Operations, Boron Concentration

7.5 Cross-References:

- 7.5.1 RM-AA-101, Records Management Program
- 7.5.2 S1(2).OP-SO.CVC-0006(Q), Boron Concentration Control
- 7.5.3 S1(2).OP-SO.CVC-0008(Q), Rapid Boration
- 7.5.4 S1(2).OP-SO.RCS-0001(Q), Rod Control System Operation
- 7.5.5 SC.RE-ST.ZZ-0003(Q), Core Reactivity Balance Calculation
- 7.5.6 S1(2).RE-RA.ZZ-0016(Q), Curvebook
- 7.5.7 S1(2).RE-RA.ZZ-0012(Q), Figures

sC.RE-ST.ZZ-0002(Q)

ATTACHMENT 3 SHUTDOWN MARGIN VERIFICATION FOR MODES 1 OR 2 Page 1 of 3

SALEM UNIT

1.0 PURPOSE

- 1.1 The purpose of this attachment is to determine the SDM with a critical reactor.
- 1.2 This attachment satisfies the surveillance requirements of T/S 4.1.1.1.1.a and 4.1.1.1.2.
- 1.3 This attachment **SHALL** be performed within 1 hour after detection of an inoperable control rod and at least once per 12 hours thereafter while the rod(s) is (are) inoperable.
- 1.4 This attachment is used to ensure adequate shutdown margin IAW SC.RE-ST.ZZ-0003(Q), Core Reactivity Balance Calculation.

2.0 PREREQUISITES

2.1 The reactor is in Mode 1 or Mode 2 with $k_{eff} \ge 1.0$.

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 All figures are located in S1(2).RE-RA.ZZ-0016(Q) Curvebook.
 - 3.2 All data from the tables and figures should be taken as the absolute value. Any mathematical signs (+/-) should be propagated throughout the rest of the calculation.
- 3.3 This calculation does **NOT** consider the effects of RCS boron concentration, RCS average temperature, xenon concentration, or samarium concentration. Tave will decrease from the critical condition to the hot zero power shutdown condition. However, the reactivity effect of this will be accounted for in the power defect. The other factors will stay constant from the critical condition to the hot zero power shutdown condition.
- 3.4 The term "abs" found in some formulas refers to the absolute value of the item in question.
 - _ 3.5 Inoperable RCCAs are further classified as untrippable, dropped or misaligned.

4.0 **PROCEDURE**

4.1 CRITICAL CONDITIONS

4.1.1	POWER LEVEL	100 %RTP
4.1.2	BORON CONCENTRATION	<u>300</u> ppm
4.1.3	CONTROL BANK POSITION	Bank <u>D</u> at <u>227</u> Steps
4.1.4	BURNUP	10,000 EFPH
4.1.5	# OF UNTRIPPABLE RCCA(s)	RCCA(s)
4.1.6	# OF DROPPED OR MISALIGNED RCCA(s)	RCCA(s)

Salem Common

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ATTACHMENT 3 SHUTDOWN MARGIN VERIFICATION FOR MODES 1 OR 2 Page 2 of 3

SALEM UNIT _2_

4.2 CALCULATION OF ROD WORTH

	4.2.1	TOTAL CONTROL BANK WORTH (Figure 15/Table G)	(-) <u>3841</u> pcm
	4.2.2	TOTAL SHUTDOWN BANK WORTH (Figure 16/Table H)	<u>(-)</u> 3335_pcm
	4.2.3	MOST REACTIVE STUCK ROD WORTH (Figure 14/Table I)	728_pcm
Ø	The rea comes penalty worths	<u>NOTE</u> activity worth for a single or multiple untrippable RCCAs and drop from Table 1-6 S1(2).RE-RA.ZZ-0016, Curve Book. For multiple in 4.2.4 should have a maximum value of the sum of the total si in steps 4.2.1 and 4.2.2.	oped or misaligned RCCAs ountrippable RCCAs, the hutdown and control bank
	4.2.4	PENALTY FOR UNTRIPPABLE RCCA(s) <u>O</u> × = Item 4.1.5 × Table 1-6	Opcm
	4.2.5	PENALTY FOR DROPPED OR MISALIGNED RCCA(s)	<u>500 pcm</u>
	4.2.6	INTEGRAL ROD WORTH INSERTED AT POSITION IN ITEM 4.1.3 (If ARO, use zero) (HFP: Figure 2C/Table 1-7 or HZP: Figure 2A/Table 1-8)	pcm
Ø	The pe stuck r least o	<u>NOTE</u> malties for untrippable RCCAs include the most reactive stuck ro od worth from step 4.2.3 is not needed when calculating the tripp ne untrippable RCCA.	od worth. The most reactive bable rod worth with at
	4.2.7	CHOOSE the appropriate calculation below. MARK the calcula	tion not used "N/A."
		TRIPPABLE ROD WORTH (Item 4.2.1) + (Item 4.2.2) + (Item 4.2.3) + (Item 4.2.5) + (Item 4.2.6)	- <u>5948</u> pcm =
		OR	è

TRIPPABLE ROD WORTH WITH UNTRIPPABLE RCCA(s) _______ pcm (Item 4.2.1) + (Item 4.2.2) + (Item 4.2.4) + (Item 4.2.5) + (Item 4.2.6) = ______

sC.RE-ST.ZZ-0002(Q)

ATTACHMENT 3 SHUTDOWN MARGIN VERIFICATION FOR MODES 1 OR 2 Page 3 of 3

SALEM UNIT

4.3 CALCULATION OF SDM (Note: See Precaution 3.4)

4.3.1	TRIPPABLE ROD WORTH (Item 4.2.7)	- 5948 pcm	
4.3.2	TEN PERCENT ROD WORTH PENALTY (3841) + 3335 - 726 abs(Item 4.2.1) abs(Item 4.2.2) (Item 4.2.3) × 0.10 =	(+) 645 pcm	
4.3.3	ROD MISALIGNMENT RELAXATION PENALTY	<u>(+) 120</u> pcm	
4.3.4	POWER DEFECT (Figure 17A/Table 2-1)	2742 pcm	
4.3.5	SDM (Item 4.3.1) + (Item 4.3.2) + (Item 4.3.3) + (Item 4.3.4)=	<u>- 2441 pcm</u>	

4.4 ACCEPTANCE CRITERIA

Ø	<u>NOTE</u> REQUIRED SDM (per T/S 3.1.1.1) MODE 1 OR 2: (-) <u>1.3</u> % Δk/k = (-) <u>1300</u> PCM				
	4.4.1 IS THE SDM (Item 4.3.5) EQUAL TO OR MORE NEGATIVE THAN (-) 1300 \$ PCM?				
		YES: then surveillance is SAT:			
		NO: then surveillance is UNSAT:			
Ø	If the required reactor power	<u>NOTE</u> power defect in step 4.4.2.A is negative, then it is not possible to meet SDM by lowering and step 4.4.2.B will be 0%.			
	<u>UNIA</u> 4.4.2	IF the SDM is UNSAT, THEN PERFORM the following:			
	1	A. CALCULATE the power defect required to achieve required SDM.			
		$\frac{N/A}{abs(ltem 4.3,1)} - \frac{N/A}{ltem 4.3,2} - \frac{120 \text{ pcm}}{ltem 4.3,3} - \frac{1300 \text{ pcm}}{1300 \text{ pcm}} = \frac{N/A}{pcm}$			
	+	B. DETERMINE Reactor Power Level based on power defect in 4.4.2.A and boron concentration in 4.1.2. (Figure 17A/Table 2-1)			
		C. NOTIFY SM/CRS to initiate rapid boration, IAW S1(2).OP-SO.CVC-0008(Q), Rapid Boration, and reduce reactor power <u>UNTIL</u> the required SDM is attained.			
	Completed by:	Alfouding GAUDING Date: TODAY Time: 1020			
	Reviewed by:	Blought_ SPZINGSTEGN Date: TODAY Time: 1029			
	Salem C om	mon Page 22 of 30 Rev. 23			

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ATTACHMENT 7 COMPLETION/SIGN-OFF SHEET Page 1 of 1

1.0 COMMENTS:

(Procedure deficiencies shall be documented with corrective actions in this section.)

2.0 SIGNATURES:

3.0

Name (Print) G. Gaudidy	Initials	Signature	Date Today
REVIEWER SIGNATURES:			
Name (Print) <u>B Springsteer</u>	Initials	Signature Bernste	Date Tuday

4.0 FINAL REVIEW AND APPROVAL:

This procedure has been reviewed for completion and accuracy. All deficiencies with their associated corrective actions have been clearly recorded in the COMMENTS section above.

Approved By:		Date:	
	SM/CRS		

STATION:	SALEM		
SYSTEM:	ADMINISTRATIVE		
TASK:	Determine required actions upor	Radioactive Efflue	ent Monitor failure
TASK NUMBER:	N1200010301		
JPM NUMBER:	15-01 NRC SRO Admin A3		
ALTERNATE PATH:		K/A NUMBER:	2.3.11
APPLICABILITY:			RO SRO
	G/METHOD: Classroom		
Salem ODCM, Salem Tech Specs, S1.OP-SO.WL-0001, Rev. 27, S1.OP-SO.WG- REFERENCES: 0011, Rev. 31, S1.OP-SO.CBV-0002, Rev. 21 (All checked 8-10-16) TOOLS AND EQUIPMENT: VALIDATED JPM COMPLETION TIME: 25 min			
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL STEPS	: <u> </u>	A
Developed By:	G Gauding Instructor	Date:	8-10-16
Validated By:	M Winkelspecht / P Williams SME or Instructor	Date:	9-28-16 / 10-4-16
Approved By:	Training Department	/ Date:	10/11/10
Approved By:	Operations Departmen	Date:	10/11/16
ACTUAL JPM COMPLE	ETION TIME:		
ACTUAL TIME CRITIC	AL COMPLETION TIME:		
PERFORMED BY: GRADE: SAT			
REASON, IF UNSATISI	FACTORY:		
EVALUATOR'S SIGNA	TURE:	·····	DATE:

	NAME:
	DATE:
SYSTEM:	Administrative
TASK: TASK NUMBER:	Determine required actions upon Radioactive Effluent Monitor failure N1200010301
INITIAL CONDITIONS:	Unit 1 is operating at 100% power.
	Radiation Monitor 1R12A, Containment Noble Gas, failed its Source Check when preparing to perform a normal Containment Pressure Relief IAW S1.OP-SO.CBV-0002, Containment Pressure-Vacuum Relief System Operation.
	11 CVCS Monitor Tank is ready for release.
	14 Gas Decay Tank (GDT) is ready for release.
INITIATING CUE:	Prior to initiating the Containment Pressure Relief, Rad Monitor 1R41D, Plant Vent Release Rate, indication fails high, and is confirmed as an instrument failure.
	For the following radiological releases, determine:
	 Can the release be performed with the failed monitors described above, and,
	 If the release <u>can</u> be performed, what compensatory actions are required.
	Assume each release will be performed individually.
	RELEASES
	Containment Pressure Relief
	11 CVCS Monitor Tank release

14 GDT release

Successful Completion Criteria:

- 1. All critical steps completed
- 2. All sequential steps completed in order
- 3. All time-critical steps completed within allotted time
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

- 1. Determines ALL the releases may be performed.
- 2. Determines additional compensatory measures apply for the Waste Gas Release and the Containment Pressure Relief per key, and no additional compensatory actions are required for Liquid Release.

NAME:	n ■
DATE	

System: ADMINISTRATIVE

Task:	Determine	required actions	upon Radioactive	Effluent Monitor failure
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*	STEP NO.	STEP * Denotes a Critical Step	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide blank copies of: S1.OP-SO.WG-0011 S1.OP-SO.CBV-0002 S1.OP-SO.WL-0001 Salem ODCM			
		Waste Gas Release S1.OP-SO.WG-0011	Determines ODCM 3.3.3.9 applies to Gaseous Effluent which directs actions per Table 3.3-13.		
			Determines Table 3.3-13, Instrument #1, Waste Gas Holdup System is applicable, which requires (1) 1R41A <u>&</u> D. Action 31 applies.		

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1

JOB PERFORMANCE MEASURE

NAME:	
DATE:	

System: ADMINISTRATIVE

Task: Determine required actions upon Radioactive Effluent Monitor failure

*	STEP NO.	STEP * Denotes a Critical Step	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
* *			 Action 31 states that with less than the minimum required Operable channels, the contents of the tank may be released provided that prior to the initiating the release: a. At least two independent samples of the tanks contents are analyzed, and b. At least two technically qualified members of the facility Staff independently verify the release rate calculations and discharge valving lineup; otherwise suspend release of radioactive effluents via this pathway. Additionally, S1.OP-SO.WG-0011, Discharge of 14 Gas Decay Tank to Plant Vent, Attachment 2, Section 3.0, Dose Estimates and Approval, Step 3.4.C (on page 18) states" Grab samples are being obtained at least once per 8 hours AND analyzed for gaseous principal gamma emitters within 24 hours 		

JOB PERFORMANCE MEASURE

NAME:	
DATE:	

System: ADMINISTRATIVE

i

1

 Task:
 Determine required actions upon Radioactive Effluent Monitor failure

*	STEP NO.	STEP * Denotes a Critical Step	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*			Determines that there is no restriction on performing Liquid Releases.		
		Containment Pressure Relief S1.OP-SO.CBV-0002	Determines that Precaution and Limitation 2.3 of S1.OP-SO.CBV-0001 directs operator to notify Chemistry to comply with the contingency actions associated with the ODCM prior to performing a Containment Pressure Relief.		
	1		Determines Table 3.3-13, Instrument #3, applies to the Containment Pressure Relief. With both channels (1R41A <u>&</u> D OR 1R12A) inoperable, Action 37 applies.		

i.
OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME:	 	
DATE:		

System: ADMINISTRATIVE

1

 Task:
 Determine required actions upon Radioactive Effluent Monitor failure

*	STEP NO.	STEP * Denotes a Critical Step	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
* *			 Action 37 states that with less than the minimum required Operable channels, Containment Pressure Reliefs may be performed provided that prior to initiating the release: a. At least two independent samples of the tanks contents are analyzed, and b. At least two technically qualified members of the facility Staff independently verify the release rate calculations, otherwise suspend release of radioactive effluents via this pathway. 		
		Waste Liquid Release S1.OP-SO.WL-0001	Determines no compensatory actions are required to initiate the Liquid Release.		
	:	Terminate JPM when all paperwork is handed in.			

Note to Evaluator: JPM modeled after Pilgrim Jan 2011 NRC Exam SRO Admin JPM RC.

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

V	/// 1. Task description and number, JPM description and number are identified.
γ	2. Knowledge and Abilities (K/A) references are included.
\sim	/ Performance location specified. (in-plant, control room, or simulator)
J	$1 \sim 10^{-4}$. Initial setup conditions are identified.
マ	1 - 1 - 5. Initiating and terminating Cues are properly identified.
У	1 Control of the standards identified and verified by SME review.
2	Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
1	 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev Date 9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
	A10_If the JPM cannot be performed as written with proper responses, then revise the JPM.
	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.
	SME/Instructor: <u>7. Mannel geom</u> Date: <u>9/28/16</u>

SME/Instructor:	K Willow
SME/Instructory	· · · · · · · · · · · · · · · · · · ·
SME/Instructor	

Date: 14/4/16

Date: _____

INITIAL CONDITIONS:

Unit 1 is operating at 100% power.

Radiation Monitor 1R12A, Containment Noble Gas, failed its Source Check when preparing to perform a normal Containment Pressure Relief IAW S1.OP-SO.CBV-0002, Containment Pressure-Vacuum Relief System Operation.

11 CVCS Monitor Tank is ready for release.

14 Gas Decay Tank (GDT) is ready for release.

INITIATING CUE:

Prior to initiating the Containment Pressure Relief, Rad Monitor 1R41D, Plant Vent Release Rate, indication fails high, and is confirmed as an instrument failure.

For the following radiological releases, determine:

- 3) Can the release be performed with the failed monitors described above, and,
- If the release <u>can</u> be performed, what compensatory actions are required.

Assume each release will be performed individually.

RELEASES

- Containment Pressure Relief
- 11 CVCS Monitor Tank release
- 14 GDT release

STATION:	SALEM					
SYSTEM:	Emergency Plan					
TASK:	Classify an event and complete an ICMF limit (ESG-1)	within the regulatory committed time				
TASK NUMBER:	1240020502					
JPM NUMBER:	15-01 NRC SRO Admin A4-1 (ESG-1)					
ALTERNATE PATH:		UMBER: 2.4.41				
EVALUATION SETTING	S/METHOD: Simulate (Simulator or C	Classroom)				
REFERENCES: EP	-SA-111-F2 Rev. 2 (ALERT)					
TOOLS AND EQUIPME	NT: Inform Simulator Operators - DO	NOT ERASE ANY PROCEDURES				
VALIDATED JPM COM	PLETION TIME: 12 minutes	-				
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL STEPS:	15 minutes				
Developed By:	G Gauding Instructor	Date: 9-19-15				
Validated By:	C Davis / P Williams SME or Instructor	Date: 9-21-16 / 10-4-16				
Approved By:	Training Department	Date: 10/14/14				
Approved By:	Operations Department	Date: /0/11/14				
ACTUAL JPM COMPLETION TIME:						
ACTUAL TIME CRITICAL COMPLETION TIME:						
PERFORMED BY: GRADE: SAT	UNSAT					
REASON, IF UNSATISF	ACTORY:					
EVALUATOR'S SIGNA	TURE:	DATE:				

PSEG Restricted – Possession Requires Specific Permission from Nuclear Training Page 1 of 8

NAME: _____

DATE:

SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-1)

TASK NUMBER: 1240020502

INITIAL CONDITIONS:

 You have a maximum of 5 minutes to review the Emergency Operating Procedures used during this scenario to refresh your memory of all events/paths. At the end of your review you will become the Shift Manager (SM). Inform the Evaluator when you are ready to assume SM duties. You may continue to reference the procedures or to look at the control board but "the clock will be running." If there are multiple ECG calls, classify the most severe.

INITIATING CUE:

You are the Duty SM. Classify the event, complete the correct ECG Attachment and provide an ICMF to the Primary Communicator.

This is a Time Critical JPM.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. Declare an **ALERT under EAL RB3.P** within 15 minutes of start time, and provide ICMF to the Primary Communicator within the next 15 minutes.

NAME: ______ DATE: _____

SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-1)

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	:	Provide candidate with "Tear-off sheet" and Blank Copies of EP-SA-111-F1 through F4 (UE, ALERT, SAE, GE)	Reviews initial conditions and EOP's (as necessary – 5 minute limit prior to starting)		
		*START TIME: *Start time begins when candidate reports he/she is ready to assume SM duties	Cue: The regulatory commitment time clock has started.		
		Reviews ECG to classify event	Note: It is acceptable to use the laminated tables in the simulator, rather than the ECG		
		Classifies the event	Determines the classification of the event and refers to ECG Attachment 2 (Alert)		
	Att 2 A.1	CALL communicators to the Control Room	Pages communicators and initials as SM Cue : I am the Primary Communicator		

NAME: _____ DATE:

SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-1)

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	Att 2 A.2	IF a Security Event is in progress, THEN IMPLEMENT the prompt actions of NC.EP-EP.ZZ-0102, EC Response, Attachment 10, prior to the classification.	Determines Security Event is not in progress.		
	Att 2 A.3	If time allows, DIRECT Classification Independent Verification to be performed.	Cue: No independent verification will be performed.		

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NAME: _____ DATE:

SYSTEM: Emergency Plan

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TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-1)

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att 2 A.4	After Classification Independent Verification is obtained: • DECLARE the ALERT (enter time and date on ICMF) • COMPLETE / APPROVE the ICMF	Declares an ALERT under RB3.P within 15 minutes of Start Time: Completes and Approves the ICMF as follows: EAL#(s): RB3.P Description of Event: Potential Loss of the Reactor Coolant System Boundary Note: Description of Event is found in EAL Description Table Fills out Section III: Checks IS NOT for a Radiological Release in progress. Fills out Section IV: Retrieves wind speed (10) and direction (160) data from SPDS Initials for approval to transmit		
	Att 2 A.5	If time allows OBTAIN accuracy peer check of the completed ICMF	Cue: No peer check will be performed.	ļ	

PSEG Restricted – Possession Requires Specific Permission from Nuclear Training Page 5 of 8

NAME: _____ DATE: _____

SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-1)

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att 2 A.6	Continue with NOTIFICATION AND ACTIVATION as follows: • If not previously performed, ACTIVATE / DIRECT ACTIVATION of ERO Emergency Callout (EP 96-003) • DIRECT the Primary Communicator to implement ECG Attachment 6	Cue : Activation of ERO Emergency Callout is not required for this JPM. Provides ICMF to Primary Communicator within 15 minutes of event declaration		
-			Terminate JPM when ICMF is given to the Evaluator.		

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TQ-AA-106-0303

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

SME/Instructor: SME/Instructor SME/Instructor:

Date: Date

Date:

INITIAL CONDITIONS:

 You have a maximum of 5 minutes to review the Emergency Operating Procedures used during this scenario to refresh your memory of all events/paths. At the end of your review you will become the Shift Manager (SM). Inform the Evaluator when you are ready to assume SM duties. You may continue to reference the procedures or to look at the control board but "the clock will be ---running."-If there are multiple ECG calls, classify the most severe.

INITIATING CUE:

You are the Duty SM. Classify the event, complete the correct ECG Attachment and provide an ICMF to the Primary Communicator.

This is a Time Critical JPM.

ATTACHMENT 2 ALERT

А.	A. <u>CLASSIFICATION</u>	
	1. CALL communicators to the Control Room.	
	2. IF a Security Event is in progress, THEN IMPLEMENT the prompt actions of NC.EP-EP.ZZ-0102, EC Response, Attachment 10, prior to classification.	
	3. If time allows, DIRECT Classification Independent Verification to be	SM
	penormed	SM
	 After Classification Independent Verification is obtained: DECLARE the ALERT (enter time and date on ICMF) COMPLETE / APPROVE the ICMF 	
	5. If time allows OBTAIN accuracy peer check of the completed ICMF	EC
	6 Continue with NOTIFICATION AND ACTIVATION as follows:	EC
	If not previously performed, ACTIVATE / DIRECT ACTIVATION of ERO Emergency Callout	EC
	(EP 96-003)	EC
	 DIRECT the Primary Communicator to implement ECG Attachment 6 	
		EC
	 DIRECT the Secondary Communicator to implement ECG Attachment 8 for an ALERT 	
		EC
	 If not previously performed, VERIFY / DIRECT VERIFICATION of ERO Emergency Callout activation 	
		EC
	 UPDATE Crew/Facility with Emergency Classification Level and potential escalation criteria 	
		EC
	IMPLEMENT NC.EP-EP.ZZ-0102, EC Response	EC

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		EP-SA-111- ATT 2 Pg. 2 of 5
	INITIAL CONTACT MESSAGE FORM	
Ι.	THIS IS, COMMUNICATOR IN THE CON (NAME) TSC	TROL ROOM
	AT THE SALEM NUCLEAR GENERATING STATION, UNIT (s) No	
 II.	THIS IS NOTIFICATION OF AN ALERT WHICH WAS	
	DECLARED AT ON (Time - 24 HR CLOCK) ON (DAT	E)
	EAL # DESCRIPTION OF EVENT	
		ny release bove normal, ttributable to the
	\Box THERE IS NO RELEASE IN PROGRESS DUE TO THE EVENT $\int_{f} f$	event. See Basis or examples.
		-
IV.	33 FT. LEVEL WIND DIRECTION (From): WIND SPEED	
IV.	33 FT. LEVEL WIND DIRECTION (From): WIND SPEED (From MET Computer /SPDS) (DEGREES)	:(MPH)

EC Initials (Approval to Transmit ICMF)

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BASIS - ALERT ICMF

Classification

- <u>Non-Delegable Actions</u>: Actions taken in the process of emergency classification maybe delegated as needed with the exception of the 4 nondelegable actions listed below ⁽¹⁾
 - Classify emergencies in accordance with the Salem and Hope Creek-Event Classification Guides – Includes final determination of the classification and approval of the ICMF
 - Make decisions to notify and recommend protective actions to offsite agencies
 - Provide overall direction, control and coordination of PSEG Nuclear's Emergency Response
 - Authorize the expenditure of company funds and commit corporate resources as necessary to implement emergency procedures and/or to mitigate the accident
- <u>Communicators:</u> Call communicators to the Control Room as soon as possible to provide time for them to respond from the field

• Independent Verification:

- When the Shift Manager (SM) is the Emergency Coordinator, the Shift Technical Advisor (STA) is responsible to perform an <u>independent</u> <u>verification</u> of the EAL classification. The STA verification does not alleviate the requirement of the SM to make a timely classification. Should the SM fill the STA role, independent verification of the EAL classification will be delegated to another on-shift SRO, the Independent Assessor.
- Independent verification, while recommended, is not required and should be performed at the SM/ECs discretion as time allows and based on plant conditions. ⁽²⁾
 - STA or designee performs Independent Verification for SM
 - SM or designee performs Independent Verification for EDO
 - EDO or designee performs Independent Verification for ERM
- During the verification phase begin filling in the ICMF, completing the EAL declaration time once the EC and Independent Verifier have conferred and agree on a classification.

- <u>Accuracy Peer Check</u>: Have the STA, TSS, SSM or other knowledgeable individual perform an accuracy peer check of the ICMF. The peer check should include:
 - \circ $\;$ verification that the correct form has been used for the classification
 - review of all applicable fields that have been completed by the SM during completion of the ICMF (date, time, EAL, Description etc.) to ensure data is correct/accurate
 - EC approval initials have been completed.
- <u>Classification Timeliness</u>: Classification must occur after verification and before the 15 minute EAL clock expires. Assessment of an Emergency Condition should be completed in a timely manner, which is considered to be within 15 minutes of when events are known or should have been known. If an EAL specifies a duration time (e.g., loss of annunciators for 15 minutes or longer), the assessment time runs concurrently with the EAL duration time and is the same length. ⁽³⁾
- **<u>Rad Release Determination (Salem)</u>**: Any of the following conditions constitutes a release in progress due to the event:
 - Increase in Plant Vent Release Rate (NOT caused by operational transients or ventilation changes) which is caused by the EVENT.
 - A Steam Generator rupture which is faulted to the atmosphere (SRV, Atmospheric Vent or Line Break)
 - Evidence of an UNMONITORED release to atmosphere, examples include:
 - Primary to Secondary leak and the steam driven feed pump is in service
 - Bypass release from the Aux Building through the Electrical Pen
 - Leakage from the Containment directly to atmosphere after a LOCA
 - Elevated background radiation levels downwind from the station as monitored/reported by Radiation Protection Technician at fence line

Notification

- <u>Callout Activation (Alert, SAE, GE):</u>
 - Emergency Response Organization (ERO) Emergency Callout Activation <u>is required</u> for an Alert or higher classification.
 - Activation maybe delegated to the communicators if available, but
 - must be performed as soon as possible after classification. The SMshall perform the callout if communicators are not available.
 - Activate the ERO Emergency Callout system using the posted instructions titled "Emergency Callout Activation".
 - ERO callout system activation will be confirmed by a return call from the Everbridge system to the Communicators phone. If callout fails, then utilize backup procedures to alert the ERO (EP Aid-0032)

References:

(1) Emergency Plan, Section 3.0 - Organization, Paragraph 4.0 - Emergency Direction and Control

- (2) ECG Introduction and Usage Section 8.4.8
- (3) ECG Introduction and Usage Section 8.2.1

(4) EP 96-003 - Enhance callout system by correcting deficiencies and capturing time inefficiencies

STATION:	SALEM					
SYSTEM:	Emergency Plan					
TASK:	Classify an event and complete an limit (ESG-2)	n ICMF within the	regulatory committed time			
TASK NUMBER:	1240020502					
JPM NUMBER:	15-01 NRC SRO Admin A4-1 (ES	G-2)				
ALTERNATE PATH:		K/A NUMBER:	2.4.41			
APPLICABILITY:			RO SRO			
EVALUATION SETTING	G/METHOD: Simulate (Simula	tor or Classroom)				
REFERENCES: EF	P-SA-111-F2 Rev. 2 (ALERT)					
TOOLS AND EQUIPME	Inform Simulator Operator		SE ANY PROCEDURES			
VALIDATED JPM COM	PLETION TIME: 12 minut					
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL STEPS:	15 mi	nutes			
Developed By:	G Gauding Instructor	Date:	9-19-15			
Validated By:	C Davis / P Williams SME or Instructor	Date:	9-21-16 / 10-4-16			
Approved By:		Date:	10/11/10			
Approved By:	Operations Department	Date:	10/11/16			
ACTUAL JPM COMPLETION TIME:						
ACTUAL TIME CRITICAL COMPLETION TIME:						
PERFORMED BY:						
REASON, IF UNSATISI	FACTORY:					
EVALUATOR'S SIGNA	TURE:		DATE:			

PSEG Restricted – Possession Requires Specific Permission from Nuclear Training Page 1 of 8

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NAME: _____

DATE:

SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-2)

TASK NUMBER: 1240020502

INITIAL CONDITIONS:

 You have a maximum of 5 minutes to review the Emergency Operating Procedures used during this scenario to refresh your memory of all events/paths. At the end of your review you will become the Shift Manager (SM). Inform the Evaluator when you are ready to assume SM duties. You may continue to reference the procedures or to look at the control board but "the clock will be running." If there are multiple ECG calls, classify the most severe.

INITIATING CUE:

You are the Duty SM. Classify the event, complete the correct ECG Attachment and provide an ICMF to the Primary Communicator.

This is a Time Critical JPM.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

1. Declare an **ALERT under EAL RB3.L** within 15 minutes of start time, and provide ICMF to the Primary Communicator within the next 15 minutes.

NAME: ______ DATE: _____

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SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-2)

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide candidate with "Tear-off sheet" and Blank Copies of EP-SA-111-F1 through F4 (UE, ALERT, SAE, GE)	Reviews initial conditions and EOP's (as necessary – 5 minute limit prior to starting)		
		*START TIME: *Start time begins when candidate reports he/she is ready to assume SM duties	Cue: The regulatory commitment time clock has started.		
		Reviews ECG to classify event	Note: It is acceptable to use the laminated tables in the simulator, rather than the ECG		
		Classifies the event	Determines the classification of the event and refers to ECG Attachment 2 (Alert)		
	Att 2 A.1	CALL communicators to the Control Room	Pages communicators and initials as SM Cue: I am the Primary Communicator		

NAME: _____ DATE: _____

SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-2)

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	Att 2 A.2	IF a Security Event is in progress, THEN IMPLEMENT the prompt actions of NC.EP-EP.ZZ-0102, EC Response, Attachment 10, prior to the classification.	Determines Security Event is not in progress.		
	Att 2 A.3	If time allows, DIRECT Classification Independent Verification to be performed.	Cue: No independent verification will be performed.		

NAME: ______ DATE: _____ .

SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-2)

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att 2 A.4	After Classification Independent Verification is obtained: • DECLARE the ALERT (enter time and date on ICMF) • COMPLETE / APPROVE the ICMF	Declares an ALERT under RB3.L within 15 minutes of Start Time: Completes and Approves the ICMF as follows: EAL#(s): RB3.L Description of Event: Loss of the Reactor Coolant System Boundary Note: Description of Event is found in EAL Description Table <u>Fills out Section III:</u> Checks IS for a Radiological Release in progress. <u>Fills out Section IV</u> : Retrieves wind speed (10)and direction (160) data from SPDS Initials for approval to transmit		
	Att 2 A.5	If time allows OBTAIN accuracy peer check of the completed ICMF	Cue: No peer check will be performed.		

NAME: _____ DATE: _____

SYSTEM: Emergency Plan

TASK: Classify an event and complete an ICMF within the regulatory committed time limit (ESG-2)

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	Att 2 A.6	Continue with NOTIFICATION AND ACTIVATION as follows: • If not previously performed, ACTIVATE / DIRECT ACTIVATION of ERO Emergency Callout (EP 96-003) • DIRECT the Primary Communicator to implement ECG Attachment 6	Cue : Activation of ERO Emergency Callout is not required for this JPM. Provides ICMF to Primary Communicator within 15 minutes of event declaration		
			Terminate JPM when ICMF is given to the Evaluator.		

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TQ-AA-106-0303

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

V.	Task description and number, JPM description and number are identified.
v.	$\underline{\mathcal{L}}$ Knowledge and Abilities (K/A) references are included.
Ŵ	CO3. Performance location specified. (in-plant, control room, or simulator)
\mathcal{V}	LC4. Initial setup conditions are identified.
(\mathcal{V})	5. Initiating and terminating Cues are properly identified.
V	Δ \mathcal{P}_{6} . Task standards identified and verified by SME review.
V	\mathcal{L} Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
U	$\underline{\mathcal{P}}_{8}$. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. $\underline{\mathcal{P}}_{2}$ Date $\underline{\mathcal{Q}}_{4}\mathcal{U}_{4}\mathcal{U}_{2}$
Ś	9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
	\mathcal{K} 10. If the JPM cannot be performed as written with proper responses, then revise the JPM
M	$\mathcal{L}_{\mathcal{O}}$ 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: WI m SME/Instructor: SME/Instructor:

Date: 9.21.16 Date:

Date:

INITIAL CONDITIONS:

 You have a maximum of 5 minutes to review the Emergency Operating Procedures used during this scenario to refresh your memory of all events/paths. At the end of your review you will become the Shift Manager (SM). Inform the Evaluator when you are ready to assume SM duties. You may continue to reference the procedures or to look at the control board but "the clock will be running." If there are multiple ECG calls, classify the most severe.

INITIATING CUE:

You are the Duty SM. Classify the event, complete the correct ECG Attachment and provide an ICMF to the Primary Communicator.

This is a Time Critical JPM.

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STATION:	SALEM					
SYSTEM:	Rod Control					
TASK:	Perform a Control Rod Operat	bility Verification				
TASK NUMBER:	N0010070101					
JPM NUMBER:	15-01 NRC Sim a					
ALTERNATE PATH:	X		001 /	A4.03		
APPLICABILITY:			RO	SRO		
EVALUATION SETTING	METHOD: Simulator					
REFERENCES: Si	2.OP-ST.RCS-0001, Rev. 22 (che	ecked 8-3-16)				
TOOLS AND EQUIPMEN	IT: None					
VALIDATED JPM COMP	LETION TIME:	10 min				
TIME PERIOD IDENTIFI	ED FOR TIME CRITICAL STEPS	: <u> </u>	/A			
Developed By:	G Gauding Instructor	Date:	8-3-16			
Validated By:	M Lutek / W Russell SME or Instructor	Date:	8-22-16			
Approved By:	Training Department	Date:	10/11/16			
Approved By:	Operations Departmen	Date:	10/11/16			
ACTUAL JPM COMPLETION TIME:						
ACTUAL TIME CRITICAL COMPLETION TIME:						
PERFORMED BY: GRADE: SAT UNSAT						
REASON, IF UNSATISF	ACTORY:					
EVALUATOR'S SIGNAT	URE:		DATE:			

OPERATOR TRAINING PROGRAM JOB PERFORMANCE MEASURE JOB PERFORMANCE MEASURE SIMULATOR SETUP INSTRUCTIONS

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SYSTEM:	Rod Control
TASK:	Perform a Control Rod Operability Verification
TASK NUMBER:	N0010070101
SIMULATOR IC:	IC-251 in 15-01 NRC JPMs
MALFUNCTIONS REQUIRED:	<u>RT-1</u> will trip 21 SGFP MALF: BF0105A, 21 STM GEN FEED PUMP TRIP, Final Value: 3
OVERRIDES REQUIRED:	None
SPECIAL INSTRUCTIONS:	None
Note to Evaluator:	OP-AP-300-1001 required a peer check for all non-emergency manual rod m

OP-AP-300-1001 required a peer check for all non-emergency manual rod motion. Do NOT correct operator if a mistake is made when performing a peer check. For all required peer checks simply state "Peer check SAT".

NAME:			

DATE:

SYSTEM: Rod Control

TASK: Perform a Control Rod Operability Verification

TASK NUMBER: N0010070101

INITIAL CONDITIONS:

Unit 2 is operating at steady state, 100% power. Power has been at 100% for 30 days.

INITIATING CUE:

- You are directed to perform S2.OP-ST.RCS-0001, Reactivity Control System Rod Control Assemblies.
- A Maintenance Technician is stationed at the Rod Control System Power Cabinets.
- Communications are established via plant page between the Control Room and Jeff Stevens, NEO, at the Rod Control System Power Cabinets.
- The CRS has directed that steps 5.1.2 through 5.1.9 are to be performed in order.
- The CRS directs that 15 steps of rod insertion are to be performed for each bank to ensure that each rod moves at least 10 steps.

٠	Initial Control Rod Positions are:	
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SDA		SDB		SDC		SDD	
F-04	229	G-03	229	E-03	229	C-05	229
D-10	228	C-09	227	C-11	223	E-13	223
K-12	227	J-13	227	L-13	224	N-11	224
M-06	227	N-07	229	N-05	224	L-03	227
B-04	230	J-02	223				
D-14	224	C-06	223				
P-12	229	G-13	227				
M-02	230	N-09	230				

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

Operator trips the Rx when Shutdown Bank B is inserted in the core and a SGFP trips.

OPERATOR TRAINING PROGRAM

NAME: _____

JOB PERFORMANCE MEASURE

DATE: _____

SYSTEM: Rod Control

TASK: Perform a Control Rod Operability Verification

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		Provide marked up copy of S2.OP-ST.RCS- 0001, Rev. 22, with Prerequisite Sections 2.1-2.8 filled out.	Reviews Prerequisites.		
		Provide copy of OP-AP-300-1001, PWR Control Rod Movement Requirements.	Reviews OP-AP-300-1001, PWR Control Rod Movement Requirements.		
			Reviews and signs Precautions and Limitations. Cue: <u>IF</u> ASKED, state that no special contingency actions have been briefed other than what is in the P&L's.		
	5.1.1	IF this surveillance is to be performed	Determines step is N/A based on steady state 100% operation.		
	5.1.2	PERFORM Attachment 2, Rod Control System Voltage Checks as follows: A. PLACE Rod Bank Selector Switch to "MANUAL". B. Direct Maintenance to COMPLETE Attachment 2, Rod Control System Voltage Checks.	 Performs Attachment 2 Rod Control System Voltage Checks by: A. Places Rod Bank Selector Switch to manual. B. Directs Direct Maintenance to complete Attachment 2, Rod Control System Voltage Checks. 		
			Cue : Maintenance reports Attachment 2 Rod Control System Voltage Checks are complete SAT.		

NAME: ______

SYSTEM: Rod Control

TASK: Perform a Control Rod Operability Verification

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	Note	 The Shutdown Rod Insertion Limit (TS 3.1.3.4) is not applicable during the performance of this test for rods actually undergoing testing. Steps 5.1.3 through 5.1.10 may be performed in any order. 	Initials both notes.		

NAME: _____

SYSTEM: Rod Control

TASK: Perform a Control Rod Operability Verification

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.1.3	 PERFORM Shutdown Bank A testing as follows: A. <u>IF</u> the Rx is critical, <u>THEN</u> ENSURE T_{avg} is within +/-1°F of T_{ref}. B. PLACE Bank Selector Switch in the "SBA" position. C. ENSURE GRP. SELECT "C" lights are illuminated on Rod Control System Power Cabinets 21AC and 22AC. 	Checks Tave/Tref recorder on 2RP4 and notes Tavg is within 1°F of Tref Rotates Bank Selector Switch fully counter clockwise to the SBA position. Contacts NEO and directs him to verify GRP. SELECT "C" lights are illuminated on Rod Control System Power Cabinets 21AC and 22AC.		
*		D. Maneuver Shutdown Bank A at least 10 steps in any one direction.	<u>Cue:</u> GRP SELECT "C" lights are illuminated at Rod Control System Power Cabinets 21AC and 22AC. IAW OP-AA-300-1001, prior to rod movement, operator states initial Shutdown Bank A position, target control rod position, and direction of rod movement, then inserts SBA at least 10 steps to stated target position.		
		 E. ENSURE each rod in Shutdown Bank A indicated rod movement of at least 10 steps. F. RECORD Shutdown Bank A "Test Results" by initialing in Attachment 1. 	Verifies rod movement by viewing rod position on P-250 computer. Initials SAT for Groups 1 and 2 for SBA on Att 1.		
*		G. RESTORE Shutdown Bank A to pre-test condition.	Operator states initial Shutdown Bank A position, target control rod position, and direction of rod movement, then withdraws SBA to stated target ARO position. Continuous rod withdrawal is acceptable.		

DATE: _____

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Rod Control

TASK: Perform a Control Rod Operability Verification

		STEP			COMMENTS
	STEP	(*Denotes a Critical Step)		EVAL	(Required for UNSAT
*	NO.		STANDARD	S/U	Evaluation)
*	5.1.4	 PERFORM Shutdown Bank B testing as follows: A. <u>IF</u> the Rx is critical, <u>THEN</u> ENSURE T_{avg} is within +/-1°F of T_{ref}. B. PLACE Bank Selector Switch in the "SBB" position. C. ENSURE GRP. SELECT "C" lights are illuminated on Rod Control System Power Cabinets 21BD and 22BD. 	Checks Tave/Tref recorder on 2RP4 and notes Tavg is within 1°F of Tref. Rotates Bank Selector Switch clockwise to the SBB position. Contacts NEO and directs him to verify GRP. SELECT "C" lights are illuminated on Rod Control System Power Cabinets 21BD and 22BD.		
*		D. MANUEVER Shutdown Bank B at least 10 steps in any one direction.	<u>Cue:</u> GRP SELECT "C" lights are illuminated at Rod Control System Power Cabinets 21BD and 22BD. Operator states initial Shutdown Bank B position, target control rod position, and direction of rod movement, then inserts SBB at least 10 steps to stated target position.		
		E. ENSURE each rod in Shutdown Bank B indicated rod movement of at least 10 steps.	when the operator is checking rod position after insertion. This will trip 21 SGFP. Responds to 21 SGFP trip by tripping the		
*			Rx IAW P&L 3.13. Movement of the Rod Bank Selector Switch to MAN or AUTO under these conditions is incorrect. When the operator has either tripped the Rx or initiated rod insertion in MAN or		
			AUTO, state JPM is complete.		

TQ-AA-106-0303 Revision 4

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

í.	2M -
V	1. Task description and number, JPM description and number are identified.
И	$\sqrt{\frac{4}{2}}$ Knowledge and Abilities (K/A) references are included.
V	3. Performance location specified. (in-plant, control room, or simulator)
V	. Initial setup conditions are identified.
V	$\sqrt{2}$. Initiating and terminating Cues are properly identified.
\$	6. Task standards identified and verified by SME review.
5	$\sqrt{2}$, Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
6	2. Verify the procedure referenced by this JPM matches the most current revision of
	that procedure: Procedure Rev. 22 Date 6/13/15
	9. Pilot test the JPM:
	a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:_	MLute	-le	
SME/Instructor:_	W, Runly	Russell	
SME/Instructor:			

Date: $\frac{9/22/16}{8/22/16}$

Date:

INITIAL CONDITIONS:

Unit 2 is operating at steady state, 100% power. Power has been at 100% for 30 days.

INITIATING CUE:

- You are directed to perform S2.OP-ST.RCS-0001, Reactivity Control System Rod Control Assemblies.
- A Maintenance Technician is stationed at the Rod Control System Power Cabinets.
- Communications are established via plant page between the Control Room and Jeff Stevens, NEO, at the Rod Control System Power Cabinets.
- The CRS has directed that steps 5.1.2 through 5.1.9 are to be performed in order.
- The CRS directs that 15 steps of rod insertion are to be performed for each bank to ensure that each rod moves at least 10 steps.

•							
<u>SDA</u>		SDB		SDC		SDD	
F-04	229	G-03	229	E-03	229	C-05	229
D-10	228	C-09	227	C-11	223	E-13	223
K-12	227	J-13	227	L-13	224	N-11	224
M-06	227	N-07	229	N-05	224	L-03	227
B-04	230	J-02	223				
D-14	224	C-06	223				
P-12	229	G-13	227				
M-02	230	N-09	230				

• Initial Control Rod Positions are:

STATION:	SALEM	ne nyaku salat nyakas synthe annaki at ka			
SYSTEM:	Emergency Operating Procedures				
TASK:	Perform Actions for Containment Sump blockage				
TASK NUMBER:	N1150900501				
JPM NUMBER: ALTERNATE PATH:	15-01 NRC Sim b X	A NUMBER: 2.4.4			
APPLICABILITY:		RO SRO			
EVALUATION SETTING	G/METHOD: Simulator / Perform				
REFERENCES: AA	2-EOP-LOCA-1, REV. 30, 2-EOP-LOCA-3, Rev. 30, 2-EOP-APPX-7, Rev. 0, OP- REFERENCES: AA-101-111-1003, Rev. 6 (All rev checked 5/9/16)				
TOOLS AND EQUIPME	NT: None				
VALIDATED JPM COM	PLETION TIME: 5 minutes				
TIME PERIOD IDENTIF	TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A				
Developed By:	G Gauding Instructor	Date: 5-9-16			
Validated By:	D Cox / M Lutek SME or Instructor	Date: 8-22-16			
Approved By:	ed By: Why May Date: 10/10/10 Training Department				
Approved By: Date: /0/10/16 Operations Department					
ACTUAL JPM COMPLETION TIME:					
ACTUAL TIME CRITICAL COMPLETION TIME:					
PERFORMED BY:					
REASON, IF UNSATIS	FACTORY:				
EVALUATOR'S SIGNATURE: DATE:					

STATION:	SALEM				
YSTEM: Emergency Operating Procedures					
TASK:	K: Perform Actions for Containment Sump blockage				
TASK NUMBER:	N1150900501				
JPM NUMBER: ALTERNATE PATH:	15-01 NRC Sim b X K/A N	IUMBER: 2.4.4			
APPLICABILITY: EO F		RO SRO			
EVALUATION SETTING	METHOD: Simulator / Perform				
2-E REFERENCES: AA	OP-LOCA-1, REV. 30, 2-EOP-LOCA-3, F -101-111-1003, Rev. 6 (All rev checked 5	Rev. 30, 2-EOP-APPX-7, Rev. 0, OP- 5/9/16)			
TOOLS AND EQUIPME	NT: None				
VALIDATED JPM COM	PLETION TIME: 5 minutes	_			
TIME PERIOD IDENTIFI	ED FOR TIME CRITICAL STEPS:	N/A			
Developed By:	G Gauding Instructor	Date: 5-9-16			
Validated By:	D Cox / M Lutek SME or Instructor	Date: 8-22-16			
Approved By:	Approved By: Date: Training Department				
Approved By: Date: Operations Department					
ACTUAL JPM COMPLETION TIME:					
ACTUAL TIME CRITICAL COMPLETION TIME:					
PERFORMED BY:					
REASON, IF UNSATISF	ACTORY:				
EVALUATOR'S SIGNATURE: DATE:					

		NAME:		
		DATE:		
SYSTEM:	Emergency Operating Procedures			
TASK:	Perform Actions for Containment Sump blockage			
TASK NUMBER:	N1150900501			
SIMULATOR SETU	P: <u>RT-1 MALF</u>	S: VL0120 21SJ44 fails to position (0-100%) Severity 1.0 VL0121 22SJ44 fails to position (0-100%) Severity 2.0		
	I/O's:	AA04 B LO 21SJ44 SIS SUMP VALVE OPEN: ON AA05 B LO 21SJ44 SIS SUMP VALVE OPEN: ON		
		AA05 C LO 22SJ44 SIS SUMP VALVE CLOSED: OFF		
	ET-1	KAA01TPN 21 RHR pump STOP PB, tied to delete VL0120		
	ET-3	KAA01TPN 21 RHR pump STOP PB. tied to delete VL0121		

Mark up LOCA-3 up to step 21.

INITIAL CONDITIONS:

- A LBLOCA has occurred on RCS loop 23.
- The crew has responded by performing TRIP-1 and LOCA-1.
- The crew is performing LOCA-3 with all AC buses energized from off-site power, and is waiting at step 21 for RWST lo-lo level alarm.
- All ECCS pumps are operating except 22 CS pump which was stopped at step 8.

INITIATING CUE: You are the Reactor Operator. Continue performing LOCA-3.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

- 1. Secure all ECCS pumps.
- 2. Reestablish recirculation flow with ONE RHR pump and ONE charging OR SI pump.
NAME: _____

DATE: _____

SYSTEM: Emergency Operating Procedures

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Simulator Operator: Insert <u>RT-1</u> to cause cavitation of both RHR pumps.		
			Determines ECCS pumps are exhibiting signs of cavitation and recognizes entry into APPX-7 is warranted from Continuous Action Summary.		
			Evaluator: <u>IF</u> the intention to stop the cavitating RHR pumps is voiced, <u>THEN</u> <u>IMMEDIATELY</u> CUE: The CRS directs you to implement APPX-7. (This is to prevent activation of Event Trigger when 21 RHR pump is stopped.		
			CUE IF REQUIRED : The CRS directs you to implement APPX-7. Note : Operator may go to EOP-LOCA-5, but first step of LOCA-5 will direct performance of APPX-7. Use above cue if required in LOCA-5.		
			Evaluator: Provide paper copy of 2-EOP- APPX-7.		

NAME: _____

DATE:

SYSTEM: Emergency Operating Procedures

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	APPX-7	 CAUTION Any pump receiving suction from an RHR pump should be stopped before stopping the RHR pump. If any Charging Pump, SI Pump, or Containment Spray Pump loses suction or shows indication of cavitation, the pump should be stopped. 			
	1	 (CAS) MONITOR RHR Pump suction conditions: a. CHECK <u>NO</u> indications of cavitation. Pump Amps – stable and normal for discharge pressure and flow. Flow – stable and normal for discharge pressure. Discharge Pressure – stable and normal for flow Oscillations – none indicated 	Determines BOTH RHR pumps exhibit signs of cavitation, as well as ALL ECCS pumps being supplied from RHR pumps.		

NAME: _____

DATE: _____

SYSTEM: Emergency Operating Procedures

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	1.a RNO	 a. PERFORM the following: 1. ENSURE 21RH29 <u>AND</u> 22RH29 in AUTO. 	Places 21RH29 and 22RH29 in AUTO.		
*		 STOP <u>ANY</u> Charging Pump or SI Pump taking suction from affected RHR Pump(s) 	Stops 21 and 22 Charging pumps and 21 and 22 SI pumps.		
*		 <u>IF</u> indications of cavitation continue, <u>THEN</u> CLOSE 21CS36 <u>AND</u> 22CS36, RHR TO CS VALVE. 	Determines pump cavitation is continuing, verifies 21CS36 and 22CS36 are shut.		
		 <u>IF</u> indications of cavitation continue <u>AND</u> radiological conditions permit, <u>THEN</u> PERFORM the following: 	CUE : Radiation Protection has determined		
		 a. SEND an operator to release tags and restore CA to RH18(s). b. CLOSE affected RH18(s). 	both RHR pump rooms to be unavailable for access due to high radiation levels.		
*		 <u>IF</u> indications of cavitation continue, <u>THEN</u> REMOVE LOCKOUT(s) <u>AND</u> CLOSE affected SJ49(s), RHR TO COLD LEG. 	Determines RHR pump cavitation is continuing, and removes lockout from 21SJ49 and 22SJ49 RHR TO COLD LEG and shuts 21SJ49 and 22SJ49.		
*		 <u>IF</u> indications of cavitation continue, <u>THEN</u> STOP affected RHR Pump(s). 	Determines indications of cavitation continue, and stops 21 and 22 RHR pump. Simulator Operator: Ensure ET-1 and ET-3 are TRUE when 21 and 22 RHR pump STOP PBs are depressed. This removes the SJ44 failures.		

NAME: _____

DATE: _____

SYSTEM: Emergency Operating Procedures

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	2	CHECK <u>ALL</u> <u>AVAILABLE</u> CFCUs running in Low Speed.	Determines all CFCUs are running in Low Speed.		
*	3.	 SECURE Containment Spray flow path: a. STOP <u>ALL</u> Containment Spray Pumps. b. CHECK 21CS36 <u>AND</u> 22CS36 CLOSED. 	Stops 21 CS pump. Determines 21CS36 and 22CS36 are shut.		
	4.	(CAS) CHECK RWST level >1.2 feet.	Determines RWST level is >1.2 feet.		
	5.	 ATTEMPT to establish RHR Pump suction: a. CHECK 21SJ44 AND 22SJ44 OPEN. b. CHECK AT LEAST ONE RHR Pump running, with suction aligned to Containment Sump. 	Determines 21SJ44 <u>AND</u> 22SJ44 are open. Determines NEITHER RHR Pumps is running with suction aligned to Containment Sump.		
	5.b RNO	b. PERFORM the following:	· · ·		
	5.b RNO	 REMOVE LOCKOUT(s) <u>AND</u> CLOSE affected SJ49(s) RHR DISCH TO COLD LEG. 	Determines 21SJ49 and 22SJ49 previously shut.		
	5.b RNO	2. ENSURE 21RH29 <u>AND</u> 22RH29 in AUTO	Determines 21RH29 and 22RH29 are in AUTO.		
*	5.b RNO	3. START ONE RHR Pump.	Starts 21 OR 22 RHR pump.		

NAME: ______ DATE: _____

SYSTEM: Emergency Operating Procedures

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.b RNO	 <u>IF</u> indications of cavitation occur, <u>THEN</u> STOP the running RHR pump, <u>AND</u> START the other RHR pump. 	Determines cavitation is NOT occurring.		
	5.b RNO	 <u>IF NO</u> RHR Pumps can be run without cavitation, <u>THEN</u> STOP any running RHR Pumps <u>AND</u> GO TO Step 8. 	Determines RHR pump can be run without cavitation.		
	5.	 c) CHECK 21RH29 AND 22RH29 in AUTO. d) REMOVE LOCKOUT(s) AND CLOSE affected SJ49(s) RHR DISCH TO COLD LEG. e) CHECK ONLY ONE RHR Pump running with suction from Containment Sump. 	Determines 21RH29 and 22RH29 are in AUTO. Determines BOTH SJ49's are shut. Determines only one RHR pumps is running.		
	6.	 ATTEMPT to establish Charging Pump or SI Pump flow in recirculation mode: a. CHECK Charging Pump and SI Pump suction aligned to running RHR pump. b. CHECK ONLY ONE Charging Pump <u>OR</u> SI Pump running. 	Determines running RHR pump SJ45 is open. Determine NO Charging or SI pumps are running.		

NAME: ______ DATE: _____

SYSTEM: Emergency Operating Procedures

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	6.b RNO	START OR STOP , Charging and SI Pumps, as required, to obtain <u>ONLY</u> <u>ONE</u> pump running in recirculation alignment.	Starts ONLY ONE Charging or SI pump. Note : Per the NOTE at top of page 3, the intent of Step 6 is to start only a single pump (Charging or SI), and it is preferable to start a Charging pump. SAT performance of Step 6 does not require starting a Charging pump, just one of the 4 available charging or SI pumps.		
	6	 c. CHECK Charging Pump or SI Pump running in recirculation alignment. d. GO TO Step 9 	Determines Charging or SI pump is running in recirculation alignment.		
			Terminate JPM when operator goes to Step 9.		

JOB PERFORMANCE MEASURE

TQ-AA-106-0303

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

- 1. Task description and number, JPM description and number are identified.
 - _____2. Knowledge and Abilities (K/A) references are included.
- 3. Performance location specified. (in-plant, control room, or simulator)
- 4. Initial setup conditions are identified.
- 5. Initiating and terminating Cues are properly identified.
- Task standards identified and verified by SME review.
- 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
- 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. ____ Date _____

9. Pilot test the JPM:

- a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
- _____10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
 - _____11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	Date:
SME/Instructor:	Date:
SME/Instructor:	Date:

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

- A LBLOCA has occurred on RCS loop 23.
- The crew has responded by performing TRIP-1 and LOCA-1.
- The crew is performing LOCA-3 with all AC buses energized from off-site power, and is waiting at step 21 for RWST lo-lo level alarm.
- All ECCS pumps are operating except 22 CS pump which was stopped at step 8.

INITIATING CUE:

You are the Reactor Operator. Continue performing LOCA-3.

C			
STATION:	SALEM		
SYSTEM:	ECCS		
TASK:	Isolate the ECCS Accumulators	IAW TRIP-6	
TASK NUMBER:	1150070501		
JPM NUMBER:	15-01 NRC Sim c		
ALTERNATE PATH:	X	K/A NUMBER:	E09 EA1.1
APPLICABILITY:			<u>8.5</u> RO SRO
EVALUATION SETTING	/METHOD: Simulator	/ Perform	
REFERENCES: 2-	-EOP-TRIP-6 Rev. 30 (Rev checke	d 8-3-16)	
TOOLS AND EQUIPMEN	NT: None		
VALIDATED JPM COMF	PLETION TIME: 8	Minutes	
TIME PERIOD IDENTIFI	ED FOR TIME CRITICAL STEPS:	N	N/A
Developed By:	G Gauding Instructor	Date:	8-3-16
Validated By:	W Russell / D Cox SME or Instructor	Date:	8-22-16
Approved By:		Date:	10/11/10
Approved By:	Operations Department	Date:	10/11/16
ACTUAL JPM COMPLE	TION TIME:		
ACTUAL TIME CRITICA	L COMPLETION TIME:		
PERFORMED BY: GRADE: SAT	UNSAT		
REASON, IF UNSATISF	ACTORY:		
EVALUATOR'S SIGNAT	URE:		DATE:

NAME:

DATE:

SYSTEM: ECCS

TASK: Isolate the ECCS Accumulators IAW TRIP-6

TASK NUMBER: 1150070501

SIMULATOR SETUP:

- 1. Trip RCP's
- 2. Perform EOP's to TRIP-6, Step 12 SI ACCUM ISOLATION
- 3. Override 24SJ54, Acc. Isolation Valve, close PB in the OFF position.
- 4. Place SPDS on Press/Temp Display
- 5. Put RCS Tcolds on trend on console.
- 6. Provide marked up copy of TRIP-6

INITIAL CONDITIONS:

A reactor trip occurred when a 500KV grid perturbation occurred, which also caused all RCPs to trip. The operating crew has progressed through the EOP's and is now in 2-EOP-TRIP-6, NATURAL CIRCULATION RAPID COOLDOWN WITH RVLIS. The RCPs will NOT be restarted.

INITIATING CUE:

Begin performing 2-EOP-TRIP-6, NATURAL CIRCULATION RAPID COOLDOWN WITH RVLIS at step 12.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

- 1. Shut 21, 22, and 23 SJ54's.
- 2. Vent 24 Accumulator to atmospheric pressure.

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DATE:

SYSTEM: ECCS

TASK: Isolate the ECCS Accumulators IAW TRIP-6

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Reviews conditions and the marked up EOP- TRIP-6 Natural Circ Cooldown With RVLIS		
	12	IS RCS PRESSURE <1000 PSIG	Verifies RCS pressure <1000 psig.		
	12.1	REMOVE LOCKOUT FROM 21-24SJ54 (ACCUMULATOR OUTLET VALVES)	At 2RP4 Panel, selects VALVE OPERABLE on 21-24SJ54 ACCUMULATOR OUTLET VALVES LOCKOUT switches.		
*	12.1	CLOSE 21-24SJ54	Depresses CLOSE PB on 21-24SJ54, noting that 21, 22, and 23SJ54 begin to stroke closed.		
	12.1	ARE 21-24SJ54 CLOSED	Determines 24SJ54 is OPEN.		
*	12.2	 VENT <u>ANY</u> AFFECTED ACCUMULATORS: MAINTAIN RCS PRESSURE GREATER THAN ACCUMULATOR NITROGEN PRESSURE OPEN 2NT35 (N2 HDR VALVE) OPEN AFFECTED SJ93 (N2 SUPPLY VALVE) 	Verifies RCS Pressure >24 Accumulator Pressure Opens 2NT35 (N2 HDR VALVE) Opens 24SJ93 (N2 SUPPLY VALVE) and observes 24 Accumulator pressure lowering		

NAME: _____

DATE:

SYSTEM: ECCS

TASK: Isolate the ECCS Accumulators IAW TRIP-6

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	12.3	WHEN ACCUMULATOR VENTING IS COMPLETE <u>THEN</u> CLOSE: • 2NT35 • 21 THRU 24 SJ93	Cue: 24 Accumulator has been completely vented and 24 Accumulator pressure is now reading ZERO. Closes 2NT35 N2 HDR VALVE Closes 24SJ93 N2 SUPPLY VALVE Cue: JPM is complete		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below. \vec{u}

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J	· JUM	1. Task description and number, JPM description and number are identified.
V	1441	2. Knowledge and Abilities (K/A) references are included.
5	10g	3. Performance location specified. (in-plant, control room, or simulator)
v	ILM A	4. Initial setup conditions are identified.
V	1 Up 1	5. Initiating and terminating cues are properly identified.
v	1 Cmp	6. Task standards identified and verified by SME review.
U	imly	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
	unv	8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. $\underline{30}$ Date $\underline{8/22/16}$
	Ugs	 9. Pilot test the JPM: a. verify cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
		10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
		11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: An 2 SME/Instructor: >

Date: Date:

SME/Instructor:_____

INITIAL CONDITIONS:

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A reactor trip occurred when a 500KV grid perturbation occurred, which also caused all RCPs to trip. The operating crew has progressed through the EOP's and is now in 2-EOP-TRIP-6, NATURAL CIRCULATION RAPID COOLDOWN WITH RVLIS. The RCPs will NOT be restarted.

INITIATING CUE:

Begin performing 2-EOP-TRIP-6, NATURAL CIRCULATION RAPID COOLDOWN WITH RVLIS at step 12.

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STATION:	SALEM 1 & 2	· · · · · · · · · · · · · · · · · · ·			
SYSTEM	Emergency Operating Procedur	29			
TACK	Descend to a Loss of Last Cirk	(Initiate Diand and Fred with	e SLeumes and By		
TASK: TASK NUMBER:	Respond to a Loss of Heat Sink Head Vents) N1150290501	(Initiate Bleed and Feed with	n SI pumps and Kx		
JPM NUMBER:	15-01 NRC Sim d				
ALTERNATE PATH:	X	K/A NUMBER:EP	PE E05 EA1.1		
EVALUATION SETTING	G/METHOD: Simulator - Per	form			
REFERENCES: 2-E	EOP-FRHS-1, Loss of Secondary	Heat Sink, Rev 2031 1	112/16		
TOOLS AND EQUIPME	NT: None				
VALIDATED JPM COM	PLETION TIME: 6 min	utes			
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL STEPS	S:N/A			
Developed By:	G Gauding Instructor	Date: 8-2-16	3		
Validated By:	S Harris / J Pierce SME or Instructor	Date: 9-28-7	16		
Approved By:	Training Department	Date: 10/11/	lice		
Approved By:	Operations Department	Date: 10/11/10	6		
ACTUAL JPM COMPLETION TIME:					
ACTUAL TIME CRITICAL COMPLETION TIME:					
PERFORMED BY:					
REASON, IF UNSATISI	FACTORY:				
EVALUATOR'S SIGNA	TURE:	DATE:			

NAME: _____

DATE: _____

SYSTEM: Emergency Operating Procedures

TASK:TCAF a Loss of Heat Sink (Initiate Bleed and Feed with SI pumps and Rx Head
Vents)

TASK NUMBER: N1150290501

SIMULATOR SETUP: RX HEAD VENT KEYS ARE LOCATED IN SIM BOOTH

IC-254 developed by : MSL rupture (10%)downstream of MSIVs. Fail all MSIVs open. All AFW pumps failed. Fail <u>2PR2</u> shut. Performed TRIP-1 through Step 20. SG WR levels <32%.

INITIAL CONDITIONS:

- Unit 2 initiated a Rx trip from 100% power in response to a Main Steamline break at the mixing bottle.
- An automatic Safety Injection initiated.
- The Main Turbine failed to trip automatically, and was manually tripped from the control console.
- MSLI failed, and all MSIV's remain open.
- All AFW flow has been lost.
- EOP-TRIP-1 was performed and a transition to FRHS-1, Loss of Secondary Heat Sink was made at Step 20.1

INITIATING CUE:

You are the Reactor Operator. Perform FRHS-1 starting at Step 1.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

- 1. Stop ALL RCPs.
- 2. Open 2PR1.
- 3. Open Rx Head Vent Valves 2RC40-2RC43.

NAME: _____

DATE:

SYSTEM: Emergency Operating Procedures

TASK:

Respond to a Loss of Heat Sink (Initiate Bleed and Feed with SI pumps and Rx Head Vents)

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	1	IS TOTAL AFW FLOW LESS THAN 22E04 LB/HR DUE TO OPERATOR ACTIONS	Determines it was not operator action which caused total AFW flow to be less than 22E04 lb/hr.		
	2	<u>IF AT LEAST ONE INTACT OR</u> <u>RUPTURED</u> SG IS AVAILABLE, <u>THEN</u> DO <u>NOT</u> FEED A <u>FAULTED</u> SG	Recognizes ALL SGs are faulted.		
	3	IS RCS PRESSURE GREATER THAN <u>ANY INTACT</u> OR <u>RUPTURED</u> SG PRESSURE	Checks RCS pressure on control console and determines it is greater than all SG pressures checked on control console.		
	3.1	ARE RCS T-HOTS GREATER THAN 350°F	Checks RCS Thot indication on control console and determines that RCS Thots are greater than 350°F.		;
	4	<u>IF</u> WR LEVELS IN <u>AT LEAST TWO</u> SG'S ARE LESS THAN 32% (37% ADVERSE), <u>THEN</u> IMMEDIATELY GO TO STEP 21 TO INITIATE RCS BLEED AND FEED	Determines at least 2 SG WR levels < 32% and goes to Step 21.		

NAME: _____

DATE:

SYSTEM: Emergency Operating Procedures

TASK:

Respond to a Loss of Heat Sink (Initiate Bleed and Feed with SI pumps and Rx Head Vents)

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	21	<u>CAUTION</u> TO ESTABLISH RCS HEAT REMOVAL BY RCS BLEED AND FEED, STEPS 24 THRU 29 MUST BE PERFORMED QUICKLY AND WITHOUT INTERRUPTION	Reads Step.		
*	23	STOP <u>ALL</u> RCPS	Depresses STOP PB for 21-24 RCPs and verifies green stop light illuminates and red start light extinguishes.		
	22	INITIATE SI	Uses Safeguards key and initiates SI on at least one train of Safeguards initiation.		
	23	ARE SI VALVES IN SAFEGUARDS POSITION	Checks 2RP4 and/or console indication to determine that all valves listed in Table B are in Safeguards position. <u>Table B valves are:</u> 2SJ4 OPEN BIT INLET 2SJ5 OPEN BIT INLET 2SJ12 OPEN BIT OUTLET 2SJ13 OPEN BIT OUTLET 2CV68 CLOSED CHARGING DISCHARGE 2CV69 CLOSED CHARGING DISCHARGE (continued next page)		

NAME: ______ DATE: _____

SYSTEM: Emergency Operating Procedures

TASK:

Respond to a Loss of Heat Sink (Initiate Bleed and Feed with SI pumps and Rx Head Vents)

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Table B Valves (con't):21-24SJ54 OPEN ACCUMULATOR OUTLET2SJ1OPEN RWST TO CHARGING2SJ2OPEN RWST TO CHARGING2CV40CLOSED DISCHARGE STOP2CV41CLOSED DISCHARGE STOP		
	23.1	IS 21 <u>OR</u> 22 CHARGING PUMP RUNNING	Checks control console and determines 21 and 22 charging pump are running.		
		IS BIT FLOW ESTABLISHED	Checks console and determines BIT flow is established.		
	23.2	IS ANY SI PUMP RUNNING	Checks control console and determines 21 and 22 SI pumps are running.		
		ARE VALVES IN TABLE C OPEN FOR <u>AT LEAST</u> ONE RUNNING SI PUMP	Checks control console indication for valves listed in Table C and determines the valves are open for at least one running SI pump. <u>Table C valves are:</u> <u>21/22 SI PUMPS</u> 2SJ30 (FROM RWST) 21/22SJ33 (SI PUMP SUCTION) 2SJ135 (COLD LEG DISCHARGE) 21/22SJ134 (COLD LEG DISCHARGE)		

NAME: _____

DATE:

SYSTEM: Emergency Operating Procedures

TASK:

Respond to a Loss of Heat Sink (Initiate Bleed and Feed with SI pumps and Rx Head Vents)

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		ARE ALL CHARGING AND SI PUMPS RUNNING AND ALIGNED TO DELIVER FLOW	Determines all charging and SI pumps are running and aligned to deliver flow.		
	24	OPEN <u>BOTH</u> PZR PORV STOP VALVES	Checks control console and determines BOTH 2PR6 and 2PR7 PORV STOP VALVES are open.		
*		OPEN <u>BOTH</u> PZR PORVS	Places 2PR1 in manual and depresses 2PR1 PZR PORV open PB and verifies green closed light extinguishes and red open light illuminates. Places 2PR2 in manual and depresses 2PR2 PZR PORV open PB and reports that 2PR2		
			will not open.		
	24.1	ARE <u>BOTH</u> PZR PORV STOP VALVES OPEN	Checks control console and determines BOTH 2PR6 and 2PR7 PORV STOP VALVES are open.		
		ARE <u>BOTH</u> PZR PORVS OPEN	Determines 2PR2 PZR PORV is not open.		
*	24.2	OPEN 2RC40 THRU 2RC43 (REACTOR HEAD VENTS)	Inserts key into each 2RC40 THRU 2RC43 (REACTOR HEAD VENTS) switch on 2RP3, turns to open, and verifies each valve opens.		
			Terminate JPM when operator has opened 2RC40 thru 2RC43 Reactor Head Vents.		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

- - ✓ <u>𝒴 μ</u> 2. Knowledge and Abilities (K/A) references are included.
- u 1 3. Performance location specified. (in-plant, control room, or simulator)
- $r \sqrt{2} \sqrt{4}$ 4. Initial setup conditions are identified.
- $\int \sqrt{2} \frac{\gamma}{2} \frac{\gamma}{2}$ 5. Initiating and terminating Cues are properly identified.
 - 6. Task standards identified and verified by SME review.
- Y Y 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
 - 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. <u>30</u> Date <u>**1**/24</u>
 - _**𝒴 №** 9. Pilot test the JPM:
 - a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
 - 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
 - _____11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: J. PIERCE SME/Instructor: S. UArris SME/Instructor:

Date: Date: 9

Date:

INITIAL CONDITIONS:

- Unit 2 initiated a Rx trip from 100% power in response to a Main Steamline break at the mixing bottle.
- An automatic Safety Injection initiated.
- The Main Turbine failed to trip automatically, and was manually tripped from the control console.
- MSLI failed, and all MSIV's remain open.
- All AFW flow has been lost.
- EOP-TRIP-1 was performed and a transition to FRHS-1, Loss of Secondary Heat Sink was made at Step 20.1

INITIATING CUE:

You are the Reactor Operator. Perform FRHS-1 starting at Step 1.

STATION:	Salem Generating Station					
SYSTEM:	Emergency Operating Procedures					
TASK: TCAF Total Loss of All Service Water						
TASK NUMBER:	N1140380401					
JPM NUMBER: ALTERNATE PATH:	15-01 NRC Sim e	A NUMBER:	076 A2	.01		
APPLICABILITY:				SRO		
EVALUATION SETTING	G/METHOD: Simulator / Perform					
S2 S2 REFERENCES: (A	2.OP-AB.SW-0001, Loss of SW Header 2.OP-AB.SW-0005, Loss of All Service 2.OP-AR.ZZ-0002, Overhead Annuncial Il rev checked 8-3-16)	r Pressure, Rev Water Rev. 4 tor Window B R	v. 16 Rev. 36			
TOOLS AND EQUIPME	ENT: None					
VALIDATED JPM COM	IPLETION TIME: 5 minutes					
TIME PERIOD IDENTIF	HED FOR TIME CRITICAL STEPS:	N//	۹			
Developed By:	G Gauding Instructor	Date:	3-23-16			
Validated By:	W Russell / D Cox SME or Instructor	Date:	8-22-16			
Approved By:	Training Department	Date:	10/11/10			
Approved By: Date: /0///// Operations Department						
ACTUAL JPM COMPLETION TIME:						
ACTUAL TIME CRITICAL COMPLETION TIME:						
PERFORMED BY: GRADE: SAT UNSAT						
REASON, IF UNSATIS	REASON, IF UNSATISFACTORY:					
EVALUATOR'S SIGNA	TURE:		DATE:			

PSEG Confidential- Possession Requires Specific Approval from Nuclear Training

JOB PERFORMANCE MEASURE

	NAME:
	DATE:
SYSTEM:	Abnormal Operating Procedures
TASK:	TCAF a Total Loss of All Service Water
TASK:	N1140380401
Simulator Setup	IC-255 100% power. 21 charging pump in service 2 SW bay removed from service IAW S2.OP-AB.SW-003, Service Water Bay Leak. All 4 bay pumps in service. S2.OP-AB.SW-003 out and marked up. <u>MALFS: Tied to RT-1</u> 24 SW pump trip 25 SW pump trip 26 SW pump trip
INITIAL CONDITI	ONS:

Unit 2 is operating at 100% power.

21 charging pump is in service.

23 charging pump is aligned for Normal operation IAW Section 4.1 of S2.OP-SO.CVC-0002, Charging Pump Operation.

#2 SW Bay has been removed from service to isolate a leak in the bay IAW S2.OP-AB.SW-0003, Service Water Bay Leak.

All #4 Service Water Bay pumps are in service.

INITIATING CUE:

You are the Reactor Operator. Respond to all indications and alarms.

Successful Completion Criteria

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- **4.** JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made

Task Standard for Successful Completion:

- 1. Trip the Rx
- 2. Stop all RCPs prior to or within 3 minutes of any RCP bearing temperature reaching 175°F or any other RCP trip criteria being met in S2.OP-AB.RCP-001.
- 3. Place 23 Charging pump in service.
- 4. Reduce operating CCW pumps to one.

NAME:	

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SYSTEM: Abnormal Operating Procedures

TASK: TCAF a Loss of all Service Water

*	STEP	STEP	STANDARD	EVAL S/U	COMMENTS
	NO	Simulator Operator: Insert <u>RT-1</u> after operator assumes watch. This trips all 4 Bay SW pumps.			
			Recognizes that all SW pumps have tripped.		t.
			Enters S2.OP-AB.SW-0005, Loss of All Service Water directly, or responds IAW ARP for low service water header pressures. ARP steps are after AB.SW-5 steps here in JPM. AB.SW-1 steps are after ARP steps here in JPM.		
*	AB.SW-5 3.1	TRIP the reactor, <u>AND</u> CONFIRM the Reactor Trip.	Trips the Rx using either trip handle, and confirms the Rx trip.	-	
*	AB.SW-5 3.2	STOP all RCPs.	Depresses stop PBs for all RCPs.		
		<u>GO TO</u> 2-EOP-TRIP-1, Reactor Trip or Safety Injection, <u>AND</u> CONTINUE with this procedure.	Cue: You are to continue with S2.OP-AB.SW- 0005 while other operators perform TRIP-1. Evaluator : Silence OHA's as not associated with loss of SW.		∳
*	AB.SW-5 3.4	CLOSE the following valves to isolate letdown: • 2CV3, 45 GPM ORIFACE	Shuts the open orifice isolation valve and		

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*	STEP	STEP	STANDARD	EVAL S/II	COMMENTS
		 2CV4, 75 GPM ORIFICE 2CV5, 75 GPM ORIFICE 	ensures the remaining orifice isolation valves are shut.	3/0	
	AB.SW-5 3.5	INITIATE Attachment 1, Continuous Action Summary.	Initiates Attachment 1, Continuous Action Summary.		
*	AB.SW-5 3.6	 IF a Centrifugal Charging Pump is in service AND the 23 Charging Pump is IMMEDIATELY available to be placed in service, THEN PERFORM the following : A. VERIFY ALL 21-24 RCP Seal Inlet Temperatures <225°F as indicated on 2CC1 or the Plant Computer B. ENSURE 23 Charging Pump is aligned for Normal Operation IAW S2.OP-SO.CVC-0002(Q) Charging Pump Operation. C. PLACE 23 Charging Pump in MANUAL. D. PLACE Charging Master Flow Controller in MANUAL. E. SET 23 Charging Pump Speed Demand to 10-12%. F. START 23 Charging Pump AND immediately INCREASE Speed Demand to approximately 20% to couple pump. G. ADJUST 23 Charging Pump Speed Demand to obtain desired flow. H. ENSURE Seal Injection Flow 6-12 gpm to each Reactor Coolant Pump not to exceed 40 gpm total Seal 	Determines a centrifugal charging pump is in service and 23 charging pump is immediately available to be placed in service.		

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*	STEP No.	STEP	STANDARD	EVAL S/U	COMMENTS
*		 Injection Flow. I. STOP 21 and 22 Centrifugal Charging Pumps. J. DISPATCH an Operator to monitor operation of 23 Charging Pump due to the potential for rising Component Cooling Water System temperature. 			
	AB.SW-5 3.7	IF a Centrifugal Charging Pump is in service AND the 23 Charging Pump is NOT IMMEDIATELY available to be placed in service, THEN STOP 21 and 22 Centrifugal Charging Pumps.	Determines a Centrifugal Charging Pump is not in service		
	AB.SW-5 3.8	PLACE 2CC131, RCP THERMAL BARRIER, in MANUAL.	Places 2CC131, RCP THERMAL BARRIER, in MANUAL.		
*	AB.SW-5 3.9	PLACE Component Cooling Pumps in MANUAL <u>AND</u> REDUCE the number of operating Component Cooling Water Pumps to one.	Places all Component Cooling Pumps in MANUAL <u>AND</u> stops all but one Component Cooling Water Pumps.		
			Terminate JPM.		
	ARP OHA's B-13,14	 3.1 VERIFY header low pressure using 2PA5373 on 2CC1. 3.2 IF low pressure conditions exists due to known system configuration, <u>THEN GO TO</u> S2.OP-SO.SW-0001(Q) Service water Pump operation, to adjust system pressure. 3.3 IF a valid low pressure condition exists, THEN GO TO S2.OP-AB.SW-0001(Q), 	Determines header pressure is low. Determines loss of SW system pressure does not conditions exists due to known system configuration. Determines valid low pressure condition exists, and goes to S2.OP-AB.SW-0001, Loss of		

* STI	EP o,	STEP	STANDARD	EVAL S/U	COMMENTS
		Loss of Service Water Header Pressure.	Service Water Header Pressure.		
AB.S 3.	W-1 1	INITIATE Attachment 1, Continuous Action Summary.	Initiates Attachment 1, Continuous Action Summary.		19-1
AB.S 3.1	W-1 2	 Is there indication of a leak in a Service Water Bay per the following? Visual indication OHA B-29, 21-23 SW PMP SMP AREA LVL HI OHA B-30, 24-26 SW PMP SMP AREA LVL HI 	Determines there is no unisolated leak (SW Bay 2 has been isolated)		
AB.S 3.4	W-1 4	START Service Water pumps to maintain header pressure between 95 and 105 psig.	Determines no SW pumps are available to be started.		
AB.S 3.	W-1 5	Is there a leak or valve malfunction on the turbine header as indicated by any of the following?	Determines the cause of low SW header pressure is from loss of all SW pumps.		
AB.S 3.0	W-1 6	Are both nuclear Service Water headers in service?	Determines neither nuclear SW header is in service.		
AB.S 3.	W-1 7	IF the Unit is in a Service Water Header Outage	Determines the Unit is not in a Service Water Header Outage.		
AB.S 3.	W-1 8	<u>IF</u> the Unit is <u>NOT</u> in a Service Water Header Outage, <u>THEN</u> GO TO S2.OP- AB.SW-0005 (Q), Loss of All Service Water	Determines the Unit is not in a Service Water Header Outage, and goes to S2.OP-AB,SW- 0005.		

TERMINATING CUE: After reduction of CCW pumps to one, terminate JPM.

TQ-AA-106-0303 Revision 5

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

U JUM	1. Task description and number, JPM description and number are identified.
v sliph U	2. Knowledge and Abilities (K/A) references are included.
v. um	3. Performance location specified. (in-plant, control room, or simulator)
V/Un la	4. Initial setup conditions are identified.
VI WAL	5. Initiating and terminating Cues are properly identified.
w why	6. Task standards identified and verified by SME review.
-Un	I. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
- UKA	8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. <u>4</u> Date <u>8</u> 22/10
what	 9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
	10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	W. Durul	Russelly 1	
SME/Instructor:_	J- (.x	M	

Date: Date: 8 22-16

SME/Instructor:_____

Date: _____

INITIAL CONDITIONS:

Unit 2 is operating at 100% power.
21 charging pump is in service.
23 charging pump is aligned for Normal operation IAW Section 4.1 of S2.OP-SO.CVC-0002,
Charging Pump Operation.
#2 SW Bay has been removed from service to isolate a leak in the bay IAW S2.OP-AB.SW-0003,
Service Water Bay Leak.
All #4 Service Water Bay pumps are in service.

INITIATING CUE:

You are the Reactor Operator. Respond to all indications and alarms.

STATION:	SALEM		
SYSTEM:	Pressurizer and PRT		
TASK:	Adjust PRT level and pressu	е	
TASK NUMBER:	N0100110101		
JPM NUMBER:	15-01 NRC Sim f		
ALTERNATE PATH:			007 A4.04
APPLICABILITY:			ROSRO
EVALUATION SETTING	METHOD: Simulator	Perform	
REFERENCES: S	2.OP-SO.PZR-0003, Rev. 15 (ch	ecked 8-5-16)	
TOOLS AND EQUIPME	NT: None		
VALIDATED JPM COMF		8 min	
TIME PERIOD IDENTIFI	ED FOR TIME CRITICAL STEP	S:N	I/A
Developed By:	G Gauding Instructor	Date:	8-5-16
Validated By:	M Lutek / W Russell SME or Instructor	Date:	8-22-16
Approved By:	Training Department	Date:	10/11/14
Approved By:	Operations Department	Date:	10/11/16.
ACTUAL JPM COMPLE	TION TIME:		
ACTUAL TIME CRITICA	L COMPLETION TIME:		
PERFORMED BY:	F		
GRADE: SAT			
REASON, IF UNSATISF	ACTORY:		
EVALUATOR'S SIGNAT	URE:		DATE:

NAME: _____

DATE:

SYSTEM: Pressurizer and PRT

TASK: Adjust PRT level and pressure

TASK NUMBER: N0450040101

SIMULATOR SETUP: 15-01 NRC IC-256 PRT level 56.2% (or low enough for the PRT Hi-Lo Lvl alarm to be locked in) with PRT pressure 9.8 psig. Paper copies of procedure needed.

INITIAL CONDITIONS:

Unit 2 is at 100% power.

2PR1 is leaking and 2PR6 is shut with power applied. Operators have been attempting to determine the leak rate through 2PR1.

Console alarm PRT Level Hi-Lo is in alarm (lo) with PRT level at 56.2%.

INITIATING CUE:

You are directed to raise PRT level to 60% IAW S2.OP-SO.PZR-0003, Pressurizer Relief Tank Operation, Section 5.1.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

1. Raise PRT level to > 60% while maintaining PRT pressure \leq 10 psig.

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: ______

SYSTEM: PZR and PRT

TASK: Adjust PRT level and pressure

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		Provide marked up paper copy of S2.OP- SO.PZR-0003.	Reviews Precautions and Limitations.		
	5.1.1	IF PRT level is low, <u>THEN</u> PERFORM the following:	 Note: The step for reducing PRT pressure may be performed prior to raising level, since pressure is close to the maximum allowed. (See Step 5.1.1.D) IF PRT pressure reduction is performed first, <u>THEN</u> Cue if PRT pressure is lowered past 7 psig" CRS states that the pressure reduction is sufficient to allow filling of the PRT now." 		
*	5.1.1.A	<u>IF</u> required, <u>THEN</u> START 21 or 22 Primary Water Pump.	Depresses start pushbutton for 22 Primary Water Pump. (aligned for manual start) OR Places 21 Primary Water Pump in manual and depresses start pushbutton for 21 Primary Water Pump. <u>IF</u> operator does not start a Primary Water Pump and will gravity feed to makeup to the PRT, <u>THEN Cue:</u> The CRS directs you to use a Primary Water pump to makeup to the PRT.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: PZR and PRT

TASK: Adjust PRT level and pressure

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.1.1.B	OPEN 2WR80, CONT PRI WATER STOP.	Depresses open pushbutton for 2WR80 CONT PRI WATER STOP and verifies open light lit.		
*	5.1.1.C	OPEN 2WR82, PRT WATER SUPPLY.	Depresses open pushbutton for 2WR82, PRT WATER SUPPLY and verifies open light lit.		
*	5.1.1.D	<u>IF</u> PRT pressure approaches 10 psig, <u>THEN</u> OPEN 2PR15, VENT, as necessary, to maintain PRT pressure at >3 psig and ≤10 psig.	Depresses open pushbutton for 2PR15, VENT <u>prior to PRT pressure rising</u> <u>above 10.0 psig</u> , and depresses close pushbutton prior to PRT pressure lowering below 3.1 psig. Note: IF PRT Hi Pressure alarm is received, it prevents the 2PR15 from opening, and pressure cannot be reduced. <u>When</u> operator has demonstrated that they can raise level without exceeding 10 psig, <u>then</u> Cue: PRT level is now 60%		

NAME: _____

DATE:

SYSTEM: PZR and PRT

TASK: Adjust PRT level and pressure

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.1.1.E	 When PRT level increases to between 59% and 86%: 1. CLOSE 2WR80, CONT PRI WATER STOP. 2. CLOSE 2WR82, PRT WATER SUPPLY 3. ENSURE 2PR15, VENT is closed. 4. IF Primary Water Pump is in service IAW Step 5.1.1.A, AND is NOT required to be in service for any other reason, THEN STOP running Primary Water Pump. 	 When PRT level rises to 60%: Closes 2WR80, CONT PRI WATER STOP. Closes 2WR82, PRT WATER SUPPLY. Ensures 2PR15, VENT is closed. Depresses stop pushbutton for running Primary Water Pump. <u>IF</u> 21 Primary Water pump was used to fill PRT, <u>THEN</u> places 21 or 22 Primary Water pump in auto. 		
	5.1.1.F	DIRECT a second Operator to perform an Independent Verification of component position in Attachment 1, Section 1.0			

TERMINATING CUE: After operator reads Step 5.1.1.F, state JPM is complete.

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

	, & MM
W 1	1. Task description and number, JPM description and number are identified.
v /	2. Knowledge and Abilities (K/A) references are included.
* /	3. Performance location specified. (in-plant, control room, or simulator)
6	4. Initial setup conditions are identified.
W /	5. Initiating and terminating Cues are properly identified.
~ /	6. Task standards identified and verified by SME review.
V	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
	$\frac{1}{2}$ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 15. Date $\frac{3}{22}/16$
	9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
	10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.
	SME/Instructor: W. Russell Date: 8/22/16 SME/Instructor: W. Russell Date: 8/22/16

SME/Instructor:_____

Date: _____
INITIAL CONDITIONS:

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Unit 2 is at 100% power.

2PR1 is leaking and 2PR6 is shut with power applied. Operators have been attempting to determine the leak rate through 2PR1.

Console alarm PRT Level Hi-Lo is in alarm (lo) with PRT level at 56.2%.

INITIATING CUE:

You are directed to raise PRT level to 60% IAW S2.OP-SO.PZR-0003, Pressurizer Relief Tank Operation, Section 5.1.

STATION:	Salem Generating Station				
SYSTEM:	Emergency Operating Procedures				
TASK:	Perform Actions for a Loss of All AC F Station Power Transformer)	Power (Energize a 4KV Vital Bus from a			
TASK NUMBER:	1150140501				
JPM NUMBER: ALTERNATE PATH:	15-01 NRC Sim g K/A	NUMBER: EPE 055 EA1.07 E FACTOR: 4.3 4.5			
		RO SRO			
EVALUATION SETTING	METHOD: Simulator / Perform				
REFERENCES: S2.	OP-SO.DG-0001, Rev. 39, S2.OP-SO.4	4KV-0001, Rev. 32			
TOOLS AND EQUIPME	NT: None				
VALIDATED JPM COM	PLETION TIME: 10 minutes				
TIME PERIOD IDENTIFI	ED FOR TIME CRITICAL STEPS:	N/A			
Developed By:	G Gauding Instructor	Date: 4-18-16			
Validated By:	Hancock / Russell SME or Instructor	Date: 8-16-16			
Approved By:	Training Department	Date: 10/11/10			
Approved By:	Approved By: Date: /////// Operations Representative				
ACTUAL JPM COMPLETION TIME:					
ACTUAL TIME CRITICAL COMPLETION TIME:					
PERFORMED BY:					
GRADE: SAT UNSAT					
REASON, IF UNSATISF	ACTORY:				
EVALUATOR'S SIGNAT	ſURE:	DATE:			

NAME:	 •	
DATE:		

SYSTEM: Emergency Operating Procedures

TASK:Perform Actions for a Loss of All AC Power (Energize a 4KV Vital Bus from a Station
Power Transformer)

TASK 1150140501

NUMBER:

Simulator Setup: IC-256 (with 24ASD racked down and control power off)

INITIAL CONDITIONS:

- 1. Unit 2 is recovering from a loss of all AC Power.
- 2. The crew is performing step 16 of 2-EOP-LOPA-1.
- 3. 23 AFW pump is supplying all required AFW flow.
- 4. 2A EDG was started first and is providing power to 2A Vital Bus
- 5. 2B EDG was just started and is powering 2B 4KV vital bus.
- 6. 2C 4KV Vital Bus remains deenergized and unavailable.
- 7. 24 Station Power Transformer (SPT) has just been energized.
- 8. With 24 SPT now available, the CRS has directed that S2.OP-SO.DG-0001 Section 5.8 and S2.OP-SO.4KV-0001 Section 5.3.6 be utilized to swap 2A Vital Bus from 2A EDG to 24 SPT.

INITIATING CUE:

You are the Control Board Operator. Complete Section 5.8 of S2.OP-SO.DG-0001, and then utilize Section 5.3.6 of S2.OP-SO.4KV-0001 to restore power to 2A Vital Bus from 24 SPT. Prerequisites and Precautions and Limitations have been reviewed and signed.

Successful Completion Criteria

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made

Task Standard for Successful Completion:

- Energize 2A 4KV vital bus using 24 SPT

NAME:	
DATE:	

SYSTEM: Emergency Operating Procedures

TASK: Perform Actions for a Loss of All AC Power (Energize a 4KV Vital Bus from a Station Power Transformer)

	STEP	STEP	STANDARD	EVAL	COMMENTS
	No.	(* denotes critical task)		S/U	
		Provide marked up copies of S2.OP-SO.DG-0001 and S2.OP-SO.4KV-0001.			
	SO.DG-1 5.8.1	IF 2A EDG is paralleled on 2A 4KV Vital Bus	Determines 2A Diesel Generator is not paralleled on 2A 4KV Vital Bus.		
*	5.8.2	 <u>IF</u> 2A Vital Bus is isolated and energized from 2A EDG, <u>THEN</u>: PLACE redundant equipment in service as necessary to support deenergizing 2A Vital Bus 	Places redundant equipment in service as needed: • 22 CCW pump		
*		• STOP all 2A Vital Bus loads using Attachment 1	Note: 1 SW pump with the TGA isolated is sufficient for maintaining SW header pressure Stops the following equipment (if running): 21 CCW pump 21 SW pump 21 CFCU 21 Aux Building Exhaust Fan 21 SWGR Room Supply Fan 21 SWGR Room Exhaust Fan 21 SWGR Room Exhaust Fan 21 SHGR Room Exhaust Fan 21 SH Pump 21 FHB Exhaust Fan 21 AFW pump		

	STEP	STEP	STANDARD	EVAL	COMMENTS
	No.	(* denotes critical task)	STANDARD	S/U	COMMENTO
*	5.8.3	 OPEN 2A DIESEL GENERATOR BREAKER by performing one of the following: OPEN 2AD1AX6D, 2A DIESEL GENERATOR BREAKER (64' Swgr Rm), or PRESS 2A BREAKER OPEN pushbutton (2CC3), or PLACE 2A-DF-GCP-3, GENERATOR CIRCUIT (BCS), to TRIP (2A D/G Control Panel). 	 Opens 2A DIESEL GENERATOR BREAKER by performing one of the following: Directs opening of 2AD1AX6D, 2A DIESEL GENERATOR BREAKER (64' Swgr Rm), or Presses 2A BREAKER OPEN pushbutton (2CC3), or Directs placing 2A-DF-GCP-3, GENERATOR CIRCUIT (BCS), to TRIP (2A D/G Control Panel). 		
	5.8.4	ALLOW Diesel to run unloaded for ≥ 3 minutes prior to stopping the EDG.	Cue: 2A EDG will be shutdown by local operator.		
	5.8.5	If diesel unloading	Determines step is N/A		
	SO.4KV-1 5.3.6	IF 2A 4KV Vital Bus is to be energized from 24 SPT,THEN:			
	5.3.6.A	Direct NEO to RACK UP 2AD1AX24ASD, 24 STATION POWER TRANSFORMER INFEED BREAKER (64' Swgr Rm).	Contacts NEO and directs them to rack up 2AD1AX24ASD, 24 STATION POWER TRANSFORMER INFEED BREAKER.		
		1	Simulator Operator: MODIFY REMOTE 5021D to ON, then report 2AD1AX24ASD, 24		

*	5.3.6.C	 PERFORM the following: 1. PRESS AND HOLD control console 24ASD CLOSE pushbutton. 2. RELEASE pushbutton when 24ASD indicates CLOSED. 3. ENSURE the following: a. Console bezel 24ASD MIMIC BUS INTLK CLOSE SELECTION is extinguished. b. 2A 4KV Vital Bus voltage is 4.275 - 4.336KV (normal) OR 4.330 - 4.417KV (single source of off-site power). c. OHA J-17, 2A 4KV VTL BUS UNDRVOLT, is clear. 	Presses and Holds control console 24ASD CLOSE pushbutton, then releases pushbutton when 24ASD indicates closed. Checks Console bezel 24ASD MIMIC BUS INTLK CLOSE SELECTION is extinguished. Determines 2A Vital Bus voltage is 4.275 - 4.385KV (single source of off-site power. Determines OHA J-17 2A 4KV VTL BUS UNDRVOLT is clear.	
			Terminate JPM.	

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

b	12	1. Task description and number, JPM description and number are identified.
c	12	2. Knowledge and Abilities (K/A) references are included.
U	12	3. Performance location specified. (in-plant, control room, or simulator)
V	12	4. Initial setup conditions are identified.
V	17	5. Initiating and terminating Cues are properly identified.
${\it v}$	12	_6. Task standards identified and verified by SME review.
·L		7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Ń	7	8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 29 Date 3/10/16
	$-\gamma$	_ 9. Pilot test the JPM:
	ð	a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
	2	- 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
	-9	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: 1 All Hancoul Date: 8/16/16 SME/Instructor W. Durul Russel/ Date: 8/16/16

SME/Instructor:

Date:

INITIAL CONDITIONS:

- 1. Unit 2 is recovering from a loss of all AC Power.
- 2. The crew is performing step 16 of 2-EOP-LOPA-1.
- 3. 23 AFW pump is supplying all required AFW flow.
- 4. 2A EDG was started first and is providing power to 2A Vital Bus
- 5. 2B EDG was just started and is powering 2B 4KV vital bus.
- 6. 2C 4KV Vital Bus remains deenergized and unavailable.
- 7. 24 Station Power Transformer (SPT) has just been energized.
- With 24 SPT now available, the CRS has directed that S2.OP-SO.DG-0001 Section 5.8 and S2.OP-SO.4KV-0001 Section 5.3.6 be utilized to swap 2A Vital Bus from 2A EDG to 24 SPT.

INITIATING CUE:

You are the Control Board Operator. Complete Section 5.8 of S2.OP-SO.DG-0001, and then utilize Section 5.3.6 of S2.OP-SO.4KV-0001 to restore power to 2A Vital Bus from 24 SPT. Prerequisites and Precautions and Limitations have been reviewed and signed.

STATION:	SALEM 1 & 2		
SYSTEM:	Loss of Control Air		
TASK:	TCAF a Loss of Control Air		
TASK NUMBER:	N1140070401		
JPM NUMBER:	15-01 NRC Sim h		
ALTERNATE PATH:	X	K/A NUMBER:	APE 065 AA2.06
		SRO X	<u>3.6</u> <u>4.2</u> RO SRO
EVALUATION SETTING	G/METHOD: Simulator -	Perform	
S2 REFERENCES: S2	.OP-AB.CA-0001, Rev. 21 Los .OP-AR.ZZ-0011, Rev. 60, pa	ss of Control Air (both r ges 118-128	ev checked 8-5-16)
TOOLS AND EQUIPME	NT: None		
VALIDATED JPM COM	PLETION TIME: 8	minutes	
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL ST	EPS: N	/A
Developed By:	G Gauding Instructor	Date:	8-5-16
Validated By:	M Lutek / W Russell SME or Instructor	Date:	8-22-16
Approved By:	Training Department	Al- Date:	10/11/14
Approved By:	Operations Department	Date:	10/11/16
ACTUAL JPM COMPLE	ETION TIME:		
ACTUAL TIME CRITIC	AL COMPLETION TIME:		
PERFORMED BY: GRADE: SAT	UNSAT		·
REASON, IF UNSATISI	FACTORY:		
EVALUATOR'S SIGNA	TURE:		DATE:

PSEG Restricted - Possession Requires Specific Permission from Nuclear Training Page 1 of 13

	NAME:
	DATE:
SYSTEM:	Loss of Control air
TASK:	TCAF Loss of Control Air
TASK NUMBER:	N1140070401
SIMULATOR SETU	P: Check 2WG41 is open
15-01 NRC IC-258	
<u>RT-1</u>	
MALF: CA0221 #2 S REM : CA13D LOO I/O : AQ01 OVL	STATION AIR CMPRSSR TRIP CKOUT #1 STATION AIR CMPRSR, Delay 1:30 O COMP 1 TROUBLE ALARM, Fin Val: ON, Delay 1:30
Other setup: REM: CA15D LOC CA11D #1 E CA12M #1 E	CKOUT #3 STATION AIR CMPRSR EMERGENCY AIR COMPRSR IN AUTO Fin Val: MANUAL EMRGENCY AIR CMPRSR SWITCH Fin Val: Stop
I/O : AQ01 OVL	O COMP 3 TROUBLE ALARM, Fin Val: ON
INITIAL CONDITIO	NS:
Unit 2 is opeA WG release	rating at 100% power. se is in progress from 21 GDT.

- #3 SAC is C/T for scheduled maintenance.
- Unit 1 is operating at 100% power.

INITIATING CUE:

You are the Unit 2 Reactor Operator. Respond to all indications and alarms.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

- 1. Isolate Letdown
- 2. Terminate Gaseous Release
- 3. Trip the Rx prior to auto trip on lo lo SG NR level.

NAME: _____ DATE: _____

SYSTEM: Loss of Control Air

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Note: The #1 and #3 Compressor Trouble alarms on 2CC1 do NOT have audible or flash capabilities (S2.OP-AR.ZZ-0011 page 120).		
		Simulator Operator: Insert <u>RT-1</u> after operator assumes watch.			
			Determines #2 Station Air Compressor (SAC) has tripped, and the Unit 2 Emergency Control Air Compressor (ECAC) has automatically started.		
			Note : All 3 SAC supply breakers open is an auto start signal for both ECAC's. The Unit 2 ECAC will auto start, (Unit 1 will not). By design, the ECAC will not load until its control air header pressure lowers to 85 psig. 2A control air header is supplied from #2 ECAC, 2B control air header is supplied from #1 ECAC.		
			Note: The next-to-load SAC (follow) will not immediately start. It requires Station Air header pressure to drop to 5 psig below the follow setpoint (105 psig) for ~ 5 seconds.		
			Refers to the S2.OP-AR.ZZ-0011, Control Console 2CC1, ARP for COMPR 2 TROUBLE.		

NAME: _____

DATE:

SYSTEM: Loss of Control Air

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	ARP 3.1	 <u>IF</u> SAC 2 trips, <u>THEN:</u> A. COORDINATE (as necessary) with Unit 1 B. ENSURE operating <u>OR</u> START at least one SAC IAW SC.OP-SO.SA-0001(Z), Station Air System Operation. 	Coordinates with Unit 1 to start at least one SAC IAW SC.OP-SO.SA-0001(Z), Station Air System Operation. Cue when contacted as Unit 1: Unit 1 will ensure #1 SAC is placed in service.		
	ARP 3.2	<u>IF AT ANY TIME</u> Station Air pressure cannot be maintained \geq 100 psig, <u>THEN</u> GO TO S2.OP-AB.CA-0001(Q), Loss of Control Air.	GOES TO S2.OP-AB.CA-0001(Q), Loss of Control Air, when Station Air pressure lowers to 100 psig if AB not entered previously.		
			Simulator Operator: Ensure #1 SAC locks out 1:30 after insertion of RT-1, then announce twice on plant page: "#1 Station Air Compressor Trip."		
			Recognizes that no SAC's are running, and enters S2.OP-AB.CA-0001 if not entered previously.		

NAME: _____

DATE:

SYSTEM: Loss of Control Air

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*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Note: Approximate event times are listed below from insertion of RT-1 .		
			1 min – 1 SAC auto starts. 1 min 30 sec – 1 SAC trips. 3 min 50 sec – 2 ECAC begins loading. 4 min 10 sec - 2B Control Air header	;	
			pressure reaches 80 PSIG, and SA low pressure alarm. 4 min 25 sec – CA low pressure alarm. 6.5 min – 21-24BF19 Feed Reg Valves begin		
			closing. 7 min 10 sec – G-15 OHA ADFCS TRBL.		
	AB.CA 3.1	INITIATE Attachment 1, Continuous Action Summary.	Initiates Attachment 1, Continuous Action Summary.		
			Cue IF Required: If CAS Step 8.0 action is being taken to refer to Attachment 2 for valve fail positions and for further action to be taken, then: Cue: The CRS will refer to Attachment 2		
	3.2	 EITHER of the following conditions exist? ALL Station Air Compressors stopped EITHER Station Air Header <100 psig 	Determines all SAC's are stopped or determines Station Air Header pressure is <100 psig.	I	

NAME: _____

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DATE:

SYSTEM: Loss of Control Air

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.3	IF a loss of 1F Group Bus has occurred, AND 1H Group Bus is available, <u>THEN</u> SEND an Operator to restore power to #1 SAC Auxiliary Oil pump by transferring 11 Turbine West 230V Control Center IAW Attachment 14, Section 1.0.	Determines a loss of 1F Group Bus has not occurred.	-	
	3.4	IF a loss of 2 F Group Bus has occurred, <u>AND</u> 2 H Group Bus is available, <u>THEN</u> SEND an Operator to restore power to #2 SAC Auxiliary Oil pump by transferring 21 Turbine West 230V Control Center IAW Attachment 14, Section 2.0.	Determines a loss of 2F Group Bus has not occurred.		
	3.5	IF a loss of 1 H Group Bus has occurred, <u>AND</u> 1 F Group Bus is available, <u>THEN</u> SEND an Operator to restore power to #3 SAC Auxiliary Oil pump by transferring 11 Turbine East 230V Control Center IAW Attachment 14, Section 3.0.	Determines a loss of 1H Group Bus has not occurred.		

N	A	M	E
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DATE: _____

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SYSTEM: Loss of Control Air

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*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.6	START or have Unit One Control Room START <u>Next to Load</u> Station Air Compressor.	Determines no SAC's are available. Cue if required: If Unit 1 is contacted, report that #3 Station Air Compressor is tagged out and #1 Station Air Compressor has tripped, and that an operator has been dispatched to the Station Air Compressors.		
	3.7	Either Station Air Header indicating less than100 psig?	Determines both Station Air Headers are indicating less than100 psig.		
	3.8	Attempt to START , or have Unit One Control Room START , remaining Station Air Compressor.	Determines no SAC's can be started.		
	3.9	NOTIFY the CRS/SM to evaluate use of temporary air compressors.	Cue: CRS will evaluate use of temporary air compressors.		
	3.10/3.11	2A Control Air Header less than or equal to 88 psig?	Determines 2A control air header pressure is: less than or equal to 88 psig and determines #2 ECAC is in service OR >88 psig.		

NAME: _____

DATE: _____

SYSTEM: Loss of Control Air

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.12/3.13	2B Control Air Header less than or equal to 88 psig?	Determines 2B control air header pressure is: less than or equal to 88 psig and contacts Unit 1 to place #1 ECAC in service OR >88 psig. Cue: When Unit 1 is contacted to start #1 ECAC, state: " # 1 ECAC has tripped. "		
	3.14	 SEND operators to: LOCATE <u>AND</u> ISOLATE ANY air system leaks. INVESTIGATE cause of ANY air compressor trip/trouble. 	 Dispatches operators to: LOCATE AND ISOLATE any air system leaks. INVESTIGATE cause of air compressor trip/trouble. 		
	3.15	 IF Station Air is lost, <u>AND</u> EITHER of the following are in service: Spent Fuel Pool Transfer Pool Weir Gate Seals SG Nozzle Dams <u>THEN</u>: A. EVACUATE personnel from areas subject to leakage/flooding. B. INITIATE monitoring of Fuel Pool or Reactor Vessel levels for the need to makeup due to leakage. 	 Determines Station Air is lost, and <u>neither</u> of the following are in service: Spent Fuel Pool Transfer Pool Weir Gate Seals SG Nozzle Dams 	ł	

NAME: _____

DATE: _____

SYSTEM: Loss of Control Air

TASK: TCAF a Loss of Control Air

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.16	IF cooling water to the Station or Emergency Air Compressors is lost, <u>THEN</u> INITIATE the applicable portion of Attachment 6.	Determines cooling water to the Station or Emergency Air Compressors is not lost.		
	3.17	BOTH 2A and 2B Control Air Headers less than 80 psig?	Determines both 2A and 2B Control Air Headers are not <80 psig.		
	3.18	 ANY Excess Flow Check Valve closed as indicated by at least one of the following? (Attachment 5, Excess Flow Check Valve Table) [INPO IER L2 15-16] Groups of valves repositioning with normal air pressure indicated in Control Room Local observation of low pressure downstream of an Excess Flow Check Valve 	Determines NO Excess Flow Check Valve closed.		
	3.19	2B Control Air Header less than 80 psig?	Determines 2B Control Air Header is <80 psig.		
	3.57	CONTINUE			
*	3.58	CLOSE the following valves: A. 2CV3, LTDWN ORIFICE ISOL VALVE B. 2CV4, LTDWN ORIFICE ISOL VALVE C. 2CV5, LTDWN ORIFICE ISOL VALVE D. 2CV2 LETDOWN LINE ISOL VALVE E. 2CV277 LTDWN LINE ISOL VALVE F. 2CV7 LTDWN HX INLET VALVE	Closes the following valves: A. 2CV3, LTDWN ORIFICE ISOL VALVE B. 2CV4, LTDWN ORIFICE ISOL VALVE C. 2CV5, LTDWN ORIFICE ISOL VALVE D. 2CV2 LETDOWN LINE ISOL VALVE E. 2CV277 LTDWN LINE ISOL VALVE F. 2CV7 LTDWN HX INLET VALVE		

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NAME: _____

DATE: _____

SYSTEM: Loss of Control Air

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	3.57	 VERIFY ANY Liquid or Gaseous release is stopped by ensuring the following valves CLOSED: 2WL51, TO CIRC WTR DISCHARGE 2WG41, GAS DECAY TK TO PLANT VENT 	Determines 2WG41, GAS DECAY TK TO PLANT VENT is open, and shuts 2WG41, GAS DECAY TK TO PLANT VENT. Verifies 2WL51 is shut.		
*	CAS 6.0	 IF AT ANY TIME Station Air is lost, <u>THEN:</u> INITIATE monitoring of 21- 24BF19 SG FW CONT VALVE, operation. IF ANY BF19 SG FW CONT VALVE closes <u>AND</u> Applicable SG water level CANNOT be maintained, <u>THEN:</u> A. TRIP the Reactor B. CONTINUE with this procedure C. GO TO 2-EOP-TRIP-1, Reactor Trip Or Safety Injection 	Identifies all BF19 valves closing. Trips the Reactor.		

NAME: _____

DATE: _____

SYSTEM: Loss of Control Air

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	TRIP-1		Performs Immediate Actions of EOP-TRIP-1: Confirms the Rx trip Trips the Main turbine Checks at least 1 4KV vital bus energized Determines SI is not initiated or required. Cue after Immediate Actions have been performed: The CRS and another operator will continue performing the EOPs. You are to continue in current procedure.		
			Terminate JPM once Rx has been tripped, letdown isolated, and the WG release terminated.		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

/	24	1. Task description and number, JPM description and number are identified.
<u>/</u>	21	2. Knowledge and Abilities (K/A) references are included.
	N	3. Performance location specified. (in-plant, control room, or simulator)
1	8U	A. Initial setup conditions are identified.
/	211	5. Initiating and terminating Cues are properly identified.
<u>/</u>	7n	6. Task standards identified and verified by SME review.
	8 U	γ_{-7} . Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
	J-U1	8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 21 Date $8/22$
	f u	 9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
		_10. If the JPM cannot be performed as written with proper responses, then revise the JPM
		_11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	MLVTER	- Jow
SME/Instructor:_	W. Quel	Russell

Date: $\frac{\delta/22}{16}$ Date: $\frac{\delta/22}{16}$

SME/Instructor:_____

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Date:		
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INITIAL CONDITIONS:

- Unit 2 is operating at 100% power.
- A WG release is in progress from 21 GDT.
- #3 SAC is C/T for scheduled maintenance.
 Unit 1 is operating at 100% power.

INITIATING CUE:

You are the Unit 2 Reactor Operator. Respond to all indications and alarms.

STATION:	SALEM				
SYSTEM:	Pressurizer/Pressure Relief				
TASK:	Transfer Pressurizer 22 Backup Heaters to Emergency Power Supply				
TASK NUMBER:	115 043 05 01				
JPM NUMBER:	15-01 NRC Annual IP-i				
ALTERNATE PATH:	K/A	NUMBER:010_A4.02			
APPLICABILITY:		RO SRO			
EVALUATION SETTING	G/METHOD: In Plant, Simulate				
REFERENCES: S2	.OP-SO.PZR-0010 Rev. 10 (Rev. checke	ed 8-5-16)			
TOOLS AND EQUIPME	NT: None				
VALIDATED JPM COM	PLETION TIME: 20 minutes	_			
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL STEPS:	N/A			
Developed By:	G Gauding Instructor	Date: 8-5-16			
Validated By:	S Bickhart / J Hancock SME or Instructor	Date: 9-30-16			
Approved By:	Training Department	Date: 10/10/16			
Approved By:	Operations Department	Date: 10/10/14			
ACTUAL JPM COMPLETION TIME:					
ACTUAL TIME CRITICAL COMPLETION TIME:					
PERFORMED BY:					
REASON, IF UNSATIS	ACTORT:				
EVALUATOR'S SIGNA	TURE:	DATE:			

SYSTEM: Pressurizer/Pressure Relief

TASK: Transfer Pressurizer 22 Backup Heaters to Emergency Power Supply

 TASK
 115 043 05 01

 NUMBER:
 INITIAL CONDITIONS:

Due to a loss of power to the group buses it is necessary to energize the PZR Backup Heaters from their emergency power supply.

INITIATING CUE:

The CRS directs you to perform S2.OP-SO.PZR-0010(Q), Section 5.3, Transferring Pzr Htr 22 BU Group To The Emergency Power Supply.

All prerequisites and Precautions and Limitations have been reviewed and completed.

2A EDG is carrying 2A Vital Bus and is loaded to 2400 KW.

You have a JAM key.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

- 1. Simulate opening all but three PZR heater disconnects.
- 2. Simulate aligning emergency power to PZR heater bus from 2A vital bus.

NAME: _____ DATE: _____

SYSTEM: Pressurizer/Pressure Relief

TASK: Transfer 22 Backup Heaters to Emergency Power Supply

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		Operator obtains procedure S2.OP- SO.PZR-0010, Pressurizer Backup Heaters Power Supply Transfer.	Provide marked up copy of S2.OP- SO.PZR-0010, Pressurizer Backup Heaters Power Supply Transfer		
	5.3.1	ENSURE 2AX1AX14X, 2EP PRESSURIZER HEATER BUS FEED (EMERGENCY) is OPEN (84' Swgr Rm).	Locates breaker 2AX1AX14X 2EP PRESSURIZER HEATER BUS FEED (EMERGENCY) on 2A 460V Vital Bus, Elev. 84' Swgr Rm and determines current breaker position. Cue : 2AX1AX14X Breaker indicates OPEN.		
	5.3.2	 Request NCO to PERFORM the following: A. PLACE 22 Backup Group in MANUAL. B. PRESS the 22 BACKUP OFF pushbutton 	Locates nearest means of communications and requests NCO to place 22 B/U Htrs in MANUAL and press the 22 BACKUP OFF pushbutton. Cue: NCO reports 22 B/U Htrs are in MANUAL and 22 BACKUP OFF pushbutton has been depressed.		
*	5.3.3	ENSURE 2EX1EP2EPX, 2EP 480V PRESSURIZER HEATER BUS MAIN BREAKER is OPEN (78' Electrical Penetration).	Locates 2EX1EP2EPX, 2EP 480V PRESSURIZER HEATER BUS MAIN BREAKER on El. 78 Electrical Pen. Cue: 2EX1EP2EPX, 2EP 480V PRESSURIZER HEATER BUS MAIN BREAKER is OPEN.		

NAME: ______ DATE: _____

SYSTEM: Pressurizer/Pressure Relief

TASK: Transfer 22 Backup Heaters to Emergency Power Supply

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.3.4	REMOVE interlock key from breaker 2EX1EP2EPX.	Describes turning key and removing interlock key from breaker 2EX1EP2EPX. Note : Tab must be pushed in to rotate key to allow its removal.		
*	5.3.5	PLACE any eleven of the following disconnects in OFF (only three disconnects are to remain ON) <u>AND</u> MARK the remaining disconnects as N/A:	Operator locates individual heater disconnects, places all but three disconnects in OFF and notes disconnects left ON as N/A in procedure.		
*	5.3.6	PLACE, 2AX1AX14X-1, 2EP PZR HTR BUS EMERGENCY FEED DISCONNECT SWITCH, in the ON position (Elev 78' Electrical Penetration).	Operator locates 2AX1AX14X-1, 2EP PZR HTR BUS EMERGENCY FEED DISCONNECT SWITCH, and places it in the ON position (Elev 78' Electrical Penetration).		
*	5.3.7	INSERT interlock key, <u>AND</u> UNLOCK breaker 2AX1AX14X.	Locates Corry Key Interlock on 2AX1AX14X breaker, inserts and turns key.		
	5.3.8	NOTIFY NCO that PZR Htr 22 B/U Group has been transferred to the emergency power supply (2A 460V Vital Bus).	Candidate makes report to the Control Room. Repeat back notification and state: JPM is complete.		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

h	2. 2. 1. Task description and number, JPM description and number are identified.
h	2. Knowledge and Abilities (K/A) references are included.
V	2. 2. Performance location specified. (in-plant, control room, or simulator)
v	4. Initial setup conditions are identified.
h	5. Initiating and terminating Cues are properly identified.
h	26. Task standards identified and verified by SME review.
R	$\frac{2}{2}$ /7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
N	8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. <u>Y</u> Date <u>n</u> <u>u</u> <u>u</u> <u>u</u>
/~) 9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
	10. If the JPM cannot be performed as written with proper responses, then revise the JPM
	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	n	Hanad
SME/Instructor	Beller	BICECHARY
SME/Instructor:		

Date: <u>9/30/16</u> Date: <u>9/30/16</u>

Date:

INITIAL CONDITIONS:

Due to a loss of power to the group buses it is necessary to energize the PZR Backup Heaters from their emergency power supply.

INITIATING CUE:

The CRS directs you to perform S2.OP-SO.PZR-0010(Q), Section 5.3, Transferring Pzr Htr 22 BU Group To The Emergency Power Supply.

All prerequisites and Precautions and Limitations have been reviewed and completed.

2A EDG is carrying 2A Vital Bus and is loaded to 2400 KW.

You have a JAM key.

STATION:	SALEM				
SYSTEM:	Auxiliary Feedwater				
TASK:	ASK: Perform Auxiliary Feedwater Back Leakage Test				
TASK NUMBER:	N0610160204				
JPM NUMBER: ALTERNATE PATH:	15-01 NRC IP-j	K/A NUMBER: _	061 K1	.02	
APPLICABILITY: EO F			RO	SRO	
EVALUATION SETTING	G/METHOD: Inplant- Simulate				
REFERENCES: S1.	.OP-PT.AF-0002, Rev. 7, Auxiliary F	eedwater Backlea	akage (checked	8-5-16)	
TOOLS AND EQUIPME	NT: Calculator				
VALIDATED JPM COM	PLETION TIME:5 minute	es			
TIME PERIOD IDENTIF	IED FOR TIME CRITICAL STEPS:	N/.	Α		
Developed By:	G Gauding Instructor	Date:	8-5-16		
Validated By:	S Bickhart / J Hancock SME or Instructor	Date:	9-30-16		
Approved By:	Training Department	Date:	10/10/10		
Approved By:	Operations Department	Date:	10/10/14		
ACTUAL JPM COMPLETION TIME:					
ACTUAL TIME CRITICAL COMPLETION TIME:					
PERFORMED BY: GRADE: SAT	UNSAT		. <u>.</u>		
REASON, IF UNSATISF	REASON, IF UNSATISFACTORY:				
EVALUATOR'S SIGNA	EVALUATOR'S SIGNATURE: DATE:				

NAME:	 	
DATE:		

SYSTEM: Auxiliary Feedwater System

 TASK:
 Perform Auxiliary Feedwater Back Leakage Test

TASK NUMBER: N0610160204

INITIAL CONDITIONS:

Unit 1 is operating at 100% power. 11 AFW pump was secured 30 minutes ago after its normally scheduled quarterly surveillance run.

INITIATING CUE:

You are directed to perform S1.OP-PT.AF-0002, Auxiliary Feedwater Backleage.

Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.

Task Standard for Successful Completion:

- 1. Determine 13 AFW line venting is required
- 2. Vent 13 AFW line

NAME: _____ DATE: _____

SYSTEM: AFW

TAS	SK: Perform Auxiliary Feedwater Back Leakage Test				
*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide operator with blank copy of S1.OP- PT.AF-0002, Rev. 7, and a calculator.	Reviews and initial all Prerequisites and Precautions and Limitations.		
*	5.1.1	 RECORD following on Attachment 1, Section 1.0: AFW Line Temperatures (1TA16555I) Highest line temperature Average line temperature Temperature difference 	After locating 1TA165551, provide the following AFW line temperatures: 11- 104 12- 106 13- 161 14- 108 On Attachment 1, records AFW temperatures, calculates total of 479, divides that by 4 and determines highest line temp is 161 and average line temp is 119.75. Determines Temp Diff 161- 119 75 =		
*	5.1.2	IF temperature in each line is <120°F, AND temperature difference between highest and average line temp is <10°F, THEN RECORD Test Results in Attachment 1, Section 5.0.	41.25 . Determines highest temp is >120°F		

NAME:	

SYSTEM: AFW

TASK: Perform Auxiliary Feedwater Back Leakage Test

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.3	IF temperature in any line is ≥120°F AND <160°F, THEN: A. RECORD Auxiliary Feedwater System piping temperatures every hour in Control Room Narrative Log. B. RECORD Test Results in Attachment 1, Section 5.0.	Determines highest temp is >160°F		
*	5.1.4	IF temperature difference between highest and average line temp is >10°F, THEN RECORD Test Results in Attachment 1, Section 5.0.	Determines temperature difference between highest and average line temp is >10°F, and records Test Results in Attachment 1, Section 5.0., as UNSAT for all three categories.		
	5.1.6	IF temperature in any line is ≥160°F THEN: A. RECORD findings in Control Room Narrative Log. B. VENT Auxiliary Feedwater pumps/piping IAW Section 5.2.			

NAME: _____

SYSTEM: AFW

TASK: Perform Auxiliary Feedwater Back Leakage Test

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.2.1	 IF 11 Auxiliary Feedwater Pump and piping is affected, THEN: A. SLOWLY THROTTLE OPEN 11AF83, AF PUMP VENT, until a solid stream of water is observed. B. CLOSE 11AF83. C. SLOWLY THROTTLE OPEN 11AF114, AF PUMP DISCH VENT, until a solid stream of water is observed. D. CLOSE 11AF114. 	Locates and opens 11AF83, AF PUMP VENT, until a solid stream of water is observed. Cue: A solid stream of water is observed. Closes 11AF83 Locates and opens11AF114, AF PUMP DISCH VENT, until a solid stream of water is observed. Cue: A solid stream of water is observed. Closes 11AF114.		
			Terminate JPM		

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PSEG Restricted – Possession Requires Specific Approval from Nuclear Training Page 6 of 8

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

	1. Task description and number, JPM description and number are identified.
12	2/2. Knowledge and Abilities (K/A) references are included.
v J	3. Performance location specified. (in-plant, control room, or simulator)
2	2/4. Initial setup conditions are identified.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	5. Initiating and terminating Cues are properly identified.
v 2	6. Task standards identified and verified by SME review.
w 2	$2\sqrt{7}$ . Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
n J	$\frac{2}{2}$ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. $2$ Date $\frac{1}{6}$
2	<ul> <li>9. Pilot test the JPM:</li> <li>a. verify Cues both verbal and visual are free of conflict, and</li> <li>b. ensure performance time is accurate.</li> </ul>
	10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

HANGU SME/Instructor: BICKHART SME/Instructor SME/Instructor:

Date: <u>G</u>/30/16 Date: **9/3اد** 

Date: _____

#### JOB PERFORMANCE MEASURE

#### INITIAL CONDITIONS:

Unit 1 is operating at 100% power. 11 AFW pump was secured 30 minutes ago after its normally scheduled quarterly surveillance run.

#### **INITIATING CUE:**

You are directed to perform S1.OP-PT.AF-0002, Auxiliary Feedwater Backleage.

STATION:	SALEM				
SYSTEM:	Emergency Diesel Generator				
TASK:	ASK: Start and synchronize an Emergency Diesel Generator				
TASK NUMBER:	113 001 05 01				
JPM NUMBER:	15-01 NRC IP-k				
ALTERNATE PATH:		K/A NUMBER: 064 A2.09			
APPLICABILITY: EO		RO SRO			
EVALUATION SETTING	/METHOD: In Plant / Simulate				
REFERENCES: 2A	Diesel Generator Operation, S2.OP-	SO.DG-0001(Q)Rev. 39 (checked 8-5-16)			
TOOLS AND EQUIPME	NT: None				
VALIDATED JPM COM	PLETION TIME: 20 min				
TIME PERIOD IDENTIFI	ED FOR TIME CRITICAL STEPS:	N/A			
Developed By:	G Gauding Instructor	Date: 8-5-16			
Validated By:	S Bickhart / J Hancock SME or Instructor	Date: 9-30-16			
Approved By:	Training Department	Date: 10/10/10			
Approved By:	Operations Department	Date: 10/10/16			
ACTUAL JPM COMPLETION TIME:					
ACTUAL TIME CRITICAL COMPLETION TIME:					
PERFORMED BY: GRADE: SAT UNSAT					
REASON, IF UNSATISFACTORY:					
EVALUATOR'S SIGNAT	ſURE:	DATE:			
SYSTEM:
 EDG

 TASK:
 Start and synchronize an Emergency Diesel Generator

 TASK
 113 001 05 01

 NUMBER:
 Unit 2 is operating at 100% power, with no equipment OOS. Engineering has requested a loaded run of 2A EDG.

### **INITIATING CUE:**

The Unit 2 CRS has directed you to locally start and load 2A D/G IAW S2.OP-SO.DG-0001(Q), Section 5.2. & 5.4

Prerequisites, Precautions and Limitations, and Section 5.1, Diesel Generator Startup Checks have been performed.

### Successful Completion Criteria:

- 1. All critical steps completed.
- 2. All sequential steps completed in order.
- 3. All time-critical steps completed within allotted time.
- 4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:

Perform S2.OP-SO.DG-0001 Sections 5.2 and 5.4 in correct order and to completion.

SYSTEM:

Emergency Diesel Generator Locally start and load an Emergency Diesel Generator TASK:

*	STEP NO.         STEP (*Denotes a Critical Step)           Provide marked up copy of S2.OP- SO.DG-0001 2A Diesel Generator Operation		STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.2.1	<b>NOTIFY</b> NCO that 2A Diesel Generator is to be locally started.	Locates nearest page. <b>Cue:</b> NCO acknowledges.		
	5.2.2	<b>CHECK</b> voltage permissive indicator light 2DAE4-LT2, EDG VOLTAGE, on Generator Control Panel is OFF	Points out voltage permissive indicator light 2DAE4-LT2, EDG VOLTAGE, on Generator Control Panel.		
	5.2.3	<b>CHECK</b> speed permissive indicator light 2DAE4-LT3, EDG SPEED, on Generator Control Panel is OFF.	Points out speed permissive indicator light 2DAE4-LT3, EDG SPEED, on Generator Control Panel.		
*	5.2.4	IF 2A 4KV Vital Bus is currently energized, (Diesel Generator is to be parallel loaded), <u>THEN</u> : A. <b>PLACE</b> 2A-DF-GCP-1, 2A DIESEL GEN LOADING SW in MANUAL (DROOP). B. <b>ENSURE</b> B-9, GENERATOR LOADING IN DROOP MODE, is in alarm.	Points out 2A-DF-GCP-1, 2A DIESEL GEN LOADING SW., and simulates rotating to DROOP position. <b>Cue:</b> Annunciator B-9, Generator loading in Droop Mode annunciates.		

SYSTEM: TASK: Emergency Diesel Generator Locally start and load an Emergency Diesel Generator

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.2.5	PLACE 2A-DF-SS, 2A DG STOP/START SWITCH in START.	Points out 2A-DF-SS, 2A DG STOP/START SWITCH, and simulates placing in START.		
*	5.2.6	IF Diesel Generator Speed is <u>NOT</u> 900 rpm, <u>THEN</u> <b>SET</b> speed to 900 rpm using the SPEED CONTROL SWITCH (GS).	Cue: 2A Diesel is accelerating. Cue when Speed indicator is checked: Speed is 880 rpm. Points out SPEED CONTROL SWITCH (GS) and simulates turning in RAISE direction. Cue: 2A Diesel Speed is 900 rpm		
	5.2.7	<ul> <li><u>IF</u> 2AD1AX6D*, 2A Diesel Generator 125VDC breaker is closed, THEN:</li> <li><b>CHECK</b> voltage permissive indicator light 2DAE4-LT2, EDG VOLTAGE, on Generator Control Panel is ON.</li> <li><b>CHECK</b> speed permissive indicator light 2DAE4-LT3, EDG SPEED, on Generator Control Panel is ON.</li> </ul>	Points out voltage permissive indicator light 2DAE4-LT2, EDG VOLTAGE. <b>Cue:</b> Voltage permissive indicator light 2DAE4-LT2, EDG VOLTAGE Light is on Points out speed permissive indicator light 2DAE4-LT3, EDG SPEED <b>Cue:</b> Speed permissive indicator light 2DAE4-LT3, EDG SPEED light is on		

SYSTEM:

NAME: _____ DATE: _____

Emergency Diesel Generator Locally start and load an Emergency Diesel Generator TASK:

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.2.8	<ul> <li><u>IF</u> Field Ground Relay 64/G white indicating light is OFF, <u>AND</u> C-6, GENERATOR FIELD GROUND, is clear, <u>THEN</u>:         <ul> <li>A. <b>RESET</b> 64/G relay</li> <li>B. <b>ENSURE</b> 64/G white indicating light is illuminated.</li> </ul> </li> </ul>	Points out Field Ground Relay 64/G white indicating light. <b>Cue:</b> Field Ground Relay 64/G white indicating light is illuminated.		
	5.2.9	<b>ENSURE</b> 2A Diesel Generator K1C Field Flashing Relay Supervisory Light is OFF.	Points out 2A Diesel Generator K1C Field Flashing Relay Supervisory Light <b>Cue:</b> 2A Diesel Generator K1C Field Flashing Relay Supervisory Light is off.		
	5.2.10	RECORD the following Diesel Generator Start Readings:	Points out gages and switches to determine readings. Cue when proper gauge is pointed out : <u>2VM189</u> Gen. Volts - 4160 Volts on all 3 phases <u>2FM186</u> Gen. Frequency - 60 Hz <u>2PL6429</u> LO Hdr. Press - 80 psig <u>2PL6449</u> JW Hdr. Press - 45 psig <u>2PL6449</u> JW Hdr. Press - 45 psig <u>2PL7209</u> Air Manifold Press - 0 psig <u>2TA16524</u> Gen. Stator Temp - 187°		

SYSTEM: TASK:

Emergency Diesel GeneratorLocally start and load an Emergency Diesel Generator

*	STEP NO. STEP (*Denotes a Critical Step)		STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.2.11 <u>IF</u> 2A Diesel Generator is to be operated unloaded for an extended period of time(>30 minutes), <u>THEN</u> <b>INITIATE</b> Section 5.7, Diesel Generator Running Checks.		Cue: Diesel will be parallel loaded.		
	5.2.12	<u>IF</u> Diesel Generator is to be parallel loaded, <u>THEN</u> <b>INITIATE</b> Section 5.4, Diesel Generator Parallel Loading.	Initiates Section 5.4, Diesel Generator Parallel Loading.		
	5.4.1	IF Section 5.1 Diesel Generator Startup Checks, was <u>NOT</u> performed, <u>THEN</u> at 2A DG 4KV cabinet cubicle breaker 2AD1AX6D, <b>PLACE</b> selector switch 2A DG SYNC ENABLE in ENABLE.	Verifies Section 5.1 is complete.		
	5.4.2	<b>NOTIFY</b> NCO that 2A EDG is to be synchronized and loaded locally.	<b>Cue:</b> NCO acknowledges 2A DG is to be synchronized and loaded locally.		· · · · · · · · · · · · · · · · · · ·
	5.4.3	ENSURE 2A-DF-GCP-1, 2A DIESEL GEN LOADING SW, in MANUAL (DROOP)	Verifies 2A-DF-GCP-1, 2A DIESEL GEN LOADING SW, is in MANUAL (DROOP)		

**SYSTEM:** Emergency Diesel Generator

TASK: Locally start and load an Emergency Diesel Generator

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.4.4	ADJUST 2A EDG output voltage, as indicated on VOLTMETER-GEN (2VM189) to 50 - 100 Volts higher than that of 2A 4KV Vital Bus voltage, as indicated by VOLTMETER-BUS (2VM190), using the VOLTAGE CONTROL SWITCH (VCS).	<ul> <li>When operator points out 2VM189 and 2VM190, then Cue: 2VM189 reads 4150, and 2VM190 reads 4150.</li> <li>Points out VOLTAGE CONTROL SWITCH (VCS) and simulates going to RAISE.</li> <li>Cue: 2VM189 reads 4210, and 2VM190 reads 4150.</li> </ul>		
	5.4.5	<b>ENSURE</b> generator terminal voltage is present on all 3 phases by rotating VOLTMETER SWITCH - GEN (VS-G) through each position <u>AND</u> OBSERVING voltmeter 2VM189.	Points out VOLTMETER SWITCH - GEN (VS-G), simulates rotating through each position, while observing 2VM189 <b>Cue:</b> Voltage is present on all three phases.		
	5.4.6	<b>ENSURE</b> 2A 4KV Vital Bus voltage is present on all 3 phases by rotating VOLTMETER SWITCH - BUS (VS-B) through each position <u>AND</u> OBSERVING voltmeter 2VM190.	Points out VOLTMETER SWITCH - BUS (VS-B), simulates rotating through each position, while observing 2VM190 <b>Cue:</b> Voltage is present on all three phases.		

SYSTEM:

**TEM:** Emergency Diesel Generator

TASK:	Locally start and load an Emergency Diesel Generator
-------	------------------------------------------------------

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.4.7	<ul> <li>PLACE the following switches in "1-2":</li> <li>VOLTMETER SWITCH - GEN (VS-G)</li> <li>VOLTMETER SWITCH - BUS (VS- B)</li> </ul>	Points out VOLTMETER SWITCH - GEN (VS-G) and VOLTMETER SWITCH - BUS (VS-B) Cue: Switches are in 1-2.		
	5.4.8	ENSURE 2DAE4-LT2, EDG Voltage indication light is ON.	Points out 2DAE4-LT2, EDG Voltage indication light. <b>Cue:</b> 2DAE4-LT2, EDG Voltage indication light is on.		
	5.4.9	ENSURE 2DAE4-LT3, EDG Speed indication light is ON.	Points out 2DAE4-LT3, EDG Speed indication light. <b>Cue:</b> 2DAE4-LT2, EDG Voltage indication light is on.		
	5.4.10	<b>SYNCHRONIZE</b> 2A Diesel Generator to 2A 4KV Vital Bus as follows:			
*	5.4.10 A.	PLACE 2A-DF-SYNCH, 2A DG SYNC SWITCH (SS) to ON.	Points out 2A-DF-SYNCH, 2A DG SYNC SWITCH (SS), and simulates placing in ON position.		

SYSTEM: TASK:

**Emergency Diesel Generator** Locally start and load an Emergency Diesel Generator NAME: _____ DATE: _____

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.4.10 B.	ADJUST Diesel speed using the SPEED CONTROL SWITCH (GS) such that Synchroscope pointer rotates slowly in the FAST (clockwise) direction.	<ul> <li>When operator points out synchroscope, then Cue: Scope is going in the slow direction.</li> <li>Points out SPEED CONTROL SWITCH (GS)and simulates going to RAISE.</li> <li>Cue Synchroscope pointer rotating slowly in the FAST direction.</li> </ul>		
	5.4.10 C.	<b>ENSURE</b> the following four SYNC CHECK RELAY 25 UPPER AND LOWER VOLTAGE LIMIT LEDS are ON. "Upper Voltage Limit" "L OK" "B OK" "Lower Voltage Limit" "L OK" "B OK"	Points out four SYNC CHECK RELAY 25 UPPER AND LOWER VOLTAGE LIMIT LEDS. <b>Cue as each LED is located:</b> Light is on.		
	5.4.10 D.	<u>IF</u> the SYNC CHK RELAY 25 $\Delta$ F OK LED is OFF, <u>THEN</u> <b>ADJUST</b> 2A Diesel Generator speed using the SPEED CONTROL SWITCH (GS) until the $\Delta$ F OK LED is ON.	Points out SYNC CHK RELAY 25 ∆F OK LED. <b>Cue</b> Light is on <b>.</b>		
	5.4.10 E.	ENSURE DG SYNC PERMISSIVE green indicating light is ON each time the synchroscope indicator is near 12 o'clock position (+/- approximately 3 minutes), <u>AND</u> is OFF in any other position of the synchroscope.	<b>Cue</b> DG SYNC PERMISSIVE green indicating light is ON each time the synchroscope indicator is near 12 o'clock position (+/- approximately 3 minutes), <u>AND</u> is OFF in any other position of the synchroscope.		

SYSTEM:

: Emergency Diesel Generator

TASK:

SK: Locally start and load an Emergency Diesel Generator

*	STEP NO.	STEP (*Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.4.10 F	<b>COORDINATE</b> the following when the synchroscope is at "12 o'clock" (+zero, -2 minutes):			
		<ol> <li>CLOSE 2A-DF-GCP-3 GENERATOR CIRCUIT BREAKER SWITCH (BCS)</li> <li>RAISE 2A Diesel Generator load to ≥ 500KW using SPEED CONTROL SWITCH (GS) to prevent tripping the Diesel Generator Breaker on reverse power.</li> </ol>	<ul> <li>Points out 2A-DF-GCP-3 GENERATOR CIRCUIT BREAKER SWITCH (BCS) and simulates taking to the CLOSE position when the synch scope is at 12 o'clock.</li> <li>Cue 2A Diesel Generator Breaker has closed.</li> <li>Points out SPEED CONTROL SWITCH (GS) simulates going to RAISE while observing KW meter.</li> <li>Cue Load is 500 KW.</li> </ul>		
	5.4.10 G	PLACE 2A-DF-SYNCH, 2A DG SYNCH SWITCH (SS) to OFF.	Points out 2A-DF-SYNCH, 2A DG SYNCH SWITCH (SS), and simulates placing it in OFF position. <b>Cue:</b> JPM is complete.		

### JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

**NOTE:** All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

G	2.5.1. Task description and number, JPM description and number are identified.
4	5.5 2. Knowledge and Abilities (K/A) references are included.
4	2. Performance location specified. (in-plant, control room, or simulator)
4	2.4. Initial setup conditions are identified.
6	5. Initiating and terminating Cues are properly identified.
h	2 516. Task standards identified and verified by SME review.
6	2.5.7.7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
	3 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. 31 Date <u>9/30/16</u>
	9. Pilot test the JPM: a. verify Cues both verbal and visual are free of conflict, and b. ensure performance time is accurate.
	10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
	11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.
	SME/Instructor: Jem Hawach Date: 9/30/16

Buth BICHART SME/Instructor

Date: 9/30/16

SME/Instructor:

Date: _____

### **INITIAL CONDITIONS:**

Unit 2 is operating at 100% power, with no equipment OOS. Engineering has requested a loaded run of 2A EDG.

### **INITIATING CUE:**

The Unit 2 CRS has directed you to locally start and load 2A D/G IAW S2.OP-SO.DG-0001(Q), Section 5.2. & 5.4

Prerequisites, Precautions and Limitations, and Section 5.1, Diesel Generator Startup Checks have been performed.

Appendix D Scenario Outline Form ES-D-1						
Facility:       Scenario No.:       ESG-1       Op-Test No.:       15-01 NRC         Examiners:        Operators:						
Event No.	Malf. No.	Event Type*	Event Description			
1	PR0017A	l ALL	Controlling PZR level channel fails low (TS)			
2	RC0002	C ALL	RCS leak (TS)			
3	RC0002	M ALL	Small Break LOCA			
4	RP0342 RP0343	C CRS / RO	High Head ECCS isolation valves fail to open			
5	CB09 A DI KCB09ASE	C CRS / PO	SEC fails to reset			
6	RP318E1 RP318E2 AF0353A AF0353B	C CRS / PO	All AFW pumps fail to start			
7	RC0002	C CRS / RO	SBLOCA escalation after entering SI Termination procedure			
L						

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

# SIMULATOR EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:	15-01 NRC ESG-1
SCENARIO NUMBER:	15-01 NRC ESG-1
EFFECTIVE DATE:	See Approval Dates
EXPECTED DURATION:	60 minutes
<b>REVISION NUMBER:</b>	00
PROGRAM:	L.O. REQUAL
	STA
	OTHER

Revision Summary New issue for 15-01 ILOT NRC exam

PREPARED BY:	G Gauding	7-18-16
	Lead Regulatory Exam Author	Date
APPROVED BY:	Operations Training Manager	Date
APPROVED BY:	Facility Representative	<i>10   11   11.</i> Date

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SCAN OF SIGNED SCENARIO COVER SHEET

# OBJECTIVES

- A. Given the order or indications of a charging system malfunction, perform actions as the nuclear control operator to RESPOND to the loss or malfunction of the charging system in accordance with S2.OP-AB.CVC-0001.
- B. Given indication of a loss or malfunction of the Charging system DIRECT corrective action for a Charging System malfunction in accordance with S2.OP-AB.CVC-0001.
- C. Given the indications of a reactor coolant system (RCS) malfunction or leak, perform actions as the nuclear control operator to RESPOND to the malfunctioning accordance with S2.OP-AB.RC-0001.
- D. Given the indications of a reactor coolant system (RCS) malfunction or leak, DIRECT the response to the malfunction in accordance with S2.OP-AB.RC-0001.
- E. Given the order or indications of a reactor trip, perform actions as the nuclear control operator to RESPOND to the reactor trip in accordance with 2-EOP-TRIP-1.
- F. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with 2-EOP-TRIP-1.
- G. Given the order or indications of a safety injection, perform actions as the nuclear control operator to RESPOND to the safety injection in accordance with the approved station procedures.
- H. Given indication of a safety injection, DIRECT the response to the safety injection in accordance with the approved station procedures.
- I. Given a safety injection has occurred and inadequate ECCS flow exists, ALIGN equipment to obtain required ECCS flow in accordance with station procedures.
- J. Given the order or indications of a loss of coolant accident (LOCA), complete actions as the nuclear control operator to PERFORM the immediate response to the LOCA in accordance with the approved station procedures.
- K. Given indication of a loss of coolant accident (LOCA), DIRECT the immediate response to the LOCA in accordance with the approved station procedures.
- L. Given conditions that allow SI termination, perform actions as the nuclear control operator to TERMINATE safety injection in accordance with the approved station procedures.
- M.– Given conditions that allow SI termination, DIRECT the response to the safety injection termination in accordance with the approved station procedures.

II. MAJOR EVENTS

- A. Controlling PZR Level Channel fails low
- B. 20 gpm RCS leak
- C. 150 gpm SBLOCA
- D. SBLOCA escalation during SI termination

# III. SCENARIO SUMMARY

- A. The crew will take the watch with the unit at 100% power, MOL. PZR Pressure Channel III is selected for Control.
- B. After the crew assumes the watch, the controlling PZR level channel will fail low. CVCS Letdown will isolate, and the Master Flow Controller will raise charging flow. The crew will enter S2.OP-AB.CVC-0001, Loss of Charging. The crew will take manual control of charging flow and return PZR level to program. The crew will remove the failed channel from service. The crew will restore normal letdown. The CRS will identify Tech Specs.
- C. After the PZR level channel failure has been addressed, a 20 gpm RCS leak will occur. The crew will diagnose the leak. The crew will swap to a centrifugal charging pump and a 45 gpm orifice, and estimate the leak rate. The CRS will identify Tech Specs.
- D. After the crew has stabilized PZR level and the CRS has identified Tech Specs, the RCS leak will rise to 150 gpm. The crew will diagnose deteriorating primary conditions. When it is determined that PZR level will be unable to be maintained >11%, the crew will take the CAS action to trip the reactor and initiate Safety Injection.
- E. The crew will perform plant stabilization and diagnostics in EOP-TRIP-1, Reactor Trip or Safety Injection. The crew will identify no AFW flow. 2A SEC will not reset, and will require deenergization to start 21 AFW pump. The crew will establish at least 22E4 lbm/hr AFW flow. (CT#1)
- F. The crew will determine there is no High Head ECCS flow, and open the BIT Isolation Valves to establish High Head ECCS Injection (CT#2).
- G. The crew will transition to EOP-LOCA-1, Loss of Reactor Coolant when directed in TRIP-1.
- H. The crew will reset Safeguards in LOCA-1, and determine SI termination criteria are met to transition to EOP-TRIP-3, SI Termination.
- I. The crew will stop all but one Charging pump and align CVCS for normal charging. When evaluating the leak, the SBLOCA will get significantly larger. The crew will diagnose degrading conditions and take the CAS action to start ECCS pumps as necessary, and go to EOP-LOCA-2.
- J. The scenario will terminate when the transition to LOCA-2 has been made.

IV. INITIAL CONDITIONS

____ IC-231

 Initial
 Description

 1
 VC1and VC4 C/T

- 2 RCPs (SELF CHECK)
- ____ 3 RTBs (SELF CHECK)
- _____4 MS167s (SELF CHECK)
- _____ 5 500 KV SWYD (SELF CHECK)
- _____6 SGFP Trip (SELF CHECK)
- _____7 23 CV PP (SELF CHECK)
- 8 PZR Pressure Channel III selected for Control.
- 9 Complete Attachment 2 "Simulator Ready-for-Training/Examination Checklist."

Note: Tables with blue headings may be populated by external program, do not change column name without consulting Simulator Support group

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EVENT TRIGGERS:

Initial ET #	Description	
	EVENT ACTION:	
	COMMAND:	
	PURPOSE:	· · · · · · · · · · · · · · · · · · ·

M	ALFUNCTIONS:					
SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	PR0017A PZR LEVEL CH I (LT459) FAILS H/L	N/A	N/A	N/A	RT-1	0
02	RC0002 RCS LEAK INTO CONTAINMENT ( equiv to 0- 4 inches )	N/A	N/A	N/A	RT-3	20
03	RP0342 2SJ12 FAILS TO AUTO OPEN ON SEC	N/A	N/A	N/A	N/A	
04	RP0343 2SJ13 FAILS TO AUTO OPEN ON SEC	N/A	N/A	N/A	N/A	
05	RP318E1 Aux Feed Pump 21 Fails to Start on SEC	N/A	N/A	N/A	N/A	
06	RP318E2 Aux Feed Pump 22 Fails to Start on SEC	N/A	N/A	N/A	N/A	
07	AF0353A 21 AFP FAILURE TO AUTO START ON ANY (ALL) SIGNALS	N/A	N/A	N/A	N/A	
08	AF0353B 22 AFP FAILURE TO AUTO START ON ANY (ALL) SIGNALS	N/A	N/A	N/A	N/A	

RI	REMOTES:						
SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition	
01	DG01D DEENERGIZE "A" SEC CABINET	N/A	N/A	N/A	RT-9	YES	
02	SP01A1 Prevailing Wind Speed	N/A	N/A	N/A	N/A	10	
03	SP01A2 Prevailing Wind Direction	N/A	N/A	N/A	N/A	160	
04	MS05A 21MS45 21 STM GEN STM SUP-23 AFP	N/A	N/A	N/A	N/A	0	
05	MS06A 23MS45 23 STM GEN STM SUP-23 AFP	N/A	N/A	N/A	N/A	0	

OV	ERRIDES:					
SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	CB09 A DI KCB09ASE 2A SFGD EMER OPR-EMERG LOADING RESET	N/A	N/A	N/A	N/A	OFF

ОТ	HER CONDITIONS:
	Description

_____ 1.

,

# V. SEQUENCE OF EVENTS

- A. State shift job assignments.
- B. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).
- C. Inform the crew "The simulator is running. You may commence panel walkdowns at this time. CRS please inform me when your crew is ready to assume the shift".
- D. Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
1. Controlling PZR Level Channel Fails LOW			
Simulator Operator: Insert <u>RT-1</u> on direction from Lead Evaluator. MALF: PR0017A PZR LVL CH I (LT459) FAILS H/L Severity: 0			
	RO reports unexpected OHA E-36, PZR HTR OFF LVL LO.		
	RO diagnoses controlling PZR level channel failure.		
	RO may request permission to place the Master Flow Controller in manual prior to direction in AB.CVC to do so.		
	CRS enters S2.OP-AB.CVC-0001, Loss of Charging.		
	CRS directs initiation of Attachment 1 CAS.		
	RO reports charging pumps are running, and no indication of cavitation.		
	RO reports PZR level channel I has failed low.		
	If not previously performed, RO takes manual control of charging and maintains PZR level within band assigned by CRS.		
		1	

Ρ	а	g	е	1	0	of	27
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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
	RO selects operable channel for Control, Alarm, and Recorders.		
	RO restores PZR heaters to pre-event condition.		
	RO announces OHA E-20 PZR HTR ON LVL HI as expected when it annunciates due to no letdown with charging flow established.		
	<ul> <li>PO restores letdown by: <ul> <li>Ensuring open 2CV7</li> <li>Placing 2CV18 in manual and closing, then opening until close PB extinguishes.</li> <li>Opening 2CV2 and 2CV277, then placing both in auto.</li> <li>Ensuring charging flow is ~85-90 gpm.</li> <li>Opening a 75 gpm orifice isolation valve while adjusting 2CV18 to control letdown pressure ~300 psig.</li> <li>Placing 2CV18 in auto.</li> </ul> </li> </ul>		
	RO returns Master Flow Controller to auto when PZR level returns to program.		
	CRS contacts IC for assistance in removing channel from service.		
	CRS enter LCO 3.3.1.1 action 6.		
Proceed to next event after Tech Spec call at direction from Lead evaluator.			· , , ,

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
3. 20 gpm RCS leak			
Simulator Operator: Insert <u>RT-3</u> on direction from Lead Evaluator			
MALF: RC0002 – RCS Leak into Containment. Final Value: 20 gpm		·	
	RO reports that charging flow is rising (if MFC has been returned to auto) and PZR level is lowering slowly.		
	Crew reports reading on 2R11A containment radiation monitor is rising.		
	RO reports unexpected OHA C-2 CNTMT SUMP PMP START when it occurs.		
	CRS enters S2.OP-AB.RC-0001, Reactor Coolant System Leak.		
	CRS directs initiation of Attachment 1 CAS.		
	RO reports RCS temperature > 350°F in Mode 1.		
	RO reports PZR level is lowering.		
Note: PZR level is above program, and charging flow will be lower than normal to reduce PZR level. If charging flow is raised here to stabilize level, then step to place a centrifugal charging pump in			н <u>і</u> і

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
service may not be performed.		100	
	CRS enters S2.OP-AB.RAD-0001, Abnormal Radiation after OHA A-6 unexpected annunciation.		
	RO swaps to a centrifugal charging pump IAW Step 3.14, and raises charging flow to stabilize PZR level.		
	PO reduces letdown flow to minimum by opening 2CV3, maintaining letdown pressure ~300 psig with 2CV18 in manual, then closing the open 75 gpm orifice and returning 2CV18 to auto.		
	RO stabilizes PZR level and estimates leak rate.		
	CRS initiates S2.OP-ST.RC-0008, Reactor Coolant System Water Inventory Balance.		
	CRS contacts Rad Pro for recommendation on CFCU operation.		
<b>Role Play:</b> If contacted state Rad Pro recommends placing 2 CFCU's in Low Speed and 2 CFCU's in High Speed.			
	PO places 2 CFCU's in Low Speed and 2 CFCU's in High Speed.		· ÷ ·
	CRS initiates actions to locate and isolate the leak IAW Attachment 2.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LUG	
	CRS enters TSAS 3.4.7.2.b action b for RCS		
	leakage, and 3.6.1.4 for containment pressure		
	If it has reached 0.3 psig.		
Proceed to next event on direction from Lead Evaluator.			
3. SBLOCA			
Simulator Operator: MODIFY MALF RC0002 from 20 to 150 on direction from Lead Evaluator.			
	RO reports PZR level trending down and		
	adjusts charging flow to maintain PZR level.		
	RO reports PZR level will not be able to be maintained >17%.		
	CRS directs Rx trip and Safety Injection		
	RO trips the reactor and confirms the reactor trip.		
	RO initiates Safety Injection.		
	<ul> <li>RO continues Immediate Actions of TRIP-1</li> <li>Trips the Main Turbine</li> <li>Reports at least one 4KV vital bus energized.</li> <li>Reports SI initiated.</li> </ul>		· · · · · · · · · · · · · · · · · · ·
	CRS and RO verify performance of immediate actions.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		200	
4. AFW fails to initiate			
	PO reports SEC loading is not complete for 2A		-
	and 2B vital buses, 21 and 22 AFW pumps		
	started but is not providing any AFW flow.		
	PO blocks 24 and 28 SECs		
	NO DIOCKS ZA ANU ZB SECS.		
	PO resets 2A and 2B SECs.		
	PO reports 2A SEC will not reset.		
	CRS dispatches operator to deepergize 24		
	SEC.		
Simulator Operator: 2 minutes	· · · · · · · · · · · · · · · · · · ·		
after being dispatched, insert <u>RT-9</u> to deenergize 2A SEC.			
	RO starts 22 AFW pump.		
22E4 lbm/hr AFW flow to the			
SG's prior to a transition to			
FRHS-1 being required.			
SATUNSAT			
	PO reports AFW pump status, and starts 21		
	Arvy pump when ZA SEC is deenergized.		
	PO reports not all valve groups in Table B are		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	in safeguards position.		nen en son de l'entre de la contra de la contra de la contra contra de la segue de la contra de la contra de la
	PO reports 2SJ12 and 2SJ13 BIT isolation valves have not opened.		
	RO opens 2SJ12 and 2SJ13 and reports BIT flow is established.		
CT#2 (CT-6) Establish flow from at least one charging pump prior to transition out of TRIP-1.			
SAIUNSAI			
	RO reports 21 and 22CA330s are shut.		
	RO reports containment pressure has remained <15 psig.		
	PO reports no high steam flow condition.		
	CRS directs implementation of the ECG.		
	PO reports all 4KV vital buses energized.		
	RO reports CAV in AP mode.		
	RO reports 2 switchgear supply and one exhaust fan are running.		
	RO reports 2 or more CCW pumps running.		
	RO reports RCS not aligned for Cold Leg Recirc.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LUG	
	RO reports charging flow is at least 100 gpm		
	on SI systems charging flow meter.		
	RO reports RCS pressure is not <1540 psig.	· · · · · · · · · · · · · · · · · · ·	
	PO reports total AFW flow is 22F4 lbm/br or		
	9% level in at least one SG NR level, then maintains 19-33% level.		
	RO reports all RCPs running, and RCS		
	temperature is stable at or trending to 547°F.		
	RO reports both RTBs are open.		
	RO reports both PZR PORVs are shut with		
	their Block Valves open.		
	RO reports all RCPs in service and PZR spray		
	operating as expected for current plant conditions.		
	DO reporte DOS pressure >1250 paig and		
	maintains seal injection flow to all RCPs.		
	PO reports no indication of faulted SGs.		
	PO/RO report no indications of a steam		
	generator tube rupture.		
	RO reports radiation monitor channel status in Table F.		н. С
	PO reports 2 or more channels rising or in		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
	warning or alarm.	LUG	
	CRS transitions to EOP-LOCA-1, Loss of Reactor Coolant.		
<b>Note:</b> CFST monitoring will commence after the transition out of TRIP-1. STA will report to the control room 10 minutes after being paged.			
	PO reports no faulted SGs.		
	PO reports total AFW flow is 22E4 lbm/hr or 9% level in at least one SG NR level, then maintains 19-33% level.		
	PO reports no ruptured SGs.		
	RO resets SI, Phase A, and Phase B isolations.		
	RO opens 21 and 22CA330s.		
	PO resets 2C SEC, and reports 230V control centers reset.		
	RO resets SGBD Sample Isolation Bypass and opens 21-24SS94s.		
	CRS directs chemistry to sample SGs for activity and boron.		,
	RO reports PORVs are shut with Block valves open.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LOG	
	RO reports subcooling > 0°F.		
	PO reports AFW flow >22E4 lbm/hr or SG NR level >9%.		
	RO reports RCS pressure is stable or rising.	······	
	RO reports PZR level >11%.		
	CRS transitions to EOP-TRIP-3, SI Termination.		
	RO resets SI, Phase A, and Phase B isolations if not previously reset.		
	RO opens 21 and 22CA330s if not previously performed.		
	RO reports spray valves are not failed open.		
	PO resets 2C SEC and reports 230V control centers reset if not previously performed.		
	RO stops all but one charging pump.		
	RO reports RCS pressure is stable or rising.		
	RO reports charging pump suction is aligned to the RWST.		
	RO opens 2CV139 and 2CV140 if shut.		
	RO shuts BIT isolation valves 2SJ4, 2SJ5,		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LOG	
	2SJ12, 2SJ13.		
	RO shuts 2CV55 Charging Flow Control valve.		
	RO opens 2CV68 and 2CV69 Charging		
	Discharge valves.		
MALF RC0002 from 150 to 2000			
when 2000 and 2000 are open.	38		
	BO adjusts 2CV55 to maintain PZR level		
	>25%		
	RO reports PZR level is not stable or rising.		
	<b>X</b>		
	PO reports no faulted SGs.		
	RO opens BIT isolation valves 2SJ4,5,12,13,		
	and shuts normal charging line isolation valves		
	2CV68 and 69.		
	CRS goes to EOP-LOCA-2, Post LOCA		
	Cooldown and Depressurization.		
Terminete econorie en direction			
from Load Evaluator after the			
transition to $10CA_2$ is made			

# VI. SCENARIO REFERENCES

- A. Alarm Response Procedures (Various)
- B. Technical Specifications
- C. Emergency Plan (ECG)
- D. OP-AA-101-111-1003, Use of Procedures
- E. S2.OP-IO.ZZ-0004, Power Operation
- F. S2.OP-AQB.CVC-0001, Loss of Charging
- G. S2.OP-AB.RC-0001, Reactor Coolant System Leak
- H. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
- I. 2-EOP-TRIP-3, Safety Injection Termination
- J. 2-EOP-LOCA-1, Loss of Reactor Coolant
- K. 2-EOP-LOCA-2, Post LOCA Cooldown and Depressurization

### ATTACHMENT 1 UNIT TWO PLANT STATUS TODAY

 MODE:
 1
 POWER:
 100%
 RCS BORON:
 857
 MWe
 1220

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED):

NA REACTIVITY PARAMETERS

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

ABNORMAL PLANT CONFIGURATIONS: PZR Pressure Channel III is selected for Control

CONTROL ROOM:

Unit 1 and Hope Creek at 100% power. No penalty minutes in the last 24 hrs.

PRIMARY:

SECONDARY:

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

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# **ATTACHMENT 2**

### SIMULATOR READY FOR TRAINING CHECKLIST

- 1. Verify simulator is in "TRAIN" Load
- 2. Simulator is in RUN
- 3. Overhead Annunciator Horns ON
- 4. All required computer terminals in operation
- 5. Simulator clocks synchronized
- 6. All tagged equipment properly secured and documented
- _____ 7. TSAS Status Board up-to-date
- 8. Shift manning sheet available
- 9. Procedures in progress open and signed-off to proper step
- 10. All OHA lamps operating (OHA Test) and burned out lamps replaced
- 11. Required chart recorders advanced and ON (proper paper installed)
- 12. All printers have adequate paper AND functional ribbon
  - 13. Required procedures clean
- 14. Multiple color procedure pens available
- 15. Required keys available
- 16. Simulator cleared of unauthorized material/personnel
- 17. All charts advanced to clean traces and chart recorders are on.
- 18. Rod step counters correct (channel check) and reset as necessary
- 19. Exam security set for simulator
- 20. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter with Baseline Data filled out
- 21. Shift logs available if required
- ____ 22. Recording Media available (if applicable)
- 23. Ensure ECG classification is correct
- _____ 24. Reference verification performed with required documents available
- ____ 25. Verify phones disconnected from plant after drill.
- 26. Verify EGC paperwork is marked "Training Use Only" and is current revision.
- _____ 27. Ensure sufficient copies of ECG paperwork are available.

### ATTACHMENT 3

### **CRITICAL TASK METHODOLOGY**

In reviewing each proposed CT, the examination team assesses the task to ensure, that it is essential to safety. A task is essential to safety if, in the judgment of the examination team, the improper performance or omission of this task by a licensee will result in direct adverse consequences or in significant degradation in the mitigative capability of the plant. The examination team determines if an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance. If incorrect performance of a task by an individual necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

- I. Examples of CTs involving essential safety actions include those for which operation or correct performance prevents...
  - degradation of any barrier to fission product release
  - degraded emergency core cooling system (ECCS) or emergency power capacity
  - a violation of a safety limit
  - a violation of the facility license condition
  - incorrect reactivity control (such as failure to initiate Emergency Boration or Standby Liquid Control, or manually insert control rods)
  - a significant reduction of safety margin beyond that irreparably introduced by the scenario
- II. Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to...
  - effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.
  - recognize a failure or an incorrect automatic actuation of an ESF system or component.
  - take one or more actions that would prevent a challenge to plant safety.
  - prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation.



### SCENARIO IDENTIFIER: 15-01 ILOT NRC ESG-1 REVIEWER: C Recchione

- Initials Qualitative Attributes
- CR 1. The scenario has clearly stated objectives in the scenario.
- CR 2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue crew into expected events.
- CR 3. The scenario consists mostly of related events.
- CR 4. Each event description consists of:
  - the point in the scenario when it is to be initiated
  - the malfunction(s) that are entered to initiate the event
  - the symptoms/cues that will be visible to the crew
  - the expected operator actions (by shift position)
  - the event termination point
- CR 5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- CR 6. The events are valid with regard to physics and thermodynamics.
- CR 7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- CR 8. The simulator modeling is not altered.
- CR 9. All crew competencies can be evaluated.
- CR 10. The scenario has been validated.
- CR 11. If the sampling plan indicates that the scenario was used for training during the requalification cycle, evaluate the need to modify or replace the scenario.
- CR 12. ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.
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Initial		Quantitative Attributes (as per ES-301-4, and ES-301 Section D.5.d)
GG	3	Malfunctions after EOP entry: 1-2
GG	2	Abnormal Events: 2-4
GG	1	Major Transients: 1-2
GG	2	EOPs entered/requiring substantive actions: 1-2
GG	0	EOP contingencies requiring substantive actions: 0-2
GG	2	EOP based Critical tasks: 2-3

#### COMMENTS:



#### 15-01 NRC ESG-1

## CT#1 (CT-4) Establish the minimum required feed flow prior to a transition to FRHS-1 being required.

Basis: Failure to establish the required minimum feed flow rate under the postulated plant conditions, results in "adverse consequence(s) or significant degradation in the mitigative capability of the plant." Failure to perform the critical task represents a "demonstrated inability of the crew to:

- Take an action or combination of actions that would prevent a challenge to plant safety
- Recognize a failure / incorrect auto actuation of an ESF system or component."

### CT#2 (CT-6) Establish flow from at least one high-head ECCS pump before transition out of TRIP-1.

Basis: Failure to manually start at least one Charging pump under the postulated conditions constitutes misoperation or incorrect crew performance in which the crew does not prevent "degraded emergency core cooling system (ECCS) ... capacity." In this case, at least one Charging/SI pump (high-head SI pump for LP plants) can be manually started from the control room. Therefore, failure to manually start a Charging/SI pump (high-head SI pump for LP plants) also represents a failure by the crew to "demonstrate the following abilities:

- Effectively direct or manipulate engineered safety feature (ESF) controls that would prevent a significant reduction of safety margin beyond that irreparably introduced by the scenario
- Recognize a failure or an incorrect automatic actuation of an ESF system or component"

Additionally, under the postulated plant conditions, failure to manually start a Charging/SI pump (high-head SI pump for LP plants) (when it is possible to do so) is a "violation of the facility license condition."

Note to Evaluators: CT numbers in parentheses are the corresponding Westinghouse ERG Rev. 2- based Critical Task procedure WCAP-17711-NP

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#### ATTACHMENT 6

**ESG-PRA RELATIONSHIP EVALUATION** 

#### EVENTS LEADING TO CORE DAMAGE

<u>Y/N</u>	Event	<u>Y/N</u>	Event
Ν	TRANSIENTS with PCS Unavailable	Ν	Loss of Service Water
Ν	Steam Generator Tube Rupture	Ν	Loss of CCW
Ν	Loss of Offsite Power	N	Loss of Control Air
Ν	Loss of Switchgear and Pen Area Ventilation	Ν	Station Black Out
Y	LOCA		

### COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

<u>Y/N</u>	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR
Ν	Containment Sump Strainers	N	Gas Turbine
Ν	SSWS Valves to Turbine Generator Area	Ν	Any Diesel Generator
Ν	RHR Suction Line valves from Hot Leg	Y	Auxiliary Feed Pump
N	CVCS Letdown line Control and Isolation Valves	N	SBO Air Compressor

#### OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

- Y/N OPERATOR ACTION
- N Restore AC power during SBO
- N Connect to gas turbine
- N Trip Reactor and RCPs after loss of component cooling system
- N Re-align RHR system for re-circulation
- N Un-isolate the available CCW Heat Exchanger
- N Isolate the CVCS letdown path and transfer charging suction to RWST
- N Cooldown the RCS and depressurize the system
- N Isolate the affected Steam Generator that has the tube rupture(s)
- N Early depressurize the RCS
- N Initiate feed and bleed

Complete this evaluation form for each ESG.

Appendix D	Scenario Outline	Form ES-D-1
Facility: <u>SALEM 1 &amp; 2</u>	_ Scenario No.:ESG-2	Op-Test No.: <u>15-01 NRC</u>
Examiners:	Operators:	

Initial Conditions: 89.4% power, MOL. Xenon is building in at 25 pcm/hour. 2C EDG Jacket Water heater is C/T after failing yesterday.

Turnover: Power is reduced in preparation for performing Main Turbine Valve testing later in shift. Maintain current power.

Event No.	Malf. No.	Event Type*	Event Description
1	AN0266	C CRS	2C EDG Pre-lube pump failure (TS)
2	CN0117C	C CRS / PO	23 Condensate pump trip
3		R CRS/RO N PO	Downpower
4	SG0078A	C ALL	SGTL (TS)
5	SG0078A	M ALL	SGTR
6	RC0003C RC0003A	C ALL	23 RCP trip during cooldown
7	VL0123	C CRS / RO	PZR PORV fails to shut during RCS depressurization

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

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#### SIMULATOR EXAMINATION SCENARIO GUIDE

15-01 NRC ESG-2
15-01 NRC ESG-2
See Approval Dates
60 minutes
00
L.O. REQUAL
X INITIAL LICENSE
STA
OTHER

Revision Summary New issue for 15-01 ILOT NRC exam

PREPARED BY:	G Gauding	8-3-16
	Lead Regulatory Exam Author	Date
APPROVED BY:	MuFL	10/12/14
	Operations Training Manager	Daté
APPROVED BY:	Facility Representative	<i>16/11/16</i> Bate

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SCAN OF SIGNED SCENARIO COVER SHEET

#### I. OBJECTIVES

- A. Given a loss of a heater drain pump or condensate pump, take corrective action IAW S2.OP-AB.CN-0001.
- B. Given the order or indications of a feedwater or condensate system malfunction, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with S2.OP-AB.CN-0001.
- C. Given indication of a feedwater or condensate system malfunction, DIRECT the response to the malfunction in accordance with S2.OP-AB.CN-0001.
- D. Given a steam generator tube leak, take corrective action, IAW S2.OP-AB.SG-0001.
- E. Given the order or indications of a steam generator tube leak (SGTL), perform actions as the nuclear control operator to RESPOND to the tube leak in accordance with S1/S2.OP-AB.SG-0001.
- F. Given the order or indications of a steam generator tube leak (SGTL), DIRECT the response to the tube leak, in accordance with S2.OP-AB.SG-0001.
- G. Given the order or indications of a reactor trip, perform actions as the nuclear control operator to RESPOND to the reactor trip in accordance with 2-EOP-TRIP-1.
- H. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with 2-EOP-TRIP-1.
- Given the order or indications of a safety injection, perform actions as the nuclear control operator to RESPOND to the safety injection in accordance with the approved station procedures.
- J. Given indication of a safety injection, DIRECT the response to the safety injection in accordance with the approved station procedures.
- K. Given the order or indications of a steam generator tube rupture (SGTR), perform actions as the nuclear control operator to RESPOND to the tube rupture in accordance with the approved station procedures.
- L. Given indication of a steam generator tube rupture (SGTR), DIRECT the response to the SGTR in accordance with the approved station procedures.

#### II. MAJOR EVENTS

- A. 2C EDG Pre-lube pump failure (TS)
- B. 23 Condensate pump trip
- C. Power Reduction
- D. 21 SGTL / 21 SGTR
- E. Loss of Spray during RCS depressurization
- F. Stuck open PZR PORV during RCS depressurization

#### III. SCENARIO SUMMARY

- A. The crew will take the watch with the unit at 89.4% power, BOL. Power was reduced last shift in preparation for performing Main Turbine Valve testing later this shift. 2C EDG Jacket Water heater failed last shift. Condensate Polisher is in service.
- B. After the crew assumes the watch, the 2C EDG Pre-lube pump will fail. The CRS will identify 2C EDG is now inoperable, and enter the appropriate LCO. The CRS will initiate actions to ensure S2.OP-ST.500-0001, Electrical Power Systems AC Sources Alignment is performed within one hour.
- C. After the EDG failure has been addressed, 23 Condensate pump will trip. The crew will enter S2.OP-AB.CN-0001, Main Feedwater / Condensate System Abnormality, and perform actions to bypass the polisher and feedwater heaters strings as required to maintain SGFP suction pressure.
- D. The crew will perform a power reduction to ≤ 85% power and ensure SGFP suction pressure remains above 320 psig.
- E. During the power reduction, a SGTL will occur on 21 SG. The crew will enter S2.OP-AB.SG-0001, Steam Generator Tube Leak. The crew will perform actions to minimize the spread of secondary contamination and minimize the potential for steam release from the affected SG. The crew will isolate the steam supply to 23 AFW pump from 21 SG, and the CRS will identify 23 AFW is inoperable and enter the appropriate LCO.
- F. After the AFW pump LCO is identified, the SG tube will rupture. The crew will identify the SGTR, and initiate a Rx trip and Safety Injection based on the uncontrolled rise in 21 SG NR or WR level.
- G. The crew will perform plant stabilization and diagnostics in EOP-TRIP-1, Reactor Trip or Safety Injection. 21 AFW pump will trip shortly after starting. The crew will isolate AFW flow to and steam flow from 21 SG. (CT-1).
- H. The crew will transition to EOP-SGTR-1, Steam Generator Tube Rupture to address the tube rupture. The crew will perform a cooldown to target temperature and demonstrate the ability to maintain RCS temperature < Target temperature (CT-2). The crew will initiate a RCS depressurization. During the depressurization the RCP providing driving head for Spray flow will trip. The crew will open a PZR PORV to continue the depressurization. If 2PR1 is the selected PORV, it will not open, and 2PR2 will be used.
- I. The PZR PORV opened to depressurize the RCS will fail to shut when demanded after the depressurization is complete. The crew will attempt to terminate the depressurization by closing the PORV Block valve, which will not shut.
- J. The scenario will be terminated after the CRS transitions to EOP-SGTR-3, SGTR with LOCA Subcooled Recovery, to address the loss of RCS pressure with the stuck open PORV.

IV. INITIAL CONDITIONS

IC-232

 Initial
 Description

 1
 VC1and VC4 C/T

- 2 RCPs (SELF CHECK)
- _____ 3 RTBs (SELF CHECK)
- _____ 4 MS167s (SELF CHECK)
- ____ 5 500 KV SWYD (SELF CHECK)
- _____ 6 SGFP Trip (SELF CHECK)
- ____7 23 CV PP (SELF CHECK)
- 8 Complete Attachment 2 "Simulator Ready-for-Training/Examination Checklist."

Note: Tables with blue headings may be populated by external program, do not change column name without consulting Simulator Support group

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EVENT TRIGGERS:							
Initial	ET #	Description					
		EVENT ACTION:	MONP254 <10. //CONTROL BANK C GROUP POSITION				
	1	COMMAND:					
		PURPOSE:	<update as="" needed=""></update>				
		EVENT ACTION:	KB202LCI //2PR7 RELIEF VALVE-22 STOP VALVE				
	3	COMMAND:					
		PURPOSE:	<update as="" needed=""></update>				

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SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	AN0266 SER 266 FAILS - :J20 2C DIESEL GENERATOR URGENT TROUBLE	N/A	N/A	N/A	RT-1	SER POINT FAILS/OVRD TO ON
02	CN0117C 23 CONDENSATE PUMP TRIP	N/A	N/A	N/A	RT-3	
03	SG0078A 21 STEAM GENERATOR TUBE RUPTURE	N/A	N/A	N/A	RT-5	5
04	AN3735 AAS 735 FAILS - :21 TGA SUMP LEVEL HIGH	00:03:00	N/A	N/A	RT-11	AAS POINT FAILS/OVRD TO ON
05	AN3736 AAS 736 FAILS - :22 TGA SUMP LEVEL HIGH	00:03:10	N/A	N/A	RT-11	AAS POINT FAILS/OVRD TO ON
06	AN3737 AAS 737 FAILS - :23 TGA SUMP LEVEL HIGH	00:03:20	N/A	N/A	RT-11	AAS POINT FAILS/OVRD TO ON
07	AN3738 AAS 738 FAILS - :24 TGA SUMP LEVEL HIGH	00:03:30	NA	N/A	RT-11	AAS POINT FAILS/OVRD TO ON
08	AN3739 AAS 739 FAILS - :25 TGA SUMP LEVEL HIGH	00:03:50	N/A	N/A	RT-11	AAS POINT FAILS/OVRD TO ON
09	AF0181A 21 AUX FEEDWATER PUMP TRIP	00:04:00	N/A	N/A	ET-1	
10	VL0297 2PR1 Fails to Position ( 0-100% )	N/A	N/A	N/A	N/A	0
11	VL0298 2PR2 Fails to Position ( 0-100% )	N/A	N/A	N/A	RT-13	100
12	RC0003C 23 RC PUMP ELECTRICAL TRIP	N/A	N/A	N/A	RT-7	
13	RC0003A 21 RC PUMP ELECTRICAL TRIP	N/A	N/A	N/A	RT-9	
14	VL0123 2PR7 Fails to Position (0-100%)	N/A	N/A	N/A	ET-3	90

R	EMOTES:					
SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
01	SP01A1 Prevailing Wind Speed	N/A	N/A	N/A	N/A	10
02	SP01A2 Prevailing Wind Direction	N/A	N/A	N/A	N/A	160

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oV	ERRIDES:					
SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	C201 A LO QC201AY3 2C DIESEL GEN-TROUBLE ALARM	N/A	N/A	N/A	N/A	ON

TO	THER CONDITIONS:
	Description

1. None

#### V. SEQUENCE OF EVENTS

- A. State shift job assignments.
- B. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).
- C. Inform the crew "The simulator is running. You may commence panel walkdowns at this time. CRS please inform me when your crew is ready to assume the shift".
- D. Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
1. 2C EDG Pre-Lube pump failure			
Simulator Operator: Insert <u>RT-1</u> on direction from Lead Evaluator. MALF: AN0266 SER 266 Fails – J20 2C DIESEL GENERATOR URGENT TROUBLE			
<b>Role play:</b> 2 minutes after being dispatched call control room and report 2C EDG Alarm Window A-7 PRE-LUBE PUMP FAILURE is in alarm. You have checked the Pre-lube pump and it is NOT running.	PO announces unexpected OHA J-20, 2C DG URGENT TRBL. The crew refers to the ARP and dispatches an operator to investigate.		
The Pre-lube pump breaker remains shut.	CRS refers to S2.OP-SO.DG-0003, 2C Diesel Generator Operation and recognizes 2C EDG is now inoperable with the Jacket Water Heater and Pre-lube pump inoperable, and enters LCO 3.8.1.1.b, action b. CRS determines that S2.OP-ST.500-0001, Electrical Power Systems AC Sources Alignment must be performed within one hour		· · · · · · · · · · · · · · · · · · ·

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
	to demonstrate the operability of the	LOG	
	independent AC Sources (action b.1)		
Proceed to next event on direction			
from Lead Evaluator.			
2. 23 Condensate pump trip			
Simulator Operators losort PT-3			
on direction from Lead Evaluator.			
MALF:CN0117C 23 Condensate			
Parale to P			
	PO announces 23 Condensate pump trip.		
	CRS enters S2 OP-AB CN-0001 Main		
	Feedwater / Condensate System Abnormality.		1
	PO reports no SGEP tripped		
	Poliepolis no SGIT inpped.		
	PO reports 23 Condensate pump tripped.		
	PO bypasses condensate polisher by opening		
	21 thru 23 CN108 if SGFP suction pressure is		
	<320 psig.		
Role Play: If dispatched, after 3			
minutes report as NEO that you			
can't see anything wrong with 23			
4KV breaker, report after 2 minutes			
that there is an overcurrent relay			
nag dropped.			
	PO reports SGFP suction pressure.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
<b>Note</b> : Crew should discuss power increase expected when the CN47 is opened. (Note in AB.CN-1).	·····		
	CRS directs 2CN47 opened if suction pressure remains < 320 psig.		
•	PO isolates letdown by closing 21-24GB4 and 21-24GB185 if 2CN47 is open.		
,	CRS directs power reduction to 85% at ≤5%/min with 2 Condensate pumps and 3 Heater Drain pumps in service IAW Attachment 2.		
	CRS enters S2.OP-AB.LOAD-0001, Rapid Load Reduction, to perform the load reduction.		
	CRS directs initiation of AB.LOAD CAS.		
	RO calculates boron addition and rate for power reduction.		
	RO initiates boration.		
	PO initiates turbine load reduction to 85% at rate directed by CRS.		
	RO announces auto rod motion when it occurs.		
Proceed to next event on direction			

Evaluator/Instructor Activity

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
from Lead Evaluator.			
3. 21 SG Tube Leak			
Simulator Operator: Insert <u>RT-5</u> on direction from Lead evaluator. MALF: SG00078A 21 STEAM GENERATOR TUBE RUPTURE			
Severity: 5			
	RO reports unexpected OHA A-6 and identifies 2R53A 21 Main Steamline N2 monitor from CRT indication in alarm.		
	RO reports 2R53A level >1000 gpd.		
	CRS enters S2.OP-AB.SG-0001, Steam Generator Tube Leak, and S2.OP-AB.RAD- 0001, Abnormal Radiation.		
	RO reports OHA A-6 reflash is 2R15 Condenser Air Ejector monitor in alarm.		
	CRS directs initiation of AB.SG CAS.		
	RO reports when 2R19A is in warning and alarm.		
	PO reports when SGBD isolation occurs on high radiation.		
	CRS dispatches operator to isolate TGA and Condensate Polisher area sump pumps.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
Simulator Operator: When dispatched to isolate TGA and polisher building sumps, insert <u>RT-</u> <u>11</u> . This deenergizes 21-25 TGA sump pumps after a 3 minute time delay.			
	RO reports PZR level being maintained stable by rising charging flow.		
<b>Note:</b> Initial charging flow with stable PZR level is ~89 gpm. 23 charging pump will deliver ~99 gpm at full flow and seal injection of ~26 gpm. <u>IF</u> RO reports PZR level is lowering (due to lag in Master Flow control response,) then RO will swap to a centrifugal charging pump at Step 3.6.			
	RO reports PZR level can be maintained stable or rising.		
<b>Note:</b> SGBD will isolate ~2.5 minutes after 2R53D alarms. This will cause RCS temp and PZR level to rise.			
	PO reports when load reduction is complete.		
	RO reports unit 2 is in MODE 1.		4
	RO reports 21 SG is affected SG.		
	PO sets 21MS10 to 1045 psig, and ensures		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment	
	21GB4, 21MS18, and 21MS7 are shut.			
	CRS dispatches an operator to shut 21MS45 steam supply to 23 AFW pump.			
<b>Note:</b> Do <u>NOT</u> report the 21MS45 is shut until AFTER 23 AFW pump has been tripped at step 4.7 of SGTR-1.				
	CRS enters LCO 3.7.1.2 for less than 3 operable AFW pumps, and LCO 3.4.7.2.c for >150 gpd primary to secondary leakage though 21 SG.			
	CRS determines (Action Level 3) the unit must be less than 50% in less than one hour, the unit placed in Hot Standby within 6 hours.			
	CRS dispatches an operator to realign SGBD and Sampling.			
Proceed to next event on direction from Lead Evaluator after Tech Specs have been addressed.				
Simulator Operator: MODIFY MALF SG00078A from 5 to 650 on direction from Lead Evaluator.				
	RO reports indications of worsening tube leak/rupture, with lowering PZR level and pressure.			1
	CRS directs RO to trip the Rx, confirm the Rx			I

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
	trip, and initiate a Safety Injection, then enter TRIP-1.		
	RO trips the Rx, confirms the Rx trip, and initiates Safety Injection.		
Simulator Operator: Ensure <u>ET-1</u> is true when the rx is tripped. This trips 21 AFW pump after a 4 minute delay.			
	RO backs up the Main Turbine trip, reports 4KV vital buses energized, and reports SI manually initiated.		
	CRS and RO verify TRIP-1 immediate actions.	· · · · · · · · · · · · · · · · · · ·	
	PO receives CRS concurrence and isolates AFW to 21 SG by closing 21AF11 and 21AF21.		
CT#1 (CT-18) Isolate feed flow into (part 1) and steam flow from (part 2) 21 SG prior to a transition to SGTR-3 being required. (steam flow isolation will be performed on page 18)			
Part 1 SAT UNSAT			
	PO receives CRS concurrence and reduces total AFW flow to no less than 22E04 lbm/hr until at least one SG NR level is > 9%, then		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
	maintains NR levels 19-33%.	LUU	
	PO reports when 21 AFW pump trips, and adjusts flow from 22 and 23 AFW pumps as required based on current SG NR levels.		
<b>Note:</b> 21 AFW pp supplies 23/24 SGs 22 AFW pp supplies 21/22 SGs 23 AFW pump supplies all SGs			
Simulator Operator: Use REMOTE AF20 to OFF 2 minutes after being dispatched to remove control power from 21 AFW pump breaker.			
	PO reports all available equipment started on SEC loading.		
	PO reports which AFW pumps are running.		
	PO reports correct safeguards valve alignment.		
	RO reports 21 and 22CA330s are shut.		
	RO reports containment pressure remains less than 15 psig.		
	PO reports no indication of hi steam flow.		
	PO reports all 4KV vital buses energized.		
	RO reports ventilation systems lineups correct		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	for current plant conditions.		en en son son de son de la companya de la companya de son de la constantin de la companya de la companya de la La constantin de la companya de la companya de la constantin de la constantin de la companya de la companya de l
	RO reports at least 2 CCW pumps are running.		
	RO reports proper ECCS flow indicated for current plant conditions.		
	PO reports AFW status, and maintains at least 22E4 lbm/hr flow until at least one SG NR level is >9%, then maintains SG NR levels 19-33%.		
	RO reports RCP status, and RCS temperature stable at or trending to 547°.		
	RO reports both RTBs are open.		
	RO reports PZR PORVs are shut with Block valves open.		
	RO reports PZR spray status for current plant conditions.		
	RO reports RCS pressure is >1350 psig.		
	RO maintains seal injection flow to RCPs.		
	PO reports no SGs are faulted.		
	PO reports NR or WR level is rising in 21 SG.		
	CRS transitions to EOP-SGTR-1, Steam Generator Tube Rupture.		1

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
<b>Note:</b> STA will report to Control Room 10 minutes after being paged to report, and initiate monitoring of CFSTs.			
	RO maintains seal injection flow to all RCPs.		
	PO reports 21 SG is ruptured, and ensures 21MS10 is set at 1045 psig.		
	PO reports 21MS10 operating as expected for current pressure.		
	PO shuts 21MS167, and verifies 21MS7, 21MS18, and 21GB4 are shut.		
Note: These steps complete CT#1			
CT#1 (CT-18) Isolate feed flow into and steam flow from 21 SG prior to a transition to SGTR-3 being required. SATUNSAT			
	PO reports 21 SG is ruptured.		
	PO reports 23 AFW pump is not the only source of AFW.		
	PO ensures 23 AFW pump speed at minimum and trips 23 AFW pump.		
	CRS dispatches operator to shut 21MS45 if		ł

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
	not previously performed.	LOG	
	CRS dispatches operator to shut 2SS321 sample valve.		
	PO reports 21 SG is isolated from all intact SGs.		
	PO controls AFW flow if required to maintain 21 SG NR level >9%.		
	PO reports when 21MS10 opens for pressure control @ 1045 psig.		
	PO reports 21 SG pressure is >375 psig.		
	CRS determines target temperature from Table D. (503°F for ruptured SG pressure ≥1000 psig.)		
	PO reports intact SGs are available for cooldown.		
	PO reports steam dumps are available, and places in MS Pressure Control-Manual at 25% to perform cooldown.		
	PO bypasses Tavg when Tavg Low-Low is reached.		
	Crew monitors hottest CET temperature while continuing in procedure.		
<b>Note:</b> When hottest CET is <503°F, crew will stop cooldown with steps			1

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
on next page.			
	RO reports power is available to both PZR PORV Stop valves, both PZR PORVs are shut, and both PZR PORV Stop valves are open.		
	RO resets SI and Phase A isolation, and reports Phase B isolation reset.		
	RO opens 21 and 22CA330.		
	PO resets each SEC and reports 230V control centers are reset.		
	RO reports RHR suction is aligned to the RWST and no RHR pump discharge flow.		
	RO stops both RHR pumps.		
	PO reports 21 SG is ruptured and 21MS167 is shut.		
	RO shuts charging pump mini flows when RCS pressure is < 1500 psig.		
	RO reports when hottest CET is less than RCS cooldown target temp.		
	PO stops the cooldown and dumps steam to maintain RCS temp < target temp.		
CT#2 (CT-19) Establish and <u>maintain</u> an RCS temperature so that transition from SGTR-1 does			1

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
not occur because temperature is too high to maintain minimum subcooling, or so low it causes transition to FRTS or FRSM.			and and an and a shared and the bookspectra of the second and an and an address of the second and the second of
SATUNSAT			
	PO reports 21 SG pressure is stable or rising.		
	RO reports RCS subcooling >20 deg.		
	RO reports normal PZR spray is available.		
	RO fully opens both PZR Spray Valves.		
	RO reports PZR Spray is reducing RCS pressure.		
	Crew continues depressurization.		
Simulator Operator: Insert <u>RT-7</u> on direction from Lead Evaluator once RO reports spray effectiveness. MALF: 23 RCP trip			
	RO reports 23 RCP trip.		
Note: The crew is in a "do loop" when reducing RCS pressure using spray, and will return to Step 19.2	· · · · · · · · · · · · · · · · · · ·		
	RO reports with loss of 23 RCP, spray is no longer effectively reducing RCS pressure.		

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Expected Plant/Student Response	SBT	Comment
RO shuts both PZR Spray valves.		
RO reports both PZR PORVs are available.		
Crew reviews depressurization criteria.	-	
CRS directs RO to open only one PORV.		
IF 2PR1 is selected as the PORV to depressurize, RO reports 2PR1 will not open.		
RO opens 2PR2.		
RO reports when condition in Table E is met.		
RO reports 2PR2 will not shut.		
CRS directs closure of 2PR7 PZR PORV Block Valve.		
	Expected Plant/Student Response         RO shuts both PZR Spray valves.         RO reports both PZR PORVs are available.         Crew reviews depressurization criteria.         CRS directs RO to open only one PORV.         IF 2PR1 is selected as the PORV to depressurize, RO reports 2PR1 will not open.         RO opens 2PR2.         RO reports when condition in Table E is met.         RO reports 2PR2 will not shut.         CRS directs closure of 2PR7 PZR PORV Block Valve.	Expected Plant/Student Response       SBT LOG         RO       Shuts both PZR Spray valves.

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports that after initiating closed on 2PR7, the open limit extinguished but the closed limit has not illuminated.		
	RO reports RCS pressure is NOT rising.		
	CRS transitions to EOP-SGTR-3, SGTR with LOCA – Subcooled Recovery.		
Terminate the scenario when the transition to SGTR-3 is announced.			

#### VI. SCENARIO REFERENCES

- A. Alarm Response Procedures (Various)
- B. Technical Specifications
- C. Emergency Plan (ECG)
- D. OP-AA-101-111-1003, Use of Procedures
- E. S2.OP-IO.ZZ-0004, Power Operation
- F. S2.OP-SO.DG-0003, 2C Diesel Generator Operation
- G. S2.OP-ST.500-0001, Electrical Power Systems AC Sources Alignment
- H. S2.OP-AB.SG-0001, Steam Generator Tube Leak
- I. S2.OP-AB.LOAD-0001, Rapid Load Reduction
- J. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
- K. 2-EOP-SGTR-1, Steam Generator Tube Rupture

TQ-AA-106-0204 Page 25 of 31 **ATTACHMENT 1** UNIT TWO PLANT STATUS TODAY MODE: POWER: 89.4% RCS BORON: MWe 1080 1 1114 SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED): NA REACTIVITY PARAMETERS Control Bank D is at 193 steps. Xenon is building in at 25 pcm / hr following downpower last shift MOST LIMITING LCO AND DATE/TIME OF EXPIRATION: EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS: S2.OP-PT.TRB-0003, Main Turbine Valve testing is being briefed by a dedicated test team to be performed in one hour.

ABNORMAL PLANT CONFIGURATIONS: 2C EDG Jacket Water heater is failed and C/T.

#### CONTROL ROOM:

Unit 1 and Hope Creek at 100% power. No penalty minutes in the last 24 hrs.

#### PRIMARY:

#### SECONDARY:

Condensate Polisher is in service

#### RADWASTE:

No discharges in progress

#### CIRCULATING WATER/SERVICE WATER:

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#### **ATTACHMENT 2**

#### SIMULATOR READY FOR TRAINING CHECKLIST

- 1. Verify simulator is in "TRAIN" Load
- 2. Simulator is in RUN
- 3. Overhead Annunciator Horns ON
- 4. All required computer terminals in operation
- 5. Simulator clocks synchronized
- 6. All tagged equipment properly secured and documented
- 7. TSAS Status Board up-to-date
- 8. Shift manning sheet available
- 9. Procedures in progress open and signed-off to proper step
- 10. All OHA lamps operating (OHA Test) and burned out lamps replaced
- 11. Required chart recorders advanced and ON (proper paper installed)
- 12. All printers have adequate paper AND functional ribbon
  - 13. Required procedures clean
- 14. Multiple color procedure pens available
- 15. Required keys available
- 16. Simulator cleared of unauthorized material/personnel
- 17. All charts advanced to clean traces and chart recorders are on.
- 18. Rod step counters correct (channel check) and reset as necessary
- 19. Exam security set for simulator
- 20. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter with Baseline Data filled out
- 21. Shift logs available if required
- _____ 22. Recording Media available (if applicable)
- 23. Ensure ECG classification is correct
- 24. Reference verification performed with required documents available
- 25. Verify phones disconnected from plant after drill.
- 26. Verify EGC paperwork is marked "Training Use Only" and is current revision.
- 27. Ensure sufficient copies of ECG paperwork are available.

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#### **ATTACHMENT 3**

#### CRITICAL TASK METHODOLOGY

In reviewing each proposed CT, the examination team assesses the task to ensure, that it is essential to safety. A task is essential to safety if, in the judgment of the examination team, the improper performance or omission of this task by a licensee will result in direct adverse consequences or in significant degradation in the mitigative capability of the plant. The examination team determines if an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance. If incorrect performance of a task by an individual necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

- I. Examples of CTs involving essential safety actions include those for which operation or correct performance prevents...
  - degradation of any barrier to fission product release
  - degraded emergency core cooling system (ECCS) or emergency power capacity
  - a violation of a safety limit
  - a violation of the facility license condition
  - incorrect reactivity control (such as failure to initiate Emergency Boration or Standby Liquid Control, or manually insert control rods)
  - a significant reduction of safety margin beyond that irreparably introduced by the scenario
- II. Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to...
  - effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.
  - recognize a failure or an incorrect automatic actuation of an ESF system or component.
  - take one or more actions that would prevent a challenge to plant safety.
  - prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation.

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#### SCENARIO IDENTIFIER: 15-01 ILOT NRC ESG-2 REVIEWER: C Recchione

- Initials Qualitative Attributes
- CR 1. The scenario has clearly stated objectives in the scenario.
- CR 2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue crew into expected events.
- CR 3. The scenario consists mostly of related events.
- CR 4. Each event description consists of:
  - the point in the scenario when it is to be initiated
  - the malfunction(s) that are entered to initiate the event
  - the symptoms/cues that will be visible to the crew
  - the expected operator actions (by shift position)
  - the event termination point
- CR 5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- CR 6. The events are valid with regard to physics and thermodynamics.
- CR 7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- CR 8. The simulator modeling is not altered.
- CR 9. All crew competencies can be evaluated.
- CR 10. The scenario has been validated.
- CR 11. If the sampling plan indicates that the scenario was used for training during the regualification cycle, evaluate the need to modify or replace the scenario.
- CR 12. ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

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Initial		Quantitative Attributes (as per ES-301-4, and ES-301 Section D.5.d)
	-	
GG	2	Malfunctions after EOP entry: 1-2
GG	3	Abnormal Events: 2-4
GG	1	Major Transients: 1-2
GG	1	EOPs entered/requiring substantive actions: 1-2
GG	0	EOP contingencies requiring substantive actions: 0-2
GG	2	EOP based Critical tasks: 2-3

#### COMMENTS:

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15-01 ILOT NRC ESG-2

## CT#1 (CT-18) Isolate feed flow into and steam flow from 21 SG prior to a transition to SGTR-3 being required.

Basis: Failure to isolate the ruptured SG causes a loss of differential pressure between the ruptured SG and the intact SGs. The fact that the crew allows the differential pressure to dissipate and, as a result, are then forced to transition to a contingency ERG constitutes an incorrect performance that "necessitates the crew taking compensating action that would complicate the event mitigation strategy...."

# CT #2: (CT-19) Establish and <u>maintain</u> an RCS temperature so that transition from SGTR does not occur because temperature is too high to maintain minimum subcooling, or so low it causes transition to FRTS or FRSM.

Basis: Failure to establish and maintain the correct RCS temperature during a SGTR leads to a transition from E-3 to a contingency ERG. This failure constitutes an incorrect performance that "necessitates the crew taking compensating action that would complicate the event mitigation strategy...."

Note to Evaluator: CT numbers in parentheses are the corresponding Westinghouse ERG Rev. 2- based Critical Tasks procedure WCAP-17711-NP

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#### ATTACHMENT 6

#### ESG-PRA RELATIONSHIP EVALUATION

#### EVENTS LEADING TO CORE DAMAGE

<u>Y/N</u>	Event	<u>Y/N</u>	<u>Event</u>
Ν	TRANSIENTS with PCS Unavailable	Ν	Loss of Service Water
Y	Steam Generator Tube Rupture	N	Loss of CCW
N	Loss of Offsite Power	Ν	Loss of Control Air
N	Loss of Switchgear and Pen Area Ventilation	Ν	Station Black Out
Ν	LOCA		

#### COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

<u>Y/N</u>	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OF
Ν	Containment Sump Strainers	N	Gas Turbine
Ν	SSWS Valves to Turbine Generator Area	Y	Any Diesel Generator
Ν	RHR Suction Line valves from Hot Leg	Y	Auxiliary Feed Pump
Ν	CVCS Letdown line Control and Isolation Valves	N	SBO Air Compressor
	-		

#### OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

Y/N	OPERATOR ACTION

- N Restore AC power during SBO
- N Connect to gas turbine
- N Trip Reactor and RCPs after loss of component cooling system
- N Re-align RHR system for re-circulation
- N Un-isolate the available CCW Heat Exchanger
- N isolate the CVCS letdown path and transfer charging suction to RWST
- Y Cooldown the RCS and depressurize the system
- Y Isolate the affected Steam Generator that has the tube rupture(s)
- N Early depressurize the RCS
- N Initiate feed and bleed

Complete this evaluation form for each ESG.

Appendix	ppendix D Scenario Outline Form ES				
Facility: Examin	Facility:       Scenario No.:       ESG-3       Op-Test No.:       15-01 NRC         Examiners:        Operators:				
Initial C Turnov	onditions: 1x10 ⁻⁸	Amps during sta	artup at BOL. 25 CFCU C/T. 23 Charging pump C/T.		
Event No.	Malf. No.	Event Type*	Event Description		
1	PR0016A	I CRS / RO	Controlling PZR Pressure Instrument fails high (TS)		
2	RD0267	C CRS / RO	Dropped control rod (TS)		
3	MS0090Ar21	M ALL	Steam Rupture in containment on 21 SG during rod insertion		
4	RP0277A RP0277B MS0092E MS0092F MS0092G MS0092H	C ALL	ALL MSIVs fail to shut		
5	AF0181A	C CRS / PO	21 AFW pump trip		
6	RP318L1 RP318L2	C ALL	Containment Spray pumps fail to start		
# SIMULATOR EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:	15-01 NRC ESG-3
SCENARIO NUMBER:	15-01 NRC ESG-3
EFFECTIVE DATE:	See Approval Dates
EXPECTED DURATION:	60 minutes
REVISION NUMBER:	00
PROGRAM:	L.O. REQUAL
	STA
	OTHER

Revision Summary New issue for 15-01 ILOT NRC exam

8-11-16 **PREPARED BY:** G Gauding Date Lead Regulatory Exam Author 10 **APPROVED BY: Operations Training Manager** 'Date *lo|la-| IC* Date **APPROVED BY:** Facility Representative

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SCAN OF SIGNED SCENARIO COVER SHEET

# I. OBJECTIVES

- A. Given the order or indications of a pressurizer control system malfunction, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with S1/S2.OP-S2.OP-AB.PZR-0001.
- B. Given indication of a pressurizer control system malfunction, DIRECT the response to the malfunction in accordance with S2.OP-AB.PZR-0001.
- C. Given indication of a dropped control rod perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with S2.OP-AB.ROD-0002.
- D. Given indication of a dropped control rod DIRECT the response to the malfunction in accordance with S2.OP-AB.ROD-0002.
- E. Given the order or indications of a loss of secondary coolant, perform actions as the nuclear control operator to RESPOND to the coolant loss in accordance with EOP-LOSC-1.
- F. Given indication of a loss of secondary coolant, DIRECT the response to the loss of secondary coolant, in accordance with EOP-LOSC-1.
- G. Given the order or indications of a reactor trip, perform actions as the nuclear control operator to RESPOND to the reactor trip in accordance with 2-EOP-TRIP-1.
- H. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with 2-EOP-TRIP-1.
- Given the order or indications of a safety injection, perform actions as the nuclear control operator to RESPOND to the safety injection in accordance with the approved station procedures.
- J. Given indication of a safety injection, DIRECT the response to the safety injection in accordance with the approved station procedures.
- K. Given the order or indications of a multiple steam generator depressurization, perform actions as the nuclear control operator to RESPOND to the generator depressurization in accordance with EOP-LOSC-2.
- L. Given indication of a multiple steam generator depressurization, DIRECT the response to the generator depressurization in accordance with EOP-LOSC-2.

# II. MAJOR EVENTS

- A. Controlling PZR Pressure Instrument fails high
- B. Dropped control rod
- C. Steam Leak/Rupture in containment

III. SCENARIO SUMMARY

- A. The crew will take the watch with the unit stable at 1x10⁻⁸ Amps during a plant startup, BOL.
   21 SGFP is in service and 22 SGFP is O/S. Steam dumps are in MS Pressure Control Auto
   @ 1,000 psig. 25 CFCU is C/T for maintenance. 23 charging pump is C/T for emergent maintenance. The crew will be instructed to raise power to 2%.
- B. After assuming the watch and before the power ascension is started, the controlling PZR Pressure instrument will fail high, deenergizing PZR heaters and causing both PZR Spray valves to open fully. The crew will respond IAW S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction to establish manual control of PZR pressure control and restore pressure to normal, swap to an operable channel, and remove the failed channel from service. The CRS will identify applicable LCO's.
- C. After the Pressurizer Pressure control system failure has been addressed, a control rod will drop fully into the core. The crew will respond IAW S2.OP-AB.ROD-0002, Dropped Rod. The crew will identify the Rx is subcritical, and initiate control rod insertion to fully insert all Control and Shutdown rods. The CRS will identify applicable LCO's.
- D. During the rod insertion, a steam leak in containment will occur on 21 SG. The crew will diagnose changing containment conditions, and determine a Rx trip is required and MSLI will be required in an attempt to isolate the steam leak.
- E. The crew will trip the Rx. The steamline will rupture. MSLI (auto and manual) will fail to shut any MSIV. The crew will initiate Safety Injection when it is identified that the source of the steam leak is not isolated.
- F. The crew will perform plant stabilization actions in EOP-TRIP-1, Reactor Trip or Safety Injection. With all SGs faulted, the crew will maintain AFW flow to each SG. 21 AFW pump will trip during TRIP-1 performance. Containment Spray pumps will not automatically start when demanded on hi-hi containment pressure, and the crew will manually start at least one CS pump (CT-1). The crew will transition to EOP-LOSC-1, Loss of Secondary Coolant.
- G. The crew will transition to EOP-LOSC-2, Multiple Steam Generator Depressurization with all SG's faulted.
- H. The crew will identify the RCS cooldown rate of >100°F / hr, and control AFW flow to minimize RCS cooldown (CT-2). The crew will reset Safeguards. When evaluating SI Flow Reduction Criteria, local operators will successfully shut a MSIV. The crew will recognize rising pressure in that SG, and transition to LOSC-1.
- I. The scenario will be terminated upon transition to LOSC-1.

# IV. INITIAL CONDITIONS

_ IC-233

P	REP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)
Initial	Description
1	VC1and VC4 C/T
2	RCPs (SELF CHECK)
3	RTBs (SELF CHECK)
4	MS167s (SELF CHECK)
5	500 KV SWYD (SELF CHECK)
6	SGFP Trip (SELF CHECK)
7	23 CV PP (SELF CHECK)
8	21 Charging pump in service
9	25 CFCU C/T
10	23 Charging pump C/T
11	IOP-3 open and complete up to Section 4.3, Power Operation.
12	Complete Attachment 2 "Simulator Ready-for-Training/Examination Checklist."

Note: Tables with blue headings may be populated by external program, do not change column name without consulting Simulator Support group

	EVE	NT TRIGGERS:	
Initial	ET#	Description	
		EVENT ACTION:	MONP254 <10 // CONT ROD BANK C < 10 ( RX TRIP )
	1	COMMAND:	
		PURPOSE:	<update as="" needed=""></update>

MALFUNCTIONS:						
SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	PR0016A PZR PRESS CH I (PT455) FAILS H/L	N/A	N/A	N/A	RT-1	2500
02	RD0267 ANY ROD(S) INADVERTENTLY DROPS	N/A	N/A	N/A	RT-3	3
03	MS0090Ar 21 Main Steam Line Leak Inside Cont AFTER orifice	N/A	N/A	N/A	RT-5	2
04	RP0279A AUTO MSLIS FAILS TO ACT, TRN A	N/A	N/A	N/A	N/A	
05	RP0279B AUTO MSLIS FAILS TO ACT, TRN B	N/A	N/A	N/A	N/A	
06	MS0092E 21MS167 FAILS OPEN	N/A	N/A	N/A	N/A_	
07	MS0092F 22MS167 FAILS OPEN	N/A	N/A	N/A	N/A	
08	MS0092G 23MS167 FAILS OPEN	N/A	N/A	N/A	N/A	
09	MS0092H 24MS167 FAILS OPEN	N/A	N/A	N/A	N/A	
10	RP0274A AUTO SI FAILS TO ACT, TRN A	N/A	N/A	N/A	N/A	
11	RP0274B AUTO SI FAILS TO ACT, TRN B	N/A	N/A	N/A	N/A	
12	AF0181A 21 AUX FEEDWATER PUMP TRIP	00:05:00	N/A	N/A	ET-1	
13	RP318L1 21 CS Pump Fails to Start on SEC	N/A	N/A	N/A	N/A	
14	RP318L2 22 CS Pump Fails to Start on SEC	N/A	N/A	N/A	N/A	

REMOTES:						
SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
01	CV52D 23 CHG PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
02	PR34D PORV STOP VALVE 2PR6 TAGGED	N/A	N/A	N/A	RT-7	TAGGED
03	SP01A1 Prevailing Wind Speed	N/Å	N/A	N/A	N/A	10
04	SP01A2 Prevailing Wind Direction	N/A	N/A	N/A	N/A	160
05	CT195-1D 25 CFCU BKR #1 High Speed 125VDC	N/A	N/A	N/A	N/A	OFF
06	CT195-2D 25 CFCU BKR #2 High Speed 125VDC	N/A	N/A	N/A	N/A	OFF

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OV	ERRIDES:		128	Tur I		
SELF- CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	CI11 C LO QCI11HR2 TURNING GEAR-ENGAGED	N/A	N/A	N/A	N/A	ON
02	CI11 E LO QCI11PR2 TURNING GEAR-STARTED	N/A	N/A	N/A	N/A	ON
03	CI11 F LO QCI11TG2 TURNING GEAR-STOPPED	N/A	N/A	N/A	N/A	OFF
04	CI11 D LO QCI11LG2 TURNING GEAR-DISENGAGED	N/A	N/A	N/A	N/A	OFF

07	THER CONDITIONS:
	Description

____ 1. None

# V. SEQUENCE OF EVENTS

- A. State shift job assignments.
- B. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).
- C. Inform the crew "The simulator is running. You may commence panel walkdowns at this time. CRS please inform me when your crew is ready to assume the shift".
- D. Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LUG	
1. Controlling PZR pressure instrument fails HIGH			
Simulator Operator: Insert <u>RT-1</u> on direction from Lead Evaluator. MALF: MALF: PR0016A PZR Press CH I (PT-455) fails H/L Final Value: 2500			
	RO announces unexpected OHA alarms D-8 RC Press HI, and E-42 2PR1 ½ Trip.		
	RO determines actual pressure is not high and reports spray valves open, and recommends placing Master Pressure Controller in manual.		
	CRS directs RO to place Master Pressure Controller in manual.		
	RO takes manual control of Master Pressure controller, and lowers demand (increase pressure) to close sprays.		
	CRS enters S2.OP-AB.PZR-001, Pressurizer Pressure Malfunction.		
	CRS directs initiation of AB.PZR CAS.		
	CRS gives band for control of PZR pressure.		
	RO identifies PZR Press Channel I failed high.		
	RO selects Channel III for control.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LOG	
	RO matches master pressure controller		
	demand to current pressure and returns		
	Master Pressure Controller to A010.		
	RO shuts 2PR6.		
<b>Note:</b> The requirement to shut 2PR6 and deenergize it is within			
one hour of the PZR Pressure Channel I instrument failure IAW			
Tech Specs.			
	CRS directs WCC to remove power from		
	2PR6.		
Simulator Operator: Insert RT-7			
2 minutes after being directed to			
REMOTE: PR34D PORV Stop			1
Valve 2PR6 tagged			
	CRS directs PO to initiate removing failed		
	channel from service and contact I&C for		
	support IAW S2.OP-SO.RPS-003.		
	PO checks that tripping associated bistables		
	will not result in an ESF or RPS actuation.		
Note: Crew may wait for I&C			
response before performing any actions in S2.OP-SO.RPS-0003.			
	PO verifies that Channel III is selected for		
	Master Pressure Control.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LOG	
	PO selects PZR Pressure recorder to channel other than I.		
	CRS enters TSAS 3.3.1.1 Action 6, 3.3.2.1.b Action 19*, 3.4.5.b, and 3.2.5.		
Proceed to next event on direction from Lead Evaluator.			
2. Dropped control rod			
Simulator Operator: Insert <u>RT-3</u> on direction from Lead Evaluator.	1		
MALF: RD0064 ANY ROD INADVERTENTLY DROPS Severity: 3			
	RO reports unexpected OHA E-48 ROD BOTTOM, and reports Shutdown Bank rod 1SA3 rod bottom light is illuminated.		
	CRS enters S2.OP-AB.ROD-0002, Dropped Rod.		
	RO reports control rods are in manual.		
	PO reports Main Turbine is S/D.		
	RO reports the reactor is subcritical as a result of the dropped rod.		
	CRS directs RO to insert all control and shutdown bank rods.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
	interes and the well-conformation and the second state the line of the second s	LOG	
	RO initiates insertion of control rods in manual.		
Simulator Operator: Once rod insertion has commenced, insert <u>RT-5</u> on direction from Lead Evaluator MALF: MS0090Ar Severity: 2			
3. 21 SG steam leak / rupture in containment			
	PO announces OHA C-38, CFCU LK DET HI as unexpected, and shortly after, OHA C-30, CFCU LK DET HI-HI as well.		
	PO refers to ARP for OHA C-38 and C-30.		
	PO reports indications of a steam leak inside containment including: - Containment pressure rising - Tavg slowly lowering - Rising steam flows on all loops - Steam dump demand lowering		
	CRS enters S2.OP-AB.STM-0001, Excessive Steam Flow.		
	CRS directs monitoring of AB.STM CAS.		
	CRS notifies Emergency Services of the steam leak.		
	PO reports that the Main Turbine is not		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	latched.		n 1992 i sun de la companya da 1993 i sense de la companya de la companya de la companya de la companya de la Na la companya de la companya da 1993 i sense de la companya de la companya de la companya de la companya de la
	PO reports no indication of MS10 or steam dump valves malfunction.		
	RO reports no indication of a SG Safety Valve partially open or leaking.		
	RO reports Rx power and RCS temperature are NOT stable.	-	
	CRS directs the RO to trip the Rx.		
<b>Note:</b> A MSLI will be required to attempt to isolate the steam leak in containment. The CRS can use the CAS of AB.STM for direction, or will use Step 11 in TRIP-1 when containment pressure exceeds 15 psig. Auto and Manual MSLI are failed and will not actuate.			
Simulator Operator: After the Rx is tripped, then MODIFY MALF MS0090Ar to 100 with a 5 minute ramp.			
	RO trips the Rx and confirms the Rx trip.		
<b>Simulator Operator:</b> Ensure <u>ET-1</u> is true upon the Rx trip. This trips 21 AFW pump after a 5 minute delay.			
	IF using AB.STM CAS, then RO will attempt a		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
	MSLI, and reports it did not actuate.	LOG	
	<b>IF</b> using AB.STM CAS, RO reports the steam leak is NOT isolated.		
	<b>IF</b> using AB.STM CAS, RO initiates SI and begins performing TRIP-1 immediate actions.		
	<ul> <li>RO continues Immediate Actions of TRIP-1: <ul> <li>Reports the Main Turbine is tripped.</li> <li>Reports all 4KV vital buses are energized.</li> <li>Reports a demand for Safety Injection is present and Safety Injection has NOT actuated (or reports Safety injection was manually initiated as described in previous step).</li> </ul> </li> <li>RO initiates Safety Injection (if not previously performed.)</li> </ul>		
<b>Note:</b> With <u>all</u> SGs faulted, AFW flow should not be isolated to <u>any</u> SG.			
	PO reports SEC loading is not complete.		
	PO reports all available equipment started.		
	PO reports 21 and 22 AFW pumps are running, and if not previously performed, receives permission to throttle total AFW flow to no less than 22E4 lbm/hr.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LUG	
	PO reports valve groups in Table B are in Safeguards position.		
	RO reports 21 and 22CA330 are shut.		
	PO reports when 21 AFW pump trips, and adjusts AFW flow if required.		
	RO reports containment pressure has not remained less than 15 psig.		
	RO initiates Phase B and Spray actuation.		
	RO reports neither Containment Spray pump has started.		
	RO blocks 2A and 2C SECs.		
	PO resets 2A and 2C SEC's.		
	RO starts 21 and 22 CS pumps.		
CT#1 (CT-3) Manually start at least one Containment Spray pump before a red path challenge develops on the containment CSF.			
SATUNSAT			
	RO reports MSLI has failed to close any MSIV.		
	RO stops all RCPs.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
		LOG	
	RO reports MSLI has failed to close any MSIV.		
	CRS dispatches operators to place valves from Table D (locally close MSIVs) in safeguards position if not previously performed.		
	PO reports all 4KV vital buses are energized.		
	RO reports control room ventilation is in Accident Pressurized mode.		
	RO reports 2 switchgear supply and 1 exhaust fan are running.		
	RO reports 2 CCW pumps running.		
	RO reports ECCS flow as expected for current RCS pressure.		
	PO maintains total AFW flow greater than 22E4 lbm/hr until at least one SG NR level is >15% (adverse), then maintains SG NR level 19-33%.		
	RO reports no RCPs are running.		
	RO reports RCS Tcolds are dropping.		
	PO reports no dumping steam.		
	RO reports MSLI failed to isolate any MSIV.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports both RTBs are open.		
	RO reports both PZR PORVs are closed.		
	RO reports 2PR6 is shut, and 2PR7 is open.		
	CRS dispatches operator to restore power to 2PR6 if deenergized.		
	RO reports no RCPs are running.		
	RO maintains seal injection flow to all RCPs.		
	PO reports all SG pressures are dropping in an uncontrolled manner with MSLI failure.		
	CRS transitions to EOP-LOSC-1, Loss of Secondary Coolant.		
<b>Note:</b> CFSTs are in effect when transition out of TRIP-1 occurs. STA will report to control room 10 minutes after being summoned via page to monitor CFSTs.			
	RO reports MSLI failed to shut any MSIV, all MS7 and MS18 valves are shut, and action has been directed to locally shut MSIVs.		
	PO reports all SG pressures are dropping in an uncontrolled manner.		
	CRS transitions to EOP-LOSC-2, Multiple Steam Generator Depressurization.		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT	Comment
Note: 23 AFW pump may be left in service if it is determined it is necessary to maintain minimum AFW flow to keep SG tubes wet.	PO reports all valves in table A are shut except for all MSIVs. CRS dispatches operators, if not previously performed, to locally shut valves in Table A one loop at a time. CRS determines 23 AFW pump in service, and either stops 23 AFW pump or leaves it in service. IF required, PO lowers 23 AFW pump speed to minimum, trips then stops 23 AFW pump. IF required, CRS dispatches operator to shut 21 and 23MS45 steam supplies to 23 AFW pump. RO reports RCS cooldown rate is >100°F / hr. PO reduces AFW flow to each SG to no less than 1.0E4 lbm / hr.	LÖG	
CT#2 (CT-33) Control the AFW rate to not less than 1E4 lbm/hr to minimize the cooldown rate.			
	When STA reports RED path on Heat Sink,		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
na i len i dage da dela dela dela dela dela di la prove più i proven fighte dela dela di discontra di structura	CRS transitions to FRHS-1, verifies operator action was cause of RED path, and returns to procedure in effect.		na na manana kanana kanana kasa manana kasa manana kanana kanana kanana kanana kanana kanana kanana kanana kan Ana kanana kanana kanana kanana kasa manana kanana kanana kanana kanana kanana kanana kanana kanana kanana kana
	RO reports RCS Thots are dropping.		
	RO reports RCS pressure, and reports a cooldown is in progress or RCPs are secured.		
	RO reports both PZR PORVs are closed.		
	RO reports 2PR6 is shut, and 2PR7 is open.		
	RO resets SI, Phase A, and Phase B.		
	RO opens 21 and 22CA330.		
	PO reports all SECs are reset.		
	PO reports all 230V Control Centers reset.		
	RO resets SGBD Sample Isolation Bypass, and opens 21-24SS94s.		
	CRS directs Chemistry to sample SGs for activity and boron.		
	PO reports no indication of any SGTR.		
	RO reports RHR pumps running with suction from RWST, and no discharge flow.		
	RO reports RCS pressure is stable or rising, and stops both RHR pumps		

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports both CS pumps are running.		
	RO reports containment pressure.		
	<ul> <li>If/when containment pressure is &lt;13 psig,</li> <li>then RO:</li> <li>Resets Spray actuation</li> <li>Stops both CS pumps</li> <li>Shuts 21 and 22CS2 CS pump discharge valves</li> </ul>		
	RO reports RWST lo level alarm has not actuated.		
	RO reports RCS Thots status. IF <375, PO removes lockouts for 21-24SJ54's, and RO shuts 21-24SJ54's.		
	RO reports subcooling is >0°F.		
	RO reports RCS pressure and trend.		
	<ul> <li>RO reports RCS pressure is stable or rising and:</li> <li>Realigns charging pump through normal charging line and adjusts 2CV55 to maintain PZR level &gt;33%.</li> <li>Reports PZR level trend.</li> </ul>		
Simulator Operator: When Step 20 is complete then shut 23MS167 by deleting MALF MS0092G and ensuring 23MS167 shuts.			

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Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports indication of 23MS167 being shut.		
	CRS determines pressure rise in 23 SG requires transition to LOSC-1.		
	CRS transitions to LOSC-1.		
Terminate the scenario when the transition to LOSC-1 is announced.	· · · · · · · · · · · · · · · · · · ·		

# VI. SCENARIO REFERENCES

- A. Alarm Response Procedures (Various)
- B. Technical Specifications
- C. Emergency Plan (ECG)
- D. OP-AA-101-111-1003, Use of Procedures
- E. S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load
- F. S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction
- G. S2.OP-AB.ROD-0002, Dropped Rod
- H. S2.OP-AB.STM-0001, Excessive Steam Flow
- I. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
- J. 2-EOP-LOSC-1 Loss of Secondary Coolant
- K. 2-EOP-LOSC-2 Multiple Steam Generator Depressurization

#### ATTACHMENT 1 UNIT TWO PLANT STATUS TODAY

MODE: 1 POWER: 1x10⁻⁸ A RCS BORON: 1711 MWe 0

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED):

NA REACTIVITY PARAMETERS Control Bank D at 130 steps withdrawn. Core burnup 500 EFPH.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION: 3.6.2.3 for 25 CFCU action a expires in 165 hours.

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS: S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load complete up to Section 4.3, Power Operation.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Unit 1 and Hope Creek at 100% power.

#### PRIMARY:

21 Charging pump in service

23 Charging pump C/T for emergent repair, expected return in 2 hours

25 CFCU C/T for breaker replacement

#### SECONDARY:

21 SGFP in service22 SGFP O/S with steam supply valves shut

#### RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

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# ATTACHMENT 2

#### SIMULATOR READY FOR TRAINING CHECKLIST

- 1. Verify simulator is in "TRAIN" Load
- 2. Simulator is in RUN
- 3. Overhead Annunciator Horns ON
- 4. All required computer terminals in operation
- 5. Simulator clocks synchronized
- 6. All tagged equipment properly secured and documented
- 7. TSAS Status Board up-to-date
- 8. Shift manning sheet available
- 9. Procedures in progress open and signed-off to proper step
- 10. All OHA lamps operating (OHA Test) and burned out lamps replaced
- 11. Required chart recorders advanced and ON (proper paper installed)
- 12. All printers have adequate paper AND functional ribbon
  - 13. Required procedures clean
- 14. Multiple color procedure pens available
- 15. Required keys available
- 16. Simulator cleared of unauthorized material/personnel
- 17. All charts advanced to clean traces and chart recorders are on.
- 18. Rod step counters correct (channel check) and reset as necessary
- _____ 19. Exam security set for simulator
- 20. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter with Baseline Data filled out
- ____ 21. Shift logs available if required
- 22. Recording Media available (if applicable)
- 23. Ensure ECG classification is correct
- _____ 24. Reference verification performed with required documents available
- _____ 25. Verify phones disconnected from plant after drill.
- _____ 26. Verify EGC paperwork is marked "Training Use Only" and is current revision.
- 27. Ensure sufficient copies of ECG paperwork are available.

# ATTACHMENT 3

#### CRITICAL TASK METHODOLOGY

In reviewing each proposed CT, the examination team assesses the task to ensure, that it is essential to safety. A task is essential to safety if, in the judgment of the examination team, the improper performance or omission of this task by a licensee will result in direct adverse consequences or in significant degradation in the mitigative capability of the plant. The examination team determines if an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance. If incorrect performance of a task by an individual necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

- I. Examples of CTs involving essential safety actions include those for which operation or correct performance prevents...
  - degradation of any barrier to fission product release
  - degraded emergency core cooling system (ECCS) or emergency power capacity
  - a violation of a safety limit
  - a violation of the facility license condition
  - incorrect reactivity control (such as failure to initiate Emergency Boration or Standby Liquid Control, or manually insert control rods)
  - a significant reduction of safety margin beyond that irreparably introduced by the scenario
- II. Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to...
  - effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.
  - recognize a failure or an incorrect automatic actuation of an ESF system or component.
  - take one or more actions that would prevent a challenge to plant safety.
  - prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation.



SCEN	IARIO	IDENTIFIER: 15-01 NRC ESG-3 REVIEWER: C Recchione
Initials	, 1997 - 1997 - 1997 - 1997 5	Qualitative Attributes
CR CR	1. 2.	The scenario has clearly stated objectives in the scenario. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue crew into expected events.
CR CR	3. 4.	<ul> <li>The scenario consists mostly of related events.</li> <li>Each event description consists of:</li> <li>the point in the scenario when it is to be initiated</li> <li>the malfunction(s) that are entered to initiate the event</li> <li>the symptoms/cues that will be visible to the crew</li> <li>the expected operator actions (by shift position)</li> <li>the event termination point</li> </ul>
CR	5.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
CR CR	6. 7.	The events are valid with regard to physics and thermodynamics. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
CR CR CR CR	8. 9. 10. 11.	The simulator modeling is not altered. All crew competencies can be evaluated. The scenario has been validated. If the sampling plan indicates that the scenario was used for training during the
CR	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

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Initial		Quantitative Attributes (as per ES-301-4, and ES-301 Section D.5.d)
GG	2	Malfunctions after EOP entry: 1-2
GG	3	Abnormal Events: 2-4
GG	1	Major Transients: 1-2
GG	2	EOPs entered/requiring substantive actions: 1-2
GG	0	EOP contingencies requiring substantive actions: 0-2
GG	2	EOP based Critical tasks: 2-3

#### COMMENTS:

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15-01 NRC ESG-3

# CT#1 (CT-3) Manually actuate at least one Containment Spray pump before an extreme challenge develops to the containment CSF.

Basis: Failure to manually actuate the minimum required complement of containment cooling equipment under the postulated conditions demonstrates the inability of the crew to "recognize a failure or an incorrect automatic actuation of an ESF system or component."

#### CT#2 (CT-33) Control the AFW rate to not less than 1E4 lbm/hr to minimize the cooldown rate.

Basis: Failure to control the AFW flow rate to the SGs leads to an unnecessary and avoidable severe challenge to the integrity CSF. Also, failure to perform the critical task increases the challenges to the subcriticality and the containment CSFs beyond those irreparably introduced by the postulated plant conditions. Thus, failure to perform the critical task constitutes a demonstrated inability by the crew to "take one or more actions that would prevent a challenge to plant safety." It also fails to prevent "a significant reduction of safety margin beyond that irreparably introduced by the scenario."

Note to Evaluator: CT numbers in parentheses are the corresponding Westinghouse ERG Rev. 2- based Critical Tasks procedure WCAP-17711-NP

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#### ATTACHMENT 6

**ESG-PRA RELATIONSHIP EVALUATION** 

#### EVENTS LEADING TO CORE DAMAGE

<u>Y/N</u>	Event	<u>Y/N</u>	Event
Ν	TRANSIENTS with PCS Unavailable	Ν	Loss of Service Water
N	Steam Generator Tube Rupture	N	Loss of CCW
Ν	Loss of Offsite Power	Ν	Loss of Control Air
Ν	Loss of Switchgear and Pen Area Ventilation	N	Station Black Out
Ν	LOCA		

# COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR
Containment Sump Strainers	N	Gas Turbine
SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
RHR Suction Line valves from Hot Leg	Y	Auxiliary Feed Pump
CVCS Letdown line Control and Isolation Valves	Ν	SBO Air Compressor
	COMPONENT, SYSTEM, OR TRAIN Containment Sump Strainers SSWS Valves to Turbine Generator Area RHR Suction Line valves from Hot Leg CVCS Letdown line Control and Isolation Valves	COMPONENT, SYSTEM, OR TRAINY/NContainment Sump StrainersNSSWS Valves to Turbine Generator AreaNRHR Suction Line valves from Hot LegYCVCS Letdown line Control and Isolation ValvesN

#### OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

Y/N	OPERATOR ACTION

- N Restore AC power during SBO
- N Connect to gas turbine
- N Trip Reactor and RCPs after loss of component cooling system
- N Re-align RHR system for re-circulation
- N Un-isolate the available CCW Heat Exchanger
- N Isolate the CVCS letdown path and transfer charging suction to RWST
- N Cooldown the RCS and depressurize the system
- N Isolate the affected Steam Generator that has the tube rupture(s)
- N Early depressurize the RCS
- N Initiate feed and bleed

Complete this evaluation form for each ESG.